

## **Solicitation 12062-183**

### **FXE Administration Building Renovation P12188**

**Bid Designation: Public**



**City of Fort Lauderdale**

## Bid 12062-183

### FXE Administration Building Renovation P12188

Bid Number 12062-183  
 Bid Title FXE Administration Building Renovation P12188

Bid Start Date Oct 19, 2017 2:20:24 PM EDT  
 Bid End Date Nov 24, 2017 2:00:00 PM EST  
 Question & Answer End Date Nov 17, 2017 5:00:00 PM EST

Bid Contact Fausto Vargas  
 Procurement Specialist  
 Finance - Procurement Division  
 fvargas@fortlauderdale.gov

Contract Duration One Time Purchase  
 Contract Renewal Not Applicable  
 Prices Good for 120 days  
 Pre-Bid Conference Nov 9, 2017 10:00:00 AM EST  
 Attendance is optional  
 Location: Fort Lauderdale Executive Airport Administration Building  
 6000 NW 21st Avenue,  
 Fort Lauderdale, Florida 33309

Bid Comments **INVITATION TO BID**

Sealed bids will be received electronically until 2:00 p.m., local time, on Friday, November 24, 2017, and opened immediately thereafter in the 5th Floor Conference Room, City Hall, City of Fort Lauderdale, Florida, 100 North Andrews Avenue, Fort Lauderdale, Florida, 33301, for BID NO., 12062-183, PROJECT NO., 12188, FORT LAUDERDALE EXECUTIVE AIRPORT ADMINISTRATION BUILDING RENOVATIONS.

This project consists of Drawing File No., 4-140-42, Sixty-five (65) sheets.

The work includes, but is not limited to, renovations of the single-story Fort Lauderdale Executive Airport (FXE) Administration Building, including the construction of a new conference room and office spaces, new landscaping and irrigation, parking improvements, LED site lighting, replacement of the existing HVAC unit, new carpeting, paint, interior LED lighting, installation of covered canopies for parking areas, installation of car charging station, and renovations of the existing bathrooms.

The building renovations includes, but is not limited to, removal of A/C dry well, existing partitions, doors and frames, plumbing fixtures, flooring finish, light fixtures, HVAC diffuser, acoustical ceiling tiles. Installation of concrete foundations, concrete slabs, reinforced concrete, masonry walls, steel joists, metal roofing, membrane roofing and insulation, building insulation, hollow metal doors and frames, impact-resistant glazed aluminum storefront doors and windows, exterior stucco, carpet, vinyl, porcelain tile, resilient flooring, interior and exterior painting, miscellaneous specialty items, fire sprinkler system, mechanical cooling and ventilation system, plumbing fixtures and piping and electrical power and lighting systems.

Site work includes, but is not limited to, clearing and grubbing, curbing, landscaping, removal of pavement marking, roundabout circle, installation of canopies for parking areas, grading, sodding, installation of irrigation system, landscaping, pavement striping, site lighting, and colored, stamped concrete patio deck. Site work also includes installation of car charging station including, but not limited to, concrete pad, saw



cutting, epoxy grout, conduit, cabling, charging stations, and all materials and equipment for a complete working system.

The covered parking canopies and charging station are bid alternate quantities.

**NOTE: Payment on this contract will be made by Check.**

**Licensing Requirements:** Possession of a Broward County (Florida) General Engineered Construction Builder Contractor (GITS) License and/or one that is appropriately issued by the State of Florida is required for this project.

The bidder shall familiarize himself with Article 16 - Liquidated Damages, contained within the Construction Agreement.

**Pre-Bid Meeting/Site visit:** A pre-bid meeting and site visit will be held on **Thursday, November 9, 2017, at 10:00 a.m.,** local time, at Fort Lauderdale Executive Airport Administration Building, 6000 NW 21<sup>st</sup> Avenue, Fort Lauderdale, Florida 33309.

While attendance is not mandatory, it is strongly suggested that all Contractors attend the pre-proposal conference and site visit since tours at other times might not be available . It will be the sole responsibility of the bidder to inspect the City's location and become familiar with the scope of the City's requirements and systems prior to submitting a proposal. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a proposal will be considered evidence that the proposer has familiarized himself with the nature and extent of the work, equipment, materials, and labor required.

Bidding blanks may be obtained free of charge at BIDSINC.COM. Drawing Plans are on file in the Public Works Department, City of Fort Lauderdale at 100 North Andrews Avenue, 4<sup>th</sup> floor, (Monday thru Friday 8:00 am to 4:30 pm) at a NON-REFUNDABLE cost of \$50.00 (including sales tax per set) . Only cash or cashier's check made payable to the City of Fort Lauderdale are accepted.

It will be the sole responsibility of the bidder to ensure that his bid is submitted prior to the bid opening date and time listed. **PAPER BID SUBMITTALS WILL NOT BE ACCEPTED. BIDS MUST BE SUBMITTED ELECTRONICALLY VIA BIDSINC.COM**

**Bid Security** : A certified check, cashier's check, bank officer's check or bid bond for FIVE percent (5%) of the bid amount, made payable to the City of Fort Lauderdale, Florida, shall accompany each proposal.

**Bid Bonds:**

Bidders can submit bid bonds for projects four different ways:

BidSync allows bidders to submit bid bonds electronically directly through their system using Surety 2000 . For more information on this feature and to access it, contact BIDSINC customer care department.

Bidders may upload their original executed bid bond on BIDSINC to accompany their bids with the electronic proposal, and deliver, upon request, the original, signed and sealed hard copy within five (5) business days after bid opening, with the company name, bid number and title clearly indicated.

Bidders can hand deliver their bid bond in a sealed envelope to the Finance Department/Procurement Services Division, 100 North Andrews Avenue, Room 619, Fort Lauderdale, FL 33301-1016, before time of bid opening, with the company name, bid number and title clearly indicated on the envelope.

Bidders can mail their bid bond to the Finance Department/Procurement Services Division, 100 North Andrews Avenue, Room 619, Fort Lauderdale, FL 33301-1016, before time of bid opening, with the company name, bid number and title clearly indicated on the envelope.

**Certified Checks, Cashier's Checks and Bank Drafts**

These cannot be submitted via BIDSINC, nor are their images allowed to be uploaded and submitted with your electronic bid. These forms of securities, as well as hard copy bid bonds, must be received on or before the Invitation to Bid (ITB) opening date and time, at the Finance Department, Procurement Services Division, 100 North Andrews Avenue, Room 619, Fort Lauderdale, FL 33301-1016, with the bid number and title clearly indicated on the envelope.

It is the bidder's sole responsibility to ensure that his bid bond or other bid security is received by the Procurement Services Division before time of bid opening. Failure to adhere to this requirement may be grounds to consider the bid as non-responsive.

The City of Fort Lauderdale reserves the right to waive any informality in any or all bids and to reject any or all bids.

For information concerning technical specifications, please utilize the question/answer feature provided by BIDSYNC at [www.bidsync.com](http://www.bidsync.com). Questions of a material nature must be received prior to the cut-off date specified in the solicitation. Material changes, if any, to the scope of services or bidding procedures, will only be transmitted by written addendum. (See addendum section of BIDSYNC Site). **Contractors please note:** No part of your bid can be submitted via FAX. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the Contractor has familiarized himself with the nature and extent of the work, equipment, materials, and labor required. The entire bid response must be submitted in accordance with all specifications contained in this solicitation.

Information on bid results and projects currently out to bid can be obtained on the City's website – <http://www.fortlauderdale.gov/departments/finance/procurement-services>. For general inquiries, please call (954) 828-5239.

### Item Response Form

Item 12062-183--01-01 - Base Bid

Quantity 1 lump sum

Unit Price

Delivery Location City of Fort Lauderdale

[See ITB Specifications](#)

See ITB Specifications

Fort Lauderdale FL 33301

Qty 1

#### Description

Renovations of the single-story Fort Lauderdale Executive Airport (FXE) Administration Building, including the construction of a new conference room and office spaces, new landscaping and irrigation, parking improvements, LED site lighting, replacement of the existing HVAC unit, new carpeting, paint, interior LED lighting, and renovations of the existing bathrooms. The building renovations includes, but is not limited to, removal of A/C dry well, existing partitions, doors and frames, plumbing fixtures, flooring finish, light fixtures, HVAC diffuser, acoustical ceiling tiles. Installation of concrete foundations, concrete slabs, reinforced concrete, masonry walls, steel joists, metal roofing, membrane roofing and insulation, building insulation, hollow metal doors and frames, impact-resistant glazed aluminum storefront doors and windows, exterior stucco, carpet, vinyl, porcelain tile, resilient flooring, interior and exterior painting, miscellaneous specialty items, fire sprinkler system, mechanical cooling and ventilation system, plumbing fixtures and piping and electrical power and lighting systems. Site work includes, but is not limited to, clearing and grubbing, curbing, landscaping, removal of pavement marking, roundabout circle, installation of canopies for parking areas, grading, sodding, installation of irrigation system, landscaping, pavement striping, site lighting, and colored, stamped concrete patio deck.

Item 12062-183--01-02 - Bid Alternate 1

Quantity 1 lump sum

Unit Price

Delivery Location City of Fort Lauderdale

[See ITB Specifications](#)

See ITB Specifications

Fort Lauderdale FL 33301

Qty 1

#### Description

Furnishing and Installation of covered canopies for parking spaces including, but not limited to, mobilization, permits, concrete footings, columns, canopies, grout, and all materials and equipment for a complete work.

Item 12062-183--01-03 - Bid Alternate 2

Quantity 1 lump sum

Unit Price

Delivery Location City of Fort Lauderdale

[See ITB Specifications](#)

See ITB Specifications

Fort Lauderdale FL 33301

Qty 1

**Description**

Furnishing and Installation of a single pedestal mounted, dual head electric vehicle charging station including, but not limited to, concrete pad, saw cutting, epoxy grout, conduit, cabling, charging stations, 3-year service program, 1-year warranty, installation and maintenance software, and all materials and equipment for a complete working system. Units shall be similar to that currently in use by City of Fort Lauderdale.

Item 12062-183--01-04 - Allowance 1

Quantity 1 allowance

Unit Price

Delivery Location City of Fort Lauderdale

[See ITB Specifications](#)

See ITB Specifications

Fort Lauderdale FL 33301

Qty 1

**Description**

Labor allowance account to be used with verification and approval in writing by the City

Item 12062-183--01-05 - Allowance 2

Quantity 1 allowance

Unit Price

Delivery Location City of Fort Lauderdale

[See ITB Specifications](#)

See ITB Specifications

Fort Lauderdale FL 33301

Qty 1

**Description**

Material allowance account to be used with verification and approval in writing by the City

Item 12062-183--01-06 - Allowance 3

Quantity 1 allowance

Unit Price

Delivery Location City of Fort Lauderdale

[See ITB Specifications](#)

See ITB Specifications

Fort Lauderdale FL 33301

Qty 1

**Description**

Permit allowance account to be used with verification and approval in writing by the City

**CITY OF FORT LAUDERDALE  
CONTRACT AND SPECIFICATIONS PACKAGE**

**BID NO. 12062-183**

**PROJECT NO. 12188**

**FXE ADMINISTRATION BUILDING  
RENOVATIONS**



**FDOT FIN. Proj. No.: 440025-1-94-01 (Construction)**

**Issued on Behalf of: The Public Works Department  
100 North Andrews Avenue  
Fort Lauderdale, Florida 33301**

**Drawings and Specifications by:  
HDR Engineering, Inc.  
ACAI Associates, Inc.  
Delta Consulting Engineers, Inc.**

**FERNANDO BLANCO  
AIRPORT ENGINEER/PROJECT MANAGER II**

**FAUSTO VARGAS  
PROCUREMENT SPECIALIST I  
Telephone: (954) 828-6167 E-mail: [fvargas@fortlauderdale.gov](mailto:fvargas@fortlauderdale.gov)**

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**DESIGN TEAM**

1. **City Project Manager:** Fernando Blanco  
**City of Fort Lauderdale**  
100 N. Andrews Avenue  
Fort Lauderdale, Florida 33301
  
2. **Civil Engineer:** Cody T. Parham, P.E., FL. Lic. No. 73904  
**HDR Engineering, Inc.**  
3250 West Commercial Blvd., Suite 100  
Fort Lauderdale, Florida 33309
  
3. **Landscape Architect:** Thomas White, A.S.L.A., FL Lic. No. 1100  
**City of Fort Lauderdale**  
100 N. Andrews Avenue  
Fort Lauderdale, Florida 33301
  
4. **Project Architect:** Adolfo Cotilla  
FL. Lic. No. AR-0008011  
**ACAI Associates, Inc.**  
2937 W. Cypress Creek Rd., Suite 200  
Fort Lauderdale, Florida 33309
  
5. **Mechanical Engineer:** George Sanjuan, P.E., FL. Lic. No. 46100  
**Delta G Consulting Engineers, Inc.**  
707 N.E. 3<sup>rd</sup> Ave., Suite 200  
Fort Lauderdale, Florida 33304

**DESIGN TEAM (continued)**

6. **Plumbing Engineer:** George Sanjuan, P.E., FL. Lic. No.46100  
**Delta G Consulting Engineers, Inc.**  
707 N.E. 3<sup>rd</sup> Ave., Suite 200  
Fort Lauderdale, Florida 33304
  
7. **Electrical Engineering:** George Sanjuan, P.E., FL. Lic. No.46100  
**Delta G Consulting Engineers, Inc.**  
707 N.E. 3<sup>rd</sup> Ave., Suite 200  
Fort Lauderdale, Florida 33304
  
8. **Fire Protection Engineering:** George Sanjuan, P.E., FL. Lic. No.46100  
**Delta G Consulting Engineers, Inc.**  
707 N.E. 3<sup>rd</sup> Ave., Suite 200  
Fort Lauderdale, Florida 33304
  
9. **Structural Engineering:** M. Eric Martin, P.E., FL. Lic. No. 73675  
**HDR Engineering, Inc.**  
3250 West Commercial Blvd., Suite 100  
Fort Lauderdale, Florida 33309



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**Note: The following documents are available electronically for completion.**

- Attachment 1 - Construction Bid Certification
- Attachment 2 - CITB Questionnaire Sheets
- Attachment 3 - CITB Prime Contractor ID Form
- Attachment 4 - CITB Non-Collusion Statement
- Attachment 5 - CITB Non-Discrimination Certification Form
- Attachment 6 - Local Price Preference Certification

These documents must be returned with your bid along with your bid security, proof of insurance, and proof of required licenses/certifications.

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Sealed bids will be received electronically until 2:00 p.m., local time, on **Friday, November 24, 2017**, and opened immediately thereafter in the 5th Floor Conference Room, City Hall, City of Fort Lauderdale, Florida, 100 North Andrews Avenue, Fort Lauderdale, Florida, 33301, for **BID NO., 12062-183, PROJECT NO., 12188, FORT LAUDERDALE EXECUTIVE AIRPORT ADMINISTRATION BUILDING RENOVATIONS.**

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**Bid Bonds:**

Bidders can submit bid bonds for projects four different ways:

- 1) BidSync allows bidders to submit bid bonds electronically directly through their system using **Surety 2000**. For more information on this feature and to access it, contact BIDSYNC customer care department.
- 2) Bidders may **upload** their original executed bid bond on BIDSYNC to accompany their bids with the electronic proposal, and deliver, upon request, the original, signed and sealed hard copy within five (5) business days after bid opening, with the company name, bid number and title clearly indicated.
- 3) Bidders can **hand deliver** their bid bond in a sealed envelope to the Finance Department/Procurement Services Division, 100 North Andrews Avenue, Room 619, Fort Lauderdale, FL 33301-1016, before time of bid opening, with the company name, bid number and title clearly indicated on the envelope.
- 4) Bidders can **mail** their bid bond to the Finance Department/Procurement Services Division, 100 North Andrews Avenue, Room 619, Fort Lauderdale, FL 33301-1016, before time of bid opening, with the company name, bid number and title clearly indicated on the envelope.

**Certified Checks, Cashier's Checks and Bank Drafts**

These **cannot** be submitted via BIDSYNC, nor are their images allowed to be uploaded and submitted with your electronic bid. These forms of securities, as well as hard copy bid bonds, must be received on or before the Invitation to Bid (ITB) opening date and time, at the Finance Department, Procurement Services Division, 100 North Andrews Avenue, Room 619, Fort Lauderdale, FL 33301-1016, with the bid number and title clearly indicated on the envelope.

It is the bidder's sole responsibility to ensure that his bid bond or other bid security is received by the Procurement Services Division before time of bid opening. Failure to adhere to this requirement may be grounds to consider the bid as non-responsive.

The City of Fort Lauderdale reserves the right to waive any informality in any or all bids and to reject any or all bids.



For information concerning technical specifications, please utilize the question/answer feature provided by BIDSYNC at [www.bidsync.com](http://www.bidsync.com). Questions of a material nature must be received prior to the cut-off date specified in the solicitation. Material changes, if any, to the scope of services or bidding procedures, will only be transmitted by written addendum. (See addendum section of BIDSYNC Site). **Contractors please note:** No part of your bid can be submitted via FAX. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the Contractor has familiarized himself with the nature and extent of the work, equipment, materials, and labor required. The entire bid response must be submitted in accordance with all specifications contained in this solicitation.

Information on bid results and projects currently out to bid can be obtained on the City's website – <http://www.fortlauderdale.gov/departments/finance/procurement-services>. For general inquiries, please call (954) 828-5239.

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## **INSTRUCTIONS TO BIDDERS**

The following instructions are given for the purpose of guiding bidders in properly preparing their bids or proposals. These directions have equal force and weight with the specifications and strict compliance is required with all of these provisions.

**QUALIFICATIONS OF BIDDERS** – No proposal will be accepted from, nor will any contract be awarded to, any person who is in arrears to the CITY OF FORT LAUDERDALE, upon any debt or contract, or who has defaulted, as surety or otherwise, upon any obligation to the City, or who is deemed irresponsible or unreliable by the City Commission of Fort Lauderdale.

**PERSONAL INVESTIGATION** - Bidders shall satisfy themselves by personal investigation, and by such other means as they may think necessary or desirable, as to the conditions affecting the proposed work and the cost. No information derived from maps, plans, specifications, or from the Engineer, City Manager, or their assistants shall relieve the Contractor from any risk or from fulfilling all terms of the contract.

**INCONSISTENCIES** – Any seeming inconsistency between different provisions of the plans, specifications, proposal or contract, or any point requiring explanation must be inquired into by the bidder, in writing, at least ten (10) days prior to the time set for opening proposals. After proposals are opened, the bidders shall abide by the decision of the Engineer as to such interpretation.

**ADDENDA AND INTERPRETATIONS** - No interpretations of the meaning of the plans, specifications or other contract documents will be made orally to any bidder. Prospective bidders must request such interpretation in writing as instructed in the bid package. To be considered, such request must be received by the Questions and Answers deadline as indicated in BIDSYNC.COM. Material changes, if any, to the scope of services or bidding procedures will only be transmitted by written addendum. **It is the bidder's responsibility to verify if addendums have been issued in BIDSYNC.COM.** Failure of any bidder to receive any such addenda or interpretation shall not relieve any bidder from any obligation under his bid as submitted. All addenda so issued shall become a part of the contract document. **Bidder** shall verify **in BIDSYNC.COM** that he has all addenda before submitting a bid.

**LEGAL CONDITIONS** - Bidders are notified to familiarize themselves with the provisions of the laws of the State of Florida relating to hours of labor on municipal work, and with the provisions of the laws of the State of Florida and the Charter and the ordinances of the City of Fort Lauderdale.

**PUBLIC ENTITY CRIMES** - A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a Contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, Florida Statutes, for CATEGORY TWO for a period of thirty-six (36) months from the date of being placed on the convicted vendor list.

**FORMS OF PROPOSALS** - Each proposal and its accompanying statements must be made on the blanks provided. **THE FORMS MUST BE SUBMITTED ELECTRONICALLY, IN GOOD ORDER WITH ALL BLANKS COMPLETED**, and must show the name of the bidder and a statement as to its contents.

**FORMS OF PROPOSALS (CONTINUED)** - The proposal must be signed by one duly authorized to do so, and in case signed by a deputy or subordinate, the principal's properly written authority to such deputy or subordinate must accompany the proposal. No proposal will be accepted, for any reason whatsoever, which is not submitted to the City as stated above, within the specified time.

**INSURANCE** - Contractor shall provide and shall require all of its sub-contractors to provide, pay for, and maintain in force at all times during the term of the Agreement, such insurance, including Property Insurance (Builder's Risk), Commercial General Liability Insurance, Business Automobile Liability Insurance, Workers' Compensation Insurance, Employer's Liability Insurance, and Umbrella/Excess Liability, as stated below. Such policy or policies shall be issued by companies authorized to do business in the State of Florida and having agents upon whom service of process may be made in the State of Florida.

**BID BOND** - A certified check, cashier's check or bank officer's check, for the sum set forth in the advertisement, made payable to the City of Fort Lauderdale, Florida, or bid bond in such amount, shall accompany each proposal as evidence of the good faith and responsibility of the bidder. The check or bond shall be retained by the City as liquidated damages should the bidder refuse to or fail to enter into a contract for the execution of the work embraced in this proposal, in the event the proposal of the bidder is accepted. Retention of such amount shall not be construed as a penalty or forfeiture.

The above bond or check shall be a guarantee that the bidder will, if necessary, promptly execute a satisfactory contract and furnish good and sufficient bonds. As soon as a satisfactory contract has been executed and the bonds furnished and accepted, the check or bond accompanying the proposal of the successful bidder will be returned to him. The certified or other checks or bid bonds of the unsuccessful bidders will be returned to them upon the acceptance of the bid of the successful bidder. If the successful bidder shall not enter into, execute, and deliver such a contract and furnish the required bonds within ten (10) days after receiving notice to do so, the certified or other check or bid bond shall immediately become the property of the City of Fort Lauderdale as liquidated damages. Retention of such amount shall not be construed as a penalty or forfeiture.

**FILLING IN BIDS** - All prices must be electronically submitted in the proposal pages, and all proposals must fully cover all items for which proposals are asked and no other. Bidders are required to state the names and places of residence of all persons interested, and if no other person is interested, the bidder shall distinctly state such fact and shall state that the proposal is, in all respects, fair and without collusion or fraud. Where more than one person is interested, it is required that all persons interested or their legal representative make all verification and subscribe to the proposal.

**PRICES QUOTED:** Deduct any discount offered and quote firm net unit prices. In the case of a discrepancy in computing the amount of the bid, the unit price quoted will govern. All prices quoted shall be F.O.B. destination, freight prepaid (Bidder pays and bears freight charges, Bidder owns goods in transit and files any claims), unless otherwise stated in Special Conditions. Each item must be bid separately. No attempt shall be made to tie any item or items contained in the ITB with any other business with the City.

**BIDS FIRM FOR ACCEPTANCE:** Bidder warrants, by virtue of bidding, that his bid and the prices quoted in his bid will be firm for acceptance by the City for a period of one hundred and twenty (120) days from the date of bid opening unless otherwise stated in the ITB. The City shall award contract within this time period or shall request to the recommended awarded vendor an extension to hold pricing, until products/services have been awarded.

**ADDITIONAL ITEMS OR SERVICES:** The City may require additional items or services of a similar nature, but not specifically listed in the contract. The Contractor agrees to provide such items or services, and shall provide the City prices on such additional items or services based upon a formula or method, which is the same or similar to that used in establishing the prices in his proposal. If the price(s) offered are not acceptable to the City, and the situation cannot be resolved to the satisfaction

of the City, the City reserves the right to procure those items or services from other vendors, or to cancel the contract upon giving the Contractor thirty (30) days written notice.

DELETION OR MODIFICATION OF SERVICES: The City reserves the right to delete any portion of the Contract at any time without cause, and if such right is exercised by the City, the total fee shall be reduced in the same ratio as the estimated cost of the work deleted bears to the estimated cost of the work originally planned. If work has already been accomplished on the portion of the Contract to be deleted, the Contractor shall be paid for the deleted portion on the basis of the estimated percentage of completion of such portion.

If the Contractor and the City agree on modifications or revisions to the task elements, after the City has approved work to begin on a particular task or project, and a budget has been established for that task or project, the Contractor will submit a revised budget to the City for approval prior to proceeding with the work.

CAUSES FOR REJECTION - No proposal will be canvassed, considered or accepted which, in the opinion of the City Commission, is informal or unbalanced, or contains inadequate or unreasonable prices for any items; each item must carry its own proportion of the cost as nearly as is practicable. Any alteration, erasure, interlineation, or failure to specify bids for all items called for in the schedule shall render the proposal informal.

REJECTION OF BIDS - The City reserves the right to reject any bid if the evidence submitted by the bidder, or if the investigation of such bidder, fails to satisfy the City that such bidder is properly qualified to carry out the obligations and to complete the work contemplated. Any or all proposals will be rejected, if there is reason to believe that collusion exists among bidders. A proposal will be considered irregular and may be rejected, if it shows serious omissions, alterations in form, additions not called for, conditions or unauthorized alternates, or irregularities of any kind. The City reserves the right to reject any or all proposals and to waive such technical errors as may be deemed best for the interests of the City.

BID PROTEST PROCEDURE: Any proposer or bidder who is not recommended for award of a contract and who alleges a failure by the City to follow the City's procurement ordinance or any applicable law may protest to the Procurement Division – Deputy Director of Finance, by delivering a letter of protest within five (5) days after a Notice of Intent to award is posted on the City's website at the following link: [http://www.fortlauderdale.gov/purchasing/notices\\_of\\_intent.htm](http://www.fortlauderdale.gov/purchasing/notices_of_intent.htm). The complete protest ordinance may be found on the City's website at the following link: <http://www.fortlauderdale.gov/purchasing/protestordinance.pdf>

WITHDRAWALS - Any bidder may, without prejudice to himself, withdraw his proposal at any time prior to the expiration of the time during which proposals may be submitted. Such request for withdrawal must be in writing and signed in the same manner and by the same person who signed the proposal. After expiration of the period for receiving proposals, no proposal can be withdrawn, modified, or explained.

CONTRACT - The bidder to whom award is made shall execute a written contract to do the work and maintain the same in good repair until final acceptance by the proper authorities, and shall furnish good and sufficient bonds as specified within ten (10) days after receiving such contract for execution. If the bidder to whom the first award is made fails to enter into a contract as provided, the award may be annulled and the contract let to the next lowest bidder who is reliable, responsible, and responsive in the opinion of the City Commission, and that bidder shall fulfill every stipulation and obligation as if such bidder were the original party to whom award was made.

The contract shall provide that the Contractor agrees to correct any defective or faulty work or material, which may appear within one (1) year after completion of the work and receipt of final payment.

**ENFORCEMENT OF SPECIFICATIONS** - Copies of the specifications will be placed in the hands of all the assistants to the Engineer and Inspectors employed on the work, who shall enforce each and every requirement of the contract. Such assistants shall have no authority to vary from such requirements.

**COPIES OF DRAWING PLANS** - Copies of the drawing plans are on file in the Public Works Department, City Hall, 4<sup>th</sup> Floor, 100 N. Andrews Avenue, Fort Lauderdale, Florida 33301.

**SURETY BOND** – The Contractor shall execute and record in the public records of Broward County, Florida, a payment and performance bond in an amount at least equal to the Contract Price with a surety insurer authorized to do business in the State of Florida as surety, ("Bond"), in accordance with Section 255.05, Florida Statutes (2014), as may be amended or revised, as security for the faithful performance and payment of all of the Contractor's obligations under the Contract Documents.

The successful bidder shall furnish a performance and payment bond in compliance with Section 255.05, Florida Statutes, written by a Corporate Surety company, holding a Certificate of Authority from the Secretary of the Treasury of the United States as acceptable sureties on federal bonds, in an amount equal to the total amount payable by the terms of the contract, executed and issued by a Resident Agent licensed by and having an office in the State of Florida, representing such Corporate Surety, conditioned for the due and faithful performance of the work, and providing in addition to all other conditions, that if the Contractor, or his or its subcontractors, fail to duly pay for any labor, materials, or other supplies used or consumed by such Contractor, or his or its subcontractor or subcontractors, in performance of the work contracted to be done, the Surety will pay the same in the amount not exceeding the sum provided in such bonds, together with interest at the rate of fifteen percent (15%) per annum, and that they shall indemnify and save harmless the City of Fort Lauderdale to the extent of any and all payments in connection with carrying out of the contract, which the City may be required to make under the law.

The Contractor is required at all times to have a valid surety bond in force covering the work being performed. A failure to have such bond in force at any time shall constitute a default on the part of the Contractor. A bond written by a surety, which becomes disqualified to do business in the State of Florida, shall automatically constitute a failure on the part of the Contractor to meet the above requirements.

Such bond shall continue in effect for one (1) year after completion and acceptance of the work with liability equal to at least twenty-five percent (25%) of contract price, or an additional bond shall be conditioned that the Contractor will correct any defective or faulty work or material which appear within one (1) year after completion of the contract, upon notification by the City, except in contracts which are concerned solely with demolition work, in which cases twenty-five percent (25%) liability will not be applicable.

**AUDIT OF CONTRACTOR'S RECORDS** - Upon execution of the Contract, the City reserves the right to conduct any necessary audit of the Contractor's records. Such an audit, or audits, may be conducted by the City or its representatives at any time prior to final payment, or thereafter, for a period up to three (3) years. The City may also require submittal of the records from either the Contractor, the Subcontractor, or both. For the purpose of this Section, records shall include all books of account, supporting documents and papers deemed necessary by the City to assure compliance with the contract provisions.

Failure of the Contractor or Subcontractor to comply with these requirements may result in disqualification or suspension from bidding for future contracts or disapproval as a Subcontractor at the option of the City.

The Contractor shall assure that each of its Subcontractors will provide access to its records pertaining to the project upon request by the City.

PERIODIC ESTIMATE FOR PARTIAL PAYMENT - After the Contractor has submitted a periodic estimate for partial payment, approved and certified by the Public Works Department, the City shall make payment in the manner provided in the Contract Documents and in accordance with Florida's Prompt Payment Act, Section 218, Florida Statutes.

RESERVATION FOR AWARD AND REJECTION OF BIDS - The City reserves the right to accept or reject any or all bids, part of bids, and to waive minor irregularities or variations to specifications contained in bids, and minor irregularities in the bidding process. The City also reserves the right to award the contract on a split order basis, lump sum basis, individual item basis, or such combination as shall best serve the interest of the City. The City reserves the right to make an award to the responsive and responsible bidder whose product or service meets the terms, conditions, and specifications of the ITB and whose bid is considered to best serve the City's interest. In determining the responsiveness of the offer and the responsibility of the Bidder, the following shall be considered when applicable: the ability, capacity and skill of the Bidder to perform as required; whether the Bidder can perform promptly, or within the time specified, without delay or interference; the character, integrity, reputation, judgment, experience and efficiency of the Bidder; the quality of past performance by the Bidder; the previous and existing compliance by the Bidder with related laws and ordinances; the sufficiency of the Bidder's financial resources; the availability, quality and adaptability of the Bidder's supplies or services to the required use; the ability of the Bidder to provide future maintenance, service or parts; the number and scope of conditions attached to the bid.

MINORITY AND WOMEN BUSINESS ENTERPRISE PARTICIPATION AND BUSINESS - It is the desire of the City of Fort Lauderdale to increase the participation of minority (MBE) and women-owned (WBE) businesses in its contracting and procurement programs. While the City does not have any preference or set aside programs in place, it is committed **to a policy of equitable participation for these firms**. The City of Fort Lauderdale wants to increase the participation of Minority Business Enterprises (MBE), Women Business Enterprises (WBE), and Small Business Enterprises (SBE) in its procurement activities. If your firm qualifies in accordance with the below definitions please indicate in the space provided in this ITB.

Minority Business Enterprise (MBE) "A Minority Business" is a business enterprise that is owned or controlled by one or more socially or economically disadvantaged persons. Such disadvantage may arise from cultural, racial, chronic economic circumstances or background or other similar cause. Such persons include, but are not limited to: Blacks, Hispanics, Asian Americans, and Native Americans.

The term "Minority Business Enterprise" means a business at least 51 percent of which is owned by minority group members or, in the case of a publicly owned business, at least 51 percent of the stock of which is owned by minority group members. For the purpose of the preceding sentence, minority group members are citizens of the United States who include, but are not limited to: Blacks, Hispanics, Asian Americans, and Native Americans.

Women Business Enterprise (WBE) a "Women Owned or Controlled Business" is a business enterprise at least fifty-one percent (51%) of which is owned by females or, in the case of a publicly owned business, at least fifty-one percent (51%) of the stock of which is owned by females.

Small Business Enterprise (SBE) "Small Business" means a corporation, partnership, sole proprietorship, or other legal entity formed for the purpose of making a profit, which is independently owned and operated, has either fewer than 100 employees or less than \$1,000,000 in annual gross receipts.

BLACK includes persons having origins in any of the Black racial groups of Africa.

WHITE includes persons whose origins are Anglo-Saxon and Europeans and persons of Indo-European decent including Pakistani and East Indian.

HISPANIC includes persons of Mexican, Puerto Rican, Cuban, Central and South American, or other Spanish culture or origin, regardless of race.

NATIVE AMERICAN includes persons whose origins are American Indians, Eskimos, Aleuts, or Native Hawaiians.

ASIAN AMERICAN includes persons having origin in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands.

DEBARRED OR SUSPENDED BIDDERS OR PROPOSERS - The bidder or proposer certifies, by submission of a response to this solicitation, that neither it nor its principals and subcontractors are presently debarred or suspended by any Federal department or agency.



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## SPECIAL CONDITIONS

### 01. PURPOSE

The City of Fort Lauderdale, Florida (City) is seeking bids from qualified bidders, hereinafter referred to as the Contractor, to provide airfield lighting rehabilitation services for the City's Public Works Department, in accordance with the terms, conditions, and specifications contained in this Invitation To Bid (ITB).

### 02. TRANSACTION FEES

The City of Fort Lauderdale uses BidSync ([www.bidsync.com](http://www.bidsync.com)) to distribute and receive bids and proposals. There is no charge to vendors/contractors to register and participate in the solicitation process, nor will any fees be charged to the awarded contractor.

### 03. SUBMISSION OF BIDS

It is the sole responsibility of the Contractor to ensure that their bid is submitted electronically through BidSync at [www.bidsync.com](http://www.bidsync.com) and that any bid security not submitted via BidSync reaches the City of Fort Lauderdale City Hall, Procurement Services Division, 6<sup>th</sup> floor, Room 619, 100 N. Andrews Avenue, Fort Lauderdale, FL 33301 in a sealed envelope marked on the outside with the ITB solicitation number and Contractor's name, no later than the time and date specified in this solicitation. **PAPER BID SUBMITALS WILL NOT BE ACCEPTED. PLEASE SUBMIT YOUR BID RESPONSE ELECTRONICALLY.**

### 04. INFORMATION OR CLARIFICATION

For information concerning procedures for responding to this solicitation, contact **Fausto Vargas, Procurement Specialist I**, at (954) 828-6167 or email at [fvargas@fortlauderdale.gov](mailto:fvargas@fortlauderdale.gov). Such contact shall be for clarification purposes only.

For information concerning technical specifications please utilize the question/answer feature provided by BidSync at [www.bidsync.com](http://www.bidsync.com). Questions of a material nature must be received prior to the cut-off date specified in the solicitation. Material changes, if any, to the scope of services or bidding procedures will only be transmitted by written addendum. (See addendum section of BidSync Site). **Contractors please note:** No part of your bid can be submitted via FAX. No variation in price or conditions shall be permitted based upon a claim of ignorance. Submission of a bid will be considered evidence that the Contractor has familiarized himself with the nature and extent of the work, and the equipment, materials, and labor required. The entire bid response must be

submitted in accordance with all specifications contained in this solicitation. The questions and answers submitted in BidSync shall become part of any contract that is created from this ITB.

## 05. PRE-BID MEETING AND SITE VISIT

There will be a pre-bid meeting and site visit on Thursday, November 9, 2017, at 10:00 a.m. at the **Airport Administration Building 6000 NW 21st Avenue, Fort Lauderdale, Florida 33309**. It is strongly suggested that all contractors attend the pre-proposal conference and site visit since tours at other times might not be available.

While attendance is not mandatory, it will be the sole responsibility of the bidder to inspect the City's location and become familiar with the scope of the City's requirements and systems prior to submitting a proposal. No variation in price or conditions shall be permitted based upon a claim of ignorance. It is strongly suggested that all Contractor's attend the pre-bid meeting and/or site visit.

## 06. CONTRACT PERIOD

- 5.1 The Contractor recognizes that TIME IS OF THE ESSENCE. The Work shall commence within **30** calendar days of the date of the Notice to Proceed. During this period contractor shall submit shop drawings, procure materials, establish staging area, coordinate and attend airfield security/badging classes, obtain permits, and begin mobilization.
- 5.2 The Work shall be Substantially Completed within **180** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.
- 5.3 The Work shall be finally completed on the Final Completion Date and ready for final payment in accordance with this Agreement within **210** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.

The City of Fort Lauderdale reserves the right to waive any informality in any bid and to reject any or all bids. The City of Fort Lauderdale reserves the right to reduce or delete any of the bid items.

**At time of award of contract, the City reserves the right to set a maximum dollar limit that may be expended on this project. Contract quantities of any or all items may be increased, reduced, or eliminated to adjust the contract amount to coincide with the amount of work necessary or to bring the contract value to within the established limit. All quantities are estimated and the City reserves the right to increase, reduce, or eliminate the contract quantities in any amount.**

**The undersigned bidder affirms that he has or will obtain all equipment necessary to complete the work described, that he has or will obtain all required permits and licenses from the appropriate agencies, and that his firm is authorized to do business in the State of Florida.**

**07. BID SECURITY**

A certified check, cashier's check, bank officer's check or bid bond for **FIVE** percent (5%) of the bid amount, made payable to the City of Fort Lauderdale, Florida, shall accompany each proposal.

**08. REQUIRED LICENSES/CERTIFICATIONS**

Contractor must possess the following licenses/certifications to be considered for award.

**Broward County (Florida) General Engineered Construction Builder Contractor (GITS) License and/or one that is appropriately issued by the State of Florida is required for this project.**

***Note: Contractor must have proper licensing prior to submitting bid and must submit evidence of same with bid***

**09. SPECIFIC EXPERIENCE REQUIRED**

The following expertise is required to be considered for this contract. Specific references attesting to this expertise must be submitted with bid.

The contractor shall have previous construction experience in constructing additions/modifications to existing public buildings, in the State of Florida within the last ten (10) years. Bidder shall submit proof of construction experience for a minimum of three (3) projects of similar scope and scale (or larger) and shall, for each project listed, identify location; dates of construction; project name and overall scope; scope of work that was self-performed by Contractor; and client's name, address, telephone number and e-mail address.

***By signing this bid solicitation, contractor is affirming that this expertise will be provided for this contract at no additional charge.***

**10. BID ALLOWANCE**

| <b>Allowance</b>                          | <b>\$</b>        |
|---|------------------|
| Allowance account for additional labor    | 20,000           |
| Allowance account for additional material | 20,000           |
| Allowance account for Permit Fees         | 60,000           |
| <b>TOTAL</b>                              | <b>\$100,000</b> |

***Note: The City will add this allowance to your bid.***

**11. INSURANCE REQUIREMENTS** (See Article 10, Bonds and Insurance, of the Contract for details)  
Insurance

11.1 Contractor shall provide and shall require all of its sub-contractors to provide, pay for, and maintain in force at all times during the term of the Agreement, such

insurance, including Property Insurance (Builder's Risk), Commercial General Liability Insurance, Business Automobile Liability Insurance, Workers' Compensation Insurance, Employer's Liability Insurance, and Umbrella/Excess Liability, as stated below, as well as Professional Liability insurance in the amount of \$1,000,000 for any Architectural and/or Engineering requirements associated with the fulfillment of the contract if required. Such policy or policies shall be issued by companies authorized to do business in the State of Florida and having agents upon whom service of process may be made in the State of Florida. **A Sample Insurance Certificate shall be included with the proposal to demonstrate the firm's ability to comply with insurance requirements. Provide a previous certificate or other evidence listing the insurance companies' names for all required coverage, and the dollar amounts of the coverage.**

- A. The City is required to be named as additional insured on the Commercial General Liability insurance policy. BINDERS ARE UNACCEPTABLE. The insurance coverage required shall include those classifications, as listed in standard liability insurance manuals, which most nearly reflect the operations of the Contractor. Any exclusions or provisions in the insurance maintained by the Contractor that precludes coverage for the work contemplated in this Agreement shall be deemed unacceptable, and shall be considered a breach of contract.
- B. The Contractor shall provide the City an original Certificate of Insurance for policies required by Article 10. All certificates shall state that the City shall be given ten (10) days' notice prior to expiration or cancellation of the policy. The insurance provided shall be endorsed or amended to comply with this notice requirement. In the event that the insurer is unable to accommodate, it shall be the responsibility of the Contractor to provide the proper notice. Such notification will be in writing by registered mail, return receipt requested and addressed to the Finance Department. Such policies shall: (1) name the insurance company or companies affording coverage acceptable to the City, (2) state the effective and expiration dates of the policies, (3) include special endorsements where necessary. Such policies provided under Article 10 shall not be affected by any other policy of insurance, which the City may carry in its own name.
- C. Contractor shall as a condition precedent of this Agreement, furnish to the City of Fort Lauderdale, c/o Project Manager, 100 N. Andrews Avenue, Fort Lauderdale, FL 33301, Certificate(s) of Insurance upon execution of this Agreement, which indicate that insurance coverage has been obtained which meets the requirements as outlined below:

- 11.2 Property Insurance (Builder's Risk): The Contractor shall purchase and maintain property insurance upon the Work at or off the site of 100% of the contract completed value. These policies shall insure the interest of the owner, contractor and subcontractors in the Work, and shall insure against "all risks" of physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage. All such insurance required by this paragraph shall remain in effect until the Work is completed and accepted by the City.

### 11.3 Commercial General Liability

- A. Limits of Liability:
- |   |             |
|---|-------------|
| Bodily Injury and Property Damage - Combined Single Limit |             |
| Each Occurrence   | \$1,000,000 |
| Project Aggregate   | \$1,000,000 |
| General Aggregate   | \$2,000,000 |
| Personal Injury   | \$1,000,000 |
| Products/Completed Operations                             | \$1,000,000 |
- B. Endorsements Required:
- City of Fort Lauderdale included as an Additional Insured
  - Broad Form Contractual Liability
  - Waiver of Subrogation
  - Premises/Operations
  - Products/Completed Operations
  - Independent Contractors
  - Owners and Contractors Protective Liability
  - Contractor's Pollution Liability – **N/A**

### 11.4 Business Automobile Liability

- A. Limits of Liability:
- |   |             |
|---|-------------|
| Bodily Injury and Property Damage - Combined Single Limit |             |
| All Autos used in completing the contract                 |             |
| Including Hired, Borrowed or Non-Owned Autos              |             |
| Any One Accident  | \$1,000,000 |
- B. Endorsements Required:
- Waiver of Subrogation

### 11.5 Workers' Compensation and Employer's Liability Insurance

Limits: Workers' Compensation – Per Florida Statute 440  
Employers' Liability - \$500,000

Any firm performing work on behalf of the City of Fort Lauderdale must provide Workers' Compensation insurance. Exceptions and exemptions can only be made if they are in accordance with Florida Law.

Contractor must be in compliance with all applicable State and Federal workers' compensation laws, including the U.S. Longshore Harbor Workers' Act or Jones Act.

- 11.6 **Umbrella/Excess Liability:** The Contractor shall provide umbrella/excess coverage with limits of no less than \$2,000,000 excess of Commercial General Liability, Automobile Liability and Employer's Liability.
- 11.7 All insurance policies required above shall be issued by companies authorized to do business under the laws of the State of Florida, with the following qualifications:

The Contractor's insurance must be provided by an A.M. Best's "A-" rated or better insurance company authorized to issue insurance policies in the State of Florida, subject to approval by the City's Risk Manager. Any exclusions or provisions in the insurance maintained by the Contractor that precludes coverage for work contemplated in this project shall be deemed unacceptable, and shall be considered breach of contract.

NOTE: CITY PROJECT NUMBER MUST APPEAR ON EACH CERTIFICATE.

**A Sample Insurance Certificate shall be included with the proposal to demonstrate the firm's ability to comply with insurance requirements. Provide a previous certificate or other evidence listing the insurance companies' names for all required coverage, and the dollar amounts of the coverage.**

Compliance with the foregoing requirements shall not relieve the Contractor of their liability and obligation under this section or under any other section of this Agreement.

The Contractor shall be responsible for assuring that the insurance certificates required in conjunction with this Section remain in force for the duration of the Project. If insurance certificates are scheduled to expire during the contractual period, the Contractor shall be responsible for submitting new or renewed insurance certificates to the City at a minimum of thirty (30) calendar days in advance of such expiration. In the event that expired certificates are not replaced with new or renewed certificates that cover the contractual period, the City shall:

- A. Suspend the Agreement until such time as the new or renewed certificates are received by the City.
- B. The City may, at its sole discretion, terminate the Agreement for cause and seek damages from the Contractor in conjunction with the violation of the terms and conditions of the Agreement.

11. **PERFORMANCE AND PAYMENT BOND:** 100%  
**Number of awards anticipated:** One

13. **CITY PROJECT MANAGER**

The Project Manager is hereby designated by the City as Fernando Blanco, whose address is 100 North Andrews, 5<sup>th</sup> Floor, Fort Lauderdale, FL 33301. The Project Manager will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the Contract Documents in connection with completion of the Work in accordance with this Agreement.

14. **LIQUIDATED DAMAGES** *(See Article 16, Liquidated Damages, of the Contract for details)*

Upon failure of the Contractor to complete the Work within the time specified for completion, the Contractor shall pay to the City the sum of **Five Hundred Dollars (\$500.00)** for each and every calendar day that the completion of the Work is delayed beyond the time specified in this Agreement for completion, as fixed and agreed liquidated damages and not as a penalty, so long as the delay is caused by the Contractor. (See Article 16, Liquidated Damages Clause, of the Contract)

15. **PAYMENT**

**Payment on this contract will be made by Check.**

16. **WORK SCHEDULE (including overtime hours):** As detailed on the plans

17. **INSPECTION OVERTIME COST:** N/A



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CITY OF FORT LAUDERDALE  
CONSTRUCTION AGREEMENT

THIS AGREEMENT made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_, by and between the City of Fort Lauderdale, a Florida municipal corporation (City) and \_\_\_\_\_, (Contractor), (parties);

WHEREAS, the City desires to retain a contractor for the Project as expressed in its Invitation to Bid No., \_\_\_\_\_, Project Number, \_\_\_\_\_ which was opened on \_\_\_\_\_; and,

WHEREAS, the Contractor has expressed its willingness and capability to perform the necessary work to accomplish the Project.

NOW, THEREFORE, the City and the Contractor, in consideration of the mutual covenants and conditions contained herein and for other good and valuable consideration, the receipt and sufficiency is hereby acknowledged, agree as follows:

**ARTICLE 1 – DEFINITIONS**

Whenever used in this Agreement or in other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural forms:

- 1.1 Agreement – This written Agreement between the City and the Contractor covering the work to be performed including other Contract Documents that are attached to or incorporated in the Agreement.
- 1.2 Application for Payment – The form accepted by the City which is to be used by the Contractor in requesting progress or final payment and which is to include such supporting documentation as is required by the Contract Documents.
- 1.3 Approve – The word approve is defined to mean review of the material, equipment or methods for general compliance with design concepts and with the design concepts and with the information given in the Contract Documents. It does not imply a responsibility on the part of the City to verify in every detail conformance with plans and specifications.
- 1.4 Bid – The offer or Bid of the Contractor submitted on the prescribed form setting forth the total prices for the Work to be performed.
- 1.5 Bid Documents – This Agreement, advertisement for Invitation to Bids, the Instructions to Bidders, the Bid Form (with supplemental affidavits and agreements), the Contract Forms, General Conditions, the Supplementary Conditions, the Specifications, and the Plans, which documents all become an integral part of the Contract Documents.
- 1.6 Certificate of Substantial Completion - Certificate provided by the City certifying that all Work, excluding the punch list items, has been completed, inspected, and accepted by the City.

- 1.7 Change Order - A change order is defined as a written order to a contractor approved by the City, authorizing a revision of an underlying agreement between the City and a contractor that is directly related to the original scope of work or an adjustment in the original contract price or the contract time directly related to the original scope of work, issued on or after the effective date of the contract.
- 1.8 City – The City of Fort Lauderdale, Florida including but not limited to its employees, agents, officials, representatives, contractors, subcontractors, volunteers, successors and assigns, with whom the Contractor has entered into the Agreement and for whom the Work is to be provided.
- 1.9 Contract Documents – The Contract Documents shall consist of this Agreement, Exhibits to this Agreement, Public Construction Bond, Performance Bond, Payment Bond and Certificates of Insurance, Notice of Award and Notice to Proceed, General Conditions as amended by the Special Conditions, Technical Specifications, Plans/Drawings, Addenda, Bid Form and supplement Affidavits and Agreements, all applicable provisions of State and Federal Law and any modification, including Change Orders or written amendments duly delivered after execution of Agreement, Invitation to Bid, Instructions to Bidders and Bid Bond, Contractor's response to the City's Invitation to Bid, Schedule of Completion, Schedule of Values, all amendments, modifications and supplements, change orders and work directive changes issued on or after the Effective Date of the Agreement, as well as any additional documents that are required to be submitted under the Agreement.

Permits on file with the City and or those permits to be obtained shall be considered directive in nature and will be considered a part of this Agreement. A copy of all permits shall be given to the City for inclusion in the Contract Documents. Terms of permits shall be met prior to acceptance of the Work and release of the final payment.

- 1.10 Contract Price – The monies payable to the Contractor by the City under the Contract Documents and in accordance with the line item unit prices listed in the Bid.
- 1.11 Contract Time – The number of calendar days stated in the Agreement for the completion of the Work. The dates on which the work shall be started and shall be completed as stated in the Notice to Proceed.
- 1.12 Contractor – The person, firm, company, or corporation with whom the City has entered into the Agreement, including but not limited to its employees, agents, representatives, contractors, subcontractors, their subcontractors and their other successors and assigns.
- 1.13 Day – A calendar day of twenty-four (24) hours ending at midnight.
- 1.14 Defective – An adjective which when modifying the word "Work" refers to work that is unsatisfactory, faulty, or deficient, or does not conform to the Contract Documents or does not meet the requirements of any inspection, test or approval referred to in the Contract Documents, or has been damaged prior to the Project Manager's recommendation of final payment.
- 1.15 Effective Date of the Agreement – The effective date of the agreement shall be the date the City Commission approves the work. The contractor shall provide all required

payment and performance bonds and insurances to the City within ten (10) Calendar days following the City Commission approval. Upon verification of all bonds and insurances, the City will issue a notice to proceed (NTP) to the Contractor. Contract time will commence on the date when the Notice to Proceed is issued. The Contractor shall commence the work immediately upon receipt of the Notice to Proceed. Failure of the contractor to proceed with the work will constitute non-performance of the Contractor and would be ground for termination of the contract per ARTICLE 17 of the Agreement.

- 1.16 Final Completion Date – The date the Work is completed, including completion of the final punch list, and delivered along with those items specified in the Contract Documents and is accepted by the City.
- 1.17 Hazardous Materials (HAZMAT) - Any solid, liquid, or gaseous material that is toxic, flammable, radioactive, corrosive, chemically reactive, or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment defined in Section 101(14) of Comprehensive Environmental Response, Compensation and Liability Act of 1980 and in 40 CFR 300.6. Also defined by 49 CFR 171.8 as a substance or material designated by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and which has been so designated.
- 1.18 Hazardous Substance - As defined by Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act; any substance designated pursuant to Section 311(b) (2) (A) of the Clean Water Act; any element, compound, mixture, solution or substance designated pursuant to Section 102 identified under or listed pursuant to Section 3001 of the Solid Waste Disposal Act {but not including any waste listed under Section 307[a] of the Clean Water Act}; any hazardous air pollutant listed under Section 112 of the Clean Air Act; and any imminently hazardous chemical substance or mixture pursuant to Section 7 of the Toxic Substances Control Act. The term does not include petroleum, including crude oil or any fraction thereof, which is not otherwise specifically listed or designated as a hazardous substance in the first sentence of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).
- 1.19 Hazardous Waste - Those solid wastes designated by OSHA in accordance with 40 CFR 261 due to the properties of ignitability, corrosivity, reactivity, or toxicity. Any material that is subject to the Hazardous Waste Manifest requirements of the EPA specified in 40 CFR Part 262.
- 1.20 Holidays - Those designated non-work days as established by the City Commission of the City of Fort Lauderdale.
- 1.21 Inspection – The term “inspection” and the act of inspecting as used in this Agreement is defined to mean the examination of construction to ensure that it conforms to the design concept expressed in the plans and specifications. This term shall not be construed to mean supervision, superintending and/or overseeing.

- 1.22 Notice of Award - The written notice by City to the Contractor stating that upon compliance by the Contractor with the conditions precedent enumerated therein, within the time specified that the City will sign and deliver this Agreement.
- 1.23 Notice to Proceed – A written notice given by the City to the Contractor fixing the date on which the Contract Time will commence to run and on which the Contract Time will end.
- 1.24 Plans - The drawings which show the character and scope of the work to be performed and which have been prepared or approved by the City and are referred to in the Contract Documents.
- 1.25 Premises (otherwise known as Site or Work Site) – means the land, buildings, facilities, etc. upon which the Work is to be performed.
- 1.26 Project – The total construction of the Work to be provided as defined in the Contract Documents.
- 1.27 Project Manager - The employee of the City, or other designated individual who is herein referred to as the Project Manager, will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the contract Documents in connection with completion of the Work in accordance with this Agreement. The Project Manager, or designee, shall be the authorized agent for the City unless otherwise specified.
- 1.28 Punch List - The City's list of Work yet to be done or be corrected by the Contractor, before the Final Completion date can be determined by the City.
- 1.29 Record Documents - A complete set of all specifications, drawings, addenda, modifications, shop drawings, submittals and samples annotated to show all changes made during the construction process.
- 1.30 Record Drawings or "As-Builts" - A set of drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor. These documents will be signed and sealed by a Professional Engineer or a Professional Land Surveyor licensed in the State of Florida, hired by the Contractor at no additional expense to the City..
- 1.31 Substantially Completed Date – A date when the Contractor has requested in writing, stating that the Work is substantially completed and is ready for an inspection and issuance of a final punch list for the Project. The date will be determined by the City after a substantial completion walk-thru has been conducted.
- 1.32 Work – The entire completed delivered product or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating material and equipment into the product, all as required by the Contract Documents.

## ARTICLE 2 – SCOPE OF WORK

- 2.1 The Contractor shall complete all work as specified or indicated in the Contract Documents. The Project for which the Work under the Contract Documents may be the whole or only part is generally described as follows:

**FORT LAUDERDALE EXECUTIVE AIRPORT  
ADMINISTRATION BUILDING RENOVATIONS  
ITB 12062-183 PROJECT 12188**

- 2.2 All Work for the Project shall be constructed in accordance with the Drawings and Specifications. The Work generally involves:

### PROJECT DESCRIPTION

The work includes, but is not limited to, renovations of the single-story Fort Lauderdale Executive Airport (FXE) Administration Building, including the construction of a new conference room and office spaces, new landscaping and irrigation, parking improvements, LED site lighting, replacement of the existing HVAC unit, new carpeting, paint, interior LED lighting, installation of covered canopies for parking areas, installation of car charging station, and renovations of the existing bathrooms.

The building renovations includes, but is not limited to, removal of A/C dry well, existing partitions, doors and frames, plumbing fixtures, flooring finish, light fixtures, HVAC diffuser, acoustical ceiling tiles. Installation of concrete foundations, concrete slabs, reinforced concrete, masonry walls, steel joists, metal roofing, membrane roofing and insulation, building insulation, hollow metal doors and frames, impact-resistant glazed aluminum storefront doors and windows, exterior stucco, carpet, vinyl, porcelain tile, resilient flooring, interior and exterior painting, miscellaneous specialty items, fire sprinkler system, mechanical cooling and ventilation system, plumbing fixtures and piping and electrical power and lighting systems.

Site work includes, but is not limited to, clearing and grubbing, curbing, landscaping, removal of pavement marking, roundabout circle, installation of canopies for parking areas, grading, sodding, installation of irrigation system, landscaping, pavement striping, site lighting, and colored, stamped concrete patio deck. Site work also includes installation of car charging station including, but not limited to, concrete pad, saw cutting, epoxy grout, conduit, cabling, charging stations, and all materials and equipment for a complete working system.

The covered parking canopies and charging station are bid alternate quantities.

- 2.3 Within ten (10) days of the execution of this Agreement, the Contractor shall submit a Construction Schedule, Schedule of Values and a listing of those subcontractors that will be utilized by the Contractor. The general sequence of the work shall be submitted by the Contractor and approved by the City before any work commences. The City reserves the right to issue construction directives necessary to facilitate the Work or to minimize any conflict with operations.

### ARTICLE 3 – PROJECT MANAGER

- 3.1 The Project Manager is hereby designated by the City as Fernando Blanco, whose address is 100 N. Andrews Avenue, 5<sup>th</sup> Floor, Fort Lauderdale, FL 33301. The Project Manager will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the Contract Documents in connection with completion of the Work in accordance with this Agreement.

### ARTICLE 4 – CONTRACT DOCUMENTS

The Contract Documents which comprise the entire Agreement between the City and Contractor are attached to this Agreement, are made a part hereof and consist of the following:

- 4.1 This Agreement.
- 4.2 The Contract Documents may only be altered, amended, or repealed in accordance with the specific provisions of the terms of this Agreement.
- 4.3 Exhibits to this Agreement: (Plans sheets [ ] to [ ] inclusive).
- 4.4 Public Construction Bond, Performance Bond, Payment Bond and Certificates of Insurance.
- 4.5 Notice of Award and Notice to Proceed.
- 4.6 General Conditions as amended by the Special Conditions.
- 4.7 Technical Specifications.
- 4.8 Plans/Drawings.
- 4.9 Addenda number \_\_\_\_\_ through \_\_\_\_\_, inclusive.
- 4.10 Bid Form and supplement Affidavits and Agreements.
- 4.11 All applicable provisions of State and Federal Law.
- 4.12 Invitation to Bid No., \_\_\_\_\_, Instructions to Bidders, and Bid Bond.
- 4.13 Contractor's response to the City's Invitation to Bid No., \_\_\_\_\_, dated \_\_\_\_\_.
- 4.14 Schedule of Completion and Schedule of Values.
- 4.15 All amendments, modifications and supplements, change orders and work directive changes issued on or after the Effective Date of the Agreement.
- 4.16 Any additional documents that are required to be submitted under the Agreement.

- 4.17 Permits on file with the City and or those permits to be obtained shall be considered directive in nature and will be considered a part of this Agreement. A copy of all permits shall be given to the City for inclusion in the Contract Documents. Terms of permits shall be met prior to acceptance of the Work and release of the final payment.

In the event of any conflict between the documents or any ambiguity or missing specification or instruction, the following priority is established:

- a. Specific direction from the City Manager (or designee).
- b. Approved change orders, addenda or amendments.
- c. Specifications (quality) and Drawings (location and quantity).
- d. Supplemental conditions or special terms.
- e. General Terms and Conditions.
- f. This Agreement dated \_\_\_\_\_ and any attachments.
- g. Invitation to Bid No., \_\_\_\_\_, and the specifications prepared by the City.
- h. Contractor's response to the City's Invitation to Bid No., \_\_\_\_\_, dated \_\_\_\_\_.
- i. Schedule of Values.
- j. Schedule of Completion.

If during the performance of the Work, Contractor finds a conflict, error or discrepancy in the Contract Documents, Contractor shall so report to the Project Manager, in writing, at once and before proceeding with the Work affected shall obtain a written interpretation or clarification from the City.

It is the intent of the specifications and plans to describe a complete Project to be constructed in accordance with the Contract Documents. Any Work that may reasonably be inferred from the specifications or plans as being required to produce the intended result shall be supplied whether or not it is specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials, or equipment, such works shall be interpreted in accordance with such meaning. Reference to standard specifications, manuals or codes of any technical society, organization or associations, or to the code of any governmental authority whether such reference be specific or implied, shall mean the latest standard specification, manual or code in effect as of the Effective Date of this Agreement, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall change the duties and responsibilities of the City, the Contractor, or any of their agents or employees from those set forth in the Contract Documents.



## ARTICLE 5 – CONTRACT TIME

- 5.1 The Contractor recognizes that **TIME IS OF THE ESSENCE**. The Work shall commence within **30** calendar days of the date of the Notice to Proceed. During this period contractor shall submit shop drawings, procure materials, establish staging area, coordinate and attend airfield security/badging classes, obtain permits, and begin mobilization.
- 5.2 The Work shall be Substantially Completed within **180** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.
- 5.3 The Work shall be finally completed on the Final Completion Date and ready for final payment in accordance with this Agreement within **210** calendar days after the date when the Contract Time commences to run as provided in the Notice to Proceed.

## ARTICLE 6 – CONTRACT PRICE

- 6.1 City shall pay Contractor for performance of the Work in accordance with Article 7, subject to additions and deletions by Change Order, as provided for in this Agreement, in the lump sum amount of \_\_\_\_\_.
- 6.2 The parties expressly agree that the Contract Price, which shall not exceed the amount of \$\_\_\_\_\_ constitutes the total maximum compensation payable to Contractor for performing the Work, plus any Work done pursuant to a Change Order. The Contract Price is in accordance with the line item unit prices listed in the Bid. Any additional duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change to the Contract Price.
- 6.3 The Contract Price constitutes the compensation payable to Contractor for performing the Work plus any Work done pursuant to a Change Order. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change in the Contract price.

## ARTICLE 7 – PAYMENT

- 7.1 Contractor shall submit Applications for Payment in accordance with the Contract Documents. Applications for Payment will be processed by City as provided in the General Conditions.
- 7.2 Progress Payments. City shall make progress payments on account of the Contract Price on the basis of Contractor's monthly Applications for Payment, which shall be submitted by the Contractor between the first (1<sup>st</sup>) and the tenth (10<sup>th</sup>) day after the end of each calendar month for which payment is requested. All progress payments will be made on the basis of the progress of the Work completed.
- 7.3 Prior to Final Completion, progress payments will be made in an amount equal to ninety percent (90%) of the value of Work completed less in each case the aggregate of payments previously made.

- 7.4 Final Payment. Upon final completion of the Work in accordance with the General Conditions, as may be supplemented, the City shall pay Contractor an amount sufficient to increase total payments to one-hundred percent (100%) of the Contract Price. However, not less than ten percent (10%) of the Contract Price shall be retained until Record Drawings (as-builts), specifications, addenda, modifications and shop drawings, including all manufacturers' instructional and parts manuals are delivered to and accepted by the City.
- 7.5 City may withhold, in whole or in part, payment to such extent as may be necessary to protect itself from loss on account of:
- 7.5.1 Defective work not remedied.
  - 7.5.2 Claims filed or reasonable evidence indicating probable filing of claims by other parties against Contractor or City because of Contractor's performance.
  - 7.5.3 Failure of Contractor to make payments properly to Subcontractors or for material or labor.
  - 7.5.4 Damage to another contractor not remedied.
  - 7.5.5 Liquidated damages and costs incurred by Consultant for extended construction administration, if applicable.
  - 7.5.6 Failure of Contractor to provide any and all documents required by the Contract Documents.

When the above grounds are removed or resolved satisfactory to the Project Manager, payment shall be made in whole or in part.

- 7.6 The City shall make payment to the Contractor in accordance with the Florida Prompt Payment Act, Section 218.70, Florida Statutes.
- 7.7 The City shall make payment to the Contractor through utilization of the City's P-Card Program.

## **ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS**

In order to induce the City to enter into this Agreement, Contractor makes the following representations upon which the City has relied:

- 8.1 Contractor is qualified in the field of public construction and in particular to perform the Work and services set forth in this Agreement.
- 8.2 Contractor has visited the Work Site, has conducted extensive tests, examinations and investigations and represents and warrants a thorough familiarization with the nature and extent of the Contract Documents, the Work, locality, soil conditions, moisture conditions and all year-round local weather and climate conditions (past and present), and, in reliance on such tests, examination and investigations conducted by Contractor and the Contractor's experts, has determined that no conditions exist that would in any manner affect the Proposed Price and that the project can be completed for the Proposed Price submitted within the Contract Time as defined in this Agreement. Furthermore, Contractor warrants and confirms that he is totally familiar with, understands and obligates Contractor to comply with all federal, state and local laws,

ordinances, rules, regulations and all market conditions that affect or may affect the cost and price of materials and labor needed to fulfill all provisions of this Agreement or that in any manner may affect cost, progress or performance of the Work.

- 8.3 The Contractor has satisfied itself as to the nature and location of the Work under the Contract Documents, the general and local conditions of the Project, particularly those bearing upon availability of transportation, disposal, handling and storage of materials, availability of labor, water, electric power, and roads, the conformation and conditions at the ground based on City provided reports, the type of equipment and facilities needed preliminary to and during the prosecution of the Work and all other matters which can in any way affect the Work or the cost thereof under the Contract Documents.
- 8.4 The Contractor has also studied carefully all reports of investigations and tests of subsurface and latent physical conditions at the site or otherwise affecting cost, progress or performance of the Works, and finds and has further determined that no conditions exist that would in any manner affect the Proposed Price and that the project can be completed for the Proposed Price submitted.
- 8.5 Contractor has made or caused to be made examinations, investigations, tests and studies of such reports and related data in addition to those referred to in Paragraphs 8.2, 8.3 and 8.4 above as he deems necessary for the performance of the Work at the Contract Prices, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents; and no additional examinations, investigations, tests, reports or similar data are, or will be, required by Contractor for such purposes.
- 8.6 Contractor has correlated the results of all such observations, examinations, investigations, tests, reports and data with the terms and conditions of the Contract Documents.
- 8.7 Contractor has given City written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution by City is acceptable to the Contractor.
- 8.8 Labor
- 8.8.1 The Contractor shall provide competent, suitable qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. The Contractor shall at all times maintain good discipline and order at the site.
- 8.8.2 The Contractor shall, at all times, have a competent superintendent, capable of reading and thoroughly understanding the drawings and specifications, as the Contractor's agent on the Work, who shall, as the Contractor's agent, supervise, direct and otherwise conduct the Work.
- 8.8.3 The Contractor shall designate the superintendent on the job to the City, in writing, immediately after receipt of the Notice to Proceed. The Contractor understands and agrees that the superintendent's physical presence on the job site is indispensable to the successful completion of the Work. If the superintendent is frequently absent from the job site, the Project Manager may

deliver written notice to the Contractor to stop work or terminate the Contract in accordance with Article 17.

- 8.8.4 The Contractor shall assign personnel to the job site that have successfully completed training programs related to trench safety, confined space and maintenance of traffic. A certified "competent person" shall be assigned to the job site. Personnel certified by the International Municipal Signal Associations with Florida Department of Transportation qualifications are required relative to maintenance of traffic. Failure to pursue the Work with the properly certified supervisory staff may result in notice to stop work or terminate the Contract in accordance with Article 17.

8.9 Materials:

- 8.9.1 The Contractor shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities and all other facilities and incidentals necessary for the execution, testing, initial operation and completion of Work.

- 8.9.2 All material and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. Suppliers shall be selected and paid by the Contractor; the City reserves the right to approve all suppliers and materials.

- 8.10 Work Hours: Except in connection with the safety or protection of persons, or the Work, or property at the site or adjacent thereto, and except as otherwise indicated in the Supplementary Conditions, all work at the site shall be performed during regular working hours between 7 a.m. and 6:00 p.m., Monday through Friday. The Contractor will not permit overtime work or the performance of work on Saturday, Sunday or any legal holiday (designated by the City of Fort Lauderdale) without the Project Manager's written consent at least seventy-two (72) hours in advance of starting such work. If the Project Manager permits overtime work, the Contractor shall pay for the additional charges to the City with respect to such overtime work. Such additional charges shall be a subsidiary obligation of the Contractor and no extra payment shall be made to the Contractor for overtime work. It shall be noted that the City's Inspector work hours are from 8:00 a.m. to 4:30 p.m. and any Work requiring inspection oversight being performed outside of this timeframe shall be paid for by the Contractor as Inspector overtime. The cost to the Contractor to reimburse the City for overtime inspection is established at direct-labor and overtime costs for each person or inspector required. Incidental overtime costs for engineering, testing and other related services will also be charged to the Contractor at the actual rate accrued.

- 8.11 Patent Fee and Royalties: The Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work, or any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. The Contractor hereby expressly binds himself or itself to indemnify and save harmless the City from all such claims and fees and from any and all suits and action of every name and description that may be brought against City on account of any such claims, fees, royalties, or costs for any such invention or patent, and from any and all suits or actions that may

be brought against said City for the infringement of any and all patents or patent rights claimed by any person, firm corporation or other entity.

- 8.12 Permits: The Contractor shall obtain and pay for all permits and licenses. There shall be no allowance for Contractor markup, overhead or profit for permits and licenses. The Contractor shall pay all government charges which are applicable at the time of opening of proposals. It shall be the responsibility of the Contractor to secure and pay for all necessary licenses and permits of a temporary nature necessary for the prosecution of Work.
- 8.13 Law and Regulations: The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the Work. If the Contractor observes that the specifications or plans are at variance therewith, the Contractor shall give the Project Manager prompt written notice thereof, and any necessary changes shall be adjusted by any appropriate modifications. If the Contractor performs any work knowing or having reason to know that it is contrary to such laws, ordinances, rules and regulations, and without such notice to the Project Manager, the Contractor shall bear all costs arising therefrom; however, it shall not be the Contractor's primary responsibility to make certain that the specifications and plans are in accordance with such laws, ordinances, rules and regulations.
- 8.14 Taxes: The Contractor shall pay all sales, consumer, use and other similar taxes required to be paid by him in accordance with the laws of the City of Fort Lauderdale, County of Broward, State of Florida.
- 8.15 Contractor Use of Premises: The Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workmen to areas permitted by law, ordinances, permits and/or the requirements of the Contract Documents, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment.

The Contractor shall not enter upon private property for any purpose without first securing the permission of the property owner in writing and furnishing the Project Manager with a copy of said permission. This requirement will be strictly enforced, particularly with regard to such vacant properties as may be utilized for storage or staging by the Contractor.

The Contractor shall conduct his work in such a manner as to avoid damage to adjacent private or public property. Any damage to existing structures of work of any kind, including permanent reference markers or property corner markers, or the interruption of a utility service, shall be repaired or restored promptly at no expense to the City or property owner.

The Contractor will preserve and protect all existing vegetation such as trees, shrubs and grass on or adjacent to the site which do not reasonably interfere with the construction, as determined by the Project Manager. The Contractor will be responsible for repairing or replacing any trees, shrubs, lawns and landscaping that may be damaged due to careless operation of equipment, stockpiling of materials, tracking of grass by equipment or other construction activity. The Contractor will be liable for, or will be required to replace or restore at no expense to the City all

vegetation not protected or preserved as required herein that may be destroyed or damaged.

During the progress of the work, the Contractor shall keep the premises free from accumulations of waste materials, rubbish and debris resulting from the Work. At the completion of the Work, the Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials and shall leave the site clean and ready for occupancy by the City. The Contractor shall restore to their original condition those portions of the site not designated for alteration by the Contract Documents at no cost to the City.

- 8.16 Project Coordination: The Contractor shall provide for the complete coordination of the construction effort. This shall include, but not necessarily be limited to, coordination of the following:

8.16.1 Flow of material and equipment from suppliers.

8.16.2 The interrelated work with affected utility companies.

8.16.3 The interrelated work with the City where tie-ins to existing facilities are required.

8.16.4 The effort of independent testing agencies.

8.16.5 Notice to affected property owners as may be directed by the Project Manager.

- 8.17 Project Record Documents and Final As-Builts (Record Drawings): Contractor shall be responsible for maintaining up-to-date redline as-built drawings, on site, at all times during construction. All as-built information shall be surveyed and verified by a professional land surveyor registered in the State of Florida. Contractor shall provide the City with a minimum of three (3) sets of signed and sealed record drawings (Final As-Builts) and a CD of the electronic drawings files created in AutoCad 2014 or later. All costs associated with survey work required for construction layout and as-built preparation shall be the responsibility of the Contractor.

- 8.18 Safety and Protection:

8.18.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

8.18.1.1 All employees working on the project and other persons who may be affected thereby.

8.18.1.2 All the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site.

8.18.1.3 Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

8.18.2 The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall

erect and maintain all necessary safeguards for such safety and protection. The Contractor shall notify owners of adjacent property and utilities when execution of the Work may affect them at least seventy-two (72) hours in advance (unless otherwise required). All damage, injury or loss to any property caused, directly or indirectly, in whole or in part by the Contractor, any subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, shall be remedied by the Contractor. The Contractor's duties and responsibilities for safety and protection of the Work shall continue until such time as all the Work is completed and accepted by the City.

- 8.19 Emergencies: In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the City is obligated to act to prevent threatened damage, injury or loss. The Contractor shall give the Project Manager prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby.
- 8.20 Risk of Loss: The risk of loss, injury or destruction shall be on the Contractor until acceptance of the Work by the City. Title to the Work shall pass to the City upon acceptance of the Work by the City.
- 8.21 Environmental: The Contractor has fully inspected the Premises and agrees, except as to the presence of any asbestos, to accept the Premises in an "as is" physical condition, without representation or warranty by the City of any kind, including, without limitation, any and all existing environmental claims or obligations that may arise from the presence of any "contamination" on, in or about the Premises. Further, Contractor and all entitles claiming by, through or under the Contractor, releases and discharges the City, from any claim, demand, or cause of action arising out of or relating to the Contractor's use, handling, storage, release, discharge, treatment, removal, transport, decontamination, cleanup, disposal and/or presence of any hazardous substances including asbestos on, under, from or about the Premises. The Contractor shall have no liability for any pre-existing claims or "contamination" on the Premises.

The Contractor shall not use, handle, store, discharge, treat, remove, transport, or dispose of Hazardous Substances including asbestos at, in, upon, under, to or from the Premises until receipt of instructions from the City. At such time, a City approved Change Order, which shall not include any profit, shall authorize the Contractor to perform such services.

The Contractor shall immediately deliver to the Project Manager complete copies of all notices, demands, or other communications received by the Contractor from any governmental or quasi-governmental authority or any insurance company or board of fire underwriters or like or similar entities regarding in any way alleged violations or potential violations of any Environmental Law or otherwise asserting the existence or potential existence of any condition or activity on the Premises which is or could be dangerous to life, limb, property, or the environment.

For other and additional consideration, the Contractor hereby agrees, at its sole cost and expense, to indemnify and protect, defend, and hold harmless the City and its respective employees, agents, officials, officers, representatives, contractors and

subcontractors, successors, and assigns (hereafter the "City") from and against any and all claims, demands, losses, damages, costs, expenses, including but not limited to mitigation, restoration, and natural restoration expenses, liabilities, assessments, fines, penalties charges, administrative and judicial proceedings and orders, judgments, causes of action, in law or in equity, remedial action requirements and/or enforcement actions of any kind (including, without limitation, attorneys' fees and costs) directly or indirectly arising out of or attributable to, in whole or in part, the Contractor's use, handling, storage, release, threatened release, discharge, treatment, removal, transport, decontamination, cleanup, disposal and/or presence of a Hazardous Substance (excluding asbestos) on, under, from, to or about the Premises or any other activity carried on or undertaken on or off the Premises by the Contractor or its employees, agents or subcontractors, in connection with the use, handling, storage, release, threatened release, discharge, treatment, mitigation, natural resource restoration, removal, transport, decontamination, cleanup, disposal and/or presence or any Hazardous Substance including asbestos located, transported, or present on, under, from, to, or about the Premises. This indemnity is intended to be operable under 42 U.S.C. sections 9607, as amended, and any successor section.

The scope of the indemnity obligations includes, but is not limited to: (a) all consequential damages; (b) the cost of any required or necessary repair, cleanup, or detoxification of the applicable real estate and the preparation and implementation of any closure, remedial or other required plan, including without limitation; (i) the costs of removal or remedial action incurred by the United States government or the State of Florida or response costs incurred by any other person, or damages from injury to destruction of, or loss of, natural resources, including the cost of assessing such injury, destruction, or loss, incurred pursuant to the Comprehensive Environmental Response, Compensation and Liability Act, as amended; (ii) the clean-up costs, fines, damages, or penalties incurred pursuant to any applicable provisions of Florida law; and (iii) the cost and expenses of abatement, correction or cleanup, fines, damages, response costs, or penalties which arise from the provisions of any other statute, law, regulation, code ordinance, or legal requirement state or federal; and (c) liability for personal injury or property damage arising under any statutory or common law tort theory, including damages assessed for the maintenance of a public private nuisance, response costs, or for the carrying on of an abnormally dangerous activity.

8.22 No Extended Damages: For other and additional good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Contractor covenants and agrees that in the event of any delay of construction or for any other reason or allegation or claim, and notwithstanding the reason of the delay, reason, claim or allegation or who caused them or the construction delay or whether they were caused by the City, that there will be no entitlement to Contractor to or for any direct or indirect financial damages or losses for extended corporate overhead impact, extended project overhead impacts, project support services, mobilization or demobilization or by whatever other label or legal concept or theory and types of names or labels or basis such claims may have, or any business damages or losses of whatever type or nature, and Contractor hereby waives any right to make any such claim or claims. This provision will have application and effect when construction delays are anticipated and agreed upon by both the City and the Contractor.

8.23 No Liens: If any Subcontractor, supplier, laborer, or materialmen of Contractor or any other person directly or indirectly acting for or through Contractor files or attempts to



file a mechanic's or construction lien against the real property on which the work is performed or any part or against any personal property or improvements or claim against any monies due or to become due from the City to Contractor or from Contractor to a Subcontractor, for or on account of any work, labor, services, material, equipment, or other items furnished in connection with the Work or any Change Order, Contractor agrees to satisfy, remove, or discharge such lien or claim at its own expense by bond, payment, or otherwise within twenty (20) days of the filing or from receipt of written notice from the City.

Additionally, until such time as such lien or claim is satisfied, removed or discharged by Contractor, all monies due to Contractor, or that become due to Contractor before the lien or claim is satisfied, removed or otherwise discharged, shall be held by City as security for the satisfaction, removal and discharge of such lien and any expense that may be incurred while obtaining such. If Contractor shall fail to do so, City shall have the right, in addition to all other rights and remedies provided by this Agreement or by law, to satisfy, remove, or discharge such lien or claim by whatever means City chooses at the entire and sole cost and expense of Contractor which costs and expenses shall, without limitation, include attorney's fees, litigation costs, fees and expenses and all court costs and assessments.

- 8.24 Weather Emergencies: Upon issuance of a Hurricane Watch by the National Weather Service, the Contractor shall submit to the City a plan to secure the work area in the event a Hurricane Warning is issued. The plan shall detail how the Contractor will secure the Premises, equipment and materials in a manner as to prevent damage to the Work and prevent materials and equipment from becoming a hazard to persons and property on and around the Premises. The plan shall include a time schedule required to accomplish the hurricane preparations and a list of emergency contacts that will be available and in the City before, during and immediately after the storm.

Upon issuance of a Hurricane Warning by the National Weather Service, if the Contractor has not already done so, the Contractor shall implement its hurricane preparedness plan. Cost of development and implementation of the hurricane preparedness plan shall be considered as incidental to construction. Cost of any clean up and rework required after the storm will be considered normal construction risk within Florida and shall not entitle the Contractor to any additional compensation. Contractor shall be entitled to request an extension in time for completion of the Work, in accordance with the provisions of Article 15 of this Agreement, equal to the time he is shut down for implementation of the preparedness plan, the duration of the storm and a reasonable period to restore the Premises.

- 8.25 Force Majeure: No Party shall hold the other responsible for damages or for delays in performance caused by force majeure, acts of God, or other acts or circumstances beyond the control of the other party or that could not have been reasonably foreseen and prevented. For this purposes, such acts or circumstances shall include, but not be limited to weather conditions affecting performance, floods, epidemics, war, riots, strikes, lockouts, or other industrial disturbances, or protest demonstrations. Should such acts or circumstances occur, the parties shall use their best efforts to overcome the difficulties arising therefrom and to resume the Work as soon as reasonably possible with the normal pursuit of the Work.

Inclement weather, continuous rain for less than three (3) days or the acts or omissions of subcontractors, third-party contractors, materialmen, suppliers, or their subcontractors, shall not be considered acts of force majeure.

No Party shall be liable for its failure to carry out its obligations under the Agreement during a period when such Party is rendered unable by force majeure to carry out its obligation, but the obligation of the Party or Parties relying on such force majeure shall be suspended only during the continuance of the inability and for no longer period than the unexpected or uncontrollable event.

The Contractor further agrees and stipulates, that its right to excuse its failure to perform by reason of force majeure shall be conditioned upon giving written notice of its assertion that a Force Majeure delay has commenced within 96 hours after such an occurrence. The CONTRACTOR shall use its reasonable efforts to minimize such delays. The CONTRACTOR shall promptly provide an estimate of the anticipated additional time required to complete the Project.

- 8.26 Participation by Disadvantaged Business Enterprises in Department of Transportation Financial Assisted Contracts: The recipient shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any DOT-assisted contract or in the administration of its DBE program or the requirements of 49 CFR part 26. The recipient shall take all necessary and reasonable steps under 49 CFR part 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts. The recipient's DBE program, as required by 49 CFR part 26 and as approved by DOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the recipient of its failure to carry out its approved program, the Department may impose sanctions as provided for under part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. 3801 *et seq.*).

Additionally, the contractor assures that they, the sub recipient or the subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate. (This additional language must be included in each subcontract the prime contractor signs with a subcontractor.)

## **ARTICLE 9 – CITY'S RESPONSIBILITIES**

- 9.1 The City shall furnish the data required of the City under the Contract Documents promptly and shall make payments to the Contractor promptly after they are due as provided in Article 7.
- 9.2 The City's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in the Contract Documents.

### 9.3 Technical Clarifications and Interpretations:

9.3.1 The City shall issue, with reasonable promptness, such written clarifications or interpretations of the Contract Documents as it may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. Should the Contractor fail to request interpretation of questionable items in the Contract Documents, the City shall not entertain any excuse for failure to execute the Work in a satisfactory manner.

9.3.2 The City shall interpret and decide matters concerning performance under the requirements of the Contract Documents, and shall make decisions on all claims, disputes or other matters in question. Written notice of each claim, dispute or other matter will be delivered by claimant to the other Party but in no event later than five (5) days after the occurrence of event, and written supporting data will be submitted to the other Party within five (5) days after such occurrence. All written decisions of the City on any claim or dispute will be final and binding.

9.4 The Contractor shall perform all Work to the reasonable satisfaction of the City in accordance with the Contract Documents. In cases of disagreement or ambiguity, the City shall decide all questions, difficulties, and disputes of whatever nature, which may arise under or by reason of this Agreement or the quality, amount and value of the Work, and the City's decisions on all claims, questions and determination are final.

## **ARTICLE 10 – BONDS AND INSURANCE**

10.1 Public Construction and Other Bonds: The Contractor shall furnish Public Construction or Performance and Payment Bonds ("Bond"), each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all the Contractor's obligations under the Contract Documents. These Bonds shall remain in effect until at least one (1) year after the date of final payment, except as otherwise provided by law. All Bonds shall be furnished and provided by the surety and shall be in substantially the same form as prescribed by the Contract Documents and be executed by such sureties as (i) are licensed to conduct business in the State of Florida, and (ii) are named in the current list of Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department and (iii) otherwise meet the requirements set forth herein that apply to sureties. All Bonds signed by an agent must be accompanied by a certified copy of the authority to act.

10.1.1 Performance Bond: The Contractor shall execute and record in the public records of Broward County, Florida, a payment and performance bond in an amount at least equal to the Contract Price with a surety insurer authorized to do business in the State of Florida as surety, ("Bond"), in accordance with Section 255.05, Florida Statutes (2014), as may be amended or revised, as security for the faithful performance and payment of all of the Contractor's obligations under the Contract Documents.

A Corporate Surety Bond legally issued, meeting the approval of, and running to the City in an amount not less than the Contract Price of such improvements, conditioned that the Contractor shall maintain and make all repairs to the improvements constructed by the Contractor at their own expense and free of charge to the City, for the period of one (1) year after the date of acceptance of the Work within such period by reason of any imperfection of the material used or by reason of any defective workmanship, or any improper, imperfect or defective preparation of the base upon which any such improvement shall be laid.

- 10.2 Disqualification of Surety: If the Surety on any Bond furnished by the Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in the State of Florida or it ceases to meet the requirements of clauses (i) and (ii) of Paragraph 10.1, the Contractor shall within five (5) days thereafter substitute another Bond and Surety, both of which shall be acceptable to the City.

10.3 Insurance

10.3.1 Contractor shall provide and shall require all of its sub-contractors to provide, pay for, and maintain in force at all times during the term of the Agreement, such insurance, including Property Insurance (Builder's Risk), Commercial General Liability Insurance, Business Automobile Liability Insurance, Workers' Compensation Insurance, Employer's Liability Insurance, and Umbrella/Excess Liability, as stated below, as well as Professional Liability insurance in the amount of \$1,000,000 for any Architectural and or Engineering requirements associated with the fulfillment of the contract if required. Such policy or policies shall be issued by companies authorized to do business in the State of Florida and having agents upon whom service of process may be made in the State of Florida. **A Sample Insurance Certificate shall be included with the proposal to demonstrate the firm's ability to comply with insurance requirements. Provide a previous certificate or other evidence listing the insurance companies' names for all required coverage, and the dollar amounts of the coverage.**

- A. The City is required to be named as additional insured on the Commercial General Liability insurance policy. BINDERS ARE UNACCEPTABLE. The insurance coverage required shall include those classifications, as listed in standard liability insurance manuals, which most nearly reflect the operations of the Contractor. Any exclusions or provisions in the insurance maintained by the Contractor that precludes coverage for the work contemplated in this Agreement shall be deemed unacceptable, and shall be considered a breach of contract.
- B. The Contractor shall provide the City an original Certificate of Insurance for policies required by Article 10. All certificates shall state that the City shall be given ten (10) days' notice prior to expiration or cancellation of the policy. The insurance provided shall be endorsed or amended to comply with this notice requirement. In the event that the insurer is unable to accommodate, it shall be the responsibility of the Contractor to provide the proper notice. Such notification will be in writing by

registered mail, return receipt requested and addressed to the Finance Department. Such policies shall: (1) name the insurance company or companies affording coverage acceptable to the City, (2) state the effective and expiration dates of the policies, (3) include special endorsements where necessary. Such policies provided under Article 10 shall not be affected by any other policy of insurance, which the City may carry in its own name.

- C. Contractor shall as a condition precedent of this Agreement, furnish to the City of Fort Lauderdale, c/o Project Manager, 100 N. Andrews Avenue, Fort Lauderdale, FL 33301, Certificate(s) of Insurance upon execution of this Agreement, which indicate that insurance coverage has been obtained which meets the requirements as outlined below:

10.3.2 Property Insurance (Builder's Risk): - N/A

10.3.3 Commercial General Liability

- A. Limits of Liability:  
 Bodily Injury and Property Damage - Combined Single Limit  
 Each Occurrence \$1,000,000  
 Project Aggregate \$1,000,000  
 General Aggregate \$2,000,000  
 Personal Injury \$1,000,000  
 Products/Completed Operations \$1,000,000
- B. Endorsements Required:  
 City of Fort Lauderdale included as an Additional Insured  
 Broad Form Contractual Liability  
 Waiver of Subrogation  
 Premises/Operations  
 Products/Completed Operations  
 Independent Contractors  
 Owners and Contractors Protective Liability  
 Contractor's Pollution Liability – **N/A**

10.3.4 Business Automobile Liability

- A. Limits of Liability:  
 Bodily Injury and Property Damage - Combined Single Limit  
 All Autos used in completing the contract including Hired, Borrowed or Non-Owned Autos  
 Any One Accident \$1,000,000
- B. Endorsements Required:  
 Waiver of Subrogation

10.3.5 Workers' Compensation and Employer's Liability Insurance

Limits: Workers' Compensation – Per Florida Statute 440  
 Employers' Liability - \$500,000

Any firm performing work on behalf of the City of Fort Lauderdale must provide Workers' Compensation insurance. Exceptions and exemptions can only be made if they are in accordance with Florida Law.

Contractor must be in compliance with all applicable State and Federal workers' compensation laws, including the U.S. Longshore Harbor Workers' Act or Jones Act.

- 10.3.6 **Umbrella/Excess Liability:** The Contractor shall provide umbrella/excess coverage with limits of no less than \$2,000,000 excess of Commercial General Liability, Automobile Liability and Employer's Liability.
- 10.3.7 All insurance policies required above shall be issued by companies authorized to do business under the laws of the State of Florida, with the following qualifications:

The Contractor's insurance must be provided by an A.M. Best's "A-" rated or better insurance company authorized to issue insurance policies in the State of Florida, subject to approval by the City's Risk Manager. Any exclusions or provisions in the insurance maintained by the Contractor that precludes coverage for work contemplated in this project shall be deemed unacceptable, and shall be considered breach of contract.

NOTE: CITY PROJECT NUMBER MUST APPEAR ON EACH CERTIFICATE.

**A Sample Insurance Certificate shall be included with the proposal to demonstrate the firm's ability to comply with insurance requirements. Provide a previous certificate or other evidence listing the insurance companies' names for all required coverage, and the dollar amounts of the coverage.**

Compliance with the foregoing requirements shall not relieve the Contractor of their liability and obligation under this section or under any other section of this Agreement.

The Contractor shall be responsible for assuring that the insurance certificates required in conjunction with this Section remain in force for the duration of the Project. If insurance certificates are scheduled to expire during the contractual period, the Contractor shall be responsible for submitting new or renewed insurance certificates to the City at a minimum of thirty (30) calendar days in advance of such expiration. In the event that expired certificates are not replaced with new or renewed certificates that cover the contractual period, the City shall:

- A. Suspend the Agreement until such time as the new or renewed certificates are received by the City.
- B. The City may, at its sole discretion, terminate the Agreement for cause and seek damages from the Contractor in conjunction with the violation of the terms and conditions of the Agreement.

**ARTICLE 11- WARRANTY AND GUARANTEE, TESTS AND INSPECTIONS,  
CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

- 11.1 Warranty: The Contractor warrants and guarantees to the City that all Work will be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects shall be given to the Contractor. All defective work, whether or not in place, may be rejected, corrected or accepted as provided in this Article.
- 11.1.1 Warranty of Title: The Contractor warrants to the City that it possesses good, clear and marketable title to all equipment and materials provided and that there are no pending liens, claims or encumbrances against the equipment and materials.
- 11.1.2 Warranty of Specifications: The Contractor warrants that all equipment, materials and workmanship furnished, whether furnished by the Contractor, its subcontractors or suppliers, will comply with the specifications, drawings and other descriptions supplied or adopted and that all services will be performed in a workmanlike manner.
- 11.1.3 Warranty of Merchantability: The Contractor warrants that any and all equipment to be supplied pursuant to this Agreement is merchantable, free from defects, whether patent or latent in material or workmanship, and fit for the ordinary purposes for which it is intended.
- 11.2 Tests and Inspections: Contractor shall retain the services of an independent, certified, testing lab to perform all testing as required by the specifications, Contract drawings, and any applicable permitting agency. Contractor shall provide evidence of certification to the City before the work and testing is done. Testing results shall be submitted to the Engineer for review and approval at the time the results are provided to the Contractor. The Contractor shall give the Project Manager and City Inspector a minimum of twenty-four (24) hours' advanced notice of readiness of the Work for all required inspections, tests, or approvals and shall notify all applicable permitting agencies in a timely manner based on requirements set forth in the permit documents.
- 11.2.1 Neither observations by the Project Manager nor inspections, tests or approvals by others shall relieve the Contractor from its obligations to perform the Work in accordance with the Contract Documents.
- 11.3 Uncovering Work: If any work that is to be inspected, tested or approved is covered without approval or consent of the Project Manager, it must, if requested by the Project Manager, be uncovered for observation and/or testing. Such uncovering and replacement shall be at the Contractor's sole expense unless the Contractor has given the Project Manager timely notice of the Contractor's intention to cover such Work and the Project Manager has not acted with reasonable promptness in response to such notice.
- 11.3.1 If the Project Manager considers it necessary or advisable that Work covered in accordance with Paragraph 11.2.1, 11.2.2 and 11.2.3 be observed by the City or inspected or tested by others, the Contractor at the City's request, shall

uncover, expose or otherwise make available for observation, inspection or testing as the Project Manager may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, the Contractor shall bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services, and an appropriate deductive Change Order shall be issued. If, however, such work is not found to be defective, the Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection testing and reconstruction if he makes a claim therefore as provided in Articles 14 and 15.

- 11.4 City May Stop the Work: If the Work is defective, or the Contractor fails to supply sufficient skilled supervisory personnel or workmen or suitable materials or equipment or the work area is deemed unsafe, the City may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City to stop the Work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor or any other party. The City will not award any increase in Contract Price or Contract Time if the Work is stopped due to the circumstances described herein.
- 11.5 Correction or Removal of Defective Work Before Final Payment: If required by the Project Manager, the Contractor shall promptly, without cost to the City and as Specified by the Project Manager, either correct any defective Work, whether or not fabricated, installed or completed, or if the Work has been rejected by the City remove it from the site and replace it with non-defective Work.
- 11.6 One Year Correction Period After Final Payment: If within one (1) year after the date of final acceptance, or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any work is found to be defective, the Contractor shall promptly, without cost to the City and in accordance with the City's written instructions, either correct such defective Work, or, if it has been rejected by the City, remove it from the site and replace it with non-defective Work.
- If The Contractor does not promptly comply with the terms of such instructions or in an emergency where delay would cause serious risk of loss or damage, the City may have the defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs for such removal and replacement, including compensation for additional professional services, shall be paid by the Contractor.
- 11.7 Acceptance of Defective Work, Deductions: If, instead of requiring correction or removal and replacement of defective Work, the City, at the city's sole option, prefers to accept it, the City may do so. In such a case, if acceptance occurs prior to the Project Manager's recommendation of final payments, a Change Order shall be issued incorporating the necessary revisions in the Contracts Documents, including appropriate reduction in the Contract Price; or if the acceptance occurs after such recommendation, an appropriate amount shall be paid by the Contractor to the City.
- 11.8 City May Correct Defective Work: If the Contractor fails within a reasonable time after written notice of the Project Manager to proceed to correct defective Work or to



remove and replace rejected Work as required by the Project Manager in accordance with Paragraph 11.5, or if the Contractor fails to perform the Work in accordance with the Contract Documents, the City may, after seven (7) days written notice to the Contractor, correct and remedy any such deficiency. In exercising its rights under this paragraph, the City shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, the City may exclude the Contractor from all or part of the site, take possession of all or part of the Work, suspend the Contractor's services related thereto and take possession of the Contractor's tools, construction equipment and materials stored at the site or elsewhere. The Contractor shall allow the City's representative agents and employees such access to the site as may be necessary to enable the City to exercise its rights under this paragraph. All direct and indirect costs of the City in exercising such rights shall be charged against the Contractor in an amount verified by the Project Manager, and a Change Order shall be issued incorporating the necessary revisions in the Contract Documents and a reduction in the Contract Price. Such direct and indirect costs shall include, in particular but without limitation, compensation for additional professional services required and costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of the Contractor's defective Work. The Contractor shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by the City of the City's right hereunder.

## **ARTICLE 12 – INDEMNIFICATION**

12.1 Disclaimer of Liability: The City shall not at any time, be liable for injury or damage occurring to any person or property from any cause, whatsoever, arising out of Contractor's construction and fulfillment of this agreement.

12.2 Indemnification: For other, additional good valuable consideration, the receipt and sufficiency of which is hereby acknowledged:

12.2.1 Contractor shall, at its sole cost and expense, indemnify and hold harmless the City, its representatives, employees and elected and appointed officials from or on account of all claims, damages, losses, liabilities and expenses, direct, indirect or consequential including but not limited to fees and charges of engineers, architects, attorneys, consultants and other professionals and court costs arising out of or in consequence of the performance of this Agreement at all trial and appellate levels. Indemnification shall specifically include but not be limited to claims, damages, losses, liabilities and expenses arising out of or from (a) the negligent or defective design of the project and Work of this Agreement; (b) any act, omission or default of the Contractor, its Subcontractors, agents, servants or employees; (c) any and all bodily injuries, sickness, disease or death; (d) injury to or destruction of tangible property, including any resulting loss of use; (e) other such damages, liabilities, or losses received or sustained by any person or persons during or on account of any operations connected with the construction of this Project including the warranty period; (f) the use of any improper materials; (g) any construction defect including both patent and latent defects; (h) failure to timely complete the work; (i) the violation of any federal, state, county or city laws, ordinances or regulations by Contractor, its subcontractors, agents, servants, independent contractors or employees; (j) the breach or alleged breach by Contractor of any

term of the Agreement, including the breach or alleged breach of any warranty or guarantee.

- 12.2.2 Contractor agrees to indemnify, defend, save and hold harmless the City, its officers, agents and employees, from all damages, liabilities, losses, claims, fines and fees, and from any and all suits and actions of every name and description that may be brought against City, its officers, agents and employees, on account of any claims, fees, royalties, or costs for any invention or patent and/or for the infringement of any and all copyrights or patent rights claimed by any person, firm, or corporation.
- 12.2.3 Contractor shall pay all claims, losses, liens, settlements or judgments of any nature in connection with the foregoing indemnifications including, but not limited to, reasonable attorney's fees and costs for trials and appeals.
- 12.2.4 If any Subcontractor, supplier, laborer, or materialmen of Contractor or any other person directly or indirectly acting for or through Contractor files or attempts to file a mechanic's or construction lien against the real property on which the work is performed or any part or against any personal property or improvements thereon or make a claim against any monies due or to become due from the City to Contractor or from Contractor to a Subcontractor, for or on account of any work, labor, services, material, equipment, or other items furnished in connection with the Work or any change order, Contractor agrees to satisfy, remove, or discharge such lien or claim at its own expense by bond, payment, or otherwise within five (5) days of the filing or from receipt of written notice from the City.

Additionally, until such time as such lien or claim is satisfied, removed or discharged by Contractor, all monies due to Contractor, or that become due to Contractor before the lien or claim is satisfied, removed or otherwise discharged, shall be held by City as security for the satisfaction, removal and discharge of such lien and any expense that may be incurred while obtaining the discharge. If Contractor shall fail to do so, City shall have the right, in addition to all other rights and remedies provided by this Agreement or by law, to satisfy, remove, or discharge such lien or claim by whatever means City chooses at the entire and sole cost and expense of Contractor which costs and expenses shall, without limitation, include attorney's fees, litigation costs, fees and expenses and all court costs and assessments, and which shall be deducted from any amount owing to Contractor. In the event the amount due Contractor is less than the amount required to satisfy Contractor's obligation under this, or any other article, paragraph or section of this Agreement, the Contractor shall be liable for the deficiency due the City.

- 12.2.5 The Contractor and the City agree that Section 725.06(2), Florida Statutes controls the extent and limits of the indemnification and hold harmless provisions of this Agreement, if any, and that the parties waive any defects in the wording of this Article that runs afoul of said statutory section.

## ARTICLE 13 – CHANGES IN THE WORK

- 13.1 Without invalidating this Agreement, the City may, at any time or from time to time order additions, deletions or revisions in the Work through the issuance of Change Orders. Upon receipt of a Change Order, the Contractor shall proceed with the Work involved. All Work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made as provided in Article 14 or Article 15 on the basis of a claim made by either Party.
- 13.2 The Project Manager may authorize minor changes in the work not involving an adjustment in the Contract Price or the Contract Time, which are consistent with the overall intent of the Contract Documents. Such changes must be in writing and signed by the City and the Contractor.
- 13.3 If notice of any change affecting the general scope of the Work or change in the Contract Price is required by the provisions of any Bond to be given to the Surety, it will be the Contractor's responsibility to so notify the Surety, and the amount of each applicable Bond shall be adjusted accordingly. The Contractor shall furnish proof of such adjustment to the City.

## ARTICLE 14 – CHANGE OF CONTRACT PRICE

Change of Contract Price, approved by City, shall be computed as follows:

- 14.1 Cost of the Work: The term "Cost of the Work" means the sum of all direct costs necessarily incurred and paid by Contractor in the proper performance of the Work.

Except as otherwise may be agreed to in writing by the City, these costs shall be in amounts no higher than those prevailing in the City and shall include only the following items and shall not include any of the costs itemized in Paragraph 14.3:

- 14.1.1 Payroll costs for employees in the direct employ of the Contractor in the performance of the Work under schedules of job classifications agreed upon by the City and the Contractor. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus and cost of fringe benefits which shall include social security contributions, unemployment, excise and payroll taxes, worker's compensation, health and retirement benefits, bonuses, sick leave, vacation and applicable holiday pay.
- 14.1.2 Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage, and required suppliers and field services. All cash discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to the City, and the Contractor shall make provisions so that they may be obtained.
- 14.1.3 Supplemental costs including the following:

- 14.1.3.1 Cost, including transportation and maintenance of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work.
- 14.1.3.2 Rentals of all construction equipment and machinery and the parts whether rented from the Contractor or others in accordance with rental agreements approved by the City, and the costs of transporting, loading, unloading, installation, dismantling and removal. The rental of any such equipment, machinery or parts shall cease when the use is no longer necessary for the Work.
- 14.1.3.3 Sales, consumer, use or similar taxes related to the Work and for which the Contractor is liable, imposed by laws and regulations.
- 14.1.3.4 Royalty payments and fees for permits and licenses.
- 14.1.3.5 The cost of utilities, fuel and sanitary facilities at the Work site.
- 14.1.3.6 Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.
- 14.1.3.7 Cost of premiums for additional bonds and insurance required because of changes in the Work.

14.2 The Contract Price may only be increased by a Change Order when Work is modified in accordance with Article 13 and approved by the City in writing. Any claim for an increase in the Contract Price resulting from a Change Order shall be based on written notice delivered to the Project Manager within ten (10) days of the occurrence of the Change Order giving rise to the claim. Notice of the amount of the claim with supporting data shall be included in the Change Order and delivered within twenty (20) days of such occurrence unless Project Manager allows an additional period of time to ascertain accurate cost data. Any change in the Contract Price resulting from any such claim shall be incorporated in the Change Order. **IT IS EXPRESSLY AND SPECIFICALLY AGREED THAT ANY AND ALL CLAIMS FOR CHANGES TO THE CONTRACT PRICE SHALL BE WAIVED IF NOT SUBMITTED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THIS SECTION.**

14.3 Not Included in the Cost of the Work: The term "cost of the Work" shall not include any of the following:

14.3.1 Payroll costs and other compensation of the Contractor's officers executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditor, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by the Contractor whether at the site or in the Contractor's principal or branch office for general administration of the work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 14.1.1, all of which are to be considered administrative costs covered by the Contractor's fee.

14.3.2 Expenses of the Contractor's principal and branch offices other than the Contractor's office at the site.

14.3.3 Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the Work and charges against the Contractor for delinquent payments.

14.3.4 Cost of premiums for all bonds and for all insurance whether or not the Contractor is required by the Contract Documents to purchase and maintain the same.

14.3.5 Costs due to the negligence of the Contractor, any subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.

14.3.6 Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 14.1

14.4 Basis of Compensation: The Contractor's compensation, allowed to the Contractor for overhead and profit, shall be determined as follows:

14.4.1 A mutually acceptable negotiated fee:

14.4.1.1 For costs incurred under Paragraphs 14.1.1 and 14.1.2, the Contractor's fee shall not exceed five percent (5%).

14.4.1.2 No fee shall be payable on the basis of costs itemized under Paragraphs 14.1.3.1, 14.1.3.2, 14.1.3.3, 14.1.3.4, 14.1.3.5, 14.1.3.6, 14.1.3.7, 14.3.1, 14.3.2, 14.3.3, 14.3.4, 14.3.5 and 14.3.6.

14.4.1.3 The amount of credit to be allowed by the Contractor to the City for any such change which results in a net decrease plus a deduction in the Contractor's fee by an amount equal to five percent (5%) for the net decrease.

14.4.1.4 When both additions and credits are involved in any one change the combined overhead and profit shall be figured on the basis of net increase if any, however, not to exceed five percent (5%) of the agreed compensation. Profit will not be paid on any Work not performed.

14.5 Cost Breakdown Required: Whenever the cost of any Work is to be determined pursuant to this Article, the Contractor will submit in form acceptable to the City an itemized cost breakdown together with supporting documentation. Whenever a change in the Work is to be based upon mutual acceptance of a lump sum, whether the amount is an addition, credit, or no-charge-in-cost, the Contractor shall submit an estimate substantiated by a complete itemized breakdown:

14.5.1 The breakdown shall list quantities and unit prices for materials, labor, equipment and other items of cost.

14.5.2 Whenever a change involves the Contractor and one (1) or more subcontractors and the change is an increase in the agreed compensation, the overhead and profit percentage for the Contractor and each subcontractor shall be itemized separately.

14.6 Time for the City to Approve Extra Work: Any Extra Work in an amount up to and not exceeding a cumulative amount of \$25,000 for a specific project can be approved by the City Manager and shall require a written Change Order proposal to be submitted to the Public Works Director for submittal and approval by the City Manager. Extra Work exceeding the cumulative amount of \$25,000 for a specific project must be approved by the City Commission and a written Change Order proposal must be submitted to the Public Works Director for submittal and approval by the City Manager and City Commission. No financial or time claim for delay to the project resulting from the Change Order approval process outlined above under Section 14.6 will be allowed.

## **ARTICLE 15 – CHANGE OF THE CONTRACT TIME**

15.1 The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time shall be based on written notice delivered to the Project Manager within five (5) days of the occurrence of the event giving rise to the claim. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

15.2 The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the Contractor if a claim is made there for as provided in Paragraph 15.1. Such delays shall include but not be limited to, acts or neglect by the City, or to fires, floods, labor disputes, epidemics, abnormal weather conditions, or acts of God.

15.3 All time limits stated in the Contract Documents are of the essence. The provisions of this Article 15 shall not exclude recovery for damages for delay by the Contractor.

15.4 Delays caused by or resulting from entities, contractors or subcontractors who are not affiliated with the CONTRACTOR (non-affiliated Contractors) shall not give rise to a claim by the CONTRACTOR for damages for increases in material and/or labor costs. Such entities, contractors and subcontractors include, but are not limited to, the City's contractors and subcontractors, Florida Power and Light Company, AT&T and Florida East Coast Railway, LLC.

15.5 Rights of Various Interests: Whenever work being done by City's forces or by other contractors is contiguous to or within the limits of work covered by this Contract, the respective rights of the various interests involved shall be established by the Project Manager to secure the completion of the various portions of the work in general harmony.

## ARTICLE 16 – LIQUIDATED DAMAGES

- 16.1 Upon failure of the Contractor to complete the Work within the time specified for completion, the Contractor shall pay to the City the sum of **Five Hundred Dollars (\$500.00)** for each and every calendar day that the completion of the Work is delayed beyond the time specified in this Agreement for completion, as fixed and agreed liquidated damages and not as a penalty, so long as the delay is caused by the Contractor. Should an act of God or the acts or omissions of the City, its agents or representatives, in derogation to the terms of this Agreement cause the delay, the Contractor shall not be responsible for the delay nor liquidated damages. Liquidated damages are fixed and agreed upon between the Parties, recognizing the impossibility of precisely ascertaining the amount of damages that will be sustained by the City as a consequence of such delay and both parties desiring to obviate any question of dispute concerning the amount of damages and the cost and effect of the failure of the Contractor to complete the Work on time. Liquidated damages shall apply separately to each portion of the Work for which a time of completion is given. The City shall have the right to deduct from or retain any compensation which may be due or which may become due and payable to the Contractor the amount of liquidated damages, and if the amount retained by the City is insufficient to pay in full such liquidated damages, the Contractor shall pay all liquidated damages in full. The Contractor shall be responsible for reimbursing the City, in addition to liquidated damages or other damages for delay, for all costs of engineering, architectural fees, and inspection and other costs incurred in administering the construction of the Project beyond the completion date specified or beyond an approved extension of time granted to the Contractor whichever is later. Delays caused by or resulting from entities, contractors or subcontractors who are not affiliated with the Contractor shall not give rise to a claim by Contractor for damages for increase in material and/or labor costs. Such entities, contractors and subcontractors include, but are not limited to, the City's contractors and subcontractors, Florida Power and Light Company, AT&T, and Florida East Coast Railway, LLC.
- 16.2 No Extended Damages: For other and additional good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Contractor covenants and agrees that in the event of any delay of construction or for any reason, allegation or claim, and notwithstanding the reason of the delay, reason, claim or allegation or who caused them or the construction delay or whether they were caused by the City, that there will be no entitlement to Contractor to or for any direct or indirect financial damages or losses for extended corporate overhead impact, extended project overhead impacts, project support services, mobilization or demobilization or by whatever other label or legal concept or theory and types of names or labels or basis such claims may have, or any business damages or losses of whatever type or nature, and Contractor hereby waives any right to make any such claim or claims. This provision will have application and effect when construction delays are anticipated and agreed upon by both the City and the Contractor.

## ARTICLE 17 – SUSPENSION OF WORK AND TERMINATION

- 17.1 City May Suspend Work: The City may, at any time and without cause, suspend the Work or any portion of the Work for a period of not more than ninety (90) days by

notice in writing to the Contractor which shall fix the date on which Work shall be resumed. The Contractor shall resume the Work on the date fixed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension, if the Contractor makes a claim as provided in Articles 14 and 15.

17.2 City's Right to Terminate Contract: The City may terminate this Agreement upon fifteen (15) calendar days' written notice upon the occurrence of any one or more of the following events:

17.2.1 If the Contractor commences a voluntary case or a petition is filed against the Contractor, under any chapter of the Bankruptcy Code, or if the Contractor takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency.

17.2.2 If the Contractor makes a general assignment for the benefit of creditors.

17.2.3 If a trustee, receiver, custodian or agent of the Contractor is appointed under applicable law or under Contract, whose appointment or authority to take charge of property of the Contractor is for the purpose of enforcing a lien against such property or for the purpose of general administration of such property for the benefit of the Contractor's creditors.

17.2.4 If Contractor fails to begin the Work within fifteen (15) calendar days after the Project Initiation Date, or fails to perform the Work with sufficient workers and equipment or with sufficient materials to ensure the prompt completion of the Work, or shall perform the Work unsuitably, or cause it to be rejected as defective and unsuitable, or shall discontinue the prosecution of the Work pursuant to the accepted schedule or if Contractor shall fail to perform any material term set forth in the Contract Documents, or from any other cause whatsoever shall not carry on the Work in an acceptable manner, Project Manager may give notice in writing to Contractor and its Surety of such delay, neglect or default, specifying the same.

17.2.5 If the Contractor repeatedly fails to make prompt payments to subcontractors or for labor, material or equipment.

17.2.6 If the Contractor repeatedly disregards proper safety procedures.

17.2.7 If the Contractor disregards any local, state or federal laws or regulations.

17.2.8 If the Contractor otherwise violates any provisions of this Agreement.

17.3 If Contractor, within a period of ten (10) calendar days after such notice, shall not proceed in accordance therewith, the City may exclude the Contractor from the Work site and take the prosecution of the Work out of the hands of the Contractor, and take possession of the Work and all of the Contractor's tools, appliances, construction equipment and machinery at the site and use them without liability to the City for trespass or conversion, incorporate in the Work all materials and equipment stored at the site or for which the City has paid the Contractor but which are stored elsewhere,



and finish the Work as the City may deem expedient. In this instance, the Contractor shall not be entitled to receive any further compensation until the Work is finished.

17.3.1 If after notice of termination of Contractor's right to proceed, it is determined for any reason that Contractor was not in default, the rights and obligations of City and Contractor shall be the same as if the notice of termination had been issued pursuant to the Termination for Convenience clause as set forth in Section 17.5 below.

17.3.2 Upon receipt of Notice of Termination pursuant to Sections 17.2 or 17.5, Contractor shall promptly discontinue all affected work unless the Notice of Termination directs otherwise and deliver or otherwise make available to City all data, drawings, specifications, reports, estimates, summaries and such other information as may have been required by the Contract Documents whether completed or in process.

17.4 If the Contractor commits a default due to its insolvency or bankruptcy, the following shall apply:

17.4.1 Should this Agreement be entered into and fully executed by the parties, funds released and the Contractor (Debtor) files for bankruptcy, the following shall occur:

17.4.1.1 In the event the Contractor files a voluntary petition under 11 U.S.C. 301 or 302, or an order for relief is entered under 11 U.S.C. 303, the Contractor shall acknowledge the extent, validity, and priority of the lien recorded in favor of the City. The Contractor further agrees that in the event of this default, the City shall, at its option, be entitled to seek relief from the automatic stay pursuant to 11 U.S.C. 362. The City shall be entitled to relief from the automatic stay pursuant to 11 U.S.C. 362(d) (1) or (d) (2), and the Contractor agrees to waive the notice provisions in effect pursuant to 11 U.S.C. 362 and any applicable Local Rules of the United States Bankruptcy Court. The Contractor acknowledges that such waiver is done knowingly and voluntarily.

17.4.1.2 Alternatively, in the event the City does not seek stay relief, or if stay relief is denied, the City shall be entitled to monthly adequate protection payments within the meaning of 11 U.S.C. 361. The monthly adequate protection payments shall each be in an amount determined in accordance with the Note and Mortgage executed by the Contractor in favor of the City.

17.4.1.3 In the event the Contractor files for bankruptcy under Chapter 13 of Title 11, United States Code in addition to the foregoing provisions, the Contractor agrees to cure any amounts in arrears over a period not to exceed twenty-four (24) months from the date of the confirmation order, and such payments shall be made in addition to the regular monthly payments required by the Note and mortgage. Additionally, the Contractor shall agree that the City is over secured and, therefore, entitled to interest and attorney's fees pursuant to 11 U.S.C. 506(b). Such fees shall be allowed and payable as an

administrative expense. Further, in the event the Contractor has less than five (5) years of payments remaining on the Note, the Contractor agrees that the treatment afforded to the claim of the City under any confirmed plan of reorganization shall provide that the remaining payments shall be satisfied in accordance with the Note, and that the remaining payments or claim shall not be extended or amortized over a longer period than the time remaining under the Note.

17.4.2 Should this Agreement be entered into and fully executed by the parties, and the funds have not been forwarded to Contractor, the following shall occur:

17.4.2.1 In the event the Contractor files a voluntary petition pursuant to 11 U.S.C. 301 or 302, or an order for relief is entered under 11 U.S.C. 303., the Contractor acknowledges that the commencement of a bankruptcy proceeding constitutes an event of default under the terms of this Agreement. Further, the Contractor acknowledges that this Agreement constitutes an executory contract within the meaning of 11 U.S.C. 365. The Contractor acknowledges that this Agreement is not capable of being assumed pursuant to 11 U.S.C. 365(c)(2), unless the City expressly consents in writing to the assumption. In the event the City consents to the assumption, the Contractor agrees to file a motion to assume this Agreement within ten (10) days after receipt of written consent from the City, regardless of whether the bankruptcy proceeding is pending under Chapter 7, 11, or 13 of Title 11 of the United States Code. The Contractor further acknowledges that this Agreement is not capable of being assigned pursuant to 11 U.S.C. 365(b)(1).

- 17.5 Termination for Convenience: This Contract may be terminated for convenience in writing by City upon thirty (30) days written notice to Contractor (delivered by certified mail, return receipt requested) of intent to terminate and the date on which such termination becomes effective. In such case, Contractor shall be paid for all work executed and expenses incurred prior to termination in addition to termination settlement costs reasonably incurred by Contractor relating to commitments which had become firm prior to the termination. Payment shall include reasonable profit for work/services satisfactorily performed. No payment shall be made for profit for work/services which have not been performed.
- 17.6 Where the Contractor's service have been so terminated by the City, the termination shall not affect any rights of the City against the Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due the Contractor by the City will not release the Contractor from liability.
- 17.7 The Contractor has no right, authority or ability to terminate the Work except for the wrongful withholding of any payments due the Contractor from the City.

## **ARTICLE 18 – DISPUTE RESOLUTION**

- 18.1 Resolution of Disputes: Questions, claims, difficulties and disputes of whatever nature which may arise relative to the technical interpretation of the Contract Documents and

fulfillment of this Agreement as to the character, quality, amount and value of any work done and materials furnished, or proposed to be done or furnished under or, by reason of, the Contract Documents which cannot be resolved by mutual agreement of Contract Administrator and Contractor shall be submitted to the Consultant for resolution. When either party has determined that a disputed question, claim, difficulty or dispute is at an impasse, that party shall notify the other party in writing and submit the question, claim, difficulty or dispute to the Consultant for resolution. The parties may agree to a proposed resolution at any time without the involvement and determination of the Consultant.

- 18.1.1 Consultant shall notify Contract Administrator and Contractor in writing of Consultant's decision within twenty-one (21) calendar days from the date of the submission of the question, claim, difficulty or dispute, unless Consultant requires time to gather information or allow the parties to provide additional information.
- 18.1.2 In the event the determination of a dispute by the Consultant under this Article is unacceptable to any of the parties hereto, the party objecting to the determination must notify the other party and the City Manager, in writing within ten (10) days after receipt of the determination. The notice must state the basis of the objection and the proposed resolution. Final resolution of such dispute shall be made by the City Manager. The City Manager's decision shall be final and binding on the parties.
- 18.1.3 All non-technical administrative disputes (such as billing and payment) shall be determined by Contract Administrator.
- 18.1.4 During the pendency of any dispute and after a determination thereof, Contractor, Consultant, and Contract Administrator shall act in good faith to mitigate any potential damages including utilization of construction schedule changes and alternate means of construction. During the pendency of any dispute arising under this Agreement, other than termination herein, Contractor shall carry on the Work and adhere to the progress schedule. The Work shall not be delayed or postponed pending resolution of any disputes or disagreements.
- 18.1.5 For any disputes which remain unsolved, within sixty (60) calendar days after Final Completion of the Work, the parties shall participate in mediation to address all unresolved disputes. A mediator shall be mutually agreed upon by the parties. Should any objection not be resolved in mediation, the parties retain all their legal rights and remedies under applicable law. If a party objecting to a determination, fails to comply in strict accordance with the requirements of this Article, said party specifically waives all of its rights provided hereunder, including its rights and remedies under applicable law.

## **ARTICLE 19 – NOTICES**

- 19.1 All notices required by any of the Contract Documents shall be in writing and shall be deemed delivered upon mailing by certified mail, return receipt requested to the following:

To the City:

City Manager  
City of Fort Lauderdale  
100 North Andrews Avenue  
Fort Lauderdale, Florida 33301

with copy to the:

Project Manager and City Attorney  
City of Fort Lauderdale  
100 North Andrews Avenue  
Fort Lauderdale, Florida 33301

To the Contractor:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **ARTICLE 20 – LIMITATION OF LIABILITY**

- 20.1 The City desires to enter into this Agreement only if in so doing the City can place a limit on the City's liability for any cause of action arising out of this Agreement, so that the City's liability for any breach never exceeds the sum of \$1,000. For other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Contractor expresses its willingness to enter into this Agreement with the knowledge that the Contractor's recovery from the City to any action or claim arising from the Agreement is limited to a maximum amount of \$1,000, which amount shall be reduced by the amount actually paid by the City to the Contractor pursuant to this Agreement, for any action or claim arising out of this Agreement. Nothing contained in this paragraph or elsewhere in this Agreement is in any way intended either to be a waiver of the limitation placed upon the City's liability as set forth in Section 768.28, Florida Statutes, or to extend the City's liability beyond the limits established in said Section 768.28; and no claim or award against the City shall include attorney's fees, investigative costs, expert fees, suit costs or pre-judgment interest.
- 20.2 No Extended Damages: For other and additional good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Contractor covenants and agrees that in the event of any delay of construction or for any reason, allegation or claim, and notwithstanding the reason of the delay, reason, claim or allegation or who caused them or the construction delay or whether they were caused by the City, that there will be no entitlement to Contractor to or for any direct or indirect financial damages or losses for extended corporate overhead impact, extended project overhead impacts, project support services, mobilization or demobilization or by whatever other label or legal concept or theory and types of names or labels or basis

such claims may have, or any business damages or losses of whatever type or nature, and Contractor hereby waives any right to make any such claim or claims. This provision will have application and effect when construction delays are anticipated and agreed upon by both the City and the Contractor.

## ARTICLE 21 – GOVERNING LAW

- 21.1 This Agreement shall be governed by the laws of the State of Florida. Both Parties agree that the courts of the State of Florida shall have jurisdiction of any claim arising in connection with this Agreement. Venue for any claim, objection or dispute arising out of this Agreement shall be in Broward County, Florida. **By entering into this Contract, Contractor and City hereby expressly waive any rights either party may have to a trial by jury or any civil litigation related to, or arising out of the Project. Contractor shall specifically bind all subcontractors to the provisions of this Contract.**

## ARTICLE 22 – MISCELLANEOUS

- 22.1 The duties and obligations imposed by this Agreement and the rights and remedies available to the parties and, in particular but without limitation, the warranties, guaranties and obligations imposed upon the Contractor and all of the rights and remedies available to the City, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by laws or regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents, and the provisions of this Paragraph will survive final payment and termination or completion of this Agreement.
- 22.2 The Contractor shall not assign or transfer this Agreement or its rights, title or interests. The obligations undertaken by the Contractor pursuant to this Agreement shall not be delegated or assigned to any other person or firm. Violation of the terms of this Paragraph shall constitute a material breach of Agreement by the Contractor and the City any, at its discretion, cancel this Agreement and all rights, title and interest of the Contractor which shall immediately cease and terminate.
- 22.3 The Contractor and its employees, volunteers and agents shall be and remain an independent contractors and not agents or employees of the City with respect to all of the acts and services performed by and under the terms of this Agreement. This Agreement shall not in any way be constructed to create a partnership, association or any other kind of joint undertaking or venture between the Parties.
- 22.4 The City reserves the right to audit the records of the Contractor relating in any way to the Work to be performed pursuant to this Agreement at any time during the performance and term of this Agreement and for a period of three (3) years after completion and acceptance by the City. If required by the City, the Contractor agrees to submit to an audit by an independent certified public accountant selected by the

City. The Contractor shall allow the City to inspect, examine and review the records of the Contractor at any and all times during normal business hours during the term of this Agreement.

- 22.5 The remedies expressly provided in this Agreement to the City shall not be deemed to be exclusive but shall be cumulative and in addition to all other remedies in favor of the City now or later existing at law or in equity.
- 22.6 Should any part, term or provisions of this Agreement be decided by the courts to be invalid, illegal or in conflict with any state or federal law, the validity of the remaining portion or provision shall not be affected.
- 22.7 Scrutinized Companies: Subject to *Odebrecht Construction, Inc., v. Prasad*, 876 F.Supp.2d 1305 (S.D. Fla. 2012), *affirmed*, *Odebrecht Construction, Inc., v. Secretary, Florida Department of Transportation*, 715 F.3d 1268 (11th Cir. 2013), with regard to the "Cuba Amendment," the Contractor certifies that it is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2016), that it is not engaged in a boycott of Israel, and that it does not have business operations in Cuba or Syria, as provided in section 287.135, Florida Statutes (2016), as may be amended or revised. The City may terminate this Agreement at the City's option if the Contractor is found to have submitted a false certification as provided under subsection (5) of section 287.135, Florida Statutes (2016), as may be amended or revised, or been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2016), or is engaged in a boycott of Israel or has been engaged in business operations in Cuba or Syria, as defined in Section 287.135, Florida Statutes (2016), as may be amended or revised.
- 22.8 Public Entity Crimes: In accordance with the Public Crimes Act, Section 287.133, Florida Statutes, a person or affiliate who is a contractor, consultant or other provider, who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to the City, may not submit a bid on a contract with the City for the construction or repair of a public building or public work, may not submit bids on leases of real property to the City, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with the City, and may not transact any business with the City in excess of the threshold amount provided in Section 287.017, Florida Statutes, for category two purchases for a period of thirty-six (36) months from the date of being placed on the convicted vendor list. Violation of this section by Contractor shall result in cancellation of the City purchase and may result in Contractor debarment.
- 22.9 Attorney Fees: If CITY or CONSULTANT incurs any expense in enforcing the terms of this Agreement through litigation, the prevailing party in that litigation shall be reimbursed for all such costs and expenses, including but not limited to court costs, and reasonable attorney fees incurred during litigation.

## 22.10 Public Records

**IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT [PRRCONTRACT@FORTLAUDERDALE.GOV](mailto:PRRCONTRACT@FORTLAUDERDALE.GOV), 954-828-5002, CITY CLERK'S OFFICE, 100 N. ANDREWS AVENUE, FORT LAUDERDALE, FLORIDA 33301.**

Contractor shall:

1. Keep and maintain public records that ordinarily and necessarily would be required by the City in order to perform the service.
2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes (2016), as may be amended or revised, or as otherwise provided by law.
3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of this contract if the Contractor does not transfer the records to the City.
4. Upon completion of the Contract, transfer, at no cost, to the City all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of this Contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of this Contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

## **ARTICLE 23 – FAA REQUIRED CONTRACT PROVISIONS FOR AIRPORT CONTRACTS (NON-AIP CONTRACTS)**

- 23.1 General Civil Rights Provisions: The Contractor agrees to comply with pertinent statutes, Executive Orders and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision binds the Contractor and subtier contractors from the bid solicitation period through the completion of the contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

## 23.2 Title VI Clauses for Compliance with Non-Discrimination Requirements:

During the performance of this Contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

1. Compliance with Regulations: The Contractor (hereinafter includes consultants) will comply with the Title VI List of Pertinent Nondiscrimination Acts And Authorities, as they may be amended from time to time, which are herein incorporated by reference and made a part of this Contract.
2. Non-discrimination: The Contractor, with regard to the work performed by it during the Contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Nondiscrimination Acts and Authorities, including employment practices when the Contract covers any activity, project, or program set forth in Appendix B of 49 CFR part 21.
3. Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations, either by competitive bidding, or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the Contractor's obligations under this Contract and the Nondiscrimination Acts And Authorities on the grounds of race, color, or national origin.
4. Information and Reports: The Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the City or the Federal Aviation Administration to be pertinent to ascertain compliance with such Nondiscrimination Acts And Authorities and instructions. Where any information required of the Contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor will so certify to the sponsor or the Federal Aviation Administration, as appropriate, and will set forth what efforts it has made to obtain the information.
5. Sanctions for Noncompliance: In the event of a Contractor's noncompliance with the Non-discrimination provisions of this Contract, the City will impose such Contract sanctions as it or the Federal Aviation Administration may determine to be appropriate, including, but not limited to:
  - a. Withholding payments to the Contractor under the Contract until the Contractor complies; and/or
  - b. Cancelling, terminating, or suspending a Contract, in whole or in part.
6. Incorporation of Provisions: The Contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the City or the Federal Aviation Administration may



direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the City to enter into any litigation to protect the interests of the City. In addition, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

### 23.3 Title VI List of Pertinent Nondiscrimination Acts and Authorities:

During the performance of this Contract, the Contractor, for itself, its assignees, and successors in interest agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin);
- 49 CFR part 21 (Non-discrimination In Federally-Assisted Programs of The Department of Transportation—Effectuation of Title VI of The Civil Rights Act of 1964);
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability); and 49 CFR part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, sub- recipients and Contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 – 12189) as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38;
- The Federal Aviation Administration’s Non-discrimination statute (49 U.S.C. §47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure

compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

Fort Lauderdale Executive Airport Administration Building Renovations  
(Contractor)  
Project 12188

**CITY**

IN WITNESS OF THE FOREGOING, the parties have set their hands and seals the day and year first above written.

CITY OF FORT LAUDERDALE, a municipal  
corporation of the State of Florida

By: \_\_\_\_\_  
LEE R. FELDMAN, City Manager

(CORPORATE SEAL)

ATTEST:

By: \_\_\_\_\_  
JEFFREY A. MODARELLI  
City Clerk

Approved as to Legal Form:

By: \_\_\_\_\_  
RHONDA MONTOYA HASAN  
Assistant City Attorney

**CONTRACTOR**

WITNESSES:

CONTRACTOR.,  
a Florida corporation.

\_\_\_\_\_

By \_\_\_\_\_

\_\_\_\_\_

Print Name

\_\_\_\_\_

PRINT NAME

\_\_\_\_\_

Title

\_\_\_\_\_

ATTEST:

\_\_\_\_\_

Print Name

BY: \_\_\_\_\_

\_\_\_\_\_

PRINT NAME

\_\_\_\_\_

Secretary

(CORPORATE SEAL)

STATE OF FLORIDA:  
COUNTY OF BROWARD:

The foregoing instrument was acknowledged before me this \_\_\_\_ day of \_\_\_\_\_, 2017, by \_\_\_\_\_ (Name), \_\_\_\_\_ (Title) of \_\_\_\_\_, a Florida corporation, on behalf of the Corporation.

SEAL

\_\_\_\_\_  
Notary Public, State of Florida\_\_\_\_\_  
Name of Notary Typed, Printed or Stamped☐ Personally Known or ☐ Produced Identification:

Type of Identification Produced: \_\_\_\_\_

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## **GENERAL CONDITIONS**

**Unless otherwise modified in the projects special conditions, the following General Conditions shall be part of the Contract:**

**GC - 01 - DEFINITIONS** - The following words and expressions, or pronouns used in their stead, shall wherever they appear in the Contract and the Contract Documents, be construed as follows:

"Addendum" or "Addenda" - shall mean the additional Contract provisions issued in writing, by the Engineer, prior to the receipt of bids.

"Bid" – shall mean the offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

"Bidder" – shall mean any person, firm, company, corporation or entity submitting a Bid for the Work.

"Bonds" –shall mean Bid, performance and payment bonds and other instruments of security, furnished by Contractor and his surety in accordance with the Contract Documents.

"City" – shall mean the City of Fort Lauderdale, Florida, a Florida municipal corporation. In the event the City exercises its regulatory authority as a government body, the exercise of such regulatory authority and the enforcement of any rules, regulations, codes, laws and ordinances shall be deemed to have occurred pursuant to City's authority as a governmental body and shall not be attributable in any manner to the City as a party to this Contract. For the purpose of this Contract, "City" without modification shall mean the City Commission, and/or City Manager or his/her designee(s) as applicable.

"Construction Manager" - shall mean the Public Works Director or his/her designee.

"Construction Project Manager" - shall mean the Public Works Director or his/her designee

"Consultant" – shall mean a person, firm, company, corporation or other entity employed by the City to perform the professional services for the project.

"Contract Work" - shall mean everything expressed or implied to be required to be furnished and furnished by the Contractor by any one or more of the parts of the Contract Documents referred to in the Contract hereof except Extra Work as hereinafter defined, it being understood that, in case of any inconsistency in or between any part or parts of this Contract, the Public Works Director shall determine which shall prevail.

"Design Documents" – shall mean the construction plans and specifications included as part of a Bid/Proposal Solicitation prepared either by the City or by the Consultant under a separate Agreement with the City.

"Engineer" - shall mean the Public Works Director or his/her designee.

"Extra Work" - shall mean work other than that required by the Contract.

"Inspector" – shall mean an authorized representative of the City assigned to make necessary inspections of materials furnished by Contractor and of the Work performed by Contractor.

"Notice" - shall mean written notice sent by certified United States Mail, return receipt requested, or sent by commercial express carrier with acknowledgement of delivery, or via fax or email, or by hand delivery with a request for a written receipt of acknowledgment of delivery and shall be served upon the Contractor either personally or to its place of business listed in the Bid.

"Owner" - shall mean the City of Fort Lauderdale.

"Project Manager" - shall mean the Public Works Director or his/her designee.

"Public Works Director" -shall mean the Public Works Director of the City of Fort Lauderdale, Florida or his/her designee(s).

"Site" - shall mean the area upon or in which the Contractor's operations are carried out and such other areas adjacent thereto as may be designated as such by the Public Works Director.

"Subcontractor" - shall mean any person, firm, company, corporation or other entity, other than employees of the Contractor, who or which contracts with the contractor, to furnish, or actually furnishes labor and materials, or labor and equipment, or labor, materials and equipment at the site.

"Surety" - shall mean any corporation or entity that executes, as Surety, the Contractor's performance and payment bond securing the performance of this Contract.

**GC - 02 - SITE INVESTIGATION AND REPRESENTATION** - The Contractor acknowledges that it has satisfied itself as to the nature and location of the Work under the Contract Documents, the general and local conditions of the Site, particularly those bearing upon availability of transportation, disposal, handling and storage of materials, availability of labor, water, electric power, and roads, the conformation and conditions at the ground based on City provided reports, the type of equipment and facilities needed preliminary to and during the prosecution of the Work and all other matters which can in any way affect the Work or the cost thereof under the Contract Documents.

The Contractor acknowledges that it has conducted extensive tests, examinations and investigations and represents and warrants a thorough familiarization with the nature and extent of the Contract Documents, the Work, locality, soil conditions, moisture conditions and all year-round local weather and climate conditions (past and present), and, in reliance on such tests, examination and investigations conducted by Contractor and the Contractor's experts, has determined that no conditions exist that would in any manner affect the Bid Price and that the project can be completed for the Bid Price submitted.

The Contractor, on its own, has made or caused to be made examinations, investigations, tests and studies of reports and related data in addition to those referred above, as Contractor deemed necessary to perform the Work at the Bid price set by the Contractor, within the contract time and in accordance with the other terms and conditions of the Contract Documents and the Bid made by the Contractor; and no additional examinations, investigations, tests, reports or similar data are, or will be, required by Contractor to assure that the Work can be done at the Bid price set by the Contractor.

The Contractor further acknowledges that it has satisfied itself based on any geotechnical reports the City may provide and inspection of the project Site as to the character, quality, and quantity of surface and subsurface materials to be encountered from inspecting the site and from evaluating information derived from exploratory work that may have been done by the City or included in the Contract Documents and finds and has further determined that no conditions exist that would in any manner affect the Bid price and that the project can be completed for the Bid price submitted.

Any failure by the Contractor to acquaint itself with all the provided information and information obtained by visiting the project Site will not relieve Contractor from responsibility for properly estimating the difficulty or cost thereof under the Contract Documents. In the event that the actual subsurface conditions vary from the actual City provided reports, the Contractor shall notify the City and the Contract amount may be adjusted depending on the conditions, at the approval of the City.

**GC - 03 - SUBSTITUTIONS** - If the Contractor desires to use materials and/or products of manufacturer's names different from those specified in the Contract Documents, the Bidder requesting the substitution shall make written application as described herein. The burden of proving the equality of the proposed substitution rests on the Bidder making the request. To be acceptable, the proposed substitution shall meet or exceed all expressed requirements of the Contract Documents and shall be submitted upon the Contractor's letterhead, in addition to the "Contractor's Request for Substitution" form provided by the Public Works Director. The following requirements shall be met in order for the substitution to be considered:

1. Requests for substitution shall reach the Public Works Director no less than ten (10) Working Days prior to the date set for opening of Bids; and
2. Requests for substitution shall be accompanied by such technical data, as the party making the request desires to submit. The Public Works Director will consider reports from reputable independent testing laboratories, verified experience records from previous users and other written information valid in the circumstances; and
3. Requests for substitution shall completely and clearly indicate in what respects the materials and/or products differ from those indicated in the Contract Documents; and
4. Requests for substitution shall be accompanied by the manufacturer's printed recommendations clearly describing the installation, use and care, as applicable, of the proposed substitutions; and
5. Requests for substitution shall be accompanied by a complete schedule of changes in the Contract Documents, if any, which must be made to permit the use of the proposed substitution; and
6. Provide the "Contractor's Request for Substitution" form, completely executed. Failure to provide all pertinent data will result in immediate rejection of such a request.

If a proposed substitution is approved by the Public Works Director, an Addendum will be issued to prospective bidders not less than three (3) working days prior to the date set for opening of Bids. Unless substitutions are received and approved as described above, the successful Bidder shall be responsible for furnishing materials and products in strict accordance with the Contract Documents.

**GC - 04 - CONTROL OF THE WORK** - The Public Works Director shall have full control and direction of the Work in all respects. The Public Works Director and/or his authorized designee(s) shall, at all times, have the right to inspect the Work and materials. The Contractor shall furnish all reasonable facilities for obtaining such information, as the Public Works Director may desire respecting the quality of the Work and materials and the manner of conducting the Work. Should the Contractor be directed or permitted to perform night Work, or to vary the period which work is ordinarily carried on in the daytime, he shall give ample notice to the Public Works Director so that proper and adequate inspection may be provided. Such Work shall be done only under such regulations as are furnished in writing by the Public Works Director, and no extra compensation shall be allowed to the Contractor therefore. In the event of night work, the Contractor shall furnish



such light, satisfactory to the Public Works Director, as will insure proper inspection. Nothing herein contained shall relieve the Contractor from compliance with any and all City ordinances relating to noise or Work during prohibited hours.

The Contractor shall keep the Public Works Director informed, a reasonable time in advance, as to his need for grades and lines in order that the same may be furnished and all necessary measurements made for records and for payment with the minimum of inconvenience to the Public Works Director or of delay to the Contractor. The Contractor shall submit to the Public Works Director or Inspector on the job a written request outlining the streets, etc., for which the Contractor desires lines and grades. It is the intention not to delay the Work for the giving of lines and grades, but when necessary, work operations shall be suspended for such reasonable time as the Public Works Director may require for this purpose. However, such cost increases shall be authorized either by the City Manager and/or designee, or the City Commission based upon the purchasing threshold amounts provided for in Chapter 2 of the City of Fort Lauderdale's Code of Ordinances.

**GC - 05 - SUBCONTRACTOR** - The Contractor shall not sublet, in whole or any part of the Work without the written consent and approval of the Public Works Director. Within ten (10) days after official notification of starting date, the Contractor must submit in writing, to the Public Works Director, a list of all Subcontractors. No Work shall be done by any Subcontractor until such Subcontractor has been officially approved by the Public Works Director. A subcontractor not appearing on the original list will not be approved without written request submitted to the Public Works Director and approved by the Public Works Director. In all cases, the Contractor shall give his personal attention to the Work of the Subcontractors and the Subcontractor is liable to be discharged by the Contractor, at the direction of the Public Works Director, for neglect of duty, incompetence or misconduct.

Acceptance of any Subcontractor, other person, or organization by the Public Works Director shall not constitute a waiver of any right of Public Works Director to reject defective Work or Work not in conformance with the Contract Documents.

Contractor shall be fully responsible for all acts and omissions of his Subcontractors and of persons and organizations directly or indirectly employed by them and of persons and organizations for whose acts any of them may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him. Nothing in the Contract Documents shall create any contractual relationship between City and any Subcontractor or other person or organization having a direct contract with Contractor, nor shall it create any obligation on the part of City to pay or to see to the payment of any moneys due to any Subcontractor or other person, or organization, except as may otherwise be required by law.

**GC - 06 - QUANTITIES** - It is mutually agreed that the proposal shows the approximate amounts only along with the Plans and the general location. It is also mutually agreed that no change will be made involving any departure from the general scheme of the Work and that no such change involving a material change in cost, either to the City or Contractor, shall be made, except upon written permission of the City. However, the Public Works Director shall have the right to make minor alternations in the line, grade, plan, form or materials of the Work herein contemplated any time before the completion of the same. That if such alterations shall diminish the quantity of the Work to be done, such alterations shall not constitute a claim for damages or anticipated profits. That if such alterations increase the amount of the Work to be done, such increase shall be paid for according to the quantity actually performed and at the unit price or prices stipulated therefore in the Contract.

The City shall, in all cases of dispute, determine the amount or quantity of the several kinds of Work which are to be paid for under this Contract, and shall decide all questions relative to the execution of the same, and such estimates and decisions shall be final and binding.

Any Work not herein specified, which might be fairly implied as included in the Contract, of which the City shall judge, shall be done by the Contractor without extra charge. However, such cost increases shall be authorized either by the City Manager and/or designee, or the City Commission based upon the purchasing threshold amounts provided for in Chapter 2 of the City of Fort Lauderdale's Code of Ordinances.

**GC-07 - NO ORAL CHANGES** - Except to the extent expressly set forth in the Contract, no change in or modification, termination or discharge of the Contract in any form whatsoever, shall be valid or enforceable unless it is in writing and signed by the parties charged, therewith or their duly authorized representative.

**GC - 08 - PERMITS AND PROTECTION OF PUBLIC** – Permits on file with the City and or those permits to be obtained shall be considered directive in nature and will be considered a part of this Contract. A copy of all permits shall be given to the City and become part of the Contract Documents. Terms of permits shall be met prior to acceptance of the Work and release of the final payment.

The Contractor shall be required to observe all the ordinances in relation to obtaining permits for occupying, excavating, or in any way obstructing the streets and alleys. He shall erect and maintain barricades and sufficient safeguards around all excavations, embankments or obstructions; he shall place sufficient warning lights at or near the Work; keep the same burning from sunset to sunrise, employ watchmen, and strictly obey all laws and ordinances controlling or limiting those engaged in similar work.

Where there are telephones, light or power poles, water mains, conduits, pipes or drains or other construction, either public or private, in or on the streets or alleys, the Work shall be so conducted that no interruption or delay will be caused in the operation or use of the same. Proper written notice shall be given, and all the facilities, afforded the owners of such construction encountered or likely to be encountered, as will enable them to preserve the same from injury.

The Contractor shall not be permitted to interfere with public travel and convenience by grading or tearing up streets indiscriminately, but the Work of constructing the various items in this contract shall proceed in an orderly, systematic and progressive manner.

Contractor shall not load nor permit any part of any structure to be loaded with weights that will endanger the structure, nor shall he subject any part of the Work to stresses or pressures that will endanger it.

Where lifting operations involving the use of specialized cranes are required as part of construction, Contractor must make undertake the following investigation and submit the results and documentation to the Engineer prior to commencing any lifting operations: marking a very specific area in the field for the placement of the crane; a drawing showing the limitations of the job operation (i.e. not over adjacent properties or pedestrian and high vehicular traffic areas); underground utility exploration in the vicinity of the crane location, which may include ground penetrating radar to identify voids or old pipe or other subsurface features that could lead to sudden failure; assessment of the underlying soil and roadway materials and a worst case analysis based on entire load being distributed on just one or two outriggers; provision of properly sized pads under the outriggers; loading charts from manufacturer showing allowable configurations/loads; and inspection to make sure crane operation is in accordance with the permit conditions.

**GC - 09 - DISEASE REGULATIONS** - The Contractor shall enforce all sanitary regulations and take all precautions against infectious diseases as the Public Works Director may deem necessary. Should any infectious or contagious diseases occur among his employees, he shall arrange for

the immediate removal of the employee from the Site and isolation of all persons connected with the Work.

**GC - 10 - CONTRACTOR TO CHECK PLANS, SPECIFICATIONS, AND DATA** - The Contractor shall verify all dimensions, quantities, and details shown on the plans, supplementary drawings, schedules, or other data received from the Public Works Director, and shall notify the Public Works Director of all errors, omissions, conflicts and discrepancies found therein within three (3) working days of discovery. Failure to discover or correct errors, conflicts, or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory Work, faulty construction, or improper operation resulting there from nor from rectifying such condition at his own expense.

**GC - 11 - SUPPLEMENTARY DRAWINGS** - When, in the opinion of the Public Works Director, it becomes necessary to explain more fully the Work to be done, or to illustrate the work further, or to show any changes which may be required, drawings, known as supplementary drawings, with specifications pertaining thereto, will be prepared by the Public Works Director and copies will be given to the Contractor.

The supplementary drawings shall be binding upon the Contractor with the same force as the original Plans. Where such supplementary drawings require either less or more than the estimated quantities of work, credit to the City or compensations therefore to the Contractor shall be subject to the terms of the Contract.

**GC - 12 - MATERIALS AND WORKMANSHIP** - All material and workmanship shall, in every respect, be in conformity with approved modern practice and with prevailing standards of performance and quality. In the event of dispute the Public Works Director's decision shall be final. Wherever the Plans, specifications, Contract Documents, or the directions of the Public Works Director are unclear as to what is permissible and/or fail to note the quality of any Work, that interpretation will be made by the Public Works Director, which is in accordance with approved modern practice, to meet the particular requirements of the Contract.

In all cases, new materials shall be used, unless this provision is waived by notice from the City in writing.

**GC - 13 - SAFEGUARDING MARKS** - The Contractor shall safeguard all points, stakes, grade marks, monuments, and bench marks made or established on the Work, bear the cost of re-establishing same if disturbed, or bear the entire expense of rectifying Work improperly installed due to not maintaining or protecting or for removing without authorization, such established points, stakes and marks. The Contractor shall safeguard all existing and known property corners, monuments and marks not related to the Work and, if required, shall bear the cost of having them re-established by a licensed surveyor if disturbed or destroyed during the course of construction.

**GC - 14 - EXISTING UTILITY SERVICE** - All existing utility service shall be maintained with a minimum of interruption at the expense of the Contractor.

**GC - 15 - JOB DESCRIPTION SIGNS** – Contractor, at Contractor's expense, shall furnish, erect, and maintain suitable weatherproof signs on jobs over \$100,000 containing the following information:

1. City Seal (in colors)
2. Project or Improvement Number
3. Job Description
4. Estimated Cost
5. Completion Date

Minimum size of sign shall be four feet high, eight feet wide and shall be suitably anchored. The entire sign shall be painted and present a pleasing appearance. Exact location of signs will be determined in the field. Two (2) signs will be required, one at each end of the job. All costs of this work shall be included in other parts of the work.

**GC - 16 - FLORIDA EAST COAST RIGHT-OF-WAY** - Whenever a City contractor is constructing within the Florida East Coast Railway Company's Right-of-Way, it will be mandatory that the contractor carry separate bodily injury and property damage insurance in the amounts as stated below. This insurance shall be taken out and maintained during the life of the Contract.

Bodily injury insurance in an amount not less than \$500,000.00 for injuries, including wrongful death to any one person, and subject to the same limit for each person, in an amount not less than \$1,000,000.00 on account of any one occurrence, and

Property damage insurance in an amount not less than \$500,000.00 for damages on account of any one occurrence and in an amount not less than \$1,000,000.00 for damages on account of all occurrences.

**GC - 17 - ACCIDENTS** - The Contractor shall provide such equipment and facilities as are necessary and/or required, in the case of accidents, for first aide services to be provided to a person who may be injured during the project duration. The Contractor shall also comply with the OSHA requirements as defined in the United States Labor Code 29 CFR 1926.50.

In addition, the Contractor must report immediately to the Public Works Director every accident to persons or damage to property, and shall furnish in writing full information, including testimony of witnesses regarding any and all accidents.

**GC - 18 - SAFETY PRECAUTIONS** - Contractor must adhere to the applicable environmental protection guidelines for the duration of a project. If hazardous waste materials are used, detected or generated at any time, the Project Manager must be immediately notified of each and every occurrence. The Contractor shall comply with all codes, ordinances, rules, orders and other legal requirements of public authorities (including OSHA, EPA, DERM, the City, Broward County, State of Florida, and Florida Building Code), which bear on the performance of the Work.

The Contractor shall take the responsibility to ensure that all Work is performed using adequate safeguards, including but not limited to: proper safe rigging, safety nets, fencing, scaffolding, barricades, chain link fencing, railings, barricades, steel plates, safety lights, and ladders that are necessary for the protection of its employees, as well as the public and City employees. All riggings and scaffolding shall be constructed with good sound materials, of adequate dimensions for their intended use, and substantially braced, tied or secured to ensure absolute safety for those required to use it, as well as those in the vicinity. All riggings, scaffolding, platforms, equipment guards, trenching, shoring, ladders and similar actions or equipment shall be OSHA approved, as applicable, and in accordance with all Federal, State and local regulations.

**GC - 19 - DUST PREVENTION** - The Contractor shall, by means of a water spray, or temporary asphalt pavement, take all necessary precautions to prevent or abate a dust nuisance arising from dry weather or Work in an incomplete stage. All costs of this Work shall be included in cost of other parts of the Work.

Should the Contractor fail to abate a dust nuisance by the above methods, and then he will be required to immediately construct temporary patches per City standards.

**GC - 20 - PLACING BARRICADES AND WARNING LIGHTS** - The Contractor shall furnish and place, at his own expense, all barricades, warning lights, automatic blinker lights and such devices necessary to properly protect the work and vehicular and pedestrian traffic. Should the Contractor

fail to erect or maintain such barricades, warning lights, etc., the Public Works Director may, after 24 hours' notice to the Contractor, proceed to have such barricades and warning lights placed and maintained by City or other forces and all costs incurred thereof charged to the Contractor and may be retained by the City from any monies due, or to become due, to the Contractor.

**GC - 21 - TRAFFIC CONTROL** - The Contractor shall coordinate all Work and obtain, through the Engineering Department, any permits required to detour traffic or close any street before starting to work in the road. The following section: Part VI Traffic Controls for Street and Highway Construction and Maintenance Operations, MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, U.S. Department of Transportation Federal Highway Administration, 2009, or current edition, shall be used as a guide for requirement and placement of traffic control devices, signs and barricades. The Public Works Director shall determine requirements for the above. The above publication is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. In the event that a Maintenance of Traffic (MOT) Plan is required, the Plan shall be prepared by an A.A.S.T.A. certified technician.

All traffic control devices, flashing lights, signs and barricades shall be maintained in working condition at all times.

**GC - 22 - COORDINATION** - The Contractor shall notify all utilities, transportation department, etc., in writing, with a copy to the Public Works Director before construction is started and shall coordinate his Work with them. The Contractor shall cooperate with the owners of any underground or overhead utility lines in their removal, construction and rearrangement operations in order that services rendered by these parties will not be unnecessarily interrupted.

The Contractor shall arrange his Work and dispose of his materials so as to not interfere with the operation of other Contractors engaged upon adjacent work and to join his Work to that of others in a proper manner and to perform his Work in the proper sequence in relation to that of other Contractors all as may be directed by the Public Works Director.

Each Contractor shall be responsible for any damage done by him or his agents to the work performed by another Contractor.

The Contractor shall contact the Broward County Transportation Department and the Florida Department of Transportation, as applicable, to verify and obtain location of any and all traffic conduits, loops, and street light underground services.

**GC - 23 - WATER** - Bulk water used for construction, flushing pipelines, and testing shall be obtained from fire hydrants. Contractor shall make payment for hydrant meter at Treasury Billing Office, 1st Floor, City Hall, 100 N. Andrews Avenue. With the paid receipt, contractor can pick up hydrant meter at the utility location office. No connection shall be made to a fire hydrant without a meter connected.

**GC - 24 - PROHIBITION AGAINST CONTRACTING WITH SCRUTINIZED COMPANIES** - Scrutinized Companies: Subject to *Odebrecht Construction, Inc., v. Prasad*, 876 F.Supp.2d 1305 (S.D. Fla. 2012), *affirmed*, *Odebrecht Construction, Inc., v. Secretary, Florida Department of Transportation*, 715 F.3d 1268 (11th Cir. 2013), with regard to the "Cuba Amendment," the Contractor certifies that it is not on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2016), that it is not engaged in a boycott of Israel, and that it does not have business operations in Cuba or Syria, as provided in section 287.135, Florida Statutes (2016), as may be amended or revised. The City may terminate this Agreement at the City's option if the Contractor is found to have submitted a false certification as provided under subsection (5) of section 287.135, Florida Statutes (2016), as may be amended or revised, or been placed on the Scrutinized Companies

with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List or the Scrutinized Companies that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2016), or is engaged in a boycott of Israel or has been engaged in business operations in Cuba or Syria, as defined in Section 287.135, Florida Statutes (2016), as may be amended or revised.

**GC - 25 - LOCATION OF UNDERGROUND FACILITIES** - If the Proposer, for the purpose of responding to this solicitation, requests the location of underground facilities through the Sunshine State One-Call of Florida, Inc. notification system or through any person or entity providing a facility locating service, and underground facilities are marked with paint, stakes or other markings within the City pursuant to such a request, then the Proposer shall be deemed non-responsive to this solicitation in accordance with Section 2-184(5) of the City of Fort Lauderdale Code of Ordinances.

**GC - 26 – USE OF FLORIDA LUMBER TIMBER AND OTHER FOREST PRODUCTS** - In accordance with Florida Statute 255.20 (3), The City specifies that lumber, timber, and other forest products used for this project shall be produced and manufactured in the state of Florida if such products are available and their price, fitness, and quality are equal. This requirement does not apply to plywood specified for monolithic concrete forms, if the structural or service requirements for timber for a particular job cannot be supplied by native species, or if the construction is financed in whole or in part from federal funds with the requirement that there be no restrictions as to species or place of manufacture.

The Bidder affirms by submitting a bid response to this solicitation that they will comply with section 255.20 (3) Florida Statutes.

**GC – 27 – PUBLIC RECORDS/TRADE SECRETS/COPYRIGHT:** The Proposer's response to the Solicitation is a public record pursuant to Florida law, which is subject to disclosure by the City under the State of Florida Public Records Law, Florida Statutes Chapter 119.07 ("Public Records Law"). The City shall permit public access to all documents, papers, letters or other material submitted in connection with this Solicitation and the Contract to be executed for this Solicitation, subject to the provisions of Chapter 119.07 of the Florida Statutes.

Any language contained in the Proposer's response to the Solicitation purporting to require confidentiality of any portion of the Proposer's response to the Solicitation, except to the extent that certain information is in the City's opinion a Trade Secret pursuant to Florida law, shall be void. If a Proposer submits any documents or other information to the City which the Proposer claims is Trade Secret information and exempt from Florida Statutes Chapter 119.07 ("Public Records Laws"), the Proposer shall clearly designate that it is a Trade Secret and that it is asserting that the document or information is exempt. The Proposer must specifically identify the exemption being claimed under Florida Statutes 119.07. The City shall be the final arbiter of whether any information contained in the Proposer's response to the Solicitation constitutes a Trade Secret. The City's determination of whether an exemption applies shall be final, and the proposer agrees to defend, indemnify, and hold harmless the City and the City's officers, employees, and agent, against any loss or damages incurred by any person or entity as a result of the City's treatment of records as public records. Proposals purporting to be subject to copyright protection in full or in part will be rejected.

EXCEPT FOR CLEARLY MARKED PORTIONS THAT ARE BONA FIDE TRADE SECRETS PURSUANT TO FLORIDA LAW, DO NOT MARK YOUR RESPONSE TO THE SOLICITATION AS PROPRIETARY OR CONFIDENTIAL. DO NOT MARK YOUR RESPONSE TO THE SOLICITATION OR ANY PART THEREOF AS COPYRIGHTED.

**IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:**

**Mailing Address:** City Clerk's Office  
100 N. Andrews Avenue  
Fort Lauderdale, FL 33301

**Telephone Number:** (954) 828-5002

**E-mail Address:** [prcontract@fortlauderdale.gov](mailto:prcontract@fortlauderdale.gov)

Contractor shall:

1. Keep and maintain public records that ordinarily and necessarily would be required by the City in order to perform the service.
2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes (2016), as may be amended or revised, or as otherwise provided by law.
3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of this contract if the Contractor does not transfer the records to the City.
4. Upon completion of the Contract, transfer, at no cost, to the City all public records in possession of the Contractor or keep and maintain public records required by the City to perform the service. If the Contractor transfers all public records to the City upon completion of this Contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of this Contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

# **SUPPLEMENTAL CONDITIONS**



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**SUPPLEMENTAL CONDITIONS  
PROJECT 12188  
FORT LAUDERDALE EXECUTIVE AIRPORT  
ADMINISTRATION BUILDING RENOVATIONS**

**1. SUPPLEMENTAL CONDITIONS**

The supplemental conditions included herein are intended to address items of work not included or addressed in the Construction Specifications. In case of a conflict, the Construction Specifications shall be subordinate to corresponding sections of the Supplemental Conditions.

**2. CONSTRUCTION PROJECT COORDINATION PLAN**

The purpose of the following outline is to establish guidelines to ensure operational safety during construction activities on the Fort Lauderdale Executive Airport. The primary document of reference, which is also made a part of these specifications and shall be adhered to by the Contractor is the U. S. Department of Transportation Federal Aviation Administration Advisory Circular 150/5370-2E (or latest revision) and its references.

It is the intent of the notes contained in this outline to establish a plan for construction on the Airport in order to maximize safety and minimize time and economic loss to the aviation community, along with construction contractors and others directly affected by the project. The following objectives should be targeted by the Contractor and must be considered when planning construction schedules and operational activities.

- A. Keep the Airport operational for all user aircraft.
- B. Minimize delays for aircraft operations.
- C. Maintain safety of aircraft operations.
- D. Minimize delays to construction operations.
- E. Minimize aircraft operation/construction activity conflicts.

Maximum, safe utilization of the Airport during construction is the ultimate goal to be achieved through communication and cooperative coordination between Contractor, jobsite Inspector (as a representative of the Engineer), the Airport Management, and the ATCT, as described herein.

- 2.1 All operations in airfield area to be performed only in coordination with the ATCT, Airport Management, and the Inspector assigned to the project.
- 2.2 Construction equipment regularly operating in the airfield area shall be marked with a flag on a staff, at least 36" square and a flashing amber light. Flag shall consist of a checkered pattern of international orange and white squares of not less than 1 foot on each side (in accordance with FAA AC 150/5210-5).

Vehicles (including all cars, trucks, construction equipment, etc.) are forbidden to penetrate aircraft movement areas or runway approach areas unless they are escorted by an authorized vehicle having the required radio, or are controlled by flagmen under a control plan approved in advance. Communication on radios shall be restricted to safety and coordination communications with the ATCT, and shall not be used for routine construction communications between contractor's personnel. All vehicles must

obtain clearance from the control tower before entering aircraft movement areas. The control tower shall be informed of all activity within the aircraft movement areas

**Any vehicle or contractor personnel crossing any aircraft movement areas without notifying ATCT personnel shall be fined the maximum amount of \$500.00 and shall not be allowed back on the construction site.**

- 2.3 Materials stockpile and storage, vehicle parking, location of construction office (if requested), and storage of equipment when not in use shall be as directed by the Engineer. The Contractor shall dispose of all surplus materials and facilities removed from the limits of work in a manner and to a location acceptable to the Engineer and Airport Management.

Materials to be reused shall be stockpiled as directed above, and salvaged facilities desired to be retained by the Airport shall be stored as directed by the Engineer. Other removed materials shall be placed in approved spoil areas or other approved locations. Any surplus fill so removed shall be neatly graded as directed by the Engineer.

- 2.4 The Contractor shall ascertain the location of and protect all existing and new FAA cables, airport lighting cables and facilities, and appurtenant facilities during construction and ensure that all circuits and facilities are maintained in a safe and properly operable condition. The local FAA Airway Facilities Sector Field Office (AFSFO) personnel will, upon request, mark all FAA cables in the vicinity of construction once, prior to the start of work. Contact number to call to request locations is (954) 467-7099. At least two weeks should be allowed for requested work to be completed. The Contractor shall be responsible for protecting cable location markings, and shall be responsible for any damage to cables within three feet of the marked cable route.

The Contractor shall also ascertain the location of all utility services (water, sewer, gas, electrical, power, telephone, etc.) within the work limits and ensure that continual and equal service is maintained during all construction activities.

Should any FAA, FP&L, AT&T, or other outside utility company's cable or facility be inadvertently cut, damaged, or disrupted, the owner of that cable or facility shall be notified immediately. The Contractor shall not make any splices or repairs in such cables or facilities unless specifically authorized by the owner of that cable or facility. The Contractor shall be responsible for the cost of any repairs required.

All locations indicated on the plans are approximate and shall be field verified prior to beginning construction.

- 2.5 The Contractor's activities must not degrade in any way the security provided by the airport perimeter fence, unless Airport Management approves specific exemptions to this provision in advance of construction activities. Any temporary gates installed or fencing relocated for the Contractor at his expense shall maintain this project in a secure condition at all times. The Contractor shall provide a security guard at each of his access points to the airport, unless they are locked and secured, in order to prevent unauthorized persons from entering and to direct authorized construction vehicles on the proper route to their destination within the airport. A portable guard house shall be utilized at all construction gates and shall be located in close proximity to the gate. An employee sitting in a car "watching the gate" shall not be acceptable. If any gate is found to be unlocked without a guard in place, or should the guard allow any access

without verifying the proper authority for access, the Contractor shall be fined \$500 for each occurrence.

- 2.6 The Contractor shall be responsible for controlling smoke and dust or blowing sand or soil caused by construction activities using one or a combination of the following methods, to the satisfaction of the Engineer and the Airport Management:
- A. Application of water and/or calcium chloride (minimum of three times per day or as directed by the Engineer).
  - B. Exposing the minimum area of erodible earth at one time.
  - C. Applying temporary mulch with or without seeding (only in locations as approved by Airport Management).
  - D. Using covered haul trucks.

Additionally, contractor shall be required to keep a vacuum sweeper vehicle with operator on duty during all hauling operations across pavement in use by aircraft. No additional compensation will be provided for dust or sand control.

- 2.7 Attractions for birds in the area of construction, such as trash, unprotected grass seeding, or ponded water must be avoided.
- 2.8 All electrical work shall be in strict accordance with the National Electric Code, latest edition. Electrical sub-contractor must furnish after hours contact phone number in case of emergency. This number must be an actual number and not an answering service.
- 2.9 Definitions:

**Air Operations Area (AOA)** - An AOA is any area of the airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft. An AOA shall include such paved or unpaved areas that are intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.

**NOTAM (Notice to Airmen)** - NOTAMs are advisories issued by FAA Flight Service Station when conditions at an airport exist that could adversely affect safe aircraft operations such as construction related closures or hazardous conditions.

Any construction activity within 200 feet from runway centerline or within 65 feet from taxiway centerline will be considered to be within the AOA and will require closure of the affected areas (the exception being work specifically approved by Airport Management and FAA up to active aprons and taxiways). Such closures of an AOA must be coordinated with Airport Management at least 48 hours prior to commencing proposed work in order that arrangements can be made for issuance of applicable NOTAMs. The Contractor shall not close an AOA until so authorized by Airport Management and until the necessary temporary barricades and closure markings are in place. The sequence of construction phases and updated work schedules shall be provided to the Engineer to enable close coordination with aircraft routing and operations and maintain the currency of NOTAMs during the construction period. The Contractor shall also advise the Airport Management when situations have been improved to a point where NOTAMs may be cancelled. **Once a NOTAM has been issued, Contractor shall adhere strictly to the construction schedule agreed to for the NOTAM.**

- 2.10 At times when Runway 9-27 threshold is displaced, or equipment is operating in the ILS critical zone, the ILS must be taken off the air or ILS operations restricted by the ATCT. Also, when equipment is operating between a localizer antenna and its associated threshold, that localizer must be taken off the air. Due to such requirements, such work must be closely coordinated with the Airport Management requiring timing described above necessary for the issuance of applicable NOTAMs. If construction operations require shutdown of a navigational aid from service for more than 24 hours or in excess of 4 hours daily on consecutive days, a 45-day minimum notice is desirable prior to the facility shutdown. Additionally, the Contractor shall cease construction and remove all equipment from the critical area when directed by the FAA or airport personnel due to weather or other special operating conditions.

- 2.11 Definition:

**Federal Aviation Regulations (FAR) Part 77 - Objects Affecting Navigable Airspace** - Applicable section of this advisory establishes standards for determining obstructions in navigable airspace by establishing imaginary surfaces with relation to the airport and to each runway.

No penetrations of the imaginary surfaces defined in FAR Part 77 shall be allowed unless approval is obtained from Airport Management and the FAA. When penetrations are unavoidable, approval should be requested as far in advance as is practical to allow, if such penetrations are acceptable, sufficient time for issuance of applicable NOTAMs. The Contractor shall prepare appropriate sketches with precise locations shown on the Airport Layout Plan along with elevations depicting the obstructing objects' relationship to the imaginary surfaces. Special approval must be obtained from Airport Management and the FAA for use of equipment exceeding a height of 30 feet. All exceptionally tall equipment (such as cranes, derricks, etc.) operating on the airport shall be in direct radio communication with the control tower (e.g., two-way radios, ground control frequency of 121.75 Mhz, operators proficient in English, experienced or trained in such communication and required response).

- 2.12 All excavations exceeding 3 inches depth and width or slopes greater than 5% within runway or taxiway or runway/taxiway safety areas shall be backfilled or covered prior to reopening the runway or taxiway. No open trenches (exceeding 3 inches depth and width) will be permitted overnight or over weekends within the runway/taxiway safety areas. The Engineer and Airport Management must approve any deviation from the requirements. All open trenches, stockpiled material, and excavation not within the areas described above shall be permanently marked with orange flags and lighted with flashing amber light units which shall operate continuously.
- 2.13 Runways and taxiways shall be kept free of all debris, dirt, trash, refuse, water bottles, soda cans, etc., at all times. Material tracked onto these areas shall be removed immediately. Contractor must keep a vacuum sweeper vehicle with operator on site with operator on duty during all hauling operations across pavement in use by aircraft. Continuous inspections will be made. See item 2.6 for approved methods of debris control.
- 2.14 Work on the airport is also in close proximity to potable water supply wellfields, requiring that extreme care be taken when handling fuel, oils, etc. Any spillages should be promptly and properly cleaned up. The stipulations of the Broward County Water Resources Management Division "Checklist for Surface Water Management" are permit requirements and dictate preventative measures necessitated by construction in such wellfield areas.

- 2.15 Open flame welding or torch-cutting operations are prohibited unless adequate fire and safety precautions are provided and have been approved by the Engineer.
- 2.16 Construction safety meetings shall be established for the life of the contract to monitor, coordinate and adopt safety measures, on all matters of airport safety relating to this contract. Meetings will be scheduled by the Engineer at least once every week to discuss project schedule and applicable safety measures. These meetings shall be composed of the Contractor's superintendent, the Inspector, Airport Management, and (if available) the FAA/FDOT. In addition, representatives of the Fixed Base Operator (FBO) tenants may be invited, their attendance optional, and at their own discretion. The Owner reserves the right to amend the plan as necessary to maintain an acceptable level of safety during construction. Sub-contractors shall also be required to attend these meetings if they are scheduled to be performing any work on the project.
- 2.17 During the pre-construction Meeting, the Contractor shall designate a representative to be responsible for the safety aspects of the project. The representative shall be available on a 24-hour basis. In addition, the Contractor shall designate a responsible representative on call 24 hours per day for emergency maintenance of airport hazard lighting and barricades.
- 2.18 In addition to the appropriate notification procedures, temporary runway and taxiway closures require that the applicable lighting circuits be disconnected during the closure period. Temporarily closed taxiways are usually treated as unusable, or hazardous, areas (as described below).
- 2.19 Hazardous areas, in which no part of an aircraft may enter, are indicated by use of barricades with alternate orange and white markings. The barricades are supplemented with orange flags at least 20 by 20 inches square and made and installed so that they are always in the extended position and properly oriented. For nighttime use, the barricades are to be supplemented with flashing red lights. The intensity of the lights and spacing for barricades, flags, and lights must be such that they adequately delineate the hazardous area.

### **3. PROTECTION OF WILDLIFE AND NATURAL HABITAT**

The Contractor shall make provisions to protect the existing wildlife on the airport within the limits of this project. Known nests for burrowing owls and turtles are marked with a white PVC **T** in the ground. Contractor shall investigate the stockpile area, work area, and haul routes for marked and unmarked nests before storing materials and beginning construction. All unmarked nests shall be marked with a white PVC **T**. Existing markers shall not be removed without Engineer's approval. Nests shall be protected with the construction of temporary safety fencing. Said fencing to be placed within a 50-foot radius of nesting holes, to be approximately 3 feet in height, and to be made out of orange PVC material.

All reasonable efforts must be made by the Contractor to protect the existing wildlife and their nests. Nests that lie directly in the construction area that cannot co-exist with construction must be brought to the Engineer's attention. Nests may not be displaced or destroyed without the Engineer's approval.

Work areas and access to work areas shall be clearly delineated by the Contractor to avoid vehicular movement in turf areas that may contain nests or other features that could be damaged or destroyed by unnecessary traffic. All construction traffic shall be confined to paved areas to the greatest extent possible.

#### **4. PORTABLE CONSTRUCTION LIGHTING.**

The Contractor is responsible for providing work area lighting of sufficient quality and quantity to construct the Work to the quality standards called for in the Plans and Specifications. At a minimum the construction lighting shall meet the following requirements:

- a. For any construction that will be performed during nighttime hours the Contractor shall ensure that the work areas are adequately illuminated. A minimum of 10-foot candles of illumination shall be provided in the work areas, using maneuverable light plants with 1,000-watt metal halide floodlights, mounted as high as practicality will allow. The Contractor shall determine the number of light plants and their required spacing to achieve the illumination levels specified herein.

The light should be positioned to provide the most natural color illumination and contrast with a minimum of shadows. The pavement area shall be lighted at a maximum spacing of 100 feet from both sides to eliminate objectionable shadows. A demonstration of the adequacy of the lighting will be required prior to beginning any night work. The Contractor shall work with Airport Operations when determining positions for each portable light unit so that the lighting will not interfere with the vision of pilots or Air Traffic Control Tower personnel.

- b. For night work, the Contractor shall equip all paving machines, rollers, distributor trucks, and other equipment with artificial illumination to safely illuminate the area immediately surrounding their work areas.
- c. Contractor shall remove all equipment and store in the staging areas during non-working hours, and prior to the re-opening of the Runways.

#### **5. STAND-BY EQUIPMENT**

- a. The Contractor shall maintain stand-by equipment at the construction site for all construction work to be performed under this Contract. The specific number and type of equipment shall be that which is necessary to complete the work planned for that work period should any piece of equipment break down. At a minimum, at least one milling machine, one paving machine, and one roller will be required on stand-by whenever the taxiway is being worked on. The Contractor is advised that work during 24-hour per day closures, night closures, and weekend closures is more intensive than that performed at other times; therefore, additional stand-by equipment may need to be provided by the Contractor for the 24-hour per day closures, night closures, and weekend closure work.

Standby equipment includes equipment such as paving machines, milling machines, rollers, trenching machines, core drills, backhoes, graders, and tack coat distributor trucks and any other equipment necessary to complete the proposed work. In addition, stand-by clean up equipment such as sweepers, brooms, vacuum trucks, water trucks, and air compressors with wands for blowing debris from cracks, shall be available to ensure timely re-opening of the pavement at the end of each work period.

- b. Stand-by equipment may only be used to replace broken equipment during a work period. The Contractor shall properly repair or replace broken equipment before being allowed to proceed with the next work period.

- c. The Contractor shall ensure arrangement for supply of enough material to re-open the construction area to aircraft operations in case of break down of an asphalt production plant. This will include back-up plants, storage of a minimum quantity of material, as required by Item P-401 " Plant Mix Bituminous Pavements" of the Specifications, in storage bins at the start of each shift's work, as well as material in trucks. In the event of an emergency beyond the control of the Contractor that reduces asphalt production during a work period, the Contractor may be permitted to mill out materials placed to meet grade or transition requirements. Any material milled to facilitate re-opening of the runway due to break-down of an asphalt plant or lack of stored material shall not be eligible for payment.
- d. The Contractor shall submit a listing and description of all regular and standby equipment that will be provided for 24-hour per day closures, night closures, weekend closures, and other work, by number, type, size, and manufacturer to the Engineer for acceptance.
- e. Should Contractor fail to have adequate standby equipment in place at beginning of each work shift, the Contractor shall be denied opportunity to continue for that work shift. Said denial shall only be lifted when Contractor provides adequate standby equipment. Contractor shall not be entitled to additional time to compensate for lost time due to inadequate standby equipment being available.
- f. Contractor shall maintain adequate equipment on site at all times to allow adequate clean up to open pavement for aircraft use. At a minimum, the Contractor shall have a vacuum truck and a power broom on site and ready for use.

## **6. PRE-PHASE COORDINATION MEETINGS.**

At least 10 calendar days prior to beginning each phase of the Work, the Contractor shall hold a planning meeting to discuss, at a minimum, operational restrictions, work to be performed, haul routes (including Contractor signing and marking), closures, safety, testing requirements, submittal requirements, inspection requirements, schedule, communications, erosion control, stockpile locations and disposal schedule, location of stand-by equipment, salvaged materials container location, barricade layout, barricade placement schedule (including barricade storage areas during non-working hours) and other topics as appropriate. The Contractor shall submit a plan for all of the elements described above, to the Engineer for review, no less than 10 calendar days prior to each pre-phase meeting.

The Contractor shall prepare a construction traffic control plan for each haul route. The Contractor's traffic control plan shall conform to the requirements of the City traffic engineer, and shall be approved by the Engineer. The plan shall be included in Contractor's submittal for the pre-phase coordination meeting. When the haul route is not in use, all traffic control signs shall either be covered or removed and stored. The Contractor shall remove all construction signs after the completion of the work.

## **7. SCHEDULING AND DAILY OPERATIONS.**

All work hours will be subject to written approval of the Engineer and Airport Operations, and in accordance with the approved work schedule. The Contractor shall also provide weekly and daily work plans. The Contractor shall have equipment and personnel staged and ready to occupy the site at the start time listed. **No runway closure will take place until the Contractor's equipment and personnel are in place as close as practical to the work area and ready to proceed into the work area and begin operations.** Prior to the end of each work shift, the Contractor shall arrange to have Airport Operations inspect the site to confirm that the site is being left in a satisfactory condition. The Contractor shall allow



sufficient time to make any corrections and or cleanup items found to be deficient before opening at the required times listed. Any runway or taxiway safety area that does not pass the operations inspection shall remain closed until corrective measures are complete and approved by Airport Operations.

**8. OPERATING CONDITIONS AND SAFETY.**

All Contractor operations and activities shall comply with the requirements contained or identified in the Plans and these Specifications. Night work shall require use of sufficient portable light towers to provide safe and efficient operation conditions.

**9. PHASING AND SCHEDULE NOTES.**

All Contractor phasing and scheduling of construction operations and activities shall comply with the requirements contained or identified in the Plans and these Specifications. The phasing schedule represents the general sequence of the Work. Although the intent is for each phase to be completed in the order indicated, the Contractor may be directed by the Engineer to change the order of phases, at no additional cost to the Owner.

**10. CONTRACTOR'S CORRECTIVE ACTION PLAN**

Should contractor repeatedly fail to open a runway/taxiway on time, City may instruct Contractor to stop work until such time as Contractor presents a plan acceptable to the City to modify operations to ensure opening of runway/taxiway at the scheduled time. For the purposes herein, repeatedly shall be defined as 3 or more times. Should said work stoppage be found to be necessary, it is understood that it is due solely to the Contractor's failure to perform in accordance with the contract requirements and the Contractor shall not be entitled to any additional time for construction, nor shall he be entitled to any additional compensation for any cause alleged to be due to the work stoppage.

# **GEOTECHNICAL REPORT**

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December 8, 2016

HDR Engineering, Inc.  
3250 W Commercial Boulevard, Suite S-100  
Fort Lauderdale, Florida 33309

Attn: Mr. John Neff, P.E.  
Senior Project Manager

Re: Geotechnical Engineering Services  
Administrative Building Addition  
Fort Lauderdale Executive Airport  
Fort Lauderdale, Florida  
TSF File No. 7111-16-390

Dear John:

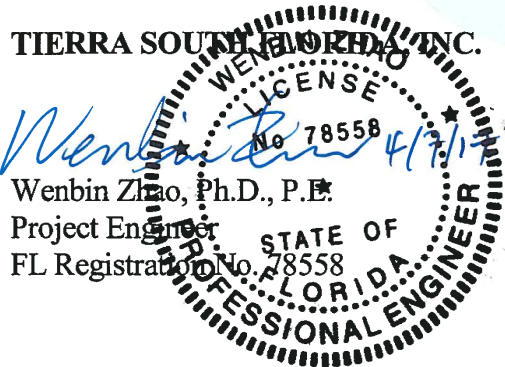
**TIERRA SOUTH FLORIDA, INC. (TSF)** is pleased to transmit our Geotechnical Engineering Services Report for the referenced project. This report includes the results of field exploration and laboratory testing, geotechnical recommendations for foundation design, as well as general site development.

We appreciate the opportunity to perform this Geotechnical Study and look forward to continued participation during the design and construction phases of this project. If you have any questions pertaining to this report, or if we may be of further service, please contact our office.

Respectfully submitted,

**TIERRA SOUTH FLORIDA, INC.**

Wenbin Zhao, Ph.D., P.E.  
Project Engineer  
FL Registration No. 78558



Ramakumar Vedula, P.E.  
Principal Engineer  
FL Registration No. 54873

*[Handwritten signature]* 4/7/17

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### **APPENDIX - BORING LOCATION PLAN / SOIL PROFILE – SHEET 1**

## **1.0 EXECUTIVE SUMMARY**

A geotechnical exploration and evaluation of the subsurface conditions has been completed for the proposed Administrative Building Addition located at Fort Lauderdale Executive Airport in Fort Lauderdale, Florida. In general, below the asphalt or topsoil, the borings performed at the site encountered sandy soils extending to the boring termination depths.

The groundwater level at the time of drilling was about 11 to 12 feet below existing grade.

The results of this exploration indicate that the subsurface conditions at the site are generally suitable for the use of shallow foundations for support of the proposed structural loads. The floor slab can be grade-supported. In order to prepare the site for new construction, site preparation will involve densification of the upper soils. Details related to site development, foundation design, and construction considerations are included in subsequent sections of this report.

The owner/designer should not rely solely on this Executive Summary and must read and evaluate the entire contents of this report prior to utilizing our engineering recommendations.

## **2.0 PROJECT INFORMATION**

### **2.1 Project Authorization**

TSF has completed a geotechnical exploration for the proposed Administrative Building Addition located at Fort Lauderdale Executive Airport in Fort Lauderdale, Florida. This exploration was authorized by Mr. John Neff, P.E. of HDR Engineering, Inc.

### **2.2 Project Description**

Our understanding of the project is based on general information obtained from Mr. John Neff of HDR Engineering, Inc. including a site plan and an "Aerial Photograph" indicating the existing building and proposed boring locations.

We understand that The Fort Lauderdale Executive Airport (FXE) Administration Building, approximately 10,000 square feet in area, located at 6000 NW 21st Avenue in Fort Lauderdale, Florida will be renovated and an addition added to the main structure.

Detailed structural loading information regarding the proposed construction has not been provided; however, for the purposes of this report, we have assumed maximum column loads and wall loads in the order of 100 kips and 2.0 kips per linear foot, respectively. Floor slab loads of less than 150 psf are also assumed.

The geotechnical recommendations presented in this report are based on the available project information, building location, and the subsurface materials described in this report. If any of the noted information is incorrect, please inform TSF in writing so that we may amend the recommendations presented in this report if appropriate and if desired by the client. TSF will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

### **2.3 Purpose and Scope of Services**

The purpose of this study was to explore the subsurface conditions at the site to enable an evaluation of acceptable foundation systems for the proposed construction. This report briefly outlines the testing procedures, describes the site and subsurface conditions, and presents geotechnical recommendations for foundation design, and general site development.

Our scope of services included drilling a total of two (2) Standard Penetration Test (SPT) borings to a depth of 15 feet and one (1) SPT boring to a depth of 10 feet below the surface in the proposed addition, plus the preparation of this geotechnical report.

Geotechnical recommendations regarding the following items are presented herein:

- Foundation soil preparation requirements,
- Foundation types, depths, allowable bearing capacities, and an estimate of potential settlement and,
- Comments regarding factors that may impact construction and performance of the proposed construction.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands or hazardous or toxic materials in the soil, surface water, groundwater, or air on or below, or around this site. Any statement in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes. Prior to further development of this site, an environmental assessment is advisable.



### **3.0 SITE AND SUBSURFACE CONDITIONS**

#### **3.1 Site Location and Description**

The project site is located within Fort Lauderdale Executive Airport at 6000 NW 21st Avenue in Fort Lauderdale, Florida. At the time of field exploration, the area of proposed site improvements was observed to be occupied by landscape/grass area.

#### **3.2 Subsurface Conditions**

Review of the “Soil Survey of Broward County Area, Florida”, prepared by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), indicates the site is mapped as St. Lucie fine sand, 0 to 2 percent slopes.

Subsurface conditions at the site were explored with a combination of two (2) Standard Penetration Test (SPT) borings to a depth of 15 feet and one (1) SPT boring to a depth of 10 feet, located as shown on the Boring Location Plan, Sheet 1. The soil test boring profiles are presented on Sheet 1. The SPT borings were drilled using a Diedrich D-50 drill rig. Samples of the in-place materials were recovered at frequent intervals using a standard split spoon driven with a 140-pound hammer freely falling 30 inches (the SPT after ASTM D 1586). Samples of the in-place soils were returned to our laboratory for classification by a geotechnical engineer, in general accordance with the Unified Soil Classification System (USCS).

The borings performed at the site, typically encountered sandy soils (SP) sandy soils extending to the boring termination depths below the topsoil/grass areas. The Standard Penetration N-Values indicated that the soils are generally in loose to medium dense condition.

The above subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The soil boring profiles should be reviewed for specific information at individual boring locations. These records include soil descriptions, stratifications, and Standard Penetration resistances. The stratifications shown on the soil profiles represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual. Water level information obtained during field operations is also shown on these soil profiles. Samples collected for classification and laboratory testing will be retained for 30 days from the date of this report and then will be discarded.

### **3.3 Groundwater Information**

Groundwater levels were measured in the borings upon completion of the drilling activities. The depths to the free water surface at the time of drilling the borings was found about 11 to 12 feet below existing grade. We expect the groundwater to typically fluctuate within about 2 feet from where it was encountered during the drilling activities.

In general, the seasonal high groundwater level is not intended to define a limit or ensure that future seasonal fluctuations in groundwater levels will not exceed the estimated levels. Post-development groundwater levels could exceed the normal seasonal high groundwater level estimate as a result of a series of rainfall events, changed conditions at the site that alter surface water drainage characteristics, or variations in the duration, intensity, or total volume of rainfall. We recommend that the Contractor determine the actual groundwater levels at the time of the construction to determine groundwater impact on his or her construction procedures.

## **4.0 EVALUATION AND RECOMMENDATIONS**

### **4.1 Geotechnical Discussion**

The geotechnical study completed for the proposed addition confirms that the site is suitable for the planned construction when viewed from a soil mechanics and foundation engineering perspective. Subsurface conditions at the site are not expected to impose any major geotechnical constraints or limitations on the constructed project.

The additions may be supported on shallow spread foundations and employ conventional slab-on-grade for the ground floor. Densification of the surficial soils of the site will be needed to increase the shear strength and reduce foundation and slab settlements to tolerable values.

Recommendations for site preparation, foundation design and related construction are presented in the following sections of this report.

### **4.2 Site Preparation**

To prepare for construction, we recommend that existing vegetation be removed from the proposed construction areas, and that the building footprint be compacted with a self-propelled roller (Ingersoll-Rand SD 100D or equivalent) until the subsoils achieve 95 percent of maximum dry density (ASTM D 1557) to a depth of at least 12 inches below the existing grade. **Existing utilities should be identified and removed or re-routed as required. Underground pipes that cannot be removed should be pressure grouted.** The soil densification should encompass the entire footprint of the structure plus a 5-foot wide perimeter that extends beyond the maximum lines of the superstructure.

Rolled subgrade should be visually observed for signs of pumping, weaving or other types of instability. Signs of such instability could be due to the existence of weak and/or compressible subsoils. Corrective action for this condition should include excavation of weak subsoils followed

by replacement with clean granular fill compacted to 95 percent of the ASTM D 1557 maximum dry density. Structural fill used to raise the site to structure bottom levels should consist of clean sand and/or sand and gravel (ASTM D 2487), with a maximum of 12 percent passing the U.S. Standard No. 200 sieve. The structural fill should be placed in thin lifts (12-inch thick loose measure or less), near the optimum moisture content for compaction, and be compacted to at least 95 percent of maximum dry density (ASTM D 1557).

Existing building structures and foundations near the proposed addition need to be protected against vibrations. Near existing buildings (within 50 feet), proofrolling should be performed in a static mode. The subsoils should be compacted to achieve 95 percent of maximum dry density (ASTM D 1557) to a depth of at least 12 inches below the stripped grade. Ground vibrations induced by the compaction operations should be closely monitored to assess if there is a potential impact to any existing adjacent structures.

Following site preparation as discussed above, the foundation areas should be excavated and the footings formed and poured in-the-dry. Soils loosened by excavation should be re-compacted to meet the compaction requirement prescribed herein. Unsuitable material or organic soils (if any) found at foundation bottoms should be removed and replaced with structural fill, constructed as discussed above.

In places where additional structural fill is required to achieve design grade, each lift of compacted engineered fill should be tested by a representative of the geotechnical engineer prior to placement of subsequent lifts. The edges of compacted fill should extend 5 feet beyond the edges of buildings prior to sloping.

#### **4.3 Foundation Recommendations**

Conventional spread footings are generally most economical when the existing soil conditions allow them to be founded at shallow depths. Based on the data currently available and given the site preparation is completed as discussed above, we recommend supporting the planned structure on conventional spread foundations based in engineered fill and/or the surficial granular soils of the site. The footings should be designed and proportioned for a maximum bearing pressure of 2,500 pounds per square foot (psf). Footings should bottom at least 18 inches below final grade. Footings supporting individual columns should have a minimum width of 36 inches and continuous footings a minimum width of 24 inches, even if the geometry produces a bearing pressure less than the allowable.

Settlement of foundations based in the in-situ granular soils and/or engineered fill will occur as an elastic response of the soils to the building loads applied. Given site and soil preparation that is completed before footing construction, and using the design criteria discussed above, we estimate that total and differential foundation settlements should be about 1 inch and ½ inch, respectively. In our opinion, these settlements are within the range considered tolerable for the types of structures planned. The settlement forecast is based on imposed soil bearing pressure from structural loadings not exceeding 2,500 pounds per square foot. These settlement estimates need to be confirmed or modified once loading information becomes available. Because the subsoils of the site are granular in nature, settlement should occur as the loads are applied to foundations and should essentially be

complete by the time the building superstructures are finished.

Excavating equipment may disturb the granular bearing soil in foundation areas. The upper 24 inches of foundation bottom soils should be compacted to achieve not less than 95 percent of the maximum dry density, as determined by ASTM D 1557, immediately prior to reinforcing and concrete placement. The footings will likely require shoring or temporary retaining systems to maintain the stability of nearby soils, under existing foundations structures. **Existing footings of the adjacent structure should be adequately protected during construction of the addition.**

The foundation excavations should be observed by a representative of TSF prior to steel or concrete placement to assess that the foundation materials are capable of supporting the design loads and are consistent with the materials discussed in this report. Loose soil zones encountered at the bottom of the footing excavations should be adequately compacted to the aforementioned 95% criteria.

#### **4.4 Floor Slab Recommendations**

We recommend the procedures described in "Site Preparation" section of this report be used to prepare the floor slab subgrade. Slab-on-grade construction may then be employed for the ground floor of the building. The floor slab should be suitably reinforced to make it as rigid as practical. Joints should be provided at the junctions of the slab with the walls and columns so that a small amount of independent movement can occur without causing damage. The floor slab design, if based on elastic methods, should employ a modulus of subgrade reaction of 150 pounds per cubic inch (pci).

If moisture intrusion into the floor slab is not desired, an impermeable membrane should be installed on the soil subgrade before the slab is cast. Normally, a 6-mil thick polyethylene film is satisfactory as a subgrade moisture barrier. However, some floor coverings may have a comparatively sensitive tolerance to moisture flux that a thin polyethylene film cannot suppress. Under these conditions, other types of moisture membranes may need to be considered.

Due to the nature of the building, proper means of drainage must be provided to remove water away from the foundations and slab areas.

#### **4.5 Utilities**

All utilities should be installed per the requirements of the Civil Engineering drawings and specifications. When backfilling over utility lines, the fill should be placed in lifts and compacted to at least 95% of the material's maximum dry density as determined by the Modified Proctor Compaction Test (ASTM D 1557). The loose lift thickness is expected to vary between 6 inches and 12 inches depending on the compaction equipment used by the contractor. Layers of limestone were noted in some of the borings.

## **5.0 CONSTRUCTION CONSIDERATIONS**

It is recommended that TSF be retained to provide observation and testing of construction activities involved in the foundation, earthwork, and related activities of this project to verify subsurface conditions. TSF cannot accept any responsibility for any conditions that deviate from those described in this report, nor for the performance of the foundation if not engaged to also provide construction observation and testing for this project.

### **5.1 Excavations**

In Federal Register, Volume 54, No. 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P." This document was issued to better ensure the safety of workmen entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavations or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

Sloped open-cut excavations are expected to be sufficient for construction of the shallower footings. The footings will likely require shoring or temporary retaining systems to maintain the stability of nearby soils. Open excavations in these areas will required proper bracing, shoring to protect from sloughing of trench walls.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottoms. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations.

We are providing this information solely as a service to our client. TSF does not assume responsibility for construction site safety or the contractor's or other parties' compliance with local, state, and federal safety or other regulations.

## **6.0 REPORT LIMITATIONS**

The recommendations submitted are based on the available subsurface information obtained by TSF and design details furnished by HDR Engineering, Inc. for the proposed project.

If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, TSF should be notified immediately to determine if changes in the preliminary foundation recommendations are required. If TSF is not retained to perform these functions, TSF will not be responsible for the impact of those conditions of the project.

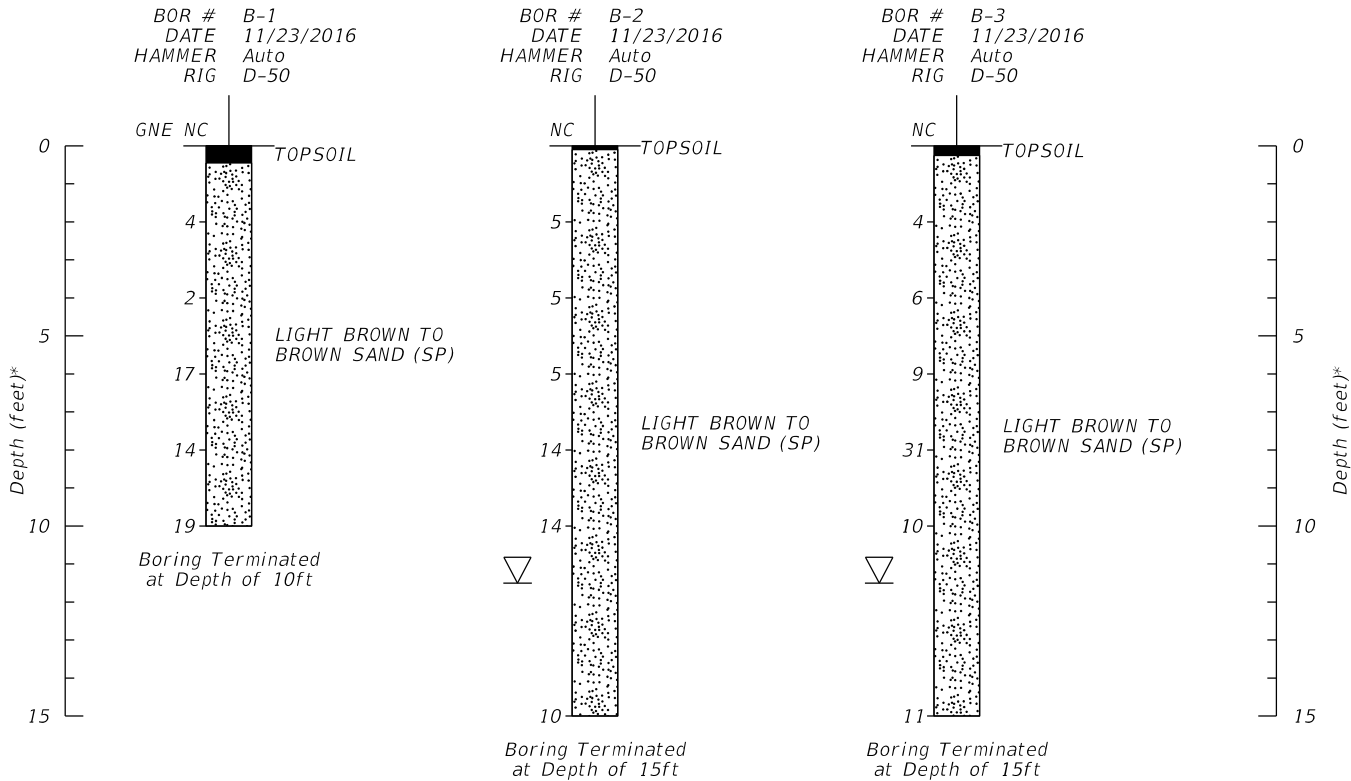
The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

After the plans and specifications are more complete, the geotechnical engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents.

This geotechnical report has been prepared for the exclusive use of HDR Engineering, Inc. for the specific application to the proposed Administrative Building Addition located at Fort Lauderdale Executive Airport in Fort Lauderdale, Florida.

## **APPENDIX**

### **Boring Location Plan / Soil Profiles – Sheet 1**



▽ ENCOUNTERED GROUNDWATER TABLE

NUMBERS TO THE LEFT OF BORINGS INDICATE CORRECTED SPT VALUE FOR 12" PENETRATION USING AN AUTOMATIC HAMMER CORRECTION FACTOR OF 1.24.

NC

\* DENOTES DEPTH IN FEET FROM EXISTING GROUND SURFACE

Topsoil

Sand



## **SECTION 011000 SUMMARY**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Special Conditions and other Division 01 Specification Sections, apply to this Section.
  - 1. The written specifications package entitled **Fort Lauderdale Executive Airport Administration Building Renovations, City Project P12188**.

#### **1.2 INTENT OF DRAWINGS AND SPECIFICATIONS**

- A. Intent of the drawings and specifications is to cover an installation complete in every respect. It is not necessarily intended to provide every detail on drawings or in the specifications. The City will not be responsible for absence of any detail, which the Contractor may require, nor for any special construction that may be found necessary as work progresses. If an item is either indicated or specified, it shall be considered sufficient for inclusion of said item in the contract. Contractor shall furnish and install materials and equipment normally furnished with such systems and as needed to complete a fully operational installation, whether mentioned or not, which are customary to the trade.
- B. Incidental accessories not usually shown or specified, but which are necessary for the proper installation and operation shall be included in the work without additional cost to the City, as if herein depicted or specified.
- C. Any material or work not shown on drawings, but mentioned in specifications, or vice versa, shall be furnished, delivered and installed by the Contractor without additional cost to the City.
- D. Drawings are diagrammatic and indicate the general arrangement of systems and work indicated (do not scale drawings).

#### **1.3 SUMMARY**

- A. This Section includes the following:
  - 1. Project Information
  - 2. Work covered by the Contract Documents
  - 3. Phased Construction
  - 4. Work by City
  - 5. Work by Other Contracts
  - 6. Special Ordered Products
  - 7. Use of Premises
  - 8. Work restrictions
  - 9. Mobilization

#### **1.4 PROJECT INFORMATION**

- A. Project Identification: Project 12188 – Executive Airport Administration Building Renovations

1. Project Location: 6000 NW 21<sup>st</sup> Avenue, Fort Lauderdale, FL 33309
- B. Owner: City of Fort Lauderdale
  1. City's Representative: Fernando Blanco, Airport Engineer / Project Manager II

## **1.5 WORK COVERED BY CONTRACT DOCUMENTS**

- A. The Work is defined by the Contract Documents and includes, but is not limited to the following:

1. The work includes, but is not limited to, renovations of the single-story Fort Lauderdale Executive Airport (FXE) Administration Building, including the construction of a new conference room and office spaces, new landscaping and irrigation, parking improvements, LED site lighting, replacement of the existing HVAC unit, new carpeting, paint, interior LED lighting, installation of covered canopies for parking areas, installation of car charging station, and renovations of the existing bathrooms.

The building renovations includes, but is not limited to, removal of A/C dry well, existing partitions, doors and frames, plumbing fixtures, flooring finish, light fixtures, HVAC diffuser, acoustical ceiling tiles. Installation of concrete foundations, concrete slabs, reinforced concrete, masonry walls, steel joists, metal roofing, membrane roofing and insulation, building insulation, hollow metal doors and frames, impact-resistant glazed aluminum storefront doors and windows, exterior stucco, carpet, vinyl, porcelain tile, resilient flooring, interior and exterior painting, miscellaneous specialty items, fire sprinkler system, mechanical cooling and ventilation system, plumbing fixtures and piping and electrical power and lighting systems.

Site work includes, but is not limited to, clearing and grubbing, curbing, landscaping, removal of pavement marking, roundabout circle, installation of canopies for parking areas, grading, sodding, installation of irrigation system, landscaping, pavement striping, site lighting, and colored, stamped concrete patio deck. Site work also includes installation of car charging station including, but not limited to, concrete pad, saw cutting, epoxy grout, conduit, cabling, charging stations, and all materials and equipment for a complete working system.

The covered parking canopies and charging station are bid alternate quantities.

2. Project will be constructed under a single prime contract.
  - a. Division of work: The division of work among its separate Subcontractors is the responsibility of the General Contractor, and the City assumes no responsibility to act as arbitrator to establish subcontract limits between any sections of the work.

## **1.6 PHASED CONSTRUCTION**

- A. The Work shall be conducted in 4 phases, with each phase substantially complete before beginning the next phases (see sheet APH-01 for construction phasing).
- B. Before commencing Work of each phase, submit a schedule showing the sequence, commencement and completion dates, and move-out and -in dates of City's personnel for all

phases of the Work.

## **1.7 WORK BY CITY**

- A. General: Cooperate fully with City so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by City. Coordinate the Work of this Contract with work performed by City.

## **1.8 WORK UNDER OTHER CONTRACTS**

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.
- B. Concurrent Work: The City has the right to award other contracts in connection with the work, and Contractor shall properly coordinate with any such Contractors.

## **1.9 SPECIAL ORDERED PRODUCTS**

- A. Availability of Specified Items

Contractor shall verify that all specified items will be available for procurement and installation during the progress of the work. Any other materials, not specifically described in any section but required for proper completion of the work, shall be as submitted by the Contractor subject to evaluation and approval of the City Engineer.

## **1.10 USE OF PREMISES**

- A. General: Contractor shall have full use of project site for construction operations during construction period. Contractor's use of project site is limited only by City's right to perform work or to retain other contractors on portions of Project.
- B. General: Contractor shall have limited use of project site for construction operations as indicated on Drawings by the Contract limits, and as indicated by requirements of this Section.
- C. Use of Site: Limit use of project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

### **1. Limits:**

- a. Limit site disturbance, including earthwork and clearing of vegetation, to 20 feet (6 m) beyond building perimeter; 5 feet (1.5 m) beyond primary roadway curbs, walkways, and main utility branch trenches; and 25 feet (7.6 m) beyond pervious paving areas.
- 2. City Occupancy: Allow for City occupancy of Project site.
- 3. Driveways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to City, City's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

- a. Schedule deliveries to minimize use of driveways and entrances.
  - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- D. See Special Conditions. (This site is on FXE Airport property and is a fully operational airport)

#### **1.11 WORK RESTRICTIONS**

- A. Work Restrictions, General: Comply with restrictions on construction operations as listed here and in the construction plans.
  - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Work shall be generally performed as indicated in the construction plans.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by City or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  - 1. Notify City not less than two working days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without City's written permission.
- D. Employee Identification: Owner will provide identification tags for Contractor personnel working on the Project site. Require personnel to utilize identification tags at all times.

#### **1.12 MOBILIZATION**

- A. The work specified in this Section shall consist of the preparatory work and operations in mobilizing for beginning work on the project, including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site; and for the establishment of temporary offices, testing services, safety equipment and first aid supplies, sanitary and other facilities, survey services, site clean-up, restoration of disturbed sodded areas and photographs as required by these Specifications and Special Provisions, and any Federal, State and/or local laws and regulations. The costs of any other pre-construction expense necessary for the start of the work, excluding the cost of construction materials, shall also be included in this Section.

#### **1.13 SPECIFICATION FORMATS AND CONVENTIONS**

- A. Specification Format: The Specifications are organized into Divisions and Sections using the CSI/CSC's "Master Format" numbering system.
  - 1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
  - 2. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.

- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
  2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
    - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
  3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 011000**

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**SECTION 012600  
CONTRACT MODIFICATION PROCEDURES**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
  - 1. Division 01 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

**1.3 MINOR CHANGES IN THE WORK**

- A. Engineer will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on form included following the end of Part 3.

**1.4 REQUESTS FOR INFORMATION**

- A. If latent or unforeseen conditions arise that may require changes in the Work, the Contractor may submit a Request for Information to the Project Manager on the form included following the end of Part 3.

**1.5 PROPOSAL REQUESTS**

- A. City-Initiated Proposal Requests: Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
  - 1. Proposal Requests issued by Engineer are not instructions either to stop work in progress or to execute the proposed change.
  - 2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
    - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    - c. Include costs of labor and supervision directly attributable to the change.

- d. Include an updated Contractor's Construction Schedule that indicates the effect of the change.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Engineer.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
  3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  4. Include costs of labor and supervision directly attributable to the change.
  5. Include an updated Contractor's Construction Schedule that indicates the effect of the change.
  6. Comply with requirements in General Conditions Section GC-03 "Substitution" if the proposed change requires substitution of one product or system for product or system specified.

#### **1.6 ADMINISTRATIVE CHANGE ORDERS**

- A. Unit Price Adjustment: Refer to Construction Agreement, Article 14, for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit price work.

#### **1.7 CHANGE ORDER PROCEDURES**

- A. On City's approval of a Proposal Request, Engineer will issue a Change Order for signature of the Contractor on City's standard form. The Change Order will not be official until approved by the appropriate City Officials and signed by the City Engineer, City Manager.

#### **PART 2 - PRODUCTS (Not Used)**

#### **PART 3 - EXECUTION (Not Used)**

**END OF SECTION 012600**



**SUPPLEMENTAL INSTRUCTIONS  
FOR MINOR CHANGES**

CITY OF FORT LAUDERDALE

CITY PROJECT NO: #P

REQUEST NO: \_\_\_\_\_

PROJECT:

DATE:

OWNER: **City of Fort Lauderdale**

CONTRACTOR:

TO: \_\_\_\_\_

CONTRACT DATED: \_\_\_\_\_

The work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in Contract Sum or Contract Time. Prior to proceeding in accordance with these instructions, indicate your acceptance of these instructions for minor changes to the Work as consistent with the Contract Documents and return a copy to the City.

DESCRIPTION:

ATTACHMENTS:

\_\_\_\_\_  
ENGINEER:

FAXED TO: (    ) Contractor  
              (    ) Site Office  
              (    ) Eng. Insp. (954) 828-5074

CC: Project Inspector  
Main File

**PROPOSAL REQUEST**  
**CITY OF FORT LAUDERDALE**

CITY PROJECT NO: #P

REQUEST NO:

PROJECT:

DATE:

OWNER: **City of Fort Lauderdale**

CONTRACTOR:

TO:

CONTRACT DATED:

Please submit an itemized quotation for changes in the **CONTRACT SUM** and/or **TIME** incidental to the proposed modifications to the Contract Documents described herein.

**THIS IS NOT A CHANGE ORDER NOR A DIRECTION TO PROCEED WITH THE WORK DESCRIBED HEREIN.**

DESCRIPTION:

ATTACHMENTS:

ENGINEER:

FAXED TO: (    ) Contractor  
(    ) Site Office  
(    ) Eng. Insp. (954) 828-5074

CC: Project Inspector  
Main File

**REQUEST FOR SUBSTITUTION**  
CITY OF FORT LAUDERDALE

CITY PROJECT NO: #P \_\_\_\_\_

REQUEST NO: \_\_\_\_\_

PROJECT: \_\_\_\_\_

OWNER: **City of Fort Lauderdale**

DATE: \_\_\_\_\_

CONTRACTOR: \_\_\_\_\_

TO: \_\_\_\_\_

CONTRACT DATED: \_\_\_\_\_

NAME AND ADDRESS OF CONTRACTOR:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

hereby requests acceptance of the following product or system as an "acceptable substitution".

**NAME AND DESCRIPTION OF SPECIFIED PRODUCT OR SYSTEM:**  
\_\_\_\_\_  
\_\_\_\_\_

MANUFACTURER: \_\_\_\_\_

SPECIFICATION SECTION \_\_\_\_\_, PAGE(S) \_\_\_\_\_

PARAGRAPH(S) \_\_\_\_\_

DRAWING \_\_\_\_\_ DETAIL NUMBER \_\_\_\_\_

**NAME AND DESCRIPTION OF PROPOSED SUBSTITUTION:**  
\_\_\_\_\_  
\_\_\_\_\_

MANUFACTURER: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_

NAME OF VENDOR: \_\_\_\_\_

NAME AND ADDRESS OF PREVIOUS PROJECT WHERE PROPOSED SUBSTITUTION  
WAS UTILIZED: \_\_\_\_\_  
\_\_\_\_\_

TELEPHONE: \_\_\_\_\_

REASON FOR PROPOSING SUBSTITUTION: \_\_\_\_\_  
\_\_\_\_\_

DOES SUBSTITUTION AFFECT OTHER MATERIALS, INSTALLATION OR SYSTEMS?

YES \_\_\_\_\_ NO \_\_\_\_\_ IF YES, ATTACHED COMPLETE DATA.

DOES SUBSTITUTION REQUIRE REVISION OR REDESIGN OF ANY COMPONENT OF  
BUILDING OR ELECTRICAL OR MECHANICAL WORK?

YES \_\_\_\_\_ NO \_\_\_\_\_ IF YES, ATTACHED COMPLETE DATA.

**THE ATTACHED DATA IS FURNISHED FOR EVALUATION OF THE SUBSTITUTION:**( ) CATALOG ( ) DRAWINGS ( ) SAMPLES ( ) TESTS ( ) REPORTS ( ) OTHER  
\_\_\_\_\_

**REQUEST FOR SUBSTITUTION****SAVING TO CITY FOR ACCEPTING SUBSTITUTE:**

COST OF SPECIFIED ITEM:

\_\_\_\_\_  
DOLLARS  
(\$\_\_\_\_\_)

COST OF SUBSTITUTION ITEM:

\_\_\_\_\_  
DOLLARS  
(\$\_\_\_\_\_)

TOTAL SAVINGS (CREDIT) TO CITY FOR ACCEPTING SUBSTITUTE:

\_\_\_\_\_  
DOLLARS  
(\$\_\_\_\_\_)

THE UNDERSIGNED HEREBY CERTIFIES THAT THIS PROPOSED SUBSTITUTION HAS BEEN FULLY CHECKED AND COORDINATED WITH THE CONTRACT DOCUMENTS, THAT THE PROPOSED SUBSTITUTION MEETS OR EXCEEDS THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND THAT ALL INFORMATION IS TRUE AND ACCURATE.

FIRM NAME: \_\_\_\_\_

BY: \_\_\_\_\_

DATE SIGNED: \_\_\_\_\_

PRINT NAME LEGIBLY: \_\_\_\_\_

FAXED TO:

CC

## **SECTION 012900 PAYMENT PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
  - 1. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 2. Division 01 Section "Unit Prices" for administrative requirements governing use of unit prices.
  - 3. Division 01 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.
- C. **BASIS OF PAYMENT** - The price for each items shall include the furnishing of all labor, materials, equipment and incidentals required to complete the construction and to repair in a manner satisfactory to the Engineer any and all damage, as a result of work under this contract, done to existing structures, pavement, grass, utility pipe lines, conduits, drains, catch basins, and including all above and underground obstructions not specifically named here-in: replacing in a manner satisfactory to the Engineer and or all of the above items which may be damaged beyond repair as a result of work under this contract.
- D. **Retainage:** The City shall retain a portion of each partial payment according to the following schedule:
  - 1. The City will retain ten percent (10%) of all monies earned by Contractor until the work has been accepted by the City as Finally Complete.

#### **1.3 APPLICATIONS FOR PAYMENT**

- A. The General Contractor must meet with the City Representative on or about the 25th of each month. The City Representative will go over the pay items and agree on the quantities and the dollar amounts of the work completed during the month. The parties will sign a copy of the agreed amounts and a copy will be left with each representative.
- B. The General Contractor will make up a partial pay request using the City-supplied forms and submit the request to the City Representative before the first of the upcoming month.
- C. Each pay request must be accompanied by a partial release of lien by the General

Contractor and by all Subcontractors, suppliers, and for all labor, as outlined below.

1. Starting with the second (2nd) pay request and for each and every pay request thereafter, the General Contractor shall submit partial release of liens from all Subcontractors, suppliers, and laborers covering the preceding month's request (SEE FOLLOWING EXAMPLE).
  2. EXAMPLE: In the first (1st) pay request, payment is requested by General Contractor for the electrician. The General Contractor must attach his partial release of lien.
  3. For the second (2nd) pay request, the General Contractor must attach his partial release of lien from the electrician for the amounts billed in the 1st pay request; i.e., the General Contractor will be running one (1) month behind with the releases from the Subcontractors, suppliers, etc., until the final pay request.
- D. For the final pay request, the General Contractor will be required to submit FINAL release of liens for ALL Subcontractors, suppliers, etc., and for ALL labor BEFORE FINAL PAYMENT WILL BE MADE.
- E. No partial payments, after the first payment, will be made until all partial release of liens are submitted for the preceding month's billing, as described
- F. Each Application for Payment shall be consistent with previous applications and payments as certified by and paid for by City.
- G. Payment Application Forms: Use City Form "PERIODIC ESTIMATE FOR PARTIAL PAYMENT" as form for Applications for Payment.
1. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. City will return incomplete applications without action.
  2. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
  3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- H. Release of Lien: With each Application for Payment, submit release of lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
1. Submit partial release of lien on each item for amount requested in previous application, after deduction for retainage, on each item.
  2. When an application shows completion of an item, submit final release of lien.
  3. City reserves the right to designate which entities involved in the Work must submit release of lien forms.
- I. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
  2. Contractor's Construction Schedule (preliminary if not final).
  3. Certificates of insurance and insurance policies.
  4. Performance and payment bonds.

- J. City may withhold, in whole or in part, payment to such extent as may be necessary to protect itself from loss on account of:
1. Defective Work not remedied.
  2. Claims filed or reasonable evidence indicating probable filing of claims by other parties against Contractor or City because of Contractor's performance.
  3. Failure of Contractor to make payments properly to Subcontractors or for material or labor.
  4. Damage to another contractor not remedied.
  5. Liquidated damages and costs incurred by City and/or Consultant for extended construction administration.
  6. Failure of Contractor to provide any and all documents required by the Contract Documents.
- K. No partial payment estimate will be processed for any contract which is beyond the contract completion date. After a contract runs past the completion date, only a final payment will be made when all work is complete.
- L. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
  2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
  3. Updated final statement, accounting for final changes to the Contract Sum.
  4. Evidence that claims have been settled.
  5. Final, liquidated damages settlement statement.
- M. The acceptance of final payment shall constitute a waiver of all claims by contractor, except those previously made in strict accordance with the provisions of the Contract and identified by Contractor as unsettled at the time of the application for final payment.
- N. If evidence is produced before the final settlement of all or any balance, that the party of the second part has failed to pay to laborers, employed on this work, or failed to pay for the materials used therein, or if the City has reason to suspect the same, the City may withhold such balance and, upon written evidence satisfactory to the City as to the amount due for such labor and materials, settle and pay for the same and charge the amounts to the party of the second part and deduct the same from said balance or balances.
- O. Payment for Insurance and Surety/Performance and Payment Bonds can be made upon submittal of the first contractor request for payment, less standard retainage.
- P. The work specified in this Section shall consist of the preparatory work and operations in mobilizing for beginning work on the project, including, but not limited to, those operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site; and for the establishment of temporary offices, testing services, safety equipment and first aid supplies, sanitary and other facilities, survey services, site clean-up, restoration of disturbed sodded areas and photographs as required by these Specifications and Special Provisions, and any Federal, State and/or local laws and regulations. The costs of any other pre-construction expense necessary for the start of the work, excluding the cost of construction materials, shall also be included in this Section.

Measurement of mobilization for payment shall be the work under this Section completed and accepted in accordance with the Plans and these Specifications.

| <u>Percent of Original<br/>Contract Amount Earned</u> | <u>Allowable Percent of the Lump Sum<br/>Price For Mobilization</u> |
|---|---|
| 5   | 25  |
| 25  | 25  |
| 50  | 40  |
| 100   | 10  |

Partial payments for the item "Mobilization" shall be made in accordance with the above schedule and the sum total of all the partial payments for the item "Mobilization" will be limited to 5% of the original Contract Amount for the project. Any remaining amount will be paid upon completion of all work under the Project.

The standard retainage will be applied to these allowances. Partial payments made on this item shall in no way act to preclude or limit any of the provisions for partial payments otherwise provided for by the Contract.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 012900**



**SECTION 013100  
PROJECT MANAGEMENT AND COORDINATION**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
1. Coordination Drawings.
  2. Submittals.
  3. Special Project Procedures.
  4. Administrative and supervisory personnel.
  5. Project meetings.
  6. Requests for Interpretation (RFIs).
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.
- C. Related Sections include the following:
1. Division 01 Section "Summary of Multiple Contracts" for a description of the division of Work among separate contracts and responsibility for coordination activities not in this Section.
  2. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
  3. Division 01 Section "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
  4. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.
  5. Division 01 Section "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

**1.3 DEFINITIONS**

- A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

**1.4 COORDINATION**

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
- B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work.

Each contractor shall coordinate its operations with operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
  3. Make adequate provisions to accommodate items scheduled for later installation.
  4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for City and separate contractors if coordination of their Work is required.
- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's Construction Schedule.
  2. Preparation of the Schedule of Values.
  3. Installation and removal of temporary facilities and controls.
  4. Delivery and processing of submittals.
  5. Progress meetings.
  6. Pre-installation conferences.
  7. Project closeout activities.
  8. Startup and adjustment of systems.
  9. Project closeout activities.

## **1.5 SUBMITTALS**

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
    - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
    - b. Indicate required installation sequences.
    - c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Construction Project Manager for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

2. Sheet Size: At least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 24 by 36 inches (750 by 1000 mm).
  3. Number of Copies: Submit two opaque copies of each submittal. Construction Project Manager will return one copy.
    - a. Submit five copies where Coordination Drawings are required for operation and maintenance manuals. Construction Project Manager will retain two copies; remainder will be returned. Mark up and retain one returned copy as a Project Record Drawing.
  4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.
- B. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
1. Name, address, and telephone number of entity performing subcontract or supplying products.
  2. Number and title of related Specification Section(s) covered by subcontract.
- C. Key Personnel Names: Within 10 days of contract award, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

## **1.6 SPECIAL PROJECT PROCEDURES**

- A. Discrepancies, Errors: Should discrepancies or errors appear in the drawings or specifications concerning materials, workmanship, or quantity of work to be performed, the Contractor will be required to immediately notify the City before proceeding with the work. If the Contractor fails to notify the City and proceeds with the work, Contractor will be required to correct the errors at his/her own expense. In the event of a conflict between the drawings and specifications, the City will decide on the way to perform the work or supply the materials. See also General Conditions, "Contractor to Check Plans and Data," Section GC-10
- B. Dimensions and Measurements: The figured dimensions on the drawings or notes including dimensions shall be used for construction instead of measurements of the drawings by scale. No scale measurements shall be used as a dimension for construction. Dimensions on all drawings as well as the detail drawings themselves are subject in every case to measurements of adjacent or previously completed work. All such measurements necessary shall be taken before undertaking any work dependent upon such data. Field verification of dimensions on plans is mandatory since actual locations, distances, and levels will be governed by actual field conditions.
- C. Discrepancies or Inconsistencies: Should any discrepancy or inconsistency appear between

larger and smaller scale drawings in any of the divisions of the specifications or in any of the contract documents, such discrepancy shall be immediately submitted to the City for correction before proceeding with the work in question. In no case shall the Contractor make any alterations, erasures, changes or modifications in the drawings or specifications.

1. Should it appear that any of the work as specified or shown by the drawings is not sufficiently detailed or explained, the Contractor shall apply to the City for such further details or information as may be necessary for full understanding of the work in question.
  2. The data set forth in these specifications and indicated on the drawings are as accurate as can be obtained, but their extreme accuracy is not guaranteed. Final application thereto shall be determined on the job as conditions may demand and subject to the approval of the City.
- D. Plans and Specifications Acknowledgment by Subcontractors and Suppliers: All Subcontractors and suppliers must submit, through the General Contractor to the City Engineer, a statement on their individual letterhead stationery, signed and sealed with their corporate seal, or a notarized statement on their letterhead stationery in the absence of a corporate seal, that the individual Subcontractor or Supplier:
1. Has received or reviewed a FULL set of approved plans and specifications for the project,
  2. Is aware that items concerning their particular trade may be shown and/or detailed in other trades or sections of the plans and specifications, and
  3. Will comply with said plans, specifications and all applicable codes and permit requirements.
- E. In the event a Subcontractor or Supplier notes a mistake or details appear incomplete, or if there are questions or concerns with the plans and specifications, the Subcontractor or Supplier will immediately notify the General Contractor. No work will proceed until such conflicts or questions are resolved in writing.
- F. The Subcontractor will not be permitted to start work, nor will any Shop drawings/submittals be accepted for review from a supplier until this letter of acknowledgment is received and approved by the General Contractor and City Engineer. Also, the City will not process any pay request for the work of any Subcontractor or Supplier whose acknowledgment letter is not on file with the City.

## **1.7 ADMINISTRATIVE AND SUPERVISORY PERSONNEL**

- A. The Contractor shall employ a competent superintendent who can communicate with spoken English, and who shall be in attendance at the site full-time when any work is in progress. The superintendent shall be satisfactory to the City's Engineer and shall not be changed except with the consent of the City's Engineer.
- B. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.
1. Include special personnel required for coordination of operations with other contractors.

## **1.8 PROJECT MEETINGS**

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Construction Project Manager of scheduled meeting dates and times.
  2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
  3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Construction Project Manager, within 48 hours of the completion of the meeting.
    - a. Minutes from all meetings shall be prepared by the Contractor, reflecting all items discussed as well as agreed upon or suggested solutions. These minutes shall be a true reflection of what actually happened at the meeting.
    - b. Items discussed and not resolved or being handled by any one of the parties present shall be reflected along with the name of the person responsible in all ongoing minutes until it is resolved.
    - c. Minutes shall be typewritten within 24 hours from the completion of the meeting. They shall immediately be delivered electronically to all parties present and followed by a copy through the mail to the Construction Project Manager.
    - d. All items requiring information and not resolved shall be reflected in each and every set of minutes thereafter until it is totally resolved.
- B. Preconstruction Meeting: After the contract(s) has been awarded, executed, and a tentative work schedule has been composed, and prior to the start of the work, the Contractor, the Construction Project Manager, the City's Representative, and other persons and/or governmental agencies that are involved shall meet. The minimum agenda is to include but is not limited to the following:
1. Distribute and discuss list of major Subcontractors
  2. Tentative construction schedule
  3. Phasing
  4. Critical work sequencing and long-lead items
  5. Relation and coordination of Prime Contractor
  6. Designation of key personnel and their duties
  7. Procedures for processing field decisions and Change Orders
  8. Procedures for RFIs
  9. Procedures for testing and inspecting
  10. Adequacy of distribution of contract documents
  11. Submittal of Shop drawings, project data, and samples
  12. Procedures for maintaining Record documents
  13. Use of premises
  14. Work restrictions
  15. City's occupancy requirements
  16. Responsibility for temporary facilities and controls
  17. Procedures for moisture and mold control
  18. Major equipment deliveries and priorities
  19. Working hours
  20. Safety and first-aid procedures
  21. Security procedures
  22. Housekeeping procedures including progress cleaning
  23. Schedule of values
  24. Processing of payments or contract
- C. Progress Meetings: Conduct progress meetings at bi-weekly intervals. Coordinate dates of

meetings with preparation of payment requests.

1. Attendees: In addition to representatives of City and the Construction Project Manager, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
  - a. Review and approve minutes of previous Progress Meeting.
  - b. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
    - 1) Review schedule for next period.
  - c. Review present and future needs of each entity present, including the following:
    - 1) Interface requirements.
    - 2) Sequence of operations.
    - 3) Status of submittals.
    - 4) Deliveries.
    - 5) Off-site fabrication.
    - 6) Access.
    - 7) Site utilization.
    - 8) Temporary facilities and controls.
    - 9) Work hours.
    - 10) Hazards and risks.
    - 11) Progress cleaning.
    - 12) Quality and work standards.
    - 13) Status of correction of deficient items.
    - 14) Field observations.
    - 15) RFIs.
    - 16) Status of proposal requests.
    - 17) Pending changes.
    - 18) Status of Change Orders.
    - 19) Pending claims and disputes.
    - 20) Documentation of information for payment requests.
3. Minutes: General Contractor shall record the meeting minutes. These minutes shall indicate all items discussed as well as agreed upon or suggested solutions. They shall be a true reflection of what occurred at the meeting.
4. Reporting: Within 48 hours, distribute minutes of the meeting by electronic means to each party present and to parties who should have been present.
  - a. Schedule Updating: Revise Contractor's Construction Schedule after each

progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

- D. Project Closeout Conference: City shall schedule and conduct a project closeout conference, at a time convenient to City and Construction Project Manager, but no later than **30** days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
  2. Attendees: Authorized representatives of City, City's Commissioning Authority, Construction Project Manager, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
  3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
    - a. Preparation of record documents.
    - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    - c. Submittal of written warranties.
    - d. Requirements for preparing operations and maintenance data.
    - e. Requirements for delivery of material samples, attic stock, and spare parts.
    - f. Requirements for demonstration and training.
    - g. Preparation of Contractor's punch list.
    - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    - i. Submittal procedures.
    - j. Coordination of separate contracts.
    - k. Owner's partial occupancy requirements.
    - l. Installation of Owner's furniture, fixtures, and equipment.
    - m. Responsibility for removing temporary facilities and controls.
  4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

## **1.9 REQUESTS FOR INTERPRETATION (RFIs)**

- A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
  2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
1. City Project Number
  2. City Project Name.

3. Date.
  4. Name of Contractor.
  5. RFI number, numbered sequentially.
  6. Specification Section number and title and related paragraphs, as appropriate.
  7. Drawing number and detail references, as appropriate.
  8. Field dimensions and conditions, as appropriate.
  9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  10. Contractor's signature.
  11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
    - a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- C. Hard-Copy RFIs: Form at end of this Section.
1. Identify each page of attachments with the RFI number and sequential page number.
- D. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above. Word Template is available upon request from the City Engineer's Office.
1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- E. Construction Project Manager's Action: Construction Project Manager will review each RFI, determine action required, and return it. Allow seven days for Construction Project Manager's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for coordination information already indicated in the Contract Documents.
    - d. Requests for adjustments in the Contract Time or the Contract Sum.
    - e. Requests for interpretation of Construction Project Manager's actions on submittals.
    - f. Incomplete RFIs or RFIs with numerous errors.
  2. Construction Project Manager's action may include a request for additional information, in which case Construction Project Manager's time for response will start again.
  3. Construction Project Manager's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
    - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Construction Project Manager in writing within 10 days of receipt of the RFI response.
- F. On receipt of Construction Project Manager's action, update the RFI log and immediately



distribute the RFI response to affected parties. Review response and notify Construction Manager within seven days if Contractor disagrees with response.

- G. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log bi-weekly. Include the following:
1. Project name.
  2. Name and address of Contractor.
  3. RFI number including RFIs that were dropped and not submitted.
  4. RFI description.
  5. Date the RFI was submitted.
  6. Date Construction Project Manager's response was received.
  7. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
  8. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

#### **1.10 MAINTENANCE OF AIRPORT OPERATIONS TRAFFIC**

A. DESCRIPTION:

1. The work specified in this Section consists of maintaining traffic within the limits of the project for the duration of the construction period. It shall include the construction and maintenance of any necessary detour facilities along the project and the furnishing, installing and maintaining of traffic control and safety devices required for safe and expeditious movement of traffic as may be called for on the plans. The term "Maintenance of Traffic" or MOT as used herein shall include all of such facilities, devices and operations as are required for the safety and convenience of the public as well as for minimizing public nuisance; all as specified in this Section. The Section also includes installing temporary orange plastic fencing around any owl or tortoise nests, as directed by the Project Manager or Owner's Representative.
2. When the project plans include or identify a specific Maintenance of Traffic Plan, alternate proposals will be considered when they are found to be equal to or better than the plan specified. In no case may the Contractor begin work until the Project Manager has approved the Maintenance of Traffic Plan in writing. Modifications to the Maintenance of Traffic Plan that become necessary shall also be approved in writing. Except in an emergency, as determined by the Project Manager, no changes to the approved plan will be allowed until approval to change such plan has been received.
3. The Contractor shall conduct their operations in such a manner that no undue hazard will result due to the requirements of this section, and the procedures and policies described therein shall in no way act as a waiver of any of the terms of the liability of the Contractor or their surety.

B. CONSTRUCTION METHODS

1. The contractor shall be responsible for performing daily inspections, including week-ends and holidays, with some inspections at nighttime, of the installations on the project and replace all equipment and devices not conforming to the approved standard during that inspection. The project personnel will be advised of the schedule of these inspections and be given the opportunity to join in the inspection as is deemed necessary.

2. The responsibility for installation and maintenance of adequate traffic control devices, warning devices and barriers, for the protection of the traveling public and workers, as well as to safeguard the work area in general shall rest with the Contractor. The required traffic control devices, warning devices and barriers shall be erected by the Contractor prior to creation of any hazardous condition and in conjunction with any necessary rerouting of traffic. The Contractor shall immediately remove, turn or cover any devices or barriers that do not apply to existing conditions.

The Contractor shall make the Project Manager aware of any scheduled operation which will affect traffic patterns or safety sufficiently in advance of commencing such operation to permit their review of the plan for installation of traffic control devices, warning devices, or barriers proposed by the Contractor.

The Contractor shall assign one of their employees the responsibility of maintaining the position and condition of all traffic control devices, warning devices and barriers throughout the duration of the contract. The Project Manager shall be kept advised at all times as to the identification and means of contacting this employee on a 24-hour basis.

3. All traffic control devices (including signs), warning devices, barricades and barriers shall be furnished by the Contractor.
4. Traffic control devices, warning devices, and barriers shall be kept in the correct position, properly directed, clearly visible and clean at all times. Damaged, defaced or dirty Devices or barriers shall be immediately repaired, replaced or cleaned as directed.
5. The Contractor shall provide competent flagmen to direct traffic where one-way operation in a single lane is in effect and in other situations as may be required by the standards established.
6. Where a detour changes the lane use or where normal vehicle paths are altered during construction, all existing pavement markings that will be in conflict with the adjusted vehicle paths shall be removed. Over-painting will not be allowed. The removal may be accomplished by any method that will not materially damage the surface texture of the pavement and which will eliminate the previous marking pattern regardless of weather and light conditions.

All pavement markings that will be in conflict with "next phase of operation" vehicle paths shall be removed as described above, prior to opening to traffic, when possible. Markings that cannot be removed prior to changing traffic patterns will be removed as soon as practicable. The term "practicable" shall be interpreted as meaning or implying:

- a. Marking removal equipment will be scheduled for use immediately following any change in lanes.
- b. If darkness or inclement weather interferes with removal operations, such operations will be accomplished during the next daylight period or as soon thereafter as weather conditions permit.
- c. If equipment failures occur such equipment will be repaired, replaced, or leased so that the removal can be accomplished by the following day.

7. The Contractor shall provide portable light towers as required for work. The towers shall be trailer mounted, that can be folded for easy transport and storage. The towers shall contain a diesel generator to power a minimum 6000 watts and have fuel capacity to operate at full load for a minimum of 48 hours. It shall be designed to be weather proof. The towers shall be telescoping and capable of rotating over 360 degrees and shall have a minimum of four (4) 1000 watt metal halide floodlights.

**PART 2 - PRODUCTS (Not Used)**

**PART 3 - EXECUTION (Not Used)**

**END OF SECTION 013100**

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## **SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
  - 1. Startup Construction Schedule.
  - 2. Contractor's Construction Schedule.
  - 3. Submittals Schedule.
  - 4. Daily construction reports.
  - 5. Material location reports.
  - 6. Site condition reports.
  - 7. Special reports.
- B. Related Sections include the following:
  - 1. Division 01 Section "Summary of Multiple Contracts" for preparing a combined Contractor's Construction Schedule.
  - 2. Division 01 Section "Payment Procedures" for submitting the Schedule of Values.
  - 3. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
  - 4. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
  - 5. Division 01 Section "Photographic Documentation" for submitting construction photographs.
  - 6. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.

#### **1.3 DEFINITIONS**

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
  - 1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
  - 2. Predecessor Activity: An activity that precedes another activity in the network.
  - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by the Construction Project Manager.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction

project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
  - 1. Float time is not for the exclusive use or benefit of either City or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
  - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
  - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Milestone: A key or critical point in time for reference or measurement.
- H. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.
- I. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
  - 1. Working electronic copy of schedule file in MS Project.
  - 2. PDF electronic file.
  - 3. **Two (2)** paper copies.
- B. Startup construction schedule.
  - 1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
  - 1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
- E. Daily Construction Reports: Submit **one (1)** copy of daily construction reports at **weekly** intervals.

## **1.5 QUALITY ASSURANCE**

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Construction Project Manager's request.
- B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section 013100 "Project Management and Coordination." Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:
  - 1. Review software limitations and content and format for reports.
  - 2. Verify availability of qualified personnel needed to develop and update schedule.
  - 3. Discuss constraints.
  - 4. Review time required for review of submittals and resubmittals.
  - 5. Review requirements for tests and inspections by independent testing and inspecting agencies.
  - 6. Review time required for Project closeout and City startup procedures.
  - 7. Review and finalize list of construction activities to be included in schedule.
  - 8. Review submittal requirements and procedures.
  - 9. Review procedures for updating schedule.

## **1.6 COORDINATION**

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
  - 1. Secure time commitments for performing critical elements of the Work from parties involved.
  - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

## **PART 2 - PRODUCTS**

### **2.1 SUBMITTALS SCHEDULE**

- A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.
  - 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
  - 2. Initial Submittal: Submit concurrently with preliminary bar-chart schedule and network diagram. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

- a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

## 2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to proceed to date of Final Completion.
- B. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
  1. Activity Duration: Define activities so no activity is longer than ten (10) days, unless specifically allowed by Construction Project Manager.
  2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
  3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
  4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Construction Project Manager's administrative procedures necessary for certification of Substantial Completion.
  5. Punch List and Final Completion: Include not more than **thirty (30)** days for completion of punch list items and final completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
  1. Phasing: Arrange list of activities on schedule by phase.
  2. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
  3. Work Restrictions: Show the effect of the following items on the schedule:
    - a. Coordination with existing construction.
    - b. Limitations of continued occupancies.
    - c. Uninterruptible services.
    - d. Partial occupancy before Substantial Completion.
    - e. Use of premises restrictions.



- f. Provisions for future construction.
  - g. Seasonal variations.
  - h. Environmental control.
- 4. Retain subparagraph and associated subparagraphs below for large projects and complicated small projects. Consider limiting it to critical work or important subcontracts.
- 5. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
  - a. Subcontract awards.
  - b. Submittals.
  - c. Purchases.
  - d. Installation.
  - e. Tests and inspections.
  - f. Adjusting.
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, Final Completion.
- F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
  - 1. Unresolved issues.
  - 2. Unanswered Requests for Information.
  - 3. Rejected or unreturned submittals.
  - 4. Notations on returned submittals.
  - 5. Pending modifications affecting the Work and Contract Time.
- G. Recovery Schedule: When periodic update indicates the Work is **fourteen (14)** or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and dating by which recovery will be accomplished.
- H. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules.
  - 1. Microsoft Project 2010 for Windows 7 operating system.

## 2.3 STARTUP CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule seven (7) days prior to the date established for the Pre-Construction Conference.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first **ninety (90)** days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

## 2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within **fourteen (14)** days of date established for the Notice to Proceed. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
  - 1. For construction activities that require 3 months or longer completing, indicate an estimated completion percentage in **ten (10)** percent increments within time bar.

## 2.5 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
  - 1. List of subcontractors at Project site.
  - 2. List of separate contractors at Project site.
  - 3. Approximate count of personnel at Project site.
  - 4. Equipment at Project site.
  - 5. Material deliveries.
  - 6. High and low temperatures and general weather conditions.
  - 7. Accidents.
  - 8. Meetings and significant decisions.
  - 9. Unusual events (refer to special reports).
  - 10. Stoppages, delays, shortages, and losses.
  - 11. Meter readings and similar recordings.
  - 12. Emergency procedures.
  - 13. Orders and requests of authorities having jurisdiction.
  - 14. Change Orders received and implemented.
  - 15. Construction Change Directives received and implemented.
  - 16. Services connected and disconnected.
  - 17. Equipment or system tests and startups.
  - 18. Partial Completions and occupancies.
  - 19. Substantial Completions authorized.
- B. Site Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

## 2.6 SPECIAL REPORTS

- A. General: Submit special reports directly to City within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, and response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise City in advance

when these events are known or predictable.

### **PART 3 - EXECUTION**

#### **3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE**

- A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
  - 1. In-House Option: City may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
  - 2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
  - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
  - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
  - 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- C. Distribution: Distribute copies of approved schedule to Construction Project Manager, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
  - 1. Post copies in Project meeting rooms and temporary field offices.
  - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

**END OF SECTION 013200**

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## **SECTION 013233 PHOTOGRAPHIC DOCUMENTATION**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for the following:
1. Preconstruction photographs.
  2. Periodic construction photographs.
  3. Final Completion construction photographs.
  4. Preconstruction video recordings.
  5. Periodic construction video recordings.
  6. Web-based construction photographic documentation.
- B. Related Sections include the following:
1. Division 01 Section "Submittal Procedures" for submitting photographic documentation.
  2. Division 01 Section "Closeout Procedures" for submitting digital media as Project Record Documents at Project closeout.
  3. Division 31 Section "Site Clearing and Grubbing" for photographic documentation before site clearing operations commence.

#### **1.3 INFORMATIONAL SUBMITTALS**

- A. Construction Photographs: Submit digital media files of each photographic view within **seven (7)** days of taking photographs.
1. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph. File names shall be in the following format: City project number – date taken (YYMMDD) – picture number (example: 10350-090408-011 would indicate project number 10350 taken on April 8, 2009 photograph number 11). Submit on CD with folders for separate dates.
  2. Identification: On jewel case and CD, provide an applied label with the following information:
    - a. Name of Project.
    - b. Name of Contractor.
    - c. Dates photographs were taken.

#### **1.4 COORDINATION**

- A. Auxiliary Services: Cooperate with photographer and provide auxiliary services requested, including access to Project site.

## 1.5 USAGE RIGHTS

- B. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

## PART 2 - PRODUCTS

### 2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.

## PART 3 - EXECUTION

### 3.1 CONSTRUCTION PHOTOGRAPHS

- A. Aerial Photographer: Engage a qualified commercial aerial photographer to take aerial construction photographs (minimum three (3) photographs for site work). Photographs shall be included with monthly pay applications.
- B. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
- C. Daily Progress Photographs: Take daily photographs to document progress. Take photographs of all work that will be concealed by subsequent construction activity. Such photographs shall fully document actual installed conditions.
- D. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
  - 1. Date and Time: Include date and time in filename for each image.
  - 2. Field Office Images: Maintain one set of images accessible at the field office at Project site, available at all times for reference. Identify images same as for those submitted to Architect.
- E. Preconstruction Photographs: Before **commencement of excavation, commencement of demolition, or starting construction**, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, or, as directed by Architect.
  - 1. Flag **excavation areas** and **construction limits** before taking construction photographs.
  - 2. Take **ten (10)** photographs to show existing conditions adjacent to property before starting the Work.
- F. Periodic Construction Photographs: Take minimum **ten (10)** photographs weekly, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points, including aerial photographs to show status of construction and progress since last photographs were taken.

- G. Final Completion Construction Photographs: Take **ten (10)** color photographs after date of Substantial Completion for submission as Project Record Documents.

### **3.2 CONSTRUCTION VIDEO RECORDINGS (N/A)**

**END OF SECTION 013233**

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## **SECTION 013300 SUBMITTAL PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections include the following:
  - 1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
  - 2. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
  - 3. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
  - 4. Division 01 Section "Photographic Documentation" for submitting construction photographs
  - 5. Division 01 Section "Closeout Procedures" for submitting warranties.

#### **1.3 DEFINITIONS**

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

#### **1.4 ACTION SUBMITTALS**

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Engineer's and additional time for handling and reviewing submittals required by those corrections.
  - 1. Coordinate submittal schedule with list of subcontracts, and Contractor's construction schedule.
  - 2. Initial Submittal: Submit concurrently with startup construction schedule. List those

submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
  - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

## **1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS**

- A. Engineer's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by City for Contractor's use.
  1. City will furnish Contractor one set of digital data drawing files of the Contract Drawings.
    - a. Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
    - b. Digital Drawing Software Program: The Contract Drawings are available in AutoCad 2010 dwg format.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
  1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
  1. Initial Review: Allow 10 working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow ten (10) working days for review of each resubmittal.

## **PART 2 - PRODUCTS**

### **2.1 SUBMITTAL PROCEDURES**

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Action Submittals: Submit four (4) paper copies of each submittal unless otherwise indicated. Engineer will return three copies.
  2. Informational Submittals: Submit four (4) paper copies of each submittal unless otherwise indicated. Engineer will return three copies.
- B. Shop Drawings: Prepare Project-specific information. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on City's digital data drawing files is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
  2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches.
  3. Submit Shop Drawings in the following format:
    - a. Four (4) copies of each submittal. Engineer will retain two copies; remainder will be returned.

### **PART 3 - EXECUTION**

#### **3.1 CONTRACTOR'S REVIEW**

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. See requirements in Section 017700.
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, and date of Contractor's approval.

#### **3.2 ENGINEER'S ACTION**

- A. General: Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:
  1. Approved as submitted
  2. Approved as noted
  3. Revise and resubmit
  4. Rejected.

- C. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
- D. Partial or incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

**END OF SECTION 013300**

**SECTION 015000  
TEMPORARY FACILITIES AND CONTROLS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities. Contractor to provide temporary trailer, secured per code, to contain permit drawings and as contractor's site office. This temporary facility to be air conditioned.
- B. Related Sections include the following:
1. Division 01 Section "Summary" for limitations on utility interruptions and other work restrictions.
  2. Division 01 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
  3. Divisions 02 through 16 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.
  4. Division 31 Section "Termite Control" for pest control.

**1.3 DEFINITIONS**

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

**1.4 USE CHARGES**

- A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, City's Representative, Architect, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Pay sewer service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Pay water service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric power service use charges for electricity used by all entities for construction operations.

## **1.5 SUBMITTALS**

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

## **1.6 QUALITY ASSURANCE**

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

## **1.7 PROJECT CONDITIONS**

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before City's acceptance, regardless of previously assigned responsibilities.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Pavement: Comply with Division 32 pavement Sections.
- B. Chain-Link Fencing: Minimum 0.148-inch, thick, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top rails.
- C. Lumber and Plywood: Comply with requirements in Division 06 Section "Rough Carpentry."
- D. Paint: Comply with requirements in Division 09 painting Sections.

### **2.2 TEMPORARY FACILITIES**

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of construction personnel, including City's Representative. Keep office clean and orderly. Furnish and equip offices as follows:
  - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
  - 2. Conference room of sufficient size to accommodate meetings of 10 to 12 individuals. Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack board.
  - 3. Drinking water and private toilet.
  - 4. Coffee machine and supplies.
  - 5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 76 deg F.
  - 6. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

7. Dedicated telephone line for facsimile machine.
  8. Facsimile machine and all supplies, including maintenance and electrical service.
  9. Copy machine and all supplies, including maintenance and electrical service.
  10. Answering machine on Contractor's telephone line.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
1. Store combustible materials apart from building.
- D. The following additional facilities as required for completion of the work.
1. Construction signs.
  2. Contractor's and subcontractor's equipment.
  3. Temporary containers for construction waste materials.
  4. Temporary barricades, railings and fences.

## **2.3 EQUIPMENT**

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless City authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
  2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
  3. Permanent HVAC System: If City authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION, GENERAL**

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

### **3.2 TEMPORARY UTILITY INSTALLATION**

- A. General: Install temporary service or connect to existing service.
1. Arrange with utility company, City, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary sewers to city system as directed by authorities having jurisdiction.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Water Service: Use of City's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to City. At Substantial Completion, restore these facilities to condition existing before initial use.
  1. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.
- E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- F. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- H. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
  1. Install electric power service, unless otherwise indicated.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
  1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- J. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install at least one telephone line for each field office.
  1. Provide additional telephone lines for the following:
    - a. Provide a dedicated telephone line for each facsimile machine and computer in each field office.
    - b. Provide one telephone line for City's use.
  2. At each telephone, post a list of important telephone numbers.
    - a. Police and fire departments.
    - b. Ambulance service.



- c. Contractor's home office.
  - d. Architect.
  - e. Engineers.
  - f. City of Fort Lauderdale Construction Manager.
  - g. Principal subcontractors' field and home offices.
3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.
- K. Electronic Communication Service: Provide temporary electronic communication service, including electronic mail, in common-use facilities.
1. Provide DSL in primary field office.

### **3.3 SUPPORT FACILITIES INSTALLATION**

- A. General: Comply with the following:
- 1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.
  - 2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to City.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
- 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
  - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- C. Parking: Provide temporary parking areas for construction personnel.
- D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
- 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
- E. Project Identification and Temporary Signs: Provide Project identification and other signs as indicated in contract documents. Install signs where indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.
- 1. Provide temporary, directional signs for construction personnel and visitors.
  - 2. Maintain and touchup signs so they are legible at all times.
- F. Waste Disposal Facilities: Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal." Also comply with all LEED requirements.
- G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 01 Section "Execution" for progress cleaning requirements and LEED requirements.

### 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
  - 1. Comply with work restrictions specified in Division 01 Section "Summary" and all LEED requirements.
- B. Temporary Erosion and Sedimentation Control: Comply with requirements specified in Division 31 Section 311000 "Site Clearing."
- C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
  - 1. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Tree and Plant Protection: Comply with requirements specified in Division 32 Section "Tree Protection and Trimming."
- F. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- G. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for City. Perform control operations lawfully, using environmentally safe materials.
- H. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
  - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
  - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide City with one set of keys.
- I. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
- J. Barricades, Warning Signs, and Lights: Comply with requirements of Florida Building Code Chapter 33 for erecting structurally adequate barricades, including warning signs and

lighting.

- K. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
  - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.
- L. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by City from fumes and noise.
  - 1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.
  - 2. Construct dustproof partitions with 2 layers of 3-mil polyethylene sheet on each side. Cover floor with 2 layers of 3-mil polyethylene sheet, extending sheets 18 inches up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant plywood.
    - a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches between doors. Maintain water-dampened foot mats in vestibule.
  - 3. Insulate partitions to provide noise protection to occupied areas.
  - 4. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
  - 5. Protect air-handling equipment.
  - 6. Weather strip openings.
  - 7. Provide walk-off mats at each entrance through temporary partition.
- M. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
  - 1. Prohibit smoking in construction areas.
  - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

### **3.5 OPERATION, TERMINATION, AND REMOVAL**

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. City reserves right to take possession of Project identification signs.
  2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
  3. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

**END OF SECTION 015000**

City of Fort Lauderdale

# Construction Sign Request Form

Bid 12062-183  
P12188

Title (Bold):

**Fort Lauderdale Executive Airport Administration Building Renovations**

Title (Not Bold):

What's Happening?

Renovation of Fort Lauderdale Executive Airport Administration Building, including construction of new conference room and offices, new a/c system, and replacing lights with new LED lights.

Benefits:

Reduce maintenance and energy usage in the building, and reduce water usage on the landscaping.

Number of Neighbors Benefitted:

N/A

Cost:

T.B.D

Month and Year of Expected Completion:

06/2018

Contractor:

T.B.D

Phone: 954-828-8000

We're Working On:

Project Manager Signature

Date

Senior Project Manager Signature

Date

015900-2

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## SECTION 015900 – CONSTRUCTION SIGN

### PART 1 GENERAL

Contractor, at contractor's expense, shall furnish and install a **4' x 8'** sign (with white painted posts) prior to start of construction. A sample sign template is below but is not specific to the project. The exact style and design of the sign will be provided by the CITY to the Contractor during the preconstruction meeting in PDF format.



See Page 2, "Construction Sign Request Form", for information on the sign for this Project.

**END OF SECTION**

## **SECTION 016000 PRODUCT REQUIREMENTS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section. All products indicated as such to possess full documentation for compliance of LEED requirements.

#### **1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. Related Sections include the following:
  - 1. Division 01 Section "References" for applicable industry standards for products specified.
  - 2. Division 01 Section "Closeout Procedures" for submitting warranties for Contract closeout.
  - 3. Divisions 02 through 48 Sections for specific requirements for warranties on products and installations specified to be warranted.

#### **1.3 DEFINITIONS**

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
  - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
  - 2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. Contractor to use the specific product specified unless permission has been given to the contractor for substitution of comparable product, by the Architect.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-



service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

#### **1.4 SUBMITTALS**

- A. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
  2. Form: Tabulate information for each product under the following column headings:
    - a. Specification Section number and title.
    - b. Generic name used in the Contract Documents.
    - c. Proprietary name, model number, and similar designations.
    - d. Manufacturer's name and address.
    - e. Supplier's name and address.
    - f. Installer's name and address.
    - g. Projected delivery date or time span of delivery period.
    - h. Identification of items that require early submittal approval for scheduled delivery date.
  3. Completed List: Within 60 days after date of Notice to Proceed, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
  4. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.
- B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. To be considered part of the original bid, all such requests must be submitted to the Architect (10) ten calendar days prior to the bid-opening day. Unless the City has specifically approved a proposed substitution in writing, it will not be considered, under any circumstances, a part of the bid proposal.
  2. Documentation: All approvals of substitution shall be accomplished before the completion of the bidding process. Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified material or product cannot be provided.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by City and separate contractors that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
  - e. Samples, where applicable or requested.
  - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and cities.
  - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - h. Research/evaluation reports evidencing compliance with Florida Building Code from an organization acceptable to Building Official.
  - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
  - j. Cost information, including a proposal of change, if any, in the Contract Sum.
  - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
  - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
- a. Form of Acceptance: Change Order or Change Directive.
  - b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.
- C. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
- a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
  - b. Use product specified if Architect cannot make a decision on use of a comparable product request within time allocated.
- D. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

## 1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously

selected, even if previously selected products were also options.

## **1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
  - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
  - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- C. Storage:
  - 1. Store products to allow for inspection and measurement of quantity or counting of units.
  - 2. Store materials in a manner that will not endanger Project structure.
  - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
  - 4. Store cementitious products and materials on elevated platforms.
  - 5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
  - 6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
  - 7. Protect stored products from damage and liquids from freezing.

## **1.7 PRODUCT WARRANTIES**

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
  - 1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to City.
  - 2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for City.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
  - 1. Manufacturer's Standard Form: Modified to include Project-specific information and

- properly executed.
  - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
  - 3. Refer to Divisions 02 through 48 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

## **PART 2 - PRODUCTS**

### **2.1 PRODUCT SELECTION PROCEDURES**

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
- 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
  - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
  - 3. City reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
  - 4. Where products are accompanied by the term "as selected," Architect will make selection.
  - 5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
  - 6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
- B. Product Selection Procedures:
- 1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
  - 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
  - 3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
  - 4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
  - 5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
  - 6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
  - 7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions"

- Article for consideration of an unnamed product or system.
8. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.
  9. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
    - a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.
  10. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
    - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
    - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## 2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect. Specific product as called out in the drawings or specifications shall be used and other products as mentioned may be considered for approval by Architect.
- B. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
  1. Requested substitution offers City a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities City must assume. City's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by City, and similar considerations.
  2. Requested substitution does not require extensive revisions to the Contract Documents.
  3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  4. Substitution request is fully documented and properly submitted.
  5. Requested substitution will not adversely affect Contractor's Construction Schedule.
  6. Requested substitution has received necessary approvals of authorities having jurisdiction.

7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.
10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

## **2.3 COMPARABLE PRODUCTS**

A. Conditions: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and cities, if requested.
5. Samples, if requested.

## **PART 3 - EXECUTION (Not Used)**

**END OF SECTION 016000**

**SECTION 017419  
CONSTRUCTION WASTE MANAGEMENT**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for the following:
1. Salvaging nonhazardous demolition and construction waste.
  2. Recycling nonhazardous construction waste.
  3. Disposing of nonhazardous construction waste.
- B. Related Sections: Division 1 Section 01500 TEMPORARY FACILITIES AND CONTROLS for environmental-protection measures during construction, and location of waste containers at Project site.

**1.3 DEFINITIONS**

- A. Building: Any structure used or intended for supporting or sheltering any use or occupancy as defined in the International Building Code.
- B. Construction: Building of any building or structure or any portion thereof.
- C. Construction and Demolition Debris or Debris: Used or discarded materials removed from premises during construction or renovation of a structure resulting from construction, renovation, remodeling, repair, or demolition operations on any building, or other structure and shall include, but not be limited to: demolition debris; new construction debris; debris from renovation projects, including tenant improvements and additions; debris from flood control and storm drain construction and; debris from road construction; debris from construction, renovation, or demolition of pump stations and bridges, abutments; earth; and debris from construction, renovation, or demolition of retaining walls and underground utilities. Construction and demolition debris does not include hazardous waste, contaminated earth or soil, and materials without any use or market value even after re-manufacturing.
- D. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- E. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

- F. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- G. Divert: To use material for any purpose other than disposal in a landfill.
- H. Diversion Requirement: Percentage of the total construction and demolition debris generated by a project that is required to be diverted from a landfill as required for this project.
- I. Estimated Cost of Construction: Total projected cost of completing a proposed project.
- J. Green Building Practices: A whole systems approach to the design, construction, and operation of buildings and structures that helps mitigate the environmental, economic, and social impacts of construction, demolition, and renovation. Green building practices such as those described in the LEED rating system, recognize the relationship between natural and built environments and seek to minimize the use of energy, water, and other natural resources and provide a healthy, productive environment.
- K. LEED: Leadership in Energy and Environmental Design Rating System as established by U.S. Green Building Council.
- L. LEED TM Green Building Design and Construction, New Construction Rating SystemTM: Version 3 of the Leadership in Energy and Environmental Design (LEEDTM) Rating SystemTM.
- M. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- N. Recycling: Process of collecting, sorting, cleansing, treating, and reconstituting materials that would otherwise become solid waste, and returning them to the economic mainstream in the form of raw material for new, reused, or reconstituted products which meet the quality standards necessary to be used in the marketplace.
- O. Reuse: Further or repeated use of construction or demolition debris. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- P. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.
- Q. Structure: That which is built or constructed, an edifice or building of any kind or any piece of work artificially built or composed of parts joined together in some definite manner and permanently attached to the ground.

#### **1.4 PERFORMANCE REQUIREMENTS**

- A. Salvage/Recycle Requirements: Owner's goal is to salvage and recycle as much nonhazardous demolition and construction waste as possible.



- B. Develop waste management plan that results in end-of-Project rates for salvage/recycling of at least 75 percent by weight of total waste generated by the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials.

## 1.5 SUBMITTALS

- A. The following shall be submitted in accordance with SUBMITTAL PROCEDURES in sufficient detail to show full compliance with the specification:
1. Preconstruction Submittals: Waste Management Plan: Submit plan within 5 days of date established for the Notice to Proceed.
  2. Certificates: Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit three copies of report. Include the following information:
    - a. Material category.
    - b. Generation point of waste.
    - c. Total quantity of waste in tons.
    - d. Quantity of waste salvaged, both estimated and actual in tons.
    - e. Quantity of waste recycled, both estimated and actual in tons.
    - f. Total quantity of waste recovered (salvaged plus recycled) in tons.
    - g. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
  3. Closeout Submittals:
    - a. Waste Reduction Calculations: Before request for Substantial Completion, submit three copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
    - b. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
    - c. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
    - d. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
    - e. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
  4. LEED Submittal: LEED letter template completed on LEED On Line for Credit MR 2.1/2.2, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.

## 1.6 QUALITY ASSURANCE

- A. Waste Management Conference: Conduct conference at Project site to comply with requirements. Review methods and procedures related to waste management including, but not limited to, the following:
1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
  2. Review requirements for documenting quantities of each type of waste and its disposition.
  3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
  4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
  5. Review waste management requirements for each trade.

## **1.7 WASTE MANAGEMENT PLAN**

- A. Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of land-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
  2. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
  3. Recycled Materials: Include list of local receivers and processors, and type of recycled materials each will accept.
    - a. Include names, addresses, and telephone numbers.
  4. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
  5. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### **3.1 PLAN IMPLEMENTATION**

- A. Implement waste management plan as approved by the Owner. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Contractor shall submit Waste Reduction Progress Reports concurrent with each Application for Payment, in accordance with paragraph "Submittals." Prepare LEED letter template for Credit MR 2.1/2.2, signed by Contractor, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met. At completion of project Contractor shall also submit Waste Reduction Calculations, Records of Donations, Recycling and Processing Facility Records, and Landfill and Incinerator Disposal Records in accordance with paragraph entitled "Submittals."
- C. Waste Management Coordinator: Designate a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- D. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
  - 1. Distribute waste management plan to everyone concerned within three days of submittal return.
  - 2. Distribute waste management plan to entities when they first begin work on site. Review plan procedures and locations established for salvage, recycling, and disposal.
- E. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, and donated.

### **3.2 SALVAGING DEMOLITION WASTE**

- A. Salvaged Items for Donation: Permitted on Project site.

### **3.3 RECYCLING CONSTRUCTION WASTE, GENERAL**

- A. Hire a waste company that will do certified off site restoration and documentation and/or a combination of the following
- B. Recycle paper and beverage containers used by on-site workers.
- C. Recycling Receivers and Processors: Contractor to procure local recycling receivers and processors for the duration of construction activities at the building site.

- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical. Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements.
1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
    - a. Inspect containers and bins for contamination and remove contaminated materials if found.
  2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
  4. Store components off the ground and protect from the weather.
  5. Remove recyclable waste off the Owner's property and transport to recycling receiver or processor.

### **3.4 RECYCLING DEMOLITION WASTE**

- A. Metals: Separate metals by type.
1. Structural Steel: Stack members according to size, type of member, and length.
  2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- B. Piping: Reduce piping to straight lengths and store by type and size.
- C. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- D. Conduit: Reduce conduit to straight lengths and store by type and size.

### **3.5 RECYCLING CONSTRUCTION WASTE**

- A. Packaging:
1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
  2. Polystyrene Packaging: Separate and bag materials.
  3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
  4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
1. Clean Cut-offs of Lumber: Grind or chip into small pieces.

2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- C. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.
  1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
    - a. Review with Landscape Architect use clean ground gypsum board as inorganic soil amendment.

### **3.6 DISPOSAL OF WASTE**

- A. Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to the Owner.
  1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off the Owner's property and legally dispose of them.

### **3.7 WASTE MANAGEMENT PLAN**

- A. A Waste Management Plan shall be submitted by the contractor. Example of Comingled Waste Management Plan as follows:

## Construction Waste Management Plan – Commingled

Project: **P11242 - FXE U.S. Customs & Border Protection Facility**Contractor: **(Contractor's Name)**

Objective: To maximize waste diverted from landfill by recycling as much construction debris as possible.

Method: Project owner and builder **(Contractors name)** Construction will use a waste hauler/contractor who specializes in material recycling. **(Hauler's name)** owns and operates the local Recycling facilities.

**(Hauler's name)** roll-off containers will be used onsite to collect comingled waste. (Hauler's name) will haul project waste from the jobsite to their **(location address)**, Material Recovery Facility for sorting.

**(Hauler's name)** separates construction and demolition debris into the following categories: concrete, wood, metals, cardboard, dirt, drywall, and miscellaneous mixed waste. Materials are then sold to local recycling centers for reuse in the manufacture of specific products (i.e. the cardboard and metals) or processed (via screening or grinding) and resold as base (i.e. the concrete).

Separation: Waste will be comingled with the exception of cardboard; to protect the cardboard from damage we will provide a separate, labeled container.

Documentation: **(Hauler's name)** will provide monthly waste reports detailing material types and totals.

Final Destinations for Waste:

- Concrete: **(Example: Road Base/Drainage.)**
- Wood: **(Example: Mulch.)**
- Metals: **(Example: FPT/Sunrise Metals.)**
- Cardboard: **(Example: All-American Recycling.)**
- Dirt: **(Example: Central Landfill, Pompano Beach, Florida.)**
- Drywall: **(Example: Central Landfill, Pompano Beach, Florida.)**
- Miscellaneous Waste: **(Example: Central Landfill, Pompano Beach, Florida.)**

## 3.8 SCHEDULE

| Construction Waste Description | Diverted or Landfill Waste? | If Comingled waste is diverted off-site, enter percentage diverted (%) | Hauler or Location | Waste |
|--------------------------------|-----------------------------|--|--------------------|-------|
|                                |                             |  |                    |       |

**END OF SECTION 017419**

## **SECTION 017700 CLOSEOUT PROCEDURES**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Substantial Completion procedures.
  - 2. Final completion procedures.
  - 3. Warranties.
  - 4. Final cleaning.
  - 5. Repair of the Work.
- B. Related Sections include the following:
  - 1. Division 01 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
  - 2. Division 01 Section "Photographic Documentation" for submitting Final Completion construction photographs and negatives.
  - 3. Division 01 Section "Execution Requirements" for progress cleaning of Project site.
  - 4. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
  - 5. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 6. Division 01 Section "Demonstration and Training" for requirements for instructing City's personnel.
  - 7. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

#### **1.4 CLOSEOUT SUBMITTALS**

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

### C. As Built Project Record Survey

1. Upon completion of the work, after Substantial Completion and before Final Acceptance, the Contractor will supply to the Engineer a complete "as built" survey of the entire project site. The "as-built" project record survey shall be performed in conjunction with the paving operation, the Contractor will supply to the Engineer a complete "as built" survey of the centerline profile and corresponding cross-section grades at all 50 foot stations in the longitudinal direction. Provide survey points at all profile grade change locations as defined on the proposed profile. Provide survey points at all PC and PT locations as defined on the Geometry Plan. Provide as-built elevations in all additional locations where proposed elevations are given on the plans. All survey points, including horizontal and vertical control, property corners, section corners and references (hereinafter referred to as "survey points") shall be clearly marked and referenced prior to construction. These survey points must be sufficiently referenced so that they can be re-established after construction if they are disturbed.
2. This "as built" survey will be a complete topographic survey of the entire project site surrounded by the limit of construction plus 50-feet in all directions. If any work is done outside the limits of construction for any reason, this limit of survey will be increased to include this area plus 50-feet. This survey shall be certified by a Registered Land Surveyor as meeting the minimum Technical Standards for topographic surveys as set forth in chapter 5J-17, Florida Administrative Code. The survey data must be supplied as a signed and sealed drawing (24" x 36"), PDF file (24" x 36"), and "readable" AutoCAD CADD file. All cogo points in the drawing file are to be Civil 3D point objects. All survey data shall also be supplied in ASCII format. ASCII format shall be comma delimited PNEZD with complete point descriptions. Each point or feature shown on the survey shall have a corresponding point or points in the ASCII file and the descriptions of the points in the ASCII file shall correspond to the call outs and descriptions of the point and features on the survey. The topographic survey shall describe the entire site at the same scale as the construction drawings and will be arranged on the required size sheets in a neat and logical manner. Larger scale details are to be provided to clarify any complicated or complex areas. The horizontal and vertical control and datum established and shown on the project plans shall be the basis of the survey. Work specified herein shall be considered incidental to the project scope and will not be paid as a separate item.

### 1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

### 1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of **ten (10)** days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
  1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities.



2. Include occupancy permits, operating certificates, and similar releases.
  2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
  3. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of **ten (10)** days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
  2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
  3. Complete startup and testing of systems and equipment.
  4. Perform preventive maintenance on equipment used prior to Substantial Completion.
  5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Division 01 Section "Demonstration and Training."
  6. Advise Owner of changeover in heat and other utilities.
  7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
  8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  9. Complete final cleaning requirements, including touchup painting.
  10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of **ten (10)** days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Construction Project Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Construction Project Manager will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
  2. Results of completed inspection will form the basis of requirements for final completion.

## 1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
  2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of **ten (10)** days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Construction Project Manager will either proceed with inspection or notify Contractor of unfulfilled requirements. Construction Project Manager will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

## 1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, **starting with exterior areas first and proceeding from lowest floor to highest floor.**
  2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
  3. Include the following information at the top of each page:
    - a. Project number and name.
    - b. Date.
    - c. Name of Architect
    - d. Name of Contractor.
    - e. Page number.
  4. Retain and revise one of four subparagraphs below if default submittal format in Division 01 Section "Submittals Procedures" is not appropriate. Due to nature of punch list process, electronic worksheet software is often preferred file type. Submit list of incomplete items in the following format:
    - a. City of Fort Lauderdale Punch List Inspection Form
    - b. MS Excel electronic file. Construction Project Manager will return annotated file.
    - c. PDF electronic file. Construction Project Manager will return annotated file.
    - d. Three (3) paper copies. Construction Project Manager will return two (2) copies.

## 1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Construction Project Manager for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within fifteen (15) days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of

Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
  2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
  3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
  4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

**PART 2 - PRODUCTS (N/A)**

**PART 3 - EXECUTION (N/A)**

**END OF SECTION 017700**

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Advancement  
of Constructio  
Technology

## PUNCH LIST

Project: \_\_\_\_\_

From (A/E): \_\_\_\_\_

Site Visit Date: \_\_\_\_\_

To (Contractor): \_\_\_\_\_

A/E Project Number: \_\_\_\_\_

Contract For: \_\_\_\_\_

The following items require the attention of the Contractor for completion or correction. This list may not be all-inclusive, and the failure to include any items on this list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

| Item<br>Number | Room<br>Number | Location<br>(Area) | Description | Correction/Completion<br>Date | Verification<br>A/E Check |
|----------------|----------------|--------------------|-------------|-------------------------------|---------------------------|
|----------------|----------------|--------------------|-------------|-------------------------------|---------------------------|

☐ Attachments

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

Copies: ☐ Owner ☐ Consultants ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ \_\_\_\_\_ ☐ File

Project Number: \_\_\_\_\_ Project Name: \_\_\_\_\_ Inspection Date: \_\_\_\_\_  
Contractor: \_\_\_\_\_ Project Manager: \_\_\_\_\_ Inspector: \_\_\_\_\_

| Item No. | Description of Deficiency | Date Completed |       | Comments |
|----------|---------------------------|----------------|-------|----------|
|          |                           | Contractor     | PM/CI |          |
|          |                           |                |       |          |
|          |                           |                |       |          |
|          |                           |                |       |          |
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|          |                           |                |       |          |

Instructions for completing the *Final Inspection Punch-list Corrective Action Form*.

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The Construction Project Manager, in conjunction with the assigned construction inspector is responsible for preparing this form. It shall be completed in cooperation with the project's prime contractor and will be used as the official record for any and all punch-list items. Under no circumstances shall final payment be made until all items identified on this form are corrected to the satisfaction of the Construction Project Manager.

1. Prior to scheduling Substantial Completion/Final Inspection, all permits should be cleared by the building department, all O&M Manuals should be turned over to the city, and all warranty information should be provided in a three ring binder and on CD-ROM.
2. Schedule inspection, coordinating with necessary staff to properly evaluate the completeness of the project.
3. The Final Inspection Punch-list Corrective Action Form is to be used to document discrepancies that are minor in nature (i.e., paint chips, minor blemishes, etc....) if major items of work are not complete, lack required quality, or are not acceptable for any reason, the final inspection should be rescheduled for a time when these items have been completed.
4. Fill in the form completely: Project Number and Name, Date of inspection, the contractor's name, PM and inspector's names should all be filled in.
5. Beginning with item number 1, list the description of the deficiency, and any amplifying information required to fully document the item to be corrected. For instance, Item No. 1; Description of Deficiency - Door entering main office sticks; Notes – Door should be adjusted to open and close properly.
6. Use as many forms as required to fully document the inspection results. In the lower right hand side of the form indicate page number and total number of forms used (for example 1 of 4)
7. If there is any disagreement as to whether or not an item is a deficiency, it should be documented and then
8. When an item is corrected, the Contractor shall initial the form and indicate the date work was completed. If the PM/CI concurs with the acceptance of the work, they will initial and date in the corresponding block.
9. Substantial completion will not be issued if there is a large number of punch list items or if there are major deficiencies with the work. If you have any questions regarding whether or not an item is major, or if there are a large number deficiencies, contact the Senior Project Manager.
10. Under no circumstances will final payment be made without documented completion of the Punch-List.

**SECTION 017823  
OPERATION AND MAINTENANCE DATA**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
1. Operation and maintenance documentation directory.
  2. Emergency manuals.
  3. Operation manuals for systems, subsystems, and equipment.
  4. Maintenance manuals for the care and maintenance of systems and equipment.
- B. Related Sections include the following:
1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
  2. Division 01 Section "Closeout Procedures" for submitting operation and maintenance manuals.
  3. Division 01 Section "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
  4. Divisions 02 through 16 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

**1.3 DEFINITIONS**

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

**1.4 SUBMITTALS**

- A. Initial Submittal: Submit 2 draft copies of each manual at least 15 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Architect will return one copy of draft and mark whether general scope and content of manual are acceptable.
- B. Final Submittal: Submit one copy of each manual in final form at least 15 days before final inspection. Architect will return copy with comments within 15 days after final inspection.
1. Correct or modify each manual to comply with Architect's comments. Submit 3 copies of each corrected manual within 15 days of receipt of Architect's comments.



## **1.5 COORDINATION**

- A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

## **PART 2 - PRODUCTS**

### **2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY**

- A. Organization: Include a section in the directory for each of the following:
  - 1. List of documents.
  - 2. List of systems.
  - 3. List of equipment.
  - 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

### **2.2 MANUALS, GENERAL**

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
  - 1. Title page.
  - 2. Table of contents.
  - 3. Manual contents.
- B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
  - 1. Subject matter included in manual.
  - 2. Name and address of Project.
  - 3. Date of submittal.
  - 4. Name, address, and telephone number of Contractor.
  - 5. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number

in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
    - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
    - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
  2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
  3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
  4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
  5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
    - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

## **2.3 EMERGENCY MANUALS**

- A. Content: Organize manual into a separate section for each of the following:
1. Type of emergency.
  2. Emergency instructions.
  3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and

component:

1. Fire.
  2. Flood.
  3. Gas leak.
  4. Water leak.
  5. Power failure.
  6. Water outage.
  7. System, subsystem, or equipment failure.
  8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of City's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
1. Instructions on stopping.
  2. Shutdown instructions for each type of emergency.
  3. Operating instructions for conditions outside normal operating limits.
  4. Required sequences for electric or electronic systems.
  5. Special operating instructions and procedures.

## **2.4 OPERATION MANUALS**

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions.
  2. Performance and design criteria if Contractor is delegated design responsibility.
  3. Operating standards.
  4. Operating procedures.
  5. Operating logs.
  6. Wiring diagrams.
  7. Control diagrams.
  8. Piped system diagrams.
  9. Precautions against improper use.
  10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number.
  2. Manufacturer's name.
  3. Equipment identification with serial number of each component.
  4. Equipment function.
  5. Operating characteristics.
  6. Limiting conditions.
  7. Performance curves.
  8. Engineering data and tests.
  9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
  2. Equipment or system break-in procedures.
  3. Routine and normal operating instructions.
  4. Regulation and control procedures.
  5. Instructions on stopping.
  6. Normal shutdown instructions.
  7. Seasonal and weekend operating instructions.
  8. Required sequences for electric or electronic systems.
  9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

## **2.5 PRODUCT MAINTENANCE MANUAL**

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
  2. Manufacturer's name.
  3. Color, pattern, and texture.
  4. Material and chemical composition.
  5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
  2. Types of cleaning agents to be used and methods of cleaning.
  3. List of cleaning agents and methods of cleaning detrimental to product.
  4. Schedule for routine cleaning and maintenance.
  5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

## 2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
  - 1. Standard printed maintenance instructions and bulletins.
  - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
  - 3. Identification and nomenclature of parts and components.
  - 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
  - 1. Test and inspection instructions.
  - 2. Troubleshooting guide.
  - 3. Precautions against improper maintenance.
  - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - 5. Aligning, adjusting, and checking instructions.
  - 6. Demonstration and training videotape, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
  - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
  - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

## **PART 3 - EXECUTION**

### **3.1 MANUAL PREPARATION**

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by City's operating personnel for types of emergencies indicated.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
  1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by City's operating personnel.
- D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
  1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
  1. Do not use original Project Record Documents as part of operation and maintenance manuals.
  2. Comply with requirements of newly prepared Record Drawings in Division 01 Section "Project Record Documents."
- F. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

**END OF SECTION 017823**

**SECTION 017839  
PROJECT RECORD DOCUMENTS**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
1. Record Drawings.
  2. Record Specifications.
  3. Record Product Data.
- B. Related Sections include the following:
1. Division 01 Section "Closeout Procedures" for general closeout procedures.
  2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
  3. Divisions 02 through 48 Sections for specific requirements for Project Record Documents of the Work in those Sections.

**1.3 SUBMITTALS**

- A. Record Drawings: Comply with the following:
1. No later than 30 days after completion of the job, the Contractor shall provide City/IA/SMD with record prints of the Contract Drawings as well as Auto CAD files. A hard-copy of the security system as-built, as well as the Auto CAD files, shall also be provided to the City/IA/SMD no later than 30-days after completion of the job.
- B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one copy of each Product Data submittal.
1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.

**PART 2 - PRODUCTS**

**2.1 RECORD DRAWINGS**

- A. Record Prints: Maintain one set of black-line white prints of the Contract Drawings and Shop

## Drawings.

1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Accurately record information in an understandable drawing technique.
    - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
      - 1) Document with photographs.
  2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Depths of foundations below first floor.
    - d. Locations and depths of underground utilities.
    - e. Revisions to routing of piping and conduits.
    - f. Revisions to electrical circuitry.
    - g. Actual equipment locations.
    - h. Duct size and routing.
    - i. Locations of concealed internal utilities.
    - j. Changes made by Change Order or Work Change Directive.
    - k. Changes made following Architect's written orders.
    - l. Details not on the original Contract Drawings.
    - m. Field records for variable and concealed conditions.
    - n. Record information on the Work that is shown only schematically.
  3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
  4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
  5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
  7. Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. Make corrections where required.
- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  2. Identification: As follows:
    - a. Project number.
    - b. Project name.



- c. Date.
- d. Designation "PROJECT RECORD DRAWINGS."
- e. Name of Contractor.

## **2.2 RECORD SPECIFICATIONS**

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  - 4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
  - 5. Note related Change Orders, Record Product Data, and Record Drawings where applicable.

## **2.3 RECORD PRODUCT DATA**

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
  - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  - 3. Note related Change Orders, Record Specifications, and Record Drawings where applicable.

## **2.4 MISCELLANEOUS RECORD SUBMITTALS**

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

# **PART 3 - EXECUTION**

## **3.1 RECORDING AND MAINTENANCE**

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

- C. Record Documents of water, sewer and drainage must be provided for the General Contractor by a Professional Land Surveyor and must be satisfactory for approval by the Broward County Health Department and the Broward County Department of Planning and Environmental Protection.
- D. Final pay request will not be processed until Record Documents have been completed and submitted to the City.

**END OF SECTION 017839**

## **SECTION 017900 DEMONSTRATION AND TRAINING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes administrative and procedural requirements for instructing City's personnel, including the following:
  - 1. Demonstration of operation of systems, subsystems, and equipment.
  - 2. Training in operation and maintenance of systems, subsystems, and equipment.
  - 3. Demonstration and training video recordings.
- B. Related Requirements:
  - 1. Divisions 02 through 33 Sections for specific requirements for demonstration and training for products in those Sections.
- C. Allowances: Furnish demonstration and training instruction time under the Demonstration and Training Allowance as specified in Division 01 Section "Allowances."
- D. Unit Price for Instruction Time: Length of instruction time will be measured by actual time spent performing demonstration and training in required location. No payment will be made for time spent assembling educational materials, setting up, or cleaning up. See requirements in Division 01 Section "Unit Prices."

#### **1.3 INFORMATIONAL SUBMITTALS**

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
  - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For facilitator, instructor, and videographer.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.

- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

#### **1.4 CLOSEOUT SUBMITTALS**

- A. Demonstration and Training Video Recordings: Submit two copies within 5 days of end of each training module.
1. Identification: On each copy, provide an applied label with the following information:
    - a. Name of Project.
    - b. Name and address of videographer.
    - c. Name of Architect.
    - d. Name of Construction Manager.
    - e. Name of Contractor.
    - f. Date of video recording.
  2. Transcript: Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
  3. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
  4. At completion of training, submit complete training manual(s) for City's use prepared and bound in format matching operation and maintenance manuals and in PDF electronic file format on compact disc.

#### **1.5 QUALITY ASSURANCE**

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

## **1.6 COORDINATION**

- A. Coordinate instruction schedule with City's operations. Adjust schedule as required to minimize disrupting City's operations and to ensure availability of City's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

## **PART 2 - PRODUCTS**

### **2.1 INSTRUCTION PROGRAM**

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
  1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
    - a. System, subsystem, and equipment descriptions.
    - b. Performance and design criteria if Contractor is delegated design responsibility.
    - c. Operating standards.
    - d. Regulatory requirements.
    - e. Equipment function.
    - f. Operating characteristics.
    - g. Limiting conditions.
    - h. Performance curves.
  2. Documentation: Review the following items in detail:

- a. Emergency manuals.
  - b. Operations manuals.
  - c. Maintenance manuals.
  - d. Project record documents.
  - e. Identification systems.
  - f. Warranties and bonds.
  - g. Maintenance service agreements and similar continuing commitments.
3. Emergencies: Include the following, as applicable:
  - a. Instructions on meaning of warnings, trouble indications, and error messages.
  - b. Instructions on stopping.
  - c. Shutdown instructions for each type of emergency.
  - d. Operating instructions for conditions outside of normal operating limits.
  - e. Sequences for electric or electronic systems.
  - f. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
  - a. Startup procedures.
  - b. Equipment or system break-in procedures.
  - c. Routine and normal operating instructions.
  - d. Regulation and control procedures.
  - e. Control sequences.
  - f. Safety procedures.
  - g. Instructions on stopping.
  - h. Normal shutdown instructions.
  - i. Operating procedures for emergencies.
  - j. Operating procedures for system, subsystem, or equipment failure.
  - k. Seasonal and weekend operating instructions.
  - l. Required sequences for electric or electronic systems.
  - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
  - a. Alignments.
  - b. Checking adjustments.
  - c. Noise and vibration adjustments.
  - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
  - a. Diagnostic instructions.
  - b. Test and inspection procedures.
7. Maintenance: Include the following:
  - a. Inspection procedures.
  - b. Types of cleaning agents to be used and methods of cleaning.
  - c. List of cleaning agents and methods of cleaning detrimental to product.

- d. Procedures for routine cleaning
  - e. Procedures for preventive maintenance.
  - f. Procedures for routine maintenance.
  - g. Instruction on use of special tools.
8. Repairs: Include the following:
- a. Diagnosis instructions.
  - b. Repair instructions.
  - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - d. Instructions for identifying parts and components.
  - e. Review of spare parts needed for operation and maintenance.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Division 01 Section "Operations and Maintenance Data."
- B. Set up instructional equipment at instruction location.

#### **3.2 INSTRUCTION**

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and City for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct City's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
  - 1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
  - 2. City will furnish an instructor to describe City's operational philosophy.
  - 3. City will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
  - 1. Schedule training with City, through Architect and, through Construction Manager, with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of an oral and a written performance-based test.
- F. Cleanup: Collect used and leftover educational materials and give to City. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

### 3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
  - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Video: Provide minimum 640 x 480 video resolution converted to format file type acceptable to City, on electronic media.
  - 1. Electronic Media: Read-only format compact disc acceptable to **City**, with commercial-grade graphic label.
  - 2. File Hierarchy: Organize folder structure and file locations according to project manual table of contents. Provide complete screen-based menu.
  - 3. File Names: Utilize file names based upon name of equipment generally described in video segment, as identified in Project specifications.
  - 4. Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the Equipment Demonstration and Training DVD that describes the following for each Contractor involved on the Project, arranged according to Project table of contents:
    - a. Name of Contractor/Installer.
    - b. Business address.
    - c. Business phone number.
    - d. Point of contact.
    - e. E-mail address.
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
  - 1. Film training session(s) in segments not to exceed 15 minutes.
    - a. Produce segments to present a single significant piece of equipment per segment.
    - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
    - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.



- D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
  - 1. Furnish additional portable lighting as required.
- E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.
- F. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
- G. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

**END OF SECTION 017900**

## **SECTION 02 41 16**

### **SELECTIVE DEMOLITION**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. This Section includes demolition of selective portions of the existing building and protection for existing construction to remain as indicated on the Drawings. Selective demolition includes, but is not limited to, the following:
  - 1. Demolition and removal as indicated of partitions, walls, doors, door frames, door hardware, floor finishes and wall base, casework, ceiling grid and ceiling tile, exterior sidewalks, and other exterior items.
  - 2. Termination of exposed utility services for electrical, plumbing and HVAC
  - 3. Repair procedures for selective demolition operations and as otherwise indicated on the Drawings.
  - 4. Salvage of selective demolition items for reuse as indicated on the Drawings
  - 5. Selective removal of gypsum board in existing partitions to remain where solid backing is required or indicated on the Drawings
  - 6. Patch and repair surfaces left exposed from selective demolition work, as well as any surfaces to remain that are damaged by work of the Contract.
- B. Related Sections:
  - 1. Applicable Sections in Division-1
  - 2. Section 02 41 25 - Cutting and Patching
  - 3. Applicable Sections in Divisions 21, 22, 23 and 26

##### **1.2 DEFINITIONS**

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

##### **1.3 MATERIALS OWNERSHIP**

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed promptly from the Project site.

## 1.4 SUBMITTALS

- A. Contractor's Proposed Dust-Control and Noise-Control Measures: Proposed measures must be approved by the Architect and the Owner prior to the commencement of any Selective Demolition Work.
  - 1. Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation.
  - 2. Identify options if proposed measures are later determined to be inadequate.
- B. Provide a Schedule of Selective Demolition Activities: Indicate the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
  - 2. Interruption of utility services.
  - 3. Coordinate with Owner's Representative and Facility Manager for shutoff, capping, and continuation of utility services.
  - 4. Use of elevator and stairs as indicated on the Drawings.
  - 5. Locations of temporary partitions and means of egress
  - 6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work Areas.
- C. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.
- D. Pre-demolition Photographs: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.

## 1.5 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.
- D. Pre-demolition Conference: Conduct conference at Project site. Review methods and procedures related to selective demolition including, but not limited to, the following:
  - 1. Inspect and discuss condition of construction to be selectively demolished.
  - 2. Review structural load limitations of existing structure.
  - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

## 1.6 PROJECT CONDITIONS

- A. The Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted. Provide not less than 72-hours' notice to Architect and Owner's Representative of activities that will affect Owner's operations.
- B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.
- C. The Owner assumes no responsibility for condition of areas to be selectively demolished. Conditions existing at time of inspection for bidding purposes will be maintained by the Owner as far as practical.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and the Owner's Representative.
- E. Storage or sale of removed items or materials on-site will not be permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations. Maintain fire-protection facilities in service during selective demolition operations.

## PART 2 - PRODUCTS

### 2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
  - 1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
  - 2. Use materials whose installed performance equals, or surpasses that of existing materials.
- B. Comply with material and installation requirements specified in individual Specification Sections.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to the Architect.
- E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

### 3.2 UTILITY SERVICES

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
- B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by the Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to the Owner and to authorities having jurisdiction.
  - 1. Provide at least 72-hours' notice to Owner's Representative if shutdown of service is required during changeover.
- C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
  - 1. Arrange to shut off indicated utilities with utility companies.
  - 2. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.
  - 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

### 3.3 PREPARATION

- A. All materials for new construction must be on-site prior to the commencement of selective demolition activities
  - 1. Existing glazing shall not be removed until all re-glazing materials are on-site and readily available for installation
  - 2. Existing exterior openings shall not be removed until all new exterior opening assemblies are on-site and readily available for installation
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Erect temporary protection where required by authorities having jurisdiction.
  - 2. Do not close or obstruct walks, walkways, or other adjacent occupied or used facilities without permission from the Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
  - 3. Protect existing site improvements, appurtenances, and landscaping to remain.

- C. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of the Building.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
- D. Temporary Enclosures: Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.
- E. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

### 3.4 POLLUTION CONTROLS

- A. Dust Control: Use temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
- B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

### 3.5 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required for new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
  - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
  - 4. Maintain adequate ventilation when using cutting torches.

5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  6. Remove framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  7. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  8. Dispose of demolished items and materials promptly.
  9. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.
- B. Existing Facilities: Comply with Owner's requirements for using and protecting elevators, stairs, walkways, loading docks, building entries and other building facilities during selective demolition operations.
- C. Removed and Salvaged Items: Comply with the following:
1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers.
  3. Store items in a secure area until delivery to the Owner.
  4. Transport items to Owner's storage area designated by the Owner.
  5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items: Comply with the following:
1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
  2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  3. Protect items from damage during transport and storage.
  4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

### 3.6 PATCHING AND REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by selective demolition operations. Comply with Section 02 41 25, Cutting and Patching

### 3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Promptly and properly dispose of demolished materials. Do not allow demolished materials to accumulate on-site. Do not burn demolished materials.
- B. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

**END OF SECTION 02 41 16**

**SECTION 02 41 25****CUTTING AND PATCHING****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Definition: Cutting and patching includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required for restoring surfaces to their original condition after installation of other work.
  - 1. Cutting and patching is performed for coordination of the work, to uncover work for access or inspection, to obtain samples for testing, to permit alterations to be performed or for other similar purposes.
  - 2. Cutting and patching performed during the manufacture of products, or during the initial fabrication, erection or installation processes is not considered to be "cutting and patching" under this definition. Drilling of holes to install fasteners and similar operations are also not considered to be "cutting and patching".
- B. Refer to other sections of these specifications for specific cutting and patching requirements and limitations applicable to individual units of work.
  - 1. Refer to Division-26 Sections for requirements pertaining to fire alarm and fire suppression system work.
  - 2. Unless otherwise specified, requirements of this section apply to mechanical and electrical work.
  - 3. Refer to Division-21, 22, 23 and Division-26 sections for additional requirements and limitations on cutting and patching of mechanical and electrical work.

**1.2 SUBMITTALS**

- A. Procedural Proposal for Cutting and Patching: Submit a written proposal to the City's Representative in accordance with submittals procedures contained in Division-1 of these specifications, describing procedures at least fourteen (14) calendar days before the time cutting and patching is to be performed, and requesting written approval to proceed.
- B. The Procedural Proposal for Cutting and Patching shall include the following information, as applicable, in the submittal:
  - 1. Extent: Describe location and description of cutting and patching. Show how cutting and patching will be performed and indicate why cutting and patching cannot be avoided. Include the necessity of cutting or alteration, alternatives to cutting and patching, and the effects of cutting and patching on the City and/or other contractors.
  - 2. Changes to Existing Construction: Describe anticipated results of the work in terms of changes to existing work, including structural, operational and visual changes, changes in the Building's appearance, as well as other significant elements.
  - 3. Products: List products to be used and firms that will perform work.



4. Dates and Times: Indicate when cutting and patching work is expected to be performed.
5. Utilities: List utilities that will be disturbed or otherwise be affected by cutting and patching work. Indicate those utilities that will be relocated and those that will be temporarily out-of-service. Indicate how long utility service will be disrupted.
6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations to show how that reinforcement is integrated with original structure to satisfy requirements.

B. Approval by the City's Representative to proceed with cutting and patching work does not waive the City's Representative's right to later require complete removal and replacement of work found to be cut and patched in an unsatisfactory manner.

### 1.3 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural work in a manner that would result in a reduction of load-carrying capacity or of load-deflection ratio. The cutting and patching plan shall include, but not be necessarily limited to, work required at the following structural elements:

1. Bearing walls
2. Structural concrete
3. Structural steel
4. Lintels
5. Structural decking
6. Stair systems
7. Equipment supports
8. Piping, ductwork, vessels and equipment
9. Structural systems of other construction

B. Operational and Safety Limitations: Do not cut and patch the following operational elements or safety related components in a manner that would result in a reduction of their capacity to perform in the manner intended, including energy performance, or that would result in increased maintenance, or decreased operational life or decreased safety:

1. Primary operational systems and equipment
2. Air or smoke barriers
3. Fire-protection systems
4. Control systems
5. Communication systems
6. Conveying systems
7. Electrical wiring systems
8. Operating systems of other construction

C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or results in increased maintenance or decreased operational life or safety.

1. Water, moisture, or vapor barriers

2. Membranes and flashings
  3. Exterior wall construction
  4. Equipment supports
  5. Piping, ductwork, vessels and equipment
  6. Noise and vibration control elements and systems
- D. Visual Requirements: Do not cut and patch work exposed on the building's exterior or in its occupied spaces, in a manner that would, in the City Representative's opinion, result in lessening the building's aesthetic qualities.
1. Do not cut and patch work in a manner that would result in substantial visual evidence of cut and patch work.
  2. Remove and replace work judged by the City's Representative to be cut and patched in a visually unsatisfactory manner.
  3. Retain the original installer or fabricator if possible, or another recognized experienced and specialized firm to cut and patch the following work:
    - a) Custom Woodwork
    - b) Drywall
    - c) Acoustical ceilings
    - d) Carpeting
    - e) HVAC enclosures, cabinets, and covers
- E. Existing Warranties: Remove, replace, patch and repair materials and surfaces cut or damaged during cutting and patching operations by methods and with materials so as not to void existing warranties.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. General: Except as otherwise indicated, or as directed by the City's Representative, use materials for cutting and patching that are identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
1. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect.
  2. Use materials for cutting and patching that will result in equal-or-better performance characteristics.

## **PART 3 - EXECUTION**

### **3.1 INSPECTION**

- A. Before cutting, examine the surfaces to be cut and patched and the conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the work.
- B. Before proceeding with cutting and patching involving two or more trades, meet at the Project site with the entities providing or affected by the cutting patching. Review areas of potential interference and conflict. Coordinate layout of the work and resolve potential conflicts before proceeding with the work.

### 3.2 PREPARATION

- A. Provide temporary support to ensure structural integrity of Work to be cut.
- B. Protection: Protect new and existing work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for that part of the Project that may be exposed during cutting and patching operations.
  - 1. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
  - 2. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas of the Building. Coordinate with the City's Representative.

### 3.3 PERFORMANCE

- A. General: Employ skilled workmen to perform cutting and patching work. Except as otherwise indicated or as approved by the City's Representative, proceed with cutting and patching at the earliest feasible time and complete work without delay.
- B. Cutting: Cut the work using methods that are least likely to damage work to be retained or adjoining work. Where possible, review proposed procedures with the original installer. Comply with original installer's recommendations.
  - 1. General: Use hand or small power tools designed for sawing or grinding, not hammering and chopping where cutting is required.
  - 2. Cut holes and slots as small as practicable, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  - 4. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  - 6. Temporarily cover openings when not in use.
  - 7. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing-up, and similar operations following performance of other work. Patch with seams that are durable and as

invisible as possible. Comply with specified tolerances for the work. Provide materials that comply with specified installation requirements.

1. Inspect and test patched areas to demonstrate integrity of work where feasible.
2. Restore exposed finishes of patched areas and where necessary extend finish restoration into retained adjoining work in a manner which will eliminate evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions are removed, extend one finished area into another, and patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials if necessary to achieve uniform color and appearance.
4. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch after the patched area has received prime and base coat. Provide additional coats as necessary until patch blends with adjacent surfaces.
5. Patch, repair or re-hang existing ceilings as necessary to provide an even plane surface of uniform appearance.
6. At penetrations of fire-rated walls, partitions, ceilings or floor construction, completely seal void with fire-rated materials to full thickness of the penetrated element. Coordinate with requirements of Section 07 84 00, Firestop Systems.
7. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weather-tight condition.

#### 3.4 CLEANING

- A. Thoroughly clean areas and spaces where work is performed or used as access to work. Remove completely paint, mortar, oils, putty and items of similar nature.
- B. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied.
- C. Restore damaged pipe covering to its original condition.

**END OF SECTION 02 41 25**

**SECTION 03 09 00****CONCRETE****Part 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Cast-in-place concrete and grout.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 - Procurement and Contracting Requirements.
  - 2. Division 01 - General Requirements.
  - 3. Section 03 15 19 - Anchorage to Concrete.

**QUALITY ASSURANCE**

- C. Referenced Standards:
  - 1. American Concrete Institute (ACI):
    - a. 117, Specification for Tolerances for Concrete Construction and Materials.
    - b. 211.1, Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete.
    - c. 212.3R, Chemical Admixtures for Concrete.
    - d. 304R, Guide for Measuring, Mixing, Transporting, and Placing Concrete.
    - e. 304.2R, Placing Concrete by Pumping Methods.
    - f. 305.1, Hot Weather Concreting.
    - g. 306.1, Cold Weather Concreting.
    - h. 318, Building Code Requirements for Structural Concrete.
    - i. 347, Guide to Formwork for Concrete.
    - j. CT-13, Concrete Terminology.
  - 2. ASTM International (ASTM):
    - a. A82, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
    - b. A185, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
    - c. A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
    - d. A1064, Standard Specification for Steel Wire and Welded Wire Replacement, Plain and Deformed, for Concrete.
    - e. C31, Standard Practice for Making and Curing Concrete Test Specimens in the Field.
    - f. C33, Standard Specification for Concrete Aggregates.
    - g. C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
    - h. C94/C94M, Standard Specification for Ready-Mixed Concrete.
    - i. C138, Standard Method of Test for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
    - j. C143, Standard Test Method for Slump of Hydraulic Cement Concrete.
    - k. C150, Standard Specification for Portland Cement.
    - l. C172, Standard Practice for Sampling Freshly Mixed Concrete.
    - m. C173, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
    - n. C231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
    - o. C260, Standard Specification for Air-Entraining Admixtures for Concrete.
    - p. C289, Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method).

- q. C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
  - r. C494, Standard Specification for Chemical Admixtures for Concrete.
  - s. C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
  - t. C1315, Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
  - u. D882, Standard Test Method for Tensile Properties of Thin Plastic Sheet.
  - v. D994, Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
  - w. D1056, Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
  - x. D1709, Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.
  - y. D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
  - z. E96, Standard Test Methods for Water Vapor Transmission of Materials.
  - aa. E329, Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.
  - 3. Corps of Engineers (COE):
    - a. CRD-C621, Standard Specification for Packaged, Dry, Hydraulic-Cement Grout (Nonshrink).
  - 4. National Ready Mixed Concrete Association (NRMCA).
- D. Quality Control:
- 1. Concrete testing agency:
    - a. Contractor to employ and pay for services of a testing laboratory to:
      - 1) Perform materials evaluation.
      - 2) Design concrete mixes.
    - b. Concrete testing agency to meet requirements of ASTM E329.
  - 2. Do not begin concrete production until proposed concrete mix design has been approved by Engineer.
    - a. Approval of concrete mix design by Engineer does not relieve Contractor of his responsibility to provide concrete that meets the requirements of this Specification.
  - 3. Adjust concrete mix designs when material characteristics, job conditions, weather, strength test results or other circumstances warrant.
    - a. Do not use revised concrete mixes until submitted to and approved by Engineer.
  - 4. Perform structural calculations as required to prove that all portions of the structure in combination with remaining forming and shoring system has sufficient strength to safely support its own weight plus the loads placed thereon.
- E. Qualifications:
- 1. Ready mixed concrete batch plant certified by NRMCA.
  - 2. Formwork, shoring and reshoring for slabs and beams except where cast on ground to be designed by a professional engineer currently registered in the state where the Project is located.

## 1.2 DEFINITIONS

- A. Per ACI CT-13 except as modified herein:
  - 1. Concrete fill: Non-structural concrete.
  - 2. Concrete Testing Agency: Testing agency employed to perform materials evaluation, design of concrete mixes or testing of concrete placed during construction.
  - 3. Exposed concrete: Exposed to view after construction is complete.
  - 4. Indicated: Indicated by Contract Documents.
  - 5. Nonexposed concrete: Not exposed to view after construction is complete.
  - 6. Required: Required by Contract Documents.

7. Specified strength: Specified compressive strength at 28 days.
8. Submitted: Submitted to Engineer.

### 1.3 SUBMITTALS

- A. Shop Drawings:
  1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
  2. Concrete mix designs proposed for use.
    - a. Concrete mix design submittal to include the following information:
      - 1) Sieve analysis and source of fine and coarse aggregates.
      - 2) Test for aggregate organic impurities.
      - 3) Test for deleterious aggregate per ASTM C289.
      - 4) Proportioning of all materials.
      - 5) Type of cement with mill certificate for cement.
      - 6) Type of fly ash with certificate of conformance to specification requirements.
      - 7) Slump.
      - 8) Air content.
      - 9) Brand, type, ASTM designation, and quantity of each admixture proposed for use.
      - 10) 28-day cylinder compressive test results of trial mixes per ACI 318 and as indicated herein.
  3. Product technical data including:
    - a. Acknowledgement that products submitted meet requirements of standards referenced.
    - b. Manufacturer's installation instructions.
    - c. Manufacturers and types:
      - 1) Joint fillers.
      - 2) Curing agents.
      - 3) Chemical sealer.
      - 4) Bonding and patching mortar.
      - 5) Construction joint bonding adhesive.
      - 6) Nonshrink grout with cure/seal compound.
  4. Reinforcing steel:
    - a. Show grade, sizes, number, configuration, spacing, location and all fabrication and placement details.
    - b. In sufficient detail to permit installation of reinforcing without having to make reference to Contract Drawings.
    - c. Obtain approval of Shop Drawings by Engineer before fabrication.
    - d. Mill certificates.
  5. Scaled (minimum 1/8 IN per foot) drawings showing proposed locations of construction joints, control joints, expansion joints (as applicable) and joint dimensions.
  6. Strength test results of in place concrete including slump, air content and concrete temperature.
  7. Certifications:
    - a. Certification of standard deviation value in psi for ready mix plant supplying the concrete.
    - b. Certification that the material and sources submitted in the mix design will be used in the concrete for this project.
  8. Test reports:
    - a. Cement mill reports for all cement to be supplied.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Storage of Material:
  1. Cement and pozzolan:
    - a. Store in moistureproof, weathertight enclosures.
    - b. Do not use if caked or lumpy.
  2. Aggregate:

- a. Store to prevent segregation and contamination with other sizes or foreign materials.
    - b. Obtain samples for testing from aggregates at point of batching.
    - c. Do not use frozen or partially frozen aggregates.
    - d. Do not use bottom 6 IN of stockpiles in contact with ground.
    - e. Allow sand to drain until moisture content is uniform prior to use.
  - 3. Admixtures:
    - a. Protect from contamination, evaporation, freezing, or damage.
    - b. Maintain within temperature range recommended by manufacturer.
    - c. Completely mix solutions and suspensions prior to use.
  - 4. Reinforcing steel: Support and store all rebars above ground.
- B. Delivery:
- 1. Concrete:
    - a. Prepare a delivery ticket for each load for ready-mixed concrete.
    - b. Truck operator shall hand ticket to {Owner's Representative} {Engineer} at the time of delivery.
    - c. Ticket to show:
      - 1) Mix identification mark.
      - 2) Quantity delivered.
      - 3) Amount of each material in batch.
      - 4) Outdoor temp in the shade.
      - 5) Time at which cement was added.
      - 6) Numerical sequence of the delivery.
      - 7) Amount of water added.
  - 2. Reinforcing steel:
    - a. Ship to jobsite with attached plastic or metal tags with permanent mark numbers.
    - b. Mark numbers to match Shop Drawing mark number.

## Part 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following products and manufacturers are acceptable:
  - 1. Nonshrink, nonmetallic grout:
    - a. Sika "SikaGrout 212."
    - b. Euclid Chemical "NS Grout."
    - c. BASF Admixtures, Inc. "Masterflow 713."
  - 2. Expansion joint fillers:
    - a. Permaglaze Co.
    - b. Rubatex Corp.
    - c. Williams Products, Inc.
  - 3. Form coating:
    - a. Richmond "Rich Cote."
    - b. Industrial Lubricants "Nox-Crete Form Coating."
    - c. Euclid Chemical "Kurez DR VOX."
  - 4. Cementitious Concrete Coating:
    - a. Aquafin International.
    - b. BASF Building Systems.
    - c. Euclid Chemical Company.
  - 5. Chemical sealer:
    - a. L&M Construction Chemicals, Inc.
    - b. Euclid Chemical Company.
    - c. Dayton Superior.
- B. Submit request for substitution in accordance with Specification Section 01 25 00.



## 2.2 MATERIALS

- A. Portland Cement: Conform to ASTM C150 Type I/II.
- B. Fly Ash:
  - 1. ASTM C618, Class F or Class C.
  - 2. Nonstaining.
    - a. Hardened concrete containing fly ash to be uniform light gray color.
  - 3. Maximum loss on ignition: 4percent.
  - 4. Compatible with other concrete ingredients.
  - 5. Obtain proposed fly ash from a source approved by the State Highway Department in the state where the Project is located for use in concrete for bridges.
- C. Admixtures:
  - 1. Air entraining admixtures: ASTM C260.
  - 2. Water reducing, retarding, and accelerating admixtures:
    - a. ASTM C494 Type A through E.
    - b. Conform to provisions of ACI 212.3R.
    - c. Do not use retarding or accelerating admixtures unless specifically approved in writing by Engineer and at no cost to Owner.
    - d. Follow manufacturer's instructions.
    - e. Use chloride free admixtures only.
  - 3. Maximum total water soluble chloride ion content contributed from all ingredients of concrete including water, aggregates, cementitious materials and admixtures by weight percent of cement:
    - a. 0.10 allconcrete.
  - 4. Do not use calcium chloride.
  - 5. Pozzolanic admixtures: ASTM C618.
  - 6. Provide admixtures of same type, manufacturer and quantity as used in establishing required concrete proportions in the mix design.
- D. Water: Potable, clean, free of oils, acids and organic matter.
- E. Aggregates:
  - 1. Normal weight concrete: ASTM C33, except as modified below.
  - 2. Fine aggregate:
    - a. Clean natural sand.
    - b. No manufactured or artificial sand.
  - 3. Coarse aggregate:
    - a. Crushed rock, natural gravel, or other inert granular material.
    - b. Maximum amount of clay or shale particles: 1 percent.
  - 4. Gradation of coarse aggregate:
    - a. Lean concrete and concrete topping: Size #7.
    - b. All other concrete: Size #67.
- F. Concrete Grout:
  - 1. Nonshrink, nonmetallic grout:
    - a. Nonmetallic, noncorrosive, nonstaining, premixed with only water to be added.
    - b. Grout to produce a positive but controlled expansion.
    - c. Mass expansion not to be created by gas liberation.
    - d. Minimum compressive strength of nonshrink grout at 28 days: 6500 psi.
    - e. In accordance with COE CRD-C621.
  - 2. Epoxy grout:
    - a. 3-component epoxy resin system.
      - 1) Two liquid epoxy components.
      - 2) One inert aggregate filler component.
    - b. Each component packaged separately for mixing at jobsite.
- G. Reinforcing Steel:

1. Reinforcing bars: ASTM A615, Grade 60.
  2. Welded wire reinforcement:
    - a. ASTM A185 or ASTM A1064.
    - b. Minimum yield strength: 60,000 psi.
  3. Column spirals: ASTM A82 or ASTM A1064.
- H. Forms:
1. Prefabricated or job built.
  2. Wood forms:
    - a. 5/8 or 3/4 IN 5-ply structural plywood of concrete form grade.
    - b. Built-in-place or prefabricated type panel.
  3. Metal forms:
    - a. Metal forms may be used except for aluminum in contact with concrete..
    - b. Forms to be tight to prevent leakage, free of rust and straight without dents to provide members of uniform thickness.
  4. Chamfer strips: Clear white pine, surface against concrete planed.
- I. Form Ties:
1. Commercially fabricated for use in form construction.
    - a. Field fabricated ties are unacceptable.
  2. Constructed so that ends or end fasteners can be removed without causing spalling at surfaces of the concrete.
  3. 3/4 IN minimum to 1 IN maximum diameter cones on both ends.
  4. Embedded portion of ties to be not less than 1-1/2 IN from face of concrete after ends have been removed.
  5. Cone size:
    - a. 3/4 IN minimum to 2 1/2 IN maximum diameter cones on both ends.
    - b. Depth of cone not to exceed the concrete reinforcing cover.
  6. Form release: Nonstaining and shall not prevent bonding of future finishes to concrete surface.
- J. Chairs, Runners, Bolsters, Spacers, and Hangers:
1. Stainless steel, epoxy coated, or plastic coated metal.
    - a. Plastic coated: Rebar support tips in contact with the forms only.
- K. Chemical Floor Sealer:
1. Colorless low VOC water-based solution containing acrylic copolymers.
    - a. ASTM C1315, Class B, minimum 30 percent solids.
  2. L&M Construction Chemicals Inc. Dress & Seal WB 30.
- L. Cementitious Concrete Coating:
1. Polymer modified Portland cement based coating for concrete and masonry.
    - a. Waterproof.
    - b. Resistant to both positive and negative hydrostatic pressure.
    - c. Breathable.
  2. BASF "Masterseal 581 Thoroseal".
    - a. Color:
      - 1) Interior surfaces: Standard gray.
      - 2) Exterior surfaces: Custom color to match concrete surface.
      - 3) Texture: Fine.
- M. Membrane Curing Compound:
1. ASTM C309, Type II-B.
  2. Resin based, dissipates upon exposure to UV light.
  3. Curing compound shall not prevent bonding of any future coverings, coatings or finishes.
- N. Expansion Joint Filler:
1. In contact with water or sewage:
    - a. Closed cell neoprene.

- b. ASTM D1056, Class SC (oil resistant and medium swell) of 2 to 5 psi compression deflection (Grade SCE41).
- 2. Exterior driveways, curbs and sidewalks:
  - a. Asphalt expansion joint filler.
  - b. ASTM D994.
- 3. Other use:
  - a. Fiber expansion joint filler.
  - b. ASTM D1751.

## 2.3 CONCRETE MIXES

- A. General:
  - 1. All concrete to be ready mixed concrete conforming to ASTM C94/C94M.
  - 2. Provide concrete of specified quality capable of being placed without segregation and, when cured, of developing all properties required.
  - 3. All concrete to be normal weight concrete.
  - 4. Provide pozzolan content for all cast-in-place construction.

- B. Strength:
  - 1. Provide specified strength and type of concrete for each use in structure(s) as follows:

| TYPE         | WEIGHT        | SPECIFIED STRENGTH* |
|--------------|---------------|---------------------|
| All concrete | Normal weight | 4000 psi            |

\* Minimum 28-day compressive strength.

- C. Air Entrainment:
  - 1. Provide air entrainment in all concrete resulting in a total air content percent by volume as follows:

| MAX AGGREGATE SIZE | TOTAL AIR CONTENT PERCENT |
|--------------------|---------------------------|
| 1 IN or 3/4 IN     | 6 ±1-1/2                  |
| <3/4 IN            | 6-1/2 ±1-1/2              |

- 2. Air content to be measured in accordance with ASTM C231, ASTM C173, or ASTM C138.

- D. Slump - 4 IN maximum, 1 IN minimum:
  - 1. Measured at point of discharge of the concrete into the concrete construction member.
  - 2. 8 IN maximum after addition of superplasticizer (if used).
  - 3. Concrete of lower than minimum slump may be used provided it can be properly placed and consolidated.
  - 4. Pumped concrete:
    - a. Provide additional water at batch plant to allow for slump loss due to pumping.
    - b. Provide only enough additional water so that slump of concrete at discharge end of pump hose does not exceed maximum slump specified above.
  - 5. Determine slump per ASTM C143.
- E. Selection of Proportions:
  - 1. General:
    - a. Proportion ingredients to:
      - 1) Produce proper workability, durability, strength, and other required properties.
      - 2) Prevent segregation and collection of excessive free water on surface.
  - 2. Minimum cement contents and maximum water cement ratios for concrete to be as follows:

| SPECIFIED STRENGTH | TARGET CEMENT, MAXIMUM AGGREGATE SIZE |        |      | MAXIMUM WATER CEMENT RATIO BY WEIGHT |
|--------------------|---------------------------------------|--------|------|--------------------------------------|
|                    | 1/2 IN                                | 3/4 IN | 1 IN |                                      |
| 4000               | 564                                   | 564    | 564  | 0.45                                 |

3. Fly ash:
    - a. For cast-in-place concrete only, a maximum of 25 percent by weight of Portland cement content per cubic yard may be replaced with fly ash at rate of 1 LB fly ash for 1 LB of cement.
    - b. When fly ash is used, the water to cementitious materials ratio shall not exceed the maximum value specified herein.
  4. Concrete mix proportioning methods for normal weight concrete:
    - a. Proportion mixture to provide desired characteristics using one of methods described below:
      - 1) Method 1 (Trial Mix):
        - a) Per ACI 318, Chapter 5, except as modified herein.
        - b) Air content within range specified above.
        - c) Record and report temperature of trial mixes.
        - d) Proportion trial mixes per ACI 211.1.
      - 2) Method 2 (Field Experience):
        - a) Per ACI 318, Chapter 5, except as modified herein:
        - b) Field test records must be acceptable to Engineer to use this method.
        - c) Test records shall represent materials, proportions and conditions similar to those specified.
  5. Required average strength to exceed the specified 28-day compressive strength by the amount determined or calculated in accordance with the requirements of Chapter 5 of ACI 318 using the standard deviation of the proposed concrete production facility.
- F. Controlled Low-Strength Material (CLSM):
1. A mixture of cement, fly ash, fine sand, water and air having a consistency which will flow under a very low head.
  2. Approximate quantities of each component per cubic yard of mixed material:
    - a. Cement (Type I or II): 50 LBS
    - b. Fly ash: 200 LBS
    - c. Fine sand: 2,700 LBS
    - d. Water (approximate): 420 LBS
    - e. Air content (approximate): 10 percent.
  3. Actual quantities shall be adjusted to provide a yield of 1 CY with the materials used.
  4. Approximate compressive strength should be 85 to 175 PSI.
  5. Fine sand shall be an evenly graded material having not less than 95 percent passing the No. 4 sieve and not more than 5 percent passing the No. 200 sieve.

## Part 3 - EXECUTION

### 3.1 FORMING AND PLACING CONCRETE

- A. Formwork:
1. Contractor is responsible for design and erection of formwork.
  2. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation and position.
    - a. Allowable tolerances: As recommended in ACI 347.
  3. Provide slabs and beams of minimum indicated depth when sloping foundation base slabs or elevated floor slabs to drains.

- a. For slabs on grade, slope top of subgrade to provide floor slabs of minimum uniform indicated depth.
    - b. Do not place floor drains through beams.
  4. Openings:
    - a. Provide openings in formwork to accommodate work of other trades.
    - b. Accurately place and securely support items built into forms.
  5. Chamfer strips: Place 3/4 IN chamfer strips in forms to produce 3/4 IN wide beveled edges on permanently exposed corners of members.
  6. Clean and adjust forms prior to concrete placement.
  7. Tighten forms to prevent mortar leakage.
  8. Coat form surfaces with form release agents prior to placing reinforcing bars in forms.
- B. Reinforcement:
1. Position, support and secure reinforcement against displacement.
  2. Locate and support with chairs, runners, bolsters, spacers and hangers, as required.
  3. Set wire ties so ends do not touch forms and are directed into concrete, not toward exposed concrete surfaces.
  4. Lap splice lengths: ACI 318 Class B top bar tension splices unless indicated otherwise on the Drawings.
  5. Extend reinforcement to within 2 IN of concrete perimeter edges.
    - a. If perimeter edge is earth formed, extend reinforcement to within 3 IN of the edge.
  6. Minimum concrete protective covering for reinforcement: As shown on Drawings.
  7. Do not weld reinforcing bars.
  8. Welded wire reinforcement:
    - a. Install welded wire reinforcement in maximum practical sizes.
    - b. Splice sides and ends with a splice lap length measured between outermost cross wires of each fabric sheet not less than:
      - 1) One spacing of cross wires plus 2 IN.
      - 2) 1.5 x development length.
      - 3) 6 IN.
    - c. Development length: ACI 318 basic development length for the specified fabric yield strength.
- C. Construction, Expansion, and Contraction Joints:
1. Locate joints as indicated on Contract Drawings or as shown on approved Shop Drawings.
    - a. Where construction joint spacing shown on Drawings exceeds the joint spacing indicated in Paragraph below, submit proposed construction joint location in conformance with this Specification Section.
  2. Unplanned construction joints will not be allowed.
  3. Locate wall vertical construction joints at 50 FT maximum.
  4. Locate construction joints in floor slabs and foundation base slabs so that concrete placements are approximately square and do not exceed 4000 SF.
  5. Locate construction joints in columns and walls:
    - a. At the underside of beams, girders, haunches, drop panels, column capitals, and at floor panels.
    - b. Haunches, drop panels, and column capitals are considered part of the supported floor or roof and shall be placed monolithically therewith.
    - c. Column based need not be placed monolithically with the floor below.
  6. Install construction joints perpendicular to main reinforcement with all reinforcement continued across construction joints.
  7. At least 48 HRS shall elapse between placing of adjoining concrete construction.
  8. Thoroughly clean and remove all laitance and loose and foreign particles from construction joints.
  9. Before new concrete is placed, dampen concrete surfaces.
- D. Embedments:

1. Set and build in anchorage devices and other embedded items required for other work that is attached to, or supported by concrete.
2. See Specification Section 03 15 19 - Anchorage to Concrete.
3. Use setting diagrams, templates and instructions for locating and setting.

E. Placing Concrete:

1. Place concrete in compliance with ACI 304R and ACI 304.2R.
2. Place in a continuous operation within planned joints or sections.
3. Begin placement when work of other trades affecting concrete is completed.
4. Place concrete by methods which prevent aggregate segregation.
5. Do not allow concrete to free fall more than 4 FT.
6. Where free fall of concrete will exceed 4 FT, place concrete by means of tremie pipe or chute.

F. Consolidation: Consolidate all concrete using mechanical vibrators supplemented with hand rodding and tamping, so that concrete is worked around reinforcement and embedded items into all parts of forms.

G. Protection:

1. Protect concrete from physical damage or reduced strength due to weather extremes.
2. In cold weather comply with ACI 306.1 except as modified herein.
  - a. Do not place concrete on frozen ground or in contact with forms or reinforcing bars coated with frost, ice or snow. Minimum concrete temperature at the time of mixing:



- b. Do not place heated concrete that is warmer than 80 DegF.
  - c. If freezing temperatures are expected during curing, maintain the concrete temperature at or above 50 DegF for 7 days or 70 DegF for 3 days.
  - d. Do not allow concrete to cool suddenly.
3. In hot weather comply with ACI 305.1 except as modified herein.
  - a. At air temperature of 90 DegF and above, keep concrete as cool as possible during placement and curing.
  - b. Do not allow concrete temperature to exceed 90 DegF at placement.
  - c. Prevent plastic shrinkage cracking due to rapid evaporation of moisture.
  - d. Do not place concrete when the actual or anticipated evaporation rate equals or exceeds 0.2 LBS/SF/HR as determined from ACI 305.1, Figure 2.1.5.

H. Curing:

1. Begin curing concrete as soon as free water has disappeared from exposed surfaces.
2. Cure concrete by use of moisture retaining cover, burlap kept continuously wet or by membrane curing compound.
3. Provide protection as required to prevent damage to concrete and to prevent moisture loss from concrete during curing period.
4. Provide curing for minimum of 7 days.
5. Form materials left in place may be considered as curing materials for surfaces in contact with the form materials except in periods of hot weather.
6. In hot weather follow curing procedures outlined in ACI 305.1.
7. In cold weather follow curing procedures outlined in ACI 306.1.
8. Curing vertical surfaces with a curing compound:
  - a. Cover vertical surfaces with a minimum of two coats of the curing compound.
  - b. Allow the preceding coat to completely dry prior to applying the next coat.
  - c. Apply the first coat of curing compound immediately after form removal.

- d. Vertical surface at the time of receiving the first coat shall be damp with no free water on the surface.
  - e. A vertical surface is defined as any surface steeper than 1 vertical to 4 horizontal.
- I. Form Removal:
- 1. Remove forms after concrete has hardened sufficiently to resist damage from removal operations or lack of support.
  - 2. Where no reshoring is planned, leave forms and shoring used to support concrete until it has reached its specified 28-day compressive strength.

### 3.2 CONCRETE FINISHES

- A. Tolerances:
- 1. Class A: 1/8 IN in 10 FT.
  - 2. Class B: 1/4 IN in 10 FT.
- B. Surfaces Exposed to View:
- 1. Provide a smooth finish for exposed concrete surfaces and surfaces that are:
    - a. To be covered with a coating or covering material applied directly to concrete.
    - b. Scheduled for grout cleaned finish.
  - 2. Remove fins and projections, and patch voids, air pockets, and honeycomb areas with cement grout.
  - 3. Cementitious concrete coating:
    - a. Form facing material shall produce a smooth, hard, uniform texture.
      - 1) Use forms specified for surfaces exposed to view.
    - b. Prepare the surface in accordance with manufactures printed installation instructions.
    - c. Brush on coating to entire surface.
      - 1) As a mixing liquid for the coating, use bonding agent and water mixture as recommended by the manufacture.
      - 2) Apply two (2) coats at 2 LB/SQ YD per coat.
    - d. When second coat is set, float to a uniform texture with a sponge coat.
    - e. Provide this finish at the following locations:
      - 1) {Walls, columns, exposed to view.}
- C. Surfaces Not Exposed to View:
- 1. Patch voids, air pockets and honeycomb areas with cement grout.
  - 2. Fill tie holes with nonshrink, nonmetallic grout.
- D. Slab Float Finish:
- 1. After concrete has been placed, consolidated, struck off, and leveled, do no further work until ready for floating.
  - 2. Do not use water to aid in finishing.
  - 3. Begin floating when water sheen has disappeared and surface has stiffened sufficiently to permit operation.
  - 4. During or after first floating, check planeness of entire surface with a 10 FT straightedge applied at not less than two different angles.
  - 5. Cut down all high spots and fill all low spots during this procedure to produce a surface within Class B tolerance throughout.
  - 6. Refloat slab immediately to a uniform sandy texture.
- E. Troweled Finish:
- 1. Float finish surface.
  - 2. Next power trowel, and finally hand trowel.
  - 3. Do not use water to aid in finishing.
  - 4. Produce a smooth surface which is relatively free of defects with first hand troweling.
  - 5. Perform additional trowelings by hand after surface has hardened sufficiently.
  - 6. Final trowel when a ringing sound is produced as trowel is moved over surface.
  - 7. Thoroughly consolidate surface by hand troweling.

8. Leave finished surface essentially free of trowel marks, uniform in texture and appearance and plane to a Class A tolerance.
  9. On surfaces intended to support floor coverings remove any defects of sufficient magnitude that would show through floor covering by grinding.
- F. Broom Finish: Immediately after concrete has received a float finish as specified, give it a transverse scored texture by drawing a broom across surface.

### 3.3 GROUT

- A. Preparation:
1. Nonshrinking, nonmetallic grout:
    - a. Clean concrete surface to receive grout.
    - b. Saturate concrete with water for 24 HRS prior to grouting.
- B. Application:
1. Nonshrinking, nonmetallic grout:
    - a. Mix in a mechanical mixer.
    - b. Use no more water than necessary to produce flowable grout.
    - c. Place in accordance with manufacturer's instructions.
    - d. Completely fill all spaces and cavities below the bottom of baseplates.
    - e. Provide forms where baseplates and bedplates do not confine grout.
    - f. Where exposed to view, finish grout edges smooth.
    - g. Except where a slope is indicated on Drawings, finish edges flush at the baseplate, bedplate, member, or piece of equipment.
    - h. Protect against rapid moisture loss by covering with wet rags or polyethylene sheets.
    - i. Wet cure grout for seven (7) days, minimum.

### 3.4 FIELD QUALITY CONTROL

- A. Owner will employ and pay for services of a concrete testing laboratory to perform testing of concrete placed during construction.
1. Contractor to cooperate with Owner in obtaining and testing samples.
- B. Tests During Construction:
1. Strength test:
    - a. For each strength test, mold and cure cylinders from each sample in accordance with ASTM C31.
      - 1) Cylinder size: Per ASTM C31.
        - a) 4 IN cylinders may not be used for concrete mixes with concrete aggregate size larger than 1 IN.
      - 2) Quantity:
        - a) 6 IN DIA by 12 IN high: Four (4) cylinders.
        - b) 4 IN DIA by 8 IN high: Six (6) cylinders.
    - b. Field cure one (1) cylinder for the seven (7) day test.
      - 1) Laboratory cure the remaining.
    - c. Test cylinders in accordance with ASTM C39.
      - 1) 6 IN DIA cylinders:
        - a) Test two (2) cylinders at 28 days for strength test result and the one (1) field cured sample at seven (7) days for information.
        - b) Hold remaining cylinder in reserve.
      - 2) 4 IN DIA cylinders:
        - a) Test three (3) cylinders at 28 days for strength test result and the one (1) field cured cylinder at seven (7) days for information.
        - b) Hold remaining cylinders in reserve.
    - d. Strength test result:
      - 1) Average of strengths of two (2) 6 IN DIA cylinders or three (3) 4 IN DIA cylinders from the same sample tested at 28 days.



- 2) If one (1) cylinder in a test manifests evidence of improper sampling, molding, handling, curing, or testing, discard and test reserve cylinder(s); average strength of remaining cylinders shall be considered strength test result.
- 3) Should all cylinders in any test show any of above defects, discard entire test.
- e. Frequency of tests:
  - 1) All concrete:
    - a) One (1) strength test to be taken not less than once a day, nor less than once for each 60 CU YD or fraction thereof placed in any one (1) day.
    - b) Once for each 5000 SQ FT of slab or wall surface area placed each day
    - c) If total volume of concrete on Project is such that frequency of testing required in above paragraph will provide less than five (5) strength tests for each concrete mix, tests shall then be made from at least five (5) randomly selected batches or from each batch if fewer than five (5) batches are provided.
  2. Slump test:
    - a. Per ASTM C143.
    - b. Determined for each strength test sample.
    - c. Additional slump tests may be taken.
  3. Air content:
    - a. Per ASTM C231, ASTM C173, and ASTM C138.
    - b. Determined for each strength test sample.
  4. Temperature: Determined for each strength test sample.
- C. Evaluation of Tests:
  1. Strength test results:
    - a. Average of 28-day strength of two cylinders from each sample.
      - 1) If one cylinder manifests evidence of improper sampling, molding, handling, curing or testing, strength of remaining cylinder will be test result.
      - 2) If both cylinders show any of above defects, test will be discarded.
- D. Acceptance of Concrete:
  1. Strength level of each type of concrete shall be considered satisfactory if both of the following requirements are met:
    - a. Average of all sets of three consecutive strength tests equals or exceeds the required specified 28-day compressive strength.
    - b. No individual strength test falls below the required specified 28-day compressive strength by more than 500 psi.
  2. If tests fail to indicate satisfactory strength level, perform additional tests and/or corrective measures as directed by Engineer.
    - a. Perform additional tests and/or corrective measures at no additional cost to Owner.
- E. Concrete tolerances per ACI 117.

### 3.5 SCHEDULES

- A. Form Types:
  1. Surfaces exposed to view:
    - a. Prefabricated or job-built wood forms.
    - b. Laid out in a regular and uniform pattern with long dimensions vertical and joints aligned.
    - c. Produce finished surfaces free from offsets, ridges, waves, and concave or convex areas.
    - d. Construct forms sufficiently tight to prevent leakage of mortar.
  2. Surfaces normally submerged or not normally exposed to view: Wood or steel forms sufficiently tight to prevent leakage of mortar.
  3. Other types of forms may be used:
    - a. For surfaces not restricted to plywood or lined forms.
    - b. As backing for form lining.

- B. Grout:
  - 1. Nonshrinking, nonmetallic grout: General use.
- C. Concrete Finishes:
  - 1. Slab finishes:
    - a. Use following finishes as applicable, unless otherwise indicated:
      - 1) Floated finish: Surfaces intended to receive roofing, concrete topping, lean concrete, concrete fill and waterproofing.
      - 2) Troweled finish: Interior floor slabs, exposed roof slabs and base slabs of structures, equipment bases, and column bases.
      - 3) Broom finish: Sidewalks, docks, concrete stairs, and ramps.

**END OF SECTION**

## **SECTION 03 15 19**

### **ANCHORAGE TO CONCRETE**

#### **Part 1 - GENERAL**

##### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Requirements for all cast-in-place anchor bolts, anchor rods, reinforcing adhesive anchorage, and post-installed concrete anchors required for the Project but not specified elsewhere in the Contract Documents.
  - 2. Design of all concrete anchors not indicated on the Drawings including, but not limited to, installation of anchors into concrete for the following structural and nonstructural components:
    - a. Structural members and accessories.
    - b. Metal, wood, and plastic fabrications.
    - c. Architectural components.
    - d. Mechanical and electrical equipment and components.
    - e. Plumbing, piping, and HVAC work.
    - f. All other components requiring attachment to concrete.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 - Procurement and Contracting Requirements.
  - 2. Division 01 - General Requirements.
  - 3. Section 03 09 00 - Concrete.
  - 4. Section 09 90 00 - Paintings and Coatings.

##### **1.2 QUALITY ASSURANCE**

- A. Referenced Standards:
  - 1. American Concrete Institute (ACI):
    - a. 318, Building Code Requirements for Structural Concrete and Commentary.
  - 2. American Concrete Institute/Concrete Reinforcing Steel Institute (ACI-CRSI):
    - a. Adhesive Anchor Installation Certification Program: Adhesive Anchor Installer.
  - 3. American Institute of Steel Construction (AISC):
    - a. 303, Code of Standard Practice for Steel Buildings and Bridges.
  - 4. ASTM International (ASTM):
    - a. A36, Standard Specification for Carbon Structural Steel.
    - b. A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
    - c. A123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
    - d. A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
    - e. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
    - f. A496, Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
    - g. A563, Standard Specification for Carbon and Alloy Steel Nuts.
    - h. A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
    - i. F436, Standard Specification for Hardened Steel Washers.
    - j. F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
    - k. F594, Standard Specification for Stainless Steel Nuts.
    - l. F1554, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
  - 5. ICC Evaluation Service (ICC-ES):

- a. AC193, Acceptance Criteria for Mechanical Anchors in Concrete Elements.
  - b. AC308, Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements.
- 6. Building code:
  - a. Florida Building Code and associated standards, 2014 Edition including all amendments, referred to herein as Building Code.
- B. Qualifications:
  - 1. Anchor designer for Contractor-designed post-installed anchors {and cast in place anchorage} shall be a professional engineer licensed in the State that the Project is located in.
  - 2. Installer for post-installed anchors shall be trained by the manufacturer or certified by a training program approved by the Engineer.
- C. Post-installed anchors and related materials shall be listed by the following agencies:
  - 1. ICC-ES.
  - 2. Engineer approved equivalent.

### 1.3 DEFINITIONS

- A. Adhesive Anchors:
  - 1. Post-installed anchors developing their strength primarily from chemical bond between the concrete and the anchor.
  - 2. Includes anchors using acrylics, epoxy and other similar adhesives.
- B. Anchor Bolt: Any cast-in-place anchorage that is made of a headed (i.e. bolt) material.
- C. Anchor Rod: Any cast-in-place or post-installed anchorage made from unheaded, threaded, rod or deformed bar material.
- D. Concrete Anchor: Generic term for either an anchor bolt or an anchor rod.
- E. Galvanizing: Hot-dip galvanizing per ASTM A123 or ASTM A153 with minimum coating of 2.0 OZ of zinc per square foot of metal (average of specimens) unless noted otherwise or dictated by standard.
- F. Hardware: As defined in ASTM A153.
- G. Installer or Applicator:
  - 1. Installer or applicator is the person actually installing or applying the product in the field at the Project site.
  - 2. Installer and applicator are synonymous.
- H. MPIL: Manufacturer's printed installation instructions.
- I. Mechanical Anchors:
  - 1. Post-installed anchors developing their strength from attachment other than thru adhesives or chemical bond to concrete.
  - 2. Includes expansion anchors, expansion sleeve, screw anchors, undercut anchors, specialty inserts and other similar types of anchorages.
  - 3. Drop-in anchors and other similar anchors are not allowed.
- J. Post-Installed Anchor: Any adhesive or mechanical anchor installed into previously placed and adequately cured concrete.

### 1.4 SUBMITTALS

- A. Shop Drawings:
  - 1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
  - 2. Product technical data including:
    - a. Acknowledgement that submitted products meet requirements of referenced standards.
    - b. Manufacturer material data sheet for each anchor.

- 1) Clearly indicate which products on the data sheet are proposed for use on the Project.
  - c. Manufacturer's printed installation instructions.
  - d. Current ICC-ES report for each post-installed anchor system indicating the following:
    - 1) Certification that anchors meet all requirements indicated in this Specification.
    - 2) Performance data showing that anchor is approved for use in cracked concrete.
    - 3) Seismic design categories for which anchor system has been approved.
    - 4) Required installation procedures.
    - 5) Special inspection requirements for installation.
  - e. Anchorage layout drawings and details:
    - 1) Indicate anchor diameter, embedment, length, anchor type, material and finish.
    - 2) Drawings showing location, configuration, spacing and edge distance.
  - f. Contractor Designed Post-Installed Anchors:
    - 1) Show diameter and embedment depth of each anchor.
    - 2) Indicate compliance with ACI 318, Appendix D,.
    - 3) Design tension and shear loads used for anchor design.
    - 4) Engineering design calculations:
      - a) Indicate design load to each anchor.
      - b) When the design load is not indicated on Drawings, include calculations to develop anchor forces based on Design Criteria listed herein.
      - c) Sealed and signed by contractor's professional {structural} engineer.
      - d) Calculations will be submitted for information purposes only.
    - 5) Type of post-installed anchor system used.
      - a) Provide manufacturer's ICC-ES report for the following:
        - (1) Mechanical anchorage per ICC-ES AC193.
        - (2) Adhesive anchorage per ICC-ES AC308.
- B. Samples:
1. Representative samples of concrete anchors may be requested by Engineer. Review will be for type and finish only. Compliance with all other requirements is exclusively the responsibility of the Contractor.
- C. Informational Submittals:
1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
  2. Certification of qualifications for each installer of post-installed anchors.
    - a. Indicate successful completion or certification for each type of approved post-installed anchor as required by the Contract Documents.
    - b. Provide one of the following for each type of anchor, as required by this specification section:
      - 1) Letter from manufacturer documenting successful training completion for mechanical anchors only.
      - 2) Certification of completion for Engineer approved program.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to job site in manufacturer's or distributor's packaging undamaged and complete with installation instructions.
- B. Store above ground on skids or other supports to keep items free of dirt and other foreign debris and to protect against corrosion.
- C. Protect and handle materials in accordance with manufacturer's recommendations to prevent damage or deterioration.

## Part 2 - PRODUCTS

### 2.1 MATERIALS

- A. Cast-in-place Concrete Anchors:
  - 1. Building, nonbuilding structures, and equipment:
    - a. ASTM F1554, Grade 36 or Grade 55 with weldability supplement S1 for galvanized threaded rods.
    - b. ASTM A307, Grade A for galvanized headed bolts.
  - 2. All other cast-in-place concrete anchors:
    - a. Stainless steel with matching nut and washer.
    - b. Submerged application: ASTM F593, Type 316.
    - c. Non-submerged application: ASTM F593, Type 304 or Type 316.
- B. Post-Installed Mechanical and Adhesive Concrete Anchors:
  - 1. Stainless steel with matching nut and washer.
  - 2. Submerged application: ASTM F593, Type 316.
  - 3. Non-submerged application: ASTM F593, Type 304 or Type 316.
- C. Reinforcement: See Section 03 21 00.
- D. Headed Studs: ASTM A108 with a minimum yield strength of 50,000 psi and a minimum tensile strength of 60,000 psi.
- E. Deformed Bar Anchors: ASTM A496 with minimum yield strength of 70,000 psi and a minimum tensile strength of 80,000 psi.
- F. Washers:
  - 1. ASTM F436 unless noted otherwise.
  - 2. If stainless steel anchorage is being used for cast-in-place anchorage, furnish washers of the same material and alloy as in the accompanying anchorage.
  - 3. Plate washers: Minimum 1/2IN thick fabricated ASTM A36 square plates as required.
  - 4. Follow manufacturer's requirements for all post-installed anchorage.
- G. Nuts:
  - 1. ASTM A563 for all cast-in-place anchorage.
  - 2. If stainless steel anchorage is being used for cast-in-place anchorage, nuts shall meet ASTM F594 and be the matching material and alloy as in the accompanying anchorage.
  - 3. Follow manufacturer's requirements if using post-installed anchorage.
- H. Galvanizing Repair Paint:
  - 1. High zinc dust content paint for regalvanizing welds and abrasions.
  - 2. ASTM A780.
  - 3. Zinc content: Minimum 92 percent in dry film.
  - 4. ZRC "ZRC Cold Galvanizing" or Clearco "High Performance Zinc Spray."
- I. Dissimilar Materials Protection: See Specification Section 09 90 00.

### 2.2 contractor designed anchorage

- A. Acceptable Manufacturers:
  - 1. Post-installed anchor systems for the listed manufacturers will be considered only if a current ICC-ES evaluation report is submitted in accordance with the SUBMITTALS Article in PART 1 of this Specification Section and if the anchor system is approved by the Engineer.
    - a. Hilti.
    - b. Powers Fasteners.
    - c. Simpson Strong-Tie.
  - 2. Submit request for substitution in accordance with Specification Section 01 25 00.
- B. Contractor shall design the anchorage when any of the following occur:

1. Design load for concrete anchorage is shown on the Drawings.
  2. When specifically required by the Contract Documents.
  3. When an anchorage is required but not specified in the Drawings.
  4. When anchorage is shown on Drawings other than Structural Drawings.
- C. Anchorage Design Loads:
1. Determine all of the design loads, including wind and seismic loads, per the Building Code.
    - a. Anchorage of equipment and non-structural components: Use the actual dead and operating loads provided by the manufacturer.
- D. When Contract Drawings, other than the Structural Drawings, indicate an anchor diameter or length, the Contractor design shall incorporate these as "minimums."
- E. Cast-in-Place Concrete Anchors:
1. Provide the material, nominal diameter, embedment length, spacing, edge distance and design capacity to resist the calculated load based on the requirements given in the Building Code including ACI 318, Appendix D,
  2. Design assuming cracked concrete.
- F. Post-installed Concrete Anchors:
1. Provide the manufacturer's system name/type, nominal diameter, embedment depth, spacing, minimum edge distance, cover, and design capacity to resist the specified load based on requirements given in the Building Code, ACI 318, Appendix D, and current ICC-ES report, for the anchor to be used.
  2. Design assuming cracked concrete.

## 2.3 engineer designed anchorage

- A. When the size, length and details of anchorages are shown on Contract Structural Drawings, Contractor design of anchorage is not required
- B. Acceptable Manufacturers:
1. Additional newer post-installed anchor systems for the listed manufacturers will be considered only if a current evaluation agency report is submitted in accordance with the SUBMITTALS Article in PART 1 of this Specification Section, the anchor system is certified by ICC-ES for cracked concrete conditions, and if approved by the Engineer.
  2. Mechanical Anchors:
    - a. Hilti:
      - 1) Kwik Bolt 3 (ICC-ES ESR-2302).
  3. Adhesive Concrete Anchors:
    - a. Hilti:
      - 1) HIT RE 500-SD (ICC-ES ESR-2322).
      - 2) HIT RE 500 V3 (ICC ESR-3814).
  4. Screw Concrete Anchors:
    - a. Hilti: Kwik HUS-EZ Screw (ICC-ES ESR-3027).
  5. Submit request for substitution in accordance with Specification Section 01 25 00.
    - a. Substitution request to indicate the proposed anchor has the at least the same tension and shear strength as the specified anchor installed as indicated in the Contract Drawings.
    - b. Calculations to be stamped by a Professional Engineer registered in the state that the Project is located in.

## Part 3 - EXECUTION

### 3.1 GENERAL

- A. Cast-in-Place Anchorage:
1. Use where anchor rods or bolts are indicated on the Drawings, unless another anchor type is approved by the Engineer.

2. Provide concrete anchorage as shown on the Drawings or as required to secure components to concrete.
- B. Adhesive Anchorage:
  1. Use only where specifically indicated on the Drawings or when approved for use by the Engineer.
  2. May be used where subjected to vibration or where buried or submerged.
  3. Do not use in overhead applications or sustained tension loading conditions such as utility hangers.
  4. Contact Engineer for clarification when anchors will not be installed in compliance with manufacturer's printed installation requirements.
- C. Mechanical Anchorage:
  1. Use only where specifically indicated on the Drawings or when approved for use by the Engineer.
  2. Do not use where subjected to vibration.
  3. May be used in overhead applications.
  4. Contact Engineer for clarification when anchors will not be installed in compliance with manufacturer's printed installation requirements.
- D. Do not use powder actuated fasteners and other types of bolts and fasteners not specified herein for structural applications unless approved by the Engineer or specified in Contract Documents.

### 3.2 PREPARATION

- A. Provide adequate time to allow for proper installation and inspection prior to placing concrete for cast-in-place concrete anchorage.
- B. Prior to installation, inspect and verify areas and conditions under which concrete anchorage is to be installed.
  1. Notify Engineer of conditions detrimental to proper and timely completion of work.
  2. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.
- C. Special Inspection is required in accordance with the Building Code for all concrete anchorage.
  1. Notify the Special Inspector that an inspection is required prior to concrete placement (or during post-installed anchorage installation).
  2. See the FIELD QUALITY CONTROL Article in PART 3 of this Specification Section for additional requirements.
- D. Post-installed anchor manufacturer's representative shall demonstrate and observe the proper installation procedures for the post-installed anchors at no additional expense to the Owner.
  1. Follow such procedures to assure acceptable installation.

### 3.3 INSTALLATION

- A. Tie cast-in-place anchorage in position to embedded reinforcing steel using wire.
  1. Tack welding of anchorage is prohibited.
  2. Coat the projected portion of carbon steel anchors and nut threads with a heavy coat of clean grease after concrete has cured.
  3. Anchorage location tolerance shall be in accordance with AISC 303.
  4. Provide steel or durable wood templates for all column and equipment anchorage.
    - a. Templates to be placed above top of concrete and not impede proper concrete placement and consolidation.
- B. Unless noted or specified otherwise:
  1. Connect aluminum and steel members to concrete and masonry using stainless steel cast-in-place anchorage unless shown otherwise.
    - a. Provide dissimilar materials protection per Specification Section 09 90 00.
  2. Provide washers for all anchorage.



3. Where exposed, extend threaded anchorage a minimum of 1/2 IN above the top of the fully engaged nut.
  - a. If anchorage is cut off to the required maximum height, threads must be dressed to allow nuts to be removed without damage to the nuts.
- C. Do the following after nuts are snug-tightened down:
  1. If using post-installed anchorage, follow MPII.
  2. Upset threads of anchorage to prevent nuts from backing off.
    - a. Provide double nut or lock nut in lieu of upset threads for items that may require removal in the future.
  3. For all other cast-in-place anchorage material, tighten nuts down an additional 1/8 turn to prevent nuts from backing off.
  4. If two (2) nuts are used per concrete anchor above the base plate, tighten the top nut an additional 1/8 turn to "lock" the two (2) nuts together.
  5. If using post-installed anchorage, follow manufacturer's installation procedures.
- D. Assure that embedded items are protected from damage and are not filled in with concrete.
- E. Secure architectural components such that it will not be aesthetically distorted nor fasteners overstressed from expansion, contraction or installation.
- F. Coat aluminum surfaces in contact with dissimilar materials in accordance with Specification Section 09 90 00.
- G. Repair damaged galvanized surfaces in accordance with ASTM A780.
  1. Prepare damaged surfaces by abrasive blasting or power sanding.
  2. Apply galvanizing repair paint to minimum 6 mils DFT in accordance with manufacturer's instructions and ASTM A780.
- H. For post-installed anchors, comply with the MPII on the hole diameter and depth required to fully develop the tensile strength of the anchor or reinforcing bar.
  1. Use hammer drills to create holes.
  2. Properly clean out the hole per the ICC-ES reports utilizing a non-metallic fiber bristle brush and compressed air or as otherwise required to remove all loose material from the hole prior to installing the anchor in the presence of the Special Inspector.

### 3.4 FIELD QUALITY CONTROL

- A. Special Inspection:
  1. See Section 03 09 00.

### 3.5 CLEANING

- A. After concrete has been placed, remove protection and clean all anchorage of all concrete, dirt, and other foreign matter.
- B. Provide surface acceptable to receive field applied paint coatings when specified in Specification Section 09 90 00.

### END OF SECTION

**SECTION 04200****UNIT MASONRY****PART 1 - GENERAL****1.1 SUMMARY****A. Section Includes:**

1. Concrete masonry units (CMU's).

**1.2 ACTION SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For reinforcing steel. Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."

**1.3 INFORMATIONAL SUBMITTALS**

- A. Material Certificates: For each type and size of product indicated. For masonry units include data on material properties and material test reports substantiating compliance with requirements.
- B. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
  1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
  2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

**1.4 QUALITY ASSURANCE**

- A. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

**1.5 PROJECT CONDITIONS**

- A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit

masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

- B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

## **PART 2 - PRODUCTS**

### **2.1 MASONRY UNITS, GENERAL**

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.
- B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

### **2.2 CONCRETE MASONRY UNITS**

- A. Shapes: Provide shapes indicated and for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- B. CMUs: ASTM C 90.
  - 1. Density Classification: Normal weight.

### **2.3 CONCRETE AND MASONRY LINTELS**

- A. General: Provide one of the following:
- B. Concrete Lintels: ASTM C 1623, matching CMUs in color, texture, and density classification; and with reinforcing bars indicated. Provide lintels with net-area compressive strength not less than CMUs.
- C. Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Section 03 09 00 "Cast-in-Place Concrete," and with reinforcing bars indicated.

### **2.4 MORTAR AND GROUT MATERIALS**

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Aggregate for Mortar: ASTM C 144.

1. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
2. White-Mortar Aggregates: Natural white sand or crushed white stone.
3. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.

C. Aggregate for Grout: ASTM C 404.

D. Water: Potable.

## 2.5 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.

B. Masonry Joint Reinforcement, General: ASTM A 951/A 951M.

1. Interior Walls: Hot-dip galvanized, carbon steel.
2. Exterior Walls: Hot-dip galvanized, carbon steel.
3. Wire Size for Side Rods: 0.148-inch diameter.
4. Wire Size for Cross Rods: 0.148-inch diameter.
5. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
6. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units.

## 2.6 TIES AND ANCHORS

A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated.

1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M; with ASTM A 153/A 153M, Class B-2 coating.
2. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Connector Section: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 0.060-inch-thick, steel sheet, galvanized after fabrication
2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.187-inch-diameter, hot-dip galvanized steel wire.

C. Partition Top anchors: 0.105-inch-thick metal plate with 3/8-inch-diameter metal rod 6 inches long welded to plate and with closed-end plastic tube fitted over rod that allows rod to move in and out of tube. Fabricate from steel, hot-dip galvanized after fabrication.

## 2.7 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; formulated from neoprene, urethane, or PVC.
- B. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

## 2.8 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar or grout.
  - 2. Use portland cement mortar unless otherwise indicated.
  - 3. For exterior masonry, use portland cement mortar.
  - 4. For reinforced masonry, use portland cement mortar.
  - 5. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
  - 1. For masonry below grade or in contact with earth, use Type M.
  - 2. For reinforced masonry, use Type S.
  - 3. For mortar parge coats, use Type S.
  - 4. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.
  - 5. For interior non-load-bearing partitions, Type O may be used instead of Type N.
- D. Grout for Unit Masonry: Comply with ASTM C 476.
  - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
  - 2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
  - 3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

### 3.2 TOLERANCES

#### A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation do not vary by more than plus  $\frac{1}{2}$  inch or minus  $\frac{1}{4}$  inch.
2. For location of elements in plan do not vary from that indicated by more than plus or minus  $\frac{1}{2}$  inch.
3. For location of elements in elevation do not vary from that indicated by more than plus or minus  $\frac{1}{4}$  inch in a story height or  $\frac{1}{2}$  inch total.

#### B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls do not vary from level by more than  $\frac{1}{4}$  inch in 10 feet, or  $\frac{1}{2}$  inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than  $\frac{1}{8}$  inch in 10 feet,  $\frac{1}{4}$  inch in 20 feet, or  $\frac{1}{2}$  inch maximum.
3. For vertical lines and surfaces do not vary from plumb by more than  $\frac{1}{4}$  inch in 10 feet,  $\frac{3}{8}$  inch in 20 feet, or  $\frac{1}{2}$  inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than  $\frac{1}{8}$  inch in 10 feet,  $\frac{1}{4}$  inch in 20 feet, or  $\frac{1}{2}$  inch maximum.
5. For lines and surfaces do not vary from straight by more than  $\frac{1}{4}$  inch in 10 feet,  $\frac{3}{8}$  inch in 20 feet, or  $\frac{1}{2}$  inch maximum.

#### C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus  $\frac{1}{8}$  inch, with a maximum thickness limited to  $\frac{1}{2}$  inch.
2. For head and collar joints, do not vary from thickness indicated by more than plus  $\frac{3}{8}$  inch or minus  $\frac{1}{4}$  inch.
3. For exposed head joints, do not vary from thickness indicated by more than plus or minus  $\frac{1}{8}$  inch.

### 3.3 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- D. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- E. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.
- F. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

### 3.4 MORTAR BEDDING AND JOINTING

- A. Lay hollow CMUs as follows:
  - 1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
  - 2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
  - 3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
  - 4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

### 3.5 MASONRY JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of  $\frac{5}{8}$  inch on exterior side of walls,  $\frac{1}{2}$  inch elsewhere. Lap reinforcement a minimum of 6 inches.
  - 1. Space reinforcement not more than 16 inches o.c.
  - 2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
  - 3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.

### 3.6 ANCHORING MASONRY TO CONCRETE

- A. Anchor masonry to concrete where masonry abuts or faces concrete to comply with the following:
  - 1. Provide an open space not less than  $\frac{1}{2}$  inch wide between masonry and concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
  - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
  - 3. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

### 3.7 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
  - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
  - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.



1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 48 inches.

### 3.8 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.
- B. Inspections shall be according to ACI 530.1/ASCE 6.
- C. Testing Prior to Construction: One set of tests.
- D. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.
- E. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.
- F. Mortar Aggregate Ratio Test (Proportion Specification): For each mix provided, according to ASTM C 780.
- G. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

### 3.9 PARGING

- A. Parge exterior faces of below-grade masonry walls, where indicated, in 2 uniform coats to a total thickness of 3/4 inch.
- B. Use a steel-trowel finish to produce a smooth, flat, dense surface. Form a wash at top of parging and a cove at bottom.
- C. Damp-cure parging for at least 24 hours and protect parging until cured.

### 3.10 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
  2. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

**END OF SECTION 04200**

**SECTION 05 21 00****STEEL JOISTS****Part 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Manufactured open-web steel joists and joist accessories.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 - Procurement and Contracting Requirements.
  - 2. Division 01 - General Requirements.
  - 3. Section 05 30 00 - Metal Deck.
  - 4. Section 09 90 00 - Paintings and Coatings.

**1.2 QUALITY ASSURANCE**

- A. Referenced Standards:
  - 1. American Institute of Steel Construction (AISC):
    - a. 360, Specifications for Structural Steel Buildings (referred to herein as AISC Specification).
  - 2. ASTM International (ASTM):
    - a. A36, Standard Specification for Carbon Structural Steel.
    - b. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
    - c. A325, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
    - d. A490, Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.
  - 3. American Welding Society (AWS):
    - a. D1.1, Structural Welding Code - Steel.
  - 4. Corps of Engineers (COE):
    - a. CRD-C621, Standard Specification for Packaged, Dry, Hydraulic-Cement Grout (Nonshrink).
  - 5. Steel Joist Institute (SJI):
    - a. Recommended Code of Standard Practice for Steel Joists and Joist Girders.
    - b. Standard Specification for Open Web Steel Joists, K-Series (ANSI SJI-K-1.1).
    - c. Standard Specification for Longspan Steel Joists LH-Series and Deep Longspan Steel Joists DLH-Series (ANSI SJI-LH-DLH-1.1).
    - d. Standard Specification for Joist Girders (ANSI SJI-JG-1.1).
    - e. Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders:
      - 1) Standard Load Table Open Web Steel Joists, K-Series.
      - 2) Standard Load Table Longspan Steel Joists, LH-Series.
      - 3) Standard Load Table Deep Longspan Steel Joists, DLH-Series.
- B. Qualifications:
  - 1. Manufacturer: Member of SJI.
    - a. Structural design calculations and details of manufactured joists shall be prepared by a qualified professional engineer retained by the manufacturer.
  - 2. Qualification of welding work:
    - a. Qualify welding processes, operations, and operators in accordance with requirements of AWS D1.1.

- b. Welding operators to have been qualified during the 12-month period prior to commencement of welding.

### 1.3 SUBMITTALS

- A. Shop Drawings:
  - 1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
  - 2. Fabrication and/or layout drawings:
    - a. Detailed Shop Drawings showing size and layout of each joist unit, bridging, connections, and accessories. Include mark, number, type, location, and spacing of joists and bridging.
    - b. Show joining splice and connection to other work details.
    - c. Provide templates or location drawings for installation of anchor bolts.
    - d. Provide details of bridging, method of attachment to joists, and joist end anchorage and other details required for joist installation. Indicate beveled end plates for joist roof pitch where required.
    - e. Show shop-applied coatings.
    - f. Shop Drawings shall not be reproductions of the Contract Drawings.
  - 3. Product technical data including:
    - a. Joist manufacturer's load tables, Standard Specifications and installation instructions for each type of joist and its accessories. Include product data describing materials, shop coating, bridging, and accessories.
  - 4. Certifications:
    - a. Manufacturer's certification that steel joists and accessories comply with specified requirements.
    - b. Manufacturer member of SJI.
    - c. Joist material, shop welding and testing, manufacturing and shop inspection and testing are in accordance with SJI requirements.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle steel joists as recommended by SJI.
  - 1. Exercise care to avoid damage to joists.
- B. Store joists clear of earth on platforms, skids or other supports.
  - 1. Protect joists after delivery to prevent rust and deterioration.
- C. Provide anchor bolts and other items to be embedded in concrete or masonry, with templates as required, in time for incorporation into the work.

### Part 2 - PRODUCTS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
  - 1. Nucor Corporation Vulcraft Divisions.
  - 2. CANAM Steel Corporation.
  - 3. Socar Incorporated.

### 2.2 MATERIALS

- A. Steel: Comply with SJI and AISC Specifications for joist series indicated.
- B. High-Strength Bolts, Nuts and Washers: ASTM A325 or ASTM A490 as required, heavy hexagon structural bolts with nuts and hardened washers.
- C. Bolts and Nuts, Unfinished: ASTM A307, Grade A, regular hexagon type, low carbon steel, with carbon steel washers.

## 2.3 STEEL JOISTS

- A. Design of steel joists proposed shall have been checked by the SJI and found to conform to the standard specifications and load tables.
- B. Fabricate Joists and Accessories in accordance with SJI Specifications and as follows:
  - 1. Make shop connections and splices using either arc or resistance welding.
    - a. Do not shop bolt connections.
  - 2. Design and fabricate for maximum deflection of 1/360 of clear span under design live load.
  - 3. Shop holes, field holes, and enlargement of holes will not be permitted unless approved by Engineer.
  - 4. Fabricate bearing ends to provide following minimum bearing unless a longer bearing length is indicated on the Contract Documents.

|                         | K SERIES     | LH AND DLH SERIES | JOIST GIRDERS |
|-------------------------|--------------|-------------------|---------------|
| On masonry or concrete: | 4 IN min     | 6 IN min          | 6 IN min      |
| On steel:               | 2-1/2 IN min | 4 IN min          | 4 IN min      |

- 5. With steel angle tops and bottom chord members.
- C. Provide extended bottom chords where indicated.
  - 1. Comply with SJI and AISC requirements and load tables.
- D. Provide extended top chords where indicated.
  - 1. Comply with SJI and AISC requirements and load tables.
- E. Provide ceiling extensions in areas having ceilings attached directly to joist bottom chord.
  - 1. Provide either an extended bottom chord or a separate unit of sufficient strength to support ceiling construction.
  - 2. Extend ends to within 1/2 IN of wall surface.
- F. Provide nailers bolted to top chord where indicated.
- G. Prepare and paint steel joists and accessories in compliance with Section 09 90 00.
- H. Comply with SJI Specifications:
  - 1. Joist designations indicated on the Drawing are minimum requirements; increase as required to comply with design requirements specified.
  - 2. Wherever possible, increased joists shall have the same depth as joist indicated on Drawings.
  - 3. Where necessary to increase joist depths to meet design requirements, coordinate all project changes required due to the increased depth.
  - 4. Make all required joist revisions at no additional cost to Owner.

## 2.4 SOURCE QUALITY CONTROL

- A. Engineer reserves right to inspect joists or manufacturer's shop during joist fabrication.
- B. Identify each joist type, size and manufacturer.
  - 1. Provide tagging or other suitable (permanent) means.
  - 2. Maintain identification continuously.

## Part 3 - EXECUTION

### 3.1 PREPARATION

- A. Examine areas and conditions under which steel joists are to be installed for conditions detrimental to proper and timely completion of work.

- B. Do not proceed with work until unsatisfactory conditions have been corrected.
- C. Do not start placement of steel joists until supporting work is in place and secured.
- D. Joists will be subject to rejection if:
  - 1. Joists do not comply with requirements of SJI and AISC Specifications and requirements herein.
  - 2. Joists are improperly manufactured, welded, painted or installed.
  - 3. Joists are damaged so that strength is impaired.
  - 4. Joists are not installed as indicated on Drawings.
  - 5. Chords are not installed straight within a tolerance of plus or minus 0.0028 times the length of the joist or the distance between points of lateral support.

### 3.2 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
  - 1. Where not specifically indicated otherwise, place and secure steel joists in accordance with SJI and AISC Specifications and as herein specified.
- B. Splice joists delivered to the site in more than one piece.
- C. Do not overload joists.
  - 1. Note: Joists may not be stable or able to carry design loads until bridging and deck is fully installed.
  - 2. Contractor is solely responsible for safety, construction methods and sequencing of the Work.
  - 3. Do not install joists damaged so that strength is impaired.
- D. Place joists on supporting work, adjust and align in accurate location and spacing before permanently fastening.
  - 1. Provide end bearing and anchorages to secure all joists to supporting members or walls in accordance with SJI Specifications, unless otherwise indicated.
  - 2. When joists do not bear flush on supporting member or wall, take corrective measures to ensure full bearing.
    - a. Provide steel shims as required for uniform flush bearing.
- E. Field weld joists to supporting steel framework in accordance with SJI, AISC and AWS Specifications for type of joists used.
  - 1. Coordinate welding sequence and procedure with placing of joists.
- F. Bearing on Masonry or Concrete Bearing Surfaces:
  - 1. Secure joists resting on masonry or concrete bearing surfaces by bedding in mortar and anchoring to masonry or concrete construction as specified in SJI Specifications for type of steel joist used.
    - a. Masonry or concrete required to support joists to have reach required 28-day compressive strength prior to placing joists thereon.
    - b. Area under joist bearing shall be solidly filled with grout.
  - 2. Furnish anchor bolts or steel bearing plates to be built into concrete and masonry construction.
    - a. Furnish templates as may be necessary for accurate location of anchors. Steel bearing plates to conform to ASTM A36.
- G. Provide type, size, spacing, and attachment of bridging in accord with SJI and AISC Specifications, where not specifically indicated otherwise, except as modified herein.
  - 1. Provide diagonal type bridging as indicated.
  - 2. Do not use sag rods as substitute for bridging.
- H. Install bridging completely, immediately after erection, and before any loads are applied.
  - 1. Anchor ends of bridging lines at top and bottom chords of each joist and where terminating at walls or beams.

2. Provide bridging connections at top and bottom chords capable of safely resisting a force specified by SJI Specifications for open web, long span, deep long span joists, and joist girders respectively.
3. Do not release hoisting cables before installing center row of diagonal bridging and anchoring bridging line to prevent lateral movement.
4. During construction period, Contractor is responsible for any loads placed on joists.
  - a. Contractor's attention is directed the fact that joists may be unstable and cannot carry their design load until steel deck and bridging are completely installed.
- I. Remove or repair damaged joists or other work, to satisfaction of Engineer at no additional expense to Owner.
- J. After installation, touch up paint or field paint as specified in Section 09 90 00.

**END OF SECTION**

**SECTION 05 30 00****METAL DECK****Part 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Manufactured metal roof deck.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 - Procurement and Contracting Requirements.
  - 2. Division 01 - General Requirements.

**1.2 QUALITY ASSURANCE**

- A. Referenced Standards:
  - 1. American Iron and Steel Institute (AISI):
    - a. S100, Specification for the Design of Cold-Formed Steel Structural Members.
  - 2. ASTM International (ASTM):
    - a. A36/A36M, Standard Specification for Carbon Structural Steel.
    - b. A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
    - c. A780/A780M, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
    - d. A1008/A1008M, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
    - e. C1513, Standard Specification for Steel Tapping Screws for Cold Formed Steel Framing Connections.
    - f. D746, Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
    - g. D1056, Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
  - 3. American Welding Society (AWS):
    - a. D1.1/D1.1M, Structural Welding Code - Steel.
    - b. D1.3/D1.3M, Structural Welding Code - Sheet Steel.
  - 4. Steel Deck Institute (SDI):
    - a. 31, Design Manual for Composite Decks, Form Decks and Roof Decks.
  - 5. Underwriters Laboratories, Inc. (UL):
    - a. Fire Resistance Directory.
- B. Qualifications:
  - 1. Manufacturer:
    - a. Member of SDI.
    - b. Structural design of manufactured deck shall be prepared by a qualified professional engineer retained by the manufacturer.
  - 2. Welding work:
    - a. Qualify welding processes, operations, and operators in accordance with requirements of AWS D1.1 and AWS D1.3.
    - b. Welding operators to have been qualified during the 12 month period prior to commencement of welding, and be experienced in welding light gage metal.

**1.3 SUBMITTALS**

- A. Shop Drawings:



1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
2. Fabrication and/or layout drawings:
  - a. Detailed Shop Drawings showing the following:
    - 1) Complete framing and erection layouts.
    - 2) Location, length, type, cross section, thickness, and markings of metal deck units.
      - a) Size and location of openings.
      - b) Accessories and reinforcing.
    - 3) Sequence and procedure to be followed for erecting, fastening, and securing the deck units.
    - 4) Shop applied coatings.
    - 5) Details and gages of accessories and miscellaneous items showing sump pans, cant strips, ridge and valley plates, closure and filler strips and insulation supports.
    - 6) Welding procedures for installation including size, number, type and location of all welds required to install deck units.
    - 7) Recommended welding rod size, type, burn off rate and welder setting for deck thickness to be joined.
      - a) Define welds by use of standard AWS welding symbols.
    - 8) Correct fitting of members and accessories.
    - 9) Size and location of all openings in deck and all conditions requiring closure panels and supplementary framing.
    - 10) Shop Drawings shall not be reproductions of the Contract Drawings.
  - b. Product technical data including:
    - a. Metal deck manufacturer's specifications and installation instructions.
    - b. Manufacturer's specifications and installation instructions for:
      - 1) Welds and welding procedure.
      - 2) Galvanizing repair paint.
      - 3) Screws.
      - 4) Joint sealing compound.
    - c. Manufacturer's load tables for deck to be furnished on this project, including:
      - 1) Allowable gravity load for metal roof deck.
      - 2) Allowable diaphragm shear values for metal roof deck.
      - 3) Allowable superimposed load for metal deck.
3. Manufacturers certification that metal deck complies with specified requirements:
  - a. Manufacturer member of SDI.
  - b. Deck material, manufacturing, and shop testing and inspection are in accordance with SDI requirements.
  - c. Welder qualifications.
5. Test reports.
  - a. Manufacturer's certified test reports.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle metal deck as recommended by SDI.
  1. Exercise care to avoid damage to deck.
- B. Protect materials from rusting, denting or crushing.
  1. Store metal deck on project site off the ground with one end elevated to provide drainage and protected from the elements with a waterproof covering, ventilated to avoid condensation.
  2. Prevent rust, deterioration and accumulation of foreign material.

#### 1.5 PROJECT CONDITIONS

- A. Do not overload supporting members.
  1. Until the entire assembly is complete, the structural elements may not be stable or capable of supporting code or stated design loads.

## Part 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
1. 1-1/2 IN deep metal roof deck:
    - a. Vulcraft.
    - b. Verco Decking, Inc.
    - c. New Millennium Building Systems.
    - d. Consolidated Systems, Inc.
    - e. DACS, Inc.
- B. Submit request for substitution in accordance with Specification Section 01 25 00.

### 2.2 METAL ROOF DECK

- A. Design of the metal deck to be supplied to have been checked by SDI and found to conform to the standard specifications and load tables.
1. The allowable superimposed live uniform loading per square foot for metal roof deck supplied for the spans indicated shall equal or exceed the allowable superimposed live uniform load per square foot for the same spans as indicated in the SDI latest tables.
  2. Maximum deflection: Less than 1/240 of span under live load.
- B. Use deck configurations complying with SDI 31 and as indicated.
1. Painted deck: ASTM A1008.
  2. Galvanized deck: ASTM A653 G60 zinc coating.
- C. Metal Roof Deck, 1-1/2 IN Deep:
1. Rib type B, sheet steel, 20 GA, minimum, with minimum uncoated thickness of 1 1/2 IN, galvanized
  2. Wide rib deck: Ribs spaced approximately 6 IN OC; width of rib opening at top surface maximum 2-1/2 IN; width of bottom rib surface minimum 1-3/4 IN.

### 2.3 FABRICATION

- A. Standard Deck Profiles:

| DEPTH    | TYPE                       | RIB SPACING | TOP SURFACE<br>MAXIMUM RIB<br>OPENING | MINIMUM<br>BOTTOM OF RIB<br>WIDTH |
|----------|----------------------------|-------------|---------------------------------------|-----------------------------------|
| 1-1/2 IN | Roof Deck - Wide Rib ('B') | 6 IN        | 2-1/2 IN                              | 1-3/4 IN                          |

- B. Minimum Deck Thickness:
1. Where gage of metal is indicated, provide the minimum uncoated thickness as specified by SDI.
    - a. Delivered thickness of the uncoated steel: No less than 95 percent of the design thickness.
  2. Use steel with a minimum yield stress of 33 ksi.
- C. Fabrication:
1. Fabricate deck units in lengths to span three or more support spacings with flush, telescoped or nested 2 IN end laps.
    - a. End laps shall occur on supporting members.
    - b. Provide deck units having {overlapping} {interlocking} male and female type side laps or joints to provide positive vertical and lateral alignment of adjacent deck units.

## 2.4 ACCESSORIES

- A. Metal Closures:
  - 1. Form to configuration required to provide tight-fitting closures at open ends and sides of deck.
  - 2. Minimum thickness before galvanizing: 0.0358 IN (20 GA).
- B. Ridge and Valley Plates:
  - 1. Minimum width: 4-1/2 IN.
  - 2. Bend to provide tight-fitting closure with deck units.
  - 3. Provide plates in 10 FT length where possible.
  - 4. Minimum thickness before galvanizing: 0.0358 IN (20 GA)
- C. Welding Washers:
  - 1. 16 GA bent steel plate with 3/8 IN center hole.
  - 2. Use at all deck units thinner than 20 GA.
- D. Filler Sheet: Flat or formed 20 GA galvanized steel.
- E. Roof Sump Pans:
  - 1. Fabricate from a single piece of galvanized sheet steel with level bottoms and sloping sides to direct water flow to drain.
  - 2. Provide sump pans of adequate size to receive roof drains with bearing flanges minimum 3 IN wide.
  - 3. Recess pans not less than 1-1/2 IN below roof deck surface, unless otherwise indicated or required by deck configuration.
  - 4. Minimum thickness before galvanizing: 0.0747 IN (14 GA).
- F. Cant Strips:
  - 1. Bend cant strips to form 45 degree slope not less than 5 IN wide, with top and bottom flanges not less than 3 IN wide.
  - 2. Minimum thickness before galvanizing: 0.0358 IN (20 GA).
- G. Insulation supports.
- H. Venting: Slotted openings in bottom flutes in accordance with manufacturer's standards.
- I. Metal Pour Stops: Form to configuration required to provide mortar-tight closures at open sides and ends of deck.
- J. Primer Paint: Deck manufacturer's baked on, rust-inhibitive paint applied at plant to chemically cleaned and phosphate chemically treated metal surfaces.
- K. Galvanized coating for metal deck accessories: Conform to ASTM A653 G60 zinc coating.
- L. Galvanized Repair Paint: See Specification Section 05 50 00.
- M. Screws:
  - 1. Self-drilling, self-tapping, #12 size minimum hex washer head sheet metal screws.
  - 2. Carbon steel by Hilti.
    - a. Organic zinc chromate coated, Hilti Kwik Flex.
    - b. ASTM C1513.
- N. Powder Actuated Mechanical Fasteners:
  - 1. Material: AISI 1070 modified.
  - 2. Hardness: Minimum Rockwell Hardness C 54.5.
  - 3. Strength: Minimum tensile strength 285 ksi; minimum shear strength 175 ksi.
  - 4. Design and Manufacture: Knurled shank with forged ballistic point. Manufacturing process shall ensure steel ductility and prevent development of hydrogen embrittlement.
  - 5. Washers:
    - a. For steel bar joist framing: Minimum 12 mm (0.472 IN) steel washers.
    - b. For structural steel framing: Minimum 15 mm (0.591 IN) steel washers.

6. Corrosion Resistance:
  - a. For steel roof decks with waterproofing membrane: 5 micron zinc electroplated in accordance with ASTM B633 SC1 Type III.
  - b. For exposed steel roof decks: Minimum AISI 304 stainless steel sealing caps with bonded neoprene washer shall be installed over each fastener.
7. Design Requirements:
  - a. ICC-ES AC43 or SDI method for diaphragm shear strength and stiffness.
  - b. FM wind uplift resistance.
  - c. UL fire classification.
8. Approved Types:
  - a. For use with steel bar joist and light structural steel framing supports with top chord or flange thickness 1/8 IN to 3/8 IN:
    - 1) Hilti X-HSN24 (1/8 IN up to and including 3/8 IN)
    - 2) Other approved alternative
  - b. For use with structural steel framing supports with top flange thickness 1/4 IN or thicker:
    - 1) Hilti X-ENP-19 L15 (1/4 IN or thicker).
    - 2) Other approved alternative.
- O. Miscellaneous Steel Shapes: Comply with ASTM A36.
- P. Sheet Metal Accessories: Same material and finish as deck members.
- Q. Flexible Closure Strips for Deck:
  1. Vulcanized, closed cell expanded chloroprene elastomer, complying with ASTM D1056, Grade SCE 41.
  2. Brittleness temperature: -40 DegF, ASTM D746.
  3. Flammability resistance: Self-extinguishing.
  4. Install with adhesive in accordance with manufacturer's instructions.
    - a. Ensure complete closure.

## Part 3 - EXECUTION

### 3.1 preparation

- A. Examine areas and conditions under which metal deck is to be installed for conditions detrimental to proper and timely completion of work.
- B. Do not proceed with work until unsatisfactory conditions have been corrected.
- C. Do not start placement of metal deck until supporting work is in place and secured.
- D. Deck will be subject to rejection if metal deck:
  1. Units do not comply with requirements of SDI specifications and requirements herein.
  2. Is improperly manufactured, painted or installed.
  3. Is damaged so that strength is impaired.
  4. Is not installed as specified.

### 3.2 INSTALLATION

- A. Install roof deck units and accessories as indicated, in accordance with SDI 31, manufacturer's recommendations, final approved Shop Drawings and as specified herein.
  1. Furnish manufacturer's standard accessories as needed to complete the deck installation.
- B. Locate deck bundles to prevent overloading of structure.
- C. Do not overload metal deck or supporting members:
  1. Contractor is solely responsible for safety, construction means, methods and sequencing of the Work.
  2. Until the entire assembly is complete, the structural elements may not be stable or capable of supporting code or stated design loads.

3. Use care to assure deck construction loads are less than the recommendation of SDI 31, except where temporary shoring is installed.
- D. Place each deck unit on supporting structural frame, adjust to final position and accurately align with ends bearing on supporting members.
  1. Lap roof deck units at ends no less than 2 IN.
  2. Interlock units at sides without stretching, contracting, or deforming.
  3. Place deck units flat and square and secure to framing without warp or excessive deflection.
  4. Place units in accurate and close alignment for entire length of run and with close alignment of flutes of one unit with those of abutting unit.
- E. Plug weld sizes specified are effective fusion diameter of welds.
  1. Weld metal shall penetrate all layers of deck material and have good fusion to supporting members.
  2. Do not burn through deck.
- F. Prevent overtightening of screw fasteners by using a tool with a depth limiting nosepiece and a clutch.
- G. Fastening of 1-1/2 IN Deep Metal Roof Deck:
  1. Secure deck units to supporting frame and side laps as follows:
    - a. Fasten edge ribs of panels at each support.
    - b. At all interior supports and at ends of deck use:
      - 1) For 24 IN wide deck: Three (3) 5/8 IN round plug welds per deck unit.
      - 2) For 30 and 36 IN wide deck: Four (4) 5/8 IN round plug welds per deck unit.
      - 3) Install 22 GA deck with welding washers at weld locations.
    - c. At perimeter supports, use 5/8 IN round plug welds at 12 IN OC.
    - d. At side laps, use #12 hexhead screws at 18 IN OC.
- H. Remove and replace deck which is structurally weak or unsound or which has burn holes due to improper welding or damage which Engineer declares defective.
- I. Cut and fit deck units and accessories around other work projecting through or adjacent to decking.
  1. Make cutting and fitting neat, square and trim.
    - a. Cut deck by mechanical means, not by burning.
  2. Neatly and accurately install reinforcing at all openings except:
    - a. Circular openings less than 6 IN DIA.
    - b. Rectangular openings having no side dimension greater than 6 IN.
  3. Reinforce openings that have not been framed between 6 and 12 IN with 20 GA flat steel sheet 12 IN greater in each dimension than opening.
    - a. Place sheet around opening and fusion weld to top surface of deck at each corner and midway along each side.
- J. Install insulation supports for support of roof insulation.
  1. Provide where top surface of roof deck does not occur adjacent to edge and openings as required to completely support roof insulation.
  2. Weld into position.
- K. Install metal closure strips at all open uncovered ends and edges of roof deck, and in voids between deck and other construction.
  1. Weld into position to provide a complete decking installation.
  2. Provide flexible closure strips instead of metal closures, at Contractor's option and when approved by Engineer wherever their use will ensure complete closure.
    - a. Install with elastomeric type adhesive in accordance with written directions and recommendations of manufacturers of closure strips and adhesives.
- L. Ridge and Valley Plates:
  1. Weld ridge and valley plates to top surface of roof deck.

2. Lap end joints not less than 3 IN with laps in direction of water flow.
- M. Roof Sump Pans:
1. Place over openings in roof deck.
  2. Weld to top deck surface.
    - a. Space welds maximum 12 IN OC with at least one weld at each corner and each side midway between each corner.
  3. Cut opening in bottom of roof sump to accommodate drain size indicated.
- N. Cant Strips:
1. Weld cant strips to top surface of roof deck at 12 IN OC.
  2. Lap end joints not less than 3 IN.
- O. Install metal accessories to close all openings and gaps between deck and other construction, at objects projecting through deck, at locations where deck changes direction, and at open ends of deck units where deck units terminate.
1. Weld into position to provide a complete installation.
- P. Clean and Touch Up:
1. Remove all surplus materials and debris from surface of deck after installation.
  2. Repair damaged galvanized surfaces in accordance with Specification Section 05 50 00.

### 3.3 FIELD QUALITY CONTROL

- A. Remove and replace defective or damaged deck units.
- B. Inspection:
1. Special Inspection is required for:
    - a. Verification of proper deck and materials.
      - 1) Frequency: Prior to attaching deck.
    - b. Verification of proper weld filler materials, screws, powder actuated mechanical fasteners, weld testing and fastener spacing.
      - 1) Frequency: First 4 HRS during the first day of deck attachment and final inspection prior to covering work with concrete, insulation, or other materials.
    - c. Weld Testing:
      - 1) Make the following test in the presence of the Testing Agency employed on the project on the first deck panel to be installed :
        - a) Place one (1) end of panel over a perimeter support and attach it only to that support with two (2) welds as specified 6 IN apart.
        - b) Move the opposite end of the panel in plane parallel to the span of the panel until shear distress is noted in the weld.
        - c) Make the welds of sufficient quality to cause local distortions in the panel around the welds and show good perimeter contact between the welds and the panel.
        - d) When the results of this test are satisfactory and approved by the Testing Agency, install the remainder of the deck using the same weld rod size and type, amperage setting, and procedures used in the tested deck.
        - e) Weld Test procedure to be performed for each metal deck welder.
      - 2) Visually inspect the remainder of the welds.
        - a) When, in the opinion of the { Testing Agency, any weld is of poor quality, provide an additional weld adjacent to the rejected weld.
        - b) Place the new weld on sound, unburned deck a sufficient distance away from the rejected weld.

### END OF SECTION

## **SECTION 05 50 00**

### **METAL FABRICATIONS**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. Definition: Metal fabrications include items made from aluminum, iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not a part of structural steel or other metal systems specified elsewhere.
- B. Extent of metal fabrications is indicated on the drawings.
- C. Types of work in this section include, but are not limited to, metal fabrications for the following:
  - 1. Rough hardware
  - 2. Loose bearing and leveling plates
  - 3. Miscellaneous framing and supports
  - 4. Miscellaneous steel trim and edge protection
  - 5. Pipe bollards
  - 6. Roof ladders and safety cages
- D. Related Work:
  - 1. Concrete work is specified in Division-3
  - 2. Structural Steel joists are specified in elsewhere in Division-5

##### **1.2 QUALITY ASSURANCE**

- A. Shop Assembly: Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.
- B. Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel", and D1.3 "Structural Welding Code - Sheet Steel".

##### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's specifications, anchor details and installation instructions for products used in metal fabrications, including paint products and grout.
- B. Shop Drawings: Submit shop drawings for fabrication and erection of all specified metal fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.

- C. Samples: Submit 2 sets of representative samples of materials and finished products as may be requested by the Architect.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- A. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
- B. Ferrous Metals:
1. Steel Plates, Shapes and Bars: ASTM A 36.
  2. Steel Tubing: Cold formed, ASTM A 500; or hot-rolled, ASTM A 501.
  3. Structural Steel Sheet: Hot-rolled, ASTM A 570; or cold-rolled ASTM A 611, Class 1; of grade required for design loading.
  4. Galvanized Structural Steel Sheet: ASTM A 446, of grade required for design loading. Coating designation as indicated, or if not indicated, G90.
  5. Steel Pipe: ASTM A 53; Type and grade (if applicable) as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (schedule 40), unless otherwise indicated.
  6. Gray Iron Castings: ASTM A 48, Class 30.
  7. Malleable Iron Castings: ASTM A 47, grade as selected by fabricator.
  8. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
  9. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.
  10. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for the metal alloy to be welded.
- C. Aluminum Metals:
1. Aluminum-Alloy Standard Structural Shapes, Rolled or Extruded: ASTM B 308.
  2. Aluminum-Alloy Bar, Rod and Wire: ASTM B 211.
  3. Aluminum-Alloy Extruded Pipe and Tube: ASTM B 429, 6063-T6.
  4. Aluminum-Alloy Permanent Mold Castings: ASTM B 108.
  5. Aluminum Rivets: ASTM B 316, alloy 6053-T4 or 6061-T6.
  6. Aluminum Fasteners: Use fasteners made of same basic metal as fastened metal except use galvanized fasteners complying with ASTM A 153 for exterior aluminum units unless otherwise indicated. Do not use metals that are corrosive or incompatible with metals joined.
- D. Non-Shrink Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CE CRD-C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.
- E. Fasteners:



1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required. Powder activated fasteners are not permitted.
2. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
3. Lag Bolts: Square head type FS FF-B-561.
4. Machine Screws: Cadmium plated steel, FS FF-S-92.
5. Wood Screws: Flat head carbon steel, FS FF-S-111.
6. Plain Washers: Round, carbon steel, FS FF-W-92.
7. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
8. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.
9. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

F. Paints and Coatings:

1. Shop Primer for Ferrous Metal: Fast-curing, lead-free, abrasion-resistant, rust-inhibitive primer selected for compatibility with substrates and with types of alkyd-type finish paint systems indicated, and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements only of FS TT-P-86, Types I, II, and III.
2. Bituminous Coating: SSPC-Paint-12 (cold-applied asphalt mastic).

G. Galvanizing Metal Repair Compound:

1. Hot Applied: FS O-G-93.
2. Cold Applied: "Galvaneal", "Galvicon", or "Z.R.C.".

## 2.2 FABRICATION, GENERAL

- A. Workmanship: Use materials of size and thickness indicated or, if not indicated, as required to produce strength and durability in finished product for use intended. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of work.
- B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- C. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
- D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts.
- E. Provide for anchorage of type indicated, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.

- F. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
- G. Galvanizing: Provide a zinc coating for those items indicated or specified to be galvanized, as follows:
  - 1. ASTM A 153 for galvanizing iron and steel hardware.
  - 2. ASTM A 123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier.
  - 3. ASTM A 386 for galvanizing assembled steel products.
- H. Fabricate joints that will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.
- I. Shop Painting:
  - 1. Apply shop primer to surfaces of metal fabrications except those that are galvanized or as indicated to be embedded in concrete or masonry, unless otherwise indicated, and in compliance with requirements of SSPC-PA1 "Paint Application Specification No. 1" for shop painting.
  - 2. Surface Preparation: Prepare ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
    - a) Exteriors (SSPC Zone 1B): SSPC-SP6 "Commercial Blast Cleaning".
    - b) Interiors (SSPC Zone 1A): SSPC-SP3 "Power Tool Cleaning".

## 2.3 ROUGH HARDWARE

- A. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division-6 sections.
- B. Fabricate items to sizes, shapes and dimensions required. Furnish malleable iron washers for heads and nuts that bear on wood structural connections; elsewhere, furnish steel washers.

## 2.4 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.
- B. Galvanize all loose steel lintels.

## 2.5 MISCELLANEOUS FRAMING AND SUPPORTS

- A. Provide miscellaneous steel framing and supports which are not a part of structural steel framework, as required to complete work.
- B. Fabricate miscellaneous units to sizes, shapes and profiles indicated or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise indicated, fabricate from structural steel shapes, plates and steel bars of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.
- C. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed. Space anchors 24" o.c. and provide minimum anchor units of 1-1/4" x 1/4" x 8" steel straps except as otherwise indicated.
- D. Galvanize miscellaneous frames and supports.

## 2.6 MISCELLANEOUS STEEL TRIM AND EDGE PROTECTION

- A. Provide shapes and sizes indicated for profiles shown. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and steel bars, with continuously welded joints and smooth exposed edges.
- B. Galvanize miscellaneous steel trim and edge protection at exterior locations.

## 2.7 PIPE BOLLARDS

- A. Fabricate from 8-inch diameter, Schedule 40 steel pipe unless indicated otherwise on the Drawings. Cap bollards with 1/4-inch minimum thickness steel base plate 14-inches square.
- B. Fabricate sleeves for anchorage from steel pipe with 1/4-inch thick steel plate welded to bottom of sleeve.

## 2.8 ALUMINUM ROOF LADDERS AND SAFETY CAGES

- A. Fabricate ladders for locations shown with dimensions, spacings, details and anchorages as indicated. Comply with OSHA Standards and ANSI A14.3 standards for fixed wall ladders unless otherwise indicated. Extent is indicated on the Drawings.
- B. Fabrication: 6061-T6 aluminum alloy. Provide mill finish unless indicated otherwise on the Drawings.
  - 1. Side Rails: Continuous, with 1-1/8-inch round rungs that are serrated and secured with cast aluminum connectors, 4 solid rivets and 3/8-inch thick brackets mounted to the walls
  - 2. Cages: Fabricated of 1/4-inch by 2-inch hoops and seven 3/16-inch by 1-1/2 inch vertical bars with solid riveted connections

## 2.9 FINISHES

- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes. All exposed aluminum surfaces shall be factory mat finished.
- B. Galvanizing: For those items indicated for galvanizing, apply zinc-coating by the hot-dip process in accordance with ASTM A 123 or ASTM A 153 as applicable.
- C. Finish metal fabrications after assembly.

## **PART 3 - EXECUTION**

### **3.1 PREPARATION**

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.
- B. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

### **3.2 INSTALLATION, GENERAL**

- A. Comply with manufacturer's published installation instructions.
- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
- C. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications.
  - 1. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.
  - 2. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry or similar construction.
- D. Fit exposed connections accurately together to form tight hairline joints. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.
- E. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work.

- F. Setting Loose Plates: Clean concrete and masonry bearing surfaces of any bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.
- G. Set loose leveling and bearing plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut-off flush with the edge of the bearing plate before packing with grout. Use metallic non-shrink grout in concealed locations where not exposed to moisture; use non-metallic non-shrink grout in exposed locations, unless otherwise indicated. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

### 3.3 BOLLARDS

- A. Anchor bollards in concrete by means of pipe sleeves preset and anchored into concrete. After bollards have been inserted into sleeves, fill annular space between bollard and sleeve solid with non-shrink, nonmetallic grout mixed and placed to comply with grout manufacturer's directions.

### 3.4 ROOF LADDERS AND SAFETY CAGES

- A. Handle and store products in accordance with the manufacturer's published recommendations for products specified.
- B. Install top of the rung level with top of access/egress level. Space rungs 12-inches on centers to bottom rung
- C. Install safety railings 42-inches above top rung, then extend horizontally and return to roof or rear of parapet unless indicated otherwise.

### 3.5 PROTECTION

- A. Protect installed products and fabrications until substantial completion

### 3.6 ADJUST AND CLEAN

- A. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting. Apply by brush or spray to provide a minimum dry fill thickness of 2.0 mils.
- B. For galvanized surfaces: Clean field welds, bolted connections and abraded areas and apply galvanizing repair compound.

**END OF SECTION 05 50 00**

**SECTION 06 07 00****WOOD TREATMENT****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Preservative water-borne and fire-retardant treatment of lumber and plywood.
- B. Related Work: Section 06 10 00 – Rough Carpentry

**1.2 REFERENCES**

- A. AWPAC20-Structural Lumber, fire Retardant Treatment by Pressure Process; American Wood Preservers Association.
- B. AWPAC27-Plywood, Fire Retardant Treatment by Pressure Process; American Wood Preservers Association
- C. AWPB-American Wood Preservers Bureau.
- D. Department of Defense (DOD), Military Specification: MIL-L-19140E Lumber and Plywood, Fire Retardant Treated.

**1.3 SUBMITTALS**

- A. Wood Treatment Data:
  - 1. Submit certification from treating plant stating chemicals and process used and net amount of preservatives retained are in conformance with specified standards.
  - 2. Submit chemical treatment manufacturer's instructions for handling, storing, installation, and finishing of treated materials.
  - 3. Water-Borne Treatment: Include statement that moisture content of treated materials was reduced to levels indicated before shipment to project site.
  - 4. Fire-Retardant Treatment: Include certification by treating plant that treatment material complies with specified standard and other requirements.

**1.4 QUALITY ASSURANCE**

- A. Wood treatment shall comply with the Florida Building Code and Florida Fire Prevention Code.

**1.5 WARRANTY**

- A. Treated Wood: Provide manufacturer's standard lifetime warranty.

## PART 2 PRODUCTS

### 2.1 MATERIALS

#### A. General:

1. Where lumber or plywood is specified to be treated, comply with applicable requirements of AWPB Standards C2, Lumber, and C9, Plywood and of AWPB Standards listed.
2. Mark each treated item with AWPB Quality Mark Requirements.
3. Pressure-treat aboveground items with water-borne preservatives to comply with AWPB LP2.
4. After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 percent or less and plywood to a moisture content of 15 percent or less.
5. Treat indicated items and the following:
  - a. Wood cants, nailers, curbs, blocking, stripping, and similar members in connection with roofing, windows, flashing, vapor barriers, and waterproofing.
  - b. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
6. Pressure-treat wood members subject to contact with fresh water with water-borne preservatives for ground contact use complying with AWPB LP22.
7. Complete fabrication of treated items before treatment, where possible.
9. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

#### B. Preservative Pressure Treatment:

1. Toxicity/IEQ: Products containing chromium will not be permitted. Products containing arsenic will not be permitted.
2. Waterborne Wood Preservatives;
  - a. Wood products shall be treated with waterborne wood preservatives conforming to AWPB Standards P5, excluding those which contain arsenic and/or chromium.
  - b. Pressure treatment of wood products shall conform to the requirements of AWPB Standards U1 and T1
  - c. Retention of Preservatives:
    - 1) Moderate service conditions (weather exposure): 0.25 pounds per cubic foot (oxide basis)
    - 2) Severe conditions (constant contact with ground or water): 0.40 pounds per cubic foot (oxide basis)
3. Borate-based Preservative: Impregnate lumber with preservative treatment conforming to AWPB Standard P18

#### C. Fire Retardant Treatment

1. Toxicity/IEQ: Fire-retardant-treated wood products shall be free of halogens, sulfates, ammonium phosphate and formaldehyde.

2. Fire Retardant Formulations:

- a. Wood products shall be treated with fire retardants conforming to AWPA Standard P17
- b. Fire retardant treatment of wood products shall conform to the requirements of AWPA Standard U1, Commodity Specification H and AWPA Standard T1, Section 8.8

**PART 3 - EXECUTION**

3.1 SITE ENVIRONMENTAL PROCEDURES

- A. As specified in Division-1 and Section 06 10 00, Rough Carpentry.

3.2 APPLICATION

- A. Place treated lumber and plywood as indicated and detailed on the Drawings.
- B. Provide inspection access panels for annual inspection of the condition of the structure and connectors per Florida Building Code.

**END OF SECTION 06 07 00**



**SECTION 06 10 00****ROUGH CARPENTRY****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Definition: Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated.
- B. Types of work in this section include, but are not limited to, the following types of rough carpentry:
  - 1. Nailers
  - 2. Blocking
  - 3. Shims
  - 4. Grounds
  - 5. Construction Panels
- C. Related Sections: Wood Cabinets and Casework are specified in Section 06 40 00

**1.2 SUBMITTALS**

- A. Wood Treatment Data: Submit chemical treatment manufacturer's instructions for handling, storing, installation and finishing of treated material.
- B. Preservative Treatment: For each type specified, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained and conformance with applicable standards.
- C. For water-borne treatment, include statement that moisture content of treated materials was reduced to levels indicated prior to shipment to project site.

**1.3 PROJECT HANDLING**

- A. Delivery and storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar material.
  - 1. For lumber and plywood pressure treated with water-borne chemicals, provide sticker between each course to provide air circulation.

**1.4 PROJECT CONDITIONS**

- A. Coordination: Fit rough carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of nailers, blocking, grounds and similar supports to allow attachment of other work.

## **PART 2 - PRODUCTS**

### **2.1 LUMBER, GENERAL**

- A. Lumber Standards: Manufacture lumber to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
- B. Inspection Agencies: Inspection agencies and the abbreviations used to reference with lumber grades and species include the following:
  - 1. SPIB - Southern Pine Inspection Bureau
  - 2. WCLIB - West Coast Lumber Inspection Bureau
  - 3. WWPA - Western Wood Products Association
- C. Grade Stamps: Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
- D. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20, for moisture content specified for each use.
- E. Provide dressed lumber, S4S, unless otherwise indicated.
- F. Provide seasoned lumber with 19% maximum moisture content at time of dressing and shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.

### **2.2 MISCELLANEOUS LUMBER**

- A. Provide all necessary wood blocking (or as directed by Architect) to receive all architectural woodwork shelving standards, toilet accessories, and miscellaneous equipment panels.
- B. Provide wood for support of attachment of other work including bucks, nailers, blocking, grounds, and similar members. Provide lumber of sizes indicated, worked into shapes shown, and as follows:
  - 1. Moisture Content: 19% maximum for lumber items not specified to receive wood preservative treatment.
  - 2. Grade: Standard Grade light framing size lumber of any species or board size lumber as required. No. 3 Common or Standard grade boards per WCLIB or WWPA rules or No. 3 boards per SPIB rules.

### **2.3 CONSTRUCTION PANELS**

- A. Construction Panel Standards: Comply with PS 1 "U. S. Product Standard for Construction and Industrial Plywood" for plywood panels and, for products not manufactured under PS 1

provisions, with American Plywood Association (APA) "Performance Standard and Policies for Structural-Use Panels", Form No. E445.

- B. Trademark: Factory-mark each construction panel with APA trademark evidencing compliance with grade requirements.
- C. Plywood Backing Panels: For mounting electrical or telephone equipment, provide fire-retardant treated plywood panels with grade designation, APA C-D PLUGGED INT with exterior glue, in thickness indicated, or, if not otherwise indicated, not less than 1/2".

## 2.4 MISCELLANEOUS MATERIALS

- A. Fasteners and Anchorages: Provide size, type, material and finish as indicated and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommending nails.
- B. Provide fasteners and anchorages with a hot-dip zinc coating (ASTM A 153) where rough carpentry work is exposed to areas of high relative humidity.

## 2.5 WOOD TREATMENT BY PRESSURE PROCESS

- A. Preservative Treatment: Where lumber or plywood is indicated as "P-T" or "Treated," or is specified herein to be treated, comply with applicable requirements of AWPB Standards C2 (Lumber) and C9 (Plywood) and of AWPB Standards listed below. Mark each treated item with the AWPB Quality Mark Requirements.
- B. Pressure-treat aboveground items with water-borne preservatives to comply with AWPB LP-2. After treatment, kiln-dry lumber and plywood to maximum moisture content, respectively, of 19% and 15%. Treat indicated items and the following:
  - 1. Wood nailers, curbs, blocking, and similar members in contact with vapor barriers and waterproofing.
  - 2. Wood blocking, stripping, and similar concealed members in contact with masonry or concrete.
- C. Complete fabrication of treated items prior to treatment, where possible. If cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment and to comply with AWPB M4. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.

- B. Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.
- C. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes.
- D. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood. Pre-drill as required.

### 3.2 WOOD GROUNDS, NAILERS AND BLOCKING

- A. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
- B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated.
  - 1. Build into masonry during installation of masonry work.
  - 2. Where possible, anchor to formwork before concrete placement.
- C. Provide permanent grounds of dressed, preservative treated, key-beveled lumber not less than 1-1/2" wide and of thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.

### 3.3 INSTALLATION OF CONSTRUCTION PANELS

- A. General: Comply with applicable recommendations contained in Form No. E 30D, "APA Design/Construction Guide - Residential & Commercial," for types of construction panels and applications indicated. Screw to supports.

**END OF SECTION 06 10 00**

**SECTION 06 40 00****ARCHITECTURAL WOODWORK****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Items of architectural woodwork include, but are not limited to, the following:
  - 1. Casework (base and sink cabinets) with adjustable shelves, doors and drawer units as indicated.
  - 2. Work Surfaces with Backsplashes and Bracket Supports as indicated.
  - 3. Solid-Surface Countertops
  - 4. Storage Shelving and Shelving Units
  - 5. Wall Cabinets with doors and adjustable shelves
  - 6. Desk Units
  - 7. Hardware for casework, including locks and magnetic catches
  - 8. Plastic laminate finishes
  - 9. Sealant and miscellaneous woodwork specialties

**1.2 RELATED WORK**

- A. Rough Carpentry is specified in Section 06 10 00.
- B. Joint Sealants are further specified in Section 07 92 00.
- C. Door Hardware is specified in Section 08 71 00.
- D. Owner-Furnished Equipment Installation is specified in Section 11 31 00
- E. Mechanical and Electrical Work are specified in Divisions 21, 22, 23 and 26 respectively.

**1.3 SUBMITTALS**

- A. Shop Drawings: Submit to the Architect complete shop drawings on all items showing details, materials, location in building and installation requirements.
- B. Brochures: Submit to the Architect manufacturer's descriptive literature of all items not fabricated by the woodwork manufacturer.
- C. Samples:
  - 1. Submit to the Architect sample base cabinet built to guidelines and approved shop drawings for approval prior to starting work.
  - 2. Submit samples of plastic laminate from manufacturer's full range of colors for color selection by the Architect. Where plastic laminate colors are indicated on the Drawings, samples shall be for verification purposes.

## 1.4 QUALITY ASSURANCE

- A. "Quality Standards" of the Architectural Woodwork Institute shall apply and by reference are made a part of this specification.
- B. All work shall conform to "Premium" grade as defined in the latest edition of the AWI "Quality Standards" unless detailed as a higher grade.
- C. Quality Standard: Unless otherwise indicated, comply with WIC's "Manual of Millwork" for grades of interior architectural woodwork, construction, finishes, and other requirements.
  - 1. Provide WIC-certified compliance certificate indicating that woodwork complies with requirements of grades specified.
  - 2. Provide WIC-certified compliance certificate for installation.
- D. Competence: The approved woodwork manufacturer must have a reputation for doing satisfactory work on time and shall have completed comparable work.
- E. Single Source Responsibility: Provide woodwork with tops manufactured or furnished by same woodwork manufacturer for single responsibility.

## 1.5 DELIVERY, STORAGE AND HANDLING

- A. Protect Woodwork during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Do not deliver woodwork until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If due to unforeseen circumstances woodwork must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

## 1.6 FIELD DIMENSIONS

- A. Contractor is responsible for all details and dimensions not controlled by job conditions.
- B. Show all required field measurements on shop drawings.

# PART 2 - PRODUCTS

## 2.1 WOOD

- A. Plywood:
  - 1. Body core members, countertops, backs, drawers and pigeonhole partitions shall be exterior grade plywood, minimum 5-ply, conforming to U.S. Department of Commerce PS 1-83, bearing APA grade mark of A-B or better.
  - 2. All casework shall be of exterior grade plywood. All countertops at sinks shall be of exterior grade plywood. Particleboard and hard board will not be allowed.

- B. Hardwood: Grade I, Kiln-dried to 6-12% moisture content at fabrication. Select for stability, configuration and strength.

## 2.2 LAMINATED PLASTIC

- A. All laminated plastic shall meet NEMA Standards LD3, for textured or suede finishes. Colors, types and locations for specific types of laminated plastic sheet finish shall be as indicated on the Drawings.
- B. Types of Laminated Plastic sheet shall be as follows:
  - 1. Grade 02 – Solid Surface Sheet, 0.48-inch nominal thickness
  - 2. Grade 12 – Natural Grain Sheet, 0.035-inch nominal thickness
  - 3. Grade 20 – Natural Grain Sheet, 0.027-inch nominal thickness
- C. Basis of Design Manufacturer: Formica Brand (no substitutions unless approved by the Architect in writing)

## 2.3 HARDWARE

- A. Hinges for 3/4" Thick Doors: Brushed chrome-plated steel, five knuckle 0.088 gage, wrap-around type allowing 270-degree swing at end of casework unit mounted with minimum four, plated #8 self-taping screws per hinge leaf. For doors, up to and including 48 inches high, provide two hinges.
- B. Pulls: Surface-mounted type, Stanley #4484-US26D, EPCO #MC-402-US26D, or equivalent.
- C. Door Catches: For doors, up to and including 38 inches high, provide one heavy-duty magnetic type catch, slotted for adjustment. Attach with screws.
- D. Surface Bolts: Provide for inactive doors in cabinet door pairs with locks from one of the following:
  - 1. Ives #40 x US26D x 6 inches.
  - 2. Quality #B-6 x US26D x 6 inches.
  - 3. Baldwin #0324 x US26D x 6 inches.
- E. End Supported Shelf Standards: KV #255 AL secured with No.5 flathead screw in place of the manufacturer's standard screw/nail, or Stanley #1805 unfinished.
- F. Shelf End Support Clips: Zinc-plated as manufactured by KV #256ZC, or Stanley #1806-US2C.
- G. Fasteners and Anchors: Wall or floor anchors, screws for joining adjacent cabinets and top fasteners.
- H. Sealant: General Electric Silicone Sealant or equivalent. Refer to Section 07 92 00, "Joint Sealants" for other requirements.

## 2.4 FABRICATION

- A. Details shall conform to AWI (flush overlay design) and or as shown on drawings. Omit dust covers.
- B. Base Cabinets:
  - 1. Backs: 1/4-inch thick plywood, plastic laminate finish.
  - 2. Sides: Finished exposed end panels to cabinet assemblies in field consisting of an applied 3/4-inch thick end panel with high pressure plastic laminating. Finish as follows:
    - a) Interior Behind Doors: Plastic Laminate.
    - b) Exposed Exterior End, Front Faces and Interiors: Plastic Laminate.
    - c) Unexposed Exterior End: Phenolic overlay applied with 200 psi at 200-degree F.
  - 3. Bases: Provide each base cabinet with its own unit base, factory applied. Continuous bases are not acceptable.
- C. Acrylic Solid Surface Countertops: Provide solid surface countertops as manufactured by Formica, Corian, or Architect-approved equivalent manufacturer who products comply with the following:
  - 1. Width: 30-inches unless indicated otherwise on the Drawings
  - 2. Thickness: 1/2-inch unless indicated otherwise on the Drawings
  - 3. Tensile Strength (MPa): 56.3 when tested in accordance with ASTM D 638
  - 4. Tensile Modulus of Elasticity (GPa): 11.7 when tested in accordance with ASTM D 638
  - 5. Flexural Modulus of Elasticity ((GPa): 9.10 when tested in accordance with ASTM D 790
  - 6. Flexural Strength (MPa): 64.3 when tested in accordance with ASTM D 790
  - 7. Barcol Hardness: 65 when tested in accordance with ASTM D 2583
  - 8. Linear Thermal Expansion: Pass when tested in accordance with ASTM E 228-95
  - 9. Radiant Heat Resistance: 600+ seconds – Pass when tested in accordance with NEMA LD3-3.10
  - 10. Water Absorption: 0.019% when tested in accordance with ASTM D 570
- D. Plastic Laminate Counter Tops, Backsplashes and End Splashes: Plywood, minimum 3/4-inch thick construction. Provide where indicated on the Drawings. Finishes as follows:
  - 1. Counter Top Horizontal Surface: plastic laminate.
  - 2. Backsplash Vertical Surface: Plastic laminate to match laminate selected for horizontal surface.
  - 3. Exposed Edges: Plastic laminate.
  - 4. Backing Sheet: Plastic laminate.
- E. Wall Cabinets:
  - 1. Construction: Similar to base cabinets.
  - 2. Back, sides, top and bottom faces (both sides), front faces, exposed ends and underside of bottom: Plastic laminate.
  - 3. Recessed tops and bottoms are not acceptable.



4. Clear openings for wall cabinets: As indicated on the Drawings. Clad all surfaces with plastic laminate.
- F. Doors for Base and Wall Cabinets: 3/4-inch thick plywood with plastic laminate finish on both faces, swing-hinged, full overlap type.
- G. Leveling Devices: Furnish each base cabinet with a minimum of four approved, easily accessible, adjustable leveling devices so designed to easily allow the City re-adjustment of the casework to achieve proper operation of doors and drawers after warranty period.
- H. Countertop Supports: For non-stainless steel countertops, provide "FastCap", Model #SB-15x18 as manufactured by SpeedBrace, unless otherwise indicated on the Drawings. Finish shall be as scheduled on the Drawings. For stainless steel countertops, provide grey hardware brackets as manufactured by SpeedBrace.
- I. Adjustable Shelves: Provide notched ends of shelves to fit around adjustable shelf standards.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Coordinate, locate, and install wood grounds and back bracings in wall construction prior to installation of casework items.
- B. Rough-in: Provide holes in casework for plumbing and electrical work using templates furnished by supplier of plumbing fixtures and electrical devices.
  1. Neatly cut and accurately coordinate locations and dimensions with other trades.
  2. Provide access panels where necessary.
- C. Install casework plumb, level, true and straight with no distortions. Shim as required using concealed shims. Where casework abuts other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips and moldings as required, and in finish to match casework face.
- D. Anchor casework securely in place with concealed (when doors and drawers are closed) fasteners, anchored into structural support members of wall construction. Comply with manufacturer's instructions for support of units.
- E. Securely attach countertops to base units. Spline and glue joints in countertops; provide concealed mechanical clamping of joint. Smooth cut edges and coat with waterproof coating or adhesive.
- F. Complete hardware installation and adjust doors and drawers for proper alignment and smooth operation.

#### **3.2 CLEANING AND PROTECTION**

- A. Repair or remove and replace defective work as directed upon completion of installation.
- B. Clean exposed and semi-exposed surfaces, touch-up finish as required. Remove and refinish damaged or soiled areas.
- C. Protection: Provide final protection and maintain conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

**END OF SECTION 06 40 00**

## **SECTION 07 21 00**

### **THERMAL INSULATION**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. Extent of each type of thermal insulation work is shown on the drawings.
- B. Applications of thermal insulation include, but are not limited to, the following:
  - 1. Rigid insulation at interior locations
  - 2. Mineral fiber (acoustical) insulation blankets
  - 3. Foil-faced rigid insulation at exterior walls

##### **1.2 RELATED WORK**

- A. Concrete unit masonry is specified in Division-4
- B. Gypsum board partitions to receive acoustical insulation blankets are specified in Section 09 21 16

##### **1.3 QUALITY ASSURANCE**

- A. Fire Ratings: Comply with fire-resistance and flammability ratings as shown and specified. Comply with governing codes and regulations.
- B. Thermal Conductivity: The thickness shown for each material is for the thermal conductivity, k-value at 75 degrees F, specified for each material. Provide adjusted thickness as directed for the equivalent use of material having a different thermal conductivity.

##### **1.4 SUBMITTALS**

- A. Manufacturer's Data: Submit manufacturer's specifications and installation instructions for each type of insulation required. Include data substantiating that materials comply with specified requirements.

##### **1.5 PRODUCT HANDLING**

- A. Protection from Deterioration: Do not allow insulation materials to become wet or soiled. Comply with manufacturer's recommendations for handling, storage and protection during installation. Protect plastic insulation from exposure to sunlight.

- B. Deliver insulation materials in their original unopened packages and store in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.
- C. Mineral fiber blankets shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

## 1.6 JOB CONDITIONS

- A. Examination of Substrate: Examine the substrate and the conditions under which the insulation work is to be performed. Do not proceed with the insulation work until unsatisfactory conditions have been corrected.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Provide insulation materials that provides the R-values indicated on the Drawings or required by the Florida Building Code, latest edition, including all amendments, whichever is the more stringent.
- B. Foil-Faced Rigid Insulation: Foil-Faced, Polyisocyanurate Board Insulation: ASTM C 1289, Type I, Class 1 or 2, with maximum flame-spread and smoke-developed indices of 75 and 450, respectively, based on tests performed on unfaced core on thicknesses up to 4-inches.
- C. Mineral-fiber blanket insulation consisting of fibers manufactured from glass, slag wool, or rock wool. Provide Faced Mineral-Fiber Blanket Insulation complying with ASTM C 665, Type III, Class A, Category 1, faced with foil-scrim-kraft, or foil-scrim membrane.
- D. Sound Insulation: Mineral fiber blanket, surfaced, equal to U.S. Gypsum "Thermafiber Sound Attenuation Blanket", or Manville "Sound Attenuation Blankets". Provide in thickness as indicated on the Drawings.
- E. Mechanical Anchors: Where required, type and size shown or, if not shown, as recommended by the insulation manufacturer for the type of application shown and condition of substrate.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. General: Comply with manufacturer's instructions for the specific conditions of installation in each case including method of support or anchorage to the substrate as appropriate for each application indicated. If printed instructions are not available, or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.

- B. Extend insulation full thickness as shown over entire surface to be insulated. Cut and fit tightly around obstructions and fill voids with insulation.
- C. Apply a single layer of insulation of the thickness indicated, or the required thickness for the thermal value indicated or required to make-up the total thickness.
- D. Sound Insulation: Install prior to gypsum board application in accordance with manufacturer's printed installation instructions.

**END OF SECTION 07 21 00**

**SECTION 07 22 00****ROOF INSULATION****PART 1 - GENERAL****1.1 SECTION INCLUDED**

- A. Extent of roof insulation work is shown on the drawings.
- B. Application of roof insulation work includes, but is not limited to, tapered, rigid closed-cell polyisocyanurate insulation board with separate protection board (applied with adhesive) as indicated on the Drawings as part of a Class A roof assembly.
- C. Related Work:
  - 1. Modified Bituminous SBS Membrane Roofing is specified in Section 07 52 00
  - 2. Flashing and sheet metal associated with roofing work are specified in Section 07 62 00
  - 3. Flexible Flashing is specified in Section 07 65 00
  - 4. Roof accessories are specified in Section 07 72 00

**1.2 QUALITY ASSURANCE**

- A. Roof insulation shall be compatible with the requirements for a Class "A" roof assembly in accordance with ASTM E 108 or UL 790.
- B. Fire Ratings: Roof insulation shall have a Class A Rating or comply with the latest edition of the Florida Building Code for required fire-resistance and flammability ratings, whichever is the more stringent requirement.
- C. Wind Resistance: Comply with the latest edition of the Florida Building Code for required wind up-lift resistance requirements or FM Global whichever is the more stringent.
- D. Thermal Conductivity: Provide nominal 3-inch thickness required to produce an average minimum of R-19. The thickness specified is for the thermal conductivity, k-value at 75 degrees F. Provide adjusted thickness as directed for the equivalent use of material having a different thermal conductivity.

**1.3 SUBMITTALS**

- A. Manufacturer's Data: Submit manufacturer's specifications and installation instructions for roof insulation required. Include data substantiating that materials comply with specified requirements.

**1.4 PRODUCT HANDLING**

- A. Protection from Deterioration: Do not allow insulation materials to become wet or soiled.

- B. Comply with manufacturer's recommendations for handling, storage and protection during installation.

## 1.5 PROJECT CONDITIONS

- A. Examination of Substrate: Examine the substrate and the conditions under which the insulation work is to be performed. Do not proceed with the insulation work until unsatisfactory conditions have been corrected.

## PART 2 - PRODUCTS

### 2.1 INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C1289, Type II, felt or glass-fiber mat facer on both major surfaces. Provide factory-tapered insulation boards fabricated to slope of 1/4-inch per 12 inches, unless otherwise indicated.
  - 1. Conditioned R-value at 75 degrees F mean temperature: R-19 minimum average in accordance with ASTM C 518.
  - 2. Compressive Strength: 25-psi minimum (ASTM D 1621).
  - 3. Core Flame Spread: 25 or less in accordance with ASTM E 84.
- B. Sizes: Provide manufacturer's standard lengths and widths not to exceed board sizes of 48-inches x 48-inches. Provide in thickness to provide minimum average insulating value specified.
- C. Manufacturer: Provide rigid polyisocyanurate foam insulation as manufactured by one of the following:
  - 1. Rmax, Inc.
  - 2. Johns-Manville
  - 3. Celotex.
  - 4. Hunter (Basis of Design)

### 2.2 INSULATION ACCESSORIES

- A. Asphalt Primer: Over concrete decks, ASTM D 41.
- B. Fasteners: Provide factory-coated steel fasteners and metal plates meeting corrosion-resistance provision in FMG 4470, designed for fastening roof insulation to substrate, and acceptable to the roofing system manufacturer. Manufacturer shall test fasteners for required pullout strength and compatibility with deck type and roofing products used. Provide 1-3/8" diameter x 30-gage sheet metal caps.
- C. Cold Fluid-Applied Adhesive: Manufacturer's standard, formulated to adhere protection board to roof insulation.
- D. Insulation Cant Strips: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board.

- E. Protection Board: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board, 1/2-inch thick.

### **PART 3 - EXECUTION**

#### **3.1 PREPARATION**

- A. Verify work done by other trades meets the following requirements:
  - 1. Roof curbs, nailers, equipment supports, vents and other items penetrating the roof are properly attached to substrate and otherwise properly prepared.
  - 2. Concrete surfaces are properly primed and free of fines, edges and voids.

#### **3.2 INSTALLATION**

- A. General: Comply with manufacturer's instructions for the specific conditions of installation in each case including method of anchorage to the substrate as appropriate for the application indicated. If printed instructions are not available, or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.
- B. Extend insulation full thickness as shown over entire surface to be insulated. Cut and fit tightly around obstructions and fill voids with insulation.
- C. Apply a single layer of insulation of the thickness indicated or the required thickness for the thermal value and slope indicated, unless otherwise shown or required to make-up the total thickness. Where overall insulation thickness is 1-1/2 inches or greater, install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.
- D. Install tapered insulation conforming to slopes indicated.
- E. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes greater than 45 degrees.
- F. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- G. Mechanically Fastened and Adhered Insulation: Install each layer of insulation and secure first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type. Install subsequent layers of insulation in a cold fluid-applied adhesive.
- H. Install protection boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Loosely butt protection boards together and mechanically fasten to roof deck.

#### **3.3 CLEANING**



- A. Remove all trash and debris from roof insulation surface prior to the application of the roofing membrane.

**END OF SECTION 07 22 00**

**SECTION 07 52 00****MODIFIED BITUMINOUS SBS MEMBRANE ROOFING****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Section includes styrene-butadiene-styrene (SBS) modified bituminous membrane roofing, vapor retarder, and roof insulation.
- B. Related Work:
  - 1. Thermal Insulation is specified in Section 07 21 00
  - 2. Sheet Metal Flashings are specified in Section 07 62 00
  - 3. Roof Accessories are specified in Section 07 72 00
  - 4. Joint Sealants are specified in Section 07 92 00

**1.2 PRE-INSTALLATION MEETING**

- A. Meet with the City, Architect, City's insurer, if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
  - 1. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
  - 2. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
  - 4. Review structural loading limitations of roof deck during and after roofing.
  - 5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
  - 6. Review governing regulations and requirements for insurance and certificates if applicable.
  - 7. Review temporary protection requirements for roofing system during and after installation.
  - 8. Review roof observation and repair procedures after roofing installation.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product used in the roofing assembly
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work, including:
  - 1. Base flashings and membrane terminations.

2. Tapered insulation, including slopes.
3. Crickets, saddles, and tapered edge strips, including slopes.
4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

C. Samples for Verification: For the following products:

1. Cap sheet, of color required.
2. Flashing sheet, of color required.
3. Aggregate surfacing material in gradation required.
4. Walkway pads

D. Informational Submittals

1. Qualification Data: For Installer.
2. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article. Submit evidence of complying with performance requirements.
3. Product Test Reports: For components of membrane roofing system, for tests performed by manufacturer and witnessed by a qualified testing agency.
4. Field quality-control reports.
5. Sample Warranties: For manufacturer's special warranties.

E. Closeout Submittals: Maintenance data for roofing system; include in maintenance manuals

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is UL listed and FM Global approved for membrane roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
  1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

- D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

## 1.6 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and warranty requirements.

## 1.7 WARRANTY

- A. Special Warranty: Manufacturer's NDL Roof Guarantee to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
  - 1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, substrate board, roofing accessories, and other components of roofing system.
  - 2. Warranty Period: 20 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Basis-of-Design Product: Provide modified bituminous SBS membrane roofing system as manufactured by GAF; Product No. GTH-30456 or subject to compliance with requirements, equivalent roofing system approved by the Architect from one of the following:
  - 1. John Manville
  - 2. Firestone
  - 3. Soprema, Inc.
  - 4. Garland
- B. Source Limitations: Obtain components including roof insulation fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing and base flashings shall withstand uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction as required by the Florida Building Code, latest Edition including all amendments. Roofing and base flashings shall remain watertight.
- B. Provide a roofing system that carries a Miami-Dade Notice-of-Acceptance (NOA) for wind uplift in accordance requirements of the Florida Building Code.

- C. Energy Performance: Roofing system shall have an initial solar reflectance of not less than 0.70 and an emissivity of not less than 0.75 when tested in accordance with CRRC-1.
- D. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

## 2.3 ROOFING MATERIALS

- A. Insulation: Roofing Manufacturer's "Energy Guard" Polyiso Roof Insulation, 1-1/2-inch thick complying with requirements of ASTM C 1289; apply in one layer with adhesive in accordance with the roofing Manufacturer's published recommendations
- B. Roof Board: Roofing Manufacturer's "Securock" roof board, minimum 1/4-inch-thick, complying with ASTM C 1278; apply in one layer with adhesive in accordance with the roofing Manufacturer's published recommendations
- C. Base Ply Sheet: Roofing Manufacturer's RUBEROID HW 25 Smooth complying with ASTM D 6163; apply in two (2) plies by heat-welding for fully-adhered base sheet in accordance with the roofing Manufacturer's published recommendations.
- D. Surface Membrane: Roofing Manufacturer's RUBEROID HW Granule FR complying with ASTM D 6164; apply in one ply by heat-welding for fully-adhered surface membrane in accordance with the roofing Manufacturer's published recommendations.
- E. Flashing Membrane: Roofing Manufacturer's RUBEROID HW 25 Smooth (2X25H) complying with ASTM D 6163; apply in one ply by heat-welding for fully-adhered flashing condition in accordance with the roofing Manufacturer's published recommendations.

## 2.4 AUXILIARY ROOFING MATERIALS

- A. Asphalt Primer: ASTM D 41
- B. Roofing Asphalt: ASTM D 312, Type IV or as recommended by roofing system manufacturer for application.
- C. Cold-Applied Adhesive: Roofing system manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with roof insulation and roof board.
- D. Mastic Sealant: Polyisobutylene, plain or modified bitumen; non-hardening, non-migrating, non-skinning, and non-drying.

## 2.5 WALKWAYS

- A. Walkway Pads: Polymer-modified, reconstituted rubber pads with slip-resistant, textured surface, manufactured as a traffic pad for foot traffic and acceptable to the roofing system manufacturer; 1/2-inch thick minimum. Pad Size as indicated on the Drawings.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:
  - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
  - 2. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section "Steel Roof Deck"
  - 3. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
  - 4. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method in accordance with ASTM D 4263.
  - 5. Verify that concrete-curing compounds that impair adhesion of roofing components to roof deck have been removed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with roofing system manufacturer's published instructions.
- B. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.
- C. Roof Board Installation: Install roof board in accordance with the roofing manufacturer's published recommendations. Install with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.
- D. Install insulation with long joints of insulation in a continuous straight line, with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations. Install insulation under area of roofing to achieve required thickness.
- E. Install roof board in accordance with the roofing manufacturer's published instructions.
- F. Install roofing system in accordance with the roofing system manufacturer's published instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."

### 3.3 FLASHING INSTALLATION

- A. Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates in accordance with the roofing system manufacturer's published instructions

#### 3.4 WALKWAY INSTALLATION

- A. Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size, in accordance with walkway pad manufacturer's written instructions. Set walkway pads in cold-applied adhesive.

#### 3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and to furnish reports to the Architect.

#### 3.6 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When construction that remains does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to the Architect and the City.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and in accordance with warranty requirements.

**END OF SECTION 07 52 00**

**SECTION 07 62 00****SHEET METAL FLASHING AND TRIM****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Work of this section includes, but is not limited to, stainless steel metal flashings, aluminum parapet cap flashing (copings), over-flow scuppers, combination stucco stop with reglet flashing, and miscellaneous sheet metal accessories, trim, and associated fasteners.
- B. Related Work:
  - 1. Rough carpentry is specified in Section 06 10 00
  - 2. Modified Bituminous Membrane Roofing is specified in Section 07 52 00
  - 3. Roof Accessories are specified in Section 07 72 00
  - 4. Joint sealers are specified in Section 07 92 00.
  - 5. Plumbing work associated with flashing for vent stacks is specified in Division-22

**1.2 SUBMITTALS**

- A. Submit shop drawings showing assembly, erection, and installation methods for all flashing items indicated on the Drawings.
- B. Submit fabricators standard details, and installation manuals.

**1.3 QUALITY ASSURANCE**

- A. All flashing and sheet metal shall be fabricated and installed in accordance with SMACNA latest standard.

**1.4 WARRANTY**

- A. Furnish Owner a two-year warranty covering materials and workmanship for all flashing work in conjunction with warranty of roofing system.
- B. Warranty shall cover watertight integrity of flashing work including repair and replacement of components or systems that are deemed faulty or in disrepair by the Owner during warranty period. Items deemed faulty or in disrepair shall be repaired or replaced at no cost to the Owner.
- C. Definition of faulty components or system in disrepair includes, but is not limited to the following:
  - 1. Defects in manufacture and installation
  - 2. Defects in materials
  - 3. Leaks of any kind



## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A653, G90 coating designation; structural quality, mill phosphatized for field painting
- B. Stainless Steel Sheet: ASTM A240, Type 304; finish: 2D, dull, cold-rolled
- C. Aluminum: ASTM B 209, alloy as standard with the manufacturer for finish required, with temper as required to suit forming operations and performance required with smooth, flat surface; 0.050 inch thick;
- D. Lead: ASTM B 749, Type L51121, copper-bearing sheet lead, minimum 4 pounds per square foot (0.0625-inch thick), except not less than 6 pounds per square foot (0.0937-inch thick) for welding.

### 2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.
- B. Felt Underlayment: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, non-perforated. Slip Sheet: Rosin-sized paper, minimum 3-lb/100 sq. ft.
- C. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape.
- C. Elastomeric Sealant: ASTM C 920, silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- D. Fasteners: Same metal as flashing and sheet metal or, other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened. Types: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
  - 1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
  - 2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
  - 3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
- G. Bituminous Coating: FS TT-C-494 or SSPC - Paint 12, solvent type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.
- H. Mastic Sealant: Polyisobutylene; non-hardening, non-skinning, non-drying, non-migrating

sealant.

- I. Epoxy Seam Sealer: 2-part non-corrosive metal seam cementing compound recommended by metal manufacturer for exterior non-moving joints.
- J. Adhesives: Type recommended by flashing sheet manufacturer for waterproof/weather-resistant seaming.
- K. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size and gauge required for performance.
- L. Elastic Flashing Filler: Closed-cell polyethylene or other soft closed-cell material recommended by flashing manufacturer as filler for expansion joints to ensure movement with minimum stress on flashing sheet.
- M. Roofing Cement: ASTM D 2822, asphaltic.

## 2.3 FABRICATED UNITS - GENERAL

- A. General Metal Fabrication: Shop-fabricate work to greatest extent possible. Comply with details shown, and with applicable requirements of SMACNA "Architectural Sheet Metal Manual" and other recognized industry practices.
  - 1. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. Form work to fit substrates.
  - 2. Comply with material manufacturer instructions and recommendations for forming material.
  - 3. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels indicated with exposed edges folded back to form hems.
- B. Seams: Fabricate non-moving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- C. Expansion Provisions: Where lapped or bayonet-type expansion provisions in work cannot be used, or would not be sufficiently water/weatherproof, form expansion joints of intermeshing hooked flanges, not less than 1" deep, filled with mastic sealant (concealed within joints).
- D. Sealant Joints: Where movable, non-expansion type joints are indicated or required for proper performance of work, form metal to provide for proper installation of elastomeric sealant, in compliant with SMACNA standards.
- E. Separations: Provide for separation of metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by manufacturer/fabricator.

## 2.4 COPINGS (CAP FLASHING)

- A. General: Manufactured metal parapet coping system consisting of metal coping cap in section lengths not exceeding 12 feet; concealed anchorage with shop-fabricated corner units, end cap units, concealed splice plates with finish matching coping caps, and trim and other accessories required for complete installation with no exposed fasteners.
  - 1. Provide units of type, metal and profile indicated, compatible with flashing.
- B. Formed Aluminum Sheet Coping Caps: Manufactured coping system consisting of aluminum sheet 0.050-inch thick or thickness as required to meet performance requirements.
  - 1. Surface: Smooth, flat finish
  - 2. Finish: 2-coat fluoropolymer; color as selected by the Architect from manufacturer's full range of color samples.
  - 3. Manufacturer: Provide copings as manufactured by one of the following, or Architect approved equivalent manufacturer:
    - a) Architectural Products, Inc.
    - b) Cheney Flashing Company
    - c) Peterson Aluminum Corporation

### **PART 3 - EXECUTION**

#### **3.1 INSPECTION**

- A. Examine substrates adjoining construction and conditions under which Work is to be installed. Do not proceed with the Work until unsatisfactory conditions have been corrected.

#### **3.2 INSTALLATION**

- A. General: Comply with SMACNA requirements unless indicated otherwise.
  - 1. Refer to Section 07 92 00, Joint Sealers, for sealant installation.
  - 2. Do not proceed with Work until substrate construction is completed.
- B. Forming:
  - 1. Accurately reproduce profiles and bends.
  - 2. Make intersections sharp, even, and true.
  - 3. Make plain surfaces free from buckles and waves with minimal joints.
  - 4. Reinforce Work as required for strength and appearance.
  - 5. Bend to minimum radius recommended by manufacturer with radius not less than metal thickness.
- C. Application:
  - 1. Make joints tight.
  - 2. Conceal nails and fasteners where possible.
  - 3. Do not use face nailing on exposed surfaces.

4. Secure exposed edges to underlying materials using clips or tab-edge strips.
5. Make seams in direction of water flow.
6. Hem exposed edges 1/2 inch.
7. Perform cutting, fitting, punching for related work and provide necessary accessories.

D. Flashing:

1. Install to provide watertight protection as detailed.
2. Extend minimum 4 inches around corners.
3. Solder watertight three-way angles at corners.
4. Nail maximum 3 inch on centers unless clips or cleats are used.
5. Make continuous straight runs in maximum 24-foot lengths except where manufacturer has more stringent requirements.

E. Vent Pipe Flashing:

1. Flash and make watertight at roof with sheet lead flashing.
2. Extend minimum 8 inches from pipes in all directions and to top of vent pipe turning down into pipes.
3. Exercise extreme care to prevent rupturing flashing when turning into pipe and form to lay flat against interior of pipe to prevent blockage.

F. Separate dissimilar metals by painting with SSPC Paint 12 bituminous mastic or by using bitumen saturated and coated felt.

G. Specific Items: Refer to SMACNA Architectural Sheet Metal Specifications and comply with details indicated on Drawings.

H. Install copings in accordance with manufacturer's published instructions.

I. Pipe Flashing: Install flashing at all vent stack penetrations. Set in roofing cement and extend a minimum of 4" over roofing. Nail and cover with two plies of felt stripping.

### 3.3 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.
- B. Protection: Protect flashing and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of Substantial Completion.

**END OF SECTION 07 62 00**

## **SECTION 07 65 00**

### **FLEXIBLE FLASHING**

#### **PART 1 - GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Application of self-adhering sheet membrane flashing and associated surface preparation. Locations shall be as indicated on the Drawings.
- B. Related Work:
  - 1. Section 07 62 00 – Sheet Metal Flashing
  - 2. Section 07 92 00 – Joint Sealants
  - 3. Division - 8 Sections for Door and Window Assemblies indicated on the Drawings to receive flexible flashing

##### **1.2 SUBMITTALS**

- A. Comply with Section 01 33 00 - Submittal Procedures.
- B. Submit manufacturer's product data and application instructions.

##### **1.3 QUALITY ASSURANCE**

- A. Installer Qualifications: Use an experienced installer and adequate number of skilled personnel who are thoroughly trained and experienced in the application of self-adhesive membranes.
- B. Obtain self-adhesive flashing tape materials from a single manufacturer regularly engaged in manufacturing the product.
- C. Provide products which comply with all state and local regulations controlling use of volatile organic compounds (VOCs).

##### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Store materials in a clean, dry area in accordance with manufacturer's instructions.
- C. Store adhesives and primers at temperatures of 40o F and above to facilitate handling.
- D. Store membrane cartons on pallets.

- E. Do not store at temperatures above 90o F (32o C) for extended periods.
- F. Keep away from sparks and flames.
- G. Completely cover when stored outside. Protect from rain.
- H. Protect materials during handling and application to prevent damage or contamination.

## 1.5 ENVIRONMENTAL REQUIREMENTS

- A. Product not intended for uses subject to abuse or permanent exposure to the elements.
- B. Protect rolls from direct sunlight until ready for use.
- C. Allow a minimum of 24 hours for drying before installation after precipitation.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURER

- A. Provide flexible flashing from one of the following manufacturers:
  - 1. Carlisle SynTec, Inc.
  - 2. GAF Materials Corp.
  - 3. Grace Construction Products
  - 4. W.R. Meadows, Inc.
- B. Basis of Design Manufacturer: W.R. Meadows, Inc.

### 2.2 MATERIALS

- A. Rolled, Self-Adhering Sheet Flashing Membrane: 25 mils (0.635 mm) thick membrane consisting of self-adhesive rubberized asphalt membrane bonded to high density cross-laminated polyethylene carrier film, protected by release paper.
- B. Basis of Design Product: AIR SHIELD 25 MIL FLASHING TAPE by W. R. Meadows, Inc.
- C. Accessories:
  - 1. General: All accessory materials and flexible flashing shall be from the same manufacturer.
  - 2. Primer: Manufacturer's recommended water-based primer
  - 3. Pointing Mastic: Manufacturer's recommended mastic for sealing penetrations and terminations of flashing membrane
  - 4. Concrete Repair Materials: Manufacturer's recommended 5 and 20 Concrete Repair Mortars

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine surfaces to receive flashing tape. Notify architect if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.

### **3.2 SURFACE PREPARATION**

- A. Protect adjacent surfaces not designated to receive self-adhering flashing tape.
- B. Clean and prepare surfaces to receive membrane in accordance with manufacturer's instructions.
- C. Do not apply flashing tape to surfaces unacceptable to manufacturer.
- D. All surfaces must be clean, smooth, and dry and must be clean of oil, dust, and excess mortar.
- E. Patch all holes and voids and smooth out any surface misalignments.
- G. Concrete surfaces must be cured for a minimum of 14 days.
- H. If curing compounds are used, they must be clear, resin-based, and without oil, wax, or pigments.

### **3.3 APPLICATION**

- A. Cut flashing tape to desired length.
- B. Prime surfaces to be covered in one working day with applicable primer.
- C. Peel back the release paper to expose adhesive.
- D. Align the membrane and press into place with heavy hand pressure.
- E. Ensure laps are a minimum of 3-inches.
- F. Mechanically fasten the membrane at all vertical terminations using only smooth shank fasteners.
- G. Install the membrane so that the top membrane layer is over the bottom layer to ensure that all laps shed water.

### **3.4 PROTECTION**

- A. Cover sheet flashing as soon as possible. Do not leave it exposed to the sun or elements.

**END OF SECTION 07 65 00**

## **SECTION 07 72 00**

### **ROOF ACCESSORIES**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

A. Work of this Section includes, but is not limited to, the following roof accessories:

1. Roof curbs
2. Equipment supports.
3. Roof penetration seals.

B. Related Work:

1. Rough carpentry is specified in Section 06 10 00
2. Modified bituminous SBS membrane roofing is specified in Section 07 52 00
3. Sheet metal flashings are specified in Section 07 62 00
4. Joint sealants are specified in Section 07 92 00

##### **1.2 SUBMITTALS**

A. Product Data: For each product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.

C. Coordination Drawings: Roof plans drawn to scale and coordinating penetrations and roof-mounted items.

D. Samples: For each exposed finish for selection by the Architect.

##### **1.3 QUALITY ASSURANCE**

A. Standards: Comply with the following:

1. SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.
2. NRCA's "Roofing and Waterproofing Manual" details for installing units.

#### **PART 2 - PRODUCTS**

##### **2.1 MATERIALS**

A. Aluminum:



1. Sheet, ASTM B 209 for alclad alloy 3005H25 or alloy and temper required to suit forming operations, with mill finish, unless otherwise indicated.
  2. Extrusions: ASTM B 221 alloy 6063-T52 or alloy and temper required to suit structural and finish requirements, with mill finish, unless otherwise indicated.
- B. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, complying with AWPA C2, not less than 1-1/2 inches thick.
- C. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other non-corrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
- D. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, or PVC; or flat design of foam rubber, sponge neoprene, or cork.
- E. Bituminous Coating: SSPC-Paint 12, solvent-type bituminous mastic, nominally free of sulfur and containing no asbestos fibers, compounded for .15-mil. dry film thickness per coating.
- F. Mastic Sealant: Polyisobutylene, non-hardening, non-skinning, nondrying, non-migrating sealant.
- G. Elastomeric Sealant: Recommended by unit manufacturer that is compatible with joint surfaces; ASTM C 920, Type S, Grade NS, Class 25.
- H. Roofing Cement: ASTM D 4586, non-asbestos, fibrated asphalt cement designed for trowel application or other adhesive compatible with roofing system.

## 2.2 ROOF CURBS AND EQUIPMENT SUPPORTS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Roof Curbs: Provide roof curbs as manufactured by one of the following:
    - a. Custom Curb, Inc.
    - b. ThyCurb, Inc.
    - c. Uni-Curb, Inc.
  2. Equipment Supports: Thaler or equivalent manufacturer. Equivalency will be determined based upon compliance with the following salient requirements:
    - a. EPDM base seal available in any size diameter from 3-inches to 10-inches
    - b. Condensation-free
    - c. Slotted or perforated collar
    - d. Injection-molded urethane insulation adhered between sleeves without air pockets
    - e. Treated deck flange
    - f. 20-year Warranty

- B. General: Units capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported. Coordinate dimensions with equipment to be supported.
- C. Provide preservative-treated wood nailers at tops of units and formed flange at perimeter bottom for mounting to roof.
- D. Fabricate units to minimum height of 8-inches unless otherwise indicated. Where slope of roof deck exceeds 1/4-inch per foot fabricate support units with height tapered to match slope to level tops of units.
- E. Roof Curbs:
  - 1. Fabrication: Unless otherwise indicated or required for strength, fabricate units from minimum 0.063-inch-thick, sheet aluminum with welded corner joints.
  - 2. Insulation: Manufacturer's standard rigid or semi-rigid insulation where indicated.
- F. Cants: Formed cants and base profile coordinated with roof insulation thickness.
- G. Equipment Supports: Capable of supporting superimposed live and dead loads including equipment loads and other construction to be supported. Coordinate dimensions with equipment to be supported. Unless otherwise indicated or required for strength, fabricate units from minimum 0.064-inch-thick, sheet aluminum with welded corner joints.

## 2.3 PENETRATION SEALS

- A. Provide penetration seals composed of either black structural urethane or polymer-modified cement.
- B. Penetration seal components shall have the capability of forming round, oval, square, or rectangular shaped seals.
- C. Accessory Materials:
  - 1. Two-component urethane pourable, self-leveling sealant.
  - 2. Manufacturer's structural grade sealant, self-fixturing, moisture-curing mastic.
- D. Acceptable Manufacturer: ChemCurb System as manufactured by Chem Link, Portals Plus, or equivalent.

## 2.4 FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
  - 1. Protect mechanical finishes on exposed surfaces from damage by applying a strippable temporary protective covering before shipping
  - 2. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not

acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

- B. Aluminum Finishes: Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
  - 1. Conversion-Coated and Factory-Primed Finish: AA-C12C42R1x Organic Coating as follows: Air-dried primer of not less than 2.0 mil dry film thickness.
  - 2. High-Performance Organic Finish: Manufacturer's standard two-coat thermo-cured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight.
- C. Galvanized Steel Sheet Finishes:
  - 1. Clean surfaces with non-petroleum solvent so surfaces are free of oil and other contaminants. After cleaning apply a conversion coating suited to the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and apply galvanizing repair paint (high-zinc-dust-content paint for re-galvanizing welds in steel complying with SSPC-Paint 20) to comply with ASTM A 780.
  - 2. High-Performance Organic Finish: Cleaned and primed with inhibitive primer and manufacturer's standard two-coat, thermos-cured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight complying with AAMA 621 for coil-coated sheets.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. General: Coordinate installation of roof accessories with installation of roof deck, roof insulation, flashing, roofing membranes, penetrations, equipment, and other construction to ensure that combined elements are waterproof and weather-tight. Anchor roof accessories securely to supporting structural substrates so they are capable of withstanding lateral and thermal stresses, and inward and outward loading pressures.
- B. Install roof accessory items in accordance with construction details in NRCA's "Roofing and Waterproofing Manual", unless otherwise indicated,
- C. Separation: Separate metal from incompatible metal or corrosive substrates, including wood, by coating concealed surfaces, at locations of contact, with bituminous coating or providing other permanent separation.
- D. Flange Seals: Set flanges of accessory units in a thick bed of roofing cement to form seal, unless indicated otherwise.
- E. Penetration Seals: Install in accordance with manufacturer's published instructions.
  - 1. Bond the penetration seal components firmly in place around the roof penetration and seal with structural sealant.

2. Seal the interior of the penetration seal curb with 2-inches of pourable, self-leveling urethane sealant.
- F. Clean exposed surfaces in accordance with manufacturer's written instructions. Touch up damaged metal coatings.

**END OF SECTION 07 72 00**

**SECTION 07 84 00****FIRESTOPPING****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Work of this Section includes through-penetration firestopping systems for the types of fire-resistance-rated assemblies including, but not limited to following: Locations and UL system designations are indicated on the drawings.
  - 1. Roofs
  - 2. Walls and partitions
  - 3. Smoke barriers
- B. Locations and UL system assembly designations are indicated on the Drawings.
- C. Related Work: Fire-Stopping Joint Sealants are specified in Section 07 92 00.

**1.2 PERFORMANCE REQUIREMENTS**

- A. F-Ratings: Provide firestopping systems with F-ratings equaling or exceeding fire-resistance rating of constructions penetrated as determined per ASTM E 814.
- B. T-Ratings: Provide firestopping systems with T-ratings required, as well as F-ratings, determined per ASTM E 814, where systems protect penetrating items with potential to contact adjacent materials in occupied floor areas including, but not limited, to the following:
  - 1. Penetrations located outside wall cavities.
  - 2. Penetrations located outside fire-resistive shaft enclosures.
  - 3. Penetrations located in construction containing fire-protection-rated openings.
  - 4. Penetrating items larger than 4-inch-diameter nominal pipe or .16-sq. in. in overall cross-sectional area.
- C. For firestopping systems exposed to view, traffic, moisture, and physical damage provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
- D. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant firestopping systems.
- E. For penetrations involving insulated piping, provide firestopping systems not requiring removal of insulation.
- F. For through-penetration firestopping systems exposed to view, provide products with flame-spread indices of less than 25 and smoke-developed indices of less than 450, when tested per ASTM E 84.

### 1.3 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Include details of installation and design designation of testing and inspecting agency acceptable to authorities having jurisdiction that evidences compliance with requirements for each condition indicated.
- C. Product test reports.

### 1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Provide rated systems identical to those tested per ASTM E 814 and with products bearing the classification marking of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate firestopping systems.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
  - 1. A/D Fire Protection Systems Inc.
  - 2. Grace Construction Products
  - 3. Hilti Construction Chemicals, Inc.
  - 4. Specified Technologies Inc.
  - 5. 3M Fire Protection Products
  - 6. United States Gypsum Company

### 2.2 FIRESTOPPING SYSTEMS

- A. Compatibility: Provide firestopping systems that are compatible with the substrates forming openings, and with the items, if any, penetrating firestopping systems, under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Accessories: Provide accessories required to install fill materials that comply with requirements of tested assemblies, are approved by qualified testing and inspecting agency that performed testing, and are specified by manufacturer of tested assemblies.
- C. Accessories include, but are not limited to, the following:
  - 1. Permanent forming/damming/ backing materials
  - 2. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state

3. Fire-rated form board
4. Fillers for sealants
5. Temporary forming materials
6. Substrate primers
7. Collars
8. Steel sleeves

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. General: Install through-penetration firestopping systems to comply with "Performance Requirements" Article and firestopping system manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Clean openings immediately before installing firestopping systems. Remove foreign materials that could interfere with adhesion of firestopping systems. Remove laitance and form-release agents from concrete.
- C. Produce clean, sound surfaces capable of developing optimum bond with firestopping systems. Remove loose particles remaining from cleaning operation.
- D. Priming: Prime substrates when recommended in writing by firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not spill primers or allow them to migrate onto adjoining surfaces.
- E. Masking Tape: Use masking tape where required to prevent contact of firestopping with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove firestopping smears. Remove tape immediately after installation without disturbing firestopping seal.
- F. Accessories: Install accessories of types required to support fill materials during their application and in the position necessary to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
- G. After installing fill materials, remove combustible forming materials and other accessories that are not permanent components of firestopping systems.
- H. Install fill materials for firestopping systems by proven techniques. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve the fire-resistance ratings indicated.
- I. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
- J. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

- K. Identification: Identify firestopping systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestopping system installation where labels will be visible. Include the following information on labels:
1. The words: "Warning--Through-Penetration Firestopping System--Do Not Disturb. Notify Maintenance Department of Any Damage."
  2. Contractor's name, address, and phone number.
  3. Through-penetration firestopping system designation of applicable testing and inspecting agency.
  4. Date of installation.
  5. Firestopping system manufacturer's name.
  6. Installer's name.
- L. Clean excess fill materials adjacent to openings as installation progresses by methods and with cleaning materials that are approved in writing by manufacturers and that do not damage materials in which openings occur.

### 3.2 FIELD QUALITY CONTROL

- A. Notify the University's Code inspection agency at least seven days in advance of firestopping system installations; confirm dates and times on days preceding each series of installations.
- B. Do not cover up firestopping system installations that will become concealed behind other construction until inspecting agency and building inspector, if required by authorities having jurisdiction, have examined each installation.
- C. Enclose firestopping systems with other construction only after inspection reports are issued.
- D. Where deficiencies are found, repair or replace firestopping systems to comply with requirements.

**END OF SECTION 07 84 00**



**SECTION 07 92 00****JOINT SEALANTS****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Scope: Furnish and install caulking and sealant required for joints between dissimilar materials and to close other joints unless they are specified to be done under another section.
- B. Related work in other sections:
  - 1. Compressible filler for concrete work is specified in Division 3
  - 2. Joints in sheet metal are specified elsewhere in Division-7
  - 3. Sealants for glass assemblies are specified in Division-8
  - 4. Joints between gypsum board and dissimilar materials are specified in Section 09 21 16
  - 5. Sealants for ceramic tile are specified in Section 09 30 13

**1.2 SUBSTRATE DEFINITIONS**

- A. M-type substrates: Concrete, concrete masonry units, mortar, stucco, natural stone. The term "masonry" means stone, and concrete masonry work.
- B. G-type substrates: Glass and transparent plastic glazing sheets.
- C. A-type substrates: Metals, porcelain, glazed tile, and smooth plastics.
- D. O-type substrates: Wood, unglazed tile; substrates not included under other categories.

**1.3 SUBMITTALS**

- A. Product data from manufacturers for each joint sealer product required including manufacturers recommendation for preparation and application.
- B. Submit samples of sealant colors.

**1.4 QUALITY ASSURANCE**

- A. Installer Qualification: Engage installer who is experienced in at least three (3) joint sealer applications similar in type and size to that of this project.
- B. Single Source Responsibility: Obtain like materials from a single manufacturer.

## 1.5 WARRANTY

- A. Provide warranties covering sealant materials for a ten (10) year period from date of project acceptance covering joint failure. Joint failure is defined as "leaks of air or water, evidence of loss of cohesion, fading of sealant material, migration of sealant and evidence of loss of adhesion between sealant and joint edge.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. General: Manufacturers and products named for specific materials in this paragraph are believed to conform to the criteria stated for that material and to the intended standards of quality, function and appearance.
- B. Sealants and caulks used in roofing components shall be compatible and in accordance with roofing material manufacturer's recommendations.
- C. Primer: As required or recommended by sealant manufacturer for subsurface materials involved.
- D. Joint Fillers:
  - 1. For caulking compound, use oakum.
  - 2. For sealant, use round rod or closed-cell polyethylene sponge, acceptable to sealant manufacturer as compatible with sealant. Use joint filler that is at least 25% larger than width of joint.
- E. Joint Backing: Heavy polyethylene tape with adhesive backing.

### 2.2 ELASTOMERIC SEALANTS

- A. General: Chemically curing elastomeric sealants of types indicated, complying with ASTM C 920, including specific Type, Grade, Class, and Uses indicated, as well as all other requirements specified.
  - 1. Where movement capability exceeding that measured by ASTM C 920 is specified, sealant shall withstand the total movement indicated while remaining in compliance with the other requirements specified, when tested in accord with ASTM C 719, with base joint width measured at the time of application.
  - 2. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be non-staining to porous substrates, provide products that have undergone testing in Accordance with ASTM C 1248 and have not stained porous joint substrates indicated for Project
  - 3. Suitability for Immersion in Liquids: Where elastomeric sealants are indicated for joints that will be continuously immersed in liquids, provide products that have undergone

testing in accordance with ASTM C 1247 and qualify for the length of exposure indicated by reference to ASTM C 920 for Class 1 or 2. Liquid used for testing sealants is deionized water, unless otherwise indicated.

- B. Silicone Sealants - General: Provide the types of silicone sealants specified as manufactured by one of the following acceptable manufacturers as applicable:
1. Dow Corning Corporation
  2. Pecora Corporation
  3. GE Silicones
  4. Tremco
- C. Silicone Sealants:
1. Single-Component Pourable Neutral-Curing Silicone Sealant: Type: S; Grade: P; Class: 100/50; Exposures: (T) traffic and (NT) non-traffic
  2. Single-Component, Neutral and Basic-Curing Silicone Sealant: Type: S; Grade: NS; Class: 100/50; Exposure: (NT) non-traffic; non-staining to porous substrates in accordance with ASTM C 1248
  3. Single-Component, Acid-Curing Silicone Sealant: Non-sag; Class: 25; Exposure: (NT) non-traffic
  4. Single-Component Mildew-Resistant Acid and Neutral-Curing Silicone Sealants: Non-sag; Class: 25; Exposure: (NT) non-traffic
- D. Urethane Sealant: One-Part Non-sag, Low-Modulus Type S, Grade NS, Class 25, Use NT, plus movement capability of 50 percent in both extension and compression.
1. Acceptable Manufacturers:
    - a) Tremco, Inc.
    - b) Sika Corporation
    - c) Sonneborn
    - d) Pecora Corp.
- E. Polysulfide Rubber Sealant: One-Part, Non-sag; FS TT-S-00230C, Type II, Class A and as follows:
1. Joint Movement Range: 25 - 40 percent.
  2. Service Life: 10 - 20 years.
  3. Ultimate Tensile Strength: 85 - 120 psi.
  4. Shore-A Hardness: 30 - 34 at 75-degree F, and 50 percent relative humidity.
  5. Color: As selected by Architect.
  6. Acceptable Manufacturers:
    - a) Pecora Corp.
    - b) Tremco, Inc.
    - c) Sonneborn
- F. Polysulfide Synthetic Rubber Sealant: Two-Part, Non-sag; FS TT-S-00227 EOC, Type I, Class B and as follows:

1. Joint Movement Range: 25 - 50 percent.
2. Service Life: 10 - 20 years.
3. Ultimate Tensile Strength: 120 - 770 psi.
4. Shore-A Hardness: 15 - 50 at 75-degree F, and 50 percent relative humidity.
5. Color: As selected by Architect.
6. Acceptable Manufacturers:

- a) Pecora Corp.
- b) Grace Construction Products
- c) Sonneborn
- d) Tremco, Inc.
- e) W.R. Meadows

## 2.3 LATEX SEALANTS

- A. Acrylic-Latex Emulsion Sealant: One-part, non-sag, mildew-resistant, colored, paintable, complying with ASTM C 834, Type P, Grade NF
- B. Acoustical Joint Sealants: For exposed and concealed joints and where specifically indicated on the Drawings; non-sag, paintable, non-staining sealant complying with ASTM C 834. Acoustical sealants shall effectively reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by assemblies tested in accordance with ASTM E 90.
  1. Provide acoustical sealants as manufactured by Pecora, U.S. Gypsum, or equivalent meeting specified requirements

## 2.4 FIRE-STOP SEALANTS

- A. Fire-stop Sealants: Moisture-curing, single component, silicone-based, neutral-curing sealant of grade indicated below for Project conditions:
  1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces and non-sag formulation for openings in vertical and other surfaces requiring a non-slumping, gunnable sealant, unless indicated firestop system limits use to non-sag grade for both opening conditions.
  2. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
- B. Grade for Vertical Surfaces: Non-sag formulation for openings in vertical and other surfaces

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Manufacturer's representative: At the start of Sealant work a representative of the Sealant manufacturer shall be present at the job to determine that proper preparations and methods are being used to satisfactorily install his product and to assist as necessary by instructing workmen in the proper application of his product. Submit immediate notification of unsatisfactory conditions.
- B. Where shown but material type is not defined:
  - 1. Use same type as shown elsewhere for same condition of use.
  - 2. Use Caulk in interior or backup work not exposed directly to weather or wear.
  - 3. Use Sealant for exterior work and for conditions not otherwise shown or specified.
- C. Location: In addition to that which is shown, the following minimum work is required:
  - 1. Perimeter joints: Close exposed exterior and visible interior perimeter joints between dissimilar materials.
  - 2. Exterior Joints for Which No Other Sealer Is Indicated: One-part, non-sag low-modulus urethane sealant.
  - 3. Interior Joints for Which No Other Sealer Is Indicated: Acrylic-emulsion latex sealant, color as selected.
  - 4. Masonry: Coordinate with requirements of Division-4 and Drawings for extent of additional Caulk and Sealant required for open joints in masonry. Close exposed exterior and visible interior open joints. Sealant color shall be approved to match mortar color.
  - 5. Joints around Pipes, Ducts, and Conduit Penetrating Exterior Walls and Roofs: Use same sealant used for adjacent substrates.
  - 6. Wide Joints: Use Polyurethane, Non-Sag to fill joints over 1/2 inch wide.
  - 7. Clear Sealant: Use where Sealant is required in a joint between glass and metal.
  - 8. Concealed Joints in Acoustical Assemblies: Acrylic-emulsion latex sealant.

### 3.2 PREPARATION

- A. Cleaning: Remove oil, grease, and foreign or loose material from joint surfaces. Clean non-porous surfaces with oil-free solvents such as Toluol, methyl ethyl ketone, or a mixture of equal parts of xylol and acetone. Remove lacquer from aluminum surfaces in contact with Sealant if necessary to achieve adhesion. Do not use soap, detergent, or any water-base cleaner.
- B. Joint Filler: Provide under sealant, and if necessary to control its depth, also-under caulk. Position material to provide for specified depth of compound.
- C. Joint Backing: Required under sealant where depth of joint will not accept joint filler. Cover surface at back of joint with joint backing to form a continuous bond breaker between sealant and the back surface of the joint.
- D. Protection: Cover adjacent finished surfaces with a continuous strip of masking tape 2 inches wide. Apply tape prior to priming.
- E. Primer: Comply with compound manufacturer's recommendations for type of primer and its application for the substrate materials involved.

### 3.3 APPLICATION

- A. Depth of Sealant Compound: Half the joint width, but not less than 1/8 inch or greater than 3/8 inch. Caulk equal to joint width but not greater than 1/2 inch.
- B. Sealant: Apply with cartridge-type gun, keeping nozzle tip deep in joint to force compound to fill it, except where compound manufacturer recommends knife application or other techniques. Use non-sag type for joints and self-leveling type for joints in horizontal surfaces.
- C. Caulk: Apply with cartridge-type gun, keeping nozzle tip deep in joint to force compound to fill it, except where compound manufacturer recommends knife application or other techniques.

### 3.4 FINISHING

- A. Caulk: Smooth, in neat bead or bevel.
- B. Sealant: Tool surface to force it into the joint cavity and as necessary to assure wetting of entire bonding surface. Tool the surface of flat joints slightly concave. Smooth bevels and beads.
- C. Tape: Remove masking tape within 10 minutes after joint has been filled and finished.

**END OF SECTION 07 92 00**

**SECTION 08 11 00****METAL DOORS AND FRAMES****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Extent of rated and non-rated steel doors and frames is indicated on drawings and in schedules.
- B. Related Work:
  - 1. Door hardware is specified in Section 08 71 00
  - 2. Glass for doors is specified in Section 08 80 00
  - 3. Field painting of steel doors and frames is specified in Section 09 90 00

**1.2 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical product data substantiating that products comply with requirements.
- B. Shop Drawings: Submit for fabrication and installation of steel doors and frames. Include details of each frame type, required custom reinforcement, elevations of door design types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
  - 1. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.
  - 2. Indicate coordination of glazing frames and stops with glass and glazing requirements.

**1.3 QUALITY ASSURANCE**

- A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications: Standard Steel Doors and Frames" (SDI-100) and as herein specified.
- B. Provide all exterior door and frame assemblies having Miami-Dade Products Control Notice of Acceptance (NOA) for hurricane wind resistance and air-borne missile impact from hurricane force winds.

**1.4 DELIVERY, STORAGE AND HANDLING**

- A. Deliver hollow metal work in cartons or crated to provide protection during transit and job storage.

- B. Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided finish items are equal in all respects to new work and acceptable to Engineer; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4" high wood blocking. Avoid use of non-vented plastic or canvas shelters that could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4" spaces between stacked doors to promote air circulation.

## **PART 2 - PRODUCTS**

### **2.1 ACCEPTABLE MANUFACTURERS**

- A. Manufacturer: Subject to compliance with requirements, provide exterior, fire-rated steel doors and frames by one of the following:
  - 1. Black Mountain Door, LLC (Basis of Design)
  - 2. Ingersoll Rand (Steelcraft)
  - 3. CECO Door Products
  - 4. Republic Doors and Frames
- B. Manufacturer: Subject to compliance with requirements, provide interior steel doors and frames by one of the following:
  - 1. Ingersoll Rand (Steelcraft)
  - 2. CECO Door Products
  - 3. Republic Doors and Frames

### **2.2 METAL FRAMES**

- A. Design and Construction for Frames Set in Concrete:
  - 1. Fully welded custom construction with mitered or butted head and jamb members with integral stops and with combination buck and trim in sizes and profiles as shown on the Drawings.
  - 2. Mortised, reinforced and drilled/tapped for mortise hardware in accordance with approved finish hardware schedule and templates furnished to the hollow metal door manufacturer by the hardware supplier.
  - 3. Provide factory dimples in jamb faces for flush anchor bolt installation.
- B. Frames Set in Metal Stud Openings: Provide manufacturer's "knock-down" types.
- C. Fabrication:
  - 1. Head and Jamb Material: 16 gauge, pre-bonderized electro-zinc coated sheet steel in accordance with ASTM A 366 and ASTM A 591, Class C.
  - 2. Corner Construction: Continuous welds ground flush and smooth without dishing.



3. Stops: Minimum depth 5/8", sanitary or hospital type where noted on Drawings or schedules, standard to the manufacturer, cut-off at 45-degree angle.
- D. Exterior frames shall carry a fire-rating and be part of a NOA rated assembly
- E. Hardware Reinforcements and Preparations:
1. Butt (Hinge) Reinforcing: Steel plate 3/16-inch-thick by 1-1/4-inch minimum to 1-1/2-inch maximum by 10 inches long, offset where required so faces of butts are flush with door frame edge, secured by not less than six spot welds, three at each end of the plate.
  2. Strike Reinforcement: Offset clips of 12-gauge steel, 1-1/4-inch minimum to 1-1/2-inch maximum by 3 inches long.
  3. Closer Foot Reinforcing:
    - a) 10-gauge steel plates (minimum 14 inches long by 1-inch wide) in both rabbet (each side of stop) and stop of head section near corner of hinge jamb.
    - b) Provide Styrofoam over plates to allow closer foot screws to seat without interference from grout fill.
- E. Location of Finished Hardware: Locate in accordance with the requirements of Florida Americans with Disabilities Accessibility Guidelines, or as otherwise directed by the Architect.
- F. Drilling and Tapping for Surface Hardware: May be done in the field, standard to the manufacturer.
- G. Silencer (Mute) Provisions: Punch frames to receive silencers on strike jamb as scheduled in hardware sets found in Door Hardware Section for this Project except on weather-stripped frames.
- H. Jamb Anchors for Metal Stud System:
1. Minimum 18-gauge steel anchors of suitable design standard to the frame manufacturer.
  2. Provide at least three anchors up to 5'-0" high opening, four anchors up to 7'-0" high opening and one additional anchor for each additional 30 inches of opening height or part thereof for both the strike and hinge jambs.
- I. Jamb Anchors for Cast-in-Place Concrete:
1. Provide "Z" sections, "Hat" sections or "pipe spacers" standard to the manufacturer.
  2. Provide at least three anchors up to 7'-6" high opening and one anchor for each additional 30 inches of opening height or part thereof for both strike and hinge jambs.

3. Provide complete with minimum 3/8" diameter lag screws complete with shields or as otherwise directed by the Architect.
- J. Floor Anchors: 14-gauge galvanized sheet steel angle shaped anchors for each jamb which extends to the floor, punched for not less than two 1/4-inch diameter bolts at each jamb.
- K. Spreaders: Provide frames with temporary steel spreader bars tack welded to jambs to maintain full rigidity and proper alignment during installation.

## 2.4 METAL DOORS

- A. Types: Custom flush, seamless hollow construction with louvers or vision cutouts as shown or specified on Drawings and in this Section.
- B. Exterior Doors: Out-swinging type, both single leaf and paired, fire-rated with Miami Dade County Product Control NOA. Provide "Firedoor Series S-4080F" door assemblies as manufactured by Black Mountain Door, LLC or architect approved equivalent.
- C. Sizes and Thicknesses:
  1. Width and Height: As indicated on Drawings.
  2. Thickness: 1-3/4 inches unless otherwise specified or shown.
- D. Fabrication:
  1. Face Plates: 16 gauge, pre-bonderized, electro-zinc coated, cold-rolled stretcher leveled sheet steel in accordance with ASTM A 366 and ASTM A 591, Class C.
  2. Door Perimeters:
    - a) Edge Channel: Reinforce both door edges full height with 16 gauge pre-bonderized electro-zinc coated unequal leg steel edge channels as shown on Drawings.
    - b) Hinge Brace: Reinforce door edge at each hinge location with minimum 16-gauge steel hinge brace as shown on Drawings.
- E. Bevel for Single Acting Doors: 1/8 inch in 2 inches.
- F. Door Tops: Reinforce door tops with full width 16-gauge pre-bonderized, electro-zinc coated steel channels as shown on Drawings. Door tops shall have flush surface.
- G. Door Bottoms: Reinforce door bottoms with full width 16 gauge pre-bonderized electro-zinc coated steel channels. Provide weep holes in the bottom of exterior doors on each side.
- H. Stiffeners: Provide vertical members spaced not more than 6 inches on center with shape standard to manufacturer.
- I. Core Fill: Mineral wool fill standard to manufacturer.

- J. Lockset Preparation: Template doors in accordance with lock manufacturer's templates furnished by hardware supplier and based on lock type shown in approved finish hardware schedule.
- K. Hardware Reinforcements and Preparation:
  - 1. Drill/tap for mortised hardware in accordance with accepted finish hardware schedule and templates furnished by hardware supplier.
  - 2. Drilling and tapping for surface applied hardware shall be done in the field.
  - 3. Locate finish hardware in accordance with the requirements of "Florida Americans with Disabilities Accessibility Guidelines", or as otherwise directed by the Architect.
  - 4. Butt (Hinge) Reinforcing: Steel plate, 3/16-inch-thick by 1-1/4-inch minimum to 1-1/2-inch maximum by 10 inches long, offset where required and secured by a minimum of six spot welds.

## 2.5 CHANNEL GLAZING STOPS FOR LIGHT OPENINGS

- A. Fixed: Minimum 18 gauge.
- B. Removable: Minimum 18 gauge secured 2-inches maximum from each corner and at six inches on center in between with countersunk cadmium or zinc plated screws drilled and tapped into light frames.
- C. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.

## 2.6 SHOP FINISHING AND PAINTING

- A. After fabrication, grind exposed weld marks smooth and flush. Clean and de-grease surfaces. Apply metallic filler, sand smooth and apply prime coat as follows:
- B. Prime Coat:
  - 1. Exterior Doors and Frames: Provide galvanized coating as follows:
    - a) ASTM A 123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier
    - b) ASTM A 386 for galvanizing assembled steel products
  - 2. Interior Doors and Frames: Thoroughly cover all surfaces with manufacturer's standard rust inhibitive metal primer baked-on to provide uniform dry film thickness of not less than 1.0 mil without runs, smears, or bare spots.

## 2.8 SPECIAL TEMPLATING REQUIREMENTS

- A. Template doors for cylinder in hollow metal doors scheduled to receive exit devices with night-latch action.

- B. Provide 1-1/4-inch diameter hole in the exterior door face to receive the cylinder.
- C. Provide 1/2-inch diameter hole in the interior door face to allow the penetration of the cylinder tailpiece.
- D. Provide holes in the interior door face to receive cylinder, retaining screws in correct quantity, location and size.

## **PART 3 - EXECUTION**

### **3.1 INSPECTION**

- A. Do not proceed with the work of this Section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- B. Inspect doors and frames upon delivery for damage. Minor damage may be repaired provided refinished items are equal in all respects to new work and acceptable to the Architect. Otherwise remove and replace damaged items as directed.

### **3.2 INSTALLATION**

#### **A. Frames:**

1. Install plumb, level and true to line, secured in openings.
2. Install frames in accordance with accepted shop drawings and manufacturer's printed instructions.
3. Place frames prior to construction of enclosing walls and ceilings.
4. Jamb Anchors: At exterior wall, masonry wall and metal stud wall construction provide approved jamb anchors adjacent to each hinge location on hinge jamb and at corresponding heights on strike jamb.
5. Grout Fill: Fill strike, head and hinge jamb solid with concrete or grout.
6. Frames shall be poured in place with concrete or grout.

- B. Doors: Install in openings plumb, level and true to line. Apply hardware and adjust to achieve smooth and quiet operation. Unless otherwise specified, all hardware shall be mounted with fastening devices supplied by hardware manufacturer.

#### **C. Final Adjustment for Doors and Hardware:**

1. Door Contact with Silencers: Doors shall strike a minimum of two silencers without binding the lock or latch bolt in the strike plate.
2. Head, Strike and Hinge Jamb Margin: 1/8 inch.

3. Bolts and Screws: Leave tight and firmly seated.
4. Prior to acceptance of Project, clean all hardware of paint or foreign material.

**END OF SECTION 08 11 00**

**SECTION 08 14 00****WOOD DOORS****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Solid core, fire-rated and non-fire-rated flush wood doors.

**1.2 RELATED WORK**

- A. Door Hardware is specified in Section 08 71 00
- B. Steel door frames for flush wood doors are specified in Section 08 11 00
- C. Natural finishing of wood doors is specified in Section 09 90 00, Paints and Coatings

**1.3 SUBMITTALS**

- A. Product Data: Submit door manufacturer's technical data for each type of flush wood door, including details of core and edge construction, trim for openings, and factory-finishing specifications if applicable.
- B. Shop Drawings: Submit shop drawings indicating location and size of each door, elevation of each kind of door, details of construction, glazing requirements; location and extend of hardware blocking, fire ratings, and other pertinent data.
- C. Samples: Submit samples, 1'-0" square, for door faces with solid wood edging representing typical range of color and grain for veneer and solid lumber required.

**1.4 REGULATORY REQUIREMENTS**

- A. Conform to all applicable codes for fire rated doors.

**1.5 QUALITY ASSURANCE**

- A. Quality Standards: Comply with the following standards:
  - 1. NWWDA Quality Standard: I.S. "Industry Standard for Wood Flush Doors", of National Wood Window and Door Association (NWWDA).
  - 2. AWI Quality Standards: "Architectural Woodwork Quality Standards", including Section 1300 "Architectural Flush Doors", of Architectural Woodwork Institute (AWI) for grade of door, core construction, finish and other requirements exceeding those of NWWDA quality standard.

- B. NWWDA Quality Marking: Mark each wood door with NWWDA Wood Flush Door Certification Hallmark certifying compliance with applicable requirements of NWWDA I.S. 1 Series.
- C. Fire-Rated Wood Doors: Provide wood doors which are identical in materials and construction to units tested in door and frame assemblies per ASTM E 152 and which are labeled and listed for ratings indicated by UL, Warnock Hersey or other testing and inspection agency acceptable to authorities having jurisdiction.
- D. Manufacturer: Obtain doors from a single manufacturer.

#### 1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Protect doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with requirements of referenced standards and recommendations of NWWDA pamphlet "How to Store, Handle, Finish, Install, and Maintain Wood Doors", as well as with manufacturer's instructions.
- B. Identify each door with individual opening numbers that correlate with designation system used on shop drawings for door, frames and hardware, using temporary, removable or concealed markings.
- C. Conditioning: Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during remainder of construction period to comply with Referenced AWI quality standard including Section 100-S-3 "Moisture Content", applicable to Project's location.

#### 1.7 WARRANTY

- A. General: Warranties shall be in addition to, and not a limitation of, other rights the City may have under the Contract Documents.
- B. Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form signed by Manufacturer, Installer and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup or twist) or that show telegraphing of core construction in face veneers, or do not conform to tolerance limitations of referenced quality standards.
  - 1. Warranty shall also include reinstallation that may be required to repair or replacement of defective doors where defect was not apparent prior to hanging.
  - 2. Warranty shall be in effect for 5 years or life of installation (as standard with manufacturer) after date of Substantial Completion.
- C. Contractor's Responsibility: Replace or refinish doors where Contractor's work contributed to rejection or to voiding of manufacturer's warranty.

### PART 2 - PRODUCTS

## 2.1 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with specified requirements, provide doors from one of the following:

1. Algoma Hardwoods Inc.
2. Eggers Industries
3. Weyerhaeuser Architectural Doors
4. Mohawk Flush Doors, Inc.

## 2.2 INTERIOR WOOD DOORS

A. Solid Core Doors for Natural Finish: Comply with the following requirements:

1. Materials: F-ply, SLC-F, AWI Standard Section 1300, staved lumber core with glued blocks, medium density overlay, all hardwood veneers bonded under heat and pressure.
2. Veneer: White Birch suitable for stained finish
3. Cross Banding: Hardwood
4. Vertical Edge Bands: Hardwood
5. Horizontal Edge Bands: Softwood
6. Adhesives: Type I

B. Fire-Rated Solid Core Doors: Provide faces and grade to match non-rated doors in same area of building, unless otherwise indicated. Manufacturer's standard core construction as required to provide fire-resistance rating indicated. Provide manufacturer's standard laminated edge construction for improved screw-holding capability and split resistance as compared to edges composed of a single layer of treated lumber.

## 2.3 SHOP PRIMING

A. Shop-seal faces and edges of doors for stain and varnish finish in accordance with Section 09 90 00, Paints and Coatings.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine installed door frames prior to hanging door:

1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
2. Do not install doors with defects.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION

A. Hardware: For installation see Section, "Door Hardware", of these specifications.



- B. Manufacturer's Instructions: Install wood doors to comply with manufacturer's instructions and of referenced AWI standard and as indicated.
- C. Install fire-rated doors in corresponding fire-rated frames in accordance with requirements of NFPA No. 80.
- D. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails more than limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
  - 1. Fitting Clearances for Non-Rated Doors: Provide 1/8" at jambs and heads and 1/8" from bottom of door to top of decorative floor finish or covering. Where threshold is shown, or scheduled, provide 1/4" clearance from bottom of door to top of threshold.
  - 2. Contractor responsible for determining overall thickness of decorative floor finish or covering.
  - 3. Fitting Clearances for Fire-Rated Doors: Comply with NFPA 80.
  - 4. Bevel non-rated doors 1/8" in 2" at lock and hinge edges.
  - 5. Bevel fire-rated doors 1/8" in 2" in lock edge; trim stiles and rails only to extend
- E. Field-Finished Doors: Refer to Division-9 Section, "Paints and Coatings", for finishing requirements.

### 3.3 ADJUSTING AND PROTECTION

- A. Operation: Re-hang or replace doors that do not swing or operate freely.
- B. Protect doors as recommended by door manufacturer to assure that wood doors will be without damage or deterioration at time of Substantial Completion.

**END OF SECTION 08 14 00**

**SECTION 08 31 00****ACCESS DOORS AND PANELS****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Extent and location of access doors and panels required are indicated on drawings.
- B. Sizes: 18" X 18" for chases; 24" X 24" for ceilings.
- C. Built-in anchors and grouting of frames set in masonry construction are specified in Division-4, Masonry.

**1.2 QUALITY ASSURANCE**

- A. Coordination: Furnish inserts and anchoring devices that must be built into other work for installing access doors. Coordinate delivery with other work to avoid delay.
- B. Provide access doors with UL labels where fire-rated units are required in rated assemblies.

**1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions and directions for installation of anchorage devices.
- B. Samples: 2 samples, 3" x 5" minimum size, of each panel face material showing factory finished color and texture.

**PART 2 - PRODUCTS****2.1 ACCEPTABLE MANUFACTURERS**

- A. Manufacturer: Provide access doors by one of the following:
  - 1. Milcor Div.; Inryco, Inc.
  - 2. Karp Associates, Inc.
  - 3. Nystrom, Inc.

**2.2 MATERIALS AND FABRICATION**

- A. Furnish each access door assembly manufactured as an integral unit, complete with all parts and ready for installation.

- B. Steel Access Doors and Frames: Fabricate units of continuous welded steel construction. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of support shown.
- C. Frames: Fabricate from 16-gage steel.
- D. Fabricate frame with exposed flange approximately 1" wide around perimeter of frame for units installed in suspended ceiling assemblies.
- E. For plaster applications, furnish frames with galvanized expanded metal lath and exposed casing bead, welded to perimeter of frame.
- F. Flush Panel Doors: Fabricate from not less than 18-gage sheet steel with face of panel formed to provide recess below surface of applied finish. Reinforce panel as required to prevent buckling. Finish with manufacturer's factory-applied prime paint.
- G. Furnish recessed panels and frames with expanded metal lath for concealed installation in plaster.
- H. Locking Devices: Furnish flush, turn ring cam locks of number required to hold door in flush, smooth plane when closed.
- I. Recessed panel doors: Provide access sleeves for each locking device. Furnish plastic grommets and install in holes cut through finish.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION**

- A. Comply with manufacturer's instructions for installation of access doors.
- B. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces. Coordinate with work of other trades.

#### **3.2 ADJUST AND CLEAN**

- A. Adjust hardware and panels after installation for proper operation.
- B. Remove and replace panels for frames that are warped, bowed or otherwise damaged.
- C. Leave surfaces clean and ready for final finish.

**END OF SECTION 08 31 00**

**SECTION 08 41 13****ALUMINUM-FRAMED ENTRANCES****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. This Section includes exterior aluminum-framed entrances with small and large missile impact-resistant glazing lites. Locations are indicated on the Drawings.
- B. Related Sections: The following sections contain requirements that relate to this Section:
  - 1. Glazing requirements are specified in Section 08 80 00
  - 2. Hardware is specified in Section 08 71 00

**1.2 SYSTEM PERFORMANCE REQUIREMENTS**

- A. General: Provide aluminum-framed entrance assemblies that comply with performance characteristics specified herein.
- B. Thermal Movement: Design aluminum entrance door framing to provide for expansion and contraction of the component materials. Entrance doors shall function normally over the specified temperature range.
  - 1. The system shall be capable of withstanding a metal surface temperature range of 180-degree F without buckling, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, stress on glass, or other detrimental effects.
- C. Design Requirements: Provide aluminum entrance door assemblies that comply with structural performance, air infiltration, and water penetration requirements indicated.
  - 1. Wind Loads: Provide aluminum entrance and storefront assemblies capable of withstanding wind load requirements of the Florida Building Code, latest edition including all amendments.
  - 2. Provide assemblies having Miami-Dade Products Control Approval for hurricane wind resistance and air-borne missile impact from hurricane force winds.
- D. Structural Performance: Systems shall be designed to meet the structural requirements of the Florida Building Code, latest edition including all amendments. Structural compliance shall be demonstrated by means of Miami Dade County Products Control Section Notice of Acceptance (NOA).
- E. Air Infiltration: Provide aluminum entrance and storefront framing system with an air infiltration rate of not more than 0.06 CFM per sq. ft. of fixed area (excluding operable door edges) when tested in accordance with ASTM E 283 at an inward test pressure differential of 1.57 psf.

- F. Water Penetration: Provide framing systems with no uncontrolled water penetration (excluding operable door edges) as defined in the test method when tested in accordance with ASTM E 331 at an inward test pressure differential of 6.24 psf.

### 1.3 SUBMITTALS

- A. Product data for each aluminum-framed entrance required, including:
  - 1. Manufacturer's standard details and fabrication methods
  - 2. Data on finishing, hardware and accessories
  - 3. Recommendations for maintenance and cleaning of exterior surfaces
- B. Shop drawings for each aluminum-framed entrance assembly required, including:
  - 1. Layout and installation details, including relationship to adjacent work
  - 2. Elevations at 1/4-inch scale
  - 3. Detail sections of typical composite members
  - 4. Anchors and reinforcement
  - 5. Hardware mounting heights
  - 6. Provisions for expansion and contraction
  - 7. Glazing details
- C. Hardware Schedule: Indicate on the detailed shop drawings a list and description of all hardware as required by the Contract Documents.
- D. Samples for Initial Color Selection: Submit pairs of samples of each specified color and finish on 12-inch-long sections of extrusions or formed shapes. Where normal color variations are anticipated, include 2 or more units in each set of samples indicating extreme limits of color variations.
- E. Test Reports: Provide certified test reports from a qualified independent testing laboratory showing that impact resistant glazing systems comply with the impact and cyclic testing as required by the Florida Building Code.

### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed installations of aluminum-framed entrances similar in design and extent to those required for the project and whose work has resulted in construction with a record of successful in-service performance.
- B. Fabricator Qualifications: Provide aluminum-framed entrances fabricated by a firm experienced in producing systems that are similar to those indicated for this Project, and that have a record of successful in-service performance. The fabricator shall have sufficient production capacity to produce components required without causing delay in progress of the Work.
- C. Single Source Responsibility: Obtain aluminum-framed entrance assemblies from one source and from a single manufacturer.

- D. Design Criteria: The drawings indicate the size, profile, and dimensional requirements of aluminum-framed entrance work required and are based on the specific types and models indicated. Aluminum-framed entrances by other manufacturers may be considered, provided specified performance is provided and deviations in dimensions and profiles are minor and do not change the design concept as judged solely by the Architect.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver aluminum-framed entrances in the manufacturer's original protective packaging.
- B. Store aluminum components in a clean dry location away from uncured masonry or concrete. Cover components with waterproof paper, tarpaulin or polyethylene sheeting in a manner to permit circulation of air. Stack framing components in a manner that will prevent bending and avoid significant or permanent damage.

## 1.6 PROJECT CONDITIONS

- A. Field Measurements: Check openings by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the work.
- B. Maintain openings to receive aluminum-framed entrances to the field dimensions (plumb and level) recorded on shop drawings.

## 1.7 WARRANTY

- A. Warranty: Submit a written warranty, executed by the manufacturer, agreeing to repair or replace units that fail in materials or workmanship within the specified warranty period. Failures include, but are not necessarily limited to:
  - 1. Structural failures including excessive deflection, excessive leakage or air infiltration
  - 2. Faulty operation
  - 3. Deterioration of metals, metal finishes and other materials beyond normal weathering
- B. Warranty Period: 2-years after the date of Substantial Completion.
- C. The warranty shall not deprive the City of other rights or remedies the City may have under other provisions of the Contract Documents, and is in addition to and runs concurrent with other warranties made by the Contractor under requirements of the Contract Documents.
  - 1. Exit Devices shall have a 5-year warranty against defects in material and workmanship from date of Project acceptance, and shall have a N.O.A. for Dade County Hurricane Code Component Testing Approval for +/- 80 PSF.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide aluminum-framed entrances as manufactured by one of the following:
1. PGT Architectural Systems (Basis of Design)
  2. Kawneer Company, Inc.
  3. United States Aluminum
  4. YKK AP America, Inc.
  5. Arch Aluminum & Glass
- B. Salient Features shall include the following:
1. ADA Threshold Water Performance: 3 PSF
  2. Framing Members: Extruded Aluminum Alloy minimum 6063-T5
  3. Finish: As indicated on the Drawings or as selected by the Architect from manufacturer's standard options.
  4. Glazing: Interior glazed
  5. Silicone Sealants: As recommended and approved by the Door Assembly manufacturer
  6. Shear Block Construction
  7. All fasteners and butt hinges shall be stainless steel
  8. Hardware: Unless scheduled otherwise in the Hardware Schedule contained in Section 08 71 00, provide door manufacturer's standard pull/push bar and ADA bumper threshold
  9. Glass for entrance doors shall be hurricane-resistant laminated glass in accordance with Section 08 80 00 Glazing

## 2.2 MATERIALS

- A. Aluminum Members: Alloy and temper recommended by the manufacturer for strength, corrosion resistance, and application of required finish; comply with ASTM B 221 for aluminum extrusions, ASTM B 209 for aluminum sheet or plate, and ASTM B 211 for aluminum bars, rods and wire.
- B. Carbon steel reinforcement of aluminum framing members shall comply with ASTM A 36 for structural shapes, plates and bars, ASTM A 611 for cold rolled sheet and strip, or ASTM A 570 for hot rolled sheet and strip.
- C. Glass and Glazing Materials: Comply with requirements of "Glazing" section of these specifications.
- D. Fasteners: Provide fasteners of aluminum or other material warranted by the manufacturer to be non-corrosive and compatible with aluminum components, hardware, anchors and other components.
1. Reinforcement: Where fasteners screw-anchor into aluminum members less than 0.125 inches thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard non-corrosive pressed-in splined grommet nuts.
  2. Exposed Fasteners: Do not use exposed fasteners except for application of hardware. For application of hardware, use Phillips flat-head machine screws that match the finish of member or hardware being fastened.

- E. Concealed Flashing: 0.0179-inch (26 gage) minimum dead-soft stainless steel, or 0.026-inch thick minimum extruded aluminum of alloy and type selected by manufacturer for compatibility with other components.
- F. Brackets and Reinforcements: Provide high-strength aluminum brackets and reinforcements; where use of aluminum is not feasible provide nonmagnetic stainless steel or hot-dip galvanized steel complying with ASTM A 123.
- G. Concrete and Masonry Inserts: Provide hot-dip galvanized steel embeds or concrete inserts for placement into masonry complying with ASTM A 123.
- H. Compression Weather-stripping: Manufacturer's standard replaceable compressible Weather-stripping gaskets of molded PVC complying with ASTM D 2287.

## 2.3 HARDWARE

- A. General: Aluminum and glass swing doors shall be supplied complete with heavy-duty hardware as scheduled, or required for operation, and shall include, but not be limited to, the following:
  - 1. Hinges
  - 2. Closers
  - 3. Thresholds
  - 4. Panic Exit Devices
  - 5. Door Pulls
  - 6. Push Bars
- B. Refer to Division 8 Section "Door Hardware" for other requirements including lock cylinders.

## 2.4 COMPONENTS

- A. Entrance Door Framing System: Provide entrance door framing systems fabricated from extruded aluminum members of size and profile indicated. Include sub-frames and other reinforcing members of the type indicated. Provide for flush glazing storefront from the exterior on all sides without projecting stops. Shop-fabricate and pre-assemble frame components where possible. Provide frame sections without exposed seams.
- B. Entrance Door Frames: Provide tubular and channel frame entrance door frame assemblies, as indicated, with welded or mechanical joints in accordance with manufacturer's standards. Reinforce as necessary to support required loads.
- C. Glazed Entrance Doors: Provide tubular frame members, fabricated with mechanical joints using heavy inserted reinforcing plates and concealed tie-rods or j-bolts.
  - 1. Glazing: Fabricate doors to facilitate replacement of glass or panels, without disassembly of stiles and rails. Provide snap-on extruded aluminum glazing stops, with exterior stops anchored for non-removal.
  - 2. Design: Provide 1-3/4-inch-thick doors of medium style design (3-1/2-inch nominal width) unless indicated otherwise on the Drawings.



## 2.5 FABRICATION

- A. General: Fabricate aluminum-framed entrance door assemblies to designs, sizes and thicknesses indicated and to comply with indicated standards. Sizes and profile requirements are indicated on the drawings. Variable dimensions are indicated, with maximum and minimum dimensions required, to achieve design requirements and coordination with other work.
- B. Prefabrication: Complete fabrication, assembly, finishing, hardware application, and other work to the greatest extent possible before shipment to the Project site. Disassemble components only as necessary for shipment and installation.
  - 1. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work to prevent damage to exposed finish surfaces. Complete these operations for hardware prior to application of finishes.
  - 2. Do not drill and tap for surface-mounted hardware items until time of installation at project site.
  - 3. Pre-glaze door and frame units to greatest extent possible.
- C. Welding: Comply with AWS recommendations. Grind exposed welds smooth to remove weld spatter and welding oxides. Restore mechanical finish. Welding behind finished surfaces shall be performed in such a manner as to minimize distortion and discoloration on the finished surface.
- D. Reinforcing: Install reinforcing as required for hardware and as necessary for performance requirements, sag resistance and rigidity.
- E. Dissimilar Metals: Separate dissimilar metals with bituminous paint, or a suitable sealant, or a non-absorptive plastic or elastomeric tape, or a gasket between the surfaces. Do not use coatings containing lead.
- F. Continuity: Maintain accurate relation of planes and angles with hairline fit of contacting members. Uniformity of Metal Finish: Abutting extruded aluminum members shall not have an integral color or texture variation greater than half the range indicated in the sample pair submittal.
- G. Fasteners: Conceal fasteners wherever possible.
- H. Weather-stripping: Provide compression weather-stripping against fixed stops. At other edges, provide sliding weather-stripping retained in adjustable strip mortised into door edge.
  - 1. Provide EPDM or vinyl-blade gasket weather-stripping in bottom door rail, adjustable for contact with threshold.

## 2.6 FINISHES

- A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.

- B. Provide manufacturer's standard powder coat paint finish, complying with AAMA 2604 High Performance Organic Coatings (2.0 to 3.0 mils film thickness. Color shall be as indicated on the Drawings.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and supports, with the Installer present, for compliance with requirements indicated, installation tolerances, and other conditions that affect installation of aluminum-framed entrance assemblies. Correct unsatisfactory conditions before proceeding with the installation. Do not proceed with installation until unsatisfactory conditions are corrected.

### **3.2 INSTALLATION**

- A. Comply with manufacturer's instructions and recommendations for installation.
- B. Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Install components in proper alignment and relation to established lines and grades indicated. Provide proper support and anchor securely in place.
- C. Construction Tolerances: Install aluminum-framed entrance assemblies to comply with the following tolerances:
  - 1. Variation from Plane: Do not exceed 1/8 inch in 12 feet of length or 1/4 inch in any total length.
  - 2. Offset from Alignment: The maximum offset from true alignment between two identical members abutting end to end in line shall not exceed 1/16 inch.
  - 3. Diagonal Measurements: The maximum difference in diagonal measurements shall not exceed 1/8 inch.
- D. Separate aluminum and other corrodible metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.
  - 1. Zinc or cadmium plate steel anchors and other unexposed fasteners after fabrication.
  - 2. Paint dissimilar metals where drainage from them passes over aluminum.
  - 3. Paint aluminum surfaces in contact with mortar, concrete or other masonry with alkali resistant coating.
  - 4. Paint wood and similar absorptive material in contact with aluminum and exposed to the elements or otherwise subject to wetting, with two coats of aluminum house paint. Seal joints between the materials with sealant.
- E. Drill and tap frames and doors and apply surface-mounted hardware items. Comply with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.

- F. Set sill members and other members in bed of sealant as indicated, or with joint fillers or gaskets as indicated to provide weather-tight construction. Comply with requirements of Division 7 for sealants, fillers, and gaskets.
- G. Refer to "Glazing" Section of Division 8 for installation of glass indicated to be glazed into doors and framing, and not pre-glazed by manufacturer.

### 3.3 ADJUSTING

- A. Adjust operating hardware to function properly, for smooth operation without binding, and for weather-tight closure.

### 3.4 CLEANING

- A. Clean the completed system, inside and out, promptly after installation, exercising care to avoid damage to coatings.
- B. Clean glass surfaces after installation, complying with requirements contained in the "Glazing" Section for cleaning and maintenance. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

### 3.5 PROTECTION

- A. Institute protective measures required throughout the remainder of the construction period to ensure that aluminum-framed entrances will be without damage or deterioration, other than normal weathering, at time of acceptance.

**END OF SECTION 08 41 13**

**SECTION 08 43 13****ALUMINUM-FRAMED STOREFRONT WINDOWS****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. This Section includes storefront-type framing systems and fixed window units including small and large missile impact-resistant framing system requirements.
- B. Related Sections: Glazing requirements are specified in Section 08 80 00

**1.2 SYSTEM PERFORMANCE REQUIREMENTS**

- A. General: Provide aluminum storefront window assemblies that comply with performance characteristics specified herein.
- B. Thermal Movement: Design the aluminum storefront window framing to provide for expansion and contraction of the component materials.
  - 1. The system shall be capable of withstanding a metal surface temperature range of 180-degree F without buckling, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, stress on glass, or other detrimental effects.
- C. Design Requirements: Provide aluminum storefront windows that comply with structural performance, air infiltration, and water penetration requirements indicated.
  - 1. Wind Loads: Provide aluminum storefront window assemblies capable of withstanding 110 wind loads in accordance with ASCE 7 (latest Edition).
  - 2. Provide window assemblies having Miami-Dade Notice of Acceptance (NOA) for hurricane wind resistance and air-borne missile impact from hurricane force winds.
- D. Structural Performance: Systems shall be designed to meet the structural requirements of the Florida Building Code, latest edition. Structural compliance shall be demonstrated by means of ASTM test results or certification and calculations by a Florida licensed Structural Engineer.
  - 1. Deflection Normal to the Plane of the Wall: Test pressure required to measure deflection of framing members normal to the plane of the wall shall be equivalent to the wind load requirements of the Code specified above. Deflection shall not exceed 1/180 of the clear span, when subjected to uniform load deflection test.
  - 2. Deflection Parallel to the Plane of the Wall: Test pressures required to measure deflection parallel to the plane of the wall shall be equal to 1.5 times the wind pressures required in the Code specified above. Deflection of any member carrying its full dead load shall not exceed an amount that will reduce glass bite below 75 percent of the

design dimension and shall not reduce the edge clearance between the member and the fixed panel, glass or other fixed member above to less than 1/8 inch.

- E. Air Infiltration: Provide aluminum storefront window assemblies with an air infiltration rate of not more than 0.06 CFM per sq. ft. of fixed area (excluding operable door edges) when tested in accordance with ASTM E 283 at an inward test pressure differential of 1.57 psf.
- F. Water Penetration: Provide aluminum storefront window assemblies with no uncontrolled water penetration as defined in the test method when tested in accordance with ASTM E 331 at an inward test pressure differential of 6.24 psf.

### 1.3 SUBMITTALS

- A. Product data for each aluminum storefront window assemblies required, including:
  - 1. Manufacturer's standard details and fabrication methods
  - 2. Data on finishing and accessories
  - 3. Recommendations for maintenance and cleaning of exterior surfaces
- B. Shop drawings for each aluminum storefront window assembly required, including:
  - 1. Layout and installation details, including relationship to adjacent work
  - 2. Elevations at 1/4-inch scale
  - 3. Detail sections of typical composite members
  - 4. Anchors and reinforcement
  - 5. Provisions for expansion and contraction
  - 6. Glazing details
- C. Samples for Initial Color Selection: Submit pairs of samples of each specified color and finish on 12-inch-long sections of extrusions or formed shapes. Where normal color variations are anticipated, include 2 or more units in each set of samples indicating extreme limits of color variations.
- D. Test Reports: Provide certified test reports from a qualified independent testing laboratory that show impact resistant glazing systems have complied with the impact and cyclic testing as required by the Florida Building Code, latest edition including all amendments.

### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed installations of aluminum storefront window assemblies similar in design and extent to those required for the project and whose work has resulted in construction with a record of successful in-service performance.
- B. Fabricator Qualifications: Provide aluminum storefront window assemblies fabricated by a firm experienced in producing systems that are similar to those indicated for this Project, and that have a record of successful in-service performance. The fabricator shall have sufficient production capacity to produce components required without causing delay in progress of the Work.

- C. Single Source Responsibility: Obtain aluminum storefront window assemblies from one source and from a single manufacturer.
- D. Design Criteria: The drawings indicate the size, profile, and dimensional requirements of aluminum storefront window assemblies required and are based on the specific types and models indicated. Aluminum storefront window assemblies by other manufacturers may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged solely by the Architect.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver aluminum storefront components in the manufacturer's original protective packaging.
- B. Store aluminum components in a clean dry location away from uncured masonry or concrete. Cover components with waterproof paper, tarpaulin or polyethylene sheeting in a manner to permit circulation of air. Stack framing components in a manner that will prevent bending and avoid significant or permanent damage.

## 1.6 PROJECT CONDITIONS

- A. Field Measurements: Check openings by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the work.
- B. Maintain openings to receive aluminum storefront window assemblies to the field dimensions (plumb and level) recorded on shop drawings.

## 1.7 WARRANTY

- A. Warranty: Submit a written warranty, executed by the manufacturer, agreeing to repair or replace units that fail in materials or workmanship within the specified warranty period. Failures include, but are not necessarily limited to:
  - 1. Structural failures including excessive deflection, excessive leakage or air infiltration
  - 2. Faulty operation
  - 3. Deterioration of metals, metal finishes and other materials beyond normal weathering
- B. Warranty Period: 5 years after the date of Substantial Completion.
- C. The warranty shall not deprive the City of other rights or remedies the City may have under other provisions of the Contract Documents, and is in addition to and runs concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide storefront window assemblies, fixed multi-lite and single unit conventional and impact resistive systems as manufactured by one of the following:

1. Kawneer Company, Inc.
2. United States Aluminum
3. YKK AP America, Inc.
4. Arch Aluminum & Glass
5. Crawford Tracey

## 2.2 MATERIALS

- A. Aluminum Members: Alloy and temper recommended by the manufacturer for strength, corrosion resistance, and application of required finish; comply with ASTM B 221 for aluminum extrusions, ASTM B 209 for aluminum sheet or plate, and ASTM B 211 for aluminum bars, rods and wire.
- B. Carbon steel reinforcement of aluminum framing members shall comply with ASTM A 36 for structural shapes, plates and bars, ASTM A 611 for cold rolled sheet and strip, or ASTM A 570 for hot rolled sheet and strip.
- C. Glass and Glazing Materials: Comply with requirements of "Glass" section of these specifications.
- D. Fasteners: Provide fasteners of aluminum or other material warranted by the manufacturer to be non-corrosive and compatible with aluminum components, hardware, anchors and other components.
1. Reinforcement: Where fasteners screw-anchor into aluminum members less than 0.125 inches thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard non-corrosive pressed-in splined grommet nuts.
  2. Exposed Fasteners: Do not use exposed fasteners except for application of hardware. For application of hardware, use Phillips flat-head machine screws that match the finish of member or hardware being fastened.
- E. Concealed Flashing: 0.0179-inch (26 gage) minimum dead-soft stainless steel, or 0.026-inch thick minimum extruded aluminum of alloy and type selected by manufacturer for compatibility with other components.
- F. Brackets and Reinforcements: Provide high-strength aluminum brackets and reinforcements; where use of aluminum is not feasible provide nonmagnetic stainless steel or hot-dip galvanized steel complying with ASTM A 123.
- G. Concrete and Masonry Inserts: Provide hot-dip galvanized steel embeds or concrete inserts for placement into masonry complying with ASTM A 123.
- H. Framing System Gaskets and Sealants: Manufacturer's standard, including replaceable compressible weather-stripping gaskets of molded PVC complying with ASTM D 2287.

## 2.3 COMPONENTS

- A. Storefront Window Framing System: Provide storefront window framing systems fabricated from extruded aluminum members of size and profile indicated. Include sub-frames and other reinforcing members of the type indicated. Provide for flush glazing storefront from the exterior on all sides without projecting stops. Shop-fabricate and pre-assemble frame components where possible. Provide storefront frame sections without exposed seams.
- B. Mullion Configurations: Provide pockets at the inside glazing face to receive resilient elastomeric glazing. Make provisions to drain moisture accumulation to the exterior.

## 2.4 FABRICATION

- A. General: Fabricate aluminum storefront window components to designs, sizes and thicknesses indicated and to comply with indicated standards. Sizes and profile requirements are indicated on the drawings. Variable dimensions are indicated, with maximum and minimum dimensions required, to achieve design requirements and coordination with other work.
- B. Prefabrication: Complete fabrication, assembly, finishing, and other work to the greatest extent possible before shipment to the Project site. Disassemble components only as necessary for shipment and installation.
  - 1. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work to prevent damage to exposed finish surfaces.
  - 2. Pre-glaze frame units to greatest extent possible.
- C. Welding: Comply with AWS recommendations. Grind exposed welds smooth to remove weld spatter and welding oxides. Restore mechanical finish. Welding behind finished surfaces shall be performed in such a manner as to minimize distortion and discoloration on the finished surface.
- D. Reinforcing: Install reinforcing as necessary for performance requirements, sag resistance and rigidity.
- E. Dissimilar Metals: Separate dissimilar metals with bituminous paint, or a suitable sealant, or a non-absorptive plastic or elastomeric tape, or a gasket between the surfaces. Do not use coatings containing lead.
- F. Continuity: Maintain accurate relation of planes and angles with hairline fit of contacting members. Uniformity of Metal Finish: Abutting extruded aluminum members shall not have an integral color or texture variation greater than half the range indicated in the sample pair submittal.
- G. Fasteners: Conceal fasteners wherever possible.

## 2.5 FINISHES

- A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.



- B. Provide manufacturer's Kynar finish; color as selected by the Architect from manufacturer's full sample color range.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and supports, with the Installer present, for compliance with requirements indicated, installation tolerances, and other conditions that affect installation of aluminum storefront window assemblies.
- B. Correct unsatisfactory conditions before proceeding with the installation. Do not proceed with installation until unsatisfactory conditions are corrected.

### **3.2 INSTALLATION**

- A. Comply with manufacturer's instructions and recommendations for installation.
- B. Set units plumb, level, and true to line, without warp or rack of framing members or panels. Install components in proper alignment and relation to established lines and grades indicated. Provide proper support and anchor securely in place.
- C. Construction Tolerances: Install aluminum storefront window assemblies to comply with the following tolerances:
  - 1. Variation from Plane: Do not exceed 1/8 inch in 12 feet of length or 1/4 inch in any total length.
  - 2. Offset from Alignment: The maximum offset from true alignment between two identical members abutting end to end in line shall not exceed 1/16 inch.
  - 3. Diagonal Measurements: The maximum difference in diagonal measurements shall not exceed 1/8 inch.
  - 4. Offset at Corners: The maximum out-of-plane offset of framing at corners shall not exceed 1/32 inch.
- D. Separate aluminum and other corrodible metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.
  - 1. Zinc or cadmium plate steel anchors and other unexposed fasteners after fabrication.
  - 2. Paint dissimilar metals where drainage from them passes over aluminum.
  - 3. Paint aluminum surfaces in contact with mortar, concrete or other masonry with alkali resistant coating.
  - 4. Paint wood and similar absorptive material in contact with aluminum and exposed to the elements or otherwise subject to wetting, with two coats of aluminum house paint. Seal joints between the materials with sealant.
- E. Set sill members and other members in bed of sealant as indicated, or with joint fillers or gaskets as indicated to provide weather-tight construction. Comply with requirements of Division 7 for sealants, fillers, and gaskets.

- F. Refer to "Glass" Section of Division 8 for installation of glass and other panels indicated to be glazed into storefront framing, and not pre-glazed by manufacturer.

### 3.3 CLEANING

- A. Clean completed systems, inside and out, promptly after installation, exercising care to avoid damage to coatings.
- B. Clean glass surfaces after installation, complying with requirements contained in the "Glass" Section for cleaning and maintenance. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

### 3.4 PROTECTION

- A. Institute protective measures required throughout the remainder of the construction period to ensure that aluminum storefront window assemblies will be without damage or deterioration, other than normal weathering, at time of acceptance.

**END OF SECTION 08 43 13**

**SECTION 08 56 80****ALUMINUM TRANSACTION WINDOWS****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Section includes heavy-duty, commercial, aluminum transaction windows. Extent and location of transaction windows required are indicated on drawings.
- B. Sizes: As indicated on the Drawings.
- C. Built-in anchors and grouting of frames set in masonry are specified in Division-4.

**1.2 QUALITY ASSURANCE**

- A. Coordination: Furnish inserts and anchoring devices that must be built into other work for installing transaction window assemblies. Coordinate delivery with other work to avoid delay.
- B. Provide transaction window assemblies with UL labels where fire-rated units are required in rated assemblies.

**1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data and installation instructions for the type of aluminum transaction window assembly indicated, including setting drawings, templates, instructions and directions for installation of anchorage devices.
- B. Shop Drawings: Submit for fabrication and installation of transaction windows. Include details, elevations and installation requirements for finish hardware and cleaning.
- C. Samples, 3" x 5" minimum size, of each panel face material showing factory finished color and texture.
- D. Certification: Provide printed data in sufficient detail to indicate compliance with the contract documents.

**1.4 DELIVERY, STORAGE AND HANDLING**

- A. Deliver window assemblies crated to provide protection during transit and job storage
- B. Inspect windows upon delivery for damage. Unless minor defects can be made to comply with specifications and Architect's satisfaction, damaged parts shall be removed and replaced.
- C. Store window assemblies at the site under cover in a dry location.

## 1.5 PROJECT CONDITIONS

- A. Field Measurements: Check openings by accurate field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the work.

## 1.6 WARRANTY

- A. All material and workmanship shall be warranted against defects for a period of one year from the date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. Manufacturer: Provide aluminum transaction windows by one of the following:
  - 1. C. R. Lawrence Co., Inc.
  - 2. Horton Automatics
  - 3. Arcadia, Inc.
  - 4. Easi-Serv Products

### 2.2 MATERIALS

- A. Frames: 4-inch aluminum frame modules shall be constructed of 6063-T5 extruded aluminum. Replacement and servicing of glass shall be from the operations side of the window by means of an access panel in the top header and not require the removal of the frame from the opening. Window slides on top-hung heavy-duty ball bearing slides and comes with poly-pile weather stripping and self-latching handle. Overall frame sizes shall be as indicated on the Drawings.
- B. Finish: All aluminum shall be clear anodized unless indicated otherwise on the Drawings.
- C. Glazing: Laminated glass, one-half inch thickness, unless indicated otherwise on the Drawings.
- D. Provide assemblies with stainless steel customer shelf.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Comply with manufacturer's published instructions for installation transaction windows.
- B. Replace damaged units with new units.

### 3.2 CLEANING AND PROTECTION

- A. Clean frame and glazing surfaces after installation complying with manufacturer's published instructions. Remove excess glazing sealant compounds, dirt or other substances.
- B. Institute protective measures required throughout the remainder of the construction period to ensure that windows do not incur any damage or deterioration at the time of final acceptance.

**END OF SECTION 08 56 80**

**SECTION 08 71 00****DOOR HARDWARE****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Door hardware work includes, but is not limited to, furnishing hardware items required for swing doors indicated on schedules and shown on drawings including hinges, lock or latch sets, dead locks, cylinders, bolts, exit devices, push/pull units, closers and miscellaneous door control devices and protection plates.
- B. Related Work Specified in Other Sections:
  - 1. Steel Door Frames are specified in Section 08 11 00
  - 2. Aluminum-Framed Entrances are specified in Section 08 41 13
  - 3. Electrical requirements for security hardware are specified in Division 26
- C. Work Not Included:
  - 1. Rough Hardware - Section 05 50 00
  - 2. Hardware for casework - Section 06 40 00

**1.2 SUBMITTALS**

- A. Before ordering any material, prepare and submit shop drawings and/or product data of all hardware materials and complete hardware schedule to the Architect and the Owner for review.
  - 1. Door numbers and hardware groups are not to be changed.
  - 2. Horizontally formatted schedules will not be accepted.
- B. Submit initial draft of hardware schedule at earliest possible date to facilitate the fabrication of other work, particularly hollow metal frames. Include with schedule, product data or other shop drawings and information essential to coordinate review of hardware schedule. Include in schedule installation dimensions for the benefit of the Installer.
- C. Schedule shall be specific and conclusive with respect to catalog numbers, finishes, template requirements, brackets, type of fasteners and locations. Incomplete schedule will not be checked.
- D. Check specified schedule against latest revised plans when making up schedule for approval. Schedule each door separately and, where practical, schedule item numbers the same as door numbers shown on drawings and schedules and in consecutive sequences.
- E. Submit final draft of hardware schedule, after approvals are complete, for use on project. Six (6) copies shall be required.

1. Copies of the hardware schedule and templates shall be submitted and approved before ordering.
  2. Horizontally oriented schedules will not be accepted
  3. Include a separate index listing all doors in the Project, sorted numerically, with appropriate set number next to each door
  4. Identify all manufacturers of each item with type, numbers, and finish symbols
  5. Acceptance of hardware schedule will not relieve the Contractor of the responsibility of furnishing the specified hardware and all hardware necessary to complete the Project
  6. Exchange approved schedules and templates with related trades, to ensure accurate setting, reinforcing and fitting of finish, and for their preparation of contract submittals
- F. Prepare detailed keying schedule after obtaining the Owner's instructions and requirements. Submit for approval.
- G. Provide parts and maintenance manual and proper tools necessary to maintain hardware items. Coordinate with Project Close-Out requirements in Division-1.
- H. Samples, if requested, shall be submitted to the Architect for approval. Approved samples, if of proper finish, will be delivered to job site and may be used in the Work. Otherwise samples will be returned to Contractor upon completion.

### 1.3 QUALITY ASSURANCE

- A. Supplier: Provide hardware from a recognized hardware supplier that has in employment an Architectural Hardware Consultant (AHC) in good standing as certified by Society of Architectural Hardware Consultants Council, and who has experience in preparation of architectural hardware specifications, estimating, detailing, ordering, servicing of architectural hardware, and who is available at reasonable times during course of the Work for consultation with the Owner, Architect and Contractor.
- B. Hardware that is to be installed in, or on fire labeled doors and frames shall be tested and listed by Underwriters Laboratories (UL) or Warnock Hersey Fire Laboratories Division.
1. All listed hardware shall comply with National Fire Protection Association (NFPA) Standard 80 and NFPA 101 and be properly stamped or labeled for easy identification.
- C. All hardware shall comply with State of Florida, Federal and local handicap accessibility laws and codes. In the event of conflict, the more, or most, stringent requirement shall govern.
- D. Assume sole responsibility for the provision, proper coordination and functioning of door hardware required for all openings, whether openings listed in the detailed schedule, including proper type of strike plates, length of spindle, hand, backset and bevel of locks, hand and degree opening for closers, length of kick plates, length of rods and flush bolts, type of door stop and other functions or mechanism to meet the requirements of the project.

### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver hardware only after detailed schedule and samples have been approved.
- B. Pack hardware by building unless otherwise directed.

- C. Hardware shall be sorted and delivered to job site plainly marked to correspond with item numbers of approved schedule and be specific as to exact opening and other locations for which items are packaged. Each door opening shall receive separate item number of hardware schedule.
- D. Check all shipments to insure proper accessories and templates have been included.
- E. Provide dry, secure lock-up for hardware delivered to the Project. Control handling and installation of hardware items that are not immediately replaceable so that the completion of the work will not be delayed by hardware losses.
- F. Handle all hardware in a manner to minimize marring, scratching or damage.
- G. Promptly replace items damaged in shipment or from improper handling with proper material without additional cost to the Owner.

## 1.5 WARRANTY

- A. Provide in conjunction with the hardware supplier a written guarantee that all materials furnished under this Section will be free from defects in materials and workmanship for a period of three (3) years from date of final Certificate of Acceptance.
- B. Closers shall have a 10-year warranty from date of final acceptance.
- C. After a complete inspection provide written certification that all materials furnished have been properly located in accordance with the hardware schedule and installed in accordance with the manufacturer's instructions.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Approved Manufacturers of specific door hardware items:
  - 1. Butts (Hinges): Ives, Hager, or equivalent
  - 2. Locksets, Latchsets, Deadbolts, Cylinders and Keying: STANLEY (no substitutions)
  - 3. Door Closers: STANLEY D-4550 or LCN 4041 Series
  - 4. Exit Devices: APEX, Von Duprin or Precision
  - 5. Push/Pull Plates, Kick Plates: Ives, Trimco, or Rockwood
  - 6. Wall Bumpers, Silencers, Door Holders and Stops: Ives, Glynn Johnson, or Rockwood
  - 7. Thresholds (with weather-stripping): Zero, Pemko, or NGP
  - 8. Flush Bolts: Trimco, D.C.I., Rockwood, or Ives

### 2.2 HINGES

- A. Hinges shall be full mortise, 5 knuckle, ball-bearing, stainless steel.



- B. Use three (3) hinges per door up to 7'-6" and one hinge for each additional thirty (30) inches of height.
- C. Use four (4) hinges per door over 40" in width.
- D. Provide three-knuckle, concealed bearing type, minimum 4-1/2 inches high. For doors with closers and all exterior doors, provide ball bearing type hinges.
  - 1. Exterior Doors: 4-1/2 x 4-1/2 - 32D - S.H. with non-removable pins.
  - 2. Exterior Doors with Closers: 4-1/2 x 4-1/2 - 32D - S.H. with non-removable pins
  - 3. Interior Doors: 4-1/2 x 4-1/2 - 10B.
  - 4. Interior Doors with Closers: 4-1/2 x 4-1/2 - 10B.
- E. Provide off-set hinges where Drawings show door swings of 180 degrees.

## 2.3 LOCKSETS

- A. Locksets and latchsets shall conform to the following requirements:
  - 1. Stanley: Series and Design as indicated in the Hardware Schedule.
    - a) Locksets and latchsets shall have self-aligning, thru-bolted trim.
    - b) Lever handles shall be of forged or cast brass or bronze construction and conform to ANSI A117.1. Levers that contain a hollow cavity will not be accepted.
  - 2. Functions and designs shall be as designated in Hardware Schedule.
  - 3. Finish: #626 - Satin Chrome unless indicated otherwise in the Hardware Schedule
- B. Provide cylinders to fit storefront entrance doors and exit devices: Best cores (no substitutions)
- C. Provide tactile warning on all locksets to areas deemed to be dangerous to the visually impaired. Areas include, but are not limited to, mechanical rooms, electrical rooms, and custodial spaces.

## 2.4 CLOSING DEVICES

- A. All door closers shall be rack and pinion type, cast iron or R-14 aluminum alloy, have full complement needle bearings and have three separate, independently adjusted, non-critical valves for back check, general closing speed, and final latch closing speed. Pressure relief valves will not be permitted. All heavy-duty arms shall be forged steel. Size closers in accordance with manufacturer's recommendations before installation.
- B. All closers shall comply with Positive Pressure Fire Testing and meet requirements of UL 10C and UBC 7-2.
- C. All closers shall be mounted on door side opposite public corridor except where door reveal or jamb conditions prevent this application.
- D. Provide all drop plates or accessories necessary for proper function or installation of closers.

## 2.5 EXIT DEVICES

- A. Exit Devices shall be UL approved, ANSI Grade 1, heavy duty, push bar type. Function as designated in Hardware Groups.
- B. Provide APEX 2100 Series (or equivalent hardware approved by the Owner). Exit devices shall be non-handed and field reversible. Base material and finish shall be satin chrome #626. Chassis shall be investment cast steel and zinc dichromated.
- C. Exit devices shall have dead latching capability. Touch bars shall have dampeners for quiet operation.
- D. Trim shall be heavy-duty cast material US26D and shall be through-bolted. All trim shall be vandal-resistant.
- E. Exit devices shall accommodate vision lites or glass windows up to 1/4-inch without spacers or shims.

## 2.5 MISCELLANEOUS HARDWARE ITEMS

- A. Push, Pull and Kick Plates:
  - 1. All push plates shall be 8" x 16" x 0.050-inch, 630 stainless steel finish, 4" x 16" when required by door stile
  - 2. All pull plates shall be stainless steel furnished with thru-bolts for concealed mounting. Provide in #630 finish. Bases for grips shall project straight out, perpendicular to face of door.
  - 3. Provide kickplates on all door closer equipped doors. Size to 10-inch high and 2-inch less than door width on single doors and 1-inch less on pairs, material 0.050 stainless steel, #630 finish.
- B. Stops and Holders: Provide units as manufactured by Ives in accordance with the Hardware Schedule. All doors shall be provided with stops at maximum degree permitted by conditions.
- C. Thresholds: Weather-stripped, handicapped accessible types as scheduled or detailed.
- D. Gasketing and Weather-Strips: Provide continuous units at head and jambs of all exterior doors. Units shall consist of an extruded aluminum housing (6063 alloy), mill finish, with closed cell sponge neoprene seal. Saddle and soundproofing shall be equivalent to those scheduled as manufactured by Zero:
- E. Silencers: Equivalent to Glynn-Johnson #GJ64, Trimco #1229S, or Quality #1337A.
  - 1. Provide three (3) rubber silencers per single door
  - 2. Provide two (2) rubber silencers per pair of doors
- F. Wrought Box Strike: Provide in hollow metal door frames.

## 2.7 FASTENERS

A. Screws: Provide as follows:

1. Hollow Metal Doors: Approved machine.
2. Kick Plates: O.H. Phillips recess Type A SMS.
3. Thresholds: Pemko FHSL 25-1/4 x 1/4-20 x 2", cad plated expansion screw in one unit or acceptable equivalent.
4. Brush Weather-stripping: As recommended by manufacturer.
5. Finish: Match finish of surfaces to which they are applied.

## 2.8 FINISHES

A. Hardware item finishes shall be as follows unless indicated otherwise on the Hardware Schedule:

1. Hinges: US32D (630)
2. Locksets, Cylinders, Dead Bolts: US26D (626)
3. Exit Devices: US32D (630) with US26D (626) trim
4. Closers: Standard Aluminum Finish
5. Trim Items: US32D (630)
6. Holders and Stops: US32D (630) and US26D (626)
7. Gasketing and Weather-Strips: Mill finish anodized aluminum

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Examine openings scheduled to receive hardware. Repair openings requiring corrective work prior to installation of hardware.
- B. Do not install door hardware until operations causing dampness have been completed.

### 3.2 INSTALLATION

- A. Install hardware in accordance with manufacturer's installation instructions; unless otherwise indicated. Install door closers with thru bolts and grommet nuts or hex bolts.
- B. Install hardware items at the following heights and locations, unless otherwise indicated. Heights are shown from finish floor to centerline of item:
 

|   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Hinges</li> <li>2. Cylindrical Lockset</li> <li>3. Deadlock or Deadlatch</li> <li>4. Push Plate</li> <li>5. Pull Plate</li> <li>6. Panic Bar</li> </ol> | <ol style="list-style-type: none"> <li>Standard Placement</li> <li>38"</li> <li>48"</li> <li>48"</li> <li>42"</li> <li>38"</li> </ol> |
|---|---|
- C. Install closers per manufacturer's template to provide 180-degree opening regardless of the actual swing of the door.

1. Mount closers on Room side of door.
2. Install closer foot with five (5) 1/4-20 bolts for metal frames; provide an approved spacer if required by the width of the stop for fifth screw. Screws shall not be used on metal frames or doors.
3. Adjust closers as recommended by the manufacturer.

D. Exit Devices: Install with thru bolts, four at each end of device.

E. Kick plates: 1/4" of Bottom of door.

F. Stops and Holders:

1. Stops: Walls - on wall where knob or pull hits; floors - on floor as far from hinge as conditions permit.
2. Overhead Door Holder - per template.
3. Door Holder - 2" from lead edge of door (at top or bottom depending on holder type); install with thru bolts and grommet nuts or sex bolts.

G. Rim Deadlocks: Install with thru bolts and grommet nuts or hex bolts. Secure inside cylinder retaining plate to inside door face with at least one metal screw to avoid cylinder from being rotated from exterior. Provide 0.125-inch thick aluminum spacer plate between surface of door and body of lock. Size of plate shall not be less than size of lock body.

H. Surface Bolts: Install with thru bolts and grommet nuts or hex bolts.

I. Thresholds: Set in full bed of sealant. Install bumper type thresholds to permit bottom inside of door to seat against threshold seal, and for door to extend below the bottom edge of this seal.

J. Door Pulls: Install with thru bolts and grommet nuts or hex bolts.

K. Weather-Stripping: Install in accordance with manufacturer's recommendations.

L. Textured Coatings: Provide on door handles to mechanical and electrical room doors as required under the Florida DCA Accessibility Guidelines.

### 3.3 KEYS AND KEYING

A. Provide construction cores and keys during the construction period. Construction control and operating keys and cores shall not be part of the Owner's permanent keying system or furnished on the same keyway (or key section) as the Owner's permanent keying system.

1. All cylinders shall be either seven pin or six pin as scheduled

B. Permanent cores and keys (prepared according to the accepted keying schedule) shall be furnished to the Owner prior to occupancy. Construction keys and extractor keys shall be turned over to the Owner at the end of the Project. Obtain receipt.

C. Provide keys as follows:

1. Two (2) Change Keys
2. Six (6) Master Keys per Set
3. Nine (9) Construction Keys
4. Two (2) Extractor Keys

- D. Mark and tag all miscellaneous keys for such items as electric panels, access doors, and built-in casework with room number or location. Turn these keys over to the Owner's authorized representative upon acceptance of the Project. Obtain receipt.

### 3.4 ADJUSTMENT, CLEANING AND PROTECTION

- A. Adjust and check each operating item of hardware to ensure correct operation and function. Replace units that cannot be adjusted to operate for intended application.
- B. Final Adjustment: Wherever hardware installation is made more than one month prior to building acceptance or occupancy of space or area, return during week prior to acceptance or occupancy and make final check and adjustment of all hardware items. Clean hardware as necessary to restore correct operation, function and finish. Adjust door control devices to compensate for final operation HVAC equipment.
- C. Protection: Whenever hardware is in areas where it may be subject to damage during construction by handling, cleaning, or painting, protect or temporarily remove from its location until adverse conditions have ceased.

### 3.5 HARDWARE SCHEDULE DESCRIPTION

- A. Provide hardware items as scheduled elsewhere in the Contract Documents. Special or unusual conditions not covered shall have hardware of similar type and quality to meet job conditions, and it is Contractor's responsibility to see that all hardware is supplied to meet job requirements and produce a complete job.
- B. All exit devices shall be mounted with sex nuts and bolts.
- C. Contractor shall provide the Owner with a Keying Schedule at least 12 weeks prior to completion of the Project.
- D. At completion of the Project, Owner will provide cylinders to the Contractor for installation by the Contractor.

**END OF SECTION 08 71 00**

**SECTION 08 80 00****GLASS AND GLAZING****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. This Section includes glazing for the following products, including those specified in other Sections where glazing requirements are specified by reference to this Section:
  - 1. Aluminum-Framed Storefront Windows
  - 2. Aluminum-framed glass entrances
  - 3. Vision Lites
- B. Glazing locations shall be as indicated on the Drawings.
- C. Related Sections: The following sections contain requirements that relate to this Section.
  - 1. Aluminum-Framed Entrances are specified in Section 08 41 13
  - 2. Aluminum-Framed Storefront Windows are specified in Section 08 43 13
  - 3. Doors with glass lites are specified elsewhere in Division-8

**1.2 DEFINITIONS**

- A. Manufacturer is used in this Section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standard.
- B. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's directions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated glass standard.

**1.3 SYSTEM PERFORMANCE REQUIREMENTS**

- A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading (where applicable), without failure including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; and other defects in construction.
  - 1. Provide glass units for exterior openings that have an NOA Miami-Dade Products Control Approval for hurricane wind resistance and air-borne missile impact from hurricane force winds.
- B. Glass Design: Glass thicknesses indicated on Drawings are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for the

various size openings in the thicknesses and strengths (annealed or heat-treated) to meet or exceed the following criteria:

1. Minimum glass thickness, nominally, of lites in glass assemblies shall be 9/16-inch unless otherwise indicated.
  2. Minimum glass thicknesses of lites, whether composed of annealed or heat-treated glass, are selected so the worst-case probability of failure does not exceed 8 lites per 1000 for lites set vertically or not over 15 degrees off vertical and under wind action. Determine minimum thickness of monolithic annealed glass in accordance with ASTM E 1300. For other than monolithic annealed glass, determine thickness per glass manufacturer's standard method of analysis including applying adjustment factors to ASTM E 1300 based on type of glass.
- C. Normal thermal movement results from the following maximum change (range) in ambient and surface temperatures acting on glass-framing members and glazing components. Base engineering calculation on materials' actual surface temperatures due to both solar heat gain and nighttime sky heat loss. Temperature Change (Range): 120 degrees F ambient; 180 degrees F, material surfaces.

#### 1.4 SUBMITTALS

- A. Product data for each glass product and glazing material indicated including NOA documentation.
- B. Samples for verification purposes of 12-inch-square samples of each type of glass indicated except for clear monolithic glass products, and 12-inch-long samples of each color required (except black) for each type of sealant or gasket exposed to view. Install sealant or gasket sample between two strips of material representative in color of the adjoining framing system.
- C. Product certificates signed by glazing materials manufacturers certifying that their products comply with specified requirements. Separate certifications are not required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program of a recognized certification agency or independent testing agency acceptable to authorities having jurisdiction.
- D. Compatibility and adhesion test reports from sealant manufacturer indicating that glazing materials were tested for compatibility and adhesion with glazing sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed for adhesion.
- E. Product test reports for each type of glazing sealant and gasket indicated, evidencing compliance with requirements specified.
- F. Maintenance data for glass and other glazing materials to be included in Operating and Maintenance Manual specified in Division 1.

## 1.5 QUALITY ASSURANCE

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. FGMA Publications: "FGMA Glazing Manual."
  - 2. LSGA Publications: "LSGA Design Guide."
  - 3. SIGMA Publications: TM-3000 "Vertical Glazing Guidelines".
- B. Safety Glass: Products complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials.
- C. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.
- D. Single-Source Responsibility for Glass: Obtain glass from one source for each product indicated below:
  - 1. Primary glass of each (ASTM C 1036) type and class indicated.
  - 2. Heat-treated glass of each (ASTM C 1048) condition indicated.
  - 3. Laminated glass of each (ASTM C 1172) kind indicated.
- E. Single-Source Responsibility for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.
- F. Preconstruction Compatibility and Adhesion Testing: Submit to sealant manufacturers, samples of each glass, gasket, glazing accessory, and glass-framing member that will contact or affect glazing sealants for compatibility and adhesion testing as indicated below:
  - 1. Use test methods standard with sealant manufacturer to determine if priming and other specific preparation techniques are required for rapid, optimum glazing sealants adhesion to glass and glazing channel substrates. Perform tests under normal environmental conditions during installation.
  - 2. Submit not less than nine pieces of each type and finish of glass-framing members and each type, class, kind, condition, and form of glass (monolithic, laminated, insulating units) for adhesion testing, as well as one sample of each glazing accessory (gaskets, setting blocks and spacers) for compatibility testing.
  - 3. Schedule sufficient time to test and analyze results to prevent delay in the Work.
  - 4. Investigate materials failing compatibility or adhesion tests. Obtain sealant manufacturer's written recommendations for corrective measures, including using special primers.
  - 5. Testing is not required when glazing sealant manufacturer can submit required preparation data that is acceptable to Architect and is based on previous testing of



current sealant products for adhesion to and compatibility with submitted glazing materials.

- G. Pre-Installation Conference: Conduct conference at Project site to comply with requirements of Division-1 Section "Project Management and Coordination."

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials to comply with manufacturer's directions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

## 1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing materials manufacturer or when glazing channel substrates are wet from rain, frost, condensation, or other causes.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURER

- A. The Basis of Design glass manufacturer for this Project is PPG. Other glass manufacturer's products will be considered by the Architect and the Owner provided they meet specified performance requirements, salient features listed below, and provide an aesthetic match in terms of color tint and degree of reflectivity.
- B. Salient Features:
  - 1. Low-E Insulating glass
  - 2. U-Value: 0.29
  - 3. Shading Coefficient: 0.19
  - 4. Solar Heat Gain Coefficient: 0.17
  - 5. Visible Transmittance: 21%
  - 6. Reflectance: 12%

## 2.2 PRIMARY FLOAT GLASS PRODUCTS

- A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Class as indicated in each Product Data Sheet at end of this Section, and Quality q3 (glazing select).

## 2.3 HEAT-TREATED FLOAT GLASS

- A. Fabrication Process: By vertical (tong-held) or horizontal (roller-hearth) process, at manufacturer's option, except provide horizontal process where indicated as tongless or free of tong marks.

- B. Coated, Clear, Heat-Treated Float Glass: Glass shall be 3/16-inch tempered as manufactured by Viracon, Inc. or equivalent. Reflective coating shall be installed on the #2 surface.
- C. Coated, Tinted, Heat-Treated Float Glass: Glass shall be 3/16-inch tempered as manufactured by Viracon, Inc. or equivalent. Tint shall be manufacturer's standard bronze unless indicated otherwise on the Drawings.

## 2.4 FIRE-RATED GLASS

- A. Non-Wired Clear Glass: 90-minute rating (2-hour rating); thickness: 3/4-inch; Tested and Certified to UL 10B and UL 10C; Impact Safety Rating: Category I and II in accordance with CPSC 16 CFR; STC 38 rating.
- B. Non-Wired Clear Glass: 20-minute rating without hose stream (1-hour rating); thickness: 1/4-inch; Tested and Labeled by Intertek/Warnock-Hersey and UL; Impact Safety Rating: Category I and II in accordance with CPSC 16 CFR; STC 28 rating.
- C. Available Manufacturers: Subject to compliance with requirements, manufacturers offering fire-rated glass products that may be incorporated in the Work include, but are not limited to, the following companies.
  - 1. SAFTIFIRST (Basis of Design)
  - 2. Pilkington
  - 3. AFG Glass Company
  - 4. Technical Glass Products

## 2.5 LAMINATED GLASS PRODUCTS

- A. Laminated Glass Products: Comply with ASTM C 1172 for kinds of laminated glass indicated and other requirements specified.
- B. Interlayer: Polyvinyl butyral sheets or Ionoplast interlayer material, clear, and of thickness and composition to comply with testing and product approvals. Subject to compliance with requirements, plastic interlayer products that may be incorporated in the Work include, but are not limited to the following:
  - 1. Polyvinyl Butyral Interlayer: Saflex, Monsanto Co. or Butacite, E. I. du Pont de Nemours & Co., Inc.
  - 2. Sentryglass Plus, E.I. du Pont de Nemours & Co., Inc.
- C. Laminating Process: Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets as follows: Laminate lites in autoclave with heat plus pressure.

## 2.6 HEAT-TREATED WINDOW GLASS

- A. Provide PPG Solarban R100 Solar Gray + Clear, 1-inch, Low-E Insulating Glass.
- B. Salient Features: Per Article 2.1, Paragraph B

C. Locations: Exterior glass windows and glass vision lites

## 2.7 ELASTOMERIC GLAZING SEALANTS

A. General: Provide products of type indicated, complying with the following requirements:

1. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials they will contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
2. Suitability: Comply with sealant and glass manufacturer's recommendations for selecting glazing sealants and tapes that are suitable for applications indicated and conditions existing at time of installation.
3. Colors: Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

B. Elastomeric Glazing Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with ASTM C 920 requirements indicated on each Elastomeric Glazing Sealant Product Data Sheet at the end of this Section, including those referencing ASTM classifications for Type, Grade, Class and Uses.

1. Additional Movement Capability: Provide products, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, with the capability to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements of ASTM C 920 for uses indicated.

## 2.8 GLAZING GASKETS

A. Soft Compression Gaskets: Extruded or molded closed-cell, integral-skinned gaskets of material indicated below, complying with ASTM C 509, Type II, black, and of profile and hardness required to maintain watertight seal:

1. EPDM
2. Silicone
3. Thermoplastic polyolefin rubber
4. Any material indicated above

B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following companies.

1. Advanced Elastomer Systems, L.P.
2. Schnee-Morehead, Inc.
3. Tremco, Inc.

## 2.9 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85 +/- 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side-walking).

## 2.10 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine glass framing, with glazier present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
  - 2. Presence and functioning of weep system.
  - 3. Minimum required face or edge clearances.
  - 4. Effective sealing between joints of glass-framing members.
- B. Do not proceed with glazing until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

### 3.3 GLAZING, GENERAL

- A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.

- B. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. Protect glass from edge damage during handling and installation as follows:
  - 1. Use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass lites with flares or bevels on bottom horizontal edges so edges are located at top of opening, unless otherwise indicated by manufacturer's label.
  - 2. Remove damaged glass from Project site and legally disposed of off-site. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by pre-construction sealant-substrate testing.
- E. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass sizes larger than 50 united inches (length plus height) as follows:
  - 1. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.
  - 2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

#### 3.4 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
- B. Secure compression gaskets in place with joints located at corners to compress gaskets producing a weather-tight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

- C. Install gaskets so they protrude past face of glazing stops.

### 3.5 SEALANT GLAZING (WET)

- A. Install continuous spacers between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel weep systems until sealants cure. Secure spacers in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass. Install pressurized gaskets to protrude slightly out of channel to eliminate dirt and moisture pockets.

### 3.6 PROTECTION AND CLEANING

- A. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.
- E. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

**END OF SECTION 08 80 00**

**SECTION 08 91 19****FIXED LOUVERS****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Extent of fixed louvers is indicated on the Drawings.
- B. Work includes, but is not limited to, fixed extruded aluminum, weatherproof, stationary blade, self-draining louvers with bird and insect screens.
- C. Related Work:
  - 1. Concrete unit masonry is specified in Division-4
  - 2. Rough carpentry is specified in Section 06 10 00
  - 3. Sealants are specified in Section 07 92 00
  - 4. Portland Cement Stucco is specified in Section 09 24 23
  - 5. Painting is specified in Section 09 90 00

**1.2 SUBMITTALS**

- A. Shop Drawings: Submit drawings showing sections, elevations, and details of head, jamb and sill conditions. Show requirements for anchorage and application of sealant.
- B. Product Data: Submit manufacturer's literature fully describing louver assemblies.
- C. Samples: Submit manufacturer's standard range powder-coated metal finishes for selection by the Architect.

**1.3 QUALITY ASSURANCE**

- A. Provide fixed louvers from a single source Manufacturer
- B. All fixed louvers shall fully meet requirements of the Florida Building Code, latest Edition (including all amendments) and have a Miami Dade County NOA.

**PART 2 - PRODUCTS****2.1 MATERIALS**

- A. Aluminum Sheet: ASTM B209, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer to provide required finish.
- B. Aluminum Extrusions: ASTM B221, Alloy 6063-T52.

C. Bituminous Paint: SSPC Paint 12 (cold-applied asphalt mastic)

## 2.2 FABRICATION

- A. Fabricate frames including integral sills to suit adjacent construction with tolerances for installation, including application of sealants in joints between louvers and adjoining work.
- B. Include supports, anchorages, and accessories required for complete assembly.
- C. Provide sill extensions and loose sills made of same material as louvers where required for drainage to the exterior and to prevent water penetrating the building interior.
- D. Join frame members to one another and to stationary louver blades by welding, except where indicated otherwise or where field bolted connections between frame members are made necessary by size of louvers. Maintain equal blade spacing, including separation between blades and frames at head and sill to produce uniform appearance.

## 2.3 FIXED EXTRUDED ALUMINUM LOUVERS

- A. Horizontal, Drainable Blade Louvers: Dual drain recessed mullion type; units designed to collect and drain water to exterior at sill by means of gutters in front edges of blades, and channels in jambs and mullions. Provide units with extrusions not less than 0.081-inch thick of depth and sizes indicated on the Drawings.
- B. Free Area: Not less than 50 percent.
- C. Water Penetration: Not more than 0.05 ounces per square foot of free area at an airflow of 1000 FPM free area velocity.
- D. AMCA Certification: Provide units bearing AMCA Certified Ratings Seal.
- E. Continuous Horizontal Blades: Conceal supporting framework from vision on outside face of louver by placing braces, mullions and brackets on inside face, with close fitting, field-fabricated splice joints in blades designed to permit expansion and contraction without deforming blades or framework.
- F. Louvers shall be fitted with 1/2-inch mesh 0.063-inches thick aluminum bird screen in a removable extruded aluminum frame.
- G. Finish: Provide manufacturer's powder-coat finish, color as selected by the Architect from manufacturer's standard range of colors.

## 2.4 MANUFACTURER

- A. Subject to compliance with specified requirements, provide aluminum wall louvers by one of the following:
  - 1. Construction Specialties, Inc.
  - 2. Airline Products Co.



3. The Airolite Co.
4. Industrial Louvers

## 2.5 FASTENINGS

- A. Concrete and Masonry: Minimum 3/8-inch diameter concealed round or hex head stainless steel machine screws. Provide gages and lengths to suit unit installation conditions. Use Phillips flat-head machine screws for exposed fasteners.
- B. Wood Bucks: No.14 round head stainless steel sheet metal screws.
- C. Aluminum: Stainless steel or anodized aluminum fasteners.
- D. Anchors and Inserts: Cadmium-plated steel, self-drilling type.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Coordinate installation of wall louvers with the installation of concrete unit masonry.
- B. Install metal wall louvers in accordance with manufacturer's printed instructions and accepted shop drawings under direct supervision of manufacturer's representatives using mechanics skilled in this type of work.
- C. Erect louvers plumb, level and true.
  1. Do not distort louver by erection screws or fittings.
  2. Exposed rivets and fasteners will not be acceptable.

### 3.2 CLEANING

- A. Clean stains off finished surfaces in accordance with louver manufacturer's published recommendations.

**END OF SECTION 08 91 19**

**SECTION 08 95 20****FIBERGLASS-SANDWICH-PANEL ASSEMBLIES****PART 1- GENERAL****1.1 WORK INCLUDED**

- A. This Section includes assemblies incorporating 2-3/4" fiberglass sandwich panels and a aluminum frame for an open canopy system.
- B. Related Work:
  - 1. Metal supporting framework is specified in Section 05 50 00, Metal Fabrications
  - 2. Wood curbs and cants are specified in Section 06 10 00, Rough Carpentry
  - 3. Roofing and flashing systems are specified in Division-7
  - 4. Glass and glazing is specified in Section 08 80 00
  - 5. Joint sealants are specified in Section 07 92 00

**1.2 PERFORMANCE REQUIREMENTS**

- A. Deflection of entire system shall be no more than L/180, unless otherwise indicated.
- B. Structural Loads: Provide system capable of handling the following loads when supporting full dead load:
  - 1. Live Load: 30 PSF
  - 2. Wind Load: As indicated on structural drawings

**1.3 SUBMITTALS**

- A. Product Data: Submit shop drawings and color samples of face sheets and finishes in accordance with provisions of Division-1.
- B. Samples: Submit product sample showing thickness, face sheets, colors and insulation; size of sample shall be 14" x 28".
- C. Test Reports: To be furnished by systems manufacturer in accordance with Division 1 requirements for Submittals. Manufacturer shall submit certified test reports by an independent testing organization for each type and class of panel system. Reports shall verify that the material will meet all performance requirements of this specification. Previously completed test reports will be acceptable if by current manufacturer and indicative of products used on this project. Test reports required include, but are not limited to the following:
  - 1. Current FBC Product Approval meeting local requirements
  - 2. Flame Spread and Smoke Developed (UL 723) – Submit UL Card
  - 3. Burn Extent (ASTM D 635)
  - 4. Color Difference (ASTM D 2244)

5. Impact Strength (FBC requirements)
  6. Bond Tensile Strength (ASTM C 297 after aging by ASTM D 1037)
  7. Bond Shear Strength (ASTM D 1002)
  8. Beam Bending Strength (ASTM E 72)
  9. Fall Through Resistance (ASTM E 661)
  10. Insulation U-Factor (NFRC 100)
  11. NFRC System U-Factor Certification (NFRC 700)
  12. Solar Heat Gain Coefficient (NFRC or Calculations)
  13. Air Leakage (ASTM E 283)
  14. Structural Performance (ASTM E 330)
  15. Water Penetration (ASTM E 331)
  16. Class A Roof Covering Burning Brand (ASTM E 108)
  17. ASTM E1886/1996 or TAS 201, 202 and 203
  18. Daylight Autonomy
- D. Proof of regular, independent quality control monitoring under a nationally recognized building code review and listing program shall be submitted.
- E. Complete energy and structural calculations and all above data must be submitted with any request to be included as an approved product to bid this section.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Erection shall be by an installer which has been in the business of erecting and installing specified materials for at least five (5) consecutive years, and can show evidence of satisfactory completion of projects of similar size, scope and type.
- B. Submittal drawings and panel calculations to be reviewed and stamped by a Florida registered engineer.
- C. Translucent panel manufacturer, materials and installation shall be currently listed or approved by the Florida Building Commission for use in Wind-Borne Debris Regions. Translucent panel design, materials and installation shall meet current requirements of the Florida Building Code.
- D. Materials and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten (10) consecutive years and which can show evidence of these materials being satisfactorily used on at least ten (10) projects on Florida of similar size, scope and type within such a period. At least three (3) projects shall have been in successful use for 10 years or longer.
- E. Performance Requirement: The manufacturer shall be responsible for the configuration and fabrication of the complete panel system.
- F. Product Options: Drawings indicate size, dimensions and profile to structural translucent panel system. Specifications indicate performance required. Other manufacturers that can meet portions of this specification and wish to be considered alternates must comply with Division-1 requirements for substitutions and can offer alternate bids for consideration using those guidelines.

## 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions in system installation areas and indicate if dimensions on shop drawings are actual or guaranteed dimensions.

## 1.7 WARRANTY

- A. Submit manufacturer's and installer's written warranty agreeing to repair or replace panel system work, which fails in materials or workmanship within one year of the date of delivery. Failure of materials or workmanship shall include leakage, excessive deflection, and deterioration of finish on metal exceeding normal weathering and defects in accessories, insulated translucent sandwich panels and other components of the work.

## 1.8 PRODUCT HANDLING

- A. Store panels on long edge, several inches above the ground, blocked and under cover to prevent damage. Follow manufacturer's storage and handling instructions.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURER

- A. The basis for this specification is for products manufactured by Kalwall Corporation. Other manufacturers may bid this project provided they comply with all performance requirements of this specification and submit evidence thereof. Listing other manufacturers' names in this specification does not constitute approval of their products or relieve them of compliance with all the performance requirements contained herein.

1. Kalwall Corporation, Tel: (800) 258-9777 – Email: [info@kalwall.com](mailto:info@kalwall.com)
2. Local Installing Distributor: Specified Architectural Systems, Inc – 9942 Currie Davis Drive, Suite C, Tampa, FL 33619. Phone: (813) 915-6100.
3. Contact: Lisa Fox Venables, Phone: (954) 501-5895, Email: [lisa.fox@specarcsys.com](mailto:lisa.fox@specarcsys.com)

## 2.2 MATERIALS - TRANSLUCENT FACE SHEETS - PANEL FABRICATION

- A. Translucent fiberglass faces shall be manufactured from glass fiber reinforced thermoset resins by insulated system fabricator specifically for architectural use. Thermoplastic faces such as polycarbonate and acrylic, are not acceptable.
- B. Flammability – Interior Face Sheet Flame spread: Underwriters Laboratories (UL) listed, which requires periodic unannounced retesting, with flame spread rating no greater than 10 and smoke developed no greater than 350-400 when tested in accordance with UL 723. Burn extent by ASTM D-635 shall be no greater than 1”.
- C. Weatherability: The full thickness of the exposed exterior face shall not change color more than 3.0 Hunter or CIE Units DELTA E by ASTM D-2244 after five (5) years outdoor South Florida weather at 5° facing South, determined by the average of at least three (3) white samples with and without a protective film or coating to ensure maximum, long-term color

stability.

- D. The exposed exterior face shall have a permanent glass veil erosion barrier integrally embedded to provide maximum long-term resistance to fiber exposure. Sacrificial plastic surface films, coatings or veils are not acceptable.
- E. Exterior face sheet shall be smooth, .070" thick and aqua in color. Interior face sheet shall be .045-inch thick, Type A and aqua in color. Faces shall not vary more than +/- 10% in thickness and be uniform in color.
- F. Panel system shall be 2-3/4" thick, made of two (2) sheets of translucent fiberglass, bonded by heat and pressure to an aluminum grid core specifically for architectural use.
- G. Thermal Insulation: Panels shall have a NFRC laboratory tested "U" factor of .53 by ASTM C-236, E-1423 and C-1199. System shall be NFRC certified with a "U" value of .68.
- H. Light and Solar Transmission: Roof panels shall have a light transmission of 20% and solar heat gain coefficient of 0.38 per ASTM E-972.
- I. Grid Core:
  - 1. Grid pattern shall be nominal 12" x 24" shoji and symmetrical about the horizontal center line for each flat panel.
  - 2. The aluminum I-beam grid core shall be 6063-T6 or 6005-T5 with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam shall be not less than 7/16". The I-beam grid shall be machined to tolerances of not greater than +/- .002".
  - 3. Panels shall withstand 1200°F fire for minimum (1) hour without collapse or exterior flaming.
- J. ADHESIVE
  - 1. The laminate adhesive shall be heat and pressure resin-type engineered for structural sandwich panel use, with minimum 25-years field use. Adhesive shall pass testing requirements specified by the International Conference of Building Officials "Acceptance Criteria for Sandwich Panel Adhesive".
  - 2. Minimum strength shall be 750 PSI tensile strength by ASTM C-297 after two (2) exposures to six (6) cycles each of the aging conditions prescribed by ASTM D-1037.
  - 3. Shear strength by ASTM D-1002 minimum after exposures to five (5) separate aging conditions:
    - a) 50% Relative Humidity at 73°F: 540 PSI
    - b) 182°F: 100 PSI
    - c) Accelerated Aging by ASTM D-1037 at room temperature: 800 PSI
    - d) Accelerated Aging by ASTM D-1037 at 182°F: 250 PSI
    - e) 500 Hour Oxygen Bomb by ASTM D-572: 1400 PSI
- K. IMPACT RESISTANCE: Fiberglass sandwich panels shall meet Hurricane Small Missile impact requirements per the Florida Building Code.
- L. Translucent structural sandwich panel shall be a true sandwich panel of flat fiberglass sheets bonded to a grid core of mechanically interlocking aluminum I-beams and shall be laminated

under a controlled process of heat and pressure, and deflect no more than 1.9" at 30 psf in 10' by ASTM E-72.

- M. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat, sharp edge. In order to insure bonding strength, white spots at intersections of muntins and Mullions shall not exceed 4 for each 40 square feet of panel, nor shall they be more than 3/36" in width.
- N. Panels and aluminum perimeter frame shall be pre-assembled where practical and sealed at the factory. Panels should be shipped to the job site in rugged shipping units, ready for erection.
- O. Perimeter Closure System, Battens and Aluminum Finishes
  - 1. Closure system shall be extruded 6063-T6 and 6063-T5 aluminum clamp-tight screw type. Curved closure system may be roll formed.
  - 2. Aluminum closures to be supplied with 300 series stainless steel screws (excluding final fasteners to building) and shall be factory sealed to the panels. Aluminum battens and cap plates shall be field installed.
  - 3. All exposed aluminum to be architectural corrosion resistant finish which meets the performance requirements of AAMA 2604, color to be selected from manufacturer's standards.
  - 4. Flexible sealing tape shall be manufacturer's standard pre-applied to serrated edges of closure system at factory under controlled conditions.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Do not install systems until conditions adversely affecting installation and performance have been corrected.

#### **3.2 PREPARATION**

- A. The general contractor shall prepare openings including isolating dissimilar materials from aluminum system which may cause damage by electrolysis, and shall provide temporary enclosures if required.

#### **3.3 INSTALLATION**

- A. The installer shall erect translucent panel system in strict accordance with approved shop drawings as supplied by manufacturer, including fastening and sealing. All surfaces shall be cleaned before sealants are applied.
- B. Secure non-moveable joints and accommodate thermal and mechanical movements.
- C. If required, insure weep holes are correctly installed.

- D. After other trades have completed work on adjacent material, inspect translucent panel installation and make any adjustments necessary to ensure proper installation and weather-tight conditions.
- E. All staging and lifts required for the complete panel system installation and field measuring shall be provided by and maintained by the installing contractor.

#### 3.4 CLEANING

- A. Clean panel system, both sides, after installation according to manufacturer's published recommendations.

**END OF SECTION 08 95 20**

## **SECTION 09 21 16**

### **GYPSUM BOARD ASSEMBLIES**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. Scope: Furnish and install gypsum board surfaces complete including, but not limited to, the following:
  - 1. Metal suspension, metal framing, metal furring, and metal support systems for these surfaces unless noted as being specified in another section.
  - 2. Drywall framing members required to support the application of other work.
  - 3. Regular and Fire-Rated (Type-X) gypsum panels for walls and ceilings
  - 4. Fire-Rated (Type-X) gypsum fiberglass panels
  - 5. Tile Backer Board
  - 6. Acoustical insulation
- B. Provide fire-rated paperless gypsum panels where fire-resistance ratings are indicated on the Drawings.

##### **1.2 RELATED WORK**

- A. Rough Carpentry is specified in Section 06 10 00
- B. Thermal Insulation is specified in Section 07 21 00
- C. Firestopping caulks and putties are specified in Section 07 84 00
- D. Joint Sealants are specified in Section 07 92 00
- E. Steel Door Frames are specified in Section 08 11 00
- F. Painting and Coatings are specified in Section 09 90 00

##### **1.3 QUALITY ASSURANCE**

- A. Fire Resistance Rating: Where indicated, provide materials and construction which are identical to those of assemblies whose fire resistance rating has been determined per ASTM E 119 by a testing and inspecting organization acceptable to authorities having jurisdiction:
  - 1. By reference to Gypsum Association file number in GA-600 "Fire Resistance Design Manual" or to design designations in UL "Fire Resistance Directory" as testing agencies acceptable to jurisdictional authorities.
  - 2. Provide products that comply with the following limits for surface burning characteristics when tested in accordance with ASTM E84:



- a) Flame Spread: 25 maximum
- b) Smoke Developed: 450 maximum

B. Single Source Responsibility: Obtain each type of gypsum board and related joint treatment materials from a single manufacturer.

#### 1.4 SUBMITTALS

A. Submit manufacturer's product data for each type of product specified and shown on the Drawings.

#### 1.5 WARRANTY

A. Provide manufacturer's 3-year warranty against manufacturing defects.

### **PART 2 - PRODUCTS**

#### 2.1 ACCEPTABLE MANUFACTURERS

A. Gypsum Board: Subject to compliance with specified requirements, provide products and materials by one of the following manufacturers:

- 1. American Gypsum
- 2. USG Corp.
- 3. G-P Gypsum Corp. (Basis of Design)
- 4. National Gypsum Company

B. Provided fire-rated gypsum board materials as required or indicated on the Drawings.

#### 2.2 MATERIALS

A. Fire-rated Gypsum Board: 5/8-inch thick, Type "X", with tapered edges. Type "X" board shall carry the UL classification mark for 15, 15, 0 surface burning characteristics.

B. Regular Gypsum Board: ASTM C 36, tapered edge, 5/8-inch thick x 48 inches wide x longest stock length to fit available dimensions.

C. Paperless Gypsum Board Panels: 5/8-inch thick, "DensArmor Plus" and "DensArmor Plus Fireguard" as manufactured by Georgia-Pacific, or equivalent.

- 1. Provide 5/8-inch thick "DensArmor Plus Abuse-Resistant Interior Panels" in high traffic areas where indicated on the Drawings.
- 2. Provide 5/8-inch thick "DensArmor Plus" Tile-Backing Panels complying with ASTM C 1177 at wet locations and at locations to receive ceramic tile applications.

D. Sound Dampening Gypsum Board: 5/8-inch thick, "QuietRock DensArmor Plus", paperless, sound dampening panels with an STC rating of 50-54 as manufactured by Georgia-Pacific,

or equivalent.

- E. Drywall Framing Members: Studs, furring channels, floor and ceiling tracks, connecting accessories and clips as required for a complete framing system. Size of framing members shall be as indicated on the Drawings and shall be 20-gauge unless indicated otherwise. Members shall be designed for screw-on application of board, fabricated by one manufacturer, and meeting or exceeding the following requirements. Framing shall provide a lateral load resistance of 5-lbs. per square foot.
1. Stud: ASTM C 645; approximately 20-gauge minimum roll formed, electro-galvanized or hot-dip galvanized steel channels in required widths, having not less than 1-1/4-inch-wide flanges, pierced webs and section properties equal to or exceeding USG Corp. metal studs.
    - a) If stud height exceeds manufacturer's recommendations for indicated size, spacing or surface material, provide heavier gauge studs in conformance with manufacturer's recommendations.
    - b) Members for rough framing for door openings 2 feet 8 inches wide or more in interior partitions and for partitions to receive ceramic wall tile shall be 20-gauge minimum thickness.
    - c) Use 18-gauge studs to support wall supported architectural woodwork where indicated on the Drawings
    - d) Use 16-gauge studs to support soffit construction where indicated on the Drawings.
  2. Track for Metal Studs: U-shaped approximately 20 gauge minimum electro-galvanized or hot-dip galvanized steel, sized to receive the studs, in not less than 10 foot lengths. Provide heavier gauge when recommended by manufacturer for condition involved.
  3. Furring Channels: 20 gauge electro-galvanized or hot-dip galvanized "Z" channels in 12-foot lengths, 1-1/2-inch-deep unless otherwise indicated on the Drawings.
  4. Spacing: All stud walls shall be 16" on center maximum.
- F. Fasteners: No.6 self-drilling, cross-slot, countersunk head, zinc-plated, 1-1/4-inch-long screws.
1. For web or runner tracks or studs: Concrete nails or "shot" fasteners, masonry nails, sheet metal screws, or toggle bolts as required by conditions.
  2. For drywall furring channels: Sheet metal screws, nails, or wire clips as required by conditions.
  3. For furring brackets: Screws, nails, concrete nails or wire clips as required by conditions.
  4. For resilient channels: Sheet metal or drywall screws as required by conditions.
- G. Adhesive: Embedding type joint compound or laminating adhesive as recommended by gypsum board manufacturer. Use adhesives that have a VOC content of 50 g/L or less when calculated in accordance with 40 CFR 59, Subpart D (EPA Method 24).

- H. Mastic: An asphaltic solvent base damp-proofing product formulated for brush on application with a VOC content of 50 g/L or less when calculated in accordance with 40 CFR 59, Subpart D (EPA Method 24).
- I. Acoustical Sealant: As specified in Division 7 Section, Joint Sealants. Provide sealants that have a VOC content of 250 g/L or less when calculate in accordance with 40 CFR 59, Subpart D (EPA Method 24)
- J. Joint Treatment Material:
  - 1. General: Materials complying with ASTM C-475, ASTM C-840 and recommendations of manufacturer.
  - 2. Joint Tape: Paper reinforcing tape; use pressure sensitive with compatible joint compound.
  - 3. Setting-type joint compound, factory pre-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated:
    - a) Where setting-type joint compounds are indicated for use as taping compounds, use formulation that develops greatest bond strength and crack resistance and is compatible with other joint compounds applied over it.
    - b) For pre-filling gypsum board joints, use formulation recommended by gypsum board manufacturer for this purpose.
    - c) For filling joints and treating fasteners of water-resistant gypsum backing board behind base for ceramic tile, use formulation recommended by manufacturer.
  - 4. Drying-type joint: factory-prepackaged vinyl - based products complying with the following requirements for formulation and intended use:
    - a) Ready-mix formulation: factory per-mix product.
    - b) Topping compound formulated for finish (or third) coats.
- K. Gypsum Board Ceiling Components:
  - 1. Runner channels: 1-1/2-inch web, cold rolled steel weighing 475 lbs. minimum per 1,000 lineal feet, having rust-inhibitive coating.
  - 2. Furring channels: 3/4-inch web, cold rolled steel weighing 300 lbs. minimum per 1,000 lineal feet, rust-inhibitive coating.
  - 3. Wire: Federal Specification QQ-W-461 Class I galvanized steel.
- L. Wall plugs: Wood filled metal type of 24 gauge or heavier galvanized metal, 2 inches or more in depth. Wood plugs will not be permitted.
- M. Drywall Accessories: Provide the following items fabricated completely of heavy gauge galvanized sheet steel and distributed by the gypsum board manufacturer.

1. Corner Bead: Gypsum Association Type CB 114 X 114 having 1-1/4 inch or wider flanges
  2. Casing: Gypsum Association Type LC in size necessary to receive board and designed for finishing with joint treatment
  3. Casing with vinyl gasket having 1/4-inch vinyl foam tape: National Gypsum Gold Bond No. 500 VB or equivalent where indicated on the Drawings.
  4. Control joint: "V" shaped with 7/8-inch flanges.
- N. Glass Fiber Tape: Federal Specification HH-C-00466 having 20 x 10 thread count, coated to be compatible with mastic used.
- O. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool. Provide blankets with recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content constitutes a minimum of 25 percent by weight.
1. Sound Insulation shall have a flame spread rating of 25 and smoke development index of less than 450 when tested in accordance with ASTM E 84.
  2. Provide in thickness and density as indicated on the Drawings, but in no case less than 3-1/2 inches thick and 2.5 pounds per cubic foot (PCF)
  3. Manufacturer: U.S Gypsum, Manville, or other manufacturer's equivalent products

### **PART 3 - EXECUTION**

#### **3.1 GENERAL REQUIREMENTS**

- A. Standards: Unless they are modified or exceeded by the requirements of this Specification, conform to framing system manufacturer's recommendations and then to the following specifications of the Gypsum Association:
1. For Framing: "Installation of Screw-Type Steel Framing Members to Receive Gypsum board".
  2. For gypsum board application and finishing: GA-216 "Recommended Specification for the Application and Finishing of Gypsum Board".
- B. Coordination with Other Trades:
1. Reinforcing: Reinforce partitions as necessary to accommodate work of other trades which will be attached to, or bear on drywall construction. Reinforcing shall conform to drywall component manufacturer's recommendations. Provide back-up members to reinforce framing and provide support at surface mounted items. Verify requirements in Sections where surface mounted work is specified. In the absence of specific requirements, provide 2x wood blocking in sufficient width to accommodate the required

fastenings. Fasten the blocking rigidly to the drywall framing and close against the drywall facing.

2. Building in other work: Cut, frame and fit this work around recessed, built into or penetrating work such as fixtures, outlet boxes, fittings, pipes, conduit, etc., and supports.

C. Finishes:

1. Leave surfaces of this work in acceptable condition to receive applied finishes as scheduled or specified. Review applicable Specification Sections and coordinate with appropriate other trades to determine requirements.
2. Unless specifically schedule or specified otherwise, all gypsum board surfaces shall receive a Level-4 finish. All joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three (3) separate coats of joint compound. All joint compound shall be smooth and free from tool marks and ridges.

D. Mechanical and Electrical: Cooperate with these trades for location requirements for other work to be installed or located on surfaces provided under this Section. Fit gypsum wallboard work close around penetrating work.

E. Temperature: Maintain continuous controlled interior temperature of at least 55 degrees F. 24 hours before and during application of this work and until building is occupied. Provide adequate ventilation to eliminate excessive moisture.

F. Workmanship: Vertical framing shall be tested with a straight edge both ways to establish that planes are true, plumb and level. If so directed, the plane of ceiling suspension shall be checked with a water level, and unacceptable areas adjusted until they are satisfactory. Do not cover framing or suspension until it is approved.

### 3.2 FRAMING FOR FURRED CEILINGS, SOFFITS

- A. Provide Runner Channels to support furred ceilings and soffits. Unless otherwise required by time-design of referenced authority for fire-rated assemblies, space runners at 4 feet on centers and within 6 inches of abutting vertical surfaces or other interruption of runners. Tie runners to bar joists or beams with 10-gauge Wire.

### 3.3 PARTITION FRAMING

A. General: Where Drywall Studs are required, provide system of type, width and spacing necessary to form partition of required construction and thickness.

1. Special requirement - Where one side of a partition is drywall, provide metal framing required for the partition regardless of the material required on the opposite side.

- B. Tracks: Accurately align tracks in accordance with the partition layout. Fasten tracks at 24 inches on center but not less than 2 fasteners per section. Conform to details for sound seal where partitions abut each other and dissimilar surfaces.
- C. Studs: Screw studs to tracks through both flanges at jambs of openings, partition intersections and corners. Provide an additional stud within 2 inches of end stud where partition abuts a dissimilar surface. At Control Joints provide double studs spaced 1/2 inch between. Provide horizontal members behind for work of other trades. Place the studs web-to-web. Locate the short stud over the head member of the opening. Where Control Joint is required above opening and aligned with jamb, space studs with 1/2 inch between them. Provide a Track across head of opening to receive the short studs. Fasten jamb stud to each opening frame anchor with 2 fasteners. In addition, provide a full-length 20-gauge stud with 2 inches of each jamb stud. Construct framing above opening as directed by gypsum board manufacturer.
- D. Blocking: Where top track is located more than 1 foot above the finish ceiling line, block the space between studs at the ceiling line to provide backing for gypsum board facing. Use length of track cut and coped tight between stud webs. Fasten track to each stud. Provide similar blocking behind horizontal joints in the first layer of gypsum board applied to the studs vertically.
- E. Bracing: Where partitions are not braced from both sides by abutting or continuous completed ceiling systems, brace partition framing as necessary to align and hold it for application of the finish, and to provide rigidity. Completed ceilings that do not provide bracing for partitions include direct suspension acoustic systems, and any other system that is discontinuous, ceiling to ceiling across the partition or discontinuous from ceiling to wall at the partition. Conform to the following minimum requirements:
  - 1. Partition that extends above ceiling - Provide bracing where partition is not tied to framing of abutting ceilings.
  - 2. Partition between ceilings of 2 different heights - When the distance to the lower abutting ceiling measured from the top of the partition is more than 1/3 the maximum partition height, provide bracing.
  - 3. Method: For braces use lengths of tracks or studs, single or boxed as required by their length. Locate braces 4 feet on centers. For partitions short of structure height, fasten braces to the top track. For structure-high partitions, fasten braces to a track fastened across the face of the studs over the facing material and close above abutting ceiling. Extend braces diagonally and fasten them to the structure above. Unless continuous obstructions interfere, braces for partitions having ceilings on both sides shall extend alternately from opposite sides of the partition. Other methods of bracing may be submitted for approval prior to use.

### 3.4 VERTICAL FURRING

- A. General: Vertical furring shall consist of 20 gauge galvanized 1-1/2-inch furring channels at locations shown on the drawings and details. Furring shall be installed at 16" on centers unless noted otherwise.

### 3.5 GYPSUM BOARD APPLICATION

- A. Installation: Use wallboards of maximum practical length to reduce end joints. Edges and ends of boards shall be in contact but not forced into place. End joints shall be staggered. Joints on opposite sides of a partition shall not occur on the same stud.
- B. Erect single-layer standard and fire rated gypsum boards vertically with edges and ends occurring over firm bearing.
- C. For double layer application, use gypsum backing board for first layer, placed parallel to framing or furring members. Place second layer perpendicular to first layer. Ensure that joints of first layer do not occur over joints of first.
- D. Screws: Shall be spaced not less than 3/8" from ends and edges of wallboard. Screws shall be spaced not over 12" apart on sidewalls. The wallboard shall be held in from contact with the member while the screws are being driven. The heads shall be recessed slightly below the surface of the wallboard with the final drive. Care must be taken not to break the paper face.

### 3.6 DRYWALL ACCESSORIES

- A. Corner beads: Required at external corners of face board, continuous in one piece from floor to ceiling.
- B. Casings: Required at visible edges of boards and where face board abuts a dissimilar material. Use casing in long lengths with tight butt joints and mitered corners.
- C. Control joints: Locate at approximately 30 feet on centers in continuous walls. Behind control joints provide double supports spaced 1/2 inch apart and fasten board on each side of joint to a separate support.
- D. Edge Trim: Shapes as required per ASTM C-1047.
- E. Material: Formed metal complying with sheet steel zinc-coated by hot-dipped process.

### 3.7 GYPSUM BOARD FINISHING

- A. Standards: Finish visible drywall work to a Level 4 finish to provide a suitable base for the required applied finishes as they are specified, without additional procedures to mask defects in the drywall work. Any work not conforming to this standard shall be made acceptable as directed.
- B. Face board: Treat joints and fastener heads in visible surfaces. Where face board is required to extend above finish ceiling or is concealed by permanent construction or equipment, treat the joints only using full number of compound coats. Sanding may be omitted. Pre-fill open joints.
- C. Taping: Apply a uniformly thin 4-inch wide layer of Joint Compound over each joint. Center Joint Tape over the joint and embed it into the compound leaving sufficient material under

the tape to provide a proper bond. Reinforce inside corner angles with the tape folded to conform to the angle and embed it into the compound.

- D. Floating: Cover the tape with a coat of Joint Compound extending approximately 3 inches on each side of the tape and feathered out at the edges. After this coat is dry, apply a second coat of compound with a smooth, uniform, slight crown over the joint and the edge feathered slightly beyond the preceding coat. Allow joints to dry for a minimum of 24 hours between each application of compound.
- E. Sand exposed joints, edges and corners to produce surface ready to receive final wall finish.

**END OF SECTION 09 21 16**



**SECTION 09 22 00****METAL FRAMING AND LATH****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Extent of metal framing and lath is indicated on the Drawings.
- B. Work includes, but is not limited to, expanded metal lath, metal framing associated with Portland cement plaster (stucco) work, and plaster accessories and trim.
- C. Related Work:
  - 1. Portland cement plaster (stucco) work is specified in Section 09 24 23
  - 2. Metal Fabrications are specified in Section 05 50 00
  - 3. Rough Carpentry is specified in Section 06 10 00
  - 4. Joint Sealants are specified in Section 07 92 00
  - 5. Framing for Gypsum Board is specified in Section 09 21 16

**1.2 QUALITY ASSURANCE**

- A. Comply with latest specification of Metal Lath Manufacturer's Association and ANSI Standards, ANSI A42.3 and ANSI A42.4 except where more stringent or more detailed requirements are indicated.
- B. Comply with ML/SFA "Guidelines for Metal Lathing and Furring" and "Technical Bulletin 10I" for selection of metal lath for each application indicated.

**1.3 SUBMITTALS**

- A. Product Data: Submit two copies of manufacturer's product guidelines and installation instructions for each item and each system required in the work. Include reports and other data as may be required to show compliance with these guidelines.

**1.4 DELIVERY, STORAGE AND HANDLING**

- A. Protect lath and metal support materials from exposure to weather. Deliver in manufacturer's unopened containers or bundles, identified with name, brand, type, and grade.
- B. Store inside in a dry, ventilated space.

**PART 2 - PRODUCTS****2.1 MANUFACTURER**

A. Acceptable Manufacturers: Provide products and systems from one of the following:

1. Manufacturers of Metal Supports:

- a) Alabama Metal Industries.
- b) Dale Industries, Inc.
- c) Gold Bond Building Products Division, National Gypsum Co.
- d) United States Gypsum Co.

2. Manufacturers of Expanded Metal Lath:

- a) Dale Industries.
- b) Alabama Metal Industries.
- c) K-Lath Division, Tree Island Steel.

3. Manufacturers of Accessories:

- a) Fry Reglet Corp.
- b) Gold Bond Building Products Division, National Gypsum Co.
- c) Dale Industries.
- d) Alabama Metal Industries.
- e) MM Systems Corp.
- f) United States Gypsum Co.

B. Manufacturer's Recommendations: Except where otherwise indicated, provide the type, weight, grade and finish of materials, and include for each system the clips, fasteners, ties, reinforcing, stiffeners, shoes, tracks, hangers, brackets, anchors, accessories, and trim as recommended by the manufacturer for the application indicated.

C. Use manufacturer's standard products. Comply with FS QQ-L-101.

## 2.2 MATERIALS

A. Metal and Finishes: Manufacturer's standard steel products unless indicated as zinc alloy or other metal. Where not otherwise indicated, provide manufacturer's standard galvanized finish or steel products except as follows:

- 1. Exterior Components: Hot-dip galvanized finish; ASTM A525 G90 for 18-gauge lighter formed metal products, ASTM A123 galvanized after fabrication for 16 gauge and heavier products.
- 2. Exterior Exposed Plastering Accessories: Provide zinc alloy accessories for exterior work.

## 2.3 HORIZONTAL METAL FRAMING

A. General: Size metal ceiling supports to comply with the following, unless otherwise indicated.

B. Lathing and Furring for Portland Cement and Portland Cement-Lime Plastering, Exterior (Stucco) and interior: ANSI A42.3-1971 including May 1976 Addendum.

C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.

- D. Load Bearing (Transverse and Axial) Studs and Runners: ASTM C 955 and complying with the following requirements for quality, grade, and finish of steel sheet; for design thickness of base metal (uncoated); and other dimensional characteristics.
- E. Metal Quality: Zinc-coated (galvanized) steel sheet complying with ASTM A 446, Coating Designation G90, for grades indicated below:
  - 1. Grade A (33,000 psi yield point) for design thicknesses of 0.0478" (18 gage) or less.
  - 2. Grade D (50,000 psi yield point) for design thicknesses of 0.0598" (16 gage) or more.
- F. Channels: Cold-rolled steel, 0.0598" min, thickness of base metal (uncoated), allowable bending stress of 18,000 psi, protected with galvanizing complying with ASTM A 525 for G90 coating designation, and as follows:
  - 1. Carrying Channels: See studs and runners article above.
  - 2. Furring Channels: 3/4" deep x 7/16" wide flanges, 316 lbs. per 1000' galvanized.
  - 3. Provide galvanized channels for all installations.
- G. Anchorage Devices: Screws, cast-in-place concrete inserts or other devices appropriate for anchorage to the form of structural framing indicated and whose suitability for use intended has been proven through standard construction practices or certified test data.
  - 1. Size devices to develop full strength of hanger but not less than 3 times calculated hanger loading, except size direct pull-out concrete inserts for 5 x calculated hanger loading.

## 2.4 VERTICAL METAL FURRING

- A. Channel Furring and Braces: Cold-rolled steel, 0.0598" min. thickness of base (uncoated) metal, allowable bending stress of 18,000 psi, protected with galvanizing, 3/4" deep x 7/16" wide flanges, 316 lbs. per 1000' with galvanized finish.

## 2.5 METAL LATH

- A. Expanded Metal Lath: Fabricate expanded metal lath from zinc-coated (galvanized) steel sheet to produce lath complying with ASTM C 847 for type, configuration and other characteristics indicated below.
- B. Diamond Mesh Lath: Comply with the following requirements:
  - 1. Configuration: Flat; Weight: 3.4 lbs. per square yard.
  - 2. Configuration: Self-furring; Weight: 3.4 lbs. per square yard.
- C. Paper Backing: Where paper-backed diamond mesh lath is indicated, provide asphalt-impregnated paper factory-bonded to back and complying with FS UU-B-790, for Type I, Grade D (vapor permeable), Style 2.
- D. Lath Attachment Devices: Devices of material and type required by referenced standards and recommended by lath manufacturer for secure attachment of lath to framing members and of lath to lath.

## 2.6 PLASTER ACCESSORIES

- A. General: Comply with material provisions of Lathing and Furring for Portland Cement and Portland Cement-Lime Plastering Exterior (Stucco) and interior, ANSI A42.3-1971 including May 1976 Addendum.
  - 1. Coordinate depth of accessories with thicknesses and number of coats required.
  - 2. All accessories to be zinc alloy wherever possible and hot dip galvanized (G90) elsewhere.
- B. Metal Corner Reinforcement: Expanded large mesh diamond metal lath fabricated from zinc-alloy or welded wire mesh fabricated from 0.0475" diameter zinc-coated (galvanized) wire, and specially formed to reinforce external corners of Portland cement plaster on exterior exposures while allowing full plaster encasement.
- C. Metal Corner Beads: Small nose corner beads fabricated from zinc alloy, with expanded flanges of expanded large mesh diamond lath to allow full encasement by plaster.
- D. Casing Beads: Square-edged style, with expanded flanges and removable protective tape, of Zinc alloy.
- E. Control Joints: Prefabricate, of material and type indicated below:
  - 1. Material: Zinc alloy.
  - 2. One-Piece Type: Folded pair of non-perforated screeds in M-shaped configuration, with expanded flanges.

## PART 3 - EXECUTION

### 3.1 INSTALLATION OF LATHING AND FURRING, GENERAL

- A. Portland Cement Plaster Lathing and Furring Installation Standard: Install lathing and furring materials indicated for Portland cement plaster to comply with ANSI A42.3, including May 1976 Addendum.
- B. Install supplementary framing, blocking, and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar work to comply with details indicated or if not otherwise indicated, to comply with applicable published recommendations of gypsum plaster manufacturer, or if not available, of "Gypsum Construction Handbook" published by United States Gypsum Co.
- C. Isolation: Where lathing and metal support system abuts building structure horizontally, and where partition/wall work abuts overhead structure, isolate the work from structural movement sufficiently to prevent transfer of loading into work from the building structure. Install slip or cushion type joints to absorb deflections but maintain lateral support.
- D. Frame both sides of control and expansion joints independently, and do not bridge joints with furring and lathing or accessories.

### 3.2 INSTALLATION OF CEILING SUSPENSION SYSTEMS

- A. Preparation and Coordination: Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure that inserts and other structural anchorage provisions have been installed to receive ceiling hangers in a manner that will develop their full strength and at spacing required to support ceiling.
  - 1. Furnish concrete inserts, and other devices indicated, to other trades for installations well in advance of time needed for coordination with other work.
- B. Hanger Installation: Attach hangers to structure above ceiling to comply with ML/SFA "Specifications for Metal Lathing and Furring" and with referenced standards.
- C. Install ceiling suspension system components of sizes and spacing indicated but not in smaller sizes or greater spacing than that required by referenced lathing and furring installation standards.
- D. Carrying Channels: Space cold formed carrying channels (studs/joists and runners) as indicated on drawings.
- E. Furring Channels to Receive Metal Lath: Space furring channels not over 16" on center for 3/4 lb. diamond mesh lath.

### 3.3 INSTALLATION OF METAL FURRING

- A. Metal Furring to Receive Metal Lath: Comply with requirements of ML/SFA "Specification for Metal Lathing and Furring" applicable to each installation condition indicated.
- B. Space furring members 16" on center, except space ceiling/soffit furring 13-1/2" on center.

### 3.4 METAL LATHING

- A. Install expanded metal lath for the following applications where plaster base coats are required. Provide appropriate type, configuration and weight of metal lath selected from materials indicated which comply with Referenced lathing installation standards.
- B. Vertical metal framing and furring: Nail self-furring diamond mesh lath directly to monolithic surfaces not complying with requirements of referenced plaster application standards for characteristics that permit direct bond with plaster.

### 3.5 INSTALLATION OF PLASTERING ACCESSORIES

- A. General: Comply with referenced lathing and furring installation standards for provision and location of plaster accessories of type indicated. Miter or cope accessories at corners; install with tight joints and in alignment. Attach accessories securely to plaster bases to hold accessories in place and alignment during plastering.
- B. Accessories for Portland Cement Plaster: Install accessories of type indicated at following locations:

1. External Corners: Install corner beads at external corners
  2. Casing Beads: Install at terminations of plaster work
- C. Control Joints: Install control joints at locations indicated, or if not indicated, at locations complying with the following criteria and approved by Architect.
1. Where an expansion or control joint occurs in surface of construction directly behind plaster membrane.
  2. Where, in plastered surfaces of ceilings and walls, distances between, and areas within, control joints exceed, respectively, the following measurements: 10' in either direction and 100 square feet; and where length to width ratio exceeds 2-1/2 to 1.
  3. Extend joints full width or height of plaster membrane where Portland cement plaster panel sizes or dimensions change.
- D. Install prefabricated expansion joints of 2-piece design where shown as "Expansion Joint"; 3/8" joint width for exterior.
- E. Install channel screeds (reveals) where indicated. Where ends of channel sections meet, set in bead of sealant; set all splice plates in mastic.
- 3.6 TOLERANCES
- A. Install members to provide surface plane with maximum variation of 1/8 inch in 10 feet in any direction.

**END OF SECTION 09 22 00**

## **SECTION 09 24 23**

### **PORTLAND CEMENT STUCCO**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. Extent of Portland cement stucco is shown on drawings and in schedules.
- B. Types of Portland cement stucco required include, but are not limited to, exterior work.
- C. Related Work: Metal Framing and Lath is specified in Section 09 22 00

##### **1.2 QUALITY ASSURANCE**

- A. Coordination of Work: Coordinate layout and installation of suspension system components for suspended soffits with other work supported by, or penetrating through, soffits.
- B. Single Source Responsibility: Obtain materials for Portland cement plaster from a single source for each type of material required to ensure consistency in quality of performance and appearance.

##### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's product specifications and installation instructions for each product, including data showing compliance with the requirements.
- B. Material Certificates: Submit producer's certificate for each kind of plaster aggregate indicated, evidencing that materials comply with requirements.

##### **1.4 DELIVERY, STORAGE AND HANDLING**

- A. Deliver Cementitious materials in original packages, containers or bundles bearing brand name and identification of manufacturer.
- B. Store materials inside, under cover and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, aging, corrosion, and damage from construction traffic and other causes.

##### **1.5 PROJECT CONDITIONS**

- A. Environmental Requirements, General: Comply with requirements of referenced plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during and after application of plaster.

- B. Protect contiguous work from moisture deterioration and soiling which might result from plastering operations. Provide temporary covering and whatever other provisions may be necessary to minimize harmful spattering of plaster on other work.
- C. Warm Weather Requirements: Protect plaster against uneven and excessive evaporation and from strong flows of dry air, both natural and artificial. Apply and cure plaster as required by climatic and job conditions to prevent drying out during cure period. Provide suitable coverings, moist curing, barriers to deflect sunlight and wind, or combinations of these, as required.

## **PART 2 - PRODUCTS**

### **2.1 ACCEPTABLE MANUFACTURERS**

- A. Manufacturer: Subject to compliance with requirements, provide stucco products of one of the following:
  - 1. W.R. Bonsal Co.
  - 2. Thoro
  - 3. Rinker Materials Corp.
  - 4. Florida Stucco Corp.

### **2.2 PORTLAND CEMENT PLASTER MATERIALS**

- A. Base Coat Cements: Type as indicated below.
- B. Portland cement, ASTM C 150, Type I or III.
- C. Masonry cement, ASTM C 91, Type N
- D. Finish Coat Cement: Material and color as indicated below:
- E. Portland cement, ASTM C 150, type as follows: Type I.
- F. Cement Color: Gray.
- G. Lime: Special hydrated lime for finishing purposes, ASTM C 206, Type S, or special hydrated lime for masonry purposes, ASTM C 207, Type S.
- H. Sand Aggregates For Base Coats: ASTM C 897.
- I. Aggregate for Finish Coats: ASTM C 897, natural sand, white in color.

### **2.3 MISCELLANEOUS MATERIALS AND ACCESSORIES**

- A. Stucco Water Repellent: Euclid Chemical's Internal Waterpeller, or another product as approved by the Architect.
- B. Bonding Agent: ASTM C 932. Color different from substrate.



- C. Water for Mixing and Finishing Plaster: Potable, free of substances capable of affecting plaster set or of damaging plaster, lath or accessories.
- D. Channel Reveals: 3/8-inch, rigid vinyl (PVC) stucco wall reveals as manufactured by Vinyl Corp., #CS 38-50, or as otherwise approved by the Architect.

## 2.4 PORTLAND CEMENT PLASTER MIXES AND COMPOSITIONS

- A. General: Comply with ASTM C 926 for base and finish coat mixes as applicable to plaster bases, materials and other requirements as indicated, except that plastic cement not permitted.
- B. Base Coat Mixes and Compositions: Proportion materials for respective base coats in parts by volume for Cementitious materials and in parts by volume per sum of Cementitious materials for aggregates to comply with the following requirements for each method of application and plaster base indicated. Adjust mix proportions below within limits specified to attain workability.
- C. Three-Coat Work on Metal Lath: Base coats as indicated below are at Contractor's option:
  - 1. Option #1: Scratch Coat: 1 part Portland cement, 0 to 3/4 parts lime, 2-1/2 to 4 parts sand; Brown Coat: 1 part Portland cement, 0 to 3/4 parts lime, 3 to 5 parts sand.
  - 2. Option #2: Scratch Coat: 1 part Portland cement, 1 to 2 parts masonry cement, 2-1/2 to 4 parts sand; Brown Coat: 1 part Portland cement, 1 to 2 parts masonry cement, 3 to 5 parts sand.
  - 3. Option #3: 1 part masonry cement, 2-1/2 to 4 parts sand; Brown Coat: 1 part masonry cement, 3 to 5 parts sand.
- D. Two-Coat Work on Concrete Unit Masonry: Base coats as indicated below are at Contractor's option:
  - 1. Base Coat: 1 part Portland cement, 3/4 to 1-1/2 parts lime, 3 to 4 parts sand.
  - 2. Base Coat: 1 part masonry cement, 3 to 4 parts sand.
- E. Job-Mixed Finish Coats: Proportion materials for finish coats in parts by volume for Cementitious materials and parts by volume of aggregates per sum of Cementitious materials to comply with the following requirements: Mixes are at Contractor's option.
  - 1. 1-part Portland cement, 3/4 to 1-1/2 parts lime, 3 parts sand.
  - 2. 1-part Portland cement, 1 part masonry cement, 3 parts sand.
  - 3. 1-part masonry cement, 1-1/2 parts sand.

## 2.5 MIXING

- A. Mechanically mix Cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.

## **PART 3 - EXECUTION**

### **3.1 PREPARATIONS FOR PLASTERING**

- A. Clean plaster bases and substrates for direct application of Portland cement plaster, removing loose material and substances that might impair the work.
- B. Apply bonding agent on concrete and masonry surfaces indicated for direct Portland cement plaster application; comply with manufacturer's instructions for application.
- C. Install temporary grounds and screeds as necessary to ensure accurate rodding of plaster to true surfaces; coordinate with scratch-coat work.
- D. Surface Conditioning: Immediately before plastering, dampen the surfaces of concrete and masonry that are indicated for direct application of plaster, except where a bonding agent has been applied. Experiment with moisture application to determine degree of saturation that will result in optimum suction for plastering.

### **3.2 PROVISIONS FOR DRAINAGE BEHIND EXTERIOR PLASTER**

- A. At the bottom of exterior walls where the wall is supported by a floor or foundation, a drip screed and through-wall flashing or weep holes or other effective means to drain away any water that may get behind the plaster shall be provided.
- B. Where vertical and horizontal exterior plaster surfaces meet, terminate both surfaces with casing beads with the vertical surface protruding at least 1/4 inch below the intersecting horizontal plastered surface, thus providing a drip edge. Terminate the casing bead for the horizontal surface at least 1/4 inch from the back of the vertical surface to provide drainage.
- C. Extend cotton rope weeps installed in block work or other backup so that ropes project at a slight downward angle out through the stucco. Leave excess rope length for trimming by painter.

### **3.3 RELIEF FROM STRESS**

- A. Where plaster and metal plaster base continues across the face of a concrete column, or other structural member, place water-resistive building paper or felt between the metal plaster base and the structural member (or use paper or plastic-backed metal plaster base). Where the width of the structural member exceeds the approved span capability of the metal plaster base, use self-furring metal plaster base and scatter nail sparingly to bring paper and metal base to general plane.

- B. Where dissimilar base materials abut, and are to receive a continuous edge of plaster, provide one of the following:
1. Install a suitable metal accessory, such as casing beads back-to-back or a control joint member at the juncture of such bases (verify design appropriateness with Architect).
  2. Cover the juncture with an 8" wide strip of galvanized, self-furring metal plaster base extending 4" on either side of the juncture.
  3. Extend self-furring metal plaster base 4" onto the abutting base where one of the bases is metal plaster base.

### 3.4 PLASTER APPLICATION

- A. Portland Cement Application Standard: Apply Portland cement plaster materials, compositions, and mixes to comply with ASTM C926.
- B. Sequence plaster application with the installation and protection of other work, so that neither will be damaged by the installation of the other.
- C. Do not use materials which are caked or lumpy or which are dirty or contaminated by foreign materials.
- D. Do not use excessive water in the mixing and application of plaster materials.
- E. Tolerances: Do not deviate more than 1/8" in 10'-0" from a true plane in finished plaster surfaces, as measured by a 10'-0" straightedge placed at any location on surface.
- F. Plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground, unless otherwise indicated. Where plaster is not terminated at metal by casing beads, cut base coat free from metal before plaster sets and groove finish coat at the junctures with metal.
- G. Corners: Make internal corners and angles square; finish external corners flush with corner beads.
- H. Number of Coats: Apply Portland cement plaster, of composition indicated, to comply with the following requirements:
1. Provide 3-coat work on metal lath bases as follows:

|                    | At vertical<br>surfaces | At horizontal<br>surfaces |
|--------------------|-------------------------|---------------------------|
| 1st (scratch) coat | 3/8"                    | 1/4"                      |
| 2nd (brown) coat   | 3/8"                    | 1/4"                      |
| 3rd (finish) coat  | 1/8"                    | 1/8"                      |
| Total (minimum)    | 7/8"                    | 5/8"                      |

2. Provide 2-coat work on solid masonry/concrete bases as follows:

|                    | At vertical<br>unit masonry | At vertical<br>concrete | At horizontal<br>surfaces |
|--------------------|-----------------------------|-------------------------|---------------------------|
| 1st (scratch) coat | 3/8"                        | 1/4"                    | varies                    |
| 2nd (finish) coat  | 1/4"                        | 1/8"                    | varies                    |
| Total              | 5/8"                        | 3/8"*                   | 3/8" max.                 |

\*Provide 5/8" total where unit masonry and concrete are in same plane on same wall.

- I. Finish Coats: Apply finish coats to comply with the following requirements:
  1. Float Finish: Apply finish coat to a uniform thickness of 1/8" to completely cover base coat, uniformly floated to a true even plane with a fine-textured (sand) finish matching Architect's sample.
  2. Moist cure plaster base and finish coats to comply with ASTM C926.

### 3.5 CUTTING AND PATCHING

- A. Cut, patch, repair and point-up Portland cement plaster as necessary to accommodate other work. Repair cracks and indented surfaces. Point-up finish plaster surfaces around items which are built into or penetrate plaster surfaces. Repair or replace the work to eliminate blisters, buckles, check cracking, dry-outs, efflorescence, excessive pinholes, and similar imperfections. Repair or replace the work as necessary to comply with required visual effects.

### 3.6 CLEANING AND PROTECTION

- A. Remove temporary covering and whatever other provisions were made to minimize spattering of plaster on other work. Promptly remove plaster from door frames, windows, and other surfaces that are not to be plastered. Repair surfaces that have been stained, marred or otherwise damaged during the plastering work. When plaster work is completed, remove unused materials, containers, equipment, and plaster debris.
- B. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures plaster work being without damage or deterioration at time of Substantial Completion.

**END OF SECTION 09 24 23**

**SECTION 09 30 13****CERAMIC TILE****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Definition: Tile includes ceramic surfacing units made from clay or other ceramic materials.
- B. Extent of tile work is indicated on drawings and schedules.
- C. Types of tile work in this section include, but are not limited to, the following:
  - 1. Porcelain ceramic cove base
  - 2. Porcelain ceramic floor tile
  - 3. Trim units and special shapes
  - 4. Marble Thresholds and Window Sills
  - 5. Setting materials and grout
- D. Portland cement plaster scratch coat on wall surfaces indicated to receive tile is work of this section.
- E. Sealing expansion and other joints in tile work with elastomeric joint sealers is work of this section.
- F. Backing board for ceramic wall tile application is specified in Section 09 21 16, "Gypsum Board Assemblies".
- G. Resilient Sheet and Tile Flooring are specified elsewhere in Division-9

**1.2 QUALITY ASSURANCE**

- A. Source of Materials: Provide materials obtained from one source for each type and color of tile, grout, and setting materials.
- B. Tile shall conform to requirements of TCA 137.1-1980, standard grade.
- C. Manufacturers: 10 year's minimum satisfactory experience.
- D. Installer: 5 year's minimum satisfactory experience.

**1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical information and installation instructions for materials required, except bulk materials. Include complete maintenance recommendations.
- B. Samples for Initial Selection Purposes: Submit manufacturer's color charts consisting of actual tiles or sections of tile showing full range of colors, textures and patterns available for

each type of tile indicated. Include samples of grout and accessories involving color selection.

C. Samples for verification purposes: Submit the following:

1. Samples for each type of tile and for each color and texture required on plywood or hardboard backing and grouted. For Porcelain Ceramic Tile, not less than 36" square
2. Full size samples for each type of trim, accessory and for each color.
3. 6" long samples of marble stone thresholds.

D. Certification: Furnish Master Grade Certificates for each shipment and type of tile, signed by manufacturer and Installer.

#### 1.4 PRODUCT HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Prevent damage or contamination to materials by water, freezing, foreign matter or other causes.

#### 1.5 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Maintain temperatures at not less than 50° F (10° C) in tiled areas during installation and for 7 days after completion, unless higher temperatures required by referenced installation standard or manufacturer's instructions.

#### 1.6 EXTRA STOCK

- A. Deliver minimum of 1/2 of 1 percent of total square feet not less than one unopened carton of each color, pattern and shape of ceramic floor and wall tile material required for project for maintenance use.
- B. Deliver minimum of 1/2 of 1 percent of total square feet not less than one unopened carton of each color, pattern and shape of porcelain tile material required for project for maintenance use.
- C. Clearly identify each carton.

#### 1.7 WARRANTY

- A. Provide a 2-year written labor and material warranty.
- B. Should defects develop, including any loss of adhesion to the subfloor or wall surfaces, completely replace tile to the satisfaction of the University.

### PART 2 - PRODUCTS

## 2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products of one of the following manufacturers:

1. Porcelain Ceramic Tile: Floors and Base

- a) DALTILE (Basis of Design)
- b) Crossville
- c) Summitville Tiles, Inc.

2. Latex Portland Cement Grout:

- a) LATRICRETE Intl, Inc.
- b) WR Bonsal Co.
- c) Bostik

3. Chemical-Resistant Joint Sealants:

- a) Tremco, Inc.
- b) HB Fuller Co.

4. Tile Cleaners:

- a) Hillyard Chemical Co.
- b) L & M Surco Mfg. Co., Inc.

## 2.2 GENERAL

- A. ANSI Standard for Ceramic Tile: Comply with ANSI A137.1 "American National Standard Specifications for Ceramic Tile" for types and grades of tile indicated. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated.
- B. ANSI Standard for Tile Installation Materials: Comply with ANSI standard referenced with installation products and materials indicated.
- C. Colors, Textures and Patterns: For tile and other products requiring selection of colors, surface textures or other appearance characteristics, provide products to match characteristics specified or indicated on the Drawings or, if not otherwise indicated, as selected by Architect from manufacturer's standards. Provide tile trim and accessories that match color and finish of adjoining flat tile.
- D. Mounting: Where factory-mounted tile is required, provide back or edge-mounted tile assemblies as standard with manufacturer unless another mounting method is indicated.

## 2.3 TILE PRODUCTS

- A. Porcelain Ceramic Floor Tile: 3/8" thick, plain face, cushion edges, factory-back mounted. Basis of Design: DAL TILE "DIGNATARY", Stone Attache Collection, Colorbody Porcelain Tile. Tile colors and sizes shall be as indicated on the Drawings.

- B. Base, Trim Units and Special Shapes: Provide tile base, trim units and special shapes to match characteristics of adjoining flat tile and to comply with following requirements:
1. Size: As indicated on the Drawings, coordinated with sizes and coursing of adjoining flat tile, where applicable.
  2. External Corners: Bullnose shapes with round out base and top trim special shapes.
  3. Internal Corners: Field-buttet square with square in-corner base and top trim special shapes.

## 2.4 MARBLE THRESHOLDS AND SILLS

- A. General: Provide marble which is uniform in color and finish, fabricated to sizes and profiles indicated on the Drawings, or for thresholds, as required to provide transition between tile surfaces and adjoining finished floor surfaces.
- B. Provide marble thresholds complying with ASTM C 503 requirements for exterior use and abrasion resistance for uses subject to heavy foot traffic. Provide white, honed marble complying with MIA Group "A" requirements for soundness.

## 2.5 SETTING MATERIALS

- A. Thin-Set Portland Cement Mortar: Where thin-set Portland cement mortar applications are indicated, use the following unless otherwise required.
1. Latex-Portland cement mortar, ANSI A118.4, latex modified 1:1 sand and Portland cement.
  2. Latex liquid to be Laticrete 4237 or other as approved by Architect.
  3. Portland cement mortar: ANSI A108.1.
  4. Dry Set Mortar, Factory sanded Portland cement and additives: ANSI A118.1.
- B. Organic Adhesive: ANSI A136.1; Type II. Provide primer-sealer where recommended by manufacturer.

## 2.6 GROUTING MATERIALS

- A. Latex-Portland Cement Grout: ANSI A118, pre-blended compound of Portland cement, selected and graded aggregates, color pigments and chemical additives gauged with latex additive to comply with manufacturer's directions.
1. Use latex additive in grout that is compatible with latex additive in latex-Portland cement mortar.
  2. Latex liquid to be Laticrete 3701 or equivalent product as approved by Architect.
- B. Portland Cement Grout: ANSI A108.1.

## 2.7 MISCELLANEOUS MATERIALS

- A. Single-component Sealants: ASTM C 920, Type S, Grade NS, use NT (for use in joints in non-traffic areas).



- B. Two-Component Sealants: ASTM C 920, Type M, Grade P, Class 25, use T (for use in joints subject to pedestrian traffic).
- C. Tile Cleaner: Product specifically acceptable to manufacturer of tile and grout manufacturer for application indicated as recommended by National Tile Promotion Federation, 112 North Alfred St., Alexandria, VA 22134 or Ceramic Tile Institute, 700 N. Virgil Ave., Los Angeles, CA 90029.

## **PART 3 - EXECUTION**

### **3.1 INSPECTION**

- A. Examine surfaces to receive tile work and conditions under which tile will be installed. Do not proceed with tile work until surfaces and conditions comply with requirements indicated in referenced tile installation standard.

### **3.2 INSTALLATION, GENERAL**

- A. ANSI Tile Installation Standard: Comply with applicable parts of ANSI 108 series of tile installation standards included under "American National Standard Specifications for the Installation of Ceramic Tile".
- B. TCA Installation Guidelines: TCA "Handbook for Ceramic Tile Installation"; comply with TCA installation methods indicated or, if not otherwise indicated, as applicable to installation conditions shown.
- C. Extend tile work into recesses and under or behind equipment and fixtures, to form a complete covering without interruptions, except as otherwise shown. Terminate work neatly at obstructions, edges and corners without disrupting pattern or joint alignment.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures and other penetrations so that plates, collars, or covers overlap tile.
- E. Jointing Pattern: Unless otherwise shown or indicated on the Drawings, lay tile in grid pattern. Align joints when adjoining tiles on floor, base, walls and trim are same size. Layout tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise shown. For tile mounted in sheets make joints between tile sheets same width as joints within tile sheets so that extent of each sheet is not apparent in finished work.
- F. Lay out tile wainscots to next full tile beyond dimensions indicated.
- G. Expansion Joints: Locate expansion joints and other sealant filled joints, including control, contraction and isolation joints, where indicated, or if not indicated, at spacings and locations recommended in TCA "Handbook for Ceramic Tile Installation", and approved by Architect.

Prepare joints and apply sealants to comply with requirements of referenced standards and sealant manufacturer.

- H. Grout tile to comply with referenced installation standards, using grout materials indicated.
- I. Mix and install proprietary components to comply with grout manufacturer's directions.

### 3.3 FLOOR INSTALLATION METHODS

- A. Porcelain Tile: Install tile to comply with requirements indicated below for setting bed methods, TCA installation methods related to types of subfloor construction, and grout types.
  - 1. Thin-set Portland Cement Mortar: ANSI A108.5
  - 2. Concrete Sub-floors, Interior: TCA F113.
  - 3. Grout: Latex-Portland cement.
- B. Marble Thresholds: Install at locations indicated. Set thresholds in same type of setting bed as abutting field tile unless otherwise indicated. Set in thin-set mortar for locations, where mortar bed would otherwise be exposed above adjacent non-tile floor finish.

### 3.4 CLEANING AND PROTECTION

- A. Cleaning: Upon completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's printed instructions, but no sooner than 14 days after installation. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of acid cleaning. Flush surface with clean water before and after cleaning.
- B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile work.
- C. Protection: When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage and wear.
  - 1. Prohibit foot and wheel traffic from using tiled floors for at least 7 days after grouting is completed.
  - 2. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

**END OF SECTION 09 30 13**

## **SECTION 09 51 00**

### **ACOUSTICAL CEILINGS**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. Work of this section includes, but is not limited to, the following:
  - 1. Acoustical tile in exposed suspension systems
  - 2. Suspension grid systems for acoustical tile ceilings
  - 3. Perimeter trim
- B. Furnish special anchors or inserts for placement of suspension systems.

##### **1.2 RELATED WORK**

- A. Gypsum board ceilings and framing are specified in Section 09 21 16.
- B. Items of mechanical and electrical work to be installed in acoustical ceiling grids are specified in Divisions 23 and 25 and 26 respectively.

##### **1.3 SUBMITTALS**

- A. Submit shop drawings indicating grid layout and related dimensions, junctions with other work or ceiling finishes, interrelation of mechanical and electrical items related to system: prepare coordinated reflected ceiling plan relating mechanical and electrical work by level/elevation above finish floor and their penetrations to acoustical ceiling.
- B. Provide product data on each type of metal suspension grid system components and each type of acoustical ceiling tile.
- C. Samples: Submit two samples each, twelve inches long, of suspension system main runner, cross runner, edge trim. Submit two samples full size of acoustical tiles.
- D. Submit manufacturer's published installation instructions.

##### **1.4 QUALITY ASSURANCE**

- A. Installer: Company with three years minimum documented experience.
- B. Fire Performance Characteristics: Provide acoustical ceiling components that are identical to those tested for the following fire performance characteristics, according to ASTM test method indicated, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate marking of applicable testing and inspecting agency.

C. Surface Burning Characteristics: As follows, tested per ASTM E 84.

1. Flame Spread: 25 or less.
2. Smoke Developed: 50 or less.

D. Tolerances:

1. Free of irregularities and level to within 1/8" in 12 feet.
2. Maximum deflection: 1/360 of span.

E. Installation of Acoustical Ceiling Suspension Systems: ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.

## 1.5 ENVIRONMENTAL REQUIREMENTS

A. Continuously maintain temperature and humidity at a value near those indicated for final occupancy.

## 1.6 SEQUENCING AND SCHEDULING

A. Do not install acoustical ceilings until building is enclosed, dust-generating activities have terminated, and overhead work is completed, tested, and approved.

B. Schedule installation of acoustic units after interior wet work is dry.

## 1.7 EXTRA STOCK

A. Provide extra quantity of acoustical units equal to two (2) panels for each 100 panels of each type of ceiling panel installed. Obtain receipt from Architect or City's representative.

# PART 2 - PRODUCTS

## 2.1 ACCEPTABLE MANUFACTURERS - SUSPENSION SYSTEM

A. Subject to compliance with specified requirements, provide suspension grid systems as manufactured by one of the following:

1. Armstrong World Industries, Inc.
2. Chicago Metallic Corp.
3. CERTAINTEED

B. Products by Armstrong have been used as the basis of design for this Project.

## 2.2 SUSPENSION SYSTEM MATERIALS

A. Grid: ASTM C635, intermediate, and non-fire rated exposed Tee system for ceiling tiles as specified in Article 2.4. Grid Finish: Manufacturer's "Blizzard White" factory applied baked enamel finish.

- B. Accessories: Stabilizer bars, clips, splices, and edge moldings.
- C. Support Channels and Hangers: Galvanized steel; size and type of suit application, to rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of 1/360.
- D. Basis of Design: Armstrong "Silhouette" 1/8-inch reveal suspension systems for types of acoustical tiles specified unless otherwise indicated on the Drawings.

## 2.3 ACCEPTABLE MANUFACTURERS - ACOUSTICAL TILE

- A. Subject to compliance with specified requirements, provide acoustical ceiling tiles as manufactured by one of the following:
  - 1. Armstrong World Industries, Inc.
  - 2. CERTAINTEED Ceilings
  - 3. USG Corporation
- B. Products by Armstrong World Industries, Inc. have been used as the Basis of Design for this Project.

## 2.4 ACOUSTICAL TILE

- A. Type ACT-1: Wet-formed mineral fiber tiles with Manufacturer's "DuraBrite" acoustically transparent membrane with factory-applied latex paint finish; Type IV, Form 2, Pattern E, fire-class "A" units, complying with ASTM E 1264, and the following requirements:
  - 1. Pattern: Manufacturer's Standard Non-Directional Pattern
  - 2. Light Reflectance: 0.90
  - 3. Color: "White"
  - 4. Grade: NRC 0.75
  - 5. CAC Rating: 35
  - 6. Edge Detail: Beveled tegular, lay-in tiles for exposed "T" System; locations as indicated on the Drawings
  - 7. Thickness: 9/16"
  - 8. Sizes: 24" x 24" unless indicated otherwise on the Drawings
  - 9. Basis of Design: "ULTIMA" (with Manufacturer's "Air Guard" Coating) lay-in acoustical ceiling tiles as manufactured by Armstrong Ceiling Solutions.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Verify that existing conditions are ready to receive work.
- B. Verify that layout of hangers will not interfere with other work.
- C. Beginning of installation means acceptance of existing conditions.

### 3.2 INSTALLATION

- A. General: Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire-resistance rating requirements as indicated, and Cisca standards applicable to work.
- B. Arrange acoustical units and orient directionally patterned units (if any) in manner shown by reflected ceiling plans. Install panels with pattern running in one direction.
- C. Install suspension systems to comply with ASTM C 636, with hangers supported only from building structural members. Locate hangers not less than 6" from each end and spaced 4'-0" along each carrying channel or direct-hung runner, unless otherwise indicated, leveling to tolerance of 1/8" in 12'-0".
  - 1. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperatures. Spliced hanger wires are not allowed.
  - 2. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum which are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal force by bracing, or other equally effective means.
  - 3. Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units.
  - 4. Screw-attach moldings to substrate at intervals not over 16" on center and not more than 3" from ends, leveling with ceiling suspension system to tolerance of 1/8" in 12'-0". Miter corners accurately and connect securely.
- D. Install acoustical units in coordination with suspension system and exposed runner moldings. Scribe and cut units for accurate fit at borders and penetrations. Stiffen edges of cut units as required to eliminate evidence of oil-canning or buckling.

### 3.3 CLEANING

- A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

**END OF SECTION 09 51 00**

**SECTION 09 65 13****RESILIENT BASE AND ACCESSORIES****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Section includes, but is not limited to, vinyl wall base and flooring accessories.
- B. Extent of resilient base and accessories is indicated on the Drawings.

**1.2 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data for each type of resilient base and accessory.
- B. Samples for Initial Selection Purposes: Submit manufacturer's standard color charts in form of actual sections of resilient base and accessories, showing full range of colors available, for each type of resilient base and accessory required.
- C. Certification for Fire Test Performance: Submit certification from an independent testing laboratory acceptable to authorities having jurisdiction that resilient base and accessories comply with specified fire test performance requirements.
- D. Maintenance Instructions: Submit two (2) copies of manufacturer's recommended maintenance practices for each type of resilient base and accessory required.

**1.3 QUALITY ASSURANCE**

- A. Manufacturers: Provide each type of resilient base and accessories as produced by a single manufacturer, including recommended primers, adhesives, sealants, and leveling compounds.
- B. Performance Test Criteria: Provide resilient base and accessories that comply with the following fire test performance criteria as determined by an independent testing laboratory acceptable to authorities having jurisdiction.
  - 1. Fire Resistance:
    - a) Flame Spread: Class C (Not more than 75) per ASTM E 84
    - b) Smoke Density: Not more than 450 when tested in accordance with ATM E 662
    - c) Critical Radiant Flux: Class 1 > 0.45 W/square cm
  - 2. Meets or exceeds performance requirements for resistance to heat/light, aging, chemicals, and dimensional stability when tested in accordance with ASTM F 1861

3. Flexibility: Will not crack, break or show any signs of fatigue when bent around a 1/4-inch diameter cylinder.

#### 1.4 PROJECT CONDITIONS

- A. Maintain minimum temperature of 65° F (18° C) in spaces to receive resilient flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Store resilient base and accessory materials in spaces where they will be installed for at least 48 hours before beginning installation. Subsequently, maintain minimum temperature of 55° F (13° C) in areas where work is completed.
- B. Install resilient base and accessories after other finishing operations, including painting, have been completed.

### PART 2 - PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following:
  1. Manufacturers of Resilient Wall Base and Accessories:
    - a) Johnsonite (Basis of Design)
    - b) Roppe Corporation
    - c) Armstrong World Industries, Inc.

#### 2.2 RESILIENT WALL BASE

- A. Wall Base: ASTM F 1861, Type TV (vinyl, thermoplastic), Group 1 (solid, homogeneous), and as follows:
  1. Style: Cove (with top-set toe)
  2. Minimum Thickness: 0.19 inch
  3. Height: 6-inches unless indicated otherwise on the Drawings
  4. Lengths: Cut lengths 48 inches long, manufacturer's standard
  5. Outside and Inside Corners: Job formed or pre-molded.
  6. Surface: Smooth

#### 2.3 RESILIENT ACCESSORIES

- A. Manufacturers: Provide products from one of the following manufacturers:
  1. Johnsonite
  2. Armstrong World Industries (Basis of Design)
  3. Roppe Corporation
- B. Edge Reducer (Transition) Strips: Vinyl types of width required thickness to protect exposed edge of resilient flooring. Color as selected by Architect from the manufacturer's



standard colors. Provide units of maximum available length, to minimize number of joints.

- C. Adhesives (Cements): Waterproof, stabilized, low VOC type as recommended by flooring manufacturer to suit material and substrate conditions. Asphalt emulsions and other non-waterproof types are not acceptable.
- D. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.
- E. Leveling and Patching Compounds: Latex type as recommended by flooring manufacturer.

### **PART 3 - EXECUTION**

#### **3.1 INSPECTION**

- A. Require Installer to inspect floor surfaces to determine that they are satisfactory.

#### **3.2 PREPARATION**

- A. Broom-clean floor or vacuum floor surfaces to receive resilient base and accessories.

#### **3.3 INSTALLATION OF WALL BASE AND ACCESSORIES**

- A. Install resilient base and accessories using method indicated in strict compliance with manufacturer's published instructions
- B. Apply wall base to walls, columns, pilasters, casework and other permanent fixtures in rooms or areas where base is required.
  - 1. Install base in lengths as long as practicable, with preformed corner units, or fabricated from base materials with mitered or coped inside corners.
  - 2. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.
- C. On masonry surfaces, or other similar irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
- D. Apply edge strips before installation of resilient flooring. Secure units to substrate with manufacturer's recommended adhesive.

#### **3.4 EXTRA STOCK**

- A. Deliver stock of maintenance materials to the Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
- B. Wall Base and Accessories: Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

**END OF SECTION 09 65 13**

## **SECTION 09 65 16**

### **RESILIENT SHEET FLOORING**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. Resilient homogeneous electrostatic discharge (ESD) sheet vinyl flooring.
- B. Extent of resilient sheet flooring is indicated on the Drawings.
- C. Related Work: Resilient Base and Accessories are specified in Section 09 65 13

##### **1.2 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data for each type of resilient sheet flooring specified.
- B. Shop Drawings: Show installation details and locations of borders, patterns, location of floor inserts and seams.
- C. Samples for Initial Selection Purposes: Submit manufacturer's standard color charts in form of actual sections of resilient sheet flooring, including accessories, showing full range of colors and patterns available, for each type of resilient sheet flooring required.
- D. Certification for Fire Test Performance: Submit certification from an independent testing laboratory acceptable to authorities having jurisdiction that resilient sheet flooring complies with fire test performance requirements.
- E. Maintenance Instructions: Submit two (2) copies of manufacturer's recommended maintenance practices for each type of resilient sheet flooring and accessory required.

##### **1.3 QUALITY ASSURANCE**

- A. Manufacturer: Provide each type of resilient sheet flooring product as produced by a single manufacturer, including recommended primers, adhesives, sealants, and leveling compounds. Manufacturer shall be ISO 9001 and ISO 14001 Certified.
- B. Installer Qualifications:
  - 1. At least five (5) years' experience in the installation of resilient sheet flooring
  - 2. Experience on at least five (5) projects of similar size, type and complexity as this Project
  - 3. Employer of workers for this Project who are competent in techniques required by the manufacturer for resilient flooring installation indicated.

- C. Fire Test Performance: Provide resilient sheet flooring which complies with the following fire test performance criteria as determined by an independent testing laboratory acceptable to authorities having jurisdiction.

- 1. Critical Radiant Flux (CRF): Class I, not less than 0.45 watts per square cm per ASTM E 648

#### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Store flooring and installation materials in protected dry spaces with ambient temperatures maintained within range recommended by the flooring manufacturer, but not less than 55 degrees F, or more than 85 degrees F.
- B. Store flooring rolls in an upright position on a smooth flat surface immediately upon delivery to the Project site.

#### 1.5 PROJECT CONDITIONS

- A. Maintain minimum temperature of 65° F in spaces to receive resilient sheet flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Store resilient sheet flooring materials in spaces where they will be installed for at least 48 hours before beginning installation. Subsequently, maintain minimum temperature of 55° F in areas where work is completed.
- B. Install resilient sheet flooring after other finishing operations, including painting, have been completed. Do not install resilient sheet flooring over concrete slabs until the latter have been cured and are sufficiently dry to achieve bond with adhesive as determined by resilient flooring manufacturer's recommended bond and moisture test.
- C. After installation, maintain temperatures within range recommended by the flooring manufacturer, but not less than 55 degrees F or more than 85 degrees F.
- D. Prohibit traffic during flooring installation and for at least 48 hours after flooring installation.

#### 1.6 WARRANTY

- A. Provide Manufacturer's special limited warranty in which manufacturer agrees to repair or replace flooring that fails within specified warranty period. Material warranty shall be direct from the product manufacturer.
- B. Flooring failures include, but are not limited to, the following:
  - 1. Material manufacturing defects
  - 2. Surface wear and deterioration to the point of wear-through
  - 3. Failure due to substrate moisture exposure not exceeding 80 percent relative humidity when tested according to ASTM F 2170 or 5-pounds moisture vapor emission rate when tested according to ASTM F 1869

- C. Special Limited Warranty: Installer's standard form in which installer agrees to repair or replace flooring that fails due to poor workmanship or faulty installation within the 2-year warranty period from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.1 ACCEPTABLE MANUFACTURERS**

- A. Manufacturer: Provide resilient sheet flooring as manufactured by FLEXCO (Basis of Design Manufacturer) - "Delane Electrostatic Discharge (ESD) Vinyl Flooring".
- B. Other manufacturers, whose products may be considered for equivalency by the Architect, include the following:
  - 1. Armstrong World Industries, Inc.
  - 2. Johnsonite
  - 3. Mannington Mills

### **2.2 RESILIENT SHEET VINYL FLOORING**

- A. General: Provide unbacked homogeneous vinyl sheet flooring products complying with ASTM F 1913, and as follows:
  - 1. Size: Manufacturer's standard and as indicated otherwise on the Drawings
  - 2. Construction: Homogeneous electrostatic discharge sheet vinyl flooring
  - 3. Gauge: 1/8-inch minimum nominal overall per ASTM F 386
  - 4. Color: As indicated on the Drawings for the flooring products specified as follows

### **2.3 ACCESSORIES**

- A. Manufacturers - General: Provide products as recommended by the sheet flooring manufacturer.
- C. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.
- D. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by the flooring manufacturer.
- E. Adhesives: Water-resistant, low VOC type as recommended by the flooring manufacturer for substrate and conditions indicated. Full-spread application.
- F. Heat Welding Rod: As supplied by the flooring manufacturer in color that blends with the resilient flooring color.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Require Installer to inspect subfloor surfaces to determine that they are satisfactory. A satisfactory subfloor surface is defined as one that is smooth and free from cracks, holes, ridges, coatings preventing adhesive bond, and other defects impairing performance or appearance.
- B. Verify the following:
  - 1. Installation area is dry, weather-tight and in compliance with specified requirements
  - 2. Permanent heat, lighting and ventilation systems are installed and operable
  - 3. Other work, including overhead work that could cause damage, dirt, dust or otherwise interrupt installation has been completed.
  - 4. No foreign materials or objects are present on the substrate and that it is clean and ready for preparation and installation
  - 5. Tests to verify that the moisture vapor emission rate or substrate relative humidity is within the specified ranges
  - 6. Concrete slab surface pH level is within the specified range
  - 7. Concrete slab surface deviation is no greater than 3/16-inch within 10-feet as described in AC1117R

### 3.2 PREPARATION

- A. Use leveling and patching compounds as recommended by flooring manufacturer for filling small cracks, holes and depressions in sub-floors.
- B. Remove coatings from subfloor surfaces that would prevent adhesive bond, including curing compounds incompatible with resilient flooring adhesives, paint, oils, waxes and sealers.
- C. Broom-clean or vacuum surfaces to be covered, and inspect subfloor.
- D. Concrete Substrates: Prepare according to ASTM F 710.
  - 1. Verify that substrates are dry and free of sealers, curing compounds and other additives. Remove coatings and other substances that are incompatible with adhesives using mechanical methods recommended by the flooring manufacturer
  - 2. Alkalinity Testing: Perform pH testing according to ASTM F 710. Proceed with installation only if pH readings are between 7.0 and 8.5.
- E. Moisture Testing: Perform testing in accordance with one of the following:
  - 1. Perform ASTM F 2170 relative humidity test and proceed with installation only after substrates have maximum relative humidity of 80 percent.
  - 2. Perform ASTM F 1869 calcium chloride test and proceed with installation only after substrates have maximum moisture-vapor-emission rate of 5-lb/1000 square feet in 24 hours
- G. Use trowelable concrete based leveling and patching compound with the same moisture vapor tolerance as the adhesive to fill depressions, holes, cracks, grooves or other irregularities in the substrate.

- H. Place flooring and installation materials into spaces where they will be installed at least 48 hours before installation. Install flooring materials only after they have reached the same temperature as space where they are to be installed.
- I. Sand the surface of the concrete floor slab
- J. Sweep and then vacuum substrates immediately before installation. After cleaning, examine substrate for moisture, alkaline slats, grit, dust or other contamination. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.3 VINYL SHEET FLOORING INSTALLATION

#### A. General:

- 1. Comply with resilient flooring manufacturer's published installation instructions
- 2. Take necessary precautions to minimize noise, odors, dust and inconvenience during installation
- 3. Fit flooring neatly and tightly to vertical surfaces, equipment anchors, floor outlets and other interruptions of the floor surface
- 4. Extend flooring into toe spaces, door reveals, closets, and similar openings unless otherwise indicated.

#### B. Lay out flooring as follows:

- 1. Minimize number of seams and place them at inconspicuous areas
- 2. Locate seams as shown on approved Shop Drawings

#### C. Adhered Flooring: Attach products to substrates using a full spread of adhesive applied to substrate to comply with adhesive and flooring manufacturer's published instructions.

#### D. Vinyl Sheet Flooring Seams: Finish seams to produce surfaces flush with adjoining flooring surfaces. Comply with ASTM F 1516. Rout joints and use heat-welding rod to permanently and seamlessly fuse sections together.

### 3.4 CLEANING AND PROTECTION

#### A. Perform the following operations after completing resilient sheet flooring installation:

- 1. Remove marks and blemishes from flooring surfaces
- 2. Sweep and then vacuum flooring
- 3. Damp-mop flooring to remove soiling

#### B. Protect flooring from abrasions, indentations, and other damage from subsequent operations and placement of equipment during remainder of construction period.

**END OF SECTION 09 65 16**

## **SECTION 09 65 19**

### **RESILIENT TILE FLOORING**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. Resilient tile flooring includes, but is not limited to, vinyl conductive and static dissipative tile.
- B. Extent of resilient tile flooring is indicated on the Drawings.
- C. Related Work: Resilient Base and Accessories are specified in Section 09 65 13

##### **1.2 QUALITY ASSURANCE**

- A. Manufacturers: Provide each type of resilient tile flooring as produced by a single manufacturer, including recommended primers, adhesives, sealants, and leveling compounds.
- B. Fire Test Performance: Provide resilient tile flooring which complies with the following fire test performance criteria as determined by an independent testing laboratory acceptable to authorities having jurisdiction.
  - 1. Critical Radiant Flux (CRF): Class I, not less than 0.45 watts per square cm per ASTM E 648
  - 2. Fire Test Data:
    - a) Flooring Radiant Panel Critical Radiant Flux: 0.45 watts per square centimeter or more, Class I per ASTM E 648
    - b) Optical Smoke Density: 450 or less per ASTM E 662
    - c) Flame Spread: ASTM E 84; Standard Formula, Class-B (26-75) or Class-A Formula, (Class A (0 – 25)
    - d) Surface Flame Propagation: Passes, less than 2.0 per UL 992

##### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data for each type of resilient tile flooring.
- B. Samples for Initial Selection Purposes: Submit manufacturer's standard color charts in form of actual sections of resilient flooring, including accessories, showing full range of colors and patterns available, for each type of resilient tile flooring required.
- C. Certification for Fire Test Performance: Submit certification from an independent testing laboratory acceptable to authorities having jurisdiction that resilient flooring complies with fire test performance requirements.



- D. Maintenance Instructions: Submit two (2) copies of manufacturer's recommended maintenance practices for each type of resilient flooring and accessory required.

#### 1.4 PROJECT CONDITIONS

- A. Maintain minimum temperature of 65° F (18° C) in spaces to receive resilient tile flooring for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. Store resilient tile flooring materials in spaces where they will be installed for at least 48 hours before beginning installation. Subsequently, maintain minimum temperature of 55° F (13° C) in areas where work is completed.
- B. Install resilient tile flooring after other finishing operations, including painting, have been completed. Do not install resilient tile flooring over concrete slabs until the latter have been cured and are sufficiently dry to achieve bond with adhesive as determined by resilient flooring manufacturer's recommended bond and moisture test.

### PART 2 - PRODUCTS

#### 2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design Manufacturer for Conductive and Static Dissipative Solid Vinyl Tile: FLEXCO Corporation.
- B. Alternative Manufacturers: Subject to compliance with requirements and approval by the Architect, other manufacturers offering vinyl tile products that may be incorporated in the work include, but are not limited to, the following:
  - 1. Armstrong World Industries, Inc.
  - 2. Kentile Floors, Inc.
  - 3. Tarkett

#### 2.2 CONDUCTIVE AND STATIC DISSIPATIVE SOLID VINYL TILE (VT)

- A. General: Provide products complying with ASTM F 1700, Class I, 1/8-inch Gauge, and as follows:
  - 1. Size: Manufacturer's standard sizes as indicated on the Drawings
  - 2. Material: Tough, clear, polyurethane-coated unified wear layer composed of polyvinyl chloride resins, plasticizers, stabilizers, and filled vinyl backing
  - 3. Thickness: 0.125-inch nominal overall with 20 mil wear layer
  - 4. Electrical Resistance Requirements: Conductive and Static Dissipative tile shall meet electrical resistance requirements of ASTM F 150
  - 5. Critical Radiant Flux: Passes ASTM E648, Class 1
  - 6. Static Load Limit: 250 psi per ASTM F 970; 2000 psi per modified ASTM F 970
  - 7. Static Propensity: Passes requirements of AATCC 134
  - 8. Abrasion-Resistance: Excellent per ASTM F 510
  - 9. Static Propensity: Conductive less than 5 volts with conductive shoes; static dissipative less than 20 with conductive shoes

- 10. Resistance to Chemicals: Passes ASTM F925
- 11. Surface Flame Propagation: Passes (Less than 2.0) per UL 992

## 2.3 ACCESSORIES

- A. Manufacturers: Provide products as recommended by the floor tile manufacturer:
- B. Vinyl Welding Rods: From Manufacturer of floor tile; colors matching floor tile.
- C. Adhesives (Cements): Waterproof, stabilized, low VOC type as recommended by Floor tile manufacturer to suit material and substrate conditions. Asphalt emulsions and other non-waterproof types are not acceptable.
- D. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.
- E. Leveling and Patching Compounds: Latex type as recommended by flooring manufacturer.

## PART 3 - EXECUTION

### 3.1 INSPECTION

- A. Require Installer to inspect subfloor surfaces to determine that they are satisfactory. A satisfactory subfloor surface is defined as one that is smooth and free from cracks, holes, ridges, coatings preventing adhesive bond, and other defects impairing performance or appearance.
- B. Perform bond and moisture tests on concrete sub-floors to determine if surfaces are satisfactory.

### 3.2 PREPARATION

- A. Use leveling and patching compounds as recommended by resilient flooring manufacturer for filling small cracks, holes and depressions in sub-floors.
- B. Remove coatings from subfloor surfaces that would prevent adhesive bond, including curing compounds incompatible with resilient flooring adhesives, paint, oils, waxes and sealers.
- C. Broom-clean or vacuum surfaces to be covered, and inspect subfloor.
- D. Apply concrete slab primer, if recommended by flooring manufacturer, prior to application of adhesive. Apply in compliance with manufacturer's directions.

### 3.3 FLOOR TILE INSTALLATION

- A. Install resilient tile flooring using method indicated in strict compliance with manufacturer's published instructions. Extend resilient tile flooring into toe spaces, door reveals, and into closets and similar openings.

- B. Scribe, cut and fit resilient tile flooring to permanent fixtures, built-in furniture and cabinets, pipes, outlets and permanent columns, walls, and partitions.
- C. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent marking device.
- D. Tightly cement resilient tile flooring to sub-base without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections. Hand roll resilient flooring at perimeter of each covered area to assure adhesion.

#### 3.4 CLEANING AND PROTECTION

- A. Sweep or vacuum floor thoroughly immediately upon completion of resilient tile flooring.
- B. Do not wash floor until time recommended by resilient floor tile manufacturer has elapsed to allow resilient flooring to become well-sealed in adhesive.
- C. Damp-mop floor being careful to remove black marks and excessive soil.

#### 3.5 EXTRA STOCK

- A. Deliver stock of maintenance materials to the Owner. Furnish maintenance materials from same manufactured lot as materials installed and enclosed in protective packaging with appropriate identifying labels.
- B. Furnish not less than one box for every 50 boxes or fraction thereof installed, for each type, color, pattern and size of tile installed.

**END OF SECTION 09 65 00**

**SECTION 09 68 13****MODULAR CARPET****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Work of this section includes, but is not limited to, modular carpet and carpet base adhered to substrates, including related accessories. Locations shall be as indicated on the Drawings.

**1.2 RELATED WORK**

- A. Concrete floor sealers are specified in Section 09 90 00, Painting and Coating.
- B. Metal thresholds are specified in Section 08 71 00, Door Hardware
- C. Other metal floor finish transition components are indicated on the Drawings.

**1.3 REFERENCES**

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM D 2859 - Standard Test Method for Flammability of Finished Textile Floor Covering Materials.
  - 2. ASTM E 84 - Surface Burning Characteristics of Building Materials.
  - 3. ASTM E 648 - Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- B. Carpet and Rug Institute (CRI): Standard 104-02, Installation Specification of Commercial Carpet.

**1.4 SUBMITTALS**

- A. Shop Drawings: Indicate installation plan for modular carpet specified including edge terminations.
- B. Product Data: Provide data on all specified products including carpeting, adhesives, carpet accessories, fillers and other floor preparation materials, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation. Provide manufacturer's standard color range for selection of colors for carpet and accessories.
  - 1. For modular carpet, documentation indicating compliance with testing and product requirements of Carpet and Rug Institute's "Green Label Plus" program
  - 2. For installation adhesive, including published statement of VOC content

C. Samples:

1. Carpet: Submit two full carpet module samples of each type of carpet specified illustrating color and pattern for each carpet material specified. Include manufacturer's identification trade name and catalog number for carpet and manufacturer's signed certificate stating that carpet supplied complies with the specifications.
2. Accessories: Submit two, 3-inch long (or manufacturer's standard length) samples of carpet saddle, dividers, reducers, and other accessories.

D. Manufacturer's Installation Instructions:

1. Hard Copy Manual: Indicate special procedures and perimeter conditions requiring special attention.
2. Video Recorded Maintenance Demonstration: Submit video-recorded demonstration of manufacturer's recommended maintenance, cleaning and repair procedures. Submit in accordance with requirements for closeout submittals specified in Division-1 General Requirements.

E. Test Results: Submit independent testing laboratory reports indicating that carpet meets or exceeds the flammability tests specified, and the specifications for manufacture as required in Article 2.2 below.

F. Mill Certification and Warranties: Submit documentation and evidence that carpet delivered on site meets specified requirements. Include lot numbers and other data to substantiate manufacture and quality of carpet.

G. Warranties: Submit fiber and carpet manufacturer's warranties in accordance with closeout requirements of Division-1.

## 1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing specified carpet with minimum five (5) years documented experience.
- B. Installer: Company approved by specified carpet manufacturer specializing in installing carpet with minimum three (3) years-documented experience.

## 1.6 REGULATORY REQUIREMENTS

- A. Flammability Ratings: Carpet tile shall meet the requirements of ASTM E 648, Class 1 for glue-down applications. Smoke Density Rating shall be less than 450 per ASTM E 662.
- B. Static Control: Carpet tile shall be furnished with a permanent static control system within the face yarn to reduce the level of electrostatic voltage built up in the floor covering to below the normal thresholds of human sensitivity, measured at 2500-3300 static volts at 70 degrees F and 20% relative humidity, and to comply with AATCC-134 (under 3.5 KV).

## 1.7 ENVIRONMENTAL REQUIREMENTS

- A. Store materials for 24 hours prior to installation in area of installation to achieve temperature stability.
- B. Maintain temperature in area of installation between a minimum of 65 degrees F and a maximum of 95 degrees F ambient temperature 3 days prior to, during, and 72 hours after installation. Maintain temperature 24 hours per day, 7 days per week.

## 1.8 PRODUCT VERIFICATION

- A. Contractor's Delivery Inspection: Inspect and verify materials upon delivery to project site for quantity, packaging, labeling, condition of materials, and product compliance with specification. Ensure that carpet delivered to project site are as specified and are ready for installation. Maintain records on site (lot numbers, shipping receipts, or other identification as established by the Contractor for tracking delivered carpet materials) of the carpet materials delivered and installed.

## 1.9 MAINTENANCE DATA

- A. Submit under provisions of Section 01 77 00, Closeout Procedures.
- B. Include maintenance procedures, recommended maintenance and cleaning materials, recommended cleaning equipment, and suggested schedule for cleaning.
  - 1. Maintenance and Cleaning Materials: Identify chemicals and other materials required to properly maintain carpet. Clearly identify each material by brand name and source. List quantities and mix solutions for proper application and use.
  - 2. Equipment: Identify each tool and equipment type recommended for a total carpet maintenance program by common name and description or by manufacturer's name.
  - 3. Schedule: Outline cleaning and maintenance activities and indicate optimum frequency of each activity.
- C. Recorded Maintenance Demonstration: Provide video on CD of manufacturer's recommended maintenance, cleaning, and repair procedures.

## 1.10 EXTRA MATERIAL

- A. Furnish under provisions of Section 01 77 00, Closeout Procedures.
- B. Carpet: Deliver a minimum of 5% of modular carpet of each type, color, and pattern specified exclusive of material required to properly complete installation. Furnish extra materials from same production run as materials installed.
- C. Packaging and Identification: Package extra carpet in securely fastened, waterproof wrappings and deliver to the University under provisions of Section 01770, Closeout Procedures.

# PART 2 - PRODUCTS

## 2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with specified requirements, provide modular carpet as manufactured by one of the following manufacturers:
  - 1. INTERFACE
  - 2. Shaw Industries
  - 3. Lees Commercial Carpets
- B. Modular carpet and base by INTERFACE, "Cubic", Color - #4289 "MATRIX" is the Basis of Design product for this Project.
- C. Sub-Floor Fillers: Subject to compliance with requirements, provide products manufactured by the following that are suitable for the double-glue installation method:
  - 1. Ardex Inc.
  - 2. The W.W. Henry Company.
  - 3. Equivalent manufacturer recommended by the carpet cushion manufacturer for the double-glue installation method
- C. Metal Carpet Accessories: Provide products as manufactured Schluter as indicated on the Drawings, or equivalent products by one of the following:
  - 1. Macklanburg-Duncan Floor Covering Products.
  - 2. Saddles at Fire Rated Partitions: National Guard Products, Inc., or Pemko.

## 2.2 MODULAR CARPET

- A. Provide modular carpet as indicated on the Drawings and as specified in this Section.
- B. Environmental Requirements: Provide modular carpet that complies with testing and product requirements of Carpet and Rug Institute's "Green Label Plus" program.

## 2.3 MODULAR CARPET

- A. Provide modular carpet and carpet base that comply with the following requirements:
 

|                          |   |
|--------------------------|---|
| 1. Product Construction  | Tufted Textured Loop                              |
| 2. Fiber                 | 100% Recycled Content Type 6 Nylon                |
| 3. Dye Method            | 100% Solution Dye                                 |
| 4. Soil/Stain Protection | Mfg.'s standard                                   |
| 5. Antimicrobial         | Mfg's standard                                    |
| 6. Yarn Weight           | 18 oz./square yard                                |
| 7. Machine Gauge         | 1/12-inch   |
| 8. Pile Height           | 0.14 inches                                       |
| 9. Stitches              | 8.2 per inch                                      |
| 10. Pile Density         | 6,968 per cubic yard                              |
| 11. Total Thickness      | 0.28 inches                                       |
| 12. Size                 | 20 inches x 20 inches (nominal)                   |
| 13. Radiant Panel        | Passes Class 1 (ASTM E 648) Critical Radiant Flux |
| 14. Smoke Density        | Less than or equal to 450 per ASTM E 662          |

- |                       |  |
|-----------------------|--|
| 15. Static            | < 3.0 KV per AATCC-134                       |
| 16. Backing           | As selected by the Architect                 |
| 17. Color             | As selected by the Architect                 |
| 18. Recycled Content: | 62% (58% Post-Industrial / 4% Post-Consumer) |

## 2.4 SUB-FLOOR FILLERS

- A. Acceptable Products: Subject to compliance with requirements, provide products that are suitable for the double-glue installation method, and recommended by the carpet cushion manufacturer as being compatible with substrate surface, material and conditions.

## 2.5 CARPET ACCESSORIES

- A. Provide metal carpet accessories and saddles at fire rated partitions from acceptable manufacturers listed under Article 2.1.
- B. Other Manufacturers: Submit for approval by the Architect.
- C. Accessory Colors: As specified or selected by the Architect from manufacturer's standard colors.
- D. Miscellaneous Accessories:
1. Reducer: As recommended by the carpet manufacturer for double-glue installation method in heavy traffic areas.
  2. Carpet Edge Guard: As indicated on the Drawings, or if not indicated, Pemko No.174A, or equivalent as approved by Architect.
- E. Adhesives: Water-resistant, mildew-resistant, non-staining type to suit products and subfloor conditions indicated that complies with flammability requirements for installed carpet and is recommended or provide by the carpet and carpet pad manufacturers. Provide adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

# PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 feet and that there are no surface deviations of more than 1/16 inch per linear foot in any direction. Correct deviations as specified below:
- B. Verify concrete floors are dry to a maximum moisture content of 7 percent and exhibit negative alkalinity, carbonization, or dusting.
- C. Verify that surfaces are clean and ready to receive work.

## 3.2 PREPARATION



- A. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler as recommended by the carpet cushion manufacturer. Grind concrete to remove ridges, lumps, and other deviations above the flat floor.
- B. Apply, trowel, and float filler to achieve smooth, flat hard surface. Prohibit traffic until filler is cured.
- C. Vacuum clean substrate. Ensure that all dust, loose material, grease, oil and other foreign substances are removed from substrate.
- D. Environmental Conditions: Maintain temperature and other environmental factors as specified, during and after installation.
- E. Material Pre-Conditioning: Maintain carpet materials and adhesives at between 65 degrees F. and 95 degrees F for 48 hours prior to use. Ensure that all materials are climatized prior to installation.

### 3.3 INSTALLATION

- A. Comply with CRI 104-02.
- B. Lay modular carpet tile in accordance with the manufacturer's published instructions. Butt seams without compression leaving no gaps. Trim any excess and tightly fit modular carpet along wall perimeter.
- C. Using a carpet roller, roll the installed modular carpet in both directions to promote complete adhesion between the modular carpet and the substrate. Roll a second time three to twelve hours after initial rolling to establish a strong bond between substrate and modular carpet.

### 3.4 CLEANING

- A. Clean and vacuum carpet surfaces.
- B. Dispose of carpet remnants, packaging materials, and other related refuse off site. Do not utilize Owner's dumpsters for disposal of items related to carpet or its installation.

### 3.5 PROTECTION

- A. Prohibit traffic from carpet areas for 24 hours after installation.
- B. Cover areas to receive foot traffic with undyed, untreated building paper. Maintain covering until final cleaning as specified in section 01 77 00.
- C. Replace carpet damaged by traffic or other means at no additional cost to the City.

### 3.6 WARRANTY WORK

- A. Remove bubbles and ripples, repair seams, joints, and edges at the time of warranty inspection (generally one year subsequent to the date of substantial completion). Note and repair any instances of adherence problems between modular carpet and floor substrates.

**END OF SECTION 09 68 13**

**SECTION 09 90 00****PAINTS AND COATINGS****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Scope: Surface preparation, painting, and finishing of new exposed interior and exterior items and surfaces. The work also includes:
  - 1. Painting of new exterior and interior existing building surfaces as well as those surfaces damaged or modified by work under this contract.
  - 2. Touch-up painting of exterior and interior new building surfaces where new mechanical and electrical work is installed.
  - 3. Surface preparation, priming, and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.
- B. Paint exposed surfaces whether or not colors are designated on the Drawings or in "schedules", except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. Color or finish not designated will be selected from available approved colors or finishes.
  - 1. Painting includes field painting exposed bare and covered pipes and ducts (including color-coding), hangers, exposed steel and ironwork, and primed metal surfaces of mechanical and electrical equipment.
- C. Painting is not required on pre-finished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
  - 1. Pre-finished items not to be painted include the following factory-finished components:
    - a) Acoustic materials
    - b) Architectural woodwork and casework
    - c) Finished mechanical and electrical equipment
    - d) Light fixtures
    - e) Distribution cabinets
  - 2. Concealed surfaces not to be painted included wall or ceiling surfaces in the following generally inaccessible areas:
    - a) Furred areas
    - b) Pipe spaces
  - 3. Finished metal surfaces not to be painted include:

- a) Anodized aluminum
  - b) Stainless steel
  - c) Chromium plate
  - d) Copper
  - e) Bronze
  - f) Brass
4. Operating parts not to be painted include moving parts of operating equipment such as the following:
- a) Valve and damper operators
  - b) Linkages
  - c) Sensing devices
  - d) Motor and fan shafts
5. Labels: Do not paint over Underwriter's Laboratories (UL). Factory Mutual (FM) or other code required labels or equipment name, identification, performance rating, or nomenclature plates.
- D. Related Sections: Sections containing requirements that relate to this section include, but are not limited to, the following:
- 1. Division-5 Sections for shop priming ferrous metal.
  - 2. Division-6 Section "Architectural Woodwork" for shop priming architectural woodwork.
  - 3. Division-8 Section "Metal Doors and Frames: for shop priming steel doors and frames.
  - 4. Division-8 Section "Access Doors" for shop priming steel doors and frames.
  - 5. Divisions-23, 25 and 26: Painting of mechanical and electrical work is specified in these Divisions respectively.

## 1.2 SUBMITTALS

- A. Make all submittals 90 days prior to any work requiring final color or material selection.
- B. Product Data: Manufacturer's technical information, label analysis and application instructions for each material proposed for use. List each material and cross-reference the specific coating and finish system and application. Identify each material by the manufacturer's catalog number and general classification.
- C. Samples for initial color selection in the form of manufacturer's color charts. After review of color charts, submit color chips to be selected by the Architect for surfaces to be coated.
- D. Samples for verification purposes: Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate. Define each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.
- 1. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.

2. Submit samples on the following substrates for review of color and texture only:
  - a) Concrete: Provide two 4-inch square samples for each color and finish.
  - b) Exterior Cement Plaster on Concrete Masonry: Provide two 4-inch by 8-inch samples of masonry for finish and color.
  - c) Ferrous and Non-Ferrous Metal: Provide two 4-inch square samples of flat metal and two 8-inch long samples of solid metal for each color and finish.
  - d) Gypsum Board: Provide two 12-inch by 12-inch samples gypsum board for finish and color.

### 1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
- B. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers. Notify the Architect of problems anticipated using the materials specified.
- C. Field Samples: On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 100 square feet of surface until required sheen, color and texture are obtained. Simulate finished lighting conditions for review of in-place work. Final acceptance of colors will be from job-applied samples.
- D. Material Quality: Provide the manufacturer's best quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
  1. Proprietary names used to designate colors or materials re not intended to imply that products named are required or to exclude equal products of other manufacturers.
  2. Federal Specifications (FS) establish a minimum quality level of paint materials, except where other product identification is used. Provide written certification from the manufacturer that materials provided meet or exceed these criteria.
  3. Products that comply with qualitative requirements of applicable Federal Specifications, yet differ in quantitative requirements, may be considered for use when acceptable to the Architect. Furnish material data and manufacturer's certificate of performance to Architect for proposed substitutions.

### 1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
  1. Product name or title of material
  2. Product description (generic classification or binder type)
  3. Federal Specification number, if applicable

4. Manufacturer's stock number and date of manufacture
5. Contents by volume, for pigment and vehicle constituents
6. Thinning instructions
7. Application instructions
8. Color name and number

- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 degrees F. Maintain containers used in storage in a clean condition, free of foreign materials and residue. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

## 1.5 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 degrees and 90 degrees F.
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 degrees F and 95 degrees F.
- C. Do not apply paint in rain, fog or mist, when the relative humidity exceeds 85 percent, at temperatures less than 5 degrees F above the dew point, or to damp or wet surfaces. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

## PART 2 - PRODUCTS

### 2.1 PAINT MATERIALS

- A. Provide paints as manufactured by Sherwin Williams, Benjamin Moore, or Porter Paints. Paint and coating products by Sherwin Williams have been used as the basis of design for this Project.
- B. Primers, Undercoats, Split and Finish Coats: Use materials from same manufacturer when such materials are applied on same surface.
- C. Color Selection: As selected from Manufacturer's standard color palette.
1. Tint primers and undercoats to approximate shade of selected finish coat color.
  2. For deep tone finish colors, use Deep Base Primers recommended by manufacturer for surface.
  3. Dry Mil Thickness:
    - a) Comply with manufacturer's specifications.

- b) If thinning of materials is performed, apply additional coats to achieve full film thickness of coats specified.
4. Color Selections:
- a) If color is not listed for any specific area or item, it does not relieve Contractor of responsibility for providing colors to be selected.
  - b) Color selection made by Architect is to determine basic color required for surface.
  - c) Colors with same designation but produced from two or more sources shall match when viewed from distance of 24 inches or more.
  - d) Final application of colors shall match prepared samples approved by the Architect.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine substrates and conditions under which painting will be performed for compliance with requirements for application of paint. Do not begin paint application until unsatisfactory conditions have been corrected.
- B. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

#### **3.2 PREPARATION**

- A. General Procedures: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures and similar items in place that are not to be painted, or provide surface-applied protection prior to surface preparation and painting.
  - 1. Remove these items if necessary for complete painting of the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
  - 2. Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to cleaning. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- B. Surface Preparation: Clean and prepare surfaces to be painted in accordance with the manufacturer's instructions for each particular substrate condition and as specified.
  - 1. Provide barrier coats over incompatible primers or remove and re-prime. Notify Engineer in writing of problems anticipated with using the specified finish coat material with substrates primed by others.
  - 2. Cementitious Materials: Prepare concrete, concrete masonry block and cement plaster panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents using pressure-cleaning methods. Roughen as required to remove

glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

- a) Use abrasive blast-cleaning methods if recommended by the paint manufacturer.
    - b) Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
  3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper as required. Sand surfaces exposed to view smooth and dust off.
    - a) Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
    - b) Prime or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, and cases.
    - c) Seal tops, bottoms, and cutouts of unprimed interior wood doors with a heavy coat of varnish or sealer immediately upon delivery.
  4. Ferrous Metals: Clean non-galvanized ferrous metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council. Touch up bare areas and shop-applied prime coats that have been damaged. Wire brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.
  5. Galvanized Surfaces: Clean galvanized surfaces with non-petroleum based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- C. Materials Preparation: Carefully mix and prepare paint materials in accordance with manufacturer's directions.
1. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
  2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into materials. Remove film and if necessary, strain material before using.
  3. Use only thinners approved by the paint manufacturer, and only within recommended limits.

### 3.3 APPLICATION



- A. Apply paints and coatings in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
  - 1. Paint colors, surface treatments, and finishes are indicated in "Schedules".
  - 2. Provide finish coats that are compatible with primers used.
  - 3. The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce an even smooth surface in accordance with the manufacturer's directions.
  - 4. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
    - a) Apply bird repellent coating by brush or sprayer. Spray application shall require a spray gun with a discharge pressure of more than 40 psi, but not more than 150 psi.
  - 5. The term "exposed surfaces: includes areas visible when permanent or built-in fixtures, covers, grilles, and similar components are in place. Extend coatings in these areas as required to maintain the system integrity and provide desired protection.
  - 6. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.
  - 7. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
  - 8. Paint backsides of access panels and removable or hinged covers to match exposed surfaces.
  - 9. Finish exterior doors on tops, bottoms, and side edges same as exterior faces.
  - 10. Sand lightly between each succeeding enamel or varnish coat.
  - 11. Omit primer on metal surfaces that have been shop-primed and touch-up painted.
- C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  - 1. Allow sufficient time between successive coats to permit proper drying.

2. Do not re-coat until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure and where application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- D. Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer.
- E. Mechanical and Electrical Work: Painting mechanical and electrical work is limited to items exposed in mechanical equipment rooms and in occupied spaces.
- F. Mechanical items to be painted include but are not limited to the following:
1. Piping, pipe hangers, and supports
  2. Ductwork
  3. Insulation
  4. Supports
  5. Motors and mechanical equipment
  6. Accessory items
- G. Electrical items to be painted include but are not limited to conduit and fittings.
- H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- I. Prime Coats: Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been prime coated by others. Re-coat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.
- J. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- K. Complete Work: Match approved samples for color, texture, and overage. Remove, refinish, or repaint work not in compliance with specified requirements.

### 3.4 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
- B. Upon completion of painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping, using care not to scratch or damage adjacent finished surfaces.

### 3.5 PROTECTION

- A. Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to the Architect.
- B. Provide "wet paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

### 3.6 EXTERIOR PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates indicated. Where bird repellant coating is indicated on the Drawings, provide bird repellent coating system as specified in PART-2 of these specifications.
- B. Concrete:
  - 1. Elastomeric Epoxy Coating: 2 coats over 1 coat of sealer, minimum dry film thickness 8-10 mils per coat.
- C. Stucco and Cement Plaster:
  - 1. Low Luster Acrylic Finish: Two finish coats over primer.
    - a) Primer: Exterior concrete and masonry primer
    - b) Finish Coats: Exterior textured low-luster acrylic paint
- D. Ferrous Metal (including, but not limited to, exterior steel doors and frames): Primer is not required on shop-primed items.
  - 1. Full-Gloss Alkyd Enamel: 2 finish coats over primer.
    - a) Primer: Synthetic Rust-Inhibiting Primer
    - b) First Coat: Alkyd Gloss Enamel
    - c) Second Coat: Alkyd Gloss Enamel
  - 2. Deep Color, High-Gloss Alkyd Trim Enamel: 2 coats over primer.
    - a) Primer: Alkyd-Type Zinc Chromate Primer.
    - b) First Coat: Deep Color Alkyd Resin Exterior Trim Paint.
    - c) Second Coat: Deep Color Alkyd Resin Exterior Trim Paint.
- E. Zinc-Coated Metal:
  - 1. High-Gloss Alkyd Enamel: 2 finish coats over primer.
    - a. Primer: Galvanized Metal Primer
    - b. First Coat: Alkyd Gloss Enamel
    - c. Second Coat: Alkyd Gloss Enamel

### 3.7 INTERIOR PAINT SCHEDULE

A. General: Provide the following paint systems for the various substrates, as indicated.

B. Concrete (Walls):

1. Lusterless (Flat) Latex Finish: 3 coats (Ceilings).

- a) First Coat: Latex based Wall Primer Sealer
- b) Second Coat: Acrylic Latex Flat Enamel
- c) Third Coat: Acrylic Latex Flat Enamel

2. Semi-Gloss Acrylic Enamel Finish: 3 coats.

- a) Primer: Latex based Wall Primer Sealer
- b) Second Coat: Acrylic Semi-Gloss Enamel
- c) Finish Coat: Acrylic Semi-Gloss Enamel

C. Concrete Floors (Except floors scheduled to receive fluid applied flooring): 2 coats of Thompson's "Waterseal".

D. Concrete Masonry Units:

1. Semi-gloss Acrylic Enamel Finish: 2 coats over filled surfaces.

- a) Block Filler: High-Performance Latex Block Filler
- b) Second Coat: Acrylic Semi-Gloss Enamel
- c) Finish Coat: Acrylic Semi-Gloss Enamel

E. Gypsum Drywall Systems:

1. Lusterless (Flat) Emulsion Finish (Ceilings): 2 coats.

- a) Primer: Latex-Based Interior White Primer
- b) Finish Coat: Latex-Based Interior Flat Paint

2. Semi-gloss Enamel Finish: 3 coats (2.5 mils dry film thickness).

- a) Primer: Latex-Based Interior Flat Paint
- b) Second Coat: Interior Enamel Undercoat
- c) Third Coat: Interior Semi-Gloss Odorless Latex Enamel

F. Woodwork and Hardboard, Opaque Enamel:

1. Semi-gloss Enamel Finish: 3 coats.

- a) Undercoat: Interior Latex Enamel Undercoat
- b) First Coat: Interior Semi-Gloss Odorless Latex Enamel
- c) Second Coat: Interior Semi-Gloss Odorless Latex Enamel

2. Full Gloss Enamel Finish: 3 coats.

- a) Undercoat: Interior Latex Enamel Undercoat
- b) First Coat: Interior Gloss Odorless Latex Enamel
- c) Second Coat: Interior Gloss Odorless Latex Enamel

3. Stain Finish (for doors and wood base): 3 coats.

- a) First Coat: Stain SW3109-B
- b) Second and third Coats: Clear satin polyurethane

G. Ferrous Metal (including, but not limited to, steel doors and frames): Primer is not required on shop-primed items.

1. Full Gloss Enamel Finish: 2 coats over primer with total dry film thickness not less than 2.5 mils.

- a) Primer: Synthetic Rust-Inhibiting Primer
- b) Undercoat: Interior Enamel Undercoat
- c) Finish Coat: Interior Gloss Latex Enamel

H. Zinc-Coated Metal:

1. Lusterless (Flat) Finish: 2 finish coats over primer with total dry film thickness not less than 2.5 mils (for inside of ducts where visible).

- a) Primer: Galvanized Metal Primer
- b) First Coat: Latex based Interior Flat Paint
- c) Second Coat: Latex based Interior Flat Paint

2. Full Gloss Enamel Finish: 2 coats over primer with total dry film thickness not less than 2.5 mils.

- a) Primer: Galvanized Metal Primer
- b) Undercoat: Interior Enamel Undercoat
- c) Finish Coat: Interior Gloss Latex Enamel

I. Fabric Covering over Insulation:

1. Flat Latex Emulsion "Size": 2 coats. Add fungicidal agent to render fabric mildew-proof.

- a) First Coat: Latex based Interior Flat Paint
- b) Second Coat: Latex based Interior Flat Paint

3.8 EXTRA STOCK

A. Provide five (5) gallons of each finish paint product specified in unopened, correctly labeled containers from original batch utilized on the Project.

**END OF SECTION 09 90 00**

**SECTION 10 14 00****SIGNAGE****PART 1 - GENERAL****1.1 WORK INCLUDED**

A. Work of this Section includes, but is not limited to, the following:

1. Emergency Exit Signs
2. Capacity Signs
3. Exit Route Signs
4. Toilet Room Handicapped Signs
5. Interior Space Number and Name Signs
6. Fire Extinguisher and Fire Pull Station Signage

B. Refer also to the Drawings for interior signage formats, dimensions and profiles.

**1.2 QUALITY ASSURANCE**

A. Comply with Department of Community Affairs, "Florida Americans with Disabilities Guidelines".

**1.3 SUBMITTALS**

A. Submit manufacturer's technical data and installation instructions for each type of identifying device required.

B. Submit shop drawings showing sign dimensions, letterform and letter heights.

C. Submit one (1) full size sample for the following identifying devices showing style, specified color, and method of attachment. If approved, sample shall be incorporated in the Work.

1. Interior space number and name sign

D. Submit a comprehensive schedule of all space names and numbers as well as quantities and locations of all other signs specified.

**1.4 DELIVERY, STORAGE AND HANDLING**

A. Package signs in labeled name groups.

B. Store and protect products from soiling, damage, and degradation from exposure to excessive heat, moisture, and humidity.

**1.5 ENVIRONMENTAL REQUIREMENTS**

- A. Do not install signs when ambient temperature is below 70 degrees F. Maintain minimum temperature during and after installation of signs.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
  - 1. American Graphics, Inc.
  - 2. Mills Manufacturing, Inc.
  - 3. Best Mfg. Co.
  - 4. Mohawk Sign Systems
- B. Products of other manufacturers will be considered providing their products equal or exceed the quality specified, as well as the type, size, finish, letter style and arrangement specified.

### **2.2 SPACE SIGNS**

- A. Provide signs in design shown on the Drawings for all spaces using a sand-carved process, and as follows:
  - 1. Tactile characters/symbols shall be raised the required 1/32-inch from sign face. Glue-on letters will not be accepted.
  - 2. All text shall be accompanied by Grade 2 Braille.
  - 3. Perimeter Borders: 3/8-inch.
  - 4. All letters, numbers and symbols shall contrast with their background, either light characters on a dark background, or dark characters on a light background. Characters and background shall have a non-glare finish.
- B. Plaque material shall be laminated colored plastic, 1/8-inch thick with contrasting core color. The plastic laminate shall be non-static, fire-retardant and self-extinguishing. The plastic laminate shall be impervious to most acids, alkalis, alcohol, solvents, abrasives and boiling water.
- C. Letter form shall upper case Helvetica.
- D. Size of letters and numbers shall be as follows unless otherwise indicated:
  - 1. Space Numbers: 1/4-inch minimum
  - 2. Space Name: 1-1/2-inch minimum
  - 3. Symbol Size: 3-inch
  - 4. Building Name and Number: 1-1/2-inch minimum
- E. Standard Grade 2 Braille shall be below copy.

## 2.3 EMERGENCY EGRESS SIGNS

- A. Provide signs in accordance with requirements of Article 202, with red background and white raised lettering reading "EMERGENCY EGRESS - KEEP AREA CLEAR". Braille lettering is not required. Sign dimensions: 1-1/2 inches high by width required for copy. Locate next to all emergency egress windows and doors.
- B. Mounting shall be with non-removable head screws using shields. Mount at locations as directed by Architect in the field.

## 2.4 CAPACITY SIGNS

- A. Provide signs, 1-1/2 inches high by length required, reading "MAXIMUM CAPACITY". Allow for three (3) digits after "maximum capacity"; copy to be determined later.
- B. Fabricate signs in accordance with requirements specified in Article 2.2. Braille lettering is not required.
- C. Mounting shall be with non-removable head screws using shields where mounted on masonry surfaces.

## 2.5 EXIT ROUTE SIGNS

- A. Provide exit route sign frames, one required in every occupied space at main exit doors, consisting of 10-inch by 12-inch, 3/4-inch by 3/4-inch black anodic architectural aluminum channel frame with metal clips reinforced mitered corners.
- B. Frames shall have 1/8-inch clear matte Plexiglas face and 1/8-inch tempered hardboard back with four (4) tamperproof screws fastened through hardboard back to wall. Allow for the installation of show card message between face and back.

## 2.6 TOILET ROOM AND TOILET ROOM HANDICAPPED SIGNS

- A. Provide signs in designs as shown on the Drawings. Handicapped signs shall depict International Symbol of Accessibility (wheelchair) at each toilet room equipped with facilities for the handicapped. Sizes shall be 8-inches by 8-inches unless otherwise indicated on the Drawings.
- B. Color shall be white on a blue background.
- C. Fabricate signs in accordance with requirements specified in Article 2.2.
- D. Mounting shall be with non-removable head screws, 5-feet above finish floor to centerline of sign.

## 2.7 SPACE NAME AND NUMBER SIGNS



- A. Provide one sign at each door leading into each space. Size shall be 6-inches by 6-inches unless otherwise indicated on the Drawings. Size for spaces accessed from the exterior shall 6-inches by 4-inches unless otherwise indicated.
- B. Fabricate signs in accordance with requirements specified in Article 2.2.
- C. Mounting: Signs shall be installed on the wall adjacent to the latch side of the door. If there is no space on the latch side of the door, including double leaf doors, signs shall be placed on the nearest adjacent wall.
  - 1. Mounting Height: 3'-6" above the finished floor to the centerline of the sign.
  - 2. Mounting location shall be so that a person may approach within three inches of signage without encountering protruding objects or standing within the swing of a door.

## 2.8 FIRE EXTINGUISHER AND PULL STATION SIGNS

- A. Copy to Read: "FIRE PULL STATION"  
"FIRE EXTINGUISHER"
- B. Fabricate signs in accordance with requirements specified in Article 2.2 with red background and white raised letters, 1-1/2 inches high by width needed for copy. Braille lettering is not required.
- C. Mount on wall surfaces with non-removable oval head screws 5'-0" above finish floor to centerline of sign.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that surfaces are ready to receive work.
- B. Verify location, placement and alignment of signage prior to installation.

### 3.2 INSTALLATION

- A. Install in accordance with manufacturer's published instructions.
- B. Install signage after receiving surfaces are finished in locations as indicated or directed.
- C. Install signage on receiving surface plumb and level.
- D. Clean and polish each signage component following installation.

**END OF SECTION 10 14 00**

## **SECTION 10 44 00**

### **FIRE PROTECTION SPECIALTIES**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. Extent of fire extinguisher and cabinet work is indicated on the Drawings and includes, but is not limited to, the following:
  - 1. ABC-type portable fire extinguishers and brackets.
  - 2. K-type portable fire extinguishers and brackets
  - 3. Fire extinguisher cabinets where indicated on the Drawings
  - 4. Attachment hardware

##### **1.2 SUBMITTALS**

- A. Product Data: Submit manufacturer's technical data and installation instructions for all portable fire extinguishers required. For fire extinguisher cabinets include rough-in dimensions and details showing mounting methods, relationships to surrounding construction, style and materials.

#### **PART 2 - PRODUCTS**

##### **2.1 ACCEPTABLE MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following:
  - 1. Larsen's Manufacturing Co. (Basis of Design)
  - 2. J.L. Industries
  - 3. Potter-Roemer
- B. Equivalent products of other manufacturers may be proposed, but in no case, should extinguishers have a plastic valve and handle assembly.

##### **2.2 FIRE EXTINGUISHERS**

- A. General: Provide fire extinguishers for each extinguisher cabinet and other locations indicated, in colors and finishes selected by the Architect from manufacturer's standard.
- B. Abbreviations indicated below to identify extinguisher types related to UL classification and rating system and not necessarily to type and amount of extinguishing material contained in extinguisher.

1. Multi-purpose Dry Chemical Type (4A-60B, C-FE): UL-rated, 10-pound nominal capacity.
2. Wet Chemical, 6-liter capacity, UL-rated, Type K: Kitchen areas.

### 2.3 FIRE EXTINGUISHER CABINETS

- A. General: Provide fire extinguisher cabinets of suitable size for housing fire extinguishers of types and capacities required.
  1. Fire Extinguisher Cabinets: Semi-recessed types with 1-1/2-inch reveal as manufactured by Larson's Manufacturing Co. have been used as a basis of design for this Project.
- B. Construction: Manufacturer's standard 304 stainless steel box with #4 finish; trim, frame, door and hardware to suit cabinet type. Weld all joints and grind smooth. Miter and weld perimeter door frames.
- C. Cabinet Type: Suitable for mounting conditions indicated for semi-recessed type cabinet box (tub) recessed in fire-rated and non-fire-rated walls.
- D. Door Material and Construction: Manufacturer's standard door construction coordinated with cabinet type.
  1. Aluminum: Manufacturer's standard flush, extruded or fabricated aluminum units with all corners mitered; full tempered glass panel; tempered glass, 1/8-inch thick unless otherwise indicated.
  2. Door Hardware: Provide manufacturer's standard door operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam action latch, or door pull, exposed or concealed, and friction latch. Provide concealed or continuous type hinge permitting door to open 180 degrees.
- E. Dimensions: Provide cabinets with inside dimensions as follows unless shown otherwise on the Drawings: Fire Extinguisher Cabinets: 24" H x 9-1/2" W x 6" D.

### 2.4 FIRE EXTINGUISHER BRACKETS

- A. Provide brackets as manufactured by the fire extinguisher manufacturer, sized to accommodate fire extinguishers required for this Project.
- B. All wet chemical Type-K fire extinguishers shall be installed on brackets similar to Larsen's Model #1007 or equivalent.

### 2.5 FACTORY FINISHING OF FIRE EXTINGUISHER CABINETS

- A. General: Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations except as otherwise indicated. Apply finishes in factory after products are assembled. Protect cabinets with plastic or paper covering prior to shipment.
- B. Finish: Manufacturer's standard clear satin anodized aluminum finish.

**PART 3 - EXECUTION****3.1 INSTALLATION**

- A. Install items included in this section in locations and at heights to comply with applicable regulations.
- B. Prepare recesses in walls for fire extinguisher cabinets as required by type and size of cabinet and style of trim, and to comply with manufacturer's instructions.
- C. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.
- D. All extinguishing equipment shall have annual maintenance performed and be certified in accordance with requirements of NFPA 10 no more than one (1) month prior to occupancy.

**3.2 IDENTIFICATION**

- A. Identify fire extinguisher in cabinet with lettering spelling "FIRE EXTINGUISHER" painted on door by silk-screen process. Provide lettering on doors as indicated, or if not indicated, as selected by the Architect from manufacturer's standard letter sizes, styles, colors, and layouts.
- B. Identify all fire extinguishers with permanent marking (non-removable label, engraving, silk screen process) as follows:
- C. Identify bracket mounted extinguishers with red, letter decals spelling "FIRE EXTINGUISHER" applied to wall surface. Letter size, style, and location shall be as selected by the Architect.

**END OF SECTION 10 44 00**

**SECTION 10 75 00****FLAGPOLES****PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Flagpole.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 01 - General Requirements.
  - 2. Division 03 - Concrete.

**1.2 QUALITY ASSURANCE**

- A. Referenced Standards:
  - 1. Aluminum Association (AA):
    - a. DAF 45, Designation System for Aluminum Finishes.
  - 2. ASTM International (ASTM):
    - a. A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
    - b. B241, Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
  - 3. National Association of Architectural Metal Manufacturers (NAAMM):
    - a. FP 1001, Guide Specifications for Design of Metal Flagpoles.

**1.3 SUBMITTALS**

- A. Shop Drawings:
  - 1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
  - 2. Product technical data including:
    - a. Acknowledgement that products submitted meet requirements of standards referenced.
    - b. Manufacturer's installation instructions.
    - c. Manufacturer's complete line of finishes for Engineer's selection.

**PART 2 - PRODUCTS****2.1 MANUFACTURERS**

- A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
  - 1. Flagpoles:
    - a. American Flagpole.
    - b. Concord Industries, Inc.
    - c. Peterson Flags.
    - d. U.S. Flag and Flag Pole Supply.
- B. Submit request for substitution in accordance with Specification Section 01 25 00.

**2.2 MATERIALS**

- A. Pole: Aluminum.
- B. Ball: Aluminum.
- C. Truck: Aluminum.

- D. Halyard: Braided polypropylene.
- E. Cleats and Collar: Aluminum.
- F. Foundation Sleeve: Steel.
- G. Anchors: Steel.
- H. Miscellaneous Fasteners: Aluminum or stainless steel.

## 2.3 FABRICATION

- A. General:
  - 1. Seamless extruded tubing.
    - a. ASTM B241, 6063-T6 alloy.
  - 2. Minimum wall thickness 0.188 IN.
  - 3. Single length construction when possible.
    - a. If single length construction is not possible, provide precision jointery with self-aligning internal splicing sleeve.
- B. Pole:
  - 1. Exposed height:
    - a. See Contract Drawings
  - 2. Setting depth: Manufacturer's suggested depth for height of pole specified.
    - a. Design to be in accordance with NAAMM FP-1001.
    - b. See Contract Drawings for design wind speed and other requirements.
- C. Ball:
  - 1. 14 GA.
  - 2. Size: Diameter to match size of pole at top of pole.
  - 3. Flush seam.
  - 4. Finish to match pole.
- D. Truck:
  - 1. Double metal sheave cast aluminum.
  - 2. Stainless steel roller bearings.
- E. Halyard:
  - 1. 5/16 IN minimum thickness.
  - 2. Braided.
  - 3. Two (2) chrome plated bronze swivel snap hooks for each.
- F. Cleats:
  - 1. Two (2) each, 9 IN cast aluminum.
  - 2. Stainless steel screws: 5/16 IN minimum.
  - 3. Finish to match pole.
- G. Collar: Spun aluminum with finish to match pole.
- H. Foundation Sleeve:
  - 1. 14 GA galvanized per ASTM A53, G-90.
  - 2. Corrugated.
  - 3. Minimum 3/16 IN galvanized steel baseplate and support plate.
    - a. G-90 coating.
  - 4. 3/4 IN steel lightning arrester to extend minimum of 12 IN below footing.
- I. Finish:
  - 1. AA Architectural Class 1 finish.

**PART 3 - EXECUTION****3.1 APPLICATION**

- A. Install products in accordance with manufacturer's instructions.
- B. Paint all portions of flagpole below grade with heavy coat of bituminous paint.
- C. Provide positive lightning ground for flagpole installation.
- D. See Division 03 for concrete for foundation.

**END OF SECTION**

**SECTION 11 31 00****OWNER-FURNISHED EQUIPMENT INSTALLATION****PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Provide all labor and material for the installation of Owner-Furnished equipment. Extent and types of Owner-furnished equipment installation is indicated on the drawings.
- B. Related Work:
  - 1. Plumbing Work is specified in Division 22
  - 2. Ventilation Work is specified in Division 23
  - 3. Electrical Work is specified in Division 26

**PART 2 - PRODUCTS****NOT USED****PART 3 - EXECUTION****3.01 INSTALLATION**

- A. General: Comply with manufacturer's published installation instructions and recommendations.
- B. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate for proper operation of equipment.
- C. Utilities: Refer to the Drawings and Divisions 22, 23 and 26 for plumbing, ventilation, and electrical requirements respectively.

**END OF SECTION 11 31 00**



## **SECTION 12 51 00**

### **HORIZONTAL BLINDS**

#### **PART 1 - GENERAL**

##### **1.1 WORK INCLUDED**

- A. This Section includes aluminum, non-perforated, horizontal louver blinds.

##### **1.2 SUBMITTALS**

- A. Product data for each type of horizontal louver blind specified. Include printed data on physical characteristics.
- B. Shop drawings showing location and extent of blinds. Show installation details at and relationship to adjoining work. Indicate location of blind controls.
- C. Samples for initial selection purposes in manufacturer's standard sizes showing full range of standard colors
- D. Maintenance data to include in Operating and Maintenance Manual specified in Division 1.

##### **1.3 QUALITY ASSURANCE**

- A. Surface Burning Characteristics: Provide blinds identical to those tested for the following fire performance characteristics as determined by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Test Method: NFPA 701, Small Scale Vertical Burn Test.
- B. Single-Source Responsibility: Obtain horizontal blinds from one source of a single manufacturer.

##### **1.4 PROJECT CONDITIONS**

- A. Field Measurements: Check openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay in the Work.

#### **PART 2 - PRODUCTS**

##### **2.1 MANUFACTURERS**

- A. Products: Subject to compliance with requirements, provide horizontal louver blinds as manufactured by Skyblinds, Hunter Douglas, or Levolor Corp.

## 2.2 MATERIALS AND FABRICATION

- A. Product Standard and Description: American Window Covering Manufacturers Association (AWCMA) Document 1029. Each horizontal louver blind unit consists of slats, rails, cord lock, tilting mechanism, tapes, and installation hardware.
- B. Slats: Manufacturer's standard aluminum, non-perforated, slat, 1-inch wide
- C. Lifting and Tilting Mechanisms: Non-corrosive, self-lubricating materials.
- D. Unit Sizes: Obtain units fabricated in sizes to fill window openings between (inside) jambs, measured at 74 degree F. Width and length shall be equal to 1/2 inch less than opening dimensions formed by jamb, head, and sill members of opening in which each blind is installed.
- E. Installation Fasteners: Not less than two fasteners per bracket, fabricated from metal non-corrosive to blind hardware and adjoining construction and to support blind units under conditions of normal use.

## 2.3 HORIZONTAL LOUVER BLINDS

- A. Slat Description: 1-inch, unperforated slats.
- B. Tilt Operation: Full-tilt, manual with wand.
- C. Cord Lock Operation: Cord lock with lock that pulls cord to stop blind at any position in ascending or descending travel.
- D. Cord Equalizers: Self-aligning to maintain horizontal blind position.
- E. Mounting: Wall.
- F. Color: As selected by the Architect/Engineer

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine openings where horizontal louver blinds will be installed prior to beginning installation. Verify that critical dimensions are correct and surface conditions acceptable.
- B. Complete all finishing operations, including painting, before beginning installation.

### 3.2 INSTALLATION

- A. Install blinds level, plumb, and located so exterior slat edges in any position are not closer than 1 inch to interior face of glass lites, gaps between slat ends and jambs do not exceed 1/4 inch plus or minus 1/8 inch, and bottom rail in fully lowered position is within 1/2 inch of bottom of window or other opening.

- B. After completing the installation, clean blind surfaces according to the manufacturer's instructions.

**END OF SECTION 12510**

**SECTION 13 31 23**  
**PRE-ENGINEERED SHADE STRUCTURES**

**PART 1 – GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Conditions and Division 1 Specification Sections, apply to this section.

**1.2 SUMMARY**

- A. The shade structure contractor shall be responsible for the design, supply and installation of the work specified herein. The intent of this specification is to have only one single contractor be responsible for all the above functions.

**1.3 REFERENCES**

- A. Shade structures must comply with the latest revision of applicable codes and regulations including FBC 2014.
- B. American Society for Testing Materials (ASTM)
- C. American Welding Society: Structural Welding Code AWS D1.1: Symbols for Welding and Nondestructive Testing AWS 2.3.
- D. American Institute of Steel Construction (AISC): Specifications for the design, fabrication and erection of structural steel.

**1.4 SUBMITTALS**

**1.4.1 With Bid Submittals:**

- A. Provide proof of installed reference sites with six structures for similar scope of project and installation that are engineered to FBC 2014 specifications. Include in reference list sizes and design style of structures with install dates and project locations.
- B. Provide a minimum of 5 fabric samples to demonstrate fabric color range and powder coat color selections.
- C. Provide proof of all quality assurance items including;
  - 1. A list of at least three reference projects that have been installed a minimum of 5 years.
  - 2. Proof of General liability, Professional liability and umbrella insurance as per section 1.5 C
  - 3. Proof of a Corporate Safety Program along with an Injury & Illness Prevention Program.
  - 4. Proof of an Annual Maintenance Inspection Program
  - 5. Proof of Corporate Quality Control Manual as per section 1.5 E

### 1.5 QUALITY ASSURANCE

Fabrication and erection are limited to firms with proven experience in design and construction of fabric shade structures and such firms shall meet the following minimum requirements. No substitutions shall be allowed for the following:

- A. A single shade contractor shall design, supply and erect the fabric shade structures including the foundations.
- B. All bidders shall have at least 10 years' experience in the design, engineering, manufacture, and installation of structures, engineered to FBC requirements with similar scope and a successful construction record of in-service performance.
- C. All bidders shall be able to provide proof with bid submittal of a minimum of \$1,000,000 general/public liability insurance, \$3,000,000 professional liability (PL) insurance and additional \$2,000,000 umbrella/excess liability insurance.
- D. The shade manufacturer shall have a Corporate Quality Control program and manual describing their complete quality assurance program.
- E. All bidders must have an in-house warranty & service department and local office to assist in repairs and service calls.

### 1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify layout information for shade structures shown on the Drawings in relation to the property survey and existing structures, and verify locations by field measurements prior to construction.

### 1.7 WARRANTY

- A. The successful bidder shall provide a 12-month warranty on all labor and materials.
- B. A supplemental warranty from the manufacturer shall be provided for a period of 10 years (pro-rated) on fabric and 10 years on the structural integrity of the steel from date of substantial completion.
- C. The warranty shall not deprive the Owner of other rights the Owner may have under the provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

## PART 2 – PRODUCTS

### 2.1 GENERAL

A. Scope: The fabric project shall consist single joined Panoramas covering 28 parking spaces as indicated on drawings. Columns will be a minimum of HSS 10" x 10" x 3/8" and top frames will be a minimum of 10" x 6" x 3/8".

- B. The structures shall be manufactured by Shade Structures, Inc. dba USA SHADE & Fabric Structures, or approved equivalent. The manufacturer is responsible to provide a turnkey product to include the foundations and project management.
- C. Contact: USA Shade & Fabric Structures, PO Box 52146, Atlanta GA 30354 PH: 678-575-3543 Steve Caporini, Regional Manager.

C. To qualify as an approved equivalent, please submit product documentation, fabric samples and all quality assurance criteria as per section 1.4 at least 10 days prior to bid to be considered. Any approvals of substitutions shall be issued by addendum only prior to bid date. No substitutions will be allowed after award of bid.

D. The shade structure shall conform to the current adopted version of the Florida Building Code 2014 and local agency additions and amendments.

- A. All shade structures are engineered and designed to meet a minimum of 115 mph (Ultimate) wind load, Exposure C, Building Category II and a live load of 5 lbs/sf<sup>2</sup>. All shade structures shall be engineered with a zero wind pass-through factor on the fabric. When ASD Steel Design Method is used based on FBC 2014 Section 1605.3.1 the Dead + 0.75 of Live + 0.45 of Wind Load cases must be combined. NO EXCEPTIONS.

B. Steel:

1. All steel members of the shade structure shall be designed in strict accordance with the requirements of the "American Institute of Steel Construction" (AISC) Specifications and the "American Iron and Steel Institute" (AISI) Specifications for Cold Formed Members for Structural Steel Fabrication as per FBC 2014 Section 1704.2.2
2. All connections shall have a maximum internal sleeving tolerance of .0625 inches using high tensile strength steel sections with a minimum sleeve length of 6 inches.
3. All non-hollow structural steel members shall comply to ASTM A-36. All hollow structural steel members shall be cold formed, high strength steel and comply with ASTM A-500, Grade C. All steel plates shall comply to ASTM A-572, Grade 50. All galvanized steel tubing shall be triple coated for rust protection using an in-line electro-plating coat process. All galvanized steel tubing shall be internally coated with zinc and organic coatings to prevent corrosion.

C. Bolts:

1. All structural field connections of the shade structure shall be designed and made with high strength bolted connections using ASTM A-325 bolts.
2. All stainless steel bolts shall comply with ASTM F-593, Alloy Group 1 or 2.
3. All bolt fittings shall include rubber washer for watertight seal at joints. All nuts shall comply with ASTM F-594, Alloy Group 1 or 2.

D. Welding:

1. All shop-welded connections of the shade structure shall be designed and performed in strict accordance with the requirements of the "American Welding Society" (AWS) Specifications. Structural welds shall be made in compliance with the requirements of the "Prequalified" welded joints where applicable and by certified welders. No onsite or field welding shall be permitted.
2. All full penetration welds shall be continuously inspected by an independent inspection agency and shall be tested to the requirement of FBC 2014 and local agency additions and amendments.

E. Powder coating:

1. Galvanized steel tubing preparation prior to powder coating shall be executed in accordance to solvent cleaning SSPC-SP1. Solvent such as water, mineral spirits, xylol, toluol, which are to be used to remove foreign matter from the surface. A mechanical method prior to solvent cleaning prior to surface preparation shall be executed according to Power Tool Cleaning SSPC-SP3 and utilizing wire brushes abrasive wheels and needle gun, etc.
  2. Carbon structural steel tubing preparation prior to powder coating shall be executed in accordance to commercial blast cleaning SSPC-SP6 or NACE #3. A commercial blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, mill scale, rust, coating, oxides, corrosion, products and other foreign material.
  3. Powder coating shall be sufficiently applied, with a minimum three mils thickness and cured at the recommended temperature to provide proper adhesion and stability to meet salt spray and adhesion tests as defined by the American Society of Testing Materials.
  4. Powder used in the powder coat process shall have the following characteristics:
    - a. Specific Gravity: 1.68 +/- 0.05
    - b. Theoretical coverage: 114 +/- 4ft<sup>2</sup>/lb/mil
    - c. Mass loss during cure: <1%
    - d. Maximum storage temperature: 75°F
    - e. POWDURA® Super Durable TGIC-Free Polyester provides better exterior durability, UV resistance and gloss retention than standard TGIC powders. Further, it accepts and holds onto electrical charge better and longer than standard TGIC powders, improving transfer efficiency by 10% or more. The technology's non-toxic, TGIC-free properties also contribute to making it a greener solution for metal finishers.
- F. Tension Cable: Steel cable is determined based on calculated engineering load.
1. For light and medium loads, 1/4" (nominal) galvanized 7x19 strand cable to be used.
  2. For heavy loads, 3/8" (nominal) galvanized 7 x 19 cable to be used.
- G. Fabric Roof Systems
1. UV Shade Fabric
    - a. UV shade fabric is made of a UV stabilized Shadesure® cloth as manufactured by MultiKnit Ltd and made of a UV stabilized high-density polyethylene mesh. Mesh shall be raschel knitted with monofilament and tape yarn filler to ensure that material will not unravel if cut. Panels to be 10ft wide.
    - b. Fire Testing: Fabric shall conform and pass the ASTM E84 testing standard.
    - c. The fabric knot is to be made using monofilament and tape filler, which has a weight of 195g per square meter.
  2. Fabric Properties:
    - a. Life Expectancy: A minimum of 8 years continuous exposure to the sun
    - b. Fading: Minimum fading after 5 years (3 years for red)
    - c. Fabric Mass: 2.43-2.58 oz/sqft (190-200g/sm)
    - d. Fabric Width: 9.8425 (3m)
    - e. Roll Length: 164.04 (50m)
    - f. Roll Dimensions: 62.99"x16.5354" (160 cm x 42 cm)
    - g. Roll Weight: +/- 66 lbs (=/-30 kg)
    - h. Minimum Temperature: -13°F (-25° C)
    - i. Maximum Temperature: +176°F (80° C)

3. Stitching & Thread:
  - a. All sewing threads are to be double stitched.
  - b. Thread shall be GORE Tenara Sewing Thread manufactured from 100% expanded PTFE (Teflon); mildew resistant exterior approved thread. Thread shall meet or exceed the following:
    - 1) Flexible temperature range
    - 2) Very low shrinkage factor
    - 3) Extremely high strength, durable in outdoor climates
    - 4) Resists flex and abrasion of fabric
    - 5) Unaffected by cleaning agents; acid rain, mildew, salt water and rot resistant, unaffected by most industrial pollutants
    - 6) Treated for prolonged exposure to the sun

## 2.2 SHIPPING AND HANDLING

- A. All steel surfaces touched by tie down straps are to be padded before final clinching. This can be accomplished by using carpet pads or factory manufactured padding.
- B. All dunnage must be padded before painted products are set in place. Smaller and loose pieces must be padded and totally separate from paint padding.
- C. Unloading: Lift forks to be covered with properly fitted padding. All dunnage must be padded vertically and horizontally to prevent damage to painted surfaces. When unloading, take care to prevent tools and other hard surface items from making contact with painted items.

## PART 3 – EXECUTION

### 3.1 INSTALLATION

- A. Installations of shade structures shall be performed by a licensed and bonded contractor by the State of Florida.
- B. The contractor installing the structure shall comply with manufactures instructions for assembly, installation, and erection per approved drawings.
- C. Concrete
  1. Unless noted otherwise for footing and piers by General Contractor's Engineer, concrete specification for footings, piers, slabs, curbs and walkways shall meet a minimum 2,500 psi at 28-day strength.
  2. Concrete work is executed in strict accordance with the latest American Concrete Institute Building Code (ACI 318-99).
  3. Slump 4" maximum.
  4. Whenever daily ambient temperatures are below 80 degrees Fahrenheit, the contractor may have mix accelerators and hot water added at the batch plant.
    - a. temperature range between 75-80 degrees, 1% accelerator High Early (non-calcium)
    - b. temperature range between 70-75 degrees, 2% accelerator High Early (non-calcium)
    - c. temperature range below 70 degrees, 3% accelerator High Early (non-calcium)



- d. The contractor shall not pour any concrete when daily ambient temperature is below 55 degrees Fahrenheit.

**TABLE 1**

| <b>Temperature Range</b> | <b>% Accelerator</b> | <b>Type Accelerator</b>  |
|--------------------------|----------------------|--------------------------|
| 75-80 degrees            | 1%                   | High Early (non calcium) |
| 70-75 degrees            | 2%                   | High Early (non calcium) |
| Below 70 degrees         | 3%                   | High Early (non calcium) |

**D. Foundations:**

1. All Anchor Bolts set in new concrete shall be ASTM A-325.
2. All Anchor Bolts shall be Hot Dipped Galvanized.
3. Footings shall be a minimum of 30" diameter by 8' deep.

**3.1 SAFETY PROCEDURES**

- A. All schools will be notified of the schedule and confirmed before starting installation. The Contractor is responsible for the coordination of work with other trades.
- B. All staff personnel are to be dressed and conduct themselves in accordance with OSHA standards. All staff must be properly trained for equipment that they might use. Safety is a top priority.
- C. All vehicles and machinery are to be properly licensed and insured and must be operated by licensed operators in accordance with OSHA standards. All cranes and lifts must be operated in accordance with manufacturer's guidelines.
- D. The handling of steel during installation is critical. Exercise care when lifting items so that it does not come into contact with other surfaces. Clean sand and other deleterious material from structural items before moving or lifting. Before installation, all items are to be washed with soap and water and dried with cloths. All grease, dust, oils, and other latent materials are to be removed during this washing. When pouring concrete pour backs at columns, protect paint by using plastic and tape to prevent concrete from splashing on finish surfaces.
- E. All concrete must be cut with a wet diamond blade to ensure that it leaves a clean finish. If at any stage the existing remaining surface lifts, creating a tripping hazard, additional saw cutting will be required so as to leave a neat and uniform joint.
- F. Cover all open holes at all times with solid plywood and spoils to prevent access until concrete is poured.
- G. All equipment and/or product must be stored inside the fenced area.

**END OF SECTION 13 31 23**

**SECTION 21 05 00**  
**COMMON WORK RESULTS FOR FIRE SUPPRESSION**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section includes complete fire suppression system including sprinkler system, standpipe system, fire department connections including firestopping.

**1.2 SYSTEM DESCRIPTION**

- A. Sprinkler System: Conform to the following criteria:
  - 1. Coverage for entire building.
  - 2. Design system hydraulically to NFPA 13.
  - 3. System performance to achieve ordinary hazard occupancy requirements.
- B. Standpipe System: Design to NFPA 14.
- C. Firestopping Materials: Comply with requirements of Section 07 84 00 - Firestopping.
- D. Firestopping: Conform to UL for fire resistance ratings and surface burning characteristics.

**1.3 SUBMITTALS**

- A. Shop Drawings: Indicate detailed fire pump and jockey pump layout, pipe layout, supports, components, accessories, sizes, and hydraulic calculations.
- B. Product Data: Submit data for pipe materials used, valves, manufacturer's catalog sheet for equipment indicating rough-in size, finish, accessories, pump type, capacity, power requirements, certified pump curves, and NPSH.

**1.4 CLOSEOUT SUBMITTALS**

- A. Project Record Documents: Record actual locations of sprinkler heads.
- B. Operation and Maintenance Data: Submit description of components of system, servicing requirements, record drawings, inspection data, and parts lists.

**1.5 QUALITY ASSURANCE**

- A. Perform Work in accordance with:
  - 1. Sprinkler Systems: NFPA 13.
  - 2. Standpipe and Hose Systems: NFPA 14.

## **PART 2 PRODUCTS**

### **2.1 PIPE AND TUBE**

- A. Steel Pipe: ASTM A53/A53M, Grade B, ASTM A135, or ASME B36.10M, Schedule 10 or 40 black.
  - 1. Steel Fittings: ASME B16.9, wrought steel, butt welded; ASME B16.25, butt weld ends; ASTM A234/A234M, wrought carbon steel and alloy steel; ASME B16.5, steel flanges and fittings; ASME B16.11, forged steel socket welded and threaded.
  - 2. Cast Iron Fittings: ASME B16.1, flanges and fittings; ASME B16.4, threaded fittings.
  - 3. Malleable Iron Fittings: ASME B16.3, threaded type; ASTM A47/A47M.
  - 4. Mechanical Grooved Couplings: Malleable iron housing, "C" shaped elastomeric sealing gasket, steel bolts, nuts, and washers; galvanized for galvanized pipe.

### **2.2 GATE VALVES**

- A. Up to and including 2 inches: Bronze body and trim, rising stem, hand wheel, solid wedge or disc, threaded ends.
- B. Over 2 inches: Iron body, bronze trim, rising stem pre-grooved for mounting tamper switch, hand wheel, OS&Y, solid bronze or cast iron wedge, flanged or grooved ends.

### **2.3 BUTTERFLY VALVES**

- A. Bronze body, stainless steel disc, resilient replaceable seat, threaded ends, extended neck, hand wheel and gear drive and integral indicating device, and built-in tamper switch.

### **2.4 CHECK VALVES**

- A. Up to and including 2 inches: Bronze body and swing disc, rubber seat, threaded ends.
- B. Over 2 inches: Iron body, bronze trim, swing check with rubber disc, renewable disc and seat, flanged ends with automatic ball check.
- C. 4 inches and Over: Iron body, bronze disc with stainless steel spring, resilient seal and threaded, wafer or flanged ends.

### **2.5 DRAIN VALVES**

- A. Bronze compression stop with hose thread nipple and cap.
- B. Brass ball valve with cap and chain, 3/4 inch hose thread.

### **2.6 SPRINKLERS**

- A. Manufacturers :
  - 1. Tyco
  - 2. Viking.

3. Substitutions: Engineer approved equivalent.

- B. Suspended Ceiling Type: Concealed pendant type with brass, chrome plated or enameled finish, and matching escutcheon.
- C. Exposed Area Type: Standard upright type with brass or chrome plated finish.
- D. Sidewall Type: Recessed horizontal sidewall type brass, chrome plated or enameled finish with matching escutcheon.
- E. Guards: Finish to match sprinkler head.

## **2.7 SPRINKLER PIPING SPECIALTIES**

- A. Wet Pipe Sprinkler Alarm Valve: Check type valve with electrically or hydraulically operated alarms, with pressure retard chamber and variable pressure trim.
- B. Water Flow Switch: Vane type switch with two contacts.

## **2.8 STANDPIPE EQUIPMENT**

- A. Hose Cabinet: Formed steel construction, prime coated; recessed mounted; .16 gage thick with .12 gage thick door; glazed door style, hinged with positive latch device. Fire rated when installed within fire rated assemblies.
- B. Hose Rack: Steel with polished chrome finish; swivel or stationary type with pins and water stop.
- C. Hose: synthetic hose.
- D. Nozzle: Brass chrome plated; combination fog-straight stream and adjustable shut-off nozzle.
- E. Hose Station Valves: Angle type, 1-1/2 inch nominal size with ball drip.
- F. Hose Connection Valves: Brass, chrome plated finish, 2-1/2 inch size, thread to match fire department hardware, threaded dust cap and chain.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- A. Install in accordance **NFPA 13**.
- B. Ream pipe and tube ends to full inside diameter. Remove burrs and bevel plain end ferrous pipe.
- C. Remove scale and foreign material, inside and outside, before assembly.

- D. Install sleeves where penetrating footings, floors, or walls. Seal pipe and sleeve penetration to maintain fire resistance equivalent to fire separation of footings, floors, or walls.
- E. Install pipe runs to minimize obstruction to other work. Offset around ductwork.
- F. Install piping in concealed spaces above finished ceilings.
- G. Install **gate or butterfly** valves for shut-off or isolating service.
- H. Install drain valves at main shut-off valves, low points of piping and apparatus.
- I. Connect system to water source ahead of domestic water connection with double check valve assembly.
- J. Install heads to coordinate with reflected ceiling plan.
- K. Protection:
  - 1. Apply temporary tape or paper cover to sprinkler heads to protect from painting.
  - 2. Protect concealed sprinkler head cover plates from painting.
- L. Flush entire piping system of foreign matter.

### **3.2 INSTALLATION - FIRESTOPPING**

- A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.

**END OF SECTION**

**SECTION 21 13 13**  
**WET-PIPE SPRINKLER SYSTEMS**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Wet-pipe sprinkler system, system design, installation, and certification.

**1.2 SYSTEM DESCRIPTION**

- A. System to provide coverage for entire building.
- B. Provide hydraulically designed system to NFPA 13 ordinary hazard occupancy requirements.
- C. Determine volume and pressure of incoming water supply from water flow test data. Interface system with building fire and smoke alarm system.
- D.

**1.3 SUBMITTALS**

- A. Shop Drawings: Indicate layout of finished ceiling areas indicating sprinkler locations coordinated with ceiling installation. Indicate detailed pipe layout, hangers and supports, sprinklers, components and accessories. Indicate system controls.
- B. Product Data: Sprinklers, valves, and specialties, including manufacturers catalog information. Performance ratings, rough-in details, weights, support requirements, and piping connections.

**1.4 QUALITY ASSURANCE**

- A. Perform Work according to NFPA 13.
- B. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.
- C. Installer: Company specializing in performing Work of this Section with three years' experience.

**1.5 MAINTENANCE**

- A. Furnish extra sprinklers under provisions of NFPA 13.
- B. Furnish suitable wrenches for each sprinkler type.

## **PART 2 PRODUCTS**

### **2.1 SPRINKLERS**

- A. Manufacturers :
  - 1. Tyco.
  - 2. Viking
  - 3. Substitutions: Engineer approved equivalent
- B. Suspended Ceiling Type:
  - 1. Type: Concealed pendant type with matching escutcheon plate.
  - 2. Finish: Enamel.
  - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- C. Exposed Area Type:
  - 1. Type: Standard upright type.
  - 2. Finish: Brass or Chrome plated.
  - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- D. Side-Wall Type:
  - 1. Type: Recessed horizontal side wall type with matching escutcheon plate.
  - 2. Finish: Brass or Chrome plated.
  - 3. Escutcheon Plate Finish: Chrome plated.
  - 4. Fusible Link: Glass bulb type temperature rated for specific area hazard.
- E. Guards: Finish to match sprinkler finish.

### **2.2 PIPING SPECIALTIES**

- A. Wet Pipe Sprinkler Alarm Valve: Check type valve with divided seat ring, rubber faced clapper to automatically actuate water motor alarm and electric alarm, with pressure retard chamber and variable pressure trim, test and drain valve.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- A. Install according to NFPA 13.
- B. Install approved double check valve or back-flow preventer assembly at sprinkler system water source connection.
- C. Locate outside alarm-gong on building wall.
- D. Install piping in concealed spaces above finished ceilings.
- E. Center sprinklers in two directions in ceiling tile and install piping offsets.
- F. Hydrostatically test entire system.
- G. Require test be witnessed by Fire Marshall.

### **3.2 INTERFACE WITH OTHER PRODUCTS**

- A. Verify signal devices are installed and connected to fire alarm system.

### **3.3 CLEANING**

- A. Flush entire piping system of foreign matter.

**END OF SECTION**



**SECTION 21 30 00**  
**FIRE PUMPS**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Fire pumps.
  - 2. Fire pump accessories.
  - 3. Diesel engine drive.
  - 4. Pressure booster (jockey) pump.

**1.2 PERFORMANCE REQUIREMENTS**

- A. Conform to NFPA 20.

**1.3 SUBMITTALS**

- A. Shop Drawings: Required.
- B. Product Data: Required.
- C. Field Test Reports: Required.
- D. Manufacturer's Installation Instructions: Required.
- E. Manufacturer's Certificate: Required.

**1.4 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: Required.

**1.5 QUALITY ASSURANCE**

- A. Perform Work in accordance with UL Fire Protection Equipment Directory.

**1.6 WARRANTY**

- A. Furnish five year manufacturer warranty for fire pumps.

**PART 2 PRODUCTS**

**2.1 FIRE PUMPS**

- A. Type: Horizontal base mounted, UL 448 and UL 778, horizontal shaft, single stage, double suction, direct connected, horizontally split casing, for 250 psi. maximum working pressure.

- B. Casing: Cast or ductile iron, with suction and discharge gage port, casing wear ring, seal flush connection, drain plug, flanged suction and discharge.
- C. Impeller: Bronze double suction fully enclosed, balanced and keyed to shaft.
- D. Shaft: Solid alloy steel with replaceable] bronze sleeve.
- E. Seal: Packing gland with minimum four rings graphite impregnated packing and bronze lantern rings, 230 degrees F. maximum continuous operating temperature.
- F. Drive: Flexible coupling with coupling guard.
- G. Base plate: Cast iron or fabricated steel with integral drain rim.

## **2.2 FIRE PUMP ACCESSORIES**

- A. Eccentric suction reducer and OS&Y gate or butterfly valve on suction side of pump.
- B. Concentric increaser and check valve in pump discharge and OS&Y gate or butterfly valve on system side of check valve.
- C. Fire pump bypass fitted with OS&Y gate or butterfly valves and check valve.
- D. Main relief-valve, UL 1478, and waste cone.
- E. Suction pressure gage, 4-1/2 inch diameter dial with snubber, valve cock and lever handle.
- F. Discharge pressure gage mounted on board attached to pump, with snubber, valve cock and lever handle.
- G. Casing 3/4 inch relief valve.
- H. Float operated 3/4 inch automatic air release valve.
- I. Hose valve manifold with 2-1/2 inch hose gate valves with caps and chains.
- J. Flow metering system for closed loop testing.

## **2.3 DIESEL ENGINE DRIVE**

- A. Diesel Engine: Conform to NFPA 1247, arranged for automatic operation and include overspeed/overcrank switch and drive, two contactor switches, low oil pressure and high water temperature warning switches, and fuel shut-off solenoid, with wiring terminating in junction box.
- B. Include following engine accessories:
  - 1. Stub shaft.
  - 2. Oil bath air cleaner.
  - 3. Water-cooled exhaust manifold.
  - 4. Heat exchanger.
  - 5. Mechanical speed governor.

6. Fuel filter.
  7. Lube oil filter and by-pass valve.
  8. Lube oil cooler and relief valve.
  9. Fuel pump.
  10. Instrument panel with tachometer, hour meter, oil pressure gauge, water-temperature gauge, ammeter, hand speed control and start switch.
  11. Starting system including generator/alternator, starting-motor and voltage regulator.
  12. Exhaust silencer, residential type.
  13. Flexible exhaust tubing.
- C. Storage batteries: Dual lead acid batteries with cables and battery racks.
- D. Fuel system: above ground storage tank, fill pipe and cap, manual shut-off valve, flame-arrestor, oil level gauge, braided bronze flexible connectors, seamless type L copper tubing with flared joints. Fill tank at completion.
- E. Automatic diesel engine controller: Enclosed in floor mounted steel housing, UL listed and labeled.
1. Controller: Function to automatically start fire pump from water pressure control switch or test switch.
  2. Stop push button: To manually stop engine.
  3. Automatic conditions: Controller alternates batteries automatically on each 15 second cranking cycle. Alarm when engine not started after six attempts.
  4. Battery charger: Dual, built-in, to recharge both batteries within 24-hour period, with automatic overload protection (current limiting), individual voltmeters and ammeters for each battery.
  5. Individual pilot lights and common alarm bell for:
    - a. Charger 1 Failure.
    - b. Charger 2 Failure.
    - c. Battery 1 Failure.
    - d. Battery 2 Failure.
    - e. AC Power On.
    - f. Exercise Cycle.
    - g. High Engine Jacket Water Temperature.
    - h. Low Engine Oil Pressure.
    - i. Engine Failure to Start Automatically.
    - j. Overspeed Shutdown.
    - k. Engine Run.
    - l. Main Switch in Auto.
    - m. Low Fuel Level.
    - n. Low Water Reservoir Level.
    - o. Water Reservoir Empty.
    - p. Low Pump Room Temperature.
    - q. Low Suction Temperature.
    - r. Flow Meter On.
    - s. Relief Valve Open.

## 2.4 PRESSURE BOOSTER (JOCKEY) PUMP

- A. Electrically operated horizontal type with standard open drip-proof horizontal motor.

- B. Control by automatic jockey pump controller with full voltage starter and minimum run timer to start pump on pressure drop in system and stay in operation for minimum period of time. Fire pump starts automatically on further pressure drop or on jockey pump failure.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- A. Install Fire Pump in accordance with NFPA 20 and Diesel Engine Drive in accordance with NFPA 37.
- B. Install piping for fuel supply and return. Connect to motor. Install piping to and from exhaust silencer with thimble at wall or roof penetrations.
- C. Install piping associated with pump, pump casing and exhaust silencer.
- D. Perform flow test on entire system in accordance with NFPA 20.
- E. Schedule test to be witnessed by Fire Marshall, authority having jurisdiction, Architect/Engineer.
- F. Manufacturer's Field Services: Required.
- G. Demonstration and Training: Demonstrate automatic operation of system including verification of pressure switch set points. Furnish training to Owner.

### **END OF SECTION**

**SECTION 22 05 00**  
**COMMON WORK RESULTS FOR PLUMBING**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Identification for Plumbing Piping and Equipment.
  - 2. Sleeves.
  - 3. Mechanical sleeve seals.
  - 4. Formed steel channel.
  - 5. Firestopping relating to plumbing work.
  - 6. Firestopping accessories.

**1.2 SYSTEM DESCRIPTION**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00 - Firestopping.
- B. Firestopping: Conform to UL for fire resistance ratings and surface burning characteristics.

**1.3 SUBMITTALS**

- A. Shop Drawings: Submit for piping and equipment identification list of wording, symbols, letter size, and color coding for pipe identification and valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
- B. Product Data for Pipe and Equipment Identification: Submit for mechanical identification manufacturers catalog literature for each product required.

**PART 2 PRODUCTS**

**2.1 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT**

- A. Manufacturers:
  - 1. Seton
  - 2. Brady
  - 3. Substitutions: Engineer Approved Equivalent.
- B. Plastic Nameplates: Laminated three-layer plastic with engraved black letters on light background color.
- C. Plastic Tags: Laminated three-layer plastic with engraved black letters on light background color, minimum 1-1/2 inches diameter.

- D. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener. Color and Lettering: Conform to ASME A13.1.
- E. Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings. Color and Lettering: Conform to ASME A13.1.
- F. Plastic Underground Pipe Markers: Bright colored continuously printed plastic ribbon tape, minimum 6 inches wide by .4 mil. thick, manufactured for direct burial service.

## **2.2 SLEEVES**

- A. Sleeves for Pipes through Non-fire Rated Floors: .18 gage thick galvanized steel.
- B. Sleeves for Pipes through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or .18 gage thick galvanized steel.
- C. Sealant: Acrylic.

## **2.3 MECHANICAL SLEEVE SEALS**

- A. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

## **2.4 FORMED STEEL CHANNEL**

- A. Product Description: Galvanized .12 gage thick steel. With holes .1-1/2 inches on center.

## **2.5 FIRESTOPPING**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.
- B. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
  - 1. Silicone Firestopping Elastomeric Firestopping: Single or multiple component silicone elastomeric compound and compatible silicone sealant.
  - 2. Foam Firestopping Compounds: Single or Multiple component foam compound.
  - 3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
  - 4. Fiber Stuffing and Sealant Firestopping: Composite of mineral or ceramic fiber stuffing insulation with silicone elastomer for smoke stopping.
  - 5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
  - 6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
  - 7. Firestop Pillows: Formed mineral fiber pillows.

## **2.6 FIRESTOPPING ACCESSORIES**

- A. Installation Accessories: Comply with requirements of Section 07 84 00.
- B. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify openings are ready to receive sleeves.

### **3.2 INSTALLATION - PIPING AND EQUIPMENT IDENTIFICATION**

- A. Install plastic nameplates with adhesive.
- B. Install plastic tags with corrosion resistant metal chain.

### **3.3 INSTALLATION - SLEEVES**

- A. Exterior watertight entries: Seal with mechanical sleeve seals.
- B. Set sleeves in position in forms. Provide reinforcing around sleeves.
- C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- D. Extend sleeves through floors .1 inch above finished floor level. Caulk sleeves.
- E. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with firestopping] insulation and caulk. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- F. Install chrome plated steel escutcheons at finished surfaces.

### **3.4 INSTALLATION - FIRESTOPPING**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.
- B. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.

**END OF SECTION**

**SECTION 22 05 16**  
**EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Flexible pipe connectors.
  - 2. Expansion joints.
  - 3. Expansion compensators.
  - 4. Pipe alignment guides.
  - 5. Swivel joints.
  - 6. Pipe anchors.

**1.2 DESIGN REQUIREMENTS**

- A. Provide structural Work and equipment required for expansion and contraction of piping. Verify anchors, guides, and expansion joints provide and adequately protect system.
- B. Expansion Compensation Design Criteria:
  - 1. Installation Temperature: 50 degrees F..
  - 2. Domestic Hot Water: 140 degrees F..
  - 3. Safety Factor: 30 percent.

**1.3 SUBMITTALS**

- A. Shop Drawings: Indicate layout of piping systems, including flexible connectors, expansion joints, expansion compensators, loops, offsets and swing joints.
- B. Product Data:
  - 1. Flexible Pipe Connectors: Indicate maximum temperature and pressure rating, face-to-face length, live length, hose wall thickness, convolutions per foot and per assembly, fundamental frequency of assembly, braid structure, and total number of wires in braid.
  - 2. Expansion Joints: Indicate maximum temperature and pressure rating, and maximum expansion compensation.
- C. Manufacturer's Installation Instructions: Special procedures.

**1.4 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: Submit adjustment instructions.

**1.5 QUALITY ASSURANCE**

- A. Perform Work according to ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.



- B. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.
- C. Installer: Company specializing in performing Work of this Section with three years' experience.

## **1.6 WARRANTY**

- A. Furnish **five** year manufacturer warranty for leak-free performance of packed expansion joints.

## **PART 2 PRODUCTS**

### **2.1 FLEXIBLE PIPE CONNECTORS**

- A. Steel Piping:
  - 1. Inner Hose: Carbon Steel, Stainless Steel or Bronze.
  - 2. Exterior Sleeve: Single braided or Double braided, stainless steel or bronze.
  - 3. Maximum offset: 3/4 inch on each side of installed center line.
- B. Copper Piping:
  - 1. Inner Hose: Bronze.
  - 2. Exterior Sleeve: Braided bronze.
  - 3. Maximum offset: 3/4 inch on each side of installed center line.

### **2.2 EXPANSION JOINTS**

- A. Stainless Steel Bellows Type:
  - 1. Application: Steel piping 3 inch. and smaller.
- B. External Ring Controlled Stainless Steel Bellows Type:
  - 1. Application: Steel piping 3 inch. and larger.
- C. Sphere Compensators:
  - 1. Application: Steel piping 2 inch. and larger.
- D. Two-ply Bronze Bellows Type:
  - 1. Construction: Bronze with anti-torque device, limit stops, internal guides.
  - 2. Application: Copper piping.
- E. Low Pressure Compensators with two-ply Bronze Bellows:
  - 1. Application: Copper or steel piping 2 inch. and smaller.
- F. Copper with Packed Sliding Sleeve:
  - 1. Application: Copper or steel piping 2 inch. and larger.

### **2.3 ACCESSORIES**

- A. Pipe Alignment Guides: Two-piece welded steel with enamel paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum .1 inch. thick insulation, minimum .3 inch. travel.

- B. Swivel Joints: Fabricated steel or Bronze body, double ball bearing race, field lubricated, with rubber (Buna-N)o-ring seals.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- A. Install Work according to ASME B31.9.
- B. Install flexible pipe connectors on pipes connected to equipment supported by vibration isolation. Refer to Section 22 05 48. Provide line size flexible connectors.
- C. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other end. Install in horizontal plane unless indicated otherwise.
- D. Rigidly anchor pipe to building structure. Provide pipe guides to direct movement only along axis of pipe. Erect piping so strain and weight is not on cast connections or apparatus.
- E. Provide support and anchors for controlling expansion and contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required. Refer to Section 22 05 29 for pipe hanger installation requirements.
- F. Provide grooved piping systems with minimum one joint per inch pipe diameter instead of flexible connector supported by vibration isolation. Grooved piping systems need not be anchored.
- G. Provide expansion loops as indicated on Drawings.

### **3.2 MANUFACTURER'S FIELD SERVICES**

- A. Furnish inspection services by flexible pipe manufacturer's representative for final installation and certify installation is according to manufacturer's recommendations and connectors are performing satisfactorily.

**END OF SECTION**

**SECTION 22 05 29****HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT****PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Pipe hangers and supports.
  - 2. Hanger rods.
  - 3. Inserts.
  - 4. Flashing.
  - 5. Sleeves.
  - 6. Mechanical sleeve seals.
  - 7. Formed steel channel.
  - 8. Firestopping relating to plumbing work.
  - 9. Firestopping accessories.

**1.2 DEFINITIONS**

- A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

**1.3 SYSTEM DESCRIPTION**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.

\*\*\*\*\* [OR] \*\*\*\*\*

- B. Firestopping Materials: ASTM E119, ASTM E814, UL 263 and UL 1479 to achieve fire ratings as noted on Drawings for adjacent construction, but not less than 1 hour fire rating.
- C. Firestop interruptions to fire rated assemblies, materials, and components.
- D. Firestopping Materials: Comply with requirements of Section 07 84 00.
- E. Firestopping: Conform to UL for fire resistance ratings and surface burning characteristics.

**1.4 SUBMITTALS**

- A. Shop Drawings: Indicate system layout with location including critical dimensions, sizes, pipe hanger and support locations, and detail of trapeze hangers.
- B. Product Data:
  - 1. Hangers and Supports: Manufacturers catalog data including load capacity.
  - 2. Firestopping: Data on product characteristics, performance and limitation criteria.

- C. Manufacturer's Installation Instructions:
  - 1. Hangers and Supports: Submit special procedures and assembly of components.
  - 2. Firestopping: Submit preparation and installation instructions.

## **1.5 QUALITY ASSURANCE**

- A. Through-Penetration Firestopping of Fire-Rated Assemblies: UL 1479 or ASTM E814 with .010 inch water gage minimum positive pressure differential to achieve fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
  - 1. Wall Penetrations: Fire F-Ratings as indicated on Drawings, but not less than 1-hour.
  - 2. Floor and Roof Penetrations: Fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
    - a. Floor Penetrations Within Wall Cavities: T-Rating not required.
- B. Through-Penetration Firestopping of Non-Fire-Rated Floor and Roof Assemblies: Materials to resist free passage of flame and products of combustion.
  - 1. Noncombustible Penetrating Items: Noncombustible materials for penetrating items connecting maximum of three stories.
  - 2. Penetrating Items: Materials approved by authorities having jurisdiction for penetrating items connecting maximum of two stories.
- C. Fire-Resistant Joints in Fire-Rated Floor, Roof, and Wall Assemblies: ASTM E1966 or UL 2079 to achieve fire resistant rating as indicated on Drawings for assembly in which joint is installed.
- D. Fire-Resistant Joints Between Floor Slabs and Exterior Walls: ASTM E119 with .010 inch water gage minimum positive pressure differential to achieve fire resistant rating as indicated on Drawings for floor assembly.
- E. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested according to ASTM E84.
- F. Perform Work according to AWS D1.1 for welding hanger and support attachments to building structure.

## **1.6 ENVIRONMENTAL REQUIREMENTS**

- A. Do not apply firestopping materials when temperature of substrate material and ambient air is below 60 degrees F..
- B. Maintain this minimum temperature before, during, and for minimum three days after installation of firestopping materials.
- C. Provide ventilation in areas to receive solvent-cured materials.

## **1.7 WARRANTY**

- A. Furnish five year manufacturer warranty for pipe hangers and supports.

## **PART 2 PRODUCTS**

### **2.1 PIPE HANGERS AND SUPPORTS**

- A. Plumbing Piping - DWV:
  - 1. Conform to ASME B31.9, ASTM F708, MSS SP58, MSS SP69 and MSS SP89.
  - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch.: Carbon steel, adjustable swivel, split ring.
  - 3. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
  - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
  - 5. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
  - 6. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
  - 7. Vertical Support: Steel riser clamp.
  - 8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  - 9. Copper Pipe Support: Copper-plated, carbon-steel adjustable, ring.
- B. Plumbing Piping - Water:
  - 1. Conform to ASME B31.9. [ASTM F708, MSS SP58, MSS SP69, MSS SP89.
  - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch.: Carbon steel, adjustable swivel, split ring.
  - 3. Hangers for Cold Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
  - 4. Hangers for Hot Pipe Sizes 2 to 4 inches: Carbon steel, adjustable, clevis.
  - 5. Hangers for Hot Pipe Sizes 6 inches and Larger: Adjustable steel yoke, cast iron roll, double hanger.
  - 6. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
  - 7. Multiple or Trapeze Hangers for Hot Pipe Sizes 6 inches and Larger: Steel channels with welded spacers and hanger rods, cast iron roll.
  - 8. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.
  - 9. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
  - 10. Wall Support for Hot Pipe Sizes 6 inches and Larger: Welded steel bracket and wrought steel clamp with adjustable steel yoke and cast iron roll.
  - 11. Vertical Support: Steel riser clamp.
  - 12. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  - 13. Floor Support for Hot Pipe Sizes 4 inches and Smaller: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  - 14. Floor Support for Hot Pipe Sizes 6 inches and Larger: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.
  - 15. Copper Pipe Support: Copper-plated, Carbon-steel ring.

### **2.2 ACCESSORIES**

- A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.

## 2.3 INSERTS

- A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

## 2.4 FLASHING

- A. Metal Flashing: 26 gage thick galvanized steel.
- B. Metal Counterflashing: 22 gage thick galvanized steel.
- C. Lead Flashing:
  - 1. Waterproofing: .5 lb./sq. ft. sheet lead.
  - 2. Soundproofing: .1 lb./sq. ft. sheet lead.
- D. Flexible Flashing: .47 mil. thick sheet butyl; compatible with roofing.
- E. Caps: Steel, 22 gage minimum; 16 gage at fire resistant elements.

## 2.5 SLEEVES

- A. Sleeves for Pipes Through Non-Fire-Rated Floors: .18 gage thick galvanized steel.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or .18 gage thick galvanized steel.
- C. Sealant: **Acrylic**.

## 2.6 MECHANICAL SLEEVE SEALS

- A. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

## 2.7 FORMED STEEL CHANNEL

- A. Product Description: Galvanized .12 gage thick steel. With holes 1-1/2 inches on center.

## 2.8 FIRESTOPPING

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.
- B. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
  - 1. Silicone Firestopping Elastomeric Firestopping: Single or Multiple component silicone elastomeric compound and compatible silicone sealant.
  - 2. Foam Firestopping Compounds: Single or Multiple component foam compound.

3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
4. Fiber Stuffing and Sealant Firestopping: Composite of mineral or ceramic fiber stuffing insulation with silicone elastomer for smoke stopping.
5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
7. Firestop Pillows: Formed mineral fiber pillows.

## **2.9 FIRESTOPPING ACCESSORIES**

- A. Installation Accessories: Comply with requirements of Section 07 84 00.
- B. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- C. Dam Material: Permanent:
- D. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.
- E. General:
  1. Furnish UL-listed products.
  2. Select products with rating not less than rating of wall or floor being penetrated.
- F. Non-Rated Surfaces:
  1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where piping is exposed.
  2. For exterior wall openings below grade, furnish mechanical sealing device to continuously fill annular space between piping and cored opening or waterstop type wall sleeve.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond.
- C. Do not drill or cut structural members.

### **3.2 INSTALLATION**

- A. Inserts:
  1. Install inserts for placement in concrete forms.

2. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
  3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches and larger.
  4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- B. Pipe Hangers and Supports: According to ASME B31.1, ASME B31.5, ASME 31.9, ASTM F708, MSS SP 58, MSS SP 69, MSS SP 89.
- C. Support horizontal piping as scheduled.
- D. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.
- E. Place hangers within 12 inches of each horizontal elbow.
- F. Use hangers with 1-1/2 inch minimum vertical adjustment.
- G. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.
- H. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.
- I. Where piping is installed in parallel and at same elevation, provide multiple pipe or trapeze hangers.
- J. Support riser piping independently of connected horizontal piping.
- K. Provide copper plated hangers and supports for copper piping.
- L. Design hangers for pipe movement without disengagement of supported pipe.
- M. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- N. Provide clearance in hangers and from structure and other equipment for installation of insulation.
- O. Equipment Bases and Supports:
1. Provide **housekeeping pads** of concrete, minimum 3-1/2 inches thick and extending 6 inches beyond supported **equipment**.
  2. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.
  3. Provide rigid anchors for pipes after vibration isolation components are installed.
- P. Flashing:
1. Provide flexible flashing and metal counterflashing where piping penetrates weather or waterproofed walls, floors, and roofs.



2. Flash vent and soil pipes projecting 3 inches minimum above finished roof surface with lead worked .1 inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counter-flash, and seal.
3. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp device.
4. Seal drains watertight to adjacent materials.
5. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

Q. Sleeves:

1. Exterior watertight entries: Seal with mechanical sleeve seals.
2. Set sleeves in position in forms. Provide reinforcing around sleeves.
3. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
4. Extend sleeves through floors .1 inch above finished floor level; caulk sleeves.

R. Where piping penetrates floor, ceiling, or wall, close off space between pipe and adjacent work with firestopping insulation and caulk. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

S. Install chrome-plated steel escutcheons at finished surfaces.

T. Firestopping:

1. Firestopping Materials: Comply with requirements of Section 07 84 00.
2. Install material at fire-rated construction perimeters and openings containing penetrating sleeves, piping and other items requiring firestopping.
3. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
4. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating.
5. Fire-Rated Surface:
  - a. Seal opening at floor, wall, partition, ceiling, and roof as follows:
    - 1) Install sleeve through opening and extending beyond minimum of .1 inch on both sides of building element.
    - 2) Size sleeve allowing minimum of .1 inch void between sleeve and building element.
    - 3) Pack void with backing material.
    - 4) Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.
6. Non-Rated Surfaces:
  - a. Seal opening through non-fire rated wall, partition, floor, ceiling, and roof opening as follows:
    - 1) Install sleeve through opening and extending beyond minimum of .1 inch on both sides of building element.
    - 2) Size sleeve allowing minimum of .1 inch void between sleeve and building element.
    - 3) Install type of firestopping material recommended by manufacturer.

- b. Install escutcheons where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.
- c. Exterior wall openings below grade: Assemble rubber links of mechanical sealing device to size of piping and tighten in place, according to manufacturer's instructions.
- d. Interior partitions: Seal pipe penetrations at laboratories and hospital spaces. Apply sealant to both sides of penetration to completely fill annular space between sleeve and conduit.

**END OF SECTION**

**SECTION 22 05 48****VIBRATION CONTROLS FOR PLUMBING PIPING AND EQUIPMENT****PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Vibration isolators.

**1.2 PERFORMANCE REQUIREMENTS**

- A. Provide vibration isolation on motor driven equipment over .05 hp, plus connected piping.
- B. Provide minimum static deflection of isolators for equipment as follows:
  - 1. At grade, Under 20 hp
    - a. 400: .1 inch
    - b. 400 – 600 rpm: 1 inch
    - c. 600 - 800 rpm: .05 inch
    - d. 800 - 900 rpm: .02 inch
    - e. 1100 - 1500 rpm: .014 inch
    - f. Over 1500 rpm: .01 inch
  - 2. At grade, Over 20 hp
    - a. Under 400 rpm: 1 inch
    - b. 400 - 600 rpm: 2 inch
    - c. 600 - 800 rpm: 1 inch
    - d. 800 - 900 rpm: .05 inch
    - e. 1100 - 1500 rpm: .02 inch
    - f. Over 1500 rpm: .015 inch
  - 3. Upper Floors, Normal
    - a. Under 400 rpm: 3.5 inch
    - b. 400 - 600 rpm: 3.5 inch
    - c. 600 - 800 rpm: 2 inch
    - d. 800 - 900 rpm: 1 inch
    - e. 1100 - 1500 rpm: .05 inch
    - f. Over 1500 rpm: .02 inch
  - 4. Upper Floors, Critical
    - a. Under 400 rpm: 3.5 inch
    - b. 400 - 600 rpm: 3.5 inch
    - c. 600 - 800 rpm: 3.5 inch
    - d. 800 - 900 rpm: 2 inch
    - e. 1100 - 1500 rpm: .1 inch
    - f. Over 1500 rpm: .05 inch
- C. Consider upper floor locations critical unless otherwise indicated.
- D. Maintain sound level of spaces at levels not to exceed those listed below by utilizing acoustical devices.

- E. Maintain rooms at following maximum sound levels, in Noise Criteria (NC)
  - 1. Offices
    - a. Executive: 25
    - b. Conference rooms: 25
    - c. Private: 30
    - d. Open-plan areas: 35
    - e. Computer/business machine areas: 40
    - f. Public circulation: 40
  - 2. Hospitals and Clinics
    - a. Private rooms: 25
    - b. Wards: 30
    - c. Operating rooms: 25
    - d. Laboratories: 30
    - e. Corridors: 30
    - f. Public areas: 35

### 1.3 SUBMITTALS

- A. Product Data: Schedule of vibration isolator type with location and load on each. Catalog information, indicating materials and dimensional data.
- B. Design Data: Calculations indicating maximum room sound levels are not exceeded.
- C. Manufacturer's Installation Instructions: Special procedures and setting dimensions.

### 1.4 QUALITY ASSURANCE

- A. Perform Work according to ARI 575.
- B. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.
- C. Installer: Company specializing in performing Work of this Section with three years' experience.

## PART 2 PRODUCTS

### 2.1 VIBRATION ISOLATORS

- A. Manufacturers :
  - 1. Mason Industries
  - 2. Brady
  - 3. Substitutions: Engineer approved equivalent.
- B. Open Spring Isolators:
  - 1. Spring Isolators:
    - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
    - b. Code: Color code springs for load carrying capacity.

2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
  3. Spring Mounts: Furnish with leveling devices, minimum .025 inch thick neoprene sound pads, and zinc chromate plated hardware.
  4. Sound Pads: Size for minimum deflection of .05 inch ; meet requirements for neoprene pad isolators.
- C. Restrained Spring Isolators:
1. Spring Isolators:
    - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
    - b. Code: Color code springs for load carrying capacity.
  2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
  3. Spring Mounts: Furnish with leveling devices, minimum .025 inch thick neoprene sound pads, and zinc chromate plated hardware.
  4. Sound Pads: Size for minimum deflection of .05 inch.; meet requirements for neoprene pad isolators.
  5. Restraint: Furnish mounting frame and limit stops.
- D. Closed Spring Isolators:
1. Spring Isolators:
    - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
    - b. Code: Color code springs for load carrying capacity.
  2. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
  3. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
  4. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, and neoprene side stabilizers with minimum .025 inch clearance.
- E. Restrained Closed Spring Isolators:
1. Spring Isolators:
    - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
    - b. Code: Color code springs for load carrying capacity.
  2. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
  3. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
  4. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, and neoprene side stabilizers with minimum .025 inch clearance and limit stops.
- F. Spring Hanger:
1. Spring Isolators:
    - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
    - b. Code: Color code springs for load carrying capacity.

2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
  3. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators.
  4. Misalignment: Capable of 20 degree hanger rod misalignment.
- G. Neoprene Pad Isolators:
1. Rubber or neoprene-waffle pads.
    - a. 30 durometer.
    - b. Minimum 1/2 inch thick.
    - c. Maximum loading 40 psi.
    - d. Height of ribs: not to exceed 0.7 times width.
- H. Rubber Mount or Hanger: Molded rubber designed for .05 inches deflection with threaded insert.
- I. Glass Fiber Pads: Neoprene jacketed pre-compressed molded glass fiber.
- J. Seismic Snubbers:
1. Type: Non-directional and double acting unit consisting of interlocking steel members restrained by neoprene elements.
  2. Neoprene Elements: Replaceable, minimum of .075 inch thick.
  3. Capacity: 4 times load assigned to mount groupings at .04 inch deflection.
  4. Attachment Points and Fasteners: Capable of withstanding 3 times rated load capacity of seismic snubber.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify equipment and piping is installed before Work of this Section is started.

### **3.2 INSTALLATION**

- A. Install isolation for motor-driven equipment.
- B. Install spring hangers without binding.
- C. On closed spring isolators, adjust so side stabilizers are clear under normal operating conditions.
- D. Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.
- E. Support piping connections to isolated equipment resiliently as follows:
1. Up to 4 inch Diameter: First three points of support.
  2. 5 to 8 inch Diameter: First four points of support.
  3. 10 inch Diameter and Over: First six points of support.

4. Select three hangers closest to vibration source for minimum .1.0 inch. static deflection or static deflection of isolated equipment. Select remaining isolators for minimum .1.0 inch. static deflection or 1/2 static deflection of isolated equipment.

**END OF SECTION**

**SECTION 22 05 53**  
**IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Nameplates.
  - 2. Tags.
  - 3. Pipe markers.

**1.2 SUBMITTALS**

- A. Product Data: Manufacturers catalog literature for each product required.
- B. Shop Drawings: List of wording, symbols, letter size, and color coding for mechanical identification and valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
- C. Manufacturer's Installation Instructions: Special procedures and installation.

**1.3 CLOSEOUT SUBMITTALS**

- A. Project Record Documents: Record actual locations of tagged valves; include valve tag numbers.

**1.4 QUALITY ASSURANCE**

- A. Conform to NFPA 99 requirements for labeling and identification of medical gas piping systems and accessories.
- B. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories.

**1.5 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.
- B. Installer: Company specializing in performing Work of this Section with three years' experience.

**PART 2 PRODUCTS**

**2.1 NAMEPLATES**

- A. Manufacturers :
  - 1. Seton



2. Brady
  3. Substitutions: Engineer approved equivalent.
- B. Product Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.

## **2.2 TAGS**

- A. Metal Tags:
1. Brass with stamped letters; tag size minimum .1-1/2 inches diameter with finished edges.
- B. Tag Chart: Typewritten letter size list of applied tags and location in anodized aluminum frame or plastic laminated.

## **2.3 PIPE MARKERS**

- A. Color and Lettering: Conform to ASME A13.1.
- B. Plastic Pipe Markers:
1. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.
- C. Plastic Tape Pipe Markers:
1. Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.
- D. Plastic Underground Pipe Markers:
1. Bright colored continuously printed plastic ribbon tape, minimum .6 inches wide by 4 mil. thick, manufactured for direct burial service.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Degrease and clean surfaces to receive adhesive for identification materials.

### **3.2 INSTALLATION**

- A. Install identifying devices after completion of coverings and painting.
- B. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
- C. Install tags using corrosion-resistant chain. Number tags consecutively by location.
- D. Install underground plastic pipe markers .6 to 8 inches below finished grade, directly above buried pipe.
- E. Identify water heaters, pumps, tanks, and water treatment devices with plastic nameplates. Identify in-line pumps and other small devices with tags.

- F. Identify control panels and major control components outside panels with plastic nameplates.
- G. Identify valves in main and branch piping with tags.
- H. Identify piping, concealed or exposed, with plastic pipe markers. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.

**END OF SECTION**

**SECTION 22 07 00**  
**PLUMBING INSULATION**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Plumbing piping insulation, jackets and accessories.
  - 2. Plumbing equipment insulation, jackets and accessories.

**1.2 SUBMITTALS**

- A. Product Data: Submit product description, thermal characteristics and list of materials and thickness for each service, and location.
- B. Manufacturer's Installation Instructions: Submit manufacturers published literature indicating proper installation procedures.

**1.3 QUALITY ASSURANCE**

- A. Test pipe insulation for maximum flame spread index of 25 and maximum smoke developed index of not exceeding 50 in accordance with ASTM E84
- B. Pipe insulation manufactured in accordance with ASTM C585 for inner and outer diameters.
- C. Factory fabricated fitting covers manufactured in accordance with ASTM C450.

**1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- B. Protect insulation from weather and construction traffic, dirt, water, chemical, and damage, by storing in original wrapping.

**1.5 ENVIRONMENTAL REQUIREMENTS**

- A. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.

**1.6 WARRANTY**

- A. Furnish five year manufacturer warranty for man made fiber.

## PART 2 PRODUCTS

### 2.1 MANUFACTURER

- A. Manufacturers:
1. Johns Manville.
  2. Knauf
  3. Certainteed
  4. Armaflex
  5. Substitutions: Engineer approved equivalent

### 2.2 PIPE INSULATION

- A. TYPE P-1: ASTM C547, molded glass fiber pipe insulation.
1. Thermal Conductivity: 0.23 at 75 degrees F.
  2. Operating Temperature Range: 0 to 850 degrees F.
  3. Vapor Barrier Jacket: ASTM C1136, Type I, factory applied reinforced foil kraft with self-sealing adhesive joints.
  4. Jacket Temperature Limit: minus 20 to 150 degrees F.
- B. TYPE P-2: ASTM C547, molded glass fiber pipe insulation.
1. Thermal Conductivity: 0.23 at 75 degrees F.
  2. Operating Temperature Range: 0 to 850 degrees F.
- C. TYPE P-3: ASTM C612; semi-rigid, fibrous glass board noncombustible, end grain adhered to jacket.
1. Thermal Conductivity: 0.27 at 75 degrees F.
  2. Operating Temperature Range: 0 to 650 degrees F.
  3. Vapor Barrier Jacket: ASTM C1136, Type II, factory applied reinforced foil kraft with self-sealing adhesive joints.
  4. Jacket Temperature Limit: minus 20 to 150 degrees F.
- D. TYPE P-4: ASTM C612; semi-rigid, fibrous glass board noncombustible.
1. Thermal Conductivity: 0.27 at 75 degrees F.
  2. Operating Temperature Range: 0 to 650 degrees F.
- E. TYPE P-5: ASTM C534, Type I, flexible, closed cell elastomeric insulation, tubular.
1. Thermal Conductivity: 0.27 at 75 degrees F.
  2. Operating Temperature Range: Range: Minus 70 to 180 degrees F.
- F. TYPE P-6: ASTM C534, Type I, flexible, closed cell elastomeric insulation, tubular.
1. Thermal Conductivity: 0.30 at 75 degrees F.
  2. Maximum Service Temperature: 300 degrees F.
  3. Operating Temperature Range: Range: Minus 58 to 300 degrees F.
- G. TYPE P-7: ASTM C534, Type I, flexible, nonhalogen, and closed cell elastomeric insulation, tubular.
1. Thermal Conductivity: 0.27 at 75 degrees F.
  2. Maximum Service Temperature: 250 degrees F.
  3. Operating Temperature Range: Range: Minus 58 to 250 degrees F.

- H. TYPE P-8: ASTM C547, Type I or II, mineral fiber preformed pipe insulation, noncombustible.
  - 1. Thermal Conductivity: 0.23 at 75 degrees F.
  - 2. Maximum Service Temperature: 1200 degrees F.
  - 3. Canvas Jacket: UL listed, 6 oz/sq yd., plain weave cotton fabric treated with fire retardant lagging adhesive.
- I. TYPE P-9: ASTM C591, Type IV, polyisocyanurate foam insulation, formed into shapes for use as pipe insulation.
  - 1. Density: 2.0 pounds per cubic foot.
  - 2. Thermal Conductivity: 180 day aged value of 0.19 at 75 degrees F.
  - 3. Operating Temperature Range: Range: Minus 297 to 300 degrees F.
  - 4. Vapor Barrier Jacket: ASTM C1136, Type I, factory applied film of 4 mils thickness and water vapor permeance of 0.02 perms.
- J. TYPE P-10: ASTM C578, Type XIII, extruded polystyrene insulation, formed into shapes for use as pipe insulation.
  - 1. Thermal Conductivity: 180 day aged value of 0.259 at 75 degrees F.
  - 2. Operating Temperature Range: Range: Minus 297 to 165 degrees F.
  - 3. Vapor Barrier Jacket: ASTM C1136, Type I, factory applied film of 4 mils thickness and water vapor permeance of 0.02 perms.
- K. TYPE P-11: ASTM C533; Type I, hydrous calcium silicate pipe insulation, rigid molded white; asbestos free.
  - 1. Thermal Conductivity: 0.45 at 200 degrees F.
  - 2. Operating Temperature Range: 140 to 1200 degrees F.

## 2.3 PIPE INSULATION JACKETS

- A. Vapor Retarder Jacket:
  - 1. ASTM C921, white Kraft paper with glass fiber yarn, bonded to aluminized film.
  - 2. Water vapor transmission: ASTM E96/E96M; 0.02 perm-inches.
- B. ABS Plastic Pipe Jacket:
  - 1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
  - 2. Water vapor transmission: ASTM E96/E96M; 0.012 perm-inches.
  - 3. Connections: Brush on welding adhesive.
- C. Aluminum Pipe Jacket:
  - 1. ASTM B209.
  - 2. Joining: Longitudinal slip joints and 2 inch (50 mm) laps.
  - 3. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective liner.
  - 4. Metal Jacket Bands: 3/8 inch.
  - 5. Indoor Vapor Retarder Finish:
    - a. Cloth: Untreated; 9 oz/sq yd. (305 g/sq m) weight.
    - b. Vinyl emulsion type acrylic, compatible with insulation.

## 2.4 PIPE INSULATION ACCESSORIES

- A. Vapor Retarder Lap Adhesive: Compatible with insulation.

- B. Piping 1-1/2 inches diameter and smaller: Galvanized steel insulation protection shield. MSS SP-69, Type 40. Length: Based on pipe size and insulation thickness.
- C. Piping 2 inches diameter and larger: Wood insulation saddle, hard maple. Inserts length: not less than 6 inches long, matching thickness and contour of adjoining insulation.
- D. Closed Cell Elastomeric Insulation Pipe Hanger: Polyurethane insert with aluminum single piece construction with self adhesive closure. Thickness to match pipe insulation.
- E. Tie Wire: .0048 inch stainless steel with twisted ends on maximum .12 inch centers.
- F. Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement: ASTM C449/C449M.
- G. Insulating Cement: ASTM C195; hydraulic setting on mineral wool.
- H. Adhesives: Compatible with insulation.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify piping has been tested before applying insulation materials.
- B. Verify surfaces are clean and dry, with foreign material removed.

### **3.2 INSTALLATION - PIPING SYSTEMS**

- A. Piping Exposed to View in Finished Spaces: Locate insulation and cover seams in least visible locations.
- B. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one hour or less. Provide intumescent firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions.
- C. Piping Systems Conveying Fluids Below Ambient Temperature:
  - 1. Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.
  - 2. Furnish factory-applied or field-applied vapor retarder jackets. Secure factory-applied jackets with pressure sensitive adhesive self-sealing longitudinal laps and butt strips. Secure field-applied jackets with outward clinch expanding staples and seal staple penetrations with vapor retarder mastic.
  - 3. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor retarder adhesive or PVC fitting covers.
- D. Glass Fiber Board Insulation:

1. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
  2. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor retarder cement.
  3. Cover wire mesh or bands with cement to a thickness to remove surface irregularities.
- E. Polyisocyanurate Foam Insulation, Extruded Polystyrene Insulation:
1. Wrap elbows and fitting with vapor retarder tape.
  2. Seal butt joints with vapor retarder tape.
- F. Hot Piping Systems less than 140:
1. Furnish factory-applied or field-applied standard jackets. Secure with outward clinch expanding staples or pressure sensitive adhesive system on standard factory-applied jacket and butt strips or both.
  2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
  3. Do not insulate unions and flanges at equipment, but bevel and seal ends of insulation at such locations.
- G. Hot Piping Systems greater than 140:
1. Furnish factory-applied or field-applied standard jackets. Secure with outward clinch expanding staples or pressure sensitive adhesive system on standard factory-applied jacket and butt strips or both.
  2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
  3. Insulate flanges and unions at equipment.
- H. Inserts and Shields:
1. Piping 1-1/2 Diameter and Smaller: Install galvanized steel shield between pipe hanger and insulation.
  2. Piping 2 Diameter and Larger: Install insert between support shield and piping and under finish jacket.
    - a. Insert Configuration: Minimum 6 inches long, of thickness and contour matching adjoining insulation; may be factory fabricated.
    - b. Insert Material: Compression resistant insulating material suitable for planned temperature range and service.
  3. Piping Supported by Roller Type Pipe Hangers: Install galvanized steel shield between roller and inserts.
- I. Closed Cell Elastomeric Insulation:
1. Push insulation on to piping.
  2. Miter joints at elbows.
  3. Seal seams and butt joints with manufacturer's recommended adhesive.
  4. When application requires multiple layers, apply with joints staggered.
  5. Insulate fittings and valves with insulation of like material and thickness as adjacent pipe.
- J. High Temperature Pipe Insulation:
1. Install in multiple layers to meet thickness scheduled.

2. Attach each layer with bands. Secure first layer with bands before installing next layer.
  3. Stagger joints between layers.
  4. Cover with aluminum jacket with seams located on bottom side of horizontal piping.
- K. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces less than 10 feet above finished floor: Finish with aluminum jacket.
- L. Piping Exterior to Building: Provide vapor retarder jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor retarder cement. Cover with aluminum jacket with seams located at 3 or 9 o'clock position on side of horizontal piping with overlap facing down to shed water or on bottom side of horizontal piping.
- M. Buried Piping: Insulate only where insulation manufacturer recommends insulation product may be installed in trench, tunnel or direct buried. Install factory fabricated assembly with inner all-purpose service jacket with self-sealing lap, and asphalt impregnated open mesh glass fabric, with 1 mil thick aluminum foil sandwiched between three layers of bituminous compound; outer surface faced with polyester film.
- N. Prepare pipe insulation for finish painting.

### 3.3 SCHEDULES

#### A. Water Supply Services Piping Insulation Schedule:

| PIPING SYSTEM   | INSULATION TYPE | PIPE SIZE   | INSULATION THICKNESS inches |
|---|-----------------|---|-----------------------------|
| Domestic Hot Water Supply and Recirculation   | P-1             | 1-1/4 inches and smaller<br>1-1/2 inches and larger                       | 0.5<br>1.0                  |
| Domestic Hot Water Supply and Recirculation systems with domestic water temperature maintenance cable | P-1             | 1 inch and smaller<br>1-1/4 inches to 2 inches<br>2-1/2 inches and larger | 1.0<br>1.5<br>2.0           |
| Domestic Cold Water   | P-1 or P-5      | 1-1/4 inches and smaller<br>1-1/2 inches and larger                       | 0.5<br>1.0                  |
| Deionized Water   | P-1 or P-5      | All sizes   | 1.0                         |

**END OF SECTION**



**SECTION 22 10 00**  
**PLUMBING PIPING AND PUMPS**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Pipe and pipe fittings.
  - 2. Valves.
  - 3. Piping specialties.
  - 4. Plumbing drainage specialties.
  - 5. Plumbing supply specialties.
  - 6. Plumbing pumps.

**1.2 SUBMITTALS**

- A. Product Data:
  - 1. Valves: Submit manufacturers catalog information with valve data and ratings for each service.
  - 2. Plumbing drainage specialties: Submit manufacturers catalog information with sizes, capacities, rough-in requirements, service sizes, and finishes.
  - 3. Plumbing supply specialties: Submit manufacturers catalog information with sizes, capacities, rough-in requirements, service sizes, and finishes.
  - 4. Pumps: Include capacities, pump curves, equipment performance, and electrical characteristics.
- B. Manufacturer's Installation Instructions: Submit installation instructions for material and equipment.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

**1.3 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: Submit spare parts lists and maintenance procedures.

**1.4 WARRANTY**

- A. Furnish five year manufacturer warranty for pumps.

**PART 2 PRODUCTS**

**2.1 PIPES AND TUBES**

- A. Sanitary Sewer Piping, Buried Within .5 Feet of Building and Sanitary Sewer Piping, above Grade:

1. Cast Iron Pipe: ASTM A74, service weight, with neoprene gaskets or lead and oakum joints.
  2. Cast Iron Pipe: CISPI 301, hubless, service weight, with neoprene gaskets and stainless steel clamps.
  3. Copper Tube: ASTM B306, type DWV with cast bronze or wrought copper fittings and Grade 50B solder joints.
  4. ABS Pipe: ASTM D2661 or ASTM D2751 with ABS fittings and solvent weld joints.
  5. PVC Pipe: ASTM D2665 or ASTM D3034 SDR 26, polyvinyl chloride (PVC) material.
    - a. Fittings: PVC, ASTM D2665 or ASTM D3034.
    - b. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.
  6. PVC Pipe: ASTM D2665, ASTM D3034, or ASTM F679 with PVC fittings and elastomeric gasket joints.
  7. Water Piping, Buried Within 5 Feet of Building:
  8. Copper Tubing: ASTM B42, Tempered O61 annealed without fittings.
  9. Ductile Iron Pipe: AWWA C151 with ductile iron fittings rubber gasket joints and 3/4 inch. diameter rods.
- B. Water Piping, above Grade:
1. Copper Tubing: ASTM B88, Type L, drawn, with cast brass or wrought copper fittings and Grade 95TA solder joints.
  2. Galvanized Steel Pipe (Cold Water Only Sizes 4 inch. and Larger): ASTM A53/A53M, Grade B, Schedule 40 with cast iron fittings and grooved mechanical couplings.
  3. CPVC Pipe: ASTM D2846/D2846M with CPVC fittings and solvent weld joints.
- C. Storm Water Piping, Buried Within 5 Feet of Building and Storm Water Piping, above Grade:
1. Cast Iron Pipe: ASTM A74 service weight with neoprene gaskets or lead and oakum.
  2. Cast Iron Pipe: CISPI 301, hubless, service weight with neoprene gaskets and stainless steel clamps.
  3. Copper Pipe: ASTM B306, type DWV with cast bronze or wrought copper fittings and Grade 50B solder joints.
  4. Aluminum DWV Pipe: CAN 3-B281 with cast iron fittings joints of thermoplastic rubber coupling and stainless steel clamps.
  5. ABS Pipe: ASTM D2680 or ASTM D2751 with solvent weld joints.
  6. PVC Pipe: ASTM D2665 or ASTM D3034 SDR 26, polyvinyl chloride (PVC) material.
    - a. Fittings: PVC, ASTM D2665 or ASTM D3034.
    - b. Joints: ASTM D2855, solvent weld with ASTM D2564 solvent cement.
- D. Equipment Drains and Overflows:
1. Steel Pipe: ASTM A53/A53M, Grade B, Schedule 40 black steel, malleable iron or forged steel fittings, threaded or welded joints.
  2. Copper Tubing: ASTM B88, Type L, drawn, cast brass, wrought copper or mechanically extracted fittings, lead free solder joints.
  3. PVC Pipe: ASTM D1785, Schedule 40 or ASTM D2241, SDR 21 or 26, PVC fittings, solvent weld joints.

## 2.2 VALVES

- A. Manufacturers:
  - 1. Nibco.
  - 2. Apollo
  - 3. Milwaukee
  - 4. Substitutions: Engineer approved equivalent.
- B. For drinking water service, provide valves complying with NSF 61.
- C. Gate Valves:
  - 1. Up to 2 inches: Bronze body, bronze trim, non-rising stem, hand wheel, inside screw, double wedge disc, soldered or threaded.
  - 2. Over 2 inches: Iron body, bronze trim, rising stem, hand wheel, OS&Y, solid wedge, flanged or grooved ends.
- D. Ball Valves:
  - 1. Up to 2 inches: Bronze or stainless steel one piece body, chrome plated brass ball, teflon seats and stuffing box ring, lever handle, solder or threaded ends.
  - 2. Over 2 inches: Cast steel flanged body, chrome plated steel ball, Teflon seat and stuffing box seals and lever handle.
- E. Plug Valves:
  - 1. Up to 2 inches: Bronze body, bronze tapered plug, non-lubricated, Teflon packing, threaded ends.
  - 2. Over 2 inches: Cast iron body and plug, pressure lubricated, Teflon packing, flanged ends.
- F. Butterfly Valves:
  - 1. Up To 2 inches: Bronze body, stainless steel disc, resilient replaceable seat, threaded ends, extended neck, infinite position lever handle with memory stop.
  - 2. Over 2 inches: Iron body, chrome plated iron disc, resilient replaceable seat, wafer or lug ends, extended neck, 10 position lever handle.
- G. Swing Check Valves:
  - 1. Up to 2 inches: Bronze body and swing disc, solder or threaded ends.
  - 2. Over 2 inches: Iron body, bronze trim, swing disc, renewable disc and seat, flanged ends.
- H. Spring Loaded Check Valves:
  - 1. Iron body, bronze trim with threaded, wafer or flanged ends and stainless steel spring with renewable composition disc.
- I. Relief Valves:
  - 1. Bronze body, Teflon seat, stainless steel stem and springs, automatic, direct pressure actuated capacities ASME certified and labeled.

## 2.3 PIPING SPECIALTIES

- A. Flanges, Unions, and Couplings:

1. Pipe Size 2 inches and Under: Malleable iron unions for threaded ferrous piping; bronze unions for copper pipe, soldered joints.
  2. Pipe Size Over 2 inches: Forged steel flanges for ferrous piping; bronze flanges for copper piping; preformed neoprene gaskets.
  3. Grooved and Shouldered Pipe End Couplings: Malleable iron housing, C-shape elastomer composition sealing gasket, steel bolts, nuts, and washers.
  4. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
- B. Strainers:
1. Size 2 inches and Under: Threaded brass or iron body for 175 psig working pressure, Y pattern with 1/32 inch stainless steel perforated screen.
  2. Size 2-1/2 inch. to 4 inch.: Flanged iron body for 175 psig working pressure, Y pattern with 3/64 inch stainless steel perforated screen.
  3. Size 5 inch. and Larger: Flanged iron body for 175 psig working pressure, basket pattern with 1/8 inch stainless steel perforated screen.
- C. Flexible Connectors:
1. Corrugated stainless steel or bronze hose with single layer of stainless steel exterior braiding, minimum 9 inches long with copper tube ends.
- D. Pressure Gages:
1. Manufacturers:
    - a. Weksler.
    - b. Substitutions: Engineer approved equivalent.
  2. Gage: ASME B40.1, UL 393, UL 404 with bourdon tube, rotary brass movement, brass socket, front calibration adjustment, black scale on white background.
    - a. Case: Cast aluminum.
    - b. Bourdon Tube: Brass.
    - c. Dial Size: 2 inch diameter.
    - d. Mid-Scale Accuracy: two percent.
    - e. Scale: Psi.
- E. Thermometers:
1. Manufacturers:
    - a. Weksler.
    - b. Substitutions: Engineer approved equivalent.
  2. Stem Type Thermometer: ASTM E1, red appearing mercury, lens front tube, cast aluminum case with enamel finish.
    - a. Size: 7 inch.
    - b. Window: Clear Lexan.
    - c. Stem: Brass, 3/4 inch NPT long.
    - d. Accuracy: 2 percent.
    - e. Calibration: Degrees F.

## 2.4 PLUMBING DRAINAGE SPECIALTIES

- A. Roof Drains:
1. Manufacturers:
    - a. Jay R Smith
    - b. Zurn

- c. Substitutions: Engineer approved equivalent.
  - 2. Roof Drains: Lacquered cast iron body with sump:
    - a. Strainer: Removable metal dome.
    - b. Accessories: Coordinate with roofing type:
      - 1) Membrane flange and membrane clamp with integral gravel stop.
      - 2) Adjustable under deck clamp.
      - 3) Roof sump receiver.
      - 4) Waterproofing flange.
      - 5) Controlled flow weir.
      - 6) Leveling frame.
      - 7) Adjustable extension sleeve for roof insulation.
      - 8) Perforated or slotted ballast guard extension for inverted roof.
      - 9) Perforated stainless steel ballast guard extension.
  - 3. Roof Overflow Drains: Lacquered cast iron body and clamp collar and bottom clamp ring; pipe extended above flood elevation.
- B. Floor Drains:
- 1. Manufacturers:
    - a. Jay R Smith
    - b. Zurn
    - c. Substitutions: Engineer approved equivalent.
  - 2. Floor Drain (FD-1): Lacquered cast iron two piece body with double drainage flange, weep holes, reversible clamping collar, adjustable nickel-bronze strainer.
  - 3. Floor Drain (FD-2): Lacquered cast iron two piece body with double drainage flange, weep holes, reversible clamping collar, with removable perforated sediment bucket and adjustable strainer.
  - 4. Floor Drain (FD-3): Lacquered cast iron two piece body with double drainage flange, weep holes, reversible clamping collar, and adjustable nickel-bronze strainer with polished bronze funnel or anti-splash rim type strainer.
- C. Cleanouts:
- 1. Manufacturers:
    - a. Jay R Smith
    - b. Zurn.
    - c. Substitutions: Engineer approved equivalent.
  - 2. Finished Floor: Lacquered cast iron body with anchor flange, reversible clamping collar, and adjustable nickel-bronze round scored cover in service areas and depressed cover to accept floor finish in finished floor areas.
  - 3. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.

## 2.5 PLUMBING SUPPLY SPECIALTIES

- A. Backflow Preventers:
- 1. Reduced Pressure Backflow Preventers: ASSE 1013; bronze body with bronze internal parts and stainless steel springs; two independently operating, spring loaded check valves; pressure relief valve located between check valves; third check valve opens under back pressure in case of diaphragm failure; non-threaded vent outlet; assembled with two gate valves, strainer, and four test cocks.

2. Double Check Valve Assemblies: ASSE 1015 or AWWA C510; bronze body with corrosion resistant internal parts and stainless steel springs; two independently operating check valves with intermediate atmospheric vent.
- B. Water Hammer Arrestors:
- C. Manufacturers:
1. PPP
  2. Sioux Chief
  3. Substitutions: Engineer approved equivalent.
  4. Stainless steel construction, bellows or Copper construction, piston type To PDI WH 201, pre-charged suitable for operation in temperature range -100 to 300 degrees F. and maximum 250 psi. working pressure.
- D. Thermostatic Mixing Valves:
1. Manufacturers:
    - a. Leonard
    - b. Holby.
    - c. Substitutions: Engineer approved equivalent.
  2. Provide with check valve, volume control shut-off valve on outlet, stem type thermometer on outlet, strainer stop check on inlet, mounted in lockable cabinet of .16 gage prime coated steel.
  3. Conform to ASSE 1070 to temper water to maximum .110 degrees F..
- E. Hose Bibbs/Hydrants:
1. Interior Hose Bibs: Bronze or brass, replaceable hexagonal disc, hose thread spout, chrome plated with vacuum breaker.
  2. Wall Hydrant: Non-freeze, self-draining type with hose thread spout, removable key, and vacuum breaker.
- F. Diaphragm-type Compression Tanks:
1. Construction: Welded steel, ASME tested and stamped; rated for working pressure of .125 psig. with flexible diaphragm sealed into tank, and steel legs or saddles.
  2. Accessories: Pressure gage and air-charging fitting and drain.

## **2.6 IN-LINE CIRCULATOR PUMPS**

- A. Construction: Bronze casing, bronze impeller, alloy steel shaft with integral thrust collar and two oil-lubricated bronze-sleeve bearings and mechanical seal.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify excavations are to required grade, dry, and not over-excavate.

### **3.2 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

- B. Remove scale and dirt, on inside and outside piping before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

### **3.3 INSTALLATION - PIPING SYSTEMS**

- A. Install dielectric connections wherever jointing dissimilar metals.
- B. Install unions downstream of valves and at equipment or apparatus connections.
- C. Route piping parallel to building structure and maintain gradient.
- D. Install piping to maintain headroom. Group piping to conserve space. Group piping whenever practical at common elevations.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- G. Sleeve pipe passing through partitions, walls and floors.
- H. Install piping system allowing clearance for installation of insulation and access to valves and fittings.
- I. Install identification on piping systems including underground piping. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

### **3.4 INSTALLATION - VALVES**

- A. Install valves with stems upright or horizontal, not inverted.
- B. Install gate, ball or butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- C. Install ball or butterfly valves for throttling, bypass, or manual flow control services.
- D. Provide lug end butterfly valves adjacent to equipment when functioning to isolate equipment.
- E. Install spring loaded check valves on discharge of pumps.
- F. Install plug valves for throttling service. Install non-lubricated plug valves only when shut-off or isolating valves are also installed.
- G. Install 3/4 inch. gate or ball drain valves at main shut-off valves, low points of piping and at equipment.

### 3.5 INSTALLATION - PIPING SPECIALTIES

- A. Install pressure gages with pulsation dampers. Provide needle valve or ball valve to isolate each gage. Extend nipples and siphons to allow clearance from insulation.
- B. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inches for installation of thermometer sockets. Allow clearance from insulation.
- C. Install gages and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.
- D. Adjust gages and thermometers to final angle, clean windows and lenses, and calibrate to zero.
- E. Provide drain and hose connection with valve on strainer blow down connection.
- F. Test backflow preventers in accordance with ASSE 5013.

### 3.6 INSTALLATION - PLUMBING SUPPLY PIPING

- A. Install water piping in accordance with ASME B31.9.
- B. Excavate and backfill in accordance with Section 31 23 33.
- C. Provide support for utility meters in accordance with requirements of utility companies.
- D. Slope water piping and arrange to drain at low points.
- E. Install piping from relief valves, back-flow preventers and drains to nearest floor drain.
- F. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to lavatories and sinks.
- G. Provide water service complete with approved back-flow preventer and water meter with by-pass valves.
- H. Install flow controls in water circulating systems as indicated on Drawings.
- I. Disinfecting of Domestic Water Systems:
  - 1. Prior to starting, verify system is complete, flushed and clean.
  - 2. Verify pH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
  - 3. Inject disinfectant, free chlorine in liquid, powder and tablet or gas form, throughout system to obtain residual from 50 to 80 mg/L.
  - 4. Bleed water from outlets to obtain distribution and test for disinfectant residual at minimum 15 percent of outlets.
  - 5. Maintain disinfectant in system for 24 hours.
  - 6. When final disinfectant residual tests less than 25 mg/L, repeat treatment.
  - 7. Flush disinfectant from system until residual concentration is equal to incoming water or 1.0 mg/L.



8. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

### **3.7 INSTALLATION - PLUMBING DRAINAGE PIPING**

- A. Install bell and spigot pipe with bell end upstream.
- B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Install with clearance at cleanout for rodding of drainage system.
- C. Encase exterior cleanouts in concrete flush with grade.
- D. Install floor cleanouts at elevation to accommodate finished floor.
- E. Install piping penetrating roofed areas to maintain integrity of roof assembly.
- F. Excavate and backfill in accordance with Section 31 23 33 .
- G. Install bell and spigot pipe with bell end upstream.
- H. Test drainage piping in accordance with local code requirements.

### **3.8 INSTALLATION - PUMPS**

- A. Install line size shut-off valve and strainer on pump suction. Install line size check valve, shut-off valve, and balancing valve on pump discharge.
- B. Install pumps with shaft length allowing sump pumps to be located minimum 24 inches below lowest invert into sump pit and minimum 6 inches clearance from bottom of sump pit.

### **3.9 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM**

- A. Prior to starting work, verify system is complete, flushed and clean. Verify pH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- B. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L residual. Bleed water from outlets to accomplish distribution.
- C. Maintain disinfectant in system for 24 hours. When final disinfectant residual tests less than 25 mg/L, repeat treatment.
- D. Flush disinfectant from system. Take samples no sooner than 24 hours after flushing, and analyze in accordance with AWWA C601.

**END OF SECTION**

## **SECTION 22 14 29**

### **SUMP PUMPS**

#### **PART 1 GENERAL**

##### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Sump pumps.
- B. Related Sections:
  - 1. Section 22 05 03 - Pipes and Tubes for Plumbing Piping and Equipment.
  - 2. Section 22 05 23 - General-Duty Valves for Plumbing Piping.

##### **1.2 DESIGN REQUIREMENTS**

- A. Design Criteria:
  - 1. Refer to schedule at end of this section.

##### **1.3 SUBMITTALS**

- A. Shop Drawings:
  - 1. Submit installation details for pumps, piping, controls and accessories including wiring schematics.
- B. Product Data: Submit data for specified Products.

##### **1.4 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: Submit installation instructions, servicing requirements, assembly views, lubrication instructions, and replacement parts list.

##### **1.5 DELIVERY, STORAGE AND HANDLING**

- A. Prepare pumps and accessories for shipment to prevent entry of foreign matter into product body.
- B. Store products in areas protected from weather, moisture, or possible damage; do not store products directly on ground; handle products to prevent damage to interior or exterior surfaces.

##### **1.6 ENVIRONMENTAL REQUIREMENTS**

- A. Conduct operations not to interfere with, interrupt, damage, destroy, or endanger integrity of surface or subsurface structures or utilities, and landscape in immediate or adjacent areas.

## **PART 2 PRODUCTS**

### **2.1 SUMP PUMPS**

- A. Impeller: Cast iron, semi-open, non-clog.
- B. Casing: Cast iron.
- C. Mechanical Seal: Silicon carbide.
- D. Shaft: Stainless steel.
- E. Designed for continuous operation.
- F. Bearings: Upper and lower heavy duty ball bearings.

### **2.2 PUMP MOTORS**

- A. Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.
- B. Power Cable: Severe duty rated, oil and water resistant, epoxy seal on motor end.
- C. Built-in overload with automatic reset.
- D. Class B insulation.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify connections, size, and location are as indicated on Drawings.

### **3.2 INSTALLATION**

- A. Install sump pumps in accordance with Drawings and manufacturer's instructions.
- B. Provide necessary piping, fittings, and valves as indicated on Drawings.

### **3.3 FIELD QUALITY CONTROL**

- A. Upon completion of installation, examine, adjust and test each pump for proper operation.
- B. Test each pump with clean water through minimum of four complete cycles.

## **END OF SECTION**

**SECTION 22 33 00**  
**ELECTRIC DOMESTIC WATER HEATERS**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
1. Commercial electric water heaters.

**1.2 SUBMITTALS**

- A. Shop Drawings: Indicate heat exchanger dimensions, size of taps, and performance data. Indicate dimensions of tanks, tank lining methods, anchors, attachments, lifting points, taps, and drains.
- B. Product Data: Dimensioned drawings of water heaters indicating components and connections to other equipment and piping. Submit electrical characteristics and connection locations.
- C. Manufacturer's Installation Instructions: Mounting and support requirements.

**1.3 QUALITY ASSURANCE**

- A. Conform to ASME Section VIII for construction of water heaters. Provide boilers registered with National Board of Boiler and Pressure Vessel Inspectors.
- B. Water Heater Performance Requirements: Equipment efficiency not less than prescribed by ASHRAE 90.1.
- C. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.
- D. Installer: Company specializing in performing Work of this Section with three years' experience.

**1.4 FIELD MEASUREMENTS**

- A. Verify field measurements prior to fabrication.

**1.5 WARRANTY**

- A. Furnish five year manufacturer warranty for domestic water heaters.

**PART 2 PRODUCTS**

**2.1 COMMERCIAL ELECTRIC WATER HEATERS**

- A. Manufacturers :

1. Lochinvar.
  2. AO Smith
  3. Substitutions: Engineer approved equivalent.
- B. Type: Factory-assembled and wired, electric, vertical storage.
- C. Tank: Glass-lined welded steel; 4 inch. diameter inspection port, thermally insulated with minimum 2 inches. glass fiber or polyurethane encased in corrosion-resistant steel jacket; baked-on enamel finish.
- D. Controls: Automatic immersion water thermostat; externally adjustable temperature range from 60 to 180 degrees F., flanged or screw-in nichrome elements, high temperature limit thermostat.
- E. Accessories: Brass water connections and dip tube, drain valve, magnesium anode, and ASME rated temperature and pressure relief valve.
- F. Tank: Welded steel ASME labeled pressure vessel; glass lining, mounted on steel channel base with lifting lugs, insulated with **2 inch** glass fiber; enclosed with **.16 gage** steel jacket; baked enamel finish.
- G. Controls: Ventilated control cabinet, factory-wired with solid state progressive sequencing step controller, fuses, magnetic contactor, control transformer, pilot lights indicating main power and heating steps, control circuit toggle switch, electronic low-water (probe-type) cut-off, high temperature limit thermostat, flush-mounted temperature and pressure gages.
- H. Heating Elements: Flange-mounted immersion elements; individual elements sheathed with Incoloy corrosion-resistant metal alloy, rated less than 75 Watts per square inch.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Maintain manufacturer's recommended clearances around and over water heaters.
- B. Install water heater on concrete housekeeping pad, minimum 3-1/2 inches. high and 6 inches. larger than water heater base on each side.
- C. Connect piping to supply and return water heater connections.
- D. Install following piping accessories.
1. Supply:
    - a. Thermometer well and thermometer.
    - b. Strainer.
    - c. Pressure gage.
    - d. Shutoff valve.
  2. Return:
    - a. Thermometer well and thermometer.

- b. Pressure gage.
  - c. Shutoff valve.
- E. Install discharge piping from relief valves and drain valves to nearest floor drain.
- F. Install water heater trim and accessories furnished loose for field mounting.
- G. Install electrical devices furnished loose for field mounting.
- H. Install control wiring between water heater control panel and field mounted control devices.

**END OF SECTION**

**SECTION 22 40 00**  
**PLUMBING FIXTURES**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Water closets.
  - 2. Urinals.
  - 3. Lavatories.
  - 4. Sinks.
  - 5. Electric water coolers.
  - 6. Service sinks.

**1.2 SUBMITTALS**

- A. Product Data: Submit manufacturer's literature for plumbing fixtures.

**1.3 SUSTAINABLE DESIGN SUBMITTALS**

- A. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
  - 1. Water Efficiency Certificates:
    - a. Certify plumbing fixture flow rates.

**1.4 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: Submit literature and parts list.

**1.5 QUALITY ASSURANCE**

- A. Provide plumbing fixture fittings in accordance with ASME A112.18.1 that prevent backflow from fixture into water distribution system.

**1.6 WARRANTY**

- A. Furnish five year manufacturer warranties for electric water cooler compressor.

**PART 2 PRODUCTS**

**2.1 FLUSH VALVE WATER CLOSETS**

- A. Manufacturers:
  - 1. American Standard
  - 2. Kohler.
  - 3. Substitutions: Engineer approved equivalent.

- B. Bowl: Wall hung vitreous china closet with elongated rim, 1-1/2 inch spud, china bolt caps; maximum 1.28 gallon flush volume.
- C. Flush Valve: Exposed chrome plated, diaphragm type with oscillating handle, escutcheon, seat bumper, integral screwdriver stop and vacuum breaker.
- D. Seat: Solid white plastic, open front, extended back, self-sustaining hinge, brass bolts, without cover.
- E. Wall Mounted Carrier: Adjustable cast iron frame, integral drain hub and vent, adjustable spud. lugs for floor and wall attachment, threaded fixture studs with nuts and washers.

## 2.2 WALL HUNG URINALS

- A. Manufacturers :
  - 1. American Standard.
  - 2. Kohler
  - 3. Substitutions: Engineer approved equivalent.
- B. Urinal: ASME A112.19.2M or ANSI Z124.9, vitreous china, wall hung urinal with shields, integral trap, 3/4 inch top spud, steel supporting hanger; maximum 1.0 gallon flush volume.
- C. Flush Valve: Exposed chrome plated, diaphragm type with oscillating handle, escutcheon, integral screwdriver stop, vacuum breaker.
- D. Wall Mounted Carrier: Cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing studs.

## 2.3 LAVATORIES

- A. Manufacturers :
  - 1. American Standard.
  - 2. Kohler
  - 3. Substitutions: Engineer approved equivalent.
- B. Vitreous China Wall Hung Basin: Vitreous china wall-hung lavatory, rectangular basin with splash lip, front overflow.
- C. Trim: Chrome plated supply fitting with open grid strainer, water economy aerator with maximum 2.0 gpm flow, single lever handle, chrome plated brass P-trap with clean-out plug and arm with escutcheon.
- D. Wall Mounted Carrier: Cast iron and steel frame with tubular legs, lugs for floor and wall attachment, concealed arm supports, bearing plate and studs.

## 2.4 SINKS

- A. Manufacturers :
  - 1. American Standard



2. Kohler.
  3. Substitutions: Engineer approved equivalent.
- B. Single Compartment Bowl: Single compartment stainless steel, self-rimming with undercoating, 3/1/2 inch. crumb cup and chromed brass drain, ledge back drilled for trim.
- C. Trim: Chrome plated brass supply with swing spout, water economy aerator with maximum 2.2 gpm. flow, single lever handle; chrome plated brass P-trap with clean-out plug and arm with escutcheon.

## **2.5 ELECTRIC WATER COOLERS**

- A. Manufacturers :
1. Oasis
  2. Elkay.
  3. Substitutions: Engineer approved equivalent.
- B. Fountain: ARI 1010; surface handicapped mounted electric water cooler with stainless steel top, stainless steel body, elevated anti-squirt bubbler with stream guard, automatic stream regulator, mounting bracket, refrigerated with integral air cooled condenser.

## **2.6 SERVICE SINKS**

- A. Bowl: 24 x 24 x 10 inch. molded stone, floor mounted, with one inch. wide shoulders, stainless steel strainer.
- B. Trim: Exposed wall type supply with lever handles, spout wall brace, vacuum breaker, hose end spout, strainers, eccentric adjustable inlets, integral screwdriver stops with covering caps and adjustable threaded wall flanges, hose clamp and mop hanger.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify adjacent construction is ready to receive rough-in work of this section.
- B. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough in and installation.

### **3.2 INSTALLATION**

- A. Install each fixture with chrome plated rigid or flexible supplies with screwdriver stops, reducers, and escutcheons.
- B. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

**END OF SECTION**

**SECTION 23 05 00**  
**COMMON WORK RESULTS FOR HVAC**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Identification for HVAC Piping and Equipment.
  - 2. Sleeves.
  - 3. Mechanical sleeve seals.
  - 4. Formed steel channel.
  - 5. Firestopping relating to HVAC work.
  - 6. Firestopping accessories.

**1.2 SYSTEM DESCRIPTION**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.
- B. Firestopping: Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

**1.3 SUBMITTALS**

- A. Shop Drawings: Submit for piping and equipment identification list of wording, symbols, letter size, and color coding for pipe identification and valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
- B. Product Data for Pipe and Equipment Identification: Submit for mechanical identification manufacturers catalog literature for each product required.

**1.4 QUALITY ASSURANCE**

- A. Perform Work in accordance with Florida Building Code-Mechanical (2010 Edition), SMACNA Standards and local requirements.
- B. Maintain one copy of each document on site.

**PART 2 PRODUCTS**

**2.1 IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT**

- A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light background color, minimum 1-1/2 inches diameter.
- B. Plastic tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printing markings. Color and Lettering: Conform to ASME A13.1.

## **2.2 SLEEVES**

- A. Sleeves for Pipes Through Non-fire Rated Floors: .18 gage thick galvanized steel.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe.
- C. Sleeves for Round Ductwork: Galvanized steel.
- D. Sleeves for Rectangular Ductwork: Galvanized steel or wood.
- E. Sealant: Acrylic.

## **2.3 MECHANICAL SLEEVE SEALS**

- A. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify openings are ready to receive sleeves.

### **3.2 INSTALLATION - PIPING AND EQUIPMENT IDENTIFICATION**

- A. Install plastic nameplates with adhesive.
- B. Install plastic tags with corrosion resistant metal chain.

### **3.3 INSTALLATION - SLEEVES**

- A. Exterior watertight entries: Seal with mechanical sleeve seals.
- B. Set sleeves in position in forms. Provide reinforcing around sleeves.
- C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- D. Extend sleeves through floors .1 inch above finished floor level. Caulk sleeves.
- E. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with stuffing or fire stopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- F. Install chrome plated steel escutcheons at finished surfaces.

**END OF SECTION**

**SECTION 23 05 03**  
**PIPES AND TUBES FOR HVAC PIPING AND EQUIPMENT**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Pipe and pipe fittings for the following systems:
  - 1. Chilled water piping.
  - 2. Equipment drains and over flows.
- B. Related Sections:
  - 1. Section 07 84 00 - Firestopping: Product requirements for firestopping for placement by this section.
  - 2. Section 09 90 00 - Painting and Coating: Product and execution requirements for painting specified by this section.
  - 3. Section 23 05 23 - General-Duty Valves for HVAC Piping: Product requirements for valves for placement by this section.
  - 4. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment: Product requirements for pipe hangers and supports and firestopping for placement by this section.
  - 5. Section 23 05 48 - Vibration and Seismic Controls for HVAC Piping and Equipment: Product requirements for vibration isolation for placement by this section.
  - 6. Section 23 07 00 - HVAC Insulation: Product requirements for piping insulation for placement by this section.

**1.2 REFERENCES**

- A. American Society of Mechanical Engineers:
  - 1. ASME B16.3 - Malleable Iron Threaded Fittings.
  - 2. ASME B16.4 - Gray Iron Threaded Fittings.
  - 3. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
  - 4. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
  - 5. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes.
  - 6. ASME B31.1 - Power Piping.
  - 7. ASME B31.9 - Building Services Piping.
  - 8. ASME B36.10M - Welded and Seamless Wrought Steel Pipe.
  - 9. ASME Section IX - Boiler and Pressure Vessel Code - Welding and Brazing Qualifications.
- B. ASTM International:
  - 1. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - 2. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
  - 3. ASTM A395/A395M - Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.

4. ASTM A536 - Standard Specification for Ductile Iron Castings.
5. ASTM B32 - Standard Specification for Solder Metal.
6. ASTM B68 - Standard Specification for Seamless Copper Tube, Bright Annealed.
7. ASTM B75 - Standard Specification for Seamless Copper Tube.
8. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
9. ASTM B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
10. ASTM B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.
11. ASTM D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
12. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.
13. ASTM D2241 - Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Inside Diameter.
14. ASTM D2310 - Standard Classification for Machine-Made "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe.
15. ASTM D2464 - Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
16. ASTM D2466 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
17. ASTM D2467 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
18. ASTM D2564 - Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
19. ASTM D2661 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings.
20. ASTM D2751 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
21. ASTM D2846/D2846M - Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems.
22. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
23. ASTM D2996 - Standard Specification for Filament-Wound Fiberglass (Glass-Fiber-Reinforced Thermosetting Resin) Pipe.
24. ASTM F437 - Standard Specification for Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
25. ASTM F438 - Standard Specification for Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40.
26. ASTM F439 - Standard Specification for Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
27. ASTM F441/F441M - Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
28. ASTM F493 - Standard Specification for Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.
29. ASTM F876 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing.
30. ASTM F877 - Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot-and Cold-Water Distribution Systems.
31. ASTM F1476 - Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications.

- C. American Welding Society:
  - 1. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.
  - 2. AWS D1.1 - Structural Welding Code - Steel.
- D. American Water Works Association:
  - 1. AWWA C105 - American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.
  - 2. AWWA C110 - American National Standard for Ductile-Iron and Grey-Iron Fittings, 3 in. through 48 in. (75 mm through 1200 mm), for Water and Other Liquids.
  - 3. AWWA C111 - American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
  - 4. AWWA C151 - American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
- E. National Fire Protection Association:
  - 1. NFPA 30 - Flammable and Combustible Liquids Code.
  - 2. NFPA 31 - Standard for the Installation of Oil-Burning Equipment.
  - 3. NFPA 54 - National Fuel Gas Code.
  - 4. NFPA 58 - Liquefied Petroleum Gas Code.

### 1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate layout of piping systems, including equipment, critical dimensions, and sizes.
- C. Product Data: Submit data on pipe materials and fittings. Submit manufacturers catalog information.
- D. Welders' Certificate: Include welders' certification of compliance with ASME Section IX or AWS D1.1.

### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ASME B31.1 and ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.

### 1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum **three** years experience.
- B. Installer: Company specializing in performing work of this section 5 years experience.

### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

- B. Furnish temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

## **1.7 FIELD MEASUREMENTS**

- A. Verify field measurements prior to fabrication.

## **PART 2 PRODUCTS**

### **2.1 CHILLED WATER PIPING, ABOVE GROUND**

- A. Steel Pipe: ASTM A53/A53M, Schedule 40, black.
  - 1. Fittings: ASME B16.3, malleable iron or ASTM A234/A234M, forged steel welding type.
  - 2. Joints: Threaded for pipe 2 inch and smaller; welded for pipe 2-1/2 inches and larger.
- B. Steel Pipe: ASTM A53/A53M Schedule 40, black, grooved ends.
  - 1. Fittings: ASTM A395/A395M and ASTM A536 ductile iron, or ASTM A234/A234M carbon steel, grooved ends.
  - 2. Joints: Grooved mechanical couplings meeting ASTM F1476.
    - a. Housing Clamps: ASTM A395/A395M and ASTM A536 ductile iron, compatible with steel piping sizes, rigid or flexible type.
    - b. Gasket: Elastomer composition for appropriate operating temperature range.
    - c. Accessories: Steel bolts, nuts, and washers.

### **2.2 EQUIPMENT DRAINS AND OVERFLOWS**

- A. Copper Tubing: ASTM B88, Type L drawn.
  - 1. Fittings: ASME B16.18, cast brass, or ASME B16.22 solder wrought copper.
  - 2. Joints: ASTM B32, Alloy Grade Sb5 tin-antimony, or Alloy Grade Sn95 tin-silver, lead free solder.

### **2.3 UNIONS AND FLANGES**

- A. Unions for Pipe 2 inches and Smaller:
  - 1. Ferrous Piping: malleable iron, threaded.
  - 2. Copper Piping: Class 150, bronze unions with soldered joints.
  - 3. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.
- B. Flanges for Pipe 2-1/2 inches and Larger:
  - 1. Ferrous Piping: forged steel, slip-on flanges.
  - 2. Copper Piping: Class 150, slip-on bronze flanges.
  - 3. Gaskets: 1/16 inch thick preformed neoprene gaskets.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Section .01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.

### **3.2 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

### **3.3 INSTALLATION - ABOVE GROUND PIPING**

- A. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- B. Install piping to maintain headroom without interfering with use of space or taking more space than necessary.
- C. Group piping whenever practical at common elevations.
- D. Sleeve pipe passing through partitions, walls and floors.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- G. Provide access where valves and fittings are not accessible. Coordinate size and location of access doors.
- H. Install non-conducting dielectric connections wherever jointing dissimilar metals.
- I. Slope piping and arrange systems to drain at low points.
- J. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.
- K. Install piping penetrating roofed areas to maintain integrity of roof assembly.
- L. Install valves in accordance with Section 23 05 23.
- M. Insulate piping. Refer to Section 23 07 00.



N. Install pipe identification in accordance with Section 23 05 53.

**3.4 INSTALLATION - HEATING AND COOLING PIPING SYSTEMS**

A. Install chilled water] piping in accordance with ASME B31.1 and ASME B31.9.

**3.5 FIELD QUALITY CONTROL**

A. Test chilled water piping system in accordance with ASME B31.9 and ASME B31.1.

**3.6 CLEANING**

A. After completion, fill, clean, and treat chilled water piping system.

**END OF SECTION**

**SECTION 23 05 23**  
**GENERAL-DUTY VALVES FOR HVAC PIPING**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Globe valves.
  - 2. Ball valves.
  - 3. Butterfly valves.
- B. Related Sections:
  - 1. Section 23 05 03 - Pipes and Tubes for HVAC Piping and Equipment: Product and installation requirements for piping materials applying to various system types.
  - 2. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment: Product and installation requirements for pipe hangers and supports.
  - 3. Section 23 07 00 - HVAC Insulation: Product and installation requirements for insulation for valves.
  - 4. Section 23 23 00 - Refrigerant Piping: Product and installation requirements for valves and piping specialties used in refrigeration systems.

**1.2 REFERENCES**

- A. ASTM International:
  - 1. ASTM A216/A216M - Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service.
- B. Manufacturers Standardization Society of the Valve and Fittings Industry:
  - 1. MSS SP 67 - Butterfly Valves.
  - 2. MSS SP 80 - Bronze Gate, Globe, Angle and Check Valves.
  - 3. MSS SP 85 - Cast Iron Globe & Angle Valves, Flanged and Threaded.
  - 4. MSS SP 110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

**1.3 SUBMITTALS**

- A. Section 01 33 00 - Submittal Procedures.: Requirements for submittals.
- B. Product Data: Submit manufacturers catalog information with valve data and ratings for each service.
- C. Manufacturer's Installation Instructions: Submit hanging and support methods, joining procedures.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

#### **1.4 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: Submit installation instructions, spare parts lists, exploded assembly views.

#### **1.5 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing work of this section with minimum 5 years experience.

#### **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary protective coating on cast iron and steel valves.

#### **1.7 WARRANTY**

- A. Section 01 77 00 - Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish five year manufacturer warranty for valves excluding packing.

#### **1.8 EXTRA MATERIALS**

- A. Section 01 77 00 - Execution and Closeout Requirements: Requirements for extra materials.
- B. Furnish two packing kits for each size valve.

### **PART 2 PRODUCTS**

#### **2.1 GLOBE VALVES**

- A. Manufacturers:
  - 1. Nibco
  - 2. Milwaukee
  - 3. Apollo
  - 4. Substitutions: Engineer approved equivalent.

The following 2 valves can be used in low pressure steam systems.

Use Buna-N disc for water, oil, and gas services. Use teflon disc for steam services.

- B. 2 inches and Smaller: MSS SP 80, bronze body, bronze trim, threaded or union bonnet, hand wheel, Buna-N composition disc, solder or threaded ends.

- C. 2-1/2 inches and Larger: MSS SP 85, cast iron body, bronze trim, hand wheel, outside screw and yoke, flanged ends. Furnish chain-wheel operators for valves 6 inches and larger mounted over 8 feet above floor.

## 2.2 BALL VALVES

- A. Manufacturers :
  - 1. Nibco
  - 2. Milwaukee
  - 3. Apollo
  - 4. Substitutions: Engineer approved equivalent.
- B. 2 inches and Smaller: MSS SP 110, bronze body, chrome plated brass ball, teflon seats, blow-out proof stem, solder or threaded ends with union, handle with balancing stops.

## 2.3 BUTTERFLY VALVES

- A. Manufacturers :
  - 1. Nibco
  - 2. Milwaukee
  - 3. Apollo
  - 4. Substitutions: Engineer approved equivalent.
- B. 2-1/2 inches and Larger: MSS SP 67.
  - 1. Body: Cast or ductile iron, wafer, lug or grooved ends, stainless steel stem, extended neck.
  - 2. Disc: Nickel-plated ductile iron, Aluminum bronze, Elastomer coated ductile iron, Chrome plated ductile iron or stainless steel.
  - 3. Seat: Resilient replaceable Buna N.
  - 4. Handle and Operator: Infinite position lever handle with memory stop.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify piping system is ready for valve installation.

### 3.2 INSTALLATION

- A. Install valves with stems upright or horizontal, not inverted.
- B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- C. Install 3/4 inch ball valves with cap for drains at main shut-off valves, low points of piping, bases of vertical risers, and at equipment.
- D. Install valves with clearance for installation of insulation and allowing access.
- E. Provide access where valves and fittings are not accessible.

### **3.3 VALVE APPLICATIONS**

- A. Install ball or butterfly valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- B. Install ball, butterfly or globe valves for throttling, bypass, or manual flow control services.
- C. Install lug end butterfly valves adjacent to equipment when functioning to isolate equipment.
- D. Install ball or butterfly valves in chilled water systems for shut-off service.
- E. Install butterfly valves in chilled water systems interchangeably with globe valves.
- F. Install calibrated ball and globe valves in chilled water systems for throttling service.

**END OF SECTION**

**SECTION 23 05 29**  
**HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Pipe hangers and supports.
  - 2. Hanger rods.
  - 3. Inserts.
  - 4. Flashing.
  - 5. Equipment curbs.
  - 6. Sleeves.
  - 7. Mechanical sleeve seals.
  - 8. Firestopping relating to HVAC work.
  - 9. Firestopping accessories.
- B. Related Sections:
  - 1. Section 07 84 00 - Firestopping: Product requirements for firestopping for placement by this section.
  - 2. Section 23 05 03 - Pipes and Tubes for HVAC Piping and Equipment: Execution requirements for placement of hangers and supports specified by this section.
  - 3. Section 23 05 48 - Vibration and Seismic Controls for HVAC Piping and Equipment: Product and execution requirements for vibration isolators.

**1.2 REFERENCES**

- 1. ASME B31.1 - Power Piping.
- 2. ASME B31.5 - Refrigeration Piping.
- 3. ASME B31.9 - Building Services Piping.
- B. ASTM International:
  - 1. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
  - 2. ASTM E814 - Standard Test Method for Fire Tests of Through Penetration Fire Stops.
  - 3. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
  - 4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.
- C. American Welding Society:
  - 1. AWS D1.1 - Structural Welding Code - Steel.
- D. FM Global:
  - 1. FM - Approval Guide, A Guide to Equipment, Materials & Services Approved By Factory Mutual Research For Property Conservation.
- E. Manufacturers Standardization Society of the Valve and Fittings Industry:
  - 1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.

2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
  3. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
- F. Underwriters Laboratories Inc.:
1. UL 263 - Fire Tests of Building Construction and Materials.
  2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
  3. UL 1479 - Fire Tests of Through-Penetration Firestops.
  4. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
  5. UL - Fire Resistance Directory.
- G. Intertek Testing Services (Warnock Hersey Listed):
1. WH - Certification Listings.

### 1.3 DEFINITIONS

- A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

### 1.4 SYSTEM DESCRIPTION

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.
- B. Firestopping Materials: **ASTM E119, ASTM E814, UL 263, or UL 1479** to achieve fire ratings as noted on Drawings for adjacent construction, but not less than 1 hour fire rating.
- C. Firestop interruptions to fire rated assemblies, materials, and components.

### 1.5 PERFORMANCE REQUIREMENTS

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.
- B. Firestopping: Conform to **UL** for fire resistance ratings and surface burning characteristics.

### 1.6 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate system layout with location including critical dimensions, sizes, and pipe hanger and support locations and detail of trapeze hangers.
- C. Product Data:
1. Hangers and Supports: Submit manufacturers catalog data including load capacity.
  2. Firestopping: Submit data on product characteristics, performance and limitation criteria.
- D. Manufacturer's Installation Instructions:
1. Hangers and Supports: Submit special procedures and assembly of components.
  2. Firestopping: Submit preparation and installation instructions.

- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

## **1.7 QUALITY ASSURANCE**

- A. Through Penetration Firestopping of Fire Rated Assemblies: UL 1479 or ASTM E814 with 0.10 inch water gage minimum positive pressure differential to achieve fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
  - 1. Wall Penetrations: Fire F-Ratings as indicated on Drawings, but not less than 1-hour.
  - 2. Floor and Roof Penetrations: Fire F-Ratings and temperature T-Ratings as indicated on Drawings, but not less than 1-hour.
    - a. Floor Penetrations Within Wall Cavities: T-Rating is not required.
- B. Through Penetration Firestopping of Non-Fire Rated Floor and Roof Assemblies: Materials to resist free passage of flame and products of combustion.
  - 1. Noncombustible Penetrating Items: Noncombustible materials for penetrating items connecting maximum of three stories.
  - 2. Penetrating Items: Materials approved by authorities having jurisdiction for penetrating items connecting maximum of two stories.
- C. Fire Resistant Joints in Fire Rated Floor, Roof, and Wall Assemblies: ASTM E1966 or UL 2079 to achieve fire resistant rating as indicated on Drawings for assembly in which joint is installed.
- D. Fire Resistant Joints Between Floor Slabs and Exterior Walls: ASTM E119 with 0.10 inch water gage minimum positive pressure differential to achieve fire resistant rating as indicated on Drawings for floor assembly.
- E. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

## **1.8 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing Work of this section with minimum 5 years experience.

## **1.9 DELIVERY, STORAGE, AND HANDLING**

- A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.
- C. Protect from weather and construction traffic, dirt, water, chemical, and damage, by storing in original packaging.



## **1.10 ENVIRONMENTAL REQUIREMENTS**

- A. Do not apply firestopping materials when temperature of substrate material and ambient air is below 60 degrees F.
- B. Maintain this minimum temperature before, during, and for minimum 3 days after installation of firestopping materials.
- C. Provide ventilation in areas to receive solvent cured materials.

## **1.11 FIELD MEASUREMENTS**

- A. Verify field measurements prior to fabrication.

## **1.12 WARRANTY**

- A. Section 01 77 00 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish five year manufacturer warranty for pipe hangers and supports.

# **PART 2 PRODUCTS**

## **2.1 PIPE HANGERS AND SUPPORTS**

- A. Hydronic Piping:
  - 1. Conform to ASME B31.9, ASTM F708, MSS SP58, MSS SP69, MSS SP89.
  - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch.: Carbon steel, adjustable swivel, split ring.
  - 3. Hangers for Cold Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
  - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
  - 5. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hooks.
  - 6. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
  - 7. Vertical Support: Steel riser clamp.
  - 8. Floor Support for Cold Pipe: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
  - 9. Copper Pipe Support: Copper-plated, carbon steel ring.
- B. Refrigerant Piping:
  - 1. Conform to ASME B31.5, ASTM F708, MSS SP58, MSS SP69, MSS SP89.
  - 2. Hangers for Pipe Sizes 1/2 to 1-1/2 inch.: Carbon steel, adjustable swivel, split ring.
  - 3. Hangers for Pipe Sizes 2 inches and Larger: Carbon steel, adjustable, clevis.
  - 4. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
  - 5. Wall Support for Pipe Sizes 3 inches and Smaller: Cast iron hook.

6. Wall Support for Pipe Sizes 4 inches and Larger: Welded steel bracket and wrought steel clamp.
7. Vertical Support: Steel riser clamp.
8. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
9. Copper Pipe Support: Copper-plated carbon-steel ring.

## **2.2 ACCESSORIES**

- A. Hanger Rods: Mild steel threaded both ends, threaded on one end, or continuous threaded.

## **2.3 INSERTS**

- A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

## **2.4 EQUIPMENT CURBS**

- A. Manufacturers :
  1. Manufacturer of curb shall be same as equipment installed on curb.
- B. Fabrication: Welded .18 gage galvanized steel shell and base, mitered 3 inch cant, factory installed wood nailer.

## **2.5 SLEEVES**

- A. Sleeves for Pipes Through Non-fire Rated Floors: .18 gage thick galvanized steel.
- B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or **18** gage thick galvanized steel.
- C. Sleeves for Round Ductwork: Galvanized steel.
- D. Sleeves for Rectangular Ductwork: Galvanized steel or wood.
- E. Sealant: Acrylic.

## **2.6 FIRESTOPPING**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00. {07840}.
- B. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
  1. Silicone Firestopping Elastomeric Firestopping: silicone elastomeric compound and compatible silicone sealant.
  2. Foam Firestopping Compounds: component foam compound.
  3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.

4. Fiber Stuffing and Sealant Firestopping: Composite of mineral or ceramic fiber stuffing insulation with silicone elastomer for smoke stopping.
5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
7. Firestop Pillows: Formed mineral fiber pillows.

## **2.7 FIRESTOPPING ACCESSORIES**

- A. Installation Accessories: Comply with requirements of Section 07 84 00.
- B. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.
- D. General:
  1. Furnish UL listed products.
  2. Select products with rating not less than rating of wall or floor being penetrated.
- E. Non-Rated Surfaces:
  1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where piping is exposed.
  2. For exterior wall openings below grade, furnish mechanical sealing device to continuously fill annular space between piping and cored opening or water-stop type wall sleeve.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Section 01 30 00 - Administrative Requirements: Verification of existing conditions before starting work.
- B. Verify openings are ready to receive sleeves.
- C. Verify openings are ready to receive firestopping.

### **3.2 PREPARATION**

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond.
- C. Do not drill or cut structural members.

### **3.3 INSTALLATION - INSERTS**

- A. Install inserts for placement in concrete forms.
- B. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches and larger.
- D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

### **3.4 INSTALLATION - PIPE HANGERS AND SUPPORTS**

- A. Install in accordance with ASME B31.1, ASME B31.5, ASME 31.9, ASTM F708, MSS SP 58, MSS SP 69, MSS SP 89.
- B. Support horizontal piping as scheduled.
- C. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.
- D. Place hangers within 12 inches of each horizontal elbow.
- E. Use hangers with 1-1/2 inch minimum vertical adjustment.
- F. Support vertical piping at every floor.
- G. Where piping is installed in parallel and at same elevation, provide multiple pipe or trapeze hangers.
- H. Support riser piping independently of connected horizontal piping.
- I. Provide copper plated hangers and supports for copper piping.
- J. Design hangers for pipe movement without disengagement of supported pipe.
- K. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- L. Provide clearance in hangers and from structure and other equipment for installation of insulation.

### **3.5 INSTALLATION - EQUIPMENT BASES AND SUPPORTS**

- A. Provide housekeeping pads of concrete, minimum 4 inches thick and extending 6 inches beyond supported equipment.
- B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.

- C. Provide rigid anchors for pipes after vibration isolation components are installed.

### **3.6 INSTALLATION - FLASHING**

- A. Provide flexible flashing and metal Counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
- B. Provide curbs for roof installations .14 inches minimum high above roofing surface. Flash and counter-flash with sheet metal; seal watertight. Attach Counterflashing to equipment and lap base flashing on roof curbs. Flatten and solder joints.
- C. Adjust storm collars tight to pipe with bolts; caulk around top edge. Use storm collars above roof jacks. Screw vertical flange section to face of curb.

### **3.7 INSTALLATION - SLEEVES**

- A. Exterior watertight entries: Seal with mechanical sleeve seals.
- B. Set sleeves in position in forms. Provide reinforcing around sleeves.
- C. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
- D. Extend sleeves through floors .1 inch above finished floor level. Caulk sleeves.
- E. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with firestopping insulation and caulk. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
- F. Install chrome plated steel or stainless steel escutcheons at finished surfaces.

### **3.8 INSTALLATION - FIRESTOPPING**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.
- B. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, and other items, requiring firestopping.
- C. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
- D. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating, to uniform density and texture.
- E. Fire Rated Surface:
  - 1. Seal opening at floor, wall, partition, ceiling, and roof as follows:
    - a. Install sleeve through opening and extending beyond minimum of .1 inch on both sides of building element.
    - b. Size sleeve allowing minimum of .1 inch void between sleeve and building element.
    - c. Pack void with backing material.

- d. Seal ends of sleeve with UL listed fire resistive silicone compound to meet fire rating of structure penetrated.

F. Non-Rated Surfaces:

1. Seal opening through non-fire rated wall, partition, floor, ceiling, and roof opening as follows:
  - a. Install sleeve through opening and extending beyond minimum of .1 inch. on both sides of building element.
  - b. Size sleeve allowing minimum of .1 inch. void between sleeve and building element.
  - c. Install type of firestopping material recommended by manufacturer.
2. Install escutcheons where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.
3. Exterior wall openings below grade: Assemble rubber links of mechanical sealing device to size of piping and tighten in place, in accordance with manufacturer's instructions.
4. Interior partitions: Seal pipe penetrations at laboratories, hospital spaces, telecommunication rooms, and data rooms. Apply sealant to both sides of penetration to completely fill annular space between sleeve and conduit.

### 3.9 FIELD QUALITY CONTROL

- A. Inspect installed firestopping for compliance with specifications.

### 3.10 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

### 3.11 PROTECTION OF FINISHED WORK

- A. Protect adjacent surfaces from damage by material installation.

### 3.12 SCHEDULES

- A. Copper and Steel Pipe Hanger Spacing:

| PIPE SIZE<br>Inches | COPPER<br>TUBING<br>MAXIMUM<br>HANGER<br>SPACING<br>Feet | STEEL PIPE<br>MAXIMUM<br>HANGER<br>SPACING<br>Feet | COPPER<br>TUBING<br>HANGER<br>ROD<br>DIAMETER<br>Inches | STEEL PIPE<br>HANGER<br>ROD<br>DIAMETER<br>Inches |
|---------------------|--|--|---|---|
| 1/2                 | 5  | 7  | 3/8   | 3/8   |
| 3/4                 | 5  | 7  | 3/8   | 3/8   |
| 1                   | 6  | 7  | 3/8   | 3/8   |
| 1-1/4               | 7  | 7  | 3/8   | 3/8   |
| 1-1/2               | 8  | 9  | 3/8   | 3/8   |
| 2                   | 8  | 10   | 3/8   | 3/8   |
| 2-1/2 (Note 2)      | 9  | 11   | 1/2   | 1/2   |
| 3                   | 10   | 12   | 1/2   | 1/2   |

|    |    |    |       |       |
|----|----|----|-------|-------|
| 4  | 12 | 14 | 1/2   | 5/8   |
| 5  | 13 | 16 | 1/2   | 5/8   |
| 6  | 14 | 17 | 5/8   | 3/4   |
| 8  | 16 | 19 | 3/4   | 3/4   |
| 10 | 18 | 22 | 3/4   | 7/8   |
| 12 | 19 | 23 | 3/4   | 7/8   |
| 14 | 22 | 25 | 7/8   | 1     |
| 16 | 23 | 27 | 7/8   | 1     |
| 18 | 25 | 28 | 1     | 1     |
| 20 | 27 | 30 | 1     | 1-1/4 |
| 24 | 28 | 32 | 1-1/4 | 1-1/4 |

- B. Note 1: Refer to manufacturer's recommendations for grooved end piping systems.
- C. Note 2: 20 feet maximum spacing, minimum of one hanger for each pipe section close to joint behind bell. Provide hanger at each change of direction and each branch connection. For pipe sizes 6 inches and smaller, subjected to loadings other than weight of pipe and contents, limit span to maximum spacing for water service steel pipe.

**END OF SECTION**

**SECTION 23 05 48**  
**VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Vibration isolators.
- B. Related Sections:
  - 1. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment: Product requirements for pipe hangers and supports.
  - 2. Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC: Requirements for sound and vibration measurements performed independent of this section.

**1.2 REFERENCES**

- A. Air Movement and Control Association International, Inc.:
  - 1. AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
- B. American National Standards Institute:
  - 1. ANSI S1.4 - Sound Level Meters.
  - 2. ANSI S1.8 - Reference Quantities for Acoustical Levels.
  - 3. ANSI S1.13 - Methods for the Measurement of Sound Pressure Levels in Air.
  - 4. ANSI S12.36 - Survey Methods for the Determination of Sound Power Levels of Noise Sources.
- C. Air-Conditioning and Refrigeration Institute:
  - 1. ARI 575 - Method of Measuring Machinery Sound within Equipment Space.
- D. American Society of Heating, Refrigerating and:
  - 1. ASHRAE 68 - Laboratory Method of Testing In-Duct Sound Power Measurement Procedure for Fans.
  - 2. ASHRAE Handbook - HVAC Applications.
- E. ASTM International:
  - 1. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
  - 2. ASTM E477 - Standard Test Method for Measuring Acoustical and Airflow Performance of Duct Liner Materials and Prefabricated Silencers.
  - 3. ASTM E596 - Standard Test Method for Laboratory Measurement of the Noise Reduction of Sound-Isolating Enclosures.
- F. Sheet Metal and Air Conditioning Contractors':
  - 1. SMACNA - HVAC Duct Construction Standard - Metal and Flexible.



### 1.3 PERFORMANCE REQUIREMENTS

- A. Provide vibration isolation on motor driven equipment over .05 hp., plus connected piping and ductwork.
- B. Provide minimum static deflection of isolators for equipment as follows:

|                     | Upper Floors,<br>Normal | Upper Floors,<br>Critical |
|---------------------|-------------------------|---------------------------|
| 400 - 600 rpm:      | .35 inches              | 3.5 inches                |
| 600 - 800 rpm:      | .2 inches               | 3.5 inches                |
| 800 - 900 rpm:      | .1 inch                 | 2 inches                  |
| 1100 - 1500<br>rpm: | .05 inch                | .1 inch                   |
| Over 1500 rpm:      | .02 inch                | .05 inch                  |

- C. Consider upper floor locations critical unless otherwise indicated.
- D. Maintain sound level of spaces at levels not to exceed those listed below by utilizing acoustical devices.
- E. Maintain rooms at following maximum sound levels, in Noise Criteria (NC) as defined by ASHRAE Handbook., HVAC Applications.
  - 1. Offices
    - a. Executive: 25
    - b. Conference rooms: 25
    - c. Private: 30
    - d. Open-plan areas: 35
    - e. Computer/business machine areas: 40
    - f. Public circulation: 40
  - 2. Hospitals and Clinics
    - a. Private rooms: 25
    - b. Wards: 30
    - c. Operating rooms: 25
    - d. Laboratories: 30
    - e. Corridors: 30
    - f. Public areas: 40

### 1.4 SUBMITTALS

- A. Product Data: Submit schedule of vibration isolator type with location and load on each. Submit catalog information indicating, materials, dimensional data, pressure losses, and acoustical performance for standard sound attenuation products.

## 1.5 CLOSEOUT SUBMITTALS

## 1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years experience.

## 1.7 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

## PART 2 PRODUCTS

### 2.1 VIBRATION ISOLATORS

- A. Manufacturers :
  - 1. Mason Industries.
  - 2. Substitutions: Engineer approved equivalent.
- B. Open Spring Isolators:
  - 1. Spring Isolators:
    - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
    - b. Code: Color code springs for load carrying capacity.
  - 2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
  - 3. Spring Mounts: Furnish with leveling devices, minimum .025 inch. thick neoprene sound pads, and zinc chromate plated hardware.
  - 4. Sound Pads: Size for minimum deflection of .05 inch.; meet requirements for neoprene pad isolators.
- C. Restrained Spring Isolators:
  - 1. Spring Isolators:
    - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
    - b. Code: Color code springs for load carrying capacity.
  - 2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
  - 3. Spring Mounts: Furnish with leveling devices, minimum .025 inch. thick neoprene sound pads, and zinc chromate plated hardware.
  - 4. Sound Pads: Size for minimum deflection of .05 inch.; meet requirements for neoprene pad isolators.
  - 5. Restraint: Furnish mounting frame and limit stops.
- D. Closed Spring Isolators:
  - 1. Spring Isolators:

- a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
    - b. Code: Color code springs for load carrying capacity.
  2. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
  3. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
  4. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, and neoprene side stabilizers with minimum .025 inch clearance.
- E. Restrained Closed Spring Isolators:
  1. Spring Isolators:
    - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
    - b. Code: Color code springs for load carrying capacity.
  2. Type: Closed spring mount with top and bottom housing separated with neoprene rubber stabilizers.
  3. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
  4. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators, and neoprene side stabilizers with minimum .025 inch (7 mm) clearance and limit stops.
- F. Spring Hanger:
  1. Spring Isolators:
    - a. For Exterior and Humid Areas: Furnish hot dipped galvanized housings and neoprene coated springs.
    - b. Code: Color code springs for load carrying capacity.
  2. Springs: Minimum horizontal stiffness equal to 75 percent vertical stiffness, with working deflection between 0.3 and 0.6 of maximum deflection.
  3. Housings: Incorporate neoprene isolation pad meeting requirements for neoprene pad isolators.
  4. Misalignment: Capable of 20 degree hanger rod misalignment.
- G. Neoprene Pad Isolators:
  1. Rubber or neoprene-waffle pads.
    - a. 30 durometer.
    - b. Minimum 1/2 inch (13 mm) thick.
    - c. Maximum loading 40 psi (275 kPa).
    - d. Height of ribs: not to exceed 0.7 times width.
- H. Rubber Mount or Hanger: Molded rubber designed for .05 inches deflection with threaded insert.

**PART 3 EXECUTION****3.1 EXAMINATION**

- A. Section 01 31 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify equipment, ductwork and piping is installed before work in this section is started.

**3.2 INSTALLATION**

- A. Install isolation for motor driven equipment.
- B. Adjust equipment level.
- C. Install spring hangers without binding.
- D. On closed spring isolators, adjust so side stabilizers are clear under normal operating conditions.
- E. Prior to making piping connections to equipment with operating weights substantially different from installed weights, block up equipment with temporary shims to final height. When full load is applied, adjust isolators to load to allow shim removal.

**3.3 FIELD QUALITY CONTROL**

- A. Inspect isolated equipment after installation and submit report. Include static deflections.

**END OF SECTION**

**SECTION 23 05 53**  
**IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Nameplates.
  - 2. Tags.
  - 3. Pipe markers.
- B. Related Sections:
  - 1. Section 09 90 00 - Painting and Coating: Execution requirements for painting specified by this section.

**1.2 REFERENCES**

- A. American Society of Mechanical Engineers:
  - 1. ASME A13.1 - Scheme for the Identification of Piping Systems.

**1.3 SUBMITTALS**

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit manufacturers catalog literature for each product required.
- C. Shop Drawings: Submit list of wording, symbols, letter size, and color coding for mechanical identification and valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
- D. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

**1.4 CLOSEOUT SUBMITTALS**

- A. Section 01 77 00 - Execution and Closeout Requirements: Closeout procedures.
- B. Project Record Documents: Record actual locations of tagged valves; include valve tag numbers.

**1.5 QUALITY ASSURANCE**

- A. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories.

**1.6 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

- B. Installer: Company specializing in performing Work of this section with minimum three years experience.

## **1.7 FIELD MEASUREMENTS**

- A. Verify field measurements prior to fabrication.

## **PART 2 PRODUCTS**

### **2.1 NAMEPLATES**

- A. Product Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.

### **2.2 TAGS**

- A. Metal Tags:
  - 1. Brass with stamped letters; tag size minimum .1-1/2 inches diameter with finished edges.
- B. Tag Chart: Typewritten letter size list of applied tags and location in anodized aluminum frame or plastic laminated.

### **2.3 PIPE MARKERS**

- A. Color and Lettering: Conform to ASME A13.1.
- B. Manufacturers; Plastic Pipe Markers:
  - 1. Seton
  - 2. Brady
  - 3. Substitutions: Engineer approved equivalent.
  - 4. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Degrease and clean surfaces to receive adhesive for identification materials.

### **3.2 INSTALLATION**

- A. Install identifying devices after completion of coverings and painting.
- B. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive.
- C. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.
- D. Install tags using corrosion resistant chain. Number tags consecutively by location.

- E. Identify equipment and devices with plastic nameplates.
- F. Identify control panels and major control components outside panels with plastic nameplates.
- G. Identify valves in main and branch piping with tags.
- H. Identify air terminal units with plastic nameplates.
- I. Tag automatic controls, instruments, and relays. Key to control schematic.
- J. Identify piping, concealed or exposed, with plastic pipe markers. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure or enclosure, and at each obstruction.

**END OF SECTION**

**SECTION 23 05 93**  
**TESTING, ADJUSTING, AND BALANCING FOR HVAC**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Testing adjusting and balancing of air systems.

**1.2 SUBMITTALS**

- A. Draft Reports: Submit for review prior to final acceptance of Project.
- B. Test Reports: Submit prior to final acceptance of Project and for inclusion in operating and maintenance manuals. Assemble in soft cover, letter size, 3-ring binder, with table of contents page and tabs, and cover identification. Include reduced scale drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.

**1.3 QUALITY ASSURANCE**

- A. Perform Work in accordance with Florida Building Code (2010 Edition).

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

**3.1 EXAMINATION**

- A. Before starting work, verify systems are complete and operable.
- B. Report defects, deficiencies, or abnormal conditions in mechanical systems preventing system balance.
- C. Beginning of work means acceptance of existing conditions.

**3.2 INSTALLATION TOLERANCES**

- A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust to within plus or minus 10 percent of design.



### **3.3 AIR SYSTEM PROCEDURE**

- A. Adjust air handling and distribution systems to deliver design supply, return, and exhaust air quantities within previously stated tolerances.
- B. Make air flow rate measurements in ducts by traverse of entire cross sectional area of duct.
- C. Measure air quantities at air inlets and outlets.
- D. Use volume control devices to regulate air quantities only to extent those adjustments do not create objectionable air motion or sound levels. Change volume using dampers mounted in ducts.
- E. Vary total system air quantities by adjustment of fan speeds. Provide drive changes to accomplish system air flow. Vary branch air quantities by damper regulation.
- F. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across fan. Allow for pressure drop equivalent to 50 percent loading of filters.
- G. Adjust automatic outside air, return air, and exhaust air dampers for design conditions.
- H. Measure temperature conditions across outside air, return air, and exhaust air dampers to check leakage.
- I. At modulating damper locations, take measurements and balance at extreme conditions.

### **3.4 FIELD QUALITY CONTROL**

- A. Verify recorded data represents actually measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices. Set and lock memory stops.

**END OF SECTION**

## **SECTION 23 07 00**

### **HVAC INSULATION**

#### **PART 1 GENERAL**

##### **1.1 SUMMARY**

- A. Section Includes:
  - 1. HVAC piping insulation, jackets and accessories.
  - 2. HVAC equipment insulation, jackets and accessories.
  - 3. HVAC ductwork insulation, jackets, and accessories.

##### **1.2 SUBMITTALS**

- A. Product Data: Submit product description, thermal characteristics and list of materials and thickness for each service, and location.
- B. Manufacturer's Installation Instructions: Submit manufacturers published literature indicating proper installation procedures.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

##### **1.3 QUALITY ASSURANCE**

- A. Test pipe insulation for maximum flame spread index of 25 and maximum smoke developed index of not exceeding 50 in accordance with ASTM E84.
- B. Pipe insulation manufactured in accordance with ASTM C585 for inner and outer diameters.
- C. Factory fabricated fitting covers manufactured in accordance with ASTM C450.
- D. Perform Work in accordance with Florida Building Code (2010 Edition).
- E. Maintain one copy of each document on site.

##### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.
- B. Protect insulation from weather and construction traffic, dirt, water, chemical, and damage, by storing in original wrapping.

##### **1.5 ENVIRONMENTAL REQUIREMENTS**

- A. Install insulation only when ambient temperature and humidity conditions are within range recommended by manufacturer.

- B. Maintain temperature before, during, and after installation for minimum period of 24 hours.

## **1.6 WARRANTY**

- A. Furnish five year manufacturer warranty for man-made fiber.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURER**

- A. Manufacturers for Glass Fiber and Mineral Fiber Insulation :
  - 1. Johns Manville.
  - 2. CertainTeed.
  - 3. Knauf.
  - 4. Owens-Corning.
  - 5. Substitutions: Permitted.
- B. Manufacturers for Closed Cell Elastomeric Insulation :
  - 1. Aeroflex. Aerocell.
  - 2. Armacell, LLC. Armaflex.
  - 3. Nomaco. K-flex.

### **2.2 PIPE INSULATION**

- A. TYPE P-5: ASTM C534, Type I, flexible, closed cell elastomeric insulation, tubular.
  - 1. Thermal Conductivity: 0.27 at 75 degrees F.
  - 2. Operating Temperature Range: Range: Minus 70 to 180 degrees F.

### **2.3 PIPE INSULATION ACCESSORIES**

- A. Vapor Retarder Lap Adhesive: Compatible with insulation.
- B. Covering Adhesive Mastic: Compatible with insulation.

### **2.4 DUCTWORK INSULATION**

- 1. All supply and return ducts and plenums installed as part of an HVAC air distribution system shall be thermally insulated in accordance with Florida Building Code (Edition 2010).

### **2.5 DUCTWORK INSULATION JACKETS**

- A. Aluminum Duct Jacket:
  - 1. ASTM B209.
  - 2. Thickness: 0.016, 0.020, 0.025, 0.032, 0.040 inch. thick sheet.
  - 3. Finish: Smooth Embossed.
  - 4. Joining: Longitudinal slip joints and 2 inch. (50 mm) laps.
  - 5. Fittings: 0.016 inch. thick die shaped fitting covers with factory attached protective liner.

6. Metal Jacket Bands: 3/8 inch (10 mm) wide; 0.015 inch thick aluminum.; 0.010 inch thick stainless steel.
- B. Vapor Retarder Jacket:
  1. Kraft paper with glass fiber yarn and bonded to aluminized film 0.0032 inch vinyl.
  2. Water vapor transmission: ASTM E96/E96M; 0.02 1.3 perm.
  3. Secure with pressure sensitive tape.
- C. Canvas Duct Jacket: UL listed, 6 oz/sq yd (220 g/sq m), plain weave cotton fabric with fire retardant lagging adhesive compatible with insulation.

## **2.6 DUCTWORK INSULATION ACCESSORIES**

- A. Vapor Retarder Tape:
  1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
- B. Vapor Retarder Lap Adhesive: Compatible with insulation.
- C. Adhesive: Waterproof , ASTM E162 fire-retardant type.
- D. Liner Fasteners: Galvanized steel, self-adhesive pad impact applied with integral press-on head.
- E. Tie Wire: 0.048 inch (1.22 mm) stainless steel with twisted ends on maximum 12 inch (300 mm) centers.
- F. Lagging Adhesive: Fire retardant type with maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
- G. Impale Anchors: Galvanized steel, 12 gage self-adhesive pad.
- H. Adhesives: Compatible with insulation.
- I. Membrane Adhesives: As recommended by membrane manufacturer.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify piping, and ductwork has been tested before applying insulation materials.
- B. Verify surfaces are clean and dry, with foreign material removed.

### **3.2 INSTALLATION - PIPING SYSTEMS**

- A. Piping Exposed to View in Finished Spaces: Locate insulation and cover seams in least visible locations.
- B. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one hour or less. Provide intumescent

firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions. Refer to Section 07 84 00 for penetrations of assemblies with fire resistance rating greater than one hour.

- C. Piping Systems Conveying Fluids Below Ambient Temperature:
  - 1. Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.
  - 2. Furnish factory-applied or field-applied vapor retarder jackets. Secure factory-applied jackets with pressure sensitive adhesive self-sealing longitudinal laps and butt strips. Secure field-applied jackets with outward clinch expanding staples and seal staple penetrations with vapor retarder mastic.
  - 3. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor retarder adhesive or PVC fitting covers.
- D. Glass Fiber Board Insulation:
  - 1. Apply insulation close to equipment by grooving, scoring, and beveling insulation. Fasten insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
  - 2. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor retarder cement.
  - 3. Cover wire mesh or bands with cement to a thickness to remove surface irregularities.
- E. Polyisocyanurate Foam Insulation Extruded Polystyrene Insulation:
  - 1. Wrap elbows and fitting with vapor retarder tape.
  - 2. Seal butt joints with vapor retarder tape.
- F. Inserts and Shields:
  - 1. Piping 1-1/2 inches Diameter and Smaller: Install galvanized steel shield between pipe hanger and insulation.
  - 2. Piping 2 inches Diameter and Larger: Install insert between support shield and piping and under finish jacket.
    - a. Insert Configuration: Minimum 6 inches (150 mm) long, of thickness and contour matching adjoining insulation; may be factory fabricated.
    - b. Insert Material: Compression resistant insulating material suitable for planned temperature range and service.
  - 3. Piping Supported by Roller Type Pipe Hangers: Install galvanized steel shield between roller and inserts.
- G. Insulation Terminating Points:
  - 1. Coil Branch Piping 1 inch (25 mm) and Smaller: Terminate hot water piping at union upstream of the coil control valve.
  - 2. Chilled Water Coil Branch Piping: Insulate chilled water piping and associated components up to coil connection.
  - 3. Condensate Piping: Insulate entire piping system and components to prevent condensation.
- H. Closed Cell Elastomeric Insulation:
  - 1. Push insulation on to piping.
  - 2. Miter joints at elbows.
  - 3. Seal seams and butt joints with manufacturer's recommended adhesive.

4. When application requires multiple layers, apply with joints staggered.
5. Insulate fittings and valves with insulation of like material and thickness as adjacent pipe.

I. Prepare pipe insulation for finish painting. Refer to Section 09 90 00.

### **3.3 INSTALLATION - DUCTWORK SYSTEMS**

- A. Duct dimensions indicated on Drawings are finished inside dimensions.
- B. Insulated ductwork conveying air below ambient temperature:
1. Provide insulation with vapor retarder jackets.
  2. Finish with tape and vapor retarder jacket.
  3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
  4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.
- C. Insulated ductwork conveying air above ambient temperature:
1. Provide with or without standard vapor retarder jacket.
  2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.
- D. External Glass Fiber Duct Insulation:
1. Secure insulation with vapor retarder with wires and seal jacket joints with vapor retarder adhesive or tape to match jacket.
  2. Secure insulation without vapor retarder with staples, tape, or wires.
  3. Install without sag on underside of ductwork. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift ductwork off trapeze hangers and insert spacers.
  4. Seal vapor retarder penetrations by mechanical fasteners with vapor retarder adhesive.
  5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.
- E. External Elastomeric Duct Insulation:
1. Adhere to clean oil-free surfaces with full coverage of adhesive.
  2. Seal seams and butt joints with manufacturer's recommended adhesive.
  3. When application requires multiple layers, apply with joints staggered.
  4. Insulate standing metal duct seams with insulation of like material and thickness as adjacent duct surface. Apply adhesive at joints with flat duct surfaces.
  5. Lift ductwork off trapeze hangers and insert spacers.
  6. Cut insulation for tight overlapped corner joints. Support top pieces of liner at edges with side pieces.
  7. Attach insulation using steel banding or by welded pins and clips.
  8. Install insulation without sag on underside of ductwork. Use additional fasteners to prevent sagging.

**END OF SECTION**

**SECTION 23 23 00**  
**REFRIGERANT PIPING**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
1. Refrigerant piping.
  2. Unions, flanges, and couplings.
  3. Pipe hangers and supports.
  4. Refrigerant moisture and liquid indicators.
  5. Valves.
  6. Refrigerant strainers.
  7. Refrigerant pressure regulators.
  8. Refrigerant pressure relief valves.
  9. Refrigerant filter-driers.
  10. Refrigerant solenoid valves.
  11. Refrigerant expansion valves.
  12. Refrigerant receivers.
- B. Related Sections:
1. Section 07 84 00 - Firestopping: Product requirements for firestopping for placement by this section.
  2. Section 09 90 00 - Painting and Coating: Product requirements for painting for placement by this section.
  3. Section 23 05 03 - Pipes and Tubes for HVAC Piping and Equipment: Piping materials for refrigerant systems.
  4. Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment: Product requirements for pipe hangers and supports, sleeves, and firestopping for placement by this section.
  5. Section 23 05 48 - Vibration and Seismic Controls for HVAC Piping and Equipment: Product requirements for Vibration Isolation for placement by this section.
  6. Section 23 05 53 - Identification for HVAC Piping and Equipment: Product requirements for pipe identification for placement by this section.
  7. Section 23 07 00 - HVAC Insulation: Product requirements for Piping Insulation for placement by this section.

**1.2 REFERENCES**

- A. Air-Conditioning and Refrigeration Institute:
1. ARI 495 - Refrigerant Liquid Receivers.
  2. ARI 710 - Liquid-Line Driers.
  3. ARI 730 - Flow-Capacity Rating and Application of Suction-Line Filters and Filter Driers.
  4. ARI 750 - Thermostatic Refrigerant Expansion Valves.
  5. ARI 760 - Solenoid Valves for Use with Volatile Refrigerants.

- B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
  - 1. ASHRAE 15 - Safety Code for Mechanical Refrigeration.
- C. American Society of Mechanical Engineers:
  - 1. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
  - 2. ASME B16.26 - Cast Copper Alloy Fittings for Flared Copper Tubes.
  - 3. ASME B31.5 - Refrigeration Piping.
  - 4. ASME Section VIII - Boiler and Pressure Vessel Code - Pressure Vessels.
- D. ASTM International:
  - 1. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - 2. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
  - 3. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
  - 4. ASTM B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
  - 5. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers.
  - 6. ASTM B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
- E. American Welding Society:
  - 1. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.
  - 2. AWS D1.1 - Structural Welding Code - Steel.
- F. Manufacturers Standardization Society of the Valve and Fittings Industry:
  - 1. MSS SP 58 - Pipe Hangers and Supports - Materials, Design and Manufacturer.
  - 2. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.
  - 3. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
- G. Underwriters Laboratories Inc.:
  - 1. UL 429 - Electrically Operated Valves.

### **1.3 SYSTEM DESCRIPTION**

- A. Where more than one piping system material is specified, provide compatible system components and joints. Use non-conducting dielectric connections when joining dissimilar metals in systems.
- B. Provide flanges, unions, or couplings at locations requiring servicing. Use unions, flanges, or couplings downstream of valves and at equipment connections. Do not use direct welded or threaded connections to valves or equipment.
- C. Provide pipe hangers and supports in accordance with ASME B31.5, ASTM F708, MSS SP 58, MSS SP 69, and MSS SP 89.

### **1.4 SUBMITTALS**

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.



- B. Shop Drawings: Indicate layout of refrigeration piping system, including equipment, critical dimensions, and sizes.
- C. Product Data:
  - 1. Piping: Submit data on pipe materials, fittings, and accessories.
  - 2. Valves: Submit manufacturers catalog information with valve data and ratings for each service.
  - 3. Hangers and Supports: Submit manufacturers catalog information including load capacity.
  - 4. Refrigerant Specialties: Submit manufacturers catalog information including capacity, component sizes, rough-in requirements, and service sizes for the following:
    - a. Refrigerant moisture and liquid indicators.
    - b. Refrigerant strainers.
    - c. Refrigerant pressure regulators.
    - d. Refrigerant pressure relief valves.
    - e. Refrigerant filter-driers.
    - f. Refrigerant solenoid valves.
    - g. Refrigerant expansion valves.
- D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

## **1.5 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: Submit instructions for installation and changing components, spare parts lists, exploded assembly views.

## **1.6 QUALITY ASSURANCE**

- A. Perform Work in accordance with ASME B31.5 code for installation of refrigerant piping systems.

## **1.7 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
- B. Fabricator or Installer: Company specializing in performing Work of this section with minimum three years experience.

## **1.8 DELIVERY, STORAGE, AND HANDLING**

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Dehydrate and charge refrigeration components including piping and receivers, seal prior to shipment. Maintain seal until connected into system.
- C. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

- D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- E. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the Work, and isolating parts of completed system.

## **1.9 FIELD MEASUREMENTS**

- A. Verify field measurements prior to fabrication.

## **1.10 WARRANTY**

- A. Section 01 77 00 - Execution and Closeout Requirements: Product warranties and product bonds.
- B. Furnish five year manufacturer warranty for valves excluding packing.

## **PART 2 PRODUCTS**

### **2.1 REFRIGERANT PIPING**

- A. Copper Tubing: ASTM B280, drawn.
  - 1. Fittings: ASME B16.22 wrought copper.
  - 2. Joints: Braze, AWS A5.8 BCuP silver/phosphorus/copper alloy with melting range 1190 to 1480 degrees F.
- B. Copper Tubing to 7/8 inch OD: ASTM B88, Type K, annealed.
  - 1. Fittings: ASME B16.26 cast copper, compression type.
  - 2. Joints: Flared.

### **2.2 UNIONS, FLANGES, AND COUPLINGS**

- A. 2 inches and Smaller:
  - 1. Copper Pipe: Bronze, soldered joints.
- B. 2-1/2 inches and Larger:
  - 1. Copper Piping: Bronze.
  - 2. Gaskets: 1/16 inch (1.6 mm) thick preformed neoprene.
- C. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier.

### **2.3 PIPE HANGERS AND SUPPORTS**

- A. Manufacturers:
  - 1. Miro
  - 2. Substitutions: Engineer approved equivalent.
- B. Conform to ASME B31.5, ASTM F708, MSS SP 58, MSS SP 69, and MSS SP 89.
- C. Copper Pipe Support: Carbon steel rings, adjustable, copper plated.

- D. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.
- E. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

## 2.4 REFRIGERANT MOISTURE AND LIQUID INDICATORS

- A. Indicators:
  - 1. Port: **Single**, UL listed.
  - 2. Body: Copper or brass, flared or solder ends.
  - 3. Sight glass: Color-coded paper moisture indicator with removable element cartridge and plastic cap.

## 2.5 VALVES

- A. Refrigerant Check Valves:
  - 1. Globe Type:
    - a. Cast bronze or forged brass body, forged brass cap with neoprene seal, brass guide and disc holder, phosphor-bronze or stainless steel spring, teflon seat disc.
  - 2. Straight Through Type:
    - a. Spring, neoprene seat.

## 2.6 REFRIGERANT STRAINERS

- A. Straight Line or Angle Line Type:
  - 1. Brass or steel shell, steel cap and flange, and replaceable cartridge, with screen of stainless steel wire or monel reinforced with brass.
- B. Straight Line, Non-Cleanable Type:
  - 1. Steel shell, copper plated fittings, stainless steel wire screen.

## 2.7 REFRIGERANT PRESSURE REGULATORS

- A. Brass body, stainless steel diaphragm, direct acting or[pilot operated with remote pressure pilot, adjustable over .0 to 80 psig range.

## 2.8 REFRIGERANT PRESSURE RELIEF VALVES

- A. Straight Through or Angle Type: Brass body and disc, neoprene seat, factory sealed and stamped with ASME UV and National Board Certification NB.

## 2.9 REFRIGERANT FILTER-DRIERS

- A. Replaceable Cartridge Angle Type:
  - 1. Shell: ARI 710, UL listed, **brass**, removable cap.
  - 2. Filter Cartridge: Pleated media with integral end rings, stainless steel support.
  - 3. Filter/Dryer Cartridge: Pleated media with solid core sieve with activated alumina.

4. Wax Removal Cartridge: Molded bonded core of activated charcoal with integral gaskets.
- B. Permanent Straight Through Type:
  1. ARI 710, UL listed, steel shell with molded desiccant filter core.

## **2.10 REFRIGERANT SOLENOID VALVES**

- A. Valve: ARI 760, pilot operated, copper or brass body and internal parts, synthetic seat, stainless steel stem and plunger assembly, integral strainer, with flared, solder, or threaded ends. Stem designed to allow manual operation in case of coil failure.
- B. Coil Assembly: UL 429, UL listed, replaceable with molded electromagnetic coil, moisture and fungus proof, with surge protector and color coded lead wires, integral junction box with pilot light.
- C. Electrical Characteristics: single phase, 60 Hz.

## **2.11 REFRIGERANT EXPANSION VALVES**

- A. Angle or Straight Through Type: ARI 750; design suitable for refrigerant, brass body, internal or external equalizer, bleed hole, mechanical pressure limit (maximum operating pressure MOP feature), adjustable superheat setting, replaceable inlet strainer, with replaceable capillary tube and remote sensing bulb and remote bulb well.
- B. Selection: Evaluate refrigerant pressure drop through system to determine available pressure drop across valve. Select valve for maximum load at design operating pressure and minimum .10 degrees F. superheat. Select to avoid being undersized at full load and oversized at part load.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

### **3.2 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.

### **3.3 INSTALLATION - PIPE HANGERS AND SUPPORTS**

- A. Install hangers and supports in accordance with ASME B31.5, ASTM F708, and MSS SP 89.

- B. Support horizontal piping hangers as scheduled.
- C. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
- D. Place hangers within 12 inches of each horizontal elbow.
- E. Install hangers to allow 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
- F. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
- G. Where installing several pipes in parallel and at same elevation, provide multiple pipe hangers or trapeze hangers.
- H. Provide copper plated hangers and supports for copper piping.
- I. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

### **3.4 INSTALLATION - ABOVE GROUND PIPING SYSTEMS**

- A. Route piping parallel to building structure and maintain gradient.
- B. Install piping to conserve building space, and not interfere with use of space.
- C. Group piping whenever practical at common elevations.
- D. Sleeve pipe passing through partitions, walls and floors.
- E. Install pipe identification.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Provide access where valves and fittings are not exposed.
- H. Arrange refrigerant piping to return oil to compressor. Provide traps and loops in piping, and provide double risers as required. Slope horizontal piping 0.40 percent in direction of flow.
- I. Flood refrigerant piping system with nitrogen when brazing.
- J. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.
- K. Install valves with stems upright or horizontal, not inverted.
- L. Insulate piping and equipment.

- M. Provide replaceable cartridge filter-dryers, with isolation valves and bypass with valve.
- N. Locate expansion valve sensing bulb immediately downstream of evaporator on suction line.
- O. Provide external equalizer piping on expansion valves with refrigerant distributor connected to evaporator.
- P. Install flexible connectors at right angles to axial movement of compressor, parallel to crankshaft.
- Q. Fully charge completed system with refrigerant after testing.
- R. Follow ASHRAE 15 procedures for charging and purging of systems and for disposal of refrigerant.
- S. Install refrigerant piping in accordance with ASME B31.5.

### **3.5 INSTALLATION - REFRIGERANT SPECIALTIES**

- A. Refrigerant Liquid Indicators:
  - 1. Install line size liquid indicators in main liquid line downstream of condenser.
  - 2. When receiver is provided, install line size liquid indicators in liquid line downstream of receiver.
  - 3. Install line size liquid indicators downstream of liquid solenoid valves.
- B. Refrigerant Valves:
  - 1. Install service valves on compressor suction and discharge.
  - 2. Install gage taps at compressor inlet and outlet.
  - 3. Install gage taps at hot gas bypass regulators, inlet and outlet.
  - 4. Install check valves on compressor discharge.
  - 5. Install check valves on condenser liquid lines on multiple condenser systems.
  - 6. Install refrigerant charging valve in liquid line between receiver shut-off valve and expansion valve.
- C. Strainers:
  - 1. Install line size strainer upstream of each automatic valve.
  - 2. Where multiple expansion valves with integral strainers are used, install single main liquid-line strainer.
  - 3. On steel piping systems, install strainer in suction line.
  - 4. Install shut-off valves on each side of strainer.
- D. Install pressure relief valves on ASME receivers. Install relief valve discharge piping to terminate outdoors.
- E. Filter-Dryers:
  - 1. Install permanent filter-dryers in low temperature systems.
  - 2. Install permanent filter-dryer in systems containing hermetic compressors.
  - 3. Install replaceable cartridge filter-dryer vertically in liquid line adjacent to receivers.

4. Install replaceable cartridge filter-dryer upstream of each solenoid valve.

F. Solenoid Valves:

1. Install in liquid line of systems operating with single pump-out or pump-down compressor control.
2. Install in liquid line of single or multiple evaporator systems.
3. Install in oil bleeder lines from flooded evaporators to stop flow of oil and refrigerant into suction line when system shuts down.

**3.6 FIELD QUALITY CONTROL**

- A. Test refrigeration system in accordance with ASME B31.5.
- B. Pressure test refrigeration system with dry nitrogen to 200 psig.
- C. Repair leaks.
- D. Retest until no leaks are detected.

**END OF SECTION**

**SECTION 23 30 00**  
**HVAC AIR DISTRIBUTION**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Ductwork.
  - 2. Ductwork accessories.
  - 3. Fans.
  - 4. Terminal units.
  - 5. Air Outlets.
  - 6. Filters.

**1.2 SUBMITTALS**

- A. Shop Drawings: Submit duct fabrication drawings. Indicate products fabricated for Project specific application.
- B. Product Data:
  - 1. Submit sizes, capacities, materials, controls and connections to other work.
  - 2. Submit catalog performance ratings, construction, electric and duct connections, flashing and dimensions for fans and exhausters.
- C. Operation and Maintenance Data: Submit instructions for lubrication, motor and drive replacement, spare parts lists, and wiring diagrams.
- D. Samples: Submit two samples of replacement filter media with frame.
- E. Field Quality Control Reports
- F. Manufacturer's Installation Instructions: Submit relevant instructions.

**1.3 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: Submit instructions for filter replacement, spare parts lists, and wiring diagrams.

**1.4 QUALITY ASSURANCE**

- A. Perform Work in accordance with Florida Building Code (2010 Edition).
- B. Maintain one copy of each document on site.



## PART 2 PRODUCTS

### 2.1 DUCTWORK

#### A. Duct Materials:

1. Galvanized Steel Ducts: ASTM A653/A653M galvanized steel sheet, lock-forming quality.
  - a. Finish of steel components: Hot dipped galvanized steel with minimum 2.10 oz/sf (600 g/sq m) zinc coating both sides measured in accordance with ASTM A90/A90M and zinc chromated aluminum paint.
2. Aluminum Ducts: ASTM B209 (ASTM B209M); aluminum sheet, alloy 3003-H14. Aluminum Connectors and Bar Stock: Alloy 6061-T6 or of equivalent strength.
3. Fasteners: Rivets, bolts, or sheet metal screws.
4. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

#### B. Ductwork Fabrication:

1. Fabricate and support rectangular ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible and as indicated on Drawings. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
2. Fabricate and support round ducts with longitudinal seams in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible (Round Duct Construction Standards), and as indicated on Drawings. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
3. Construct T's, bends, and elbows with minimum radius 1-1/2 times centerline duct width. Where not possible and where rectangular elbows are used, provide airfoil turning vanes. Where acoustical lining is indicated, furnish turning vanes of perforated metal with glass fiber insulation.
4. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
5. Fabricate continuously welded round and oval duct fittings two gages heavier than duct gages indicated in SMACNA Standard. Minimum .4 inch. (100 mm). cemented slip joint, brazed or electric welded. Prime coat welded joints.
6. Provide standard 45-degree lateral wye takeoffs. When space does not allow 45-degree lateral wye takeoff, use 90-degree conical tee connections.
7. Seal joints between duct sections and duct seams with welds, gaskets, mastic adhesives, mastic plus embedded fabric systems, or tape.
  - a. Sealants, Mastics and Tapes: Conform to UL 181A. Provide products bearing appropriate UL 181A markings.
  - b. Do not provide sealing products not bearing UL approval markings.

### 2.2 DUCT ACCESSORIES

#### A. Volume Control Dampers:

1. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated on Drawings.

2. Fabricate splitter dampers of material matching duct gage to 24 inches (600 mm) size in each direction, and two gages heavier for larger sizes. Secure with continuous hinge or rod. Operate with minimum 1/4 inch (6 mm) diameter rod.
  3. Fabricate single blade dampers for duct sizes to 12 x 30 inch (300 x 760 mm).
  4. Fabricate multi-blade damper of opposed blade pattern with maximum blade sizes 8 x 72 inch (200 x 1825 mm). Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
  5. Except in round ductwork 12 inches (300 mm) and smaller, furnish end bearings.
  6. Furnish locking, indicating quadrant regulators on single and multi-blade dampers. Where width exceeds 30 inches (750 mm), furnish regulator at both ends.
- B. Turning Devices and Extractors:
1. Multi-blade device with blades aligned in short dimension; steel or aluminum construction; with individually adjustable blades, mounting straps.
  2. Multi-blade device with radius blades attached to pivoting frame and bracket, steel or aluminum construction, with push-pull operator strap.
- C. Flexible Duct Connections:
1. UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, approximately 3 inches (75 mm) wide, crimped into metal edging strip.
- D. Duct Access Doors:
1. Fabricate in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
  2. Access doors smaller than 12 inches (300 mm) square secured with sash locks. Access doors with sheet metal screw fasteners are not acceptable.
- E. Dynamic Fire Dampers:
1. Manufacturers: Ruskin, Greenheck.
  2. Fabricate in accordance with NFPA 90A and UL 555.
  3. Fire Resistance: 1-1/2 hours.
  4. Dynamic Closure Rating: Dampers classified for dynamic closure to 2000 fpm (10 m/s) and 4 inches wg (1 kPa) static pressure.
  5. Construction:
    - a. Integral Sleeve Frame: Minimum 20 gage (0.9 mm) roll formed galvanized steel. Blades:
      - 1) Style: Curtain type.
      - 2) Action: Spring or gravity closure upon fusible link release.
      - 3) Material: Minimum 24 gage (0.6 mm) roll formed, galvanized steel.
    - b. Closure Springs: Type 301 stainless steel, constant force type, if required.
  6. Fusible Link Release Temperature: 165 degrees F. electro-thermal link with 24 volt power.
  7. Mounting: Vertical or horizontal as indicated on Drawings.
  8. Duct Transition Connection, Damper Style:
    - a. A style - rectangular connection, frame and blades in air stream.
    - b. B style - rectangular connection, blades out of air stream, high free area.
    - c. G style - A style connection, grille mounting tabs at end of sleeve for grille.
    - d. CR style - round connection, sealed.

- e. CO style - oval connection, sealed.
- f. R style - round connection, blades in air stream, non-sealed.
- g. LR style - round connection, blades out of air stream, non-sealed.
- h. LO style - oval connection, non-sealed.
- 9. Finish: Mill galvanized.

F. Static Fire Dampers:

- 1. Manufacturers : Manufacturers : Ruskin, Greenheck.
  - a. Substitutions: Permitted.
- 2. Fire Rating: UL 555 classified and labeled as a 1-1/2 hour static fire damper.
- 3. Air Flow Rating: UL approved for dual directional air flow.
- 4. Integral Sleeve Frame: Minimum 20 gage (0.9 mm) by 12 inches (305 mm) roll formed, galvanized steel.
  - a. Factory Sealant: Apply to dampers in HVAC systems with pressures to maximum 4 inches wg (1 kPa).
- 5. Blades:
  - a. Style: Curtain type, in airstream.
  - b. Action: Spring or gravity closure upon fusible link release.
  - c. Orientation: Horizontal.
  - d. Material: Minimum 24 gage (0.6 mm) roll formed, galvanized steel.
- 6. Closure Springs: Type 301 stainless steel, constant force type, if required.
- 7. Temperature Release Device:
  - a. Fusible link, 165 degrees F. Electro-thermal link, 24 VAC or VDC.
  - b. Mounting: Vertical or Horizontal.
- 8. Duct Transition Connection, Damper Style:
  - a. A style - rectangular connection, frame and blades in air stream.
  - b. B style - rectangular connection, blades out of air stream, high free area.
  - c. G style - A style connection, grille mounting tabs at end of sleeve for grille.
  - d. R style - round connection, blades in air stream, non-sealed.
  - e. RA style - round connection, frame and blades in air stream.
  - f. LR style - round connection, blades out of air stream, non-sealed.
  - g. LO style - oval connection, non-sealed.
- 9. Finish: Mill galvanized.
- 10. Picture Frame Mounting Angles:
  - a. One-piece, roll formed retaining angles.
  - b. Factory matched and shipped attached to damper.

G. Back-draft Dampers:

- 1. Gravity back-draft dampers size 18 x 18 inches (457 x 457 mm) or smaller, furnished with air moving equipment, furnish of air moving equipment manufacturers standard construction.
- 2. Fabricate multi-blade, parallel action gravity balanced back-draft dampers of galvanized steel, or extruded aluminum, with center pivoted blades, with sealed edges, linked together, steel ball bearings, and plated steel pivot pin.

## 2.3 FANS

A. Downblast Centrifugal Roof Fans:

- 1. Manufacturer: Greenheck, Cook.
  - a. Substitutions: Permitted.

2. Fan Unit: Downblast type. V-belt or direct drive, with spun aluminum or galvanized steel with baked-on enamel fiberglass reinforced plastic housing; resilient mounted motor; aluminum wire bird screen; square base to suit roof curb with continuous curb gaskets.
3. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheave selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.
4. Motor: (refer to fan schedules on drawings).
5. Roof Curb: (refer to fan schedules on drawings and structural plans).
6. Disconnect Switch: Factory wired, non-fusible, in fan housing for thermal overload protected motor, NEMA 250 enclosure.
7. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked.
8. Accessories:
  - a. Fan speed controller.

B. Centrifugal Wall Fans:

1. Manufacturer: Greenheck, Cook.
  - a. Substitutions: Permitted.
2. Fan Unit: V-belt or direct drive with spun aluminum housing; resiliently mounted motor; aluminum wire bird screen.
3. Sheaves: For V-belt drives, provide cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.
4. Motor: (refer to fan schedule on mechanical plans).
5. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor NEMA 250 enclosure.
6. Accessories:
  - a. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked.
  - b. Fan speed controller.

C. Ceiling Fans:

1. Manufacturer: Greenheck, Cook.
  - a. Substitutions: Permitted.
2. Centrifugal Fan Unit: Direct driven with galvanized steel housing lined with 1/2 inch. acoustic insulation, resilient mounted motor, gravity backdraft damper in discharge opening, integral outlet duct collar.
3. Disconnect Switch: Cord and plug in housing or Fan mounted toggle switch for thermal overload protected motor.
4. Grille: Aluminum with baked white enamel finish.
5. Wheel: Centrifugal forward curved type constructed of injection molded or polypropylene resin.
6. Motor: Open drip proof type with permanently lubricated sealed bearings and thermal overload protection.
7. Accessories:
  - a. Wall cap with damper, round duct inlet.
  - b. Wall cap with rectangular duct inlet.
  - c. Eave elbow.

- d. Roof jack constructed of corrosion resistant, galvanized steel with baked enamel finish.
  - e. Roof cap.
  - f. Filter box.
  - g. Brick vent constructed of extruded aluminum with inlet screen.
  - h. Rubber-in-shear vibration isolator.
  - i. Ceiling radiation damper.
  - j. Fan speed controller.
  - k. Time delay relay.
- D. Inline Ceiling Fans:
- 1. Manufacturer: Greenheck, Cook.
    - a. Substitutions: Permitted.
  - 2. Configuration: Inline.
  - 3. Centrifugal Fan Unit: Direct driven with galvanized steel housing lined with 1/2 inch acoustic insulation, resilient mounted motor, gravity backdraft damper in discharge opening, integral inlet and outlet duct collar.
  - 4. Disconnect Switch: Cord and plug in housing or Fan mounted toggle switch for thermal overload protected motor.
  - 5. Wheel: Double width, double inlet Centrifugal forward curved type constructed of injection molded or polypropylene resin.
  - 6. Motor: Open drip proof type with permanently lubricated sealed bearings and thermal overload protection, mounted on rubber-shear isolators.

## 2.4 AIR OUTLETS AND INLETS

- A. Manufacturers :
- 1. Titus.
  - 2. Price.
  - 3. Naylor.
  - 4. Substitutions: Permitted.
- B. Ceiling Diffusers: Refer to Air Distribution Schedule on plans.
- C. Registers/Grilles: Refer to Air Distribution Schedule on plans.
- D. Louvers: 4 inches (100 mm) deep with blades on 45 degree slope, channel frame, birds-screen with 1/2 inch (13 mm) square mesh for exhaust and 3/4 inch (19 mm) for intake.
- 1. Material: Aluminum.
  - 2. Finish: (As per Architectural Plan).
  - 3. Installation: Refer to installation details on plans.

## 2.5 FILTERS

- A. Manufacturers :
- 1. Flanders, Purolator, Airguard, Filtrair, Filtration Group.
  - 2. Substitutions: Permitted.
  - 3. Disposable Panel Filters: Fiber blanket, factory sprayed with flameproof, non-drip, non-volatile adhesive.

4. Performance Rating: 500 fpm (2.54 m/s) face velocity.

B. Filter Gages:

1. Direct Reading Dial: 3-1/2 inch (90 mm) diameter diaphragm actuated dial in metal case, vent valves, black figures on white background.
2. Accessories: Static pressure tips with integral compression fittings, 1/4 inch (6 mm) tubing, 2-way or 3-way vent valves.

## 2.6 EXAMINATION

- A. Verify sizes of equipment connections before fabricating transitions.
- B. Verify rated walls are ready for fire damper installation.
- C. Verify ducts and equipment installation are ready for accessories.
- D. Check location of air outlets and inlets and make necessary adjustments in position to conform to architectural features, symmetry, and lighting arrangement.

## 2.7 INSTALLATION

- A. Metal Ducts: Install in accordance with SMACNA Duct Construction Standards - Metal and Flexible.
- B. Connect flexible ducts to metal ducts with liquid adhesive plus tape.
- C. Use crimp joints with or without bead for joining round duct sizes 8 inch (200 mm) and smaller with crimp in direction of airflow.
- D. Fiberglass Ducts: Install in accordance with SMACNA Fibrous Glass Duct Construction Standards.
- E. Install flexible connections immediately adjacent to fans and motorized equipment. Install flexible connections specified between fan inlet and discharge ductwork. Prevent flexible connectors being in tension while running.
- F. Install back-draft dampers on discharge of exhaust fans.
- G. Prevent passage of unfiltered air around filters by installing felt, rubber, or neoprene gaskets.
- H. Install filter gage static pressure tips upstream and downstream of filters. Mount filter gages on outside of filter housing or filter plenum, in accessible position. Adjust and level.
- I. Cut openings in ductwork to accommodate thermometers and controllers. Cut pitot tube openings for testing of systems, complete with metal can with spring device or screw to eliminate against air leakage.
- J. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities. Apply duct insulation specified in Section 22 07 00.

- K. During construction install temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- L. Install fire dampers at locations as indicated on Drawings. Install with perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
- M. Access Doors: Install access doors as requested by drawings.
  - 1. Spaced every 50 feet (15 m) of straight duct.
  - 2. Upstream of each elbow.
  - 3. Upstream of each reheat coil.
  - 4. Before and after each duct mounted filter.
  - 5. Before and after each duct mounted coil.
  - 6. Before and after each duct mounted fan.
  - 7. Before and after each automatic control damper.
  - 8. Downstream of each VAV box.
  - 9. Install at locations for cleaning kitchen exhaust ductwork in accordance with NFPA 96.
- N. Access Door Sizes: Install minimum 8 x 8 inch. Review locations prior to fabrication.
  - 1. Mark access doors for fire and smoke dampers on outside surface, with minimum 1/2 inch (13 mm) high letters reading: FIRE/SMOKE DAMPER, SMOKE DAMPER, OR FIRE DAMPER.
- O. Install fire dampers , combination fire and smoke dampers and smoke dampers at locations as indicated on Drawings. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.
  - 1. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92A.
  - 2. Install dampers square and free from racking with blades running horizontally.
  - 3. Do not compress or stretch damper frame into duct or opening.
  - 4. Handle damper using sleeve or frame. Do not lift damper using blades, actuator, or jack shaft.
- P. Support terminal units individually from structure. Do not support from adjacent ductwork. Install with minimum of 5 ft. (1.5 m) of 2 inch (50 mm) thick lined ductwork downstream of units.
- Q. Install balancing dampers on duct take-off to diffusers and grilles and registers, regardless of whether dampers are specified as part of diffuser, or grille and register assembly.
- R. Do not locate air registers, diffusers or grilles in floors of toilet or bathing rooms.
- S. Paint ductwork visible behind air outlets and inlets matte black in accordance with Section 09 90 00.
- T. Do not operate fans until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

- U. Install fans with resilient mountings and flexible electrical leads.
- V. Install sheaves required for final air balance.
- W. Install safety screen where fan inlet or outlet is exposed.

## **2.8 TESTING**

- A. For ductwork designed for 3 inches w.c. (75 mm w.c.) above ambient, pressure test minimum 25 percent of ductwork after duct cleaning, but before duct insulation is applied or ductwork is concealed. Submit test report.
  - 1. Test in accordance with SMACNA HVAC Air Duct Leakage Test Manual.
  - 2. Maximum Allowable Leakage: In accordance with ICC IECC.

**END OF SECTION**



**SECTION 23 81 03****PACKAGED ROOFTOP AIR CONDITIONING UNITS - SMALL CAPACITY****PART 1 GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Packaged rooftop air conditioning unit.
  - 2. Roof curb.
- B. Related Sections:
  - 1. Section 23 05 48 - Vibration Controls for HVAC Piping and Equipment: Vibration isolators.

**1.2 REFERENCES**

- A. Air-Conditioning and Refrigeration Institute:
  - 1. ARI 210/240 - Unitary Air-Conditioning and Air-Source Heat Pump Equipment.
  - 2. ARI 270 - Sound Rating of Outdoor Unitary Equipment.
  - 3. ARI 340/360 - Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment.
- B. Air Movement and Control Association International, Inc.:
  - 1. AMCA 500 - Test Methods for Louvers, Dampers, and Shutters.
- C. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
  - 1. ASHRAE 52.1 - Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter.
  - 2. ASHRAE 62 - Ventilation for Acceptable Indoor Air Quality.
  - 3. ASHRAE 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings.
- D. ASTM International:
  - 1. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.
- E. National Fire Protection Association:
  - 1. NFPA 54 - National Fuel Gas Code.
  - 2. NFPA 58 - Liquefied Petroleum Gas Code.
  - 3. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilating Systems.

**1.3 DEFINITIONS**

- A. Energy Efficiency Ratio (EER) - Ratio of net cooling capacity in Btuh to total rate of electric input in watts under designated operating conditions.

- B. Seasonal Energy Efficiency Ratio (SEER) - Total cooling output of an air conditioner during its normal annual usage period for cooling (in Btu) divided by total electric energy input during the same period (in Wh).

#### **1.4 SUBMITTALS**

- A. Product Data: Submit data indicating:
  - 1. Cooling and heating capacities.
  - 2. Dimensions.
  - 3. Weights.
  - 4. Rough-in connections and connection requirements.
  - 5. Duct connections.
  - 6. Electrical requirements with electrical characteristics and connection requirements.
  - 7. Controls.
  - 8. Accessories.
- B. Manufacturer's Installation Instructions: Submit assembly, support details, connection requirements, and include start-up instructions.

#### **1.5 CLOSEOUT SUBMITTALS**

- A. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, installation instructions, and maintenance and repair data.

#### **1.6 QUALITY ASSURANCE**

- A. Cooling Capacity: Rate in accordance with ARI 210/240.
- B. Sound Rating: Measure in accordance with ARI 270.
- C. Insulation and adhesives: Meet requirements of NFPA 90A.
- D. Performance Requirements: Conform to minimum EER or SEER prescribed by ASHRAE 90.1 when tested in accordance with ARI 210/240.
- E. Outside Air Damper Leakage: Test in accordance with AMCA 500.

#### **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Accept units on site. Inspect for damage.
- B. Protect units from damage by storing off roof until roof mounting curbs are in place.

#### **1.8 COORDINATION**

- A. Coordinate installation of roof curbs with roof structure, roof deck and roof membrane installation.

#### **1.9 WARRANTY**

- A. Furnish five year manufacturers warranty for compressors.

## 1.10 EXTRA MATERIALS

- A. Furnish one set filters for each unit.

## PART 2 PRODUCTS

### 2.1 ROOFTOP AIR CONDITIONING UNITS

- A. Manufacturers :
  - 1. Carrier.
  - 2. Trane.
  - 3. York (Johnson Controls)
  - 4. Daikin
  - 5. Substitutions: Engineer approved equivalent.
- B. Product Description: Self-contained, packaged, factory assembled and wired, consisting of roof curb, cabinet, supply fan, refrigerant cooling coil, compressor, refrigeration circuit, condenser, electric heating coil, air filters, mixed air casing, controls, and accessories.
- C. Configuration: Downflow air delivery.
- D. Roof Mounting Curb: 14 inch minimum high, galvanized steel, channel frame with gaskets, nailer strips. Full perimeter type for mounting under entire unit.
- E. Cabinet:
  - 1. Designed for outdoor installation with weatherproof construction.
  - 2. Panels: Constructed of galvanized steel with baked enamel finish meeting salt spray test in accordance with ASTM B117. Furnish access doors or removable access panels.
  - 3. Insulation: Factory applied to exposed vertical and horizontal panel; glass fiber with edges protected from erosion.
- F. Supply Fan: Forward curved centrifugal type, resiliently mounted. Motor permanently lubricated with built-in thermal overload protection.
- G. Evaporator Coil: Constructed of copper tubes expanded onto aluminum fins. Galvanized drain pan with piping connection. Factory leak tested under water.
- H. Compressor: Hermetically sealed, resiliently mounted with positive lubrication, and internal motor overload protection.
- I. Refrigeration circuit: Furnish thermal expansion valve, filter-drier, suction, discharge, and liquid line service valves with gauge ports, high and low pressure safety controls. Dehydrate and factory charge with oil and refrigerant.
- J. Condenser:
  - 1. Coil: Copper tube aluminum fin coil assembly Factory leak tested under water. Furnish coil with corrosion resistant coating capable of withstanding salt spray test of 1000 hours in accordance with ASTM B117.

2. Condenser Fan: Direct drive propeller fans statically and dynamically balanced. Wired to operate with compressor. Motor permanently lubricated with built-in thermal overload protection.
- K. Electric Heating Coil:
1. Finned tube heating elements or Helical nickel-chrome resistance wire coil heating elements with refractory ceramic support bushings easily accessible with automatic reset thermal cut-out, built-in contactors, galvanized steel frame, control circuit transformer and fuse, Single source power connection. Number of stages as indicated on Drawings.
  2. Controls: Start supply fan before electric elements are energized and continue operating until air temperature reaches minimum setting, with switch for continuous fan operation.
- L. Air Filters: .1 thick glass fiber disposable media in metal frames.
- M. Mixed Air Casing:
1. Outside Air Damper: Automatic, two position. Interlocked to open when supply fan starts. Furnish rain hood with screen.
- N. Controls:
1. Thermostat: 7 day programmable electronic space thermostat with 1 stage heating and 1 stage cooling with changeover and heating setback and cooling setup capability. Furnish system selector switch heat-off-cool and fan control switch, auto-on.
- O. Accessories:
1. Convenience Outlet: Factory installed, 115 volt, 15 amp, GFCI type, internally mounted.
- P. Disconnect Switch: Factory mounted, non-fused type, interlocked with access door, accessible from outside unit, with power lockout capability.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify roof curbs are installed.

### **3.2 INSTALLATION**

- A. Roof Curb:
1. Assemble roof curb.
  2. Install roof curb level.
  3. Coordinate curb installation and flashing.
  4. Install units on roof curb providing watertight enclosure to protect ductwork and utility services.
  5. Install gasket material between unit base and roof curb.
- B. Connect units to supply and return ductwork with flexible connections.

- C. Install condensate piping with trap and route from drain pan to nearest roof drain or condensate drainage system.
- D. Install components furnished loose for field mounting.
- E. Install electrical devices furnished loose for field mounting.
- F. Install control wiring between unit and field installed accessories.

### **3.3 MANUFACTURER'S FIELD SERVICES**

- A. Furnish initial start-up and shutdown during first year of operation, including routine servicing and checkout.

### **3.4 CLEANING**

- A. Vacuum clean coils and inside of unit cabinet.
- B. Install new throwaway filters in units at Substantial Completion.

### **3.5 DEMONSTRATION**

- A. Demonstrate unit operation and maintenance.

**END OF SECTION**

**SECTION 23 81 26**  
**SPLIT-SYSTEM AIR-CONDITIONERS**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Air handling unit.
  - 2. Condensing unit.

**1.2 SUBMITTALS**

- A. Product Data: Submit data indicating:
  - 1. Cooling and heating capacities.
  - 2. Dimensions.
  - 3. Weights.
  - 4. Rough-in connections and connection requirements.
  - 5. Duct connections.
  - 6. Electrical requirements with electrical characteristics and connection requirements.
  - 7. Controls.
  - 8. Accessories.
- B. Manufacturer's Installation Instructions: Submit assembly, support details, connection requirements, and include start-up instructions.
- C. Manufacturer's Field Reports: Submit start-up report.

**1.3 CLOSEOUT SUBMITTALS**

- A. Project Record Documents: Record actual locations of controls installed remotely from units.
- B. Operation and Maintenance Data: Submit manufacturer's descriptive literature, operating instructions, installation instructions, and maintenance and repair data.

**1.4 QUALITY ASSURANCE**

- A. Performance Requirements: Energy Efficiency Rating (EER) not less than prescribed by ASHRAE 90.1 Cooling Capacity: Rate in accordance with ARI 210/240.
- B. Sound Rating: Measure in accordance with ARI 270.
- C. Insulation and adhesives: Meet requirements of NFPA 90A.
- D. Maintain one copy of each document on site.

**1.5 WARRANTY**

- A. Furnish five year manufacturers warranty for compressors.

**1.6 MAINTENANCE SERVICE**

- A. Furnish service and maintenance of equipment for one year from Date of Substantial Completion. Include maintenance items as shown in manufacturer's operating and maintenance data, including filter replacements, fan belt replacement, and controls checkout and adjustments.
- B. Furnish 24-hour emergency service on breakdowns and malfunctions for this maintenance period.

**PART 2 PRODUCTS****2.1 AIR HANDLING UNIT**

- A. Configuration: As indicated on Drawings.
- B. Evaporator Fan: Motor permanently lubricated with built-in thermal overload protection.
- C. Evaporator Coil: Constructed of copper tubes expanded onto aluminum fins. Factory leak tested under water. Removable, PVC construction, double-sloped drain pan with piping connections on both sides.
- D. Refrigeration System: Refrigeration circuit controlled by factory installed thermal expansion valve.

**2.2 CONDENSING UNIT**

- A. General: Factory assembled and tested air cooled condensing units, consisting of casing, compressors, condensers, coils, condenser fans and motors, and unit controls.
- B. Unit Casings: Exposed casing surfaces constructed of galvanized steel with manufacturer's standard baked enamel finish. Designed for outdoor installation and complete with weather protection for components and controls, and complete with removable panels for required access to compressors, controls, condenser fans, motors, and drives.
- C. Compressor: Single refrigeration circuit or two independent refrigeration circuits (as specified on drawings) with rotary or hermetic reciprocating type compressors, resiliently mounted, with positive lubrication, and internal motor overload protection.
- D. Condenser Coil: Constructed of copper tubing mechanically bonded to aluminum fins, factory leak and pressure tested.

- E. Controls: Furnish operating and safety controls including high and low pressure cutouts. Control transformer. Furnish magnetic contactors for compressor and condenser fan motors.
- F. Condenser Fans and Drives: Direct drive propeller fans statically and dynamically balanced. Wired to operate with compressor. Permanently lubricated ball bearing type motors with built-in thermal overload protection.
- G. Condensing Unit Accessories: Furnish the following accessories:
  - 1. Controls to provide low ambient cooling. (only when requested on mechanical schedules).
  - 2. Time delay relay.
  - 3. Anti-short cycle timer.
  - 4. Disconnect switch.
  - 5. Vibration isolators.
  - 6. Hot gas bypass kit.
  - 7. Coil with corrosion resistant coating capable of withstanding salt spray test of 1000 hours in accordance with ASTM B117.
  - 8. Condenser Coil Guard: Condenser fan openings furnished with PVC coated steel wire safety guards.
  - 9. Suction and discharge pressure gauges.
- H. Refrigeration specialties: Furnish the following for each circuit:
  - 1. Charge of compressor oil.
  - 2. Holding charge of refrigerant.
  - 3. Replaceable core type filter drier.
  - 4. Liquid line sight glass and moisture indicator.
  - 5. Shut-off valves on suction and liquid piping.
  - 6. Liquid line solenoid valve.
  - 7. Charging valve.
  - 8. Oil level sight glass.
  - 9. Crankcase heater.
  - 10. Hot gas muffler.
  - 11. Pressure relief device.
- I. Refrigerant: Furnish charge of refrigerant [R-134].

## **2.3 CONTROLS**

- A. Thermostat: 7 day programmable electronic space thermostat with two stage heating and two stages cooling with remote sensor capability.
- B. Furnish interface to control system when required.

## **2.4 ELECTRICAL CHARACTERISTICS AND COMPONENTS**

- A. Requirements for electrical characteristics:
  - 1. Refer to Equipment Schedule.
- B. Disconnect Switch: Factory mounted, non-fused type, interlocked with access door, accessible from outside unit, with power lockout capability.



## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify concrete pad for condensing unit is ready for unit installation.

### **3.2 INSTALLATION - AIR HANDLING UNIT**

- A. Install air handling units on vibration isolators.
- B. Connect air handling units to supply and return ductwork with flexible connections.
- C. Install condensate piping with trap and provide condensate pump when required. (refer to equipment schedule).
- D. Install components furnished loose for field mounting.

### **3.3 INSTALLATION - CONDENSING UNIT**

- A. Install condensing units as per structural drawings.
- B. Install refrigerant piping from unit to condensing unit. Install refrigerant specialties when required.
- C. Evacuate refrigerant piping and install initial charge of refrigerant.
- D. Install electrical devices furnished loose for field mounting.
- E. Install control wiring between air handling unit, condensing unit, and field installed accessories.
- F. Install connection to electrical power wiring in accordance with Division 16.

### **3.4 MANUFACTURER'S FIELD SERVICES**

- A. Furnish initial start-up and shutdown during first year of operation, including routine servicing and checkout.

### **3.5 CLEANING**

- A. Vacuum clean coils and inside of unit cabinet.
- B. Install new throwaway filters in units at Substantial Completion.
- C. Install temporary filters during construction period. Replace with permanent filters at Substantial Completion.

### **3.6 DEMONSTRATION**

- A. Demonstrate air handling unit operation and maintenance.
- B. Demonstrate starting, maintenance, and operation of condensing unit.

**3.7 PROTECTION OF FINISHED WORK**

- A. Do not operate air handling units until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

**END OF SECTION**

**SECTION 26 05 00**  
**COMMON WORK RESULTS FOR ELECTRICAL**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section includes grounding electrodes and conductors; bonding methods and materials; conduit and equipment supports, anchors and fasteners; and nameplates and wire markers.

**1.2 SYSTEM DESCRIPTION**

- A. Grounding systems use metal underground pipe, metal frame of building and driven ground rod as grounding electrodes. Grounding system connections use mechanical fasteners.
- B. Select materials, sizes, and types of anchors, fasteners, and supports to carry loads of equipment and raceway, including weight of wire and cable in raceway. Anchor and fasten electrical products to building elements and finishes as follows:
1. Concrete Structural Elements: Expansion anchors and preset inserts.
  2. Steel Structural Elements: Beam clamps, spring steel clips, steel ramset fasteners, and welded fasteners.
  3. Concrete Surfaces: Self-drilling anchors and expansion anchors.
  4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Toggle bolts and hollow wall fasteners.
  5. Solid Masonry Walls: Expansion anchors and preset inserts.
  6. Sheet Metal: Sheet metal screws.
  7. Wood Elements: Wood screws.
- C. Identify Electrical components as follows:
1. Nameplate for each electrical distribution and control equipment enclosure.
  2. Wire marker for each conductor at panelboard gutters, pull boxes, and outlet and junction boxes.
- D. Firestopping Materials: Comply with requirements of Section 07 84 00.

**1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's catalog data for grounding electrodes and connections; for fastening components; and nameplates, labels, and markers.

**PART 2 PRODUCTS**

**2.1 ROD ELECTRODES**

- A. Manufacturers :

1. ERICO International Co., Harger Lighting and Grounding.
  2. Substitutions: Permitted
- B. Product Description: Copper or copper-clad steel, 3/4 inch. diameter rod electrode, 10 feet in length.

## **2.2 NAMEPLATES**

- A. Product Description: Engraved three-layer laminated plastic nameplate, black letters on white background. Letter Size:
1. 1/8 inch. letters for identifying individual equipment and loads.
  2. 1/4 inch. letters for identifying grouped equipment and loads.

## **2.3 WIRE MARKERS**

- A. Product Description: Cloth tape, split sleeve, or tubing type wire markers with circuit or control wire number permanently stamped or printed.

## **2.4 FIRESTOPPING**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.

## **2.5 FIRESTOPPING ACCESSORIES**

- A. Installation Accessories: Comply with requirements of Section 07 84 00.

# **PART 3 EXECUTION**

## **3.1 EXISTING WORK**

- A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- B. Provide temporary wiring and connections to maintain existing systems in service during construction.
- C. When performing work on energized equipment or circuits, use personnel experienced and trained in similar operations.
- D. Remove, relocate, and extend existing installations to accommodate new construction.
- E. Repair adjacent construction and finishes damaged during demolition and extension work.

## **3.2 INSTALLATION**

- A. Install rod electrodes at locations indicated.
- B. Fabricate supports from structural steel or formed steel members.

- C. Install sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.
- D. Install nameplate parallel to equipment lines. Secure nameplate to equipment front using screws or rivets.

### **3.3 INSTALLATION - FIRESTOPPING**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.

**END OF SECTION**

**SECTION 26 05 19****LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES****PART 1 GENERAL****1.1 SUMMARY**

- A. Section includes building wire and cable, conduit and tubing, surface raceway, boxes, wiring devices, wiring connectors, and connections.

**1.2 SYSTEM DESCRIPTION**

- A. Wiring Products:
1. Solid conductor for feeders and branch circuits 10 AWG and smaller.
  2. Stranded conductors for control circuits.
  3. Conductor not smaller than 12 AWG for power and lighting circuits.
  4. Conductor not smaller than 16 AWG for control circuits.
  5. Increase wire size in branch circuits to limit voltage drop to a maximum of 3 percent.
- B. Wiring Methods:
1. Concealed Dry Interior Locations: Use only building wire , Type THHN/THWN insulation, in raceway.
  2. Exposed Dry Interior Locations: Use only building wire , Type THHN/THWN insulation, in raceway.
  3. Above Accessible Ceilings: Use only building wire , Type THHN/THWN insulation, in raceway.
  4. Wet or Damp Interior Locations: Use only building wire , Type THHN/THWN insulation, in raceway.
  5. Exterior Locations: Use only building wire , Type THHN/THWN insulation, in raceway.
  6. Underground Locations: Use only building wire , Type THHN/THWN insulation, in raceway..
  7. Cable Tray Locations: Use only Tray cable Type TC.
  8. Other Locations: Use only building wire , Type THHN/THWN insulation, in raceway.
- C. Raceway and boxes are located as indicated on Drawings, and at other locations where required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements.
- D. Raceway Products:
1. Underground More than 5 Feet outside Foundation Wall: Use rigid steel conduit , thickwall nonmetallic conduit. Use cast metal boxes or nonmetallic handhole.
  2. In or Under Slab on Grade: Use rigid steel conduit, thickwall nonmetallic conduit. Use cast metal boxes.
  3. Outdoor Locations, Above Grade: Use rigid steel. Use cast metal outlet, pull, and junction boxes.

4. In Slab Above Grade: Use rigid steel conduit, thickwall nonmetallic conduit. Use cast boxes.
5. Wet and Damp Locations: Use rigid steel conduit, thickwall nonmetallic conduit. Use cast metal or nonmetallic outlet, junction, and pull boxes. Use flush mounting outlet box in finished areas.
6. Concealed Dry Locations: Use electrical metallic tubing and nonmetallic tubing. Use sheet-metal boxes. Use flush mounting outlet box in finished areas. Use hinged enclosure for large pull boxes.
7. Exposed Dry Locations: Use rigid steel, thickwall nonmetallic conduit. Use sheet-metal boxes. Use flush mounting outlet box in finished areas. Use hinged enclosure for large pull boxes.

E. Minimum Raceway Size: 1/2 inch. unless otherwise specified.

### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturer's catalog information for each wiring device.

### **1.4 QUALITY ASSURANCE**

- A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet (1.5 m) when tested according to NFPA 262.
- B. Perform Work according to Municipality of Miami Lakes Department of Public Works standards.
- C. Maintain one copy of each document on Site.

## **PART 2 PRODUCTS**

### **2.1 BUILDING WIRE**

- A. Manufacturer List:
1. Aetna Insulated Wire, Inc., Southwire Co., General Cable Co., Encore Wire Co.
  2. Substitutions: Permitted.
- B. Description: Single-conductor insulated wire.
- C. Conductor: Copper.
- D. Insulation Voltage Rating: 600 volts.
- E. Insulation Temperature Rating: 75 degrees C.
- F. Insulation Material: Thermoplastic.

### **2.2 TERMINATIONS**

- A. Terminal Lugs for Wires 6 AWG and Smaller: Solderless, compression-type copper.

- B. Lugs for Wires 4 AWG and Larger: Color-keyed, compression-type copper, with insulating sealing collars.

## **PART 3 EXECUTION**

### **3.1 EXISTING WORK**

- A. Remove exposed abandoned raceway, boxes, wire, and cable , including abandoned raceway and cable above accessible ceiling finishes.
- B. Disconnect abandoned circuits and remove raceway, wire, and cable. Remove abandoned boxes when connecting wire and cable is abandoned and removed. Install blank cover for remaining abandoned boxes.
- C. Maintain access to existing boxes and wiring connections remaining active and requiring access. Modify installation.
- D. Extend existing circuits using materials and methods compatible with existing electrical installations, or as specified.

### **3.2 INSTALLATION**

- A. Route raceway and cable to meet Project conditions.
- B. Set wall mounted boxes at elevations to accommodate mounting heights indicated.
- C. Adjust box location up to 5 feet prior to rough-in when required to accommodate intended purpose.
- D. Do not install flush mounting box back-to-back in walls; install boxes with minimum 24 inches separation.
- E. Install wall plates on flush-mounted switches, receptacles, and blank outlets.

**END OF SECTION**



**SECTION 26 05 26**  
**GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Rod electrodes.
  - 2. Active electrodes.
  - 3. Wire.
  - 4. Grounding well components.
  - 5. Mechanical connectors.
  - 6. Exothermic connections.

**1.2 SYSTEM DESCRIPTION**

- A. Grounding systems use the following elements as grounding electrodes:
  - 1. Metal underground water pipe.
  - 2. Metal building frame.
  - 3. Concrete-encased electrode.
  - 4. Ground ring.
  - 5. Rod electrode.
  - 6. Plate electrode.

**1.3 DESIGN REQUIREMENTS**

- A. Construct and test grounding systems for access flooring systems on conductive floors accordance with IEEE 1100.

**1.4 QUALITY ASSURANCE**

- A. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.

**PART 2 PRODUCTS**

**2.1 ROD ELECTRODES**

- A. Product Description:
  - 1. Material: Copper.
  - 2. Diameter: 1/2 inch.
  - 3. Length: 8 feet.
- B. Connector: Connector for exothermic welded connection or U-bolt clamp.

**2.2 ACTIVE ELECTRODES**

- A. Product Description:

1. Material: Metallic-salt-filled copper-tube electrode.
2. Shape: Straight or L-shaped.
3. Length: 8 feet.
4. Connector: Connector for exothermic welded connection or U-bolt clamp.

## **2.3 WIRE**

- A. Material: Stranded copper.
- B. Foundation Electrodes: 4 AWG.
- C. Grounding Electrode Conductor: Copper conductor.
- D. Bonding Conductor: Copper conductor.

## **2.4 GROUNDING WELL COMPONENTS**

- A. Well Pipe: 8 inches NPS by 24 inches long clay tile, concrete or fiberglass pipe with belled end.
- B. Well Cover: Cast iron or Fiberglass with legend "GROUND" embossed on cover.

## **2.5 MECHANICAL CONNECTORS**

- A. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

## **2.6 EXOTHERMIC CONNECTIONS**

- A. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

# **PART 3 EXECUTION**

## **3.1 INSTALLATION**

- A. Install in accordance with IEEE **142 and 1100**.
- B. Install grounding electrode conductor and connect to reinforcing steel in foundation footing.
- C. Bond together metal siding not attached to grounded structure; bond to ground.
- D. Install isolated grounding conductor for circuits supplying electronic cash registers and personal computers in accordance with IEEE 1100.
- E. Equipment Grounding Conductor: Install separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.

- F. Install continuous grounding using underground cold water system and building steel as grounding electrode. Where water piping is not available, install artificial station ground by means of driven rods or buried electrodes.
- G. Permanently ground entire light and power system in accordance with NEC, including service equipment, distribution panels, lighting panelboards, switch and starter enclosures, motor frames, grounding type receptacles, and other exposed non-current carrying metal parts of electrical equipment.
- H. Install branch circuits feeding isolated ground receptacles with separate insulated grounding conductor, connected only at isolated ground receptacle, ground terminals, and at ground bus of serving panel.
- I. Accomplish grounding of electrical system by using insulated grounding conductor installed with feeders and branch circuit conductors in conduits. Size grounding conductors in accordance with NEC. Install from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housing, light switch outlet boxes or metal enclosures of service equipment. Ground conduits by means of grounding bushings on terminations at panelboards with installed number 12 conductor to grounding bus.

### **3.2 FIELD QUALITY CONTROL**

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.13.
- C. Perform ground resistance testing in accordance with IEEE 142.
- D. Perform leakage current tests in accordance with NFPA 99.
- E. Perform continuity testing in accordance with IEEE 142.

### **END OF SECTION**

**SECTION 26 09 23**  
**LIGHTING CONTROL**  
**DEVICES**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Remote control lighting relays.
  - 2. Lighting contactors.
  - 3. Switches.
  - 4. Switch plates.
  - 5. Occupancy sensors.
  - 6. Photocells.
  - 7. Photocell control unit.

**1.2 SUBMITTALS**

- A. Shop Drawings: Indicate dimensioned drawings of lighting control system components and accessories.
  - 1. One Line Diagram: Indicating system configuration indicating panels, number and type of switches or devices.
  - 2. Include typical wiring diagrams for each component.
- B. Product Data: Submit manufacturer's standard product data for each system component.
- C. Manufacturer's Installation Instructions: Submit for each system component.
- D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

**1.3 CLOSEOUT SUBMITTALS**

- A. Project Record Documents: Record the following information:
  - 1. Actual locations of components and record circuiting and switching arrangements.
  - 2. Wiring diagrams reflecting field installed conditions with identified and numbered, system components and devices.
- B. Operation and Maintenance Data:
  - 1. Submit replacement parts numbers.
  - 2. Submit manufacturer's published installation instructions and operating instructions.
  - 3. Recommended renewal parts list.

**1.4 QUALITY ASSURANCE**

- A. Perform Work in accordance with Municipality of Miami Lakes Public Work's standard.
- B. Where indicated on drawings or required by applicable code, provide automatic shutoff for lighting inside building larger than 5000 square feet (465 square meters). Control shutoff by method conforming to ICC IECC.

- C. Where indicated on drawings or required by applicable code, provide automatic shutoff for lighting outside building. Control shutoff by method conforming to ICC IECC.
- D. Maintain one copy of each document on site.

## 1.5 WARRANTY

- A. Furnish 5 year manufacturer warranty for components.

## PART 2 PRODUCTS

### 2.1 REMOTE CONTROL LIGHTING RELAYS

- A. Manufacturers:
  - 1. Douglas Lighting Controls, General Electric Co.
  - 2. Substitutions: Permitted.
- B. Product Description: Heavy duty, single-coil momentary contact mechanically held remote control relays.
- C. Contacts: Rated 20 amperes at 120 volts. Rated for lighting applications with high intensity discharge (HID), fluorescent, LED lamps.
- D. Line Voltage Connections: Clamp type screw terminals.
- E. Enclosure: NEMA ICS 6, to meet conditions. Fabricate enclosure from steel finished with manufacturer's standard gray enamel.
  - 1. Interior Dry Locations: Type 1.
  - 2. Exterior Locations: Type 3R.

### 2.2 SWITCHES

- A. Manufacturers:
  - 1. Hubbell Inc., Leviton Manufacturing Co., Lutron, Legrand.
  - 2. Substitutions: Permitted.
- B. Wall Switch: Specification Grade unlighted momentary pushbutton type for overriding relays.
  - 1. Material: Plastic.
  - 2. Color: As specified by Architect

### 2.3 OCCUPANCY SENSOR

- A. Manufacturers:
  - 1. Cooper Industries Inc., Leviton, Hubbell Building Automation Inc., Lutron.
  - 2. Substitutions: Permitted.
- B. Compatible with modular relay panels. Capable of being wired directly to Class 2 wiring without auxiliary components or devices.
- C. Separate sensitivity and time delay adjustments with LED indication of sensed movement. User adjustable time-delay: 30 seconds to 12 minutes.

- D. Furnish with manual override.
- E. Operation: Silent.
- F. Room Sensors: As indicated on Drawings.
- G. Corridor and Hallway Sensors:
  - 1. Capable of detecting motion 14 feet (4 m) wide and 80 feet (24 m) long with one sensor mounted 10 feet (3 m) above floor.
  - 2. Capable of detecting motion in warehouse aisle 10 feet (3 m) wide and 60 feet (18 m) long or 100 feet (30 m) long when mounted 22 feet (7 m) above floor.
  - 3. Capable of being wired in master-slave configuration to extend area of coverage.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- A. Mount switches and occupancy sensors as indicated on Drawings.
- B. Install wiring in accordance with Section 26 05 19.
- C. Use only properly color coded, stranded wire. Install wire sizes as indicated on Drawings. Install wire in conduit in accordance with Section 26 05 19.
- D. Label each low voltage wire clearly indicating connecting relay panel. Refer to Section 26 05 00.
- E. Mount relay as indicated on Drawings. Wire numbered relays in panel to control power to each load. Install relays to be accessible. Allow space around relays for ventilation and circulation of air.
- F. Identify power wiring with circuit breaker number controlling load. When multiple circuit breaker panels are feeding into relay panel, label wires to indicate originating panel designation.
- G. Label each low voltage wire with relay number at each switch or sensor.

### **3.2 FIELD QUALITY CONTROL**

- A. Furnish services for minimum of one day for check, test, and start-up. Perform the following services:
  - 1. Check installation of panelboards.
  - 2. Test operation of remote controlled devices.
  - 3. Repair or replace defective components.
- B. Test each system component after installation to verify proper operation.
- C. Test relays, and switches after installation to confirm proper operation.
- D. Confirm correct loads are recorded on directory card in each panel.

**3.3 SCHEDULES**

|                             |    |    |    |    |    |    |    |    |    |
|-----------------------------|----|----|----|----|----|----|----|----|----|
| LIGHTING RELAY SCHEDULE     |    |    |    |    |    |    |    |    |    |
| Panel Name and Location     |    |    |    |    |    |    |    |    |    |
| Panel Number                |    |    |    |    |    |    |    |    |    |
| Relay Number                | R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 |
| Panel and Circuit           |    |    |    |    |    |    |    |    |    |
| Description                 |    |    |    |    |    |    |    |    |    |
| Switch or Sensor            |    |    |    |    |    |    |    |    |    |
| Switch or Sensor            |    |    |    |    |    |    |    |    |    |
| LIGHTING CONTACTOR SCHEDULE |    |    |    |    |    |    |    |    |    |
| Panel Name and Location     |    |    |    |    |    |    |    |    |    |
| Panel Number                |    |    |    |    |    |    |    |    |    |
| Contactor Number            | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 |
| Panel and Circuit           |    |    |    |    |    |    |    |    |    |
| Description                 |    |    |    |    |    |    |    |    |    |
| Switch or Sensor            |    |    |    |    |    |    |    |    |    |
| Switch or Sensor            |    |    |    |    |    |    |    |    |    |

**END OF SECTION**

**SECTION 26 22 00**  
**LOW-VOLTAGE TRANSFORMERS**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Two-winding transformers.
  - 2. Shielded transformers.
  - 3. Autotransformers.
  - 4. Buck-and-boost transformers.
  - 5. Transformers for nonlinear loads.
  - 6. Transformer load centers.

**1.2 SUBMITTALS**

- A. Product Data: Required.

**PART 2 PRODUCTS**

**2.1 TWO-WINDING TRANSFORMERS**

- A. Description: NEMA ST 20, factory-assembled, air-cooled, dry type transformers.
  - 1. Mounting: Wall, Floor or Trapeze.
- B. Operation
  - 1. Refer to electrical plans and riser diagram.
- C. Materials:
  - 1. Coil Conductors: Continuous copper or aluminum.
  - 2. Enclosure: NEMA ST 20. Furnish lifting eyes or brackets.

**2.2 SHIELDED TRANSFORMERS**

- A. Description: NEMA ST 20, factory-assembled, air-cooled, dry type shielded isolation transformers.
  - 1. Mounting: Wall, Floor or Trapeze.
- B. Operation:
  - 1. Refer to electrical plans and riser diagram.
- C. Materials:
  - 1. Coil Conductors: Continuous copper or aluminum.
  - 2. Enclosure: NEMA ST 20. Furnish lifting eyes or brackets.

**2.3 AUTOTRANSFORMERS**

- A. Description: NEMA ST 20, factory-assembled, air-cooled, dry type autotransformers.



1. Mounting: Wall, Floor or Trapeze.
- B. Operation:
  1. Refer to electrical plans and riser diagram.
- C. Material
  1. Coil Conductors: Continuous copper or aluminum.
  2. Enclosure: NEMA ST 20. Furnish lifting eyes or brackets.

## **2.4 BUCK-AND-BOOST TRANSFORMERS**

- A. Description: NEMA ST 1, factory-assembled, dry type two winding buck and boost transformers.
- B. Operation:
  1. Primary Voltage: 120 x 240 volts, single phase.
  2. Secondary Voltage: 12/24 volts.
- C. Materials:
  1. Coil Conductors: copper or aluminum.
  2. Enclosure: NEMA ST 1, Type 1.

## **2.5 TRANSFORMERS FOR NONLINEAR LOADS**

- A. Description: NEMA ST 20, factory-assembled, air cooled dry type transformers, ratings as indicated on Drawings, designed to supply 50 or 100 percent nonlinear load as noted.
  1. Mounting: Wall, Floor or Trapeze.
- B. Operation:
  1. Refer to electrical plans and riser diagram.
- C. Materials:
  1. Coil Conductors: Continuous copper or aluminum. Individually insulate secondary conductors and arrange to minimize hysteresis and eddy current losses at harmonic frequencies. Size secondary neutral conductor at twice secondary phase conductor ampacity.
  2. Enclosure: NEMA ST 20. Furnish lifting eyes or brackets.

## **2.6 TRANSFORMER LOAD CENTERS**

- A. Description: NEMA ST 20, transformer distribution unit with integral primary, secondary, and branch circuit breakers.
- B. Operation
  1. Refer to electrical plans and riser diagram.
- C. Molded Case Circuit Breakers: UL 489, plug-on or bolt-on type thermal magnetic trip circuit breakers, with common trip handle for poles, listed as Type SWD for lighting circuits, Class A ground fault interrupter circuit breakers. Do not use tandem circuit breakers.

**2.7 SOURCE QUALITY CONTROL**

- A. Production test each unit according to NEMA ST 20.

**PART 3 EXECUTION****3.1 INSTALLATION**

- A. Install transformers in accordance with manufacturer's published instructions.

**3.2 FIELD QUALITY CONTROL**

- A. Inspect and test in accordance with NETA ATS, except Section 4.
- B. Perform inspections and tests listed in NETA ATS, Section 7.2.1.

**END OF SECTION**

## **SECTION 26 27 26**

### **WIRING DEVICES**

#### **PART 1 GENERAL**

##### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Wall switches.
  - 2. Wall dimmers.
  - 3. Receptacles.
  - 4. Wall plates.
  - 5. Multioutlet assembly.

##### **1.2 SUBMITTALS**

- A. Product Data: Required.

#### **PART 2 PRODUCTS**

##### **2.1 WALL SWITCHES**

- A. Product Description: NEMA WD 1, Heavy-Duty or General-Duty, AC only general-use snap switch.
- B. Body and Handle: Ivory plastic with toggle or rocker handle.
- C. Ratings: Match branch circuit and load characteristics.

##### **2.2 RECEPTACLES**

- A. Product Description: NEMA WD 1, Heavy-duty or General-duty general use receptacle.
- B. Device Body: Ivory plastic.
- C. Configuration: NEMA WD 6, type **as** indicated on Drawings.
- D. Convenience Receptacle: Type 5-15 or 5-20.
- E. GFCI Receptacle: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements.

##### **2.3 WALL PLATES**

- A. Decorative Cover Plate: Ivory smooth lined, plastic or nylon.
- B. Jumbo Cover Plate: Ivory smooth lined, plastic or nylon.

- C. Weatherproof Cover Plate: Gasketed cast metal plate with hinged and gasketed device cover.

## **2.4 MULTIOUTLET ASSEMBLY**

- A. Multi-outlet Assembly: Sheet metal channel with fitted cover suitable for use as multi-outlet assembly.
- B. Receptacles: NEMA WD 6, type 5-15R, single receptacle.
- C. Receptacle Color: Ivory.
- D. Channel Finish: Ivory.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- A. Install switches with OFF position down.
- B. Do not share neutral conductor on load side of dimmers.
- C. Install receptacles with grounding pole on bottom.
- D. Connect wiring device grounding terminal to outlet box with bonding jumper and branch circuit equipment grounding conductor.
- E. Install wall plates on flush mounted switch, receptacle, and blank outlets.
- F. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
- G. Use jumbo size plates for outlets installed in masonry walls.
- H. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

### **3.2 FIELD QUALITY CONTROL**

- A. Test each receptacle device for proper polarity.
- B. Test each GFCI receptacle device for proper operation.

## **END OF SECTION**

## **SECTION 26 50 00**

### **LIGHTING**

#### **PART 1 GENERAL**

##### **1.1 SUMMARY**

- A. Section includes interior luminaires, lamps, ballasts, and accessories.

##### **1.2 SUBMITTALS**

- A. Product Data: Submit dimensions, ratings, and performance data.
- B. Samples: Submit two color chips .3 x 3 inch. in size illustrating luminaire finish color as indicated on Drawings.

#### **PART 2 PRODUCTS**

##### **2.1 LUMINAIRES**

- A. Product Description: Complete luminaire assemblies, with features, options, and accessories as indicated on Drawings.
- B. Substitutions: Not Permitted
- C. Minimum Efficacy, Lamps Greater Than 100 Watts: 60 lumens/W, except where otherwise indicated or permitted by applicable code.

##### **2.2 EMERGENCY LIGHTING UNITS**

- A. Manufacturers :
  - 1. As indicated on plans
  - 2. Substitutions: Not Permitted
- B. Product Description: Self-contained incandescent emergency lighting unit.
- C. Lamps: 12 watt minimum, sealed beam type in nickel or chrome plated steel housing.
- D. Remote Fixtures: Match fixtures on unit.
- E. Indicators: Lamps to indicate AC ON and RECHARGING.
- F. TEST switch: Transfers unit from external power supply to integral battery supply.
- G. Electrical Connection: Conduit connection.
- H. Input Voltage: 120 volts.

## 2.3 EXIT SIGNS

- A. Manufacturers :
  - 1. As indicated on plans
  - 2. Substitutions: Not Permitted
- B. Product Description: Exit sign fixture with integral battery power supply
- C. Face: Translucent face with red letters on white background.
- D. Input Voltage: 120 volts.
- E. Lamps: 5 W per side, maximum.

## 2.4 FLUORESCENT BALLASTS

- A. Manufacturers :
  - 1. Magnetek
  - 2. Substitutions: Permitted.
- B. Product Description: Electronic ballast suitable for lamps specified, with voltage to match luminaire voltage.

## 2.5 FLUORESCENT LAMPS

- A. Manufacturers :
  - 1. Magnetek
  - 2. Substitutions: Permitted.

# PART 3 EXECUTION

## 3.1 EXISTING WORK

- A. Disconnect and remove abandoned luminaires, lamps, poles, and accessories.
- B. Extend existing luminaire installations using materials and methods compatible with existing installations, or as specified.
- C. Clean and repair existing luminaires to remain or to be reinstalled.

## 3.2 INSTALLATION

- A. Install suspended luminaires using pendants supported from swivel hangers.
- B. Locate recessed ceiling luminaires as indicated on reflected ceiling plan.
- C. Install surface mounted ceiling luminaires plumb and adjust to align with building lines and with each other. Secure to prevent movement.

**3.3 ADJUSTING**

- A. Aim and adjust luminaires.
- B. Relamp luminaires, lighting units, and exit signs with failed lamps at Substantial Completion.

**END OF SECTION**

## **SECTION 27 00 00 COMMUNICATIONS**

### **PART 1 GENERAL**

#### **1.1 SUMMARY**

- A. Section includes arrangement with Telephone Utility Company for service and premises telephone pathways, and premises wiring.

#### **1.2 SYSTEM DESCRIPTION**

- A. Service entrance from Telephone Utility Company.
- B. Telephone Utility Company: AT&T
- C. Service Entrance Pathway: Empty raceway from point of Telephone Utility connection at property line to building service terminal backboard.
- D. Backbone Pathway: Conform to EIA/TIA 569 using conduit as indicated on Drawings.
- E. Horizontal Pathway: Conform to EIA/TIA 569, using raceway, backboards as indicated on Drawings.
- F. Entrance Wiring: By Telephone Utility Company.
- G. Backbone Wiring: By Telephone Utility Company. Complete from entrance equipment to each telephone closet using backbone cables.
- H. Horizontal Wiring: By Owner. Complete from telephone closet to each outlet using horizontal cables.
- I. Firestopping Materials: Comply with requirements of Section 07 84 00.

#### **1.3 SUBMITTALS**

- A. Product Data: Submit catalog data for each termination device, cable, and outlet device.

### **PART 2 PRODUCTS**

#### **2.1 TELEPHONE TERMINATION BACKBOARDS**

- A. Material: Plywood.
- B. Size: As indicated on Drawings, 3/4 inch thick.



## 2.2 TELEPHONE OUTLET JACKS

- A. Manufacturers :
  - 1. Cooper Wiring Devices Inc., Leviton Manufacturing Co.
  - 2. Substitutions: Permitted.
- B. Product Description: Conform to EIA/TIA 568 requirements for cable connectors for specific cable types.

## 2.3 BACKBONE CABLE

- A. Manufacturers :
  - 1. By utility standards
  - 2. Substitutions: Not Permitted
- B. Product Description: EIA/TIA 570, 100-ohm, unshielded twisted pair cable with 25 pairs, 22 AWG copper conductor.

## 2.4 HORIZONTAL CABLE

- A. Manufacturers :
  - 1. By Owner standards
  - 2. Substitutions: Not Permitted.
- B. Product Description: EIA/TIA 570, 100-ohm, unshielded twisted pair cable with 4 pairs, 24 AWG copper conductor.

## 2.5 FIRESTOPPING

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.

## 2.6 FIRESTOPPING ACCESSORIES

- A. Installation Accessories: Comply with requirements of Section 07 84 00.

# PART 3 EXECUTION

## 3.1 EXISTING WORK

- A. Remove exposed abandoned telephone cables and pathways, including abandoned cables and pathways above accessible ceiling finishes. Cut flush with walls and floors, and patch surfaces.
- B. Disconnect and remove abandoned telephone equipment.
- C. Maintain access to existing telephone equipment, cabling, and terminations and other installations remaining active and requiring access. Modify installation or provide access panel.
- D. Extend existing telephone installations using materials and methods compatible with existing installations, or as specified.

- E. Clean and repair existing telephone equipment to remain or to be reinstalled.

### **3.2 INSTALLATION**

- A. Install pathways in accordance with EIA/TIA 569.
- B. Install wire and cable in accordance with EIA/TIA 570.
- C. Finish paint termination backboards with durable white enamel prior to installation of telephone equipment.
- D. Install termination backboards plumb, and attach securely to building wall at each corner. Install cabinet trim plumb.
- E. Install pull wire or polyethylene pulling string in each empty telephone conduit over 10 feet in length or containing bend.

### **3.3 INSTALLATION - FIRESTOPPING**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.

**END OF SECTION**

**SECTION 28 05 28.29**  
**HANGERS AND SUPPORTS FOR ELECTRONIC SAFETY AND SECURITY**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Conduit supports.
  - 2. Formed steel channel.
  - 3. Spring steel clips.
  - 4. Sleeves.
  - 5. Mechanical sleeve seals.
  - 6. Equipment bases and supports.

**1.2 DEFINITIONS**

- A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire-rated construction.

**1.3 SYSTEM DESCRIPTION**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.

**1.4 PERFORMANCE REQUIREMENTS**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.

**1.5 SUBMITTALS**

- A. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.
- B. Product Data:
  - 1. Hangers and Supports: Manufacturers catalog data including load capacity.
  - 2. Firestopping: Product characteristics, performance and limitation criteria.
- C. Firestopping Schedule: Opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire-resistance rating of adjacent assembly.
- D. Design Data: Indicate load carrying capacity of trapeze hangers and hangers and supports
- E. Manufacturer's Installation Instructions:
  - 1. Hangers and Supports: Special procedures and assembly of components.
  - 2. Firestopping: Preparation and installation instructions.
- F. Manufacturer's Certificate: Products meet or exceed specified requirements.

- G. Firestopping Engineering Judgments: For conditions not covered by UL or WH listed designs, furnish judgments by licensed professional engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.

## 1.6 QUALITY ASSURANCE

- A. Through-penetration Firestopping of Fire-Rated Assemblies: UL 1479 or ASTM E814 with 0.10 inch w.g. minimum positive pressure differential to achieve fire F-Ratings and temperature T-Ratings as indicated, but not less than one-hour.
  - 1. Wall Penetrations: Fire F-Ratings as indicated, but not less than one-hour.
  - 2. Floor Penetrations: Fire F-Ratings and temperature T-Ratings as indicated, but not less than one-hour.
    - a. Floor Penetrations within Wall Cavities: T-Rating is not required.
- B. Through-penetration Firestopping of Non-fire-rated Floor Assemblies: Materials to resist free passage of flame and products of combustion.
  - 1. Noncombustible Penetrating Items: Noncombustible materials for penetrating items connecting maximum of three stories.
  - 2. Penetrating Items: Materials approved by authorities having jurisdiction for penetrating items connecting maximum of two stories.
- C. Fire-Resistant Joints in Fire-Rated Floor, Roof, and Wall Assemblies: ASTM E1966 or UL 2079 to achieve fire-resistance rating as indicated for assembly in which joint is installed.
- D. Fire-Resistant Joints between Floor Slabs and Exterior Walls: ASTM E119 with 0.10 inch w. g. minimum positive pressure differential to achieve fire-resistance rating as indicated for floor assembly.
- E. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested according to ASTM E84.
- F. Perform Work according to Municipality of Miami Lakes Department of Public Works standards.
- G. Manufacturer: Company specializing in manufacturing products specified in this Section with **three** years' experience.
- H. Installer: Company specializing in performing Work of this Section with minimum 3 years' experience and approved by manufacturer.

## 1.7 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply firestopping materials when temperature of substrate material and ambient air is below 60 degrees F.
- B. Maintain this minimum temperature before, during, and for minimum three days after installation of firestopping materials.

## **PART 2 PRODUCTS**

### **2.1 CONDUIT SUPPORTS**

- A. Manufacturers :
  - 1. ERICO International Co., Unistrut, Thomas and Betts Co.
  - 2. Substitutions: Permitted.
- B. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free-running threads.
- C. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.
- D. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.
- E. Conduit clamps - general purpose: One hole malleable iron for surface mounted conduits.
- F. Cable Ties: High strength nylon temperature rated to 185 degrees F.. Self-locking.

### **2.2 FORMED STEEL CHANNEL**

- A. Manufacturers :
  - 1. Cooper B-Line Inc., Unistrut
  - 2. Substitutions: Permitted.
- B. Product Description: Galvanized 12 gage ) thick steel. With holes 1-1/2 inches on center.

### **2.3 SPRING STEEL CLIPS**

- A. Manufacturers :
  - 1. Cooper B-Line Inc.,
  - 2. Substitutions: Permitted
- B. Product Description: Mounting hole and screw closure.

### **2.4 SLEEVES**

- A. Furnish materials according to Municipality of Miami Lakes Department of Public Works standards.
- B. Firestopping Insulation: Glass fiber type, non-combustible.

### **2.5 MECHANICAL SLEEVE SEALS**

- A. Manufacturers :
  - 1. Pipeline Seal and Insulator, Inc.
  - 2. Substitutions: Permitted.

## **2.6 FIRESTOPPING**

- A. Firestopping Materials: Comply with requirements of Section 07 84 00.

## **2.7 FIRESTOPPING ACCESSORIES**

- A. Installation Accessories: Comply with requirements of Section 07 84 00.

# **PART 3 EXECUTION**

## **3.1 EXAMINATION**

- A. Verify openings are ready to receive sleeves.
- B. Verify openings are ready to receive firestopping.

## **3.2 PREPARATION**

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond.
- C. Install backing materials to arrest liquid material leakage.
- D. Obtain permission from Architect/Engineer before using powder-actuated anchors.
- E. Obtain permission from Architect/Engineer before drilling or cutting structural members.

## **3.3 INSTALLATION**

- A. Hangers and Supports
  - 1. Anchors and Fasteners:
    - a. Concrete Structural Elements: Provide precast inserts, expansion anchors and preset inserts.
    - b. Steel Structural Elements: Provide beam clamps, spring steel clips, steel ramset fasteners.
    - c. Concrete Surfaces: Provide self-drilling anchors and expansion anchors.
    - d. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide toggle bolts and hollow wall fasteners.
    - e. Solid Masonry Walls: Provide expansion anchors and preset inserts.
    - f. Sheet Metal: Provide sheet metal screws.
    - g. Wood Elements: Provide wood screws.
  - 2. Inserts:
    - a. Install inserts for placement in concrete forms.
    - b. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
    - c. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.

- d. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- e. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above slab.
- 3. Install conduit and raceway support and spacing according to NEC.
- 4. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
- 5. Install multiple conduit runs on common hangers.
- 6. Supports:
  - a. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
  - b. Install surface mounted cabinets and panelboards with minimum of four anchors.
  - c. In wet and damp locations install steel channel supports to stand cabinets and panelboards .1 inch. off wall.
  - d. Support vertical conduit at every floor.

B. Firestopping

- 1. Install material at fire-rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.
- 2. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
- 3. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating, to uniform density and texture.
- 4. Compress fibered material to maximum 40 percent of its uncompressed size.
- 5. Remove dam material after firestopping material has cured.
- 6. Fire-Rated Surface:
  - a. Seal opening at floor, wall, partition, ceiling, and roof as follows:
    - 1) Install sleeve through opening and extending beyond minimum of .1 inch. on both sides of building element.
    - 2) Size sleeve allowing minimum of .1 inch. void between sleeve and building element.
    - 3) Pack void with backing material.
    - 4) Seal ends of sleeve with UL-listed fire-resistive silicone compound to meet fire rating of structure penetrated.
  - b. Where cable tray, conduit, wireway, trough penetrates fire-rated surface, install firestopping product according to manufacturer's instructions.
- 7. Non-rated Surfaces:
  - a. Seal opening through non-fire-rated wall, partition floor, ceiling, and roof opening as follows:
    - 1) Install sleeve through opening and extending beyond minimum of .1 inch. on both sides of building element.
    - 2) Size sleeve allowing minimum of .1 inch. void between sleeve and building element.
    - 3) Install type of firestopping material recommended by manufacturer.
  - b. Install floor plates or ceiling plates where conduit, penetrates non-fire-rated surfaces in occupied spaces. Occupied spaces include rooms with finished ceilings and where penetration occurs below finished ceiling.

- c. Exterior wall openings below grade: Assemble rubber links of mechanical seal to size of conduit and tighten in place, according to manufacturer's instructions.
  - d. Interior partitions: Seal pipe penetrations at clean rooms, laboratories, hospital spaces, computer rooms, telecommunication rooms, data rooms. Apply sealant to both sides of penetration to completely fill annular space between sleeve and conduit.
- C. Equipment Bases and Supports
  - 1. Provide housekeeping pads of concrete, minimum 3-1/2 inches thick and extending 6 inches beyond supported equipment.
  - 2. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.
  - 3. Construct supports of steel members formed steel channel. Brace and fasten with flanges bolted to structure.
- D. Sleeves
  - 1. Exterior watertight entries: Seal with adjustable interlocking rubber links.
  - 2. Conduit penetrations not required to be watertight: Sleeve and fill with silicon foam.
  - 3. Set sleeves in position in forms. Provide reinforcing around sleeves.
  - 4. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.
  - 5. Extend sleeves through floors 1 inch above finished floor level. Calk sleeves.
  - 6. Where conduit or raceway penetrates floor, ceiling, or wall, close off space between conduit or raceway and adjacent Work with firestopping insulation and calk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.
  - 7. Install chrome-plated steel escutcheons at finished surfaces.

## END OF SECTION



**SECTION 28 05 28.33**  
**CONDUITS AND BACKBOXES FOR ELECTRONIC SAFETY AND SECURITY**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.

**1.2 UNIT PRICE - MEASUREMENT AND PAYMENT**

- A. Raceway:
1. Basis of Measurement: By linear foot.
  2. Basis of Payment: Includes materials, delivery, handling, and installing.
- B. Boxes:
1. Basis of Measurement: By cubic foot.
  2. Basis of Payment: Includes materials, delivery, handling, and installing.

**1.3 SYSTEM DESCRIPTION**

- A. Locate raceway and boxes as indicated, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.
- B. Underground More than 5 feet outside Foundation Wall: Provide rigid steel conduit, thick-wall nonmetallic conduit. Provide cast metal boxes or nonmetallic handhole.
- C. Underground Within 5 feet from Foundation Wall: Provide rigid steel conduit, thick-wall nonmetallic conduit. Provide cast metal or nonmetallic boxes.
- D. In or Under Slab on Grade: Provide rigid steel conduit, thick-wall nonmetallic conduit, and thin-wall nonmetallic conduit. Provide cast or nonmetallic metal boxes.
- E. Outdoor Locations, Above Grade: Provide rigid steel conduit. Provide cast metal or nonmetallic outlet, pull, and junction boxes.
- F. In Slab Above Grade: Provide intermediate metal conduit, electrical metallic tubing and thick-wall nonmetallic conduit. Provide cast boxes.
- G. Wet and Damp Locations: Provide rigid steel conduit, intermediate metal conduit, thickwall nonmetallic conduit. Provide cast metal or nonmetallic outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.
- H. Concealed Dry Locations: Provide intermediate metal conduit, electrical metallic tubing, thick-wall nonmetallic conduit. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

- I. Exposed Dry Locations: Provide rigid steel conduit, intermediate metal conduit, thick-wall nonmetallic conduit. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

#### **1.4 DESIGN REQUIREMENTS**

- A. Minimum Raceway Size: 1/2 inch unless otherwise specified.

#### **1.5 SUBMITTALS**

- A. Product Data:
  - 1. Flexible metal conduit.
  - 2. Liquidtight flexible metal conduit.
  - 3. Nonmetallic conduit.
  - 4. Flexible nonmetallic conduit.
  - 5. Nonmetallic tubing.
  - 6. Raceway fittings.
  - 7. Conduit bodies.
  - 8. Surface raceway.
  - 9. Wireway.
  - 10. Pull and junction boxes.
  - 11. Handholes.
- B. Manufacturer's Installation Instructions: Application conditions and limitations of use stipulated by product testing agency specified under regulatory requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

#### **1.6 CLOSEOUT SUBMITTALS**

- A. Project Record Documents:
  - 1. Record actual routing of conduits larger than 2 inch.
  - 2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

#### **1.7 COORDINATION**

- A. Coordinate installation of outlet boxes for equipment.
- B. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

### **PART 2 PRODUCTS**

#### **2.1 CONDUIT**

- A. Metal Conduit:
  - 1. Manufacturers :
    - a. Allied Tube & Conduit, Thomas and Betts Co., EGS/Appleton Electric
    - b. Substitutions: Permitted.
  - 2. Rigid Steel Conduit: ANSI C80.1.

3. Rigid Aluminum Conduit: ANSI C80.5.
  4. Intermediate Metal Conduit (IMC): Rigid steel.
  5. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit
- B. PVC-Coated Metal Conduit:
1. Manufacturers :
    - a. Thomas and Betts Co.
    - b. Substitutions: Permitted.
  2. Product Description: NEMA RN 1; rigid steel conduit with external PVC coating, 40 mil. thick.
  3. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.
- C. Flexible Metal Conduit:
1. Manufacturers :
    - a. Southwire Co., EGS/Appleton Electric, AFC Cable Systems Inc.
    - b. Substitutions: Not Permitted.
  2. Product Description: Interlocked steel construction.
  3. Fittings: NEMA FB 1.
- D. Liquidtight Flexible Metal Conduit:
1. Manufacturers :
    - a. Southwire Co., AGS/Appleton Electric, AFC Cable Systems Inc.
    - b. Substitutions: Permitted.
  2. Product Description: Interlocked steel construction with PVC jacket.
  3. Fittings: NEMA FB 1.
- E. Electrical Metallic Tubing (EMT):
1. Manufacturers :
    - a. Western Tube and Conduit, Carlon Electrical Products
    - b. Substitutions: Permitted
  2. Product Description: ANSI C80.3; galvanized tubing.
  3. Fittings and Conduit Bodies: NEMA FB 1; steel , set screw type.
- F. Nonmetallic Conduit:
1. Manufacturers :
    - a. EGS/Appleton Electric, Carlon Electrical Products, Hubbell Premise Wiring
    - b. Substitutions: Not Permitted.
  2. Product Description: NEMA TC 2; Schedule 40, 80 PVC.
  3. Fittings and Conduit Bodies: NEMA TC 3.

## 2.2 RACEWAYS

- A. Surface Metal Raceway:
1. Manufacturers :
    - a. Hubbell Premise Wiring, Wiremold/Legrand
    - b. Substitutions: Permitted.
  2. Product Description: Sheet metal channel with fitted cover, suitable for use as surface metal raceway.
  3. Finish: Gray enamel.

4. Fittings, Boxes, and Extension Rings: Furnish manufacturer's standard accessories; match finish on raceway.
- B. Surface Nonmetal Raceway:
1. Manufacturers :
    - a. Wiremold/Legrand, Panduit Corp.
    - b. Substitutions: Not Permitted.
  2. Product Description: Plastic channel with fitted cover, suitable for use as surface raceway.
  3. Finish: Gray.
  4. Fittings, Boxes, and Extension Rings: Furnish manufacturer's standard accessories, finish to match raceway.

## 2.3 WIREWAY

- A. Manufacturers :
1. Wiremold/Legrand, Panduit Corp., Carlon Electrical Products, Square D, Cooper B-Line
  2. Substitutions: Permitted.
- B. Product Description: General purpose type wireway.
- C. Knockouts: Manufacturer's standard.
- D. Cover: Hinged, Screw
- E. Connector: Slip-in, Flanged.
- F. Fittings: Lay-in type with removable top, bottom, and side; captive screws.
- G. Finish: Rust-inhibiting primer coating with gray enamel finish.

## 2.4 BOXES

- A. Outlet Boxes:
1. Manufacturers :
    - a. Carlon Electrical Products, Emerson Electric Co. RACO
    - b. Substitutions: Permitted.
  2. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
  3. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch. male fixture studs where required.
  4. Concrete Ceiling Boxes: Concrete type.
  5. Nonmetallic Outlet Boxes: NEMA OS 2.
  6. Cast Boxes: NEMA FB 1, Type FD, **cast fer alloy**. Furnish gasketed cover by box manufacturer.
  7. Wall Plates for Finished Areas: As specified in Section 26 27 26.
  8. Wall Plates for Unfinished Areas: Furnish gasketed cover.
- B. Pull and Junction Boxes:
1. Manufacturers :
    - a. Kraloy, Hoffman, RACO, Emerson Process Management

- b. Substitutions: Permitted.
- 2. Sheet Metal Boxes: NEMA OS 1, galvanized steel.
- 3. Surface Mounted Cast Metal Box: NEMA 250, Type 4, 6; flat-flanged, surface-mounted junction box:
  - a. Material: Galvanized cast iron.
  - b. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.
- 4. In-Ground Cast Metal Box: NEMA 250, Type 6, inside flanged, recessed cover box for flush mounting:
  - a. Material: Galvanized cast iron.
  - b. Cover: Smooth cover with neoprene gasket and stainless steel cover screws.
  - c. Cover Legend: ELECTRIC.
- 5. Fiberglass Concrete composite Handholes: Die-molded, glass-fiber concrete composite hand holes:
  - a. Cable Entrance: Precut 6 inch x 6 inch cable entrance at center bottom of each side.
  - b. Cover: Glass-fiber concrete composite, weatherproof cover with nonskid finish.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

### **3.2 EXISTING WORK**

- A. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces.
- B. Remove concealed abandoned raceway to its source.
- C. Disconnect abandoned outlets and remove devices. Remove abandoned outlets when raceway is abandoned and removed. Install blank cover for abandoned outlets not removed.
- D. Maintain access to existing boxes and other installations remaining active and requiring access. Modify installation or provide access panel.
- E. Extend existing raceway and box installations using materials and methods as specified.
- F. Clean and repair existing raceway and boxes to remain or to be reinstalled.

### 3.3 INSTALLATION

#### A. General:

1. Ground and bond raceway and boxes according to Section 26 05 26.
2. Fasten raceway and box supports to structure.
3. Identify raceway and boxes.
4. Arrange raceway and boxes to maintain headroom and present neat appearance.

#### B. Raceway:

1. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.
2. Arrange raceway supports to prevent misalignment during wiring installation.
3. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
4. Group related raceway; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional raceways.
5. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports
6. Do not attach raceway to ceiling support wires or other piping systems.
7. Construct wireway supports from steel channel.
8. Route exposed raceway parallel and perpendicular to walls.
9. Route raceway installed above accessible ceilings parallel and perpendicular to walls.
10. Route conduit in and under slab from point-to-point.
11. Maximum Size Conduit in Slab Above Grade: 3/4 inch. Do not cross conduits in slab larger than 1/2 inch.
12. Maintain clearance between raceway and piping for maintenance purposes.
13. Maintain 12 inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F.
14. Cut conduit square using saw or pipe cutter; de-burr cut ends.
15. Bring conduit to shoulder of fittings; fasten securely.
16. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.
17. Install conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
18. Install no more than equivalent of three 90 degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams. Install factory elbows for bends in metal conduit larger than 2 inch size.
19. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.
20. Install fittings to accommodate expansion and deflection where raceway crosses control and expansion joints.
21. Install suitable pull string or cord in each empty raceway except sleeves and nipples.
22. Install suitable caps to protect installed conduit against entrance of dirt and moisture.
23. Surface Raceway: Install flat-head screws, clips, and straps to fasten raceway channel to surfaces; mount plumb and level. Install insulating bushings and inserts at connections to outlets and corner fittings.

24. Close ends and unused openings in wireway.

C. Boxes:

1. Install wall-mounted boxes at elevations to accommodate mounting heights as indicated.
2. Adjust box location up to .5 feet prior to rough-in to accommodate intended purpose.
3. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.
4. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
5. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
6. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
7. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
8. Install stamped steel bridges to fasten flush mounting outlet box between studs.
9. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
10. Install adjustable steel channel fasteners for hung ceiling outlet box.
11. Do not fasten boxes to ceiling support wires or other piping systems.
12. Support boxes independently of conduit.
13. Install gang box where more than one device is mounted together. Do not use sectional box.
14. Install gang box with plaster ring for single device outlets.

### **3.4 INTERFACE WITH OTHER PRODUCTS**

- A. Install conduit to preserve fire-resistance rating of partitions and other elements, using materials and methods according to Section 07 84 00.
- B. Locate outlet boxes to allow luminaires positioned as indicated on reflected ceiling plan
- C. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

### **3.5 ADJUSTING**

- A. Adjust flush-mounting outlets to make front flush with finished wall material.
- B. Install knockout closures in unused openings in boxes.

**END OF SECTION**

**SECTION 28 05 53**  
**IDENTIFICATION FOR ELECTRONIC SAFETY AND SECURITY**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Nameplates.
  - 2. Labels.
  - 3. Wire markers.
  - 4. Conduit markers.
  - 5. Stencils.
  - 6. Underground Warning Tape.
  - 7. Lockout Devices.

**1.2 SUBMITTALS**

- A. Product Data:
  - 1. Manufacturer's catalog literature for each product required.
  - 2. Electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.
- B. Samples:
  - 1. Two tags, actual size.
  - 2. Two labels, actual size.
- C. Manufacturer's Installation Instructions: Special procedures and installation.

**1.3 CLOSEOUT SUBMITTALS**

- A. Project Record Documents: Record actual locations of tagged devices; include tag numbers.

**1.4 QUALITY ASSURANCE**

- A. Perform Work according to Municipality of Miami Lakes Department of Public Works standards.
- B. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.
- C. Installer: Company specializing in performing Work of this Section with three years' experience.

**1.5 ENVIRONMENTAL REQUIREMENTS**

- A. Install labels/nameplates only when ambient temperature and humidity conditions for adhesive are within range recommended by manufacturer.



## 1.6 EXTRA MATERIALS

- A. Furnish two containers of spray-on adhesive.

## PART 2 PRODUCTS

### 2.1 NAMEPLATES

- A. Manufacturers :
  - 1. Craftmark Pipe Marker, Seton Identification Products
  - 2. Substitutions: Permitted.
- B. Product Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.
- C. Letter Size:
  - 1. 1/8 inch. high letters for identifying individual equipment and loads.
  - 2. 1/4 inch. high letters for identifying grouped equipment and loads.
- D. Minimum nameplate thickness: 1/8 inch

### 2.2 LABELS

- A. Manufacturers :
  - 1. Brady ID, Seton Identification Products
  - 2. Substitutions: Not permitted
- B. Labels: Embossed adhesive tape, with 3/16 inch. white letters on black background.

### 2.3 WIRE MARKERS

- A. Manufacturers :
  - 1. Brady ID, Ideal Industries, Inc., Grafoplast Wire Markers
  - 2. Substitutions: Not permitted
- B. Description: Cloth tape, split sleeve, or tubing type wire markers.
- C. Legend:
  - 1. Power and Lighting Circuits: Branch circuit or feeder number as indicated.
  - 2. Control Circuits: Control wire number as indicated.

### 2.4 CONDUIT AND RACEWAY MARKERS

- A. Manufacturers :
  - 1. Brady ID, Ideal Industries, Inc., Grafoplast Wire Markers
  - 2. Substitutions: Not permitted
- B. Description: Nameplate fastened with adhesive, Labels fastened with adhesive.
- C. Color:
  - 1. Fire Alarm System: Red lettering on white background.

- D. Legend:
1. Fire Alarm System: FIRE ALARM.
  2. Other Systems: By appropriate system's name

## **2.5 UNDERGROUND WARNING TAPE**

- A. Manufacturers :
1. Brady ID, Seton Identification Products, Kolbi Pipe Maker Co.
  2. Substitutions: Not permitted
- B. Description: 4 inch wide plastic tape, detectable type, colored red with suitable warning legend describing buried electrical lines.

## **2.6 LOCKOUT DEVICES**

- A. Lockout Hasps:
1. Manufacturers :
    - a. Brady ID, Master Lock Company, LLC
    - b. Substitutions: Not permitted
  2. Anodized aluminum hasp with erasable label surface; size minimum 7-1/4 x 3 inches.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Degrease and clean surfaces to receive adhesive for identification materials.

### **3.2 EXISTING WORK**

- A. Install identification on existing equipment to remain according to this Section.
- B. Install identification on unmarked existing equipment.
- C. Replace lost nameplates, labels, markers.
- D. Re-stencil existing equipment.

### **3.3 INSTALLATION**

- A. Install identifying devices after completion of painting.
- B. Nameplate Installation:
1. Install nameplate parallel to equipment lines.
  2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.
  3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.
  4. Secure nameplate to equipment front using screws, rivets, or adhesive.
  5. Secure nameplate to inside surface of door on recessed panels in finished locations.

- C. Label Installation:
  - 1. Install label parallel to equipment lines.
  - 2. Install label for identification of individual control device stations
  - 3. Install labels for permanent adhesion and seal with clear lacquer.
- D. Wire Marker Installation:
  - 1. Install wire marker for each conductor at panelboard gutters, pull boxes, outlet and junction boxes, and each load connection.
  - 2. Mark data cabling at each end. Install additional marking at accessible locations along cable run.
  - 3. Install labels at data outlets identifying patch panel and port designation as indicated.
- E. Conduit / Raceway Marker Installation:
  - 1. Install conduit, raceway marker for each conduit, raceway] longer than .6 feet.
  - 2. Conduit, Raceway Marker Spacing: 20 feet o.c.
  - 3. Raceway Painting: Identify conduit using field painting according to Section 09 90 00.
    - a. Paint colored band on each conduit longer than .6 feet.
    - b. Paint bands 20 feet o.c.
    - c. Color:
      - 1) Fire Alarm System: Red.
- F. Stencil Installation:
  - 1. Apply stencil painting according to Section 09 90 00.
- G. Underground Warning Tape Installation:
  - 1. Install underground warning tape along length of each underground conduit, raceway, or cable 6 to 8 inches below finished grade, directly above buried conduit, raceway, or cable.

**END OF SECTION**

## **SECTION 28 16 00**

### **INTRUSION DETECTION**

#### **PART 1 GENERAL**

##### **1.1 SUMMARY**

- A. Section Includes: Intrusion detection devices, alarm control panel, signaling devices, and signal wiring.

##### **1.2 SYSTEM DESCRIPTION**

- A. Intrusion Detection System: Protect building and selected areas from intrusion during SECURE hours.
- B. Alarm Sequence of Operation:
  - 1. Actuation of intrusion detecting device causes following operations:
    - a. Local alarm signaling devices sound and display with non-coded signal.
- C. Non-coded signal transmits to central station
- D. Location of actuated device indicates on control panel and on remote annunciator panel.
- E. Zoning: As indicated.

##### **1.3 SUBMITTALS**

- A. Shop Drawings: Indicate system wiring diagram showing each device and wiring connection; indicate annunciator layout.
- B. Product Data: Catalog data showing electrical characteristics and connection requirements.
- C. Test Reports: Indicate procedures and results for specified field testing and inspection.
- D. Manufacturer's Field Reports: Indicate activities on Site, adverse findings, and recommendations.

##### **1.4 CLOSEOUT SUBMITTALS**

- A. Project Record Documents: Record actual locations of intrusion detection equipment.

##### **1.5 QUALITY ASSURANCE**

- A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet when tested according to NFPA 262.

- B. Perform Work according to Municipality of Miami Lakes Department of Public Works standards.
- C. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience, and with service facilities within 100 miles of Project.
- D. Installer: Certified security system installer with service facilities within 100 miles of Project.

## **1.6 MAINTENANCE SERVICE**

- A. Furnish service and maintenance of intrusion detection system for one year from date of Substantial Completion.

## **1.7 MAINTENANCE MATERIALS**

- A. Furnish six keys of each type.

# **PART 2 PRODUCTS**

## **2.1 CONTROL PANEL**

- A. Manufacturers :
  - 1. ADT Security Services, Inc., Honeywell International Inc., Siemens Building Technology, Simplex Grinnell LP
  - 2. Substitutions: Not permitted
- B. Product Description: Modular control panel with surface wall-mounted enclosure.
- C. Power supply: Adequate to serve control panel modules, remote detectors, remote annunciators, relays, and alarm signaling devices. Furnish battery-operated emergency power supply with capacity for operating system in standby mode for 24 hours. Furnish battery-operated emergency power supply with capacity for operating system in standby mode for 96 hours.
- D. System Supervision: Furnish electrically supervised system, with supervised alarm initiating and alarm signaling circuits. Component or power supply failure places system in alarm mode.
- E. Initiating Circuits: Supervised zone module with alarm and trouble indication.
- F. Signal Circuits: Supervised zone coded signal module, sufficient for signal devices connected to system; occurrence of single ground or open condition places circuit in trouble mode and does not disable circuit from transmitting alarm.
- G. Remote Station Signal Transmitter: Electrically supervised, capable of transmitting alarm and trouble signals over telephone lines to central station receiver.
- H. Auxiliary Relays: Furnish sufficient SPDT auxiliary relay contacts for each detection zone to provide accessory functions specified.

- I. Occupied/Unoccupied Selector: Key pad function
- J. Zone Bypass Switch: Key pad function.
- K. System Bypass Switch: Keyed switch.
- L. Alarm Reset: Key-accessible reset function resets alarm system out of alarm when alarm initiating circuits have cleared.
- M. Lamp Test: Manual lamp test function causes alarm indication at each zone at control panel and at annunciator panel.
- N. Entry and Exit Time Delays: Adjustable

## 2.2 SWITCHES

- A. Magnetic Switch:
  - 1. Manufacturers :
    - a. Schneider Electric USA
    - b. Substitutions: Not permitted
  - 2. Product Description: Magnetically actuated switch with compatible magnetic target, suitable for door or window mounting.
- B. Proximity Switch:
  - 1. Manufacturers :
    - a. Bosch Security Systems, Inc., Cutler Hammer, SimplexGrinnell LP
    - b. Substitutions: Not permitted
  - 2. Product Description: Inductive type proximity switch.

## 2.3 DETECTORS

- A. Motion Detector:
  - 1. Manufacturers :
    - a. Siemens Building Technology
    - b. Substitutions: Not permitted
  - 2. Product Description: Ultrasonic type motion detector.
- B. Photoelectric Detector:
  - 1. Manufacturers :
    - a. Bosch Security Systems Inc., Optex Inc., System Sensor
    - b. Substitutions: Not permitted
  - 2. Product Description: Break-beam type detector with source and target modules.

## 2.4 REMOTE ANNUNCIATOR

- A. Manufacturers :
  - 1. Access Security Products, Silent Knight, SimplexGrinnell LP
  - 2. Substitutions: Not permitted

- B. Product Description: Supervised remote annunciator including audible and visual indication of intrusion detection by zone, and audible and visual indication of system trouble.
- C. Mounting: Factory mounted in flush/surface wall-mounted enclosure.

## **2.5 WIRE AND CABLE**

- A. Manufacturers :
  - 1. Advanced Digital Cable, Belden CDT Inc., Delco Wire and Cable Limited
  - 2. Substitutions: Permitted.
- B. Product Description: Power-limited cable, copper conductor, 300 volts insulation rated 105 degrees C.
- C. Cable Located Exposed in Plenums: Power limited cable classified for fire and smoke characteristics, copper conductor, 300 volts insulation rated 105 degrees C, suitable for use in air handling ducts, hollow spaces used as ducts, and plenums.

## **PART 3 EXECUTION**

### **3.1 EXISTING WORK**

- A. Remove exposed abandoned intrusion detection wiring, including abandoned wiring above accessible ceiling finishes. Cut cable flush with walls and floors, and patch surfaces.

### **3.2 INSTALLATION**

- A. Install 18 AWG minimum size conductors for detection and signal circuit conductors. Install wiring in cable.
- B. Make conduit and wiring connections to door hardware devices.
- C. Install engraved plastic nameplates according to Section 28 05 53.
- D. Ground and bond intrusion detection equipment and circuits according to Section 26 05 26.

### **3.3 FIELD QUALITY CONTROL**

- A. Test according to NFPA 72.

### **3.4 MANUFACTURER'S FIELD SERVICES**

- A. Furnish services of technician to supervise installation, adjustments, final connections, system testing, and Owner training.

**3.5 DEMONSTRATION AND TRAINING**

- A. Furnish 4 hours of instruction each for two persons, to be conducted at Project Site with manufacturer's representative.

**END OF SECTION**



**SECTION 28 23 00**  
**VIDEO SURVEILLANCE**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Stationary cameras, control equipment, and accessories.

**1.2 SYSTEM DESCRIPTION**

- A. Description: Video surveillance and monitoring at points as indicated.
- B. Capacity:
1. Cameras: Two.
  2. Monitors: Two.
- C. Configuration: NTSC, with 1 volt peak-to-peak across 75 ohms.
- D. Distribution: Baseband, DC to 6 MHz.

**1.3 SUBMITTALS**

- A. Shop Drawings: Indicate electrical characteristics and connection requirements, including system wiring diagram.
- B. Product Data: Catalog data showing electrical characteristics and connection requirements for each component.

**1.4 CLOSEOUT SUBMITTALS**

- A. Project Record Documents: Record actual locations of cameras and routing of television cable.

**1.5 QUALITY ASSURANCE**

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience, and with service facilities within 100 miles of Project.
- B. Supplier: Authorized distributor of specified manufacturer with three years' experience.
- C. Installer: Authorized installer of specified manufacturer with service facilities within 100 miles of Project.

**1.6 FIELD MEASUREMENTS**

- A. Verify field measurements prior to fabrication.

## 1.7 MAINTENANCE SERVICE

- A. Furnish service and maintenance of video surveillance system for one year from date of Substantial Completion.

## PART 2 PRODUCTS

### 2.1 CAMERAS

- A. Manufacturers :
  - 1. ADT Security Systems Inc., Pelco
  - 2. Substitutions: Not permitted
- B. Product Description: General purpose video camera.
- C. Camera Tube: .1 inch. diameter.
- D. Ratings:
  - 1. Input Power: 24 volts, 60 Hz.
  - 2. Resolution: 800 lines, minimum.
  - 3. Signal to noise: 44 dB, minimum.
  - 4. Synchronization: To EIA RS-170, with 2: 1 interlace.
  - 5. Automatic Light Range: 660,000 to 1.
- E. Power Supply: Separate plug-in type with 24 volt, 60 Hz output.
- F. Housing: Indoor or Weatherproof.

### 2.2 MONITORS

- A. Manufacturers :
  - 1. Per Video Surveillance System Provider
  - 2. Substitutions: Not permitted
- B. Product Description: Free-standing, color television monitor.
- C. Screen Size: Per Video Surveillance System Provider.
- D. Ratings:
  - 1. Resolution: 800 lines.
  - 2. Bandwidth: DC to 6 megahertz.
  - 3. Linearity: 2 percent maximum.

### 2.3 SWITCHING EQUIPMENT

- A. Manufacturers :
  - 1. Per Video Surveillance System Provider
  - 2. Substitutions: Not permitted
- B. Product Description: Sequential switcher with eight positions and motion detectors for automatic alarm call up.

- C. Include provisions for loop feed to remote monitor location.
- D. Include provisions for rack mounting.

## **2.4 VIDEO RECORDER**

- A. Manufacturers :
  - 1. Per Video Surveillance System Provider
  - 2. Substitutions: Not permitted
- B. Product Description: Video cassette time lapse recorder with adjustable speed ratio from 1: 1 to 400: 1.
- C. Format: VHS, 1/2 inch.
- D. Furnish automatic real time recording on alarm.
- E. Include date and time generator.
- F. Include provisions for rack mounting.

## **2.5 EQUALIZING AMPLIFIER**

- A. Manufacturers :
  - 1. Per Video Surveillance System Provider
  - 2. Substitutions: Not permitted
- B. Impedance: 75 ohms.
- C. Video Gain: 10 dB, maximum.
- D. Output: 2 volts peak-to-peak, maximum.

## **2.6 EQUIPMENT CABINETS**

- A. Manufacturers :
  - 1. Per Video Surveillance System Provider
  - 2. Substitutions: Not permitted
- B. Product Description: Free-standing equipment rack.
- C. Size and Arrangement: As selected by equipment manufacturer.

## **PART 3 EXECUTION**

### **3.1 EXISTING WORK**

- A. Disconnect and remove abandoned video surveillance equipment.

**3.2 INSTALLATION**

- A. Install engraved plastic nameplates according to Section 28 05 53.
- B. Ground and bond video surveillance equipment according to Section 26 05 26.

**3.3 MANUFACTURER'S FIELD SERVICES**

- A. Furnish manufacturer's field representative to supervise final wiring connections and system adjustments.

**3.4 ADJUSTING**

- A. Adjust manual lens irises to meet lighting conditions.

**3.5 DEMONSTRATION AND TRAINING**

- A. Furnish 4 hours of instruction each for two persons, to be conducted at Project Site with manufacturer's representative.

**END OF SECTION**

**SECTION 28 31 00**  
**FIRE DETECTION AND ALARM**

**PART 1 GENERAL**

**1.1 SUMMARY**

- A. Section Includes: Fire alarm control panels, manual fire alarm stations, automatic smoke and heat detectors, fire alarm signaling appliances, and auxiliary fire alarm equipment and power and signal wire and cable.

**1.2 SYSTEM DESCRIPTION**

- A. Fire Alarm System: NFPA 72, automatic local fire alarm system with connections to central station.
- B. Alarm Sequence of Operation: Actuation of initiating device causes following system operations:
1. Local fire alarm signaling devices sound and display with signal.
  2. Zone-coded signal transmits to central station.
  3. Location of alarm zone indicates on fire alarm control panel.
  4. Signal transmits to building elevator control panel, initiating return to main floor or alternate floor and lockout for fire service.
  5. Signal transmits to building mechanical controls, shutting down fans and operating dampers.
  6. Signal transmits by zone to release door hold-open devices.
  7. Signal releases magnetic door hold opens.
  8. Signal releases electric door locks.
- C. Drill Sequence of Operation: Manual drill function causes alarm mode sequence of operation.
- D. Trouble Sequence of Operation: System or circuit trouble causes following system operations:
1. Visual and audible trouble alarm indicates by zone at fire alarm control panel.
  2. Trouble signal transmits to central station.
- E. Zoning: As indicated.

**1.3 SUBMITTALS**

- A. Shop Drawings: Indicate system wiring diagram showing each device and wiring connection; indicate annunciator layout, and design calculations.
- B. Product Data: Submit catalog data showing electrical characteristics and connection requirements.
- C. Test Reports: Indicate procedures and results for specified field testing and inspection.

- D. Manufacturer's Field Reports: Indicate activities on Site, adverse findings, and recommendations.

#### **1.4 QUALITY ASSURANCE**

- A. Provide wiring materials located in plenums with peak optical density not greater than 0.5, average optical density not greater than 0.15, and flame spread not greater than 5 feet (1.5 m) when tested according to NFPA 262.
- B. Perform Work according to Municipality of Miami Lakes Department of Public Works standard.
- C. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience, and with service facilities within 100 miles of Project.
- D. Installer: Certified fire alarm installer with service facilities within 100 miles of Project.
- E. Design fire alarm under direct supervision of professional engineer experienced in design of this Work and licensed in State of Florida.

#### **1.5 MAINTENANCE SERVICE**

- A. Furnish service and maintenance of fire alarm equipment for one year from Date of Substantial Completion.

#### **1.6 MAINTENANCE MATERIALS**

- A. Furnish ten manual station break-glass rods.
- B. Furnish six keys of each type.

#### **1.7 EXTRA MATERIALS**

- A. Furnish three of each type of automatic smoke detector.

### **PART 2 PRODUCTS**

#### **2.1 CONTROL PANEL**

- A. Manufacturers :
  - 1. SimplexGrinnell LP
  - 2. Substitutions: Not permitted
- B. Product Description: Modular fire alarm control panel with surface wall-mounted enclosure.
- C. Power supply: Adequate to serve control panel modules, remote detectors, smoke dampers, relays, and alarm signaling devices. Include battery-operated emergency power supply with capacity for operating system in standby mode for 24 hours followed by alarm mode for 5 minutes.

- D. System Supervision: Component or power supply failure places system in trouble mode.
- E. Initiating Device Circuits: Supervised zone module with alarm and trouble indication; occurrence of single ground or open condition places circuit in trouble mode but does not disable circuit from initiating alarm.
- F. Indicating Appliance Circuits: Supervised signal module, sufficient for signal devices connected to system; occurrence of single ground or open condition places circuit in trouble mode but does not disable circuit from signaling alarm.
- G. Remote Station Signal Transmitter: Electrically supervised digital alarm communicator transmitter, capable of transmitting alarm and trouble signals over telephone lines to central station receiver.
- H. Auxiliary Relays: Sufficient SPDT auxiliary relay contacts for each detection zone to provide accessory functions specified.

## **2.2 MANUAL FIRE ALARM STATIONS**

- A. Manufacturers :
  - 1. Edwards Signaling, Federal Signal Co., System Sensor
  - 2. Substitutions: Permitted
- B. Product Description: Manual double-action station with break-glass rod.
- C. Mounting: Surface.
- D. Type: Coded.
- E. Backbox: Manufacturer's standard.

## **2.3 SPOT HEAT DETECTOR**

- A. Manufacturers :
  - 1. Edward Signaling, Federal Signal Corporation
  - 2. Substitutions: Permitted
- B. Product Description: Combination rate-of-rise and fixed temperature spot heat detector.
- C. Temperature Rating: 135 degrees F..
- D. Rate-of-Rise: 15 degrees F..

## **2.4 CEILING SMOKE DETECTOR**

- A. Manufacturers :
  - 1. Edward Signaling
  - 2. Substitutions: Permitted.

- B. Product Description: NFPA 72, photoelectric type ceiling smoke detector with following features:
  - 1. Adjustable sensitivity.
  - 2. Plug-in base.
  - 3. Auxiliary relay contact.
  - 4. Integral thermal element rated 135 degrees F.
  - 5. Visual indication of detector actuation.
  - 6. Comply with UL 268.
- C. Mounting: 4 inch. outlet box.
- D. Furnish two-wire detector with common power supply and signal circuits.

## **2.5 DUCT-MOUNTED SMOKE DETECTOR**

- A. Manufacturers :
  - 1. SimplexGrinnell LP
  - 2. Substitutions: Not permitted
- B. Product Description: NFPA 72, photoelectric type with following features:
  - 1. Key-operated normal-reset-test switch.
  - 2. Duct sampling tubes extending width of duct.
  - 3. Visual indication of detector actuation.
  - 4. Duct-mounted housing.
  - 5. Comply with UL 268A.
- C. Furnish two-wire detector with common power supply and signal circuits.

## **2.6 ALARM BELLS**

- A. Manufacturers :
  - 1. ADT Security Services Inc., Federal Signal Corporation.
  - 2. Substitutions: Permitted.
- B. Product Description: NFPA 72, vibrating electric bell with following features:
  - 1. Operating mechanism behind dome.
  - 2. Integral strobe lamp and flasher with red lettered FIRE on white lens.
  - 3. Size: 8 inch.
  - 4. Sound Rating: 81 dBA at 10 feet.

## **2.7 ALARM LIGHTS**

- A. Manufacturers :
  - 1. Edward Signaling, Federal Signal Corporation.
  - 2. Substitutions: Permitted.
- B. Product Description: NFPA 72, strobe lamp and flasher with red lettered FIRE on white lens.



## 2.8 ALARM HORN

- A. Manufacturers :
  - 1. Edward Signaling, Federal Signal Corporation, System Sensor
  - 2. Substitutions: Permitted.
- B. Product Description: NFPA 72, surface type fire alarm horn with following features:
  - 1. Sound Rating: 87 dBA at 10 feet.
  - 2. Integral strobe lamp and flasher with red lettered FIRE on white lens.

## 2.9 REMOTE ANNUNCIATOR

- A. Manufacturers :
  - 1. SimplexGrinnell
  - 2. Substitutions: Not permitted
- B. Product Description: Remote annunciator including audible and visual indication of fire alarm by zone, and audible and visual indication of system trouble.
- C. Mounting: Factory mounted in flush wall-mounted enclosure.

## 2.10 DOOR RELEASE

- A. Manufacturers :
  - 1. Tyco Fire & Building Products LP, Sargent Manufacturing Co.
  - 2. Substitutions: Not Permitted.
- B. Product Description: Magnetic door holder with integral diodes to reduce buzzing.
- C. Coil voltage: 24 VDC

## 2.11 WIRE AND CABLE

- A. Manufacturers :
  - 1. Advanced Digital Cable Inc, Belden CDT Inc., Honeywell International Inc.
  - 2. Substitutions: Permitted.
- B. Product Description: Power-limited fire-protective signaling cable, copper conductor, 300 volts insulation rated 105 degrees C.
- C. Cable Located Exposed in Plenums: Power-limited fire-protective signaling cable classified for fire and smoke characteristics, copper conductor, 300 volts insulation rated 105 degrees C, suitable for use in air handling ducts, hollow spaces used as ducts, and plenums.
- D. Fire alarm circuit conductors have insulation color or code as follows:
  - 1. Power Branch Circuit Conductors: Black, red, white.
  - 2. Initiating Device Circuit: Black, red.
  - 3. Detector Power Supply: Violet, brown.
  - 4. Signal Device Circuit: Blue (positive), white (negative).
  - 5. Door Release: Gray, gray.

6. Municipal Trip Circuit: Orange, orange.
7. Municipal Fire Alarm Loop: Black, white.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verify products and systems receiving devices are ready for installation.

### **3.2 EXISTING WORK**

- A. Remove exposed abandoned fire alarm wiring, including abandoned wiring above accessible ceiling finishes. Cut cable flush with walls and floors, and patch surfaces.
- B. Disconnect and remove abandoned fire alarm equipment.

### **3.3 INSTALLATION**

- A. Install manual station with operating handle 4 feet 6 inches above floor.
- B. Install audible and visual signal devices 7 feet 6 inches above floor.
- C. Install 16 AWG minimum size conductors for fire alarm detection and signal circuit conductors in cable.
- D. Mount end-of-line device in box with last device or separate box adjacent to last device in circuit.
- E. Mount outlet box for electric door holder to withstand 80 lb. pulling force.
- F. Connect conduit and wire to door release devices, sprinkler flow switches, sprinkler valve tamper switches, duct smoke detectors
- G. Automatic Detector Installation: Conform to NFPA 72.
- H. Install engraved plastic nameplates according to Section 28 05 53.
- I. Ground and bond fire alarm equipment and circuits according to Section 26 05 26.

### **3.4 FIELD QUALITY CONTROL**

- A. Test according to NFPA 72 and local fire department requirements.

### **3.5 MANUFACTURER'S FIELD SERVICES**

- A. Include services of certified technician to supervise installation, adjustments, final connections, and system testing.

**3.6 DEMONSTRATION AND TRAINING**

- A. Furnish 4 hours of instruction each for two persons, to be conducted at Project Site with manufacturer's representative.

**END OF SECTION**

**SECTION 31 10 00****SITE CLEARING****Part 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Site clearing, tree protection, stripping topsoil and demolition.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 - Procurement and Contracting Requirements.
  - 2. Division 01 - General Requirements.
  - 3. Section 31 23 00 - Earthwork.
  - 4. Section 31 25 00 - Soil Erosion and Sediment Control.

**Part 2 - PRODUCTS - (NOT APPLICABLE TO THIS SPECIFICATION SECTION)****Part 3 - EXECUTION****3.1 PREPARATION**

- A. Protect existing trees and other vegetation to remain against damage.
  - 1. Do not smother trees by stockpiling construction materials or excavated materials within drip line.
  - 2. Avoid foot or vehicular traffic or parking of vehicles within drip line.
  - 3. Provide temporary protection as required.
- B. Repair or replace trees and vegetation damaged by construction operations.
  - 1. Repair to be performed by a qualified tree surgeon/licensed arborist.
  - 2. Remove trees which cannot be repaired and restored to full-growth status.
  - 3. Replace with new trees of minimum 4 IN caliper or as required by local tree ordinance.
- C. Owner will obtain authority for removal and alteration work on adjoining property, as applicable.

**3.2 SITE CLEARING**

- A. Topsoil Removal:
  - 1. Strip topsoil to depths encountered or as specified within the soils report, 4 IN minimum.
    - a. Remove heavy growths of grass before stripping.
    - b. Stop topsoil stripping sufficient distance from such trees to prevent damage to main root system.
    - c. Separate from underlying subsoil or objectionable material.
  - 2. Stockpile topsoil where directed by Engineer.
    - a. Construct storage piles to freely drain surface water.
    - b. Seed or cover storage piles to prevent erosion.
  - 3. Do not strip topsoil in wooded areas where no change in grade occurs.
  - 4. Borrow topsoil: Reasonably free of subsoil, objects over 2 IN DIA, weeds and roots.
- B. Clearing and Grubbing:
  - 1. Clear from within limits of construction all trees not marked to remain.
    - a. Include shrubs, brush, downed timber, rotten wood, heavy growth of grass and weeds, vines, rubbish, structures and debris.
  - 2. Grub (remove) from within limits of construction all stumps, roots, root mats, logs and debris encountered.

- C. Disposal of Waste Materials:
1. Do not burn combustible materials on site.
  2. Remove all waste materials from site.
  3. Do not bury organic matter on site.
- 

**END OF SECTION**

**SECTION 31 23 00****EARTHWORK****Part 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Earthwork - excavation, backfilling, grading, compaction, disposal of waste and surplus materials, placing crushed stone, construction of berms, sheeting, bracing, dewatering and other Earthwork related work.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 01 - General Requirements.
  - 2. Section 31 25 00 - Soil Erosion and Sediment Control.

**1.2 QUALITY ASSURANCE**

- A. Referenced Standards:
  - 1. ASTM International (ASTM):
    - a. C33, Standard Specification for Concrete Aggregates.
    - b. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>).
    - c. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>(2,700 kN-m/m)).
    - d. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
    - e. D3786, Standard Test Method for Bursting Strength of Textile Fabrics--Diaphragm Bursting Strength Tester Method.
    - f. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
    - g. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
    - h. D4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
  - 2. Occupational Safety and Health Administration (OSHA):
    - a. 29 CFR Part 1926.650, Occupational Safety and Health Standards, referred to herein as OSHA Standards.

### 1.3 SUBMITTALS

#### A. Shop Drawings:

1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
2. Technical data including:
  - a. Acknowledgement that products submitted meet requirements of standards referenced.
  - b. Fill material test results for all parameters stated in this specification.

### 1.4 DEFINITIONS

- A. Excavation:
1. Consists of removal of material encountered to subgrade elevations required or indicated.
  2. Includes excavation of soils; pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; boulders; and rock.
- B. Foundations: Footings, base slabs, foundation walls, mat foundations, grade beams, piers and any other support placed directly on soil or rock.
- C. Non-Structural Fill/Backfill: Soil materials placed and compacted to achieve finish grade elevations that do NOT support foundations, slabs, paving, or other flatwork.
- D. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.
- E. Subgrade: The earth or soil layer immediately below foundation bearing elevation, subbase material, fill material, backfill material, or topsoil materials.
- F. Unauthorized Excavation:
1. Consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Engineer.
    - a. Unauthorized excavation, as well as associated remedial work as directed by Engineer, shall be at Contractor's expense.
  2. Unsuitable Soil Materials: Soil materials encountered at or below subgrade elevation of insufficient strength and stiffness to support construction as determined by the Engineer.

### 1.5 PROJECT CONDITIONS

- A. Salvageable Items: Carefully remove items to be salvaged, and store on Owner's premises unless otherwise directed.
- B. Dispose of waste materials, legally, off site.
1. Burning, as a means of waste disposal, is not permitted.

## Part 2 - PRODUCTS

### 2.1 MATERIALS

- A. Fill and Backfill:
1. Selected material approved by Engineer from off-site borrow.
  2. Structural Fill:

- a. May be low volume change cohesive or granular soil at Contractor's option.
  - b. Free of organic matter, frozen material and debris.
  - c. Granular soil:
    - 1) ASTM D2487 classification: **GW, GP, GM, GC, SW, or SP.**
- 3. Non-Structural Fill:
  - a. ASTM D2487 classification: **GW, GP, GM, GC, SC, SW, SP, SM, CL-ML or CL.**
  - b. Liquid limit: Less than **45.**
  - c. Maximum plasticity index: **20.**
- B. Granular Fill Under Building Floor Slabs-On-Grade, Electrical Equipment Pads, Manholes and Handholes:
  - 1. Clean, granular material.
  - 2. Less than 5 percent fines passing the No. 200 sieve.
  - 3. ASTM C33 gradation size No. 67, 3/4 IN to No. 4 or other material acceptable to Engineer.
- C. Granular Fill under Base Slabs with Pressure Relief Valves:
  - 1. Drainage material: Conform to ASTM C33, Size No. 67.
  - 2. Filter material: Conform to ASTM C33 requirements for fine aggregate.
- D. Granular Fill Under Electrical Equipment Pads, Manholes and Handholes: Clean, crushed, nonporous rock, crushed or uncrushed gravel complying with ASTM C33 gradation size No. 67, 3/4 IN to No. 4.
- E. Geotextile Filter Fabric:
  - 1. Nonwoven type.
  - 2. Equivalent opening size: 50 - 100 (U.S. Standard Sieve).
  - 3. Permeability coefficient (cm/second): 0.07 minimum, 0.30 maximum.
  - 4. Grab strength: 90 LBS minimum in either direction in accordance with ASTM D4632 requirements.
  - 5. Mullen burst strength: 125 psi minimum in accordance with ASTM D3786 requirements.
- F. Control Low Strength Material (CLSM): See Section 03 09 00.

## Part 3 - EXECUTION

### 3.1 PROTECTION

- A. Erosion Control:
  - 1. See Specification Section 31 25 00.
  - 2. Clean paved roadways daily of any spillage of dirt, rocks or debris from vehicles and equipment entering or leaving site.
  - 3. Conduct work to minimize erosion of site. Remove eroded material washed off site.
    - a. If necessary or requested by Engineer, construct stilling areas to settle and detain eroded material.
- B. Protect existing surface and subsurface features on-site and adjacent to site as follows:
  - 1. Provide barricades, coverings, or other types of protection necessary to prevent damage to existing items indicated to remain in place.
  - 2. Protect and maintain bench marks, monuments or other established reference points and property corners.
    - a. If disturbed or destroyed, replace at own expense to full satisfaction of Owner and controlling agency.



3. Verify location of utilities.
  - a. Omission or inclusion of utility items does not constitute nonexistence or definite location.
  - b. Secure and examine local utility records for location data.
  - c. Take necessary precautions to protect existing utilities from damage due to any construction activity.
    - 1) If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
    - 2) Do not interrupt existing utilities serving facilities occupied by Owner or others, during occupied hours, except when permitted in writing by Owner and then only after acceptable temporary utility services have been provided.
    - 3) Obtain Owner's approval prior to disconnecting any utility service.
  - d. Repair damages to utility items at own expense.
  - e. In case of damage, notify Engineer at once so required protective measures may be taken.
4. Maintain free of damage, existing sidewalks, structures, and pavement, not indicated to be removed.
  - a. Protect new and existing structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
  - b. Any item known or unknown or not properly located that is inadvertently damaged shall be repaired to original condition.
  - c. All repairs to be made and paid for by Contractor.
5. Provide full access to public and private premises, fire hydrants, street crossings, sidewalks and other points as designated by Owner to prevent serious interruption of travel.
6. Maintain stockpiles and excavations in such a manner to prevent inconvenience or damage to structures on-site or on adjoining property.
7. Avoid surcharge or excavation procedures which can result in heaving, caving, or slides.

### **3.2 SITE EXCAVATION AND GRADING**

- A. The site excavation and grading work includes the offsite disposition of all material:
  1. That exceed quantities required for earthwork on the project.
  2. That the engineer classifies as unclassified excavation.
  3. That the engineer classifies as unacceptable.
  4. That the engineer classifies as potentially contaminated.
- B. Excavation and Grading:
  1. Perform as required by the Contract Drawings.
  2. Contract Drawings may indicate both existing grade and finished grade required for construction of Project.
    - a. Stake all units, structures, piping, roads, parking areas and walks and establish their elevations.
    - b. Perform other layout work required.
    - c. Replace property corner markers to original location if disturbed or destroyed.
  3. Preparation of ground surface for embankments or fills:
    - a. Before fill is started, scarify to a minimum depth of 6 IN in all proposed embankment and fill areas.

- b. Where ground surface is steeper than one vertical to four horizontal, plow surface in a manner to bench and break up surface so that fill material will bind with existing surface.
  - 4. Protection of finish grade:
    - a. During construction, shape and drain embankment and excavations.
    - b. Maintain ditches and drains to provide drainage at all times.
    - c. Protect graded areas against action of elements prior to acceptance of work.
    - d. Reestablish grade where settlement or erosion occurs.
- C. Borrow:
  - 1. Provide necessary amount of approved fill compacted to density equal to that indicated in this Specification.
  - 2. Include cost of all borrow material in original proposal.
  - 3. Fill material to be approved by Engineer prior to placement.
- D. Construct embankments and fills as required by the Contract Drawings:
  - 1. Construct embankments and fills at locations and to lines of grade indicated.
    - a. Completed fill shall correspond to shape of typical cross section or contour indicated regardless of method used to show shape, size, and extent of line and grade of completed work.
  - 2. Provide approved fill material which is free from roots, organic matter, trash, frozen material, and stones having maximum dimension greater than 6 IN.
    - a. Ensure that stones larger than 4 IN are not placed in upper 6 IN of fill or embankment.
    - b. Do not place material in layers greater than 8 IN loose thickness.
    - c. Place layers horizontally and compact each layer prior to placing additional fill.
  - 3. Compact soils as required to obtain specified density. Selection of appropriate equipment is the Contractor's responsibility.
    - a. In general, compact cohesive soils by sheep'sfoot, and granular soils by pneumatic rollers, vibrators, or by other equipment as required to obtain specified density.
    - b. Control moisture for each layer necessary to meet requirements of compaction.
- E. Grading Tolerances:
  - 1. Shape the surface of the earthwork to conform to the lines, grades, and cross-sections shown in the plans. In final shaping of the surface of earthwork, maintain a tolerance of 0.2 foot above or below the plan with the following exceptions:
    - a. Shape the earthwork to match adjacent pavement, curb, sidewalk, structures, etc.
    - b. Shape the areas under sidewalk and patio to within 0.05 foot of the plan.
    - c. Shape embankments so that the embankments impounds no water.
  - 2. Ensure that the shoulder lines do not vary horizontally more than 0.3 foot from the true lines shown in the plans.

### **3.3 USE OF EXPLOSIVES**

- A. Blasting with any type of explosive is prohibited.

### **3.4 COMPACTION DENSITY REQUIREMENTS**

- A. Obtain approval from Engineer with regard to suitability of soils and acceptable subgrade prior to subsequent operations.

- B. Provide dewatering system necessary to successfully complete compaction and construction requirements.
- C. Remove frozen, loose, wet, or soft material and replace with approved material as directed by Engineer.
- D. Stabilize subgrade with well graded granular materials as directed by Engineer.
- E. Assure by results of testing that compaction densities comply with the following requirements:
  - 1. Sitework:

| LOCATION                                 | COMPACTION DENSITY                         | MOISTURE CONTENT |
|--|--|------------------|
| Under Paved Areas, Sidewalks and Piping: |  |                  |
| Cohesionless soils                       | 95 percent relative density per ASTM D1557 |                  |
| Unpaved Areas:                           |  |                  |
| Cohesionless soils                       | 90 percent relative density per ASTM D1557 |                  |

- 2. Structures:

| LOCATION   | COMPACTION DENSITY        | MOISTURE CONTENT            |
|--|---------------------------|-----------------------------|
| Inside of structures under foundations, under equipment support pads, under slabs-on-grade and scarified existing subgrade under fill material | 95 percent per ASTM D1557 | -2 to +3 percent of optimum |
| Outside structures next to walls, piers, columns and any other structure exterior member   | 95 percent per ASTM D1557 | -2 to +3 percent of optimum |

- 3. Specific areas:

| LOCATION   | COMPACTION DENSITY        | MOISTURE CONTENT            |
|--|---------------------------|-----------------------------|
| Outside structures under equipment support foundations | 95 percent per ASTM D1557 | -2 to +3 percent of optimum |

### 3.5 EXCAVATION, FILLING, AND BACKFILLING FOR STRUCTURES

- A. General:
  - 1. In general, work includes, but is not necessarily limited to, excavation for structures and retaining walls, removal of underground obstructions and undesirable material, backfilling, filling, and fill, backfill, and subgrade compaction.
  - 2. Obtain fill and backfill material necessary to produce grades required.
    - a. Materials and source to be approved by Engineer.
    - b. Excavated material approved by Engineer may also be used for fill and backfill.
  - 3. In the paragraphs of this Specification Section, the word "soil" also includes any type of rock subgrade that may be present at or below existing subgrade levels.

B. Excavation Requirements for Structures:

1. General:
  - a. Do not commence excavation for foundations for structures until Engineer approves:
    - 1) The removal of topsoil and other unsuitable and undesirable material from existing subgrade.
    - 2) Density and moisture content of site area compacted fill material meets requirements of specifications.
    - 3) Site surcharge or mass fill material can be removed from entire construction site or portion thereof.
    - 4) Surcharge or mass fill material has been removed from construction area or portions thereof.
  - b. Engineer grants approval to begin excavations.
2. Dimensions:
  - a. Excavate to elevations and dimensions indicated or specified.
  - b. Allow additional space as required for construction operations and inspection of foundations.
  - c. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction.
  - d. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
3. Removal of obstructions and undesirable materials in excavation includes, but is not necessarily limited to, removal of old foundations, existing construction, unsuitable subgrade soils, expansive type soils, and any other materials which may be concealed beneath present grade, as required to execute work indicated on Contract Drawings.
  - a. If undesirable material and obstructions are encountered during excavation, remove material and replace as directed by Engineer.
  - b. Remove unsuitable subgrade soils located below foundations. The bottom of the overexcavation shall be located outside the exterior limits of foundations around the perimeter of structure the following horizontal distance, whichever is greater:
    - 1) Distance equal to depth of overexcavation below bottom of foundations.
    - 2) 5 FT.
    - 3) As directed by Engineer.
  - c. When excavation has reached required subgrade elevations, notify Engineer, who will make an inspection of conditions.
    - 1) If Engineer determines that bearing materials at required subgrade elevations are unsuitable, provide Subgrade Stabilization as specified herein.
4. Install working surface over approved subgrade.
  - a. Minimum thickness: **12 inches**.
5. Level off bottoms of excavations to receive foundations, floor slabs, equipment support pads, or compacted fill.
  - a. Remove loose materials and bring excavations into approved condition to receive concrete or fill material.
  - b. Where compacted fill material must be placed to bring subgrade elevation up to underside of construction, scarify existing subgrade upon which fill material is to be placed to a depth of 6 IN and then compact to density stated in this Specification Section before fill material can be placed thereon.
  - c. Do not carry excavations lower than shown for foundations except as directed by Engineer.

- d. If any part of excavations is carried below required depth without authorization, notify Engineer and correct unauthorized excavation as directed. Corrections may include:
  - 1) Under soil supported footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation.
    - a) Concrete fill may be used to bring elevations to proper position.
  - 2) In locations other than those above, including slabs on grade and pile supported foundations, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Engineer.
  - 3) No extra compensation will be made to Contractor for correcting unauthorized excavations.
- 6. Make excavations large enough for working space, forms, dampproofing, waterproofing, and inspection.
- 7. Notify Engineer as soon as excavation is completed in order that subgrades may be inspected.
  - a. Do not commence further construction until subgrade under compacted fill material, under foundations, under floor slabs-on-grade, under equipment support pads, and under retaining wall footings has been inspected and approved by the Engineer as being free of undesirable material, being of compaction density required by this specification, and being capable of supporting the allowable foundation design bearing pressures and superimposed foundation, fill, and building loads to be placed thereon.
  - b. Engineer shall be given the opportunity to inspect subgrade below fill material both prior to and after subgrade compaction.
  - c. Place fill material, foundations, retaining wall footings, floor slabs-on-grade, and equipment support pads as soon as weather conditions permit after excavation is completed, inspected, and approved and after forms and reinforcing are inspected and approved.
  - d. Before concrete or fill material is placed, protect approved subgrade from becoming loose, wet, frozen, or soft due to weather, construction operations, or other reasons.
- 8. Dewatering:
  - a. Where groundwater is or is expected to be encountered during excavation, install a dewatering system to prevent softening and disturbance of subgrade below foundations and fill material, to allow foundations and fill material to be placed in the dry, and to maintain a stable excavation side slope.
  - b. Groundwater shall be maintained at least 3 FT below the bottom of any excavation.
  - c. Review Geotechnical investigation before beginning excavation and determine where groundwater is likely to be encountered during excavation.
  - d. Employ dewatering specialist for selecting and operating dewatering system.
  - e. Keep dewatering system in operation until dead load of structure exceeds possible buoyant uplift force on structure.
  - f. Dispose of groundwater to an area which will not interfere with construction operations or damage existing construction.
    - 1) Install groundwater monitoring wells as necessary.
  - g. Shut off dewatering system at such a rate to prevent a quick upsurge of water that might weaken the subgrade.
- 9. Subgrade stabilization:

- a. If subgrade under foundations, fill material, floor slabs-on-grade, or equipment support pads is in a frozen, loose, wet, or soft condition before construction is placed thereon, remove frozen, loose, wet, or soft material and replace with approved compacted material as directed by Engineer.
  - b. Provide compaction density of replacement material as stated in this Specification Section.
  - c. Loose, wet, or soft materials, when approved by Engineer, may be stabilized by a compacted working mat of well graded crushed stone.
  - d. Compact stone mat thoroughly into subgrade to avoid future migration of fines into the stone voids.
  - e. Remove and replace frozen materials as directed by Engineer.
  - f. Method of stabilization shall be performed as directed by Engineer.
  - g. Do not place further construction on the repaired subgrades, until the subgrades have been approved by the Engineer.
10. Do not place floor slabs-on-grade including equipment support pads until subgrade below has been approved, piping has been tested and approved, reinforcement placement has been approved, and Contractor receives approval to commence slab construction.
  - a. Do not place building floor slabs-on-grade including equipment support pads when temperature of air surrounding the slab and pads is or is expected to be below 40 DegF before structure is completed and heated to a temperature of at least 50 DegF.
11. Protection of structures:
  - a. Prevent new and existing structures from becoming damaged due to construction operations or other reasons.
  - b. Prevent subgrade under new and existing foundations from becoming wet and undermined during construction due to presence of surface or subsurface water or due to construction operations.
12. Shoring:
  - a. Shore, slope, or brace excavations as required to prevent them from collapsing.
  - b. Remove shoring as backfilling progresses but only when banks are stable and safe from caving or collapse.
  - c. Construct shoring that is required to retain water as part of the dewatering system, using non-permeable details such as interlock sealant for sheet piles.
13. Drainage:
  - a. Control grading around structures so that ground is pitched to prevent water from running into excavated areas or damaging structures.
  - b. Maintain excavations where foundations, floor slabs, equipment support pads or fill material are to be placed free of water.
  - c. Provide pumping required to keep excavated spaces clear of water during construction.
  - d. Should any water be encountered in the excavation, notify Engineer.
  - e. Provide free discharge of water by trenches, pumps, wells, well points, or other means as necessary and drain to point of disposal that will not damage existing or new construction or interfere with construction operations.
14. Frost protection:
  - a. Do not place foundations, slabs-on-grade, equipment support pads, or fill material on frozen ground.
  - b. When freezing temperatures may be expected, do not excavate to full depth indicated, unless foundations, floor slabs, equipment support pads, or fill material can be placed immediately after excavation has been completed and approved.
  - c. Protect excavation from frost if placing of concrete or fill is delayed.

- d. Where a concrete slab is a base slab-on-grade located under and within a structure that will not be heated, protect subgrade under the slab from becoming frozen until final acceptance of the Project by the Owner.
  - e. Protect subgrade under foundations of a structure from becoming frozen until structure is completed and heated to a temperature of at least 50 DegF.
- C. Fill and Backfill Inside of Structure and Below Foundations, Base Slabs, Floor Slabs, Equipment Support Pads and Piping:
  - 1. General:
    - a. Subgrade to receive fill or backfill shall be free of undesirable material as determined by Engineer and scarified to a depth of 6 IN and compacted to density specified herein.
    - b. Surface may be stepped by at not more than 12 IN per step or may be sloped at not more than 2 percent.
    - c. Do not place any fill or backfill material until subgrade under fill or backfill has been inspected and approved by Engineer as being free of undesirable material and compacted to specified density.
  - 2. Obtain approval of fill and backfill material and source from Engineer prior to placing the material.
  - 3. Granular fill under floor slabs-on-grade: Place all floor slabs-on-grade on a minimum of 6 IN of granular fill unless otherwise indicated.
  - 4. Fill and backfill placement:
    - a. Prior to placing fill and backfill material, optimum moisture and maximum density properties for proposed material shall be obtained from Engineer.
    - b. Place fill and backfill material in thin lifts as necessary to obtain required compaction density.
    - c. Compact material by means of equipment of sufficient size and proper type to obtain specified density.
    - d. Use hand operated equipment for filling and backfilling within 5 FT of walls and less than 3 FT above pipes.
      - 1) Compaction equipment exceeding 3000 LBS dead weight shall not be used within 5 FT of the wall as a minimum
      - 2) Contractor is responsible for method of compaction so as not to damage wall.
    - e. Use hand operated equipment for filling and backfilling next to walls.
    - f. Do not place fill and backfill when the temperature is less than 40 DegF and when subgrade to receive fill and backfill material is frozen, wet, loose, or soft.
    - g. Use vibratory equipment to compact granular material; do not use water.
  - 5. Where fill material is required below foundations, place fill material, conforming to the required density and moisture content as required to fill the specified overexcavation to bottom of foundation.
- D. Filling and Backfilling Outside of Structures:
  - 1. This paragraph of this Specification applies to fill and backfill placed outside of structures above bottom level of both foundations and piping but not under paving.
  - 2. Provide material as approved by Engineer for filling and backfilling outside of structures.
  - 3. Fill and backfill placement:
    - a. Prior to placing fill and backfill material, obtain optimum moisture and maximum density properties for proposed material from Engineer.
    - b. Place fill and backfill material in thin lifts as necessary to obtain required compaction density.
    - c. Compact material with equipment of proper type and size to obtain density specified.

- d. Use hand operated equipment for filling and backfilling within 5 FT of walls and less than 3 FT above pipes.
  - 1) Compaction equipment exceeding 3000 LBS dead weight shall not be used within 5 FT of the wall as a minimum
  - 2) Contractor is responsible for method of compaction so as not to damage wall.
- e. Use only hand operated equipment for filling and backfilling next to walls and retaining walls.
- f. Do not place fill or backfill material when temperature is less than 40 DegF and when subgrade to receive material is frozen, wet, loose, or soft.
- g. Use vibratory equipment for compacting granular material; do not use water.
- 4. Backfilling against walls:
  - a. Do not backfill around any part of structures until each part has reached specified 28-day compressive strength and backfill material has been approved.
  - b. Do not start backfilling until concrete forms have been removed, trash removed from excavations, pointing of masonry work, concrete finishing, dampproofing and waterproofing have been completed.
  - c. Do not place fills against walls until floor slabs at top, bottom, and at intermediate levels of walls are in place and have reached 28-day required compressive strength to prevent wall movement.
    - 1) See Contract Drawings for specific exceptions.
  - d. Bring backfill and fill up uniformly around the structures and individual walls, piers, or columns.
- E. Backfilling Outside of Structures under Piping or Paving:
  - 1. When backfilling outside of structures requires placing backfill material under piping or paving, the material shall be placed from bottom of excavation to underside of piping or paving at the density required for fill under piping or paving as indicated in this Specification Section.
  - 2. This compacted material shall extend transversely to the centerline of piping or paving a horizontal distance each side of the exterior edges of piping or paving equal to the depth of backfill measured from bottom of excavation to underside of piping or paving.
  - 3. Provide special compacted bedding or compacted subgrade material under piping or paving as required by other Specification Sections for the Project.

### 3.6 FIELD QUALITY CONTROL

- A. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the requirements of OSHA standards 29 CFR Part 1926.650 Subpart P, and state requirements. Where conflict between OSHA and state regulations exists, the more stringent requirements shall apply.
- B. Responsibilities of Special Inspector:
  - 1. Review proposed materials for fill and backfill around structures.
  - 2. All testing, observation and work indicated as being performed by the Engineer in this Specification Section.
  - 3. Services will include verification and documentation of satisfactory soil materials, subgrade quality, sampling, placement, moisture conditioning, compaction and testing of proposed soil materials, and field testing for quality control.
  - 4. Moisture density relations, to be established by the Engineer required for all materials to be compacted.
  - 5. Extent of compaction testing will be as necessary to assure compliance with specifications.
  - 6. Prepare and submit inspection and test reports to Engineer.



- a. Coordinate such work with other Special Inspectors.
- 7. Test reports to include the following:
  - a. Report and certification of aggregate fill and drainage fill.
  - b. Test reports on borrow material.
  - c. Verification of suitability of each footing subgrade material, in accordance with specified requirements.
  - d. Field reports; in-place soil density and moisture tests.
  - e. One optimum moisture-maximum density curve for each type of soil encountered.
  - f. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.
  - g. Other documentation necessary for Engineer to approve earthwork.
  - h. Assist Engineer to determine corrective measures necessary for defective work.
- C. Responsibilities of Testing Agency for Site Excavation and Grading:
  - 1. All testing, observation and work indicated as being performed by the Engineer in other than Article 3.5 of this Specification Section.
  - 2. Services will include verification and documentation of satisfactory soil materials, subgrade quality, sampling, placement, moisture conditioning, compaction and testing of proposed soil materials, and field testing for quality control.
  - 3. Moisture density relations, to be established by the Engineer required for all materials to be compacted.
  - 4. Extent of compaction testing will be as necessary to assure compliance with specifications.

**END OF SECTION**

**SECTION 31 23 33****TRENCHING, BACKFILLING, AND COMPACTING FOR UTILITIES****PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
  - 1. Excavation, trenching, backfilling and compacting for all underground utilities.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 00 - Procurement and Contracting Requirements.
  - 2. Division 01 - General Requirements.
  - 3. Section 03 31 31 - Concrete Mixing, Placing, Jointing, and Curing.
  - 4. Division 26 - Electrical.
  - 5. Section 31 23 00 - Earthwork.
  - 6. Section 33 05 16 - Precast Concrete Manhole Structures.
  - 7. Section 33 05 23 - Pipeline Undercrossings.

**1.2 QUALITY ASSURANCE**

- A. Referenced Standards:
  - 1. ASTM International (ASTM):
    - a. [C33, Standard Specification for Concrete Aggregates.]
    - b. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 FT-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>)).
    - c. [D2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.]
    - d. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
    - e. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
- B. Qualifications: Hire an independent soils laboratory to conduct in-place moisture-density tests for backfilling to assure that all work complies with this Specification Section.

**1.3 DEFINITIONS**

- A. Excavation: All excavation will be defined as unclassified.

**1.4 SUBMITTALS**

- A. Shop Drawings:
  - 1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
  - 2. Product technical data including:
    - a. Acknowledgement that products submitted meet requirements of standards referenced.
    - b. Manufacturer's installation instructions.
  - 3. Submit respective pipe or conduit manufacturer's data regarding bedding methods of installation and general recommendations.

4. Submit sieve analysis reports on all granular materials.
- B. Informational Submittals:
1. See Specification Section 01 33 00 for requirements for the mechanics and administration of the submittal process.
  2. Trench shield (trench box) certification if employed:
    - a. Specific to Project conditions.
    - b. Re-certified if members become distressed.
    - c. Certification by registered professional structural engineer, registered in the state where the Project is located.
    - d. Engineer is not responsible to, and will not, review and approve.

## 1.5 SITE CONDITIONS

- A. Avoid overloading or surcharge a sufficient distance back from edge of excavation to prevent slides or caving.
  1. Maintain and trim excavated materials in such manner to be as little inconvenience as possible to public and adjoining property owners.
- B. Provide full access to public and private premises and fire hydrants, at street crossings, sidewalks and other points as designated by Owner to prevent serious interruption of travel.
- C. Protect and maintain bench marks, monuments or other established points and reference points and if disturbed or destroyed, replace items to full satisfaction of Owner and controlling agency.
- D. Verify location of existing underground utilities

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Backfill Material:
  1. As approved by Engineer.
    - a. Free of rock cobbles, roots, sod or other organic matter, and frozen material.
    - b. Moisture content at time of placement: 3 percent plus/minus of optimum moisture content as specified in accordance with ASTM D698.
  2. Gravel trench backfill materials:
    - a. Uniformly graded pea gravel defined below:

| Sieve Size                | 1 IN | 3/4 IN | 3/8 IN | No. 4 | No. 20 |
|---------------------------|------|--------|--------|-------|--------|
| Percent Passing by Weight | [ ]  | [ ]    | [ ]    | [ ]   | [ ]    |

- B. Subgrade Stabilization Materials: Provide subgrade stabilization material consisting of [ ].
- C. Bedding Materials:
  1. As approved by the Geotechnical Engineer.
  2. Granular bedding materials:
    - a. [ASTM D2321 Class 1B.]
      - 1) Well-graded crushed stone.

- b. [ASTM C33, gradation 67 (3/4 IN to No. 4 sieve) defined below:]

| Sieve Size                | 1 IN | 3/4 IN | 3/8 IN | No. 4 | No. 20 |
|---------------------------|------|--------|--------|-------|--------|
| Percent Passing by Weight | 100  | 90-100 | 20-55  | 0-10  | 0      |

- 1) [Well-graded crushed stone.]
  - 2) [Well graded crushed gravel.]
  - 3) [Well graded gravel.]
3. Flowable fill:
- a. Description: Flowable fill shall be a mixture of cement, fly ash, fine sand, water, and air having a consistency which will flow under a very low head.
  - b. Material characteristics:
    - 1) The approximate quantities of each component per cubic yard of mixed material shall be as follows:
      - a) Cement (Type I or II): 50 LBS.
      - b) Fly ash: 200 LBS.
      - c) Fine sand: 2,700 LBS.
      - d) Water: 420 LBS.
      - e) Air content: 10 percent.
    - 2) Actual quantities shall be adjusted to provide a yield of 1 cubic yard with the materials used.
    - 3) Approximate compressive strength should be 85 to 175 PSI.
    - 4) Fine sand shall be an evenly graded material having not less than 95 percent passing the No. 4 sieve and not more than 5 percent passing the No. 200 sieve.
    - 5) Mixing and handling of the material shall be in accordance with Specification Section 03 31 31.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Remove and dispose of unsuitable materials as directed by Geotechnical Engineer to site provided by [Owner] [Contractor] [\_\_\_\_\_].

### 3.2 EXCAVATION

- A. Unclassified Excavation: Remove rock excavation, clay, silt, gravel, hard pan, loose shale, and loose stone as directed by Geotechnical Engineer.
- B. Excavation for Appurtenances:
  1. 12 IN (minimum) clear distance between outer surface and embankment.
  2. See Specification Section 31 23 00 for applicable requirements.
  3. See Specification Section 33 05 16 for applicable requirements.
- C. Groundwater Dewatering:
  1. Where groundwater is, or is expected to be, encountered during excavation, install a dewatering system to prevent softening and disturbance of subgrade to allow [subgrade stabilization], pipe, bedding and backfill material to be placed in the dry, and to maintain a stable trench wall or side slope.

2. Groundwater shall be drawn down and maintained at least [3] FT below the bottom of any trench or manhole excavation prior to excavation.
3. Review soils investigation before beginning excavation and determine where groundwater is likely to be encountered during excavation.
  - a. Employ dewatering specialist for selecting and operating dewatering system.
4. Keep dewatering system in operation until dead load of pipe, structure and backfill exceeds possible buoyant uplift force on pipe or structure.
5. Dispose of groundwater to an area which will not interfere with construction operations or damage existing construction.
6. Install groundwater monitoring wells as necessary.
7. Shut off dewatering system at such a rate to prevent a quick upsurge of water that might weaken the subgrade.
8. Cost of groundwater dewatering shall be [included in the lineal foot unit price of the pipe installation] [compensated under an allowance][compensated at the unit price for Bid Item [ ] - Groundwater Dewatering].

D. Trench Excavation:

1. Excavate trenches by open cut method to depth shown on Drawings and necessary to accommodate work.
  - a. Support existing utility lines [and yard piping] where proposed work crosses at a lower elevation.
    - 1) Stabilize excavation to prevent undermining of existing utility [and yard piping].
2. Open trench outside buildings, units, and structures:
  - a. No more than the distance between two manholes, structures, units, or [300] LF, whichever is less.
  - b. Field adjust limitations as weather conditions dictate.
3. Trenching within buildings, units, or structures:
  - a. No more than [100] LF at any one time.
4. Any trench or portion of trench, which is opened and remains idle for [seven (7)] calendar days, or longer, as determined by the Owner, may be directed to be immediately refilled, without completion of work, at no additional cost to Owner.
  - a. Said trench may not be reopened until Owner is satisfied that work associated with trench will be prosecuted with dispatch.
5. Observe following trenching criteria:
  - a. Trench size:
    - 1) Excavate width to accommodate free working space.
    - 2) Maximum trench width at top of pipe or conduit may not exceed outside diameter of utility service by more than the following dimensions:

| OVERALL DIAMETER OF UTILITY SERVICE | EXCESS DIMENSION |
|-------------------------------------|------------------|
| 33 IN and less                      | 18 IN            |
| more than 33 IN                     | 24 IN            |

- 3) Cut trench walls vertically from bottom of trench to 1 FT above top of pipe, conduit, or utility service.
- 4) Keep trenches free of surface water runoff.

- a) Include cost in Bid.
  - b) No separate payment for surface water runoff pumping will be made.
- E. Trenching for Electrical Installations:
  - 1. Observe the preceding Trench Excavation paragraph in PART 3 of this Specification Section.
  - 2. Modify for electrical installations as follows:
    - a. Open no more than 600 LF of trench in exterior locations for trenches more than 12 IN but not more than 30 IN wide.
    - b. Any length of trench may be opened in exterior locations for trenches which are 12 IN wide or less.
    - c. Do not over excavate trench.
    - d. Cut trenches for electrical runs with minimum 30 IN cover, unless otherwise specified or shown on Drawings.
    - e. See Division 26 for additional requirements.
- F. Flowable Fill:
  - 1. Flowable fill shall be:
    - a. Discharged from a mixer by any means acceptable to the Engineer into the area to be filled.
    - b. Placed in 4 FT maximum lifts to the elevations indicated.
      - 1) Allow 12 HR set-up time before placing next lift or as approved by the Engineer.
      - 2) Contractor shall place flowable fill lifts in such a manner as to prevent flotation of the pipe.
  - 2. Flowable fill shall not be placed on frozen ground.
  - 3. Subgrade on which flowable fill is placed shall be free of disturbed or softened material and water.
  - 4. Conform to appropriate requirements of Specification Section 31 23 00.
  - 5. Flowable fill batching, mixing, and placing may be started if weather conditions are favorable, and the air temperature is 34 DEGF and rising.
  - 6. At the time of placement, flowable fill must have a temperature of at least 40 DEGF.
  - 7. Mixing and placing shall stop when the air temperature is 38 DEGF or less and falling.
  - 8. Each filling stage shall be as continuous an operation as is practicable.
  - 9. Contractor shall prevent traffic contact with flowable fill for at least 24 HRS after placement or until flowable fill is hard enough to prevent rutting by construction equipment.
  - 10. Flowable fill shall not be placed until water has been controlled or groundwater level has been lowered in conformance with the requirements of the preceding Groundwater Dewatering paragraph in PART 3 of this Specification Section.

### **3.3 PREPARATION OF FOUNDATION FOR PIPE LAYING**

- A. Over-Excavation:
  - 1. Backfill and compact to 90 percent of maximum dry density per ASTM D698.
  - 2. Backfill with granular bedding material as option.
- B. Rock Excavation:
  - 1. Excavate minimum of 6 IN below bottom exterior surface of the pipe or conduit.
  - 2. Backfill to grade with suitable earth or granular material.

3. Form bell holes in trench bottom.
- C. Subgrade Stabilization:
  1. Stabilize the subgrade when directed by the Owner.
  2. Observe the following requirements when unstable trench bottom materials are encountered.
    - a. Notify Owner when unstable materials are encountered.
      - 1) Define by drawing station locations and limits.
    - b. Remove unstable trench bottom caused by Contractor failure to dewater, rainfall, or Contractor operations.
      - 1) Replace with subgrade stabilization with no additional compensation.

### **3.4 BACKFILLING METHODS**

- A. Do not backfill until tests to be performed on system show system is in full compliance with specified requirements.
- B. Carefully Compacted Backfill:
  1. Furnish where indicated on Drawings, specified for trench embedment conditions and for compacted backfill conditions up to 12 IN above top of pipe or conduit.
  2. Comply with the following:
    - a. Place backfill in lifts not exceeding 8 IN (loose thickness).
    - b. Hand place, shovel slice, and pneumatically tamp all carefully compacted backfill.
    - c. Observe specific manufacturer's recommendations regarding backfilling and compaction.
    - d. Compact each lift to specified requirements.
- C. Common Trench Backfill:
  1. Perform in accordance with the following:
    - a. Place backfill in lift thicknesses capable of being compacted to densities specified.
    - b. Observe specific manufacturer's recommendations regarding backfilling and compaction.
    - c. Avoid displacing joints and appurtenances or causing any horizontal or vertical misalignment, separation, or distortion.
- D. Water flushing for consolidation is not permitted.
- E. Backfilling for Electrical Installations:
  1. Observe the preceding Carefully Compacted Backfill paragraph or Common Trench Backfill paragraph in PART 3 of this Specification Section or when approved by the Engineer.
  2. Modify for electrical installation as follows:
    - a. Observe notes and details on electrical drawings for fill in immediate vicinity of direct burial cables.

### **3.5 COMPACTION**

- A. General:
  1. Place and assure bedding, backfill, and fill materials achieve an equal or higher degree of compaction than undisturbed materials adjacent to the work.
  2. In no case shall degree of compaction below minimum compactions specified be accepted.

## B. Compaction Requirements:

1. Unless noted otherwise on Drawings or more stringently by other Specification Sections, comply with following minimum trench compaction criteria.
  - a. Bedding material:

| LOCATION      | SOIL TYPE          | COMPACTION DENSITY   |
|---------------|--------------------|--|
| All locations | Cohesionless soils | [75] percent relative density by ASTM D4253 and ASTM D4254 |

## b. Carefully compacted backfill:

| LOCATION             | SOIL TYPE          | COMPACTION DENSITY   |
|----------------------|--------------------|--|
| All applicable areas | Cohesive soils     | 95 percent of maximum dry density by ASTM D698             |
|                      | Cohesionless soils | [75] percent relative density by ASTM D4253 and ASTM D4254 |

## c. Toe drain bedding and backfill:

| LOCATION      | SOIL TYPE          | COMPACTION DENSITY                                       |
|---------------|--------------------|--|
| All locations | Cohesionless soils | 60 percent relative density by ASTM D4253 and ASTM D4254 |

## d. Common trench backfill:

| LOCATION   | SOIL TYPE          | COMPACTION DENSITY  |
|--|--------------------|---|
| Under pavements, roadways, surfaces within highway right-of-ways | Cohesive soils     | 95 percent of maximum dry density by ASTM D698                |
|  | Cohesionless soils | [60] percent of relative density by ASTM D4253 and ASTM D4254 |
| Under turfed, sodded, plant seeded, nontraffic areas             | Cohesive soils     | 85 percent of maximum dry density by ATM D698                 |
|  | Cohesionless soils | [40] percent of relative density by ASTM D4253 and ASTM D4254 |

**3.6 FIELD QUALITY CONTROL**

## A. Testing:

1. Perform in-place moisture-density tests as directed by the Owner.
2. Perform tests through recognized testing laboratory approved by Owner.
3. Costs of "Passing" tests paid by Owner.
4. Perform additional tests as directed until compaction meets or exceeds requirements.
5. Cost associated with "Failing" tests shall be paid by Contractor.



6. Reference to Engineer in this Specification Section will imply Geotechnical Engineer when employed by Owner and directed by Engineer to undertake necessary inspections as approvals as necessary.
7. Assure Owner has immediate access for testing of all soils related work.
8. Ensure excavations are safe for testing personnel.

**END OF SECTION**

**SECTION 31 25 00**  
**SOIL EROSION AND SEDIMENT CONTROL**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Section Includes:
  - 1. Soil erosion and sediment control.
- B. Related Specification Sections include but are not necessarily limited to:
  - 1. Division 01 - General Requirements.

**1.2 QUALITY ASSURANCE**

- A. Referenced Standards:
  - 1. Erosion control standards: Standards and Specifications for Soil Erosion and Sediment Control in Developing Areas by the United States Department of Agriculture (USDA), Soil Conservation Service, College Park, Maryland.

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

- A. See plans.

**PART 3 - EXECUTION**

**3.1 PREPARATION**

- A. Prior to General Stripping Topsoil and Excavating:
  - 1. Install perimeter dikes and swales.
  - 2. Excavate and shape sediment basins and traps.
  - 3. Construct pipe spillways and install stone filter where required.
  - 4. Machine compact all berms, dikes and embankments for basins and traps.
  - 5. Install silt barricades where indicated.
- B. Construct sediment traps where indicated on Drawings during rough grading as grading progresses.
- C. Temporarily seed basin slopes and topsoil stockpiles:
  - 1. Rate: 1/2 LB/1000 SQFT.
  - 2. Reseed as required until good stand of grass is achieved.

**3.2 DURING CONSTRUCTION PERIOD**

- A. Maintain Basins, Dikes, Traps, Stone Filters, etc.:
  - 1. Inspect regularly especially after rainstorms.
  - 2. Repair or replace damaged or missing items.
- B. After rough grading, sow temporary grass cover over all exposed earth areas not draining into sediment basin or trap.

- C. Construct inlets as soon as possible.
  - 1. Install erosion control devices completely around inlets as detailed on Drawings.
- D. Provide necessary swales and dikes to direct all water towards and into sediment basins and traps.
- E. Do not disturb existing vegetation (grass and trees).
- F. Excavate sediment out of basins and traps when capacity has been reduced by 50 percent.
- G. Topsoil and Fine Grade Slopes and Swales, etc.: Sod or seed and mulch as soon as areas become ready.

### **3.3 NEAR COMPLETION OF CONSTRUCTION**

- A. Eliminate basins, dikes, traps, etc.
- B. Grade to finished or existing grades.
- C. Fine grade all remaining earth areas, then sod or seed per the plans.

### **END OF SECTION**

**SECTION 31 31 00****SOIL TREATMENT****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. This Section includes soil treatment for termite control.

**1.2 SUBMITTALS**

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data and application instructions
- C. Certification that products used comply with U.S. Environmental Protection Agency (EPA) regulations for termiticides.

**1.3 QUALITY ASSURANCE**

- A. In addition to requirements of these specifications, comply with manufacturer's instructions and recommendations for preparing substrate and application.
- B. Engage a professional pest control operator who is licensed in accordance with regulations of governing authorities to apply soil treatment solution.
- C. Use only termiticides that bear a federal registration number of the EPA and are approved by local authorities having jurisdiction.

**1.4 JOB CONDITIONS**

- A. Restrictions: Do not apply soil treatment solution until excavating, filling, and grading operations are completed, except as otherwise required in construction operations.
- B. To ensure penetration, do not apply soil treatment to excessively wet soils or during inclement weather. Comply with handling and application instructions of the soil toxicant manufacturer.

**1.5 WARRANTY**

- A. Warranty: Furnish written warranty, executed by Applicator and Contractor, certifying that applied soil termiticide treatment will prevent infestation of subterranean termites. If subterranean termite activity is discovered during warranty period, Contractor will re-treat soil and repair or replace damage caused by termite infestation.

- B. Warranty Period: Five (5) years from date of Substantial Completion.
- C. Warranty shall not deprive the City of other rights the City may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

## **PART 2 - PRODUCTS**

### **2.1 SOIL TREATMENT SOLUTION**

- A. General: Use an emulsible, concentrated termiticide that dilutes with water, specially formulated to prevent termite infestation. Fuel oil will not be permitted as a dilutant. Provide a solution consisting of one of following chemical elements.
- B. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
  - 1. Chlorpyrifos: Dursban TC, Dow Chemical Co.
  - 2. Permethrin:
    - a) Dragnet FT, FMC Corp.
    - b) Torpedo, ICI Americas, Inc.
  - 3. Cypermethrine:
    - a) Prevail FT, FMC Corp.
    - b) Demon, ICI Americas, Inc.
  - 4. Fenvalerate: Gold Coast Tribute, Du Pont.
  - 5. Isofenphose: Pryfon, Mobay Corp.
- C. Dilute with water to concentration level recommended by manufacturer.
- D. Other solutions may be used as recommended by Applicator if approved for intended application by local authorities having jurisdiction. Use only soil treatment solutions that are not harmful to plants.

## **PART 3 - EXECUTION**

### **3.1 APPLICATION**

- A. Surface Preparation: Remove foreign matter that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and foundations. Toxicants may be applied before placing compacted fill under slabs if recommended by toxicant manufacturer.
- B. Application Rates: Apply soil treatment solution as follows:

1. Under slab-on-grade structures, treat soil before concrete slabs are placed, using the following application rates:
    - a) Apply 4 gallons of chemical solution per 10 linear feet to soil in critical areas under slab, including entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers.
    - b) Apply 1 gallon of chemical solution per 10 square feet as an overall treatment under slab and attached slab areas where fill is soil or unwashed gravel. Apply 1-1/2 gallons of chemical solution to areas where fill is washed gravel or other coarse absorbent material.
    - c) Apply 4 gallons of chemical solution per 10 linear feet of trench for each foot of depth from grade to footing, along outside edge of building. Dig a trench 6 to 8 inches wide along outside of foundation to a depth of not less than 12 inches. Punch holes to top of footing at not more than 12 inches on center and apply chemical solution. Mix chemical solution with the soil as it is being replaced in the trench.
  2. At foundations or grade beams, treat voids at rate of 2 gallons per 10 linear feet, poured directly into the hollow spaces.
  3. At expansion joints, control joints, and areas where slabs will be penetrated, apply at rate of 4 gallons per 10 linear feet of penetration.
- C. Post signs in areas of application to warn workers that soil termiticide treatment has been applied. Remove signs after areas are covered by other construction.
- D. Reapply soil treatment solution to areas disturbed by subsequent excavation, landscape grading, or other construction activities following application.

**END OF SECTION 31 31 00**

**SECTION 32 84 00****IRRIGATION****PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. The work under in this section includes, but is not necessarily limited to:
1. Furnish and install an automatically controlled irrigation system and associated equipment.
  2. Furnish and install backflow prevention devices, water meters, and connections to existing water main pipe to provide a water supply to the irrigation systems.
  3. Furnishing all labor, materials and equipment for the proper design, installation, and testing of the irrigation system.
  4. Installation of pipe sleeves and control wire sleeves under paved areas by installing during pavement improvements, by directional boring, or cutting and patching as approved in advance of the work.
  5. Excavation, trenching, and backfill
  6. Testing all systems and making the system operational
  7. Provide "As-Built" drawings.

**1.2 QUALITY ASSURANCE**

- A. Work shall conform to all ANSI, ASTM, Standards and Specifications, and all applicable building codes and other public agencies having jurisdiction Failure to do so will make contractor liable for damage arising from his operations subsequent to discovery of such utilities not s upon the work.
- B. Obtain all permits. Pay required fees to any governmental agency having jurisdiction over the work. Inspections required by local ordinances during the course of construction shall be arranged as required. On completion of the work, satisfactory evidence shall be furnished the Owner's Representative to show that all work has been installed in accordance with the ordinances and code requirements.

**1.3 JOB CONDITIONS**

- A. Where the terms "approve", "approval", or "approved" are used in the specifications, they shall mean the approval of the Owner or the Owner's Representative in writing.
- B. A conference shall be held between the contractor and the Owner and/or the Owner's Representative concerning and work under this section before any work is started.
- C. Coordinate and cooperate with other contractors on the site to enable the work to proceed as rapidly and efficiently as possible. Install irrigation work in the course of other work such as pavement removal and replacement.
- D. Contractor's Inspection of Site:

1. Become familiar with site conditions. Should utilities not shown on the plans be found during excavations, promptly notify the Owner's Representative for instructions as to further actions on how to proceed.
  2. Make necessary adjustments in the layout as required to connect the new systems to the existing water sources. Work around existing improvements as required to complete the work.
- E. Take precautions to protect existing site conditions including plants to remain. Should damages be incurred, repair the damage to its original condition to the satisfaction of the Owner's Representative.
- F. The Owner reserves the right to substitute, add, or delete any material or work as the work progresses. Adjustment to the contract price shall be negotiated if deemed necessary by the Owner or Owner's Representative.
- G. Owner or Owner's Representative reserves the right to reject material or work not in conformance with the Contract Documents. Rejected work shall be removed or corrected within fourteen working days from time of notice from the Owner's Representative.

#### **1.4 SUBMITTALS**

- A. Submit a schedule of work within 15 days after award of the contract. Include all aspects of the work on a weekly schedule.
- B. Provide six copies of manufacturer's cut sheets of products necessary to provide the entire system outlined in the specifications or as shown on the drawings. The cut sheets shall list manufacturer's name, catalog name and catalog number as well as size, type, and illustration of product to be supplied. The information shall be supplied to the Owner's Representative for review and response. Only when Owner's Representative approves contractor's cut sheets and drawings and required information shall the contractor begin construction.
- C. Prepare an "As-Built" drawing on reproducible base sheets and show deviations from the construction documents made during construction affecting but not limited to the main line pipe, controller, remote control valve locations, meter and backflow preventer locations, pipe and control wire sleeves, changes in equipment and all sprinkler heads. The drawings shall also show approved substitutions of size, material and manufacturer's name and catalog number. Two copies of the drawings shall be delivered to the Owner before final acceptance of work.
1. Store "As-Built" drawings apart from documents used for construction. Maintain drawings in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes. Make documents available at all times for observation by the Owner or Owner's Representative.
  2. Label each document "As-Built" in neat, large, printed letters or by rubber stamp. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.
  3. Legibly mark to record actual construction and installation, including:



- a) Horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
  - b) Field Changes of dimensions and detail.
  - c) Changes made by Field Order or by Change Order.
  - d) Details not on original Contract Drawings.
4. The Owner's Representative may supply to the contractor one complete set of reproducible prints to be used for "As-Built" submittal. Contractor shall transfer all Record Documents information outlined above to these reproducible prints.
5. As-Built drawings shall be kept updated weekly and shall be reviewed by Owner or Owner's Representative during the course of the work. If during the course of the work the Record Documents are found substantially incorrect or substantially behind the progress of the work, the Owner shall have the right to hold progress payments until said documents are brought to an acceptable level of completeness.
6. Accompany submittal of Record Documents with transmittal letter in duplicate, containing:
- a) Date
  - b) Project title and number
  - c) Contractor's name and address
  - d) Title and number of each As-Built
  - e) Signature of contractor or his authorized representative signifying the "As-Built" drawings are correct with final installation of the irrigation system.

## **PART 2 – PRODUCTS**

### **2.1 GENERAL**

- A. All materials throughout the system shall be new and in new condition. No deviations from the specifications shall be allowed without prior written approval by the Owner or Owner's Representative.

### **2.2 PVC PIPE AND ACCESSORIES**

- A. The irrigation system pipe shall be as stated herein and/or as shown on the drawings, and shall be furnished, installed, and tested in accordance with these specifications and as required on the Drawings. Unless otherwise stated on the drawings, all fittings for pipe shall be capable of withstanding a sustained pressure of at least 125 P. S. I.
- 1. PVC (polyvinyl chloride) pipe of all diameters shall be Schedule 40 IPS plastic pipe and meeting all requirements of A.S.T.M. Specifications D-1784 and D-2241, D-3139, F-477.
  - 2. All swing joints, risers, and shrub risers shall be as indicated on the Drawings.
  - 3. Fittings for all pipe diameters less than 3" shall be Schedule 80 PVC welded fittings.

4. Solvent weld cement shall be colored with primer of a contrasting color and be easily recognizable from the pipe itself.
5. All sleeves for pipe and control wiring shall be Schedule 40 PVC (polyvinyl chloride) sleeves with an inside diameter at least 2" greater than the outside diameter of the pipe and/or wire bundle it is to hold. All sleeves installed shall be plainly marked in field and on As-Built drawings for future ease of location.
6. Joint compound shall be slow drying, heavy-duty; primer and shall be tinted and compatible with joint compound as recommended by the manufacturer or polyvinyl chloride pipe.

### **2.3 SPRINKLER HEADS**

- A. Each sprinkler shall be easily serviceable from the top, shall have an accessible screening device, and shall perform to the manufacturer's specifications concerning diameter of throw and gallons per minute at given pressures. Spacing of irrigation heads shall not exceed the manufacturer's recommendations. Spacing is indicated on the Drawings but may be modified to meet field conditions.
- B. Pop-up spray heads shall be fixed spray-type designed for in-ground installation and shall be as they are shown on the Drawings.

### **2.4 ELECTRIC VALVES**

- A. Valves for sprinkler sections shall be low voltage automatic remote control valves as specified on the Drawings.

### **2.5 VALVE BOXES**

- A. Valve boxes shall be of a size to cover the entire valve, pressure reducing module, solenoid, fittings and at least six inches of pipe on both sides of the valve. The boxes shall be of sufficient size to provide for ease of access for maintenance of the equipment. The cover shall be imprinted to identify the valve boxes as irrigation valve. All valve boxes shall match in manufacturer, size and be traffic rated.
- B. Use Brooks, Amtek or Carson valve boxes or an approved equal.
- C. All valve boxes shall be set with the top of lids flush with finished grade. Adjacent boxes shall be parallel with each other and running in the same direction.

### **2.6 METER BOXES:**

- A. Meter boxes shall meet the requirements of the City water and public works departments.

### **2.7 ELECTRIC CONTROLLERS**

- A. Sprinkler controllers shall provide for completely automatic operation of the sprinkler system. It shall be mounted where shown on the Drawings or as directed by the Owner or Owner's Representative. An automatic rain shut-off device shall be installed with the controller and in accordance with the manufacturer's printed instructions.

- B. The controller box shall have weatherproof construction.
- C. Establish an initial watering schedule and provide the Owner with a copy of the established schedule.
- D. The automatic controller shall be Hunter Industries manufacture, model and size as shown on the irrigation drawings.

## **2.8 BACKFLOW PREVENTER**

- A. Install above ground and locate in plant material in the area shown on the Irrigation Drawings or as directed by the City.
- B. Connect to the main pipe with threaded fittings and use Schedule 80 PVC for the risers and above ground pipe. Do not use solvent weld joints.

## **2.9 IRRIGATION CONTROL WIRE**

- A. All electrical control and ground wire shall be irrigation control cable. All wiring to be used for connecting the automatic remote control valves to the automatic controller shall be Type "UF", 600 volt, solid copper, single conductor wire with PVC insulation and bear UL approval for direct underground burial feeder cable. Insulation shall be 4/64" thick minimum covering of an approved thermoplastic compound for positive waterproof protection of sizes AWG size 18 through and including AWG size 10. AWG size 8 through AWG size 00 shall be insulated with 5/64" of the approved thermoplastic compound.
- B. All control wire and common wire shall be installed in Schedule 40 PVC sleeves between valve boxes and to the controller.
- C. Each control wire shall run from the valve to the controller and connect to the corresponding numbered station post. Do not connect control wire to other valves.
- D. Verification of wire types and installation procedures shall be checked to conform to local codes.

## **2.10 GATE VALVES**

- A. Gate valves where applicable shall conform to requirements of AWWA C-500, have bronze body, and be bronze mounted, and has a non-rising stem with solid wedge gates.

# **PART 3 - EXECUTION**

## **3.1 GENERAL**

- A. The irrigation system shall be installed in accordance with local codes, approved shop drawings, and contract specifications.
- B. The water source for the system shall be local potable water from existing water main pipe. There are more than one connection to existing water supply and each require meter and backflow prevention device. See the irrigation drawings for locations.

### 3.2 PREPARATION

- A. Layout irrigation sprinklers main lines. Adjust pipe layout to laterals as required due to site modifications or existing conditions prior to excavation.
- B. Stake the sprinkler locations and check for uniformity of coverage and correctness of pattern.
- C. Locate valves to assure ease of access for maintenance and assure there are no physical interference with other elements of the project. Align adjacent valve boxes to be parallel with each other.
- D. Furnish temporary support, adequate protection, and maintenance of all underground and surface utilities, structures, drains, sewers, and other obstructions encountered in the progress of the work.
- E. Where the grade or alignment of the pipe is obstructed by existing utility structures such as conduit, ducts, pipe branch connections to sewer mains, main drains, water services, telephone lines, the obstruction shall be permanently supported, relocated, removed, or reconstructed by the contractor in cooperation with the Owner of such utility. Work on utilities shall meet the requirements of the utility company.
- F. Route the pipe around existing trees and plants where the trenching could affect the growth and viability of the plant. No deviation from the required grade shall be made without the written direction of the Owner's Representative.

### 3.3 PIPE INSTALLATION

- A. Excavation shall be unclassified and shall include all materials encountered in the excavation of trenches for pipe installation. The trench shall be of sufficient width and depth for installation of the pipe. Cause minimum disturbance to existing conditions. Bore under existing pavement and sidewalks rather than cut and restore unless approved by the Owner's Representative in advance. No pavement shall be cut without the Owner's Representative written permission.
- B. Pipe and fittings shall be delivered and stored on the job site with suitable protection against damage.
- C. Trenches shall be made wide enough to allow a minimum of 6 inches between parallel pipelines. If not otherwise shown on the Drawings, trenches for pipes shall be made of sufficient depths to provide the minimum cover from finish grade as follows:
  - 1. 18-20" - minimum cover over main lines and control wires.
  - 2. 18" - minimum cover over lateral lines to heads.
  - 3. 24" - sleeving under pavement.
- D. Maintain all warning signs, shoring, barricades, flares, and red lanterns as required by the Safety Orders of the Division of Industrial Safety and any local ordinances and codes.
- E. The pipe and fittings shall be carefully inspected before installation in the trench. All rocks over 1" in diameter and unsuitable bearing material shall be removed from trench

in strict accordance with the pipe manufacturer's recommendations for bedding of the pipe.

- F. Compression Joints: The bell end shall be clean, dry, and shall have the proper compression ring installed without lubricant and in the proper position. The spigot end shall be clean and lubricated with the recommended lubricant. The spigot end shall then be pushed "home" as indicated when the manufacturer's reference mark is flush with the end of the bell. The completed joint shall then be carefully laid in the trench.
- G. Solvent-welded joints shall be made only on clean, dry, square-cut, smooth pipe sections. The fitting shall be "dry" tested for proper size before solvent is applied. The assembly shall proceed in accordance with recommended procedures furnished by the manufacturer.
- H. "Snake" solvent-welded pipe sections from side to side in the trench to prevent joint rupture due to thermal contraction.
- I. Pipe openings shall be plugged during construction to prevent entrance of foreign materials.
- J. Pipes placed under roadways, walkways, and other pavements, shall be in Schedule 80 P. V. C. pipe sleeves. The inside diameter of the pipe sleeve shall be two inches, minimum, larger than the outside diameter of the pipe or the combined outside diameter of pipes installed in the sleeve. Extend sleeves 18 to 24-inches on each side of the pavement or tree pit. Trim sleeves as required to install irrigation pipe in planters and tree pits. Plug the sleeve around the pipe at sleeve openings.
- K. Backfill shall be carefully placed to avoid pipe dislocation.
  - 1. Backfill material shall be free of rocks, stumps, roots and other unsuitable material.
  - 2. In planting area, the top six inches (6") shall be suitable planting soil similar to the landscape plant medium.
  - 3. Backfill shall be placed in six inch (6") lifts and shall be thoroughly compacted, except in planting area where planting soil is used.
  - 4. Backfill under pavements or sidewalks shall be compacted to a maximum density of 100% optimum moisture according to A. A. S. H. T. O. T-180. The surface of the back-filled trenches shall be even with the surrounding ground surface.

### 3.4 SPRINKLER HEAD INSTALLATION

- A. Drawing plans are schematic in nature. Locate all sprinkler heads as required to meet field conditions and adjust nozzles, spray patterns and make other adjustments required to give the landscaped areas full, complete, and proper water distribution. Meet the manufacturer's installation and adjustment requirements.
- B. Sprinkler heads located along curbs and edges of walks or paving shall be installed 6" from back of curb or paving.

### 3.5 CONTROLLER INSTALLATION

- A. The automatic irrigation controller shall be installed where shown on the irrigation drawings or where directed by the Owner's Representative.
- B. Irrigation system shall be installed, adjusted, and properly calibrated to operate the completed automatic system.
  - 1. The initial operation watering frequency set by the contractor shall provide an even precipitation rate in all landscape areas of one and one-half inch (1 1/2") per week, or as required by climatic conditions.
  - 2. Set the operating times and days of operation to meet the requirements of the Owner and the South Florida Water Management District for water use and conservation.
  - 3. Both the operation time and frequency may vary if necessary during the construction phase for plant material grow-in periods provided that any such variation is coordinated and approved with the Owner's Representative and other contractors
- C. Install an automatic rain shut-off device to stop the controller operation in event of rain. Installation shall be on or near the controller but shall not be located where sprinkler water effects its operation.

### 3.6 CONTROL WIRE INSTALLATION

- A. Install control wires in Schedule 40 PVC conduit, at least 18" below finish grade. Provide a 30", minimum, looped slack at valve boxes.
- B. No underground splices shall be made except at electric valves in valve boxes. Solder splices and coat with elastomeric waterproof cement. Wrap with electrical tape and coat again with elastomeric waterproof cement. Waterproof pre-manufactured wire connections may be used if designed by the manufacture for below grade installation.

### 3.7 TESTING AND INSTALLATION REVIEW

- A. Prior to installation of sprinkler heads, flush the irrigation system with water to clear lines of foreign materials. Cap and plug outlets and fill lines with water. Pressurize assembly as indicated on the Drawings. All joints, ties, elbows, caps, and connections shall be left uncovered during this test unless otherwise directed by the Owner's Representative.
  - 1. Long sections of main pipe or solid unbroken pipe may be buried at intervals adequate to secure stabilization of pipe runs when pressurized.
  - 2. If necessary, repair leaks and retest the assembly until satisfactory.
  - 3. Install sprinkler heads after approval by the Owner's Representative of complete assembly, less sprinkler heads.

4. Test system and meet pressure test requirements prior to requesting a test to be observed by the Owner, the Owner's Representative, City Officials or Consultants. The Owner may back-charge the Contractor for consultants and other representative's time and expenses to be present for re-testing due to leakage or malfunction of the system during the test.
- B. All items of construction and operation of the irrigation system are subject to the review and testing by the Owner or Owner's Representative. Any part of the system may be rejected because of non-compliance with the Drawings and Specifications. Rejection may also result if the system has non-suitable or inferior materials, workmanship is inadequate, assembly is improper, or for other causes which would prevent the system from functioning properly. The system may also be rejected if it is determined that the installation and assembly may be detrimental to the longevity of the irrigation system, or which would necessitate excessive manual labor and maintenance.
- C. Fully comply with the testing requirements, as well as any other tests that may be ordered by the Owner's Representative or other authorized representative of the Owner. Furnish all labor, materials, and equipment required for tests. Work stoppages for testing, work review and replacement or repair of any inadequate item shall not add to the allocated time of completion.
- D. Make all repairs, replacements, adjustments, and reconstruction to conform to test requirements.
- E. Final review shall be made when the complete systems are in place, operable, and all repairs, additions, adjustments and other work is complete. At such time, the contractor shall adequately demonstrate the proper operation of all systems, shall show the complete conformance with the plans and specifications, and demonstrate that each irrigation system gives proper and adequate coverage of landscaped areas.
- F. Acceptance by the Owner and/or Owner's Representative in no way removes the contractor of his responsibility to make further repairs, corrections and adjustments to eliminate any deficiencies which may later be discovered.

### **3.8 WARRANTY**

- A. The contractor shall fully warrant each landscape irrigation system for a period of one (1) year after the written final acceptance and will receive a written confirmation from the Owner's Representative that the warranty period is in effect.
- B. During the warranty period, the contractor shall enforce all manufacturer and supplier's warranties as if made by the contractor. Any malfunctions, deficiencies, breaks, damages, disrepair or other disorder due to materials, workmanship, or installation by the contractor and his suppliers shall be immediately and properly corrected to the proper order as directed by the Owner and/or Owner's Representative.
- C. Any damages caused by system malfunction shall be the responsibility of the contractor who shall make full and immediate restoration for said damages.

**END OF SECTION 328400**

**SECTION 32 91 13****SOIL PREPARATION****PART I - GENERAL****1.1 WORK INCLUDED**

- A. Provide labor, materials, necessary equipment and services to complete the soil preparation work, as indicated on the drawings, as specified herein or both.
- B. Including, but not limited to:
  - 1. Topsoil
  - 2. Soil Conditioners
  - 3. Sand
  - 4. Planting Soil
  - 5. Peat

**1.2 QUALITY ASSURANCE**

- A. Testing Agency: Independent testing laboratory
- B. Conform to the requirements of Regulatory Agencies
- C. Reference standards:
- D. ASTM C136 - Sieve Analysis of Soils
- E. ASTM D422 - Mechanical Analysis of Soils
- F. ASTM D424 - Plastic Limits of Soil

**1.3 SUBMITTALS**

- A. Test Reports:
  - 1. Results of topsoil analysis
  - 2. Results of water analysis
  - 3. Results of planting soil mixes analysis.
- B. Certificates:



1. Manufacturer's certification and/or testing laboratory certification that content of soil conditioners meet specification requirements.
  2. Literature and proposed application rates for all Soil Amendments.
  3. Literature and proposed application rates for all Herbicides and Sterilizers:
- C. Samples:
1. Submit a one cubic foot sample of each planting soil mix.

#### 1.4 JOB CONDITIONS

- A. Protect from damage walks, pavement, plant material, and other work or existing features.

### PART II - PRODUCTS

#### 2.1 TOPSOIL

- A. Use free draining topsoil, suitable for plant growth and free from hard clods, stiff clay, hardpan, gravel, subsoil, brush, roots, refuse or other deleterious material, and of uniform quality.
- B. Mechanical analysis for well graded topsoil:

| <u>Sieve Size</u> | <u>Percentage Passing By Dry Weight</u> |
|-------------------|---|
| 2 inch            | 100                                     |
| 1/4 inch          | 90-92                                   |
| No. 10            | 50-55                                   |
| No. 40            | 20-25                                   |
| No. 100           | 4-6                                     |
| No. 200           | 0-1                                     |

Dispose of materials larger than one-half inch off the site.

- C. Maximum Soluble Salts: 550 ppm.
- D. Acidity: pH 6.5 to pH 7.5
- E. Relative Density: 25%-50%, loose
- F. Relative Permeability: 20 in/hr minimum
- G. Plastic Index: 3-10

#### 2.2 SOIL CONDITIONERS

- A. Aluminum Sulfate: Manufacturer's standard commercial grade.
- B. Peat: Federal Specifications Q-P-166 Type 1, Class B, Sphagnum moss.

- C. Pesticides: As recommended by applicable Agricultural Public Agencies.
- D. Herbicides and Sterilizers:
  - 1. "Ronstar" pre-emergent herbicide
  - 2. "Roundup" systemic herbicide
- E. Soil Amendments:
  - 1. Fertilizer
    - a. All fertilizers shall be manufactured from quality materials, be free from impurities, uniform in composition meet recognized standards for effectiveness and be free flowing and suitable for application with approved equipment.
    - b. All fertilizer shall be delivered to the site in bags or other convenient containers, each fully labeled, conforming to the applicable state fertilizer laws, bearing the grade and the trade name of the producer.
    - c. Die Hard Root Reviver – Endo and Ectomycorrizal inoculant, as manufactured by Die hard, 1.800.628.6373 or City approved equal.
    - d. Die Hard Transplant – One Step – Endo and Ectomycorrizal inoculant, as manufactured by Die hard, 1.800.628.6373 or City approved equal.
    - e. Time release, Palm Mix fertilizer with minor elements or City approved equal.
    - f. Time release, Tree and Shrub Mix fertilizer, 6-6-6, with minor elements or City approved Equal.
    - g. Granular Triple Super Phosphate as manufactured by IMC. Agrico. 708.970.3000.
    - h. Agriform Planting Tablets, 8-8-8 plus minors, as manufactured by Grace Sierra, 408.263.8080 or City approved equal.
    - i. Scott's Turf Starter (16-25-12) or City approved equal.
    - j. Wetting agent to be Terra Sorb or City approved equal.
    - k. Soil conditioner to be "Super Lesco Wet", as manufactured by Lesco, Inc. or City Approved Equal.
  - 2. Water: From City of Fort Lauderdale irrigation wells or municipal source.
  - 3. Sand: Clean, sharp builders sand free draining and free of substances harmful to growth of plants.
  - 4. Peat: Florida and Canadian Peat from City approved sources.

5. Compost: from City approved source.

## **2.3 PLANTING SOIL MIXES**

- A. Planting Soil Mixture A to be placed in St. Augustine 'Palmetto' sod areas, shrub and ground cover beds and in broadleaf tree pits, both new and transplanted.
- 20% Topsoil, 10% Peat or Compost, 70% Sand
- B. Planting Soil Mixture B to be placed as backfill around the root balls of palms shall be 90% FDOT coarse sand and 10% topsoil.
- C. Planting Soil Mixture C to be placed in Bermuda sod areas shall be 80% sand, 20% Canadian Peat.
- D. Test pH of topsoil and planting soil mixtures. If pH is not between specified limits add approved soil conditioner/additive to bring pH within that range.

## **PART III – EXECUTION**

### **3.1 INSPECTION**

- A. Examine areas to receive soil preparation to assure work of other trades has been completed.
- B. Verify that plants to remain undisturbed have been clearly identified and protected from injury during construction. If not, identify and protect plants to remain according to procedures set forth in Section 02950 - Trees, Plants and Groundcover.
- C. Remove construction materials and debris from areas to be landscaped.
- D. Do not proceed with soil preparation until unsatisfactory conditions are corrected.

### **3.2 PERFORMANCE**

- A. Subsoil: Prepare in accordance with Section 02200 - Earthwork.
- B. Placement
1. Place planting soil mixes as accepted by the City.
  2. Place Planting Soil Mix A to 12" depth in shrub and ground cover beds and as backfill in broadleaf tree pits.
  3. Remove rocks and other objects over 1" in diameter. Repeat procedure in the event of disturbances to fine grading after completion.
  4. Smooth Planting Soil mixture to three (3) inches below top of surrounding paving, wherever planting beds abut paved surfaces.
  5. Smooth Planting Soil mixture to (2") two inches below finish grade in areas to be sodded with St. Augustine 'Palmetto' sod.

6. Smooth planting soil mixture to (6") six inches below finish grade above 14" sterile sand in areas to be sodded with Bermuda sod.
7. Do not compact planting soil mixture, but do wet-soak planting areas to assure proper settlement. Replace topsoil/planting soil mixture to specified grade after watering.
8. Apply pre-emergent weed control per manufacturers recommended rates of application to sterilize the soil.

### **3.3 CLEAN-UP**

- A. Immediately clean up spills, soil and conditioners on paved and finished surface areas.
- B. Remove debris and excess materials from project site immediately.

**END OF SECTION 32 91 13**

**SECTION 32 92 00****TURF GRASS****PART 1 – GENERAL****1.1 WORK INCLUDED**

- A. Provide labor, materials, equipment and services to complete the sodding work, as indicated on the drawings, as specified herein, or both.

**1.2 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.3 QUALITY ASSURANCE**

- A. Standards: Federal Specifications (FS) O-F-241c(1), Fertilizers, Mixed, Commercial.
- B. Testing Agency: Independent Testing Laboratory.
- C. Regulatory Agencies: Conform to the requirements of local agricultural and governing agencies.

**1.4 SUBMITTALS**

- A. Certificates:
  - 1. Growers Certification:
    - a. Grass species, and location of field from which sod is cut.
    - b. Compliance certificates for quarantine restrictions.
  - 2. Manufacturer's certification of fertilizer and herbicide composition.

**1.5 DELIVERY, STORAGE AND HANDLING**

- A. Deliver sod on pallets.
- B. Protect root system from exposure to wind or sun.
- C. Protect sod against dehydration, contamination, and heating during transportation and delivery.
- D. Do not deliver more sod than can be installed within 24 hours.
- E. Keep stored sod moist and under shade, or covered with moistened burlap.

- F. Do not pile sod more than 2 feet deep.

## **1.6 JOB CONDITIONS**

- A. Begin installation of sod after preceding related work is accepted.
1. Earthwork
  2. Grading
  3. Utilities
  4. Paving
  5. Irrigation
  6. Planting
  7. Site features
- B. Environmental Requirements:
1. Install sod during time period acceptable to the City.
  2. Do not install sod on saturated soil.
- C. Erect signs and barriers against vehicular traffic, where applicable.

## **1.7 GUARANTEE**

- A. Guarantee sod for period of twelve (12) months after date of Substantial Completion.
- B. Replacement sod under this guarantee shall be guaranteed for twelve (12) months from the date of installation.
- C. Repair damage to other plants during sod replacement.
- D. Contractor will accept responsibility for repairs of all washouts caused by weather or irrigation run off for all areas not showing an acceptable stand of grass.
- E. Contractor shall be responsible for any damaged sod caused by forklifts, tractors, trucks etc. during the placing of that sod.

## **PART 2 - PRODUCTS**

### **2.1 SOD**

- A. Grass Species:
1. St. Augustine 'Palmetto', certified
- B. American Sod Producers Association (ASPA) Grade: Nursery Grown or Approved. Field grown sod is not acceptable.
- C. Sod Configuration:
1. St. Augustine 'Palmetto'
    - a. Furnished in pads, 24" x 18" x 1-1/2", excluding top growth and thatch.

- b. Pads not stretched or broken.
  - c. Uniformly mowed height when harvested – 2 inches.
- D. Inspected and found free of diseases, nematodes, pests, and pest larvae, by entomologist of the local Agricultural agency.
- E. Weeds:
  - 1. Free of non-specified grass, nut grass or other objectionable weeds.
- F. Uniform in color, leaf texture, and density.

## **2.2 WATER**

- A. Free of substances harmful to plant growth meeting requirements in Section 02920 - Soil Preparation.

## **2.3 FERTILIZER**

- A. See Section 3.5.

## **2.4 HERBICIDES AND STERILIZERS**

- A. As recommended by local agricultural agencies.

# **PART 3 - EXECUTION**

## **3.1 INSPECTION**

- A. Verify that planting soil mix is installed as specified in Section 02920 - Soil Preparation.
- B. Water dry soil to depth of 6 inches 48 hours before sodding.

## **3.2 MYCORRHIZAL APPLICATION**

See Section 329300 – Landscape

## **3.3 INSTALLATION**

- A. Transplant sod within 48 hours after harvesting.
- B. Lay first row of sod in straight line.
- C. Butt side and end joints.
- D. Stagger end joints in adjacent rows.
- E. Do not stretch or overlap rows.
- F. Cut and trim sod edges at plant beds, walks, buildings or other edge areas.

- G. Sprinkle sod immediately after transplanting to thoroughly water and to wash in lawn sand. Add additional sand to produce a level lawn.
- G. Roll sod, with roller weighing no more than 150 lbs. per foot of roller width.
- H. Water sod and soil to depth of 6 inches within four hours after rolling to bind sod to subsoil and to remove air pockets between subsoil and sod.

### **3.4 LAWN RENOVATION**

- A. Renovate existing and/or damaged lawn areas.
- B. Renovate existing lawn damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
  - 1. Re-establish lawn where settlement or washouts occur or where minor regrading is required.
  - 2. Provide new 50/50 mix topsoil as required.
- C. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury in soil.
- D. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.
- E. Mow, dethatch, core aerate, and rate existing lawn.
- F. Remove weeds before seeding. Where weeds are extensive, apply herbicide - "Round-up" or equal, and apply as per manufacturer's specifications. Do not use pre-emergence herbicides.
- G. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.
- H. Till stripped, bare and compacted areas thoroughly to a soil depth of 6 inches.
- I. Apply soil amendments and initial fertilizers required for establishing new lawns and mix thoroughly into top 4 inches of existing soil. Provide new planting soil to fill low spots and meet finish grades.
- J. Apply St. Augustine 'Floritam' sod as required for new lawns.
- K. Water newly planted areas and keep moist until new lawn is established.

### **3.5 LAWN ESTABLISHMENT**

- A. Watering:
  - 1. Keep sod moist during first two weeks after planting.
  - 2. After two weeks, supplement rainfall to produce a minimum of 2 inches per week.



3. Obtain water for sod from sources available on or off site. On-site water may not be available. Coordinate with schedule for installation of the irrigation system.
- B. Mowing:
1. When grass reaches 5 inches in height, mow to 3.5 to 4 inches.
  2. Contractor shall maintain all grass within the project limit within the heights specified until final Certificate of Occupancy.
- C. Resod spots larger than 4" x 4" not having uniform stand of grass.
- D. Weed Eradication: Between second and third mowing, apply herbicide uniformly at manufacturer's recommended rate to reduce weed infestation.
- E. Fertilizer: 12-2-8-4
1. Immediately prior to planting, all sod areas shall be fertilized. The starter fertilizer shall be applied to the sod surface, at a rate of 176 lbs per acre.
  1. Apply fertilizer once after sodding uniformly at a rate of 20 pounds per 1,000 square feet, on a schedule, as directed by the City.
  3. Care shall be taken when spreading fertilizer to insure that there are no gaps during application. The fertilizer shall be applied under favorable conditions and by such approved methods as will ensure maximum uniformity of distribution.
- F. Establishment period to extend until final acceptance by the City.

### **3.6 CLEANING**

- A. Immediately clean spills from paved and finished surface areas.
- B. Remove debris and excess materials from project site.
- C. Dispose of protective barricades and warning signs at termination of lawn establishment.

### **3.7 FINAL INSPECTION AND ACCEPTANCE**

- A. Request final inspection for acceptance at completion.
- I. Replace rejected sod area with acceptable sod within two weeks after the inspection.

**END OF SECTION 329200**

## SECTION 32 93 00

### LANDSCAPE

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### PART 2 - PRODUCTS

##### 2.1 PLANT MATERIAL

- A. Well-formed and shaped, true to type, and free from disease, insects, and defects such as knots, sun-scald, windburn, injuries, abrasion or disfigurement.
- B. True to botanical and common name and variety: American Joint Committee on Horticultural Nomenclature, Standardized Plant Names, latest edition.
- C. Minimum grade of Florida No. 1 in accordance with Grades and Standards for Nursery Plants published by the State of Florida Department of Agriculture.
- D. Plants not listed in Grades and Standards for Nursery Plants shall conform to a Florida No. 1 as to: (1) Health and vitality; (2) condition of foliage, (3) root system, (4) freedom from pest or mechanical damage, (5) heavily branched and densely foliated according to the accepted normal shape of the species or sport.
- E. Nursery Grown: ANSI Z60.1
  - 1. Grown under climatic conditions similar to those in locality of project.
  - 2. Container grown stock:
    - a. Growing in container for minimum 30 days before delivery.
    - b. Not root bound or with root systems hardened off.  
Use only groundcover plants well-established in removable containers, integral containers, or formed homogenous soil sections.

##### 2.2 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 6 percent organic material content; free of stones ~~1 inch~~ (25 mm) or larger in any dimension and other extraneous materials harmful to plant growth.

1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
  - a. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least ~~4 inches~~ (100 mm) deep; do not obtain from agricultural land, bogs or marshes.

## **2.3 PLANTING SOIL**

- A. Planting soil mixture for backfill around trees, shrubs, and groundcover shall be 50% sand and 50% muck (screened and mixed). Planting soil shall be free of construction debris, weeds, viable weed seeds, and rocks.

## **2.4 FERTILIZER**

- A. Not necessary at the time of planting.

## **2.5 MYCORRHIZAL**

- A. All trees, palms, shrubs, ground covers, and sodded areas shall be treated with mycorrhizal dry granular fungi inoculant mixed in the backfill. See Section 3 for application rates and landscape plan notes and planting details.

## **2.6 MULCHES**

- A. Cypress mulch and red, gold or black recycled mulch shall not be used.
- B. Minimum organic matter by weight on an oven dry basis: 85%.
- C. Processed specifically for use as top mulch around plant beds.

## **2.7 PLANTING SOIL MIX**

- A. Planting soil mixture to be placed in shrub and ground cover beds, and in broadleaf tree pits.
- B. Test pH of topsoil and planting soil mixtures. If pH is not between specified limits, add approved soil conditioner/additive to bring pH within that range.

# **PART 3 - EXECUTION**

## **3.1 EXAMINATION**

- A. Examine areas to receive exterior plants for compliance with requirements and conditions affecting installation and performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, and existing exterior plants from damage caused by planting operations.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Pits and trenches:
  - 1. Shape:
    - a. Vertical sides and flat bottom.
    - b. Plant pits to be square or circular.
  - 2. Size:
    - a. For trees:
      - 1. Depth: Minimum 2 feet from finish grade and increased as necessary to accommodate planting ball and at least 12" planting soil backfill below ball or roots.
      - 2. Width or diameter: 4 ft. greater than diameter of planting ball (unless otherwise approved by the City for special planting areas).
    - b. For shrubs, 3 gallon or larger container:
      - 1. Depth: As necessary to accommodate planting ball and at least 6 in. of planting soil backfill below planting ball.
      - 2. Completely excavate all shrub beds to minimum.
- D. Planting Beds - 1 gallon or smaller container:
  - 1. Planting beds to receive a depth of 12 in. topsoil mixture throughout.
  - 2. Bring beds to smooth, even surface conforming to established grades after full settlement has occurred.
- E. Disposal of excess soil:
  - 1. Use acceptable excess excavated topsoil to form watering berms around the trees and palms.
  - 2. Dispose of unacceptable or unused excess soil off the project site or as directed by the City.
- F. Test fill tree pits with water before planting to assure proper drainage percolation is available. Pits which are found to not be adequately draining shall be excavated to a depth sufficient for drainage and backfilling with coarse sand. No allowances will be made for lost plants due to improper drainage. Replace with same species size and specification.

### 3.3 PLANTING BED ESTABLISHMENT

- A. Loosen subgrade of planting beds to a minimum depth of 6 inches (150 mm). Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
  - 1. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.

- a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
  - b. Mix lime with dry soil before mixing fertilizer.
2. Spread planting soil mix to a depth of **12 inches (300 mm)** but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
  - a. Spread approximately one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top **4 inches** of subgrade. Spread remainder of planting soil mix.
- B. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.
- C. Before planting, restore planting beds if eroded or otherwise disturbed after finish grading.

### 3.4 PLANTING

- A. General
  1. Remove burlap from rootball.
  2. Center plant in pit or trench.
  3. Face for best effect, or as directed by the City.
  4. Set plant plumb and hold rigidly in position until soil has been tamped firmly around planting ball.
  5. Use only planting soil backfill as specified herein before.
  6. Place sufficient planting soil under plant to bring top of planting ball to finish grade.
  7. Backfill pit or trench with planting soil in 9 in. layers and water each layer thoroughly to settle soil and work soil completely around roots and planting ball.
  8. After soil settles fill pit with planting soil, water, and leave pit surface even with finish grade.
  9. Topsoil berm:
    - a. Construct a mulch water ring 6 in. above finish grade forming a watering basin with a level bottom around each palm or tree.
    - b. Size: 1 ft. greater than diameter of planting ball.
    - c. Leave saucer for 3 months. At the end of 3 months, spread mulch to all planting areas. Remove excess from basin and clean area. Replace any damaged plant material.
- B. Balled and Burlapped Plants (B & B):
  1. Place in pit on planting soil backfill material that has been hand-tamped prior to placing plant.
  2. Place with burlap intact so location of ground line at top of ball is same as at nursery where grown.
  3. Remove binding at top of planting ball and remove burlap.
  4. Do not plant if planting ball is cracked, broken or showing evidence of voids before or during planting process. Replace with plant of same species, size, and specification.
- C. Container-grown plants:

1. Can removal:
  - a. Cut cans on two sides with an acceptable can cutter if cutting is required.
  - b. Do not injure planting ball.
  - c. Do not cut cans with spade or ax.
  - d. Do not cut sides on knockout cans.
  - e. Carefully remove plants without injury or damage to planting ball.
  - f. After removing plant. Superficially cut edge roots with knife on three sides.
2. Dig planting holes to size as shown.
3. Hand place plants which are in containers less than one gallon in size.
4. Hand backfill and hand tamp leaving slight depression around bases of plants.
5. Do not cover top of root ball.
6. Water for settlement and replace required planting soil.

### **3.5 MYCORRHIZAL APPLICATION**

- A. Trees: Use 3 oz. For every 1 inch caliper.  
Shrubs: Use 1 tablespoon for each gallon size.  
Palm Trees: Apply 12 oz. per foot diameter of root ball.  
Directions: Mix with backfill and distribute around the upper 12 inches of the root ball of plant.
- B. Proof of Compliance with Specifications

The Contractor will demonstrate compliance by showing invoices to prove purchase of product in sufficient quantity to cover the project at the rates recommended by the manufacturer. Include project name, date of purchase of product, and name of contact.

### **3.6 WEED CONTROL**

- A. Apply pre-emergent herbicide, as approved by the Architect, per manufacturers rate and method of application to landscape bed areas.
- B. Apply pre-emergent herbicide before mulching and again as necessary throughout required maintenance period to prevent weed seed germination.
- C. Do not use an herbicide or an application technique that will damage plant material. Replace, and / or repair damage to plants injured by herbicide application

### **3.7 TOP MULCHING**

- A. Top mulch planting pits, trenches, and areas within two days after planting.
- B. Cover watering basin or bed evenly with 3 inches of top mulch material.
- C. Water thoroughly, immediately after mulching.
- B. Hose down planting area with fine spray to wash leaves of plants at least twice a week until final acceptance.

### **3.8 GUYING AND STAKING OF TREES**

#### **A. Stake trees as shown on the drawings.**

1. Stake installation:
  - a. Drive stakes perpendicularly, 3-feet into ground at edge of root ball. Do not drive stake through root ball or soil separator or drainage gravel if present.
  - b. Number of stakes as shown on details.
2. Typing and cross-bracing:
  - a. For trees over 3-in. in caliper:
    1. Stake and tie firmly with nylon strapping per tree/palm bracing detail.
  - b. For trees under 3-in. in caliper:  
Tie nylon strapping to near vertical wood stakes per small tree planting detail.
3. Maintenance: Trees and palms to remain braced continuously during duration of project.

### **3.9 PRUNING**

#### **A. New plant material:**

1. Prune minimum necessary to remove injured twigs and branches, deadwood, and suckers. Pruning shall be done with regard to natural form of plant material.

#### **B. Existing plant material to remain:**

1. Prune branches and twigs of existing plants to remain so as to enhance the natural form of the plant material; remove injured branches, deadwood, and suckers; insure adequate clearance from new and proposed structures, and provide for a healthy growing state for new growth. Trim as specifically directed by the Landscape Architect in special conditions.

### **3.10 MAINTENANCE**

#### **A. General:**

1. Begin maintenance immediately after each item is planted and continue until final inspection and acceptance.
2. Maintain a healthy growing condition by pruning, watering, cultivating, weeding, mulching, tightening, and repairing of guys, resetting plants to proper grades or upright position, restoration of plant saucer, and furnishing and applying such sprays as necessary to keep planting free of insects and diseases.
3. The root system of plants shall be watered at such intervals as will keep the surrounding soil in best condition for promotion of root growth and plant life.
4. Keep planting saucers and beds free of weeds, grass and other undesired vegetation growth.
5. Protect planting areas and plants against trespassing and damage for the duration of the maintenance period.

6. Inspect plants at least once a week and perform maintenance promptly. Replace impaired or dead plants promptly. Do not wait until near the end of the guarantee period to make replacements of plants which have become unacceptable.
7. Remove soil ridges from around watering basins prior to end of maintenance period.

B. Watering:

1. All trees and palms to be supplied with existing irrigation system at time of planting.
2. Shrub and groundcover beds: Coordinate permanent shrub and groundcover planting with existing irrigation system maintained so that system is operational at time of planting.

**3.11 CLEANING**

- A. Fill pits / depressions in holding area and rough grade to meet surrounding elevations. Remove organic or other debris resulting from the plant relocation process.
- B. Sweep and wash paved surfaces.
- C. Remove planting debris from project site and holding area.

**END OF SECTION 329300**



**SECTION 32 96 00****TREE RELOCATION AND PROTECTION****PART 1 – GENERAL****1.1 GENERAL PROVISIONS**

- A. All applicable provisions of the Bidding and Contract requirements shall govern the work under this Section.

**1.2 WORK TO BE PERFORMED AND WORK INCLUDED**

- A. The Contractor shall provide the following:
1. Prepare and relocate trees and palms designated for relocation within the project boundaries, to include all aspects of preparation, relocation, protection, and maintenance.
  2. Protection and care of existing trees and palms to remain within the project boundaries, to include all aspects of protection, pruning, fertilization, and watering.
  3. Install and operate temporary irrigation system and hand water as required by these specifications.
  4. Follow-up maintenance as required by these specifications.
  5. Labor, materials, equipment and services to complete all preparation, relocations and protection work as indicated on the drawings, as specified herein, or both.

**1.3 SUBMITTALS**

- A. The Contractor shall submit the following:
1. Verification of qualifications. The Contractor shall provide a list of references and project list of a minimum of three (3) projects that the Contractor has successfully completed that are similar in scope of nature.
  2. List of all equipment to be utilized during tree preparation and transplanting.
  3. Proposed sequence of events from start to finish, in writing. This shall include a schedule by day as to how many units can be dug and relocated to specified areas.
  4. Literature and proposed application rates for specified wetting agents, fertilizers and soil conditioners.
  5. Verification of all required licenses and memberships.

**1.4 APPLICABLE STANDARDS AND SPECIFICATIONS**

- A. The Contractor shall comply with the following standards and specifications for all materials, methods, and workmanship unless otherwise noted:
- 1 Codes and Standards of the American Association of Nurserymen.
  - 2 Codes and Standards of the International Society of Arboriculturists.

**1.5 LICENSING AND INSURANCE**

- A. The Contractor shall be certified with the State of Florida Landscape Maintenance Association.

## **1.6 PERMITS**

- A. The Contractor shall secure any permits required in order for completion of this work.

## **1.7 DESCRIPTION**

- A. Trees to relocate on site are designated on the drawings or as directed by the Architect.
- B. Existing trees to be relocated shall be crown pruned, root pruned, and treated with soil amendments prior to relocation.
- C. Existing trees to be relocated or to remain shall be protected with barricades during construction. Trees or shrubs designated to remain, which are scarred or destroyed, shall be replaced with the same species, size, and quality at no cost to the City.
- D. All trees subject to encroachment into the rootzone, due to proposed construction, shall be root pruned 18-inches from the pavement edge or trench as indicated on the drawings and herein these specifications.
- E. Tree pits resulting from relocated material shall be backfilled with clean, stable fill, and prepared to receive the appropriate surface, as indicated on drawings.
- F. The Contractor shall call for and attend an inspection of existing conditions by the City prior to commencing work, including but not limited to identification of trees, and potential obstructions to the relocation work. The Contractor shall prepare a report of existing conditions as a matter of record, which shall also include photographs. The Contractor shall accept the existing conditions as a reference point for condition of trees, and condition of the site. Existing conditions shall then become the responsibility of the Contractor to be kept intact.

## **1.8 GUARANTEES**

- A. The Contractor shall guarantee his work according to the following requirements:
  - 1. Any tree or palm that dies or is deemed in unacceptable condition for one year following the project completion date shall be removed by the Contractor, including root ball, and backfilling of pit, at no cost to the City.
  - 2. The Contractor shall provide a comparable specimen at no additional cost to the City.
  - 3. The guarantee shall be enforced if it is deemed by the Architect, the City Landscape Inspector, or City Horticulturist that tree mortality or decline is a product of negligence by the Contractor.
  - 4. The Contractor shall maintain automatic temporary irrigation in operating order for all relocated trees and palms and all trees and palms to remain within the project area until permanent irrigation system is operable.

**PART 2 – PRODUCTS****2.1 SOIL AMENDMENTS**

- A. Soil amendments shall be as specified in Section 329300 -- Landscape.

**2.2 EQUIPMENT**

- A. Soil amendments shall be injected into the soil by means of a spray apparatus utilizing mechanical agitation to keep powered amendments suspended, where appropriate.
- B. Root pruning equipment shall be designed for this task, and shall produce clean cuts of root without damage to the resulting root ball.
- C. Relocation equipment shall be capable of lifting and transporting trees or palms without damage.

**2.3 SOIL**

- A. Soil for transplanting shall be as specified in Section 329300 – Landscape.

**2.4 WATER**

- A. It shall be the responsibility of the Contractor to provide the necessary clean and potable water to the site.

**2.5 MULCH**

- A. Mulch shall be as specified in Section 329300 – Landscape.

**2.6 BRACING AND STAKES**

- A. All bracing and stakes shall be constructed of pressure treated pine. Compression bands shall be constructed of stainless steel.

**2.7 BARRICADES**

- A. Barricades shall be constructed of 6-foot chain link fence or other barricades as approved by the City.

**PART 3– EXECUTION****3.1 PREPARATION FOR RELOCATION OF TREES AND PALMS WITHIN THE PROJECT BOUNDARIES**

- A. Crown Pruning

All trees and palms shall be crown pruned prior to relocation. The City shall be notified 48 hours in advance of all pruning activities to allow for observation.

1. Broadleaf Trees

- a. All trees to be trimmed by thinning the crown only, and not by reducing the crown dimensions. Trimming shall conform to NAA and ISA standards, including the removal of dead wood.
- b. The Contractor shall repair any existing injuries to trees including cavities and machinery marks.

2. Sabal Palms

- a. Remove all seedpods, and all fronds, as in a hurricane cut. Trim all boots to a clean, regular pattern, no more than 3-inches out from the trunk.

- B. FERTILIZATION AND WATERING

1. Preparation

- a. The Contractor shall clear the root ball area of all foreign material, trash, debris etc., to expose undisturbed soil.

2. Application / Schedule

- a. All trees and palms to be relocated shall be treated with the specified root stimulant at the time of root pruning. The specified root stimulant shall be applied at the concentration and application rates recommended by the manufacturer and approved by the City.
- b. All trees and palms to be relocated shall be deep injection fertilized at the time of transplant. Specified fertilizer shall be used and applied at the concentration and application rates recommended by the manufacturer and approved by the City.
- c. All trees and palms to be relocated shall be treated with the specified wetting agents, fertilizers, and soil conditioners at the time of relocation. Soil amendments shall be mixed to produce a single fluid with each component included at the manufacturer's recommendation and approved by the City. Injection shall be into the root zone within the limits of the proposed root ball at the rate of 50 gallons fluid per 1,000 square feet of tree canopy, using only approved injection equipment.
- d. All trees and palms to be relocated shall be treated with the specified endo and ectomycorrhizal transplant inoculant at the time of transplant. The specified transplant inoculant shall be applied at the concentration and application rates recommended by the manufacturer and approved by the City.
- e. The Contractor shall form and maintain an earth berm 6-inches high outside the proposed root ball prior to watering and apply 3-inches of approved mulch within saucer. Water application shall saturate the root ball to its entire depth.

- C. ROOT PRUNING

1. Watering

- a. All trees and palms to be relocated are to be provided with an automatic irrigation system, which provides 2 bubbler heads fed by PVC pipe to each tree and palm, prior to root pruning.

- b. The Contractor shall verify a source of municipal or well water and provide for a temporary meter to operate the irrigation system.
- c. The Contractor shall provide an irrigation timer, or battery powered valve to water trees and palms, which are to be relocated. Hand watering in lieu of an automatic system shall not be allowed, however hand watering shall be performed to avoid lapses should the automatic system be inoperable for more than 24 hours.

## 2. Barricades

- a. The Contractor shall barricade all existing trees and palms with four-foot (4') chain link fence or other barricade approved by City.
- b. Barricades shall be installed at an offset distance of 2' (two feet) outside the tree drip line/edge of tree canopy, prior to the commencement of any construction activity.

## 3. Root Pruning Technique

- a. All trees shall be excavated by digging a trench a minimum of 48-inches deep by 6-inches wide, either by hand or with a trenching machine designed for this purpose. The Contractor shall hand cut broadleaf tree roots after trenching to produce clean cuts with no splints or tears.
- b. Trees to be root pruned shall have a minimum root ball size of 10-inches per 1-inch of caliper measured at DBH for broad leaf trees, and 36-inches for coconut palms. Root balls are to be formed square with all trenches being equal distance from the trunk.
- c. Sabal palms shall not require root pruning.

## 4. Timing

- a. All broadleaf trees that are to be relocated shall be maintained for a minimum of twelve (12) weeks after root pruning and prior to relocation.
- b. Palms shall be maintained a minimum of six (6) weeks prior to relocation.

### 3.2 RELOCATION OF TREES AND PALMS

#### A. Preparation

- 1. Trees and palms shall be thoroughly soaked to the full depth of the root ball daily for seven (7) consecutive days prior to relocation.
- 2. The Contractor shall accurately locate position and elevation where all trees are intended to be planted, for verification by Architect. The Contractor shall verify that no overhead or underground utilities, existing or proposed, conflict with the proposed locations.
- 3. The Contractor shall ascertain that all proposed paths for machinery are clear of utilities and other obstructions.

#### B. Excavation of Tree Pits

1. The Contractor shall notify and coordinate with the City prior to the excavation of the tree pits.
2. The Contractor shall dig all tree pits as shown in the drawings with vertical sides and flat bottom. Portions of the existing soil may be utilized as backfill in accordance with Section 02920-Soil Preparation and Soil Mixes.
3. The Contractor shall be responsible for repairing any damage to existing utilities.

C. Digging and Handling – Broadleaf Trees

1. The Contractor shall notify the City in writing 48 hours in advance of each relocation to allow for observation of procedures.
2. The Contractor shall determine the line of previous root pruning and excavate around root mass to leave area 12-inches out from the line of root pruning undisturbed. Digging shall be accomplished so as to produce clean cuts on all roots without tearing or splitting. Trenching shall be a minimum of 48-inches deep.
3. Trees shall be handled in such a way as to avoid damage to bark and limbs subject to support cables or chains. Attach padded support cables or chains at multiple points where possible. Alternatively, tree trunks may be drilled and doweled for broadleaf trees. The City reserves the right to require doweling in lieu of lifting straps.
4. Root balls shall be undercut prior to lifting. Do not force tree from ground prior to undercutting. Ball depth to be determined upon assessing conditions at time of trenching, to keep the entire root ball intact.
5. Trees shall be properly wrapped during moving so trunks will not be scarred and damaged and to avoid broken limbs. Broken limbs or scarred trunks shall cause tree to be unacceptable and rejected at the City's option. Broken limbs and wounds, which do not, in the City's judgement, cause the tree to be rejected, shall be cleanly cut.
6. The Contractor shall transport plant material on vehicles of adequate size to prevent overcrowding, broken limbs, foliage damage, or root ball damage.
7. Root balls and foliage shall be kept moist during all phases of relocation.
8. Partially backfill tree pits with 12-inches of approved stable fill prior to setting tree. This layer of soil is to be thoroughly drenched prior to relocation to achieve a stable platform at the correct elevation so that the top of rootball is 1-inch above proposed grade.
9. Rotate tree prior to final setting to achieve best positioning relative to adjacent trees and viewing angles.

D. Backfilling

1. Flood bottom soil layer to settle tree into best position and to remove air pockets.
2. Continue to flood root ball, as planting soil is backfilled to insure removal of all air pockets.
3. Construct a saucer to retain water as shown in the drawings.

E. Bracing

1. Support tree with machinery until bracing is complete.
2. Buttresses may support separate trunks on multiple trunk trees.
3. Maintain braces until completion of project. Removal of braces shall be by others.
4. Stake installation:
  - a. Drive stakes perpendicularly, 3-feet. into ground at edge of root ball. Do not drive stake through root ball or soil separator or drainage gravel, if present.
  - b. Number of stakes should be as shown in the drawings.
5. Tying and cross-bracing:
  - a. For trees over 4-inches in caliper:
    - (1) Stake and tie firmly with nylon strapping as shown in the drawings.
  - b. For trees less than 4-inches in caliper:
    - (1) Tie nylon strapping to vertical stakes.

F. Irrigation

1. Install bubbler heads on all trees and palms and mist head risers in oaks. Connect each tree's system immediately to water source. Irrigation timer is to be operable prior to the time of transplanting; alternatively, battery powered valves may be utilized. The temporary irrigation system shall be maintained for a minimum of 90 days and shall be maintained in addition to the permanent irrigation, should the permanent system be operable during this time. Alternatively, transplanted trees shall be hand-watered daily for a minimum of 90 days.
2. Lateral lines to be buried 18-inches and marked for identification.
3. Set time to run daily, to provide an equivalent of 6-inches of rain per week for 30 days, then reduce to equivalent of 3-inches per week.

G. Barricading

1. Barricade all existing trees and palms with four-foot (4') chain link fence or other barricade approved by City.
2. Barricades shall be installed at an offset distance of 2-feet outside the tree drip line/edge of tree canopy, prior to any construction activity.

### 3.3 PROTECTION AND CARE OF EXISTING TREES AND PALMS TO REMAIN

A. Crown Pruning

1. All trees and palms to remain in place within the project limit shall be pruned within 60 days of Notice to Proceed.
2. All trees and palms to be relocated shall be pruned on a schedule that maximizes acclimatization time prior to relocation. Pruning schedule shall be reviewed and approved by the Architect / Engineer.

B. Watering

1. Existing irrigation system shall remain operable throughout the project.
2. All onsite trees to remain shall be supplied with temporary irrigation, which shall remain operable until permanent irrigation is operable. Existing irrigation system to be demolished may be utilized as the temporary irrigation system.

C. Barricading

1. Barricade all existing trees and palms with four-foot (4') chain link fence or other barricade approved by City.
2. Barricades shall be installed at an offset distance of 2-feet outside the tree drip line/edge of tree canopy, prior to any construction activity.

**END OF SECTION 329600**



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1



CITY OF FORT LAUDERDALE

CITY PROJECT NO. 12188

ADMINISTRATION BUILDING

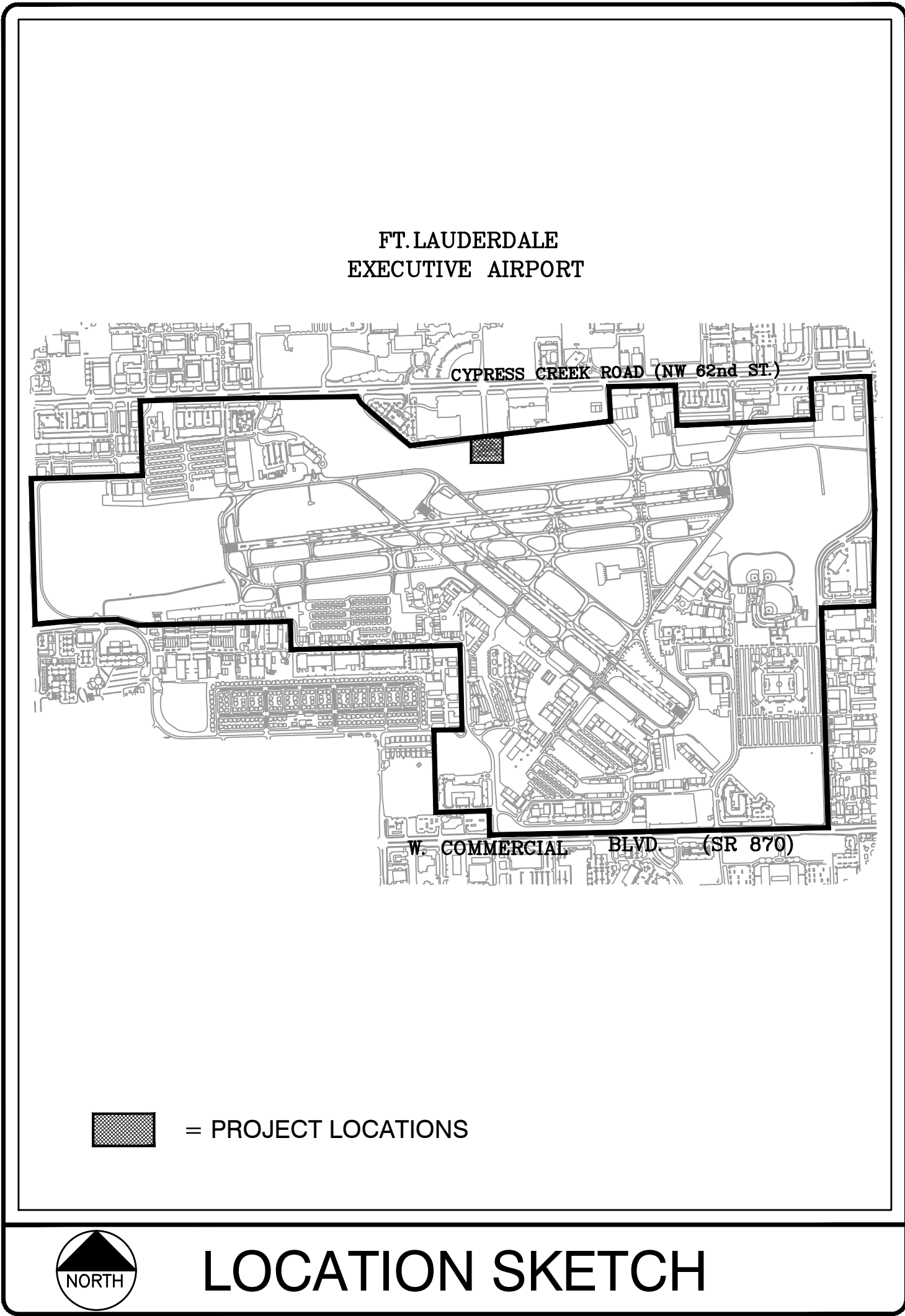
RENOVATIONS

6000 NW 21st Avenue

FORT LAUDERDALE, FLORIDA



ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE REDUCED IN SIZE BY REPRODUCTION. THIS MUST BE TAKEN INTO ACCOUNT WHEN OBTAINING SCALED DATA.



CITY PROJECT NO. 12188

ADMINISTRATION BUILDING RENOVATIONS

6000 NW 21st Avenue, Fort Lauderdale, Florida



CITY OF FORT LAUDERDALE

PUBLIC WORKS DEPARTMENT

ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

FORT LAUDERDALE CITY COMMISSION

|                       |                             |
|-----------------------|-----------------------------|
| JOHN P. "JACK" SEILER | MAYOR                       |
| BRUCE G. ROBERTS      | COMMISSIONER - DISTRICT I   |
| DEAN J. TRANTALIS     | COMMISSIONER - DISTRICT II  |
| ROBERT L. McKINZIE    | COMMISSIONER - DISTRICT III |
| ROMNEY ROGERS         | COMMISSIONER - DISTRICT IV  |

| PROJECT MANAGER  | JOB TITLE           | PHONE NO.      |
|------------------|---------------------|----------------|
| FERNANDO BLANCO  | AIRPORT ENGINEER    | (954) 828-6536 |
| CODY T. PARHAM   | CIVIL ENGINEER      | (954) 331-0917 |
| RANDY SCOTT      | ARCHITECT           | (954) 484-4000 |
| THOMAS WHITE     | LANDSCAPE ARCHITECT | (954) 828-5350 |
| STEPHEN BENDER   | MECHANICAL ENGINEER | (954) 527-1112 |
| RANDY MACCAFERRI | STRUCTURAL ENGINEER | (704) 338-6819 |

DATE: 05/31/2017

CAD FILE: 12188-G000-COVR

DRAWING FILE No.: 4-140-42

BID DOCUMENTS



GENERAL NOTES

- CITY OF FT. LAUDERDALE OPERATIONS

FPL

FAA REPRESENTATIVE

PHONE: (954) 828-4966

PHONE: (954) 956-2045

PHONE: (954) 359-5687

THE CONTRACTOR SHALL CONTACT SUNSHINE STATE ONE CALL AT 1-800-432-4770 AT LEAST TWO (2) WORKING DAYS PRIOR TO EXCAVATION. EXCAVATION IN AREAS OF EXISTING UTILITIES SHALL BE DONE BY HAND.
12. CONTRACTOR'S EMPLOYEES VEHICLES SHALL BE PARKED WITHIN THE CONTRACTOR'S STAGING AND STORAGE AREA. PARKING WILL NOT BE ALLOWED ALONG THE RIGHT-OF-WAY OF ANY PUBLIC ROADWAY. EMPLOYEE VEHICLES WILL NOT BE ALLOWED IN THE AIR OPERATION AREA (AOA).

13. CONSTRUCTION EQUIPMENT SHALL BE PARKED ONLY WITHIN THE CONTRACTOR'S STAGING AND STORAGE AREA OUTSIDE ESTABLISHED HOURS OF CONSTRUCTION.

14. THE CONTRACTOR SHALL CONTINUOUSLY MAINTAIN THE SITE FREE OF TRASH. ALL TRASH SHALL BE TOTALLY REMOVED FROM THE WORK AREA BEFORE THE END OF EACH WORK PERIOD.

15. UPON COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL CLEAN AND RESTORE THE SITE. ALL RUBBISH AND OTHER MATERIAL SHALL BE DISPOSED OF OFF AIRPORT PROPERTY AT CONTRACTOR'S DISCRETION AND EXPENSE. THE CONTRACTOR SHALL RESTORE ALL GRASSED AND PAVED AREAS WHICH ARE DISTURBED BY CONSTRUCTION ACTIVITY TO THEIR PRE CONSTRUCTION CONDITION.

16. ALL CONSTRUCTION STAKEOUT SHALL BE BY A QUALIFIED FLORIDA REGISTERED LAND SURVEYOR, AND IS THE RESPONSIBILITY OF THE CONTRACTOR. ANY DEVIATIONS FROM EXISTING GRADES AS SHOWN ON THE PLANS SHALL IMMEDIATELY BE REPORTED TO THE ENGINEER IN WRITING. EXISTING AIRPORT SURVEY MONUMENTS ARE LOCATED NEAR THE CONSTRUCTION AREA. THE CONTRACTOR SHALL AT THEIR EXPENSE, HAVE A QUALIFIED FLORIDA REGISTERED LAND SURVEYOR REPLACE ANY DISTURBED MONUMENT.

17. ALL EXISTING UTILITIES ARE TO REMAIN UNLESS OTHERWISE NOTED.

18. REFER TO THE CONTRACTOR ACCESS AND STAGING AREA PLAN FOR ACCESS POINTS TO BE USED BY THE CONTRACTOR FOR THIS PROJECT.

19. SPECIFICATIONS ARE PROVIDED WHICH REQUIRE THE CONTRACTOR TO APPLY EITHER WATER, CHEMICALS, VEGETATION OR OTHER MATERIALS TO PREVENT THE OCCURRENCE OF DUST WHICH WILL BE OBJECTIONABLE TO THE OPERATIONS OR USERS OF THE AREA. ALL COST FOR CONTROLLING DUST OR POLLUTANTS OF ANY KIND SHALL BE PAID FOR UNDER EROSION CONTROL.

20. THE EXACT LIMITS, LIGHTING AND SECURITY REQUIREMENTS OF THE CONTRACTOR'S STAGING AND STORAGE AREA SHALL BE ESTABLISHED BY THE CONTRACTOR WITH APPROVAL OF THE OWNER IN AREAS GENERALLY AS SHOWN ON THE PLANS. ANY AND ALL REQUIRED UTILITIES FOR THE CONTRACTOR'S OPERATIONS SHALL BE ARRANGED FOR AND PAID FOR BY THE CONTRACTOR DIRECTLY WITH THE APPROPRIATE UTILITY AGENCIES. UTILITY ARRANGEMENTS SHALL BE SUBJECT TO APPROVAL BY THE OWNER. THE CONTRACTOR SHALL USE THE STORAGE AND STAGING AREA SHOWN ON THE PLANS FOR ITS SHOP, MATERIAL AND EQUIPMENT STORAGE AND OTHER PROJECT RELATED ACTIVITIES, INCLUDING EMPLOYEE PARKING. ALL COSTS ASSOCIATED WITH PREPARING THE STORAGE AND STAGING AREA SITE SHALL BE BORNE BY THE CONTRACTOR. THIS INCLUDES, BUT IS NOT LIMITED TO, CLEARING AND GRADING OF THE SITE, CONSTRUCTION OF ALL TEMPORARY UTILITIES, ACCESS ROADS, ALL SECURITY FENCING, CLEANUP AND RESTORATION OF SITE TO ORIGINAL CONDITION.

21. DO NOT SCALE DRAWINGS. USE GIVEN DIMENSIONS ONLY. LARGE SCALE PLANS GOVERN OVER SMALL SCALE PLANS.

22. THE CONTRACTOR SHALL ENDEAVOR TO PROTECT PRIVATE PROPERTY. ANY DAMAGE CAUSED BY THE CONTRACTOR IN THE PERFORMANCE OF THEIR WORK SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.

23. ANY UNITED STATES COAST AND GEODETIC SURVEY (U.S.C.&G.S.) MONUMENTATION WITHIN THE CONSTRUCTION LIMITS SHALL BE PROTECTED. IF A MONUMENT IS IN DANGER OF DAMAGE, THE CONTRACTOR SHALL NOTIFY:

THE NATIONAL GEODETIC SURVEY, INFORMATION SERVICE BRANCH,  
NOAA, NNGS12  
1315 EAST-WEST HIGHWAY, ATTENTION SSMC-3 #9202  
SILVER SPRING, MARYLAND 20910-3282  
TELEPHONE: (301) 713-3242
24. CONTRACTOR SHALL PROVIDE CONSTRUCTION SITE ACCESS TO THE OWNER AND ITS REPRESENTATIVES FOR INSPECTION PURPOSES.

25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING THE WORK AREA AND COORDINATING THE OVERALL SECURITY OF THE WORK AREA AND MATERIAL STORAGE AND STAGING AREAS WITH THE OWNER.

26. WHENEVER, IN THE CONTRACT DOCUMENTS, THE WORDS "PROVIDE", "FURNISH", "INSTALL", "FURNISH AND INSTALL", OR OTHER WORDS OF LIKE IMPORT ARE USED, IT SHALL BE UNDERSTOOD THAT THE INTENT OF THE CONTRACT DOCUMENTS IS TO PROVIDE FOR THE CONSTRUCTION AND COMPLETION IN EVERY DETAIL OF THE WORK DESCRIBED. IT IS FURTHER INTENDED THAT THE CONTRACTOR SHALL FURNISH ALL LABOR, SUPERVISION, MATERIALS, EQUIPMENT, TOOLS, TRANSPORTATION, SUPPLIES, TESTING AND INCIDENTALS REQUIRED TO COMPLETE THE WORK IN ACCORDANCE WITH THE DRAWINGS (PLANS), SPECIFICATIONS AND TERMS OF THE CONTRACT.

27. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS, LICENSES, ETC., PRIOR TO COMMENCEMENT OF WORK. THE COST OF PERMITS, LICENSES, ETC., SHALL BE INCIDENTAL TO AND INCLUDED IN THE BID PRICE FOR THE RESPECTIVE PAY ITEMS. PROVIDE AND PAY FOR ALL PERMITS, LICENSES, FEES AND INSPECTIONS REQUIRED FOR THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL PAY ALL SALES, CONSUMER, USE AND OTHER TAXES REQUIRED IN ACCORDANCE WITH THE LAW OF THE PLACE OF THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN AND PAY FOR ALL REQUIRED LICENSES, FEES AND INSPECTIONS INCLUDING METER INSTALLATION FEE. THE COST FOR SUCH SHALL BE INCLUDED IN THE BID PRICE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE APPLICABLE UTILITY COMPANY(S) TO DETERMINE IF ANY FEES, CHARGES OR COSTS WILL BE DUE THE UTILITY COMPANY(S) AS REQUIRED BY THE UTILITY COMPANY(S) FOR TEMPORARY POWER, INSTALLATIONS, HOOK-UPS, ETC. THIS FEE, CHARGE OR COST SHALL BE INCLUDED IN THIS CONTRACTOR'S PRICE.

28. ITEMS SHOWN IN SCREEN (HALFTONE) ARE EXISTING. ITEMS SHOWN IN SOLID (BOLD) ARE NEW TO BE INSTALLED UNDER THIS CONTRACT, UNLESS OTHERWISE NOTED.

29. 45 DAY MINIMUM NOTICE REQUIRED FOR ANY WORK INVOLVING A FAA OR AIRPORT COMM MANHOLE OR FAA EQUIPMENT. THE NOTICE IS APPLICABLE ANYTIME THE MANHOLE IS OPENED OR ANY WORK INVOLVING CABLES BETWEEN OR WITHIN THE MANHOLES OR ANY WORK IMPACTING FAA EQUIPMENT.

PROJECT NARRATIVE


THIS PROJECT CONSISTS OF RENOVATION AND EXPANSION OF THE AIRPORT ADMINISTRATION BUILDING AND SUPPORTING SITE WORK AT THE FORT LAUDERDALE EXECUTIVE AIRPORT. 11,030 SQUARE FEET OF EXISTING OFFICE AND MEETING SPACE WILL BE RENOVATED AND A 1,900 SQUARE FOOT EXPANSION WILL BE ADDED TO THE BUILDINGS SOUTHERN END. THE NORTH END OF THE BUILDING SITE WILL HAVE MINOR FLATWORK ALONG WITH FLAGPOLE AND PARKING CANOPY STRUCTURES. 314 SQUARE FEET OF LANDSCAPE ON THE ENTRANCE DRIVEWAY WILL BE REPLACED WITH STAMPED PAVEMENT TO IMPROVE NAVIGABILITY OF THE ADMINISTRATION BUILDING'S FRONT DRIVE AISLES. ALONG WITH THE ADDITION OF STAMPED PAVEMENT, A PARAPET CANOPY WILL BE INSTALLED AT THE ENTRANCE OF THE BUILDING EXTENDING OUT TO THE DRIVEWAY TO PROVIDE SHADE FOR PASSENGERS ENTERING THE BUILDING. THE SOUTH END OF THE SITE WILL HAVE AN OUTDOOR PATIO SERVING THE EXPANDED PORTION OF THE BUILDING.

State of Florida  
Professional Engineer  
License No. 73904

CODY T. PARHAM

|                 |                     |                               |                    |             |
|-----------------|---------------------|-------------------------------|--------------------|-------------|
| DRAWN BY:<br>PS | DATE:<br>05/31/2017 | DESIGNED BY:<br>SCALE:<br>N/A | CHECKED BY:<br>JFN | FIELD BOOK: |
|                 |                     |                               |                    |             |
|                 |                     |                               |                    |             |

CITY of FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE



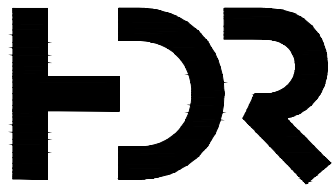
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      |    | DESCRIPTION |
|-----------|------|----|-------------|
| NO.       | DATE | BY |             |
|           |      |    |             |
|           |      |    |             |
|           |      |    |             |
|           |      |    |             |

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS

GENERAL NOTES  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                  |                 |
|------------------|-----------------|
| SHEET NO.        | OF              |
| G001             | 2               |
| TOTAL:           | 65              |
| CAD FILE:        | 12188-G001-NOTE |
| DRAWING FILE NO. | 4-140-42        |



HDR ENGINEERING, INC.

3250 WEST COMMERCIAL BLVD., SUITE 100  
FORT LAUDERDALE, FLORIDA, 33309  
T: 954.535.1876 F: 954.233.4953  
CA# 4213

BID DOCUMENTS



CONTRACTOR STAGING AREA NOTES:

1. THE EXACT LIMITS, LIGHTING AND SECURITY REQUIREMENTS OF THE CONTRACTOR'S STAGING AND STORAGE AREA SHALL BE ESTABLISHED BY THE CONTRACTOR WITH THE APPROVAL OF THE OWNER IN THE AREAS GENERALLY AS SHOWN ON THE PLANS. ANY AND ALL REQUIRED UTILITIES FOR THE CONTRACTOR'S OPERATIONS SHALL BE ARRANGED FOR AND PAID FOR BY THE CONTRACTOR DIRECTLY WITH THE APPROPRIATE UTILITY AGENCIES. UTILITY ARRANGEMENTS SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER. THE CONTRACTOR SHALL USE THE STORAGE AND STAGING AREA SHOWN ON THE PLANS FOR ITS FIELD OFFICE, SHOP, MATERIAL AND EQUIPMENT STORAGE, AND OTHER PROJECT RELATED ACTIVITIES, INCLUDING EMPLOYEE PARKING. ALL COSTS ASSOCIATED WITH PREPARING THE STORAGE AND STAGING AREA SITE SHALL BE BORNE BY THE CONTRACTOR. THIS INCLUDES BUT IS NOT LIMITED TO, CLEARING AND GRADING OF THE SITE, CONSTRUCTION OF ALL TEMPORARY UTILITIES, ACCESS ROADS, ALL SECURITY FENCING, CLEAN-UP AND RESTORATION OF SITE TO ORIGINAL CONDITION.
2. CONSTRUCTION EQUIPMENT SHALL BE PARKED ONLY WITHIN CONTRACTOR'S STAGING AND STORAGE AREA OUTSIDE OF ESTABLISHED HOURS OF CONSTRUCTION.

ACCESS AND HAUL ROAD NOTES:

1. HAUL ROADS TO BE USED UNDER THIS PROJECT SHALL BE THOSE INDICATED ON THE DRAWINGS OR OTHERWISE SPECIFICALLY AUTHORIZED BY THE OWNER. IN GENERAL, THE CONTRACTOR SHALL CONFINE EQUIPMENT AND HAULING TO THE AREAS UNDER CONSTRUCTION. NO DEBRIS SHALL BE ALLOWED ON THE ROADWAYS. OTHER PAVEMENTS SHALL BE CLEANED BY THE CONTRACTOR DAILY, AND AS REQUIRED, USING VACUUM SWEEPERS TO KEEP ALL ACCESS AND CONSTRUCTION AREAS CLEAR OF SOILS, CLODS OR OTHER DEBRIS.
2. THE ACCESS POINTS TO THE PROJECT SITE ARE SHOWN ON THE PLANS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ALL AIRPORT SERVICE ROADS TO THEIR PRECONSTRUCTION CONDITION WHERE SUCH ROADS ARE USED BY THE CONTRACTOR FOR HAULING OPERATIONS.
4. THE CONTRACTOR SHALL NOT PERMIT ANY UNAUTHORIZED PERSONNEL OR TRAFFIC ON THE SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL TO AND FROM THE VARIOUS CONSTRUCTION AREAS ON THE SITE. THE CONTRACTOR IS RESPONSIBLE FOR THE IMMEDIATE CLEAN-UP OF ANY DEBRIS DEPOSITED AT THE PROJECT SITE AND ALONG ANY ROAD AS A RESULT OF HIS/HER CONSTRUCTION TRAFFIC. DIRECTIONAL SIGNAGE AT THE ACCESS GATE AND ALONG THE DELIVERY ROUTE TO THE STORAGE AREA OR WORK SITE SHALL BE APPROVED BY THE OWNER. ALL CONTRACTOR'S MATERIAL ORDERS FOR DELIVERY TO THE SITE SHALL BE DIRECTED TO THE ACCESS POINTS IDENTIFIED.

5. RUBBER TIERED VEHICLES ONLY SHALL BE ALLOWED ON EXISTING AIRPORT PAVEMENT WHICH IS TO REMAIN.
6. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE OFF-SITE ROUTES (STATE HIGHWAYS, COUNTY ROADS OR CITY STREETS) WITH THE APPROPRIATE OWNER WHO HAS JURISDICTION OVER THE AFFECTED ROUTE.
7. ALL CONTRACTOR VEHICLES AND TRAFFIC SHALL REMAIN WITHIN THE DESIGNATED CONSTRUCTION AREAS, STAGING AREAS OR HAUL ROUTES.
8. ALL CONTRACTOR VEHICLES SHALL DISPLAY IN FULL VIEW LOGOS CONSPICUOUSLY PLACED ON EACH SIDE OF THE VEHICLE WITH 4" MINIMUM LETTER HEIGHT.
9. CONTRACTOR ACCESS GATES SHALL BE GUARDED OR LOCKED. CONTRACTOR SHALL PROVIDE GATE GUARDS IF NEEDED.
10. CONTRACTOR SHALL OBTAIN AT HIS OWN EXPENSE ANY PERMITS, INCLUDING BUT NOT LIMITED TO DRIVEWAY PERMITS, FOR CONSTRUCTION AND USE OF ACCESS GATE.
11. ACCESS GATE LOCATION IS SUBJECT TO APPROVAL BY OWNER.
12. COVER EXISTING UTILITIES IN AREAS OF TRUCK TRAFFIC WITH MINIMUM 12" OF LIMEROCK. INCLUDE IN PAY ITEM FOR MOBILIZATION.

SCHEDULING

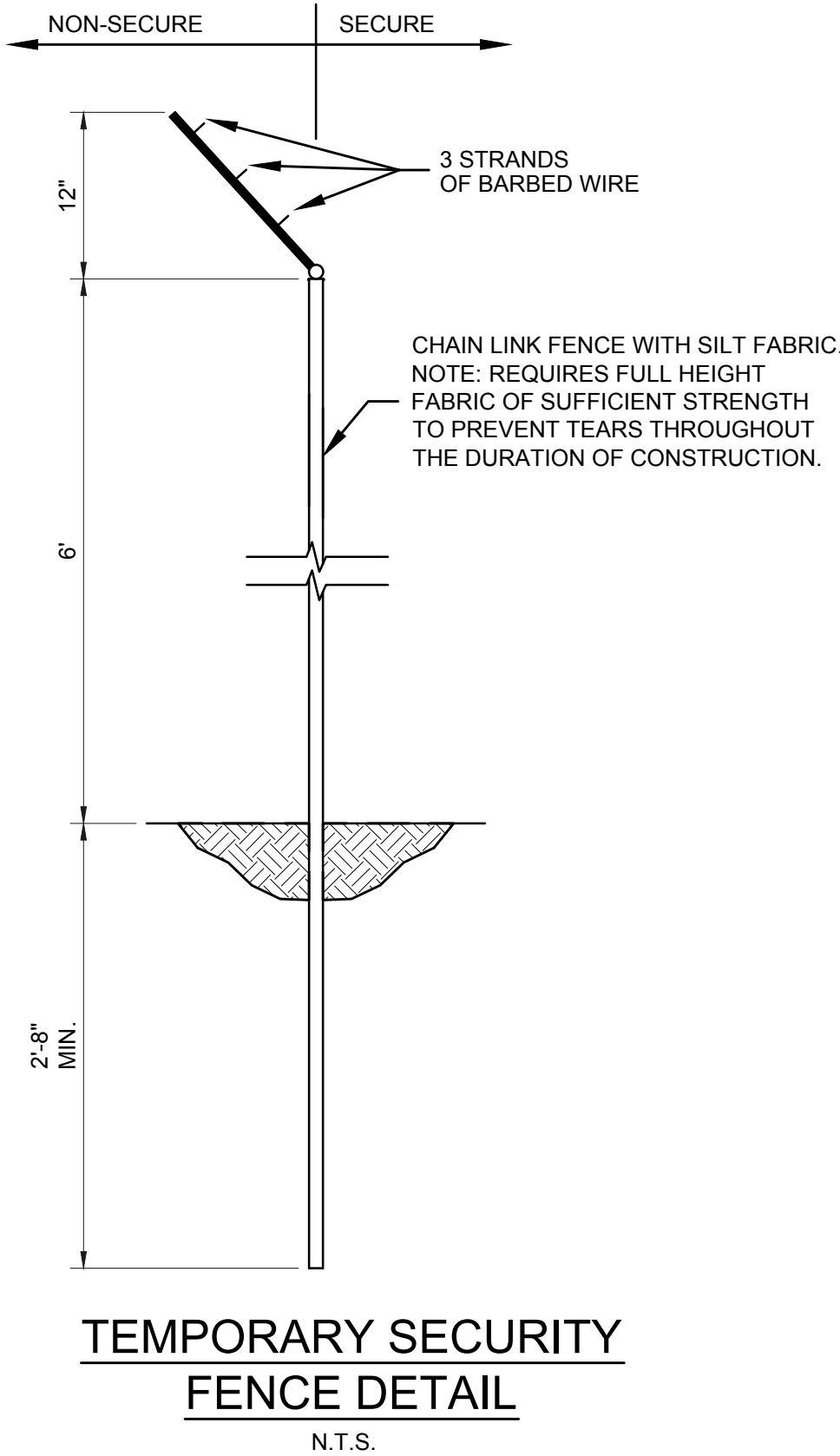
1. SITE WORK SHALL BE ALLOWED DURING 8AM - 5PM MONDAY THROUGH FRIDAY.
2. REQUESTS FOR MODIFICATIONS TO WORKING HOURS SHALL BE SUBMITTED IN WRITING TO THE AIRPORT TWO WEEKS IN ADVANCE.

PHASING

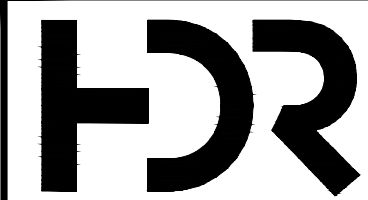
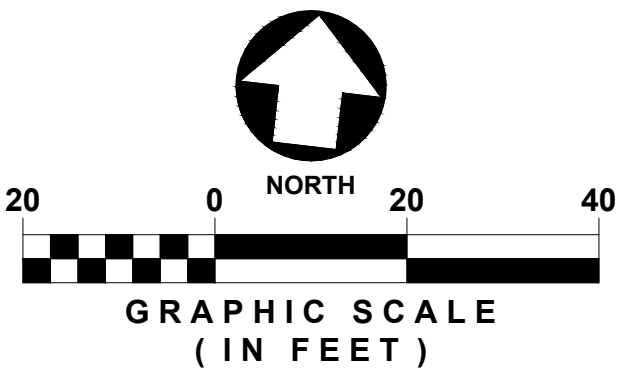
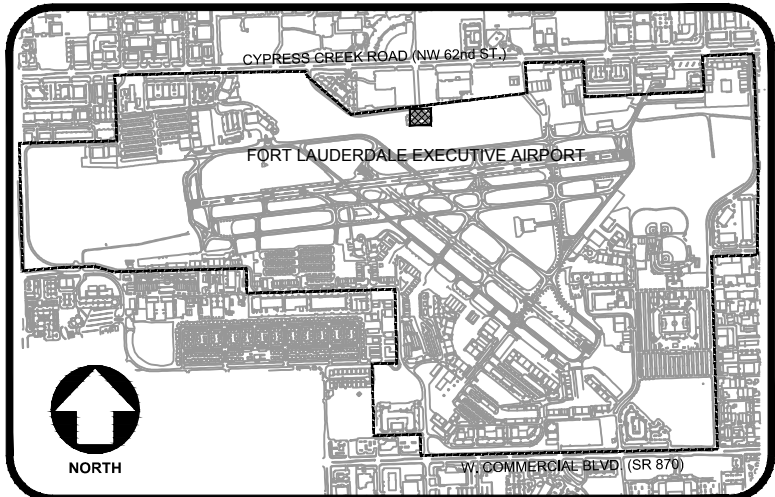
1. ONLY ONE HALF OF THE PARKING LOT MAY BE CLOSED AT ANY GIVEN TIME.
2. CONTRACTOR MUST MAINTAIN PEDESTRIAN ACCESS TO THE FRONT ENTRANCE DURING DAYTIME HOURS.
3. CONTRACTOR MUST COORDINATE WITH OWNER TO PROVIDE ALTERNATE PEDESTRIAN ENTRANCE TO THE BUILDING DURING CONSTRUCTION OF THE EXTENDED BUILDING PARAPET.

LEGEND:

- |     |      |     |      |     |                       |
|-----|------|-----|------|-----|-----------------------|
| --- | ELEC | --- | ELEC | --- | EXIST. ELECTRICAL     |
| --- | SAN  | --- | SAN  | --- | EXIST. SAN. SEWER     |
| --- | FM   | --- | FM   | --- | EXIST. FORCE MAIN     |
| --- | TEL  | --- | TEL  | --- | EXIST. FIBER OPTIC    |
| --- |      | --- |      | --- | EXIST. PAVEMENT       |
| --- |      | --- |      | --- | PARCEL BOUNDARY       |
| --- | WM   | --- | WM   | --- | EXIST. WATER MAIN     |
| --- | SD   | --- | SD   | --- | EXIST. STORM DRAIN    |
| --- |      | --- |      | --- | EXIST. SECURITY FENCE |
| --- |      | --- |      | --- | TEMP. SECURITY FENCE  |
| --- |      | --- |      | --- | FXE PROPERTY BOUNDARY |



KEY MAP



**HDR ENGINEERING, INC.**  
3250 WEST COMMERCIAL BLVD., SUITE 100  
FORT LAUDERDALE, FLORIDA, 33309  
T: 954.535.1876 F: 954.233.4953  
CA# 4213

BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
CONSTRUCTION STAGING PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                  |                 |
|------------------|-----------------|
| SHEET NO.        | OF              |
| G002             | 2               |
| TOTAL:           | 65              |
| CAD FILE:        | 12188-G002-STAG |
| DRAWING FILE NO. | 4-140-42        |

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

|              |                 |
|--------------|-----------------|
| DATE:        | 05/31/2017      |
| DRAWN BY:    | PS              |
| DESIGNED BY: | SCALE: 1" = 15' |
| CHECKED BY:  | CTP             |
| JFN          |                 |
| FIELD BOOK:  |                 |

State of Florida  
Professional Engineer  
License No. 73904

CODY T. PARHAM

CALL 48 HOURS  
BEFORE YOU DIG



IT'S THE LAW!  
DIAL 811

Know what's below.  
Call before you dig.

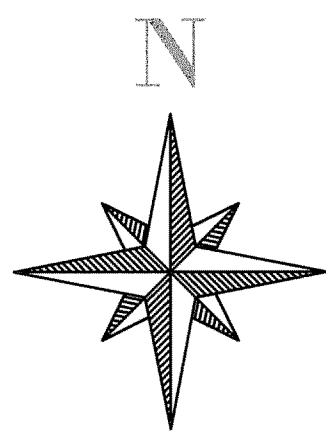
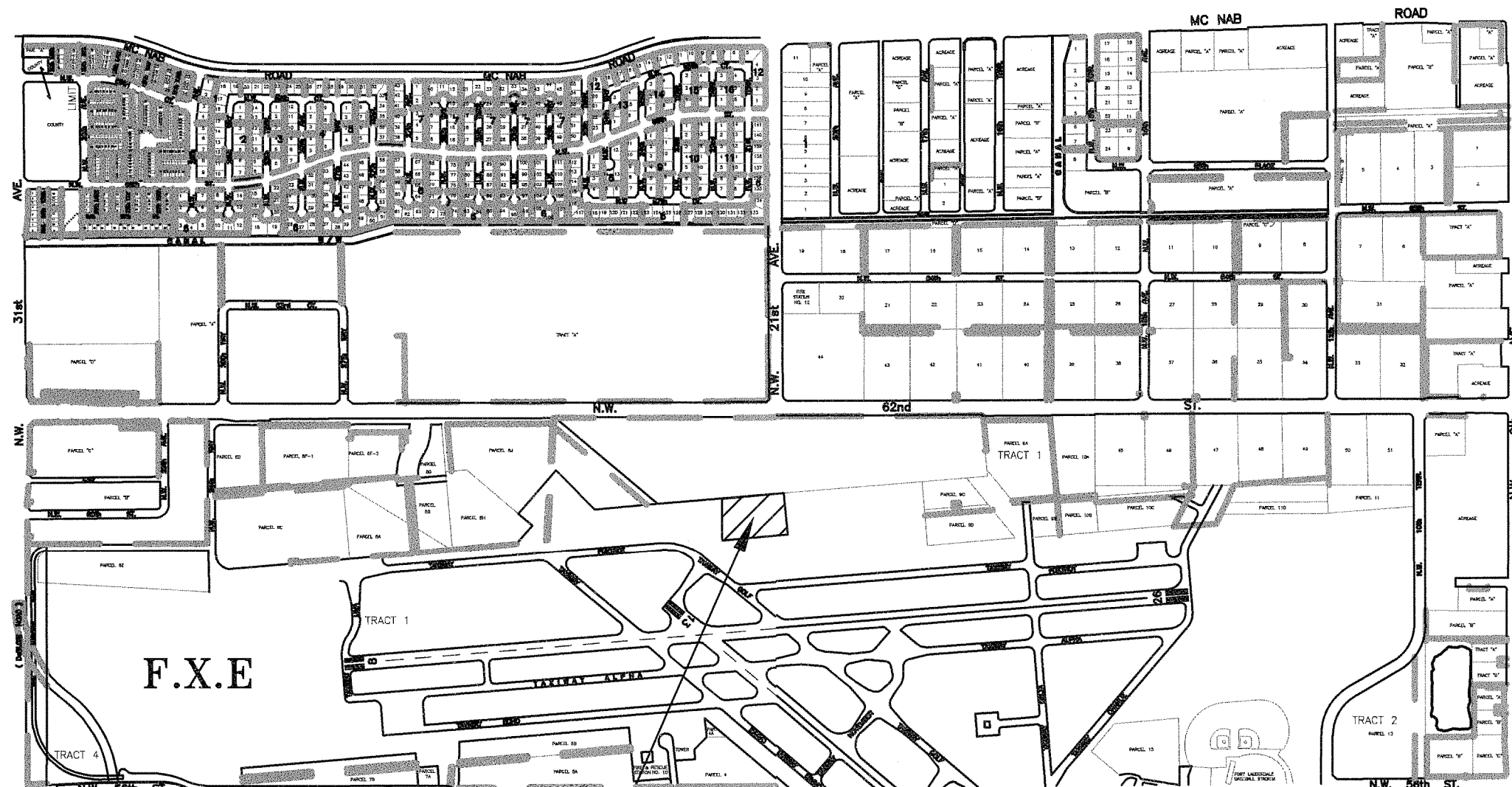
SUNSHINE STATE ONE CALL OF FLORIDA, INC.

CALL 48 HOURS BEFORE DIGGING  
FAA FACILITIES 954-356-7212



# TOPOGRAPHIC SURVEY

## LOCATION MAP



MAP OF SKETCH

N.T.S.

DESCRIPTION: EXECUTIVE AIRPORT ADMINISTRATION BUILDING (PARCEL 30)

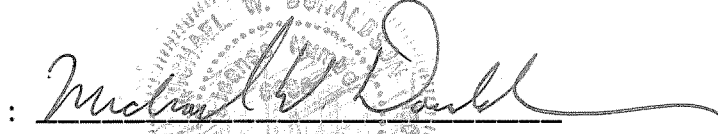
A PORTION OF TRACT 1, "F-X-E PLAT", ACCORDING TO THE PLAT THEREOF, AS RECORDED IN PLAT BOOK 119, PAGE 4, OF THE PUBLIC RECORDS OF BROWARD COUNTY, FLORIDA, IN SECTION 8 AND 9, TOWNSHIP 49 SOUTH, RANGE 42 EAST, BROWARD COUNTY, IN FORT LAUDERDALE EXECUTIVE AIRPORT, CITY OF FORT LAUDERDALE, FLORIDA, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCE AT THE SOUTHEAST CORNER OF PARCEL "D", "CYPRESS CREEK ROAD NO. 2 PLAT", ACCORDING TO THE PLAT THEREOF, AS RECORDED IN PLAT BOOK 170, PAGE 8, OF THE PUBLIC RECORDS OF BROWARD COUNTY, FLORIDA AS SHOWN PER THE F.X.E AIRPORT & LEASE PARCEL MAP CITY OF FORT LAUDERDALE EXECUTIVE AIRPORT PROJECT NO. 11404; THENCE N 83° 25' 05" E A DISTANCE OF 176.79 FEET ALONG THE NORTHERLY LINE OF SAID F-X-E PLAT AND ALSO BEING THE NORTHERLY RIGHT OF WAY OF EXECUTIVE AIRPORT WAY; THENCE DEPARTING SAID NORTHERLY LINE S 06° 34' 53" E A DISTANCE OF 60.00 FEET TO THE NORTHEAST CORNER OF PARCEL 30 AND THE POINT OF BEGINNING; THENCE CONTINUE S 06° 34' 55" E ALONG THE EASTERLY LINE OF PARCEL 30 A DISTANCE OF 250.14 FEET; THENCE S 83° 25' 05" W A DISTANCE OF 370.00 FEET TO THE SOUTHWEST CORNER OF PARCEL 30; THENCE N 06° 34' 55" W ALONG THE WESTERLY LINE OF PARCEL 30 A DISTANCE OF 250.14 FEET TO THE NORTHWEST CORNER OF PARCEL 30; THENCE N 83° 25' 05" E ALONG THE NORTHERLY LINE OF SAID PARCEL AND ALSO BEING THE SOUTHERLY RIGHT OF WAY OF EXECUTIVE AIRPORT WAY A DISTANCE OF 370.00 FEET TO THE POINT OF BEGINNING.






















SAID LANDS SITUATE, LYING AND BEING IN THE CITY OF FORT LAUDERDALE, BROWARD COUNTY, FLORIDA, CONTAINING 92551 SQUARE FEET OR 2.1247 ACRES, MORE OR LESS.

### NOTES:

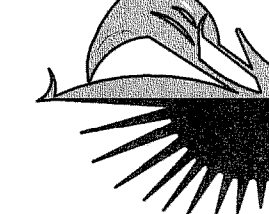
- 1) THIS TOPOGRAPHIC SURVEY IS LIMITED TO THE LOCATION OF ABOVE GROUND IMPROVEMENTS AND SPOT ELEVATIONS WITHIN THE DESCRIBED RIGHT OF WAYS, EXCEPT AS INDICATED, SUBJECT TO EXISTING EASEMENTS, RIGHT-OF WAYS, COVENANTS, RESERVATIONS AND RESTRICTIONS OF RECORD, IF ANY.
- 2) THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.
- 3) ELEVATIONS SHOWN HEREON ARE IN FEET AND DECIMALS REFERENCED TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 1929) AND CONVERTED TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 1988). THE DATUM WAS CONVERTED FROM NGVD 1929 TO NAVD 1988 UTILIZING THE U.S. ARMY CORPS OF ENGINEERS PROGRAM VERTCON. THE MODEL VALUE OF (-)1.585 WAS ADDED ALGEBRAICALLY TO THE NGVD 1929 HEIGHT.
- 4) BENCHMARK DESCRIPTION: CITY OF FORT LAUDERDALE BENCHMARK, FIELD BOOK 2087, PAGE 53, DESCRIBED AS FOLLOWS: MAG NAIL SW CORNER AREA (#7) ELEVATION= 10.194' (NGVD 1929) OR 11.784' (NAVD88)
- 5) ADDITIONS OR DELETIONS TO THIS SURVEY MAP BY OTHER THAN THE SIGNING PARTY ARE PROHIBITED WITHOUT WRITTEN CONSENT OF THE SIGNING PARTY.
- 6) THE HORIZONTAL POSITIONAL ACCURACY OF WELL DEFINED IMPROVEMENTS SHOWN HEREON IS  $\pm 0.2'$ . THE VERTICAL ACCURACY OF ELEVATIONS IS  $\pm 0.08'$ .
- 7) THIS SURVEY MAP IS INTENDED TO BE DISPLAYED AT A SCALE OF 1"=20' OR SMALLER.
- 8) PROPERTY LINES SHOWN ARE BASED ON ADJACENT PLATS AND ARE FOR INFORMATIONAL PURPOSES ONLY.
- 9) THIS IS NOT A BOUNDARY SURVEY.
- 10) HORIZONTAL FEATURE LOCATIONS ARE TO THE CENTER OF SYMBOLS AND MAY HAVE BEEN ENLARGED FOR CLARITY. DISTANCES AND ELEVATIONS SHOWN HEREON ARE UNITED STATES SURVEY FEET.
- 11) DATE OF LAST SURVEY FIELD WORK: AUGUST 29, 2016.
- 12) UNDERGROUND UTILITIES WERE NOT LOCATED.

SIGNED :   
MICHAEL W. DONALDSON  
PROFESSIONAL SURVEYOR AND MAPPER  
NO. 6490 STATE OF FLORIDA

### LEGEND:

| SYMBOL  | DESCRIPTION            | ABBREVIATIONS | DESCRIPTION                                   |
|---|------------------------|---------------|---|
|  | AERIAL TARGET          | AV            | AIR VALVE                                     |
|  | BENCH MARK             | AVMH          | AIR VALVE MANHOLE                             |
|  | BIKE LANE              | APPROX.       | APPROXIMATE                                   |
|  | BOAT CLEAT             | ASPH          | ASPHALT                                       |
|  | BURIED SETBACK         | BK            | BACK  |
|  | BUSH                   | BTM           | BOTTOM  |
|  | CABLE TELEVISION       | CCB           | C TYPE CATCH BASIN                            |
|  | CHAIN LINK FENCE       | CL            | CENTER LINE                                   |
|  | EXISTING ELEVATIONS    | C.L.F.        | CHAIN LINK FENCE                              |
|  | F-CURB                 | CHATT         | CHATTahoochie                                 |
|  | FIRE HYDRANT           | M.C.I.        | MICROWAVE COMMUNICATIONS INCORPORATED         |
|  | FORCE MAIN             | CONC.         | CONCRETE                                      |
|  | GAS LINE               | COR.          | CORNER  |
|  | GUY ANCHOR             | CMP           | CORRUGATED METAL PIPE                         |
|  | HEDGE                  | GPP           | CRUMPLER PLASTIC PIPE                         |
|  | IRON PIPE              | DCB           | D TYPE CATCH BASIN                            |
|  | IRRIGATION CONTROL BOX | DOT CB        | DEPARTMENT OF TRANSPORTATION TYPE CATCH BASIN |
|  | MANHOLE                | DIA           | DIAMETER                                      |
|  | METAL POST             | DIP           | DUCTILE IRON PIPE                             |
|  | MONITORING WELL        | ELEC          | ELECTRIC                                      |
|  | OVERHEAD WIRES         | FB            | FIELD BOOK                                    |
|  | PALM TREE              | FPL           | FLORIDA POWER AND LIGHT                       |
|  | PARKING METER          | FL            | FLOW LINE                                     |
|  | PARKING STOP           | FL CB         | FLOW LINE CATCH BASIN                         |
|  | PROPERTY EASEMENT      | FND           | FOUND   |
|  | PROPERTY LINE          | HDPE          | HIGH DENSITY POLYETHYLENE                     |
|  | PINE TREE              | ID            | IDENTIFICATION                                |
|  | PIPE END               | A-2 CB        | INLET CATCH BASIN                             |
|  | ROCK                   | I.R.          | IRON ROD                                      |
|  | RIGHT-OF-WAY           | M.H.          | MANHOLE                                       |
|  | SHAMESE CONNECTION     | MEAS          | MEASURE                                       |
|  | SPANISH BAYONET        | NCB           | N TYPE CATCH BASIN                            |
|  | SPOT LIGHT             | NIA           | NAIL IN ASPHALT                               |
|  | SQUARE DRAIN           | NIB           | NAIL IN BOTTLE CAP                            |
|  | SURVEY MARKER          | NIC           | NAIL IN CONCRETE                              |
|  | TRAFFIC SIGN           | N.T.S.        | NOT TO SCALE                                  |
|  | TREE                   | O.R.          | OFFICIAL RECORD                               |
|  | UNDERGROUND ELECTRIC   | P.K.          | PARKER KALON FASTENERS                        |
|  | ASPHALT WATER VALVE    | P.B.          | PLAT BOOK                                     |
|  | TOPO WATER VALVE       | P.O.C.        | POINT ON CURB                                 |
|  | VALLEY GUTTER          | P.S.M.        | PROFESSIONAL SURVEYOR AND MAPPER              |
|  | WATER MAN              | PCP           | PERMANENT CONTROL POINT                       |
|  | WATER METER BOX        | PVC           | POLYVINYL CHLORIDE PIPE                       |
|  | WOOD POLE              | RCP           | REINFORCED CONCRETE PIPE                      |
|  | ROUND                  | RND           | ROUND   |
|  | SANITARY               | SAN           | SANITARY                                      |
|  | SIDEWALK               | SWK           | STANDARD                                      |
|  | STORM                  | ST            | STANDARD                                      |
|  | TYPICAL                | TYP           | TYPICAL                                       |
|  | VITRIFIED CLAY PIPE    | VCP           | VITRIFIED CLAY PIPE                           |

CITY OF FORT LAUDERDALE



PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

NO.

DATE

BY

CHKD

DESCRIPTION

PROJECT # 12188  
EXECUTIVE AIRPORT ADMIN BLDG  
TOPOGRAPHIC SURVEY

FT. LAUDERDALE EXECUTIVE AIRPORT

SHEET NO.

OF

1

2

TOTAL:

2

CAD FILE:

12188-TOPO-SURV

DRAWING FILE NO.

4-140-08

CAD FILE:

4-140-08

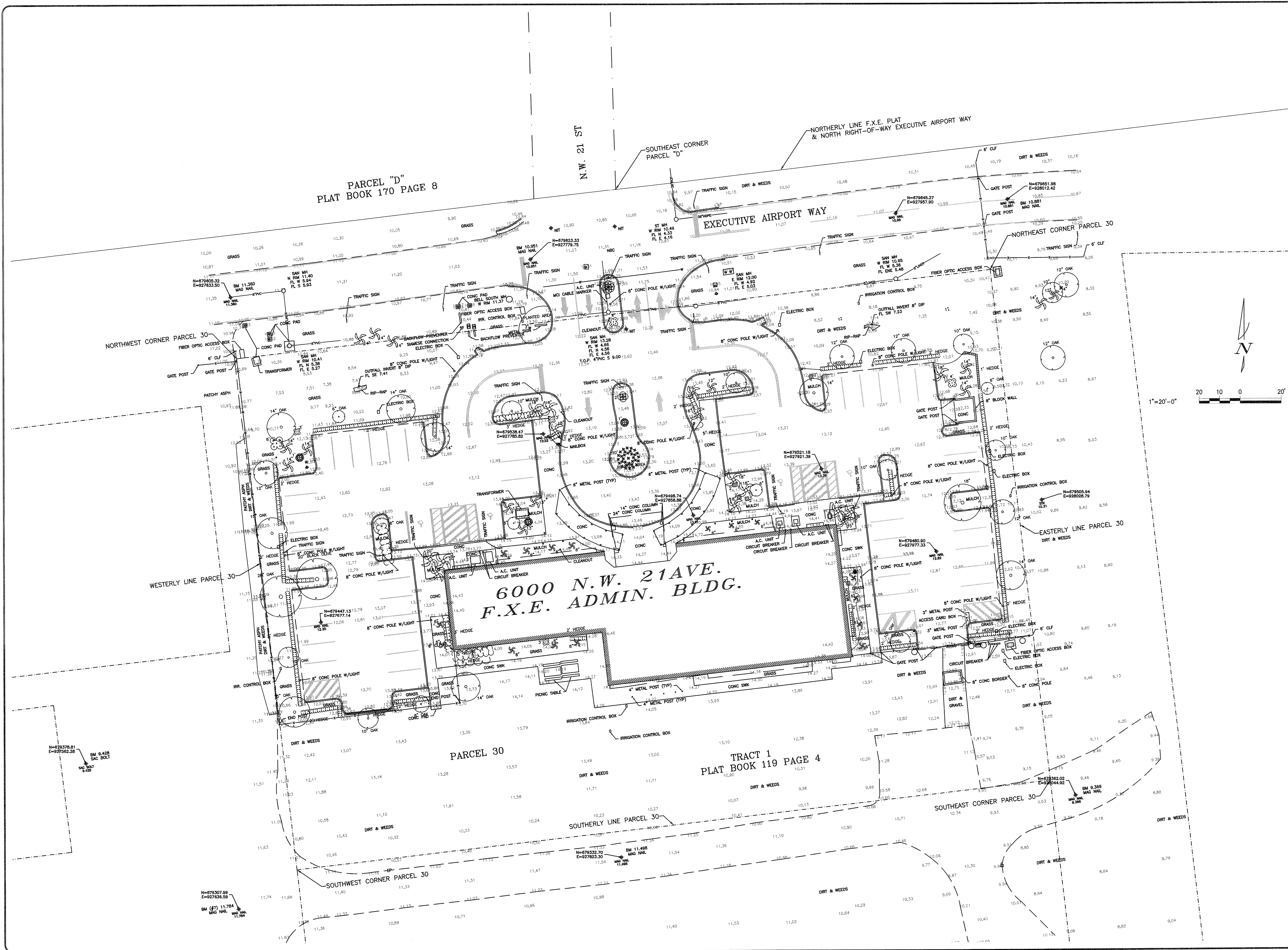
10/23/2017 1:01 PM

Exhibit 3


702 of 776

p. 702





|                              |                   |
|------------------------------|-------------------|
| DRAWN BY:<br>CH              | DATE:<br>9/8/2016 |
| DESIGNED BY:<br>CH           | SCALE:<br>1:20    |
| CHECKED BY:<br>MD            |                   |
| FIELD BOOK:<br>2087 PG 50-60 |                   |



**CITY OF FORT LAUDERDALE**  
**PUBLIC WORKS DEPARTMENT**  
**ENGINEERING & ARCHITECTURE**

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

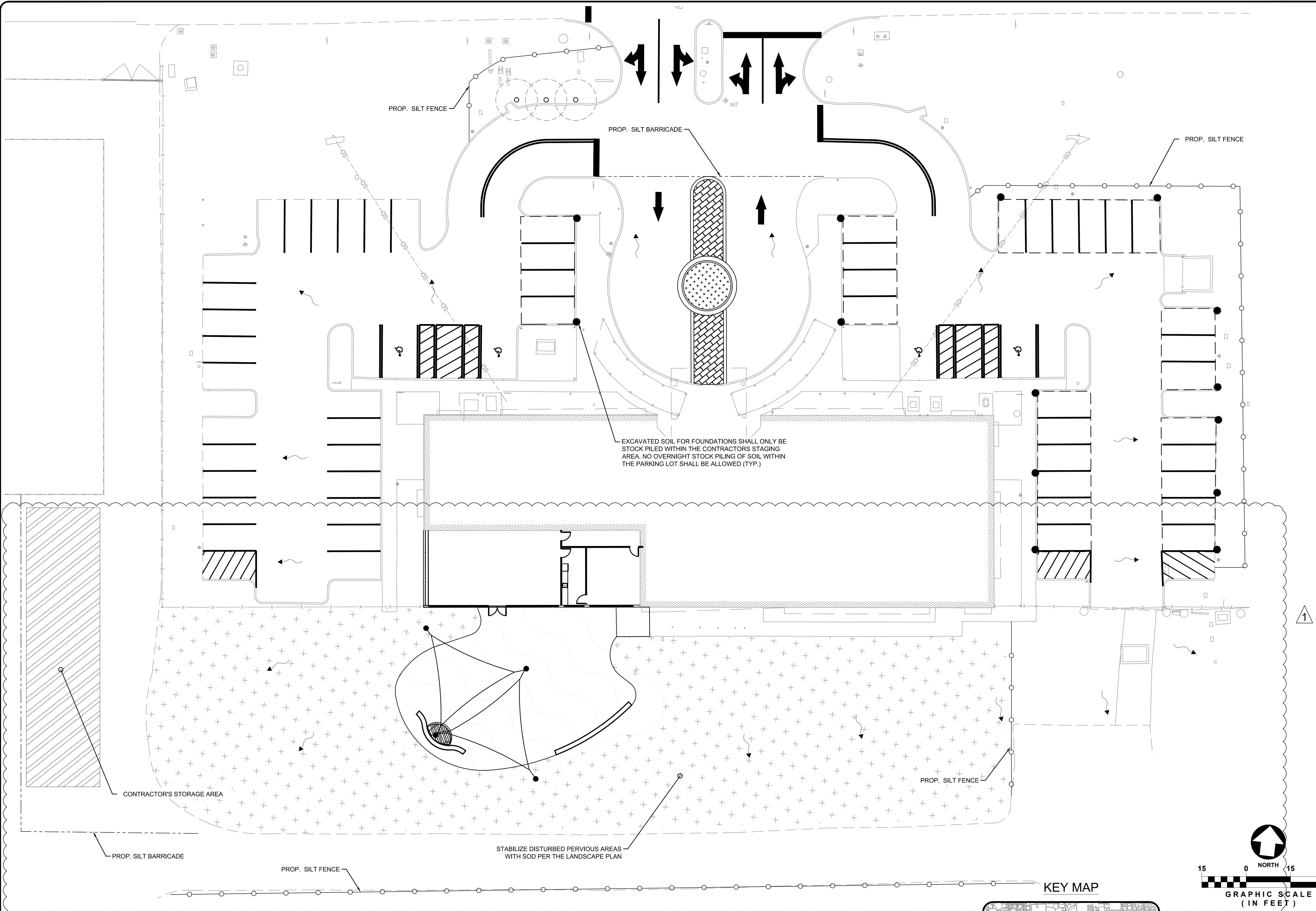
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PROJECT # 12188  
EXECUTIVE AIRPORT ADMIN BLDG  
TOPOGRAPHIC SURVEY  
FT. LAUDERDALE EXECUTIVE AIRPORT

|   |    |
|---|----|
| SHEET NO.                                   | OF |
| 2   | 2  |
| TOTAL:                                      | 2  |
| CAD FILE:<br>12188-TOPO-SURV                |    |
| DRAWING FILE NO.<br>4-140-08<br>CAM 18-0070 |    |

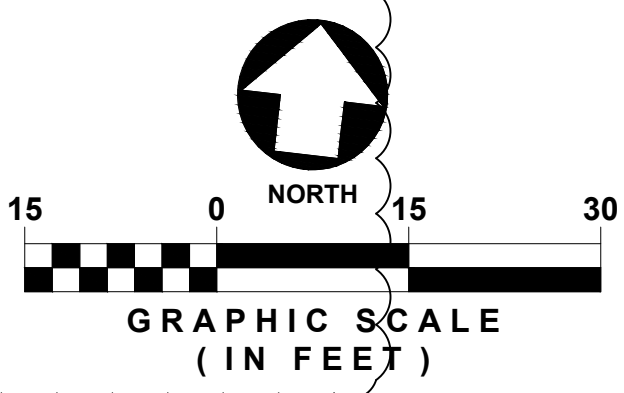
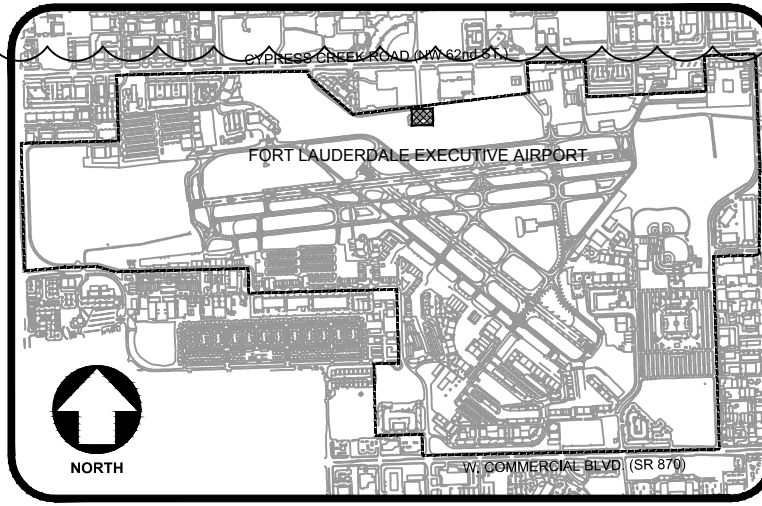


C:\PWORKING\EA01\12188-MULTI-SWPP.DWG



1

KEY MAP



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T: 954.535.1876 F: 954.233.4953  
CA# 4213

BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
STORM WATER POLLUTION PREVENTION PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                  |                  |
|------------------|------------------|
| SHEET NO.        | OF               |
| C100             | 8                |
| TOTAL:           | 65               |
| CAD FILE:        | 12188-MULTI-SWPP |
| DRAWING FILE NO. | 4-140-42         |

| REVISIONS |            |    |       | BUILDING PERMIT COMMENTS |  |
|-----------|------------|----|-------|--------------------------|--|
| NO.       | DATE       | BY | CHK'D | DESCRIPTION              |  |
| 1         | 06/11/2017 |    |       |                          |  |
|           |            |    |       |                          |  |
|           |            |    |       |                          |  |
|           |            |    |       |                          |  |

**CITY OF FORT LAUDERDALE**  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

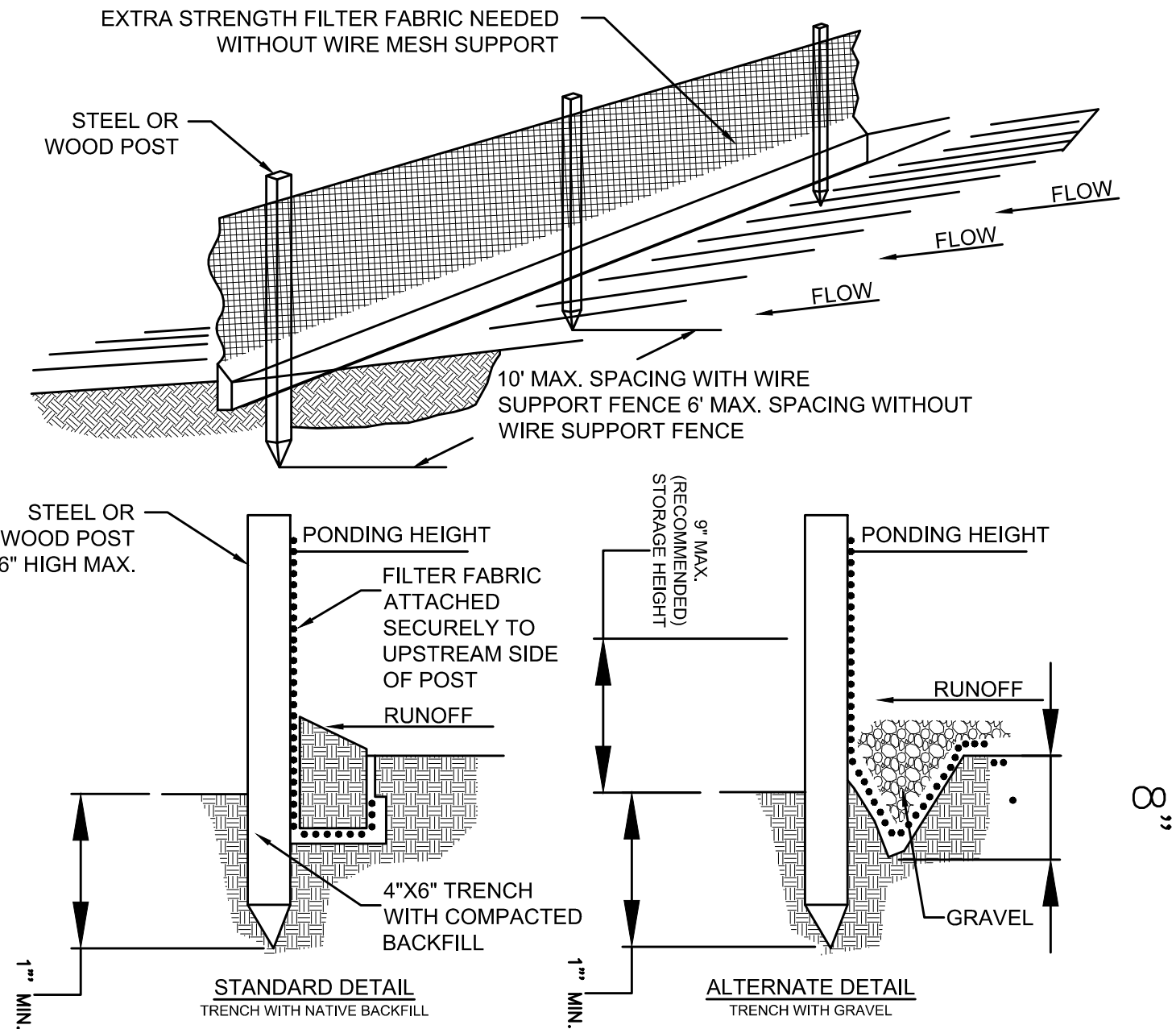
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

|              |            |
|--------------|------------|
| DATE:        | 05/31/2017 |
| DESIGNED BY: | PS         |
| CIP          | 1" = 15'   |
| CHECKED BY:  | JFN        |
| FIELD BOOK:  |            |

State of Florida  
Professional Engineer  
License No. 73904

CODY T. PARHAM

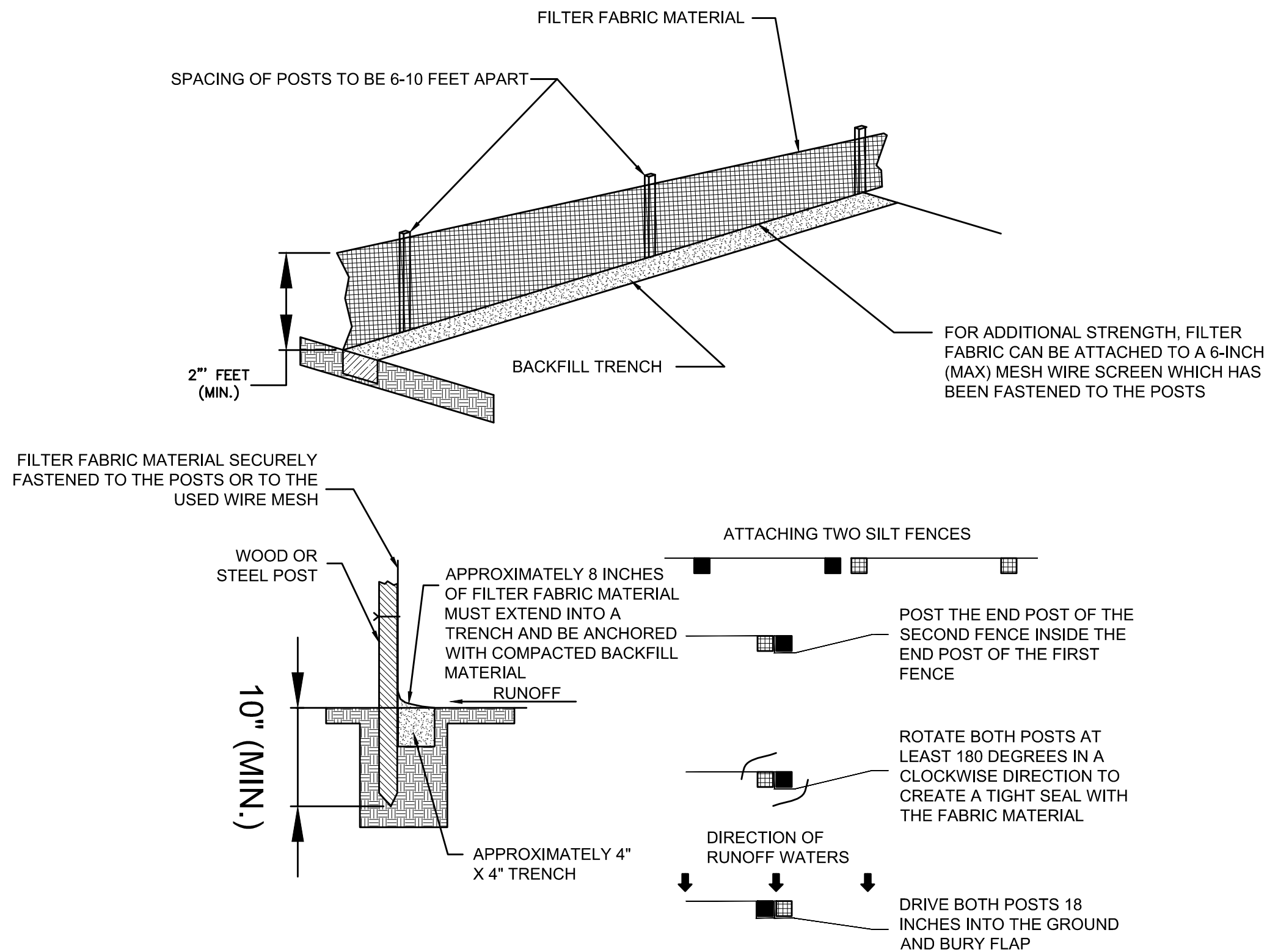




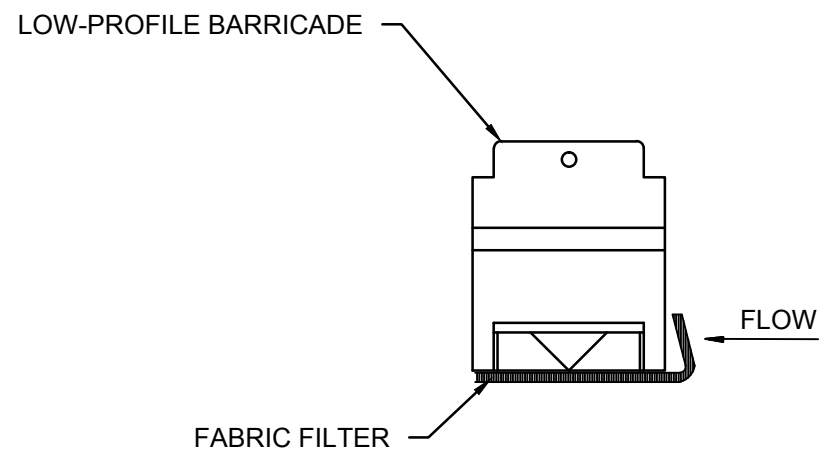
NOTE:

1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.

SILT FENCE DETAIL  
N.T.S.



SILT FENCE INSTALLATION DETAIL  
N.T.S.



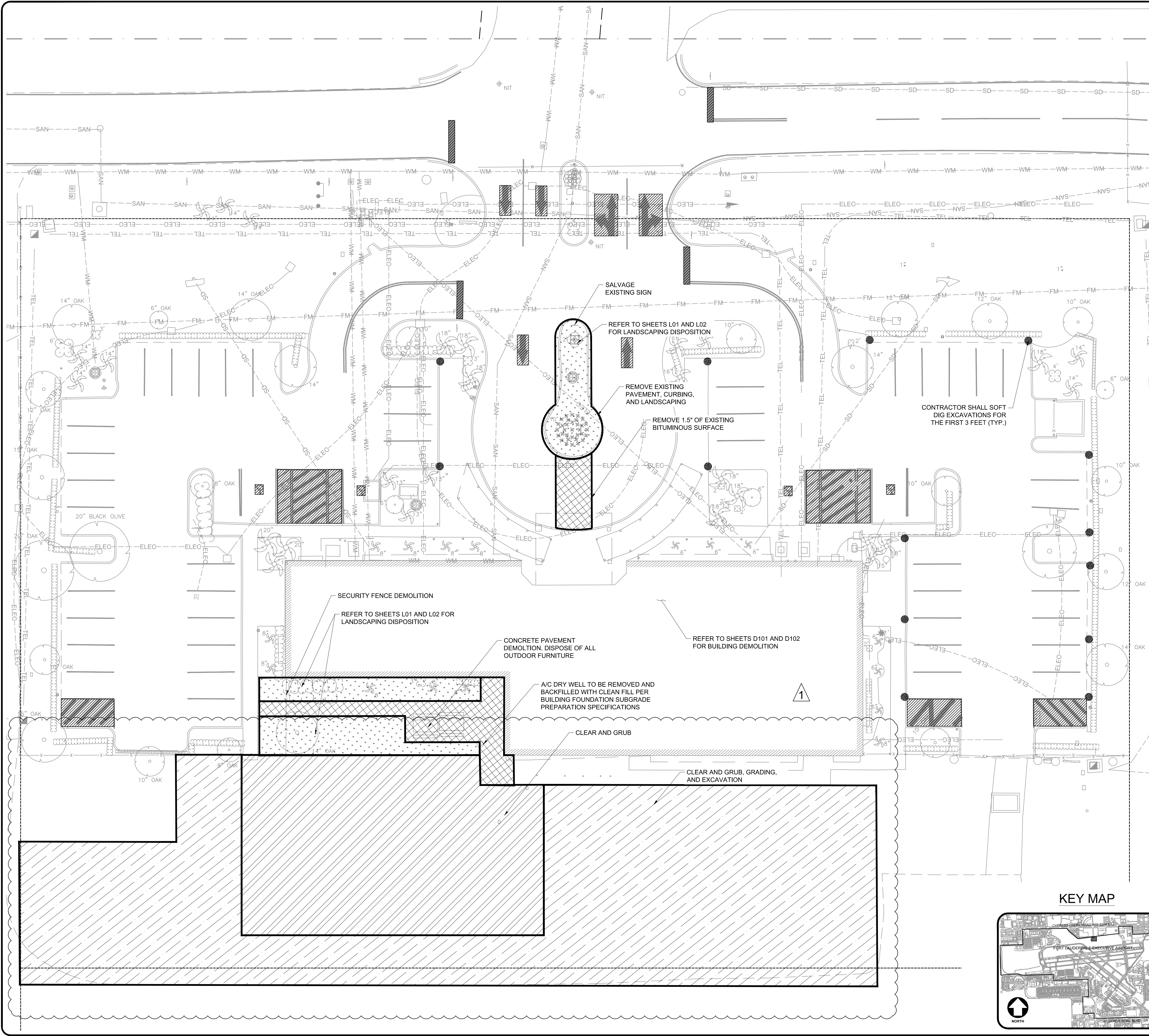
SILT BARRICADE DETAIL  
N.T.S.

STORM WATER POLLUTION PREVENTION NOTES:

1. EROSION CONTROL MEASURES SHALL BE EMPLOYED TO MINIMIZE SOIL EROSION AND TURBIDITY OF SURFACE WATERS LOCATED DOWNSTREAM OF ANY CONSTRUCTION ACTIVITY. WHILE THE VARIOUS MEASURES REQUIRED WILL BE SITE SPECIFIC, THEY SHALL BE EMPLOYED AS NEEDED IN ACCORDANCE WITH THE FOLLOWING:
  - A. IN GENERAL, EROSION SHALL BE CONTROLLED AT THE FURTHEST PRACTICAL UPSTREAM
  - B. STORMWATER INLETS SHALL BE PROTECTED DURING CONSTRUCTION BY SILT FENCE AND/OR TURBIDITY BARRIER. PROTECTION MEASURES SHALL BE EMPLOYED AS SOON AS PRACTICAL DURING THE VARIOUS STAGES OF CONSTRUCTION. MEASURES SHALL REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETE.
2. HEAVY CONSTRUCTION EQUIPMENT PARKING AND MAINTENANCE AREAS SHALL BE DESIGNED TO PREVENT OIL, GREASE, AND LUBRICANTS FROM ENTERING SITE DRAINAGE FEATURES INCLUDING STORMWATER COLLECTION AND TREATMENT SYSTEMS. CONTRACTORS SHALL PROVIDE BROAD DIKES OR SILT SCREENS AROUND, AND SEDIMENT SUMPS WITHIN SUCH AREAS AS REQUIRED TO CONTAIN SPILLS OF OIL, GREASE OR LUBRICANTS. CONTRACTORS SHALL HAVE AVAILABLE AND SHALL USE ABSORBENT FILTER PADS TO CLEAN UP SPILLS AS SOON AS POSSIBLE AFTER OCCURRENCE.
3. SILT BARRIERS, ANY SILT WHICH ACCUMULATES BEHIND THE BARRIERS, AND ANY FILL USED TO ANCHOR THE BARRIERS, SHALL BE REMOVED PROMPTLY AFTER THE END OF THE MAINTENANCE PERIOD SPECIFIED FOR THE BARRIERS.
4. BARE EARTH AREAS SHALL BE WATERED DURING CONSTRUCTION AS NECESSARY TO MINIMIZE THE TRANSPORT OF FUGITIVE DUST. IT MAY BE NECESSARY TO LIMIT CONSTRUCTION VEHICLE SPEED IF BARE EARTH HAS NOT BEEN EFFECTIVELY WATERED. IN NO CASE SHALL FUGITIVE DUST BE ALLOWED TO LEAVE THE SITE UNDER CONSTRUCTION.

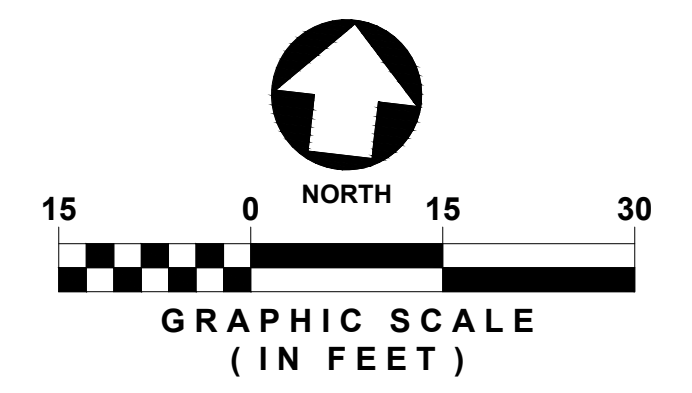
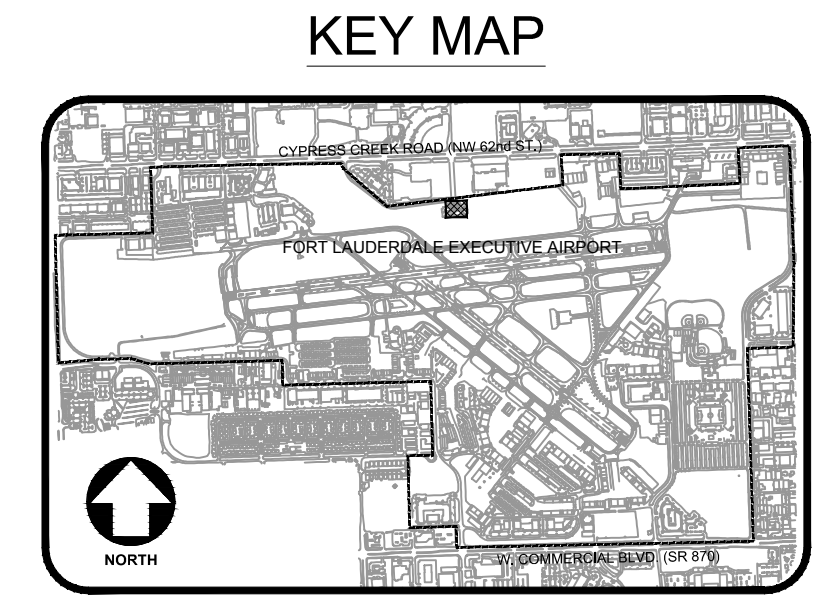
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- NOTES:
- EXISTING UTILITIES ARE BASED ON RECORDS PROVIDED TO THE DESIGN TEAM. CONTRACTOR TO VERIFY ALL UNDERGROUND FACILITIES PRIOR TO DIGGING.
  - CONTRACTOR SHALL DISPOSE OF EXISTING PATIO FURNITURE OFF SITE.

- LEGEND:
- EXCAVATION FOR CANOPY FOUNDATIONS
  - MARKING TO BE REMOVED BY GRINDING
  - EXIST. ELECTRICAL
  - EXIST. SAN. SEWER
  - EXIST. FORCE MAIN
  - EXIST. FIBER OPTIC
  - EXIST. WATER MAIN
  - EXIST. STORM DRAIN
  - FXE PROPERTY BOUNDARY
  - PARCEL BOUNDARY
  - EXISTING EDGE OF PAVEMENT



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State of Florida  
Professional Engineer  
License No. 73904

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

DATE: 05/31/2017  
DESIGNED BY: PS  
CHECKED BY: CTP  
FIELD BOOK: JFN

1" = 15'

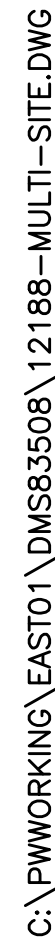
| NO. | DATE       | BY | DESCRIPTION              |
|-----|------------|----|--------------------------|
| 1   | 06/11/2017 |    | BUILDING PERMIT COMMENTS |

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
DEMOLITION PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

SHEET NO. C200 OF 8  
TOTAL: 65  
CAD FILE: 12188-MULTI-DEMO  
DRAWING FILE NO. 4-140-42

10/23/2017 1:01 PM  
CAM 16-0070  
Exhibit 3  
706 of 776






NOTES:

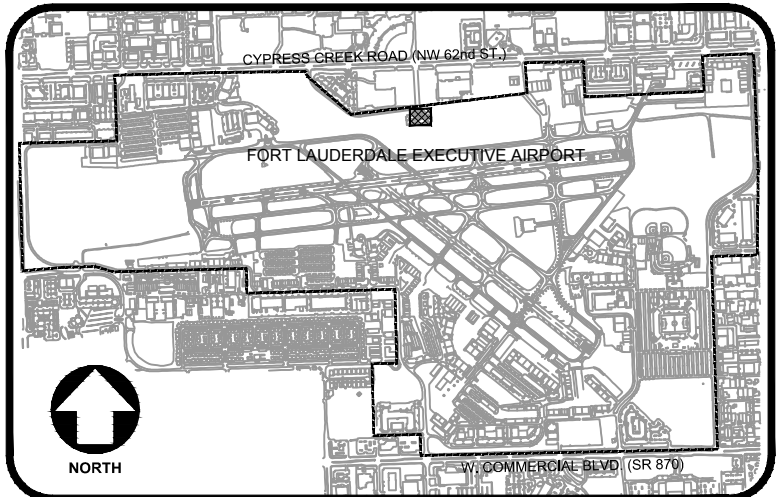
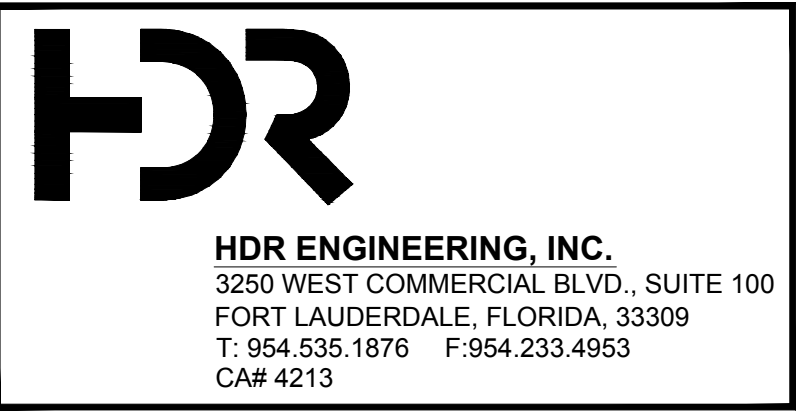
PARKING FABRIC CANOPY DETAIL TO BE PROVIDED BY CONTRACTOR.

CONTRACTOR SHALL PROVIDE AND INSTALL PARKING CANOPIES IN ACCORDANCE WITH THE SPECIFICATIONS.

UNDERGROUND UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR TO EXCAVATE WITH EXTREME CAUTION.

LEGEND:

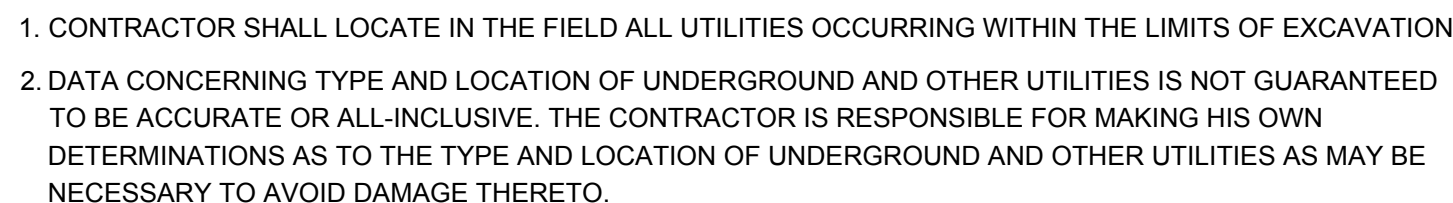

|   |  |
|---|--|
| -----   | PARKING CANOPY FOUNDATION LIMITS   |
| □   | PARKING CANOPY STRUCTURE COLUMN  |
| -----ELEC-----ELEC-----   | EXST. ELECTRICAL   |
| -----SAN-----SAN-----   | EXST. SAN. SEWER   |
| -----FM-----FM-----   | EXST. FORCE MAIN   |
| -----TEL-----TEL-----   | EXST. FIBER OPTIC  |
| -----WM-----WM-----   | EXST. WATER MAIN   |
| -----SD-----SD-----   | EXST. STORM DRAIN  |
| =====   | FXE PROPERTY BOUNDARY  |
| -----   | PARCEL BOUNDARY  |
|  | REJUVASEAL OR EQUIVALENT<br>PER MANUFACTURERS<br>INSTALLATION SPECIFICATIONS |



## BID DOCUMENTS

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| PROJECT # 12188   |             | SHEET NO. |  |           |  |     |      |  |           |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
| ADMINISTRATION BUILDING RENOVATIONS   |             | C300      |  |           |  |     |      |  |           |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
| SITE PLAN   |             | OF 8      |  |           |  |     |      |  |           |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
| 6000 NW 21st Ave, Fort Lauderdale, FL 33309   |             | TOTAL: 65 |  |           |  |     |      |  |           |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
| CAD FILE:<br>12188—MULTI—SITE   |             |           |  |           |  |     |      |  |           |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
| DRAWING FILE NO.<br>4—140—42  |             |           |  |           |  |     |      |  |           |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
| <table><tr><td colspan="2">REVISIONS</td></tr><tr><td>NO.</td><td>DATE</td></tr><tr><td></td><td>BY 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| NO.   | DATE        |           |  |           |  |     |      |  |           |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|   | BY (CHKD)   |           |  |           |  |     |      |  |           |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|   | DESCRIPTION |           |  |           |  |     |      |  |           |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
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|   | </          |           |  |           |  |     |      |  |           |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |



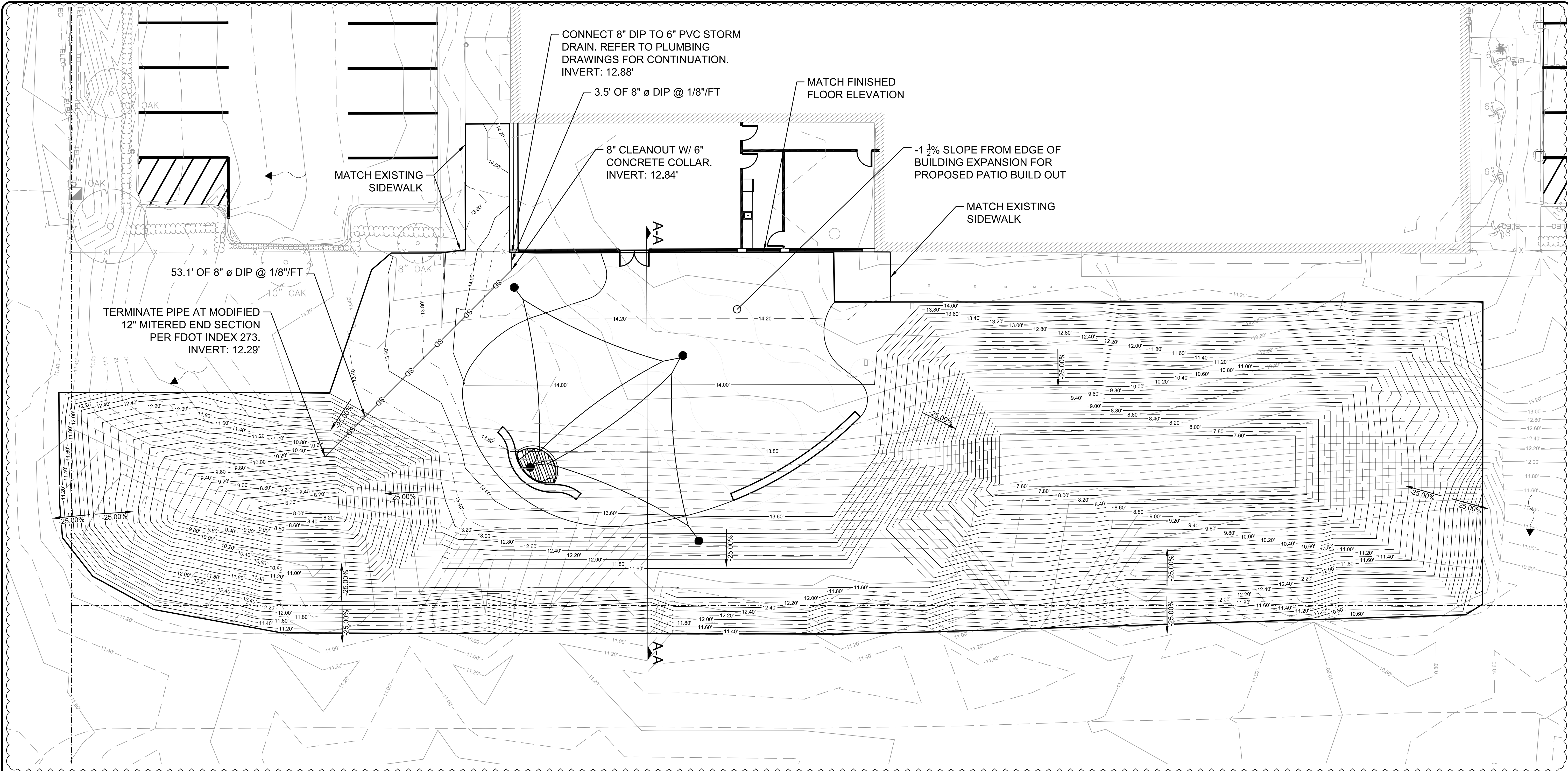
[illegible]

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

CAM 18-0070  
Exhibit 3 p. 70  
308 of 336



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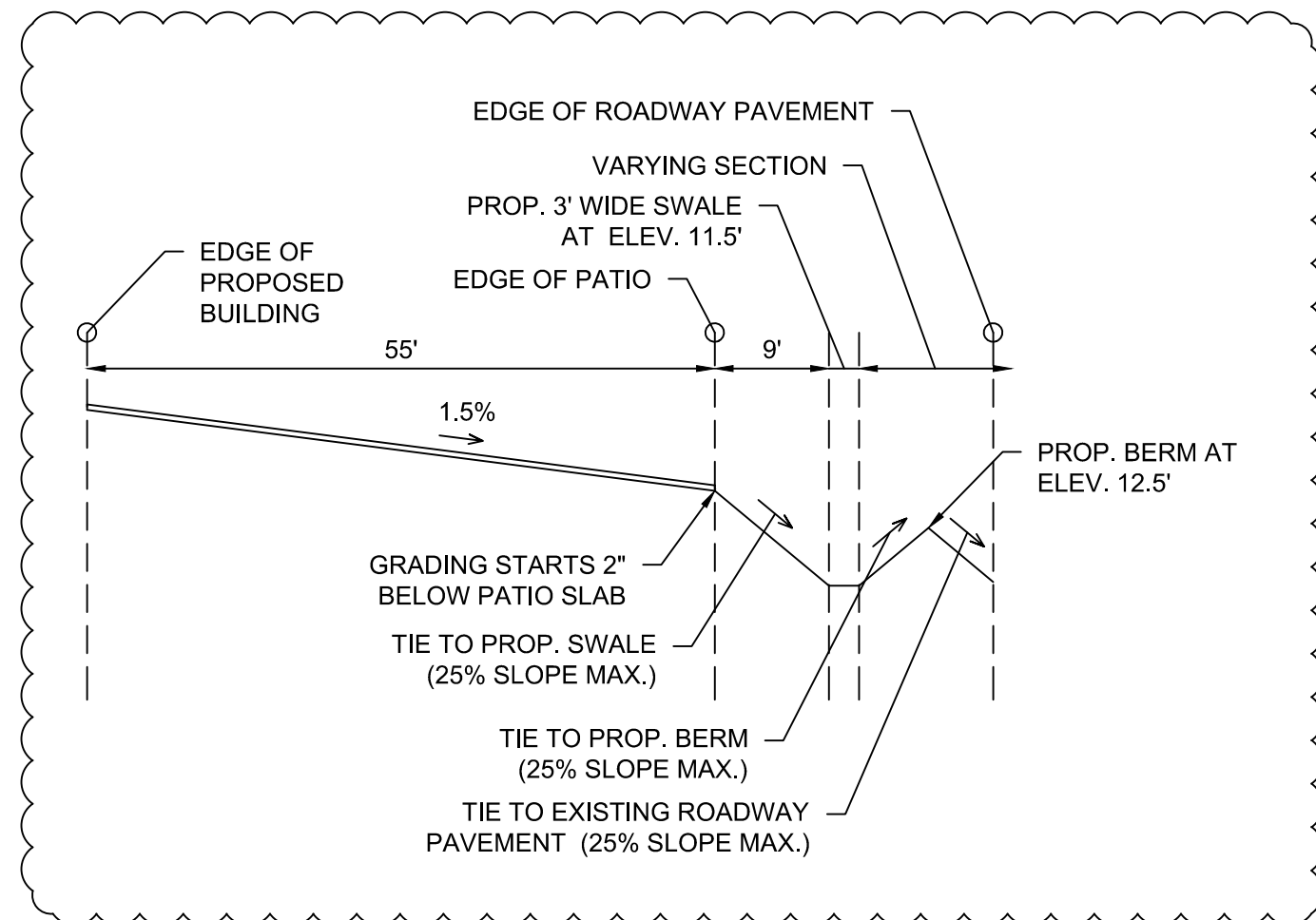


LEGEND:

- 10.00 EXISTING 0.40' CONTOUR
- 10.20 EXISTING 0.20' CONTOUR
- 10.00 PROPOSED 0.40' CONTOUR
- 10.20 PROPOSED 0.20' CONTOUR
- SD SD PROP. 8" Ø DIP

NOTES:

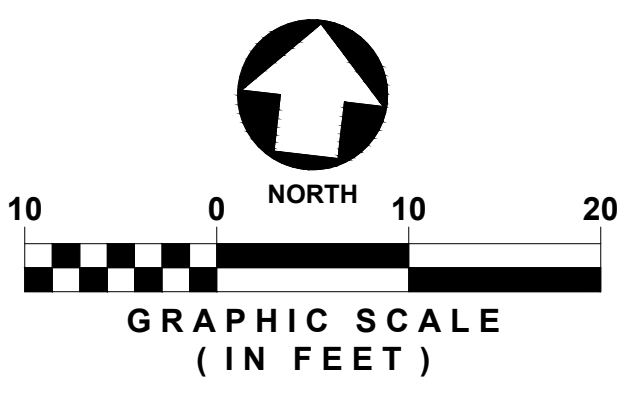
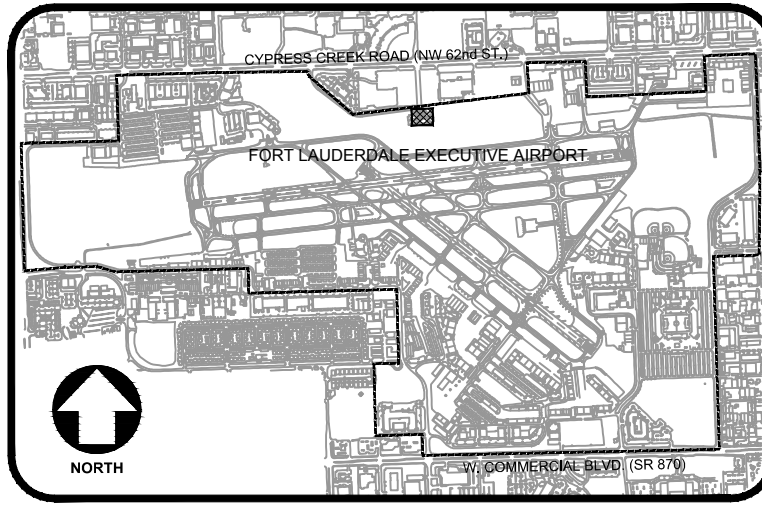
- VERTICAL DATUM IS NAVD88.
- SEE SPECIFICATIONS FOR EARTHWORK REQUIREMENTS.
- EXCAVATED MATERIAL TO BE USED AS EARTHWORK FILL.
- CONTRACTOR TO PROVIDE AS-BUILT PER BROWARD COUNTY AND WATER MANAGEMENT DISTRICT CRITERIA.



A-A SECTION A-A: TYPICAL LANDSCAPE AND PATIO SLOPES  
SCALE: 1" = 4'

1

KEY MAP



**HDR**  
HDR ENGINEERING, INC.  
3250 WEST COMMERCIAL BLVD., SUITE 100  
FORT LAUDERDALE, FLORIDA, 33309  
T: 954.535.1876 F: 954.233.4953  
CA# 4213

CALL 48 HOURS BEFORE YOU DIG  
IT'S THE LAW! DIAL 811  
Know what's below. Call before you dig.  
SUNSHINE STATE ONE CALL OF FLORIDA, INC.  
CALL 48 HOURS BEFORE DIGGING  
FAA FACILITIES 954-356-7212

State of Florida  
Professional Engineer  
License No. 73904  
CODY T. PARHAM

DATE: 05/31/2017  
DESIGNED BY: PS  
CHECKED BY: JFN  
FIELD BOOK: CTP

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

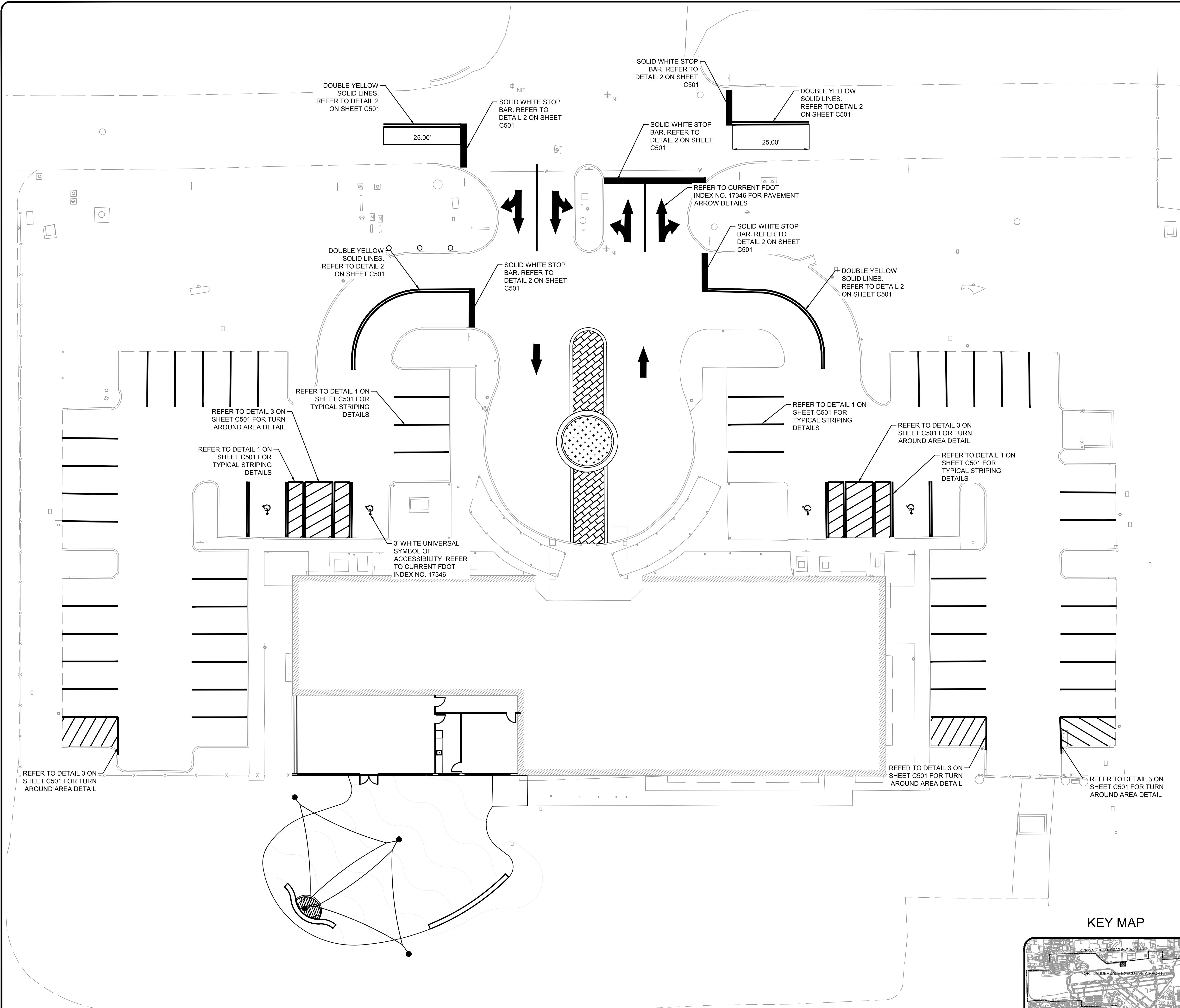
| NO. | DATE       | BY | CH'D | DESCRIPTION              |
|-----|------------|----|------|--------------------------|
| 1   | 06/11/2017 |    |      | BUILDING PERMIT COMMENTS |

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
GRADING PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                  |                  |
|------------------|------------------|
| SHEET NO.        | OF               |
| C400             | 8                |
| TOTAL:           | 65               |
| CAD FILE:        | 12188-MULTI-GRAD |
| DRAWING FILE NO. | 4-140-42         |



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MARKING NOTES:

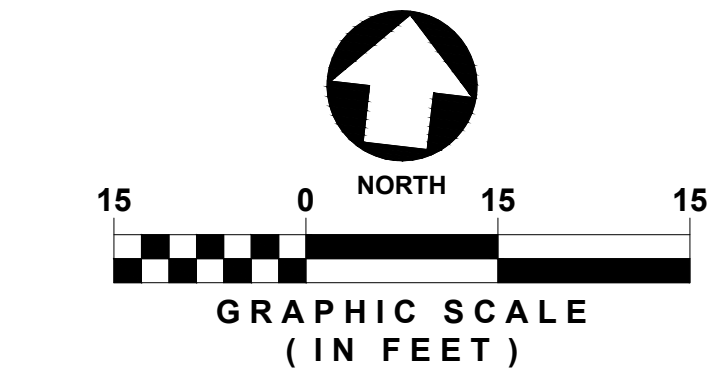
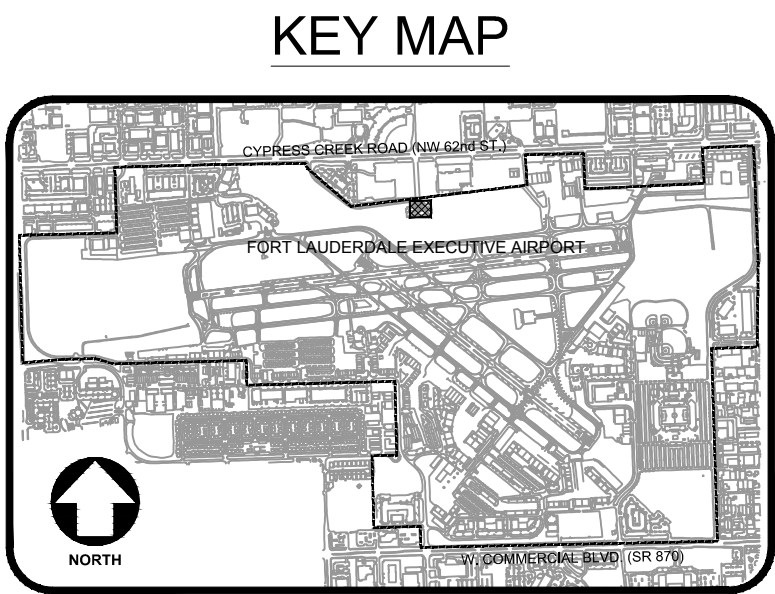
1. ALL MARKINGS SHALL COMPLY WITH FDOT SPECIFICATION SECTION 710.
2. TEMPORARY MARKINGS SHALL BE PLACED ON DRIED SEAL COAT. PERMANENT MARKINGS SHALL BE PLACED AFTER THE SEAL COAT MANUFACTURER'S RECOMMENDED CURE TIME .

CALL 48 HOURS BEFORE YOU DIG

IT'S THE LAW! DIAL 811

SUNSHINE STATE ONE CALL OF FLORIDA, INC.

CALL 48 HOURS BEFORE DIGGING  
FAA FACILITIES 954-356-7212



**HDR ENGINEERING, INC.**  
3250 WEST COMMERCIAL BLVD., SUITE 100  
FORT LAUDERDALE, FLORIDA, 33309  
T: 954.535.1876 F: 954.233.4953  
CA# 4213

State of Florida  
Professional Engineer  
License No. 73904

CODY T. PARHAM

DATE: 05/31/2017  
DESIGNED BY: PS  
CHECKED BY: JFN  
FIELD BOOK:

1" = 15'

**CITY OF FORT LAUDERDALE**  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| NO. | DATE | BY | CHK'D | REVISIONS | DESCRIPTION |
|-----|------|----|-------|-----------|-------------|
|     |      |    |       |           |             |
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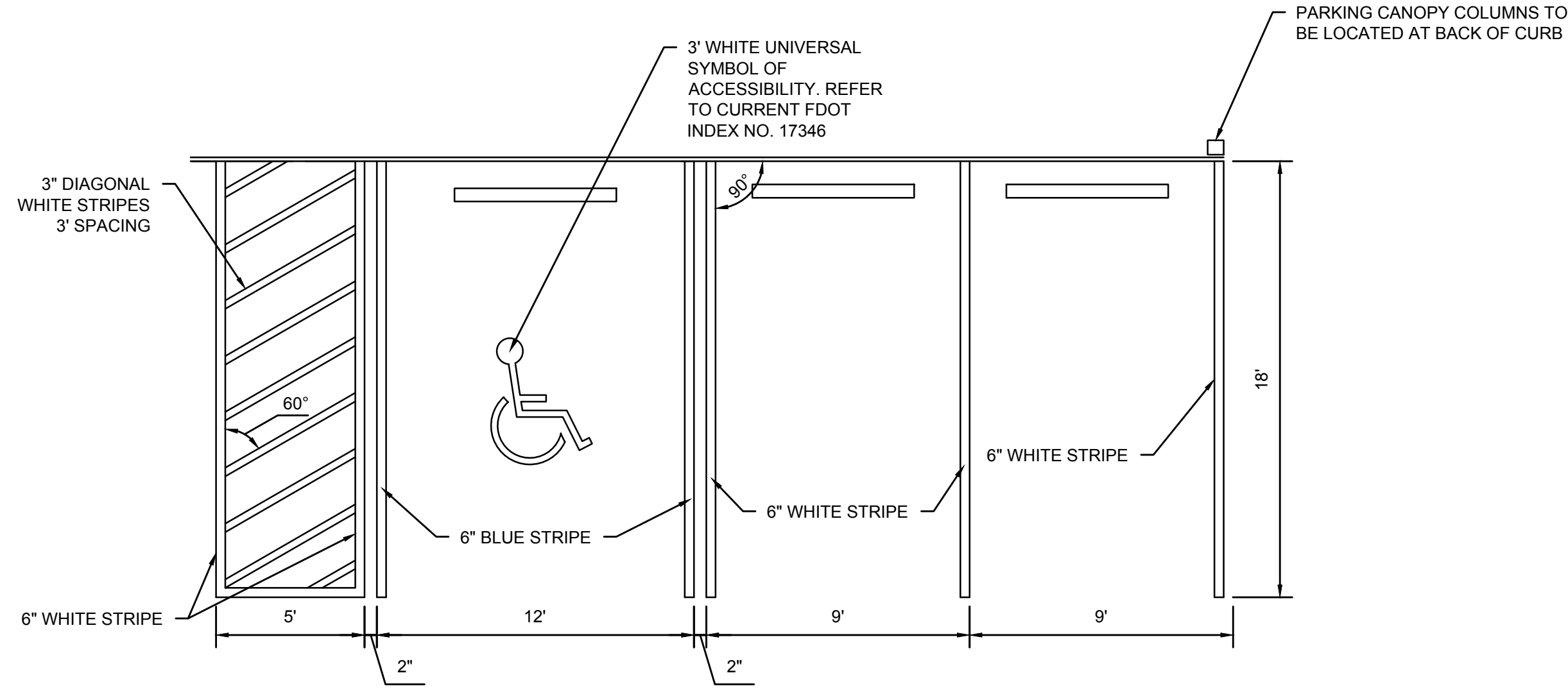
PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
PAVEMENT STRIPING AND MARKING PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

| SHEET NO. | OF |
|-----------|----|
| C500      | 8  |

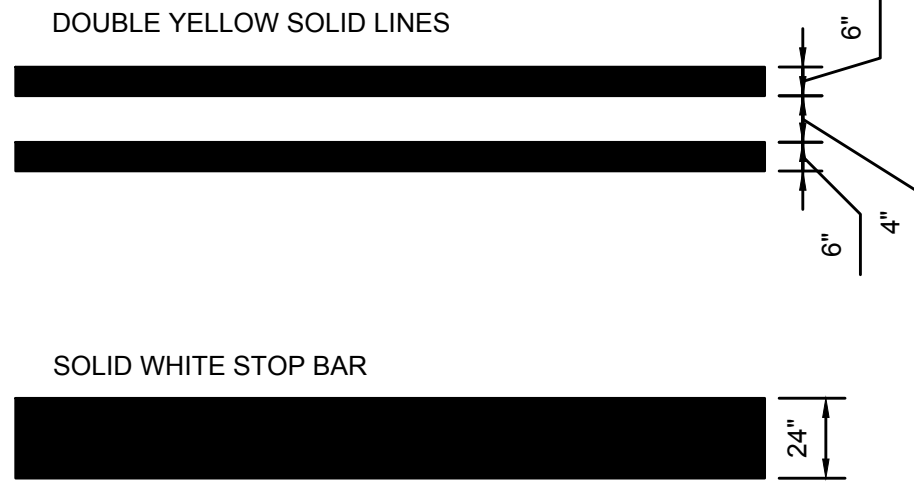
|                  |                  |
|------------------|------------------|
| TOTAL:           | 65               |
| CAD FILE:        | 12188-MULTI-STRP |
| DRAWING FILE NO. | 4-140-42         |

BID DOCUMENTS

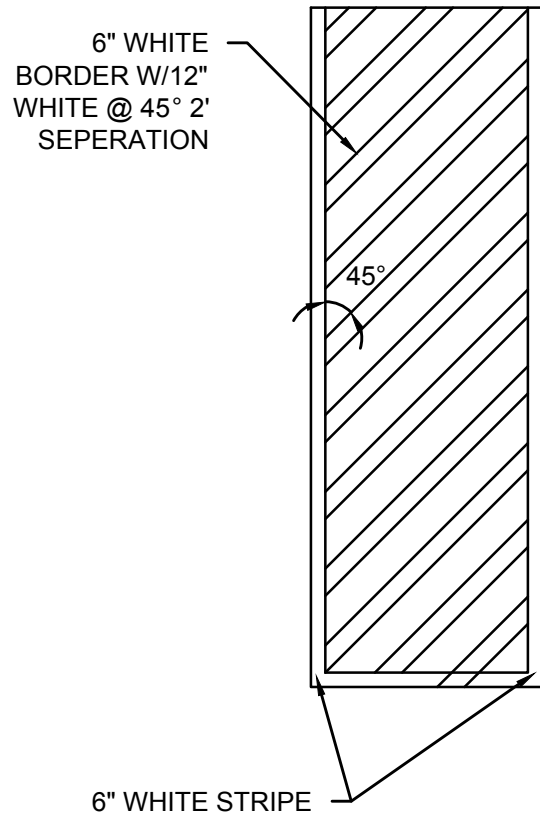
C:\PWORKING\EAST01\DMS63508\12188-MULTI-STRP.DWG



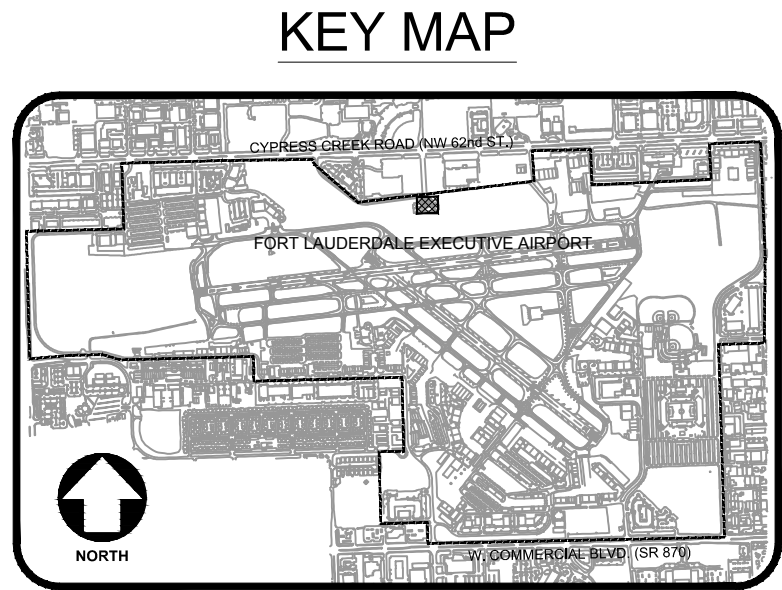
1 TYPICAL PARKING STRIPE DETAILS  
NTS

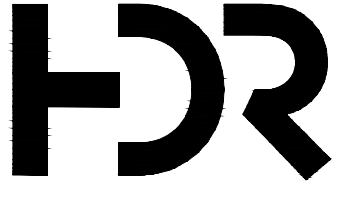


2 PAVEMENT MARKING LINE DETAILS  
NTS



3 TURN AROUND AREA DETAIL  
NTS






**HDR ENGINEERING, INC.**  
3250 WEST COMMERCIAL BLVD., SUITE 100  
FORT LAUDERDALE, FLORIDA, 33309  
T: 954.535.1876 F: 954.233.4953  
CA# 4213

BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
PAVEMENT STRIPING AND MARKING DETAILS  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

| SHEET NO.        |  | OF               |
|------------------|--|------------------|
| C501             |  | 8                |
| TOTAL:           |  | 65               |
| CAD FILE:        |  | 12188-MULTI-STRP |
| DRAWING FILE NO. |  | 4-140-42         |

| REVISIONS |      | DESCRIPTION |       |
|-----------|------|-------------|-------|
| NO.       | DATE | BY          | CHK'D |
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|           |      |             |       |



**CITY OF FORT LAUDERDALE**  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

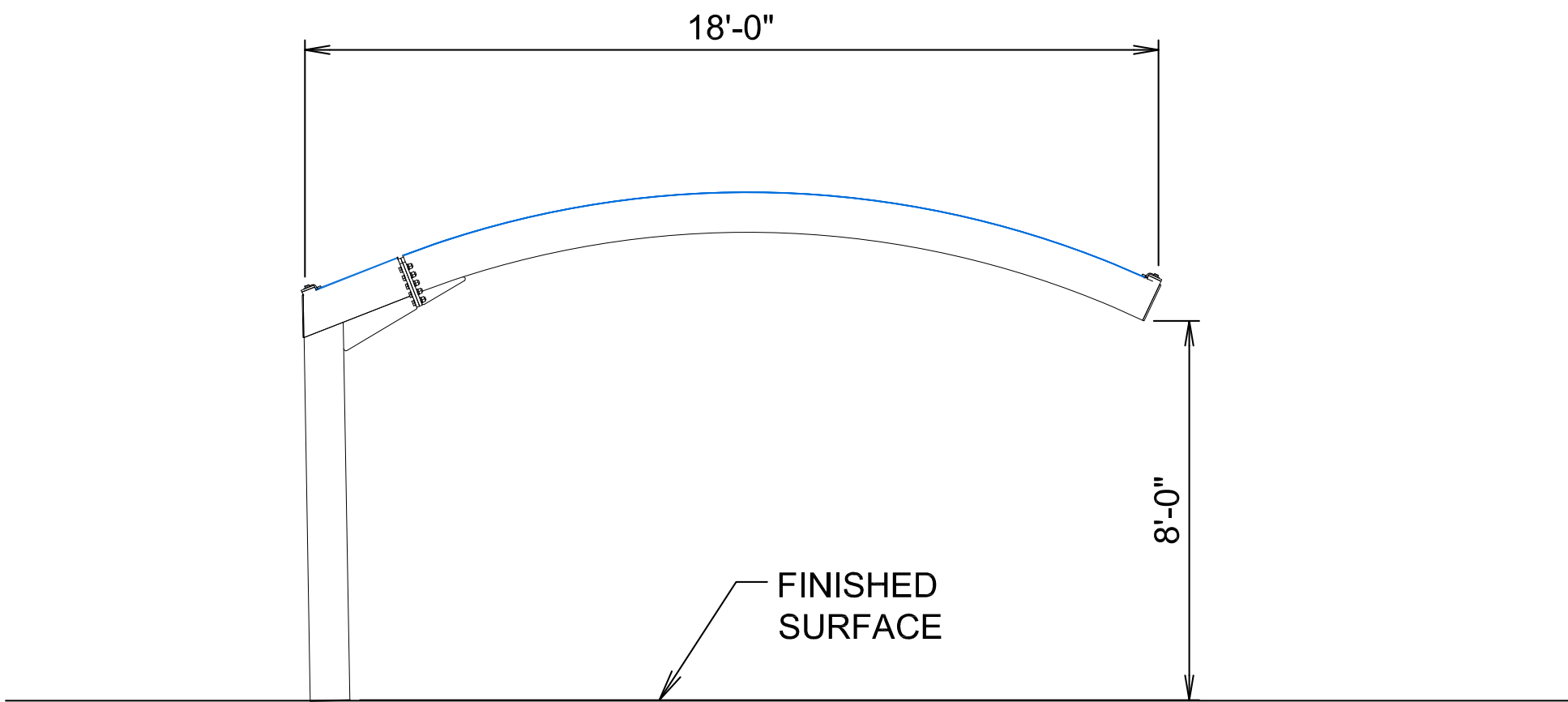
| DRAWN BY:   |  | DATE:       | DESIGNED BY: |  | SCALE: |
|-------------|--|-------------|--------------|--|--------|
| PS          |  | 05/31/2017  | CTP          |  | NTS    |
| CHECKED BY: |  | FIELD BOOK: |              |  |        |
| JFN         |  |             |              |  |        |

State of Florida  
Professional Engineer  
License No. 73904  
  
CODY T. PARHAM





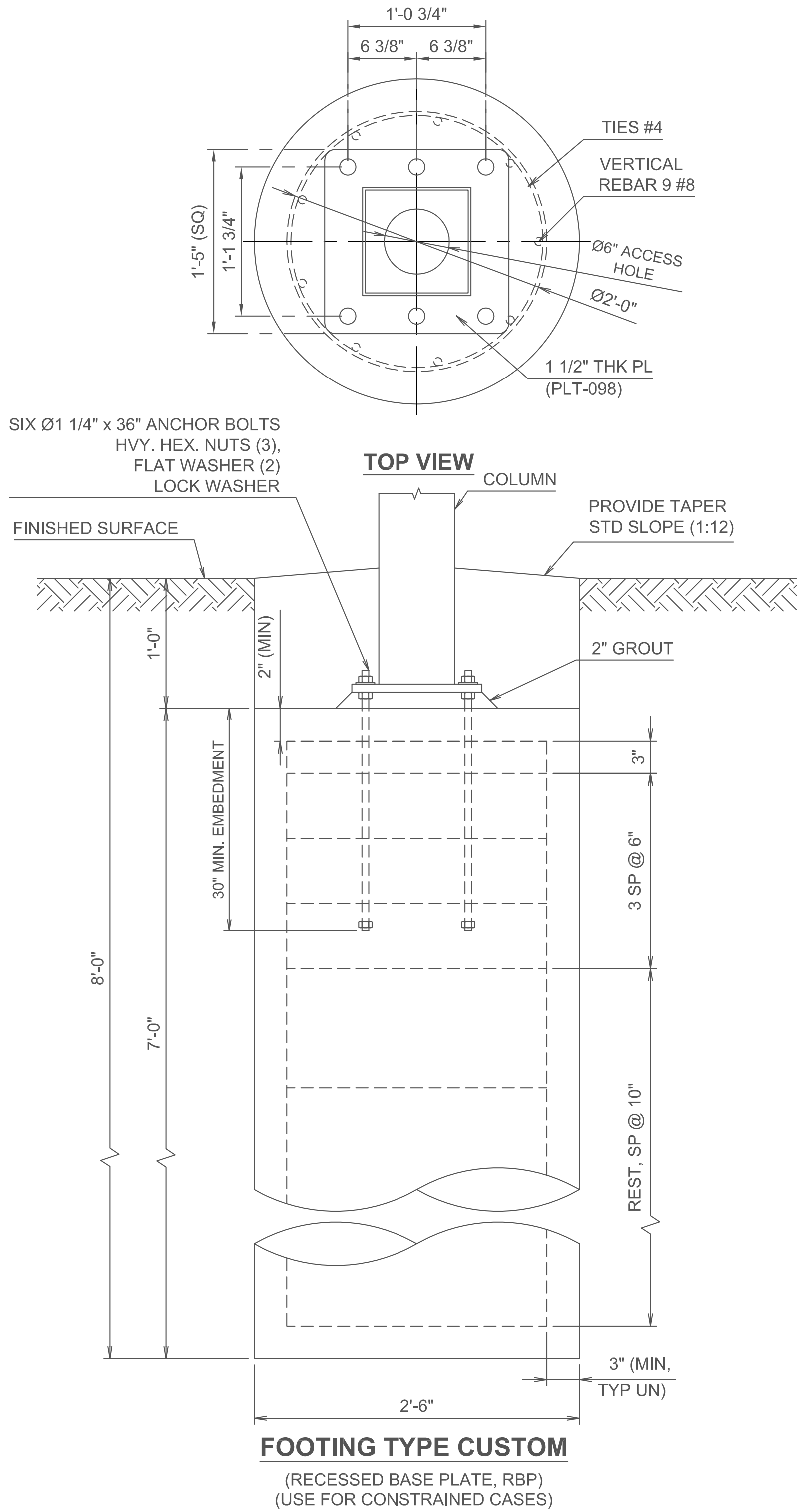
PLAN VIEW



SIDE ELEVATION

APPLIES TO ALL ROWS

| COVERAGE TABLE |              |                       |             |
|----------------|--------------|-----------------------|-------------|
| ROW            | CARS COVERED | AREA COVERED (SQ.FT.) | NO. COLUMNS |
| A              | 6            | 972                   | 3           |
| B              | 3            | 486                   | 2           |
| C              | 5            | 810                   | 3           |
| D              | 6            | 972                   | 3           |
| F              | 4            | 648                   | 2           |
| G              | 4            | 648                   | 2           |
| TOTAL:         | 28           | 4536                  | 15          |



NOTES:  
-THESE DRAWINGS ARE A PICTORIAL REPRESENTATION OF FABRIC AND STEEL ONLY. NONE OF THE REQUIRED ATTACHMENT OR CONNECTION DETAILS HAVE BEEN DEPICTED.  
-ALL DIMENSIONS AND HEIGHTS MUST BE FIELD VERIFIED PRIOR TO ANY FINAL DESIGN, FABRICATION OR INSTALLATION WORK.  
-CONTRACTOR TO SUBMIT SIGNED AND SEALED DRAWINGS FOR ALL CANOPY AND FOUNDATION COMPONENTS.

Contractor to provide signed and sealed shop drawings for approval.

|              |            |
|--------------|------------|
| DRAWN BY:    | DATE:      |
| PS           | 05/31/2017 |
| DESIGNED BY: | SCALE:     |
| CTP          | N/A        |
| CHECKED BY:  |            |
| JFN          |            |
| FIELD BOOK:  |            |

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      | DESCRIPTION |       |
|-----------|------|-------------|-------|
| NO.       | DATE | BY          | CHK'D |
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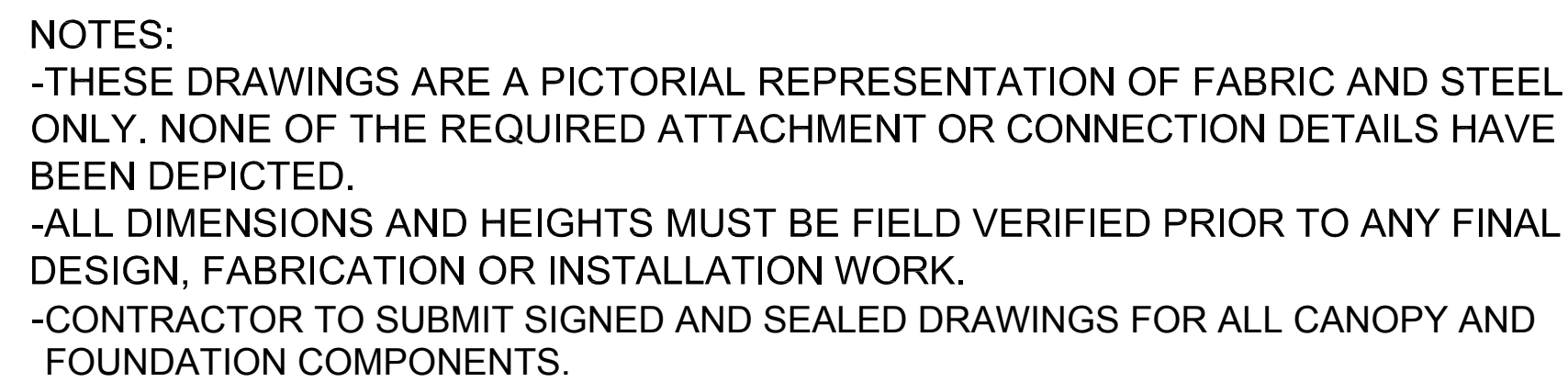
PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS

CANOPY DETAILS  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                  |    |
|------------------|----|
| SHEET NO.        | OF |
| CP100            | 2  |
| TOTAL:           | 65 |
| CAD FILE:        |    |
| DRAWING FILE NO. |    |
| 4-140-42         |    |

BID DOCUMENTS

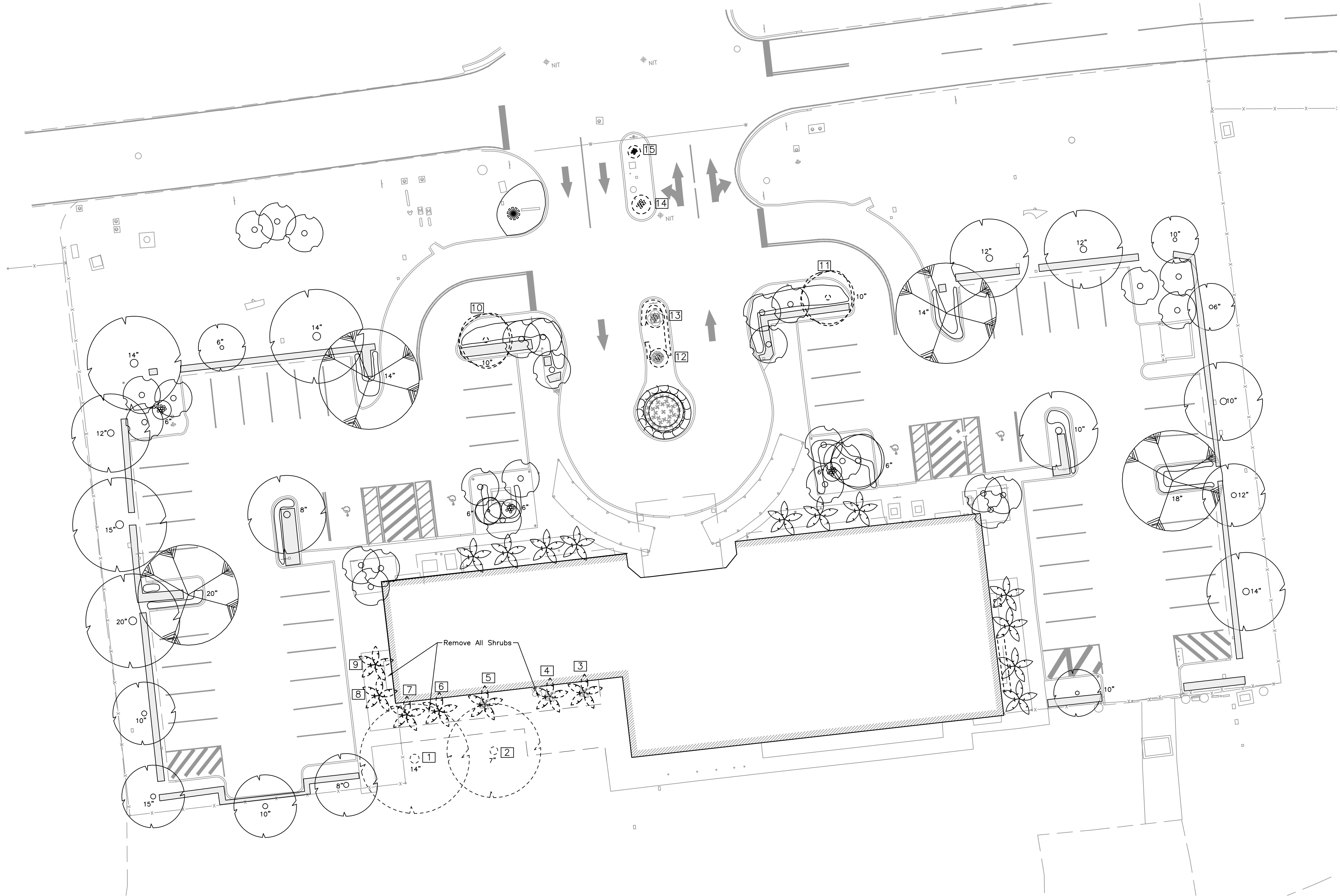
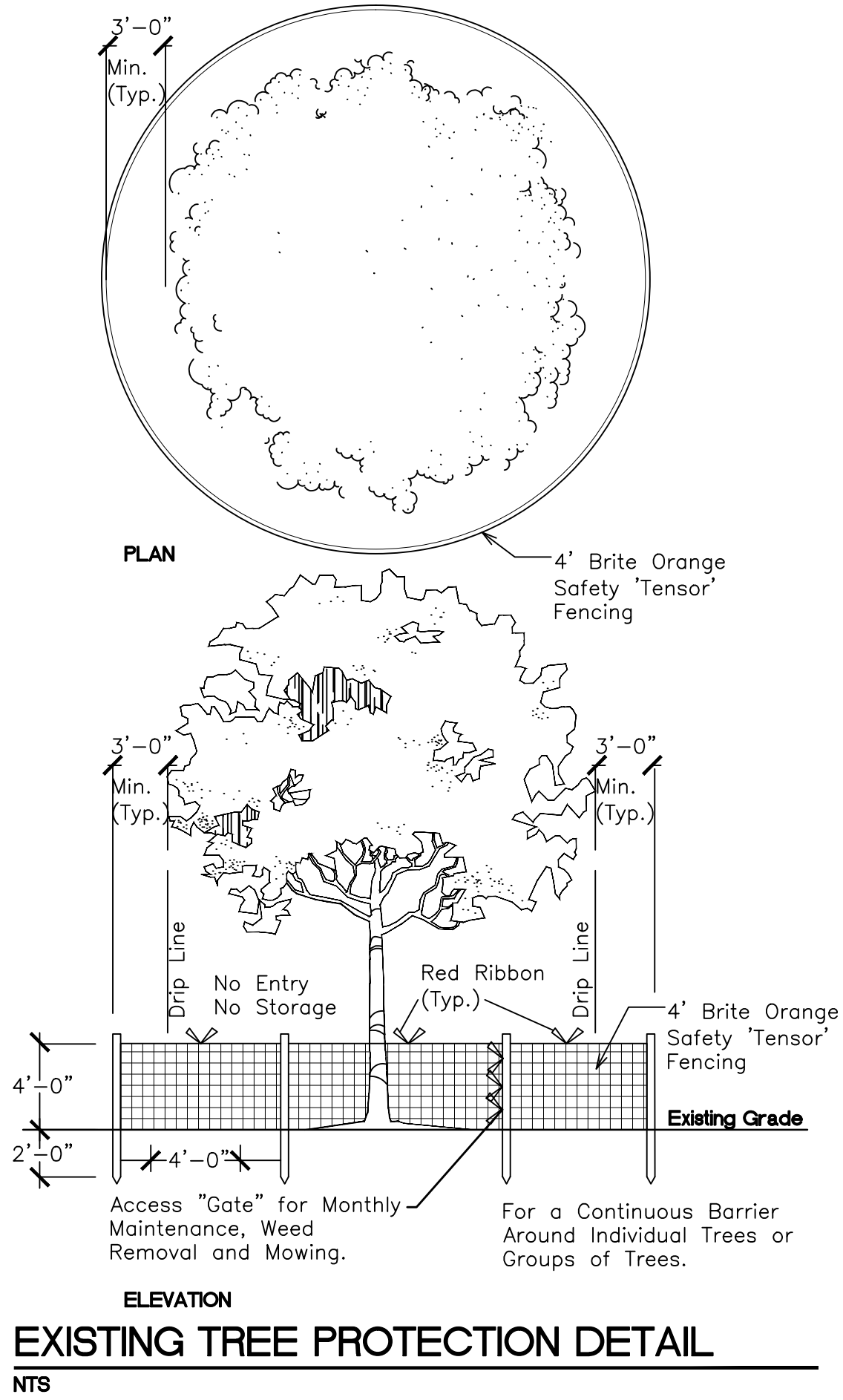




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|------------------------------|----|
| SHEET NO.                    | OF |
| CP101                        | 2  |
| TOTAL: 65                    |    |
| CAD FILE:                    |    |
| DRAWING FILE NO.<br>4-140-42 |    |



Z:\12000\100-199\12188\DESIGN\DRAWINGS\CURRENT\PERMIT\SITE PLAN LEVEL \12188-L01-TSVY.DWG



| Existing Trees/Palms To Be Removed   |  |                     |              |                  |                                    |                                       |             |      |                 |                                       |  |
|--------------------------------------|--|---------------------|--------------|------------------|------------------------------------|---------------------------------------|-------------|------|-----------------|---------------------------------------|--|
| Tree #                               | Species (Botanical Name / Common Name)           | Class               | Rating %     | =                | X DBH Caliper (In Inches)          | X (Condition)                         | Condition % | =    | Caliper Removed | Replacement Value (\$65 per Inch)     | Recommendation                             |
| 1                                    | Quercus virginiana / Live Oak                    | A                   | 100          | 1.00             | 14                                 | Good-Fair                             | 0.55        | 7.70 | \$910           |                                       | To Be Relocated On-Site                    |
| 2                                    | Quercus virginiana / Live Oak                    | A                   | 100          | 1.00             | 7                                  | Good-Fair                             | 0.55        | 3.85 | \$455           |                                       | To Be Relocated On-Site                    |
| 3-9                                  | See Palm List Below                              |                     |              |                  |                                    |                                       |             |      |                 |                                       |  |
| 10                                   | Tabebuia heterophylla / Pink Trumpet Tree        | B                   | 80           | 0.80             | 10                                 | Poor                                  | 0.25        | 2.00 | \$650           |                                       | To Be Removed, Trunk Damage                |
| 11                                   | Tabebuia heterophylla / Pink Trumpet Tree        | B                   | 80           | 0.80             | 10                                 | Very Poor                             | 0.15        | 1.20 | \$650           |                                       | To Be Removed, Trunk Damage, Future Hazard |
| 12                                   | Lagerstroemia indica / Crape Myrtle, Multi Trunk | C                   | 60           | 0.60             | 6                                  | Good-Fair                             | 0.60        | 2.16 | \$390           |                                       | To Be Removed                              |
| 13                                   | Lagerstroemia indica / Crape Myrtle, Multi Trunk | C                   | 60           | 0.60             | 6                                  | Fair                                  | 0.45        | 1.62 | \$390           |                                       | To Be Removed                              |
| 14                                   | Lagerstroemia indica / Crape Myrtle, Multi Trunk | C                   | 60           | 0.60             | 4                                  | Poor                                  | 0.30        | 0.72 | \$260           |                                       | To Be Removed                              |
| 15                                   | Lagerstroemia indica / Crape Myrtle, Multi Trunk | C                   | 60           | 0.60             | 4                                  | Very Poor                             | 0.10        | 0.24 | \$260           |                                       | To Be Removed, Severely Hat-Racked         |
| Caliper Replacement Required = 19.49 |  |                     |              |                  |                                    |                                       |             |      | \$3,965.00      | Total Replacement Value (If Required) |  |
| Condition:                           |  |                     |              |                  |                                    |                                       |             |      |                 |                                       |  |
|                                      | Specimen   | 100-80              | %            |                  |                                    |                                       |             |      |                 |                                       |  |
|                                      | Good-Healthy                                     | 79-60               | %            |                  |                                    |                                       |             |      |                 |                                       |  |
|                                      | Fair   | 59-40               | %            |                  |                                    |                                       |             |      |                 |                                       |  |
|                                      | Poor   | 39-20               | %            |                  |                                    |                                       |             |      |                 |                                       |  |
|                                      | Very Poor  | 19-1                | %            |                  |                                    |                                       |             |      |                 |                                       |  |
|                                      | Dead-Cull  | 0                   |              |                  |                                    |                                       |             |      |                 |                                       |  |
| Class                                |  |                     |              |                  |                                    |                                       |             |      |                 |                                       |  |
|                                      | A  | 100%                |              |                  |                                    |                                       |             |      |                 |                                       |  |
|                                      | B  | 80%                 |              |                  |                                    |                                       |             |      |                 |                                       |  |
|                                      | C  | 60%                 |              |                  |                                    |                                       |             |      |                 |                                       |  |
| Existing Palm List                   |  |                     |              |                  |                                    |                                       |             |      |                 |                                       |  |
| Tree #                               | Species (Botanical Name / Common Name)           | Height-OA (In Feet) | CT (In Feet) | Palm Replacement | Replacement Value (\$180 Per Palm) | Recommendation                        |             |      |                 |                                       |  |
| 3                                    | Veitchia montgomeryana / Montgomery Palm         | 25                  | 20           | 1                | \$360                              | To Be Removed-A, Very Poor Condition  |             |      |                 |                                       |  |
| 4                                    | Veitchia montgomeryana / Montgomery Palm         | 25                  | 20           | 1                | \$360                              | To Be Removed-A,B Very Poor Condition |             |      |                 |                                       |  |
| 5                                    | Veitchia montgomeryana / Montgomery Palm         | 25                  | 20           | 1                | \$360                              | To Be Removed-A,C Very Poor Condition |             |      |                 |                                       |  |
| 6                                    | Veitchia montgomeryana / Montgomery Palm         | 25                  | 20           | 1                | \$360                              | To Be Removed-A,C Very Poor Condition |             |      |                 |                                       |  |
| 7                                    | Veitchia montgomeryana / Montgomery Palm         | 25                  | 20           | 1                | \$360                              | To Be Removed-A, Very Poor Condition  |             |      |                 |                                       |  |
| 8                                    | Veitchia montgomeryana / Montgomery Palm         | 25                  | 20           | 1                | \$360                              | To Be Removed-A, Very Poor Condition  |             |      |                 |                                       |  |
| 9                                    | Veitchia montgomeryana / Montgomery Palm         | 25                  | 20           | 1                | \$360                              | To Be Removed-A, Very Poor Condition  |             |      |                 |                                       |  |
| Palm Replacement =                   |  |                     |              | 7                | \$2,520                            | Total Replacement Value (If Required) |             |      |                 |                                       |  |
| A                                    | Trunk Damage                                     |                     |              |                  |                                    |                                       |             |      |                 |                                       |  |
| B                                    | Major Cavity in Trunk                            |                     |              |                  |                                    |                                       |             |      |                 |                                       |  |
| C                                    | Very Thin Upper Caliper                          |                     |              |                  |                                    |                                       |             |      |                 |                                       |  |

EXISTING TREE / PALM LEGEND

- Lagerstroemia indica / Crape Myrtle
- Phoenix reclinata / Senegal Date Palm
- Quercus virginiana / Live Oak
- Swietenia mahogani / Mahogany
- Sabal palmetto / Cabbage Palm
- Tabebuia heterophylla / Pink Trumpet Tree
- Thrinax radiata / Florida Thatch Palm
- Veitchia montgomeryana / Montgomery Palm
- Typical Dashed Symbol = Species To Be Removed

DESIGNED BY: THOMAS WHITE, A.S.L.A. REG. No. 1100 DATE:

DESIGNED BY: THOMAS WHITE, A.S.L.A. REG. No. 1100 DATE:

DATE: 05/31/2017

DESIGNED BY: TW

DESIGNED BY: TW

CHECKED BY: IT

FIELD BOOK:

CITY OF FORT LAUDERDALE

PUBLIC WORKS DEPARTMENT

ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      | DESCRIPTION |       |
|-----------|------|-------------|-------|
| NO        | DATE | BY          | CHK'D |
|           |      |             |       |
|           |      |             |       |
|           |      |             |       |
|           |      |             |       |

PROJECT # 12188

ADMINISTRATION BUILDING RENOVATIONS

TREE SURVEY

6000 NW 21st Ave, Fort Lauderdale, FL 33309

SHEET NO. L01 OF 3

TOTAL: 65

CAD FILE: 12188-L01-TSVY

DRAWING FILE NO. 4-140-42



GENERAL PLANTING REQUIREMENTS

The plan takes precedence over the plant list.

2 Full business days before digging, call toll free 1-800-432-4770 Sunshine State One Call of Florida, Inc. Notification Center. For City of Fort Lauderdale Utilities call 1-954-828-8000. Contractors are responsible for coordinating with the owners and appropriate public agencies to assist in locating and verifying all underground utilities prior to excavation. All existing utilities shown on the plans are to be considered approximate and should be verified by the contractor prior to the start of work operations..

General site and berm grading to +/- 1 inch (1") shall be provided by the general contractor. All finished site grading and final decorative berm shaping shall be provided by the landscape contractor.

All sizes shown for plant material on the plans are to be considered Minimum. All plant material must meet or exceed these minimum requirements for both height and spread. Any other requirements for specific shape or effect as noted on the plan(s) will also be required for final acceptance.

All plant material furnished by the landscape contractor shall be Florida #1 or better as established by Grades and Standards for Florida Nursery Trees and Plants.

All trees designated as single trunk shall have a single, relatively straight, dominant leader, proper structural branching and even branch distribution. Trees with bark inclusion, tipped branches, and co-dominant trunks will not be accepted. Trees with girdling, circling and/or plunging roots will be rejected.

All planting beds shall be free of all rocks 1/2" or larger, sticks, and objectionable material including weeds, weed seeds. All limerock shall be removed/cleaned down to the native soils. Planting soil 50/50 sand/topsoil mix shall be delivered to the site in a clean loose and friable condition and is required around the root ball of all trees and palms, the top 6" of all shrubs and ground cover beds. This soil can be tilled into the existing soil after the existing soil has been cleaned of all rocks, limestone and sticks. Recycled compost is encouraged as a soil amendment alternative. Sod 1.5-2" topsoil comes furnished.

All burlap, string, cords, wire baskets, plastic or metal containers shall be removed from the rootballs before planting. Remove all bamboo and metal nursery stakes. Remove all tagging tape.

All trees/palms shall be planted so the top of the root ball, root flare are slightly above final grade. Shrub material shall be planted such that the top of the plant ball is flush with the surrounding grade. It is the sole responsibility of the landscape contractor to insure that all new plantings receive adequate water during the installation and during all plant warranty periods. Deep watering of all new trees and palms and any supplemental watering that may be required to augment natural rainfall and site irrigation is mandatory to insure proper plant development and shall be provided as a part of this contract.

All trees/palms shall be staked using biodegradable material. No wire, black strapping, or other synthetic material shall be used. Nailing into trees and palms for any reason is prohibited and the material will be rejected. Please refer to the planting details

All landscape and lawn areas shall be irrigated by a fully automatic sprinkler system with a minimum 100% coverage with all heads adjusted to 50% overlap. Each system shall be installed with an operational rain sensor and rust inhibitor. Field adjust irrigation layout to conform to the new rear patio layout.

No fertilizers are required.

All landscape areas shall be covered with Pine Straw, Pine Bark, Eucalyptus or sterilized seed free Melaleuca mulch to a minimum depth of three inches (3") of cover when settled. Spread mulch to 1" thickness 3" away from the trunks/stems of all plant material. All trees in sodded areas shall have a clean cut 4" diameter mulch ring. The 5-6" height water ring shall be made from mulch, not soil. Certain areas may receive a thicker mulch cover where noted on plans. Cypress, red, gold and green mulch is prohibited.

All open areas not covered by trees, palms, shrubs, vines or ground covers shall receive Stenotaphrum secundatum, St. Augustine 'Palmetto' sod, whether labeled on the plans or not, unless a different species is indicated on the planting plan. All noted s.f. shall be approximate; it is the contractor's responsibility to do his or her take off and sod all open areas. It shall be the responsibility of the contractor to include in the bid, the repair of any existing sod which may be damaged during construction.

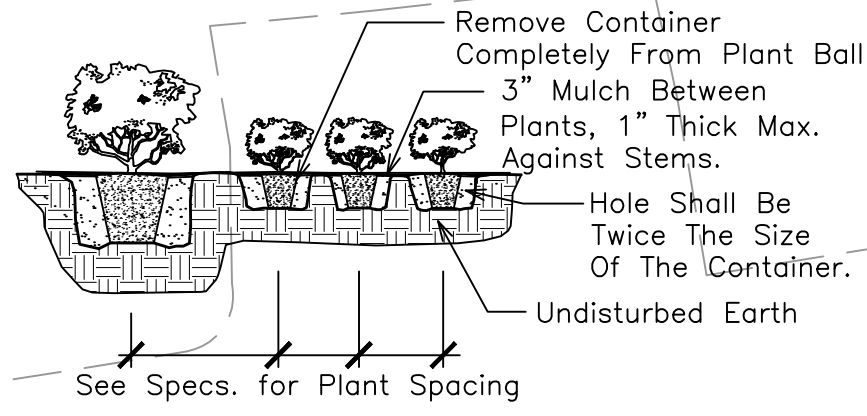
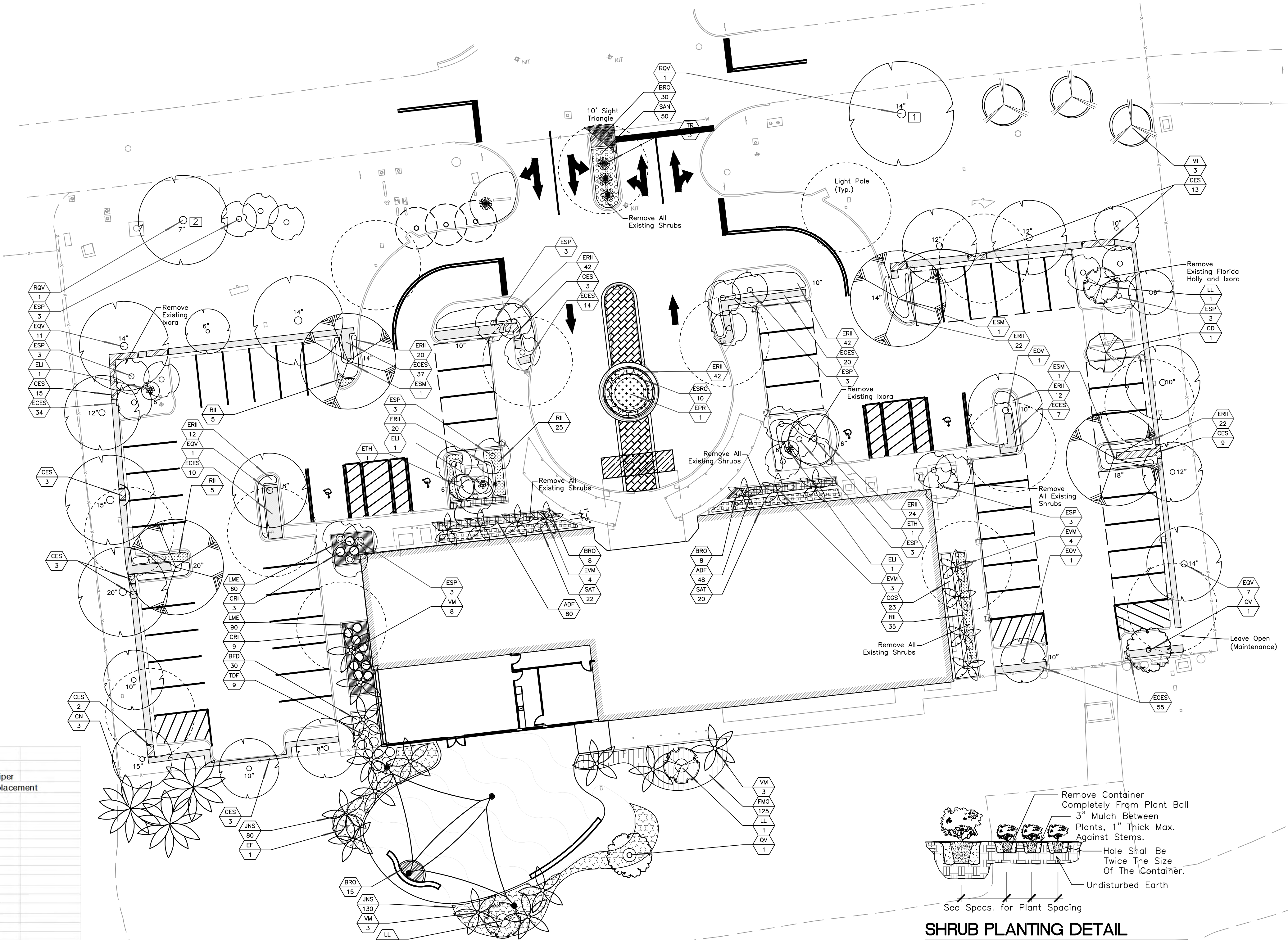
Please refer to the planting details for a graphic representation of the above notes.

All ideas, designs and plans indicated or represented by this drawing are owned by and are the exclusive property of the City of Fort Lauderdale and Thomas White, ASLA-ISA.

All plant material as included herein shall be warranted by the landscape contractor for a minimum period as follows: All trees and palms for 12 months, all shrubs, vines, groundcovers and miscellaneous planting materials for 90 days, and all lawn areas for 60 days after final acceptance by the owner or owner's representative.

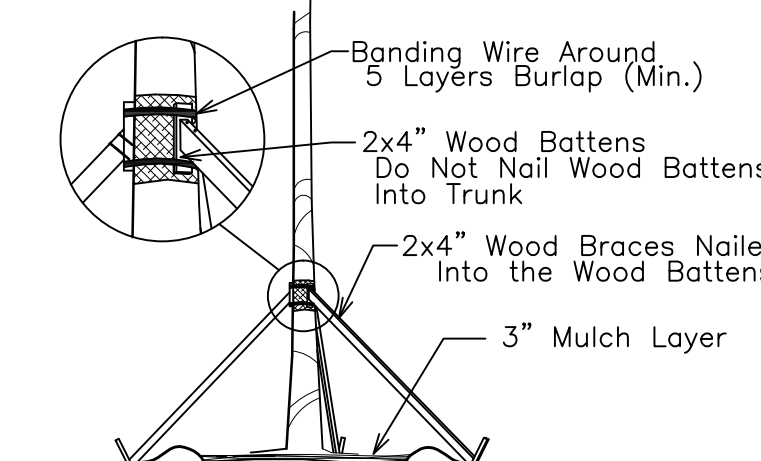
PLANT LIST

| Code                      | Drought | Qty. | Botanical Name / Common Name                            | Specifications                                 | Caliper Replacement |
|---------------------------|---------|------|---|--|---------------------|
| EXISTING TREES / PALMS    |         |      |   |  |                     |
| ELI                       | V       | 3    | Lagerstroemia indica / Crape Myrtle                     | 6" Cal., DBH                                   |                     |
| EPR                       | (N)     | 1    | Phoenix reclinata / Senegal Date Palm                   | 20" Cal., DBH                                  |                     |
| EQV                       | (N)     | 21   | Quercus virginiana / Live Oak                           | 6-20" Cal., DBH                                |                     |
| ESM                       | (N)     | 3    | Swietenia mahagoni / Mahogany                           | 14-18" Cal., DBH                               |                     |
| ESP                       | (N)     | 27   | Sabal palmetto / Cabbage Palm                           | 15-25 CT                                       |                     |
| ETH                       | V       | 2    | Tabebuia heterophylla / Pink Trumpet Tree               | 6" Cal., DBH                                   |                     |
| EVM                       | V       | 11   | Veitchia montgomeryana / Montgomery Palm                | 20" CT   |                     |
| RELOCATED TREES           |         |      |   |  |                     |
| RQV                       | (N)     | 2    | Quercus virginiana / Live Oak                           | 7 & 14" Cal., DBH                              |                     |
| PROPOSED TREES / PALMS    |         |      |   |  |                     |
| CD                        | (N)     | V    | Coccoloba diversifolia / Pigeon Plum                    | B&B Field Grown; 10x5-6", 2" Cal.              | 2                   |
| CN                        | (N)     | V    | Cocos nucifera / Green Malaysian Coconut Palm           | B&B Field Grown; 20-22" OAHt., Heavy Cal.      |                     |
| EF                        | (N)     | 1    | Eugenia basilata / Spanish Shimmer                      | B&B Field Grown; 8" x 4-5", 1.5" Cal DBH       | 1.5                 |
| LL                        | V       | 3    | Ligustrum lucidum / Ligustrum Tree                      | B&B Field Grown; 8x6-7", 6" Cal., Multi Trunks | 12                  |
| MI                        | V       | 1    | Mangifera indica / East Indian Mango                    | 25 Gal., 7-8" OAHt., 1" Cal.                   | 1                   |
| MI                        | V       | 1    | Mangifera indica / Mango Julie                          | 25 Gal., 7-8" OAHt., 1" Cal.                   | 1                   |
| MI                        | V       | 1    | Mangifera indica / Ice Cream Mango                      | 25 Gal., 7-8" OAHt., 1" Cal.                   | 1                   |
| QV                        | (N)     | 2    | Quercus virginiana / Live Oak                           | B&B Field Grown; 14" x 7-8", 3" Cal DBH        | 6                   |
| VM                        | V       | 14   | Veitchia montgomeryana / Montgomery Palm                | B&B Field Grown; 12 CT, 16-18" OAHt.           |                     |
|                           |         | 16   | Total Proposed Trees / Palms (CN, VM Counted 3:1)       |  | 24.5                |
|                           |         | 4    | Native Trees / Palms                                    |  | 14 Palms            |
|                           |         | 26%  | Native Trees / Palms                                    |  |                     |
|                           |         | 60   | Total Site Trees / Palms (CN, SP & VM Counted 3:1)      |  |                     |
|                           |         | 47   | Native Trees / Palms                                    |  |                     |
|                           |         | 78%  | Native Trees / Palms                                    |  |                     |
| EXISTING ACCENTS / SHRUBS |         |      |   |  |                     |
| ECES                      | (N)     | V    | Conocarpus erectus ser. / Silver Buttonwood             | 4" OAHt.                                       |                     |
| ERII                      | (N)     | V    | Raphiolepis indica / Indian Hawthorn                    | 2" OAHt.                                       |                     |
| ESRO                      | (N)     | V    | Strelitzia reginae / Orange Bird of Paradise            | 6" OAHt.                                       |                     |
| ACCENTS / SHRUBS          |         |      |   |  |                     |
| CES                       | (N)     | V    | Conocarpus erectus ser. / Silver Buttonwood             | 3" Cal., 24"x24", 24" OC                       |                     |
| CGS                       | (N)     | V    | Clusia guttifera / Small Leaf Clusia                    | 3" Cal., 24"x24", 36" OC                       |                     |
| CRI                       | (N)     | V    | Crinum augustum / Queen Emma Lily                       | 7" Cal., 36" x 36"                             |                     |
| JNS                       | (N)     | V    | Jasminum nitidum / Shining Jasmine                      | 3" Cal., 18"x18", 24" OC                       |                     |
| RII                       | (N)     | V    | Raphiolepis indica / Indian Hawthorn                    | 3" Cal., 18"x18", 24" OC                       |                     |
| SAT                       | (N)     | V    | Schefflera arborescens / Variegated Arboricola          | 3" Cal., 24" OAH, 36" OC                       |                     |
| TRD                       | (N)     | V    | Triplaris dactyloides / Fakahatchee Grass               | 3" Cal., 24" OAH                               |                     |
| TRD                       | (N)     | V    | Triplaris radiata / Florida Thatch Palm                 | B&B or Container; 5-6" OAHt., Dbl. Trunks      |                     |
|                           |         | 865  | Total Shrubs  |  |                     |
|                           |         | 533  | Native Shrubs   |  |                     |
|                           |         | 62%  | Native Shrubs   |  |                     |
| GROUND COVERS             |         |      |   |  |                     |
| ADF                       | V       | 128  | Asparagus densiflorus 'Myers' / Foxtail Fern            | 1 Gal., Full, 15-18" OC                        |                     |
| BFD                       | V       | 30   | Bulbine frutescens / Desert Candles                     | 1 Gal., 18" OAH, 18" OC                        |                     |
| BRO                       | V       | 61   | Bromelid spp. / Bromeliads                              | 3 Gal., 12" Spr., 18" OC                       |                     |
| FMG                       | V       | 125  | Ficus microcarpa / Green Island Ficus                   | 3 Gal., 12"x12", 24" OC                        |                     |
| LME                       | V       | 150  | Liriope muscari EG / Evergreen Giant Liriope            | 1 Gal., 12" OAH, 15" OC                        |                     |
| SAN                       | V       | 50   | Sansiveria trifasciata / Black Gold                     | 1 Gal., 18" OAH, 18" OC                        |                     |
| SOD                       |         |      |   |  |                     |
|                           | M       |      | S.F. Stenotaphrum secundatum / St. Augustine 'Palmetto' | Solid application - no gaps between seams      |                     |
|                           | (N)     |      | Florida Native Plant Species                            |  |                     |
|                           | V       |      | Very Drought Tolerant                                   |  |                     |
|                           | M       |      | Moderate Drought Tolerance                              |  |                     |



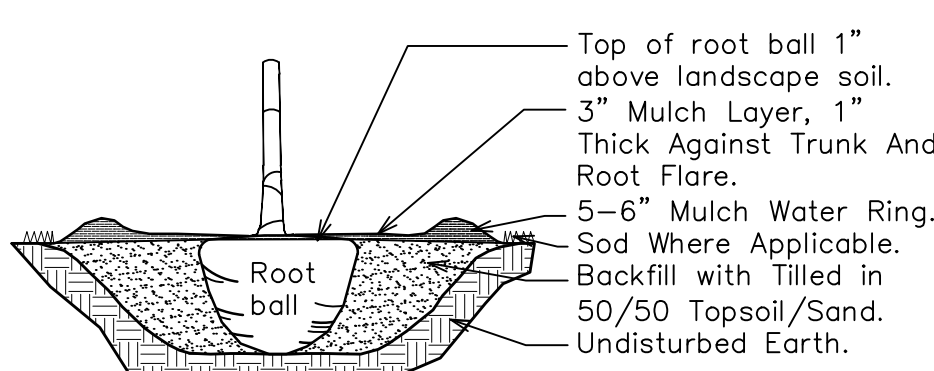
SHRUB PLANTING DETAIL

NTS



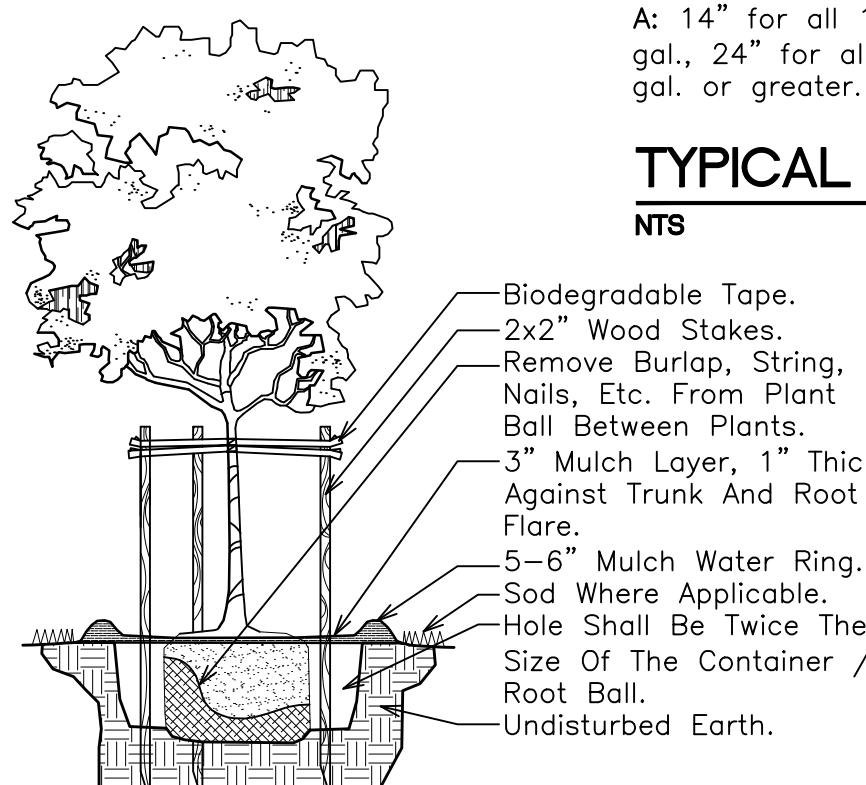
TREE/PALM BRACING DETAIL

NTS



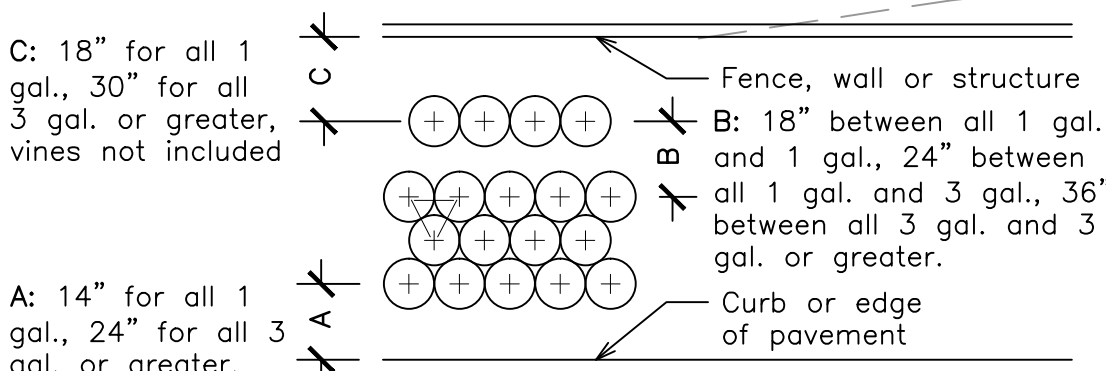
TREE/PALM PLANTING DETAIL

NTS



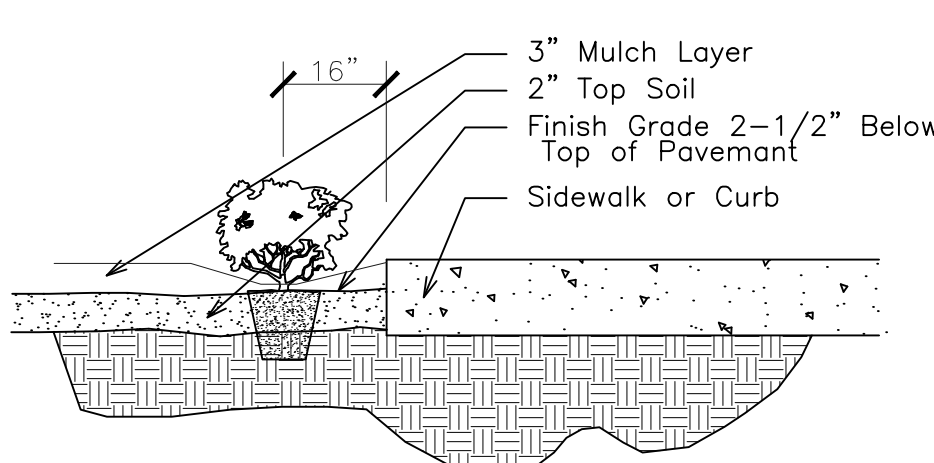
SMALL TREE PLANTING DETAIL

NTS



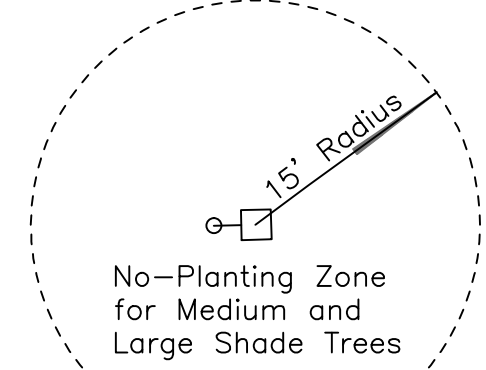
TYPICAL PLANT SPACING DETAIL

NTS



SHRUB INSTALLATION DETAIL

NTS



SITE LIGHTING

NTS

BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
LANDSCAPE PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

LANDSCAPE ARCHITECT  
THOMAS WHITE, A.S.L.A.  
REG. NO. 1100  
DATE:

DESIGNED BY: TW  
CHECKED BY: IT  
SCALE: 1" = 20'  
FIELD BOOK:

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| NO | DATE | BY | CHK'D | DESCRIPTION |
|----|------|----|-------|-------------|
|    |      |    |       |             |
|    |      |    |       |             |
|    |      |    |       |             |
|    |      |    |       |             |

SHEET NO. OF  
L02 3  
TOTAL: 65  
CAD FILE: 12188-L02-LAND  
DRAWING FILE NO. 4-140-42



IRRIGATION LEGEND:

- LATERAL ZONE LINES.
- 6" POP-UP SPRAY –  
Hunter Pro-Spray Series: Fixed or Adjustable Arc  
Nozzles as Required.  
NOTE – All of the below may not be used
- 12" R
- 90 Q  
120 T  
180 H  
240 TT  
270 TQ  
360 F
- Δ 4" POP-UP ROTOR –  
Hunter PGP Rotor W/ 22' R. Nozzle

IRRIGATION NOTES:

Piping:  
Main Lines: PVC SCH 40 Solvent Weld.

Fittings: SCH 40 PVC

Fabrication: To manufacturers specifications. Use blue or grey PVC cement, square cut, clean and prime all joints.

Allow all main lines to cure for 24 hours before pressuring.

All pipe, fittings, and solvents to conform to latest ASTM specs.

Depth of Lines: Zone Lines 1-1/2 in. and smaller = 10 in. depth, min.

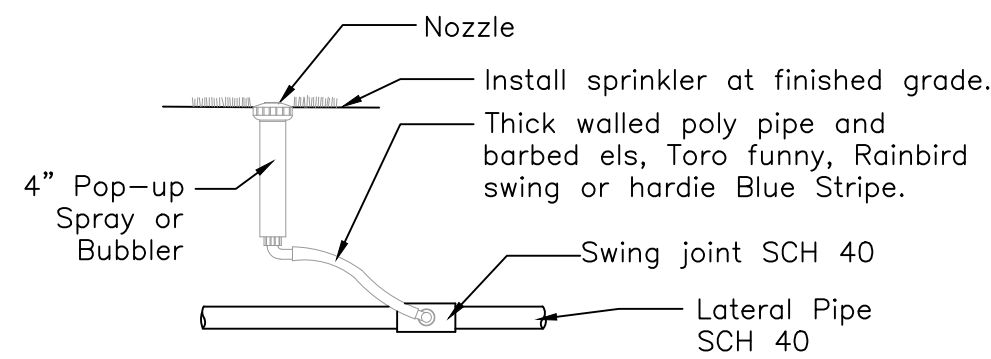
Control Wires: AWG 14 for all hot wires and AWG 12 for common.  
Solid copper type UF UL listed for direct burial.  
Run wires under main.  
Run spares, two min.  
Splice wires only in a valve box. All splices shall be moisture proof using Snap  
tite or DBY UL connectors.  
Common shall be white, hot shall be red or color coded  
Spare shall be black. Run all wires in Grey Electrical SCH 40 conduit..

Backfill all trenches free of debris, compact to original density, flush all lines, use screens in all heads, adjust heads  
for proper coverage avoiding excess water on walls, walks, etc.

All details are graphically shown only. All quantities shall be verified by the contractor prior to installation. It shall be the  
contractors responsibility to assure complete overlapping coverage. Any discrepancies shall be reported to the owner and landscape  
architect before proceeding. Codes and local regulations shall take precedence over these plans, it is the contractors responsibility  
to comply. The landscape architect reserves the right to make minor field changes, the contractor may field adjust spray nozzle  
selection to provide for proper 100% min. coverage.

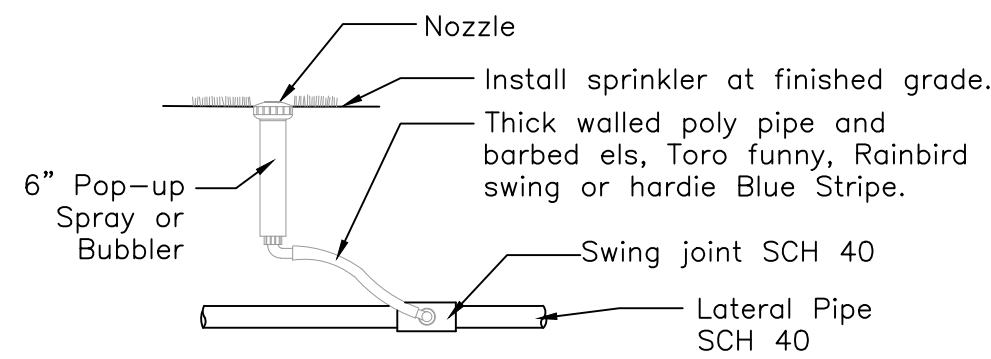
Provide owner with an accurate as installed plan(s) at completion showing main lines, wiring, valves, crossings,  
etc. using dimensions from fixed datums.

Contractor shall verify all underground utilities prior to commencement of work.



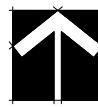
4" Pop-up Spray / Bubbler Detail

NTS



6" Pop-up Spray / Bubbler Detail

NTS



BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS

IRRIGATION PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                  |                |
|------------------|----------------|
| SHEET NO.        | OF             |
| L03              | 3              |
| TOTAL:           | 65             |
| CAD FILE:        | 12188-L03-IRRG |
| DRAWING FILE NO. | 4-140-42       |

LANDSCAPE ARCHITECT  
THOMAS WHITE, A.S.L.A.  
REG. No. 1100  
DATE:

|              |            |
|--------------|------------|
| DRAWN BY:    | DATE:      |
| TW           | 05/31/2017 |
| DESIGNED BY: | SCALE:     |
| TW           | 1" = 20'   |
| CHECKED BY:  |            |
| IT           |            |
| FIELD BOOK:  |            |

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

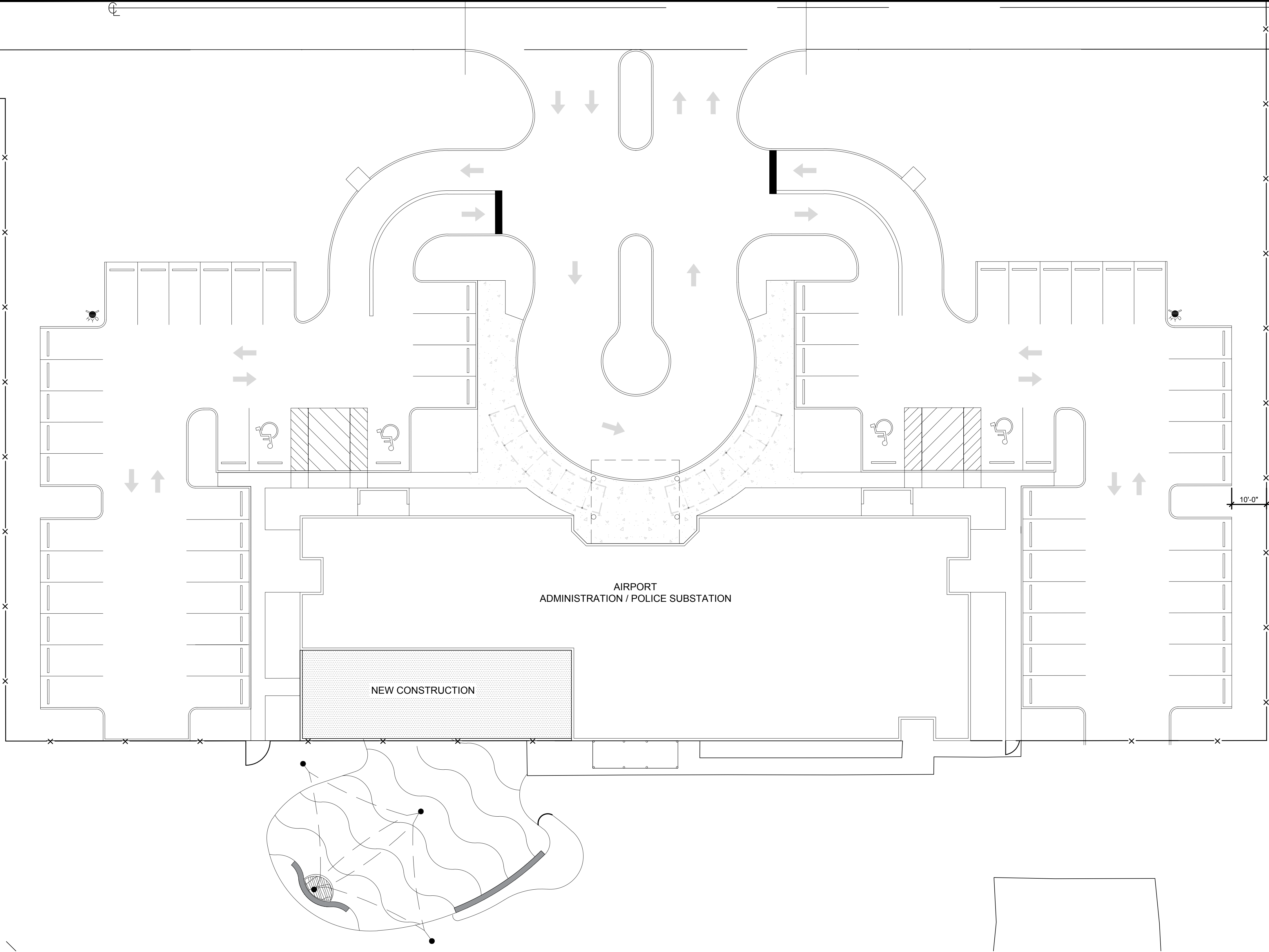


100 North Andrews Avenue, Fort Lauderdale, Florida 33301

TW: (954)828-5350  
thomasw@fortlauderdale.gov



S:\PROJECTS\16--037 G01 FXE ADMINISTRATION BUILDING ADDITION AND RENOVATION\06 DRAWINGS\0 ARCH\A-100 - SITE PLAN.DWG

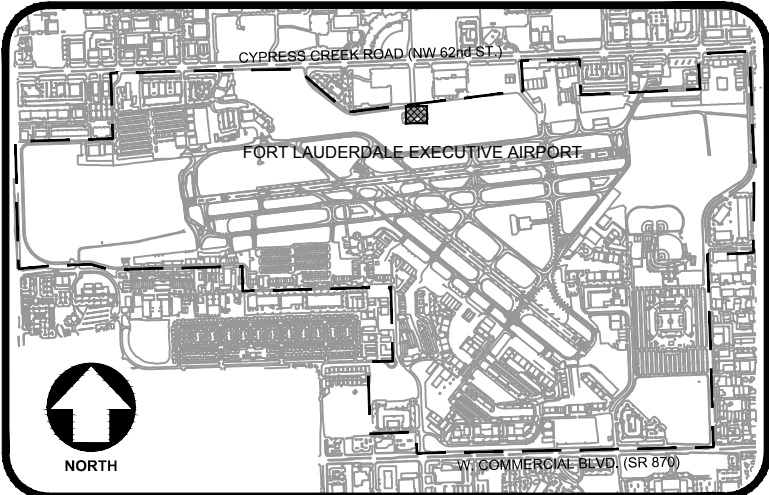


SITE PLAN  
SCALE: 1/16"=1'-0"



| CODE ANALYSIS   |   |   |                          |
|---|---|---|--------------------------|
| APPLICABLE CODES  |   |   |                          |
| THE FOLLOWING IS A LIST OF APPLICABLE CODES FOR THE PROJECT. WHERE DIFFERENT REQUIREMENTS ARE SPECIFIED BY THE FLORIDA FIRE PREVENTION CODE AND THE FLORIDA BUILDING CODE, THE MOST STRINGENT AND RESTRICTIVE REQUIREMENTS ARE APPLICABLE AND ARE NOTED IN THIS OUTLINE.<br>A. FLORIDA BUILDING CODE (FBC) 2014 EDITION<br>B. FLORIDA BUILDING CODE EXISTING BUILDING (FBCEB) 2014 EDITION<br>C. FLORIDA FIRE PREVENTION CODE, NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 2012 EDITION |   |   |                          |
| BUILDING/ZONING:  |   | CITY OF FORT LAUDERDALE, FLORIDA  |                          |
| FIRE JURISDICTION:  |   | CITY OF FORT LAUDERDALE, FLORIDA  |                          |
| BUILDING DATA   |   |   |                          |
| CONSTRUCTION TYPE (FBC CHAPTER 6)   |   | TYPE III - (NOT SPRINKLERED)<br>EXISTING 1 STORY BUILDING<br>SINGLE TENANT LEVEL 3 ALTERATION |                          |
| OCCUPANCY CLASSIFICATION (FBC CH 3 & 4)   |   | BUSINESS - (GROUP B)  |                          |
|   |   | GROSS AREA  |                          |
| EXISTING 1 STORY BUILDING   |   | TOTAL GROSS - 10,000 SF   |                          |
| ADDITION 1ST FLOOR  |   | TOTAL GROSS - 1,904 SF  |                          |
| AREA CALCULATIONS   |   |   |                          |
| FLOOR   | CALCULATIONS  |   | SQ FT                    |
| 1ST FLOOR   | EXISTING: BUSINESS, B = 10,000 GROSS SF<br>PROPOSED: BUSINESS B = 746 GROSS SF<br>PROPOSED: BUSINESS A = 1,158 GROSS SF |   | 11,904 GROSS SF          |
| OCCUPANCY CALCULATIONS (FBC TABLE 1004.1.1):  |   |   |                          |
| FLOOR   | CALCULATIONS  |   | TOTAL                    |
| 1ST FLOOR   | ASSEMBLY, A = 1,158 GROSS SF / 7 = 165<br>BUSINESS, B = 10,746 GROSS SF / 100 = 108                                     |   | 238                      |
| MEANS OF EGRESS   |   |   |                          |
| EGRESS WIDTH (FBC 1005.1):  |   |   |                          |
| FLOOR   | CALCULATIONS  | REQUIRED  | PROVIDED                 |
| 1ST FLOOR   | 0.2 X 273   | 55"   | EXIST:<br>(7)@34" = 238" |
| NUMBER OF EXITS REQUIRED (FBC TABLE 1021.1):  |   |   |                          |
| 1ST FLOOR   | 2 MIN. FOR 1 - 500  | 2   | 9                        |
| TRAVEL DISTANCE:  |   |   |                          |
| MAXIMUM TRAVEL DISTANCE (PER FBC TABLE 1016.1)  |   | 200' MAX  | 90'-0"                   |
| COMMON PATH OF TRAVEL (PER FBC 1014.3)  |   | 100' MAX  | 85'-0"                   |
| DEAD END CORRIDOR (PER FBC 1018.4)  |   | 50' MAX   | 0'-0"                    |
| CORRIDOR FIRE RESITANCE RATING (PER FBC TABLE 1018.1)   |   | 0   | 0                        |
| INTERIOR FINISHES (FBC 803.1, TABLE 803.9)  |   |   |                          |
| EXIT ENCLOSURES AND EXIT PASSAGEWAYS  | CLASS A: FLAME SPREAD 0-25; SMOKE DEVELOPED 0-450   |   |                          |
| CORRIDORS   | CLASS B: FLAME SPREAD 26-75; SMOKE DEVELOPED 0-450  |   |                          |
| ROOMS & ENCLOSED SPACES   | CLASS C: FLAME SPREAD 76-200; SMOKE DEVELOPED 0-450   |   |                          |
| SITE DATA   |   |   |                          |
| FUTURE LAND USE   | GENERAL AVIATION AIRPORT  |   |                          |
| EXISTING ZONING   | GAA - GENERAL AVIATION AIRPORT  |   |                          |
| GROSS SITE AREA   | +/- 2.11 ACRES (91,749 S.F.) 100%   |   |                          |
| GROSS BUILDING AREA   | +/- 11,904 S.F. (OFFICE)  |   |                          |
| FLOOR AREA RATIO (F.A.R.)   | 11,904 S.F. / 91,749 S.F. = 12.9%   |   |                          |
| EXISTING BUILDING HEIGHT  | 24'-7"  |   |                          |
| PROPOSED BUILDING HEIGHT  | 24'-7"  |   |                          |

KEY MAP



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construction management

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PROFESSIONAL IN CHARGE  
ADOLFO J. COTILLA, JR., AIA  
REGISTRATION  
NUMBER AR-0008011

BID DOCUMENTS

ENGINEER:  
ACAI ASSOCIATES, INC.  
PROJECT NO. 12188-000011  
DATE: 05.31.2017

DATE: 05.31.2017  
DRAWN BY: NAP  
DESIGNED BY: SCALE: AS NOTED  
CHECKED BY: ACAI  
EG/WFS  
FIELD BOOK:

TEL: 954.484.4000  
FAX: 954.484.5588

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

| NO. | DATE | BY | CHK'D | DESCRIPTION |
|-----|------|----|-------|-------------|
|     |      |    |       |             |
|     |      |    |       |             |
|     |      |    |       |             |
|     |      |    |       |             |
|     |      |    |       |             |

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
SITE PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

SHEET NO. OF  
**A100** 14

TOTAL: 65

CAD FILE:  
12188-SITE PLAN

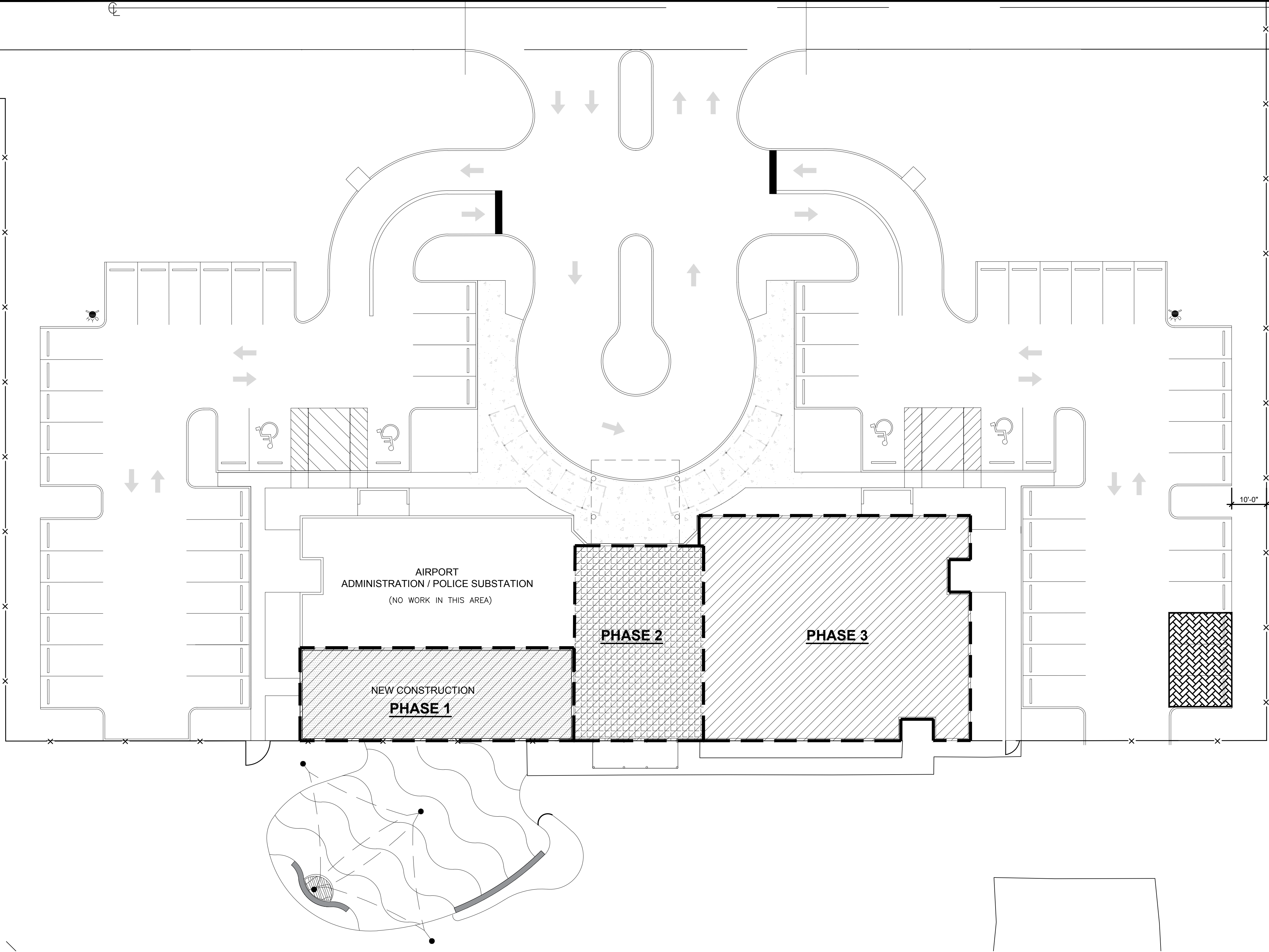
DRAWING FILE NO.  
4-140-42

CAM 16-0070  
Exhibit 3  
717 of 776

p. 717



S:\PROJECTS\16--037 G01 FXE ADMINISTRATION BUILDING ADDITION AND RENOVATION\06 DRAWINGS\0 ARCH\A-PH01 - PHASING PLAN.DWG



PHASING PLAN  
SCALE: 1/16"=1'-0"



- ### CONTRACTOR STAGING
1. THE STAGING AREA, AS SHOWN ON THE PLANS, MAY BE RELOCATED BY THE OWNER, OWNER'S REPRESENTATIVES OR ANY ASSIGNED PROJECT MANAGER PRIOR TO THE BEGINNING OF CONSTRUCTION. CONTRACTOR SHALL NOT BE PERMITTED TO STOCKPILE MATERIAL OR EQUIPMENT IN THE STAGING AREA (7) DAYS PRIOR TO BEGINNING OF CONSTRUCTION.
  2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF SAFETY BARRICADES TO ENSURE SAFETY INSIDE AND OUTSIDE OF THE BUILDING DURING CONSTRUCTION IN AREAS AFFECTED BY THIS CONTRACT.
  3. BARRICADES ARE TO REMAIN UNTIL PROJECT CONSTRUCTION IS COMPLETED UNLESS NOTED OTHERWISE.
  4. CONSTRUCTION VEHICLES AND/OR EQUIPMENT SHALL BE PARKED ONLY WITHIN CONTRACTOR'S SECURED WORK AREA.
  5. TRACTOR SHALL CONTINUOUSLY MAINTAIN THE SITE FREE OF TRASH. ALL TRASH SHALL BE TOTALLY REMOVED FROM THE WORK AREA BEFORE THE END OF EACH WORK DAY. CONTRACTOR SHALL PROVIDE AND MAINTAIN AT LEAST ONE COVERED DUMPSTER FOR TRASH DISPOSAL AT AN APPROVED LOCATION.
  6. UPON COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL CLEAN AND RESTORE THE SITE. ALL RUBBISH AND OTHER MATERIAL SHALL BE DISPOSED OFF PROPERTY AT CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL RESTORE ALL LANDSCAPING PAVED AREAS THAT ARE DISTURBED BY CONSTRUCTION ACTIVITY TO THEIR PRECONSTRUCTION CONDITION.
  7. MAINTAIN RECEPTION CAPABILITIES. KEEP NOISY ACTIVITIES OUTSIDE THE BUILDING.
  8. NEW CONFERENCE ROOM MUST BE AVAILABLE BEFORE STARTING PHASE 2.
  9. CONSIDER CLOSING MAIN ENTRANCE AND ROUTING VISITORS TO SIDE DOOR.
  10. CONTRACTOR TO PROVIDE TEMPORARY RESTROOM TRAILER FOR OFFICE PERSONNEL.
  11. UTILITY TRANSFERS TO BE PERFORMED AT NIGHT AND WEEKENDS AND COORDINATED WITH POLICE SUBSTATION.

### PHASING

**PHASE 1**  
(CONFERENCE ROOM)

WORKS TO BE PERFORMED DURING NORMAL WORK HOURS.  
(7am - 5pm)

**PHASE 2**  
(INTERNAL BUILD OUT)

TO BE COORDINATED BY OWNER FOR ACCESS FOR CONTRACTOR TO PERFORM WORK. WORK MAY BE STAGED FOR AFTER HOURS AS REQUIRED. HOURS AVAILABLE TO BE DETERMINED BY OWNER.

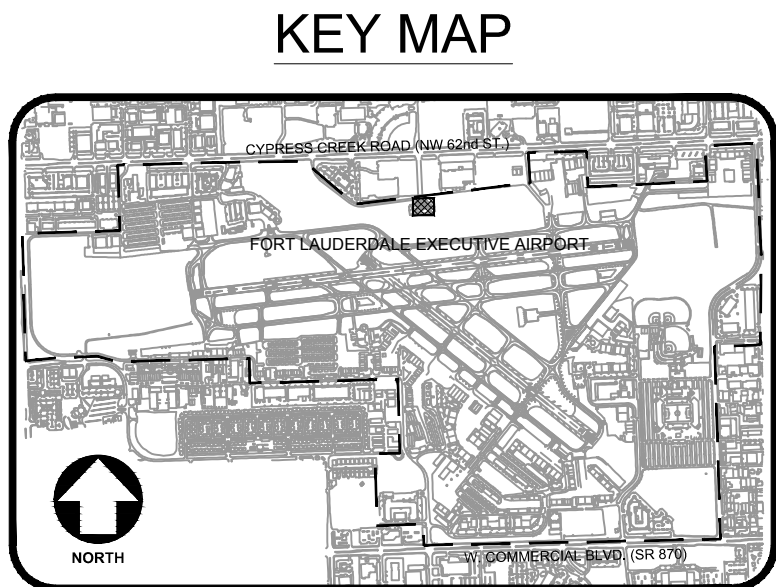
**PHASE 3**  
(OVERALL MEP & FINISHES)

CONTRACTOR TO COORDINATE WORK WITH OWNER. HOURS AVAILABLE TO BE DETERMINED BY OWNER.

TEMPORARY RESTROOM TRAILER

### CONSTRUCTION PHASING SCHEDULE

| PHASE 1: BUILDING ADDITION                       |                 |  |
|--|-----------------|--|
| 7:30 AM - 5:30 PM                                | MONDAY - FRIDAY |  |
| PHASE 2: EXISTING BUILDING MAJOR RENOVATION AREA |                 |  |
| 7:30 AM - 5:30 PM                                | MONDAY - FRIDAY |  |
| NIGHTS AND WEEKENDS: 5:30 PM - 7:00 AM           |                 |  |
| ALL DAY WEEKENDS.                                |                 |  |
| PHASE 3: EXISTING BUILDING MINOR RENOVATIONS     |                 |  |
| 5:30 PM - 7:00 AM                                | WEEKDAYS        |  |
| ALL DAY AND NIGHT ON WEEKENDS                    |                 |  |
| PHASE 4: SITE WORK                               |                 |  |
| 7:30 AM - 5:30 PM                                | MONDAY - FRIDAY |  |



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PROFESSIONAL IN CHARGE  
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REGISTRATION  
NUMBER AR--0008011

ENGINEER:  
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DATE: 06.31.2017

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DRAWN BY: DATE: 05.31.2017  
NAP  
DESIGNED BY: SCALE: AS NOTED  
ACAI  
CHECKED BY: EG/WFS  
FIELD BOOK:

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      | DESCRIPTION |       |
|-----------|------|-------------|-------|
| NO.       | DATE | BY          | CHK'D |
|           |      |             |       |
|           |      |             |       |
|           |      |             |       |
|           |      |             |       |

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS

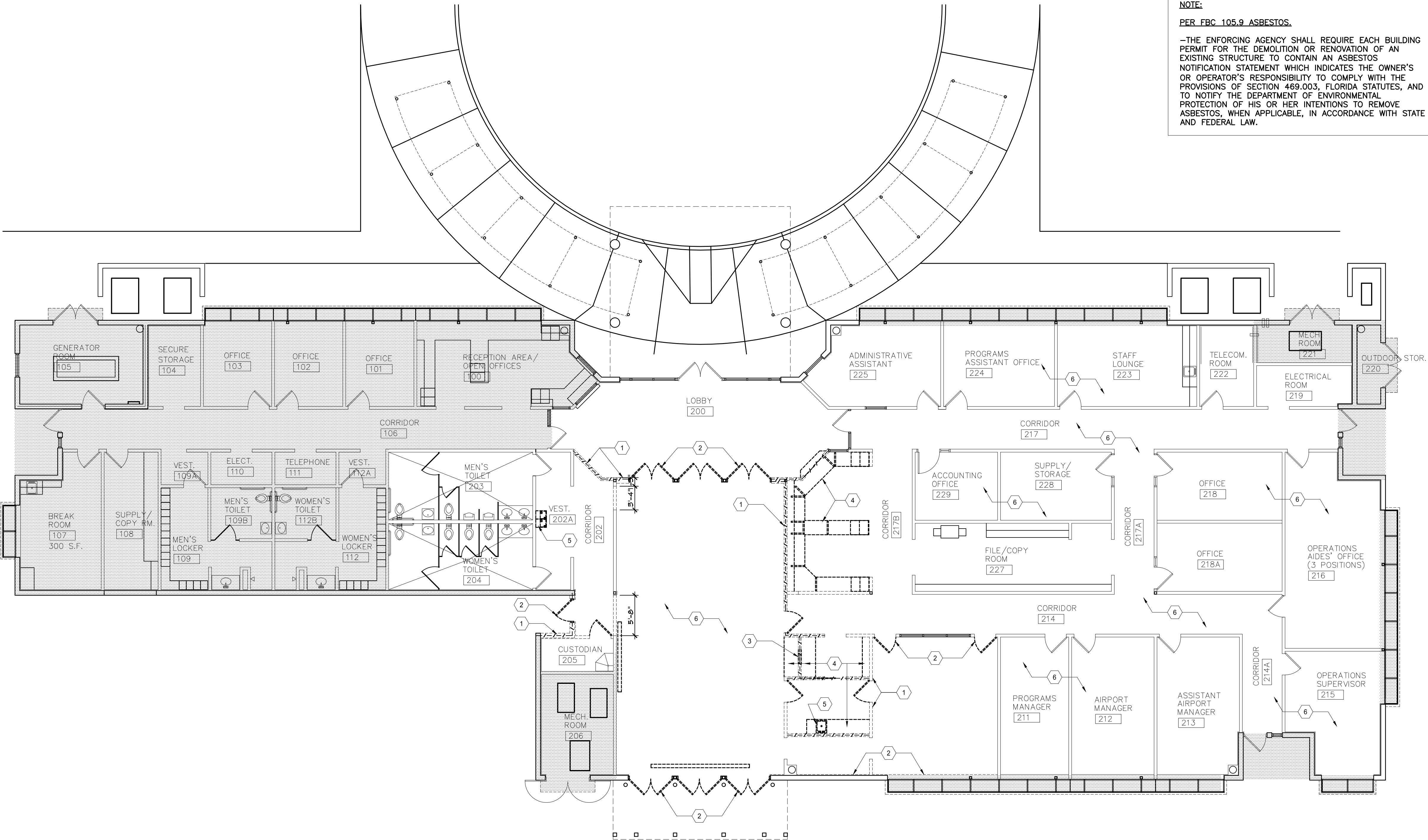
PHASING PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

| SHEET NO.        | OF                 |
|------------------|--------------------|
| APH-01           | 14                 |
| TOTAL:           | 65                 |
| CAD FILE:        | 12188-PHASING PLAN |
| DRAWING FILE NO. | 4-140-42           |

BID DOCUMENTS



S:\PROJECTS\16--037 G01 FXE ADMINISTRATION BUILDING ADDITION AND RENOVATION\06 DRAWINGS\6.01 CONSTRUCTION DOCUMENTS\0\_ARCH\0--101 - FLOOR PLAN DEMO.DWG



FLOOR PLAN - DEMOLITION

SCALE: 1/8"=1'-0"



| DEMOLITION KEY NOTES |                                   |
|----------------------|-----------------------------------|
| SYMBOL               | DESCRIPTION                       |
| 1                    | REMOVE EXISTING PARTITION (TYP.)  |
| 2                    | REMOVE DOORS AND FRAMES (TYP.)    |
| 3                    | REMOVE WINDOWS AND FRAMES (TYP.)  |
| 4                    | REMOVE CASEWORK/MILLWORK (TYP.)   |
| 5                    | REMOVE PLUMBING FIXTURE           |
| 6                    | REMOVE FLOORING FINISH THROUGHOUT |

**NOTE:**

**PER FBC 105.9 ASBESTOS.**

—THE ENFORCING AGENCY SHALL REQUIRE EACH BUILDING PERMIT FOR THE DEMOLITION OR RENOVATION OF AN EXISTING STRUCTURE TO CONTAIN AN ASBESTOS NOTIFICATION STATEMENT WHICH INDICATES THE OWNER'S OR OPERATOR'S RESPONSIBILITY TO COMPLY WITH THE PROVISIONS OF SECTION 469.003, FLORIDA STATUTES, AND TO NOTIFY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION OF HIS OR HER INTENTIONS TO REMOVE ASBESTOS, WHEN APPLICABLE, IN ACCORDANCE WITH STATE AND FEDERAL LAW.

| DEMOLITION LEGEND |   |
|-------------------|---|
| SYMBOL            | DESCRIPTION   |
|                   | EXISTING PARTITION TO REMAIN  |
|                   | DENOTES EXISTING CONSTRUCTION AND COMPONENTS TO BE REMOVED.<br>(SEE KEY DEMOLITION NOTES FOR DTLS.) |
|                   | EXISTING DOOR TO BE REMOVED   |

**GENERAL DEMOLITION NOTES**

- CONTRACTOR TO REMOVE AND DEACTIVATE ALL ELECTRICAL OUTLETS IN PARTITIONS TO BE DEMOLISHED.
- CONTRACTOR SHALL PROTECT EXISTING ADJACENT CONSTRUCTION AND OPERATIONS PRIOR TO STARTING DEMO WORK.
- DEMOLITION SERVICES AND TEMPORARY WORK PLANNED BY CONTRACTOR SHALL NOT IN ANY WAY INTERFERE WITH DAY-TO-DAY OPERATIONS WITHIN THE AFFECTED AND/ OR ADJACENT AREAS. COORDINATE WORK WITH ALL TRADES.
- TEMPORARY WORK SHALL INCLUDE (BUT NOT BE LIMITED TO) THE FOLLOWING:
  - TEMPORARY LIGHT AND POWER.
  - TEMPORARY WALLS AND / OR FLOORING.
  - BARRICADE PARTITIONS @ EGRESS CORRIDORS.
- CONTRACTOR SHALL COORDINATE ALL DEMOLITION AND TEMPORARY WORK W/BUILDING OWNER AS REQUIRED, AND SHALL MAKE ARRANGEMENTS FOR REMOVAL OF DEBRIS AND HAULING FROM PREMISES WITH A MIN. OF DISTURBANCE ON A DAILY BASIS.
- CONTRACTOR TO PROVIDE 72 HOURS PRIOR NOTICE TO BUILDING OWNER FOR SHUTDOWNS OF ALL MEP & F.
- THE DRAWINGS DO NOT INTEND TO SHOW ALL OBJECTS EXISTING AT THE SITE. THE CONTRACTOR MUST VERIFY AT SITE ALL OBJECTS TO BE PRESERVED AND REPORT TO ARCHITECT IN WRITING ANY DISCREPANCIES OR QUESTIONABLE ITEMS.
- USE ALL MEASURES NECESSARY TO PROTECT EXISTING OBJECTS DESIGNATED TO REMAIN, AND IN THE EVENT OF DAMAGE, IMMEDIATELY MAKE ALL REPAIRS AND REPLACEMENTS NECESSARY TO MEET THE APPROVAL OF THE ARCHITECT AND OWNER.
- PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL CAREFULLY INSPECT THE ENTIRE SITE OF ALL OBJECTS, UTILITIES AND STRUCTURES TO BE REMOVED AND/OR PRESERVED TO DETERMINE REQUIREMENTS FOR PROTECTION OR DISCONNECTION AND CAPPING OF WORK IN ACCORDANCE W/REQUIREMENTS OF THE UTILITY COMPANY, OR GOVERNMENT AGENCIES INVOLVED.
- THE CONTRACTOR SHALL RE-ROUTE AND/ OR CAP OFF ALL UNUSED UTILITIES COMING INTO THE SPACE AFTER CHECKING WITH THE ARCHITECT. ALL UTILITIES, IF NOT BEING RE-ROUTED SHALL BE CAPPED OFF AS REQUIRED BY CODE IN PARTITIONS, FLOORS AND CEILINGS. ALL ADJACENT AREAS TO REMAIN IN FULL OPERATION.
- CONTRACTOR SHALL NOTIFY BUILDING OWNER SEVEN CALENDAR DAYS PRIOR TO COMMENCEMENT OF DEMOLITION WORK.
- ALL EXISTING WALL COVERINGS, LOOSE PAINT OR PLASTER TO BE REMOVED. PATCH EXIST. WALLS AS REQUIRED AND PREPARE WALLS TO RECEIVE NEW WALL TREATMENTS, PAINT ETC. AS SPECIFIED.
- PRIOR TO ANY DEMOLITION, THE CONTRACTOR SHALL NOTIFY THE LOCAL ENVIRONMENTAL PROTECTION DIVISION FOR DEMOLITION AND ASBESTOS REMOVAL NOTIFICATION REQUIREMENTS.
- CONTRACTOR TO FIELD VERIFY THE LOCATION OF ALL EXISTING UTILITIES. NOTIFY ARCHITECT OF ANY DISCREPANCIES.
- EXISTING CONCRETE SLAB TO BE SAW CUT AS REQUIRED FOR ANY NEW UNDERGROUND UTILITIES. COORDINATE EXTENT OF SLAB DEMOLITION WITH MEP DRAWINGS AND NEW EQUIPMENT CUT SHEETS.
- PENETRATIONS THROUGH EXISTING STRUCTURAL COMPONENTS TO BE COORDINATED WITH MEP DRAWINGS PRIOR TO ANY CORING OR CUTTING THROUGH GROUND FLOOR SLAB AND ROOF STRUCTURE. CONTRACTOR MUST LOCATE EXISTING UTILITIES AND/OR REINFORCING STRUCTURAL ELEMENTS.
- COORDINATE FLOOR/SLAB AND/OR ROOF PENETRATIONS WITH EXISTING STRUCTURAL COMPONENTS.
- CONTRACTOR TO FIELD VERIFY LOCATION OF ALL EXISTING STRUCTURAL COMPONENTS.
- COORDINATE OPENINGS AND PENETRATIONS THROUGH EXISTING MASONRY WALLS WITH MEP DRAWINGS. PATCH AND REPAIR EXISTING STUCCO AND PAINT TO MATCH EXISTING.
- CONTRACTOR TO REMOVE EXISTING SOFFITS, GYPSUM BOARD CEILINGS, FIXTURES, DIFFUSERS AND DEVICES U.N.O.

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PROFESSIONAL IN CHARGE  
ADOLFO J. COTILLA, JR., AIA

REGISTRATION  
NUMBER AR-0008011

BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
FLOOR PLAN - DEMOLITION  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

ENGINEER:  
ACAI ASSOCIATES, INC.  
PROJECT NO. 12188  
DATE: 05.31.2017

DRAWN BY: DATE: 05.31.2017  
NAP DESIGNED BY: SCALE: AS NOTED  
ACAI CHECKED BY: WRS/EG  
FIELD BOOK: 33301

CITY of FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

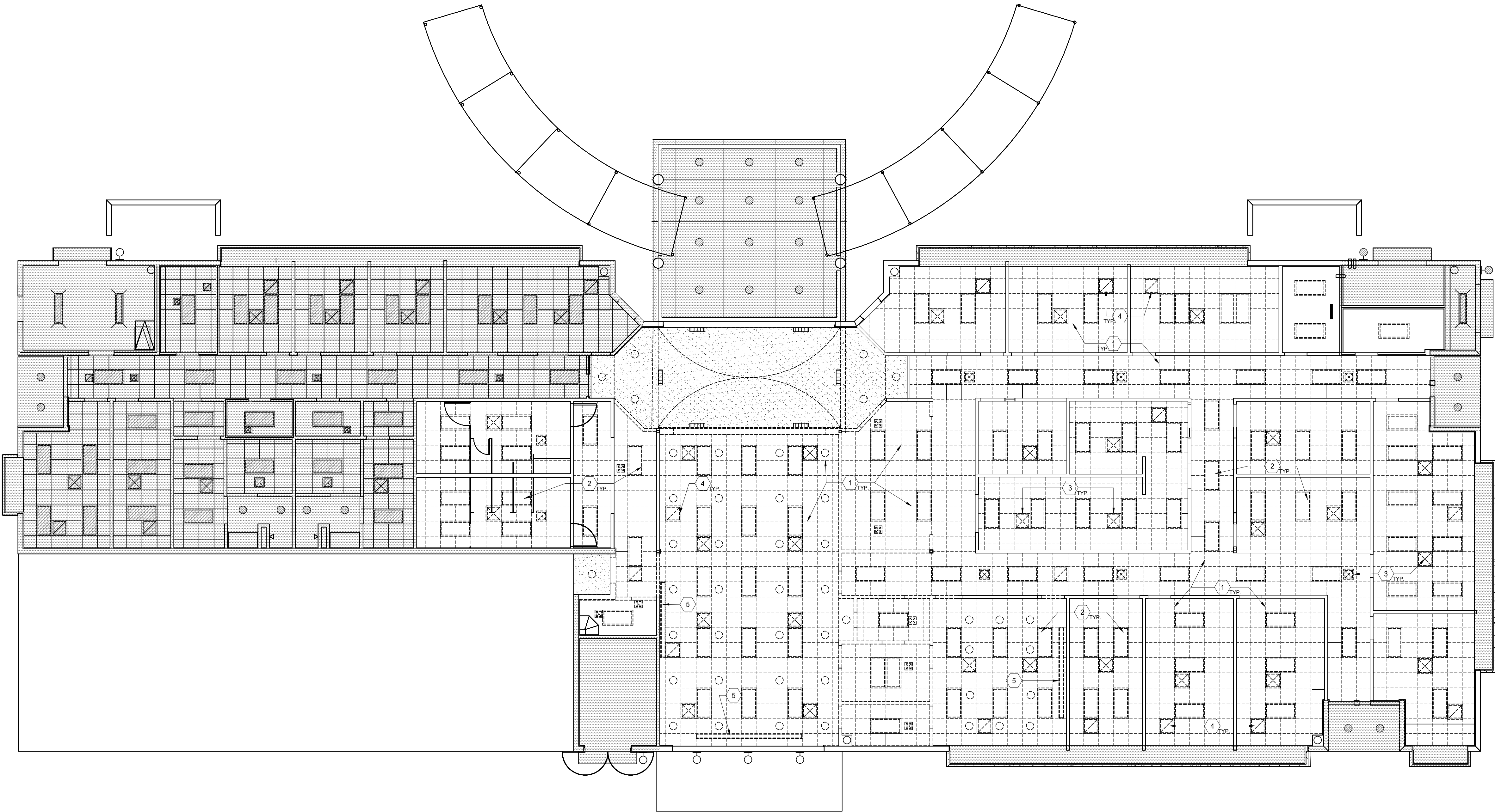
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      | DESCRIPTION |
|-----------|------|-------------|
| NO.       | DATE | BY          |
|           |      |             |
|           |      |             |
|           |      |             |
|           |      |             |

|                  |                       |
|------------------|-----------------------|
| SHEET NO.        | OF                    |
| D101             | 14                    |
| TOTAL:           | 65                    |
| CAD FILE:        | 12188-FLOOR PLAN DEMO |
| DRAWING FILE NO. | 4-140-42              |



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REFLECTED CEILING PLAN - DEMOLITION

SCALE: 1/8"=1'-0"



DEMOLITION CEILING LEGEND

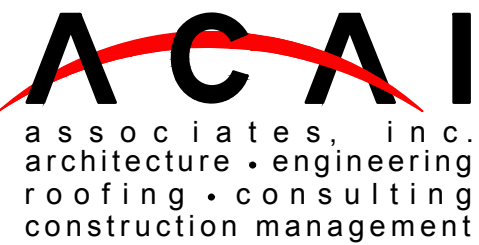
| SYMBOL | DESCRIPTION   |
|--------|---|
|        | EXISTING TO REMAIN  |
|        | EXISTING PARTITION/WALL TO BE REMOVED (SEE DEMOLITION PLAN)         |
|        | 2'x2' ACOUSTICAL CEILING TILES TO BE REPLACED.                      |
|        | EXISTING GYPSUM BOARD CEILING / SOFFIT TO BE REMOVED                |
|        | EXISTING RECESSED LIGHT FIXTURE TO BE REMOVED                       |
|        | EXISTING 2'x4' RECESSED LIGHT FIXTURE TO REMAIN.                    |
|        | EXISTING 2'x4' RECESSED LIGHT FIXTURE TO BE REPLACED (SEE MEP DWGS) |
|        | EXISTING HVAC DIFFUSER TO REMAIN.                                   |
|        | EXISTING HVAC DIFFUSER TO BE REMOVED /RELOCATED (SEE MEPF DWGS)     |

RCP DEMO GENERAL NOTES

- CONTRACTOR TO REMOVE AND DEACTIVATE ALL ELECTRICAL OUTLETS IN PARTITIONS TO BE DEMOLISHED.
- CONTRACTOR SHALL PROTECT EXISTING ADJACENT CONSTRUCTION AND OPERATIONS PRIOR TO STARTING DEMO WORK.
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- CONTRACTOR TO PROVIDE 72 HOURS PRIOR NOTICE TO BUILDING OWNER FOR SHUTDOWNS OF ALL MEP & F.
- THE DRAWINGS DO NOT INTEND TO SHOW ALL OBJECTS EXISTING AT THE SITE. THE CONTRACTOR MUST VERIFY AT SITE ALL OBJECTS TO BE PRESERVED AND REPORT TO ARCHITECT IN WRITING ANY DISCREPANCIES OR QUESTIONABLE ITEMS.
- USE ALL MEASURES NECESSARY TO PROTECT EXISTING OBJECTS DESIGNATED TO REMAIN, AND IN THE EVENT OF DAMAGE, IMMEDIATELY MAKE ALL REPAIRS AND REPLACEMENTS NECESSARY TO MEET THE APPROVAL OF THE ARCHITECT AND NSU AT NO ADDITIONAL COST.
- PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL CAREFULLY INSPECT THE ENTIRE SITE OF ALL OBJECTS, UTILITIES AND STRUCTURES TO BE REMOVED AND/OR PRESERVED TO DETERMINE REQUIREMENTS FOR PROTECTION OR DISCONNECTION AND CAPPING OF WORK IN ACCORDANCE W/ REQUIREMENTS OF THE UTILITY COMPANY, OR GOVERNMENT AGENCIES INVOLVED.
- THE CONTRACTOR SHALL RE-ROUTE AND/ OR CAP OFF ALL UNUSED UTILITIES COMING INTO THE SPACE AFTER CHECKING WITH THE ARCHITECT. ALL UTILITIES, IF NOT BEING RE-ROUTED SHALL BE CAPPED OFF AS REQUIRED BY CODE IN PARTITIONS, FLOORS AND CEILINGS. ALL ADJACENT AREAS TO REMAIN IN FULL OPERATION.
- CONTRACTOR SHALL NOTIFY NSU SEVEN CALENDAR DAYS PRIOR TO COMMENCEMENT OF DEMOLITION WORK.
- ALL EXISTING WALL COVERINGS, LOOSE PAINT OR PLASTER TO BE REMOVED. PATCH EXIST. WALLS AS REQUIRED AND PREPARE WALLS TO RECEIVE NEW WALL TREATMENTS, PAINT ETC. AS SPECIFIED.
- PRIOR TO ANY DEMOLITION, THE CONTRACTOR SHALL NOTIFY THE LOCAL ENVIRONMENTAL PROTECTION DIVISION FOR DEMOLITION AND ASBESTOS REMOVAL NOTIFICATION REQUIREMENTS.
- CONTRACTOR TO FIELD VERIFY THE LOCATION OF ALL EXISTING UTILITIES. NOTIFY ARCHITECT OF ANY DISCREPANCIES.
- PENETRATIONS THRU EXIST. STRUCTURAL COMPONENTS TO BE COORDINATED WITH MEP DRAWINGS PRIOR TO ANY CORING OR CUTTING THROUGH FLOOR SLAB. CONTRACTOR MUST LOCATE EXISTING UTILITIES AND/OR REINFORCING STRUCTURAL ELEMENTS.
- CONTRACTOR TO FIELD VERIFY LOCATION OF ALL EXISTING STRUCTURAL COMPONENTS.

RCP DEMO KEY NOTES

- REMOVE CEILING GRID AND TILE..
- REMOVE EXISTING 2'X4' LIGHTS
- REMOVE SUPPLY DIFFUSERS.
- REMOVE RETURN DIFFUSERS.
- REMOVE EXISTING PROJECTOR SCREEN.



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PROFESSIONAL IN CHARGE  
ADOLFO J. COTILLA, JR., AIA  
REGISTRATION  
NUMBER AR-0008011

ENGINEER:  
ACAI ASSOCIATES, INC.  
AIA NO. 0008011  
DATE: 05.31.2017

DRAWN BY: DATE: 05.31.2017  
NAP DESIGNED BY: SCALE: AS NOTED  
ACAI CHECKED BY: WRS/EG  
FIELD BOOK:

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ENGINEERING & ARCHITECTURE

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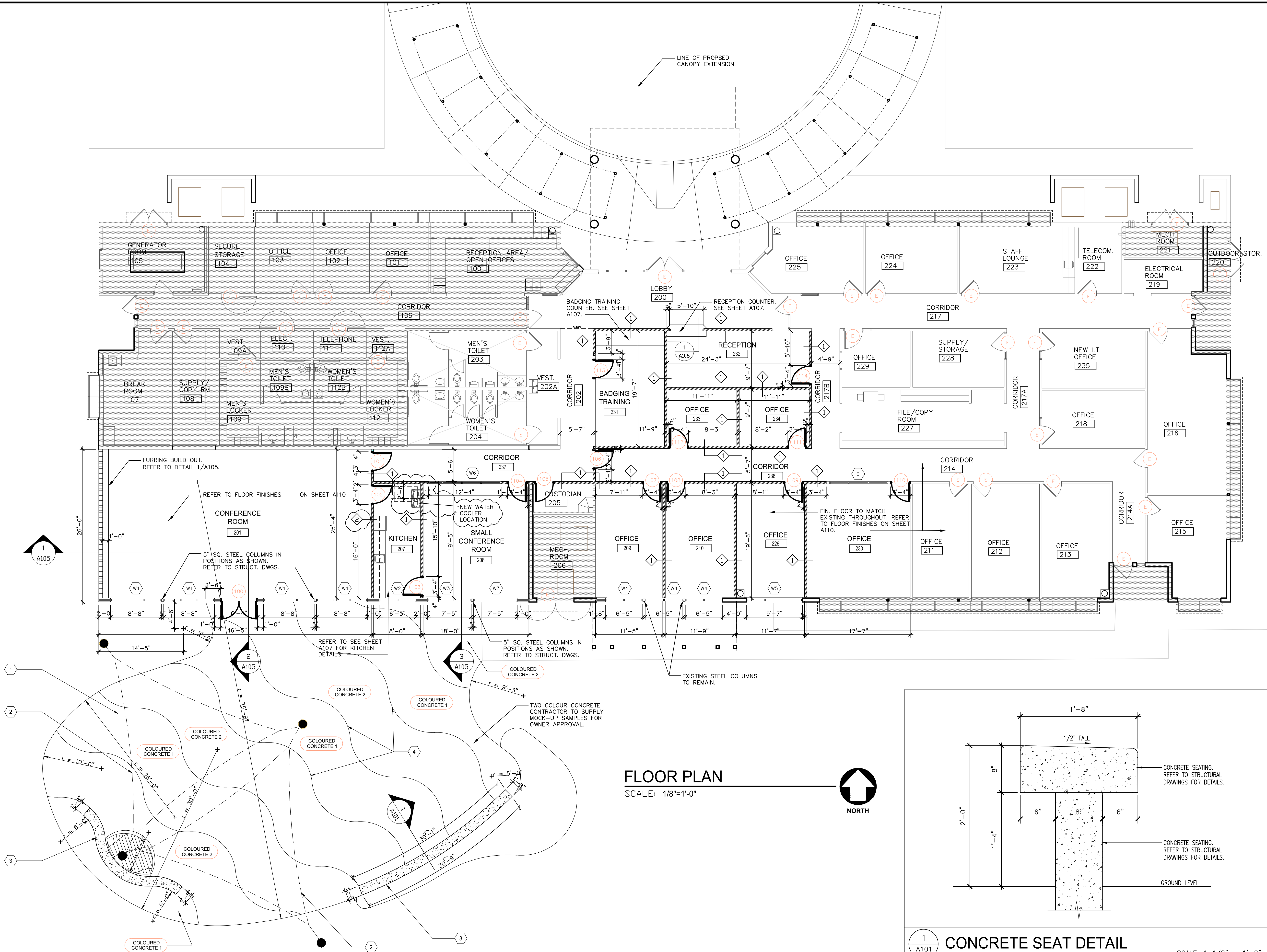
PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
REFLECTED CEILING PLAN - DEMOLITION  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

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|------------------|----------------|
| SHEET NO.        | OF             |
| D102             | 14             |
| TOTAL:           | 65             |
| CAD FILE:        | 12188-RCP DEMO |
| DRAWING FILE NO. | 4-140-42       |

BID DOCUMENTS

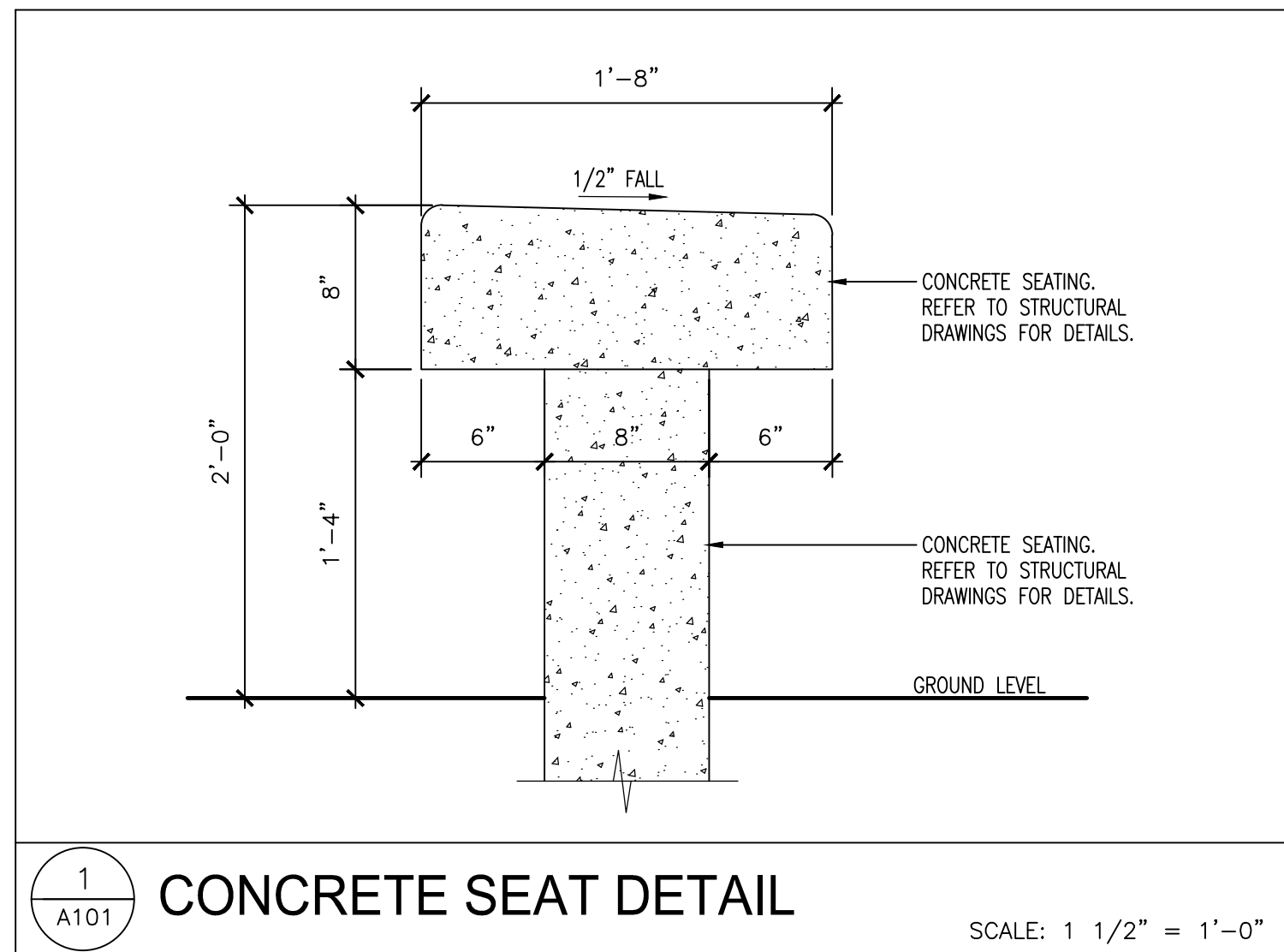


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## FLOOR PLAN

SCALE: 1/8"=1'-0"



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NUMBER AR-0008011

## LEGEND

- EXISTING TO REMAIN
- NEW CMU WALLS
- NEW PARTITIONS

## KEY NOTES:

- NEW OUTDOOR PATIO
- NEW TENSILE STRUCTURE. REFER TO CIVIL DRAWINGS
- NEW LOW WALL SEATING: CONTRACTOR TO PROVIDE WEEP HOLES FOR DRAINAGE
- CONTRACTOR TO COORDINATE CONTROL JOINTS AT 10'-0" GRID INTERVALS MAX.

ENGINEER:  
ACA I ASSOCIATES, INC.  
ADOLFO J. COTILLA, JR., AIA  
DATE: 05.31.2017

DRAWN BY: DATE: 05.31.2017  
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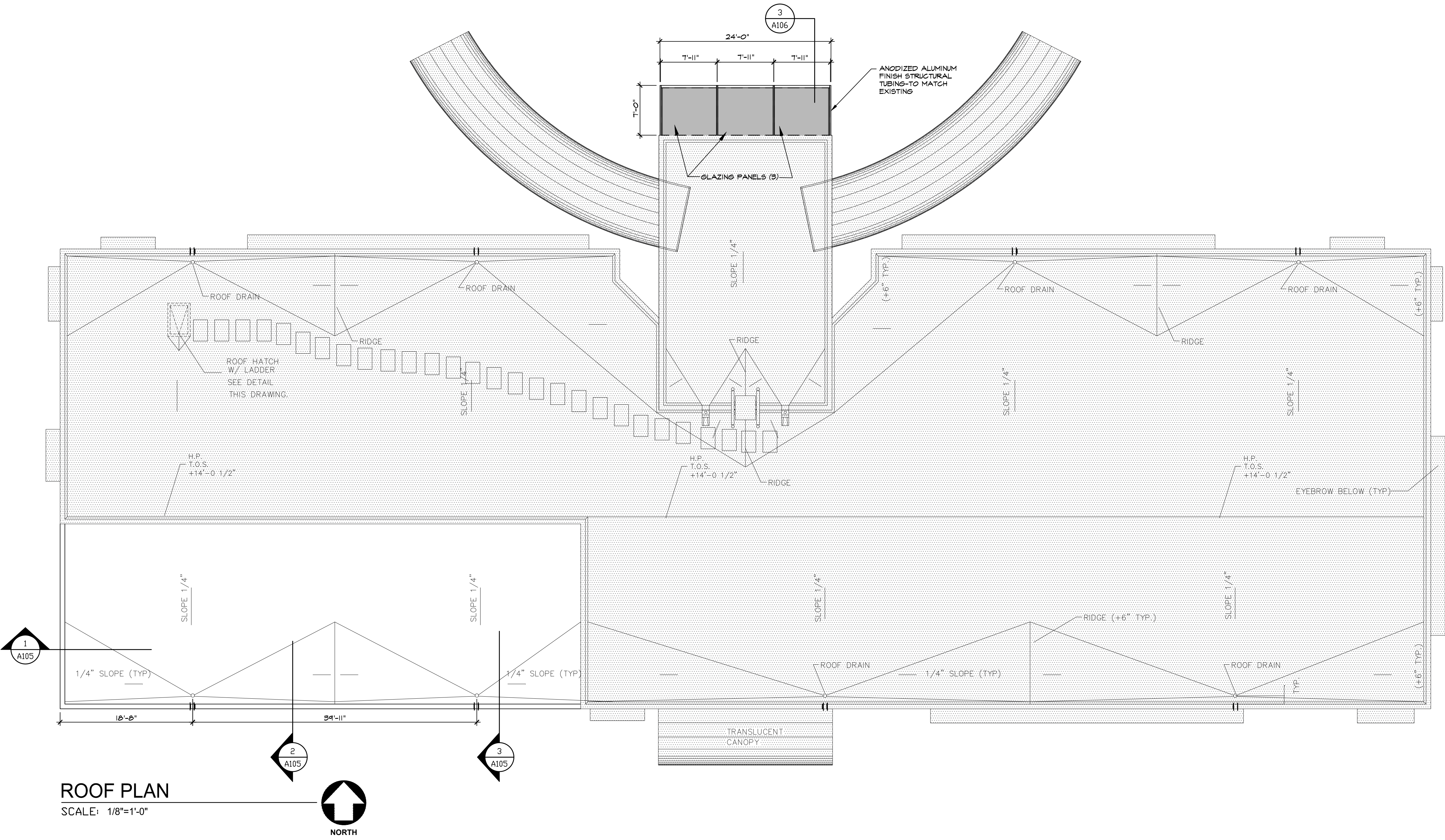
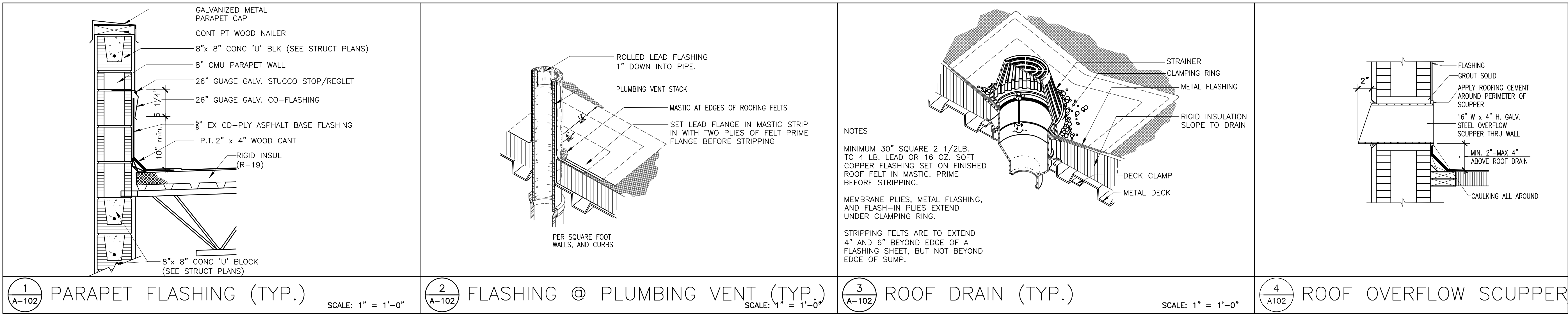
PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
FLOOR PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

| SHEET NO.        |  | OF               |  |
|------------------|--|------------------|--|
| A101             |  | 14               |  |
| TOTAL:           |  | 65               |  |
| CAD FILE:        |  | 12188-FLOOR PLAN |  |
| DRAWING FILE NO. |  | 4-140-42         |  |

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ENGINEER:  
ACAI ASSOCIATES, INC.  
0008011  
DATE: 06.31.2017

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**PROJECT # 12188**  
ADMINISTRATION BUILDING RENOVATIONS

**ROOF PLAN**  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

SHEET NO. OF  
**A102** 14

TOTAL: 65

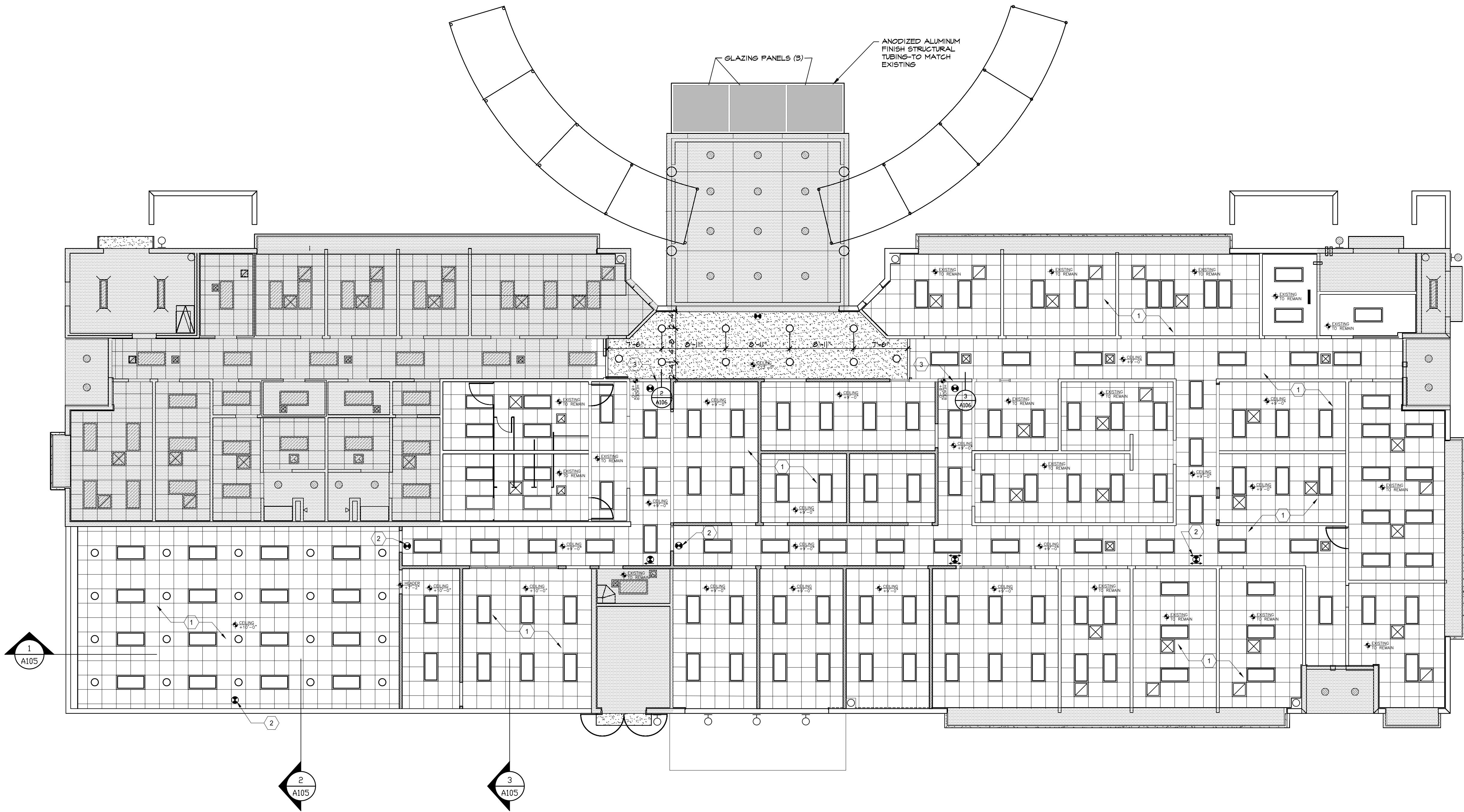
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12188-ROOF PLAN

DRAWING FILE NO.  
4-140-42

BID DOCUMENTS



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REFLECTED CEILING PLAN - NEW  
SCALE: 1/8"=1'-0"



DEMOLITION CEILING LEGEND

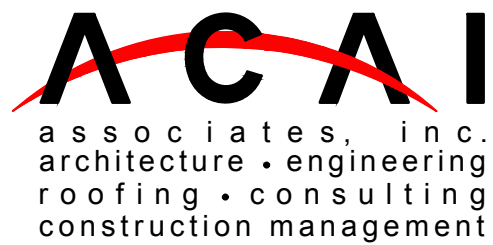
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|--------|---|
|        | EXISTING TO REMAIN                              |
|        | 2'x2' ACOUSTICAL CEILING TILE AND GRID SYSTEM   |
|        | EXISTING 2'x4' RECESSED LIGHT FIXTURE TO REMAIN |
|        | NEW 2'x4' RECESSED LIGHT FIXTURE (SEE MEP DWGS) |
|        | EXISTING HVAC DIFFUSER TO REMAIN                |
|        | NEW HVAC DIFFUSER (SEE MEPF DWGS)               |
|        | EXISTING RECESSED LIGHTS TO REMAIN              |
|        | NEW RECESSED LIGHTS (SEE MEPF DWGS)             |
|        | EXIT SIGN (SEE ELEC. DWGS.)                     |
|        | Ceiling   |
|        | DENOTES CEILING HEIGHT.                         |

RCP GENERAL NOTES

1. BUILDING SYSTEMS, FIXTURES, AND DEVICES SHOWN ON ARCHITECTURAL REFLECTED CEILING PLANS SUCH AS LIGHT FIXTURES, AIR DIFFUSERS AND SPRINKLER HEADS ARE SHOWN TO DENOTE LOCATION AND LAYOUT PATTERN WHERE PLACEMENT IS CRITICAL. THE ARCHITECTURAL DRAWINGS DO NOT REPRESENT COMPLETE SYSTEMS THAT ARE SHOWN ON OTHER DRAWINGS.
2. REFER TO MECHANICAL DRAWINGS FOR TYPES AND SIZES OF SUPPLY AND RETURN GRILLES.
3. LIGHT FIXTURES, ALARM DEVICES, AND EXIT SIGNS MAY BE SHOWN ON THE ARCHITECTURAL REFLECTED CEILING PLANS FOR LAYOUT CLARITY ONLY. SEE ELECTRICAL DRAWINGS FOR TOTAL QUANTITIES AND OTHER REQUIREMENTS
4. REFER TO ELECTRICAL DRAWINGS FOR LIGHTING SCHEDULE AND LIGHTING FIXTURES NOT SHOWN ON ARCHITECTURAL DRAWINGS.
5. WHERE AN ITEM IS MOUNTED ON THE CEILING, IT SHALL BE CENTERED ON THE ELEMENT (CEILING TILE, GYPSUM BOARD BAND, ETC) IN WHICH IT IS PLACED, UNLESS INDICATED OTHERWISE.
6. CEILING HEIGHTS ARE BASED ON DIMENSION ABOVE FINISH FLOOR. (TYPICAL)
7. SPRINKLER HEADS SHALL BE ALIGNED IN BOTH DIRECTIONS. COORDINATE LOCATION W/ LIGHTING FIXTURES, MECHANICAL, SECURITY AND FIRE ALARM DEVICES.
8. CONTRACTOR TO INSTALL CEILING GRID TIE WIRES AS PER CODE. GRID TIE WIRES TO ATTACH TO STRUCTURE ABOVE. DO NOT ATTACH TO HVAC DUCTWORK.
9. CONTRACTOR WILL BE RESPONSIBLE TO NOTIFY ARCHITECT IMMEDIATELY FOR ANY CONFLICTS WITHIN REFLECTED CEILING PLAN PRIOR TO INSTALLATION.
10. CONTRACTOR TO VERIFY HEIGHT OF EXISTING STRUCTURE AND COORDINATE CEILING HEIGHTS WITH LIGHT FIXTURES, NEW DUCTWALL/PIPING, ETC.
11. CONTRACTOR TO VERIFY HEIGHT OF EXISTING STRUCTURE PRIOR TO ORDER AND INSTALLATION OF NEW LIGHT FIXTURES AND CEILING DEVICES.
12. REFER TO FINISH SCHEDULE FOR CEILING FINISH SPECS.
13. CONTRACTOR SHALL ADVISE THE OWNER THAT AN 18" MIN. VERTICAL CLEARANCE SHALL BE MAINTAINED BETWEEN THE BOTTOM OF THE EXTENDED SPRINKLER HEADS AND THE TOP OF ANY FILES, SHELVING, LOCKERS, ETC.
14. REFER TO MECHANICAL DRAWINGS FOR HVAC DIFFUSERS, RETURNS AND ANY OTHER DEVICES NOT SHOWN ON THIS PLAN.
15. REFER TO FIRE PROTECTION DRAWINGS FOR SPRINKLER HEAD LOCATIONS NOT SHOWN ON THIS PLAN.

RCP KEY NOTES

- 1 CEILING TILE AND GRID SYSTEM. SEE FINISH SCHEDULE.
- 2 EXIT SIGN. SEE ELECTRICAL DWGS.
- 3 HEADER (TYP.). SEE DETAIL 4/A106.



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ADOLFO J. COTILLA, JR., AIA  
REGISTRATION  
NUMBER AR-0008011

ENGINEER:  
ACAI ASSOCIATES, INC.  
AIA No. 0006011  
DATE: 05.31.2017

DRAWN BY: DATE: 05.31.2017  
NAP DESIGNED BY: SCALE: AS NOTED  
ACAI CHECKED BY: WRS/EG  
FIELD BOOK:

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PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
REFLECTED CEILING PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

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| SHEET NO.        | OF            |
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| TOTAL:           | 65            |
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| DRAWING FILE NO. | 4-140-42      |

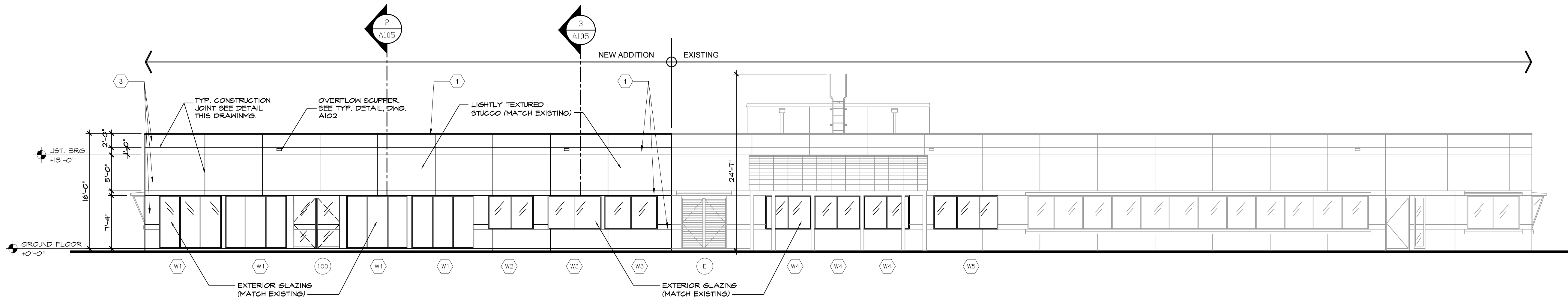
BID DOCUMENTS





**BUILDING ELEVATION (NORTH)**

SCALE: 1/8"=1'-0"

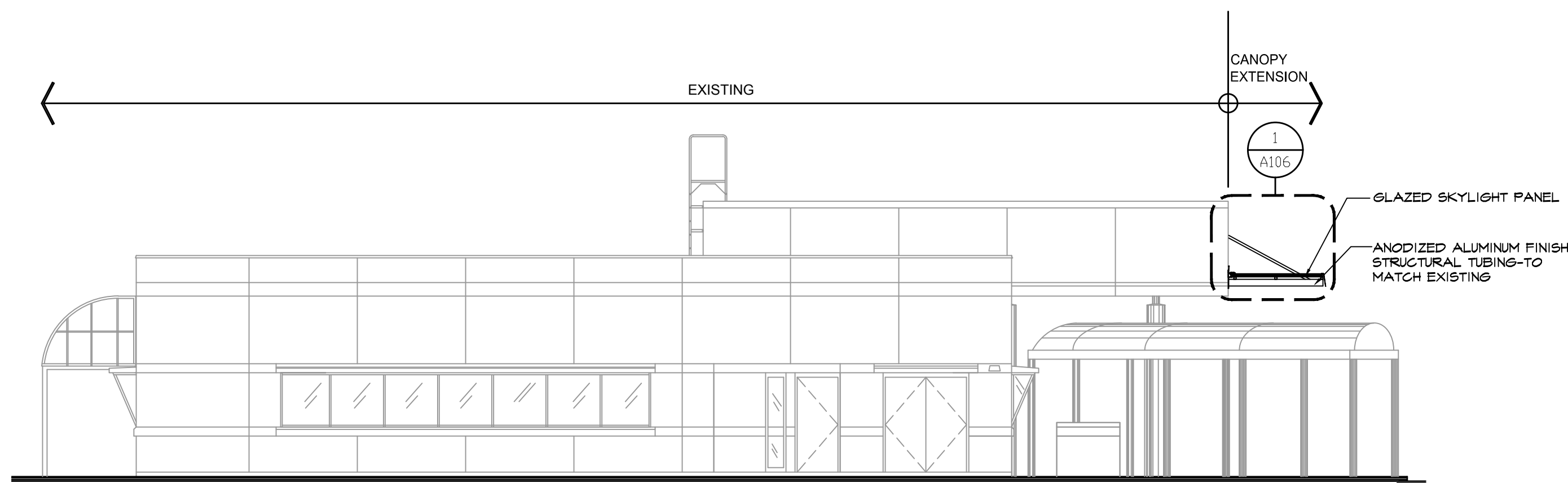


**BUILDING ELEVATION (SOUTH)**

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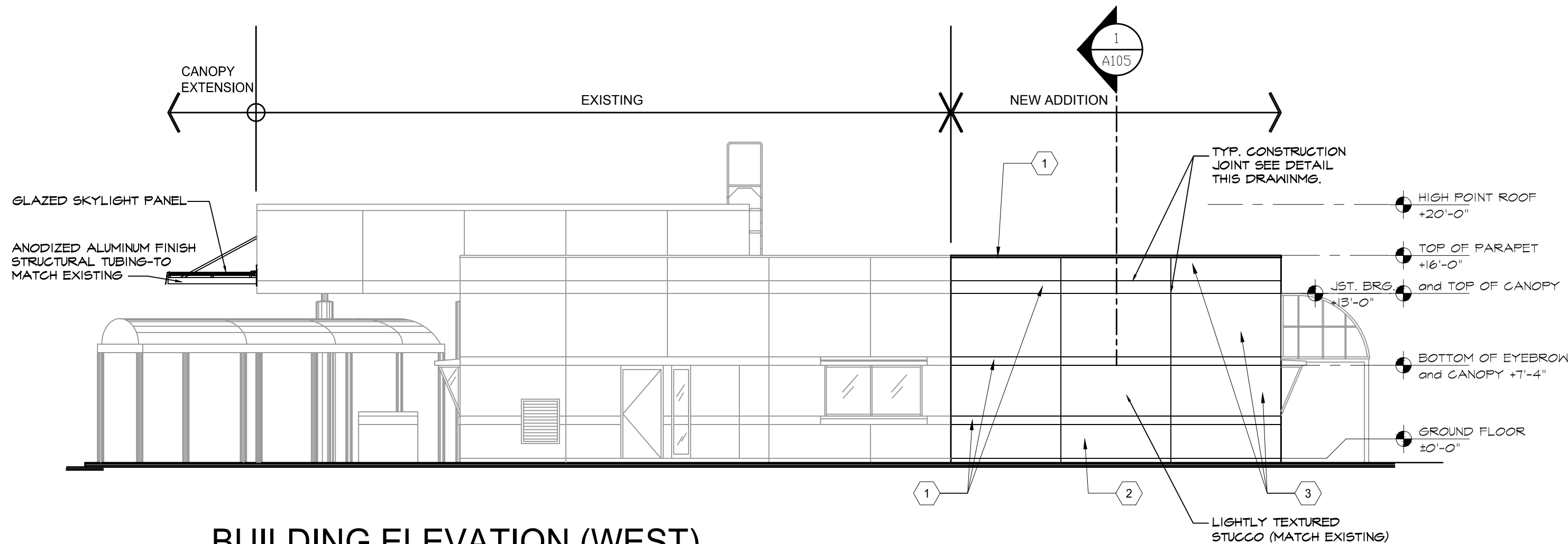
**COLOR SCHEME**

- 1 SW 8074 - SEA MEADOW
- 2 SW 6036 - ANGORA
- 3 SW 6379 - JERSEY CREAM



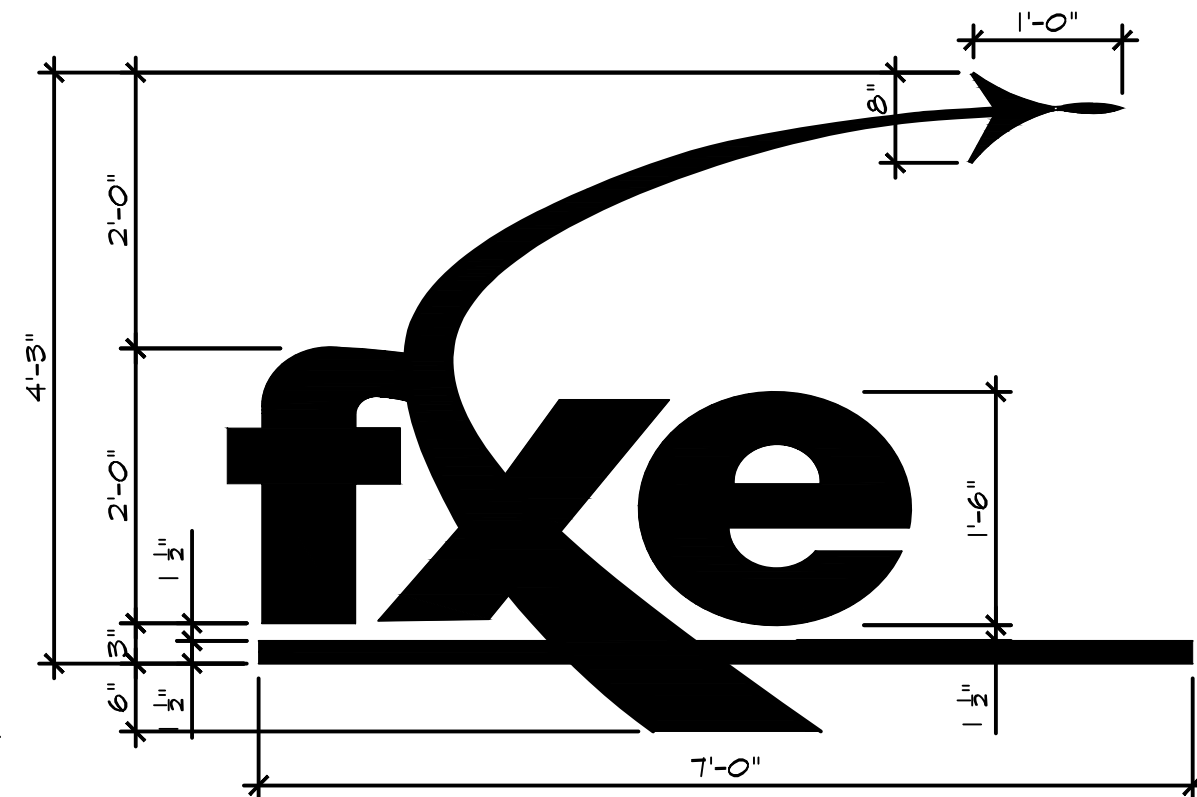
**BUILDING ELEVATION (WEST)**

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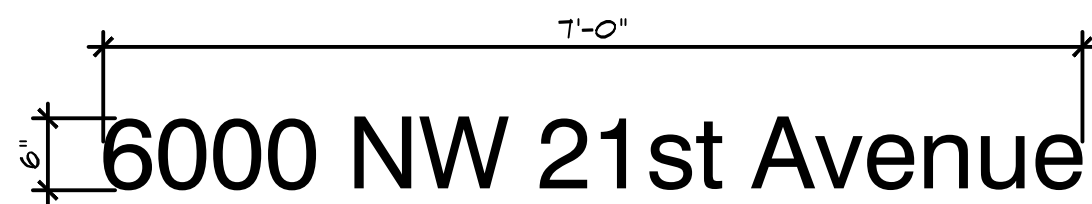
**BUILDING ELEVATION (WEST)**

SCALE: 1/8"=1'-0"



**LOGO DETAIL**

SCALE: NOT TO SCALE



**ADDRESS DETAIL**

SCALE: NOT TO SCALE

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ENGINEER:  
ACAI ASSOCIATES, INC.  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301  
DATE: 05.31.2017  
TEL: 954.484.4000  
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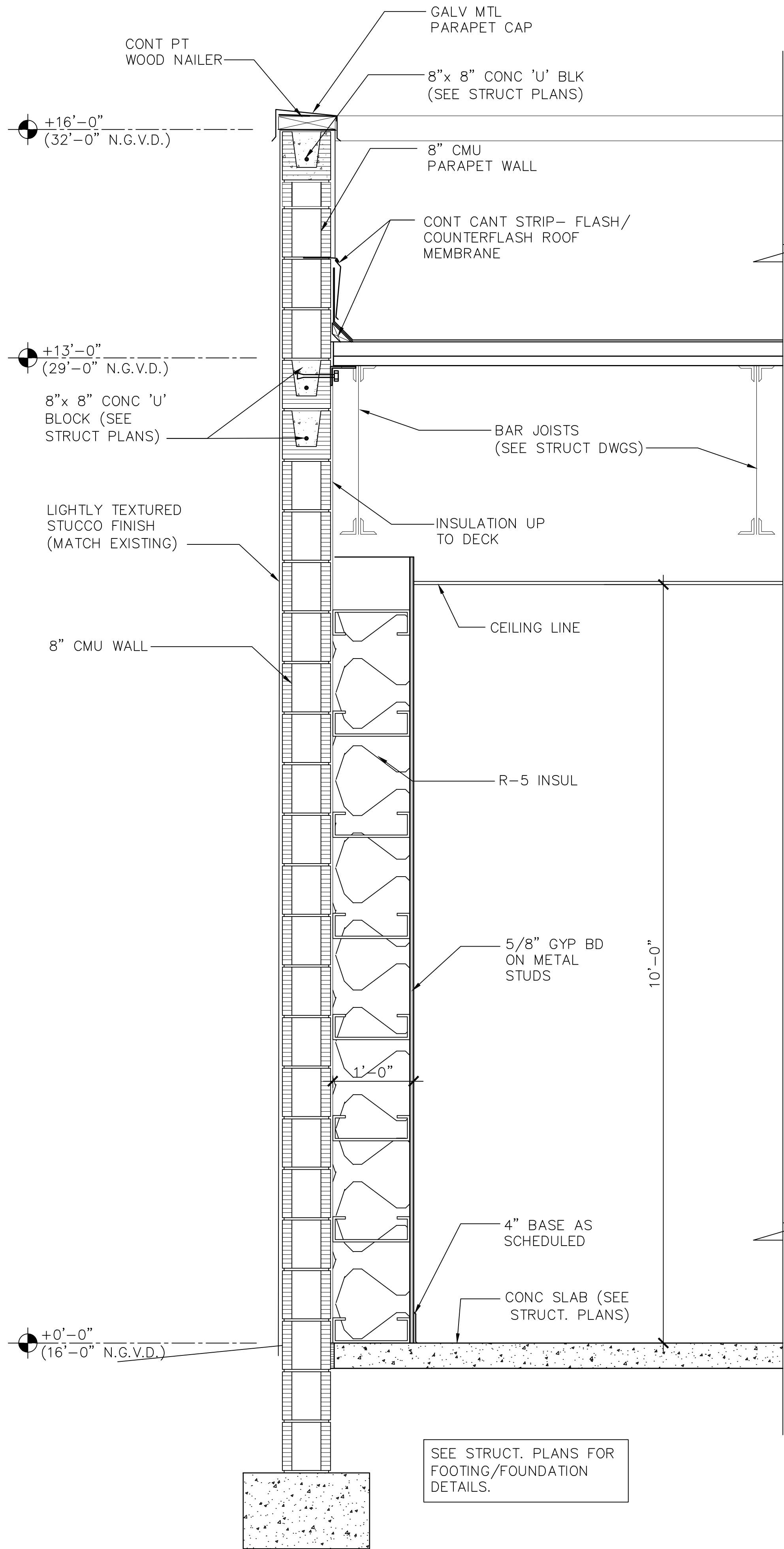
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**PROJECT # 12188**  
**ADMINISTRATION BUILDING RENOVATIONS**  
**EXTERNAL ELEVATIONS**  
**6000 NW 21st Ave, Fort Lauderdale, FL 33309**

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| SHEET NO.        | OF               |
| <b>A104</b>      | <b>14</b>        |
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| DRAWING FILE NO. | 4-140-42         |

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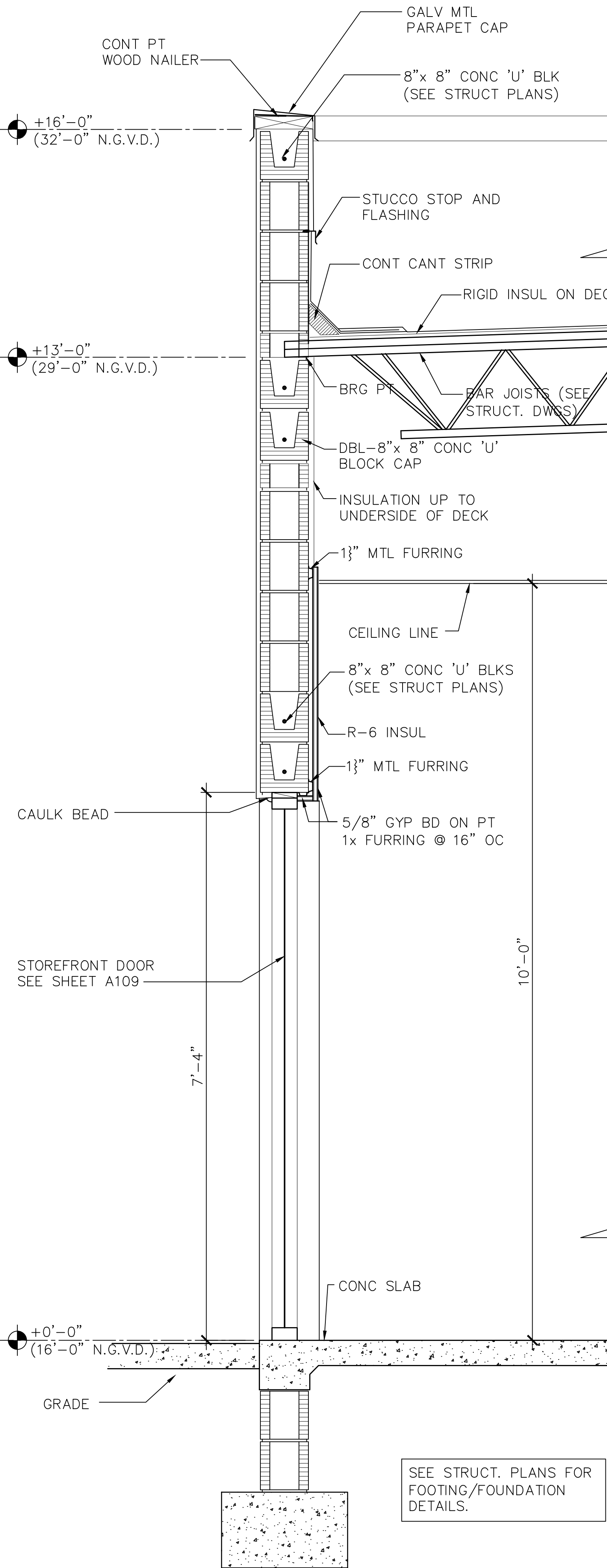
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WALL DETAIL

SCALE: 1" = 1'-0"

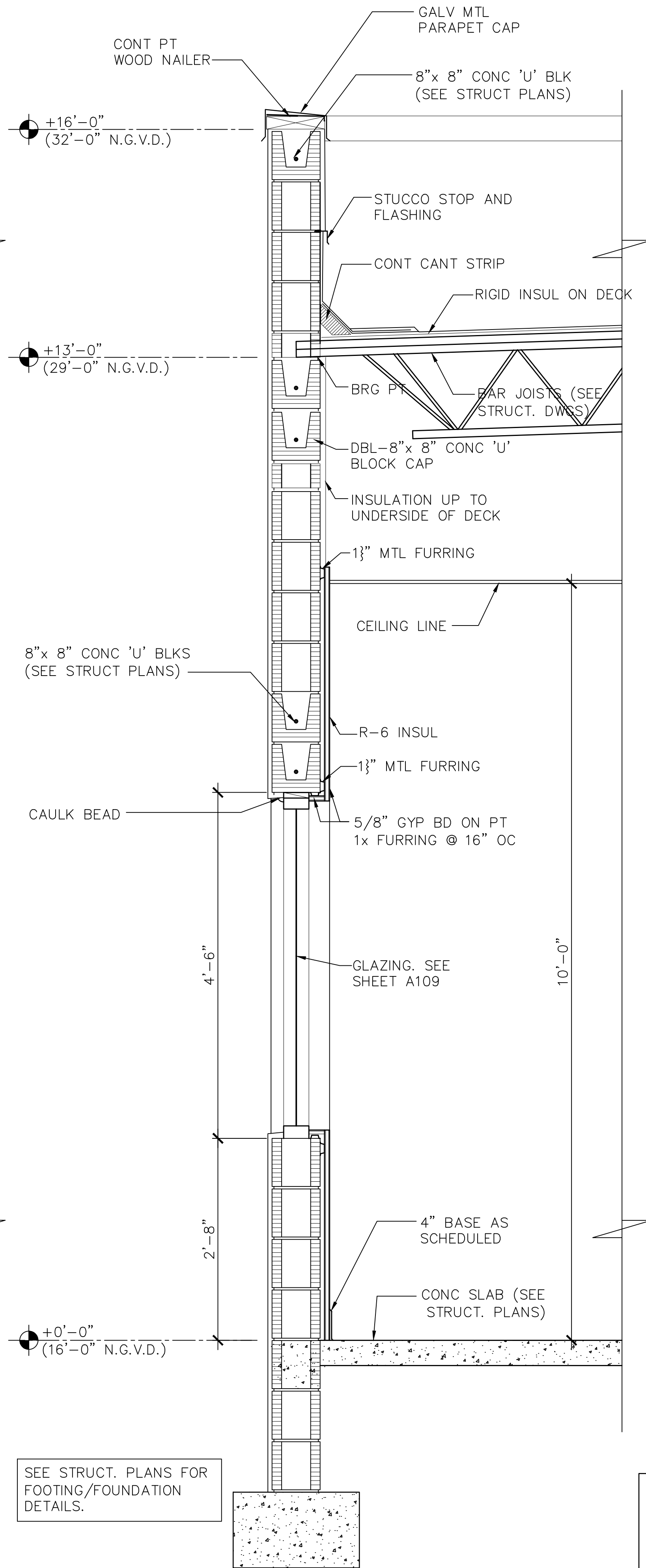
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A105



WALL DETAIL

SCALE: 1" = 1'-0"

2  
A105



WALL DETAIL

SCALE: 1" = 1'-0"

3  
A105

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ADMINISTRATION BUILDING RENOVATIONS  
WALL SECTIONS  
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| DATE:        | 05.31.2017            |
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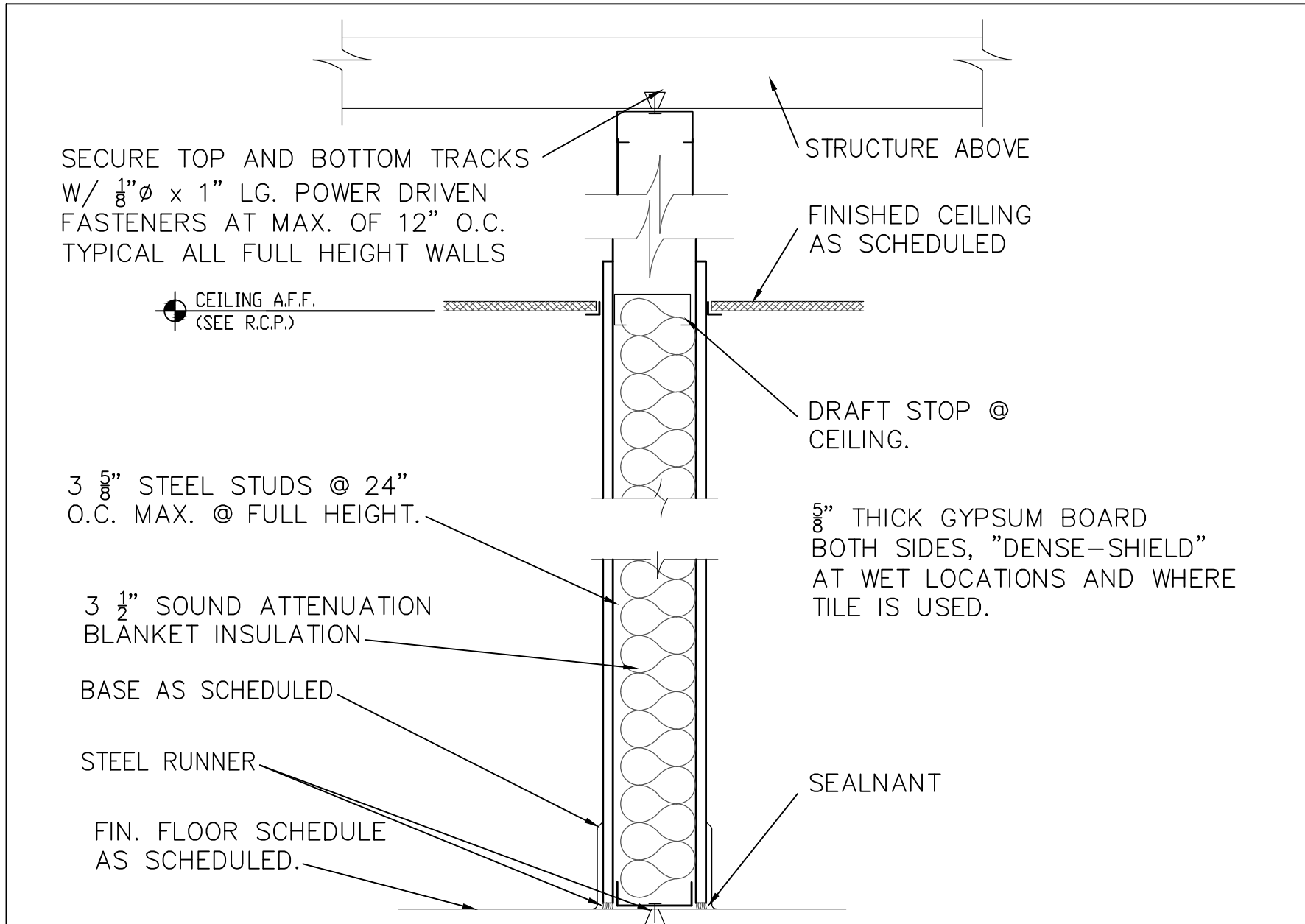
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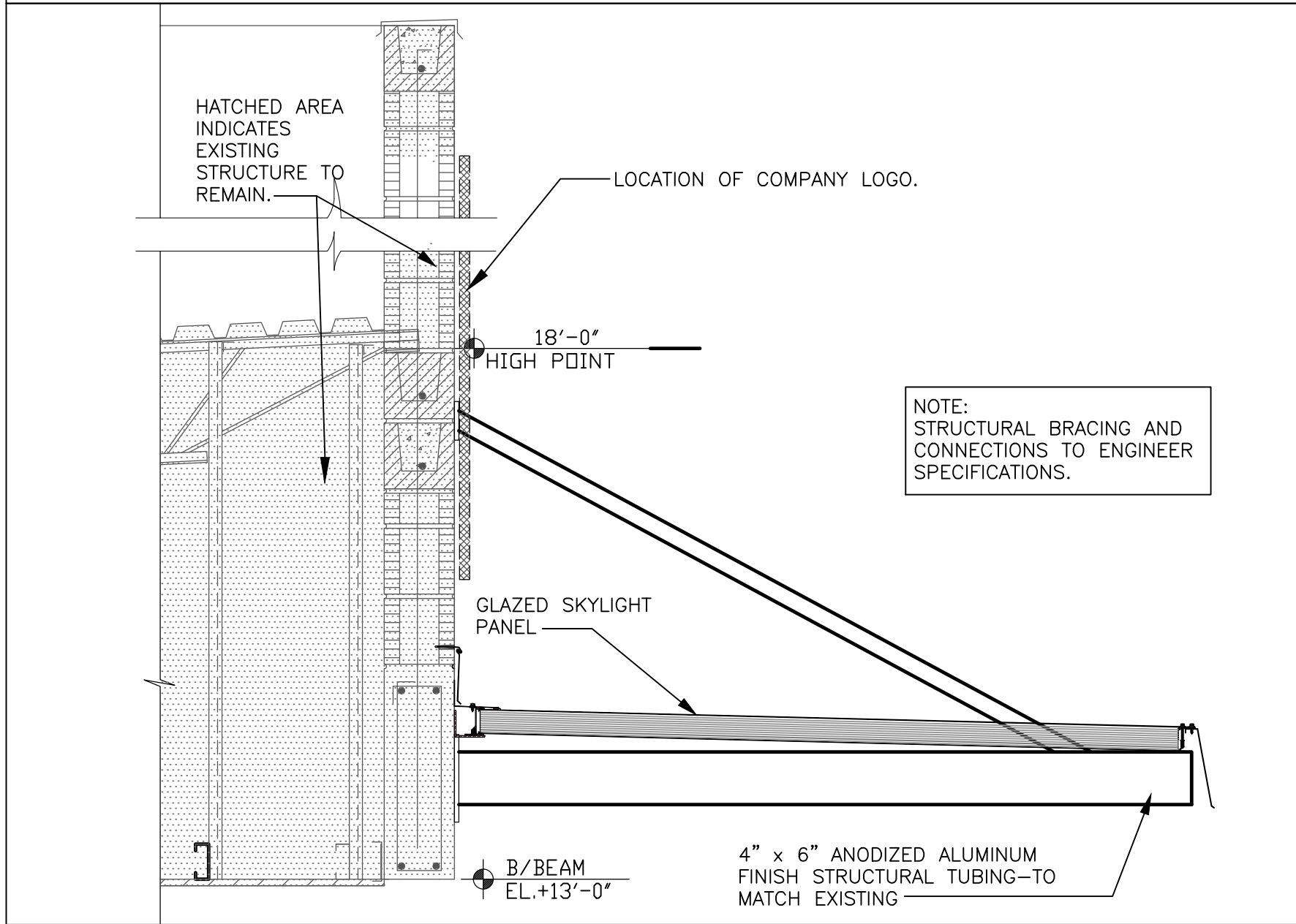
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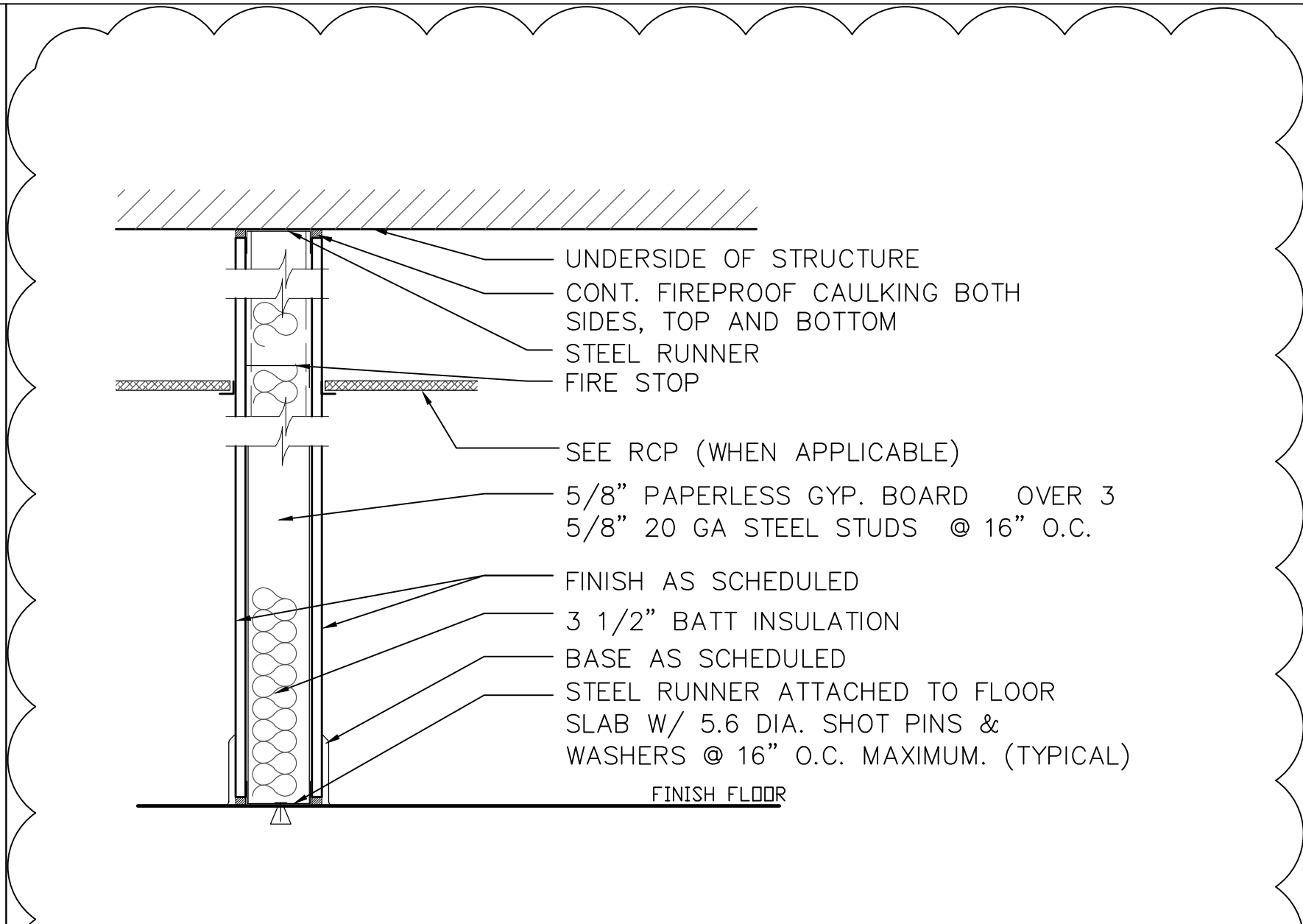
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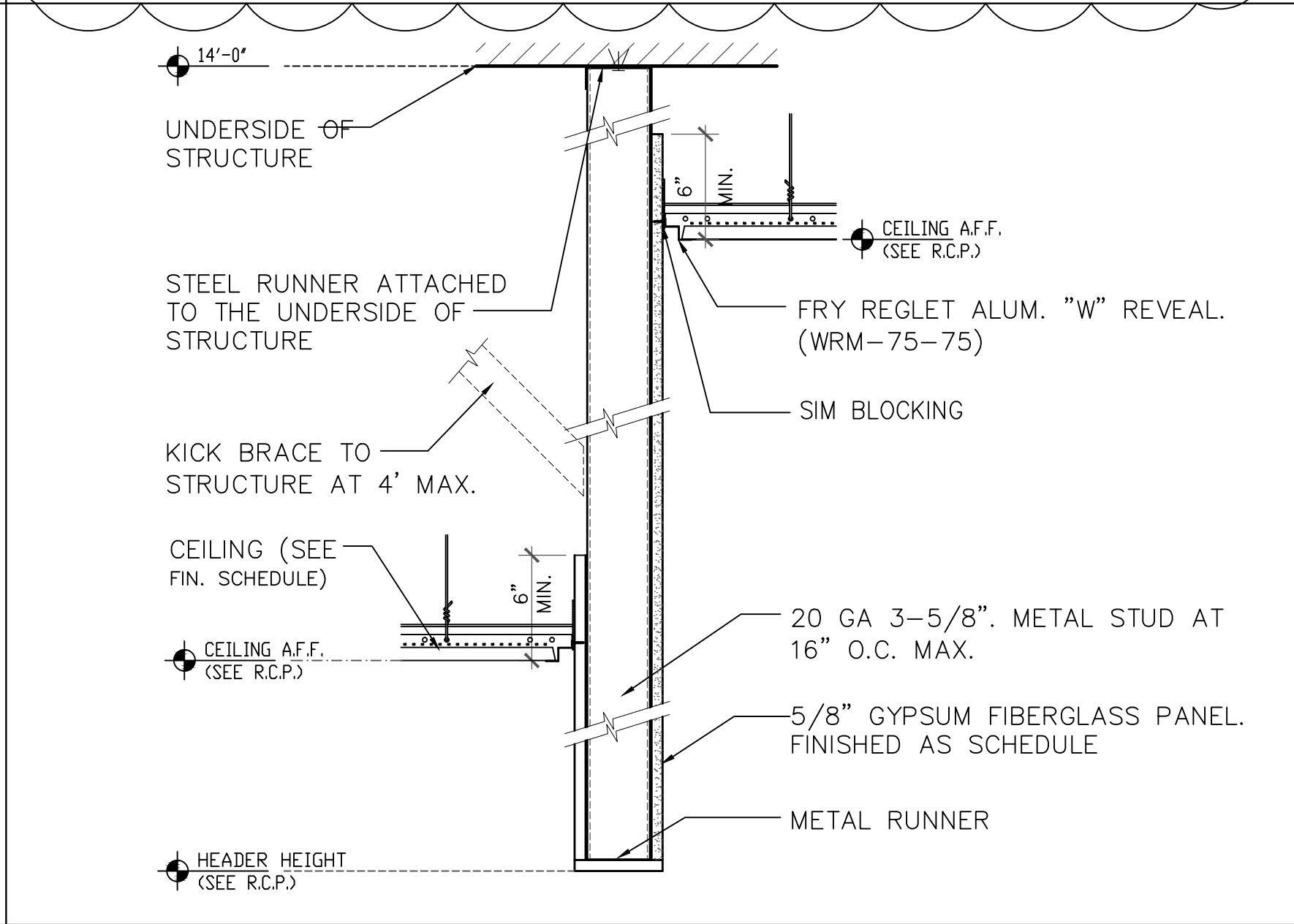
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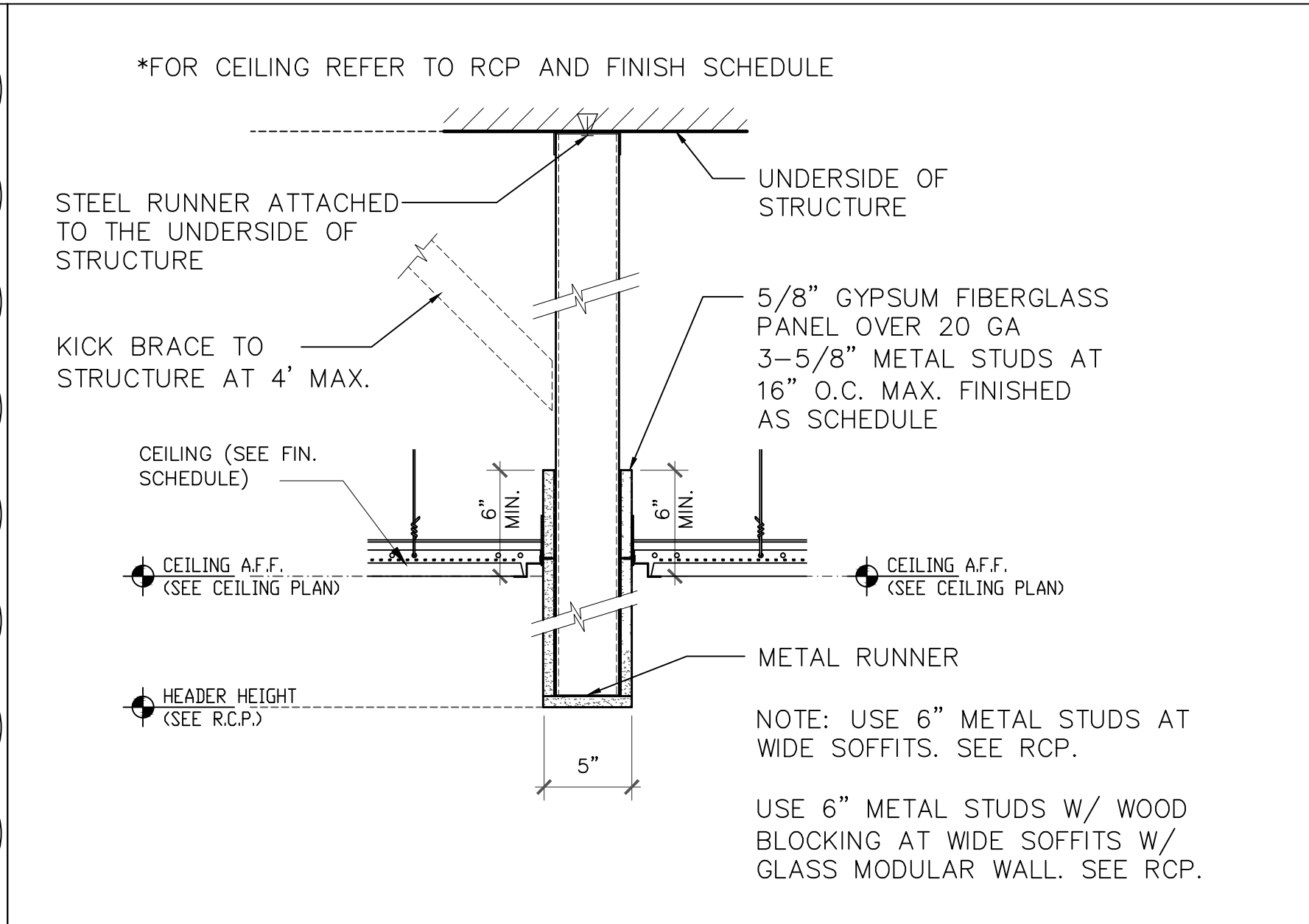
1 A106 SOFFIT DETAIL SCALE: 1 1/2" = 1'-0"



2 1HR FIRE RATED PARTITION BASED ON UL DESIGN U465 SCALE: 1 1/2" = 1'-0"



2 A106 SOFFIT DETAIL SCALE: 1 1/2" = 1'-0"



3 A106 SOFFIT DETAIL SCALE: 1 1/2" = 1'-0"

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PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
DETAIL SHEET  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

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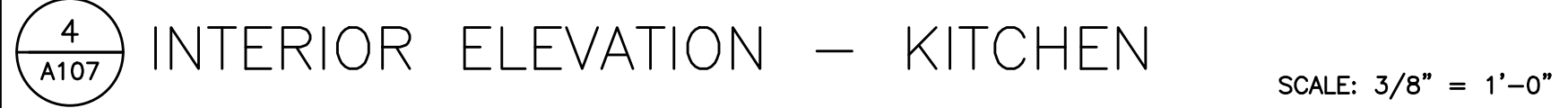
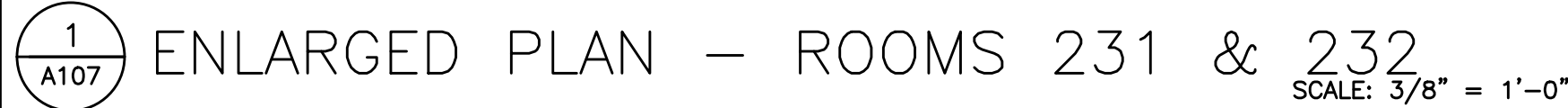
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| NAP          | 05.31.2017 |
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| ACA I        | AS NOTED   |
| CHECKED BY:  |            |
| EG/WRS       |            |
| FIELD BOOK:  |            |


ENGINEER:  
ACA I ASSOCIATES, INC.  
ACA I 000011  
DATE: 05.31.2017

TEL: 954.484.4000  
FAX: 954.484.5588





|                                    |           |
|------------------------------------|-----------|
| SHEET NO.                          | OF        |
| <b>A107</b>                        | <b>14</b> |
| TOTAL:                             | 65        |
| CAD FILE:<br>12188-INT. ELEVATIONS |           |
| DRAWING FILE NO.<br>4-140-42       |           |


**CITY OF FORT LAUDERDALE**  
**PUBLIC WORKS DEPARTMENT**  
**ENGINEERING & ARCHITECTURE**  
 100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      |    |                   |
|-----------|------|----|-------------------|
| NO.       | DATE | BY | CHK'D DESCRIPTION |

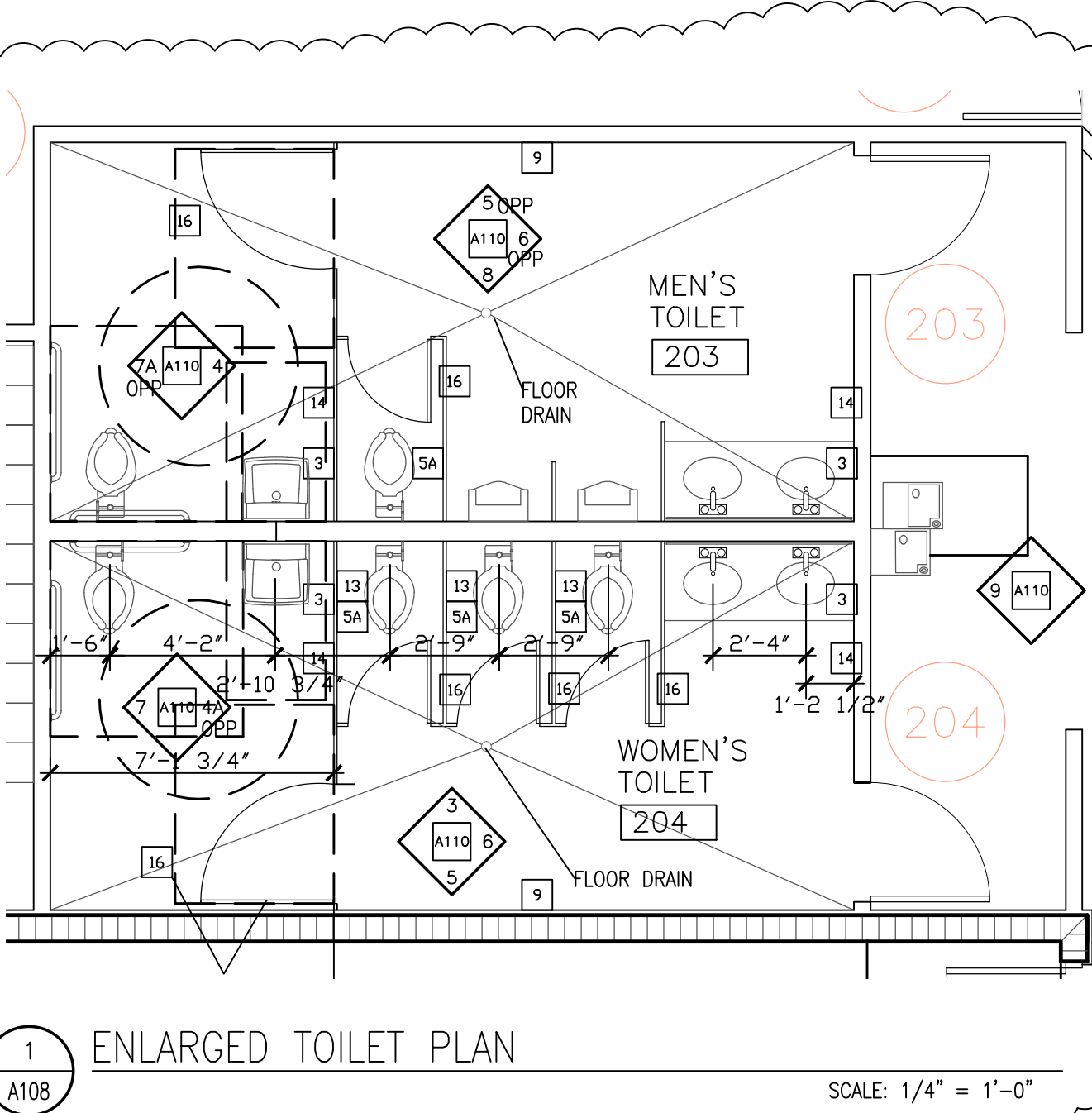
PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
INTERNAL ELEVATIONS & DETAILS  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                                    |           |
|------------------------------------|-----------|
| SHEET NO.                          | OF        |
| <b>A107</b>                        | <b>14</b> |
| TOTAL:                             | 65        |
| CAD FILE:<br>12188-INT. ELEVATIONS |           |
| DRAWING FILE NO.<br>4-140-42       |           |

CAM 18-0070  
Exhibit 3 p. 72



S:\PROJECTS\16--037 G01 FFE ADMINISTRATION BUILDING ADDITION AND RENOVATION\06 DRAWINGS\6.01 CONSTRUCTION DOCUMENTS\0\_ARCH\A-108 - WASHROOM DETAILS.DWG



### RESTROOM FIXTURES AND ACCESSORIES

ACCESSORIES MODEL N° ARE "BOBRICK"

- |  |  |
|--|--|
| 1 NOT USED   | 8 NOT USED                                     |
| 1A NOT USED  | 9 WALL HAND DRYERS B-709                       |
| 2 NOT USED   | 10 INSULATED DRAIN PIPES UNDER LAVATORIES      |
| 3 SOAP DISPENSER B-2112  | 11 TOILET PARTITIONS                           |
| 4 NOT USED   | 12 SURFACE MTD.NAPKIN / TAMPON VENDOR B-2800   |
| 5 MULTI-ROLL TOILET TISSUE DISPENSER WALL MTD. RECESSED B-3888               | 13 SURFACE MTD. NAPKIN / TAMPON DISPOSAL B-254 |
| 5A MULTI-ROLL TOILET TISSUE DISPENSER SURFACE MTD. PARTITION B-2888          | 14 PAPER TOWEL DISPENSER AND RECEPTACLE B-3949 |
| 6 WALL x 36"H. STEEL FRAMED TEMPERED GLASS MIRROR                            | 15 NOT USED                                    |
| 6A TILT MIRROR TYPICAL HC STALLS 18" x 36" STEEL FRAMED TEMPERED GLASS B-293 | 16 PARTITION MTD. CLOTHES HOOK/BUMPER B-212    |
| 7 HORIZONTAL GRAB BAR 36"L x 1 1/4" ø  | 17 NOT USED                                    |
| 7A HORIZONTAL GRAB BAR 42"L x 1 1/4" ø                                       | 18 RECESSED SOAP DISH/BAR B-4390               |
| 7B HORIZONTAL GRAB BAR 18"L x 1 1/4" ø                                       | 19 NOT USED                                    |
|  | 20 NOT USED                                    |

#### ABBREVIATIONS

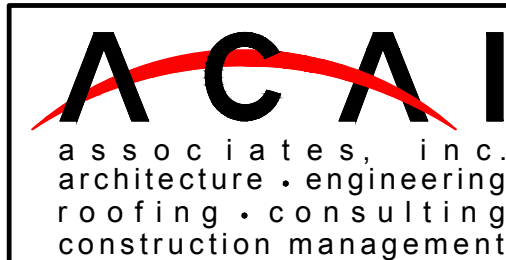
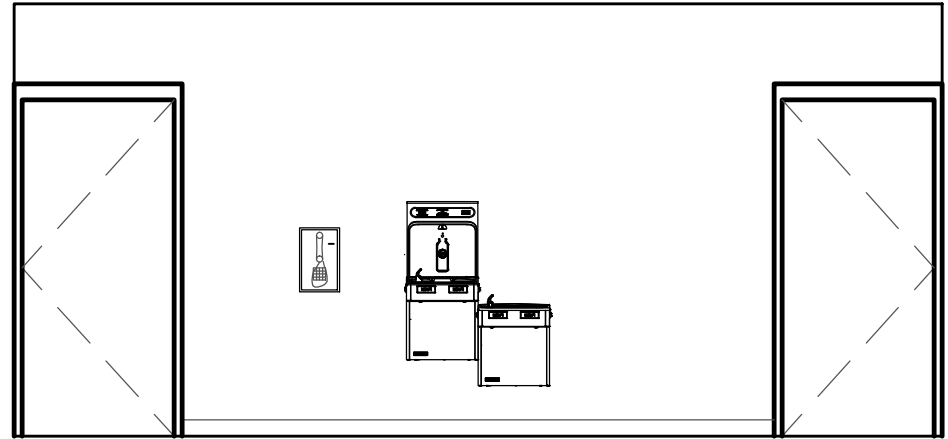
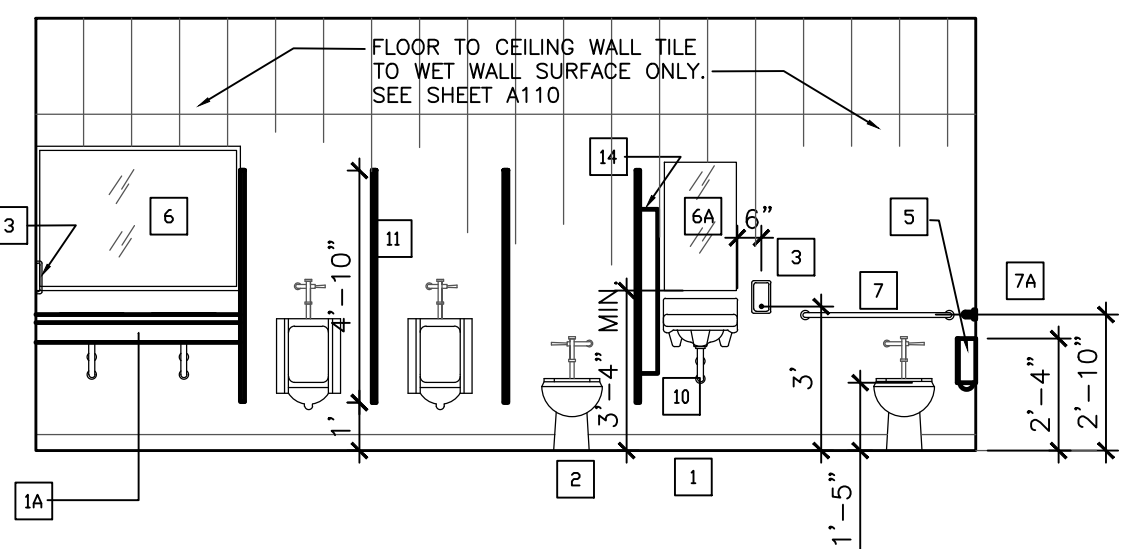
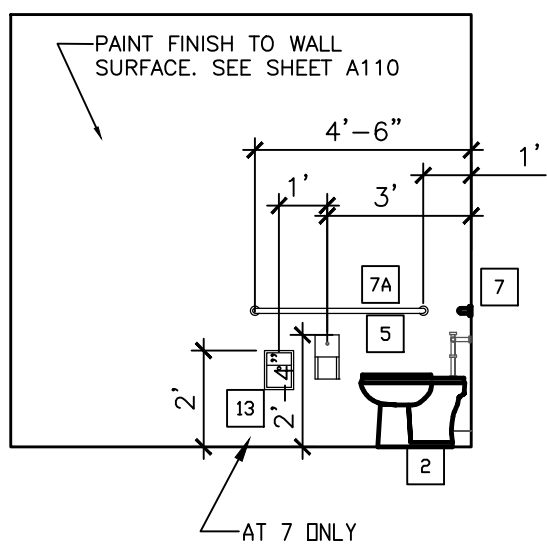
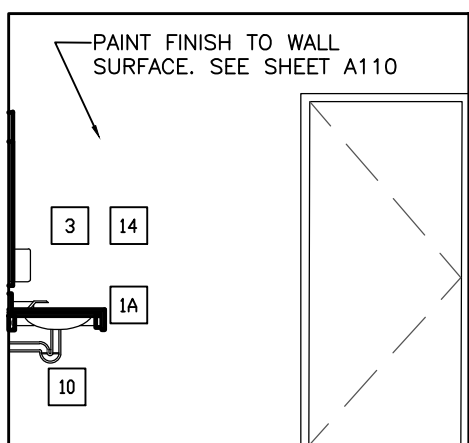
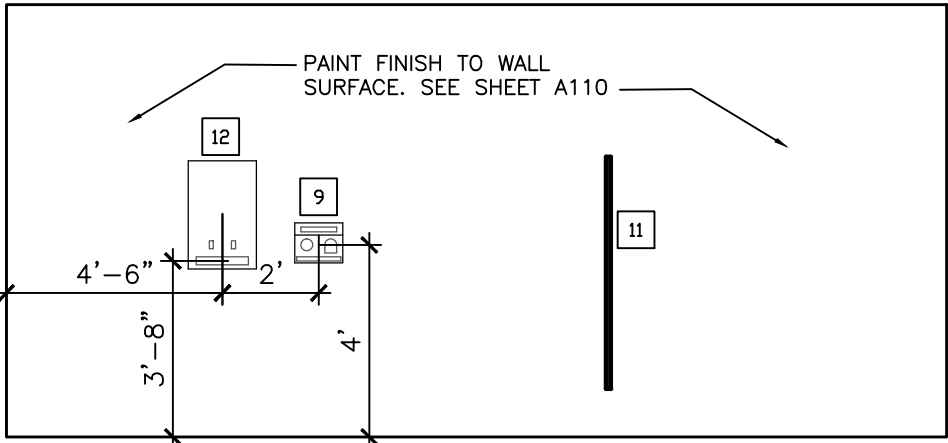
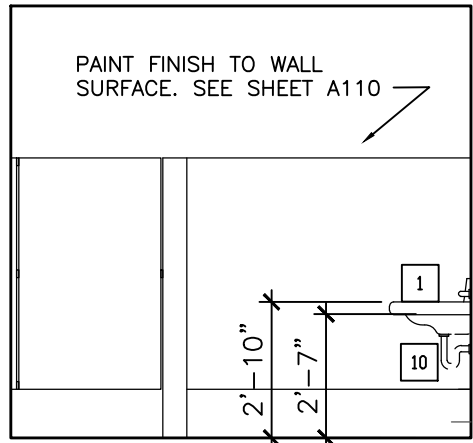
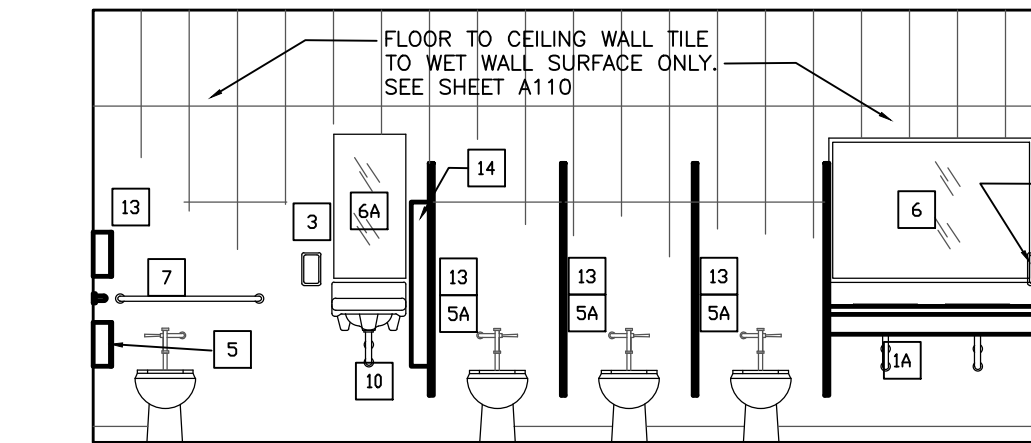
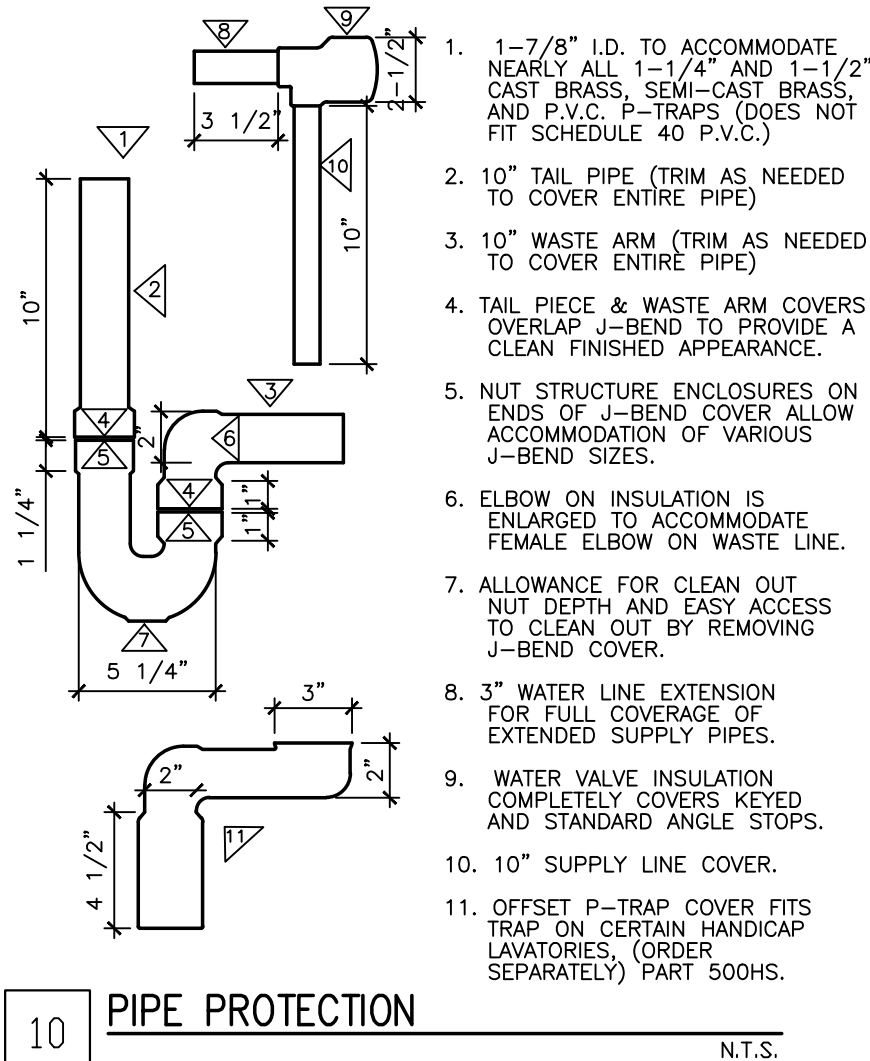
OPP OPPOSITE  
HC HANDICAP  
W WITH  
L LENGTH  
D DEPTH

ø AT  
TYP TYPICAL  
CONT WITH

#### NOTES

PROVIDE WOOD BLOCKING AS REQUIRED FOR ALL FOR ALL DRYWALL MOUNTED ACCESSORIES, TYP.

PROVIDE CONT. SEALANT ON ALL SIDES OF EACH FIXTURE, (TYP)



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PROFESSIONAL IN CHARGE  
ADOLFO J. COTILLA, JR., AIA  
REGISTRATION  
NUMBER AR-0008011

100% SUBMITTAL

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
WASHROOM DETAILS  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

| NO. | REVISIONS |             | DATE      | BY  | CHK'D | DESCRIPTION |
|-----|-----------|-------------|-----------|-----|-------|-------------|
|     | WKS       | BLDG. DEPT. |           |     |       | COMMENTS    |
| 1   |           |             | 8/11/2017 | NAP | WRS   |             |
|     |           |             |           |     |       |             |
|     |           |             |           |     |       |             |
|     |           |             |           |     |       |             |
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|     |           |             |           |     |       |             |

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

ENGINEER:  
ACAI ASSOCIATES, INC.  
AIA000011  
DATE: 05.31.2017

DESIGNED BY:  
ACAI  
SCALE: AS NOTED

CHECKED BY:  
EG/WRS  
FIELD BOOK:

DATE: 05.31.2017  
DRAWN BY: NAP  
SCALE: AS NOTED

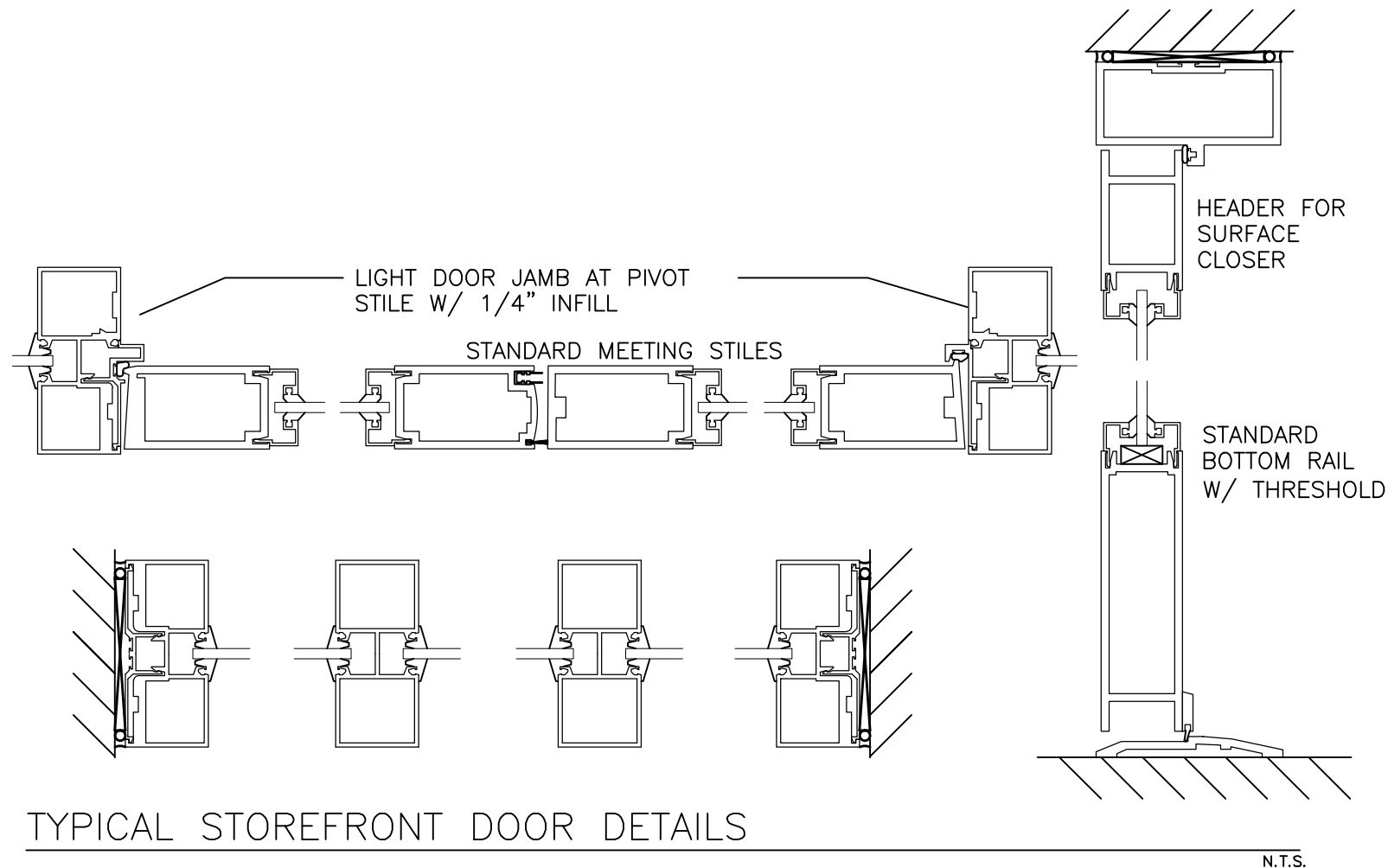
SHEET NO. OF  
A108 14  
TOTAL: 65  
CAD FILE: 12188-WASHROOMS  
DRAWING FILE NO. 4-140-42



**NOTES:**

- ## ABBREVIATIONS

|        |                          |
|--------|--------------------------|
| ALUM   | ALUMINUM                 |
| STL    | STEEL                    |
| UC     | UNDERCUT                 |
| LV     | LOUVER                   |
| HG     | HARDWARE GROUP           |
| MTL    | METAL                    |
| PT     | PAINTED                  |
| SCW-PT | SOLID CORE WOOD, PAINTED |
| C.W.   | CLEAR WIRE               |
| T.C.   | TIMBERED, CLEAR          |
| NG     | NARROW GLASS             |
| FG     | FULL GLASS               |
| IM     | IMPACT GLASS             |
| VP     | VIEW PANEL               |
| w/     | WITH                     |
| TYP    | TYPICAL                  |
| FF     | FULL FLUSH               |
| WD-PH  | WOOD PREHUNG             |
| WDP    | WOOD, PAINTED            |
| SF     | STORE FRONT              |
| SF/LT  | STORE-FRONT/SIDE-LITE    |
| HM     | HOLLOW METAL             |
| R.O.   | ROUGH OPENING            |



## WINDOW ELEVATION TYPES

# 100% SUBMITTAL

**ACA I**  
associates, inc.  
architecture • engineering  
roofing • consulting  
construction management

ACA001323 • EB0004379 • CGC010769  
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**PROFESSIONAL IN CHARGE**  
ADOLFO J. COTILLA, JR., AIA

**REGISTRATION**  
NUMBER AR—0008011

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
DOOR & WINDOW SCHEDULE  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                     |           |
|---------------------|-----------|
| SHEET NO.           | OF        |
| <b>A109</b>         | <b>14</b> |
| TOTAL:              | 65        |
| CAD FILE:           |           |
| 12188-DOORS/WINDOWS |           |
| DRAWING FILE NO.    |           |
| 4-140-42            |           |



INTERIOR FINISH PLAN GENERAL NOTES:

A. GENERAL

- 1.THE CONTRACTOR SHALL NOT SCALE DRAWINGS. IF DIMENSIONS ARE IN QUESTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ARCHITECT BEFORE CONTINUING WITH WORK.
- 2.THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ITEMS REQUIRING FINISH SELECTIONS THAT ARE NOT CLARIFIED IN THE CONTRACT DOCUMENTS OR IN THE PROJECT MANUAL.
- 3.THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IF ANY WORK INDICATED IN THE CONTRACT DOCUMENTS CAN NOT BE PERFORMED DUE TO EXISTING FIELD CONDITIONS.
4. ALL CLOSETS AND ALCOVES NOT LABELED WITH A FINISH TAG ARE TO BE FINISHED TO MATCH ADJACENT ROOM/SPACE.
5. WHERE FINISHES ARE AFFECTED BY THE SCOPE OF WORK, MATCH TEXTURE, TYPE, AND COLOR OF ADJACENT SURFACE
6. ALL ACTUAL FINISHES SAMPLES ARE TO BE REVIEWED AND APPROVED BY OWNER PRIOR TO ISSUANCE OF SHOP DRAWINGS TO ARCHITECT

B. FLOORING TRANSITIONS

- 1.FLOORING TRANSITIONS SHALL OCCUR AT THE CENTERLINE OF ALL DOORS, UNLESS OTHERWISE DESIGNATED BY FLOOR TRANSITION SYMBOLS ON THE FINISH PLANS.
- 2.TRANSITIONS ARE AS FOLLOWS:  
CARPET TO RESILIENT - REFER TO TM-1  
LUXURY VINYL PLANK TO EXISTING TERRAZZO - REFER TO TM-2  
TERRAZZO TO CARPET - REFER TO DETAIL 4/A-204

C. INTERIOR PAINTING

- 1.PAINT VERTICAL AND HORIZONTAL SURFACES OF BULKHEADS AND SOFFITS TO MATCH THE ADJACENT WALL. PAINT FINISH, UNLESS OTHERWISE NOTED.
- 2.ALL EXISTING WALLS IMPACTED BY RENOVATION THAT CALL FOR NEW FINISHES SHALL BE PAINTED FROM FLOOR TO CEILING AND END TO END OF DISRUPTED PLANE.
- D. WINDOWS, DOORS, DOOR FRAMES
- 1.CONTRACTOR SHALL PAINT ALL METAL ACCESS DOORS, ELECTRICAL PANELS, RECESSED CABINET FACES, HVAC REGISTERS, GRILLES, ETC. TO MATCH ADJACENT WALL COLOR, UNLESS LOCAL CODES REQUIRE OTHERWISE, ALL FIRE EXTINGUISHER CABINETS AND FIRE DEPARTMENT VALVE CABINETS SHALL BE PAINTED TO MATCH ADJACENT WALL COLOR, UNLESS OTHERWISE NOTED.
- 2.INTERIOR HOLLOW METAL DOORS AND DOOR FRAMES SHALL BE PAINTED DPNT-2.
3. EXISTING INTERIOR METAL DOORS AND FRAMES TO BE REPAINTED SHALL RECEIVE PAINT COLOR, DPNT-2.

E. CEILINGS

1. ALL GYPSUM BOARD CEILINGS SHALL BE PAINTED CPNT-1, UNLESS NOTED OTHERWISE. REFER TO REFLECTED CEILING PLANS FOR ACCENT SOFFIT/CEILING COLORS.
- FINISH NOTES
1. ALL INTERIOR FINISHES SHALL COMPLY WITH NFPA 101 - 10.2 AND FBC - 803.1 & TABLE 803.9
2. CONTRACTOR SHALL REFER TO THE INTERIORS FINISH LISTING ON THIS SHEET, GENERAL NOTES AND THE SPECIFICATIONS FOR ADDITIONAL PRODUCT INFORMATION.
3. ALL FINISHES ARE TO BE REVIEWED BY OWNER.
4. MINIMUM CRITICAL RADIANT FLUX FOR INTERIOR FLOOR FINISHES AND FLOOR COVERINGS SHALL NOT BE LESS THAN CLASS II AND SHALL COMPLY WITH DOCFF-1 "PILL TEST" (CSPSC 16CFR, PAR 1630) PER FBC 804.4.1

LEGEND:

XX-XX — FLOOR  
XX-XX — BASE  
XX-XX — WALL  
XX-XX — CEILING

XX-XX — ACCENT OR SPECIFIC FINISH

----- CEILING CHANGE / CEILING TREATMENT ABOVE  
----- EXISTING TO REMAIN  
===== NEW CONSTRUCTION

CARPET VCT NOT IN SCOPE  
TERRAZZO VINYL PLANK (LVP)

PARTIAL LIST OF ABBREVIATIONS USED ON THIS SHEET:

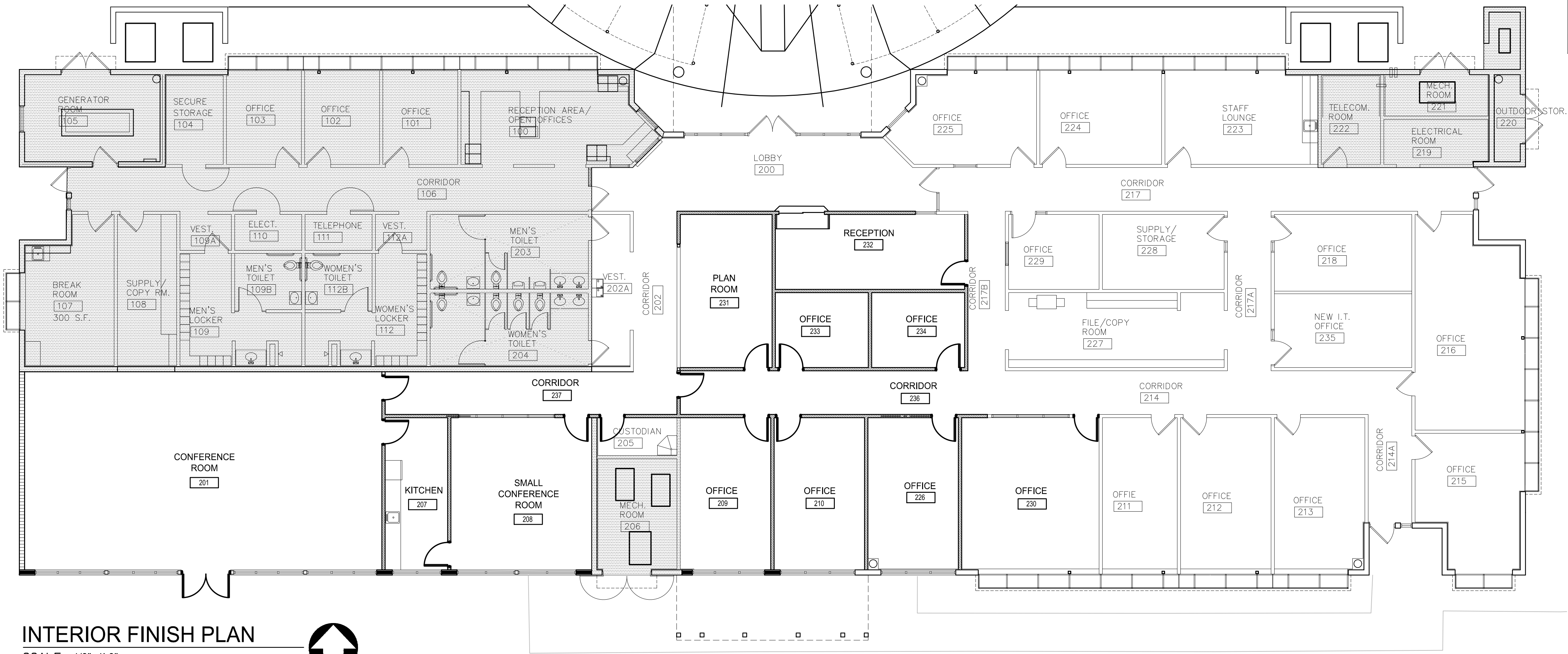
|      |                         |     |                          |
|------|-------------------------|-----|--------------------------|
| ACT  | ACOUSTICAL CEILING TILE | TM  | TRANSITION TRIM MOULDING |
| CPT  | CARPET TILE             | WDV | WOOD VENEER              |
| CPNT | CEILING PAINT           |     |                          |
| DPNT | DOOR/FRAME PAINT        |     |                          |
| EPF  | EPOXY FLOOR SYSTEM      |     |                          |
| ETR  | EXISTING TO REMAIN      |     |                          |
| IB   | INTEGRAL BASE           |     |                          |
| PFT  | PORCELAIN FLOOR TILE    |     |                          |
| PNT  | PAINT                   |     |                          |
| PWB  | PORCELAIN WALL BASE     |     |                          |
| RB   | RESILIENT BASE          |     |                          |
| SSC  | SOLID SURFACE COUNTER   |     |                          |

ROOM FINISH SCHEDULE

| NUMBER | NAME                 | FLOOR | BASE  | WALLS       | CEILING | MILLWORK<br>COUNTERTOP CABINETS | REMARKS |
|--------|----------------------|-------|-------|-------------|---------|---------------------------------|---------|
| 200    | LOBBY                | PFT-1 | PWB-1 | PNT-1       | CPNT-1  |                                 |         |
| 201    | CONFERENCE ROOM      | PFT-1 | PWB-1 | PNT-1       | ACT-1   |                                 |         |
| 202    | CORRIDOR             | PFT-1 | PWB-1 | PNT-1       | ACT-1   |                                 |         |
| 202A   | VESTIBULE            | PFT-1 | PWB-1 | PNT-1       | ACT-1   |                                 |         |
| 203    | MEN'S TOILET         | PFT-2 | PWB-1 | PNT-1/PWT-1 | ACT-1   | SSC-1                           |         |
| 204    | WOMEN'S TOILET       | PFT-2 | PWB-1 | PNT-1/PWT-1 | ACT-1   | SSC-1                           |         |
| 205    | CUSTODIAN            | EPF-1 | IB    | PNT-1       | CPNT-1  |                                 |         |
| 207    | KITCHEN              | PFT-1 | PWB-1 | PNT-1       | ACT-1   | SSC-1                           | WDV     |
| 208    | SMALL CONFERENCE RM. | PFT-1 | PWB-1 | PNT-1       | ACT-1   |                                 |         |
| 209    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 210    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 209    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 210    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 211    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 212    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 213    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 214    | CORRIDOR             | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 214A   | CORRIDOR             | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 215    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 216    | OFFICE               | PFT-1 | PWB-1 | PNT-1       | ACT-1   |                                 |         |
| 217A   | CORRIDOR             | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 217B   | CORRIDOR             | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 218    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 219    | ELECTRICAL ROOM      | ETR   | ETR   | PNT-1       | CPNT-1  |                                 |         |
| 222    | TELECOM ROOM         | ETR   | ETR   | PNT-1       | CPNT-1  |                                 |         |
| 223    | STAFF LOUNGE         | PFT-1 | PWB-1 | PNT-1       | ACT-1   | SSC-1                           | WDV     |
| 224    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 225    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 226    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 227    | FILE/COPY RM.        | CPT-1 | RB-1  | PNT-1       | ACT-1   | SSC-1                           | WDV     |
| 228    | SUPPLY/STOR. RM.     | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 229    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 230    | OFFICE               | PFT-3 | PWB-3 | PNT-1       | ACT-1   |                                 |         |
| 231    | BADGING TRAINING     | PFT-1 | PWB-3 | PNT-1       | ACT-1   | SSC-1                           | WDV     |
| 232    | RECEPTION            | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 233    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 234    | OFFICE               | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 235    | NEW I.T. ROOM        | ESD-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 236    | CORRIDOR             | CPT-1 | RB-1  | PNT-1       | ACT-1   |                                 |         |
| 237    | CORRIDOR             | PFT-1 | PWB-1 | PNT-1       | ACT-1   |                                 |         |

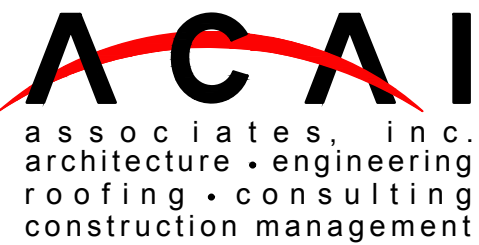
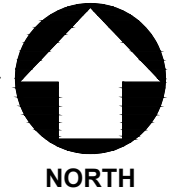
FINISH LEGEND

| FLOORING   | WALL   |
|--|--|
| <b>CPT-1</b> CARPET TILE<br>MOHAWK GROUP<br>ON THE SCENE COLLECTION<br>HUSTLE & BUSTLE GT307<br>COLOR: 949 SHARP<br>SIZE: 24"x24"            | <b>PNT-1</b> SHERWIN WILLIAMS<br>EG-SHEL. COLOR: SW 7009 PEARLY WHITE  |
| <b>PFT-1</b> PORCELAIN FLOOR TILE<br>DAL TILE<br>DIGNITARY<br>COLOR: LUMINARY WHITE DR07<br>FINISH: UNPOLISHED<br>SIZE: 12"x24" & 24"x48"    | <b>PNT-2</b> ACCENT PAINT COLOR<br>SHERWIN WILLIAMS<br>EG-SHEL. COLOR: SW 6766 MARINER   |
| <b>PFT-2</b> PORCELAIN FLOOR TILE<br>DAL TILE<br>DIGNITARY<br>COLOR: SUPERIOR TAUPE<br>FINISH: UNPOLISHED<br>SIZE: 12"x24" & ABSTRACT MOSAIC | <b>PNT-3</b> ACCENT PAINT COLOR<br>SHERWIN WILLIAMS<br>EG-SHEL. COLOR: SW 6774 FRESHWATER  |
| <b>PFT-3</b> DEKTON ARCHITECTURAL SURFACES<br>COLOR: MAKAI<br>FLOOR FORMAT: 28"x28"  | <b>PNT-4</b> ACCENT PAINT COLOR<br>SHERWIN WILLIAMS<br>EG-SHEL. COLOR: SW 7658 GRAY CLOUDS   |
| <b>EPF-1</b> STONHARD, STONCLAD GS<br>COLOR: CHARCOAL WIC7<br>SEALER   | <b>PWT-1</b> PORCELAIN WALL TILE<br>DAL TILE<br>AMBASSADOR<br>COLOR: WANDERLUST WHITE AM36<br>FINISH: UNPOLISHED<br>SIZE: 12" x 24"  |
| <b>ESD-1</b> ESD VINYL TILE<br>FLEXCO<br>DALANE ESD VINYL<br>COSMIC LATTE 316  | <b>MILLWORK &amp; MISC.</b>  |
| <b>WALL BASE:</b>  | <b>SSC-1</b> SOLID SURFACE<br>FORMICA<br>748 WHITE RENEW   |
| <b>PWB-1</b> PORCELAIN BULLNOSE<br>DAL TILE<br>DIGNITARY<br>COLOR: LUMINARY WHITE DR07<br>FINISH: UNPOLISHED<br>SIZE: 3"x24"                 | <b>CSB-1</b> COUNTER SUPPORT BRACKET<br>FASTCAP<br>SPEEDBRACE<br>SIZE: COORDINATE W/ DEPTH OF<br>COUNTER, REFER TO MILLWORK<br>DETAILS<br>FINISH: PRIMED, PAINT TO MATCH PNT-1<br>OR TO MATCH COLOR OF WALL. |
| <b>PWB-2</b> PORCELAIN COVE BASE<br>DAL TILE<br>DIGNITARY<br>COLOR: SUPERIOR TAUPE<br>FINISH: UNPOLISHED<br>SIZE: 6"x12"                     |  |
| <b>PWB-3</b> DEKTON ARCHITECTURAL SURFACES<br>COLOR: MAKAI<br>FLOOR FORMAT: 4"x28"   |  |
| <b>RB-1</b> WALL BASE<br>FLEXCO<br>TP-BASE 2000<br>B2-092 GRAY/STONE   |  |
| <b>TRANSITION MOULDINGS</b>  |  |
| <b>TM-1</b> JONHSONITE<br>ADAPTOR TRANSITION<br>CTA-XXX-A<br>COLOR: 20 CHARCOAL  | <b>DOORS AND FRAMES:</b>   |
| <b>CEILING:</b>  | <b>DPNT-1</b> HM DOORS/ FRAMES PAINT<br>SHERWIN WILLIAMS<br>SEMI-GLOSS<br>COLOR: SW 7658 GRAY CLOUDS   |
| <b>CPNT-1</b> SHERWIN WILLIAMS<br>FINISH:COLOR: SW 7005 PURE WHITE   | <b>DPNT-2</b> WOOD DOORS<br>STAIN<br>COLOR: TO MATCH EXISTING WOOD<br>DOORS  |
| <b>ACT-1</b> ARMSTRONG ULTIMA #1912<br>24"x24 BEVELED TEGULAR<br>9/16" SUSPENSION GRID SYSTEM -<br>SUPRAFINE XL. COLOR: WHITE                |  |



INTERIOR FINISH PLAN

SCALE: 1/8"=1'-0"



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REGISTRATION  
NUMBER AR-0008011

ENGINEER:  
ACAI ASSOCIATES, INC.  
0006011  
DATE: 06.31.2017

DRAWN BY: DATE: 05.31.2017  
NAP DESIGNED BY: SCALE: AS NOTED  
ACAI CHECKED BY: EG/WFS  
EG/WFS FIELD BOOK:

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISONS | DESCRIPTION |
|----------|-------------|
| NO.      | DATE        |
|          |             |
|          |             |
|          |             |
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PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
INTERIOR SCHEDULE  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                  |                     |
|------------------|---------------------|
| SHEET NO.        | OF                  |
| A110             | 14                  |
| TOTAL:           | 65                  |
| CAD FILE:        | 12188-INTERIOR SCH. |
| DRAWING FILE NO. | 4-140-42            |



HVAC NOTES

**GENERAL NOTES:**

- ALL MECHANICAL SYSTEMS ARE TO BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE SECTIONS OF THE NFPA STANDARDS, ANSI STANDARDS, THE LOCAL BUILDING CODE, NOISE & HEIGHT ORDINANCES, PLANS AND SPECIFICATIONS.
- ALL MATERIALS SHALL BE NEW AND ALL WORKMANSHIP AND MATERIALS SHALL BE IN STRICT ACCORDANCE WITH APPLICABLE LOCAL CODES, PRODUCT APPROVAL, RULES AND ORDINANCES. ANY DAMAGED EQUIPMENT SHALL BE REPLACED OR RESTORED TO ORIGINAL CONDITION.
- THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, ACCESS PANELS, CONTROL SYSTEMS, DEVICES, PERMITS AND SERVICES NECESSARY FOR FURNISHING AND INSTALLING A COMPLETE OPERABLE MECHANICAL SYSTEM.
- ALL LOUVERS, GRILLES, PIPING, ETC. SHALL BE PAINTED TO MATCH SURROUNDING COLOR AND TEXTURES AS REQUIRED BY ARCHITECT. VERIFY COLOR AND TEXTURE WITH ARCHITECT. PAINT ALL EXPOSED MECHANICAL EQUIPMENT WITH BENJAMIN MOORE EPOXY ENAMEL 182.
- THE CONTRACTOR SHALL PROVIDE PLASTIC OR ALUMINUM TYPE EQUIPMENT IDENTIFICATION LABELS FOR ALL MECHANICAL EQUIPMENT AS PER SCHEDULE TAGS (SECTION 05-00).
- ALL O/A INTAKES SHALL HAVE A 2" HIGH STENCILED LETTERING READING "INTAKE" PER FBC REQUIREMENTS.
- ALL CUTTING, PATCHING, STRUCTURAL STEEL, WEATHER PROOFING, PAINTING, AND WALL OPENINGS SHALL BE BY THE GENERAL CONTRACTOR.
- ALL OPENINGS IN BUILDING STRUCTURE, FOR DUCTWORK, PIPING, ETC. TO BE 1/2" LARGER (ON ALL SIDES) THEN THE OUTSIDE DIMENSIONS. FILL VOIDS WITH FIRE RETARDANT SILICONE FOAM (I.E. CHASE-FOAM CTC PR-855 BY CHASE TECHNOLOGY CORP.).
- PROVIDE FLEXIBLE DUCT CONNECTORS, RATED AS REQUIRED, TO ALL FANS, A/C UNITS, OR MECHANICAL EQUIPMENT.
- PROVIDE MAINTENANCE AND OPERATION MANUAL ON ALL MECHANICAL EQUIPMENT OR SYSTEMS. PROVIDE 5 SETS OF SUBMITTALS ON ALL HVAC EQUIPMENT. SUBMITTALS SHALL HAVE A SUMMARY SHEET SHOWING ALL SCHEDULED INFORMATION.
- HVAC CONTRACTOR WILL WARRANTY ALL MECHANICAL SYSTEMS, DUCTWORK, THERMOSTATS, AND ALL OTHER EQUIPMENT, PARTS AND LABOR UNDER THESE DRAWINGS AND SPECIFICATIONS FOR A PERIOD OF ONE (1) YEAR AFTER C.O. OF BUILDING. ANY REPAIRS REQUIRING SYSTEM SHUT DOWN WILL BE DONE DURING NON OPERATIONAL PERIODS. HVAC CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES PRIOR TO BIDDING AND PURCHASING ANY EQUIPMENT.
- AIR QUALITY SHOULD BE TESTED BEFORE OCCUPANCY AND SHOULD BE INSTRUMENTED AND MONITORED THEREAFTER, OR AT LEAST AT REGULAR INTERVALS.

**MECHANICAL EQUIPMENT NOTES:**

- ALL MECHANICAL EQUIPMENT SHALL BE ARI & U.L. LISTED WHERE APPLICABLE AND RATED FOR THE REQUIRED SERVICE, PRESSURES, TEMPERATURES, AND SHALL BE PROVIDED WITH ALL NECESSARY TRANSFORMERS, SEALS, VALVES, CONNECTIONS, ETC. TO FUNCTION PROPERLY.
- PROVIDE IONIZATION TYPE SMOKE DETECTORS IN THE S/A AND R/A DUCTS OF ALL AIR HANDLING EQUIPMENT WITH AIR DELIVERY CAPACITIES GREATER THAN 2000 CFM TO SHUT DOWN THE UNIT UPON DETECTION OF SMOKE. SMOKE DETECTORS SHALL BE LOCATED TO PROVIDE ACCESS FOR MAINTENANCE AND INSPECTION AND SHALL NOT BE HIGHER THAN 48" ABOVE CEILING. SMOKE DETECTOR SHALL BE UL268A LISTED AND COMPATIBLE WITH THE FACTOR SERIES 209B OR APPROVED EQUIVALENT. PROVIDE AUDIO-VISUAL TEST STATION, PER NFPA 90A-4-4, MOUNTED BELOW THE CEILING OVER NORMALLY-OCCUPIED SPACE. DO NOT LOCATE IN RESTROOMS, JANITOR OR STORAGE). PROVIDE DUCT ACCESS DOORS FOR MAINTENANCE AND INSPECTION OF SMOKE DETECTORS. ALL SMOKE DETECTORS SHALL BE BY ONE MANUFACTURER, COORDINATE VOLTAGE ETC. WITH ELECTRICAL CONTRACTOR AND FIRE ALARM SYSTEM BEFORE ORDERING.
- PROVIDE TYPE "10" FIRE DAMPERS IN ALL DUCTS OR OPENINGS PENETRATING FIRE RATED WALLS, PARTITIONS, FLOORS OR ROOF SLABS AND AT FRESH AIR INTAKES IF REQUIRED (SEE ARCHITECTS PLANS FOR RATINGS). PROVIDE RADIATION DAMPERS RATED CEILING FOR ALL CEILING OPENINGS. CEILING FANS, DIFFUSERS OR GRILLES RATED FOR USE IN THE CEILING ASSEMBLY AS SPECIFIED BY ARCHITECT.
- IN CASE OF FIRE RATED CORRIDOR DUCTS SHALL PENETRATE THROUGH SIDE OF RATED ENCLOSURE ONLY. (NO PENETRATIONS THROUGH HORIZONTAL RATED STRUCTURE).
- PROVIDE BACKDRAFT DAMPERS ON ALL EXHAUST FANS AND/OR INLINE FANS.
- PROVIDE VIBRATION ISOLATORS ON ALL MECHANICAL EQUIPMENT AS CALLED FOR IN THE SPECIFICATIONS. IF NOT SPECIFIED, AS RECOMMENDED BY MANUFACTURER FOR QUIET OPERATION (WITH 90% ISOLATION EFFICIENCY).
- PROVIDE A MIN. OF 10' CLEARANCE BETWEEN O/A INTAKES AND VTR OR EXHAUST OPENINGS.
- TEMPERATURE AND HUMIDITY SENSOR(S) LOCATION SHALL BE APPROVED BY OWNER AND ARCHITECT BEFORE INSTALLATION.
- RUN INSULATED CONDENSATE DRAINS AS PER PLUMBING DRAWINGS.
- MOUNT ALL ROOFTOP EQUIPMENT (IF USED) FOR WIND LOADS AND MOUNTING HEIGHTS AS REQUIRED BY LOCAL CODES.
- ALL PIPING AND DUCTWORK SHALL BE SLEEVED THRU WALLS, BEAMS, SLABS, ETC. AS REQUIRED AND COORDINATED WITH THE STRUCTURAL ENGINEER. REWORK BAR JOIST CROSS BRACING AND PROVIDE NECESSARY TRANSITIONS AS REQUIRED FOR DUCTWORK INSTALLATION.
- ALL INSULATION WILL HAVE FIRE/SMOKE RATING LESS THAN 25/50.
- PROVIDE MOTOR STARTERS AS FOLLOWS (UNLESS OTHERWISE RECOMMENDED BY MOTOR MANUFACTURER):  
A. PROVIDE OVERLOAD PROTECTION - 1/3 HP AND ABOVE (ALL PHASES).  
B. PROVIDE ACROSS THE LINE VOLTAGE STARTING BELOW 25 HP.
- ALL OUTDOOR EQUIPMENT SHALL COMPLY WITH LOCAL ZONING NOISE ORDINANCES. MIN. REQUIREMENT SHALL NOT EXCEED A NOISE LEVEL OF 65 DB AS MEASURED RADIALLY 30 FT FROM THE EQUIPMENT IN ALL DIRECTIONS.
- FILTERS SHALL BE IN PLACE DURING CONSTRUCTION. PROVIDE A NEW SET PRIOR TO TEST AND BALANCE AND A FINAL SET AT THE END OF ONE YEAR SERVICE PERIOD.
- COUNTERBALANCED BACKDRAFT DAMPERS SHALL BE HEAVY DUTY EXTRUDED ALUMINUM RUSKIN MODEL CB02 OR APPROVED EQUAL.
- ALL SERVICEABLE EQUIPMENT SUCH AS TERMINAL BOXES, VALVES, FIRE DAMPERS, EXHAUST FANS, AIR HANDLING UNITS, ETC., SHALL BE MOUNTED A MAXIMUM OF 14 FEET ABOVE FINISH FLOOR.
- FOR CO2 MONITORING OR CO2-BASED DEMAND CONTROLLED VENTILATION SYSTEM INSTALL CO2 SENSORS BETWEEN 3 FT. AND 6 FT. ABOVE FLOOR. CO2 SENSORS INSTALLED IN THE RETURN DUCT ARE NOT ACCEPTABLE.

| SPLIT SYSTEM SCHEDULE   |             |                  |           |        |     |         |              |                   |      |         |         |         |         |        |   |                  |                      |          |           |   |                 |            |            |       |             |       |      |       |      |  |               |            |                      |       |      |            |            |          |          |
|---|-------------|------------------|-----------|--------|-----|---------|--------------|-------------------|------|---------|---------|---------|---------|--------|---|------------------|----------------------|----------|-----------|---|-----------------|------------|------------|-------|-------------|-------|------|-------|------|--|---------------|------------|----------------------|-------|------|------------|------------|----------|----------|
| AIR HANDLING UNIT   |             |                  |           |        |     |         |              |                   |      |         |         |         |         |        | AIR COOLED CONDENSING UNIT  |                  |                      |          |           |   |                 |            |            |       | SYSTEM DATA |       |      |       |      |  |               |            |                      |       |      |            |            |          |          |
| MARK  | AREA SERVED | MODEL NO.        | TOTAL CFM | OA CFM | ESP | FAN FLA | FAN BHP (HP) | HEATER KW @ 208 V | STEP | EAOB °F | EAWB °F | LABB °F | LAWB °F | WT LBS | MCA FUSE  | UNIT VOLTS-PH-HZ | DIMENSIONS L X W X H | MARK     | MODEL NO. | WT LBS  | AIR VOLTS-PH-HZ | ELECTRICAL | COMPRESSOR |       |             |       | FAN  |       | UNIT | MAX FUSE   | CAPACITY TMBH | REF. LINES | DIMENSIONS L X W X H |       |      |            |            |          |          |
|   |             |                  |           |        |     |         |              |                   |      |         |         |         |         |        |   |                  |                      |          |           |   |                 |            | QTY.       | STAGE | RLA1        | RLA1  | RLA2 | RLA2  | QTY  | FLA  | MCA           |            | TMBH                 | SMBH  | EER  | IPLV       | SUCTION    | LIQUID   |          |
| AHU-A   | SEE PLANS   | CARRIER 40RUAA07 | 2380      | (+)    | 1.0 | 5.2     | 2.4          | 7.5               | 1    | 75.0    | 63.0    | 53.8    | 53.0    | 399    | 32.6 35   | 208-3-60         | 49X29X57             | CU-A     | 38AUZD07  | 389   | 208-3-60        | 1          | 2          | 17.5  | 136.0       | -     | -    | 2     | 1.5  | 25.0   | 30            | 70.1       | 55.1                 | 12.0  | 12.2 | PER NOTE 6 |            | 60X46X43 |          |
| AHU-B   | SEE PLANS   | CARRIER 40RUAA07 | 2435      | (+)    | 1.0 | 5.2     | 2.4          | 7.5               | 1    | 75.0    | 63.0    | 53.8    | 53.0    | 399    | 32.6 35   | 208-3-60         | 49X29X57             | CU-B     | 38AUZD07  | 389   | 208-3-60        | 1          | 2          | 17.5  | 136.0       | -     | -    | 2     | 1.5  | 25.0   | 30            | 70.1       | 55.1                 | 12.0  | 12.2 | PER NOTE 6 |            | 60X46X43 |          |
| AHU-C   | SEE PLANS   | CARRIER 40RUAA14 | 4710      | (+)    | 1.0 | 7.5     | 2.9          | 7.5               | 1    | 75.0    | 63.0    | 56.0    | 54.2    | 425    | 39.4  | 40               | 208-3-60             | 49X29X57 | CU-C      | 38AUDA12  | 516             | 208-3-60   | 2          | 2     | 15.9        | 110.0 | 15.9 | 110.0 | 2    | 1.5  | 39.0          | 50         | 122.4                | 96.9  | 11.2 | 11.6       | PER NOTE 6 |          | 60X46X51 |
| AHU-O/A   | SEE PLANS   | CARRIER 39LF08   | 1200      | 1200   | 1.5 | 4.6     | (1.5)        | -                 | -    | 91.0    | 79.0    | 53.21   | 53.13   | 763    | 5.8   | 10               | 208-3-60             | 49X50X61 | CU-O/A    | 38AUDA12  | 516             | 208-3-60   | 2          | 2     | 15.9        | 110.0 | 15.9 | 110.0 | 2    | 1.5  | 39.0          | 50         | 109.78               | 49.59 | 12.4 | -          | PER NOTE 6 |          | 60X46X51 |
| SPLIT SYSTEM NOTES:   |             |                  |           |        |     |         |              |                   |      |         |         |         |         |        |   |                  |                      |          |           |   |                 |            |            |       |             |       |      |       |      |  |               |            |                      |       |      |            |            |          |          |
| 1. PROVIDE SYSTEM CU-B WITH TWO STAGE OPERATION.  |             |                  |           |        |     |         |              |                   |      |         |         |         |         |        | 7. INSTALL CHEMICAL DRYER AND STRAINER IN REFRIGERANT LIQUID LINES.                             |                  |                      |          |           |   |                 |            |            |       |             |       |      |       |      |  |               |            |                      |       |      |            |            |          |          |
| 2. PROVIDE SPLIT TYPE COOLING COIL WITH INTERWIND ROW SPLIT (DUAL CIRCUIT-DUAL COMPRESSOR) FOR SYSTEMS AHU-C/CU-C AND AHU-OA/CU-OA. |             |                  |           |        |     |         |              |                   |      |         |         |         |         |        | 8. PROVIDE BUILT-IN DISCONNECT WITH ALL AIR HANDLING UNITS.                                     |                  |                      |          |           |   |                 |            |            |       |             |       |      |       |      |  |               |            |                      |       |      |            |            |          |          |
| 3. PROVIDE INTERWIND 6 ROW/ 8 FPI COIL FOR AHU-OA.  |             |                  |           |        |     |         |              |                   |      |         |         |         |         |        | 9. INSULATE REFRIGERANT SUCTION LINE WITH 3/4" FIRE RETARDANT ARMAFLEX.                         |                  |                      |          |           |   |                 |            |            |       |             |       |      |       |      |  |               |            |                      |       |      |            |            |          |          |
| 4. PROVIDE 2" PLEATED MERV 8 FILTER.  |             |                  |           |        |     |         |              |                   |      |         |         |         |         |        | 10. ALL REFRIGERATION COMPRESSORS SHALL BE WARRANTED FOR 5 YEARS.                               |                  |                      |          |           |   |                 |            |            |       |             |       |      |       |      |  |               |            |                      |       |      |            |            |          |          |
| 5. PROVIDE CORROSION RESISTANT COATING FOR CONDENSER COIL.  |             |                  |           |        |     |         |              |                   |      |         |         |         |         |        | 11. O/A IS PROVIDED BY 100% OA AHU-OA.  |                  |                      |          |           |   |                 |            |            |       |             |       |      |       |      |  |               |            |                      |       |      |            |            |          |          |
| 6. SIZE AND RUN REFRIGERANT PIPING AS MANUFACTURER'S LATEST PUBLISHED RECOMMENDATIONS BASED ON PIPE LENGTH.                         |             |                  |           |        |     |         |              |                   |      |         |         |         |         |        | (**) SYSTEM AHU-A/CU-A SHALL BE REPLACED. AIR DISTRIBUTION REMAIN THE SAME PER ORIGINAL DESIGN. |                  |                      |          |           |   |                 |            |            |       |             |       |      |       |      |  |               |            |                      |       |      |            |            |          |          |
|   |             |                  |           |        |     |         |              |                   |      |         |         |         |         |        |   |                  |                      |          |           | NOTES TO CONTRACTOR:<br>SYSTEMS AHU-C/CU-C AND AHU-OA/CU-OA REQUIRE INSTALLATION OF ADDITIONAL SET OF REFRIGERANT LINES.<br>CONTRACTOR TO FIELD COORDINATE ACTUAL ROUTE FOR NEW REFRIG LINES. |                 |            |            |       |             |       |      |       |      | CU UNIT HAVE CLEARANCES AS FOLLOWS:<br>TOP ~ DO NOT RESTRICT.<br>36" ONE SIDE, 12" THE OTHER.<br>PANEL SIDE ~ 48" PER NEC. |               |            |                      |       |      |            |            |          |          |

| PACKAGED ROOFTOP AIR CONDITIONING EQUIPMENT SCHEDULE                           |                     |       |     |              |      |     |     |            |       |      |      |      |           |     |  |            |      |          |      |      |          |      |       |       |   |            |         |              |   |  |  |  |  |  |
|--|---------------------|-------|-----|--------------|------|-----|-----|------------|-------|------|------|------|-----------|-----|--|------------|------|----------|------|------|----------|------|-------|-------|---|------------|---------|--------------|---|--|--|--|--|--|
| MARK   | MODEL               | CFM   |     | HEATER       |      | FAN |     | COMPRESSOR |       |      |      |      | COND. FAN |     | UNIT   | ELECTRICAL |      | EAT      |      | LAT  | CAPACITY |      | EER   | IEER  | WT  | DIMENSIONS | REMARKS |              |   |  |  |  |  |  |
| RTU  | NUMBER              | TOTAL | OA  | KWH<br>208 V | STEP | ESP | BHP | NO.        | STAGE | RLA1 | RLA1 | RLA2 | RLA2      | NO. | FLA  | MCA        | MOCP | V-PH-HZ  | DB   | WB   | DB       | WB   | TMBH  | SMBH  |   |            | LBS     | (LXWXH); IN. |   |  |  |  |  |  |
| RTU-1  | CARRIER<br>50TC-D09 | 3200  | 500 | -            | -    | 1.0 | 1.5 | 2          | 2     | 14.5 | 98.0 | 13.7 | 83.0      | 2   | 1.5  | 42         | 50   | 280-3-60 | 76.6 | 64.8 | 54.8     | 54.5 | 99.59 | 75.23 | 11.20                                       | 11.7       | 870     | 89X60X50     | (2) COMPRESSOR-(2) STAGE COOLING<br>HUMID-MIZER DEHUMIDIFICATION SYSTEM |  |  |  |  |  |
| <b>ROOFTOP AC NOTES:</b>   |                     |       |     |              |      |     |     |            |       |      |      |      |           |     |  |            |      |          |      |      |          |      |       |       |   |            |         |              |   |  |  |  |  |  |
| 1. OUTSIDE DESIGN CONDITIONS: 92DB - 78DB (FT. LAUDERDALE, FL)                 |                     |       |     |              |      |     |     |            |       |      |      |      |           |     | 10. PROVIDE CORROSION RESISTANT COATING FOR CONDENSER COIL.  |            |      |          |      |      |          |      |       |       | 16. PROVIDE CO2 SENSOR.                     |            |         |              |   |  |  |  |  |  |
| 2. PROVIDE A/C UNITS W/ PROGRAMMABLE THERMOSTAT.                               |                     |       |     |              |      |     |     |            |       |      |      |      |           |     | 11. PROVIDE FLOAT SWITCH IN DRAIN PAN WIRED TO DEACTIVATE UNIT UPON CONDENSATE BACK-UP.  |            |      |          |      |      |          |      |       |       | 17. PROVIDE UNITS WITH DIRTY FILTER SWITCH. |            |         |              |   |  |  |  |  |  |
| 3. PROVIDE OUTSIDE AIR INTAKE WITH RAINHOOD, WMS AND MOTORIZED CONTROL DAMPER. |                     |       |     |              |      |     |     |            |       |      |      |      |           |     | 12. PROVIDE FILTER RACK W/ MERV 8 FILTER.  |            |      |          |      |      |          |      |       |       | 18. PROVIDE NON-FUSED DISCONNECT.           |            |         |              |   |  |  |  |  |  |
| 4. PROVIDE SINGLE POINT KIT FOR ELECTRICAL HOOK-UP.                            |                     |       |     |              |      |     |     |            |       |      |      |      |           |     | 13. PROVIDE NON-CORROSIVE CONDENSATE DRAIN PAN.  |            |      |          |      |      |          |      |       |       |   |            |         |              |   |  |  |  |  |  |
| 5. PROVIDE DISCONNECT SWITCH WITH ALL ROOFTOP PACKAGE UNITS.                   |                     |       |     |              |      |     |     |            |       |      |      |      |           |     | 14. MANUFACTURER SHALL PROVIDE SIGNED AND SEALED DRAWINGS SHOWING MECHANICAL UNIT CABINET AND ATTACHMENT METODOLOGY ARE IN COMPLIANCE WITH THE FBC 5TH EDITION WIND LOAD REQUIREMENTS. |            |      |          |      |      |          |      |       |       |   |            |         |              |   |  |  |  |  |  |
| 6. PROVIDE DUCT SMOKE DETECTOR AS SHOWN ON PLANS.                              |                     |       |     |              |      |     |     |            |       |      |      |      |           |     | 15. CURB ANCHORING TO ROOF AS PER DETAILS IN STRUCTURAL ENGINEER PLANS.  |            |      |          |      |      |          |      |       |       |   |            |         |              |   |  |  |  |  |  |
| 7. PROVIDE FACTORY FABRICATED ROOFCURB WITH PROPER VIBRATION ISOLATORS.        |                     |       |     |              |      |     |     |            |       |      |      |      |           |     |  |            |      |          |      |      |          |      |       |       |   |            |         |              |   |  |  |  |  |  |
| 8. PROVIDE WIND RATED CURB WITH VIBRATION ISOLATION.                           |                     |       |     |              |      |     |     |            |       |      |      |      |           |     |  |            |      |          |      |      |          |      |       |       |   |            |         |              |   |  |  |  |  |  |
| 9. PROVIDE MULTIZONE VAV RTU WITH VFD.   |                     |       |     |              |      |     |     |            |       |      |      |      |           |     |  |            |      |          |      |      |          |      |       |       |   |            |         |              |   |  |  |  |  |  |

| STANDARD DUCT SEALING REQUIREMENTS   |   |  |
|--|---|--|
| (BASED ON SMACNA)  |   |  |
| SEAL CLASS   | SEALING REQUIREMENTS  | APPLICABLE STATIC PRESSURE CONSTRUCTION STANDARD |
| A  | ALL TRANSVERSE JOINTS, LONGITUDINAL SEAMS, AND DUCT WALL PENETRATIONS | 4" WG AND UP (1000 PA)                           |
| B  | ALL TRANSVERSE JOINTS AND LONGITUDINAL SEAMS ONLY                     | 3" WG (750 PA)                                   |
| C  | TRANSVERSE JOINTS ONLY  | 2" WG (500 PA)                                   |
| NOTE:<br>IN ADDITION TO THE ABOVE, ANY VARIABLE AIR VOLUME SYSTEM DUCT OF 1" (250 PA) AND 1/2" WG (125 PA) CONSTRUCTION CLASS THAT IS UPSTREAM OF THE VAV BOXES SHALL MEET SEAL CLASS C. |   |  |

| OUTSIDE AIR DAMPER CONTROLS NOTES |   |
|-----------------------------------|---|
| 1.                                | OUTDOOR AIR SUPPLY DUCT SHALL BE EQUIPPED WITH MOTORIZED DAMPER THAT WILL AUTOMATICALLY SHUT WHEN THE SPACE SERVED IS NOT IN USE.   |
| 2.                                | MOTORIZED DAMPERS SHALL NOT BE LESS THAN A CLASS 1 LEAKAGE-RATED DAMPER WITH A MAXIMUM LEAKAGE RATE OF 4 CFM PER SQUARE FOOT AT 1.0 INCH WATER GAGE WHEN TESTED IN ACCORDANCE WITH AMCA 560B. |
| 3.                                | OUTSIDE AIR DUCTS SHALL BE PROVIDED WITH A VOLUME MANUAL DAMPER, DOWNSTREAM FROM THE MOTORIZED DAMPER. DAMPER SHALL BE ADJUSTED TO PROVIDE THE AIRFLOW RATE REQUIRED BY CODE.                 |

# AIR DISTRIBUTION/DUCTWORK NOTES

- REFER TO ARCHITECTURAL PLANS FOR CEILING TYPE.
- PROVIDE OFF WHITE FINISH (SUBJECT TO ARCHITECT'S APPROVAL).
- DUCTWORK MATERIALS:  
DUCTWORK MATERIALS VS AC SYSTEMS:

| AC SYSTEM | HIGH PRESSURE DUCT<br>(VAV DUCT FROM RTU TO MEET 1/2" VAV BOX) | LOW PRESSURE DUCT<br>(VAV BOX TO FIELD AND EXHAUST DEVICE<br>AND RETURN OR OUTSIDE AIR) |
|-----------|--|---|
| RTU-1     | A.1  | A.2   |
| AHU-B     |  | A.2   |
| AHU-C     |  | A.2   |
| AHU-O/A   |  | A.1   |

DUCT SEAL CLASS AS PER SMACNA STANDARD DUCT SEALING REQUIREMENTS. (REFER TO TABLE)

- GALVANIZED SHEET METAL W/ DUCT WRAP INSULATION WITH VAPOR BARRIER. JOHNS MANVILLE MICROGLITE TYPE 75, 1.5 INCH THICKNESS, R=4.2 (MIN.) UNLESS OTHERWISE NOTED.
- PROVIDE 1-1/2" THICK FIBERGLASS DUCT BOARD WITH VAPOR BARRIER (R=6 MIN) JOHNS MANVILLE MAT-FACED MICRO AIRE OR EQUIVALENT.
- EXHAUST AIR DUCTWORK: GALVANIZED SHEETMETAL.
- FLEXIBLE AIR DUCT SHALL BE UL 181 RATED. SUCH DUCTS SHALL BE LISTED AND LABELED AS CLASS 0 OR CLASS 1 FLEXIBLE DUCTS. FLEXIBLE DUCT INSULATION TO BE R-4.2 MINIMUM.
- INSULATION SHALL BE PROTECTED FROM DAMAGE, INCLUDING THAT DUE TO SUNLIGHT, MOISTURE, EQUIPMENT MAINTENANCE, AND WIND, BUT NOT LIMITED TO THE FOLLOWING:
  - INSULATION EXPOSED TO WEATHER SHALL BE PROTECTED BY 20 GA SHEET METAL.
  - INSULATION COVERING COOLING DUCTS LOCATED OUTSIDE THE CONDITIONED SPACE SHALL INCLUDE A VAPOR RETARD LOCATED OUTSIDE THE INSULATION.
- PROVIDE FOIL-FACED INSULATION (MIN. R=5.6) ON TOP/BACK OF ALL AIR DEVICES. TAPE ALL JOINTS AND SEAMS TO PROVIDE CONTINUOUS VAPOR BARRIER OVER DEVICE AND FLEXIBLE CONNECTION.
- ALL DUCTWORK AND DIFFUSERS SHALL BE RATED FOR THE USE, PRESSURE AND TEMPERATURE SPECIFIED AND AS REQUIRED BY THE CEILING SYSTEM RATING.
- ALL DUCTWORK SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH "SMACNA" STANDARDS AND LOCAL BUILDING CODES.
- ALL DUCT SIZES ARE CLEAR INSIDE DIMENSIONS.
- SEAL ALL DUCTS, JOINTS AND SEAMS IN AN APPROVED MANNER AND INSURE AGAINST LEAKAGE.
- PROVIDE ACCESS DOORS AS REQUIRED FOR ALL MECHANICAL EQUIPMENT TO SERVICE AND VISUALLY CHECK ROTATION OF FANS AND MOTORS, POSITION OF DAMPERS, REPLACE FIRE DAMPER LINKS, ADJUST OR REPLACE CONTROLS, ETC.
- PROVIDE VANED ELBOWS IN ALL CASES, SPLITTER DAMPERS WHERE INDICATED ON DRAWINGS AND VOLUME CONTROL DAMPERS IN ALL BRANCH DUCTS OR DIFFUSER CONNECTIONS.

| AIR DISTRIBUTION SCHEDULE  |            |                     |                                 |  |
|--|------------|---------------------|---------------------------------|--|
| SYMBOL   | USE        | TYPE                | DESIGN MANUFACTURER & MODEL NO. | REMARKS  |
| A1   | SUPPLY AIR | DIFFUSERS           | TITUS TDC-AA                    | 4W-18X18 NOMINAL SIZE<br>24X24 MODULE SIZE<br>LAY-IN, ROUND NECK |
| A2   | SUPPLY AIR | DIFFUSERS           | TITUS TDC-AA                    | 2W-18X18 NOMINAL SIZE<br>24X24 MODULE SIZE<br>LAY-IN, ROUND NECK |
| A3   | SUPPLY AIR | GRILLES & REGISTERS | TITUS 300FS                     | 22X6<br>SURFACE MOUNT  |
| B1   | RETURN AIR | GRILLES & REGISTERS | TITUS 350FL                     | 24X24 LAY-IN   |
| C1   | EXH. AIR   | GRILLES & REGISTERS | TITUS 350FL                     | 24X24 LAY-IN   |
| NOTES:<br>1. REFER TO ARCHITECT PLANS FOR CEILING TYPE.<br>2. CONTRACTOR TO COORDINATE BORDER TYPE; FINISH AND COLOR FOR ALL AIR DISTRIBUTION DEVICES BEFORE ORDERING.<br>3. PROVIDE DISCHARGE PATTERN AS INDICATED ON PLANS.<br>4. ALL AIR DEVICES INSTALLED IN ACCESSIBLE AND/OR LAY-IN CEILINGS SHALL HAVE SPIN-IN FITTINGS (WITHOUT SCOOPS) WITH A MANUAL DAMPER INSTALLED IN THE BRANCH TAKE-OFF.<br>5. ALL AIR DEVICES INSTALLED IN INACCESSIBLE AND/OR DRYWALL CEILINGS SHALL BE PROVIDED WITH ADJUSTING DAMPER TO ADJUST THE AIR FLOW BY INSERTING SCREWDRIVER THROUGH THE FACE OF THE DIFFUSER.<br>6. INSTALLATION OF MVD IN ALL SUPPLY, RETURN OR EXHAUST DUCT BRANCH IS REQUIRED. |            |                     |                                 |  |

| TESTING AND BALANCING NOTES |  |
|-----------------------------|--|
| 1.                          | AIR DISTRIBUTION SYSTEM TESTING, ADJUSTING AND BALANCING SHALL BE PERFORMED ACCORDING TO 2014 FLORIDA BUILDING CODE, ENERGY CONSERVATION, SECTION C408.2.2.  |
| 2.                          | TEST, ADJUSTMENT AND SYSTEM BALANCE SHALL BE PERFORMED BY AN ENGINEER LICENSED IN THE STATE OR A COMPANY OR INDIVIDUAL HOLDING A CURRENT CERTIFICATION FROM A RECOGNIZED TESTING AND BALANCING ORGANIZATION. LICENSED MECHANICAL CONTRACTORS ARE ALLOWED TO TEST AND BALANCE SYSTEMS OF 15.0 TON OR LESS IN COOLING OR HEATING CAPACITY. |
| 3.                          | COOLING OR HEATING SYSTEM CAPACITIES OF 65,000 BTU/H OR LESS ARE EXCEMPT FROM THE TEST AND BALANCE REQUIREMENT LISTED IN THE CODE.   |
| 4.                          | ALL HVAC SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS. A WRITTEN BALANCE REPORT SHALL BE PROVIDED TO THE OWNER FOR HVAC SYSTEMS SERVING ZONES WITH A TOTAL AIR CONDITIONING AREA EXCEEDING 5,000 SQFT OR OTHERWISE REQUESTED BY THE OWNER FOR SMALLER SPACES.                                   |
| 5.                          | BALANCING PROCEDURES SHALL BE IN ACCORDANCE WITH THE NEBB PROCEDURAL STANDARDS, THE AABC NATIONAL STANDARDS, OR EQUIVALENT PROCEDURES.   |
| 6.                          | UPON CONSTRUCTION COMPLETION, ALL REVISED MECHANICAL SYSTEMS SHALL BE REBALANCED. ALL GRILLES IN SERVED AREAS SHALL BE BALANCED TO ACHIEVE REQUIRED DESIGN VALUES.   |

| GENERAL DEMOLITION NOTES |   |
|--------------------------|---|
| 1.                       | PRIOR TO COMMENCEMENT OF ANY WORK AN INDEPENDENT AABC OR NEBB CERTIFIED TAB CONTRACTOR SHALL MEASURE AND DOCUMENT, IN A TYPED REPORT THE AIRFLOW QUANTITIES PROVIDED OR EXHAUSTED BY ALL EXISTING EQUIPMENT AND DUCTS TO REMAIN THAT SERVE OR ARE SERVED FROM THE RENOVATED AREA. SUBMIT DATA TO ENGINEER FOR REVIEW. |
| 2.                       | THE CONTRACTOR SHALL PROVIDE PROTECTION FOR ALL PARTS OF THE BUILDING, ITS CONTENTS AND OCCUPANTS WHEREVER WORK UNDER THIS CONTRACT IS PERFORMED.   |
| 3.                       | DEMOLITION SHALL INCLUDE REMOVAL OF EXISTING BUILDING CONSTRUCTION TO EXTENT REQUIRED TO PERFORM CONSTRUCTION ACTIVITIES INDICATED.   |
| 4.                       | THE DEMOLITION PROCEDURES SHALL PROVIDE FOR SAFE CONDUCT OF THE WORK, PROTECTION OF PERSONNEL, CAREFUL REMOVAL AND DISPOSITION OF MATERIALS. MATERIALS TO BE SALVAGED, PROTECTION OF PROPERTY TO REMAIN UNDISTURBED, COORDINATION WITH OTHER WORK IN PROGRESS, AND TIMELY DISCONNECTION OF UTILITY SERVICES.          |
| 5.                       | EXISTING WORK TO REMAIN SHALL BE PROTECTED FROM DAMAGE. WORK DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED TO MATCH EXISTING WORK OR WORK INSTALLED UNDER THIS CONTRACT DEPENDS ON CONTRACT REQUIREMENTS.   |
| 6.                       | EXISTING WORK SHALL BE CUT, DRILLED,  |



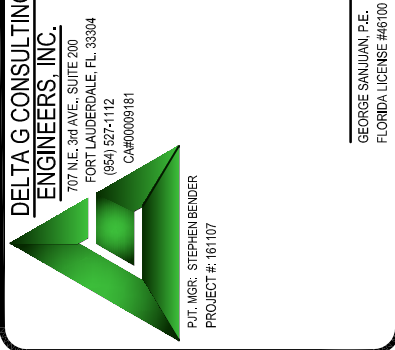
| FAN SCHEDULE  |                    |                             |           |             |            |     |              |      |            |      |             |        |       |                |                       |                         |
|---|--------------------|-----------------------------|-----------|-------------|------------|-----|--------------|------|------------|------|-------------|--------|-------|----------------|-----------------------|-------------------------|
| MARK  | SELECTION BASED ON |                             |           | SERVICE     | LOCATION   | CFM | ESP<br>IN WG | RPM  | MOTOR DATA |      |             | DRIVE  | SONES | UNIT<br>WEIGHT | ROOF<br>OPENING (IN.) | ACCESSORIES/<br>REMARKS |
|   | MAKE               | TYPE                        | MODEL NO. |             |            |     |              |      | HP         | RPM  | VOLTS-PH-HZ |        |       |                |                       |                         |
| EF-1  | GREENHECK          | CENTRIFUGAL<br>ROOF MOUNTED | G-080-D   | SEE<br>PLAN | ROOF LEVEL | 300 | 0.35         | 1490 | 1/20       | 1550 | 120-1-60    | DIRECT | 6.9   | 46             | 14.5X14.5             | 1,2,3,4                 |
| <div><div><b>GENERAL FAN NOTES:</b></div><div><div>1. ALL ROOF MOUNTED SUPPLY AND EXHAUST FANS SHALL BE APPROPRIATELY SCREENED TO PREVENT THE ENTRY OF INSECTS AND BIRDS.</div><div>2. PROVIDE MOTOR STARTERS, DISCONNECTS AND ALL ASSOCIATED CONTROLS ON ALL FANS.</div><div>3. FIELD ADJUST OPENINGS WITH STRUCTURE.</div><div>4. ALL OUTDOOR EQUIPMENT SHALL COMPLY WITH LOCAL ZONING NOISE ORDINANCE OR NOT EXCEED A NOISE LEVEL OF 55DB AS MEASURED RADIALLY 15 FT. FROM THE EQUIPMENT IN ALL DIRECTIONS.</div><div>5. COORDINATE WITH ELECTRICAL CONTRACTOR BEFORE BIDDING OR ORDERING ANY EQUIPMENT.</div></div><div><div><b>ACCESSORIES/REMARKS:</b></div><div><div>1. ROOF CURB.</div><div>2. SPEED CONTROL.</div><div>3. NOA NUMBER: 16--0209.05; FL 13225.1</div><div>4. INTERLOCK WITH RTU-1.</div></div></div></div> |                    |                             |           |             |            |     |              |      |            |      |             |        |       |                |                       |                         |

| COOLING ONLY HIGH WALL SPLIT SYSTEM SCHEDULE   |                        |       |    |     |      |                            |        |                    |              |        |             |      |      |
|--|------------------------|-------|----|-----|------|----------------------------|--------|--------------------|--------------|--------|-------------|------|------|
| AIR HANDLING UNIT  |                        |       |    |     |      | AIR COOLED CONDENSING UNIT |        |                    |              |        | SYSTEM DATA |      |      |
| MARK   | MODEL NO.              | CFM   |    | MCA | MOCP | VOLTAGE                    | WT LBS | MARK               | MODEL NO.    | WT LBS | VOLTAGE     | MCA  | MOCP |
|  |                        | TOTAL | OA |     |      |                            |        |                    |              |        |             |      |      |
| AHU-ITA;<br>AHU-ITB;   | CARRIER<br>40MKCB32B-3 | 847   | 0  | 1.0 | 15   | 208-1-60                   | 56.0   | CU-ITA;<br>CU-ITB; | 24AHA436A003 | 184.0  | 208-1-60    | 18.3 | 30   |
| <div><div>SPLIT SYSTEM NOTES:</div><div><div>1. OUTSIDE DESIGN CONDITIONS: 92FDB - 78FDB (FT. LAUDERDALE, FL)</div><div>2. PROVIDE WIRED REMOTE CONTROLLER.</div><div>3. SIZE AND RUN REFRIGERANT PIPING AS MANUFACTURER'S PUBLISHED RECOMMENDATIONS.</div><div>4. PROVIDE PROPER VIBRATION ISOLATORS AS PER ISOLATION MANUFACTURER'S RECOMMENDATIONS.</div><div>5. PROVIDE BUILT-IN CONDENSATE PUMP W/ DETECTION UNIT INSTALLED INSIDE THE INDOOR UNIT (EXTERNAL DEVICE IS NOT ALLOWED BY CODE) THAT AUTOMATICALLY CUTS OFF THE AC SYSTEM.</div><div>6. INSULATE REFRIGERANT SUCTION LINE WITH 3/4" FIRE RETARDANT ARMAFLEX.</div><div>7. PROVIDE LOW AMBIENT KIT.</div></div><div><div>8. INSTALL CHEMICAL DRYER AND STRAINER IN REFRIGERANT LIQUID LINES.</div><div>9. PROVIDE BUILT-IN DISCONNECT.</div><div>10. PROVIDE CONDENSING UNITS W/ FACTORY PRE-COATED COILS.</div><div>11. PROVIDE HURRICANE TIE-DOWN KIT FOR CONDENSING UNITS.</div></div><div><div>NOTES TO CONTRACTOR:</div><div><div>A. PROVIDE COOLING ONLY UNITS. HEAT PUMPS ARE NOT ACCEPTABLE FOR THIS APPLICATION. PROVIDE LOW AMBIENT MODELS.</div><div>B. REDUNDANCY OF N+1 IS PROVIDED FOR SYSTEM IT. CONTRACTOR TO PROVIDE CONTROLS AND ELECTRICAL CONNECTIONS TO GUARANTEE THE REQUIRED COOLING CAPACITY EVEN AFTER A UNIT SHUTDOWN OR FAILURE.</div><div>C. PROVIDE REMOTE TEMPERATURE ALARM FOR NOTIFICATION OF CRITICAL OPERATING CRITERIA OF SERVER ROOMS. COORDINATE ACTUAL LOCATION OF ALARM PANEL WITH OWNER.</div></div></div><div><div>MATERIALS:</div><div><div>A. REFRIGERANT PIPING SHALL BE TYPE L SOFT DRAWN, COPPER TUBING DEHYDRATED FOR REFRIGERANT USE. SIZE AS SHOWN ON DRAWINGS OR AS PER AIR CONDITIONING EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.</div><div>B. INSULATION: REFRIGERANT SUCTION PIPING AND CONDENSATE PIPES SHALL BE INSULATED WITH 3/4" THICK FOAMED PLASTIC INSULATION, FIRE RETARDANT TYPE. INSULATION SHALL BE INSTALLED IN PIPING BEFORE ASSEMBLY. NO SPLIT INSULATION WILL BE ACCEPTABLE. SEAL JOINTS WITH MANUFACTURER'S APPROVED ADHESIVE AND GREY TAPE.</div></div></div></div> |                        |       |    |     |      |                            |        |                    |              |        |             |      |      |

| VAV SCHEDULE (SELECTION BASED ON CARRIER 35E)   |           |          |                     |                     |                     |                     |               |          |  |
|---|-----------|----------|---------------------|---------------------|---------------------|---------------------|---------------|----------|--|
| MARK  | UNIT SIZE | CONTROLS | COOL.<br>CFM<br>MIN | COOL.<br>CFM<br>MAX | HEAT.<br>CFM<br>MIN | HEAT.<br>CFM<br>MAX | ELECTRIC HEAT |          |  |
|   |           |          |                     |                     |                     |                     | KW            | VOLTAGE  |  |
| VAV-1   | 14        | DDC      | 600                 | 2300                | 600                 | 2300                | 4.0           | 208-1-60 |  |
| VAV-2   | 6         | DDC      | 150                 | 300                 | 150                 | 300                 | 1.0           | 208-1-60 |  |
| VAV-3   | 7         | DDC      | 150                 | 600                 | 150                 | 600                 | 1.0           | 208-1-60 |  |
| <div><div>GENERAL NOTES:</div><div><div>1. VAV BOXES SHALL BE PRESSURE INDEPENDENT WITH FACTORY INSTALLED DDC CONTROLS.</div><div>2. PROVIDE 24 V CONTROL TRANSFORMER.</div><div>3. PROVIDE ELECTRICAL HEATERS WITH SCR CONTROLLER.</div><div>4. MANUFACTURER SHALL PROVIDE UNIT COMPLETE WITH FACTORY SOUND ATTENUATOR.</div><div>5. PROVIDE UNOBSTRUCTED CLEARANCE IN FRONT OF CONTROLS.</div><div>6. THE RADIATED NOISE LEVEL SHALL BE LIMITED TO 35 NC.</div><div>7. CONTRACTOR TO VERIFY UNIT HAND FOR CONNECTIONS AND ACCESS PRIOR TO ORDERING.</div><div>8. PROVIDE AIR PRESSURE SWITCH.</div></div><div><div>INSTALLATION NOTES:</div><div><div>1. CONTRACTOR TO FIELD COORDINATE EXACT LOCATION FOR BOX INSTALLATION.</div><div>2. ALLOW 36" ON CONTROL SIDE FOR SERVICING.</div><div>3. UPSTREAM DUCT WORK SHALL BE THE SAME DIAMETER AS THE INLET CONNECTION.</div><div>4. PROVIDE A MINIMUM OF 3.0 DUCT DIAMETERS OF STRAIGHT DUCT WORK UPSTREAM OF AIR INLET CONNECTION.</div><div>5. ALLOW 48 INCHES OF STRAIGHT DUCT DOWNSTREAM OF UNIT FIRST RUNOUT.</div><div>6. IF DUCT RUNOUT EXCEEDS 12 FT IN LENGTH, INCREASE RUNOUT DIAMETER 2" AND BY 4" IF LONGER THAN 25 FT.</div></div></div></div> |           |          |                     |                     |                     |                     |               |          |  |

| OUTSIDE AIR CALCULATIONS  |                     |                    |         |        |            |             |               |               |           |    |           |           |      |        |           |       |           |     |
|---|---------------------|--------------------|---------|--------|------------|-------------|---------------|---------------|-----------|----|-----------|-----------|------|--------|-----------|-------|-----------|-----|
| SINGLE & MULTIPLE ZONE RECIRCULATING SYSTEMS<br>(BASED ON FBC 2014 AND ASHRAE STANDARD 62.1-2010)   |                     |                    |         |        |            |             |               |               |           |    |           |           |      |        |           |       |           |     |
| SYSTEM TAG  | VENTILATION ZONE    | OCCUPANCY CATEGORY | Az (SF) | Pz (p) | Rp (CFM/p) | Ra (CFM/SF) | Rp x Pz (CFM) | Ra x Az (CFM) | Vbz (CFM) | Ez | Voz (CFM) | Vpz (CFM) | Zp   | Ps (p) | Σ[Pz] (p) | D (p) | Vou (CFM) | Ev  |
| RTU-1   |                     |                    |         |        |            |             |               |               |           |    |           |           |      | 62     | 103       | 0.6   | 432.2     | 0.9 |
|   | CONFERENCE RM       | CONFERENCE/MEETING | 1158.0  | 77     | 5.0        | 0.06        | 385.0         | 69.5          | 454.5     | 1  | 454.5     | 2400.0    | 0.19 |        |           |       |           |     |
|   | SMALL CONFERENCE RM | CONFERENCE/MEETING | 351.0   | 23     | 5.0        | 0.06        | 115.0         | 21.1          | 136.1     | 1  | 136.1     | 650.0     | 0.20 |        |           |       |           |     |
| AHU-B   | WARNING KITCHEN     | CAFFETERIA         | 156.0   | 3      | 7.5        | 0.18        | 22.5          | 28.1          | 50.6      | 1  | 50.6      | 350.0     | 0.14 |        |           |       |           |     |
|   |                     |                    |         |        |            |             |               |               |           |    |           |           |      | 18     | 26        | 0.7   | 229.5     | 0.8 |
|   | LOBBY               | LOBBIES            | 375.0   | 4      | 5.0        | 0.06        | 20.0          | 22.5          | 42.5      | 1  | 42.5      | 690.0     | 0.06 |        |           |       |           |     |
|   | PLAN ROOM           | OFFICE             | 231.0   | 12     | 5.0        | 0.06        | 60.0          | 13.9          | 73.9      | 1  | 73.9      | 275.0     | 0.27 |        |           |       |           |     |
|   | RECEPTION DESK      | RECEPTION          | 232.0   | 2      | 5.0        | 0.06        | 10.0          | 13.9          | 23.9      | 1  | 23.9      | 125.0     | 0.19 |        |           |       |           |     |
|   | OFFICE 1            | OFFICE             | 114.0   | 1      | 5.0        | 0.06        | 5.0           | 6.8           | 11.8      | 1  | 11.8      | 75.0      | 0.16 |        |           |       |           |     |
|   | OFFICE 2            | OFFICE             | 114.0   | 1      | 5.0        | 0.06        | 5.0           | 6.8           | 11.8      | 1  | 11.8      | 75.0      | 0.16 |        |           |       |           |     |
|   | CORRIDOR/VEST.      | CORRIDOR           | 215.0   | -      | -          | 0.06        | -             | 12.9          | 12.9      | 1  | 12.9      | 75.0      | 0.17 |        |           |       |           |     |
|   | OFFICE 3            | OFFICE             | 226.0   | 2      | 5.0        | 0.06        | 10.0          | 13.6          | 23.6      | 1  | 23.6      | 265.0     | 0.09 |        |           |       |           |     |
|   | GRAFFIC DESIGNER    | OFFICE             | 226.0   | 2      | 5.0        | 0.06        | 10.0          | 13.6          | 23.6      | 1  | 23.6      | 265.0     | 0.09 |        |           |       |           |     |
|   | BUSINESS ASSISTANT  | OFFICE             | 226.0   | 2      | 5.0        | 0.06        | 10.0          | 13.6          | 23.6      | 1  | 23.6      | 265.0     | 0.09 |        |           |       |           |     |
|   | NEW CORRIDOR        | CORRIDOR           | 203.0   | -      | -          | 0.06        | -             | 12.2          | 12.2      | 1  | 12.2      | 50.0      | 0.24 |        |           |       |           |     |
|   | NEW WEST CORRIDOR   | CORRIDOR           | 145.0   | -      | -          | 0.06        | -             | 8.7           | 8.7       | 1  | 8.7       | 50.0      | 0.17 |        |           |       |           |     |
| <div><div>DEFINITIONS:</div><div><div>Az: NET OCCUPIED FLOOR AREA</div><div>Ra: OUTDOOR AIRFLOW RATE REQUIRED PER UNIT AREA AS DETERMINED FROM TABLE 6-1</div><div>Pz: ZONE POPULATION</div><div>Rp: OUTDOOR AIRFLOW RATE REQUIRED PER PERSON AS DETERMINED FROM TABLE 6-1</div><div>Vou: UNCORRECTED OUTDOOR AIR INTAKE</div><div><math>Vou = D \sum Rp \times Pz + \sum Ra \times Az</math></div><div>D: OCCUPANT DIVERSITY</div><div><math>D = Ps / \sum Pz</math></div><div>Ps: TOTAL POPULATION IN THE AREA SERVED BY THE SYSTEM</div><div>Vot: DESIGN OUTDOOR AIR INTAKE FLOW</div><div><math>Vot = Vou / Ev</math></div></div><div><div>Ev: SYSTEM VENTILATION EFFICIENCY AS DETERMINED FROM TABLE 6-3 (BASED ON MAX. Zp)</div><div>Zp: ZONE PRIMARY OUTDOOR AIR FRACTION</div><div><math>Zp = Voz / Vpz</math></div><div>Vpz: ZONE PRIMARY AIRFLOW</div><div>Voz: ZONE OUTDOOR AIRFLOW</div><div><math>Voz = Vbz / Ez</math></div><div>Ez: ZONE AIR DISTRIBUTION EFFECTIVENESS AS DETERMINED FROM TABLE 6-2</div><div>Vbz: BREATHING ZONE OUTDOOR AIR FLOW</div><div><math>Vbz = Rp \times Pz + Ra \times Az</math></div></div></div> |                     |                    |         |        |            |             |               |               |           |    |           |           |      |        |           |       |           |     |

| LEGEND AND SYMBOLS  |                                 |  |   |
|---|---------------------------------|--|---|
|   | SMOKE DETECTOR                  |  | DIFFUSER TYPE, REF. SCHEDULE.                                 |
|   | THERMOSTAT                      |  | CFM   |
|   | HUMIDITY SENSOR                 |  | RAG TYPE, REF. SCHEDULE.                                      |
|   | REMOTE TEMPERATURE SENSOR (RTS) |  | CFM   |
|   | PRESSURE DIFFERENTIAL GAUGE     |  | EG TYPE, REF. SCHEDULE.                                       |
|   | CO2 SENSOR                      |  | EXISTING AIR DISTRIBUTION DEVICE. CFM INDICATED FOR REFERENCE |
|   | SUPPLY AIR (DIRECTION OF THROW) |  | POINT OF CONNECTION   |
|   | RETURN AIR                      |  | RETURN AIR GRILLE   |
|   | NEW HVAC PIPING                 |  | CEILING DIFFUSER  |
|   | NEW DUCTWORK                    |  | CEILING GRILLE  |
|   | EXISTING DUCTWORK               |  | EXHAUST GRILLE  |
|   | DUCT TO BE REMOVED              |  | MOTOR CONTROLLED DAMPER                                       |
|   | BACK DRAFT DAMPER               |  | OPPOSED BLADE DAMPER  |
|   | MANUAL VOLUME DAMPER            |  | AIR HANDLING UNIT   |
|   | MOTOR CONTROLLED DAMPER         |  | CONDENSING UNIT   |
|   | SMOKE DAMPER                    |  | ROOFTOP UNIT  |
|   | FIRE DAMPER                     |  | EXHAUST FAN   |
|   | AIR FLOW MEASURING DEVICE       |  | WIRE MESH SCREEN  |
|   |                                 |  | VARIABLE AIR VOLUME TERMINAL BOX                              |
| NOTE: HVAC LEGEND IS PROVIDED AS A GENERAL REFERENCE. SOME SYMBOLS SHOWN MAY NOT PERTAIN TO THIS PROJECT. |                                 |  |   |



|             |            |              |          |             |             |
|-------------|------------|--------------|----------|-------------|-------------|
| DRAWN BY:   | DATE:      | DESIGNED BY: | SCALE:   | CHECKED BY: | FIELD BOOK: |
| SB/CE/RT/AB | 05/31/2017 | SB/CE/RT/AB  | AS NOTED | GSU         |             |

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      | DESCRIPTION |  |  |  |
|-----------|------|-------------|--|--|--|
| NO.       | DATE |             |  |  |  |
|           |      |             |  |  |  |
|           |      |             |  |  |  |
|           |      |             |  |  |  |
|           |      |             |  |  |  |


PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
MECHANICAL INDEX, SYMBOL LEGEND AND NOTES  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                                   |            |
|-----------------------------------|------------|
| SHEET NO.                         | OF         |
| M101                              | 6          |
| TOTAL:                            | 65         |
| CAD FILE:                         |            |
| 161107 MECHANICAL INDEX-CONT PLAN |            |
| DRAWING FILE NO.                  |            |
| 4-140-42                          | CAM 18-007 |
| Exhibit 3                         | 732 of 776 |

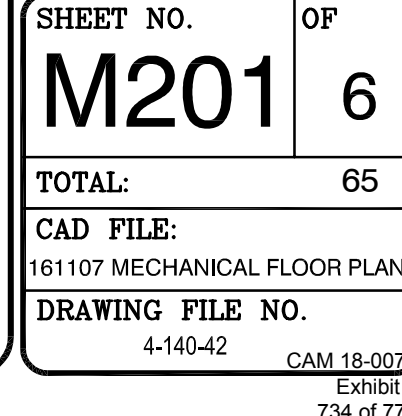




|                             |             |
|-----------------------------|-------------|
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| CAD FILE:                   |             |
| 161107 MECHANICAL DEMO PLAN |             |
| DRAWING FILE NO.            |             |
| 4-140-42                    | CAM 18-0070 |
|                             | Exhibit 3   |
|                             | 733 of 776  |

 CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

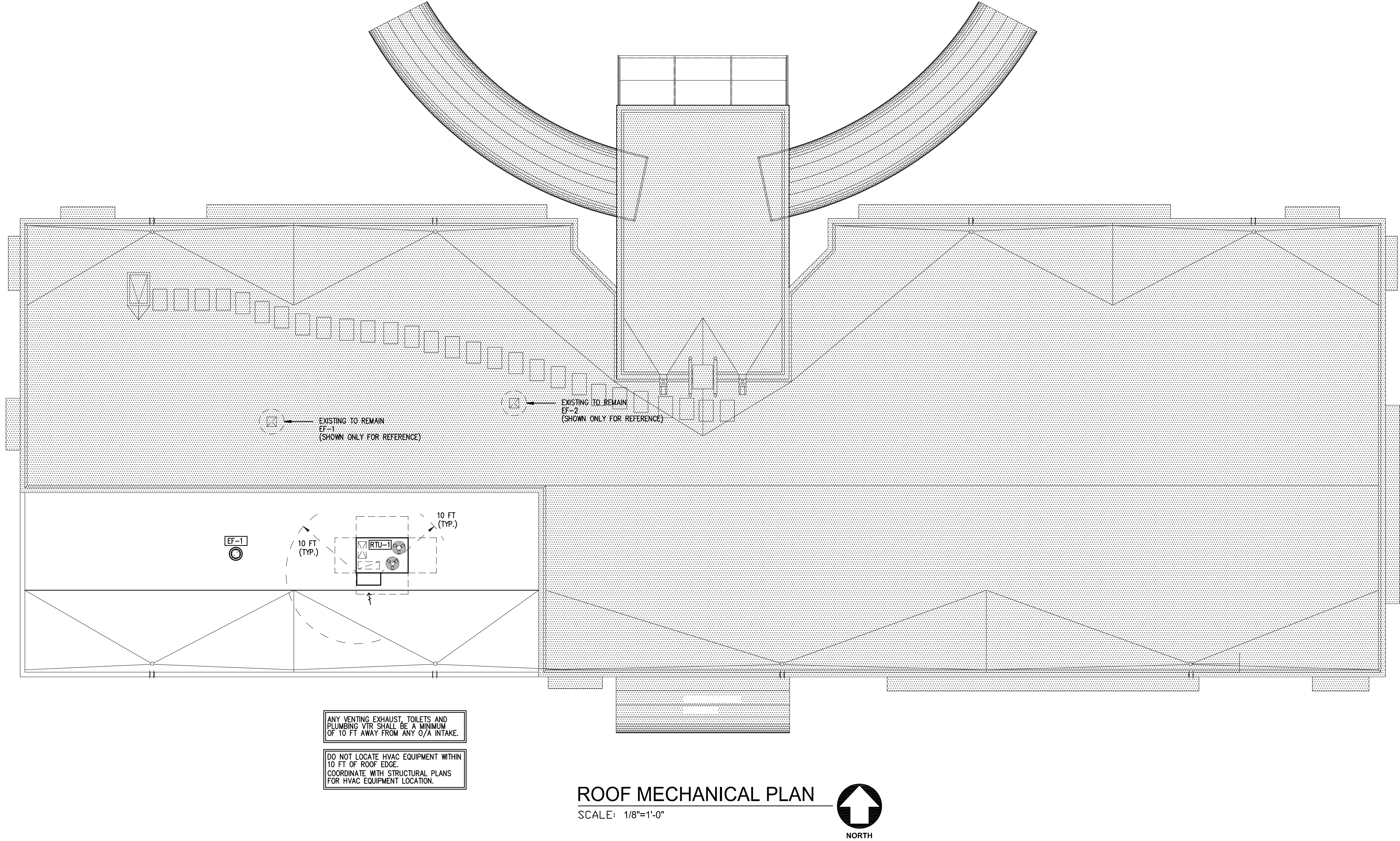




# BID DOCUMENTS



P:\161107 FORT LAUDERDALE EXECUTIVE AIRPORT - FXE ADMIN BLDG EXPANSION\ARCH\02-16-2017\A-101 - FLOOR PLAN YENI.DWG




BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS

ROOF MECHANICAL PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|  |    |
|--|----|
| SHEET NO.                                | OF |
| M300                                     | 6  |
| TOTAL: 65                                |    |
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| DRAWING FILE NO.<br>4-140-42 CAM 18-007  |    |

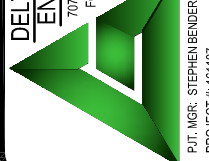
| REVISIONS |      |             |
|-----------|------|-------------|
| NO.       | DATE | DESCRIPTION |
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CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

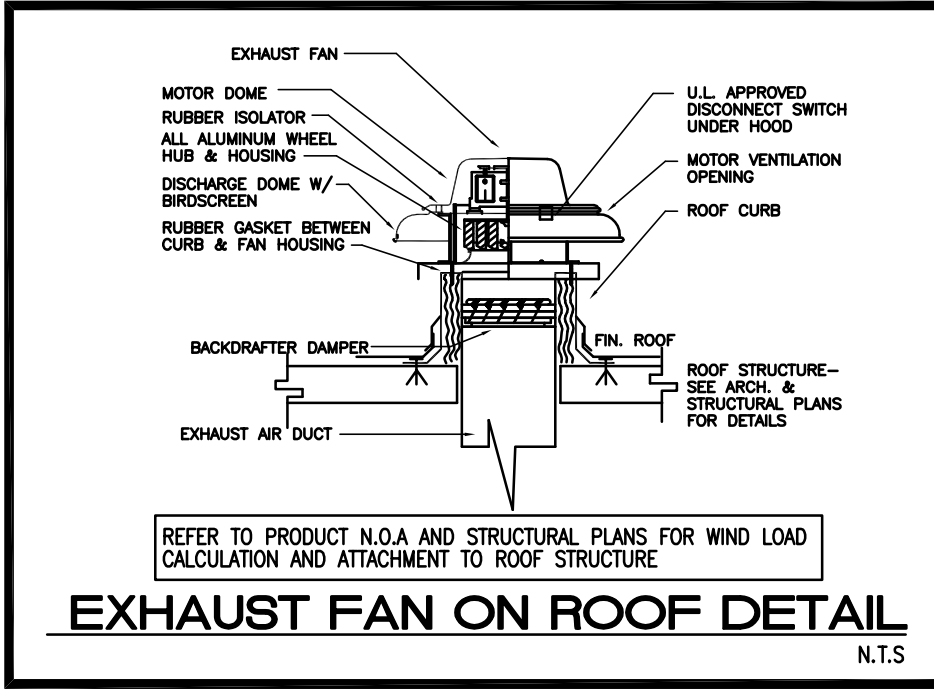
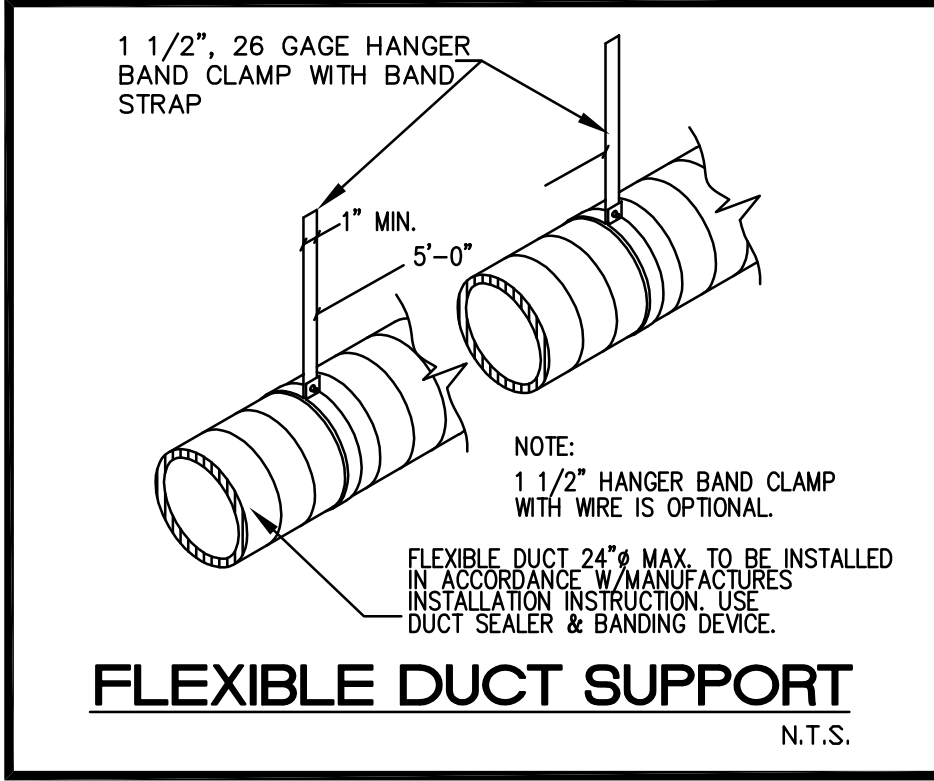
|                             |                     |
|-----------------------------|---------------------|
| DRAWN BY:<br>SB/CE/RT/AB    | DATE:<br>05/31/2017 |
| DESIGNED BY:<br>SB/CE/RT/AB | SCALE:<br>AS NOTED  |
| CHECKED BY:<br>GSJ          | FIELD BOOK:         |



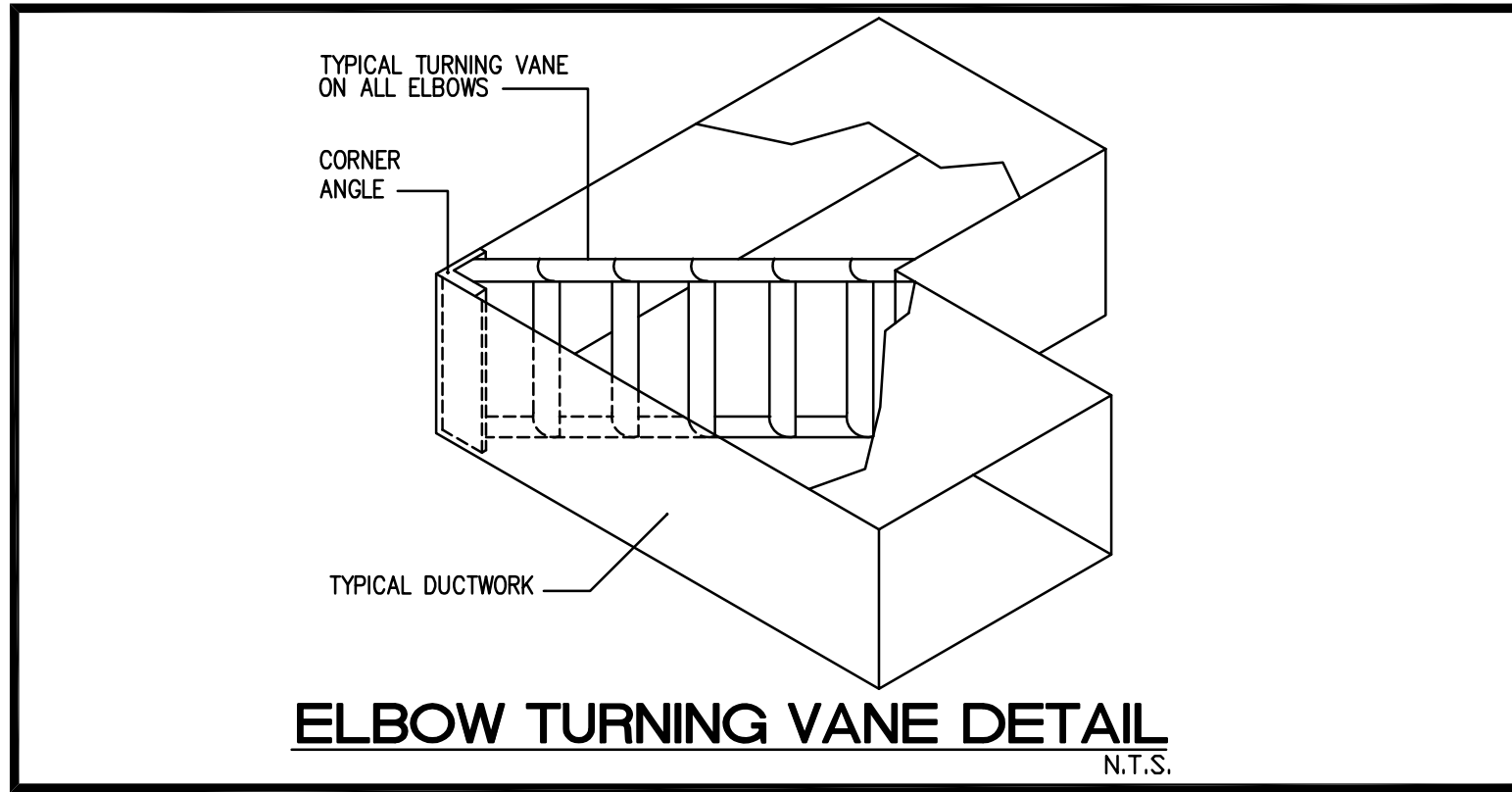
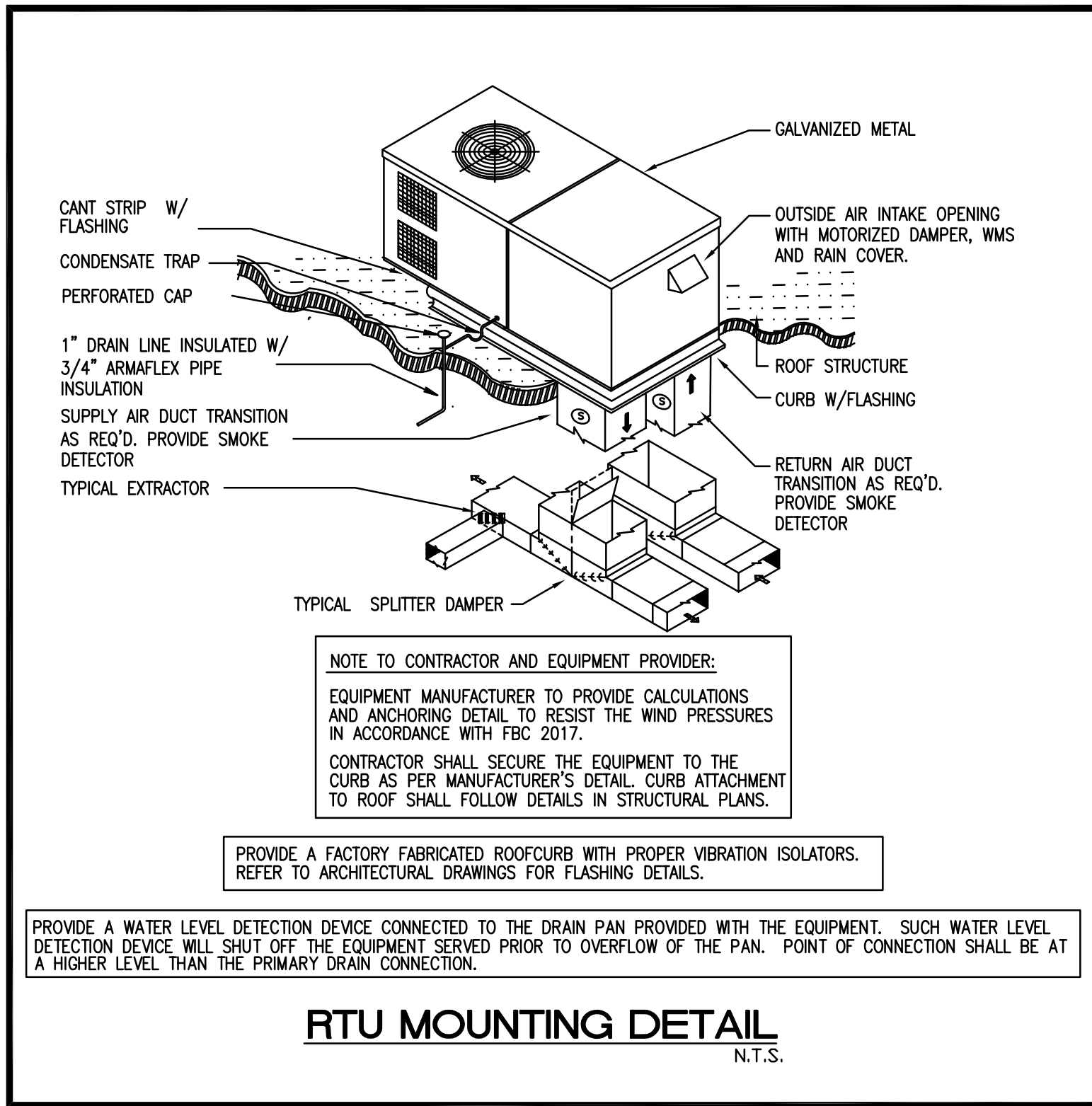
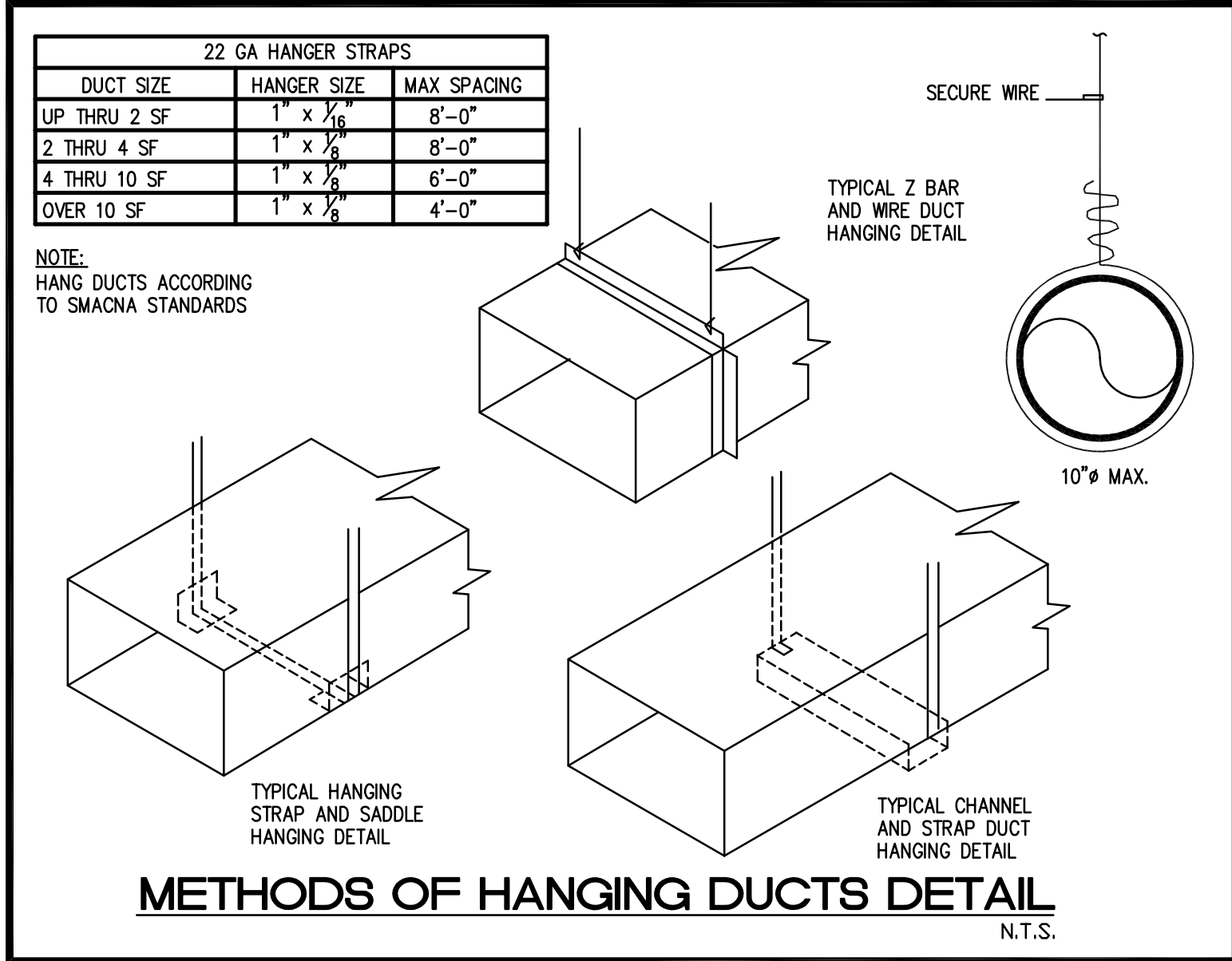
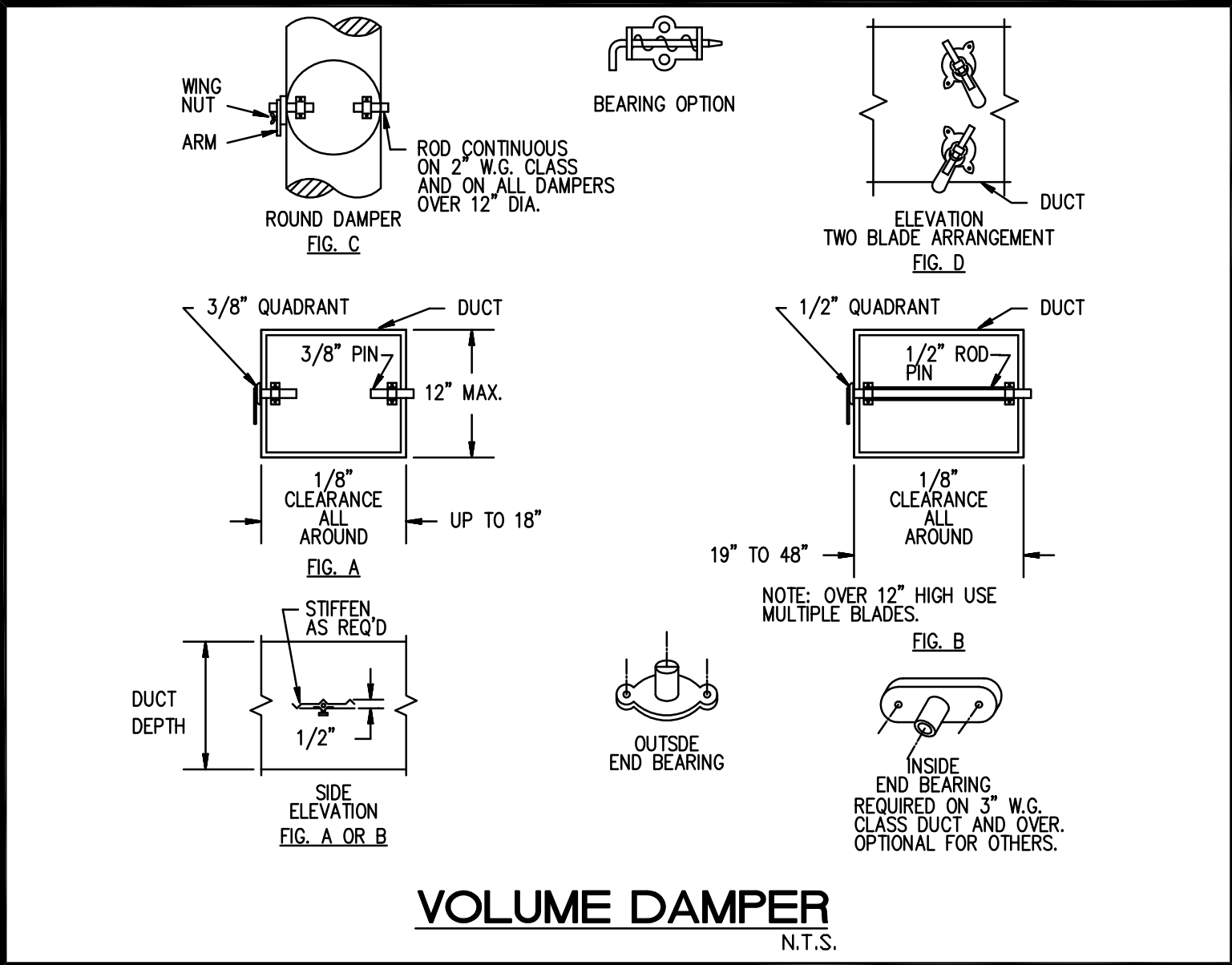
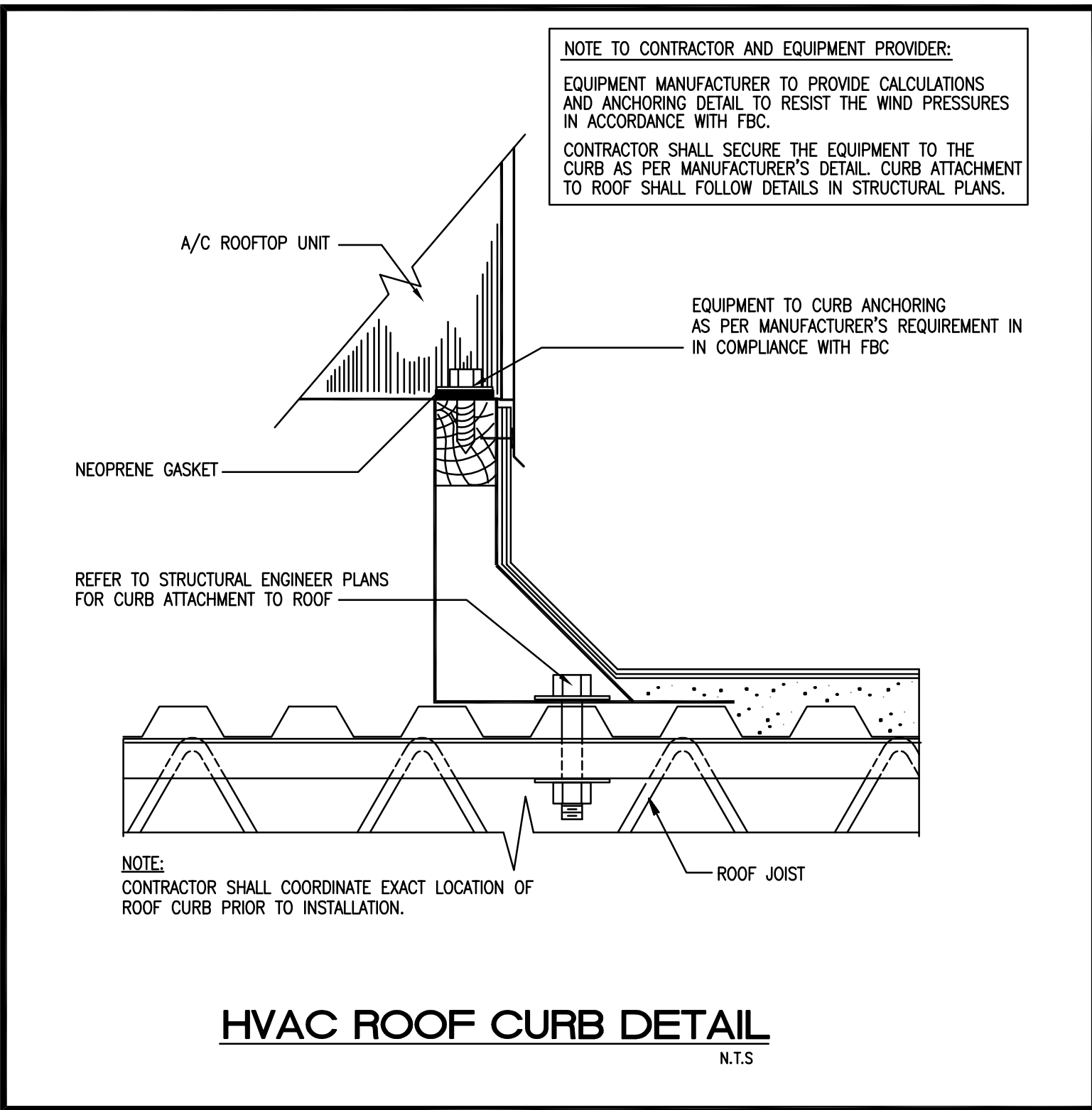
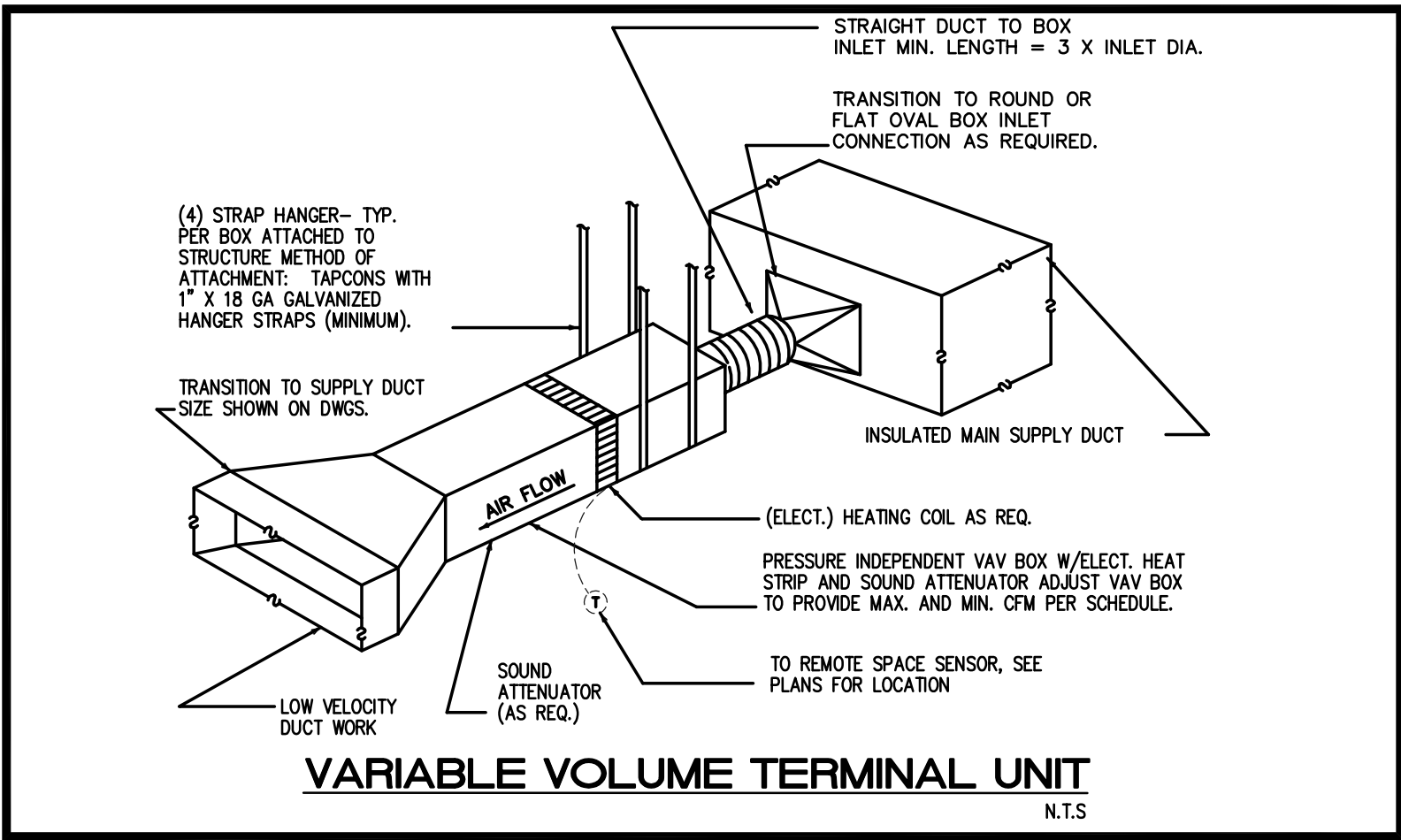
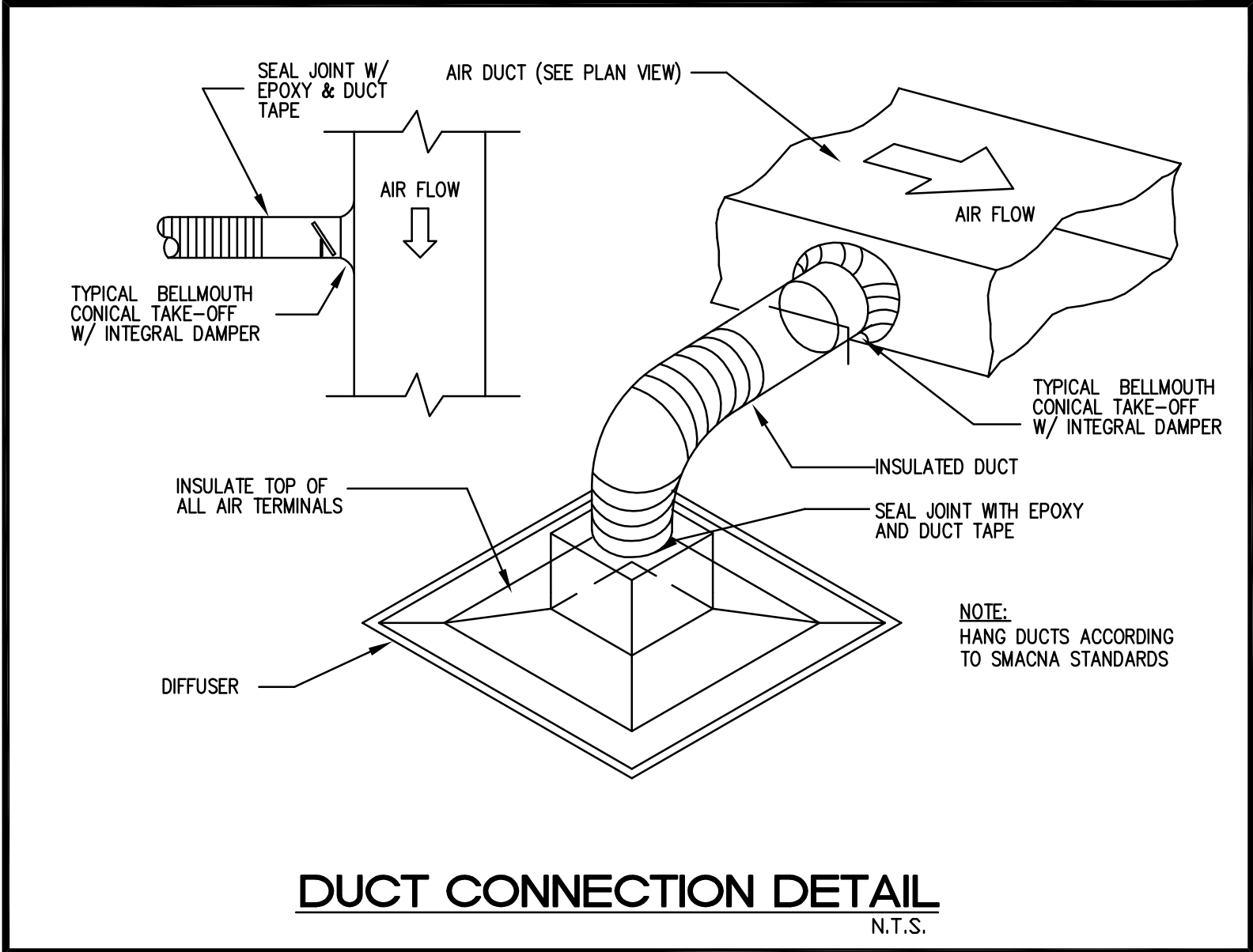
DELTA G CONSULTING  
ENGINEERING & ARCHITECTURE  
1001 S. W. 10th Ave., Suite 100  
Fort Lauderdale, FL 33304  
(954) 571-1111  
PROJECT # 12188

GEORGE DAVANIS, P.E.  
FLORIDA LICENSE #44605





NOTE: DRAWINGS/DETAILS ARE TO BE CONSIDERED DIAGRAMMATIC, NOT NECESSARILY SHOWING IN DETAIL OR TO SCALE ALL MINOR ITEMS, UNLESS SPECIFIC DIMENSIONS ARE SHOWN, THE STRUCTURAL, ARCHITECTURAL AND SITE CONDITIONS SHALL GOVERN EXACT LOCATIONS. CONTRACTOR SHALL FOLLOW DRAWINGS IN LAYING OUT WORK, AND CHECK/COORDINATE DRAWINGS OF ALL TRADES



|              |            |
|--------------|------------|
| DRAWN BY:    | DATE:      |
| SB/CE/RT/AB  | 05/05/2017 |
| DESIGNED BY: | SCALE:     |
| SB/CE/RT/AB  | AS NOTED   |
| CHECKED BY:  | GSU        |
| FIELD BOOK:  |            |

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      | DESCRIPTION |
|-----------|------|-------------|
| NO.       | DATE | BY          |
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PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
MECHANICAL DETAILS  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                  |                                |
|------------------|--------------------------------|
| SHEET NO.        | OF                             |
| M400             | 6                              |
| TOTAL:           | 65                             |
| CAD FILE:        | 161107 MECHANICAL DETAILS PLAN |
| DRAWING FILE NO. | 4-140-42 CAM 18-007            |



PLUMBING GENERAL NOTES

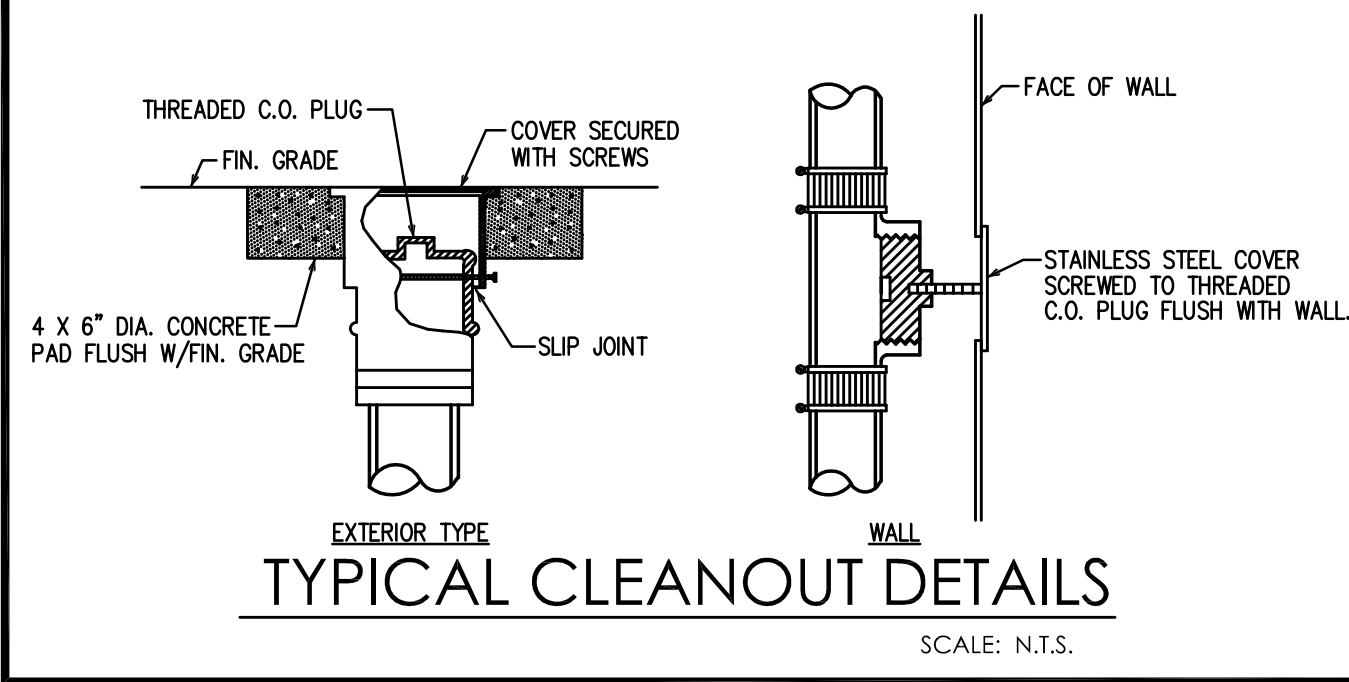
SCALE: N.T.S.

- ALL WORKMANSHIP AND MATERIAL SHALL BE IN STRICT ACCORDANCE WITH APPLICABLE LOCAL CODES, RULES AND ORDINANCES.
- CONTRACTOR SHALL VISIT THE JOB SITE AND THOROUGHLY FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS.
- ALL MATERIAL SHALL BE NEW.
- ALL WORK SHALL BE PERFORMED BY A LICENSED PLUMBING CONTRACTOR IN A FIRST CLASS WORKMANLIKE MANNER. THE COMPLETED SYSTEM SHALL BE FULLY OPERATIVE.
- ALL EXCAVATION AND BACKFILL AS REQUIRED FOR THIS PHASE OF CONSTRUCTION SHALL BE A PART OF THIS CONTRACT.
- REQUIRED INSURANCE SHALL BE PROVIDED BY THE CONTRACTOR FOR PROTECTION AGAINST PUBLIC LIABILITY AND PROPERTY DAMAGE FOR THE DURATION OF WORK.
- CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS, FEES, INSPECTION AND TESTS.
- DRAWINGS ARE DIAGRAMMATIC. DO NOT SCALE FOR THE EXACT LOCATION OF FIXTURES, PIPING, EQUIPMENT, ETC.
- ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID INTERFERENCE WITH THE PROGRESS OF CONSTRUCTION. REPORT ANY DISCREPANCY TO ENGINEER/ARCHITECT PRIOR TO BEGINNING CONSTRUCTION.
- VERIFY LOCATION, SIZE, INVERTS OF ALL EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION. ADVISE ENGINEER OF ANY DISCREPANCIES.
- WATER PIPING SHALL BE TYPE "L" COPPER FOR 2" AND UNDER AND TYPE "K" COPPER FOR 2-1/2" AND ABOVE.
- SEE "MATERIAL SPECIFICATIONS", THIS SHEET, FOR FURTHER PIPE MATERIAL REQUIREMENTS. NEW INSTALLATION SHALL MATCH EXISTING.
- AIR CONDITIONING CONDENSATE DRAIN PIPING SHALL BE COPPER DRAIN WASTE AND VENT PIPING AND FITTINGS. INSULATE ALL CONDENSATE PIPING EXCEPT UNDERGROUND AND ELECTRIC HEAT WRAP WHERE EXPOSED TO FREEZING CONDITIONS.
- FURNISH AND INSTALL APPROVED AIR CHAMBERS, AT EACH PLUMBING FIXTURE AND P.D.I. APPROVED SHOCK ARRESTORS ON MAIN LINES.
- DIELECTRIC COUPLINGS ARE REQUIRED BETWEEN ALL DISSIMILAR METAL IN PIPING AND EQUIPMENT CONNECTIONS.
- ISOLATE COPPER PIPE FROM HANGER OR SUPPORTS WITH ISOLATOR PAD (HAIR FELT LINING).
- ALL FIRE RATED FLOOR AND WALL PENETRATIONS SHALL BE PROPERLY PROTECTED FROM FIRE, SMOKE AND WATER PENETRATION BY FILLING VOIDS BETWEEN PIPE AND WALL/FLOOR SLEEVES WITH FIRE RATED FOAM, CHASE TECHNOLOGY CORP.- CTC PR-855 OR 3M, CP-25 CAULKING OR 303 PUTTY, TO ACHIEVE SAME RATING AS WALLS OR FLOORS.
- CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE (1) YEAR FROM DATE OF ACCEPTANCE BY OWNER. CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ADDITIONAL CHARGE AND SHALL INCLUDE REPLACEMENT OR REPAIR OF ANY OTHER PHASE OF THE INSTALLATION WHICH MAY HAVE BEEN DAMAGED.
- NO COMBUSTIBLE MATERIAL TO BE USED IN MECHANICAL ROOMS OR IN CEILING SPACES WHERE USED AS RETURN AIR PLENUMS.
- NO WATER, SANITARY OR DRAINAGE PIPING PERMITTED IN ELECTRICAL OR ELEVATOR EQUIPMENT ROOMS.; WATER STUBBED THRU FOR ELECTRICAL GROUND AND SPRINKLER HEAD AND PIPE W/CONTROL VALVE AS APPROVED BY LOCAL BUILDING AND FIRE DEPARTMENTS.
- ALL HOT & COLD WATER PIPES, AND CONDENSATE PIPING SHALL HAVE IDENTIFICATION AND FLOW DIRECTIONS BANDS.
- CONTRACTOR SHALL KEEP A SET OF AS BUILTS DWG. ON THE JOB SITE AT ALL TIMES AND DELIVER A SET OF UP TO DATE AS-BUILTS TO THE ENGINEER AND OWNER AT THE COMPLETION OF THE PROJECT.

SHOCK ARRESTOR SCHEDULE

| P.D.I. DESIGNATION | MANUF. & MODEL    | FIXTURE UNITS | CONNECTION |
|--------------------|-------------------|---------------|------------|
| A                  | SIoux CHIEF 652-A | 1-11          | 1/2"       |
| B                  | SIoux CHIEF 653-B | 12-32         | 3/4"       |
| C                  | SIoux CHIEF 654-C | 33-60         | 1"         |

SIoux CHIEF SHOCK ARRESTORS APPROVED FOR INSTALLATION WITH NO ACCESS DOOR REQUIRED. CONFORMS TO ANSI/ASSE 1010 STANDARDS.



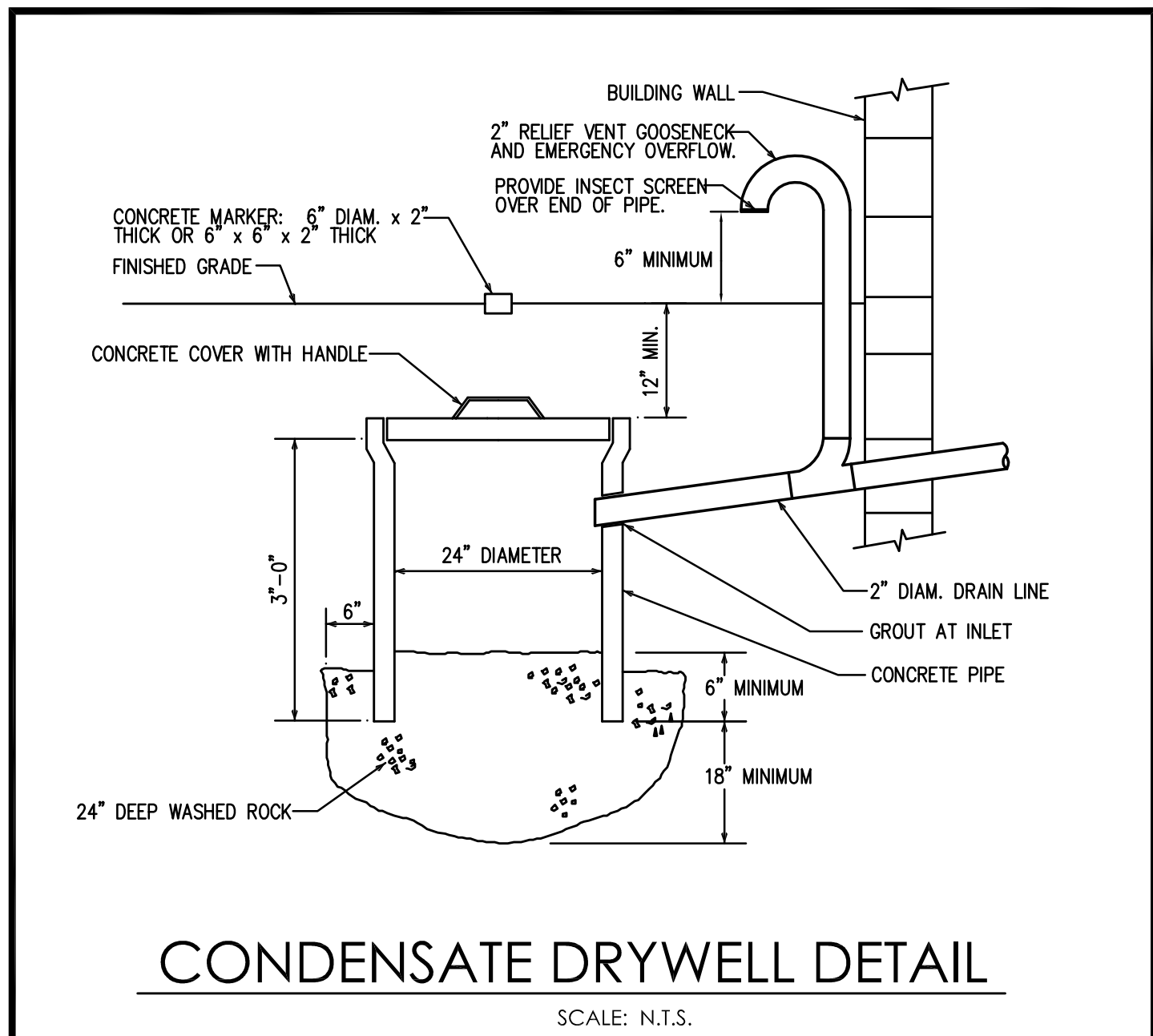
PLUMBING FIXTURE SCHEDULE

| NAME  | FIXTURE                                     | MODEL #  | ACCESSORIES   |
|-------|---|--|---|
| WC    | FLOOR MOUNTED WATER CLOSET                  | AMERICAN STANDARD ELONGATED FLUSHOMETER TOILET, MODEL #3461.528 "MADERA" 15" HEIGHT VITREOUS CHINA                   | AMERICAN STANDARD #5309.110.020 EXTRA HEAVY DUTY TOILET SEAT, INCLUDE AMERICAN STANDARD FLUSH VALVE 1.28 GPF, SENSOR, EXPOSED, BATTERY POWERED PROVIDE FLOOR FLANGE WITH ALL BRASS BOLTS AND RUBBER GASKET.   |
| WC-1  | FLOOR MOUNTED WATER CLOSET (ADA)            | AMERICAN STANDARD ELONGATED FLUSHOMETER TOILET, MODEL #3461.528 "MADERA" 16-1/2" HEIGHT VITREOUS CHINA               | AMERICAN STANDARD #5309.110.020 EXTRA HEAVY DUTY TOILET SEAT, INCLUDE AMERICAN STANDARD FLUSH VALVE 1.28 GPF, SENSOR, EXPOSED, BATTERY POWERED PROVIDE FLOOR FLANGE WITH ALL BRASS BOLTS AND RUBBER GASKET.   |
| LAV   | LAVATORY                                    | INTEGRAL (BY ARCHITECT)  | PROVIDE AMERICAN STANDARD FAUCET SELECTRONIX MODEL PWKRX #6053.105. LONG LIFE BATTERY POWERED 0.5 GPM PRESSURE COMPENSATING VANDAL RESISTANT MULTI LAMINAR SPRAY PROVIDE MIXING VALVE MODEL # 605XTMV1070 PROVIDE .46G-710 STAINLESS STEEL BOTTOM GRID PROVIDE .00P-35 CHROME PLATED CAST BRASS BODY AND BASKET AND CAST BRASS NUTS.                        |
| LAV-1 | WALL HUNG LAVATORY (ADA)                    | AMERICAN STANDARD #0965.121EC (CENTER HOLE ONLY WITH OVERFLOW) MURRO WITH EVERCLEAN WALL HUNG BASIN. VITREOUS CHINA  | PROVIDE AMERICAN STANDARD FAUCET SELECTRONIX MODEL PWKRX #6053.105. LONG LIFE BATTERY POWERED 0.5 GPM PRESSURE COMPENSATING VANDAL RESISTANT MULTI LAMINAR SPRAY PROVIDE MIXING VALVE MODEL # 605XTMV1070 5" DEEP 15-1/2"x13-1/2" SINGLE HOLE CTR McGUIRE #155A OPEN FRID STRAINER McGUIRE #8902C 1 1/4" INLETS TO 1 1/2" OUTLET P-TRAP CARRIER: ZURN Z1231 |
| UR    | URINAL                                      | AMERICAN STANDARD "ALLBROOK" MODEL # 6541.610 SELECTRONIC WHITE COLOR, WALL MOUNTED W/ 3/4" TOP SPUD. VITREOUS CHINA | URINAL FAUCET (INCLUDED) 1.0 GPF EXPOSED FLUSH VALVE SELECTRONIC WITH SENSOR FACTORY- INSTALLED CR-22 LITHIUM BATTERY JR SMITH FLOOR MOUNTED CARRIER, ADA MOUNTING HIGH.  |
| K/SK  | KITCHEN SINK                                | KITCHEN SINK DAYTON #CTRU17179DBG (SINGLE BOWL) UNDERMOUNT STAINLESS STEEL SINK WITH DISPOSER. STAINLESS STEEL       | FAUCET: AMERICAN STANDARD MONTERREY MODEL # 6405.140 TWO-HANDLE TOP-MOUNT KITCHEN FAUCET RIGID/SWIVEL GOOSENECK SPOUT WITH 5" REACH 1.5 GPM, PCA AERATOR. LESS SPRAY  |
| EWC   | BOTTLE FILLING STATION, BI-LEVEL COOLER ADA | ELKAY BOTTLE FILLING STATION MODEL # EZH20 BI-LEVEL FILTERED COOLER ELKAY MODEL # LZSTLBWS                           | McGUIRE 1/2" SUPPLY PIPE WITH S.O.V. & 1-1/4" P-TRAP.   |

(PLUMBING FIXTURE SCHEDULE CONTINUATION)

| FIXTURE               | WATER PIPE SIZE | NOMINAL SAN. SIZE | MAXIMUM FLOW RATES |
|-----------------------|-----------------|-------------------|--------------------|
| WATER CLOSET (F.V.)   | 1"              | 3"                | 1.28 GPF           |
| LAVATORY              | 1/2"            | 1 1/4"            | 0.5 GPM            |
| SINK                  | 1/2"            | 1 1/2"            | 1.5 GPM            |
| ELECTRIC WATER COOLER | 1/2"            | 1 1/4"            | 0.5 GPM            |
| URINAL                | 3/4"            | 2"                | 0.5 GPF            |

- NOTE:
- TRAP INSULATION TO MEET ADA REQUIREMENTS AND COMPLY WITH ASTM E-84 PLUMBEREX MODEL#396 OR EQUAL.
  - ALL FIXTURES SHALL COMPLY WITH TABLE 604.4 OF THE F.P.C.-2010
  - ALL WALL HUNG PLUMBING FIXTURES SHALL COMPLY W/ FBC-2010 SECTION 2318.1.15



SLOPE OF HORIZ. DRAINAGE PIPE

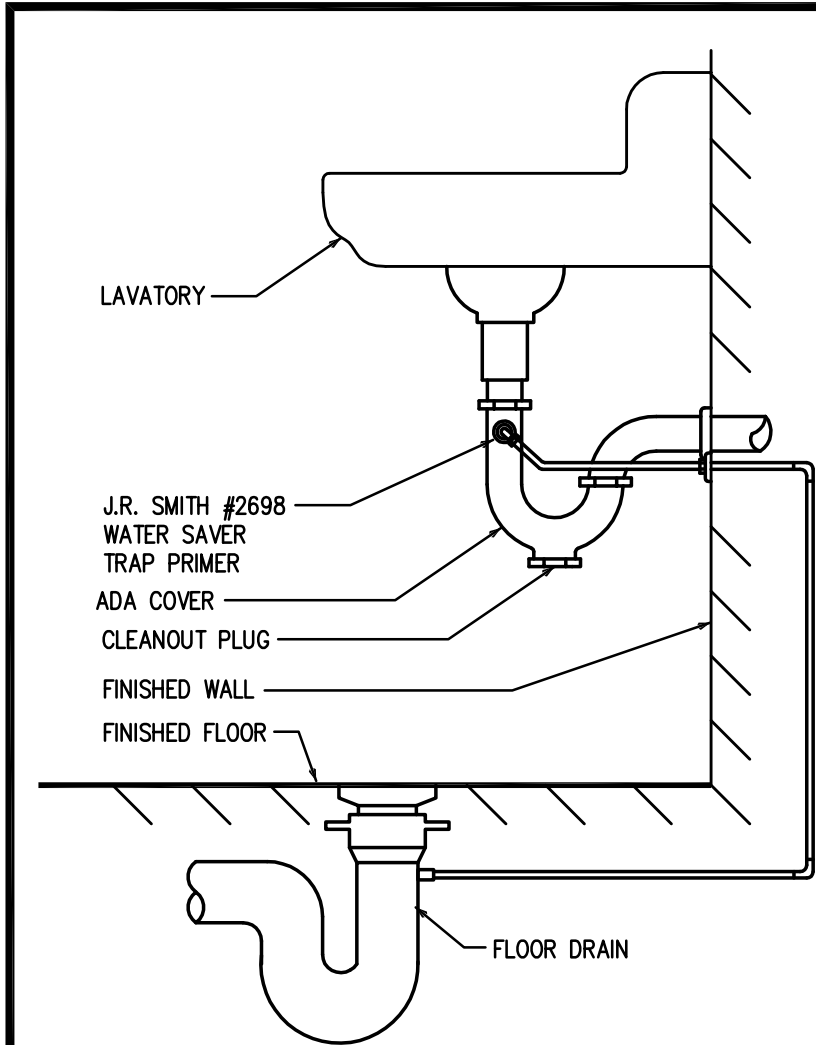
| SIZE (Inches) | MINIMUM SLOPE (inch per foot) |
|---------------|-------------------------------|
| 2-1/2 or less | 1/4                           |
| 3 to 6        | 1/8                           |
| 8 or larger   | 1/16                          |

TABLE 704.1 OF THE FLORIDA PLUMBING CODE 2010

PLUMBING SYMBOL LEGEND

SCALE: N.T.S.

| SYMBOL | DESCRIPTION           |
|--------|-----------------------|
| ----   | SANITARY LINE         |
| ----   | VENT LINE             |
| ----   | CONDENSATE LINE       |
| ----   | COLD WATER LINE       |
| ----   | HOT WATER LINE        |
| ----   | GATE VALVE            |
| ----   | WATER HAMMER ARRESTOR |
| ----   | FLOOR PENETRATION     |
| ----   | WATER CLOSET          |
| ----   | LAVATORY              |
| ----   | ELECTRIC WATER COOLER |
| ----   | CLEAN OUT             |
| ----   | FLOOR DRAIN           |
| ----   | VENT THRU ROOF        |



TRAP PRIMER DETAIL

SCALE: N.T.S.

MATERIAL SPECIFICATIONS

SCALE: N.T.S.

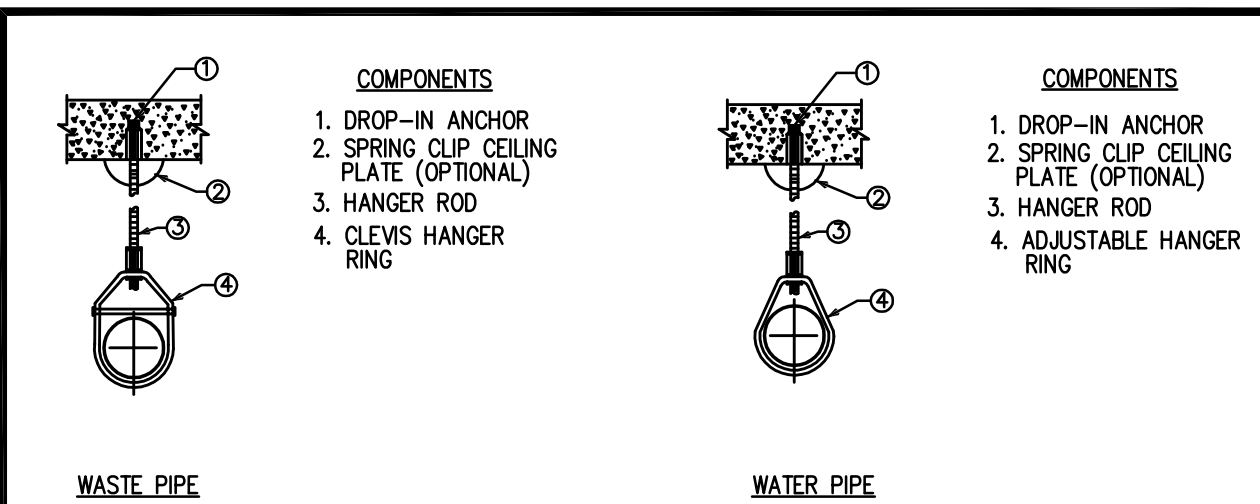
- DOMESTIC WATER PIPING SHALL BE HARD COPPER PIPE TYPE "L" ANSI / ASTM B-88 FOR 2" AND UNDER. WITH WROUGHT-COPPER SOLDER-JOINTS FITTINGS ASTM B-16.22. BELOW GRADE PIPING SHALL BE TYPE "K" ANSI / ASTM SOFT COPPER WITH NO JOINTS OR FITTINGS BELOW GRADE.
- SOIL, WASTE, VENT AND RAINWATER PIPING SHALL BE POLYVINYL CHLORIDE SCHEDULE 40 (PVC) PLASTIC DRAIN, WASTE AND VENT PIPE AND FITTINGS. PIPE AND FITTINGS SHALL CONFORMING TO ANSI STANDARD K65.56-1971 AND ASTM STANDARD D2665-82. SOLVENT CEMENT FOR POLYVINYL CHLORIDE (PVC) PLASTIC PIPE AND FITTINGS SHALL CONFORM TO ANSI STANDARD B72.16-1971 AND ASTM STANDARD D2564-80.
- AIR CONDITIONING CONDENSATE DRAIN PIPING SHALL BE COPPER D.W.V. PIPING WITH WROUGHT COPPER SOLDER-JOINT DRAINAGE FITTINGS. AND INSULATE ALL CONDENSATE PIPING EXCEPT BELOW GRADE PIPING.
- INSULATE ALL HOT WATER, HOT WATER RETURN, A.C. CONDENSATE LINES, AS FOLLOWS: HW SUPPLY AND RETURN - 1" THICK PREFORMED ARMAFLEX PIPE INSULATION. HORIZONTAL STORM DRAIN PIPING WITH 1-1/2" THICK PREFORMED FIBERGLASS PIPE INSULATION WITH FACTORY JACKET. A.C. CONDENSATE PIPING WITH 3/4" PREFORMED ARMAFLEX.

PLUMBING INDEX

| DRAWING |      |  |  |
|---------|------|--|--|
| 1       | P100 | PLUMBING INDEX, SYMBOL LEGEND AND NOTES. |  |
| 2       | P101 | SITE PLUMBING PLAN                       |  |
| 3       | P200 | FLOOR PLUMBING PLAN - DEMOLITION         |  |
| 4       | P201 | FLOOR DOMESTIC WATER PLAN                |  |
| 5       | P202 | FLOOR SANITARY PLANS                     |  |
| 6       | P300 | ROOF PLUMBING PLAN                       |  |
| 7       | P400 | ISOMETRICS                               |  |
| 8       | P--  | X  |  |
| 9       | P--  | X  |  |
| 10      |      |  |  |

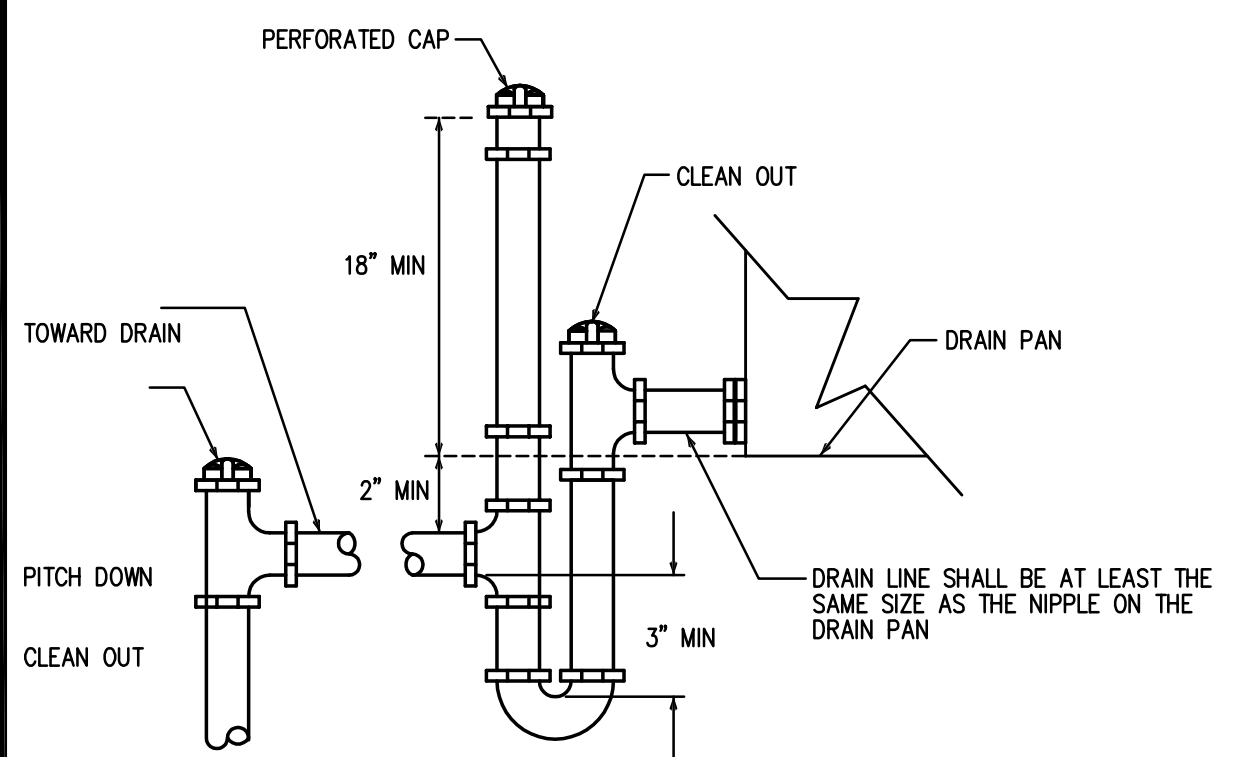
SHOP DRAWING REQUIREMENTS

- CONTRACTOR SHALL SUBMIT 6 COPIES OF COMPLETED SHOP DRAWINGS, TOGETHER AT ONE TIME AND MUST COME THROUGH THE ARCHITECT. ALL SUBMITTALS SHALL BE MADE WITHIN 30 DAYS OF NOTICE TO PROCEED.
- ALL SUBMITTALS MUST CLEARLY INDICATE EXACTLY WHICH ITEMS ARE BEING PROPOSED FOR USE. IF NOT, THE SUBMITTAL SHALL BE REJECTED.
- SUBSTITUTIONS SHALL BE LIMITED TO ONE OF THE ALTERNATES LISTED IN THE CONSTRUCTION DOCUMENTS. PRODUCTS CONSIDERED TO BE EQUAL SHALL BE REVIEWED AND ACCEPTED BY THE ENGINEER, ARCHITECT AND OWNER (10) DAYS PRIOR TO BID DATE.
- THE CONTRACTOR ASSUMES ALL DESIGN RESPONSIBILITY AND ALL FINANCIAL RISKS FOR PROCEEDING PRIOR TO SHOP DRAWINGS PROCESSING, AND ON ANY ITEM OR WORK THAT IS AT VARIANCE TO THE CONSTRUCTION DOCUMENTS.
- SHOP DRAWINGS AND SUBMITTALS FOR EACH ITEM SHALL BE REVIEWED NO MORE THAN TWICE. A THIRD SUBMITTAL ON AN ITEM MUST BE ACCOMPANIED BY A PURCHASE ORDER FROM THE CONTRACTOR OR IT SHALL BE REJECTED.
- CIRCUMSTANCES NECESSITATING A REVISION TO THE PERMITTED DOCUMENTS NOT PROCESSED PRIOR TO INSTALLATION MAY NOT BE ACCEPTED. IF ACCEPTED IT MUST BE LEGIBLE, ACCURATE AND ACCOMPANIED BY A PURCHASE ORDER FROM THE CONTRACTOR. THE REVISION SHALL BE CHARGED TO THE CONTRACTOR AND DELIVERED TO HIM ON A C.O.D. BASIS.
- SUBSTITUTIONS FROM THE BASE DESIGN OR VARIATIONS TO THE PERMITTED CONTRACT DOCUMENTS, WHETHER RESULTING FROM PROCESSED SHOP DRAWINGS OR NOT, THAT RESULT IN REQUIREMENTS IN LETTERS OF AUTHORIZATION AND/OR PERMIT CONTRACT DOCUMENT CHANGES MANDATED BY THE AUTHORITY HAVING JURISDICTION WILL NOT BE MADE BY THIS OFFICE UNLESS ACCOMPANIED BY A PURCHASE ORDER FROM THE CONTRACTOR, AND RELEASED ON A C.O.D. BASIS.



TYPICAL HANGER DETAILS

SCALE: N.T.S.



TYPICAL CONDENSATE DRAIN TRAP

SCALE: N.T.S.

GENERAL NOTE:

- COORDINATE PHASING (NIGHT WEEKENDS) WITH GENERAL CONTRACTOR.



|              |            |
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| SB/CE/RT/AB  | 05/31/2017 |
| DESIGNED BY: | SCALE:     |
| SB/CE/RT/AB  | AS NOTED   |
| CHECKED BY:  | GSU        |
| FIELD BOOK:  |            |

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100 North Andrews Avenue, Fort Lauderdale, Florida 33301

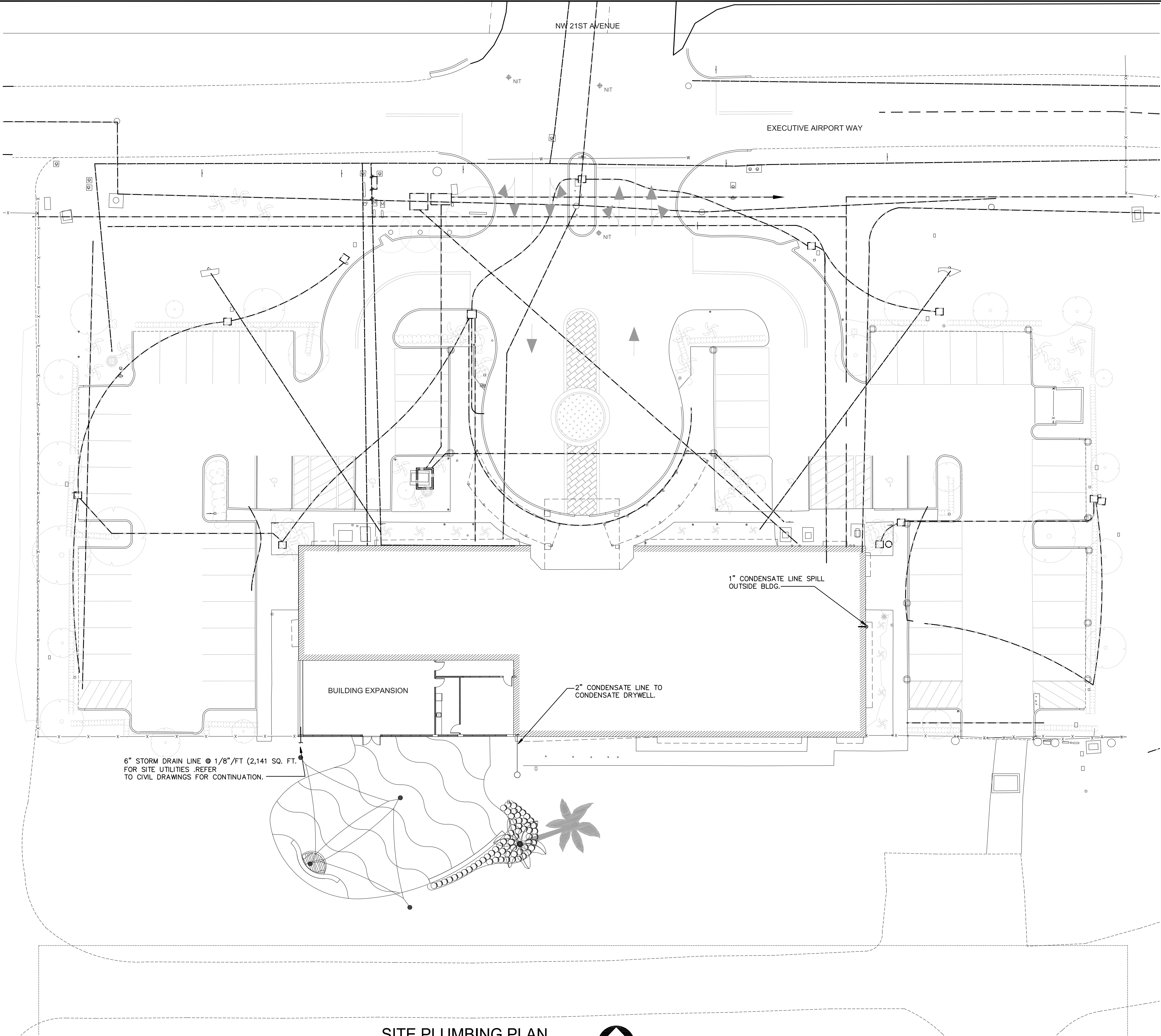
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| DATE      |             |
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PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
PLUMBING INDEX, SYMBOL LEGEND AND NOTES  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                            |    |
|----------------------------|----|
| SHEET NO.                  | OF |
| P100                       | 7  |
| TOTAL: 65                  |    |
| CAD FILE:                  |    |
| 161107 PLUMBING INDEX PLAN |    |
| DRAWING FILE NO.           |    |
| 4-140-42                   |    |
| CAM 18-007                 |    |
| Exhibit 3                  |    |
| 737 of 776                 |    |



P:\161107 FORT LAUDERDALE EXECUTIVE AIRPORT - FIVE ADMIN BLDG EXPANSION\ARCH\02-16-2017\A-101 - FLOOR PLAN YENI.DWG



SITE PLUMBING PLAN  
SCALE: 1/16"=1'-0"




BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
SITE PLUMBING PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|   |    |
|---|----|
| SHEET NO.                               | OF |
| P101                                    | 7  |
| TOTAL: 65                               |    |
| CAD FILE:<br>161107 SITE PLUMBING PLAN  |    |
| DRAWING FILE NO.<br>4-140-42 AM 18-0070 |    |

Exhibit 3  
738 of 776

| REVISIONS |      |    | DESCRIPTION |
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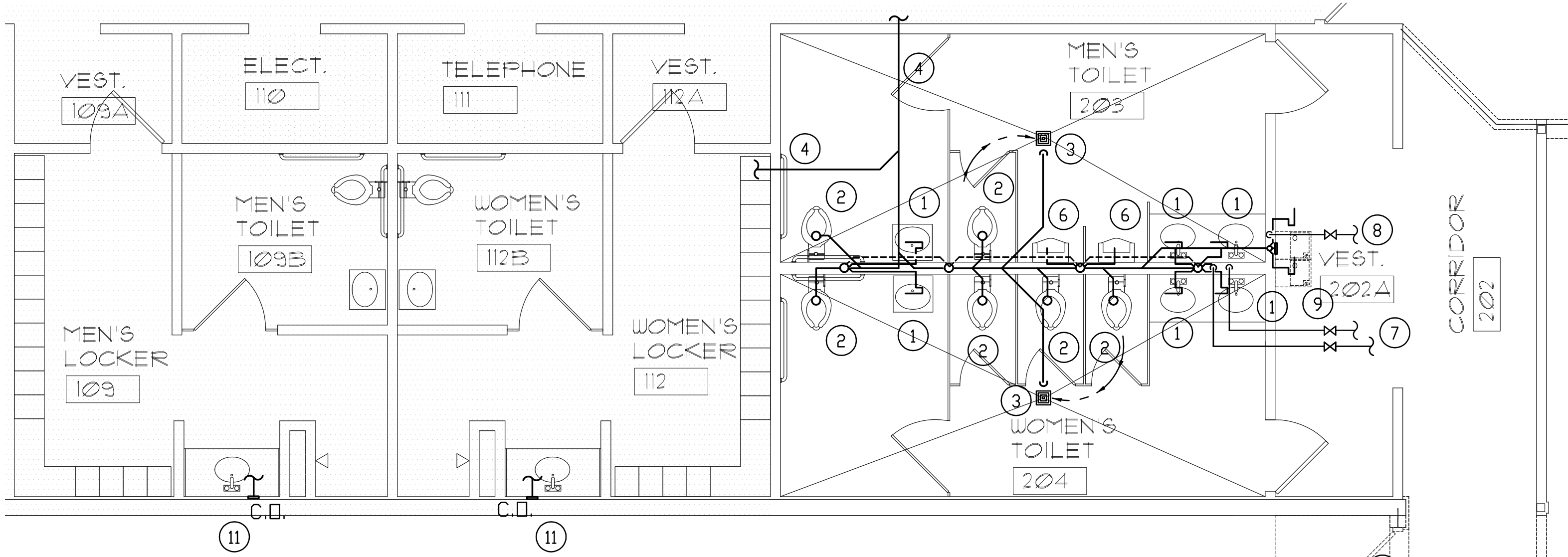
CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

|                             |                     |
|-----------------------------|---------------------|
| DRAWN BY:<br>SB/CE/RT/AB    | DATE:<br>05/31/2017 |
| DESIGNED BY:<br>SB/CE/RT/AB | SCALE:<br>AS NOTED  |
| CHECKED BY:<br>GSU          | FIELD BOOK:         |



DELTA G CONSULTING  
ENGINEERING, INC.  
FORT LAUDERDALE, FL 33304  
FLORIDA LICENSE #00000001  
PROJECT # 12188





FLOOR PLUMBING PLAN - DEMOLITION

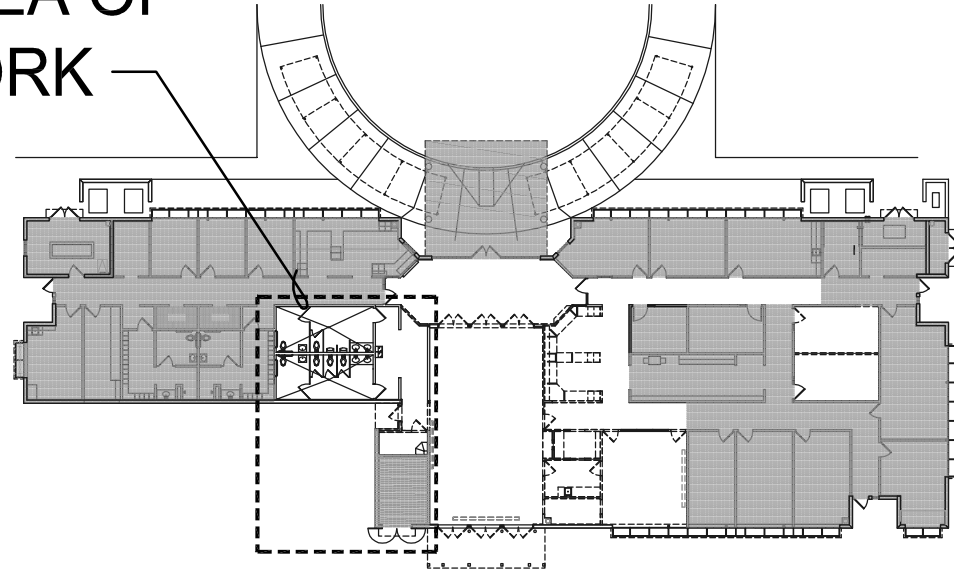
SCALE: 1/4"=1'-0"



PLUMBING DEMOLITION NOTES

- 1 REMOVE EXISTING LAVATORY AND PIPING BACK TO MAIN.
- 2 REMOVE EXISTING FLOOR WALL MOUNTED TOILET AND PIPING BACK TO MAIN.
- 3 EXISTING FLOOR DRAIN TO REMAIN.
- 4 EXISTING SANITARY PIPING TO REMAIN.
- 5 EXISTING WATER HEATER TO REMAIN.
- 6 REMOVE EXISTING URINAL AND PIPING BACK TO MAIN.
- 7 EXISTING HOT AND COLD WATER SUPPLY TO REMAIN.
- 8 EXISTING COLD WATER SUPPLY TO REMAIN.
- 9 REMOVE EXISTING ELECTRIC WATER COOLER AND PIPING BACK TO MAIN.
- 10 REMOVE EXISTING HOSE BIBB AND CAP PIPING BACK AT MAIN.
- 11 COORDINATE CLEAN OUT LOCATIONS WITH NEW CONSTRUCTION. EXTEND AND PROVIDE CAP AS REQUIRED.
- 12 EXISTING MOP SINK TO REMAIN.
- 13 REMOVE AND RELOCATE EXISTING DRY WELL (SEE SHEET P201),AND CAP ALL ASSOCIATED PIPING IN WALL, @ CEILING OR BELOW FLOOR SLAB AS REQUIRED AND PATCH TO MATCH EXISTING.

AREA OF WORK



KEYPLAN

SCALE: N.T.S.



BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS

FLOOR PLUMBING PLAN - DEMOLITION  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                           |    |
|---------------------------|----|
| SHEET NO.                 | OF |
| P200                      | 7  |
| TOTAL:                    | 65 |
| CAD FILE:                 |    |
| 161107 PLUMBING DEMO PLAN |    |
| DRAWING FILE NO.          |    |
| 4-140-42                  |    |

DELTA CONSULTING  
ENGINEERS, INC.  
1000 N. W. 10th Ave., Suite 200  
Fort Lauderdale, FL 33304  
PROJECT # 12188

SHAWN J. DELTA, P.E.  
REGISTERED PROFESSIONAL ENGINEER  
FLORIDA LICENSE NO. 12082-183

|              |            |
|--------------|------------|
| DRAWN BY:    | DATE:      |
| SB/CB/RT/IB  | 05/31/2017 |
| DESIGNED BY: | SCALE:     |
| SB/CB/RT/IB  | AS NOTED   |
| CHECKED BY:  |            |
| GSJ          |            |
| FIELD BOOK   |            |

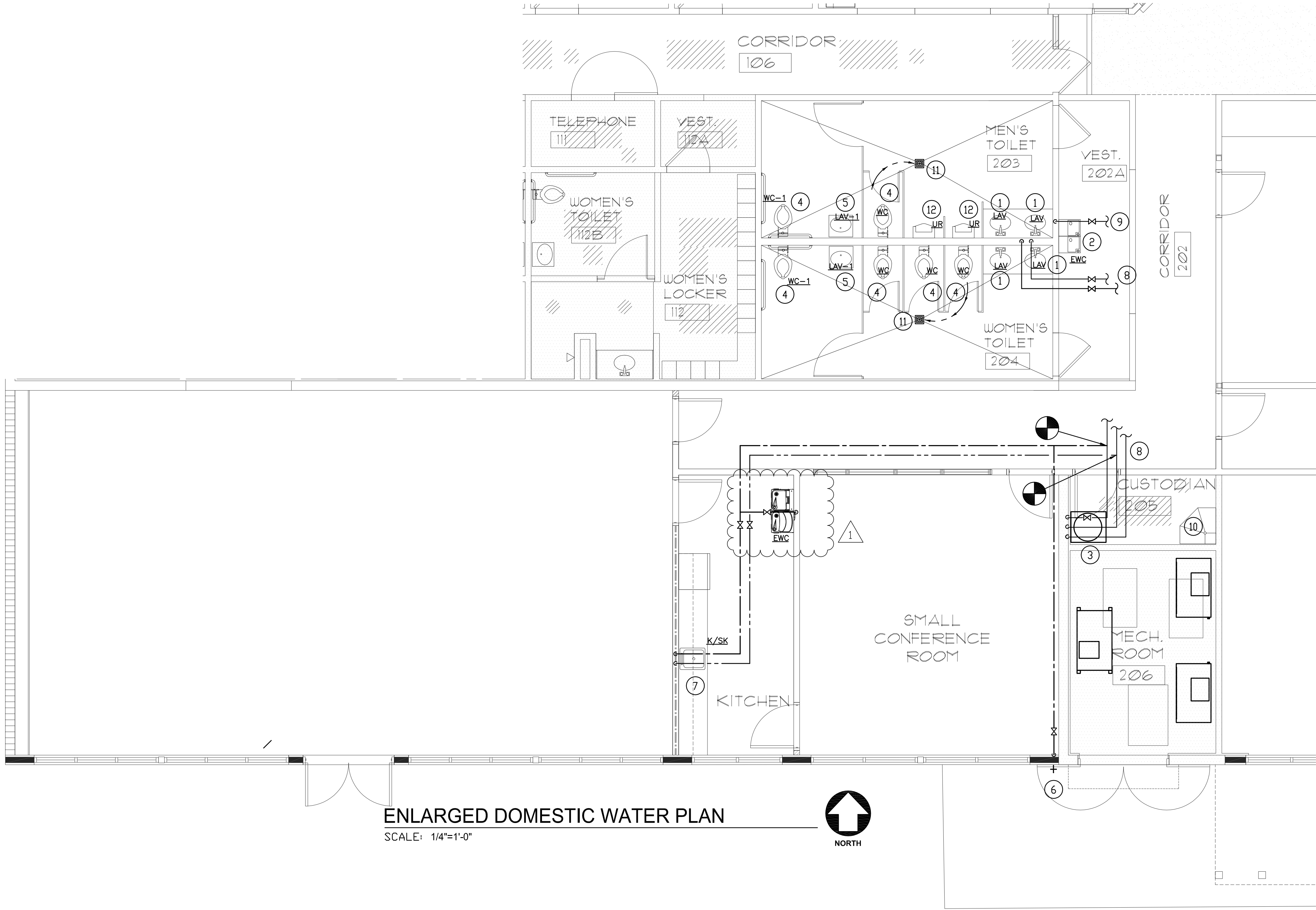
CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      | DESCRIPTION |       |
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| NO.       | DATE | BY          | CHK'D |
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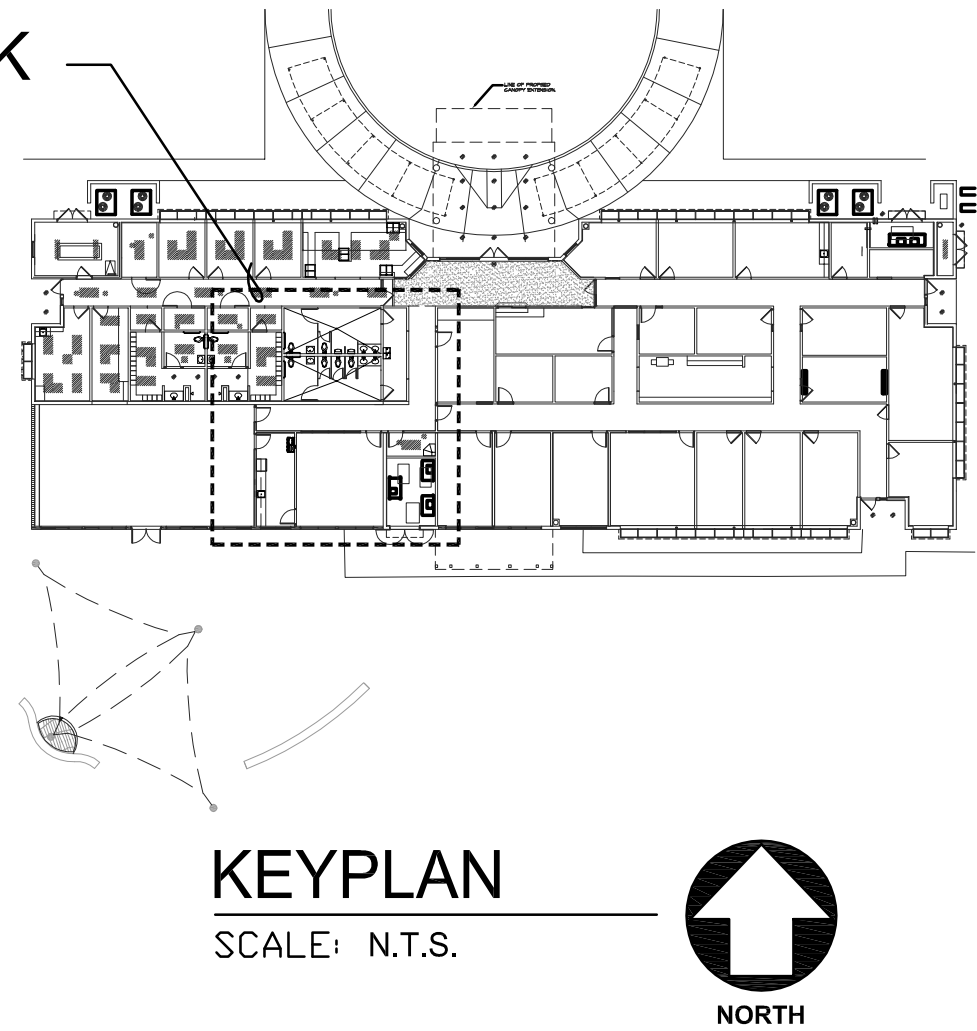
PLUMBING NEW WORK NOTES

- 1
- NEW COUNTER MOUNTED LAVATORY. SEE SHEET P100 PLUMBING FIXTURE SCHEDULE. RECONNECT NEW COLD AND HOT WATER TO EXISTING.
- 2
- NEW EWC. SEE SHEET P100 PLUMBING FIXTURES SCHEDULE. CONNECT NEW 1/2" CW TO EXISTING CW. SYSTEM. CONTRACTOR SHALL FIELD VERIFY EXACT SIZE AND LOCATION PRIOR TO CONSTRUCTION.
- 3
- EXISTING WATER HEATER TO REMAIN.
- 4
- NEW FLOOR MOUNTED FLUSH VALVE WATER CLOSET. SEE SHEET P1.0 PLUMBING FIXTURES SCHEDULE. CONTRACTOR SHALL RECONNECT COLD WATER TO EXISTING. CONTRACTOR SHALL FIELD VERIFY EXACT SIZES LOCATION AND ELEVATIONS PRIOR TO CONSTRUCTION.
- 5
- NEW WALL MOUNTED LAVATORY. SEE SHEET P100 PLUMBING FIXTURE SCHEDULE. CONNECT NEW 1/2" COLD AND NEW 1/2" HOT WATER LINES TO EXISTING COLD & HOT WATER LINES. CONTRACTOR SHALL FIELD VERIFY EXACT SIZE, LOCATIONS PRIOR TO CONSTRUCTION.
- 6
- NEW HOSE BIBB WITH SHUT-OFF VALVE AND VACUUM BREAKER.
- 7
- NEW KITCHEN SINK
- 8
- EXISTING HOT AND COLD WATER SUPPLY, AND HOT WATER RETURN, TO REMAIN.
- 9
- EXISTING COLD WATER SUPPLY TO REMAIN.
- 10
- EXISTING MOP SINK TO REMAIN.
- 11
- EXISTING FLOOR DRAIN TO REMAIN.
- 12
- NEW URINAL. SEE SHEET P100 PLUMBING FIXTURES SCHEDULE. CONTRACTOR SHALL RECONNECT COLD WATER TO EXISTING. CONTRACTOR SHALL FIELD VERIFY EXACT SIZES AND LOCATION PRIOR TO CONSTRUCTION.



ENLARGED DOMESTIC WATER PLAN  
SCALE: 1/4"=1'-0"

AREA OF  
WORK



KEYPLAN  
SCALE: N.T.S.

BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS

DOMESTIC WATER FLOOR PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                            |    |
|----------------------------|----|
| SHEET NO.                  | OF |
| P201                       | 7  |
| TOTAL:                     | 65 |
| CAD FILE:                  |    |
| 161107 DOMESTIC WATER PLAN |    |
| DRAWING FILE NO.           |    |
| 4-140-42                   |    |

| REVISIONS |           |           | DESCRIPTION              |
|-----------|-----------|-----------|--------------------------|
| NO.       | DATE      | BY (CHKD) |                          |
| 1         | 8/11/2017 |           | BUILDING PERMIT COMMENTS |
|           |           |           |                          |
|           |           |           |                          |
|           |           |           |                          |

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

DESIGNED BY: SB/CB/RT/JB  
CHECKED BY: GSJ  
FIELD BOOK:

DATE: 05/31/2017  
SCALE: AS NOTED

DELTA 6 CONSULTING  
1001 W. UNIVERSITY BLVD., SUITE 200  
FORT LAUDERDALE, FL 33304  
(954) 333-1111  
WWW.DELTA6CONSULTING.COM

REGISTERED PROFESSIONAL ENGINEER  
STATE OF FLORIDA  
LICENSE NO. 12082-183

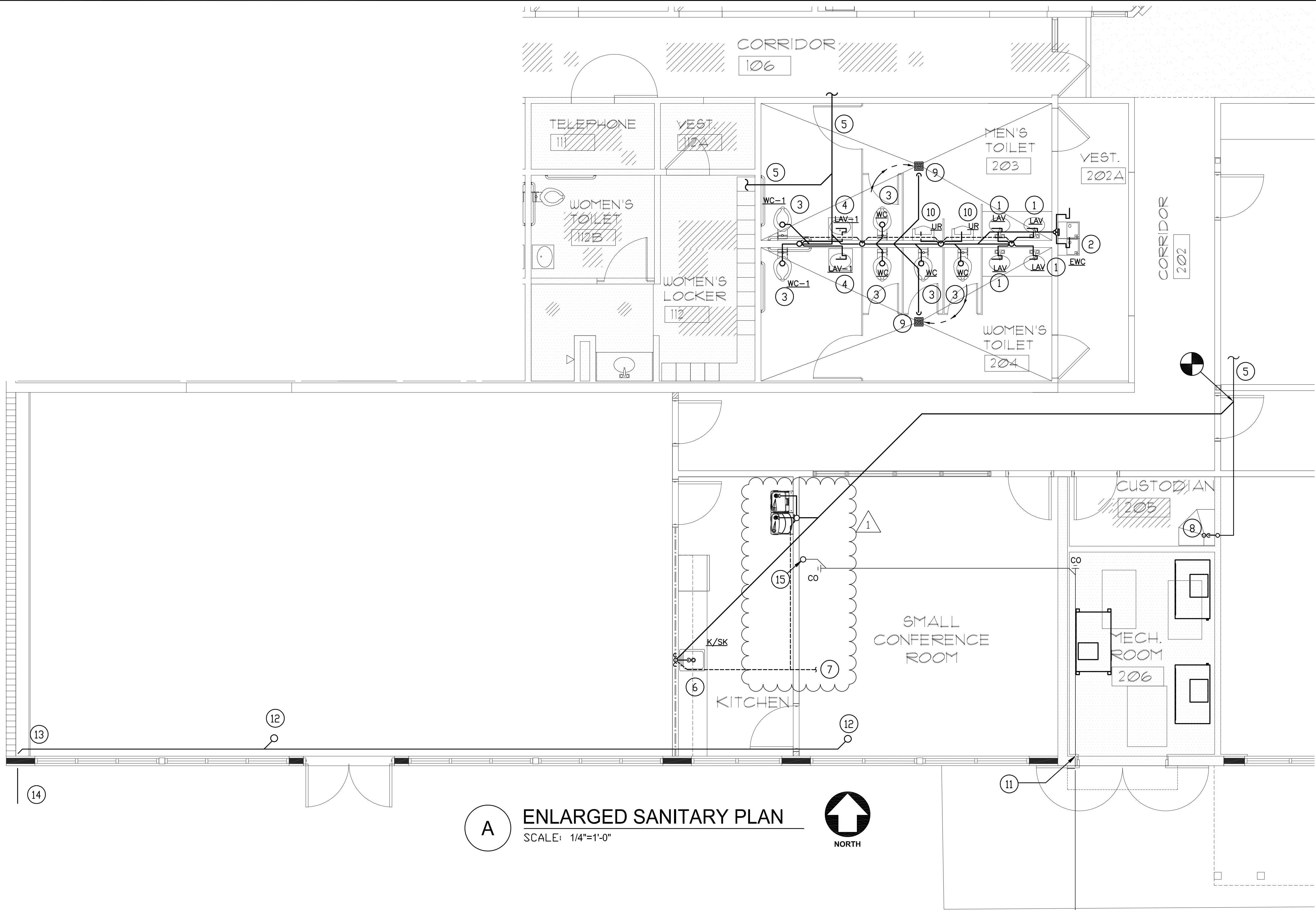
10/23/2017 1:01 PM

p. 740

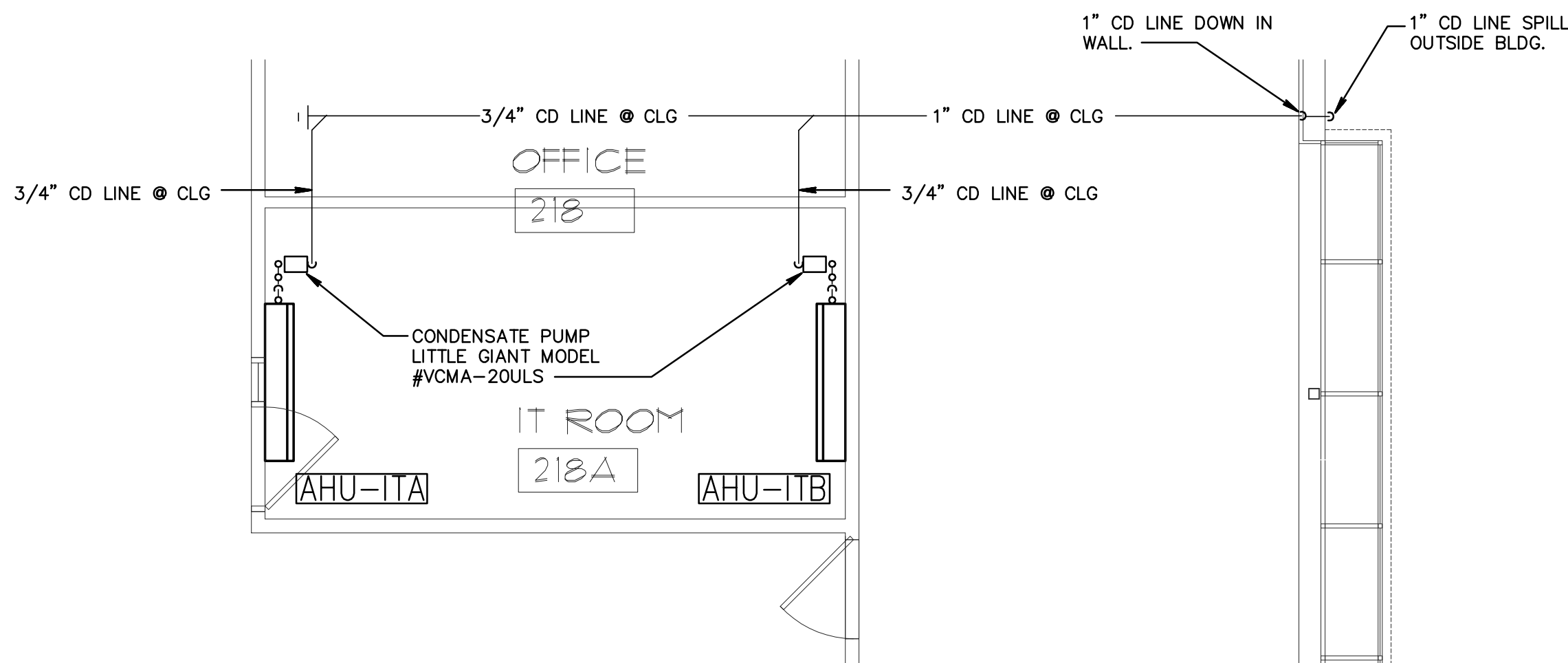


PLUMBING NEW WORK NOTES

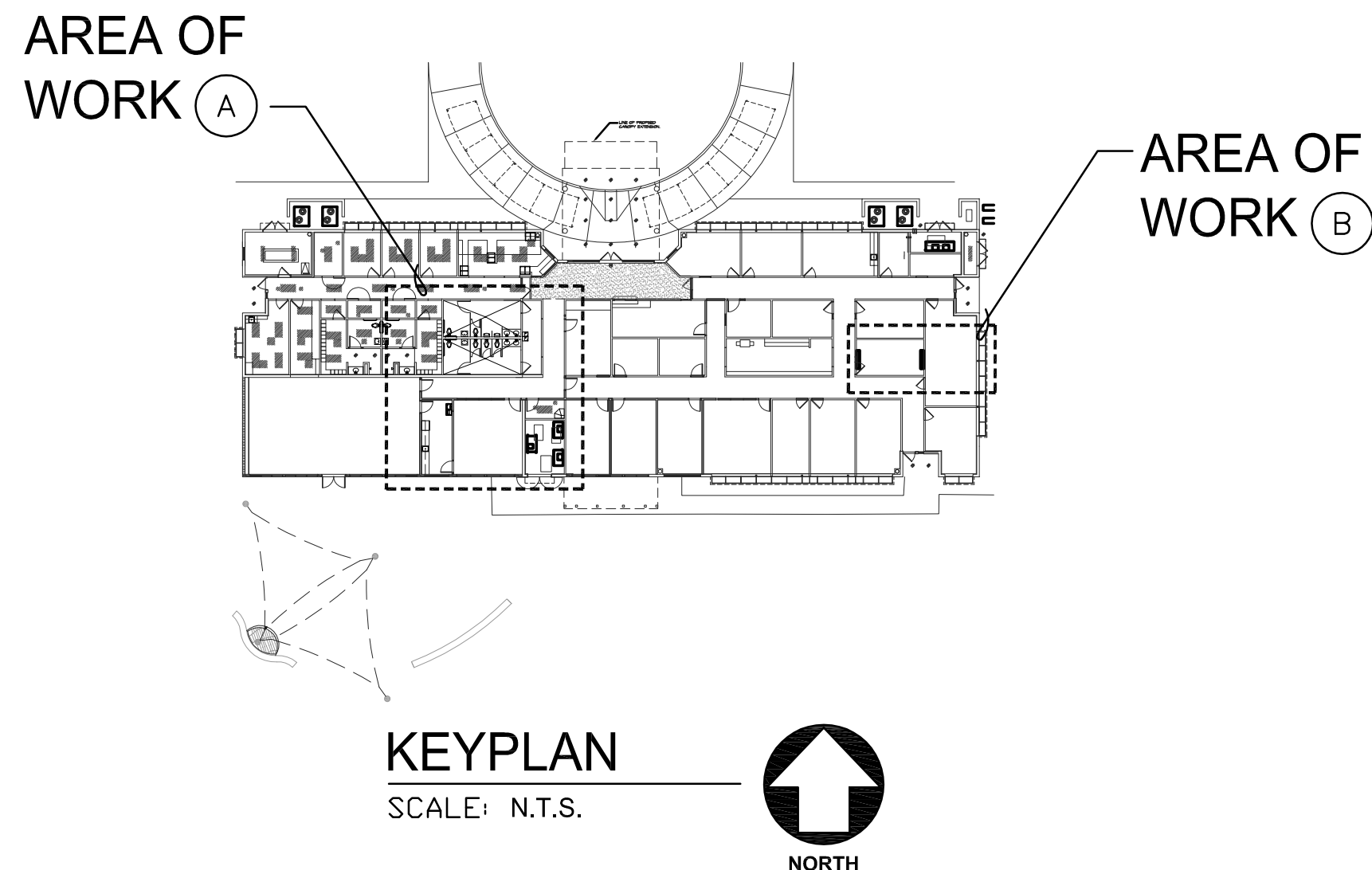
- 1 NEW COUNTER MOUNTED LAVATORY. SEE SHEET P100 PLUMBING FIXTURE SCHEDULE. RECONNECT NEW SANITARY AND VENT LINES TO EXISTING.
- 2 NEW EWC. SEE SHEET P100 PLUMBING FIXTURES SCHEDULE. CONNECT NEW 2" SANITARY AND 2" VENT LINES TO EXISTING SANITARY AND VENT SYSTEMS. CONTRACTOR SHALL FIELD VERIFY EXACT SIZE AND LOCATION PRIOR TO CONSTRUCTION.
- 3 NEW FLOOR MOUNTED FLUSH VALVE WATER CLOSET. SEE SHEET P1.0 PLUMBING FIXTURES SCHEDULE. CONTRACTOR SHALL RECONNECT SANITARY AND VENT LINES TO EXISTING. CONTRACTOR SHALL FIELD VERIFY EXACT SIZES LOCATION AND ELEVATIONS PRIOR TO CONSTRUCTION.
- 4 NEW WALL MOUNTED LAVATORY. SEE SHEET P100 PLUMBING FIXTURE SCHEDULE. CONNECT NEW 2" SANITARY AND NEW 2" VENT LINES TO EXISTING SANITARY AND VENT LINES. CONTRACTOR SHALL FIELD VERIFY EXACT SIZE, LOCATIONS AND ELEVATIONS PRIOR TO CONSTRUCTION.
- 5 EXISTING SANITARY PIPING TO REMAIN.
- 6 NEW KITCHEN SINK
- 7 CONNECT NEW 2" VENT LINE TO NEAREST VENT SYSTEM. CONTRACTOR SHALL FIELD VERIFY EXACT SIZE AND LOCATION PRIOR TO CONSTRUCTION.
- 8 EXISTING MOP SINK TO REMAIN.
- 9 EXISTING FLOOR DRAIN TO REMAIN.
- 10 NEW URINAL. SEE SHEET P100 PLUMBING FIXTURES SCHEDULE. CONTRACTOR SHALL RECONNECT SANITARY AND VENT LINES TO EXISTING. CONTRACTOR SHALL FIELD VERIFY EXACT SIZES LOCATION AND ELEVATIONS PRIOR TO CONSTRUCTION.
- 11 1" CONDENSATE LINE DOWN TO BELOW FLOOR SLAB TO CONDENSATE DRYWELL.
- 12 NEW 4" STORM DRAIN LINE FROM NEW ROOF DRAIN.
- 13 6" STORM DRAIN LINE DOWN IN WALL TO BELOW FLOOR SLAB.
- 14 6" STORM DRAIN LINE @ 1/8"/FT. (2,141 SQ. FT.) SEE SHEET P101 FOR CONTINUATION.
- 15 1" CONDENSATE LINE FROM RTU.
- 16 CONDENSATE DRYWELL UNDERGROUND W/ CONCRETE COLLAR.



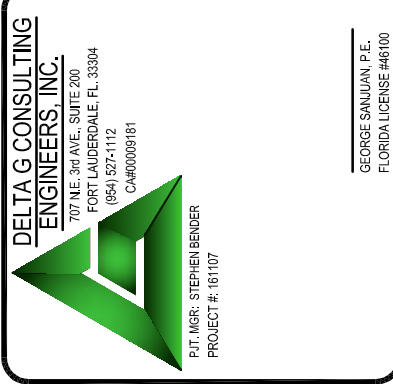
**A** ENLARGED SANITARY PLAN  
SCALE: 1/4"=1'-0"



**B** ENLARGED SANITARY PLAN - IT ROOM 218A  
SCALE: 1/4"=1'-0"



**KEYPLAN**  
SCALE: N.T.S.



|              |            |
|--------------|------------|
| DRAWN BY:    | DATE:      |
| SB/CB/RT/AB  | 05/05/2017 |
| DESIGNED BY: | SCALE:     |
| SB/CB/RT/AB  | AS NOTED   |
| CHECKED BY:  | GSJ        |
| FIELD BOOK   |            |

**CITY OF FORT LAUDERDALE**  
**PUBLIC WORKS DEPARTMENT**  
**ENGINEERING & ARCHITECTURE**

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| NO. | REVISIONS |      | DESCRIPTION              |
|-----|-----------|------|--------------------------|
|     | BY        | CHKD |                          |
| 1   | 8/11/2017 |      | BUILDING PERMIT COMMENTS |
|     |           |      |                          |
|     |           |      |                          |
|     |           |      |                          |
|     |           |      |                          |

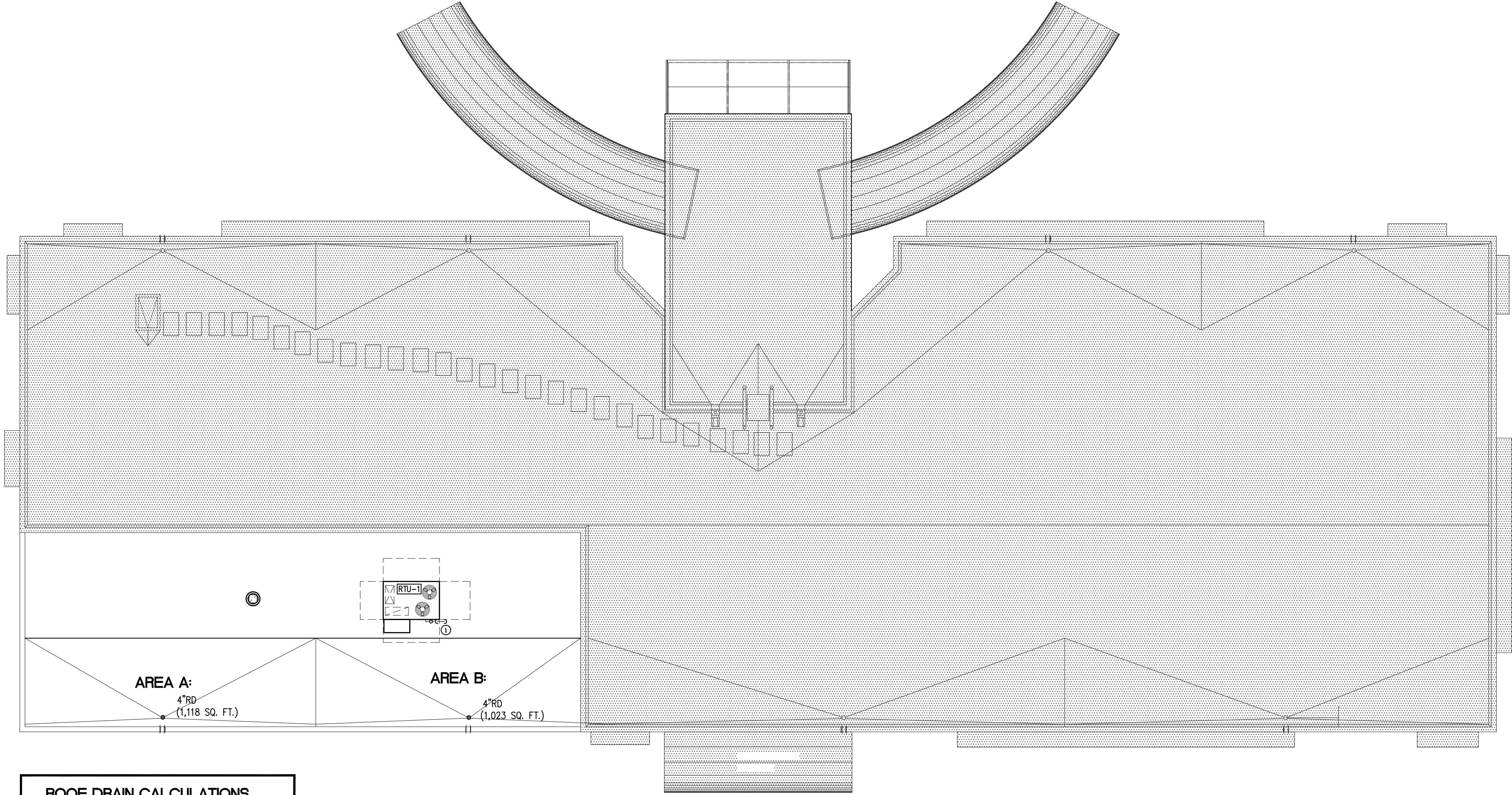
**PROJECT # 12188**  
**ADMINISTRATION BUILDING RENOVATIONS**

**SANITARY FLOOR PLAN**  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                      |           |
|----------------------|-----------|
| SHEET NO.            | OF        |
| <b>P202</b>          | <b>7</b>  |
| TOTAL:               | 65        |
| CAD FILE:            |           |
| 161107 SANITARY PLAN |           |
| DRAWING FILE NO.     | CAM       |
| 4-140-42             | 8-0070    |
|                      | Exhibit 3 |
|                      | 7 of 776  |

BID DOCUMENTS





| ROOF DRAIN CALCULATIONS                             |  |
|---|--|
| <b>AREA A:</b>                                      |  |
| AREA: 965 SQ. FT.                                   |  |
| PARAPET : 102 L x 3 H = 306 SQ. FT./2 = 153 SQ. FT. |  |
| TOTAL = 1,118 SQ. FT.                               |  |
| <b>AREA B:</b>                                      |  |
| AREA: 880 SQ. FT.                                   |  |
| PARAPET : 95 L x 3 H =285 SQ. FT./2 = 143 SQ. FT.   |  |
| TOTAL = 1,023 SQ. FT.                               |  |

PLUMBING NEW WORK NOTES  
1" CONSIDERATE LINE DOWN TO CEILING SPACE BELOW.

ROOF PLUMBING PLAN

SCALE: 1/8"=1'-0"



BID DOCUMENTS

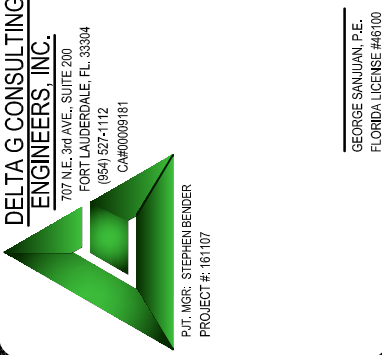
PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
ROOF PLUMBING PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                  |                           |
|------------------|---------------------------|
| SHEET NO.        | OF                        |
| P300             | 7                         |
| TOTAL:           | 65                        |
| CAD FILE:        | 161107 ROOF PLUMBING PLAN |
| DRAWING FILE NO. | 4-140-42                  |
| CAM 18-007       |                           |
| Exhibit 3        |                           |
| 742 of 776       |                           |

| REVISIONS |             |
|-----------|-------------|
| NO.       | DESCRIPTION |
|           |             |
|           |             |
|           |             |
|           |             |
|           |             |

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

|              |            |
|--------------|------------|
| DRAWN BY:    | DATE:      |
| SB/CE/RT/AB  | 05/31/2017 |
| DESIGNED BY: | SCALE:     |
| SB/CE/RT/AB  | AS NOTED   |
| CHECKED BY:  |            |
| GSJ          |            |
| FIELD BOOK:  |            |







## GENERAL ELECTRICAL NOTES

(GENERAL NOTES ARE PROVIDED AS A BASIC DESCRIPTION OF THE EXTENT AND QUALITY EXPECTED IN THIS PROJECT. IF A CONFLICT EXISTS BETWEEN THESE GENERAL NOTES AND THE REMAINDER OF THE CONTRACT DOCUMENTS THE SPECIFICATIONS, PLANS AND DETAILS WILL GOVERN.)

- THE ENTIRE INSTALLATION SHALL BE IN ACCORDANCE WITH THE FOLLOWING CODES AND STANDARDS:

  - A. FLORIDA STATE FIRE MARSHAL'S RULE 60A-3.012 FAC AND RULE CHAPTER 60A-40 FLORIDA ADMINISTRATIVE CODE (FAC) AND RULE CHAPTER 60A-40 FLORIDA ADMINISTRATIVE CODE (FAC) AND RULE CHAPTER 60A-40
  - B. NFPA 70A: NATIONAL ELECTRICAL CODE (2011 EDITION)
  - C. NFPA 72: NATIONAL FIRE ALARM CODE (2012 EDITION)
  - D. NFPA 96: HEALTH CARE FACILITIES (2012 EDITION)
  - E. NFPA 101: LIFE SAFETY CODE (2012 EDITION)
  - F. NFPA 150: STANDARD FOR EMERGENCY WANDY POWER SYSTEMS (2010 EDITION)
  - G. NFPA 780: STANDARD FOR THE INSTALLATION OF LIGHTNING PROTECTION SYSTEMS (2011 EDITION)

IN ADDITION, THE INSTALLATION SHALL ALSO BE IN ACCORDANCE WITH THE FOLLOWING:

  - A. FLORIDA BUILDING CODE 2014 5th EDITION (FBC)
  - B. FLORIDA GUIDELINES FOR DESIGN AND CONSTRUCTION OF HEALTH CARE FACILITIES (FBI GUIDELINES, 2010 EDITION)
  - C. FLORIDA PREVENTION CODE (2010 EDITION)

AS A MINIMUM, ALL EQUIPMENT SHALL MEET APPLICABLE STANDARDS, FOR THE TYPE OF EQUIPMENT AND INTENDED USE, OF THE FOLLOWING:

  - A. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
  - B. ILLUMINATING ENGINEERS SOCIETY (IES)
  - C. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
  - D. NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATES (NEMA)

E. NOTE: THESE STANDARDS ARE SUBORDINATE TO CODES AND STANDARDS SET BY U.L. ALL ELECTRICAL EQUIPMENT, DOWNSIDE ETC. SHALL BE LISTED, FOR INTENDED USE, WITH UNDERWRITER'S LABORATORIES INC. (U.L.), WHERE STANDARDS HAVE BEEN ESTABLISHED BY U.L.

CONTRACTOR TO PROVIDE ALL LABOR, MATERIALS AND SUPERVISION NECESSARY TO ACCOMPLISH THE WORK AS SHOWN AND/OR NOTED ON THE DRAWINGS.

THE CONTRACTOR SHALL VISIT THE JOB SITE AND VERIFY ALL CONDITIONS, LOCATIONS, DIMENSIONS AND COUNTS AS SHOWN OR NOTED ON THE DRAWINGS, PRIOR TO SUBMITTING BID.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL LABOR, MATERIALS AND SUPERVISION NECESSARY TO ACCOMPLISH THE WORK AS SHOWN AND/OR NOTED ON THE PLANS.

ELECTRICAL CONTRACTOR SHALL NOT SCALE DRAWINGS. CONTRACTOR SHALL REFER TO ARCHITECT PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT UNLESS NOTED OTHERWISE.

IT SHALL BE UNDERSTOOD THAT ALL WORK PERFORMED SHALL BE DONE BY A LICENSED CONTRACTOR AND IN A FIRST-CLASS WORKMANLIKE MANNER. SAID CONTRACTOR SHALL MEET ALL REQUIREMENTS SET FORTH BY ANY LOCAL ORDINANCE AND GOVERNING AUTHORITIES.

THE CONTRACTOR SHALL PROVIDE ALL REQUIRED INSURANCE FOR PROTECTION AGAINST PUBLIC LIABILITY AND PROPERTY DAMAGE FOR THE DURATION OF THE WORK.

CONTRACTOR SHALL GUARANTEE ALL WORKMANSHIP FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM DATE OF ACCEPTANCE, UNLESS INDICATED OR SPECIFIED OTHERWISE.

IT SHALL NOT BE THE INTENT OF THESE MATERIALS AND/OR SPECIFICATIONS TO SHOW EXACT DETAIL OF CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE FOR ALL REQUIREMENTS NECESSARY FOR EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING TO ORIGINAL CONDITIONS, AND ALL DAMAGES TO BUILDING SURFACES, EQUIPMENT, ETC. CAUSED DURING THE PERFORMANCE OF WORKMANSHIP.

CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ADDITIONAL CHARGE OR DELAYS AND SHALL INCLUDE REPLACEMENT OR REPAIR OF ANY OTHER PHASE OF THE INSTALLATION WHICH MAY HAVE BEEN DAMAGED THEREBY.

FOR ELECTRIC POWER SYSTEM, COORDINATE POWER SERVICE WITH POWER COMPANY.

  - A. CONTRACTOR TO PROVIDE POWER SERVICE TERMINATION WITH POWER COMPANY PRIOR TO SUBMITTING BID. CONTRACTOR TO VERIFY AVAILABLE SERVICE VOLTAGE AND PHASES WITH POWER COMPANY PRIOR TO BID AND PROVIDE BID ALLOWANCE FOR ALL WORKING ORDER.
  - B. PROVIDE TEMPORARY ELECTRICAL SERVICE FOR USE BY ALL TRADES DURING CONSTRUCTION AND REMOVE SAME AT COMPLETION OF PROJECT.

CONTRACTOR SHALL KEEP ALL AREAS IN WHICH WORK IS BEING PERFORMED, FREE FROM DEBRIS AT ALL TIMES, AND SAID AREA SHALL BE LEFT BROOK CLEAN AT THE END OF EACH WORKING DAY.

CONTRACTOR SHALL PAY FOR ALL PERMITS, FEES, INSPECTIONS, AND TESTING COSTS.

COORDINATE ALL ELECTRICAL SITE WORK WITH ALL OTHER TRADES CONTRACTORS.

IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR FOR THE ADVANCE ORDER OF LONG AND SHORT LAGS, AND FOR THE ADVANCE ORDER OF ALL OTHER TRADES RESULTING IN ANY DOWN OR LAG TIME. THE CONTRACTOR SHALL ADVANCE ORDER ANY ITEMS UNTIL APPROVED SHOP DRAWINGS ARE RETURNED TO HIM.

ELECTRICAL CONTRACTOR SHALL SUBMITTAL LAYOUTS FOR ALL CONDUITS IN ALL ELECTRICAL SPACES, ROOMS, ETC., TO ENGINEER FOR APPROVAL PRIOR TO ORDERING EQUIPMENT OR INSTALLING CONDUITS, ETC. LAYOUT SHALL CONSIST OF PLAN VIEWS (SCALE AS REQUIRED) AND ELEVATIONS (DIMENSIONED) FOR EACH SUCH SPACE, ROOM, ETC.

CONTRACTOR SHALL SUBMIT AT ONE TIME, SIX (6) SETS OF LOOSE-LEAF DOWN BOOKS, INDEXED WITH ALL PRODUCTS, MATERIALS, LIGHTING FIXTURES, WIRING DEVICES, AND ELECTRICAL CHARGES. ALL CHARGES SHALL BE FOR QUANTITIES AND DETAILS ALL EQUIPMENT SHALL BE AS SPECIFIED ON PLANS; THE RESPONSIBILITY TO ORDER OR REJECT OR RETURN TO THE PROJECT OR WHERE PERMITTED BY THE ENGINEER, THE CONTRACTOR MAY AT HIS JUDGMENT USE ANY ARTICLE, DEVICE, PRODUCT, OR MATERIAL WHICH IN THE JUDGMENT OF THE ENGINEER EXPRESSED IN WRITING IS EQUAL TO THAT WHICH IS SPECIFIED.

ALL CONDUCTORS SHALL BE COPPER, TYPE THHN/THWN EXCEPT WHERE OTHERWISE REQUIRED BY U.L. OR CODES. MINIMUM WIRE SIZE SHALL BE #12 AWG, EXCLUDING CONTROL WIRING. ALUMINUM CONDUCTORS ARE NOT PERMITTED.

ALL CONDUCTORS SHALL BE CONDUIT. ALL CONDUITS SHALL BE GALVANIZED RIGID STEEL (GRS) EXCEPT THAT: (a) PVC CONDUITS MAY BE USED UNDERGROUND PROVIDED EELBS AND RISERS ARE GALVANIZED RIGID STEEL OR SCHEDULE 80 PVC, WHERE SUBMERGED IN PHYSICAL DAMAGE OR WHERE PHYSICAL DAMAGE (EMT) IS USED IN OR ON WALLS OR CEILINGS WHERE NOT SUBJECT TO MECHANICAL DAMAGE OR CORROSIVE CONDITIONS, (c) LIQUID TIGHT FLEXIBLE CONDUIT WHERE REQUIRED, (d) FLEXIBLE METALLIC CONDUIT WHERE REQUIRED IN DRY LOCATIONS ONLY, (e) MC CABLES USED UNDER GROUND OR UNDERGROUND CONDUIT WHERE PERMITTED BY THE ENGINEER. ALL CONDUITS SHALL MEET THE REQUIREMENTS OF NEC CHAPTER 9.

FOR UNDERGROUND ELECTRICAL CONDUITS, PROVIDE PULL BOXES, SUCH THAT NO ELECTRICAL RUN HAS BEHINDS IN ANY CONDUIT. PROVIDE WARNING TAPE WHICH IS SUITABLE AND APPROVED FOR THE INTENDED USE. WARNING TAPE WHICH SAYS "WARNING BURIED ELECTRIC" SHALL BE PLACED IN TRENCHES ABOVE ALL UNDERGROUND ELECTRICAL CONDUITS. CONDUITS SHALL BE PLACED IN TRENCHES ABOVE ALL UNDERGROUND CONDUITS. WHERE UNDERGROUND CONDUITS ARE NOT EXPOSED TO MECHANICAL DAMAGE OR ARE NOT UNDER PAVED AREAS, THEY SHALL BE SCHEDULE 40 PVC.

ALL UNDERGROUND RUNS ARE SHOWN DIAGRAMATIC. EXACT ROUTING SHALL BE DETERMINED IN THE FIELD, UNLESS OTHERWISE NOTED.

WIRESHALS SHALL BE SIZED AS REQUIRED, PER NEC, UNLESS OTHERWISE NOTED (UNON).

WHERE CORE DRILLING OF FLOOR/WALLS IS REQUIRED, CONTRACTOR SHALL SEAL. OPERATIONS SHALL BE COMPLETED AFTER THE WORK IS COMPLETED. LOCATIONS OF CORED HOLES SHALL COORDINATE WITH LOCATION OF EQUIPMENT IN A MANNER TO BE CLEAN AND FUNCTIONAL. THE CONTRACTOR SHALL INSTALL ONLY ONE CONDUIT PER HOLE AND SEAL THE OPENING OF THE CONDUIT WITH AN APPROVED SEALANT.

PROVIDE FIRE RETARDANT U.L. APPROVED SEALANT ON ALL PENETRATIONS OF FIRE RATED PARTITIONS, WALLS AND STRUCTURAL SLABS. CONTRACTOR TO VERIFY, PRIOR TO SEALING, ALL LOCATIONS OF ALL SUCH FIRE RATED PARTITIONS, WALL AND STRUCTURAL SLABS.

UNLESS NOTED AS EXISTING, ALL EQUIPMENT, WIRING, DEVICES, ETC. SHALL BE NEW.

ALL CIRCUIT BREAKERS SHALL BE INVERSE TIME TYPE (THERMAL MAGNETIC OR SOLID STATE) AS REQUIRED. SPECIFICATION TWO AND THREE POLE CIRCUIT BREAKERS SHALL BE COMMON TRIP, NO THE HANDLES PERMITTED.

ALL FUSES SHALL BE CURRENT LIMITING, PER U.L., RATED 800V, UNON.

A. NON-TIME DELAY FUSES IN MAIN SIZES AND SWITCHES FEEDING PANELS.

B. THE DELAY FUSES FOR MOTORS AND A/C CIRCUITS.

ALL DISCONNECT SWITCHES SHALL BE SIZED BY NEC REQUIREMENTS TO ACCOMMODATE EQUIPMENT SERVED, INCLUDING REQUIRED FUSES U.L. SWITCHES SHALL BE HORSEPOWER RATED FOR MAX. HORSEPOWER, HEAVY DUTY TYPE.

CONTRACTOR SHALL VERIFY CIRCUIT PROTECTIVE DEVICE RATING FOR EQUIPMENT PRIOR TO INSTALLATION.

FURNISH AND INSTALL DISCONNECT SWITCHES AND WIRING FOR AIR CONDITIONING SYSTEM AS PER MANUFACTURER RECOMMENDATIONS. CONTROLS ARE TO BE SUPPLIED BY AIR CONDITIONING CONTRACTOR AND CONNECTED. PROVIDE ALL CONTROL WIRING FOR A/C SENSING DEVICES TO BE COORDINATE WITH A/C CONTRACTOR FOR WIRING DIAGRAMS AND EXACT MOUNTING LOCATIONS.

ALL ELECTRICAL EQUIPMENT SHALL BE RAINWATER WHERE EXPOSED TO THE WEATHER. ALL FLEX CONDUITS CONNECTED TO SUCH EQUIPMENT SHALL BE LIQUID TIGHT.

EQUIPMENT SHALL BE OF MATERIALS SUITABLE FOR AND NEMA RATED FOR THE ENVIRONMENT IN WHICH THEY ARE TO BE INSTALLED.

ALL CONNECTIONS TO GROUND RODS SHALL BE MADE WITH U.L. APPROVED WELDED CONNECTIONS, UNLESS NOTED OTHERWISE. THE CONTRACTOR SHALL FORM A GROUNDING ELECTRODE SYSTEM AS PER NEC 250-50.

OUTLET IN DRY LOCATIONS BOXES SHALL BE PRESSED STEEL, IN WET OR DAMP LOCATIONS SHALL BE NON-RESISTANT TO WEATHER. ALL OUTLET THREADED HUBS AND IN OTHER CLASSIFIED AREAS IT SHALL BE IN A SPECIAL ENCLOSURE. PROPER PLASTER RINGS SHALL BE USED WITH OUTLET BOXES. PROPER COORDINATION BETWEEN ELECTRICAL SUBCONTRACTOR AND CONTRACTOR FOR PROPER INSTALLATION WILL BE REQUIRED. NO "GOOF" RINGS SHALL BE ALLOWED. ALL OUTLET BOXES SHALL BE SECURELY FASTENED.

WHEN ELECTRICAL BOXES ARE LOCATED IN VERTICAL FIRE RESISTIVE ASSEMBLIES, CLASSIFIED AS FIRE-RATED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING WITHOUT AFFECTING THE FIRE CLASSIFICATION. ALL OF THE FOLLOWING CONDITIONS SHALL BE MET:

  - A. ALL ELECTRICAL BOXES SHALL BE METALLIC.
  - B. BOX OPENING SHALL OCCUR ONLY ON ONE SIDE OF FRAMING SPACE.
  - C. BOX OPENING SHALL NOT EXCEED 10322.56 SQUARE IN. (16 SQUARE INCHES).
  - D. ALL CLEARANCES BETWEEN OUTLET BOX AND GYPSUM BOARD SHALL BE COMPLETELY FILLED (OR OTHER APPROVED MATERIAL).
  - E. PROVIDE A WALL AROUND OUTLETS LARGER THAN 10322.56 SQUARE IN. (16 SQUARE INCHES). THE INTEGRITY OF THE WALL RATING SHALL BE MAINTAINED.
  - F. THE TOTAL AGGREGATE SURFACE AREA OF THE BOXES SHALL NOT EXCEED 4516 SQUARE IN. (100 SQUARE INCHES) PER 9.84 SQUARE FEET OF WALL.
  - G. OUTLET BOXES LOCATED ON OPPOSITE SIDES OF FIRE RESISTIVE ASSEMBLIES SHALL BE SEPARATED BY A MINIMUM HORIZONTAL DISTANCE OF 609.6MM (24 INCHES).
  - H. OUTLET BOXES SHALL BE SEPARATED BY A MINIMUM HORIZONTAL DISTANCE OF 609.6MM (24 INCHES).
  - I. THE OPENING IN THE GYPSUM BOARD FACING SHALL BE CUT NOT TO EXCEED 3.175MM (1/8 INCH) BETWEEN THE EDGES OF THE OUTLET BOX AND THE EDGES OF THE OPENING.

SMOKE DETECTORS SHALL BE PROVIDED NO CLOSER THAN 36" FROM SUPPLY AIR DIFFUSERS.

CONTRACTOR SHALL PROVIDE A TYPE WRITTEN DIRECTORY OF EACH PANELBOARD. HAN WRITTEN DIRECTORY IS NOT ACCEPTABLE, EXCEPT SPARE AND SPACES SHALL BE HANDWRITTEN IN THE SYSTEMS.

PROVIDE A 4" STEEL REINFORCED CONCRETE HOUSEKEEPING PAD UNDER ALL FLOOR MOUNTED ELECTRICAL EQUIPMENT.

  - A. WORKING CLEARANCES FOR ELECTRICAL EQUIPMENT SHALL BE IN COMPLIANCE WITH NEC 110-26.
  - B. THE EXCLUSIVELY DEDICATED SPACE EXTENDING FROM FLOOR TO STRUCTURAL CEILING WITH A WIDTH AND DEPTH OF THE PANELBOARD SWITCHBOARD MUST BE CLEAR OF ALL PIPING, DUCTS, EQUIPMENT FOREIGN TO THE ELECTRICAL EQUIPMENT OR ARCHITECTURAL ARTIFICES IN ACCORDANCE WITH NEC 408-10.
  - C. METER CANS, HUBS, & LUGS FOR SAME ARE TO BE FURNISHED & INSTALLED BY CONTRACTOR. CONTRACTOR TO VERIFY SPECIFIC TYPE OF METER CAN TO BE USED WITH F.P.L. PRIOR TO BID.

PROVIDE A FRAME AND SIGN ON THE MAIN ELECTRICAL ROOM DOOR TO THE BLDG. STATING THAT THE SERVICE DISCONNECTS ARE LOCATED INSIDE.

SIGNS SHALL BE PLACED AT THE MAIN DISCONNECT EQUIPMENT INDICATING TYPE AND LOCATION OF ON-SITE EMERGENCY POWER SOURCES.

FOR UNDERGROUND CONDUITS, PROVIDE THE FOLLOWING: FIRE RETARDANT AND EMERGENCY ELECTRICAL SYSTEM PANELBOARDS SERVING THE SAME BUILDING SHALL BE BONDED TOGETHER WITH AN INSULATED, CONTINUOUS, COPPER CONDUCTOR NOT SMALLER THAN NUMBER 6.

THE ELECTRICAL CONTRACTOR SHALL FURNISH A COMPLETE SET OF AS-BUILT DRAWINGS, SHOWING ALL CHANGES AND DEVIATIONS TO THE ARCHITECT/ENGINEER PRIOR TO COMPLETION OF THE PROJECT.

FOR TELEPHONE SYSTEMS:

  - A. PROVIDE GROUNDING FOR ALL TELEPHONE OUTLETS AND EQUIPMENT PER REQUIREMENTS OF THE TELEPHONE COMPANY.
  - B. COORDINATE INSTALLATION OF ALL TELEPHONE OUTLETS, RACKS, ENCLOSURES AND BACKBOARDS WITH TELE. CO.
  - C. VERIFY LOCATION OF TELEPHONE SERVICE WITH TELEPHONE COMPANY, PROVIDE SERVICE POINT, CONDUIT AND SERVICE POINT PER TELCO. INSTRUCTIONS, INCLUDE ALL ASSOCIATED COSTS IN BID.
  - D. MARK TERMINATIONS OF TELEPHONE CONDUIT AS DIRECTED BY THE TELEPHONE COMPANY.
  - E. VERIFY LOCATION OF TELEPHONE SERVICE WITH TELEPHONE COMPANY PRIOR TO SUBMITTING BID, INCLUDE ALL ASSOCIATED COSTS IN BID.
  - F. PROVIDE EXTERIOR GRADE FIRE RESISTANT RACKS FOR MOUNTING TELEPHONE EQUIPMENT AND TERMINAL STRIPS. PAINT BOARD ON ALL SIDES AND EDGES WITH TWO COATS OF FLAT BLACK

GENERAL LIGHTING NOTES:

1. CONTRACTOR SHALL COMPLY WITH 2014 FBC SECTION R404.1. MINIMUM OF 75% OF THE PERMANENTLY INSTALLED LIGHTING FIXTURES SHALL BE HIGH-EFFICIENCY LAMPS.
  2. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF LIGHT FIXTURES.
  3. COORDINATE TYPE OF CEILING FOR EACH FIXTURE WITH ARCHITECTURAL REFLECTED CEILING PLANS AND PROVIDE FIXTURE TRIM AS REQUIRED.
  4. ALL COMPACT FLUORESCENT DOWNLIGHTS SHALL USE LAMPS WITH 3500K TEMPERATURE, MINIMUM 1000 LUMENS, AND MUST BE DIRECTLY MOUNTED TO CEILING OTHERWISE NOTED.
  5. PROVIDE APPROVED FIRE RATED ENCLOSURES FOR ALL LIGHT FIXTURES LOCATED IN FIRE RATED CEILINGS.
  6. FIXTURES IN AREAS WITHOUT CEILINGS, OR IN MECHANICAL AND ELECTRICAL ROOMS SHALL BE MOUNTED WITH 1 1/2"x1 1/2"KINDORF CHANNEL SUPPORT SUSPENDED FROM SUSPENDED CEILING WITH THREE RODS. RODS SHALL BE 1/8" DIAMETER, 10"-0" A-F-F.
  7. ALL ACRYLIC LENSED FIXTURES SHALL HAVE A LENS THICKNESS OF .125 INCHES MINIMUM.
  8. HALF-SHADED FIXTURES DENOTE EMERGENCY FIXTURES EITHER WITH 1100 LUMEN EMERGENCY BATTERY PACK OR ON LIFE SAFETY CIRCUIT.
  9. LIGHTING FIXTURE SCHEDULE IS PREDICTED ON PERFORMANCE AND IS DESIGNED TO PROVIDE SPECIFIED AESTHETIC CRITERIA. ALL ALTERNATIVE SELECTIONS MUST BE SUBMITTED FOR PRIOR APPROVAL TEN (10) DAYS PRIOR TO BID DATE.
  10. ALL BALLASTS SHALL HAVE MINIMUM POWER FACTOR OF 0.90. ALL BALLASTS FOR METAL HALIDE AND HIGH PRESSURE SODIUM FIXTURES SHALL BE CONSTANT VARIATION. TYPE 1 WITH +/-5% LAMP WATTS FOR +/-10% NOMINAL LINE VOLTAGE VARIATION.
  11. PROVIDE LAMPS WITH FIXTURES, VERE LAMP TYPE WITH MANUFACTURER.
  12. FLUORESCENT LUMINAIRES THAT UTILIZE DOUBLE-ENDED LAMPS AND CONTAIN BALLAST(S) OR MULTIWIRE BALASTED LUMINAIRES SHALL CONTAIN AN INTEGRATED INTERNAL DISCONNECT AND TO BE COMPLIED WITH NEC 410.73(G).
  13. ALL OPENINGS FOR LIGHT FIXTURES IN CEILINGS SHALL BE PROTECTED IN A MANNER (THIS IS THE GOVERNING CODE) THAT WILL PROVIDE THE SAME RATING AS THE CEILING. THIS IS THE GOVERNING CODE.
  14. FOR EMERGENCY EXIT SIGNS AND EMERGENCY BATTERY PACKS MAKE CONNECTION AHEAD OF ALL SWITCHES AND CONTROLS.
  15. PROVIDE A FUSE HOLDER AND FUSE (BUSSMAN HEB AND FNQ OR EQUAL), IN THE PRIMARY SIDE OF EACH UNGROUNDED CONDUCTOR FOR ALL BALLASTS AT THE HAND HOLES OF EACH EXISTING HOLE MOUNTED LIGHTING FIXTURE OR J-BOX FOR ALL GROUND MOUNTED FIXTURE.
  16. PROVIDE WIND LOAD RATED LIGHT POLES WITH 170 MPH MINIMUM WIND SPEED (ASCE 7). EXPOSURE C WITH IMPORTANCE FACTOR OF 1.0, AND PROVIDE PHOTO METRICS WITH ALL FIXTURE SUBMITTALS. CONTRACTOR TO VERIFY VOLTAGES OF ALL LIGHT FIXTURES PRIOR TO BIDDING.
  17. PHOTO METRICS ARE BASED ON MANUFACTURER'S INFORMATION AND CATALOG NUMBERS. ALTERNATIVE MANUFACTURERS MUST PROVIDE THE IESNA FORMAT ELECTRIC FILES OF THE MANUFACTURER'S TEST INDEPENDENT TEST REPORT FOR THE PROPOSED FIXTURES ON CD OR USB DRIVE 10 WORKING DAYS PRIOR TO BID. (SPECIFIER) WILL CONFIRM THAT THE PHOTO METRIC CRITERIA HAS BEEN MET, AND IF ALTERNATE IS APPROVED WILL ISSUE AN ADDENDUM. MANUFACTURERS NOT LISTED ON THE PLANS OR IN AN ADDENDUM WILL NOT BE ACCEPTED.
  18. TO CONFIRM THAT THE SPECIFIED PHOTO METRIC CRITERIA HAS BEEN MET, A COMPUTER CD CONTAINING AN IES FILE FOR THE PROPOSED ALTERNATE MUST BE SUBMITTED TO (SPECIFIER) FOR EVALUATION NO LESS THAN 10 DAYS PRIOR TO BID. ANY ACCEPTABLE ALTERNATE MUST BE APPROVED IN WRITING PRIOR TO BIDDING.
  19. CONTRACTOR MUST BID PROJECT USING SPECIFIED LIGHTING FIXTURES AS BASE BID (N EXCEPTIONS). IF ALTERNATE FIXTURES ARE PROPOSED, THEY MUST BE BID AS AN ALTERNATE BID MUST INCLUDE:
    - A) TOTAL DOLLAR CREDIT TO OWNER IF ALTERNATE IS ACCEPTED.
    - B) LINE ITEM CREDIT FOR EACH ALTERNATE FIXTURE PROPOSED.
    - C) CATALOG SUBMITTAL DATA FOR EACH ALTERNATE FIXTURE PROPOSED.
  20. IF THERE IS A DISCREPANCY BETWEEN A FIXTURE DESCRIPTION AND GENERAL NOTES, AND THE CATALOG NUMBER LISTED, THE FIXTURE DESCRIPTION AND GENERAL NOTES SHALL GOVERN.
  21. COORDINATE FIXTURE TYPES WITH ARCHITECTURAL DRAWINGS.
  22. INTERNALLY ILLUMINATED EXIT SIGNS SHALL NOT EXCEED 5 WATTS PER SIDE.
  23. RECESSED LUMINAIRES INSTALLED IN THE BUILDING THERMAL ENVELOPE SHALL BE SEALED TO LIMIT AIR LEAKAGE BETWEEN CONDITIONED AND UNCONDITIONED SPACES. RECESSED LUMINAIRES AND RECESSED LUMINAIRES WITH RECESSED LUMINAIRES SHALL BE SEALED WITH A CARPET OR CAULK BETWEEN THE HOUSING AND THE INTERIOR WALL OR CEILING COVERING.

## ELECTRICAL SYMBOL LEGEND


| SYMBOL | DESCRIPTION   |
|--------|---|
|        | <b>LIGHTING</b> (REFER TO LIGHTING SCHEDULE)  |
|        | LIGHT FIXTURE DESIGNATION.  |
|        | LIGHTING FIXTURE, SURFACE MOUNTED   |
|        | LIGHTING FIXTURE (HID, FLUORESCENT OR INCANDESCENT), RECESSED MTD.  |
|        | LIGHTING FIXTURE, WALL MOUNTED  |
|        | EXIT LIGHT FIXTURE. DIRECTION ARROWS AS SHOWN   |
|        | WALL MOUNTED EXIT LIGHT FIXTURE   |
|        | (SHADED QUADRANT INDICATES FACE(S) OF FIXTURE)  |
|        | 2 X 2 FLUORESCENT LIGHT FIXTURE   |
|        | 2 X 4 FLUORESCENT LIGHT FIXTURE   |
|        | DIAGONAL SHADING DENOTES LIGHT FIXTURE CONNECTED TO EMERGENCY BRANCH CIRCUIT OR, W/EMERG. BATTERY PACK.   |
|        | 1 X 4 FLUORESCENT LIGHT FIXTURE   |
|        | DIAGONAL SHADING DENOTES LIGHT FIXTURE CONNECTED TO EMERGENCY BRANCH CIRCUIT OR, W/EMERG. BATTERY PACK.   |
|        | FLUORESCENT WALL MOUNTED FIXTURE WITH WALL OUTLET BOX   |
|        | FLUORESCENT STRIP FIXTURE   |
|        | DIAGONAL SHADING DENOTES LIGHT FIXTURE CONNECTED TO EMERGENCY BRANCH CIRCUIT OR, W/EMERG. BATTERY PACK.   |
|        | EXTERIOR LIGHT FIXTURE WITH ARMS AS SHOWN ON DRAWINGS   |
|        | EMERGENCY BATTERY WALL PACK WITH TWIN HEADS   |
|        | TOGGLE SWITCH 120/277V. 20 AMP. (M.H. = 48" A.F.F.)   |
|        | TOGGLE SWITCH 120/277V. 20 AMP. (M.H. = 48" A.F.F.) , 3-WAY   |
|        | TOGGLE SWITCH 120/277V. 20 AMP. (M.H. = 48" A.F.F.), 4-WAY  |
|        | TOGGLE SWITCH 120/277V. 20 AMP. KEYSWITCH, (M.H. = 48" A.F.F.)  |
|        | FAN SWITCH 120/277V. 20 AMP. (HORSEPOWER RATED)   |
|        | 30-MINUTE ROTATABLE TIMER SWITCH (M.H. = 48" A.F.F.)  |
|        | TOGGLE SWITCH 120/277V. 20 AMP., WITH PILOT LIGHT, (M.H.=48"A.F.F.)   |
|        | TOGGLE SWITCH 120/277V. 20 AMP. EXPLOSION-PROOF, (M.H.=48"A.F.F.)   |
|        | SPEED SWITCH 120/277V. 20 AMP. U.O.N. (M.H. = 48" A.F.F.)   |
|        | SINGLE PHASE MANUAL MOTOR STARTER, (M.H.=48" A.F.F.)  |
|        | DIMMER SWITCH 120/277V. 20 AMP., (M.H.=48" A.F.F.) (1500 WATTS UNLESS OTHERWISE INDICATED)  |
|        | THREE-WAY DIMMER SWITCH (48" A.F.F.)  |
|        | SINGLE POLE SWITCH (48" A.F.F.) (SUBSCRIPT INDICATES ITEM CONTROLLED)   |
|        | PANIC SWITCH, MUSHROOM TYPE, (M.H.=48" A.F.F.)  |
|        | WALL MOUNTED - OCCUPANCY SENSOR SWITCH (M.H.=48"A.F.F.)   |
|        | (a, b) or (2) INDICATES TWO POLE SWITCH   |
|        | LV INDICATES LOW VOLTAGE  |
|        | CEILING MOUNTED OCCUPANCY SENSOR - LIGHTING CIRCUIT CONTROLLER.   |
|        | CEILING MOUNTED DUAL TECHNOLOGY EXTENDED RANGE OCCUPANCY SENSOR - LIGHTING CIRCUIT CONTROLLER.  |
|        | WALL MOUNTED - OCCUPANCY SENSOR (M.H.=96"A.F.F.)  |
|        | <b>POWER PACK</b>   |
|        | <b>OCCUPANCY SENSOR NOTE:</b><br>CONTRACTOR SHALL PROVIDE ALL SWITCHPACKS AND CONDUCTORS AS REQUIRED FOR LAYOUTS AND CONTROLS SHOWN ON PLANS.   |
|        | IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE AND INSTALL A COMPLETE AND FULLY FUNCTIONAL LIGHTING CONTROL SYSTEM IN ACCORDANCE WITH THE PLANS, DETAILS, INTENT OF THE DESIGN AND SPECIFICATIONS SHOWN ON THESE PLANS. |
|        | <b>BASIC MATERIALS</b>  |
|        | DUPLEX RECEPTACLE, 20 AMP., 125V., (M.H.=18"A.F.F.)   |
|        | FLOOR OUTLET BOX AND DUPLEX RECEPTACLE 20 AMP., 125V., WITH APPROPRIATE FLANGE.   |
|        | CEILING OUTLET BOX AND DUPLEX RECEPTACLE 20A, 125V.   |
|        | DUPLEX RECEPTACLE, 20 AMP., 125V., TOP HALF SWITCHED, M.H. = 18" A.F.F. UNLESS OTHERWISE NOTED  |
|        | DUPLEX RECEPTACLE, 20 AMP., 125V., ISOLATED GROUND AND SURGE PROTECTED, (M.H.=18"A.F.F.)  |
|        | SINGLE RECEPTACLE, 20 AMP., 125V., COORDINATE M.H. WITH EQUIPMENT.  |
|        | SIMPLEX RECEPTACLE (16" A.F.F.) (EWC DENOTES ELECTRIC WATER COOLER. COORDINATE WITH EWC INSTALLER FOR MOUNTING HEIGHT)  |
|        | TWO DUPLEX RECEPTACLES WITH COMMON COVER 20A., 125V.,(18" A.F.F.)   |
|        | TWO DUPLEX RECEPTACLES WITH COMMON COVER 20A., 125V.,(42" A.F.F.)   |
|        | DUPLEX RECEPTACLE, 20 AMP., 125V., MOUNT ABOVE COUNTER @42"AF.  |
|        | SPECIAL PURPOSE OUTLET e.g. RANGE OUTLET, COORD. W/ EQUIPT.   |
|        | GFI DUPLEX RECEPTACLE, 20 AMP., 125V., (M.H.=18"A.F.F.)   |
|        | GFI DUPLEX RECEPTACLE, 20 AMP., 125V., MTD. ABOVE COUNTER (VERIFY HEIGHT)   |
|        | 30 AMP., 125V., TWIST LOCK RECEPTACLE FOR FLOOR POLISHING MACHINE   |
|        | JUNCTION BOX, MOUNTING AS SHOWN   |
|        | POWER POLE  |
|        | ELECTRIC MOTOR, NUMBER INDICATES HORSEPOWER   |
|        | MAGNETIC MOTOR STARTER OR CONTACTOR.  |
|        | COMBINATION MAGNETIC MOTOR STARTER, SIZE AS NOTED   |
|        | DISCONNECT SWITCH, SIZE AS NOTED  |
|        | # OF POLES<br>AMP RATING/FRAME  |
|        | ENCLOSURE TYPE:<br>NEMA 3R- FOR EXTERIOR<br>NEMA 1- FOR INTERIOR  |
|        | FUSE SIZE (* DENOTES AS PER MANUFACTURER)   |
|        | LIGHTING CONTROL TIME CLOCK   |
|        | PHOTOCELL, MOUNTED ON ROOF FACING NORTH   |
|        | SHUNT-TRIP BUTTON - FLUSH MOUNTED UNLESS OTHERWISE NOTED  |
|        | PLUG-IN STRIP WITH RECEPTACLES, 18" O.C. UNLESS OTHERWISE INDICATED   |
|        | CABLE TRAY  |
|        | GROUND OR GROUND ROD AS NOTED   |
|        | CONDUIT TURNING UP  |
|        | CONDUIT TURNING DOWN  |
|        | CONDUIT STUB  |
|        | CONDUIT CONTINUED   |

TO THE BEST OF THE ENGINEER'S KNOWLEDGE, THE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BLDG. CODES AND APPLICABLE FIRE-SAFETY STANDARDS AS DETERMINED BY THE LOCAL AUTHORITY IN ACCORDANCE WITH SECTION 110.3.7.4.4 AND CHAPTER 633, FLORIDA STATUTES.

## SYSTEMS SYMBOL LEGEND

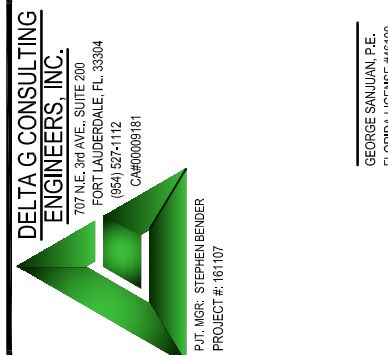
| SYMBOL   |  | DESCRIPTION  |                          |
|--|--|--|--------------------------|
|  |  | CALL BACK PUSH BUTTON  |                          |
|  |  | CIRCUIT BREAKER, TYPE AND SIZE AS PER DRAWINGS.  |                          |
|  | KP   | SECURITY SYSTEM KEYPAD   |                          |
|  | C  | CLOCK  |                          |
|  | B  | BELL   |                          |
|  | R  | AIR HANDLING UNIT SHUT-DOWN RELAY  |                          |
|  |  | POWER ON INDICATOR WITH KEYED RESET  |                          |
| <b><u>SERVICE AND DISTRIBUTION</u></b>                                   |  |  |                          |
|  |  | ELECTRICAL BRANCH CIRCUIT PANELBOARD, RECESS MOUNTED.<br>(SEE PANEL SCHEDULE FOR DETAILS)  |                          |
|  |  | ELECTRICAL BRANCH CIRCUIT PANELBOARD, SURFACE MOUNTED.<br>(SEE PANEL SCHEDULE FOR DETAILS)   |                          |
|  | T  | TRANSFORMER, SIZE AS NOTED   |                          |
|  |  | AUTOMATIC TRANSFER SWITCH  |                          |
| EXISTING EQUIPMENT TO REMAIN   |  |  |                          |
| NEW EQUIPMENT OR WORK OF THIS PROJECT                                    |  |  |                          |
| <b><u>TELEPHONE/COMPUTER RACEWAY SYSTEM</u></b>                          |  |  |                          |
|  |  | TELEPHONE/COMPUTER TERMINAL BOARD "TIB"  |                          |
|  | S  | INTERCOM SYSTEM SPEAKER  |                          |
|  |  | COMPUTER/TELEPHONE OUTLET WITH (2) 8-CONDUCTOR RJ-45 JACKS IN A SINGLE-GANG BOX MOUNTED AT 18" A.F.F.  |                          |
|  |  | = ABOVE THE COUNTER  |                          |
|  |  | P = PUBLIC PAY (48" A.F.F.)  |                          |
|  |  | W = WALL MOUNTED (18" A.F.F.)  |                          |
|  |  | DATA/TELEPHONE PORT - CEILING MOUNTED  |                          |
|  |  | DATA/TELEPHONE PORT - FLOOR MOUNTED  |                          |
|  |  | TELEVISION SIGNAL WALL OUTLET (M.H. = 18" A.F.F.) WITH 8-CONDUCTOR RJ-45 JACK AND F-TYPE RG6 COAX JACK IN SINGLE-GANG BOX.   |                          |
|  |  | TELEVISION SIGNAL WALL OUTLET F-TYPE RG6 COAX JACK & COMPUTER/TELEPHONE OUTLET (2) 8-CONDUCTOR RJ-45 JACKS IN SINGLE-GANG BOX. (18" A.F.F.)                          |                          |
| <b><u>SECURITY SYSTEM</u></b>  |  |  |                          |
|  |  | SECURITY SYSTEM CAMERA, PROVIDE POWER AND SIGNAL CONNECTION, SEE SPECS.  |                          |
|  |  | SECURITY SYSTEM MONITORS AND RECORDERS, SEE SPECS.   |                          |
|  |  | SECURITY SYSTEM CARD READER, SEE SPECS.  |                          |
|  |  | SECURITY SYSTEM CABLES IN CONDUIT, SEE SPECS.  |                          |
|  |  | SECURITY SYSTEM JUNCTION BOX AT ACCESSIBLE LOCATION.   |                          |
|  |  | SECURITY SYSTEM HIDDEN PUSH BUTTON FOR DOOR STRIKE RELEASE, COORDINATE INSTALLATION WITH FURNITURE OR EQUIPMENT.   |                          |
|  | S  | SECURITY SYSTEM SPEAKER WITH INTEGRAL MICROPHONE   |                          |
|  | KP   | SECURITY SYSTEM KNOX BOX   |                          |
| <b><u>FIRE ALARM/DETECTION SYSTEM</u></b>                                |  |  |                          |
|  |  | FIRE ALARM MANUAL PULL STATION 48" A.F.F.  |                          |
|  |  | COMBINATION AUDIBLE/VISUAL SIGNALING UNIT - FIRE ALARM HORN (SPEAKER)/ FLASHING STROBE LIGHT (WALL MTD.) MOUNT AT 80" A.F.F. OR 6" BELOW CEILING WHICHEVER IS LOWER. |                          |
|  | WP   | WP DENOTES WEATHERPROOF ENCLOSURE  |                          |
|  | VS   | VISUAL SIGNALING UNIT - FLASHING STROBE LIGHT ONLY (80" TO BOTTOM) (NO AUDIO DEVICE)   |                          |
|  |  | PHOTO-ELECTRIC SMOKE DETECTOR  |                          |
|  | E  | E = ELEVATOR   |                          |
|  | I  | I = IONIZATION   |                          |
|  |  | DUCT MOUNTED SMOKE DETECTOR, WITH SAMPLE TUBE, REMOTE TEST AND HEAVY DUTY CONTROL RELAY.   |                          |
|  | R  | R = RETURN   |                          |
|  | S  | S = SUPPLY   |                          |
|  | 2 <sub>R</sub>   | TYPICAL 120V. RESIDENTIAL TYPE SMOKE DETECTOR WITH SOUNDER BASE AND BATTERY BACK-UP.   |                          |
|  | 2 <sub>CM</sub>  | TYPICAL 120V. RESIDENTIAL TYPE COMBO SMOKE DETECTOR/CARBON MONOXIDE WITH SOUNDER BASE AND BATTERY BACK-UP.   |                          |
|  | S <sub>FA</sub>  | FIRE ALARM SPEAKER (WALL OR CEILING MOUNTED)   |                          |
|  | R/F  | FIREFIGHTER'S PHONE JACK   |                          |
|  |  | HEAT DETECTOR, FIXED TEMPERATURE (135°) UNLESS OTHERWISE INDICATED   |                          |
|  |  | FIRE ALARM FLOW SWITCH (FURNISHED BY SPRINKLER CONTRACTOR)   |                          |
|  |  | FIRE ALARM TAMPER SWITCH (FURNISHED BY SPRINKLER CONTRACTOR)   |                          |
|  |  | MOTION SENSOR - CEILING MOUNTED  |                          |
|  | MOD  | MONITOR MODULE   |                          |
|  | FACP   | FIRE ALARM CONTROL PANEL - ADDRESSABLE   |                          |
|  | FATC   | FIRE ALARM REMOTE ANNUNCIATOR PANEL - FLUSH MOUNTED  |                          |
|  | ENC  | FIRE ALARM TERMINAL CABINET  |                          |
|  |  | FIREFIGHTER'S ELEVATOR WARNING LIGHT   |                          |
| NOTE: SOME SYMBOLS SHOWN ON THIS LEGEND MAY NOT PERTAIN TO THIS PROJECT. |  |  |                          |
| <b><u>ABBREVIATIONS</u></b>  |  |  |                          |
| A.C.   | ABOVE COUNTER  | EX   | EXISTING                 |
| A.F.   | ARC FAULT  | ER   | EXISTING RELOCATED       |
| A.F.F.   | ABOVE FINISHED FLOOR   | G.F.I.   | GROUND FAULT INTERRUPTER |
| A.S.W.   | ABOVE SHOWN WINDOW RCPT.   | L.C.   | LOCKABLE COVER           |
| B.F.C.   | BELOW FINISHED CEILING   | M.H.   | MOUNTING HEIGHT          |
| B.F.G.   | BELOW FINISHED GRADE   | N  | NEW DEVICE               |
| C.B.   | CIRCUIT BREAKER  | N.F.   | NON FUSED                |
| CL   | CENTER LINE  | NL   | NIGHT LIGHT              |
| D  | DEDICATED FOR COMPUTER, PROVIDE DEDICATED GROUND AND NEUTRAL             | RE   | EXISTING TO BE REMOVED   |
| IG   | ISOLATED GROUND (ORANGE DEVICE)  | T.C.   | TERMINAL CABINET         |
|  |  | T.S.   | TIME SWITCH              |
| EM   | PROVIDE EMERGENCY BATTERY PACK W/FIXTURE, CONNECT AHEAD OF ALL SWITCHES. | U.O.N.   | UNLESS OTHERWISE NOTED   |
|  |  | WP.  | WEATHER PROOF ENCLOSURE  |
|  |  | XFMR.  | TRANSFORMER.             |
|  |  |  | DETAIL                   |
|  |  |  | SHEET NUMBER             |
| NOTE: SOME SYMBOLS SHOWN ON THIS LEGEND MAY NOT PERTAIN TO THIS PROJECT. |  |  |                          |

## ELECTRICAL INDEX

|    | DRAWING |  |  |
|----|---------|--|---|
| 1  | E100    | ELECTRICAL INDEX, SYMBOL LEGEND AND NOTES. |   |
| 2  | E101    | SITE ELECTRICAL PLAN                       |   |
| 3  | E200    | FLOOR ELECTRICAL PLAN -- DEMOLITION        |   |
| 4  | E201    | FLOOR LIGHTING -- DEMOLITION               |   |
| 5  | E202    | FLOOR FIRE ALARM -- DEMOLITION             |   |
| 6  | E203    | FLOOR POWER PLAN                           |   |
| 7  | E204    | FLOOR LIGHTING PLAN                        |   |
| 8  | E205    | FLOOR FIRE ALARM PLAN                      |   |
| 9  | E300    | RISER, DIAGRAM AND PANEL SCHEDULES         |   |
| 10 | E301    | PANEL SCHEDULES                            |   |
| 11 | E302    | ELECTRICAL DETAILS                         |   |

## SHOP DRAWING REQUIREMENTS

1. CONTRACTOR SHALL SUBMIT 6 COPIES OF COMPLETED SHOP DRAWINGS, TOGETHER AT ONE TIME AND MUST COME THROUGH THE ARCHITECT. ALL SUBMITTALS SHALL BE MADE WITHIN 30 DAYS OF NOTICE TO PROCEED.
2. ALL SUBMITTALS MUST CLEARLY INDICATE EXACTLY WHICH ITEMS ARE BEING PROPOSED FOR USE. IF NOT, THE SUBMITTAL SHALL BE REJECTED.
3. SUBSTITUTIONS SHALL BE LIMITED TO ONE OF THE ALTERNATES LISTED IN THE CONSTRUCTION DOCUMENTS. ANY SUBSTITUTIONS MUST BE CONSIDERED TO BE EQUAL, SHALL BE REVIEWED AND ACCEPTED BY THE ENGINEER, ARCHITECT AND OWNER (10) DAYS PRIOR TO BID DATE.
4. THE CONTRACTOR ASSUMES ALL DESIGN RESPONSIBILITY AND ALL FINANCIAL RISKS FOR PROCEEDING PRIOR TO SHOP DRAWINGS PROCESSING, AND ON ANY ITEM OR WORK THAT IS AT VARIANCE TO THE CONSTRUCTION DOCUMENTS.
5. SHOP DRAWINGS AND SUBMITTALS FOR EACH ITEM SHALL BE REVIEWED NO MORE THAN TWICE. A THIRD SUBMITTAL ON AN ITEM MUST BE ACCOMPANIED BY A PURCHASE ORDER FROM THE CONTRACTOR. IT SHALL BE REJECTED.
6. CIRCUMSTANCES NECESSITATING A REVISION TO THE PERMITTED DOCUMENTS NOT PROCESSED PRIOR TO THE NEXT REVIEW MAY NOT BE ACCEPTED. IF ACCEPTED IT MUST BE LEGIBLE, ACCURATE AND ACCOMPANIED BY A PURCHASE ORDER FROM THE CONTRACTOR. THE REVISION SHALL BE CHARGED TO THE CONTRACTOR AND DELIVERED TO HIM ON A C.O.D. BASIS.
7. SUBSTITUTIONS FROM THE BASE DESIGN OR VARIATIONS TO THE PERMITTED CONTRACT DOCUMENTS, WHICH RESULT IN A SHORTER LEAD TIME OR NOT, THAT RESULT IN REQUIREMENTS IN LETTERS OF AUTHORIZATION AND/OR PERMIT CONTRACT DOCUMENT CHANGES MANDED BY THE AUTHORITY HAVING JURISDICTION SHALL NOT BE MADE BY THIS OFFICE UNLESS ACCOMPANIED BY A PURCHASE ORDER FROM THE CONTRACTOR, AND RELEASED ON A C.O.D. BASIS.
8. CONTRACTOR SHALL SUBMIT 5 COPIES OF EQUIPMENT LAYOUTS OF ALL ELECTRICAL SPACES, ROOMS, ETC. TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING EQUIPMENT OR INSTALLING CONDUTS, ETC. THE LAYOUTS SHALL BE IN THE FORM OF PLAN VIEWS AT A SCALE OF 1/2" = 1"0" AND ELEVATIONS FOR EACH SUCH SPACE OR ROOM, ETC.



|              |            |
|--------------|------------|
| DRAWN BY:    | DATE:      |
| CSB/CB/RT/JB | 05/31/2017 |

DESIGNED BY: SCALE: AS NOTED  
CB/CB/RT/JB

|     |             |
|-----|-------------|
| GSJ | FIELD BOOK- |
|-----|-------------|

FIELD BOOK:

FIELD BOOK.

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

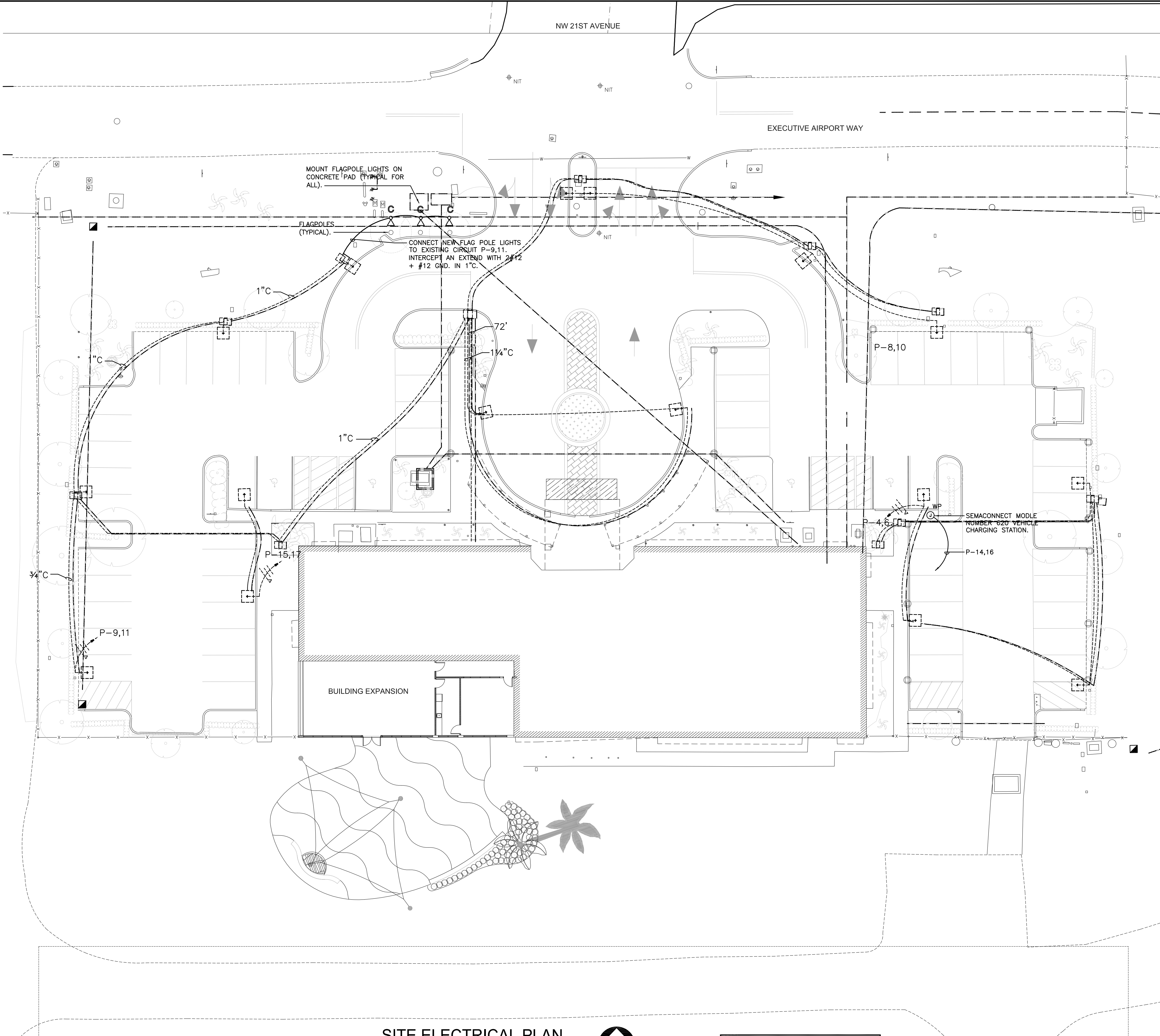
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PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
ELECTRICAL INDEX, SYMBOL, LEGEND AND NOTES  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                              |            |
|------------------------------|------------|
| SHEET NO.                    | OF         |
| E100                         | 11         |
| TOTAL:                       | 65         |
| CAD FILE:                    |            |
| 161107 ELECTRICAL INDEX PLAN |            |
| DRAWING FILE NO.             |            |
| 4-140-42                     | CAM 18-007 |
|                              | Exhibit    |
|                              | 744 of 77  |



P:\161107 FORT LAUDERDALE EXECUTIVE AIRPORT - F&E ADMIN BLDG EXPANSION\ARCH\02-16-2017\A-101 - FLOOR PLAN YENI.DWG



SITE ELECTRICAL PLAN  
SCALE: 1/16"=1'-0"



|       |                         |
|-------|-------------------------|
| ----- | EXISTING WORK TO REMAIN |
| ----- | EXISTING TO BE REMOVED  |
| ----- | NEW WORK                |

BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
SITE ELECTRICAL PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                                       |    |
|---------------------------------------|----|
| SHEET NO.                             | OF |
| E101                                  | 11 |
| TOTAL: 65                             |    |
| CAD FILE: 161107 SITE ELECTRICAL PLAN |    |
| DRAWING FILE NO. 4-140-42 AM 18-0070  |    |

Exhibit 3  
745 of 776

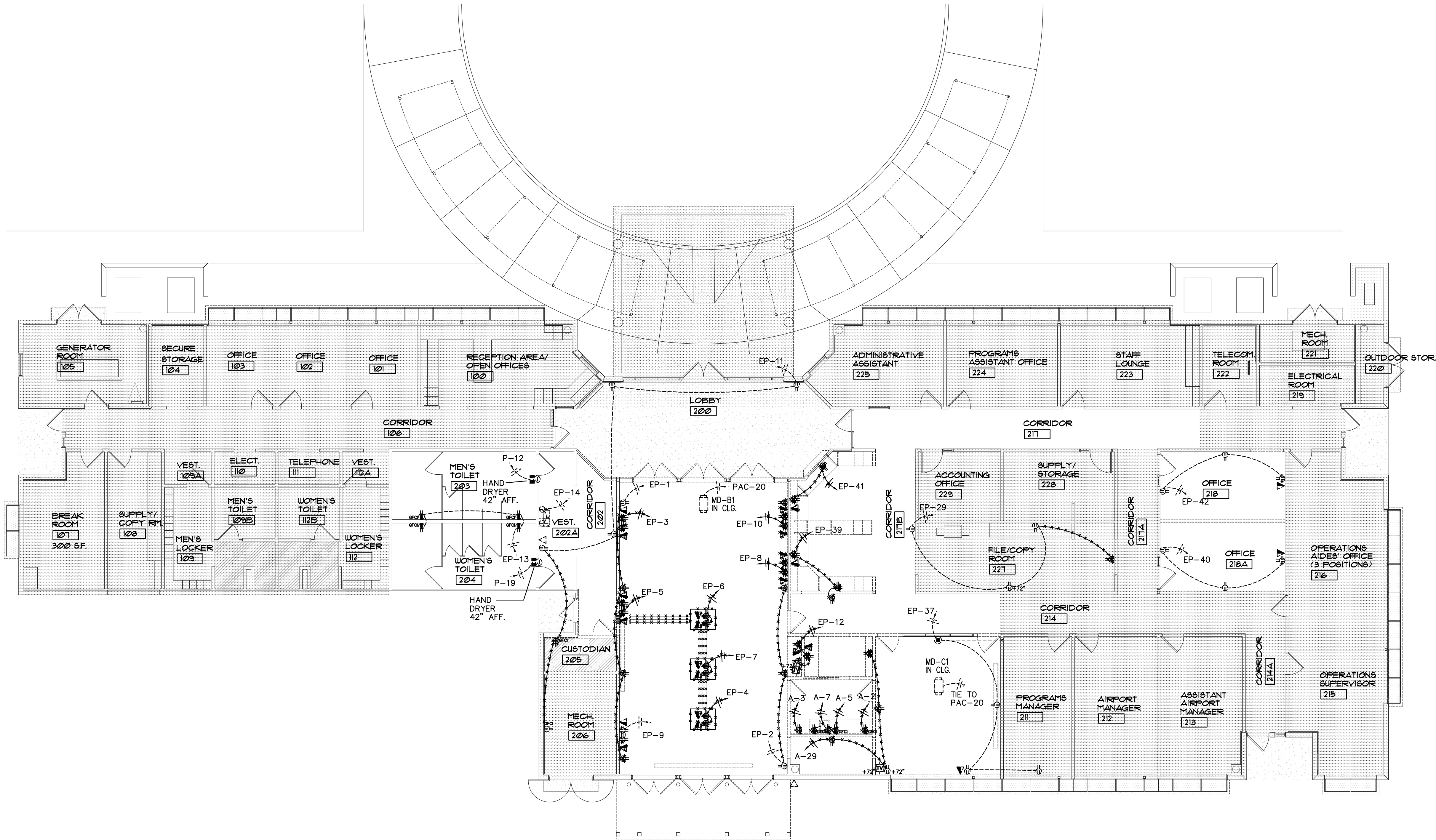
| REVISIONS |      | DESCRIPTION |      |
|-----------|------|-------------|------|
| NO.       | DATE | BY          | CHKD |
|           |      |             |      |
|           |      |             |      |
|           |      |             |      |
|           |      |             |      |
|           |      |             |      |

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

|                          |                  |
|--------------------------|------------------|
| DRAWN BY: SB/CE/RT/AB    | DATE: 05/31/2017 |
| DESIGNED BY: SB/CE/RT/AB | SCALE: AS NOTED  |
| CHECKED BY: GSI          | FIELD BOOK:      |

DELTA G CONSULTING  
ENGINEERING, INC.  
FORT LAUDERDALE, FL 33304  
P.O. BOX 10000  
FORT LAUDERDALE, FL 33304  
FLORIDA LICENSE #44091





FLOOR ELECTRICAL PLAN - DEMOLITION  
SCALE: 1/8"=1'-0"



- EXISTING WORK TO REMAIN
- EXISTING TO BE REMOVED
- NEW WORK

BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
FLOOR ELECTRICAL PLAN - DEMOLITION  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

| SHEET NO.        | OF                     |
|------------------|------------------------|
| E200             | 11                     |
| TOTAL:           | 65                     |
| CAD FILE:        | 161107 ELEC. DEMO PLAN |
| DRAWING FILE NO. | 4-140-42 CAM 18-007    |

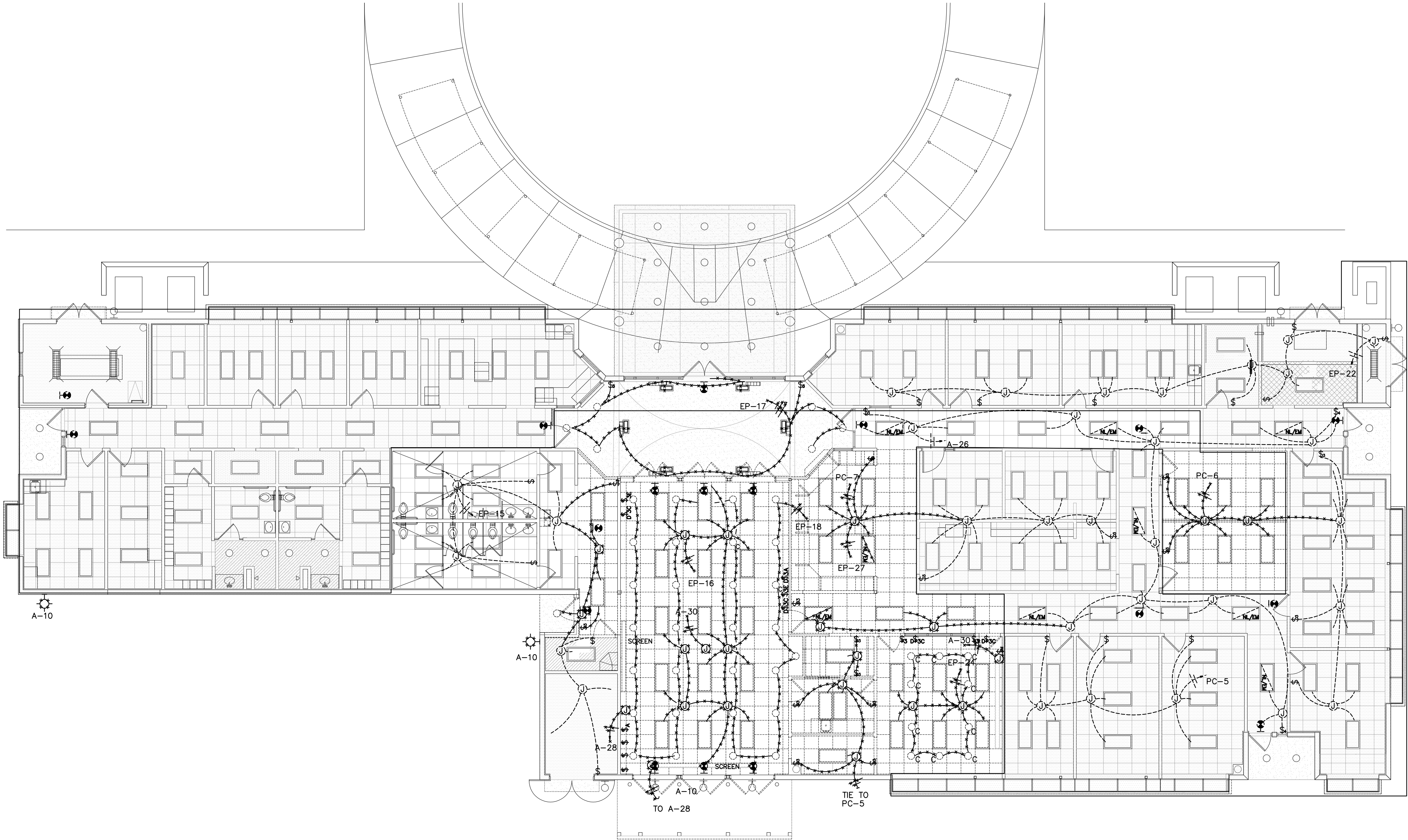
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| DRAWN BY:    | DATE:      |
| SB/CE/RT/AB  | 05/05/2017 |
| DESIGNED BY: | SCALE:     |
| SB/CE/RT/AB  | AS NOTED   |
| CHECKED BY:  | GSU        |
| FIELD BOOK:  |            |

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| NO. | DATE | BY | CHKD | DESCRIPTION |
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DELTA G CONSULTING  
10000 W. BOCA RATON BLVD.  
SUITE 100  
BOCA RATON, FL 33433  
TEL: 561-385-1111  
FAX: 561-385-1112  
PROJECT # 12188





FLOOR LIGHTING PLAN - DEMOLITION

SCALE: 1/8"=1'-0"




- EXISTING WORK TO REMAIN
- EXISTING TO BE REMOVED
- NEW WORK

BID DOCUMENTS


PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
FLOOR LIGHTING PLAN - DEMOLITION  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

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|------------------|---------------------------|
| SHEET NO.        | OF                        |
| E201             | 11                        |
| TOTAL:           | 65                        |
| CAD FILE:        | 161107 LIGHTING DEMO PLAN |
| DRAWING FILE NO. | 4-140-42                  |

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| DRAWN BY:    | DATE:      |
| SB/CE/RT/AB  | 05/31/2017 |
| DESIGNED BY: | SCALE:     |
| SB/CE/RT/AB  | AS NOTED   |
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PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301



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10000 W. BOCA RATON BLVD., SUITE 100  
BOCA RATON, FL 33433  
PROJECT # 12188

| REVISIONS |      |    | DESCRIPTION |
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| NO.       | DATE | BY |             |
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## BID DOCUMENTS

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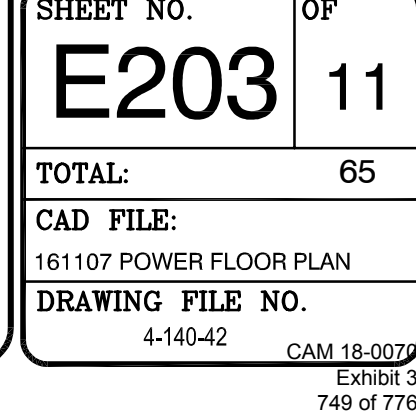
**DELTA G CONSULTING  
ENGINEERS, INC.**  
377 AL. 35th AVE., SUITE 200  
FORT LAUDERDALE, FL 33304  
(954) 420-1111  
FAX (954) 420-1112  
CAM0009715



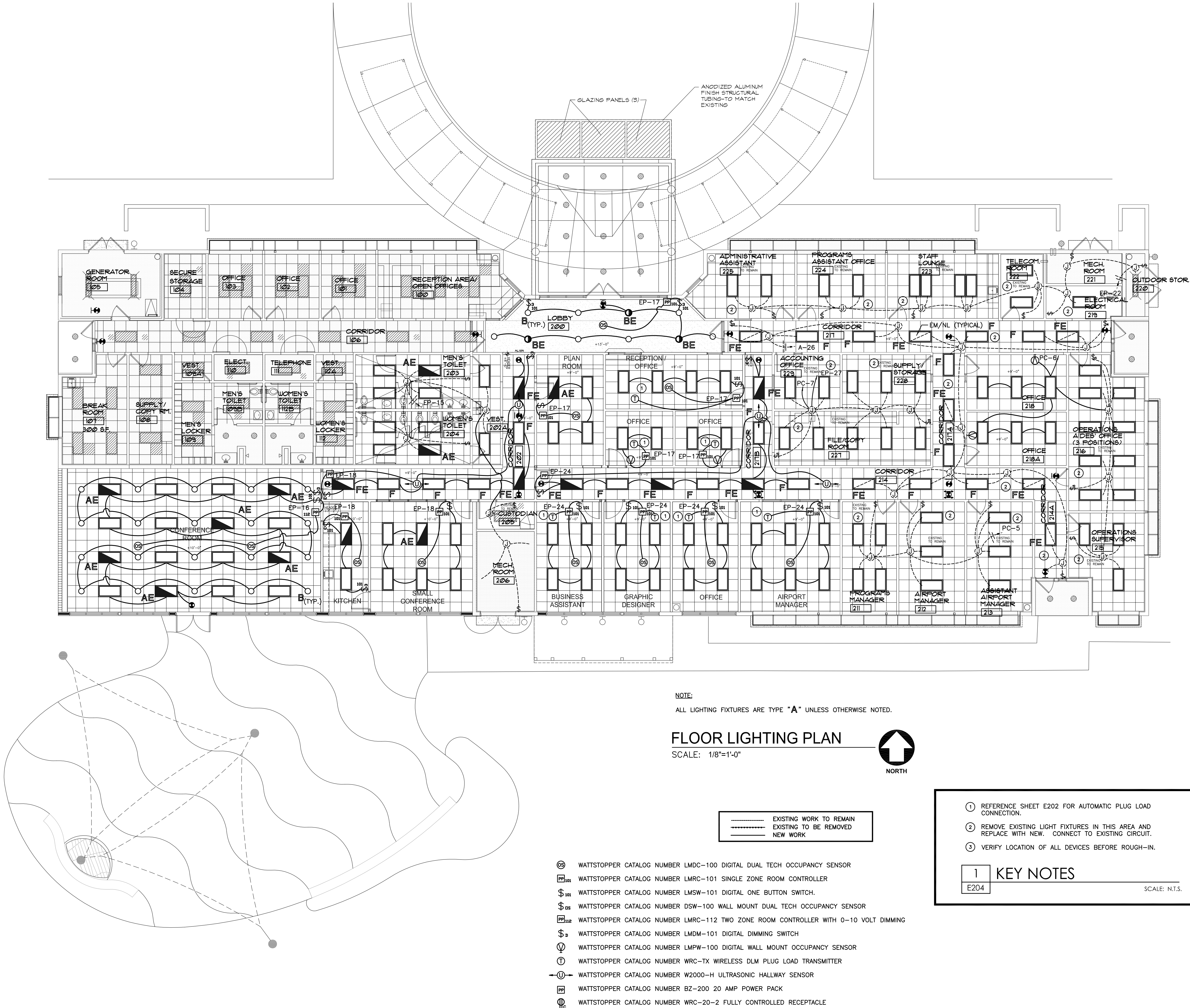
**P.J. MOE STEINENBERGER  
PRINCIPAL & PARTNER**

**GEORGE ANASTAS, P.E.  
FLORIDA LICENSE #40090**










DELTA G CONSULTING  
ENGINEERING  
1001 S. W. 10th Ave., Suite 100  
Fort Lauderdale, FL 33301  
PROJECT # 161107

|              |            |
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| SB/CE/RT/AB  | 05/05/2017 |
| DESIGNED BY: | SCALE:     |
| SB/CE/RT/AB  | AS NOTED   |
| CHECKED BY:  |            |
| GSU          |            |
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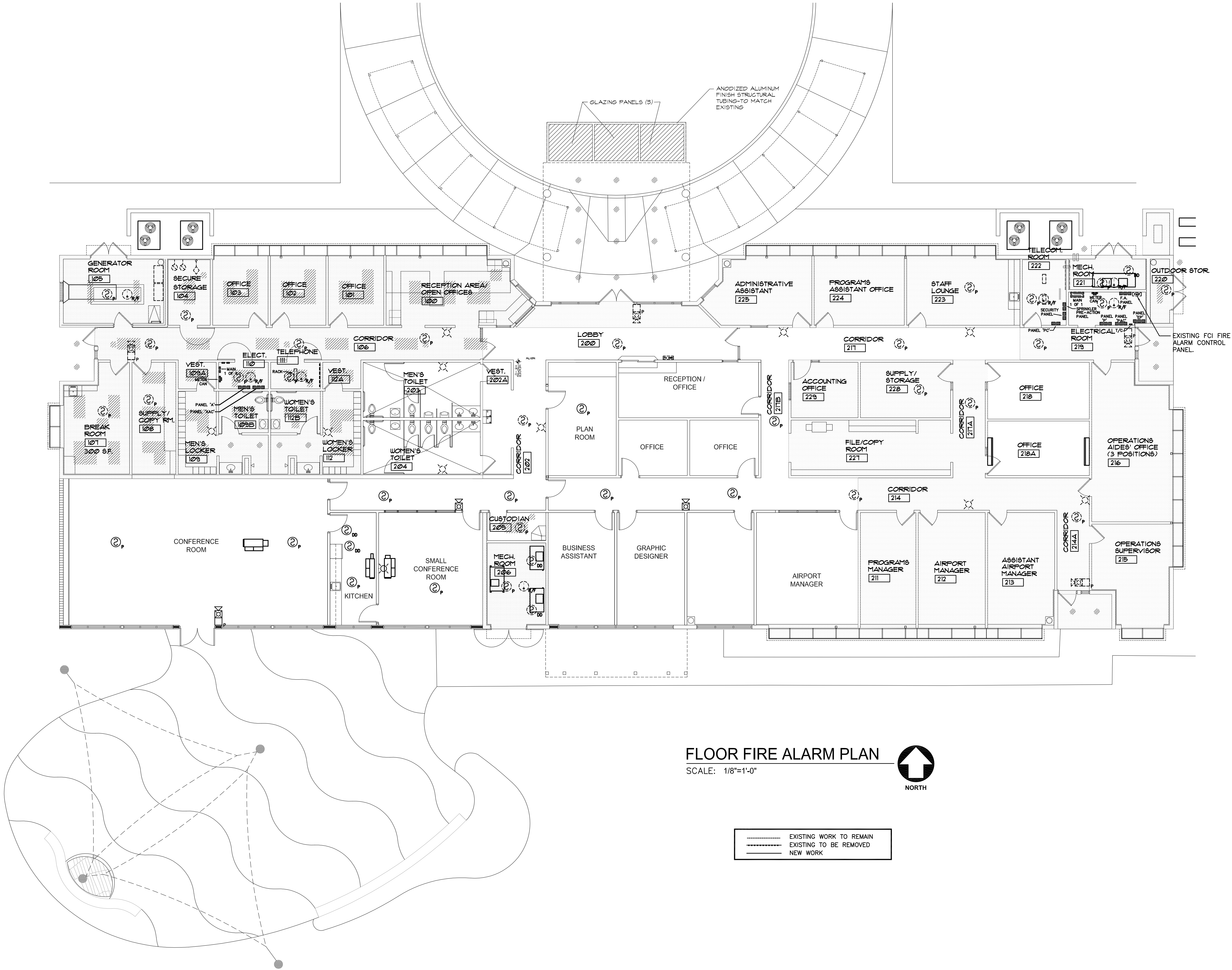
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PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS

FLOOR LIGHTING PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                            |            |
|----------------------------|------------|
| SHEET NO.                  | OF         |
| E204                       | 11         |
| TOTAL:                     | 65         |
| CAD FILE:                  |            |
| 161107 FLOOR LIGHTING PLAN |            |
| DRAWING FILE NO.           |            |
| 4-140-42                   | CAM 18-007 |
| Exhibit 3                  |            |
| 750 of 776                 |            |





FLOOR FIRE ALARM PLAN  
SCALE: 1/8"=1'-0"



- EXISTING WORK TO REMAIN
- ..... EXISTING TO BE REMOVED
- NEW WORK

**CITY OF FORT LAUDERDALE**  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      |             |
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| NO.       | DATE | DESCRIPTION |
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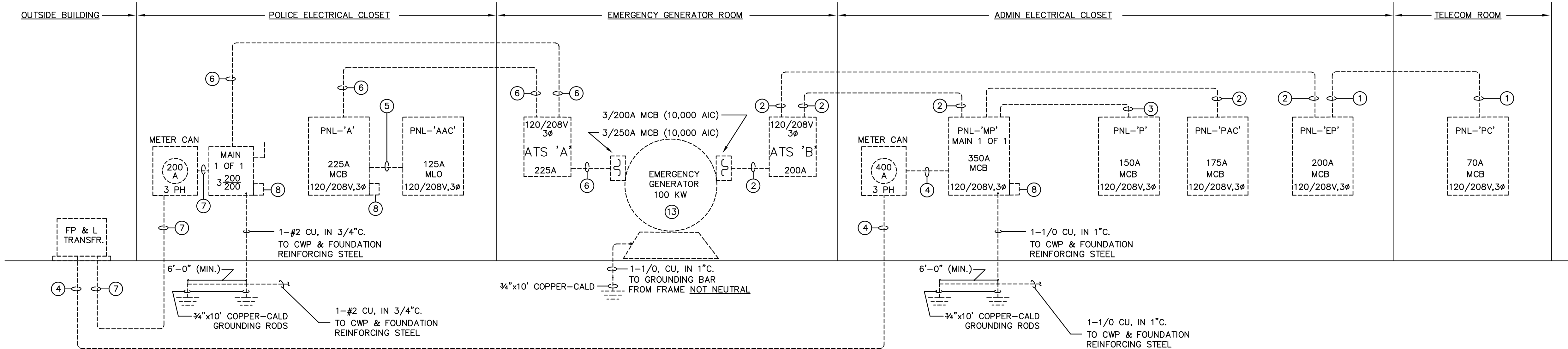
PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
FLOOR FIRE ALARM PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

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|------------------|------------------------|
| SHEET NO.        | OF                     |
| E205             | 11                     |
| TOTAL:           | 65                     |
| CAD FILE:        | 161107 FIRE ALARM PLAN |
| DRAWING FILE NO. | 4-140-42 CAM 18-007    |

DELTA G CONSULTING  
ENGINEERING & ARCHITECTURE  
10000 W. BOCA RATON BLVD., SUITE 100  
BOCA RATON, FL 33433  
TEL: 561-995-1111  
WWW.DELTACONSULTING.COM

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|--------------|------------|
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| SB/CE/RT/AB  | 05/31/2017 |
| DESIGNED BY: | SCALE:     |
| SB/CE/RT/AB  | AS NOTED   |
| CHECKED BY:  | GSU        |
| FIELD BOOK:  |            |





ELECTRICAL RISER DIAGRAM KEY NOTES:

- ① 3 #6, 1 #6 (N) & 1 #8 (G) IN A 1" CONDUIT
- ② 3-2/0, 1-2/0 (N), & 1 #6 (G) IN A 2" CONDUIT
- ③ 3-1/0, 1-1/0 (N) & 1 #6 (G) IN A 2" CONDUIT
- ④ 4 - 500MCM IN A 3" CONDUIT
- ⑤ 3 #1, 1 #1 (N), & 1 #8 (G) IN A 1½" CONDUIT
- ⑥ 3-250MCM, 1-250MCM (N) & 1 #2 (G) IN A 2½" CONDUIT
- ⑦ 4 - 250MCM IN A 2½" CONDUIT
- ⑧ TRANSIENT VOLTAGE SURGE SUPPRESSOR (TVSS)

| LOAD SUMMARY<br>(120/208V, 3ø) |         |       |
|--------------------------------|---------|-------|
|                                | KVA     | AMPS  |
| MAIN 1 OF 1<br>POLICE CLO.     | - 52.1  | 144.7 |
| MAIN 1 OF 1<br>ADMIN CLO.      | - 96.8  | 268.9 |
| TOTAL                          | - 148.9 | 413.6 |

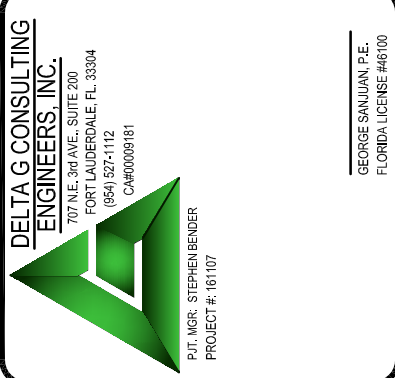
ELECTRICAL RISER DIAGRAM  
120/208V, 3ø

NOT TO SCALE

NOTE:

ALL EQUIPMENT IS EXISTING WITH NO NEW EQUIPMENT OR EQUIPMENT REMOVED.

|       |                         |
|-------|-------------------------|
| ----- | EXISTING WORK TO REMAIN |
| ----- | EXISTING TO BE REMOVED  |
| ----- | NEW WORK                |



|                             |                     |
|-----------------------------|---------------------|
| DRAWN BY:<br>SB/CE/RT/JB    | DATE:<br>05/31/2017 |
| DESIGNED BY:<br>SB/CE/RT/JB | SCALE:<br>AS NOTED  |
| CHECKED BY:<br>GSJ          |                     |
| FIELD BOOK:                 |                     |

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PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |             |
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| NO.       | DESCRIPTION |
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PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
ELECTRIC RISER  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                  |                              |
|------------------|------------------------------|
| SHEET NO.        | OF                           |
| E300             | 11                           |
| TOTAL:           | 65                           |
| CAD FILE:        | 161107 ELECTRICAL RISER PLAN |
| DRAWING FILE NO. | 4-140-42 CAM 18-007          |



| PANEL - 'A'  |                          |               |      |      |       |      |      |               |                         |
|--|--------------------------|---------------|------|------|-------|------|------|---------------|-------------------------|
| (POLICE ELECTRICAL CLOSET)   |                          |               |      |      |       |      |      |               |                         |
| 120/208 VOLTS, 3# 4 WIRE S/N 22,000 AIC  |                          |               |      |      |       |      |      |               |                         |
| 225 AMPS MAIN BREAKER OR M.L.O. 208 VOLTS  |                          |               |      |      |       |      |      |               |                         |
| FLUSH OR SURFACE MOUNTED TOP OR BOTTOM FED   |                          |               |      |      |       |      |      |               |                         |
| KVA  | SERVES                   | WIRE/CND.     | TRIP | CKT. | A B C | CKT. | TRIP | WIRE/CND.     | SERVES                  |
| 0.72   | PROG MANAGER RECEP       | 2 #12 IN 1/2" | 20   | 1    |       | 2    | 20   | 2 #12 IN 1/2" | COFFEE MICROWAVE        |
| 0.50   | REFRIG. RECEP            | 2 #12 IN 1/2" | 20   | 3    |       | 4    | 20   | 2 #12 IN 1/2" | STAFF LOUNGE RECEP      |
| 0.36   | COFFEE COUNTER           | 2 #12 IN 1/2" | 20   | 5    |       | 6    | 20   | 2 #12 IN 1/2" | STAFF/DISH DISP.        |
| 0.50   | COFFEE DISH/DISP. REC.   | 2 #12 IN 1/2" | 20   | 7    |       | 8    | 20   | 2 #12 IN 1/2" | STAFF MICROWAVE         |
| 1.00   | SECURITY LIGHTS          | 2 #12 IN 1/2" | 20   | 9    |       | 10   | 20   | 2 #12 IN 1/2" | SECURITY LIGHTS         |
| 1.02   | OFFICE LIGHTING          | 2 #12 IN 1/2" | 20   | 11   |       | 12   | 20   | 2 #12 IN 1/2" | BATH/LOUNGE LIGHTING    |
| 0.90   | CORRIDOR LIGHTING        | 2 #12 IN 1/2" | 20   | 13   |       | 14   | 20   | 2 #12 IN 1/2" | LOUNGE REFRIG.          |
| 1.08   | BATH/LOCKER RECEP.       | 2 #12 IN 1/2" | 20   | 15   |       | 16   | 20   | 2 #12 IN 1/2" | SUPPLY/COPY RECEP.      |
| 0.72   | LOUNGE RECEPTACLES       | 2 #12 IN 1/2" | 20   | 17   |       | 18   | 20   | 2 #12 IN 1/2" | COPY MACHINE RECEP.     |
| 0.36   | COUNTER RECEPTACLES      | 2 #12 IN 1/2" | 20   | 19   |       | 20   | 20   | 2 #12 IN 1/2" | RECEPTION RECEPTACLES   |
| 0.72   | OFFICE RECEPTACLES       | 2 #12 IN 1/2" | 20   | 21   |       | 22   | 20   | 2 #12 IN 1/2" | OPEN OFFICES RECEP.     |
| 0.72   | OFFICE RECEPTACLES       | 2 #12 IN 1/2" | 20   | 23   |       | 24   | 20   | 2 #12 IN 1/2" | OFFICE RECEPTACLES      |
| 1.50   | EMERG GEN HEATER JACKET  | 3 #12 IN 1/2" | 20   | 25   |       | 26   | 20   | 2 #12 IN 1/2" | CORRIDORS LIGHTING      |
| 0.72   | STAFF LOUNGE RECEPTACLES | 2 #12 IN 1/2" | 20   | 27   |       | 28   | 20   | 2 #12 IN 1/2" | MPR OVERHEAD SCREEN     |
| 0.72   | EAH                      | 2 #12 IN 1/2" | 20   | 29   |       | 30   | 20   | 2 #12 IN 1/2" | OVERHEAD PROJ/CR. SCRN. |
| 0.50   | FILE ROOM RECEPTACLES    | 2 #12 IN 1/2" | 20   | 31   |       | 32   | 20   | 2 #12 IN 1/2" | TELEPHONE BOARD         |
| 0.50   | GEN. BATTERY CHARGER     | 2 #12 IN 1/2" | 20   | 33   |       | 34   | 20   | 2 #12 IN 1/2" | CORRIDOR RECEPTACLES    |
| 0.54   | SERVICE RECEPTACLES      | 2 #12 IN 1/2" | 20   | 35   |       | 36   | 20   |               | SPARE                   |
| FED FROM: ATS 'A' W/3-250 MCM, 1-250 MCM (N) & 1-#2 (G) IN A 2 1/2" CND. TOTAL LOAD: 52.1 KVA 144.7 AMPS |                          |               |      |      |       |      |      |               |                         |

\* CONTINUOUS LIGHTING LOAD CALCULATED AT 125% PER NEC 220-3(A)  
0 CIRCUIT CONTROLLED VIA TIME CLOCK IN ELECTRICAL CLOSET.

| PANEL - 'AAC'   |                   |               |      |      |       |      |      |               |                     |
|---|-------------------|---------------|------|------|-------|------|------|---------------|---------------------|
| (POLICE ELECTRICAL CLOSET)  |                   |               |      |      |       |      |      |               |                     |
| 120/208 VOLTS, 3# 4 WIRE S/N 22,000 AIC   |                   |               |      |      |       |      |      |               |                     |
| 125 AMPS MAIN BREAKER OR M.L.O. 208 VOLTS   |                   |               |      |      |       |      |      |               |                     |
| FLUSH OR SURFACE MOUNTED TOP OR BOTTOM FED  |                   |               |      |      |       |      |      |               |                     |
| KVA   | SERVES            | WIRE/CND.     | TRIP | CKT. | A B C | CKT. | TRIP | WIRE/CND.     | SERVES              |
| 7.20  | SYSTEM A          | 3 # 10        |      | 1    |       | 2    |      | 3 # 8         | CONDENSING UNIT C   |
|   | CONDENSING UNIT   | & 1 #10 G     | 40   | 3    |       | 4    | 70   | & 1 #8 G.     |                     |
|   |                   | IN A 3/4"C.   |      | 5    |       | 6    |      | IN A 1"C.     |                     |
| 9.38  | SYSTEM A          | 3 # 10        |      | 7    |       | 8    |      | 3 # 8         | AIR HANDLING UNIT C |
|   | AIR HANDLING UNIT | & 1 #10 G     | 35   | 9    |       | 10   | 50   | & 1 #8 G.     |                     |
|   |                   | IN A 3/4"C.   |      | 11   |       | 12   |      | IN A 3/4"C.   |                     |
|   | SPARE             |               |      | 13   |       | 14   |      |               | SPARE               |
|   |                   |               |      | 15   |       | 16   | 35   |               |                     |
|   |                   |               |      | 17   |       | 18   |      |               |                     |
| 0.50  | EXHAUST FAN #1    | 2 #12 IN 1/2" | 20   | 19   |       | 20   | 20   | 2 #12 IN 1/2" | ROOF SERVICE RECEP. |
|   | SPARE             |               |      | 20   | 21    | 22   | 20   | 2 #12 IN 1/2" | RECIRCULATING PUMP  |
|   | SPARE             |               |      | 20   | 23    | 24   | 20   | 3 #12 IN 3/4" | WATER HEATER        |
|   | SPACE             |               |      | 25   |       | 26   |      |               |                     |
|   | SPACE             |               |      | 27   |       | 28   |      |               | SPACE               |
|   | SPACE             |               |      | 29   |       | 30   |      |               | SPACE               |
|   | SPACE             |               |      | 31   |       | 32   |      |               | SPACE               |
|   | SPACE             |               |      | 33   |       | 34   |      |               | SPACE               |
|   | SPACE             |               |      | 35   |       | 36   |      |               | SPACE               |
|   | SPACE             |               |      | 37   |       | 38   |      |               | SPACE               |
|   | SPACE             |               |      | 39   |       | 40   |      |               | SPACE               |
|   | SPACE             |               |      | 41   |       | 42   |      |               | SPACE               |
| FED FROM: PANEL 'A' W/3 #1, 1 #1 (N) & 1 #8 (G) IN A 1 1/2" CND. TOTAL LOAD: 25.7 KVA 71.4 AMPS |                   |               |      |      |       |      |      |               |                     |

+ HEATING AND COOLING ARE NON-CONCURRENT LOAD. HIGHEST VALUE SHOWN ON LOAD CALCULATIONS.

| PANEL "A" LOAD CALCULATION                             |  |
|--|--|
| 1- RECEPTACLES CONNECTED LOAD: 18.3 KVA                |  |
| A) FIRST 10.00 KVA @ 100% D.F. -----10.00 KVA          |  |
| B) 18.3 KVA - 10.00 KVA = 8.3 @ 50% D.F. ----- 4.2 KVA |  |
| 2- LIGHTING LOAD 6.5 KVA @ 125% D.F.----- 8.1 KVA      |  |
| 3- REMAINDER LOAD 27.3 KVA @ 100% D.F.----- 27.3 KVA   |  |
| TOTAL DEMAND LOAD----- 49.6 KVA = 137.8 AMPS           |  |

| TOTAL EMERGENCY GENERATOR LOAD  |  |
|---------------------------------|--|
| PANEL "A" - 49.6 KVA            |  |
| PANEL "EP" - 45.7 KVA           |  |
| TOTAL 95.3 KVA *                |  |
| * GENERATOR IS RATED AT 125 KVA |  |

| PANEL - 'P'  |                     |                 |      |      |       |      |      |                 |                     |
|--|---------------------|-----------------|------|------|-------|------|------|-----------------|---------------------|
| (ADMIN ELECTRICAL CLOSET)  |                     |                 |      |      |       |      |      |                 |                     |
| 120/208 VOLTS, 3# 4 WIRE S/N 22,000 AIC  |                     |                 |      |      |       |      |      |                 |                     |
| 225 AMPS MAIN BREAKER OR M.L.O. 208 VOLTS  |                     |                 |      |      |       |      |      |                 |                     |
| FLUSH OR SURFACE MOUNTED TOP OR BOTTOM FED   |                     |                 |      |      |       |      |      |                 |                     |
| KVA  | SERVES              | WIRE/CND.       | TRIP | CKT. | A B C | CKT. | TRIP | WIRE/CND.       | SERVES              |
|  | SPARE               |                 |      | 20   |       | 2    | 20   |                 | SPARE               |
|  | SPARE               |                 |      | 20   |       | 3    |      |                 | SITE/PARKING LIGHTS |
|  | SPARE               |                 |      | 20   |       | 5    |      | 3 #12 IN 3/4" C |                     |
|  | SPARE               |                 |      | 20   |       | 7    |      |                 | SITE/PARKING LIGHTS |
| 1.60   | SITE/PARKING LIGHTS | 3 #12 IN 3/4" C |      | 9    |       | 10   | 20   | 2 #10 IN 1/2" C | HAND DRYER          |
|  | SPACE               |                 |      | 13   |       | 14   |      | 3 #8 IN 1" C    | VEHICLE CHARGER     |
| 1.60   | SITE/PARKING LIGHTS | 3 #12 IN 3/4" C |      | 15   |       | 16   | 40** |                 |                     |
|  |                     |                 |      | 17   |       | 18   |      |                 | SPACE               |
| 2.30   | HAND DRYER          | 2 #10 IN 1/2" C |      | 19   |       | 20   |      |                 | SPACE               |
|  | SPACE               |                 |      | 21   |       | 22   |      |                 | SPACE               |
|  | SPACE               |                 |      | 23   |       | 24   |      |                 | SPACE               |
|  | SPACE               |                 |      | 25   |       | 26   |      |                 | SPACE               |
|  | SPACE               |                 |      | 27   |       | 28   |      |                 | SPACE               |
|  | SPACE               |                 |      | 29   |       | 30   |      |                 | SPACE               |
|  | SPACE               |                 |      | 31   |       | 32   |      |                 | SPACE               |
|  | SPACE               |                 |      | 33   |       | 34   |      |                 | SPACE               |
|  | SPACE               |                 |      | 35   |       | 36   |      |                 | SPACE               |
|  | SPACE               |                 |      | 37   |       | 38   |      |                 | SPACE               |
|  | SPACE               |                 |      | 39   |       | 40   |      |                 | SPACE               |
|  | SPACE               |                 |      | 41   |       | 42   |      |                 | SPACE               |
| FED FROM: PANEL 'MP' W/3-1/0, 1-1/0 (N) & 1 #6 (G) IN A 2" CND. TOTAL LOAD: 17.2 KVA 47.8 AMPS |                     |                 |      |      |       |      |      |                 |                     |

\* CONTINUOUS LIGHTING LOAD CALCULATED AT 125% PER NEC 220-3(A)  
0 CIRCUIT CONTROLLED VIA TIME CLOCK IN ELECTRICAL CLOSET  
\*\* NEW CIRCUIT BREAKER TO MATCH EXISTING TYPE.

| PANEL - 'EP'   |                               |  |      |      |       |      |      |               |                            |
|--|-------------------------------|--|------|------|-------|------|------|---------------|----------------------------|
| (ADMIN ELECTRICAL CLOSET)  |                               |  |      |      |       |      |      |               |                            |
| 120/208 VOLTS, 3# 4 WIRE S/N 22,000 AIC  |                               |  |      |      |       |      |      |               |                            |
| 225 AMPS MAIN BREAKER OR M.L.O. 208 VOLTS  |                               |  |      |      |       |      |      |               |                            |
| FLUSH OR SURFACE MOUNTED TOP OR BOTTOM FED   |                               |  |      |      |       |      |      |               |                            |
| KVA  | SERVES                        | WIRE/CND.                              | TRIP | CKT. | A B C | CKT. | TRIP | WIRE/CND.     | SERVES                     |
| 1.30   | PLAN ROOM                     | 2 #12 IN 1/2"                          | 20   | 1    |       | 2    | 20   | 2 #12 IN 1/2" | AIRPORT MANAGER            |
| 0.72   | OFFICE                        |  |      | 3    |       | 4    |      |               | GRAPHIC DESIGNER, OFFICE   |
| 0.90   | CONFERENCE ROOM               |  |      | 5    |       | 6    |      |               | BUSINESS ASSISTANT         |
| 0.72   | CONFERENCE ROOM               |  |      | 7    |       | 8    |      |               | SMALL CONF. ROOM           |
|  | SPARE                         |  |      | 9    |       | 10   |      |               | KITCHEN, CONF. ROOM        |
| 0.90   | LOBBY/CORR. RECEPTACLES       |  |      | 11   |       | 12   |      |               | SPARE                      |
| 0.72   | BATHROOM RECEPTACLES          |  |      | 13   |       | 14   |      |               | WATERCOOLER RECEPTACLES    |
| 1.20   | CORR/BATH LIGHTING            |  |      | 15   |       | 16   |      |               | LTS. CONFERENCE ROOM       |
| 0.58   | LTS. OFFICES AND LOBBY        |  |      | 17   |       | 18   |      |               | LTS. CONF., KIT., CORRIDOR |
| 0.50   | SECURITY SYSTEM PANEL         |  |      | 19   |       | 20   |      |               | FIRE ALARM PANEL           |
| 24.2   | PANEL 'PC' AT ADMIN ELEC. CL. | 3 #4, 1 #4(N) & 1 #1 (G) IN A 3/4" CND | 70   | 21   |       | 22   |      |               | OFFICE LIGHTING            |
|  |                               |  |      | 23   |       | 24   |      |               | LTS. OFFICES AND CORRIDOR  |
|  |                               |  |      | 25   |       | 26   |      |               | OFFICE RECEPTACLES         |
| 0.75   | NITE/EMERGENCY LIGHTS         | 2 #12 IN 1/2"                          | 20   | 27   |       | 28   | 20   |               | OFFICE RECEPTACLES         |
| 0.72   | FILE/COPY/RECEP.              |  |      | 20   | 29    | 30   | 20   |               | PROG. ASST. OFFICE, DEPT.  |
| 0.72   | ACCT. RECEP                   |  |      | 20   | 31    | 32   | 20   |               | OFFICE RECEPTACLES         |
| 0.90   | OFFICE RECEP                  |  |      | 33   |       | 34   |      |               | OFFICE RECEPTACLES         |
| 0.90   | OFFICE RECEP                  |  |      | 35   |       | 36   |      |               | UPPER RECEPTACLE           |
| 0.90   | OFFICE RECEP                  |  |      | 37   |       | 38   |      |               | UPPER RECEPTACLE           |
| 0.90   | OFFICE, CORRIDOR              |  |      | 39   |       | 40   |      |               | OFFICE 218A RECEPTACLE     |
| 1.44   | RECEPTION RECEP               |  |      | 41   |       | 42   |      |               | OFFICE 218 RECEPTACLE      |
| FED FROM: ATS 'B' W/3-2/0, 1-2/0 (N) & 1 #6 (G) IN A 2" CND. TOTAL LOAD: 55.3 KVA 153.6 AMPS |                               |  |      |      |       |      |      |               |                            |

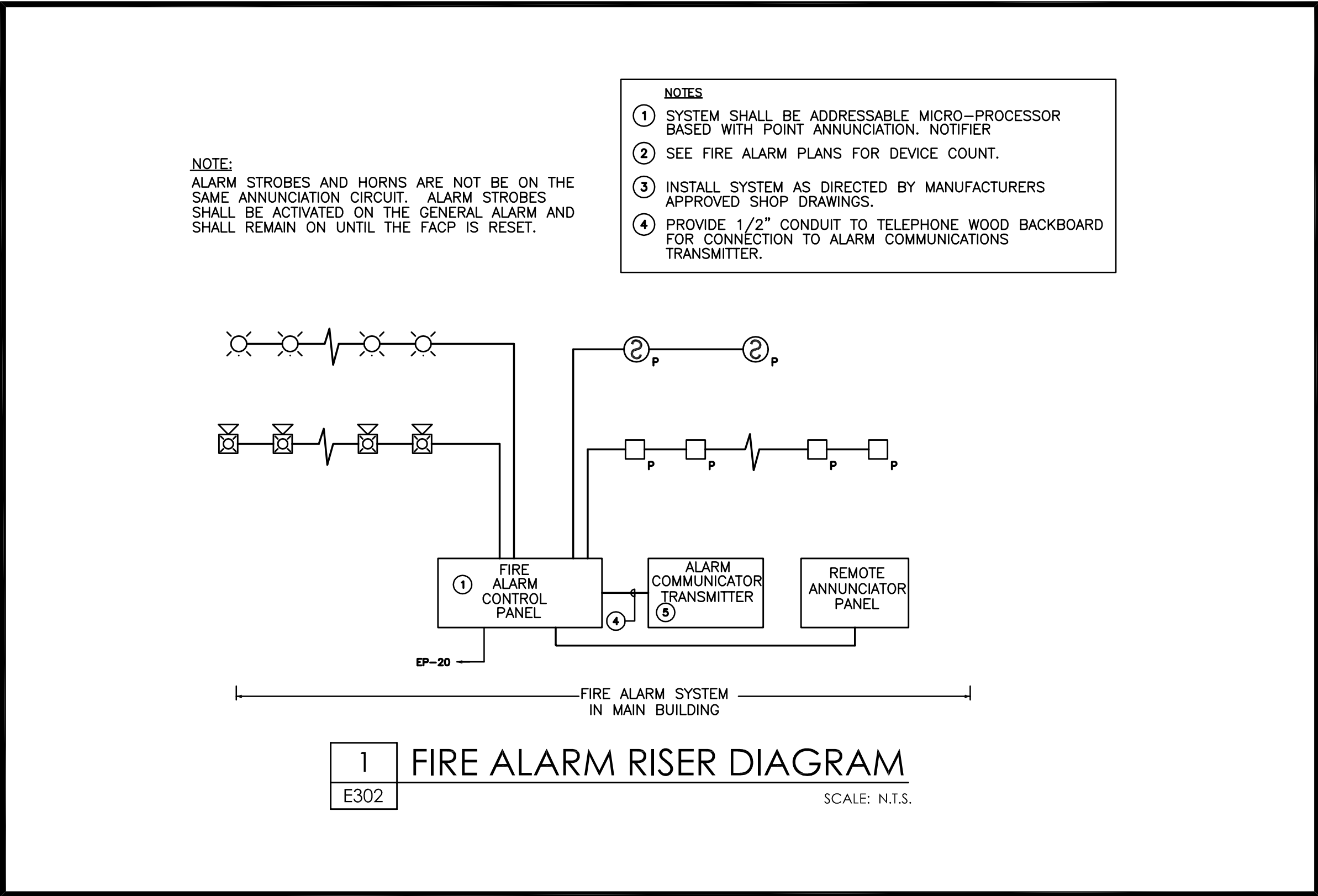
\* CONTINUOUS LIGHTING LOAD CALCULATED AT 125% PER N.E.C. 220-3 (A)

| PANEL - 'PAC'  |                   |                 |      |      |       |      |      |               |                           |
|--|-------------------|-----------------|------|------|-------|------|------|---------------|---------------------------|
| (ADMIN ELECTRICAL CLOSET)  |                   |                 |      |      |       |      |      |               |                           |
| 120/208 VOLTS, 3# 4 WIRE S/N 22,000 AIC  |                   |                 |      |      |       |      |      |               |                           |
| 225 AMPS MAIN BREAKER OR M.L.O. 208 VOLTS  |                   |                 |      |      |       |      |      |               |                           |
| FLUSH OR SURFACE MOUNTED TOP OR BOTTOM FED   |                   |                 |      |      |       |      |      |               |                           |
| KVA  | SERVES            | WIRE/CND.       | TRIP | CKT. | A B C | CKT. | TRIP | WIRE/CND.     | SERVES                    |
| 11.23  | SYSTEM O/A        | 3 # 6           |      | 1    |       | 2    | 20   | 2 #12 IN 1/2" | SECURITY ROOM A/C INSIDE  |
|  | CONDENSING UNIT   | & 1 #8 G.       | 70   | 3    |       | 4    |      |               |                           |
|  |                   | IN A 3/4"C.     |      | 5    |       | 6    |      | 2 #10 IN 1/2" | SECURITY ROOM A/C OUTSIDE |
| 1.67   | SYSTEM O/A        | 3 # 12          |      | 7    |       | 8    | 30   |               |                           |
|  | AIR HANDLING UNIT | & 1 #12 G       | 20   | 9    |       | 10   | 20** | 3 #12 IN 3/4" | AHU-ITA                   |
|  |                   | IN A 3/4"C.     |      | 11   |       | 12   |      |               |                           |
| 12.09  | NEW RTU-1         | 3 # 8 & 1 #10 G | 50** | 13   |       | 14   | 20   | 2 #12 IN 1/2" | FLAG POLE UPLIGHTS        |
|  |                   | IN A 1"C.       |      | 15   |       | 16   | 20** | 3 #12 IN 3/4" | AHU-ITB                   |
|  |                   |                 |      | 17   |       | 18   |      |               |                           |
| 0.50   | EXHAUST FAN #2    | 2 #12 IN 1/2"   | 20   | 19   |       | 20   | 20   | 2 #12 IN 1/2" | VAV-B1 & VAV-C1           |
|  | SPARE             |                 |      | 20   | 21    | 22   | 20   | 2 #12 IN 1/2" | EF-1                      |
| 0.50   | AUTO GATE         | 2 #12 IN 1/2"   | 20   | 23   |       | 24   | 20   | 2 #12 IN 1/2" | SERVICE RECEPTACLES       |
|  |                   |                 |      | 25   |       | 26   | 20   | 2 #12 IN 1/2" | SPRINKLER TIMER           |
|  | SPACE             |                 |      | 27   |       | 28   | 20** | 2 #12 IN 1/2" | WP/GFI ROOF RECEPTACLE    |
| 4.00   | VAV-1             | 3 #10 IN 3/4"   | 30** | 29   |       | 30   | 30   | 3 #10 IN 3/4" | CTU-ITA                   |
|  |                   |                 |      | 31   |       | 32   |      |               |                           |
| 2.00   | VAV-2 AND VAV-3   | 3 #12 IN 1/2"   | 20** | 33   |       | 34   | 30   | 3 #10 IN 3/4" | CTU-ITB                   |
|  |                   |                 |      | 35   |       | 36   |      |               |                           |
| FED FROM: PANEL 'MP' W/3-2/0, 1-2/0 (N) & 1 #6 (G) IN A 2" CND. TOTAL LOAD: 33.7 KVA 93.6 AMPS |                   |                 |      |      |       |      |      |               |                           |

+ HEATING AND COOLING ARE NON-CONCURRENT LOADS. HIGHEST VALUE SHOWN ON LOAD CALCULATIONS.  
\*\* NEW CIRCUIT BREAKER TO MATCH EXISTING TYPE.

| (MAIN 1 OF 1)                                      |         |   |      | 120/208 VOLTS, 3Ø 4 WIRE _____ S/N   |   |   |   |      |      |   |             |                                  |  | 22,000 AIC  |  |
|--|---------|---|------|--|---|---|---|------|------|---|-------------|----------------------------------|--|-------------|--|
| PANEL – 'MP'                                       |         |   |      | 400 AMPS   |   |   |   |      |      |   |             |                                  |  | ● 208 VOLTS |  |
| (ADMIN ELECTRICAL CLOSET)                          |         |   |      | <input type="checkbox"/> FLUSH OR <input checked="" type="checkbox"/> SURFACE MOUNTED <input type="checkbox"/> TOP OR <input checked="" type="checkbox"/> BOTTOM FED |   |   |   |      |      |   |             |                                  |  |             |  |
| KVA  | SERVES  | WIRE/CND                                      | TRIP | CKT.   | A | B | C | CKT. | TRIP | WIRE/CND                                      | SERVES      | KVA                              |  |             |  |
| 52.1   | ATS 'B' | 3-2/0, 1-2/0<br>(N) & 1 #6 (G)<br>IN A 2" CND | 200  | 1  | 1 |   |   | 2    | 100  | 3-2/0, 1-2/0<br>(N) & 1 #6 (G)<br>IN A 2" CND | PANEL 'PAC' | 33.7                             |  |             |  |
| —  | SPACE   | —   | —    | 7  |   |   |   | 8    | 150  | 3-1/0, 1-1/0<br>(N) & 1 #6 (G)<br>IN A 2" CND | PANEL 'P'   | 17.2                             |  |             |  |
| —  | SPACE   | —   | —    | 9  |   |   |   | 10   | —    | —   | SPACE       | —                                |  |             |  |
| —  | SPACE   | —   | —    | 11   |   |   |   | 12   | —    | —   | SPACE       | —                                |  |             |  |
| —  | SPACE   | —   | —    | 13   |   |   |   | 14   | —    | —   | SPACE       | —                                |  |             |  |
| —  | SPACE   | —   | —    | 15   |   |   |   | 16   | —    | —   | SPACE       | —                                |  |             |  |
| —  | SPACE   | —   | —    | 17   |   |   |   | 18   | —    | —   | SPACE       | —                                |  |             |  |
| FED FROM: FP&L TRANSFORMER W/4-500MCM IN A 3" CND. |         |   |      |  |   |   |   |      |      |   |             | TOTAL LOAD: 103.0 KVA 286.1 AMPS |  |             |  |





- 2

FIRE ALARM SYSTEM NOTES

E302

SCALE: N.T.S.
1.

SHOP DRAWINGS SHALL BE PROVIDED TO THE ENGINEER PRIOR TO BEGINNING ANY WORK. SHOP DRAWINGS SHALL SHOW WIRE COUNTS, CONDUCTOR TYPES, RACEWAY LOCATIONS AND SIZES, EQUIPMENT CATALOG NUMBERS, BATTERY CALCS., AND DESCRIPTIONS CLEARLY HIGH-LIGHTED TO SPECIFICALLY INDICATE WHICH PRODUCTS ARE PROPOSED FOR USE. AFTER SATISFACTORY REVIEW BY THE ENGINEER, THE CONTRACTOR SHALL SEEK APPROVAL BY THE FIRE MARSHALL. AFTER SATISFACTORY REVIEW BY THE FIRE MARSHALL WORK SHALL COMMENCE.
2.

ALL COMPONENTS SHALL BEAR THE U. L. LABEL FOR FIRE SERVICE USE AND SHALL BE COMPATIBLE FOR USE WITH ALL EXISTING INTERCONNECTING EQUIPMENT.
3.

THE COMPLETE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, N.E.C., N.F.P.A., A.D.A., ANSI, F.B.C., AND ALL LOCAL CODES.
4.

HORNS AND SPEAKERS SHALL BE OF SUCH CHARACTER AND SO LOCATED, AS TO BE CLEARLY HEARD THROUGHOUT AND ABOVE AMBIENT NOISE LEVELS.
5.

MINIMUM CONDUIT SIZE SHALL BE 1/2" FOR ALL RUNS. CONDUIT SHALL LOOP ALL DEVICES AND RETURN TO F.A.C.P.
6.

ALL CONDUCTORS SHALL BE COPPER AND SHALL BE SIZED FOR NO MORE THAN 1 dB LOSS. MINIMUM #18 AWG AND #14 AWG FOR HORN AND/OR STROBE CIRCUITS.
7.

CONDUCTOR INSULATION FOR CABLES SHALL BE TYPE TFN. IF CABLES PENETRATE INTO OR THROUGH PLENUM AREAS USED FOR TRANSFER OF ENVIRONMENTAL AIR, THEY SHALL BE TYPE FPLP, TEFLON INSULATED TYPE.
8.

THE CONTRACTOR SHALL FURNISH AND INSTALL ALL EQUIPMENT, CONDUIT SYSTEM, CON-DUCTORS, DEVICES, ETC., AND ALL OTHER ACCESSORIES REQUIRED FOR AN ACCEPTABLE AND FULLY FUNCTIONAL SYSTEM.
9.

FINAL CONNECTIONS BETWEEN EQUIPMENT AND WIRING SYSTEM SHALL BE MADE UNDER DIRECT SUPERVISION OF A QUALIFIED TECHNICAL REPRESENTATIVE OF THE EQUIPMENT MANU-FACTURER, WHO SHALL TEST THE SYSTEM COMPLETELY AND PROVIDE A CERTIFICATE IN WRITING AS TO THE PROPER INSTALLATION AND OPERATION OF THE FIRE ALARM SYSTEM PRIOR TO FINAL ACCEPTANCE OF THE SYSTEM BY THE OWNER.
10.

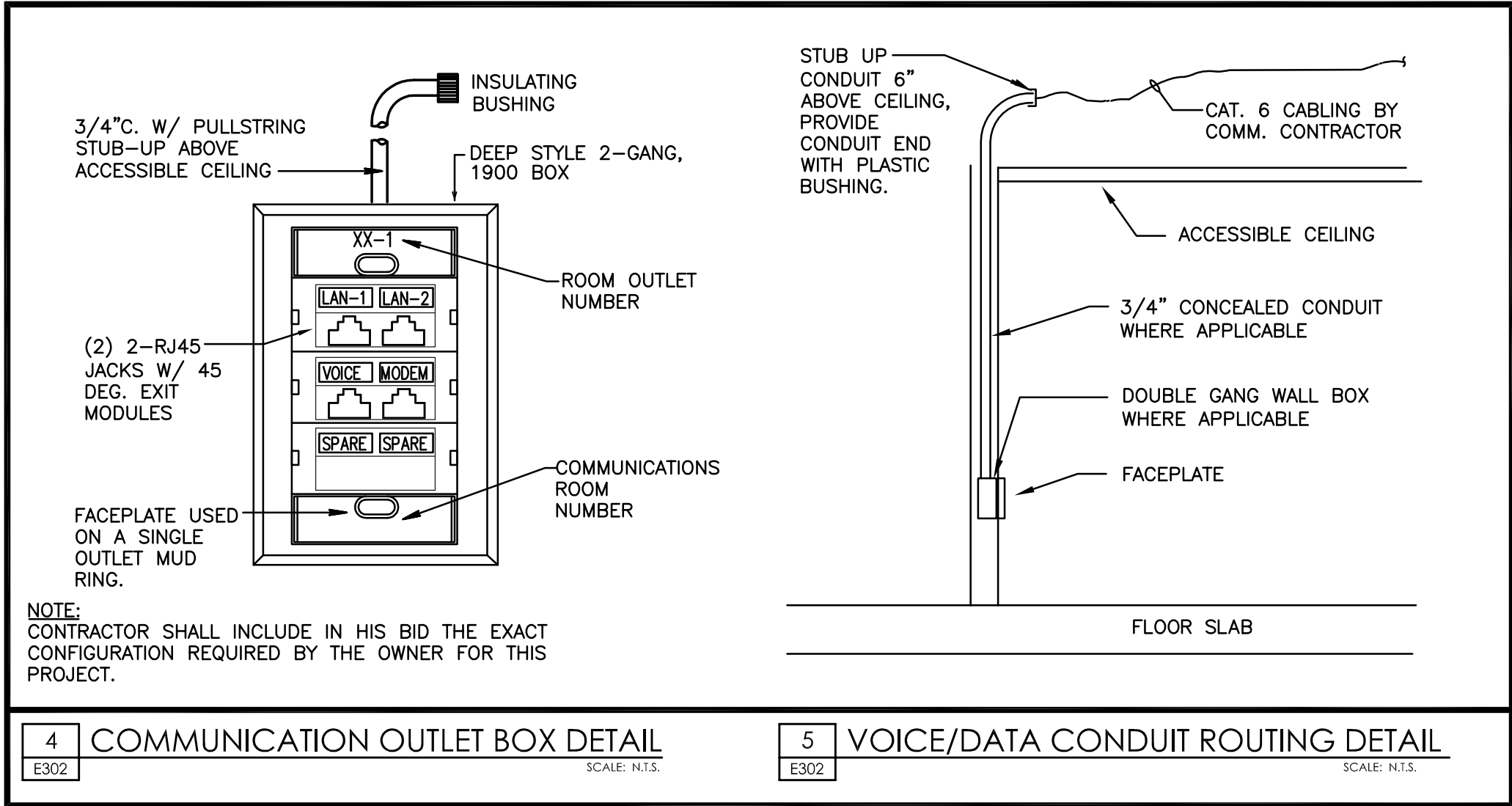
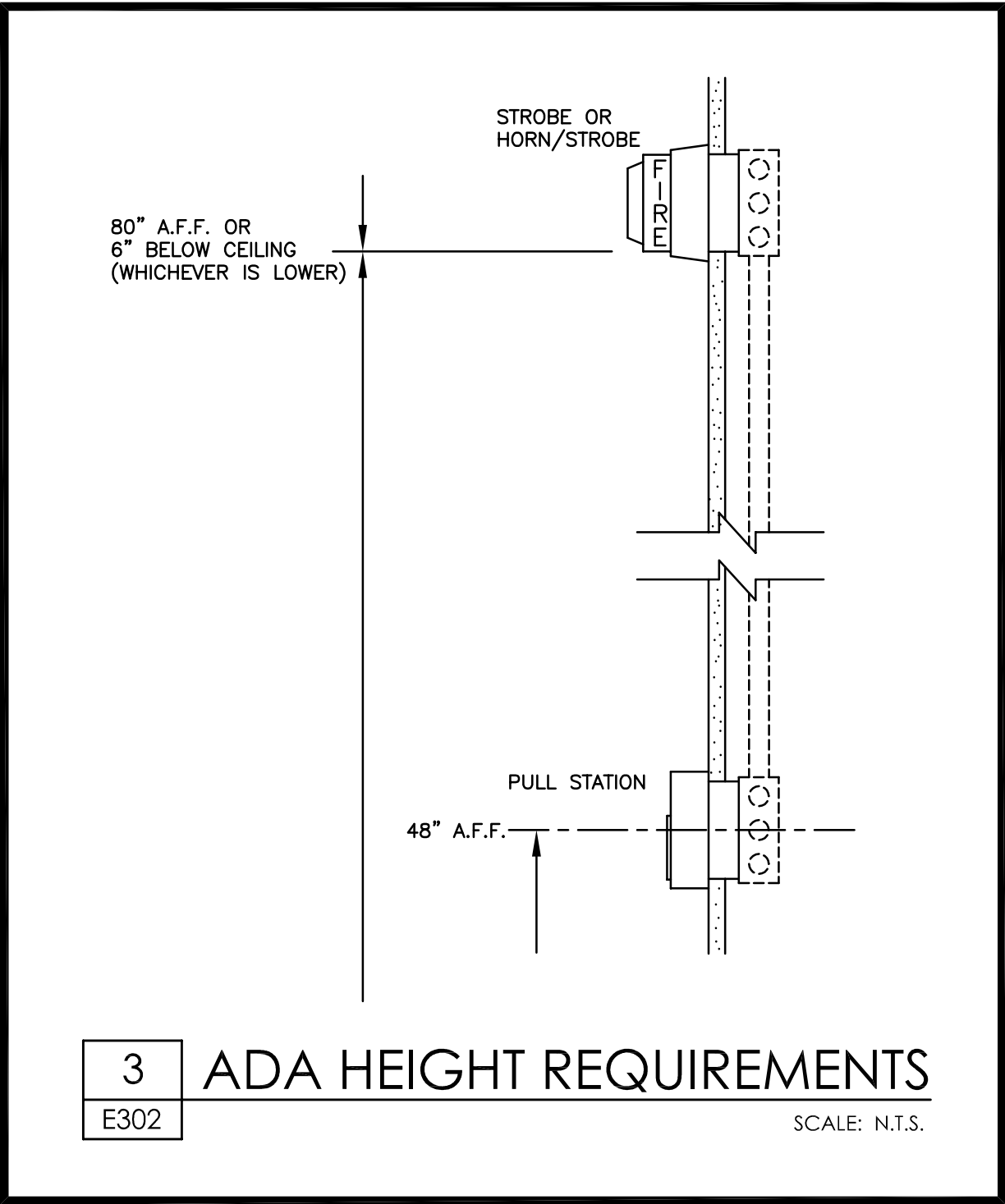
AS-BUILT DRAWINGS SHOWING POINT BY POINT CONNECTIONS OF ALL DEVICES AND FINAL EQUIPMENT LOCATIONS SHALL BE GIVEN TO THE OWNER UPON ACCEPTANCE OF INSTALLATION BY THE OWNER.
11.

ALL EQUIPMENT SHALL BE BY FCI.
12.

CONTRACTOR SHALL SUBMIT FIRE ALARM SYSTEM SHOP DRAWINGS, INCLUDE TECHNICAL DATA SHEETS TO BUILDING DEPARTMENT THAT COMPLY WITH FIRE MARSHAL'S OFFICE FIRE ALARM SYSTEM INSTALLATION REQUIREMENTS. FOR APPROVAL PRIOR TO INSTALLATION.
13.

ALL DUCT SMOKE DETECTORS SHALL INITIATE A TROUBLE/SUPERVISORY SIGNAL IN THE FIRE ALARM SYSTEM NOT A FULL ALARM.
14.

FIRE ALARM DRAWINGS ARE SCHEMATIC. ALL DEVICES FINAL LOCATION SHALL BE COORDINATED IN THE FIELD. NO CHANGE ORDERS WILL BE ALLOWED DUE TO EQUIPMENT RELOCATION PER FIELD CONDITIONS. ALL INSTALLATIONS SHALL BE COORDINATED WITH ALL TRADES INCLUDING BUT NOT LIMITED TO STRUCTURAL AND ARCHITECTURAL PRIOR TO PERFORMING ANY WORK.



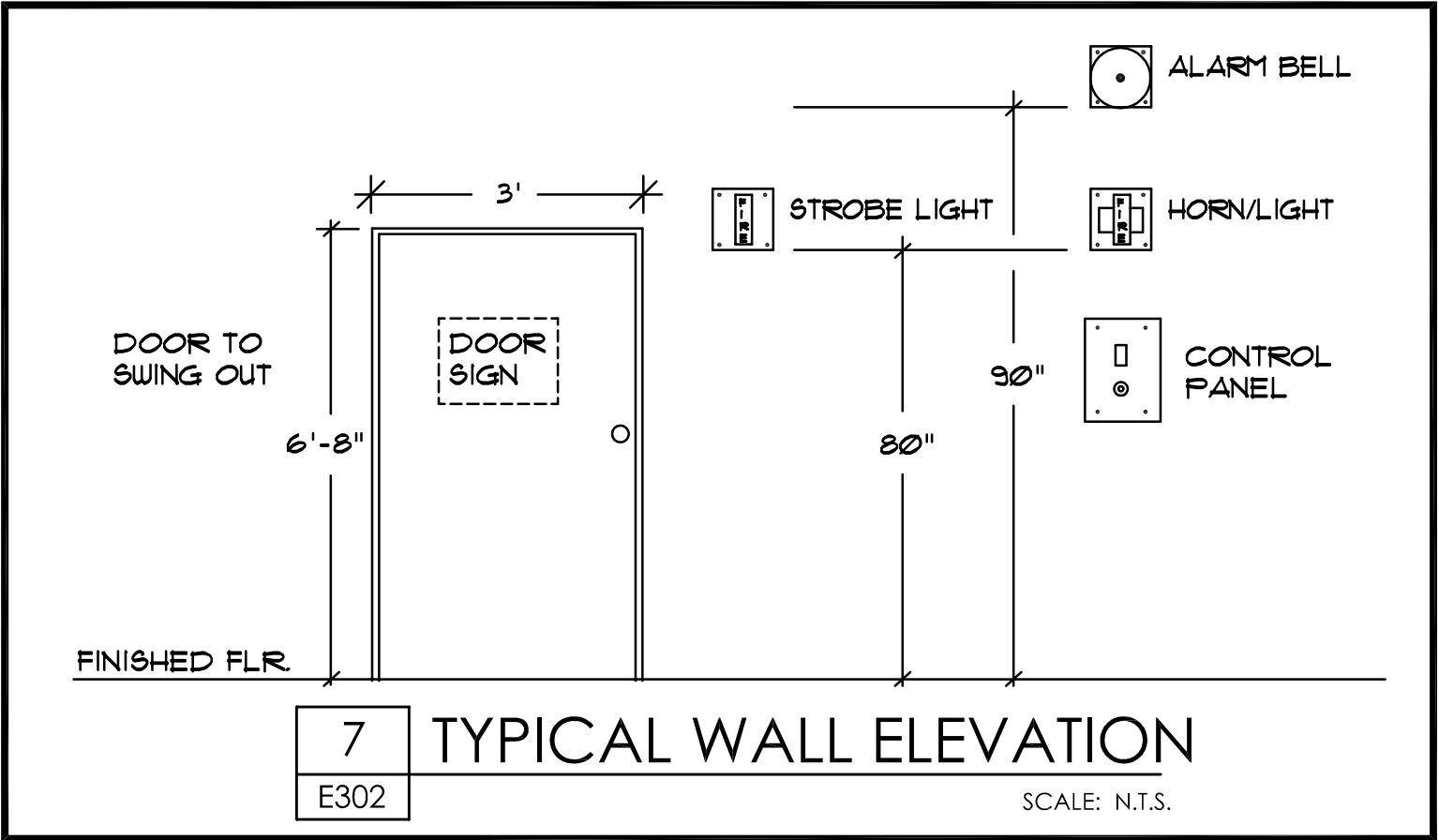
6

LIGHTING FIXTURE SCHEDULE

E302

SCALE: N.T.S.

| TYPE | DESCRIPTION             | MANUFACTURER AND CATALOG NO.                   | NO. | LAMPS<br>TYPE | WATTS | MOUNTING       | REMARKS                                  |
|------|-------------------------|--|-----|---------------|-------|----------------|--|
| A    | 2' x 4' LED             | DAYBRITE<br>2FGG43LB40-4-D-UNV-DIM             | -   | LED           | 36    | RECESSED       | GRID LAY IN                              |
| AE   | 2' x 4' LED EMERGENCY   | DAYBRITE<br>2FGG43LB40-4-D-UNV-DIM-EMLD        | -   | LED           | 36    | RECESSED       | WITH UL LISTED 90 MIN. EMERGENCY BATTERY |
| B    | LED DOWNLIGHT           | LIGHTOLIER<br>P6RD15NZ10UVB-P6RD84QVB-P6RDCC   | -   | LED           | 16    | RECESSED       |  |
| BE   | LED DOWNLIGHT EMERGENCY | LIGHTOLIER<br>P6RD15NZ10UVBEM-P6RD84QVB-P6RDCC | -   | LED           | 16    | RECESSED       | WITH UL LISTED 90 MIN. EMERGENCY BATTERY |
| C    | LED FLAGPOLE LIGHT      | GARDCO<br>DFC7-SM-RSP-32L-700-NW-G2-UNIV-WH    | -   | LED           | 71    | SURFACE        | STANCHION MOUNTED                        |
| D    | LED DOWNLIGHT           | LIGHTOLIER<br>P6RD20NZ10UVB-P6RD84QVB-P6RDCC   | -   | LED           | 21    | RECESSED       |  |
| F    | 2' x 4' LED             | DAYBRITE<br>2FGG38LB40-4-D-UNV-DIM             | -   | LED           | 32    | RECESSED       | GRID LAY IN                              |
| FE   | 2' x 4' LED EMERGENCY   | DAYBRITE<br>2FGG38LB40-4-D-UNV-DIM-EMLD        | -   | LED           | 32    | RECESSED       | WITH UL LISTED 90 MIN. EMERGENCY BATTERY |
| X    | EXIT SIGN               | BEGHELLI, INC.<br>OL2-SA-LR-1/2M-CR            | -   | LED           | 4     | CEILING RECESS | WITH UL LISTED 90 MIN. EMERGENCY BATTERY |



|                             |                     |
|-----------------------------|---------------------|
| DRAWN BY:<br>SB/CE/RT/JB    | DATE:<br>05/31/2017 |
| DESIGNED BY:<br>SB/CE/RT/JB | SCALE:<br>AS NOTED  |
| CHECKED BY:<br>GSU          | FIELD BOOK:         |

CITY OF FORT LAUDERDALE

PUBLIC WORKS DEPARTMENT

ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      | DESCRIPTION |
|-----------|------|-------------|
| NO.       | DATE | BY          |
|           |      |             |
|           |      |             |
|           |      |             |
|           |      |             |
|           |      |             |

PROJECT # 12188

ADMINISTRATION BUILDING RENOVATIONS

ELECTRICAL DETAILS


6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                  |                                |
|------------------|--------------------------------|
| SHEET NO.        | OF                             |
| E302             | 11                             |
| TOTAL:           | 65                             |
| CAD FILE:        | 161107 ELECTRICAL DETAILS PLAN |
| DRAWING FILE NO. | 4-140-42                       |
| CAM 18-007       | Exhibit 3                      |
| 754 of 776       |                                |



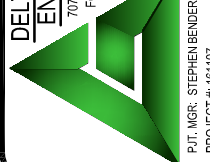
| REVISIONS |      |    | DESCRIPTION |
|-----------|------|----|-------------|
| NO.       | DATE | BY | CHK'D       |
|           |      |    |             |
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CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301



|              |            |
|--------------|------------|
| DRAWN BY:    | DATE:      |
| SD/CE/RT/AB  | 05/05/2017 |
| DESIGNED BY: | SCALE:     |
| SD/CE/RT/AB  | AS NOTED   |
| CHECKED BY:  | GSU        |
| FIELD BOOK:  |            |

DELTA G CONSULTING  
10000 W. BOULEVARD, SUITE 100  
FORT LAUDERDALE, FL 33324  
(954) 551-1111  
WWW.DELTACONSULTING.COM



GEORGE JENNIFER, P.E.  
FLORIDA LICENSE #4465





















FIRE PROTECTION INDEX

|   |       |   |
|---|-------|---|
| 1 | FP100 | FIRE PROTECTION INDEX, SYMBOL LEGEND AND NOTES. |
| 2 | FP201 | FIRE PROTECTION PLAN                            |
| 3 | --    | --  |
| 4 | --    | --  |
| 5 | --    | --  |
| 6 | --    | --  |



SHOP DRAWING REQUIREMENTS

- CONTRACTOR SHALL SUBMIT 6 COPIES OF COMPLETED SHOP DRAWINGS, TOGETHER AT ONE TIME AND MUST COME THROUGH THE ARCHITECT. ALL SUBMITTALS SHALL BE MADE WITHIN 30 DAYS OF NOTICE TO PROCEED.
- ALL SUBMITTALS MUST CLEARLY INDICATE EXACTLY WHICH ITEMS ARE BEING PROPOSED FOR USE. IF NOT, THE SUBMITTAL SHALL BE REJECTED.
- SUBSTITUTIONS SHALL BE LIMITED TO ONE OF THE ALTERNATES LISTED IN THE CONSTRUCTION DOCUMENTS. PRODUCTS CONSIDERED TO BE EQUAL SHALL BE REVIEWED AND ACCEPTED BY THE ENGINEER, ARCHITECT AND OWNER (10) DAYS PRIOR TO BID DATE.
- THE CONTRACTOR ASSUMES ALL DESIGN RESPONSIBILITY AND ALL FINANCIAL RISKS FOR PROCEEDING PRIOR TO SHOP DRAWINGS PROCESSING, AND ON ANY ITEM OR WORK THAT IS AT VARIANCE TO THE CONSTRUCTION DOCUMENTS.
- SHOP DRAWINGS AND SUBMITTALS FOR EACH ITEM SHALL BE REVIEWED NO MORE THAN TWICE. A THIRD SUBMITTAL ON AN ITEM MUST BE ACCOMPANIED BY A PURCHASE ORDER FROM THE CONTRACTOR OR IT SHALL BE REJECTED.
- CIRCUMSTANCES NECESSITATING A REVISION TO THE PERMITTED DOCUMENTS NOT PROCESSED PRIOR TO INSTALLATION MAY NOT BE ACCEPTED. IF ACCEPTED IT MUST BE LEGIBLE, ACCURATE AND ACCOMPANIED BY A PURCHASE ORDER FROM THE CONTRACTOR. THE REVISION SHALL BE CHARGED TO THE CONTRACTOR AND DELIVERED TO HIM ON A C.O.D. BASIS.
- SUBSTITUTIONS FROM THE BASE DESIGN OR VARIATIONS TO THE PERMITTED CONTRACT DOCUMENTS, WHETHER RESULTING FROM PROCESSED SHOP DRAWINGS OR NOT, THAT RESULT IN REQUIREMENTS IN LETTERS OF AUTHORIZATION AND/OR PERMIT CONTRACT DOCUMENT CHANGES MANDATED BY THE AUTHORITY HAVING JURISDICTION WILL NOT BE MADE BY THIS OFFICE UNLESS ACCOMPANIED BY A PURCHASE ORDER FROM THE CONTRACTOR, AND RELEASED ON A C.O.D. BASIS.

FIRE PROTECTION LEGEND

| SYMBOL  | DESCRIPTION                           |
|---|---------------------------------------|
|    | CONCEALED PENDENT SPRINKLER HEAD      |
|    | RECESSED PENDENT SPRINKLER HEAD       |
|    | SIDEWALL SPRINKLER HEAD               |
|    | UPRIGHT SPRINKLER HEAD                |
|    | EXISTING SPRINKLER HEAD TO BE REMOVED |
|    | FIRE PROTECTION MAIN                  |
|    | FIRE PROTECTION LINE                  |
|    | 1-1/2" FIRE HOSE LINE                 |
|   | PIPE DROP                             |
|  | EXISTING FIRE SPRINKLER LINE          |
|  | FIRE SPRINKLER LINE TO BE REMOVED     |
|  | GROOVED CONTROL VALVE W/TAMPER SWITCH |
|  | FLANGED CONTROL VALVE W/TAMPER SWITCH |
|  | CHECK VALVE                           |
|  | FLOW SWITCH                           |
|  | 1-1/2" FIRE HOSE RACK                 |
|  | HYDRAULIC REFERENCE NODE              |
|  | DENOTES EXISTING TO REMAIN            |
|  | DENOTES NEW                           |
|  | DENOTES RELOCATED                     |

FIRE SPRINKLER HEAD SCHEDULE

| SYM.  | TYPE              | ORIFCE SIZE | TEMP RATING | K FACTOR | COVERAGE AREA (W/L) | MANUFACTURER AND MODEL   |
|---|-------------------|-------------|-------------|----------|---------------------|--|
|  | PENDENT CONCEALED | 1/2"        | 155° F      | 5.6      | STANDARD            | TYCO SERIES RFL, QUICK RESPONSE W/ GLASS BULB. (TY3531)                              |
|  | UPRIGHT           | 1/2"        | 155° F      | 5.6      | STANDARD            | TYCO SERIES TY-FRB, QUICK RESP. W/ GLASS BULB. FOR TRUCK BAYS (TY3131) WHITE FINISH. |
|   |                   |             |             |          |                     |  |
|   |                   |             |             |          |                     |  |

FIRE PROTECTION GENERAL NOTES

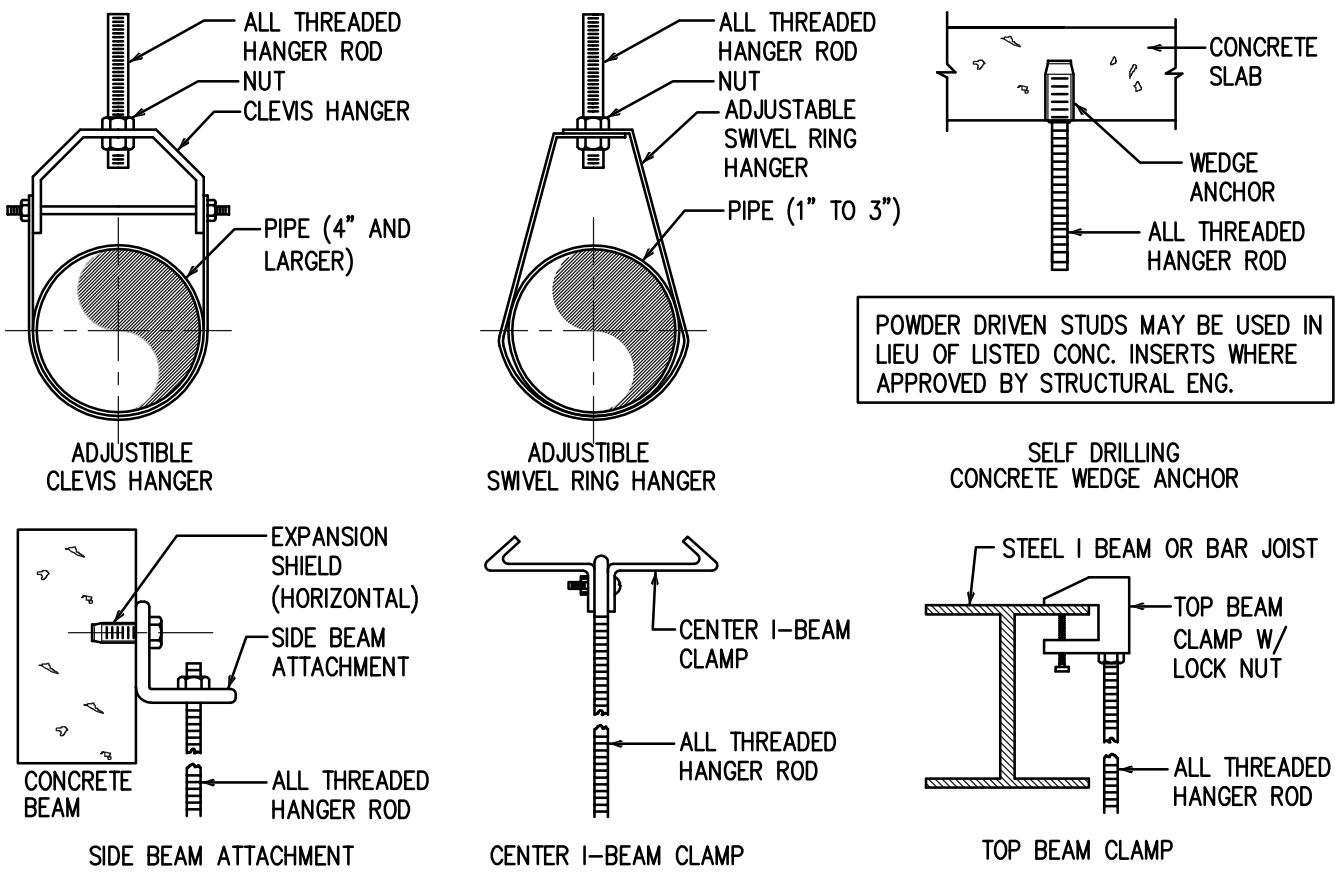
- THE FIRE PROTECTION SYSTEM INSTALLATION AND MATERIALS SHALL BE IN COMPLIANCE WITH THE FLORIDA BUILDING CODE, NFPA 13, 25, 101 AND ALL LOCAL FIRE CODES AND ORDINANCES.
- SPRINKLER SYSTEM TO BE INSTALLED BY A STATE CERTIFIED FIRE PROTECTION CONTRACTOR.
- THE WORK THAT IS TO BE DONE UNDER THIS CONTRACT INCLUDES THE FURNISHING OF ALL LABOR, MATERIALS AND EQUIPMENT, PERMITS, FEES, INSPECTIONS, TESTS, INSURANCE, ETC. REQUIRED FOR THE COMPLETION OF THE FIRE PROTECTION SYSTEM SHOWN ON THE DRAWINGS AND LISTED HEREIN.
- THE DRAWINGS ARE GENERALLY DIAGRAMMATIC. THEY DO NOT SHOW EVERY BEND, OFFSET OR OTHER FITTINGS WHICH MAY BE REQUIRED FOR THE INSTALLATION IN THE SPACE ALLOCATED, OR FOR COORDINATION WITH OTHER TRADES. CONTRACTOR SHALL COORDINATE WITH STRUCTURE, CEILING GRID AND ELEVATION, AND OTHER MECHANICAL, ELECTRICAL AND PLUMBING SERVICES BEFORE FABRICATING AND INSTALLING SPRINKLER PIPING. MAKE OFFSETS IN PIPING AS REQUIRED PER FIELD CONDITIONS. MAINTAIN 6" CLEARANCE BETWEEN PIPING AND 1 AND 2 HOUR RATED WALLS INCLUDING CORRIDOR WALLS.
- ALL FIRE PROTECTION EQUIPMENT AND DEVICES SHALL BE U.L. LISTED AND/OR FM APPROVED. ALL PIPING, HANGERS, SUPPORT METHOD AND SPRINKLER HEADS TO BE INSTALLED IN STRICT ACCORDANCE WITH NFPA 13 AND ALL LOCAL CODES AND ORDINANCES.
- SPRINKLER HEADS SHALL BE U.L. LISTED AND FM APPROVED AS INDICATED IN SCHEDULE RATED FOR 175 PSIG WORKING PRESSURE, AND PROVIDED IN ACCORDANCE WITH SCHEDULE SHOWN ON THIS SHEET. PROVIDE HEAD GUARDS ON SPRINKLERS LOCATED IN MECHANICAL AND ELECTRICAL ROOMS. CONTRACTOR SHALL PROVIDE A WALL-MOUNTED SPRINKLER HEAD CABINET CONTAINING SPARE SPRINKLER HEADS AND WRENCHES FOR REPLACING THE HEADS IN ACCORDANCE WITH NFPA 13 (MINIMUM 2 SPRINKLER OF EACH TYPE AND TEMPERATURE RATING).
- PROVIDE AUXILIARY DRAIN CONNECTION FOR ALL TRAPPED SECTION OF PIPING. PROVIDE CONCRETE SPLASHBLOCKS AT TEST/DRAINS EXTERIOR DISCHARGES AS REQUIRED. CONTRACTOR SHALL PROVIDE FLUSHING CONNECTIONS AS REQUIRED. READILY REMOVABLE FITTINGS SHALL BE PROVIDED AT THE END OF ALL CROSSEINS. ALL CROSSEINS SHALL TERMINATE IN 1-1/4" OR LARGER PIPE. ALL BRANCH LINES ON GRIDDED SYSTEMS SHALL BE ARRANGED TO FACILITATE FLUSHING.  
**FIRE PROTECTION PIPING:**  
STEEL PIPE (ABOVE GRADE): ASTM A53, ASTM A135 OR ASTM A795, UL LISTED, 300 PSIG WP, FM APPROVED FOR FIRE PROTECTION BLACK STEEL PIPE. EXTERIOR INSTALLED PIPING EXPOSED TO WEATHER SHALL BE GALVANIZED.
  - SCH. 40 FOR 1" THRU 2-1/2" WITH SCREWED ENDS
  - SCH. 10 FOR 3" AND LARGER W/ SCREWED OR GROOVED ENDS**FITTING:**
  - THREADED: ANSI/ASME B16.3, CLASS 150 MALLEABLE IRON.
  - GROOVED: ASTM A536, DUCTILE IRON OR ASTM A47, MALLEABLE IRON APPROVED FOR USE BY THE COUPLING MANUFACTURER WITH LOW FLOW CHARACTERISTICS EQUAL TO OR BETTER THAN STANDARD FITTINGS, MIN. 300 PSIG WP. GROOVED FITTINGS TO BE VICTAULIC TYPE OR APPROVED EQUAL
  - MECHANICAL GROOVED COUPLING: UL LISTED, FM APPROVED FOR FIRE PROTECTION SERVICE, MIN. 300 PSIG WP, DUCTILE OR MALLEABLE IRON HOUSING, RUST INHIBITED NO-LEAD COATING, ZINC ELECTROPLATED HEAT TREATED BOLTS AND HEAVY HEX CARBON STEEL NUTS MEETING ASTM A183 STANDARDS.**JOINTS:**
  - SCREWED, ROLL GROOVED.
  - THREADED: ANSI/ASME B1.20.1 FOR 2-1/2" AND SMALLER.
  - GROOVED: FOR 2-1/2" AND LARGER. GROOVE DIMENSIONS TO BE COMPATIBLE WITH LISTING OF COUPLING/FITTINGS USED AND OF THE SAME MANUFACTURER.
- SPRINKLER HEADS SHALL BE A MINIMUM OF 18" ABOVE ANY FLOOR OBSTRUCTION, SHELVES OR CABINETS.
- CONTRACTOR SHALL INSTALL SPRINKLERS UNDER DUCTS & OTHER OBSTRUCTIONS OVER 4 FEET IN WIDTH.
- ALL FIRE RATED FLOOR AND WALL PENETRATIONS SHALL BE PROPERLY PROTECTED FROM FIRE, SMOKE AND WATER PENETRATION BY FILLING VOIDS BETWEEN PIPE AND WALL/FLOOR SLEEVES WITH FIRE RATED FOAM, CHASE TECHNOLOGY CORP.- CTC PR-855 OR 3M, CP-25 CAULKING OR 303 PUTTY, TO ACHIEVE SAME RATING AS WALLS OR FLOORS.
- PRESSURE TEST ABOVE GROUND AND UNDERGROUND PIPING HYDROSTATIC ALLY AT 200 PSIG FOR 2 HOURS IN ACCORDANCE WITH NFPA-13. FLUSH OUT ALL PIPING IN ACCORDANCE WITH NFPA-13. PROVIDE TYPED AND COMPLETED NFPA-13 TEST CERTIFICATE FOR ABOVEGROUND PIPING. ALL WATERLOW AND SUPERVISORY SWITCHES SHALL BE TESTED FOR PROPER OPERATION AND ANNUNCIATION. FURNISH TO OWNER'S REPRESENTATIVE ALL LITERATURE AND INSTRUCTIONS FOR THE PROPER OPERATION AND MAINTENANCE OF ANY EQUIPMENT AND DEVICES INSTALLED.
- CONTRACTOR SHALL PROVIDE FIRE SPRINKLER SHOP DRAWINGS, CUT SHEETS FOR ALL COMPONENTS AND HYDRAULIC CALCULATIONS TO BUILDING DEPARTMENT FOR APPROVAL PRIOR INSTALLATION.
- ALL VALVES CONTROLLING WATER SUPPLY SHALL BE PROVIDED WITH A SUPERVISORY (TAMPER) SWITCH. SUPERVISORY SWITCH SHALL BE 120 VOLT CLOSED CIRCUIT TAMPER SWITCH, U.L. LISTED AND FM APPROVED. FLOW SWITCHES SHALL BE PADDOLE TYPE, SINGLE POLE, DOUBLE THROW WITH ADJUSTMENT FOR SENSITIVITY TO FLOW WITH TIME DELAY, U.L. LISTED AND FM APPROVED. COORDINATE LOCATION OF ALL FLOW AND TAMPER SWITCHES WITH ELECTRICAL CONTRACTOR.
- GATE VALVES 2" AND SMALLER SHALL BE O.S.&Y. THREADED BRONZE, RISING STEM, WEDGE DISC, 175 WWP. GATE VALVES 2-1/2" AND LARGER SHALL BE O.S.&Y. FLANGED IBBM RISING STEM, SOLID WEDGE DISC, 175 WWP. ALL GATE VALVES SHALL BE UL LISTED AND FM APPROVED. BUTTERFLY VALVES WITH INTEGRAL SUPERVISORY SWITCH MAY BE USED WHERE PERMITTED BY NFPA 13.
- ALL CONTROL, DRAIN, AND TEST CONNECTION VALVES SHALL BE PROVIDED WITH PERMANENTLY MARKED WEATHERPROOF METAL OR RIGID PLASTIC IDENTIFICATION SIGN IN ACCORDANCE WITH NFPA 13 AND NFPA 14. IDENTIFY THE HYDRAULICALLY DESIGNED SPRINKLER SYSTEM AND STANDPIPE WITH A PERMANENTLY MARKED WEATHERPROOF METAL OR RIGID PLASTIC IDENTIFICATION SIGN IN ACCORDANCE WITH NFPA 13 AND NFPA 14.

HYDRAULIC SIZING CRITERIA

- BUSINESS BUILDING:**
- OCCUPANCY CLASSIFICATION:
    - LIGHT HAZARD (OFFICES, BATHROOMS, CORRIDORS, ADMINISTRATIVE AREAS, CONFERENCE ROOMS, BREAK ROOM, LOBBY, RECEPTION, STAFF LOUNGE);
    - ORDINARY HAZARD 1 (ELECT. ROOM, MECHANICAL ROOMS, IT ROOM, STORAGE ROOMS, JANITOR CLOSET, FILE/COPY ROOM)
  - DENSITY: 0.10 GPM/SF; 0.15 GPM/SF.
  - AREA OF APPLICATION: 1,500 SF (MOST REMOTE AREA)
  - SPRINKLER COVERAGE: 225 SF; 130 SF.
  - TOTAL COMBINED HOSE STREAM DEMAND: 100 GPM; 250 GPM.

CODES AND STANDARDS

- THE FIRE PROTECTION SYSTEM SHALL BE INSTALLED IN COMPLIANCE WITH THE FOLLOWING APPLICABLE CODES:
- FLORIDA FIRE PREVENTION CODE, 5TH EDITION (2014).
  - UNIFORM FIRE CODE, NFPA 1, 2012 EDITION.
  - LIFE SAFETY CODE, NFPA 101, 2012 EDITION.
  - AUTOMATIC SPRINKLER SYSTEMS, NFPA 13, 2010 EDITION.
  - INSPECTION, TESTING AND MAINTENANCE OF WATER-BASED FIRE PROTECTION SYSTEMS, NFPA 25, 2011 EDITION.
  - NATIONAL FIRE ALARM CODE, NFPA 72, 2010 EDITION.
  - FLORIDA BUILDING CODE, 5TH EDITION (2014).
  - FLORIDA STATE FIRE MARSHALL'S RULE 69A-3.012 FAC.



HANGER SPACING

- 1" & 1-1/4" DIA. STEEL PIPE: MAXIMUM 12 FT. SPACING.
- 1-1/2" AND LARGER DIA. STEEL PIPE: MAXIMUM 15 FT. SPACING.
- 1" THRU 3" DIA. THREADED LIGHTWALL PIPE: MAX. 12 FT. SPACING
- ALL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH NFPA 13.
- EACH SECTION OF PIPE SHALL HAVE NO LESS THAN ONE HANGER. ARMOVERS EXCEEDING 1 FT. SHALL HAVE A HANGER.
- PROVIDE SUPPLEMENTAL TRAPEZE STEEL SUPPORTS BETWEEN BAR JOISTS AS REQUIRED TO SUPPORT PIPE HANGERS SIZED PER NFPA-13.

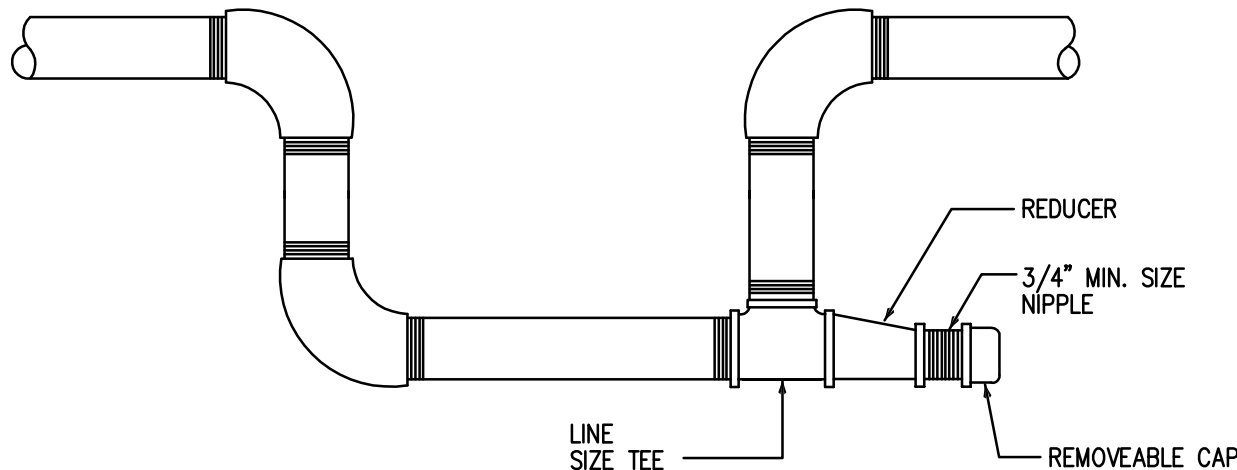
HANGER ROD SIZES

| PIPE SIZE   | DIAMETER OF ROD |      |
|-------------|-----------------|------|
|             | IN.             | MM   |
| UP TO 4"    | 3/8             | 9.5  |
| 5", 6" & 8" | 1/2             | 12.7 |
| 10" & 12"   | 5/8             | 15.9 |

PIPE HANGER DETAIL

SCALE: N.T.S.

AUXILIARY DRAINS SHALL BE PROVIDED WHERE A CHANGE IN PIPING DIRECTION PREVENTS DRAINAGE OF SYSTEM PIPING THROUGH THE MAIN DRAIN VALVE.



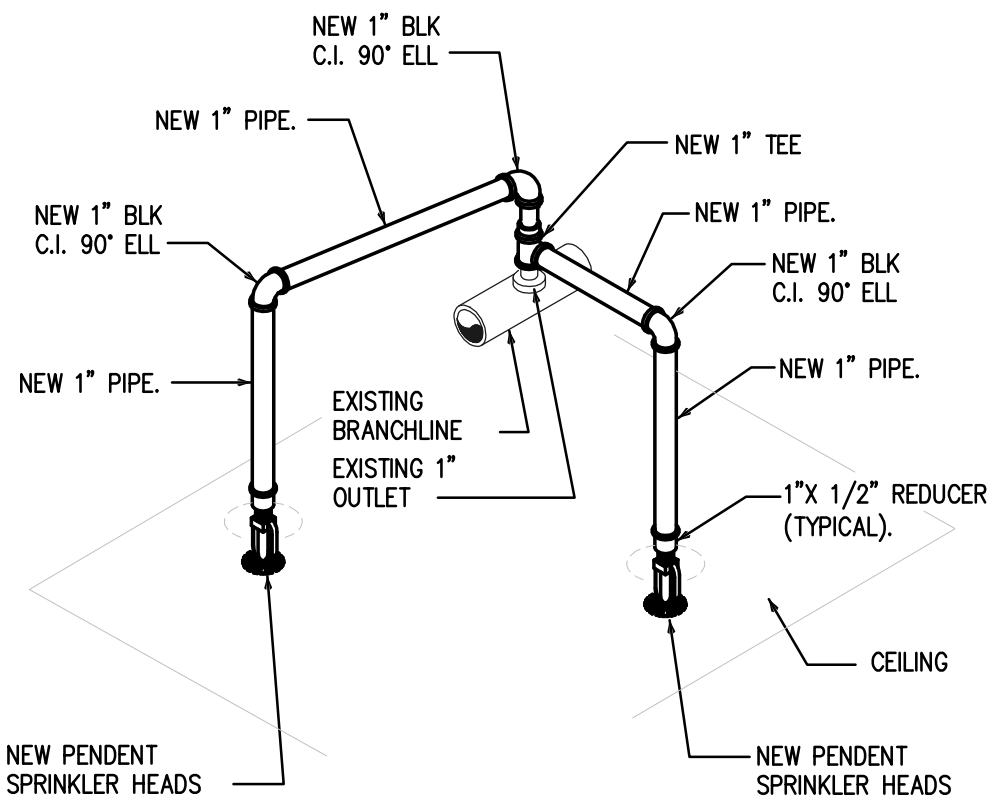
NOTE:

- TRAPPED WATER VOLUME >5 GAL. < 50 GAL.: 3/4" MIN DRAIN VALVE REQ'D.
- TRAPPED WATER VOLUME >50 GAL.: 1" MIN. DRAIN VALVE PIPED TO AN ACCESSIBLE LOCATION REQ'D.

AUXILIARY DRAIN DETAIL

SCALE: N.T.S.

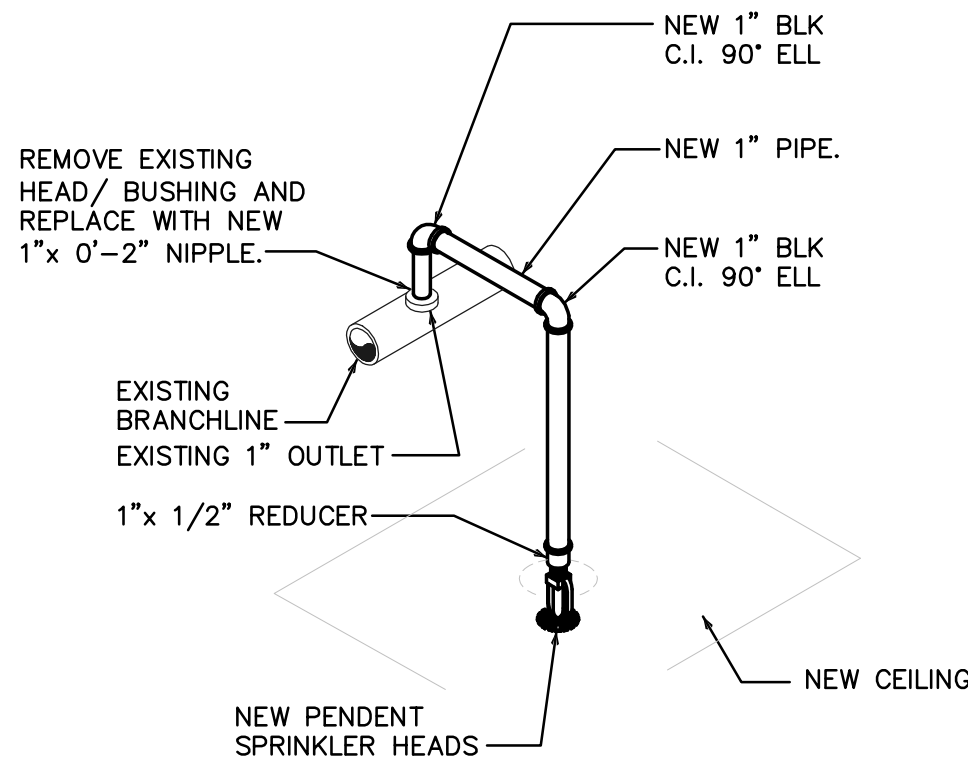
**NOTE:**  
IF MAXIMUM PRESSURE IS UNDER 100 PSI, A HANGER SHALL BE PROVIDED FOR STEEL PIPING ARMOVERS GREATER THAN 24" IN LENGTH.  
IF MAXIMUM PRESSURE EXCEEDS 100 PSI, A HANGER SHALL BE PROVIDED FOR STEEL PIPING ARMOVERS GREATER THAN 12" IN LENGTH.



ARMOVER DETAIL (2 HEADS)

SCALE: N.T.S.

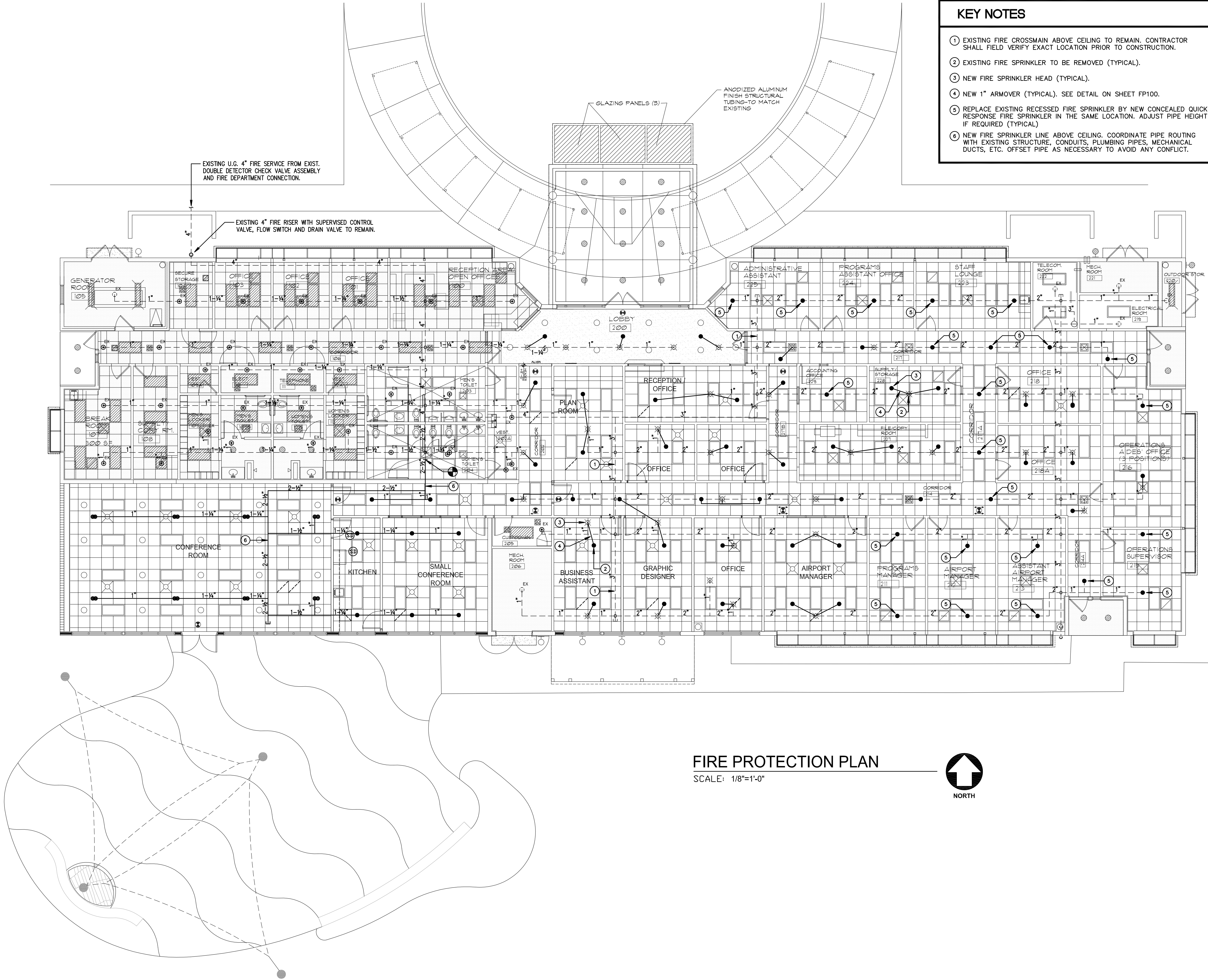
**NOTE:**  
IF MAXIMUM PRESSURE IS UNDER 100 PSI, A HANGER SHALL BE PROVIDED FOR STEEL PIPING ARMOVERS GREATER THAN 24" IN LENGTH.  
IF MAXIMUM PRESSURE EXCEEDS 100 PSI, A HANGER SHALL BE PROVIDED FOR STEEL PIPING ARMOVERS GREATER THAN 12" IN LENGTH.



ARMOVER DETAIL

SCALE: N.T.S.





- KEY NOTES**
- 1 EXISTING FIRE CROSSMAIN ABOVE CEILING TO REMAIN. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION PRIOR TO CONSTRUCTION.
  - 2 EXISTING FIRE SPRINKLER TO BE REMOVED (TYPICAL).
  - 3 NEW FIRE SPRINKLER HEAD (TYPICAL).
  - 4 NEW 1" ARMORER (TYPICAL). SEE DETAIL ON SHEET FP100.
  - 5 REPLACE EXISTING RECESSED FIRE SPRINKLER BY NEW CONCEALED QUICK RESPONSE FIRE SPRINKLER IN THE SAME LOCATION. ADJUST PIPE HEIGHT IF REQUIRED (TYPICAL)
  - 6 NEW FIRE SPRINKLER LINE ABOVE CEILING. COORDINATE PIPE ROUTING WITH EXISTING STRUCTURE, CONDUITS, PLUMBING PIPES, MECHANICAL DUCTS, ETC. OFFSET PIPE AS NECESSARY TO AVOID ANY CONFLICT.

**CITY OF FORT LAUDERDALE**  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE

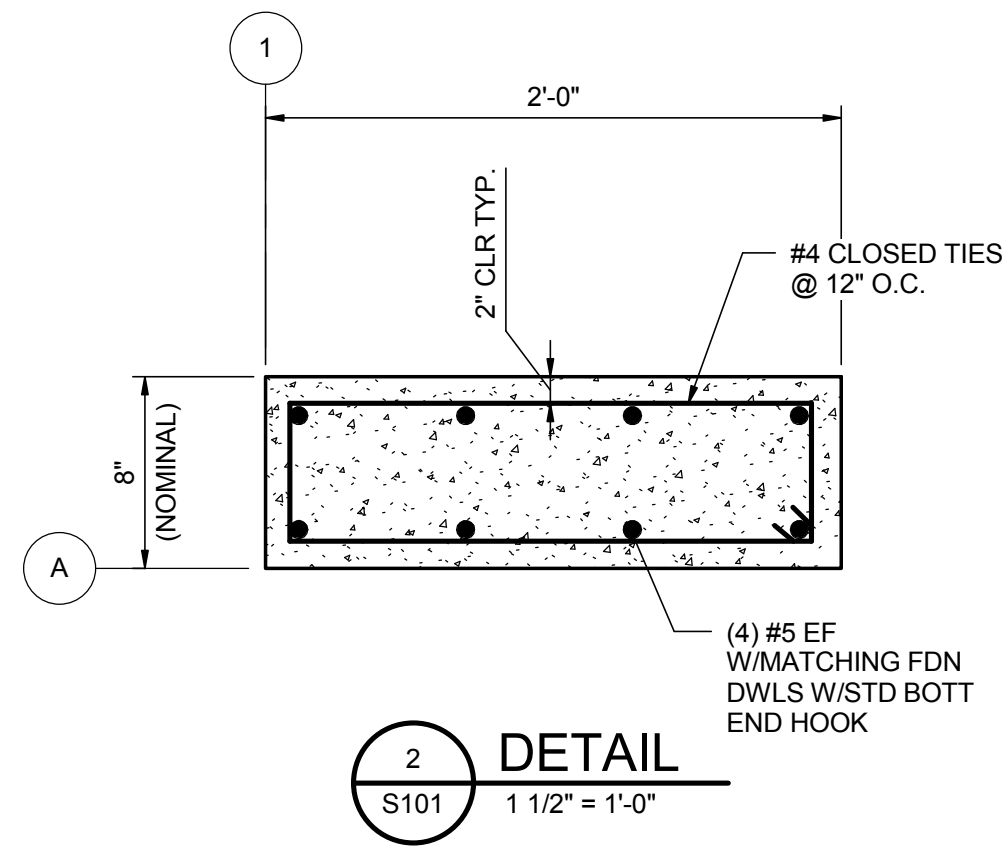
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      |    | DESCRIPTION |
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PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
FIRE PROTECTION PLAN  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                             |            |
|-----------------------------|------------|
| SHEET NO.                   | OF         |
| FP201                       | 2          |
| TOTAL:                      | 65         |
| CAD FILE:                   |            |
| 161107 FIRE PROTECTION PLAN |            |
| DRAWING FILE NO.            |            |
| 4-140-42                    | CAM 18-007 |
|                             | Exhibit 3  |
|                             | 756 of 776 |



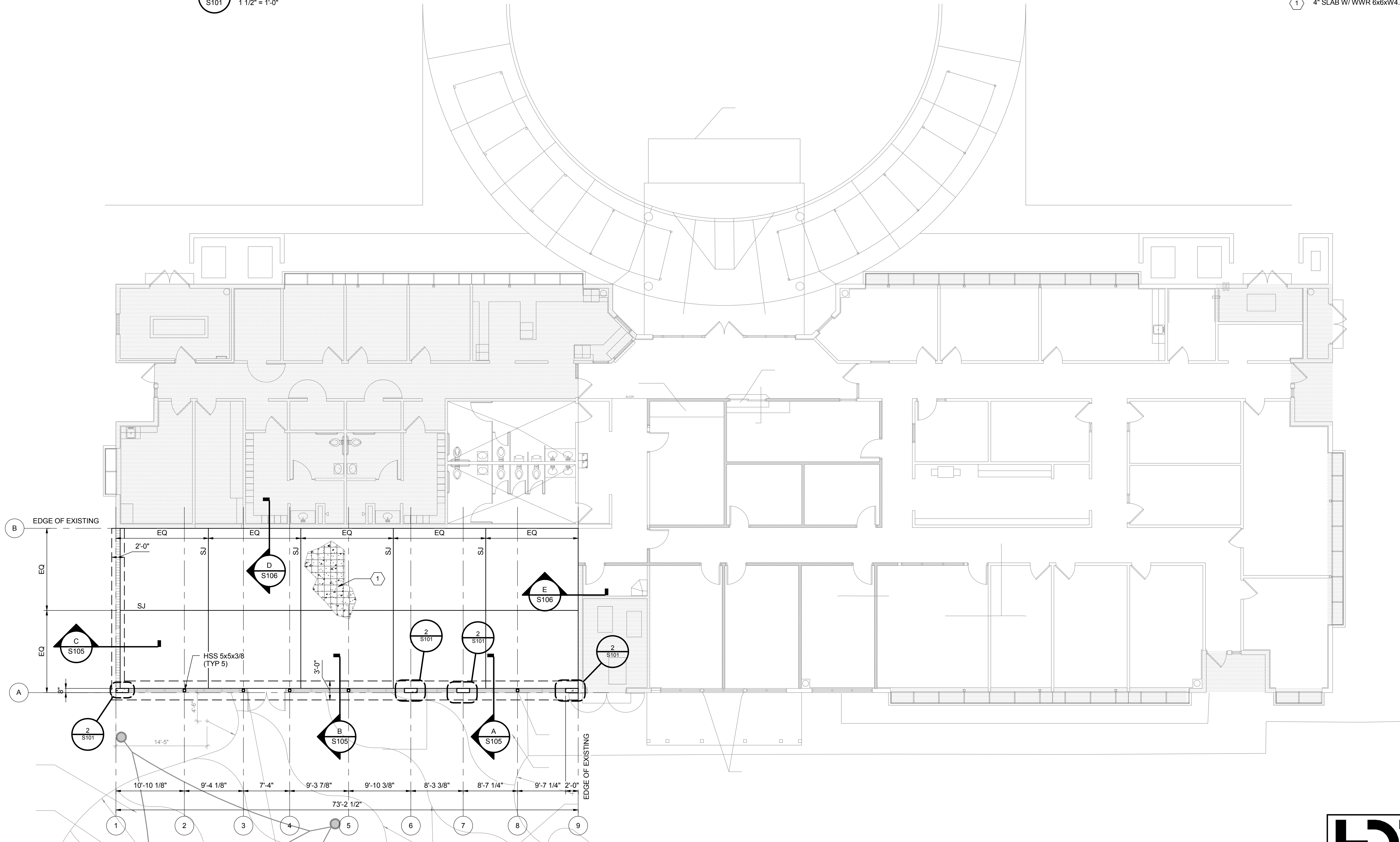


**GENERAL NOTES:**

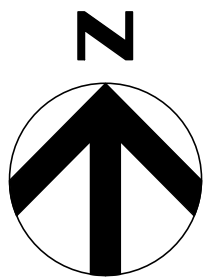
1. SEE SHEET S401 FOR STRUCTURAL STANDARD NOTES.
2. SEE SHEETS S401 TO S404 FOR STRUCTURAL STANDARD DETAILS.
3. (\*) INDICATES DIMENSION OR ELEVATION TO BE VERIFIED PRIOR TO CONSTRUCTION.
4. ALL ELEVATIONS SHOWN ARE BASED ON THE EXISTING FLOOR ELEVATION. ALL ELEVATIONS ARE LISTED AS (+) OR (-) FROM THE REFERENCED ELEVATION. SEE CIVIL SHEETS FOR EXISTING FLOOR ELEVATION.
5. FOR OUTDOOR PATIO AREA DETAILS, SEE C300.

**KEY NOTES:**

- 1 4" SLAB W/ WWR 6x6xW4.4xW4.4 @ MID-THICKNESS



1 FLOOR PLAN  
1/8" = 1'-0"



**HDR**

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CA# 4213

State of Florida  
Professional Engineer  
License No. 78675

M. ERIC MARTIN

| DATE:        | 05/31/2017 |
|--------------|------------|
| SCALE:       | AS NOTED   |
| DESIGNED BY: | HDR        |
| CHECKED BY:  | EM         |
| FIELD BOOK:  |            |

**CITY OF FORT LAUDERDALE**  
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ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

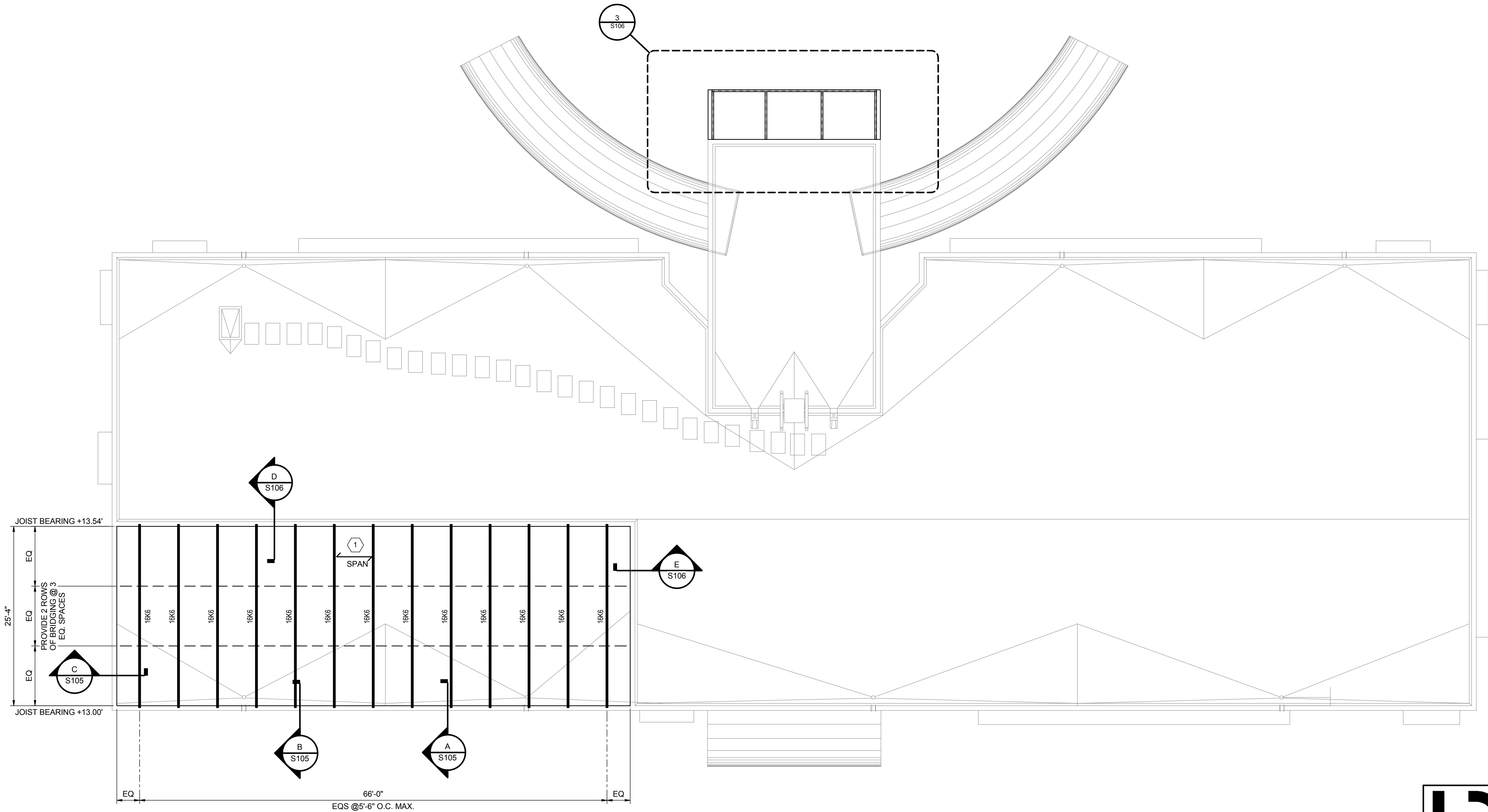
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**PROJECT # 12188**  
**ADMINISTRATION BUILDING RENOVATIONS**  
**FLOOR PLAN**  
**6000 NW 21st Ave, Fort Lauderdale, FL 33309**

| SHEET NO.        | OF             |
|------------------|----------------|
| <b>S101</b>      | <b>8</b>       |
| TOTAL:           | 65             |
| CAD FILE:        | 12188-S101_FDN |
| DRAWING FILE NO. | 4-140-42       |

BID DOCUMENTS

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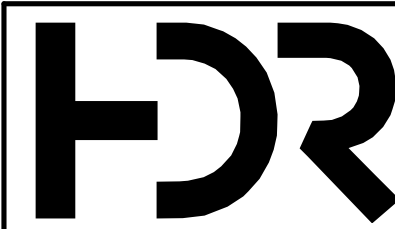
1 ROOF FRAMING PLAN  
1/8" = 1'-0"

**GENERAL NOTES:**

1. SEE SHEET S101 FOR ADDITIONAL NOTES.
2. DESIGN JOIST FOR 70 PSF (ULTIMATE) NET UPLIFT

**KEY NOTES:**

1. 1.5" WIDE RIB ROOF DECK 22GA, ATTACH TO SUPPORTS USING 5/8" PUDDLE WELDS IN A 36/5 PATTERN W/ #10 SIDELAP FASTENERS @ 12" O.C.



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Professional Engineer  
License No. 78675

M. ERIC MARTIN

|              |          |
|--------------|----------|
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| SCALE:       | AS NOTED |
| DESIGNED BY: | HDR      |
| CHECKED BY:  | EM       |
| FIELD BOOK:  |          |

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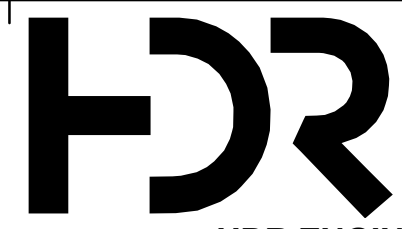
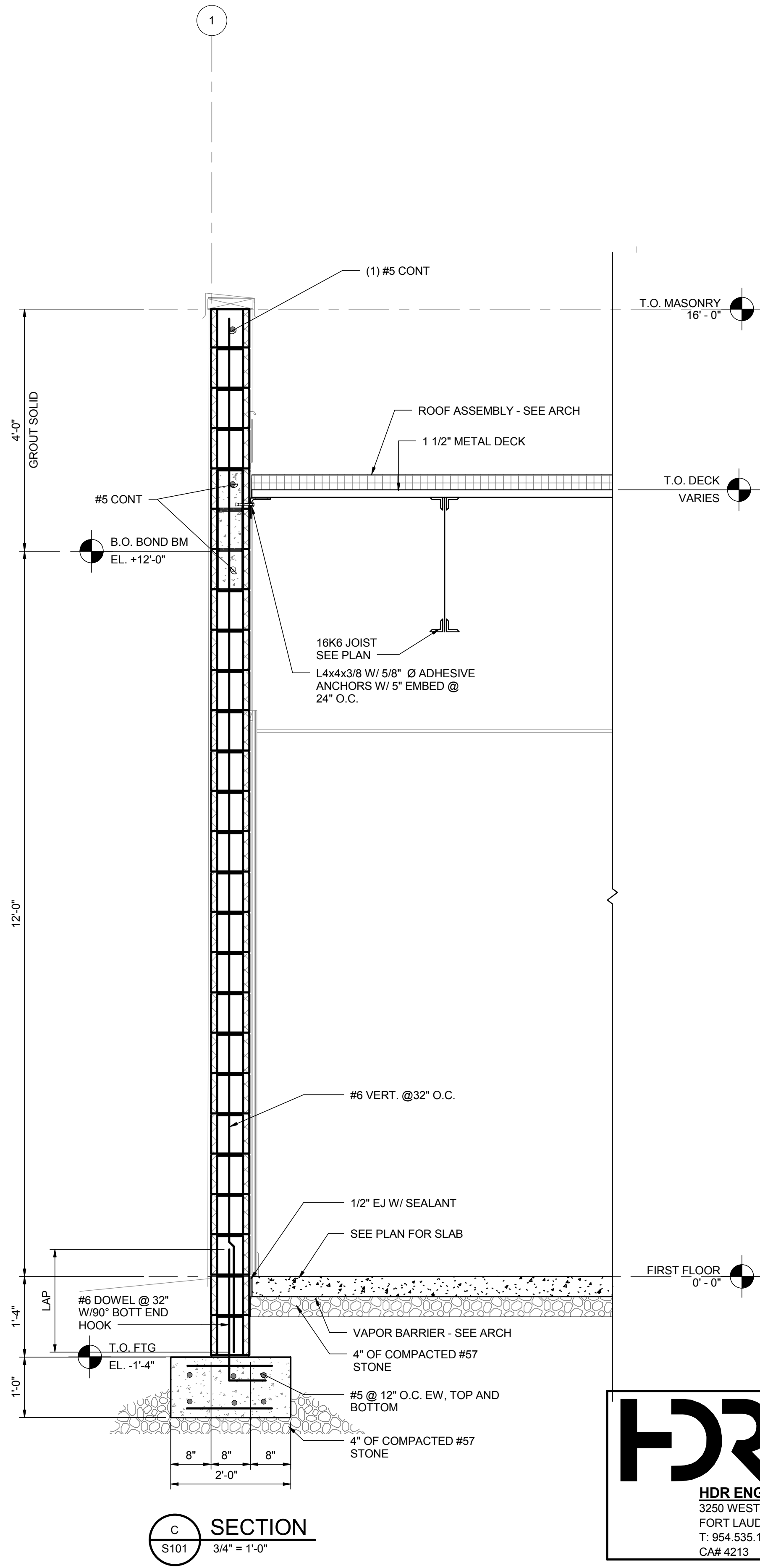
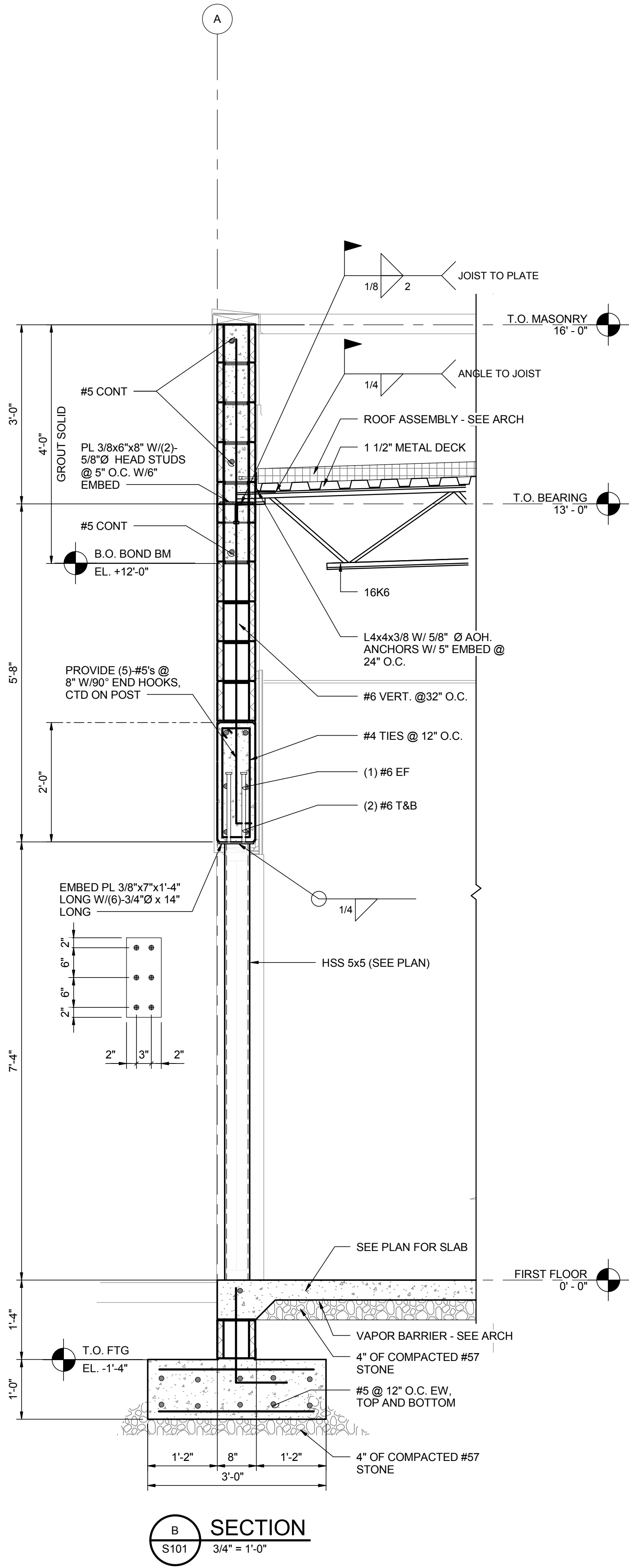
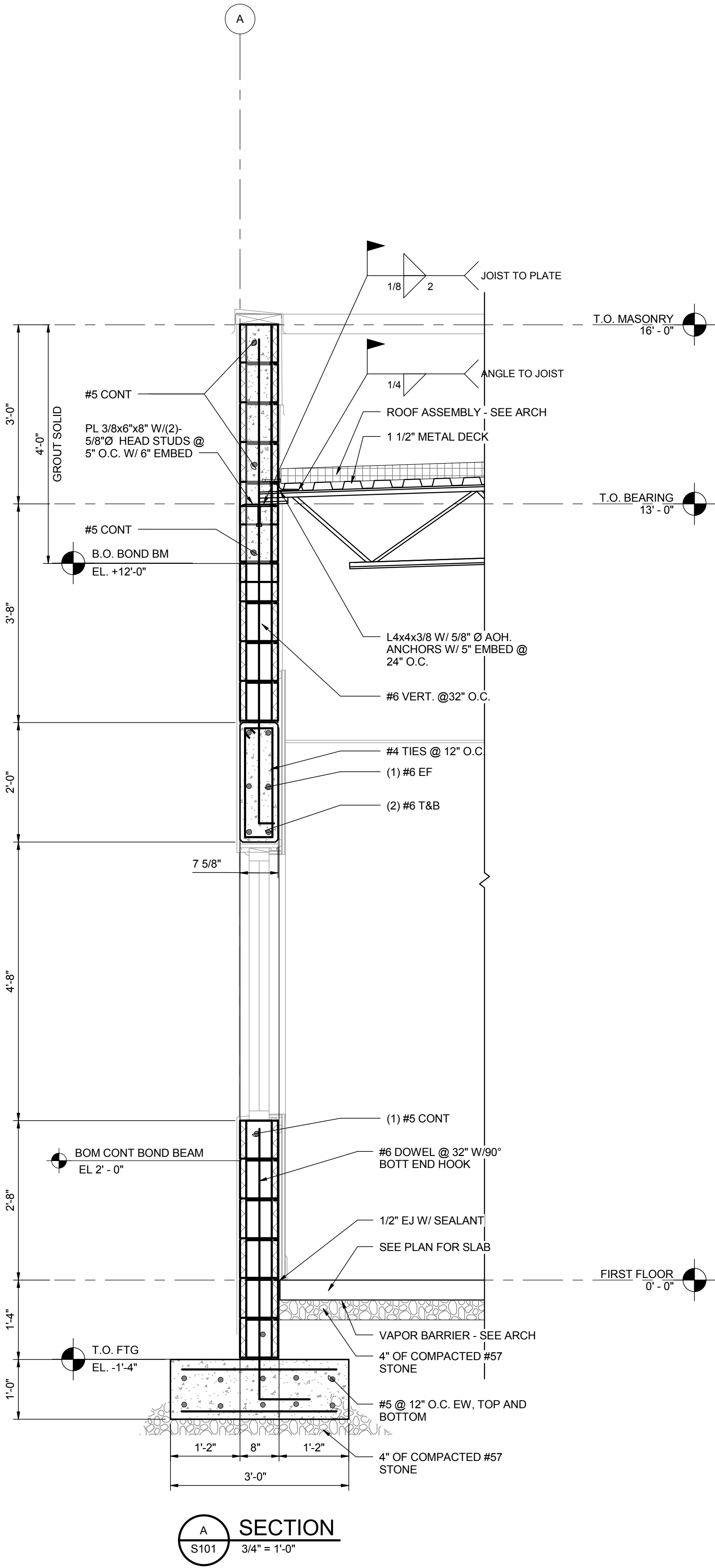
**PROJECT # 12188**  
**ADMINISTRATION BUILDING RENOVATIONS**  
**ROOF FRAMING PLAN**  
**6000 NW 21st Ave, Fort Lauderdale, FL 33309**

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| SHEET NO.        | OF              |
| <b>S102</b>      | <b>8</b>        |
| TOTAL:           | 65              |
| CAD FILE:        | 12188-S102-ROOF |
| DRAWING FILE NO. | 4-140-42        |

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GENERAL NOTES:

1. SEE S-101 FOR ADDITIONAL NOTES.



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CA# 4213

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PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
WALL SECTIONS AND DETAILS  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

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| SHEET NO.        | OF              |
| S105             | 8               |
| TOTAL:           | 65              |
| CAD FILE:        | 12188-S105-SEC1 |
| DRAWING FILE NO. | 4-140-42        |

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| DATE:        | 05/31/17 |
| SCALE:       | AS NOTED |
| DESIGNED BY: | HDR      |
| CHECKED BY:  | EM       |
| FIELD BOOK:  |          |

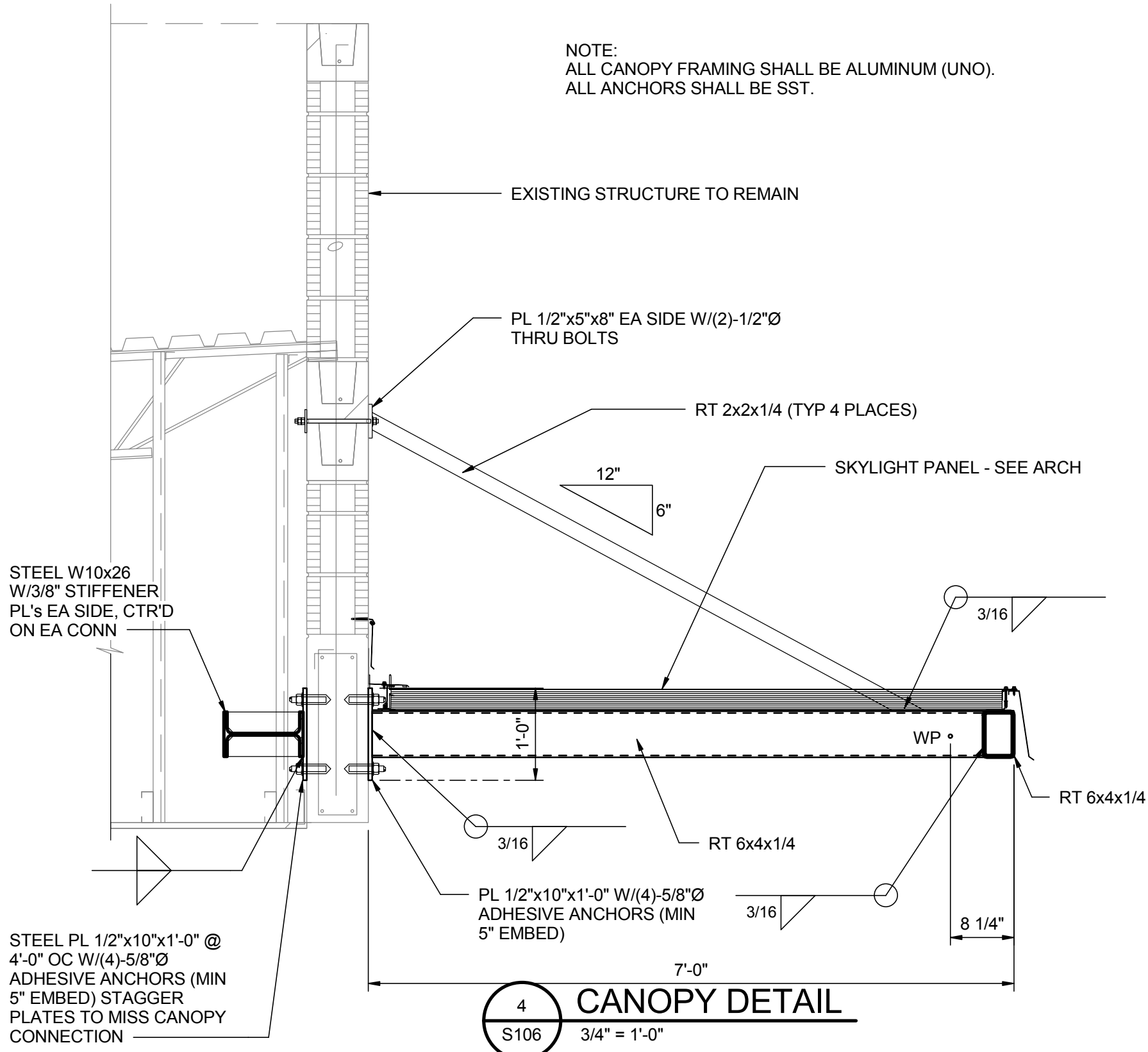
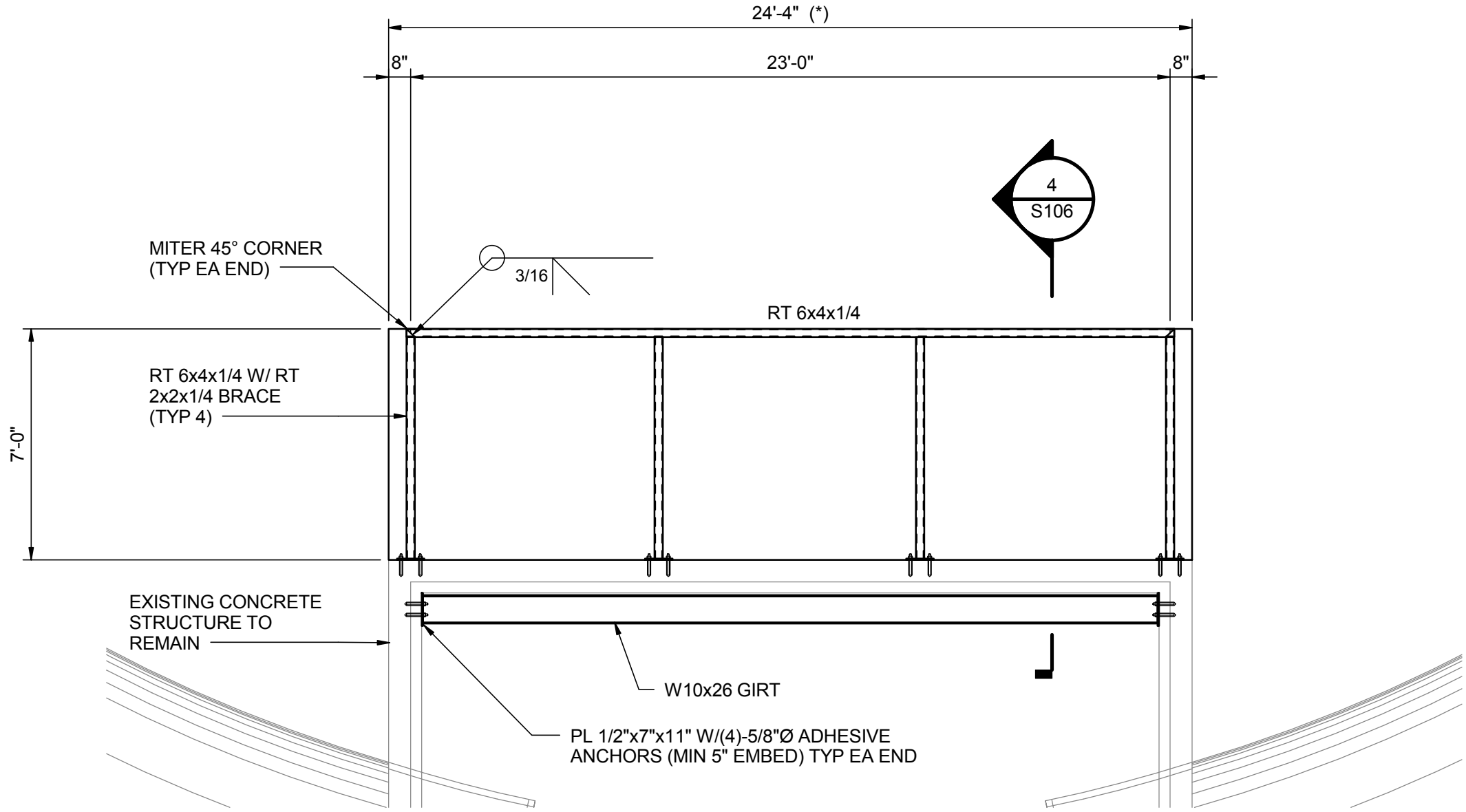
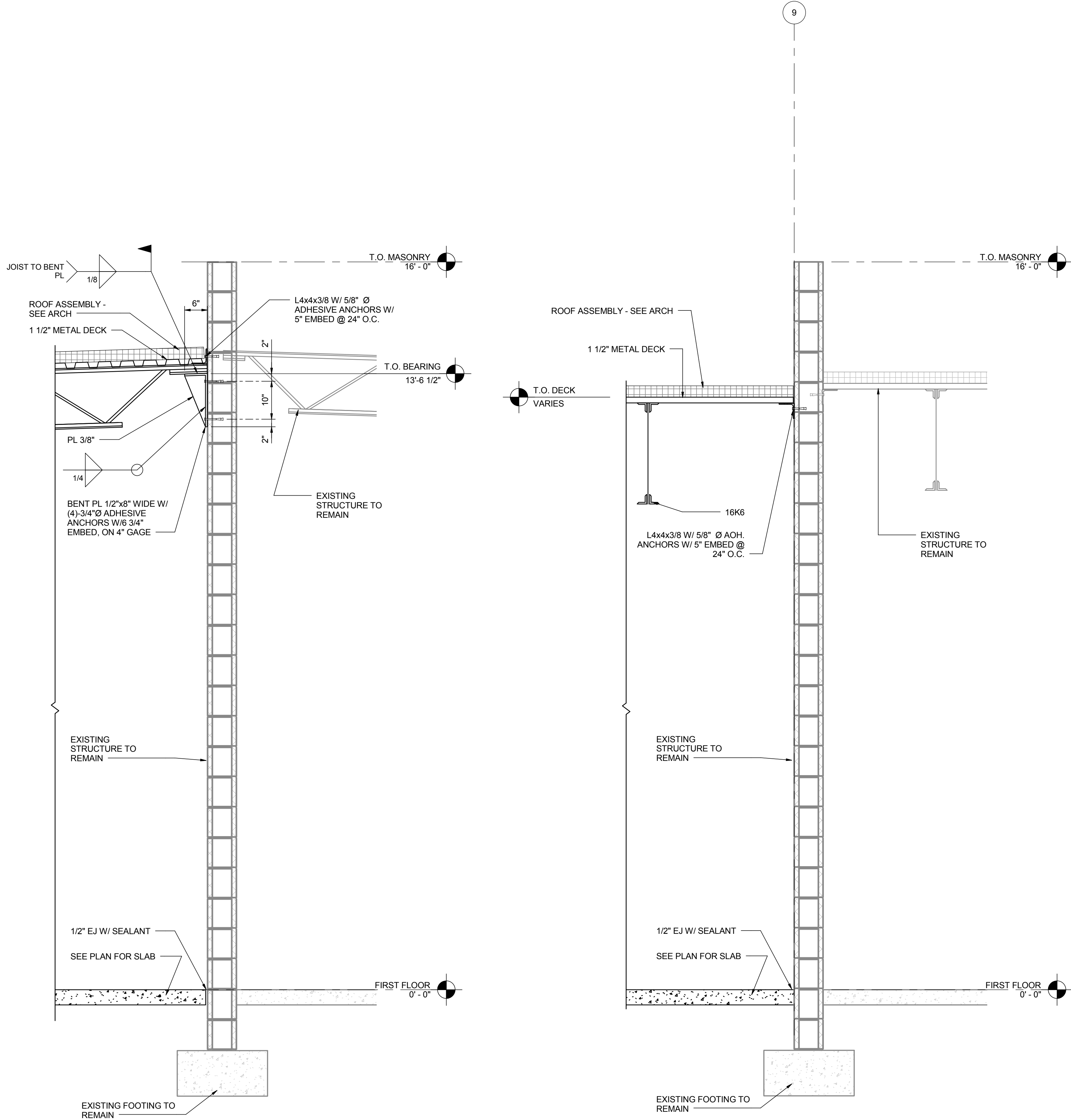
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ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

State of Florida  
Professional Engineer  
License No. 78675

M. ERIC MARTIN

GENERAL NOTES:

1. SEE S-101 FOR ADDITIONAL NOTES.



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**CITY OF FORT LAUDERDALE**  
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100 North Andrews Avenue, Fort Lauderdale, Florida 33301

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**PROJECT # 12188**  
ADMINISTRATION BUILDING RENOVATIONS  
**WALL SECTIONS, CANOPY PLAN**  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

|                  |                 |
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| SHEET NO.        | OF              |
| <b>S106</b>      | <b>8</b>        |
| TOTAL:           | 65              |
| CAD FILE:        | 12188-S106-SEC2 |
| DRAWING FILE NO. | 4-140-42        |

BID DOCUMENTS



STRUCTURAL GENERAL NOTES:

- G1 SCOPE  
THE NOTES ON THIS SHEET AND ALL THE STANDARD STRUCTURAL DETAILS ARE GENERAL AND APPLY TO THE ENTIRE PROJECT WHETHER SPECIFICALLY CALLED OUT OR NOT, UNLESS OTHERWISE SPECIFIED.
- G2 APPLICABLE SPECIFICATIONS AND CODES  
1. FLORIDA BUILDING CODE, 2014 EDITION  
2. ACI 318-11  
3. ACI 530-11  
4. AISC 360-10  
5. ASCE 7-10  
6. AWS D1.1-04, STRUCTURAL WELDING CODE - STEEL  
7. AWS D1.3-98, STRUCTURAL WELDING CODE - SHEET METAL  
8. SDI DESIGN MANUAL FOR FLOOR DECKS AND ROOF DECKS, LATEST EDITION
- G3 DESIGN CRITERIA  
1. MINIMUM VERTICAL LIVE LOADS:  
A. UNIFORM COLLATERAL LOAD INCLUDES ALLOWANCE FOR:  
\* UNIFORM PIPING LOAD (ONLY FOR PIPES SMALLER THAN 12" DIA).  
\* LIGHTING AND MECHANICAL DUCTWORK.  
B. FOR ROOF LOADS OTHER THAN LIVE LOAD;  
REFER TO SPECIFICATIONS AND OTHER DISCIPLINE'S REQUIREMENTS.  
ADDITIONAL LOADS FROM OTHER DISCIPLINE DRAWINGS INCLUDE:  
\* UNIFORM DEAD LOADS PER ARCH DRAWINGS  
\* CONCENTRATED EQUIPMENT LOADS  
\* PIPING LOADS  
\* ELECTRICAL LOADS  
2. WIND LOADS:  
A. BASIC WIND SPEED: 170 MPH (RISK CATEGORY II)  
B. WIND EXPOSURE: C  
3. SEISMIC:  
A. RISK CATEGORY: II  
B. SEISMIC IMPORTANCE FACTOR (IE): 1.0  
C. SITE CLASS: D (ASSUMED)  
D. SPECTRAL RESPONSE COEFF: S05=0.050 S01=0.036  
E. SEISMIC DESIGN CATEGORY: A  
F. ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE  
4. SNOW LOAD:  
A. GROUND SNOW (Pg): 0 PSF  
5. FUTURE LOADS:  
UNLESS SPECIFICALLY NOTED, THERE ARE NO PROVISIONS MADE FOR FUTURE FLOOR, ROOF, OR OTHER LOADS.  
G4 "GEOTECHNICAL ENGINEERING SERVICES, ADMINISTRATIVE BUILDING ADDITION, FORT LAUDERDALE EXECUTIVE AIRPORT," BY TIERRA SOUTH FLORIDA, INC., FORT LAUDERDALE, FL, DATED DECEMBER 8, 2016.  
G5 SITEWORK/EXCAVATION  
1. IF OPEN CUT EXCAVATIONS ARE PERFORMED, THEY SHALL BE SLOPED NO STEEPER THAN 1V:2H. IF DOING THIS BRINGS THE TOP OF THE EXCAVATION SLOPE WITHIN 5-FEET OF AN ADJACENT STRUCTURE OR UTILITY SUPPORTED ON SHALLOW FOUNDATIONS, THEN AN EXCAVATION SUPPORT SYSTEM WILL BE REQUIRED TO SAFEGUARD THE ADJACENT STRUCTURE.  
2. FOR EXCAVATION REQUIREMENTS SEE DIVISION 31 SPECIFICATIONS.  
3. DEWATERING WELL POINTS, SUMPS, WELLS, ETC. SHALL ONLY BE PLACED INSIDE THE EXCAVATION SUPPORT SYSTEM.  
G6 SAFETY  
SAFETY AND STRUCTURE STABILITY DURING CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. STRUCTURES HAVE BEEN DESIGNED TO RESIST THE DESIGN LIVE LOADS ONLY AS A COMPLETED STRUCTURE.  
G7 OPENINGS  
OPENINGS FOR PIPES, DUCTS, CONDUITS, ETC. ARE NOT ALL SHOWN ON THE STRUCTURAL DRAWINGS. PROVIDE THESE OPENINGS IN ACCORDANCE WITH THE OTHER CONTRACT DRAWINGS. REINFORCEMENT AROUND OPENINGS PER STANDARD STRUCTURAL DETAILS UNLESS OTHERWISE SHOWN.  
G8 STANDARD DETAILS  
THE STANDARD DETAILS DEPICT TYPICAL DETAILING TO BE USED ON THIS PROJECT. IF CONDITIONS ARE NOT EXPLICITLY SHOWN ON THE DRAWINGS THEY SHALL BE MADE SIMILAR TO THE STANDARD DETAILS. OBTAIN ENGINEER APPROVAL IN WRITING FOR SIMILAR CONDITIONS PRIOR TO CONSTRUCTION.  
G9 CONFLICTS  
IF THERE ARE CONFLICTS BETWEEN CONTRACT DRAWINGS AND SPECIFICATIONS, SPECIFICATIONS SHALL CONTROL.  
G10 SPECIAL INSPECTIONS  
SPECIAL INSPECTIONS ARE REQUIRED FOR THIS PROJECT.

CONCRETE

- C1 DESIGN PROPERTIES:  
Fy = 60,000 PSI  
fc = 4,000 PSI (ALL CONCRETE, UNO)  
Wc = 145 PCF (ALL CONCRETE, UNO)  
C2 CONCRETE COVER:  
UNLESS OTHERWISE NOTED, PROVIDE CONCRETE COVER FOR REINFORCING AS FOLLOWS:  
CONCRETE DEPOSITED AGAINST EARTH: 3"  
UNDER WATERSTOPS (WALL TO SLAB): 3"  
ALL OTHER: 2"  
SEE DRAWINGS FOR EXCEPTIONS  
C3 SEE SPECIFICATIONS FOR REINFORCING PLACEMENT REQUIREMENTS.  
C4 REFER TO OTHER DISCIPLINE DRAWINGS PRIOR TO CONSTRUCTION FOR EMBEDDED ITEMS AND PENETRATION NOT SHOWN ON STRUCTURAL DRAWINGS.  
C5 PROVIDE 3/4" CHAMFERS AT ALL EXPOSED EDGES AND 1/2" CHAMFERS AT JOINTS AS SHOWN. NOT ALL CHAMFERS MAY BE SHOWN ON DRAWINGS.  
C6 FIELD ADJUST REINFORCING AT OPENINGS AND EMBEDDED ITEMS AS SPECIFIED OR AS REQUIRED.  
C7 ALL ANCHOR BOLTS SPECIFIED ON THE DRAWINGS SHALL BE CAST-IN-PLACE UNLESS SPECIFICALLY CALLED OUT OTHERWISE.  
C8 ANCHOR BOLTS NOT SPECIFIED BY DRAWINGS SHALL BE DESIGNED BY CONTRACTOR IN ACCORDANCE WITH APPLICABLE PROJECT CODE REQUIREMENTS. COORDINATE LOCATION, SIZE AND EMBEDMENT PRIOR TO CASTING CONCRETE.  
C9 CONTINUOUS WATERSTOP SHALL BE INSTALLED IN ALL JOINTS SUBJECT TO STATIC WATER PRESSURE.  
C10 ABSOLUTELY NO WELDING OF REINFORCING BARS OR TORSION TO BEND REINFORCING BARS SHALL BE ALLOWED WITHOUT WRITTEN SPECIFIC APPROVAL FROM THE ENGINEER.  
C11 FOR ADDITIONAL CONCRETE NOT SHOWN ON STRUCTURAL DRAWINGS SEE CIVIL DRAWINGS.

STEEL

- S1 STRUCTURAL STEEL DESIGN PROPERTIES:  
WIDE FLANGE AND TEES: Fy=50 KSI  
PIPES: Fy=35 KSI  
STAINLESS STEEL: Fy=33 KSI  
HSS SECTIONS: Fy=46 KSI  
ALL OTHER PLATES AND SHAPES (UNO): Fy=36 KSI  
S2 DIMENSIONS:  
TO CENTERLINES OF COLUMNS AND BEAMS, TOP SURFACES OF BEAMS AND TUBES AND BACKS OF CHANNELS AND ANGLES UNLESS NOTED OTHERWISE.  
S3 ELEVATIONS:  
REFER TO TOP SURFACE OF MEMBER OR FLANGE UNLESS NOTED OTHERWISE.  
S4 ALL STRUCTURAL STEEL SHALL BE DETAILED AND FABRICATED IN ACCORDANCE WITH THE AISC CODE OF STANDARD PRACTICE AS MODIFIED IN THESE NOTES AND THE PROJECT SPECIFICATIONS.  
S5 CONNECTION DESIGN: SEE SPECIFICATIONS FOR SPECIFIC REQUIREMENTS.  
1. FABRICATOR IS RESPONSIBLE FOR THE DESIGN OF CONNECTIONS NOT DESIGNED ON THE STRUCTURAL DRAWINGS. ALL FABRICATOR DESIGNED CONNECTIONS SHALL BE DESIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER.  
2. GENERALLY, CONNECTIONS SHOWN ON THE DRAWINGS ARE SCHEMATIC AND ARE INTENDED TO SHOW THE RELATIONSHIP OF THE MEMBERS.  
3. WHERE BEAM REACTIONS ARE NOT SHOWN, BEAM CONNECTIONS SHALL BE DESIGNED TO 50 PERCENT OF THE TOTAL UNIFORM LOAD CAPACITY OF THE FULLY laterally-braced beam OR FOR A MINIMUM OF Ru = 10 KIPS, WHICHEVER IS GREATEST.  
4. CONNECTIONS SHALL BE DESIGNED FOR ULTIMATE AXIAL LOADS WHERE INDICATED THUS (Pu=Ft-xxK) AS KIPS, (+) INDICATES TENSION IN MEMBER AND (-) INDICATES COMPRESSION.  
5. ALL MOMENT CONNECTIONS (MC) SHALL BE DESIGNED FOR THE ULTIMATE MOMENT INDICATED THUS (Mu=Ft-xx KTM) ON THE DRAWINGS IN FOOT-KIPS. WHERE MOMENTS ARE NOT SHOWN, CONNECTIONS SHALL BE DESIGNED TO DEVELOP THE FULL FLEXURAL CAPACITY OF THE MEMBER. ALL SPECIAL MOMENT CONNECTIONS SHALL BE DESIGNED TO DEVELOP TO THE FULL FLEXURAL CAPACITY OF THE MEMBER.  
6. SPECIFIED MEMBER FORCES AND REACTIONS HAVE BEEN REDUCED IN CONFORMANCE TO CODE PROVISIONS RELATED TO COMBINATIONS OF LOADS THAT INCLUDE WIND AND SEISMIC FORCES.  
7. ALL BOLTED MOMENT CONNECTIONS SHALL BE PRE-TENSIONED AND HAVE A SLIP-CRITICAL SURFACE. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.  
S6 BOLTED CONNECTIONS:  
1. UNLESS OTHERWISE NOTED, BOLTED BEAM CONNECTIONS SHALL BE SIMPLE FRAMED SHEAR CONNECTIONS. BOLTED STEEL CONNECTIONS SHALL BE IN ACCORDANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION, LATEST EDITION USING ASTM A325 HIGH STRENGTH BOLTS. ALL BOLTED STRUCTURAL CONNECTIONS SHALL BE BEARING TYPE CONNECTIONS UNLESS OTHERWISE INDICATED TO BE SLIP-CRITICAL.  
2. CONNECTIONS WITH A325 HIGH STRENGTH BOLTS SHALL BE USED IN ALL BOLTED MOMENT PLATE CONNECTIONS. SLOTTED HOLES TRANSVERSE TO THE SHEAR LOAD APPLICATION ARE PERMITTED.  
3. ANCHOR BOLTS, WHERE INDICATED, SHALL CONFORM TO ASTM F1554. ANCHOR RODS, WHERE INDICATED, SHALL CONFORM TO ASTM A36, UNO.  
4. PROTRUDING BOLT HEADS, SHAFTS OR NUTS SHALL NOT EXTEND NOR PROHIBIT THE APPLICATION OF ARCHITECTURAL FINISHES OR PLACEMENT OF STEEL DECK AT ITS CORRECT LOCATION AND ELEVATION.  
S7 WELDED CONNECTIONS:  
1. ALL WELDING SHALL BE IN ACCORDANCE WITH THE "STRUCTURAL WELDING CODE- STEEL" (AWS D1.1) OF THE AMERICAN WELDING SOCIETY.  
2. ALL WELDS INVOLVING STEEL SHALL BE MADE USING E70XX ELECTRODES CONFORMING TO THE AMERICAN WELDING SOCIETY (AWS) D1.1. ALL WELDS INVOLVING ALUMINUM SHALL BE IN ACCORDANCE WITH AWS D1.2.  
3. WHEN FILLET WELD SIZE IS NOT INDICATED, PROVIDE MAXIMUM WELD SIZE IN ACCORDANCE WITH AISC SPECIFICATIONS.  
S8 WHERE CANTILEVER BEAMS OCCUR ON PLAN AND THE SIZE IS NOTED ONLY FOR THE BACK-SPAN, THE CANTILEVER IS INTENDED TO BE THE SAME SIZE AS THE BACK-SPAN.  
S9 SPLICING OF STEEL MEMBERS, UNLESS SHOWN ON THE DRAWINGS, IS PROHIBITED WITHOUT WRITTEN APPROVAL OF THE CONTRACTING OFFICER.  
S10 GROUT UNDER COLUMN/POST BASE SHALL NOT EXTEND ABOVE BOTTOM OF BASE PLATE. CHAMFER GROUT AT 45 DEGREES.
- SJ1 ALL STEEL JOISTS SHALL BE DESIGNED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE SJJ SPECIFICATIONS.  
SJ2 JOIST ENDS SHALL BE SECURED AND BRIDGING SHALL BE INSTALLED PRIOR TO APPLICATION OF ANY LOADS.  
SJ3 END SUPPORT  
A. MINIMUM BEARING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE SJJ SPECIFICATION.  
B. JOISTS SHALL BE WELDED TO SUPPORTS AS FOLLOWS UNO:  
LH SERIES: 1/4" FILLET WELDS, ONE EACH SIDE, 3" LONG  
C. BOLT JOISTS AS INDICATED BELOW TO STRUCTURAL STEEL SUPPORTS AT COLUMN CENTERLINES OR BOLT CONNECTIONS FOR EACH JOIST ADJACENT TO CENTERLINE.  
LH SERIES: (2) 3/4" DIAMETER BOLTS  
SJ4 JOIST BRIDGING  
1. SHALL BE PLACED PER THE SJJ SPECIFICATION UNO AND SHALL BE:  
K SERIES: HORIZONTAL RODS OR ANGLES AT TOP & BOTTOM CHORDS  
LH SERIES: HORIZONTAL ANGLES AT TOP & BOTTOM CHORDS, WITH DIAGONAL CROSS BRIDGING ANGLES AS REQUIRED PER SJJ.  
2. BRIDGING THAT TERMINATES AT OR IS INTERRUPTED BY STRUCTURAL STEEL MEMBERS, SHALL BE WELDED OR BOLTED THERETO. PROVIDE DIAGONAL (X) BRIDGING FOR ENDS OF BRIDGING LINES TERMINATING AT WALLS/BEAMS.  
3. WHERE "OPEN-WEB" JOIST LENGTHS ARE 40 FEET AND LONGER, INSTALL A CENTER ROW OF BOLTED DIAGONAL (X) BRIDGING TO PROVIDE LATERAL STABILITY BEFORE SLACKENING OF HOISTING LINES.  
SJ5 SPECIAL JOISTS  
1. JOISTS MARKED "XXKSP" (DEPTH = "XX" AS SHOWN ON PLAN) INDICATE STEEL JOISTS SUPPORTING CONCENTRATED LOADS AND/OR VARYING UNIFORM LOADS (SUCH AS IN THE CASE OF ROOF TOP MECHANICAL EQUIPMENT). JOIST SUPPLIER SHALL DESIGN AND INDICATE THESE JOISTS AND LOADS ON THE JOIST SHOP DRAWINGS SUBMITTED FOR REVIEW.  
2. CONTRACTOR SHALL VERIFY THAT MECHANICAL ROOF TOP EQUIPMENT FURNISHED IS PLACED ONLY ON DESIGNATED JOISTS (XXKSP) SUCH THAT THE DISTRIBUTION OF OPERATING WEIGHT DOES NOT EXCEED THE DESIGN LOADS GIVEN IN PLAN. GC TO COORDINATE WITH MECHANICAL DRAWINGS  
SJ6 SUBMITTALS  
JOIST MANUFACTURER SHALL SUBMIT REGISTERED P.E. SEALED SHOP DRAWINGS INCLUDING BILLS OF MATERIAL FOR REVIEW AND ACCEPTANCE BY THE ENGINEER. SUBMIT CALCULATIONS FOR SPECIAL "KSP" JOISTS INDICATING SUPPLIERS CONFORMANCE WITH SPECIFIED DESIGN CRITERIA. ALL SHOP DRAWINGS SUBMITTED SHALL BEAR THE EMBLEM OF MEMBERSHIP OF THE STEEL JOIST INSTITUTE INDICATING SUPPLIERS' COMPLIANCE WITH SJJ SPECIFICATIONS. SHOP DRAWINGS SUBMITTED FOR JOISTS FROM NON-SJ MEMBERS ARE NOT ACCEPTABLE AND WILL BE REJECTED.

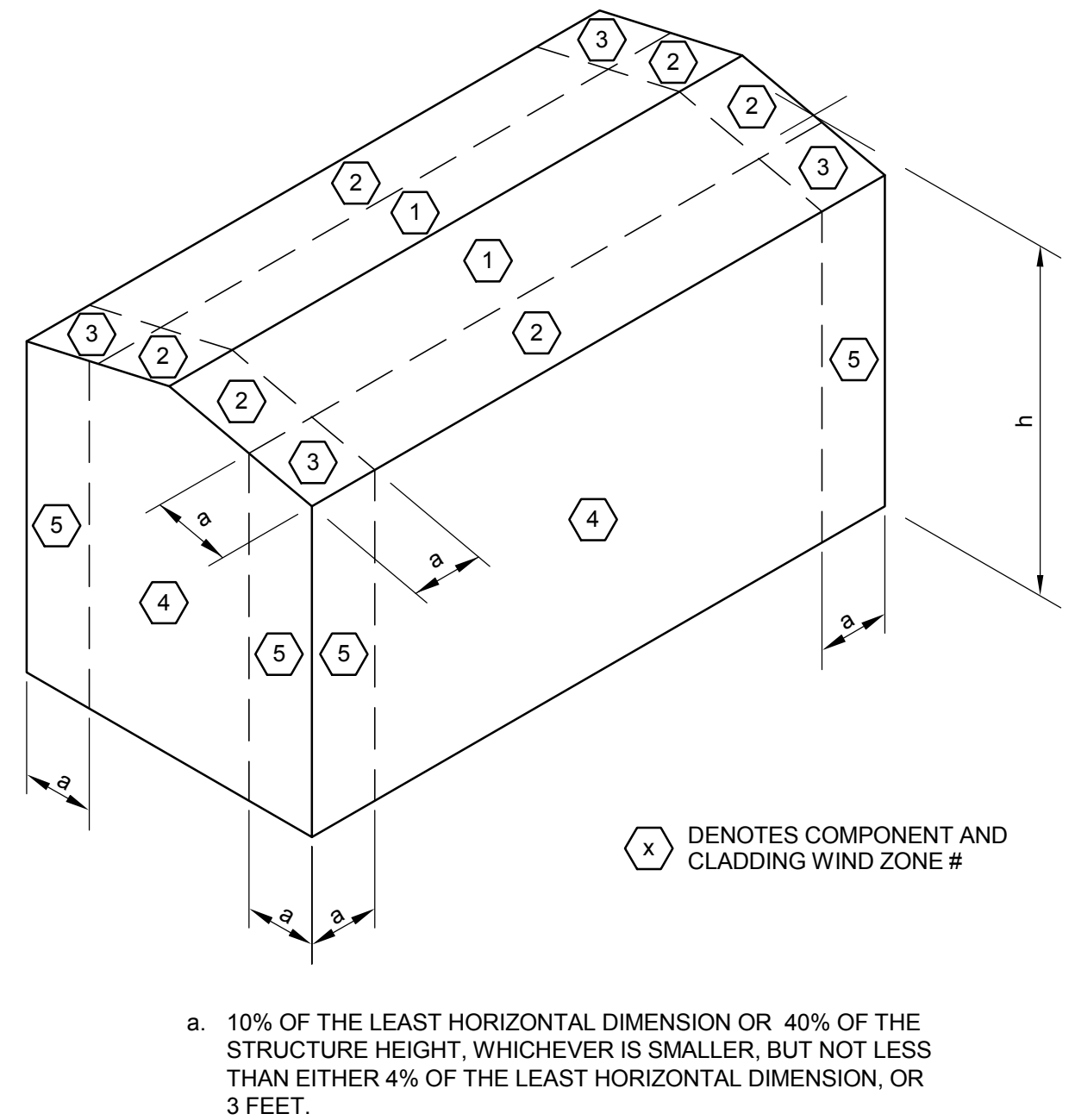
STEEL JOISTS

STEEL DECK

- SD1 STEEL DECKS SHALL HAVE THE DEPTHS, MINIMUM GAGES, AND PROPERTIES REQUIRED PER PLAN AND SPECIFICATION SECTION 05 30 00. DECK HAS BEEN SELECTED BASED ON A MINIMUM THREE SPAN CONDITION. SHALL EVALUATE THE ABILITY OF THE STEEL DECK TO ACCOMMODATE THE LOAD CONDITIONS INDICATED IN THE GENERAL NOTES FOR ALL SPAN CONDITIONS REQUIRED FOR PROPOSED DETAILING. WHERE SUPPLIER DETAILS SINGLE OR TWO SPAN CONDITIONS ON THE SHOP DRAWINGS DECK WITH A GREATER THICKNESS MAY BE REQUIRED SUBJECT TO APPROVAL BY THE ENGINEER.  
SD2 STEEL DECK AT ROOFS SHALL BE GALVANIZED PER ASTM A525 G60 (UNO).  
SD3 STEEL ROOF DECK  
A. FASTEN STEEL ROOF DECK UNITS TO STEEL SUPPORTING MEMBERS BY NOT LESS THAN 5/8" DIAMETER FUSION WELDS OR ELONGATED WELDS OF EQUAL PERIMETER. ATTACHMENTS SHALL BE SPACED NOT MORE THAN 12" O/C. AT EVERY SUPPORT AND AT CLOSER SPACINGS WHERE REQUIRED FOR DIAPHRAGM SHEAR RESISTANCE AND AS NOTED ON THE METAL DECK  
B. FOR STEEL ROOF DECK SPANS EXCEEDING 5'-0", FASTEN SIDE LAPS AT MID-SPAN USING SEAM WELDS. PROVIDE ADDITIONAL SIDELAP FASTENERS WHERE REQUIRED FOR LATERAL FORCE RESISTANCE AND AS NOTED ON THE METAL DECK ATTACHMENT SCHEDULE OF THE CONTRACT DRAWINGS.  
C. DO NOT HANG PIPES OR DUCTS FROM STEEL ROOF DECK.

ALUMINUM

- A1 STRUCTURAL ALUMINUM IS ALLOY 6061-T6 UNLESS NOTED OTHERWISE. ALL BOLTS SHALL BE STAINLESS STEEL.  
A2 DIMENSIONS:  
TO CENTERLINES OF COLUMNS AND BEAMS, TOP SURFACES OF BEAMS AND TUBES AND BACKS OF CHANNELS AND ANGLES UNLESS NOTED OTHERWISE.  
A3 ELEVATIONS:  
REFER TO TOP SURFACE OR FLANGE OF MEMBER UNLESS NOTED OTHERWISE.  
A4 WHEN FILLET WELD SIZE IS NOT INDICATED, PROVIDE MAXIMUM WELD SIZE IN ACCORDANCE WITH THE LATEST EDITION OF THE "ALUMINUM DESIGN MANUAL" BY THE ALUMINUM ASSOCIATION.  
A5 ALUMINUM IN CONTACT WITH DISSIMILAR MATERIALS OR CONCRETE: CONTACT SURFACES SHALL BE COATED PER SPECIFICATION 09 91 00.  
A6 GROUT UNDER COLUMN/POST BASE SHALL NOT EXTEND ABOVE BOTTOM OF BASE PLATE. CHAMFER GROUT AT 45 DEGREES.



| COMPONENT AND CLADDING WIND PRESSURES, PSF<br>(POSITIVE PRESSURE, NEGATIVE SUCTION) |                                       |        |        |        |        |        |
|---|---------------------------------------|--------|--------|--------|--------|--------|
| STRUCTURE   |                                       | ZONE 1 | ZONE 2 | ZONE 3 | ZONE 4 | ZONE 5 |
| ENCLOSED BUILDING   | EFFECTIVE WIND AREA = 10 SQUARE FEET  | 25.7   | 25.7   | 25.7   | 63.2   | 63.2   |
|   |                                       | -63.2  | -105.9 | -159.4 | -68.5  | -84.5  |
|   | EFFECTIVE WIND AREA = 20 SQUARE FEET  | 24.1   | 24.1   | 24.1   | 60.3   | 60.3   |
|   |                                       | -61.5  | -94.6  | -132.0 | -65.6  | -78.8  |
|   | EFFECTIVE WIND AREA = 50 SQUARE FEET  | 22.0   | 22.0   | 22.0   | 56.5   | 56.5   |
|   |                                       | -59.4  | -79.7  | -95.8  | -61.8  | -71.3  |
|   | EFFECTIVE WIND AREA = 100 SQUARE FEET | 20.3   | 20.3   | 20.3   | 53.7   | 53.7   |
|   |                                       | -57.7  | -68.5  | -68.5  | -59.1  | -65.6  |
|   | EFFECTIVE WIND AREA = 500 SQUARE FEET | 20.3   | 20.3   | 20.3   | 47.1   | 47.1   |
|   |                                       | -57.7  | -68.5  | -68.5  | -52.4  | -52.4  |

ROOF AND WALL ZONES

NTS

POST-INSTALLED ANCHORS

- PA1 SEE SPECIFICATION SECTION 03 15 19 FOR ADDITIONAL INFORMATION.  
PA2 POST-INSTALLED ANCHORS SHALL ONLY BE USED WHERE SPECIFIED ON THE CONTRACT DRAWINGS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE CONTRACTING OFFICER PRIOR TO INSTALLING POST-INSTALLED ANCHORS FOR MISSING OR MISPLACED CAST-IN-PLACE ANCHORS.  
PA3 CARE SHALL BE TAKEN IN PLACING POST-INSTALLED ANCHORS TO AVOID CONFLICTS WITH EXISTING REBAR. HOLES SHALL BE DRILLED AND CLEANED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.  
PA4 SPECIAL INSPECTION SHALL BE PROVIDED FOR ALL ADHESIVE AND MECHANICAL ANCHOR INSTALLATIONS AS REQUIRED BY THE BUILDING CODE AND ICC EVALUATION REPORTS LISTED BELOW.  
PA5 SUBSTITUTION REQUESTS, FOR PRODUCTS OTHER THAN THOSE SPECIFIED BELOW, SHALL BE SUBMITTED BY THE CONTRACTOR TO THE CONTRACTING OFFICER ALONG WITH CALCULATIONS THAT ARE PREPARED & SEALED BY A REGISTERED PROFESSIONAL ENGINEER. THE CALCULATIONS SHALL DEMONSTRATE THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING THE PERTINENT EQUIVALENT PERFORMANCE VALUES (MINIMUM) OF THE SPECIFIED PRODUCT USING THE APPROPRIATE DESIGN PROCEDURE AND/OR STANDARD(S) AS REQUIRED BY THE BUILDING CODE. PRODUCT ICC-ES CODE REPORTS SHALL BE INCLUDED WITH THE SUBMITTAL PACKAGE.  
PA6 UNLESS NOTED OTHERWISE ON PLANS, ACCEPTABLE PRODUCT QUALIFICATIONS SHALL BE:  
1. CONCRETE ANCHORS  
A. MECHANICAL ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ACI 308.2 AND ICC-ES AC108.  
B. ADHESIVE ANCHORS FOR USE IN CRACKED AND UNCRACKED CONCRETE SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ICC-ES AC308.  
2. MASONRY ANCHORS  
A. ANCHORAGE TO SOLID-GROUTED CONCRETE MASONRY.  
(1) MECHANICAL AND CONCRETE SCREW ANCHORS FOR USE IN SOLID-GROUTED CONCRETE MASONRY SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ICC-ES AC101 OR AC106, RESPECTIVELY.  
(2) ADHESIVE ANCHORS FOR USE IN SOLID-GROUTED CONCRETE MASONRY SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ICC-ES AC58.  
B. ANCHORAGE TO HOLLOW CONCRETE MASONRY.  
(1) SCREW ANCHORS FOR USE IN HOLLOW CONCRETE MASONRY SHALL HAVE BEEN TESTED AND QUALIFIED IN ACCORDANCE WITH ICC-ES AC106.  
(2) ADHESIVE ANCHORS WITH SCREEN TUBES SHALL BE TESTED AND QUALIFIED IN ACCORDANCE WITH ICC-ES AC58 OR AC60, AS APPROPRIATE. THE APPROPRIATE SCREEN TUBE SHALL BE USED AS RECOMMENDED BY THE ADHESIVE MANUFACTURER.

MASONRY

- M1 DESIGN PROPERTIES:  
Fm = 1,500 PSI  
Fy = 60,000 PSI  
M2 GROUT TO BE COARSE GROUT UNLESS NOTED OTHERWISE. MAXIMUM PARTICLE SIZE IS 3/8 INCH.  
M3 GROUT POURS SHALL NOT EXCEED 4 FEET IN HEIGHT UNLESS CLEANOUTS ARE PROVIDED IN THE BOTTOM COURSE OF THE CELL(S) TO BE GROUTED.  
M4 RESTRICTED BAR ANCHORAGE: IN CASES WHERE REINFORCING BARS CANNOT BE EXTENDED AS FAR AS REQUIRED, THE BARS SHALL EXTEND AS FAR AS POSSIBLE AND END IN STANDARD HOOK. IDENTIFY THIS SITUATION ON SHOP DRAWINGS AND CLOUD TO BRING TO ENGINEER'S ATTENTION.  
M5 IF BOND BEAMS AT INTERSECTING WALLS ARE SHOWN ON THE DRAWINGS TO MEET AT DIFFERENT ELEVATIONS, EXTEND BOTH BOND BEAMS AROUND INTERSECTING CORNER NOT LESS THAN 4-FEET IN EACH DIRECTION FOR OVERLAP CONDITION.

State of Florida  
Professional Engineer  
License No. 78675

M. ERIC MARTIN

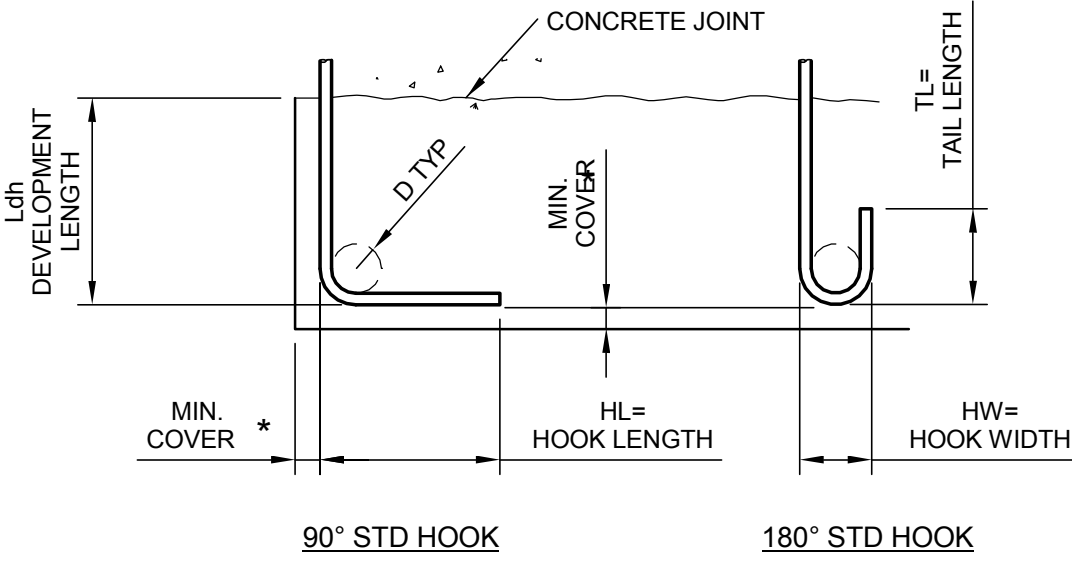
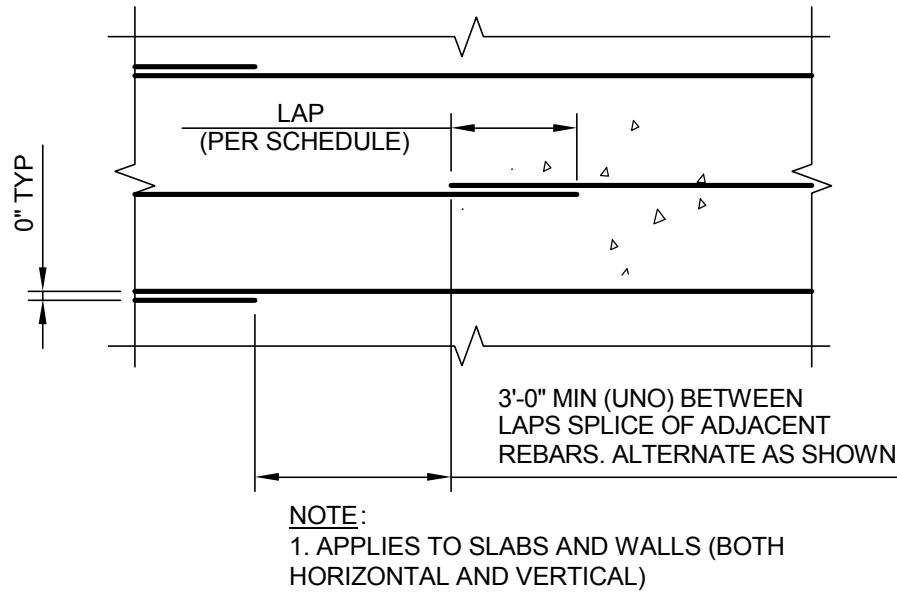
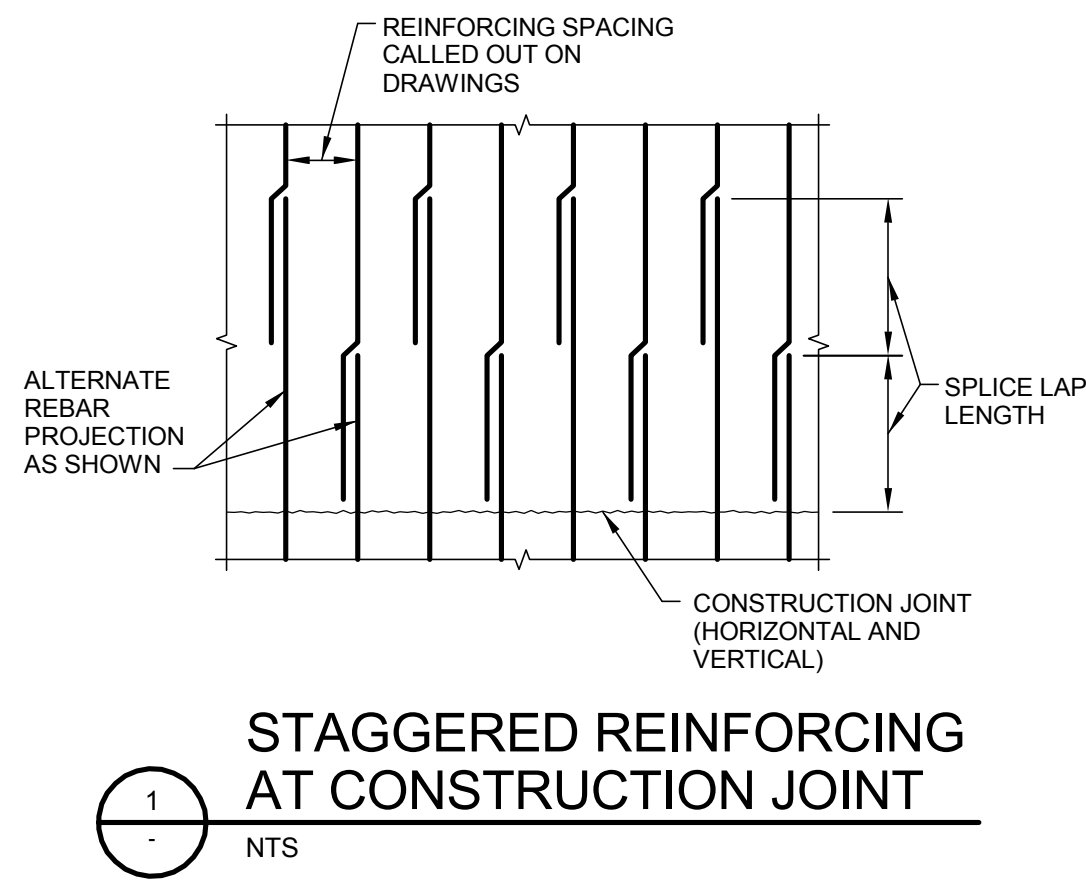
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CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33309

| REVISIONS | BY   | CHK'D | DESCRIPTION |
|-----------|------|-------|-------------|
| NO.       | DATE |       |             |
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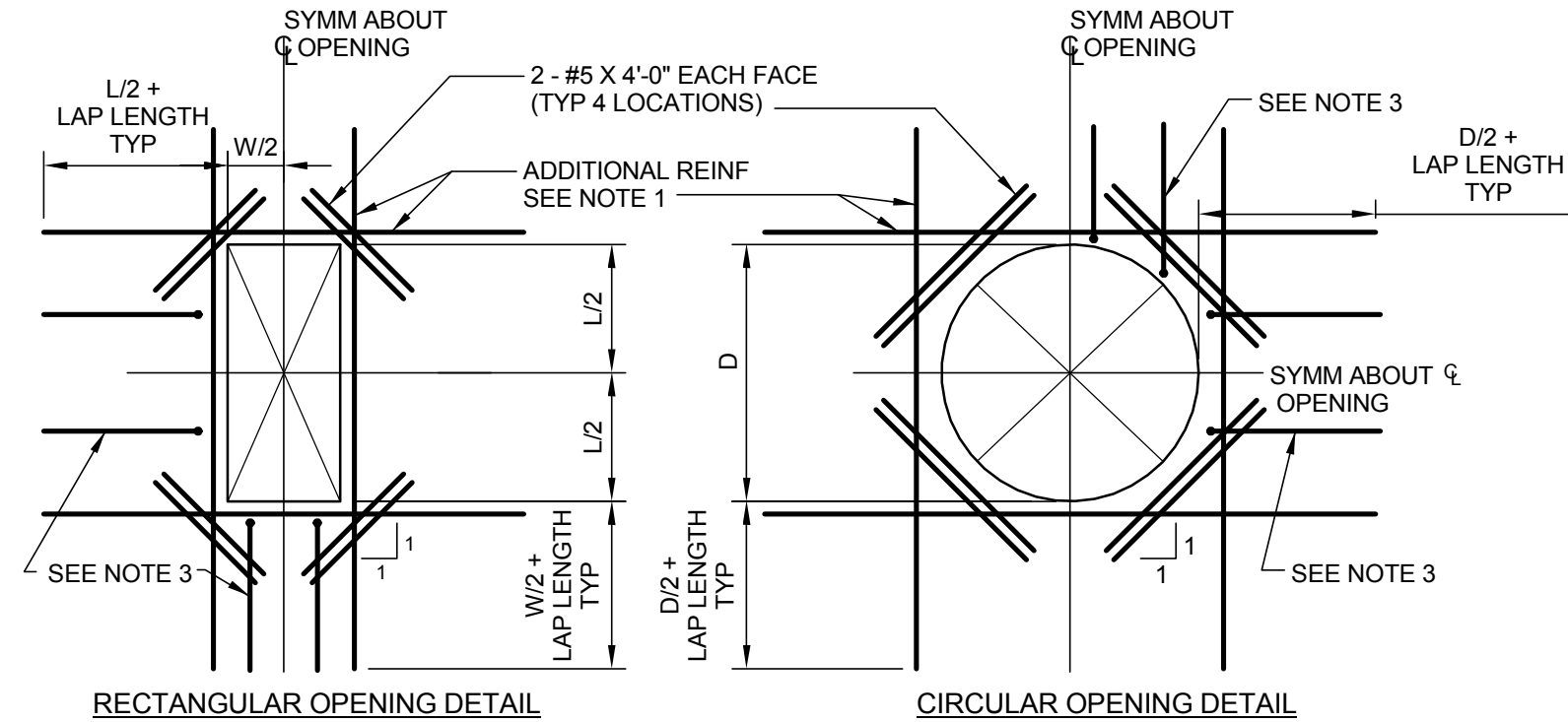
PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
STRUCTURAL GENERAL NOTES  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

| SHEET NO.        | OF              |
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| TOTAL:           | 65              |
| CAD FILE:        | 12188-S401-NOTE |
| DRAWING FILE NO. | 4-140-42        |

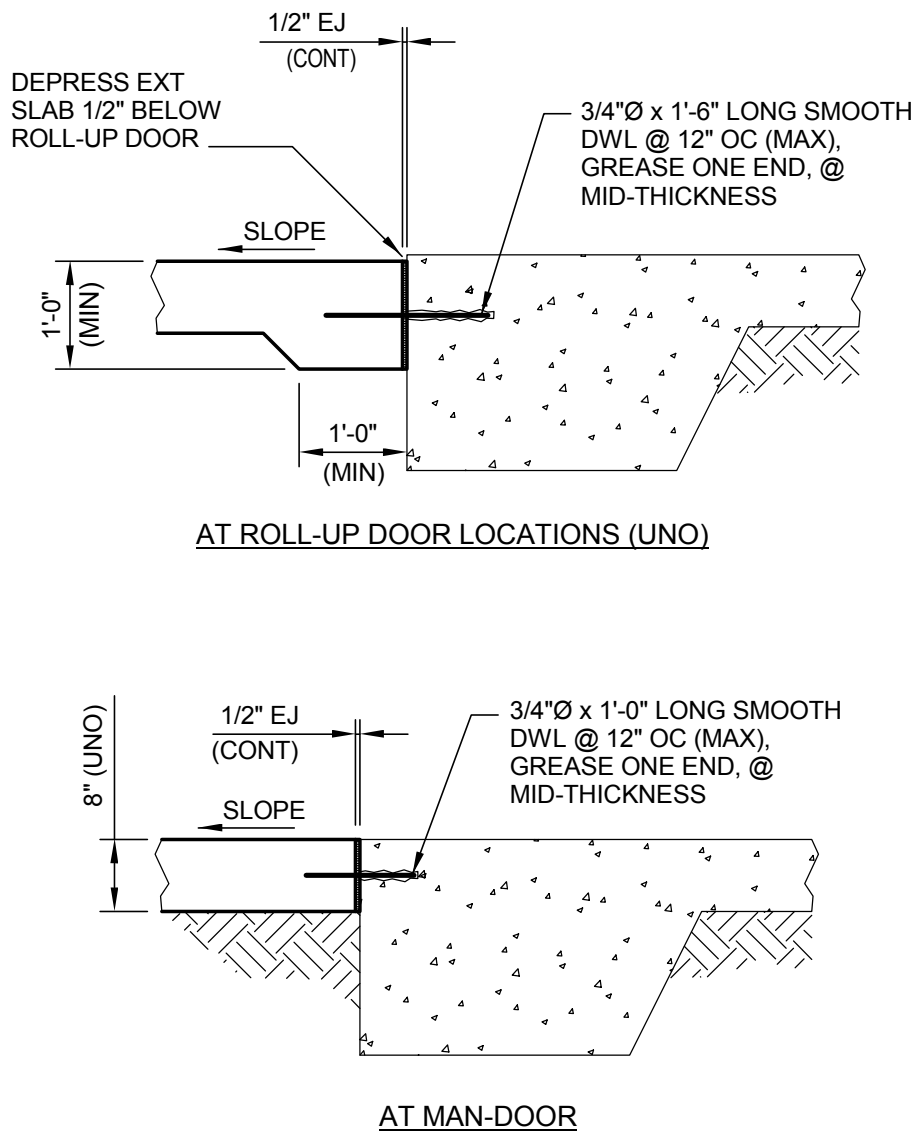
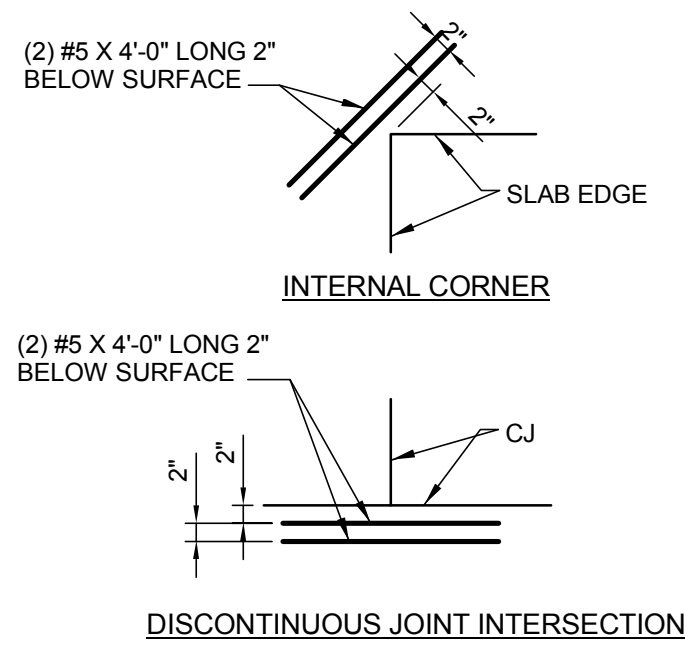
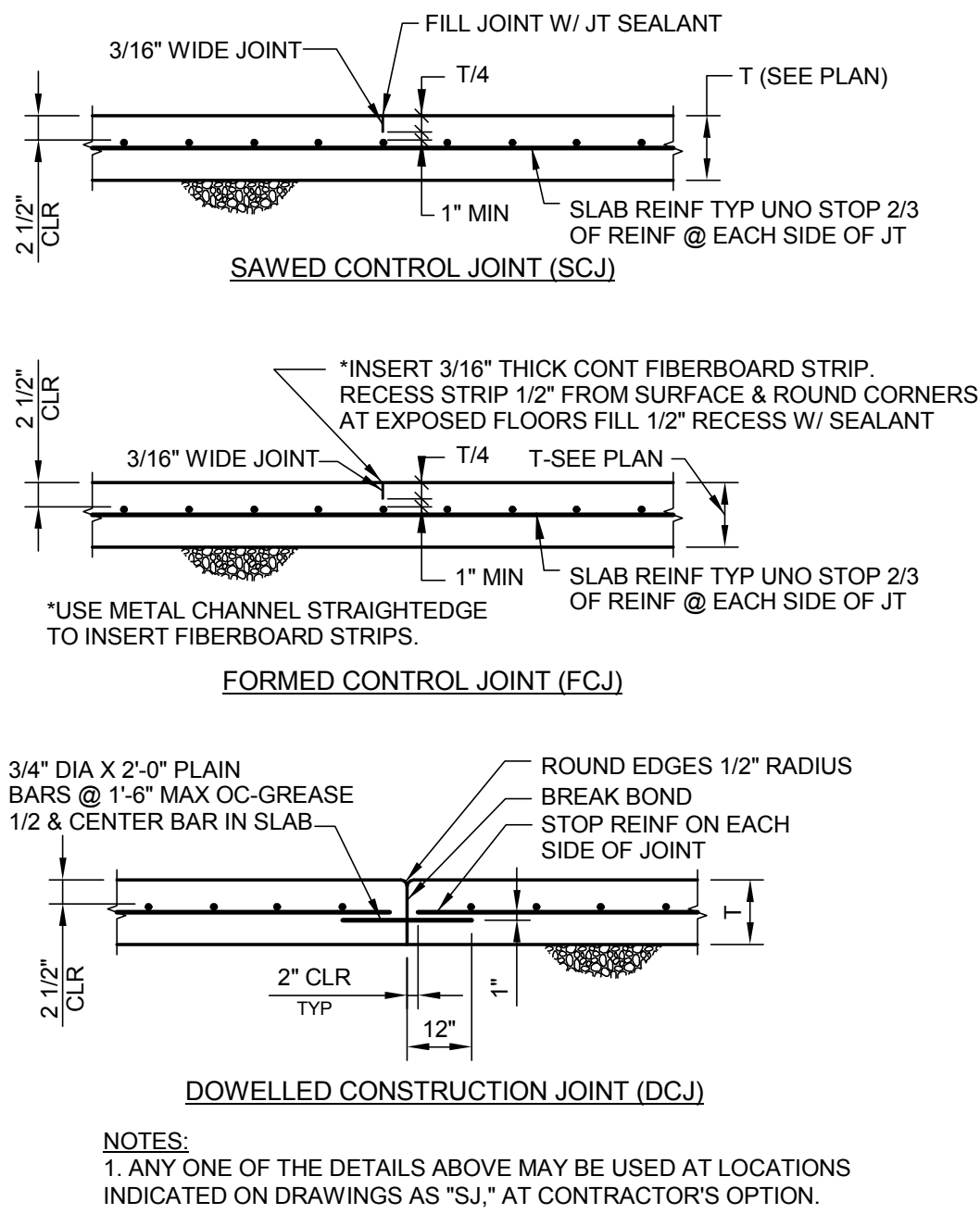


| BAR SIZE<br>GRADE 60 | HL     | HW        | TL      | D       | f'c=4000 psi<br>OR GREATER<br>Ldh * |
|----------------------|--------|-----------|---------|---------|-------------------------------------|
| #3                   | 6"     | 3"        | 3"      | 2 1/4"  | 6"                                  |
| #4                   | 8"     | 4"        | 4 1/2"  | 3"      | 7"                                  |
| #5                   | 10"    | 5"        | 5"      | 3 3/4"  | 9"                                  |
| #6                   | 1'-0"  | 6"        | 6"      | 4 1/2"  | 10"                                 |
| #7                   | 1'-2"  | 7"        | 7"      | 5 1/4"  | 12"                                 |
| #8                   | 1'-4"  | 8"        | 8"      | 6"      | 14"                                 |
| #9                   | 1'-7"  | 11 3/4"   | 10 1/2" | 9 1/2"  | 15"                                 |
| #10                  | 1'-10" | 1'-1 1/4" | 11 1/2" | 10 3/4" | 17"                                 |
| #11                  | 2'-0"  | 1'-2 3/4" | 1'-1"   | 12"     | 19"                                 |

\* COMPLYING WITH MINIMUM COVER REQUIREMENTS OF ACI 318, 12.5.3. OTHERWISE Ldh MUST BE RE-CALCULATED.



- NOTES:
1. PROVIDE ADDITIONAL REINFORCING THE SAME SIZE AS DISCONTINUOUS REINFORCEMENT AT OPENING. QUANTITY OF REINFORCING IN EACH DIRECTION SHALL BE EQUAL TO OR ONE GREATER THAN THE NUMBER OF DISCONTINUOUS BARS. PLACE 1/2 OF ADDITIONAL REINFORCING BARS EACH SIDE OF OPENING. PLACE ADDITIONAL REINFORCEMENT AT 3" OC (TYPICAL BOTH DIRECTIONS AND ALL LAYERS OF REINFORCEMENT). START FIRST BAR 2" CLEAR TO OPENING.
  2. EXTEND ADDITIONAL REINFORCING BEYOND EDGE OF OPENING AS SHOWN ABOVE. ADDITIONAL BARS MAY TERMINATE AT THE END OF THE WALL WITH A STANDARD HOOK WHERE THE LENGTH OF THE WALL WILL NOT PERMIT BARS TO EXTEND AS SHOWN ABOVE.
  3. TYPICAL WALL OR SLAB REINFORCING NOT COMPLETELY SHOWN FOR CLARITY. TERMINATE TYPICAL REINFORCING 2" CLEAR TO OPENING WITH STANDARD 90° HOOKS.
  4. OPENINGS 12" OR LESS IN SLABS AND OPENINGS 18" OR LESS IN WALLS, NO EXTRA REBARS ARE REQUIRED UNLESS SHOWN OTHERWISE. TYPICAL REINFORCING SHALL BE RESPACED (NOT CUT) TO ALLOW FOR OPENINGS TO BE MADE.
  5. UNLESS SHOWN OTHERWISE ON DRAWINGS, PROVIDE EXTRA REINFORCING AROUND OPENINGS AS SHOWN AND INDICATED ABOVE.
  6. PROVIDE ADDITIONAL DOWELS PER NOTE 1 ABOVE FOR ALL OPENINGS NEAR THE FLOOR SLAB, BASE SLAB, OR CORNERS



State of Florida  
Professional Engineer  
License No. 78675

M. ERIC MARTIN

DATE: 05/31/17  
SCALE: AS NOTED  
DESIGNED BY: HDR  
CHECKED BY: EM  
FIELD BOOK:

CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| REVISIONS |      | DESCRIPTION |       |
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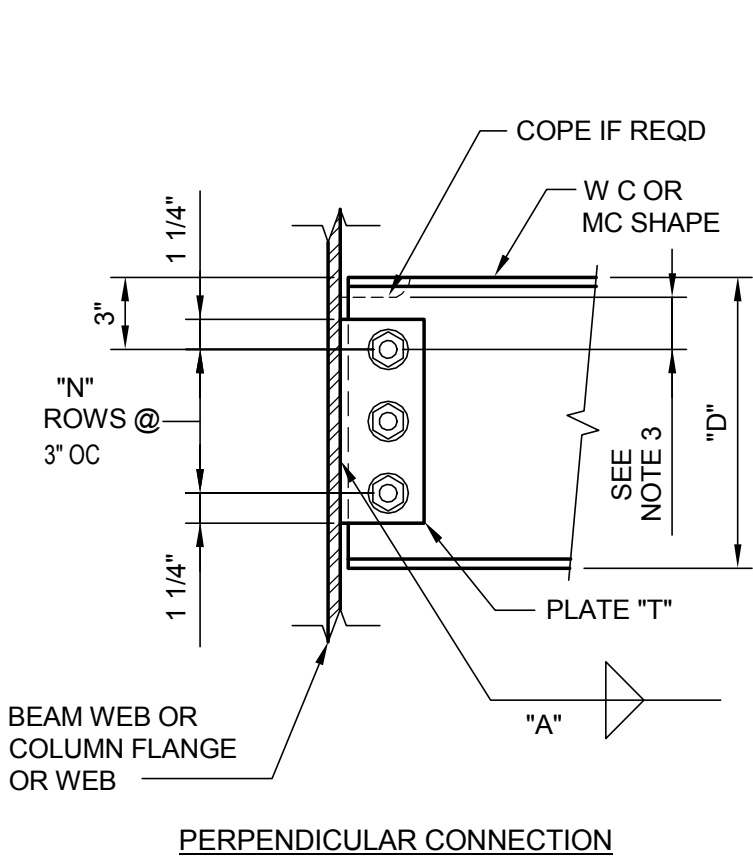
PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
STRUCTURAL STANDARD DETAILS  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

| SHEET NO.        | OF              |
|------------------|-----------------|
| S402             | 8               |
| TOTAL:           | 65              |
| CAD FILE:        | 12188-S402-STD1 |
| DRAWING FILE NO. | 4-140-42        |

**HDR**  
HDR ENGINEERING, INC.  
3250 WEST COMMERCIAL BLVD., SUITE 100  
FORT LAUDERDALE, FLORIDA, 33309  
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CA# 4213

BID DOCUMENTS

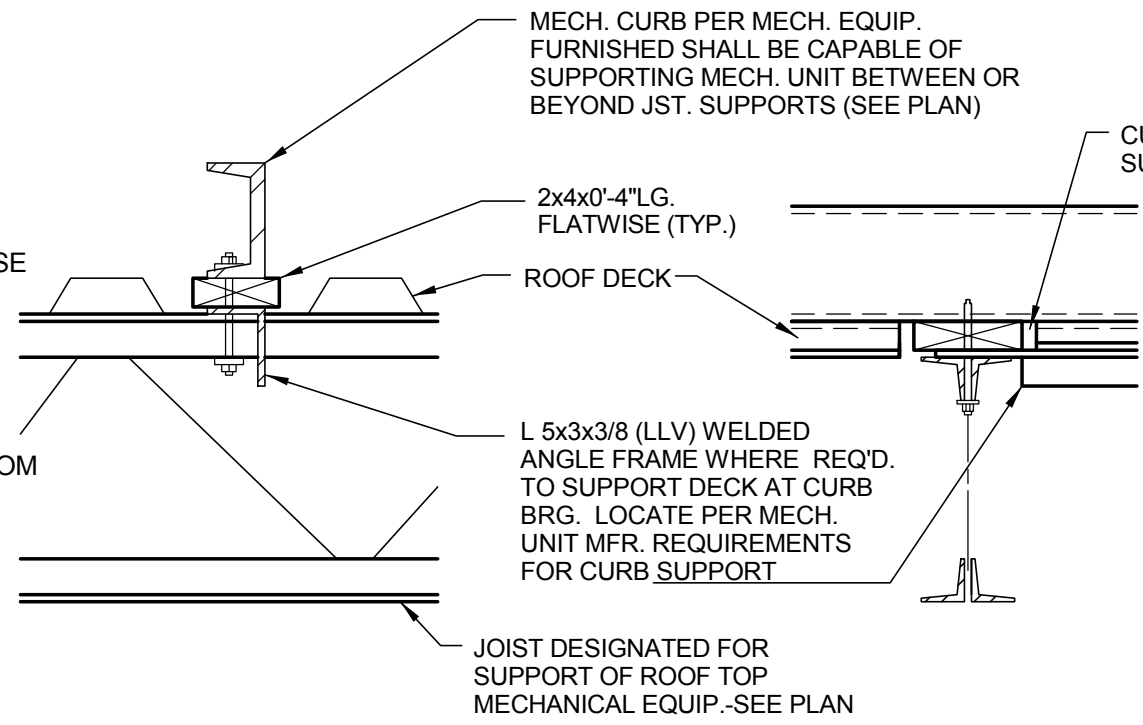




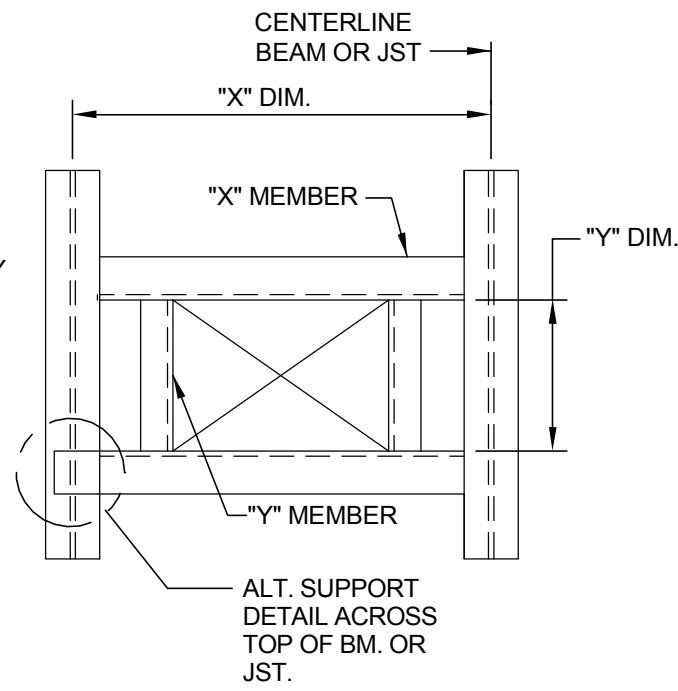
| SINGLE PLATE BEAM CONNECTION SCHEDULE 3/4" DIA BOLTS |                         |                     |               |
|--|-------------------------|---------------------|---------------|
| NOMINAL BEAM DEPTH "D"                               | NUMBER OF BOLT ROWS "N" | PLATE THICKNESS "T" | WELD SIZE "A" |
| W8   | 2                       | 5/16"               | 1/4"          |
| W10  | 2                       | 5/16"               | 1/4"          |
| W12  | 3                       | 5/16"               | 1/4"          |
| W14  | 3                       | 5/16"               | 1/4"          |
| W16  | 4                       | 5/16"               | 1/4"          |
| W18  | 5                       | 5/16"               | 1/4"          |
| W21  | 6                       | 5/16"               | 1/4"          |
| W24  | 7                       | 3/8"                | 5/16"         |
| W27  | 7                       | 3/8"                | 5/16"         |
| W30  | 8                       | 7/16"               | 3/8"          |
| W33  | 9                       | 7/16"               | 3/8"          |
| W36  | 10                      | 7/16"               | 3/8"          |

NOTES:

- ALL BOLTS SHALL BE 3/4" DIA A325-N UNLESS NOTED OTHERWISE.
- PROVIDE MINIMUM NUMBER OF BOLT ROWS "N" SHOWN AS THE TYPICAL CONN. INCREASE NUMBER OF ROWS AND / OR BOLT DIA IF INDICATED ON PLANS.
- MIN. DISTANCE FROM  $\square$  OF TOP BOLT TO A COPE SHALL BE 1 1/2". WHERE DEEP COPE ARE REQD, INCREASE DISTANCE FROM TOP OF BEAM TO  $\square$  OF TOP BOLT.
- USE STANDARD OR SHORT HORIZONTAL SLOTTED HOLES AS REQUIRED.



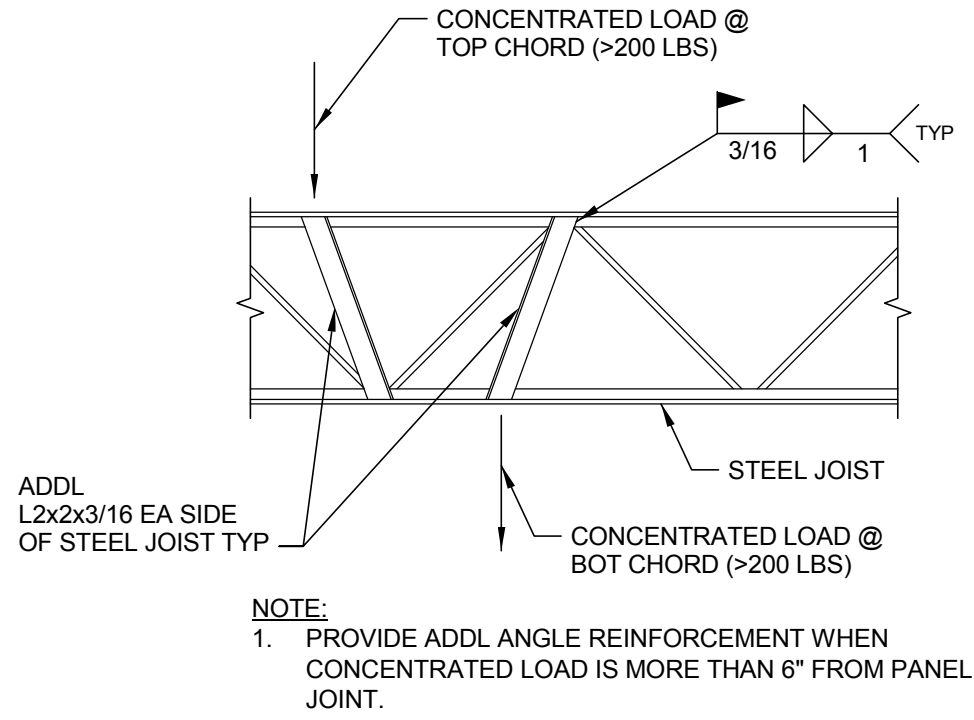
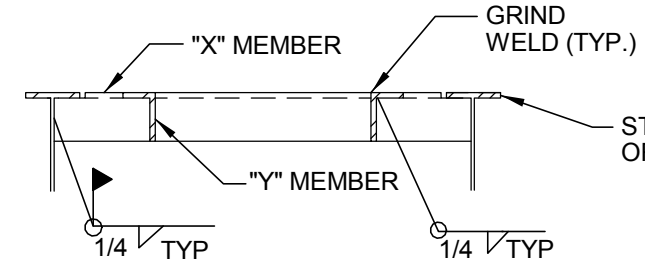
NOTE:  
LOAD CARRYING CURBS PARALLEL TO JOIST SHALL BE PLACED ONTO DECK DIRECTLY OVER SUPPORT MEMBERS. PROVIDE WOOD BLOCKING & ATTACHMENTS AT SPACING PER MANUFACTURERS REQUIREMENTS.



| MAX. "X" DIM. | "X" MEMBER (LLV) |
|---------------|------------------|
| 4'-0"         | L3x3x1/4         |
| 5'-0"         | L4x3x5/16        |
| 6'-6"         | L5x3x5/16        |

NOTE: "X" MEMBER SHALL NOT BE OF LESSER SIZE THAN "Y" MEMBER TO WHICH IT CONNECTS.

| MAX. "Y" DIM. | "Y" MEMBER (LLV) |
|---------------|------------------|
| 1'-6"         | L2 1/2x2 1/2x1/4 |
| 4'-0"         | L3x3x1/4         |
| 7'-0"         | L4x3x1/4         |
| 9'-0"         | L6x4x3/8         |



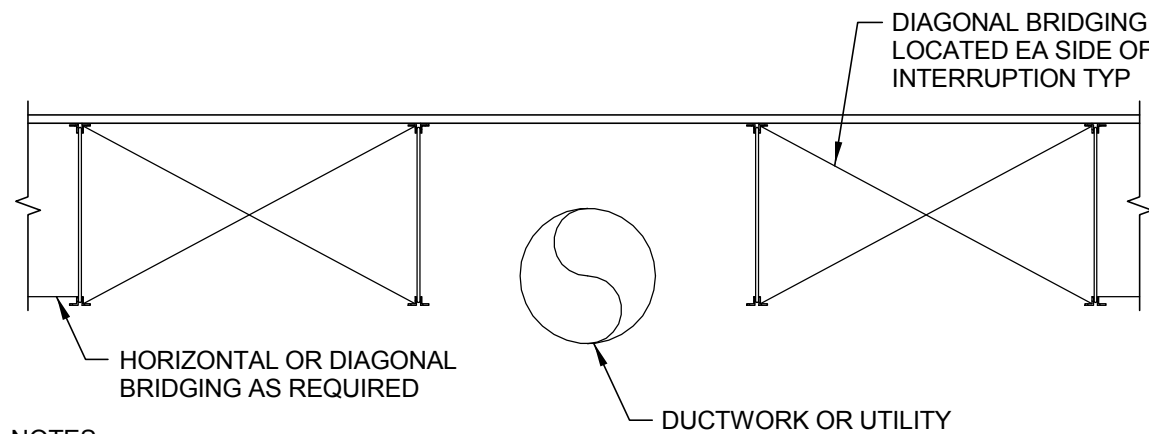
NOTE:  
1. PROVIDE ADDL ANGLE REINFORCEMENT WHEN CONCENTRATED LOAD IS MORE THAN 6" FROM PANEL JOINT.

8 TYPICAL BEAM CONNECTION - SHEAR PLATE  
NTS

9 SUPPORT DETAIL AT ROOF EQUIPMENT CURB  
NTS

10 ROOF SUPPPORT AT OPENINGS  
NTS

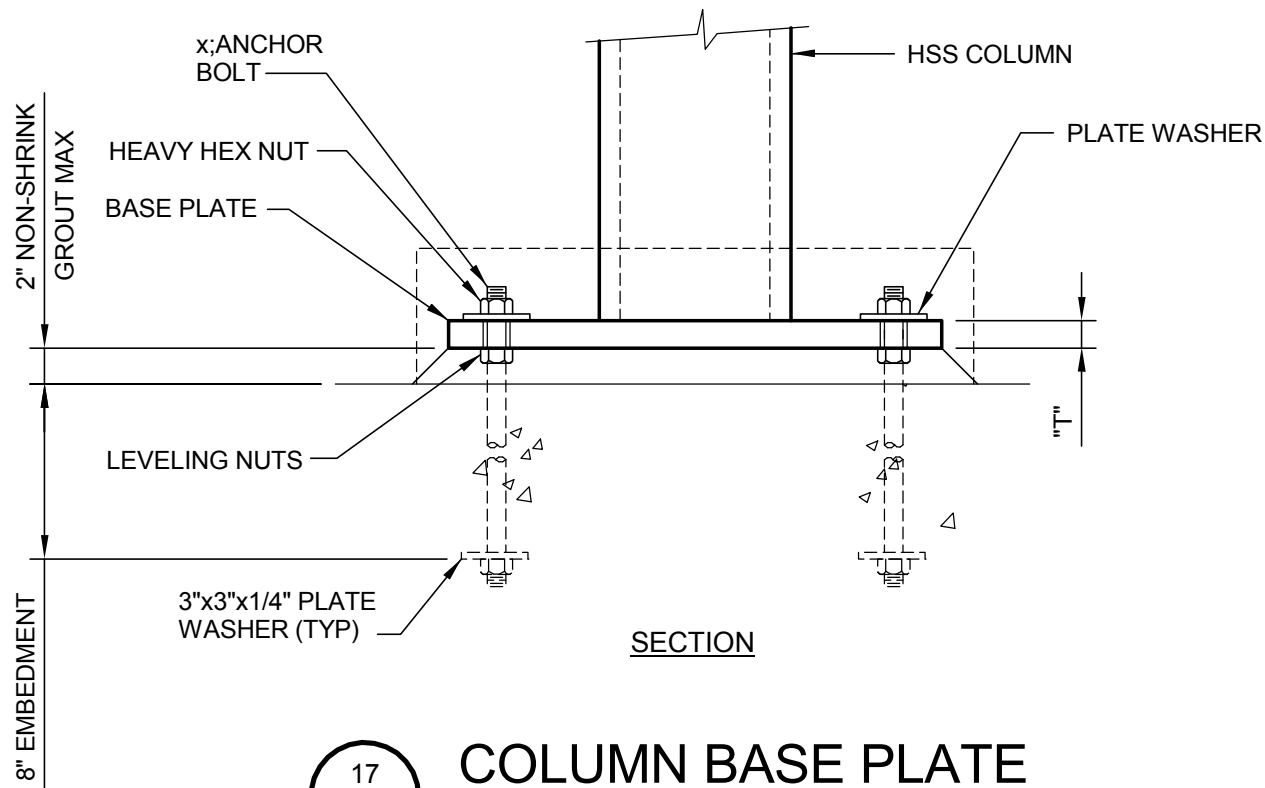
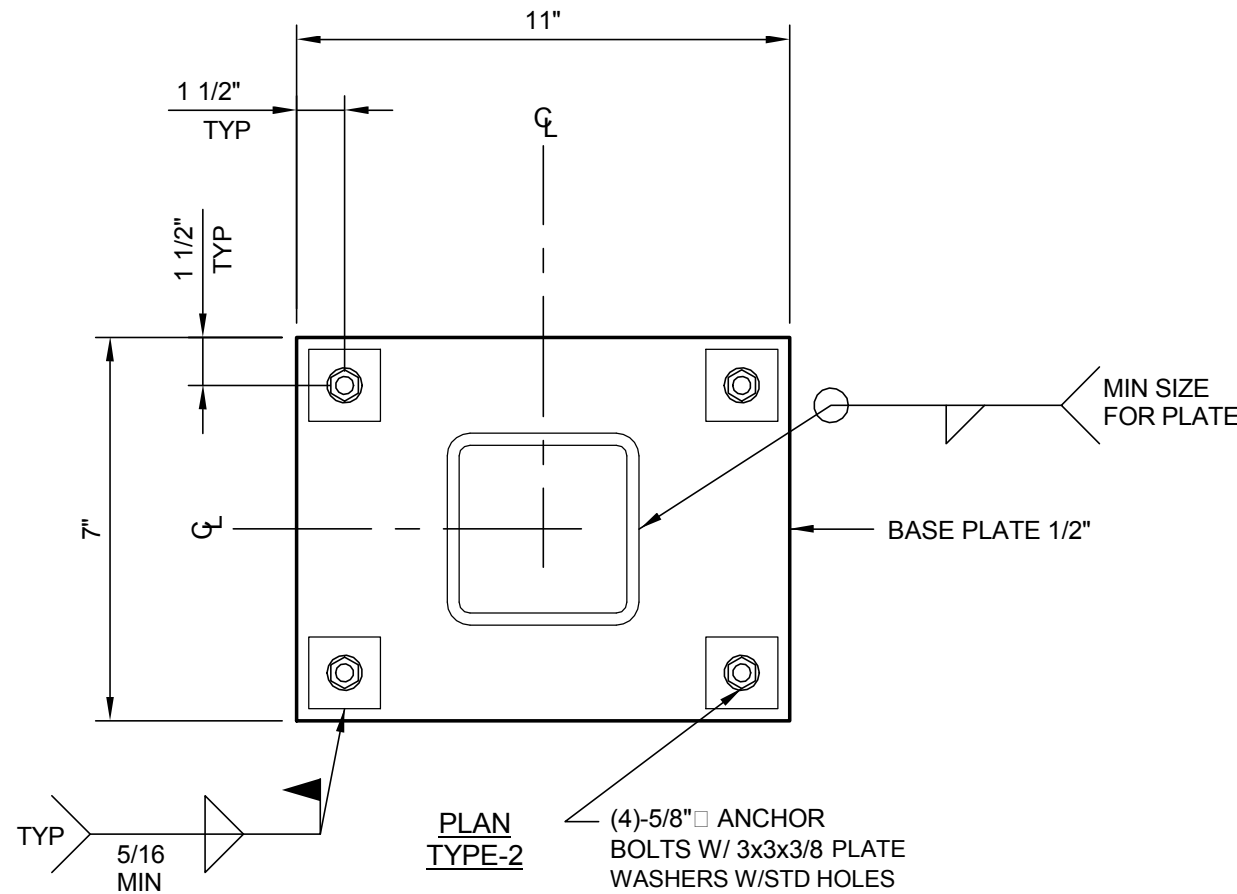
11 JOIST REINFORCEMENT AT CONCENTRATED LOAD  
NTS



NOTES:

- USE ONLY WHERE DUCTWORK OR UTILITY ARE SHOWN BETWEEN JOISTS ON ELECTRICAL, MECHANICAL OR PROCESS SHEETS. VERIFY LOCATION WITH SPECIALITY CONTRACTOR. LOCATION TO BE APPROVED BY ENGINEER.
- DO NOT INSTALL DUCTWORK OR UTILITIES IN TWO ADJACENT JOIST SPACES.

12 INTERRUPTION OF JOIST BRIDGING  
NTS



17 COLUMN BASE PLATE  
NTS

**HDR**  
HDR ENGINEERING, INC.  
3250 WEST COMMERCIAL BLVD., SUITE 100  
FORT LAUDERDALE, FLORIDA, 33309  
T: 954.535.1876 F: 954.233.4953  
CA# 4213

BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
STRUCTURAL STANDARD DETAILS  
6000 NW 21st Ave, Fort Lauderdale, FL 33309

| SHEET NO.        | OF              |
|------------------|-----------------|
| S403             | 8               |
| TOTAL:           | 65              |
| CAD FILE:        | 12188-S403-STD2 |
| DRAWING FILE NO. | 4-140-42        |

| REVISIONS | DATE | BY | CHK'D | DESCRIPTION |
|-----------|------|----|-------|-------------|
| NO.       |      |    |       |             |
|           |      |    |       |             |
|           |      |    |       |             |
|           |      |    |       |             |
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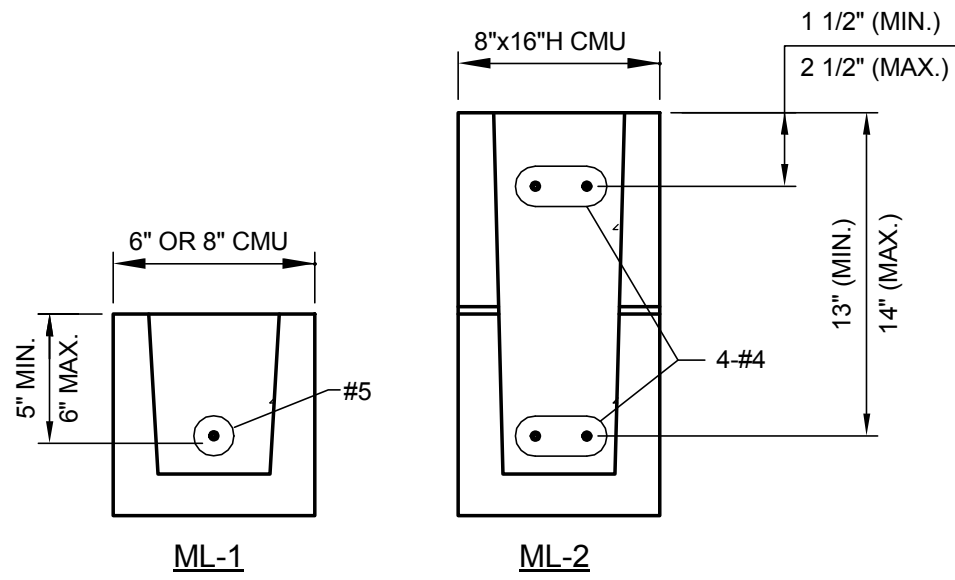
CITY OF FORT LAUDERDALE  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE  
100 North Andrews Avenue, Fort Lauderdale, Florida 33301

| DATE:       | SCALE:       | AS NOTED    |
|-------------|--------------|-------------|
| 05/31/17    |              |             |
| DRAWN BY:   | DESIGNED BY: | CHECKED BY: |
| AG          | HDR          | EM          |
| FIELD BOOK: |              |             |
|             |              |             |

State of Florida  
Professional Engineer  
License No. 78675  
M. ERIC MARTIN

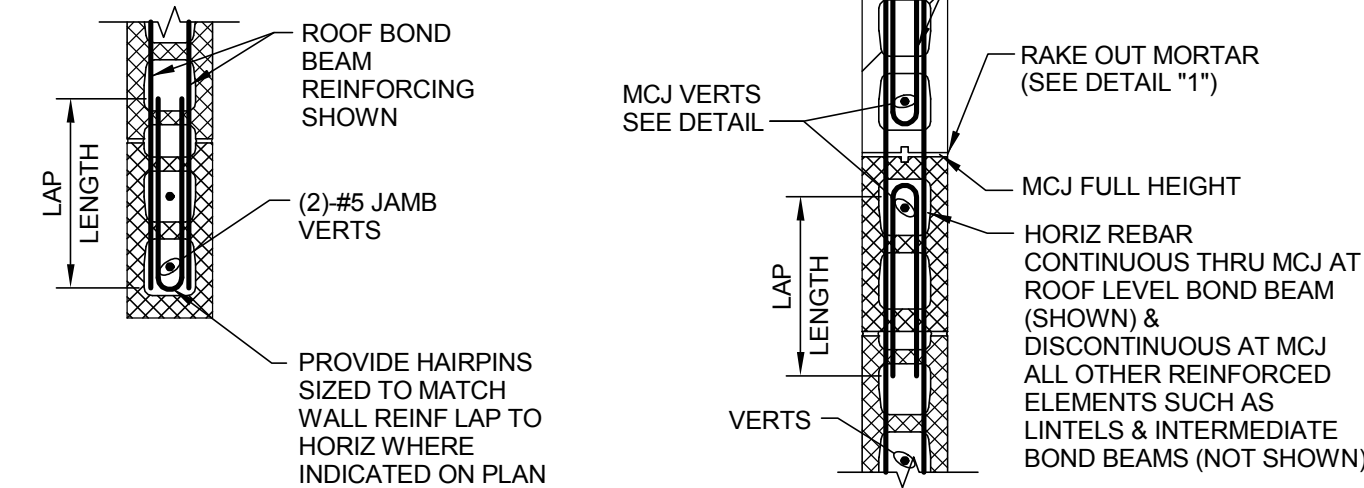
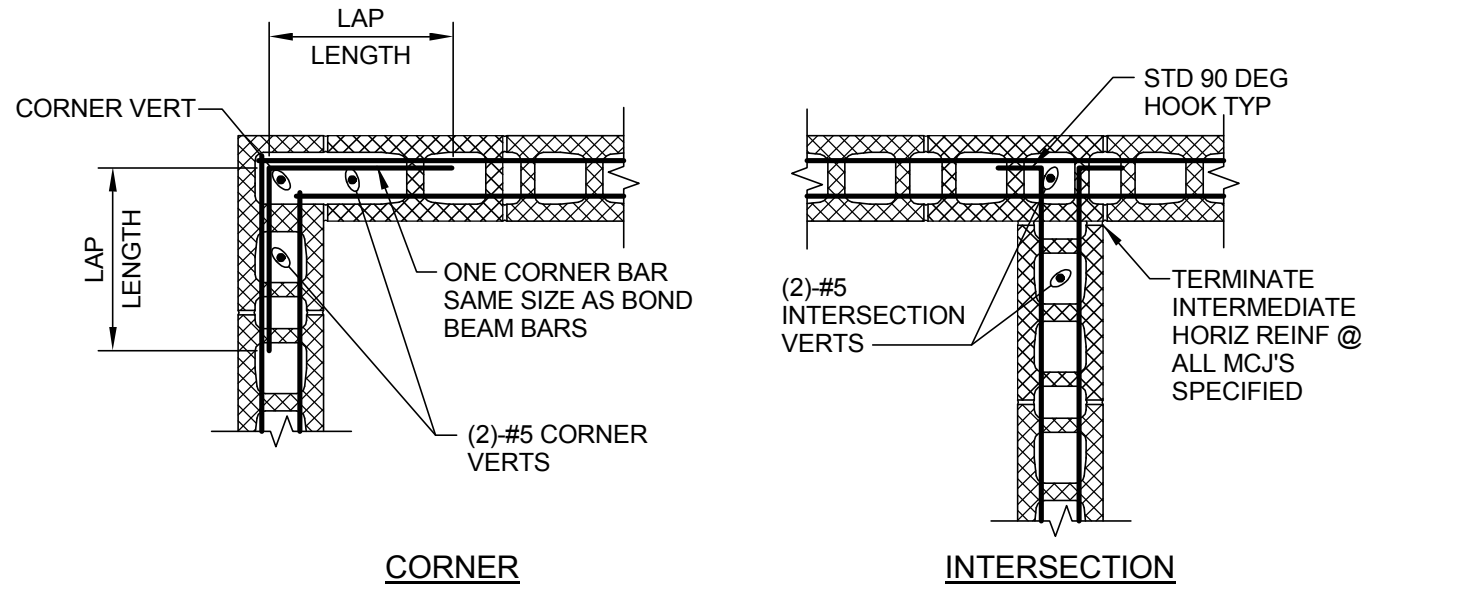
| CMU MASONRY LAP SPLICE SCHEDULE |          |         |        |        |      |     |     |
|---------------------------------|----------|---------|--------|--------|------|-----|-----|
| BAR SIZE                        | COVER    |         |        | LAP    |      |     |     |
|                                 | CMU SIZE | 6"      | 8"     | 12"    | 6"   | 8"  | 12" |
| #3                              |          | 2.625"  | 3.625" | 5.625" | 15"  | 15" | 15" |
| #4                              |          | 2.5625" | 3.563" | 5.563" | 20"  | 20" | 20" |
| #5                              |          | 2.500"  | 3.500" | 5.500" | 32"  | 25" | 25" |
| #6                              |          | 2.4375" | 3.438" | 5.438" | 60"  | 43" | 39" |
| #7                              |          | 2.375"  | 3.375" | 5.375" | 84"  | 59" | 46" |
| #8                              |          | 2.3125" | 3.313" | 5.313" | 131" | 91" | 60" |

NOTES:  
1. ACI 530-08 Eq. 2-9.  
2. SINGLE BAR PER CELL.  
3. BAR LOCATED @ CENTER OF CELL.  
4. fm = 1500 PSI  
5. Fy = 60000 PSI



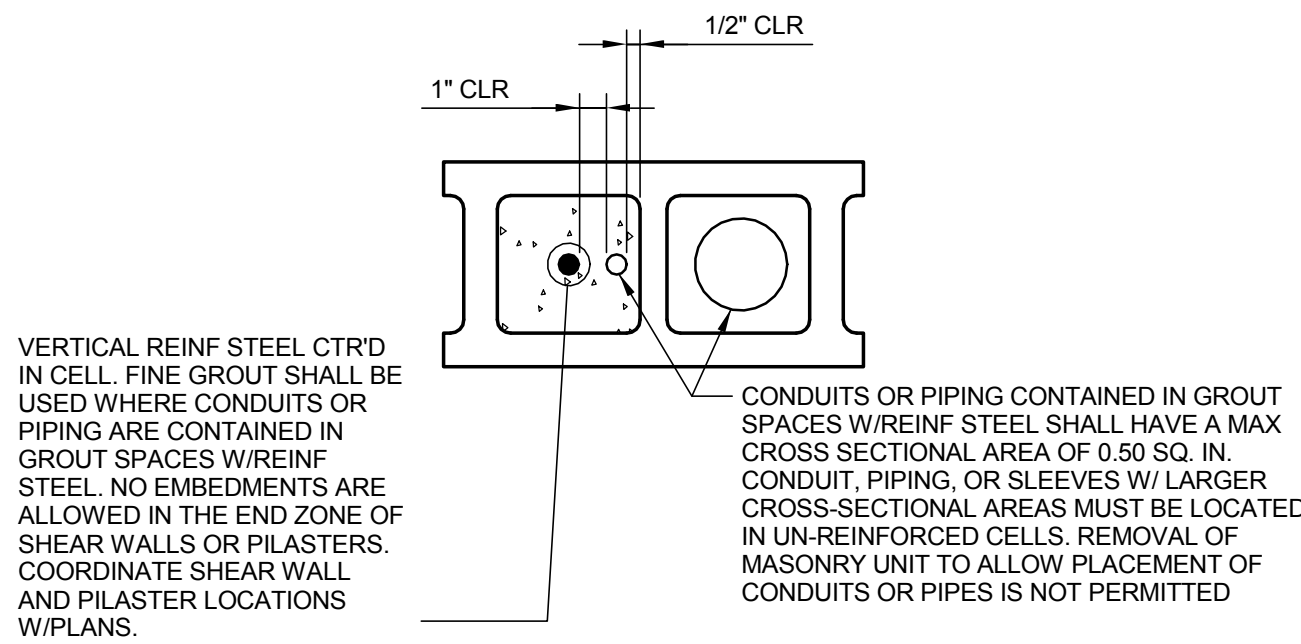
- NOTES:
1. EXTEND REINFORCING FULL LENGTH OF LINTEL AND BEYOND PER DETAIL "2" THIS SHEET.
  2. LINTELS TO BEAR MIN. 8" ON SOLID GROUTED UNITS, EACH END.
  3. ML-2 SHALL HAVE A MINIMUM (3)-#7 JAMB STEEL WITH MATCHING FOUNDATION DOWEL IN CONSECUTIVE CELLS TO CREATE A 8x24 PILASTER.
  4. VENEER LINTEL ON SEPERATE SCHEDULE/DETAIL.

1 LINTELS  
NTS




- NOTES:
1. FOR REINFORCING SEE "CMU REINFORCING SCHEDULE" OR SECTIONS.
  2. \* INDICATES LOCATION OF VERT BARS @ CENTERLINE OF WALL, UNO IN SCHEDULE OR SECTIONS.
  3. EXTEND MCJ FULL HEIGHT OF MASONRY BOND BEAM.
  4. HORIZONTAL JOINT REINFORCING NOT SHOWN.
  5. MODIFY BAR CONFIGURATION SHOWN AS REQUIRED WHERE TWO VERTICAL REINFORCING BARS ARE SHOWN ON THE SCHEDULE.
  6. SEE ARCHITECTURAL DRAWINGS FOR ADDITIONAL DETAILS.

2 CMU WALL REINFORCING  
NTS



- PIPES SHALL NOT BE EMBEDDED IN MASONRY IF THEY ARE:
- 1) CONTAINING, LIQUID, GAS, OR VAPORS HIGHER THEN 150° F (66° C)
  - 2) UNDER PRESSURE IN EXCESS OF 55 PSI (379 kPa)
  - 3) CONTAINING WATER OR OTHER LIQUIDS SUBJECT TO FREEZING

3 EMBEDDED CONDUITS, PIPES, AND SLEEVES IN CMU  
NTS




**HDR ENGINEERING, INC.**  
3250 WEST COMMERCIAL BLVD., SUITE 100  
FORT LAUDERDALE, FLORIDA, 33309  
T: 954.535.1876 F: 954.233.4953  
CA# 4213

BID DOCUMENTS

PROJECT # 12188  
ADMINISTRATION BUILDING RENOVATIONS  
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| S404             | 8               |
| TOTAL:           | 65              |
| CAD FILE:        | 12188-S404-STD3 |
| DRAWING FILE NO. | 4-140-42        |

**CITY OF FORT LAUDERDALE**  
PUBLIC WORKS DEPARTMENT  
ENGINEERING & ARCHITECTURE



100 North Andrews Avenue, Fort Lauderdale, Florida 33301

REVISIONS

| NO. | DATE | BY | CHK'D | DESCRIPTION |
|-----|------|----|-------|-------------|
|     |      |    |       |             |
|     |      |    |       |             |
|     |      |    |       |             |
|     |      |    |       |             |

DATE: 05/31/17  
SCALE: AS NOTED  
DESIGNED BY: HDR  
CHECKED BY: EM  
FIELD BOOK:

State of Florida  
Professional Engineer  
License No. 78675

M. ERIC MARTIN

**QUESTIONNAIRE SHEET**

PLEASE PRINT OR TYPE:

Firm Name: President 

Business Address:

Telephone: 

Fax:

E-Mail Address:

What was the last project of this nature which you completed? Include the year, description, and contract value.

The following are named as three corporations and representatives of those corporations for which you have performed work similar to that required by this contract, and which the City may contact as your references (include addresses, telephone numbers and e-mail addresses). Include the project name, year, description, and contract value.

|                      |
|----------------------|
| <input type="text"/> |
| <input type="text"/> |
| <input type="text"/> |

How many years has your organization been in business?

Have you ever failed to complete work awarded to you; if so, where and why?

The name of the qualifying agent for the firm and his position is:

Certificate of Competency Number of Qualifying Agent:

Effective Date:  Expiration Date:

Licensed in:  Engineering Contractor's License #

(County/State)

Expiration Date:

**NOTE: To be considered for award of this contract, the bidder must submit a financial statement upon request.**

**NOTE: Contractor must have proper licensing and shall provide copy of same with his proposal.**

**QUESTIONNAIRE SHEET**

1. Have you personally inspected the proposed work and have you a complete plan for its performance?

|  |   |
|--|---|
|  | 5 |
|  | 6 |

2. Will you sublet any part of this work? If so, list the portions or specialties of the work that you will.

a) 

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b) 

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c) 

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d) 

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e) 

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f) 

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g) 

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3. What equipment do you own that is available for the work?

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|--|---|
|  | 5 |
|  | 6 |

4. What equipment will you purchase for the proposed work?

|  |   |
|--|---|
|  | 5 |
|  | 6 |

5. What equipment will you rent for the proposed work?

|  |   |
|--|---|
|  | 5 |
|  | 6 |

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**NON-COLLUSION STATEMENT:**

By signing this offer, the vendor/contractor certifies that this offer is made independently and *free* from collusion. Vendor shall disclose below any City of Fort Lauderdale, FL officer or employee, or any relative of any such officer or employee who is an officer or director of, or has a material interest in, the vendor's business, who is in a position to influence this procurement.

Any City of Fort Lauderdale, FL officer or employee who has any input into the writing of specifications or requirements, solicitation of offers, decision to award, evaluation of offers, or any other activity pertinent to this procurement is presumed, for purposes hereof, to be in a position to influence this procurement.

For purposes hereof, a person has a material interest if they directly or indirectly own more than 5 percent of the total assets or capital stock of any business entity, or if they otherwise stand to personally gain if the contract is awarded to this vendor.

In accordance with City of Fort Lauderdale, FL Policy and Standards Manual, 6.10.8.3,

3.3. City employees may not contract with the City through any corporation or business entity in which they or their immediate family members hold a controlling financial interest (e.g. ownership of five (5) percent or more).

3.4. Immediate family members (spouse, parents and children) are also prohibited from contracting with the City subject to the same general rules.

**Failure of a vendor to disclose any relationship described herein shall be reason for debarment in accordance with the provisions of the City Procurement Code.**

**NAME****RELATIONSHIPS**

-







**In the event the vendor does not indicate any names, the City shall interpret this to mean that the vendor has indicated that no such relationships exist.**

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**CONSTRUCTION BID CERTIFICATION**

**Please Note:** All fields below must be completed. If the field does not apply to you, please note N/A in that field. If you are a foreign corporation, you may be required to obtain a certificate of authority from the department of state, in accordance with Florida Statute §607.1501 (visit <http://www.dos.state.fl.us/>).

Company: (Legal Registration)

Address:

City:  State:  Zip:

Telephone No.  FAX No.  Email:

Does your firm qualify for MBE or WBE status: MBE ☐ WBE ☐

If a corporation, state the name of the President, Secretary and Resident Agent. If a partnership, state the names of all partners. If a trade name, state the names of the individuals who do business under the trade name.

|                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| <b>Name</b>          | <b>Title</b>         | <b>Name</b>          | <b>Title</b>         |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| <b>Name</b>          | <b>Title</b>         | <b>Name</b>          | <b>Title</b>         |

**ADDENDUM ACKNOWLEDGEMENT** - Bidder acknowledges that the following addenda have been received and are included in the bid:

| Addendum No.         | Date Received        | Addendum No.         | Date Received        | Addendum No.         | Date Received        | Addendum No.         | Date Received        |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

**VARIANCES:** If you take exception or have variances to any term, condition, specification, or requirement in this bid you must specify such variance in the space provided below or reference in the space provided below all variances contained on other pages within your bid. Additional pages may be attached if necessary. No variances will be deemed to be part of the bid submitted unless such is listed and contained in the space provided below. The City does not, by virtue of submitting a variance, necessarily accept any variances. If no statement is contained in the below space, it is hereby implied that your response is in full compliance with this competitive solicitation. If you do not have variances, simply mark N/A. If submitting your response electronically through BIDS SYNC you must also click the "Take Exception" button.

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The below signatory affirms that he has or will obtain all required permits and licenses from the appropriate agencies, and that his firm is authorized to do business in the State of Florida. The below signatory agrees to furnish all labor, tools, material, equipment and supplies, and to sustain all the expense incurred in doing the work set forth in strict accordance with the bid plans and contract documents at the unit prices indicated if awarded a contract. The below signatory has not divulged to, discussed, or compared this bid with other bidders, and has not colluded with any other bidder or parties to this bid whatsoever. Furthermore, the undersigned guarantees the truth and accuracy of all statements and answers contained in this bid. The below signatory also hereby agrees, by virtue of submitting or attempting to submit a bid, that in no event shall the City's liability for bidder's direct, indirect, incidental, consequential, special or exemplary damages, expenses, or lost profits arising out of this competitive solicitation process, including but not limited to public advertisement, bid conferences, site visits, evaluations, oral presentations, or award proceedings exceed the amount of Five Hundred Dollars (\$500.00). This limitation shall not apply to claims arising under any provision of indemnification or the City's protest ordinance contained in this competitive solicitation.

**Submitted by:**

Name (printed)

Signature

Date:

Title

3

4

6



**CONSTRUCTION BID CERTIFICATION**

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Company: (Legal Registration)

Address:

City:  State:  Zip:

Telephone No.  FAX No.  Email:

Does your firm qualify for MBE or WBE status: MBE ☐ WBE ☐

If a corporation, state the name of the President, Secretary and Resident Agent. If a partnership, state the names of all partners. If a trade name, state the names of the individuals who do business under the trade name.

|                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| <b>Name</b>          | <b>Title</b>         | <b>Name</b>          | <b>Title</b>         |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| <b>Name</b>          | <b>Title</b>         | <b>Name</b>          | <b>Title</b>         |

**ADDENDUM ACKNOWLEDGEMENT** - Bidder acknowledges that the following addenda have been received and are included in the bid:

| Addendum No.         | Date Received        | Addendum No.         | Date Received        | Addendum No.         | Date Received        | Addendum No.         | Date Received        |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

**VARIANCES:** If you take exception or have variances to any term, condition, specification, or requirement in this bid you must specify such variance in the space provided below or reference in the space provided below all variances contained on other pages within your bid. Additional pages may be attached if necessary. No variances will be deemed to be part of the bid submitted unless such is listed and contained in the space provided below. The City does not, by virtue of submitting a variance, necessarily accept any variances. If no statement is contained in the below space, it is hereby implied that your response is in full compliance with this competitive solicitation. If you do not have variances, simply mark N/A. If submitting your response electronically through BIDS SYNC you must also click the "Take Exception" button.

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**Submitted by:**

Name (printed)

Date:

Signature

Date:

**BID/PROPOSAL CERTIFICATION**

**Please Note:** If responding to this solicitation through BidSync, the electronic version of the bid response will prevail, unless a paper version is clearly marked **by the bidder** in some manner to indicate that it will supplant the electronic version. All fields below must be completed. If the field does not apply to you, please note N/A in that field.

If you are a foreign corporation, you may be required to obtain a certificate of authority from the department of state, in accordance with Florida Statute §607.1501 (visit <http://www.dos.state.fl.us/>).

Company: (Legal Registration)

Address:

City:  State:  Zip:

Telephone No.  FAX No.  Email:

Delivery: Calendar days after receipt of Purchase Order (**section 1.02 of General Conditions**):

Total Bid Discount (**section 1.05 of General Conditions**):

Does your firm qualify for MBE or WBE status (**section 1.09 of General Conditions**): MBE ☐ WBE ☐

**ADDENDUM ACKNOWLEDGEMENT** - Proposer acknowledges that the following addenda have been received and are included in the proposal:

| <u>Addendum No.</u>  | <u>Date Issued</u>   | <u>Addendum No.</u>  | <u>Date Issued</u>   | <u>Addendum No.</u>  | <u>Date Issued</u>   |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
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| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

**VARIANCES:** If you take exception or have variances to any term, condition, specification, scope of service, or requirement in this competitive solicitation you must specify such exception or variance in the space provided below or reference in the space provided below all variances contained on other pages within your response. Additional pages may be attached if necessary. No exceptions or variances will be deemed to be part of the response submitted unless such is listed and contained in the space provided below. The City does not, by virtue of submitting a variance, necessarily accept any variances. If no statement is contained in the below space, it is hereby implied that your response is in full compliance with this competitive solicitation. If you do not have variances, simply mark N/A. **If submitting your response electronically through BIDSINC you must also click the "Take Exception" button.**

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The below signatory hereby agrees to furnish the following article(s) or services at the price(s) and terms stated subject to all instructions, conditions, specifications addenda, legal advertisement, and conditions contained in the bid/proposal. I have read all attachments including the specifications and fully understand what is required. By submitting this signed proposal I will accept a contract if approved by the City and such acceptance covers all terms, conditions, and specifications of this bid/proposal. The below signatory also hereby agrees, by virtue of submitting or attempting to submit a response, that in no event shall the City's liability for respondent's direct, indirect, incidental, consequential, special or exemplary damages, expenses, or lost profits arising out of this competitive solicitation process, including but not limited to public advertisement, bid conferences, site visits, evaluations, oral presentations, or award proceedings exceed the amount of Five Hundred Dollars (\$500.00). This limitation shall not apply to claims arising under any provision of indemnification or the City's protest ordinance contained in this competitive solicitation.

Submitted by:

Name (printed)

Signature

Date:

Title

## LOCAL BUSINESS PRICE PREFERENCE CERTIFICATION STATEMENT

The Business identified below certifies that it qualifies for the local business price preference classification as indicated herein, and further certifies and agrees that it will re-affirm its local preference classification annually no later than thirty (30) calendar days prior to the anniversary of the date of a contract awarded pursuant to this ITB. Violation of the foregoing provision may result in contract termination.

(1)   
Business Name

is a **Class A** Business as defined in City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the City of Fort Lauderdale current year Business Tax Receipt and a complete list of full-time employees and evidence of their addresses shall be provided within 10 calendar days of a formal request by the City.

(2)   
Business Name

is a **Class B** Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the Business Tax Receipt or a complete list of full-time employees and evidence of their addresses shall be provided within 10 calendar days of a formal request by the City.

(3)   
Business Name

is a **Class C** Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the Broward County Business Tax Receipt shall be provided within 10 calendar days of a formal request by the City.

(4)   
Business Name

requests a **Conditional Class A** classification as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. Written certification of intent shall be provided within 10 calendar days of a formal request by the City.

(5)   
Business Name

requests a **Conditional Class B** classification as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. Written certification of intent shall be provided within 10 calendar days of a formal request by the City.

(6)   
Business Name

is considered a **Class D** Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186 and does not qualify for Local Preference consideration.

BIDDER'S COMPANY:

AUTHORIZED  
COMPANY  
PERSON:

5

**CONTRACTOR'S CERTIFICATE OF COMPLIANCE WITH  
NON-DISCRIMINATION PROVISIONS OF THE CONTRACT**

The completed and signed form should be returned with the Contractor's submittal. If not provided with submittal, the Contractor must submit within three business days of City's request. Contractor may be deemed non-responsive for failure to fully comply within stated timeframes.

Pursuant to City Ordinance Sec. 2-17(a)(i)(ii), bidders must certify compliance with the Non-Discrimination provision of the ordinance.

- (a) Contractors doing business with the City shall not discriminate against their employees based on the employee's race, color, religion, gender (including identity or expression), marital status, sexual orientation, national origin, age, disability or any other protected classification as defined by applicable law.

**Contracts.** Every Contract exceeding \$100,000, or otherwise exempt from this section shall contain language that obligates the Contractor to comply with the applicable provisions of this section.

The Contract shall include provisions for the following:

- (i) The Contractor certifies and represents that it will comply with this section during the entire term of the contract.
- (ii) The failure of the Contractor to comply with this section shall be deemed to be a material breach of the contract, entitling the City to pursue any remedy stated below or any remedy provided under applicable law.

Authorized Signature

Print Name and Title

Date

6

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## Question and Answers for Bid #12062-183 - FXE Administration Building Renovation P12188

### Overall Bid Questions

#### Question 1

Is there an estimated cost or budget for this project? (Submitted: Oct 20, 2017 8:23:51 AM EDT)

#### Answer

- The estimate Budget for this project is \$1,675,000.00 (Answered: Oct 20, 2017 8:39:06 AM EDT)

#### Question 2

The bid date is scheduled for Nov. 24th the day after Thanksgiving.

Some offices will be closed. Is it possible to change bid date after Thanksgiving? (Submitted: Oct 23, 2017 11:00:35 AM EDT)

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