### **Solicitation 12089-183**

# Holiday Park War Memorial Auditorium Renovations P12128

**Bid Designation: Public** 



**City of Fort Lauderdale** 

# Bid 12089-183 Holiday Park War Memorial Auditorium Renovations P12128

Bid Number 12089 - 183

Bid Title Holiday Park War Memorial Auditorium Renovations P12128

Bid Start Date Jan 10, 2018 8:34:44 AM EST
Bid End Date Feb 12, 2018 2:00:00 PM EST

Question & Answer

**End Date** 

Feb 2, 2018 5:00:00 PM EST

Bid Contact Fausto Vargas

**Procurement Specialist** 

Finance - Procurement Division fvargas@fortlauderdale.gov

Contract Duration 180 days

Contract Renewal See Specifications

Prices Good for 120 days

Pre-Bid Conference Jan 24, 2018 11:00:00 AM EST

Attendance is optional

Location: War Memorial Auditorium

800 NE 8th Street

Fort Lauderdale, FL 33304

Site Visit to Follow Pre-proposal Meeting

#### **Bid Comments**

Sealed bids will be received electronically until 2:00 P.M., local time, on Monday, February 12, 2018, and opened immediately thereafter in the 5th Floor Conference Room, City Hall, City of Fort Lauderdale, Florida, 100 North Andrews Avenue, for BID NO., 12089-183, PROJECT NO.,12128 Holiday Park War Memorial Auditorium Renovations.

This project consists of Drawing File No. 4-140-11 (32) sheets, Not Including Cover.

This project is located at 800 NE 8th Street, City of Fort Lauderdale. The work to be accomplished under this contract includes, but is not limited to, a complete upgrade of the existing electrical systems in the building including re-wiring and interior/exterior lighting fixtures replacement with low-energy efficient light-emitting diode (LED). The electrical upgrades also include replacement of backup emergency generator.

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

<u>Licensing Requirements</u>: Possession of a State of Florida General Contractor's License or State of Florida Electrical Contractor's License may bid this project is required for this project.

<u>Pre-Bid Meeting/Site visit:</u> A pre-bid meeting and/or site visit will be held on Wednesday, January 24th, 2018, at 11:00 a.m., local time, at War Memorial Auditorium, located at 800 NE 8th Street, Fort Lauderdale, FL 33304

It is <u>strongly suggested</u> that all Contractors attend the pre-proposal conference and/or site visit since <u>tours</u> 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 (s)/facilities OR /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 Contractors attend the pre-bid meeting and/or site visit.

Bidding blanks may be obtained free of charge at BIDSYNC.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 \$25.00 (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 BIDSYNC.COM

<u>Bid Security</u>: A certified check, cashier's check, bank officer's check or bid bond for <u>FIVE</u> 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 BIDSYNC customer care department.

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.

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.

<u>Certified Checks, Cashier's Checks and Bank Drafts</u> 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 . 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) 828-5933.

Item Response Form

Item 12089-183--01-01 - BASE BID: 1) Mobilization & Demobilization

Lot Description 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

Mobilization includes the securing and cordoning off of the work area and activation of contractors physical and manpower resources for transfer to a construction site as well as making sure all utilities are available for use during actual construction, including MOT approval. *This item cannot exceed 5% of the Base Bid. Item # 1 and Base Bid Item # 2.* 

Item 12089-183--01-02 - BASE BID: 2) Renovations

Lot Description 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

Furnish all materials, labor, and equipment to perform all the work to be accomplished under this contract, which includes, but is not limited to, demolition of existing electrical and lighting systems, a new electrical and lighting systems designed including re-wiring and interior/exterior lighting fixtures replacement and all other items quantified as per drawings and specifications. The lump sum price shall include all labor, materials, equipment, electrical testing, base bid shall include insurance, bond, overhead and profit, and all other costs.

Item 12089-183--01-03 - BASE BID: 3) Backup emergency generator

Lot Description 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

Furnish all materials, labor, and equipment to perform all work to be accomplished for replacement of backup emergency generator, which includes, but is not limited to, demolition of the existing generators, concrete pads, a new backup emergency generator mounted on the new concrete pad on the north side of the building structure, and all other items quantified as per drawings and specifications. See plans for location, connections (The lump sum price shall include all labor, materials, equipment, and testing. This base bid shall include insurance, bond, overhead and profit, and all other fixed costs).

Item 12089-183--02-01 - BID ALTERNATE 1: 4) Exterior Lighting

Lot Description BID ALTERNATE 1

Quantity	1 lump sum	
Jnit Price		
Delivery Location	City of Fort Lauderdale	
	See ITB Specifications	
	See ITB Specifications	
	Fort Lauderdale FL 33301	
	Oty 1	

#### Description

Furnish all materials, labor, and equipment to perform all work to be accomplished for exterior and security lighting, mounted at the perimeter of the building structure. See plans for location, connections (The lump sum price shall include all labor, materials, equipment, and electrical testing. This item should be priced as an alternate including insurance, bond, overhead and profit, and all other fixed costs).

12089-183--03-01 - BID ALTERNATE 2: 5) Interior image projectors Item

Lot Description **BID ALTERNATE 2** 

Quantity 1 lump sum

**Delivery Location** 

**Unit Price** 

City of Fort Lauderdale

See ITB Specifications See ITB Specifications Fort Lauderdale FL 33301

Qty 1

#### Description

Furnish all materials, labor, and equipment to perform all work to be accomplished for interior image projection, mounted in the Lobby and on the side walls of the West Gallery. See plans for location, connections, and specifications. The lump sum price shall include all labor, materials, equipment, and electrical testing. This item should be priced as an alternate including insurance, bond, overhead and profit, and all other fixed costs.

12089-183--04-01 - BID ALTERNATE 3: 6) Exterior image projection on the Front Elevation. Item

**BID ALTERNATE 3** Lot Description

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

Furnish all materials, labor, and equipment to perform all work to be accomplished for exterior image projection, mounted at the front of the building structure. See plans for location, connections, and specifications. The lump sum price shall include all labor, materials, equipment, and electrical testing. This item should be priced as an alternate including insurance, bond, overhead and profit, and all other fixed costs.

tem	12089-18305-01 - BID ALTERNATE 4: /) Add Lighting Fixture capable to adjust color,
	temperature and intensity.
_ot Description	BID ALTERNATE 4

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

Furnish all materials, labor, and equipment to perform all work to be accomplished for adding adjustible color temperature and intensity changing capabilities to the Auditorium lighting fixtures. See plans for location, connections, and specifications. The lump sum price shall include all labor, materials, equipment, and testing. This item should be priced as an alternate including insurance, bond, overhead and profit, and all other fixed costs.

Item 12089-183--06-01 - BID ALTERNATE 5: 8) Windows replacement

Lot Description BID ALTERNATE 5

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

Furnish all materials, labor, and equipment to perform all work to be accomplished for replacement of the three windows, located in the three north offices. See plans for location, connections, and specifications. The lump sum price shall include all labor, materials, equipment, and testing. This item should be priced as an alternate including insurance, bond, overhead and profit, and all other fixed costs.

Item 12089-183--07-01 - BID ALTERNATE 6: 9) Ceiling tiles

Lot Description BID ALTERNATE 6

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

Furnish all materials, labor, and equipment to perform all work to be accomplished for replacement of the stained and damaged ceiling tiles, located in the central part of the Peripheral Corridor - West and in the existing tribute display at the Lobby. The lump sum price shall include all labor, materials, equipment, and testing. This item should be priced as an alternate including insurance, bond, overhead and profit, and all other fixed costs.

# CITY OF FORT LAUDERDALE CONTRACT AND SPECIFICATIONS PACKAGE

BID NO. 12089-183

**PROJECT NO. 12128** 

# Holiday Park War Memorial Auditorium Renovations



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

DANICA GRUJICIC PROJECT MANAGER II

IRINA TOKAR, RA, NCARB, LEED AP SENIOR PROJECT MANANGER

FAUSTO VARGAS
PROCUREMENT SPECIALIST I

Telephone: (954) 828-6167 E-mail: fvargas@fortlauderdale.gov

#### **TABLE OF CONTENTS**

Desc	<u>cription</u>		<u>Pages</u>
ı.	BID INFO	DRMATION	
	Instructio	to Bidn to BiddersConditions	IB-1 thru IB-6
II.	CONSTR	RUCTION AGREEMENT (SAMPLE)	
III.	GENERA	AL CONDITIONS	GC-1 thru GC-11
IV.	TECHNIC	CAL SPECIFICATIONS	
	DIVISION	N 1 – GENERAL REQUIREMENTS	
	011200 012500 012900 013100 013200 013233 013300 014000 014200 015900 016000 017700 017823 017839 017900	Special Conditions Substitutional Procedures Payment Procedures Project Management and Coordination Construction Progress Documentation Photographic Documentation Submittal Procedures Quality Requirements References Project Signs Product Requirements Closeout Procedures Operation and Maintenance Data Project Record Documents Demonstration and Training	
	DIVISION	N 3 - CONCRETE	
	031000 003200 033000	Concrete Formwork  Concrete Reinforcement  Cast-In-Place Concrete	3
	DIVISION	N 8 - OPENINGS	
	085113	Aluminum Windows	4

#### **DIVISION 26 - ELECTRICAL**

26 05 00	Common Work Results for Electrical	7
26 05 01	Investigation of Existing Electrical Systems	2
26 05 19	Low Voltage Conductors and Cables	
26 05 26	Grounding and Bonding for Electrical Systems	11
26 05 29	Hangers and Supports	5
26 05 33	Raceways and Boxes for Electrical Systems	17
26 05 53	Identification for Electrical Systems	7
26 05 73	Overcurrent Device Coordination Study with Arc Flash	7
26 08 16	Demonstration of Completed Electrical Systems	4
26 09 23	Stand Alone Lighting Controls Devices	
26 22 00	Transformers	7
26 24 13	Switchboards	8
26 24 16	Panelboards	
26 27 26	Wiring Devices	S
26 28 13	Fuses	
26 28 16	Enclosed Switches and Circuit Breakers	
26 29 13	Enclosed Controllers (Starters)	
26 32 13	Natural Gas Generators	
26 36 00	Transfers Switches	
26 43 13	Surge Protection Devices	
26 51 00	Interior Lighting	8
SCHEDUL	_E OF VALUES	6
EXHIBIT A	A OSHA ASBESTOS SURVEY RESPORT	52
EXHIBIT E	B DRAWINGS	33
	IEODMATION	30
GRANI IN	IFORMATION	

Note: The following documents are available electronically for completion and documents <u>must</u> be returned with your bid along with your bid security, proof of insurance, and proof of required licenses/certifications.

CITB Prime Contractor ID Form CITB Local Business Preference CITB Non-Collusion Statement CITB Contract Payment Method CITB Construction Bid Certification

#### **INVITATION TO BID**

Sealed bids will be received electronically until 2:00 P.M., local time, on **Monday, February 12, 2018,** and opened immediately thereafter in the 5th Floor Conference Room, City Hall, City of Fort Lauderdale, Florida, 100 North Andrews Avenue, for **BID NO., 12089-183, PROJECT NO.,12128 Holiday Park War Memorial Auditorium Renovations.** 

This project consists of Drawing File No. 4-140-11 (32) sheets, Not Including Cover.

This project is located at 800 NE 8th Street, City of Fort Lauderdale. The work to be accomplished under this contract includes, but is not limited to, a complete upgrade of the existing electrical systems in the building including re-wiring and interior/exterior lighting fixtures replacement with low-energy efficient light-emitting diode (LED). The electrical upgrades also include replacement of backup emergency generator.

#### NOTE: Payment on this contract will be made Check.

<u>Licensing Requirements</u>: Possession of a State of Florida General Contractor's License or State of Florida Electrical Contractor's License may bid this project is required for this project.

<u>Pre-Bid Meeting/Site visit:</u> A pre-bid meeting and/or site visit will be held on <u>Wednesday, January 24th, 2017, at 11:00 a.m.</u>, local time, at War Memorial Auditorium, located at 800 NE 8th Street, Fort Lauderdale, FL 33304.

It is <u>strongly suggested</u> that all Contractors attend the pre-proposal conference and/or 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(s)/facilities **OR** /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 Contractors attend the pre-bid meeting and/or site visit.

Bidding blanks may be obtained **free of charge** at BIDSYNC.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 \$25.00 (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 BIDSYNC.COM

<u>Bid Security</u>: A certified check, cashier's check, bank officer's check or bid bond for <u>FIVE</u> 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:

- 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.

<u>Certified Checks, Cashier's Checks and Bank Drafts</u> 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 <a href="www.bidsync.com">www.bidsync.com</a>. 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). <a href="Contractors please note:">Contractors please note:</a> 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 <a href="http://www.fortlauderdale.gov/departments/finance/procurement-services">http://www.fortlauderdale.gov/departments/finance/procurement-services</a>. For general inquiries, please call (954) 828-5933.

#### **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.

<u>QUALIFICATIONS OF BIDDERS</u> – 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.

<u>PERSONAL INVESTIGATION</u> - 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.

<u>INCONSISTENCIES</u> – 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.

<u>LEGAL CONDITIONS</u> - 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.

<u>PUBLIC ENTITY CRIMES</u> - 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.

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

<u>FORMS OF PROPOSALS (CONTINUED)</u>. - 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.

<u>INSURANCE</u> - 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.

<u>BID BOND</u> - 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.

<u>FILLING IN BIDS</u> - 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.

<u>PRICES QUOTED</u>: 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.

<u>BIDS FIRM FOR ACCEPTANCE</u>: 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.

<u>ADDITIONAL ITEMS OR SERVICES</u>: 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. 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.

<u>DELETION OR MODIFICATION OF SERVICES</u>: 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.

<u>CAUSES FOR REJECTION</u> - 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.

<u>REJECTION OF BIDS</u> - 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 – Procurement Manager, 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.. The complete protest City's ordinance mav be found on the website following link: at the http://www.fortlauderdale.gov/purchasing/protestordinance.pdf

<u>WITHDRAWALS</u> - 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.

<u>CONTRACT</u> - 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.

<u>ENFORCEMENT OF SPECIFICATIONS</u> - 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.

<u>COPIES OF DRAWING PLANS</u> - 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.

<u>SURETY BOND</u> – 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

<u>AUDIT OF CONTRACTOR'S RECORDS</u> - 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.

<u>PERIODIC ESTIMATE FOR PARTIAL PAYMENT</u> - 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 womenowned (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 fifty-one percent (51%) of which is owned by minority group members or, in the case of a publicly owned business, at least fifty-one percent (51%) 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.

<u>DEBARRED OR SUSPENDED BIDDERS OR PROPOSERS</u> - 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.

LOBBYING ACTIVITIES - ALL CONTRACTORS PLEASE NOTE: Any contractor submitting a response to this solicitation must comply, if applicable, with City of Fort Lauderdale Ordinance No. C-00-27 & Resolution No. 07-101, Lobbying Activities. Copies of Ordinance No., C-00-27, and Resolution No. 07-101, may be obtained from the City Clerk's Office on the 7th Floor of City Hall, 100 N. Andrews Avenue, Fort Lauderdale, Florida. The ordinance may also be viewed on the City's website at <a href="http://www.fortlauderdale.gov/clerk/LobbyistDocs/lobbyist\_ordinance.pdf">http://www.fortlauderdale.gov/clerk/LobbyistDocs/lobbyist\_ordinance.pdf</a>

#### **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 Electrical Upgrades 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 (<a href="www.bidsync.com">www.bidsync.com</a>) 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 <a href="www.bidsync.com">www.bidsync.com</a> 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 via email at 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 <a href="www.bidsync.com">www.bidsync.com</a>. 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). <a href="Contractors please note">Contractors please note</a>: 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. CONTRACT TIME

5.1 The Contractor recognizes that TIME IS OF THE ESSENCE. The Work shall commence within 10 calendar days of the date of the Notice to Proceed.

- 5.2 The Work shall be Substantially Completed within <u>150</u> 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 180 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.

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.

#### 06. BID SECURITY

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

#### 07. REQUIRED LICENSES/CERTIFICATIONS

Contractor must possess the following licenses/certifications to be considered for award. State of Florida General Contractor's License. or State of Florida Electrical Contractor's License.

Note: Contractor <u>must</u> have proper licensing and be able to provide evidence of same, if requested, at time of award.

#### 08. 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.

It is required that the contractor has experience in the installation of a minimum of three (3) projects completed within the last five (5) years on electrical systems for new and existing buildings of similar scope and scale.

## REFERENCES SHOULD NOT INCLUDE CITY OF FORT LAUDERDALE EMPLOYEES OR WORK PERFORMED FOR THE CITY.

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

#### 09. BID ALLOWANCE

**Allowance for permits:** Payments will be made to the contractor based on the actual cost of permits upon submission of paid permit receipts. The City shall not pay for other costs related to obtaining or securing permits.

The amount indicated is intended to be sufficient to cover the entire project. If the City Permit fees exceed the allowance indicated, the City will reimburse the contractor the actual amount of City Permit Fees required for project completion.

Allowance	\$
Additional equipment rental allowance	2,000.00
Additional labor allowance	20,000.00
Additional material allowance	20,000.00
Permit fee allowance	15,000.00
Permit fees and testing allowance	2,000.00
TOTAL	59,000.00

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

- 10. INSURANCE REQUIREMENTS (See Article 10, Bonds and Insurance, of the Contract for details)
  Insurance
  - 10.1 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. <u>BINDERS ARE UNACCEPTABLE</u>. 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:

#### 10.2 <u>Commercial General Liability</u>

A. Limits of Liability:

Bodily Injury and Property Damage - Combined Single Limit
Each Occurrence \$1,000,000
Project Aggregate \$2,000,000
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

#### 10.3 <u>Business Automobile Liability</u>

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. <u>Endorsements Required:</u>

Waiver of Subrogation

#### 10.4 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.

- 10.5 <u>Umbrella/Excess Liability:</u> 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.
- 10.6 <u>Crane/On-Hook:</u> The Contractor will need to provide documentation of his Crane/On-Hook coverage in the amount of \$1,000,000, if any cranes are used during the course of the Project. Additionally, the Contractor will need to provide documentation of his subcontractors Crane/On-Hook coverage in the amount of \$1,000,000 if any of his subcontractors utilize any cranes during the course of this Project.
- 10.7 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 <u>Sample Insurance Certificate</u> 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.
- Additional Insurance Requirements (Grant) c) If Recipient elect to purchase any additional liability coverage, including excess liability coverage, Recipient agree that "Broward County" shall be listed as the certificate holder and included as an additional named insured on the certificate.

subcontractor(s) perform Recipient hires to services. its subcontractor(s) shall be required to endorse "Broward County" as an additional insured on any general liability and excess liability policies.

If Recipient elect to purchase any additional liability coverage, including excess liability coverage, Recipient agree that "Broward County" shall be listed as the certificate holder and included as an additional named insured on the certificate.

If Recipient hires subcontractor(s) to perform services, its subcontractor(s) shall be required to endorse "Broward County" as an additional insured on any general liability and excess liability policies.

11. PERFORMANCE AND PAYMENT BOND: 100% of Contract.

Number of awards anticipated: One

#### 12. CITY PROJECT MANAGER

The Project Manager is hereby designated by the City as Danica Grujicic whose address is 100 North Andrews, 5<sup>th</sup> Floor, Fort Lauderdale, FL 33301, telephone number: (954) 828-5055, and email address is <a href="mailto:dgrujicic@fortlauderdale.gov">dgrujicic@fortlauderdale.gov</a>. 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.

13. **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 Two Hundred and Fifty Dollars (\$250.00) 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)

#### 14. PAYMENT Payment on this contract will be made by Check

15.	<b>WORK SCHEDULE</b>	(including	overtime	hours).
10.	TTOINI COLLEGE	IIIIOIAAIIIA		110u13/.

Regular work hours: 7:30 am to 4:00 pm, Monday through Friday. City Inspector Hours: 8:00 am to 4:30 pm, Monday through Friday.

Any inspection requested by the contractor outside those hours will be considered overtime to be paid by the Contractor.

Work during Evenings and Weekends night be require since the project is in an Active Facility. Contractor shall plan on some work to be performed during non-business hours if needed.

**16. INSPECTION OVERTIME COST:** \$75.00

#### 17. MISCELLANEOUS GRANT INFORMATION

Recipient and its subcontractors shall preserve and make available at reasonable times, for examination and audit by County, all financial records, supporting documents, statistical records, and any other documents pertaining to this Agreement for the required retention period of the Florida Public Record Act, Chapter 119, Florida Statutes, if applicable, or for three (3) years after termination of this Agreement, whichever is longer. If any audit has been initiated and audit findings have not been resolved at the end of the applicable retention period, the books, records, and accounts shall be retained until resolution of the audit findings.

Department of Transportation funds shall comply with the non-discrimination requirements in 49.C.F.R. Parts 23 and 26. Recipient shall include substantially similar language in its contracts with any and all permitted subcontractor(s) or subconsultants.

## CITY OF FORT LAUDERDALE CONSTRUCTION AGREEMENT

	THIS	AGREE	MENI	made	and	entered	ınto	this		day	ot
			<u>, 20</u>	, by an	d betw	een the	City of	Fort	Lauderdale,	a Flo	rida
muni (parti	•	rporation	(City) a	nd					, (C	ontract	or),
	WHER	FAS the	City de	sires to I	retain a	contract	or for th	ne Pro	ject as expre	ssed in	n its
Invita									, which was		
			_; and,	, -	,	,					
						ed its will	lingness	and o	capability to p	erform	the
nece	ssary wo	ork to acco	mplish t	the Proje	ct.						

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 <u>Agreement</u> 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 <u>Application for Payment</u> 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 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 <u>Bid</u> 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 <u>Bid Documents</u> –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 <u>Certificate of Substantial Completion</u> 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 <u>Change Order</u> 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 <u>City</u> 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 <u>Contract Documents</u> 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 <u>Contract Price</u> 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 <u>Contract Time</u> 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 <u>Contractor</u> 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 <u>Defective</u> 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 <u>Final Completion Date</u> 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 <u>Hazardous Materials (HAZMAT)</u> 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 <u>Hazardous Substance</u> 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 <u>Hazardous Waste</u> 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 <u>Holidays</u> Those designated non-work days as established by the City Commission of the City of Fort Lauderdale.
- 1.21 <u>Inspection</u> 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 <u>Notice of Award</u> 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 <u>Notice to Proceed</u> 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 <u>Plans</u> 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 <u>Premises (otherwise known as Site or Work Site)</u> means the land, buildings, facilities, etc. upon which the Work is to be performed.
- 1.26 <u>Project</u> 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 <u>Punch List</u> 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 <u>Record Documents</u> 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 the Engineer of Record or a Professional Land Surveyor licensed in the State of Florida.
- 1.31 <u>Substantially Completed Date</u> 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.
- 1.32 <u>Work</u> 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:

## HOLIDAY PARK WAR MEMORIAL AUDITORIUM RENOVATIONS ITB 12089-183 PROJECT 12128

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

#### PROJECT DESCRIPTION

This project is located at 800 NE 8th Street, City of Fort Lauderdale. The work to be accomplished under this contract includes, but is not limited to, a complete upgrade of the existing electrical systems in the building including re-wiring and interior/exterior lighting fixtures replacement with low-energy efficient light-emitting diode (LED). The electrical upgrades also include replacement of backup emergency generator.

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 Danica Grujicic, whose address is 100 N. Andrews Avenue, 5th. Floor, Fort Lauderdale, FL 33301, telephone number: (954) 828-5055, and email address is dgrujicic@fortlauderdale.gov. 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.
	event of any conflict between the documents or any ambiguity or missing specification truction, the following priority is established:
	a. Specific direction from the City Manager (or designee).
	b. Approved change orders, addenda or amendments.
C	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
- 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 10 calendar days of the date of the Notice to Proceed.
- 5.2 The Work shall be Substantially Completed within 150 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 <a href="180">180</a> 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.

- 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 by check.

#### 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:

- 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 <u>Work Hours:</u> 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 <u>Law and Regulations</u>: 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 <u>Taxes:</u> 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 <u>Contractor Use of Premises:</u> 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 of 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 <u>Project Coordination:</u> 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 <u>Emergencies</u>: 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 <u>Environmental:</u> 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, undue 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 eq.).

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 date 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 <u>Public Construction and Other Bonds:</u> 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: 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.

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.

- 10.2 <u>Disqualification of Surety:</u> 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. <u>BINDERS ARE UNACCEPTABLE</u>. 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.
- The Contractor shall provide the City an original Certificate of Insurance В. 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 Such notification will be in writing by provide the proper notice. 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): 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.

# 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 \$2,000,000
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

# 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 <u>Umbrella/Excess Liability:</u> 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 AND NAME MUST APPEAR ON EACH CERTIFICATE, AND THE CITY OF FORTLAUDERDALE MUST BE NAMED ON THE CERTIFICATE AS AN "ADDITIONAL INSURED".

A <u>Sample Insurance Certificate</u> 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 <u>Warranty:</u> 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 <u>Warranty of Specifications:</u> 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 <u>Tests and Inspections:</u> 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 <u>Correction or Removal of Defective Work Before Final Payment:</u> 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.
- City May Correct Defective Work: If the Contractor fails within a reasonable time after 11.8 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 <u>Disclaimer of Liability:</u> 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 <u>Indemnification:</u> 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 quarantee.
  - 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 trails 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.
    - 4.1.3.3 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 <u>Not Included in the Cost of the Work:</u> 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, expediters, 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 <u>Basis of Compensation:</u> 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 <u>Cost Breakdown Required:</u> 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 <u>Rights of Various Interests:</u> 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 6 - LIQUIDATED DAMAGES

Upon failure of the Contractor to complete the Work within the time specified for 16.1 completion, the Contractor shall pay to the City the sum of Two Hundred and Fifty **Dollars (\$250.00)** 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.

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 <u>City May Suspend Work:</u> 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 <u>City's Right to Terminate Contract:</u> 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 Contactor 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 Contactor 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 Contactor 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 Contactor 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 additional 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 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.
  - 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 <u>Termination for Convenience</u>: 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 <u>not</u> 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	Contra	actor:			
•					

#### ARTICLE 20 – LIMITATION OF LIABILITY

- The City desires to enter into this Agreement only if in so doing the City can place a 20.1 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.
- Scrutinized Companies: Subject to Odebrecht Construction, Inc., v. Prasad, 876 22.7 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 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 <u>Attorney Fees</u>: 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 <a href="mailto:precontract@fortlauderdale.gov">PRRCONTRACT@fortlauderdale.gov</a>, 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.

# 23. ADDITIONAL INSURANCE AND MISCELLANEOUS GRANT INFORMATION

# Insurance

If Recipient elect to purchase any additional liability coverage, including excess liability coverage, Recipient agree that "Broward County" shall be listed as the certificate holder and included as an additional named insured on the certificate.

If Recipient hires subcontractor(s) to perform services, its subcontractor(s) shall be required to endorse "Broward County" as an additional insured on any general liability and excess liability policies.

### Miscellaneous

Recipient and its subcontractors shall preserve and make available at reasonable times, for examination and audit by County, all financial records, supporting documents, statistical records, and any other documents pertaining to this Agreement for the required retention period of the Florida Public Record Act, Chapter 119, Florida Statutes, if applicable, or for three (3) years after termination of this Agreement, whichever is longer. If any audit has been initiated and audit findings have not been resolved at the end of the applicable retention period, the books, records, and accounts shall be retained until resolution of the audit findings.

9.22. Department of Transportation funds shall comply with the non-discrimination requirements in 49.C.F.R Parts 23 and 26. Recipient shall include substantially similar language in its contracts with any and all permitted subcontractor(s) or sub-consultants.

# HOLIDAY PARK WAR MEMORIAL AUDITORIUM RENOVATIONS (Contractor) Project 12128

# 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:
(CORPORATE SEAL)	ATTEST:
NS	By:  JEFFREY A. MODARELLI City Clerk
NRILE CO	Approved as to Legal Form:
SAMI	By: RHONDA MONTOYA HASAN Assistant City Attorney

# CONTRACTOR

WITNESSES:	CONTRACTOR., a Florida corporation.				
	_ Ву				
Print Name	PRINT NAME	Title			
	ATTEST:	2 KKI			
Print Name	BY:				
(CORPORATE SEAL)	PRINT NAME	Secretary			
STATE OF FLORIDA: COUNTY OF BROWARD:	5/2				
Florida corporation, on behalf of the Co	(Title) of	day of, 2016, by			
SEAL	Notary Public, State of Fl	orida			
	Name of Notary Typed, F	Printed or Stamped			
☐ Personally Known or ☐ Produc	ed Identification:				
Type of Identification Produced:					

# **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

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, conflictions, 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 reestablishing 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 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:

Telephone Number: (954) 828-5002

Mailing Address: City Clerk's Office

100 N. Andrews Avenue Fort Lauderdale, FL 33301

E-mail: prrcontract@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.
- 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.

## SECTION 011200 - SPECIAL WORKING CONDITIONS

#### PART 1 - GENERAL

#### 1.1 SPECIAL CONDITIONS

- A. This renovations project will be done in phases. The contractor will coordinate with project manager and arrange for working areas, parking, staging and schedules so as not to interfere with daily operations. This is an active multi-purpose facility, thus all work shall be done around their operations with minimal disruption and extensive coordination. The contractor shall give Owner 5 days' notice indicating all upcoming planned work. A phasing plan by Contractor indicating scope and timeframe for each area of work shall be supplied and updated regularly as project proceeds. The contractor shall give a 2 week look-ahead for all work on said 5 day notices. A weekly meeting to review the 2 week look-ahead shall be held on site.
- B. The City of Fort Lauderdale brings to the Contractors attention that this project is in our War Memorial Auditorium, which is in operation. Areas of the facility will be closed to the contractor at certain times. Contractor shall coordinate all access with the City in advance. Contractor shall be responsible for coordination and notification of areas to be worked on.
- C. Contractor is responsible for the demolition and/or relocation of existing equipment as necessary for the performance of the Work.
- D. Contractor to prepare provide As-Built drawings after renovation is completed.
- E. Any asbestos containing material shall not be disturbed:
  - Exhibit A OSHA Asbestos Survey Report

## 1.2 WORK RESTRICTIONS

A. On-Site Work Hours: Work shall be generally performed inside the construction site during normal business working hours of 7:30 a.m. to 4:00 p.m., Monday through Friday, unless otherwise indicated. Also, contractor must be aware of both residential and commercial surroundings (traffic and operations). Contractor shall coordinate with the City of Fort Lauderdale the timing and scheduling of on-site inspections for this project.

#### B. DEFINITIONS:

- A. Work Hours: 7:30 AM through 4:00 PM, Monday through Friday.
- B. Business Hours: 7:00 AM through 5:00 PM, Monday through Friday.
- C. Off-Hours: Hours outside of Work Hours defined above.
- D. Early morning Hours: 7:00 AM through 8:30 AM, Monday through Friday.
- C. Schedule work with Owner to fit Owner's operations, to facilitate completion of this work, to coordinate with and expedite new construction work on project, and as follows:

Contractor shall schedule with Owner work that interferes with facility operation, including shut-off of mechanical and electrical services and encumbrance of Owner's ingress and egress routes and normal operation. Provide the following notice of planned interruption of services:

# 1.3 WORK SEQUENCE

- A. Work Sequence (Phasing): Conduct the Project in phases to provide the least possible interference to activities of the Owner's personnel, and to permit the orderly transfer of personnel and equipment to the renovated facilities. The building in which Project is located will be continuously occupied during construction. Coordinate construction efforts with Owner to minimize interference with Owner's operations.
  - 1. Achieve Substantial Completion (ready for Owner's occupancy) in one room before beginning work in the next.
- B. Notify Owner's Representative 7 calendar days prior to scheduled date of Substantial Completion of each phase of the Project. Before beginning successive phases of Work, comply with the following requirements:

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

**END OF SECTION 011200** 

Page 78 of 476

#### SECTION 012500 SUBSTITUTION 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 substitutions.
- B. Related Sections:
  - 1. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
  - 2. Divisions 02 through 33 Sections for specific requirements and limitations for substitutions.

#### 1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
  - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
  - 2. Substitutions for Convenience: Changes proposed by Contractor or City that are not required in order to meet other Project requirements but may offer advantage to the City either in terms of time or cost.

#### 1.4 ACTION SUBMITTALS

- A. 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. Substitution Request Form: Use CSI Form 13.1A.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner 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. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
- e. Samples, where applicable or requested.
- f. Certificates and qualification data, where applicable or requested.
- g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
- h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
- i. Research reports evidencing compliance with Florida Building Code in effect for Project.
- j. 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 date of receipt of purchase order, lack of availability, or delays in delivery.
- k. Cost information, including a proposal of change, if any, in the Contract Sum.
- Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
- m. 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 seven days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
  - a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.
  - c. No substitutions will be allowed after bidding unless requested by the City.

# 1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

# 1.6 PROCEDURES

A. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.

#### PART 2 - PRODUCTS

## 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 10 days prior to time required for preparation and review of related submittals.
  - 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:
    - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - b. Requested substitution provides sustainable design characteristics that specified product provided for achieving LEED prerequisites and credits.
    - c. Substitution request is fully documented and properly submitted.
    - d. Requested substitution will not adversely affect Contractor's construction schedule.
    - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - f. Requested substitution is compatible with other portions of the Work.
    - g. Requested substitution has been coordinated with other portions of the Work.
    - h. Requested substitution provides specified warranty.
    - 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.
- B. Substitutions for Convenience: Architect will only consider requests for substitution if received within 7 days after the Notice to the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.
  - 1. 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:
    - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
    - b. Requested substitution does not require extensive revisions to the Contract Documents.

- c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- d. Requested substitution provides sustainable design characteristics that specified product provided for achieving LEED prerequisites and credits.
- e. Substitution request is fully documented and properly submitted.
- f. Requested substitution will not adversely affect Contractor's construction schedule.
- g. Requested substitution has received necessary approvals of authorities having jurisdiction.
- h. Requested substitution is compatible with other portions of the Work.
- i. Requested substitution has been coordinated with other portions of the Work.
- j. Requested substitution provides specified warranty.
- k. 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.

PART 3 - EXECUTION (Not Used)

**END OF SECTION 012500** 

#### 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 "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

#### 1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

## 1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
  - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
    - a. City's Form Periodic Estimate for Partial Payment.
    - b. Submittals Schedule.
    - c. Contractor's Construction Schedule.
  - 2. Submit the Schedule of Values to City Representative at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
  - 3. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line

PAYMENT PROCEDURES 012900-1

items for the Schedule of Values. Provide at least one line item for each Specification Section.

- 1. Identification: Include the following Project identification on the Schedule of Values:
  - a. Project name and location.
  - b. Project Number
  - c. Contractor's name and address.
  - d. Date of submittal.
- 2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
  - a. Related Specification Section or Division.
  - b. Description of the Work.
  - c. Name of subcontractor.
  - d. Name of manufacturer or fabricator.
  - e. Name of supplier.
  - f. Change Orders (numbers) that affect value.
  - g. Dollar value.
    - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
- 3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate. Include separate line items under required principal subcontracts for operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration, documentation and training in the amount of 5 percent of the Contract Sum.
- 4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
- 5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
  - a. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.
- 6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- 7. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

- 8. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
  - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as General Conditions expense, at Contractor's option.
- 9. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

## 1.5 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. A copy of the agreed amounts will be signed by the parties 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 asbestos contractor and 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 asbestos contractor and 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:
  - List of subcontractors.
  - 2. Schedule of Values.
  - 3. Contractor's Construction Schedule (preliminary if not final).
  - 4. Products list.
  - 5. Schedule of unit prices.
  - 6. Submittals Schedule (preliminary if not final).
  - 7. List of Contractor's staff assignments.
  - 8. List of Contractor's principal consultants.
  - 9. Copies of building permits.
  - 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  - 11. Initial progress report.
  - 12. Report of preconstruction conference.
  - 13. Certificates of insurance and insurance policies.
  - 14. Performance and payment bonds.
  - 15. Data needed to acquire City's insurance.
  - 16. Initial settlement survey and damage report if required.
- J. 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.
  - Final meter readings for utilities, a measured record of stored fuel, and similar data as
    of date of Substantial Completion or when City took possession of and assumed
    responsibility for corresponding elements of the Work.
  - 6. Final, liquidated damages settlement statement.

PAYMENT PROCEDURES 012900-4

Holiday Park War Memorial Auditorium Renovations

Project 12128

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

Page 87 of 476

## 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
  - 2. Special Project Procedures
  - 3. Administrative and supervisory personnel
  - 4. Project meetings
  - 5. 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.

#### 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.
  - 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.
- B. 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.
- C. 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. Preinstallation conferences.
  - 7. Project closeout activities.
  - 8. Startup and adjustment of systems.
  - 9. Project closeout activities.

## 1.5 SUBMITTALS

- A. Key Personnel Names: Within 15 days of notice to proceed, 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 Section GC-29, "Contractor to Check Plans Specifications, and Data."
- 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.
  - 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 stationary, 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: Attend 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.
  - 2. Minutes: Record of significant discussions and agreements achieved.
    - a. Minutes from all meetings shall be prepared by the City, 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 emailed to all parties present.
    - 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(s), the Architect, 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. Protection of existing construction including landscape materials
  - 15. Work restrictions
  - 16. City's occupancy requirements
  - 17. Responsibility for temporary facilities and controls
  - 18. Major equipment deliveries and priorities
  - 19. Construction waste management and recycling
  - 20. Parking availability
  - 21. Working hours
  - 22. Safety and first-aid procedures
  - 23. Security procedures
  - 24. Housekeeping procedures including progress cleaning.
  - 25. Schedule of values.
  - 26. Processing of payments or contract.
  - 27. DHS Security Requirements

- C. Progress Meetings: Progress meetings shall be held at bi-weekly intervals. Coordinate dates of meetings with preparation of payment requests.
  - Attendees: In addition to representatives of City and Architect, 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. Contractor shall submit a two-week look ahead schedule for review at each progress meeting.
      - 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.
      - 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: City 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 24 hours, distribute minutes of the meeting by email 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.

# 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.
  - 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. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow seven working days for Architect'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 Architect's actions on submittals.
- f. Incomplete RFIs or RFIs with numerous errors.
- 2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
- 3. Architect'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 Division 01 Section "Contract Modification Procedures."
  - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect 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 Architect'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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

**END OF SECTION 013100** 

## 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. Submittals Schedule.
  - 2. Daily construction reports.
  - 3. Material location reports.
  - 4. Field condition reports.
  - 5. Special reports.
- B. Related Sections include the following:
  - 1. Division 01 Section "Payment Procedures" for submitting the Schedule of Values.
  - 2. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
  - 3. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
  - 4. Division 01 Section "Photographic Documentation" for submitting construction photographs.
  - 5. 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 Architect.
- 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

CONSTRUCTION PROGRESS DOCUMENTATION

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. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- H. Major Area: A story of construction, a separate building, or a similar significant construction element.
- I. Milestone: A key or critical point in time for reference or measurement.
- J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.
- K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

# 1.4 SUBMITTALS

- A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:
  - 1. Scheduled date for first submittal.
  - Specification Section number and title.
  - 3. Submittal category (action or informational).
  - Name of subcontractor.
  - 5. Description of the Work covered.
  - 6. Scheduled date for Architect's final release or approval.
- B. Contractor's Construction Schedule: Submit three opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
  - 1. Submit an electronic copy of schedule, using software indicated, on CD-R, and labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date on label.
- C. CPM Reports: Concurrent with CPM schedule, submit three copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
  - 1. Activity Report: List of all activities sorted by activity number and then early start date,

CONSTRUCTION PROGRESS DOCUMENTATION

- or actual start date if known.
- 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
- 3. Total Float Report: List of all activities sorted in ascending order of total float.
- 4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.
- D. Daily Construction Reports: Submit two copies at monthly intervals.
- E. Material Location Reports: Submit two copies at monthly intervals.
- F. Field Condition Reports: Submit two copies at time of discovery of differing conditions.
- G. Special Reports: Submit two copies at time of unusual event.

## 1.5 QUALITY ASSURANCE

A. Scheduling Personnel Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.

#### 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 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.

CONSTRUCTION PROGRESS DOCUMENTATION

- 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. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
  - 1. 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. The schedule shall clearly indicate the critical path and all activities associated with it. The dependencies shall be clearly delineated.
  - 2. All activities with a time duration exceeding five (5) days shall be shown as separate items.
  - 3. Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
  - 4. Where materials require more than one (1) week fabrication or order time, this order/fabrication time shall be shown.
  - 5. Include not less than 3 days for startup and testing.
- 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. Work under More Than One Contract: Include a separate activity for each contract.
  - 3. Work by City: Include a separate activity for each portion of the Work performed by City.
  - 4. 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.
  - 5. City-Furnished Products: 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.
  - 6. 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.

CONSTRUCTION PROGRESS DOCUMENTATION

- f. Provisions for future construction.
- g. Seasonal variations.
- h. Environmental control.
- 7. 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. Mockups.
  - e. Fabrication.
  - f. Sample testing.
  - g. Deliveries.
  - h. Installation.
  - i. Tests and inspections.
  - j. Adjusting.
  - k. Curing.
  - Startup and placement into final use and operation.
- 8. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
  - a. Structural completion.
  - b. Permanent space enclosure.
  - c. Completion of mechanical installation.
  - d. Completion of electrical installation.
  - e. Substantial Completion.
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, Final Completion, and Certificate of Occupancy.
- F. Cost Correlation: At the head of schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of the Work performed as of dates used for preparation of payment requests.
  - 1. Refer to Division 01 Section "Payment Procedures" for cost reporting and payment procedures.
  - 2. Contractor shall assign cost to construction activities on the CPM schedule. Costs shall not be assigned to submittal activities unless specified otherwise but may, with Architect's approval, be assigned to fabrication and delivery activities. Costs shall be under required principal subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.
  - 3. Each activity cost shall reflect an accurate value subject to approval by Architect.
  - 4. Total cost assigned to activities shall equal the total Contract Sum.

CONSTRUCTION PROGRESS DOCUMENTATION

- G. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.
- H. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules.
  - 1. Microsoft Project 2007 for Windows operating system.

# 2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 30 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 to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

# 2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Preliminary Network Diagram: Submit diagram within 7 days of date established for the Notice to Proceed. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized, costand resource-loaded, time-scaled CPM network analysis diagram for the Work.
  - 1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 30 days after date established for the Notice to Proceed.
    - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
  - 2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
  - 3. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
  - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

CONSTRUCTION PROGRESS DOCUMENTATION

- a. Preparation and processing of submittals.
- b. Mobilization and demobilization.
- c. Purchase of materials.
- d. Delivery.
- e. Fabrication.
- f. Utility interruptions.
- g. Installation.
- h. Work by City that may affect or be affected by Contractor's activities.
- i. Testing and commissioning.
- 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
- 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
- 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
  - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
  - 1. Contractor or subcontractor and the Work or activity.
  - 2. Description of activity.
  - 3. Principal events of activity.
  - 4. Immediate preceding and succeeding activities.
  - 5. Early and late start dates.
  - 6. Early and late finish dates.
  - 7. Activity duration in workdays.
  - 8. Total float or slack time.
  - 9. Average size of workforce.
  - 10. Dollar value of activity (coordinated with the Schedule of Values).
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
  - 1. Identification of activities that have changed.
  - Changes in early and late start dates.
  - 3. Changes in early and late finish dates.
  - 4. Changes in activity durations in workdays.
  - 5. Changes in the critical path.
  - 6. Changes in total float or slack time.
  - 7. Changes in the Contract Time.
- G. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
  - 1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
  - 2. In second list, tabulate activity number, late finish date, dollar value, and cumulative

CONSTRUCTION PROGRESS DOCUMENTATION

- dollar value.
- 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
- 4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
  - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
  - b. Submit value summary printouts one week before each regularly scheduled progress meeting.

#### 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. Approximate count of personnel at Project site.
  - 3. Equipment at Project site.
  - 4. Material deliveries.
  - 5. High and low temperatures and general weather conditions.
  - Accidents.
  - 7. Meetings and significant decisions.
  - 8. Unusual events (refer to special reports).
  - 9. Stoppages, delays, shortages, and losses.
  - 10. Emergency procedures.
  - 11. Orders and requests of authorities having jurisdiction.
  - 12. Change Orders received and implemented.
  - 13. Construction Change Directives received and implemented.
  - 14. Services connected and disconnected.
  - 15. Equipment or system tests and startups.
  - 16. Partial Completions and occupancies.
  - 17. Substantial Completions authorized.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field 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.

CONSTRUCTION PROGRESS DOCUMENTATION

List chain of events, persons participating, 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.
  - 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 Architect, City Representative, 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

## 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. Time lapse photographs.
  - 4. Final Completion construction photographs.
- 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 and construction videotapes as Project Record Documents at Project closeout.

#### 1.3 SUBMITTALS

- A. Construction Photographs: Submit digital media files of each photographic view within seven days of taking photographs.
  - 1. Format: Compact Disc(s) with jpg format, uncropped unedited photograph files numbered by date taken. File names shall be in the following format: City project number date taken picture number (example: 10350-040804-011 would indicate project number 10350 taken on April 8, 2004 photograph number 11). Submit in CD jewel case.
  - 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 USAGE RIGHTS

A. 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 highest quality JPEG format produced by a digital camera with minimum sensor size of 4.0 megapixels, and at an image resolution of not less than

PHOTOGRAPHIC DOCUMENTATION

1600 by 1200 pixels.

#### PART 3 - EXECUTION

#### 3.1 CONSTRUCTION PHOTOGRAPHS

- A. Aerial Photographer: Engage a qualified commercial aerial photographer to take aerial construction photographs.
- 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.
  - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- C. Daily Progress Photographs: Take daily photographs to document progress. Take photographs of all work that will be concealed by subsequent construction activity (such as rough electrical, rough plumbing and rough ductwork). 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.
  - Field Office Images: Maintain one set of images on CD-ROM in 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 starting construction, take color photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.
  - 1. Flag excavation areas and construction limits before taking construction photographs.
  - 2. Take eight photographs to show existing conditions adjacent to property before starting the Work.
  - 3. Take eight photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
  - 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- F. Periodic Construction Photographs: Take minimum 15, digital 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. Time-Lapse Sequence Construction Photographs: Take daily, digital photographs to show status of construction and progress. Contractor to submit digital photographs on CD with each application for payment.
  - 1. Frequency: Take photographs daily, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment.

PHOTOGRAPHIC DOCUMENTATION

- 2. Vantage Points: Following suggestions by Architect and Contractor, photographer to select vantage points. During each of the following construction phases, take not less than two of the required shots from same vantage point each time to create a time-lapse sequence as follows:
  - a. Commencement of the Work, through completion of subgrade construction.
  - b. Above-grade structural framing.
  - c. Exterior building enclosure.
  - d. Interior Work, through date of Substantial Completion.
- H. Final Completion Construction Photographs: Take eight color photographs after date of Substantial Completion for submission as Project Record Documents. Architect will direct photographer for desired vantage points.
  - 1. Do not include date stamp.

END OF SECTION 013233

## 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. This Section includes 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 and construction videotapes.
  - 5. Division 01 Section "Quality Requirements" for submitting test and inspection reports and for mockup requirements.
  - 6. Division 01 Section "Closeout Procedures" for submitting warranties.
  - 7. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
  - 8. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
  - 9. Division 01 Section "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of City's personnel.
  - 10. Divisions 02 through 48 Sections for specific requirements for submittals in those Sections.

## 1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

## 1.4 SUBMITTAL PROCEDURES

- A. General: Architect may provide electronic copies of CAD Drawings of the Contract Drawings for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

SUBMITTAL PROCEDURES

- 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
- Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
  - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Submittals Schedule: Comply with requirements in Division 01 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.
- D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect'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 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect 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 10 days for review of each resubmittal.
- E. Identification: Place a permanent label or title block on each submittal for identification.
  - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
  - 2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
  - 3. Include the following information on label for processing and recording action taken:
    - a. Project name.
    - b. Date.
    - c. Name and address of Contractor.
    - d. Name and address of subcontractor.
    - e. Name and address of supplier.
    - f. Name of manufacturer.
    - g. Submittal number or other unique identifier, including revision identifier.
      - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).
    - h. Number and title of appropriate Specification Section.
    - i. Drawing number and detail references, as appropriate.
    - j. Location(s) where product is to be installed, as appropriate.
    - k. General Contractor's stamp of approval must be on all submittals, indicating that the Contractor has reviewed and approved prior to submitting to the City.

SUBMITTAL PROCEDURES

- F. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
- G. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
- H. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.
  - 1. Transmittal Form: Provide locations on form for the following information:
    - a. Project name.
    - b. Date.
    - c. Destination (To:).
    - d. Source (From:).
    - e. Names of subcontractor, manufacturer, and supplier.
    - f. Category and type of submittal.
    - g. Submittal purpose and description.
    - h. Specification Section number and title.
    - i. Drawing number and detail references, as appropriate.
    - j. Transmittal number, numbered consecutively.
    - k. Remarks.
    - I. Signature of transmitter.
- I. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
  - 1. Note date and content of previous submittal.
  - Note date and content of revision in label or title block and clearly indicate extent of revision
  - 3. Resubmit submittals until they are marked "Approved as submitted" or "Approved as noted".
- J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- K. Use for Construction: Use only final submittals with mark indicating "Approved as submitted" or "Approved as noted" by Architect.
- 1.5 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES
  - A. General: At Contractor's written request, copies of Architect's CAD files will be provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:
    - 1. CAD files will only be provided to the contractor upon written request by the contractor and upon receipt by the Architect of the signed release form provided by the Architect.

#### PART 2 - PRODUCTS

#### 2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
  - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
  - 2. Mark each copy of each submittal to show which products and options are applicable.
  - 3. Include the following information, as applicable:
    - a. Manufacturer's written recommendations.
    - b. Manufacturer's product specifications.
    - c. Manufacturer's installation instructions.
    - d. Standard color charts.
    - e. Manufacturer's catalog cuts.
    - f. Wiring diagrams showing factory-installed wiring.
    - g. Printed performance curves.
    - h. Operational range diagrams.
    - i. Mill reports.
    - j. Standard product operation and maintenance manuals.
    - k. Compliance with specified referenced standards.
    - Testing by recognized testing agency.
    - m. Application of testing agency labels and seals.
    - n. Notation of coordination requirements.
  - 4. Submit Product Data before or concurrent with Samples.
  - 5. Number of Copies: Submit five copies of Product Data, unless otherwise indicated. Architect will return two copies. Mark up and retain one returned copy as a Project Record Document.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal of Architect's CAD Drawings are otherwise permitted.
  - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Dimensions.
    - b. Identification of products.
    - c. Fabrication and installation drawings.
    - d. Roughing-in and setting diagrams.
    - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    - f. Shopwork manufacturing instructions.
    - g. Templates and patterns.
    - h. Schedules.
    - i. Design calculations.
    - j. Compliance with specified standards.

SUBMITTAL PROCEDURES

- k. Notation of coordination requirements.
- I. Notation of dimensions established by field measurement.
- m. Relationship to adjoining construction clearly indicated.
- n. Seal and signature of professional engineer if specified.
- o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
- 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 (215 by 280 mm) but no larger than 24 by 36 inches (750 by 1000 mm).
- Number of Copies: Submit five opaque copies of each submittal, unless copies are required for operation and maintenance manuals. Submit seven copies where copies are required for operation and maintenance manuals. Architect will retain three copies; remainder will be returned. Submit one additional copy for any submittal that must be reviewed by consultant,
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
  - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  - 2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of appropriate Specification Section.
  - 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    - b. Samples not incorporated into the Work, or otherwise designated as City's property, are the property of Contractor.
  - 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
    - a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
  - 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches

SUBMITTAL PROCEDURES 013300-5

showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a Project Record Sample.
  - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
  - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
  - 1. Type of product. Include unique identifier for each product.
  - 2. Number and name of room or space.
  - 3. Location within room or space.
  - 4. Number of Copies: Submit five copies of product schedule or list, unless otherwise indicated. Architect will return two copies.
    - a. Mark up and retain one returned copy as a Project Record Document.
- F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation" for Construction Manager's action.
- G. Submittals Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- H. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."
- I. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
- J. 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.
  - 3. Drawing number and detail references, as appropriate, covered by subcontract.
  - 4. Number of Copies: Submit four copies of subcontractor list, unless otherwise indicated. Architect will return two copies.
    - a. Mark up and retain one returned copy as a Project Record Document.

SUBMITTAL PROCEDURES

## 2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
  - 1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
  - 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
  - 3. Test and Inspection Reports: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- C. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and City's, and other information specified.
- E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- H. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- I. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- J. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- L. Research/Evaluation Reports: Prepare written evidence, from a model code organization

SUBMITTAL PROCEDURES

acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

- 1. Name of evaluation organization.
- 2. Date of evaluation.
- 3. Time period when report is in effect.
- 4. Product and manufacturers' names.
- 5. Description of product.
- 6. Test procedures and results.
- 7. Limitations of use.
- M. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- N. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- O. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- P. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- Q. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- R. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- S. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
  - 1. Preparation of substrates.
  - Required substrate tolerances.
  - 3. Sequence of installation or erection.
  - 4. Required installation tolerances.
  - 5. Required adjustments.
  - 6. Recommendations for cleaning and protection.
- T. Manufacturer's Field Reports: Prepare written information documenting factory-authorized

SUBMITTAL PROCEDURES

service representative's tests and inspections. Include the following, as applicable:

- 1. Name, address, and telephone number of factory-authorized service representative making report.
- 2. Statement on condition of substrates and their acceptability for installation of product.
- 3. Statement that products at Project site comply with requirements.
- 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
- 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
- 6. Statement whether conditions, products, and installation will affect warranty.
- 7. Other required items indicated in individual Specification Sections.
- U. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- V. Construction Photographs: Comply with requirements specified in Division 01 Section "Photographic Documentation."
  - 1. Material Safety Data Sheets (MSDSs): Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.

## 2.3 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
  - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

## PART 3 - EXECUTION

# 3.1 CONTRACTOR'S REVIEW

- A. 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 Architect.
- B. 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, date of Contractor's approval, and statement certifying that submittal has been

SUBMITTAL PROCEDURES

reviewed, checked, and approved for compliance with the Contract Documents.

#### 3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect 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: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Partial 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 014000 - QUALITY 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.

# 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, City, Construction Manager, or authorities having jurisdiction are not limited by provisions of this Section.

# C. Related Sections include the following:

- 1. Division 01 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
- 2. Divisions 02 through 48 Sections for specific test and inspection requirements.

# 1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect or Construction Manager.
- C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where

- indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.
- D. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.
- E. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- J. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
  - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- K. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

## 1.4 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

# 1.5 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
  - 1. Specification Section number and title.
  - 2. Description of test and inspection.
  - 3. Identification of applicable standards.
  - 4. Identification of test and inspection methods.
  - 5. Number of tests and inspections required.
  - 6. Time schedule or time span for tests and inspections.
  - 7. Entity responsible for performing tests and inspections.
  - 8. Requirements for obtaining samples.
  - 9. Unique characteristics of each quality-control service.
- C. Reports: Prepare and submit certified written reports that include the following:
  - 1. Date of issue.
  - 2. Project title and number.
  - 3. Name, address, and telephone number of testing agency.
  - 4. Dates and locations of samples and tests or inspections.
  - 5. Names of individuals making tests and inspections.
  - 6. Description of the Work and test and inspection method.
  - 7. Identification of product and Specification Section.
  - 8. Complete test or inspection data.
  - 9. Test and inspection results and an interpretation of test results.
  - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  - 12. Name and signature of laboratory inspector.
  - 13. Recommendations on retesting and reinspecting.
- D. Permits, Licenses, and Certificates: For City's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

# 1.6 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
  - 1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
  - 1. Contractor responsibilities include the following:
    - a. Provide test specimens representative of proposed products and construction.
    - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
    - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.

- f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
- Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, through Construction Manager, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
  - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect or Construction Manager.
  - 2. Notify Architect and Construction Manager seven days in advance of dates and times when mockups will be constructed.
  - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
  - 4. Obtain Architect's and Construction Manager's approval of mockups before starting work, fabrication, or construction.
    - a. Allow seven days for initial review and each re-review of each mockup.
  - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  - 6. Demolish and remove mockups when directed, unless otherwise indicated.
- K. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Sections in Divisions 02 through 49. Contractor shall submit shop drawings for review by all agencies and City.

## 1.7 QUALITY CONTROL

- A. City Responsibilities: Where quality-control services are indicated as City's responsibility, City will engage a qualified testing agency to perform these services.
  - 1. City will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  - 2. Payment for these services will be made by the City directly to the testing agency.
  - 3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Tests and inspections not explicitly assigned to City are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
  - 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

- a. Contractor shall not employ same entity engaged by City, unless agreed to in writing.
- 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
- 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
- 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
- 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with City and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
  - 1. Notify City and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  - 5. Do not releases, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  - 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
  - 1. Access to the Work.
  - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
  - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
  - 4. Facilities for storage and field curing of test samples.
  - 5. Delivery of samples to testing agencies.
  - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  - 7. Security and protection for samples and for testing and inspecting equipment at Project site.

- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
  - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for commencement of the Work.
  - 1. Distribution: Distribute schedule to City, Architect, Construction Manager, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

#### 3.1 TEST AND INSPECTION LOG

- A. Prepare a record of tests and inspections. Include the following:
  - Date test or inspection was conducted.
  - 2. Description of the Work tested or inspected.
  - 3. Date test or inspection results were transmitted to Architect.
  - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's and Construction Manager's reference during normal working hours.

#### 3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  - 1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. This includes all site work adjacent to property.
  - 2. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

**END OF SECTION 014000** 

#### SECTION 014200 - REFERENCES

#### 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 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

#### 1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- Publication Dates: Comply with standards in effect as of date of the Contract Documents B. unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
  - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

#### 1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association, Inc. (The) www.aluminum.org	(703) 358-2960
AABC	Associated Air Balance Council www.aabchq.com	(202) 737-0202
AAMA	American Architectural Manufacturers Association www.aamanet.org	(847) 303-5664
AASHTO	American Association of State Highway and Transportation Officials www.transportation.org	(202) 624-5800
AATCC	American Association of Textile Chemists and Colorists (The) www.aatcc.org	(919) 549-8141
ABAA	Air Barrier Association of America www.airbarrier.org	(866) 956-5888
ACI	ACI International (American Concrete Institute) www.aci-int.org	(248) 848-3700
ACPA	American Concrete Pipe Association www.concrete-pipe.org	(972) 506-7216
AEIC	Association of Edison Illuminating Companies, Inc. (The) www.aeic.org	(205) 257-2530

AF&PA	American Forest & Paper Association www.afandpa.org	(800) 878-8878 (202) 463-2700
AGA	American Gas Association www.aga.org	(202) 824-7000
AGC	Associated General Contractors of America (The) www.agc.org	(703) 548-3118
AHAM	Association of Home Appliance Manufacturers www.aham.org	(202) 872-5955
Al	Asphalt Institute www.asphaltinstitute.org	(859) 288-4960
AIA	American Institute of Architects (The) www.aia.org	(800) 242-3837 (202) 626-7300
AISC	American Institute of Steel Construction www.aisc.org	(800) 644-2400 (312) 670-2400
AISI	American Iron and Steel Institute www.steel.org	(202) 452-7100
AITC	American Institute of Timber Construction www.aitc-glulam.org	(303) 792-9559
ALCA	Associated Landscape Contractors of America (Now PLANET - Professional Landcare Network)	
ALSC	American Lumber Standard Committee, Incorporated www.alsc.org	(301) 972-1700
AMCA	Air Movement and Control Association International, Inc. www.amca.org	(847) 394-0150
ANSI	American National Standards Institute www.ansi.org	(202) 293-8020
APA	Architectural Precast Association www.archprecast.org	(239) 454-6989
APA	APA - The Engineered Wood Association www.apawood.org	(253) 565-6600
APA EWS	APA - The Engineered Wood Association; Engineered Wood Systems (See APA - The Engineered Wood Association)	
API	American Petroleum Institute www.api.org	(202) 682-8000
ARI	Air-Conditioning & Refrigeration Institute	(703) 524-8800

	<b>5</b>	
ARMA	Asphalt Roofing Manufacturers Association www.asphaltroofing.org	(202) 207-0917
ASCE	American Society of Civil Engineers www.asce.org	(800) 548-2723 (703) 295-6300
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute (See ASCE)	
ASHRAE	American Society of Heating, Refrigerating and Air- Conditioning Engineers www.ashrae.org	(800) 527-4723 (404) 636-8400
ASME	ASME International (The American Society of Mechanical Engineers International) www.asme.org	(800) 843-2763 (973) 882-1170
ASSE	American Society of Sanitary Engineering www.asse-plumbing.org	(440) 835-3040
ASTM	ASTM International (American Society for Testing and Materials International) www.astm.org	(610) 832-9585
AWCI	AWCI International (Association of the Wall and Ceiling Industry International) www.awci.org	(703) 534-8300
AWCMA	American Window Covering Manufacturers Association (Now WCSC)	
AWI	Architectural Woodwork Institute www.awinet.org	(571) 323-3636
AWPA	American Wood-Preservers' Association www.awpa.com	(205) 733-4077
AWS	American Welding Society www.aws.org	(800) 443-9353 (305) 443-9353
AWWA	American Water Works Association www.awwa.org	(800) 926-7337 (303) 794-7711
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	(212) 297-2122
CCC	Carpet Cushion Council www.carpetcushion.org	(610) 527-3880

CDA	Copper Development Association www.copper.org	(800) 232-3282 (212) 251-7200
CFFA	Chemical Fabrics & Film Association, Inc. www.chemicalfabricsandfilm.com	(216) 241-7333
CGA	Compressed Gas Association www.cganet.com	(703) 788-2700
CIMA	Cellulose Insulation Manufacturers Association www.cellulose.org	(888) 881-2462 (937) 222-2462
CISCA	Ceilings & Interior Systems Construction Association www.cisca.org	(630) 584-1919
CISPI	Cast Iron Soil Pipe Institute www.cispi.org	(423) 892-0137
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.org	(301) 596-2583
CRRC	Cool Roof Rating Council www.coolroofs.org	(866) 465-2523 (510) 485-7175
CPA	Composite Panel Association www.pbmdf.com	(301) 670-0604
CPPA	Corrugated Polyethylene Pipe Association www.cppa-info.org	(800) 510-2772 (202) 462-9607
CRI	Carpet & Rug Institute (The) www.carpet-rug.com	(800) 882-8846 (706) 278-3176
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	(847) 517-1200
CSI	Construction Specifications Institute (The) www.csinet.org	(800) 689-2900 (703) 684-0300
СТІ	Cooling Technology Institute (Formerly: Cooling Tower Institute) www.cti.org	(281) 583-4087
DHI	Door and Hardware Institute www.dhi.org	(703) 222-2010
EIA	Electronic Industries Alliance www.eia.org	(703) 907-7500
EIMA	EIFS Industry Members Association www.eima.com	(800) 294-3462 (770) 968-7945
EJCDC	Engineers Joint Contract Documents Committee	(703) 295-5000

	www.ejdc.org	
EJMA	Expansion Joint Manufacturers Association, Inc. www.ejma.org	(914) 332-0040
FM Approvals	FM Approvals www.fmglobal.com	(781) 762-4300
FM Global	FM Global (Formerly: FMG - FM Global) www.fmglobal.com	(401) 275-3000
FMRC	Factory Mutual Research (Now FM Global)	
FRSA	Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc. www.floridaroof.com	(407) 671-3772
FSA	Fluid Sealing Association www.fluidsealing.com	(610) 971-4850
FSC	Forest Stewardship Council www.fsc.org	49 228 367 66 0
GA	Gypsum Association www.gypsum.org	(202) 289-5440
GANA	Glass Association of North America www.glasswebsite.com	(785) 271-0208
GS	Green Seal www.greenseal.org	(202) 872-6400
GSI	Geosynthetic Institute www.geosynthetic-institute.org	(610) 522-8440
HI	Hydraulic Institute www.pumps.org	(888) 786-7744 (973) 267-9700
HI	Hydronics Institute www.gamanet.org	(908) 464-8200
HMMA	Hollow Metal Manufacturers Association (Part of NAAMM)	
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	(703) 435-2900
IAS	International Approval Services (Now CSA International)	
ICEA	Insulated Cable Engineers Association, Inc.	(770) 830-0369

Page 129 of 476

Tollday Lark Wal Mc	morial Auditorium Renovations	Troject
	www.icea.net	
ICRI	International Concrete Repair Institute, Inc. www.icri.org	(847) 827-0830
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The) www.ieee.org	(212) 419-7900
IESNA	Illuminating Engineering Society of North America www.iesna.org	(212) 248-5000
IEST	Institute of Environmental Sciences and Technology www.iest.org	(847) 255-1561
IGCC	Insulating Glass Certification Council www.igcc.org	(315) 646-2234
IGMA	Insulating Glass Manufacturers Alliance www.igmaonline.org	(613) 233-1510
ISO	International Organization for Standardization www.iso.ch	41 22 749 01 11
	Available from ANSI www.ansi.org	(202) 293-8020
ISSFA	International Solid Surface Fabricators Association www.issfa.net	(877) 464-7732 (702) 567-8150
ITS	Intertek Testing Service NA www.intertek.com	(972) 238-5591
KCMA	Kitchen Cabinet Manufacturers Association www.kcma.org	(703) 264-1690
LEED	Leadership in Energy Conscious and Environmental Design	
LMA	Laminating Materials Association (Now part of CPA)	
LPI	Lightning Protection Institute www.lightning.org	(800) 488-6864
MBMA	Metal Building Manufacturers Association www.mbma.com	(216) 241-7333
MFMA	Metal Framing Manufacturers Association, Inc. www.metalframingmfg.org	(312) 644-6610
МН	Material Handling (Now MHIA)	
MHIA	Material Handling Industry of America www.mhia.org	(800) 345-1815 (704) 676-1190

Page 130 of 476

MIA	Marble Institute of America www.marble-institute.com	(440) 250-9222
MPI	Master Painters Institute www.paintinfo.com	(888) 674-8937
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc. www.mss-hq.com	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	(312) 332-0405
NACE	NACE International (National Association of Corrosion Engineers International) www.nace.org	(800) 797-6623 (281) 228-6200
NADCA	National Air Duct Cleaners Association www.nadca.com	(202) 737-2926
NAIMA	North American Insulation Manufacturers Association www.naima.org	(703) 684-0084
NBGQA	National Building Granite Quarries Association, Inc. www.nbgqa.com	(800) 557-2848
NCMA	National Concrete Masonry Association www.ncma.org	(703) 713-1900
NCPI	National Clay Pipe Institute www.ncpi.org	(262) 248-9094
NCTA	National Cable & Telecommunications Association www.ncta.com	(202) 775-3550
NEBB	National Environmental Balancing Bureau www.nebb.org	(301) 977-3698
NECA	National Electrical Contractors Association www.necanet.org	(301) 657-3110
NeLMA	Northeastern Lumber Manufacturers' Association www.nelma.org	(207) 829-6901
NEMA	National Electrical Manufacturers Association www.nema.org	(703) 841-3200
NETA	InterNational Electrical Testing Association www.netaworld.org	(888) 300-6382 (303) 697-8441
NFPA	NFPA (National Fire Protection Association)	(800) 344-3555 (617) 770-3000

•		ý ,
	www.nfpa.org	
NFRC	National Fenestration Rating Council www.nfrc.org	(301) 589-1776
NGA	National Glass Association www.glass.org	(866) 342-5642 (703) 442-4890
NHLA	National Hardwood Lumber Association www.natlhardwood.org	(800) 933-0318 (901) 377-1818
NLGA	National Lumber Grades Authority www.nlga.org	(604) 524-2393
NOFMA	NOFMA: The Wood Flooring Manufacturers Association (Formerly: National Oak Flooring Manufacturers Association) www.nofma.com	(901) 526-5016
NRCA	National Roofing Contractors Association www.nrca.net	(800) 323-9545 (847) 299-9070
NRMCA	National Ready Mixed Concrete Association www.nrmca.org	(888) 846-7622 (301) 587-1400
NSF	NSF International (National Sanitation Foundation International) www.nsf.org	(800) 673-6275 (734) 769-8010
NSSGA	National Stone, Sand & Gravel Association www.nssga.org	(800) 342-1415 (703) 525-8788
NTRMA	National Tile Roofing Manufacturers Association (Now TRI)	
NWWDA	National Wood Window and Door Association (Now WDMA)	
PCI	Precast/Prestressed Concrete Institute www.pci.org	(312) 786-0300
PDCA	Painting & Decorating Contractors of America www.pdca.com	(800) 332-7322 (314) 514-7322
PDI	Plumbing & Drainage Institute www.pdionline.org	(800) 589-8956 (978) 557-0720
PGI	PVC Geomembrane Institute http://pgi-tp.ce.uiuc.edu	(217) 333-3929
PLANET	Professional Landcare Network (Formerly: ACLA - Associated Landscape Contractors of America)	(800) 395-2522 (703) 736-9666

Page 132 of 476

	www.landcarenetwork.org	
PTI	Post-Tensioning Institute www.post-tensioning.org	(602) 870-7540
RCSC	Research Council on Structural Connections www.boltcouncil.org	
RFCI	Resilient Floor Covering Institute www.rfci.com	(301) 340-8580
SAE	SAE International www.sae.org	(877) 606-7323 (724) 776-4841
SDI	Steel Deck Institute www.sdi.org	(847) 458-4647
SDI	Steel Door Institute www.steeldoor.org	(440) 899-0010
SEFA	Scientific Equipment and Furniture Association www.sefalabs.com	(516) 294-5424
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers (See ASCE)	
SGCC	Safety Glazing Certification Council www.sgcc.org	(315) 646-2234
SIA	Security Industry Association www.siaonline.org	(703) 683-2075
SIGMA	Sealed Insulating Glass Manufacturers Association (Now IGMA)	
SJI	Steel Joist Institute www.steeljoist.org	(843) 626-1995
SMA	Screen Manufacturers Association www.smacentral.org	(561) 533-0991
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	(703) 803-2980
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division) www.sprayfoam.org	(800) 523-6154
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	(850) 434-2611

Page 133 of 476

SPRI	Single Ply Roofing Industry www.spri.org	(781) 647-7026
SSINA	Specialty Steel Industry of North America www.ssina.com	(800) 982-0355 (202) 342-8630
SSPC	SSPC: The Society for Protective Coatings www.sspc.org	(877) 281-7772 (412) 281-2331
STI	Steel Tank Institute www.steeltank.com	(847) 438-8265
SWRI	Sealant, Waterproofing, & Restoration Institute www.swrionline.org	(816) 472-7974
TCA	Tile Council of America, Inc. www.tileusa.com	(864) 646-8453
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance www.tiaonline.org	(703) 907-7700
TMS	The Masonry Society www.masonrysociety.org	(303) 939-9700
TPI	Truss Plate Institute, Inc. www.tpinst.org	(703) 683-1010
TPI	Turfgrass Producers International www.turfgrasssod.org	(800) 405-8873 (847) 649-5555
TRI	Tile Roofing Institute www.tileroofing.org	(312) 670-4177
UL	Underwriters Laboratories Inc. www.ul.com	(877) 854-3577 (847) 272-8800
UNI	Uni-Bell PVC Pipe Association www.uni-bell.org	(972) 243-3902
USGBC	U.S. Green Building Council www.usgbc.org	(202) 828-7422
WASTEC	Waste Equipment Technology Association www.wastec.org	(800) 424-2869 (202) 244-4700
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	(800) 283-1486 (503) 639-0651
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)	(800) 223-2301 (847) 299-5200

Page 134 of 476

www.wdma	.com
----------	------

WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California) www.wicnet.org	(916) 372-9943
WIC	Woodwork Institute of California (Now WI)	
WMMPA	Wood Moulding & Millwork Producers Association www.wmmpa.com	(800) 550-7889 (530) 661-9591

WSRCA Western States Roofing Contractors Association (800) 725-0333 www.wsrca.com (650) 570-5441

WWPA Western Wood Products Association (503) 224-3930

www.wwpa.org

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

IAPMO	International Association of Plumbing and Mechanical Officials www.iapmo.org	(909) 472-4100
ICC	International Code Council www.iccsafe.org	(888) 422-7233 (703) 931-4533
ICC-ES	ICC Evaluation Service, Inc. www.icc-es.org	(800) 423-6587 (562) 699-0543
FBC	Florida Building Code	(850) 487-1824

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

CE Army Corps of Engineers www.usace.army.mil

CPSC	Consumer Product Safety Commission www.cpsc.gov	(800) 638-2772 (301) 504-7923
DOD	Department of Defense http://.dodssp.daps.dla.mil	(215) 697-6257
DOE	Department of Energy www.energy.gov	(202) 586-9220
EPA	Environmental Protection Agency	(202) 272-0167

REFERENCES

FAA	Federal Aviation Administration www.faa.gov	(866) 835-5322
FCC	Federal Communications Commission www.fcc.gov	(888) 225-5322
FDA	Food and Drug Administration www.fda.gov	(888) 463-6332
GSA	General Services Administration www.gsa.gov	(800) 488-3111
HUD	Department of Housing and Urban Development www.hud.gov	(202) 708-1112
NCHRP National Cooperative Highway Research Program (See TRB)		
NIST	National Institute of Standards and Technology www.nist.gov	(301) 975-6478
OSHA	Occupational Safety & Health Administration www.osha.gov	(800) 321-6742 (202) 693-1999
TRB	Transportation Research Board http://gulliver.trb.org	(202) 334-2934
USDA	Department of Agriculture www.usda.gov	(202) 720-2791

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

ADAAG	Americans with Disabilities Act (ADA) Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	(800) 872-2253 (202) 272-0080
CFR	Code of Federal Regulations Available from Government Printing Office www.gpoaccess.gov/cfr/index.html	(866) 512-1800 (202) 512-1800
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point http://dodssp.daps.dla.mil	(215) 697-2664
DSCC	Defense Supply Center Columbus	

**REFERENCES** 

Holiday Park War Memorial Auditorium Renovations

Project 12128

(See FS)

FED-STD Federal Standard

(See FS)

FS Federal Specification (215) 697-2664

Available from Department of Defense Single Stock Point

http://dodssp.daps.dla.mil

Available from Defense Standardization Program

www.dps.dla.mil

Available from General Services Administration

(202) 619-8925

www.gsa.gov

Available from National Institute of Building Sciences

(202) 289-7800

www.wbdg.org/ccb

**FTMS** Federal Test Method Standard

(See FS)

MIL (See MILSPEC)

MIL-STD (See MILSPEC)

MILSPEC Military Specification and Standards

(215) 697-2664

Available from Department of Defense Single Stock Point

http://dodssp.daps.dla.mil

**UFAS** Uniform Federal Accessibility Standards (800) 872-2253

Available from Access Board www.access-board.gov

(202) 272-0080

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

**DCA** Florida Department of Community Affairs (850) 488-8466

Florida Emergency Management

www.dca.state.fl.us

**FDEP** Florida Department of Environmental Protection (850) 245-2118

www.dep.state.fl.us

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

**END OF SECTION 014200** 

1/10/2018 6:36 AM

# **Construction Sign Request Form**

Title (Bold):	
Title (Not Bold):	
What's Happening?	
Benefits:	
Number of Neighbors Benefitted:	Cost:
Trainer of freighous Benefities.	
Month and Year of Expected Completion:	Contractor:
Phone: 954-828-8000	
We're Working On:	
Project Manager Signature	Date
Senior Project Manager Signature	Date

**PROJECT SIGN** 

# SECTION 015900 - PROJECT 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.

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

PRODUCT REQUIREMENTS

## 1.4 SUBMITTALS

- A. Product List: Submit a list, in tabular from, 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.
  - 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

PRODUCT REQUIREMENTS 016000-2

- addresses and names and addresses of architects and cities.
- Material test reports from a qualified testing agency indicating and interpreting g. test results for compliance with requirements indicated.
- Research/evaluation reports evidencing compliance with Florida Building Code h. from an organization acceptable to Building Official.
- Detailed comparison of Contractor's Construction Schedule using proposed i. 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.
- Cost information, including a proposal of change, if any, in the Contract Sum. j.
- Contractor's certification that proposed substitution complies with requirements in k. the Contract Documents and is appropriate for applications indicated.
- I. 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.
  - Form of Acceptance: Change Order or Change Directive. a.
  - 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 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.
    - Form of Approval: As specified in Division 01 Section "Submittal Procedures." a.
    - Use product specified if Architect cannot make a decision on use of a b. 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

PRODUCT REQUIREMENTS

- Α. 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
  - Deliver, store, and handle products using means and methods that will prevent damage, Α.

016000-3

CAM # 18-0510

1/10/2018 6:36 AM

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.

PRODUCT REQUIREMENTS 016000-5

- 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:
  - 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)

# 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. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
  - 1. Inspection procedures.
  - 2. Warranties.
  - 3. Final cleaning.
- 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. Divisions 02 through 48 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

#### 1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
  - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. Submit list of all subcontractors including names, addresses (with zip code) and telephone numbers and dollar amount of work performed.
  - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - Obtain and submit releases permitting City unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
  - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by City. Label with manufacturer's name and model number where applicable.
  - 7. Make final changeover of permanent locks and deliver keys to City. Advise City's

CLOSEOUT PROCEDURES

017700-1

- personnel of changeover in security provisions.
- 8. Complete startup testing of systems.
- 9. Submit test/adjust/balance records.
- 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
- 11. Complete final cleaning requirements, including touchup painting.
- 12. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect 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. Reinspection: Request reinspection 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.

#### 1.4 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
  - 1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
  - 2. Submit final releases of lien from all subcontractors and suppliers
  - 3. Submit pest-control final inspection report and warranty.
  - 4. Instruct City's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
  - 5. No later than 30 days after completion of the job, the contractor shall provide IA/SMD with all blueprints of the space and all associated areas (i.e. roof, garage) on AutoCAD and a hard copy of the floor plan.
  - 6. The security system shall be included in the blueprints after the initial floor design. The security system shall be on a separate layer. It shall not be included on the same layer of the electrical system. The security system shall be treated as sensitive information and shall not be given to any contractor who does not have a need to know. A hardcopy of as-built of the Security System along with the AutoCAD copy shall be provided to SMD no later than 30 days after the completion of the job. (This shall include any changes made during the construction phase). Security plan shall include furniture layout.
  - 7. The CBP/Security Management Division requires one business week after the space has been totally built out (including carpet, painting, electrical, plumbing, HVAC, communication cable, and video cable, except for the installation of the ceiling tile) to complete our security and communication inspections once these inspections are completed. After that, a final walk through shall take place by the SMD and GSA to prepare a punch list to present to the contractor/lessor. No security project shall be considered substantially complete without a final walk through.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Final payment will only be made after ALL unconditional release of liens from

all subcontractors and suppliers are received by the City.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

# 1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit three copies 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.
  - 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.
    - b. Project name
    - c. Date.
    - d. Name of Contractor.
    - e. Page number.

#### 1.6 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Partial Occupancy: Submit properly executed warranties within [15] days of completion of designated portions of the Work that are completed and occupied or used by City during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
  - 1. Bind warranties and bonds in heavy-duty, 3-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.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.
- E. Submit Certificate of Occupancy to the Architect.

#### PART 2 - PRODUCTS

#### 2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

# PART 3 - EXECUTION

#### 3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
  - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
    - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    - g. Sweep concrete floors broom clean in unoccupied spaces.
    - h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
    - i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
    - j. Remove labels that are not permanent.
    - k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
      - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

- I. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- m. Replace parts subject to unusual operating conditions.
- n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- p. Clean ducts, blowers, and coils if units were operated without filters during construction.
- q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- r. Leave Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.
- D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on City's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

# 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.
  - 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.
  - 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.
- Flood.
- 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.
  - 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.
  - 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.
  - 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.

# 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:
  - 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.
  - I. 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 markedup 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.

Holiday Park War Memorial Auditorium Renovations

Project 12128

D. Final pay request will not be processed until Record Documents have been completed and submitted to the City.

#### 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.
  - I. Required sequences for electric or electronic systems.
  - 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.

# SECTION 031000 - CONCRETE FORMWORK

# PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

A. Section 033000 – Cast-In-Place Concrete.

#### 1.2 REFERENCE STANDARDS

- A. American Concrete Institute (ACI) Latest Edition:
  - 1. 301 Specifications for Structural Concrete for Buildings.
  - 2. 347 Recommended Practice for Concrete Formwork.
- B. American Society for Testing and Materials (ASTM):
  - D1751 Pre-formed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

#### 1.3 SUBMITTALS

- A. General: In compliance with Section 013300 and as specified herein.
- B. Shop Drawings: Illustrating:
  - 1. Pertinent dimensioning.
  - 2. Methods of construction.
  - 3. Arrangement of joints.
  - 4. Location of bracing and temporary supports.
  - 5. Ties and shores.
  - 6. Schedule of erection and stripping.
- C. Product Data: Illustrating and describing:
  - 1. Inserts, anchors, sleeves and other embedded items.
  - 2. Form ties.
  - 3. Form oil and form release agent.
  - 4. Round column forms.
  - 5. Expansion joint filler.
- D. Warranty: Submit written warranty issued by form release agent manufacturer that form release agent will not cause staining, discoloration, or texturing of concrete, prevent proper bonding of subsequently applied materials, or leave a waxy or oily residue.

#### 1.4 DELIVERY AND STORAGE

- A. Storage:
  - 1. Store new and reusable form lumber and form plywood under heavy waterproof coverings, or where well protected from inclement weather.
  - 2. Stack oiled form plywood on sticking to permit proper ventilation between uses.

3. Store metal forms in such manner to prevent damage by denting, warping twisting and rusting.

#### PART 2 - PRODUCTS

# 2.1 WOOD FORM MATERIALS

- A. Form Lumber: No. 2 Southern Pine or No. 2 Douglas Fir-Larch, S4S; true and straight members free from cupping, warping, loose knots, excessive checking and other structural defects.
- B. Form Plywood: Not less than 5/8-inch thick, exterior type, Class I, Grade "B-B", mill oiled and edge sealed.
  - Concealed surfaces in Finished Work: Standard "B-B Plyform".
- C. Form Liners: Units of face design, texture, arrangement and configuration as specified in the architectural drawings and Section 033300. Furnish with manufacturer recommended liquid release agent that will not bond with, stain or adversely affect concrete surfaces, and will not impair subsequent treatments of concrete.

#### 2.2 PREFABRICATED FORMS

- A. Round Column Forms: Heavy-duty, two-piece sectional column forms suitable for multiple uses.
- B. Glass Fiber Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to structural tolerances and appearance of finished concrete surface.

# 2.3 ACCESSORIES

- A. Anchor Slots: Minimum 22 gauge galvanized steel dovetail anchor slot with removable filler insert.
- B. Construction Joint Forms: Galvanized steel, tongue and groove shape.
- C. Expansion Joint Filler: ASTM D1751, pre-molded, asphalt impregnated cellulose fiber, thickness and depth indicated. For sealed joints use bond breaker such as polyethylene tape to prevent bleeding.
  - 1. The Burke Company "Fiber Expansion Joint".
  - 2. W. R. Meadows, Inc. "SealTight Fibre Expansion Joint".
  - Sonneborn "Sonoflex Cane".
- D. Flashing Reglets: 26 gauge galvanized steel, 1-1/2 inch deep x 1/2-inch opening; install where required to receive waterproofing membrane or flashing.
- E. Form Coating:
  - 1. Concealed from View: Form oil or release agent.
  - 2. Exposed to View: Non-staining, non-residue release agent with required warranty.

- a. The Burke Company "Burke Release".
- b. L & M Construction Chemicals "Debond".
- c. Napco Construction Chemicals "Petkote".
- d. Sonneborn "Cast-Off".
- F. Form Ties: Removable-type adjustable rod ties with minimum strength of 3000 pounds each that do not leave hole greater than 7/8-inch diameter, or snap-ties that break off not less than one-inch back of concrete surface.
  - 1. Provide ties with swaged washer or other acceptable device to prevent mortar leakage along tie.
- G. Moldings and Chamfer Strips: "C-Select" or "Finish" Southern Pine, straight, sound, and free of knots and other defects.
- H. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required; of sufficient strength and character to maintain formwork in place while placing concrete.
- Shores: Tubular steel or wood forms capable of safely supporting vertical and lateral loads imposed by formwork, concrete and other construction loads and capable of preventing excessive deflection during concrete placing operations.

# PART 3 - EXECUTION

# 3.1 DESIGN

#### A. General:

- 1. Contractor is solely responsible for safety of formwork.
- 2. Design formwork in compliance with ACI 301 and ACI 347, and to resist imposed loads and pressures.
- 3. Properly brace and tie forms together to maintain their position and shape during concrete placement.
- 4. Minimize form joints.
- 5. Camber formwork as required to take up settlement caused by concrete placing.
- 6. Shoring and formwork shall be designed by an engineer registered in the State of Florida.
- 7. Shop drawing shall be submitted which bears the embossed seal of the engineer.
- B. Strength: Withstand weight of concrete and loads due to placing operations without deformation beyond 1/360 of spans.
- C. Stripping: Arrange and assemble formwork to permit dismantling and stripping without damage to concrete. Design formwork to permit stripping without removal of principal shores where required.

# 3.2 FORMWORK ERECTION

# A. Construction:

- Construct forms to provide finished profiles, shapes and dimensions indicated in Drawings.
- 2. Construct forms with tight fitting joints to prevent mortar leakage and to withstand high frequency mechanical vibration.

# B. Erection:

- 1. Erect forms plumb, straight, true-to-lines and levels, and securely brace into position.
- 2. Arrange forms to allow stripping without removal of principal shores, where and when these are required to remain in place.
- 3. Provide bracing to ensure stability of formwork.
- 4. Provide temporary ports in formwork where required to facilitate cleaning and inspection.
  - a. Locate openings at bottom of formwork to allow flushing water to drain.
  - b. Close ports with tight fitting panels, flush with inside face of forms, neatly fitted so that joints will not be apparent in exposed concrete surfaces.
- C. Tolerances: Construct formwork in compliance with ACI 301 and ACI 347 to maintain following maximum tolerances:
  - 1. Deviation From Horizontal and Vertical Lines: 1/4-inch in 10 feet.
  - 2. Deviation of Building Dimensions Indicated in Drawings and position of Partitions, Walls, and Columns: 1/4-inch in 10 feet.
  - 3. Deviation in Cross-Sectional Dimensions of Columns or Beams or Thickness of Slabs and Walls: Plus or minus 1/4-inch.

#### 3.3 FORM RELEASE AGENT

- A. Apply form release agent to form surfaces prior to placing reinforcing steel, anchoring devices, and embedded items.
  - Release agent required on form surfaces where concrete is exposed in finished work.
- B. Do not apply form release agent where concrete surfaces will receive special finishes and applied coverings that are affected by agent.
  - 1. Soak inside surfaces of untreated forms with clean water.
  - 2. Keep surfaces wet prior to placing concrete.

# 3.4 INSERTS, EMBEDDED ITEMS, OPENINGS AND ACCESSORIES

- A. Provide formed openings for pipes, conduits, sleeves, and other work embedded in and passing through concrete.
  - 1. Coordinate work of other Sections and cooperate with trades involved in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors and other inserts.
  - 2. Install anchor bolts in compliance with approved setting plans.
  - 3. Do not perform work unless indicated in drawings or reviewed prior to installation.

- 4. Do not place concrete until work is accurately located and securely fastened into position.
- B. Anchor Slots: Install in concrete surfaces abutted by ends of masonry walls and in concrete surfaces faced with masonry. Set slots vertically, extending continuously to full height of adjacent masonry at centerlines of masonry wall ends and at 2'-0" on center in walls faced with masonry.
- C. Chamfer Locations: Exterior corners of beams, joints, columns, and where indicated in Drawings.
- D. Joints: Secure expansion joint filler in place as shown in Drawings to prevent displacement when placing concrete. Bore holes through filler for rebar where required and hold down with removable spacer where sealant is to be applied. Apply polyethylene, foil, or other bond breaker tape where sealant is to be applied.

# E. Waterstops:

- 1. Strips:
  - a. Prime joint, remove one strip of paper and place waterstop in keyed joints. Lap ends one-inch.
  - b. Remove second paper strip immediately prior to placing concrete.
- 2. Ribbed with Center Bulbs:
  - a. Secure to forms.
  - b. After form removal, extend into next concrete placement.
  - c. Splice as recommended by manufacturer.
  - d. Prevent puncture tears and damage.

### 3.5 FIELD QUALITY CONTROL

- A. Inspect and check completed formwork, shoring, and bracing to ensure that work is in compliance with formwork design, and that supports, fastenings, wedges, ties, and parts are secure.
- B. Bracing and Shoring:
  - 1. Provide necessary whales, studs, and bracing to prevent forms from bulging and sagging.
  - 2. Double-wedge shores at bottom and keep wedges tight. Do not place shores on top of previously placed concrete for at least 48 hours after placing.
  - 3. Comply with ACI 301 for reshoring.
- C. Formwork for Exposed Concrete:
  - Use high density overlay plywood sheets in sizes necessary to provide uniform appearance on exposed surfaces. Fill butt joints between plywood sheets to prevent leakage. Place form ties in uniform and symmetrical pattern.
  - 2. Place moldings or chamfer strips in corners of square column, beam and wall forms except where square corners are indicated.
- D. Used form materials may be cleaned and reused if required finished surfaces can be produced.

- 1. Use form with sheet metal patches over cracks and holes for concealed work only.
- E. Records: Maintain record of concrete placement, shoring and form removal.
  - 1. Record rest cylinder strength used to determine early form removal.
  - 2. Keep record available for Architect's examination.

#### 3.6 FORM REMOVAL

- A. Do not remove forms until concrete develops sufficient strength to sustain its own weight plus any superimposed loads, and in no case sooner than permitted by ACI 347.
- B. Remove forms in such sequence as to constantly insure structural adequacy.
- C. Remove form ties and projecting nails from concrete surfaces when forms are stripped.
- D. When forms are to be reused, withdraw nails, clean, patch holes and apply uniform coat of form release agent, or form oil, immediately after stripping, and store until reused.
- E. Test cylinders may be made at Contractor's expense and unless directed otherwise by Architect, forms may be stripped from locations when concrete has attained 75% of required 28-day compressive strength.

#### SECTION 032000 - CONCRETE REINFORCEMENT

#### PART 1 - GENERAL

#### 1.1 REFERENCE STANDARDS

- A. American Concrete Institute (ACI)Latest Edition:
  - 301 Specifications for Structural Concrete for Buildings.
     318-05 Building Code Requirements for Reinforced Concrete.
  - 3. SP66 ACI Detailing Manual.
- B. American Society for Testing and Materials (ASTM):
  - 1. A82 Steel Wire, Plain, for Concrete Reinforcement.
  - 2. A185 Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
  - 3. A615 Deformed and Plain Billet-Steel Bars for Concrete
    - Reinforcement.
- C. American Welding Society (AWS):
  - 1. D1.4 Structural Welding Code Reinforcing Steel.
- D. Concrete Reinforcing Steel Institute (CRSI):
  - 1. MSP1 Manual of Standard Practice.
  - 2. 63 Recommended Practice for Placing Reinforcing Bars.
  - 3. 65 Recommended Practice for Placing Bar Supports, Specifications and Nomenclature.

### 1.2 SUBMITTALS

- A. General: In compliance with Section 013300 and as specified herein.
- B. Shop Drawings: Detail reinforcing in compliance with ACI 315.
  - 1. Provide fully detailed bar lists, bending diagrams, and placing plans.
  - 2. Indicate splices and splicing methods.
  - 3. Indicate types and grades of steel.
  - 4. Indicate quantities of reinforcing steel and wire fabric.
  - 5. Indicate supporting and spacing devices.
- C. Product Data: Manufacturer's specifications and brochures for bar support devices, and:
  - Product Data for Credit MR 4.1 and Credit MR 4.2: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating costs for each product having recycled content.
  - ii. Product Data for Credit MR 5.1 and Credit MR 5.2: For products having regional content, documentation indicating percentages by weight of regional content defined as being extracted and manufactured within 500 miles of the project site. Include statement indicating costs for each product having recycled content.

D. Reports: Certified copy of all mill reports on reinforcing steel, indicating physical properties and chemical analysis.

#### 1.3 DELIVERY AND STORAGE

- A. Deliver reinforcing steel to site in easily handled bundles with identification tags securely wired into place.
  - Store reinforcing to prevent damage and protect from corrosion and deformation.

# PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Reinforcing Steel: ASTM A615; Grade 60.
- B. Welded Steel Wire Fabric: ASTM A185; flat sheets.
- C. Bar Chairs:
  - Concealed: 16 gauge galvanized steel wire with 3 x 3-inch base, or solid plastic of proper sizes and design to properly support and position reinforcing steel
  - 2. Exposed: Fabricated from stainless steel, solid plastic, or galvanized wire with plastic tipped feet.
- D. Tie Wires: 16 gauge annealed steel.
- E. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 60%..

#### 2.2 FABRICATION

- A. Fabricate reinforcing steel to required shapes and dimensions in compliance with CRSI "Manual of Standard Practice" and ACI 315 with tolerances specified in ACI 301.
- B. Do not heat bars for bending or straightening. Do not tack weld bars.

#### PART 3 - EXECUTION

# 3.1 PREPARATION

- A. Remove grease, dirt, loose mill scale, rust and foreign substances from reinforcing before placing.
- B. Clean splashed concrete from reinforcing steel projecting from previously placed concrete before making splices and before placing subsequent concrete.

### 3.2 INSTALLATION

- A. Place reinforcing steel in compliance with CRSI "Recommended Practice for Placing Reinforcing Bars" and ACI 301. Provide not less than minimum coverage indicated in structural drawings over reinforcing steel.
- B. Placing:
  - Comply with CRSI publication Placing Reinforcing Bars. Provide not less than ACI minimum coverage over reinforcing when coverage is not indicated in Drawings.
  - 2. Place no reinforcing until forms have been coated with release agent.
  - 3. Place reinforcing supported and secured against displacement. Do not deviate from indicated alignment.
  - 4. Saddle tie reinforcing at intersections and laps. Wire stirrups to both top and bottom bars.
  - 5. Lap welded wire fabric one mesh panel at ends and sides, unless indicated otherwise.
  - Protect reinforcement from damage and displacement after installation and during concrete placing operations. Do not support runways and chutes upon reinforcing. Do not permit conveying equipment to be wheeled directly upon reinforcing.
- C. Bar Chairs: Support reinforcing upon proper support devices in compliance with CRSI "Recommended Practice for Placing Bar Supports, Specifications and Nomenclature".
  - 1. Space supports not more than 3 bar spaces each way for slabs on grade.
    - Precast concrete blocks of same mix design as concrete, with tie wires embedded into blocks may be used for slabs on grade, turned down beams and footings in lieu of bar chairs to support reinforcing.
  - 2. Locate bar and welded wire fabric reinforcing in slabs on grade and slabs on fill to occur within upper one-third of slab thickness.
  - 3. When in contract with forms and underside of floor slabs with applied finishes, or to be exposed, provide chairs specified for exposed-to-view.

# 3.3 FIELD QUALITY CONTROL

- A. Cutting and Welding: No reinforcing bars cut or welded in field without prior consent of Structural Engineer.
- B. Splicing:
  - 1. Splicing shall conform to ACI 318.
    - a. Make splices as indicated in Drawings.
    - b. Obtain Architect's approval of splices not indicated in Drawings before making splices.
  - 2. Do not splice bars at points of maximum stress.
  - 3. Stagger splices at adjacent bars.
- C. Protection: Protect reinforcement from damage and displacement after placing and during concrete placement operations. Do not support runways and chutes upon reinforcing. Do not permit conveying equipment to be wheeled directly upon reinforcing.

#### SECTION 033000 - CAST-IN-PLACE CONCRETE

#### 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.

### 1.2 SUMMARY

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

# 1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

# 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Shoring and Bracing: Indicate proposed schedule and sequence of work, including temporary shoring and bracing.
- E. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
  - 1. Aggregates.
- F. Material Certificates: For each of the following, signed by manufacturers:
  - 1. Cementitious materials.

CAST-IN-PLACE CONCRETE

033000 - 1

- 2. Admixtures.
- 3. Form materials and form-release agents.
- 4. Steel reinforcement and accessories.
- 5. Curing compounds.
- 6. Floor and slab treatments.
- 7. Adhesives.
- 8. Vapor retarders.
- 9. Repair materials.
- G. Field quality-control test reports.

# 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Finisher.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5.
  - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- D. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

# 1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

#### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
  - 2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

CAST-IN-PLACE CONCRETE

033000 - 2

# 2.2 FORM-FACING MATERIALS

- A. Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
  - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
  - 1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
  - 2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
  - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

#### 2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

#### 2.4 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

#### 2.5 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - 1. Portland Cement: ASTM C 150, Type I or II, gray or white. Cements may be supplemented with the following:
    - a. Fly Ash: ASTM C 618, Class C F.
    - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33, Class 3M coarse aggregate or better, graded.

**CAST-IN-PLACE CONCRETE** 

033000 - 3

- 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
- 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Water: ASTM C 94/C 94M and potable.

#### 2.6 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
  - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
  - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
  - 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
  - 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
  - 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

#### 2.7 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
  - 1. Available Products:
    - a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
    - b. Burke by Edoco; Agua Resin Cure.
    - c. ChemMasters; Safe-Cure Clear.
    - d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; W.B. Resin Cure.
    - e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
    - f. Euclid Chemical Company (The); Kurez DR VOX.
    - g. Kaufman Products, Inc.; Thinfilm 420.
    - h. Lambert Corporation; Aqua Kure-Clear.
    - i. L&M Construction Chemicals, Inc.; L&M Cure R.
    - j. Meadows, W. R., Inc.; 1100 Clear.
    - k. Nox-Crete Products Group, Kinsman Corporation; Resin Cure E.
    - I. Symons Corporation, a Dayton Superior Company; Resi-Chem Clear Cure.

- m. Tamms Industries, Inc.; Horncure WB 30.
- n. Unitex; Hydro Cure 309.
- o. US Mix Products Company; US Spec Maxcure Resin Clear.
- p. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of finishes.
  - 1. Available Products:
    - a. Anti-Hydro International, Inc.; AH Clear Cure WB.
    - b. Burke by Edoco; Spartan Cote WB II.
    - c. ChemMasters; Safe-Cure & Seal 20.
    - d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Cure and Seal WB.
    - e. Dayton Superior Corporation; Safe Cure and Seal (J-18).
    - f. Euclid Chemical Company (The); Aqua Cure VOX.
    - g. Kaufman Products, Inc.; Cure & Seal 309 Emulsion.
    - h. Lambert Corporation; Glazecote Sealer-20.
    - i. L&M Construction Chemicals, Inc.; Dress & Seal WB.
    - j. Meadows, W. R., Inc.; Vocomp-20.
    - k. Metalcrete Industries; Metcure.
    - I. Nox-Crete Products Group, Kinsman Corporation; Cure & Seal 150E.
    - m. Symons Corporation, a Dayton Superior Company; Cure & Seal 18 Percent E.
    - n. Tamms Industries, Inc.; Clearseal WB 150.
    - o. Unitex; Hydro Seal.
    - p. US Mix Products Company; US Spec Hydrasheen 15 percent
    - q. Vexcon Chemicals, Inc.; Starseal 309.
- F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, nondissipating, certified by curing compound manufacturer to not interfere with bonding of finishes.
  - 1. Available Products:
    - a. Burke by Edoco; Spartan Cote WB II 20 Percent.
    - b. ChemMasters; Safe-Cure Clear.
    - c. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; High Seal.
    - d. Dayton Superior Corporation; Safe Cure and Seal (J-19).
    - e. Euclid Chemical Company (The); Diamond Clear VOX.
    - f. Kaufman Products, Inc.; SureCure Emulsion.
    - g. Lambert Corporation; Glazecote Sealer-20.
    - h. L&M Construction Chemicals, Inc.; Dress & Seal WB.
    - i. MBT Protection and Repair, Div. of ChemRex; MasterKure-N-Seal VOC.
    - j. Meadows, W. R., Inc.; Vocomp-20.
    - k. Metalcrete Industries: Metcure 0800.
    - I. Nox-Crete Products Group, Kinsman Corporation; Cure & Seal 200E.

CAST-IN-PLACE CONCRETE

- m. Sonneborn, Div. of ChemRex; Kure-N-Seal.
- n. Symons Corporation, a Dayton Superior Company; Cure & Seal 18 Percent E.
- o. Tamms Industries, Inc.; Clearseal WB STD.
- p. Unitex; Hydro Seal 18.
- q. US Mix Products Company; US Spec Radiance UV-25
- r. Vexcon Chemicals, Inc.; Starseal 0800.

#### 2.8 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.
- B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- C. Epoxy Bonding Adhesive: Unless otherwise noted, ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
  - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

# 2.9 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
  - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
  - 1. Fly Ash: 25 percent.
  - 2. Combined Fly Ash and Pozzolan: 25 percent.
  - 3. Ground Granulated Blast-Furnace Slag: 50 percent.
  - 4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
  - 5. Silica Fume: 10 percent.
  - 6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
  - 7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.

- D. Admixtures: Use admixtures according to manufacturer's written instructions.
  - 1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
  - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
  - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
  - 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

# 2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Proportion normal-weight concrete mixture as follows:
  - 1. Minimum Compressive Strength 3000 psi at 28 days.
  - 2. Maximum Water-Cementitious Materials Ratio: 0.50.
  - 3. Slump Limit: 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
  - 4. Air Content: <4.0> percent, plus or minus 1.5 percent at point of delivery for exterior exposed concrete.

## 2.11 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

#### 2.12 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
  - 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F reduce mixing and delivery time to 60 minutes.

#### PART 3 - EXECUTION

## 3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

CAST-IN-PLACE CONCRETE

033000 - 7

- 1. Class B, 1/4 inch for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
  - 1. Install keyways, reglets, recesses, and the like, for easy removal.
  - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

## 3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
  - 2. Install dovetail anchor slots in concrete structures as indicated.

## 3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.
  - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 75 percent of its 28-day design compressive strength.
  - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

#### 3.4 SHORES AND RESHORES

- A. Comply with ACI 318 (ACI 318M) and ACI 301 for design, installation, and removal of shoring and reshoring.
- B. Extend shoring to ground floor to distribute loads in such a manner that no floor or roof members will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.
- C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

## 3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
  - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

CAST-IN-PLACE CONCRETE

033000 - 9

# 3.6 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, and only at locations previously approved by Engineer.
  - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
  - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
  - Locate joints for beams, slabs, joists, and girders in the middle third of spans.
     Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
  - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  - 5. Locate joints in walls beside piers integral with walls, near corners, and in concealed locations where possible.
  - 6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
  - 7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

## 3.7 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301 and subject to approval by the Engineer.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
  - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
  - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

CAST-IN-PLACE CONCRETE

033000 - 10

- D. Deposit and consolidate concrete in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
  - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  - 2. Maintain reinforcement in position on chairs during concrete placement.
  - 3. Screed surfaces with a straightedge and strike off to correct elevations.
- E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
  - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- F. Hot-Weather Placement: Comply with ACI 301 and as follows:
  - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
  - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

#### 3.8 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
- B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

#### 3.9 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

## 3.10 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
  - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
    - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
    - c. Cure concrete surfaces to receive floor coverings with either a moistureretaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project..
  - Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

- a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
- 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

## 3.11 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
  - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension in solid concrete, but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
  - 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
  - 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.
- E. Repair materials and installation not specified above may be used, subject to Architect's approval.

#### 3.12 FIELD QUALITY CONTROL

A. Testing and Inspecting: All testing and inspections by general contractor. Contractor will engage a qualified testing and inspecting agency to perform tests and to submit reports to city's project manager.

CAST-IN-PLACE CONCRETE

033000 - 13

# B. Inspections:

- 1. Steel reinforcement placement.
- 2. Steel reinforcement welding.
- 3. Headed bolts and studs.
- 4. Verification of use of required design mixture.
- 5. Concrete placement, including conveying and depositing.
- 6. Curing procedures and maintenance of curing temperature.
- 7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- 8. As required by Building Department.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
  - 1. Testing Frequency: Obtain one composite sample for each day's placement of each concrete mixture plus one set for each additional 20 cu. yd. or fraction thereof.
  - 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's placement of each concrete mixture. Perform additional tests when concrete consistency appears to change.
  - 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's placement of each concrete mixture.
  - 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
  - 5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  - 6. Compression Test Specimens: ASTM C 31/C 31M.
    - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
    - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
  - 7. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
    - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
    - A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

- 8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- 9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- 10. Test results shall be reported in writing to Engineer, Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- 11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.
- 12. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
- 13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 14. Correct deficiencies in the Work that test reports and inspections indicate dos not comply with the Contract Documents.

**END OF SECTION** 

#### SECTION 085113 - ALUMINUM WINDOWS

## PART 1 - GENERAL

- 1.1 SECTION INCLUDES
  - A. SH-800 Multi-Story aluminum single hung window.
- 1.2 RELATED SECTIONS
  - A. Section 07190 Vapor and Air Barriers
  - B. Section 07900 Joint Sealants
- 1.3 REFERENCES
  - A. AAMA American Architectural Manufacturers Association
    - 1. AAMA 103.3-93 "Procedural Guide for Aluminum and Vinyl Prime Windows and Glass Doors, Insulating Storm Products for Windows and Glass Doors and Thermal Performance of Windows and Glass Doors"
    - 2. AAMA 1302.5-76, paragraph 3.1.1 Test A through 3.1.5 Test G "Voluntary Specifications for Forced-Entry Resistant Aluminum Prime Windows"
  - B. ANSI American National Standards Institute
    - 1. ANSI/AAMA/NWWDA 101/I.S.2-97 "Voluntary Specification for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors"
  - C. ASTM American Society for Testing and Materials
    - 1. ASTM C 1036-91 "Standard Specification for Flat Glass"
    - 2. ASTM E 283-96 "Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors"
    - 3. ASTM E 330-96 "Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference"
    - 4. ASTM E 331-96 "Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference"
    - 5. ASTM E 547-96 "Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential"
    - 6. ASTM F 588-85 "Standard Test Methods for Resistance of Window Assemblies to Forced Entry Excluding Glazing"
  - D. Florida Building Code

ALUMINUM WINDOWS 085113-1

- 1. Protocol TAS-201 "Impact Test"
- 2. Protocol TAS -202 "Air, Water, Structural Test"
- 3. Protocol TAS -203 "Cyclic Wind Load Test"

#### 1.4 SYSTEM DESCRIPTION

- A. Configuration: flange construction single hung (single vent).
- B. Frame: 2.784" frame depth.
- C. Glazing: Laminated Insulated Clear Solar Ban 70XL to confirm to Climate Zone 1 Commercial Code (.65 U and .25 SHGC)
- D. Muntins: double applied colonial configuration (raised external muntin, interior flatbar) [custom: \_\_\_\_ lites across and \_\_ lites high] ]
- E. Performance Requirements
  - 1. When tested according to Miami-Dade County test protocols, meets the design pressures stated in the Miami-Dade County Notice(s) of Acceptance for this product.
  - 2. Air Infiltration: 0.3 (ft<sup>3</sup>)/min/(ft<sup>2</sup>) maximum when tested per ASTM E 283 at a 1.57 psf static air pressure difference.
  - 3. Water Resistance: no water leakage when tested per ASTM E 547 at a static air pressure difference of 15% of the positive design pressure.
  - 4. Uniform Load Structural: after testing per ASTM E 330 with a load equal to 150% of the positive design pressure, the unit must be operable, with a maximum permanent deformation in any member of 0.4% of the member's length.

## 1.5 SUBMITTALS

- A. A. Submit according to provisions of Section 01300.
- B. Product Data: provide manufacturer's standard details, specifications and catalog information, recommendations, and installation instructions.
- C. Shop Drawings: include unit elevations, details of all aluminum window sections, typical anchorage and installation details, type of glazing and window finish, and interface with other products.
- D. Finish Samples: manufacturer's available colors.
- E. Unit Samples: if required by Architect, provide scaled-down size operating samples of each unit type, to demonstrate design and construction of the unit and hardware.

## 1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: minimum five (5) years documented experience in the manufacture of aluminum windows as required for this project.

ALUMINUM WINDOWS 085113-2

- B. Installer Qualifications: workmen properly trained and skilled in the installation and handling of aluminum windows as required for this project.
- 1.7 DELIVERY, STORAGE, AND HANDLING
  - A. Store and handle windows and accessories in accordance with the manufacturer's instructions.
  - B. Protect the products from damage due to the elements, construction traffic, or other hazards, from the time of arrival through the completion of the project.

#### 1.8 WARRANTY

A. Manufacturer: warrant material and workmanship on all products for a period of three (3) years.

## PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

A. PGT Industries, Inc. Series SH-800 Multi-Story single hung aluminum window or approved equals.

## 2.2 MATERIALS

- A. Main frame members: extruded from 6063-T5 alloy, nominal 0.062" wall thickness. Meeting rail extruded from 6063HS-T54 alloy.
- B. Sash members: extruded from 6063-T5 aluminum alloy, nominal 0.062" wall thickness. Top rail extruded from 6063-T54 alloy.
- C. Hardware: two spiral torsion spring balances. One or two steel and tin-lead-zinc alloy cam lever sash locks on each vent locking beneath a groove in the fixed meeting rail (one sash lock if window width is less than 44").
- D. Weatherstripping: sides and top of vent weatherstripped with .170 x .270 fin seal, bottom of vent weatherstripped with compressed finned vinyl bulb.
- E. Glazing attachment with silicone adhesive.
- F. Screens: tubular aluminum frame with fiberglass screen cloth, vinyl spline, two plastic ringed pull screen corner keys and two compression retention springs per screen.
- G. [ Muntins: extruded aluminum 6063-T5 alloy, tube construction (flat bar used for interior surface of double applied muntins) ]

#### 2.3 ACCESSORIES

A. [ Mullions: 1x2.75 tube mull [1x4 tube mull] [heavy duty wall] [specify mull] and associated mull clips. ]

ALUMINUM WINDOWS 085113-3

## 2.4 FABRICATION

- A. Main frame and sash joints constructed with butt joint fit, assembled with phillips pan head screws, and factory sealed with Parbond or Schnee-Moorehead sealer.
- B. All hardware factory installed.
- C. Bug screens constructed and installed in unit prior to shipment.

## 2.5 FINISHES

- A. Paint: Unless otherwise noted on the drawing and with the exception of "GT's paint thickness specification range of 2.4 5.0 mils for exposed surfaces and 1.0 mil minimum on all other surfaces, AAMA 2603 coating specification applies.
- B. Powder coating currently used is Akzo Nobel Interpon D1000 (1 year) and D1010 (10-year) in white, bronze, and silver. Paint match will be necessary to ensure color consistency throughout product line. Please specify paint quoted to be as good or equal to the Akzo Nobel listed above.

## PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Verify that openings provide an acceptable anchoring surface, being clean, level, plumb, and dimensionally within the manufacturer's tolerance of clearance spacing.
- B. Correct unacceptable openings as required prior to installation.

#### 3.2 INSTALLATION

- A. Install windows and accessories in accordance with approved shop drawings and manufacturer's recommendations.
- B. Securely fasten frames, and set units level, plumb, and square with respect to the surrounding structure, without twist or bow.
- C. Place insulation materials around shim spaces as required to ensure continuity of the thermal barrier of the structure.
- D. Apply caulk all around between the aluminum frame and the structure, ensuring that a continuous airtight and watertight perimeter seal results. Leave exposed surfaces clean and free of caulk.

## 3.3 ADJUSTING AND CLEANING

- A. Ensure that units freely operate in a normal fashion, and that vents make proper contact with weatherstripping perimeter seal. Adjust frame, vent, or hardware as needed.
- B. Leave units thoroughly clean and free of dirt or other construction residue.

#### **END OF SECTION 085113**

**ALUMINUM WINDOWS** 

#### SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

#### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

#### Section Includes:

- 1. Electrical equipment coordination and installation.
- 2. Sleeves for raceways and cables.
- 3. Sleeve seals.
- 4. Grout
- 5. Common electrical installation requirements.
- 6. Commissioning requirements.

## 1.3 DEFINITIONS

EPDM: Ethylene-propylene-diene terpolymer rubber.

NBR: Acrylonitrile-butadiene rubber.

## 1.4 GENERAL REQUIREMENTS

Carefully examine General Conditions, other specification sections, and other drawings (in addition to DIVISION 26), in order to be fully acquainted with their effect on electrical work. Additions to the contract cost will not be allowed due to failure to inspect existing conditions.

Do all work in compliance with 2014 Florida Building Code Fifth Edition, and the Codes adopted therein, including NFPA 70 (2011 NEC), Florida Fire Prevention Code Fifth Edition and the regulations of the local power utility, cable television and telephone companies. Obtain and pay for any and all required permits, inspections, certificates of inspections and approval, and the like, and deliver such certificates to the Architect/Engineer.

Cooperate and coordinate with all other trades. Perform work in such manner and at such times as not to delay work of other trades. Complete all work as soon as the condition of the structure and installations of equipment will permit. Patch, in a satisfactory manner and by the proper craft, any work damaged by electrical workmen.

Furnish, perform, or otherwise provide all labor (including, but not limited to, all planning, purchasing, transporting, rigging, hoisting, storing, installing, testing, chasing, channeling, cutting, trenching, excavating and backfilling), coordination, field verification, equipment installation, support, and safety, supplies, and materials necessary for the correct installation of complete and functional electrical systems (as described or implied by these specifications and the applicable drawings).

COMMON WORK RESULTS FOR ELECTRICAL

Coordinate and verify power and telephone company service requirements prior to bid. Bid to include all work required.

Circuiting and connection of all items using electric power shall be included under this division of the specifications, including necessary wire, conduit, circuit protection, disconnects and accessories. Secure rough-in drawings and connection information for equipment involved to determine the exact requirements. See all divisions of drawings or specifications for electrically operated equipment. If the connection of an item is not shown on the electrical drawings and it is unclear how to provide for the circuiting and connection, notify the engineer of record in writing prior to bidding project. Submission of a bid indicates that the bidder has included these requirements as part of the scope of work.

## 1.5 DRAWINGS:

Indicate only diagrammatically the extent, general character, and approximate location of work. Where work is indicated, but with minor details omitted, furnish and install it complete and so as to perform its intended functions.

DIVISION 26 work called for under any section of the project specifications, shall be considered as included in this work unless specifically excluded by inclusion in some other branch of the work. This shall include roughing-in for connections and equipment as called for or inferred. Check all drawings and specifications for the project and shall be responsible for the installation of all DIVISION 26 work.

Take finish dimensions at the job site in preference to scale dimensions. Do not scale drawings where specific details and dimensions for DIVISION 26 work are not shown on the drawings, take measurements and make layouts as required for the proper installation of the work and coordination with all drawings and coordination with all other work on the project. In case of any discrepancies between the drawings and the specifications that have not been clarified by addendum prior to bidding, it shall be assumed by the signing of the contract that the higher cost (if any difference in costs) is included in the contract price, and perform the work in accordance with the drawings or with the specifications, as determined and approved by the Architect/ Engineer, and no additional costs shall be allowed to the base contract price.

Carefully check the drawings and specifications of all trades and divisions before installing any of his work. He shall in all cases consider the work of all other trades, and shall coordinate his work with them so that the best arrangements of all equipment, piping, conduit, ducts, rough-in, etc., can be obtained.

Review the specific equipment (such as mechanical, plumbing, kitchen, FFE, etc) minimum circuit ampacity and maximum over current protection requirements of equipment provided by others to confirm it is properly coordinated with the devices being purchased. Notify the AE team immediately upon discovery of discrepancies. This shall be done at the submittal stage prior to purchasing over current protection or installation of conduit, wire, disconnects, breakers, etc. No cost will be allowed for changes to coordinate.

Locations designated for outlets, switches, equipment, etc., are approximate and shall be verified by instruction in these specifications and/or notes on the drawings. Where instructions or notes are insufficient to convey the intent of the design, consult the Architect/Engineer prior to installation.

Obtain manufacturer's data on all equipment, the dimensions of which may affect electrical work. Use this data to coordinate proper service characteristics, entry locations, etc., and to ensure minimum clearances are maintained.

## 1.6 QUALIFICATIONS OF CONTRACTOR:

DIVISION 26 It is required that the contractor has experience in the installation of a minimum of three (3) projects completed within the last five (5) years on electrical systems for new and existing buildings of similar scope and scale.in order to be qualified to bid this project.

COMMON WORK RESULTS FOR ELECTRICAL

Contractor performing any part of this scope of work shall be a State of Florida Certified (Type E.C. License) electrical contractor

Provide field superintendent who has had a minimum of four (4) years previous successful experience on projects of comparable size and complexity. Superintendent shall be on the site at all times during construction and must have an active Journeyman's Electrical License.

#### 1.7 SITE VISIT/CONDITIONS

Visit the site of this contract and thoroughly familiarize with all existing field conditions and the proposed work as described or implied by the contract documents. During the course of his site visit, verify every aspect of the proposed work and the existing field conditions in the areas of construction which might affect his work. No compensation or reimbursement for additional expenses incurred due to failure or neglect to make a thorough investigation of the contract documents and the existing site conditions will be permitted.

Install all equipment so that all Code required and Manufacturer recommended servicing clearances are maintained. Coordinate the proper arrangement and installation of all equipment within any designated space. If it is determined that a departure from the Contract Documents is necessary, submit to the A/E, for approval, detailed drawings of the proposed changes with written reasons for the changes. No changes shall be implemented without the issuance of the required drawings, clarifications, and/or change orders.

Submission of a proposal will be construed as evidence that such examination has been made and later claims for labor, equipment or materials required because of difficulties encountered will not be recognized.

Existing conditions and utilities indicated are taken from existing construction documents, surveys, and field investigations. Unforeseen conditions probably exist and existing conditions shown on drawings may differ from the actual existing installation with the result being that new work may not be field located exactly as shown on the drawings. Field verify dimensions of all site utilities, conduit routing, boxes, etc., prior to bidding and include any deviations in the contract. Notify A/E if deviations are found.

All existing electrical is not shown. Become familiar with all existing conditions prior to bidding, and include in the bid the removal of all electrical equipment, wire, conduit, devices, fixtures, etc. that is not being reused, back to it's originating point.

Locate all existing utilities and protect them from damage. Pay for repair or replacement of utilities or other property damaged by operations in conjunction with the completion of this work.

Investigate site thoroughly and reroute all conduit and wiring in area of construction in order to maintain continuity of existing circuitry. Existing conduits indicated in Contract Documents indicate approximate locations. Verify and coordinate existing site conduits and pipes prior to any excavation on site. Bids shall include hand digging and all required rerouting in areas of existing conduits or pipes.

Work is in connection with existing buildings which must remain in operation while work is being performed. Work shall be in accord with the schedule required by the Contract. Schedule work for a minimum outage to Owner. Notify Owner 72 hours in advance of any shut-down of existing systems. Perform work during non-school operating hours unless otherwise accepted by Owner. Protect existing buildings and equipment during construction.

#### 1.8 TEMPORARY POWER:

Provide temporary power distribution for the connection of all single phase 120V 20A tools, OSHA work lighting, and testing as required for performance of the project. Provide OSHA required work lighting and task lighting for the project.

COMMON WORK RESULTS FOR ELECTRICAL

Coordinate requirements with the local Utility Company for availability of adequate power. Include all cost associated with any Utility Company charges for connection or upgrades in this bid price.

If power to any of the existing facilities will be interrupted, coordinate the outage with the Owner atleast 72 hours in advance. All power outages will occur outside operational hours as determined by the Owner.

Provide temporary power to any buildings, parking lot lighting, canopy lighting, lift stations, etc that will have power removed during the course of construction temporarily. Additionally, if any new buildings, parking lots, lift stations, etc will need power until the permanent power becomes available, provide temporary power until the permanent power is available.

Provide temporary lighting for all areas that will require lighting for school use as well as construction use during the course of construction. Temporary lighting must comply with all FBC requirements as though it was being installed for permanent use. This includes but is not limited to any temporary canopies, parking lots, walkways or roads. If you are unsure of how to connect or provide this lighting, notify the engineer of record in writing prior to bidding project. Submission of a bid indicates that the bidder has included these requirements as part of the scope of work.

#### 2 PRODUCTS

#### 3.1 NOT USED

#### 3 EXECUTION

# 3.2 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

Engineer shall have no responsibility for job site safety and the Contractor shall have full and sole authority for all safety programs and precautions in connection with the Work. Nothing herein shall be interpreted to confer upon the Engineer any duty regarding safety or the prevention of accidents at the jobsite.

Comply with NECA 1.

Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

Right of Way: Give to piping systems installed at a required slope.

All work shall be executed in a workmanship manner and shall present a neat mechanical appearance upon completion.

Care shall be exercised that all items are plumb, straight, level.

COMMON WORK RESULTS FOR ELECTRICAL

Care shall be exercised so that Code clearance is allowed for all panels, controls. etc., requiring it. Do not allow other trades to infringe on this clearance.

Balance load as equally as practicable on all feeders, circuits and panel buses.

The electrical circuits, components and controls for all equipment are selected and sized based on the equipment specified. If substitutions are proposed, furnish all materials and data required to prove equivalence. No additional charges shall be allowed if additional materials, labor, connections or equipment are needed for substituted products.

#### 3.3 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

Coordinate with roofing scope of work for the installation of electrical items which pierce roof. Roof penetrations shall not void warranty. Pitch pockets are not acceptable.

Where work pierces waterproofing, it shall maintain the integrity of the waterproofing. Coordinate roofing materials which pierce roof for compatibility with membrane or other roof types.

Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

Cut sleeves to length for mounting flush with both surfaces of walls.

Extend sleeves installed in floors 2 inches above finished floor level.

Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable, unless indicated otherwise.

Seal space outside of sleeves with grout for penetrations of concrete and masonry

Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants.".

Fire-Rated-Assembly Penetrations: Firestop penetrations of walls, partitions, ceilings, and floors under Division 07 Section "Firestopping."

Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work. The use of pitch pockets is not acceptable.

## 3.4 CONCRETE PADS

Furnish and install reinforced concrete housekeeping pads for transformers, switchgear, motor control centers, and other free-standing equipment. Unless otherwise noted, pads shall be four (4) inches high and shall exceed dimensions of equipment being set on them, including future sections, by three (3) inches each side, except when equipment is flush against a wall where the side against the wall shall be flush with the equipment.

COMMON WORK RESULTS FOR ELECTRICAL

Provide concrete pad for exterior pad mount transformers as required by power company.

Provide concrete pad for exterior generators as recommended by generator manufacturer and structural engineer (8" minimum).

# 3.5 MISCELLANEOUS CIRCUITS REQUIRED

Provide 120 volt, 20 amp circuit to fire protection system panel and bell (whether shown on drawings or not). Connect to spare 20 amp, 1 pole circuit breaker in nearest 120 volt panel. Notify Engineer of Record of required circuit so that final circuit information may be provided to the contractor. Re-label circuit breaker accordingly. Provide locking device on breaker. Coordinate location with civil engineer (and drawings/specifications) or fire protection engineer (and drawings/specifications) prior to bid and provide all electrical. Coordinate final location and electrical requirements with panel installer after bid and provide all electrical. Nearest panel to be nearest emergency panel, when building has emergency generator system.

Provide 120 volt, 20 amp circuit to intercom system panel (whether shown on drawings or not). Connect to spare 20 amp, 1 pole circuit breaker in nearest 120 volt panel. Notify Engineer of Record of required circuit so that final circuit information may be added to the drawings. Re-label circuit breaker accordingly. Provide locking device on breaker. Coordinate location with intercom system engineer (and drawings/specifications) prior to bid and provide all electrical. Coordinate final location and electrical requirements with panel installer after bid and provide all electrical. Nearest panel to be nearest emergency panel, when building has emergency generator system.

Provide 120 volt, 20 amp circuit to all fire alarm panels, remote panels, etc (whether shown on drawings or not). Connect to spare 20 amp, 1 pole circuit breaker in nearest 120 volt panel. Notify Engineer of Record of required circuit so that final circuit information may be added to the drawings. Re-label circuit breaker accordingly. Provide locking device on breaker. Coordinate location with fire alarm system engineer (and drawings/specifications) prior to bid and provide all electrical. Coordinate final location and electrical requirements with panel installer after bid and provide all electrical. Nearest panel to be nearest emergency panel, when building has emergency generator system.

Provide 120 volt, 20 amp circuit to fire and smoke dampers (whether shown on drawings or not). Connect to spare 20 amp, 1 pole circuit breaker in nearest 120 volt panel. Notify Engineer (whether shown on drawings or not) Provide locking device on breaker. Coordinate location with fire protection engineer (and drawings/specifications) prior to bid and provide all electrical. Coordinate final location and electrical requirements with damper installer after bid and provide all electrical. Nearest panel to be nearest emergency panel, when building has emergency generator system.

Provide 120 volt, 20 amp circuit to building control panels for HVAC system (whether shown on drawings or not). Connect to spare 20 amp, 1 pole circuit breaker in nearest 120 volt panel. Notify Engineer of Record of required circuit so that final circuit information may be added to the drawings. Re-label circuit breaker accordingly. Coordinate location with drawings or specifications prior to bid and provide all electrical.

Provide circuitry for Light Raise Projection System to coordinate the Presentation Stations and Light Raise Projector to be on the same circuit or circuit phase (whether shown as such on drawings or not). Notify Engineer of Record of required circuit so that final circuit information may be coordinated on the drawings if not indicated correctly. Relabel circuit breakers accordingly.

Provide 120V 20A circuits and receptacles for digital message boards in Kitchens. Verify exact locations with Food Nutritional Services (whether shown on drawings or not). Notify Engineer of Record of required circuit so that final circuit information may be added to the drawings. Re-label circuit breakers accordingly.

**END OF SECTION 26 05 00** 

COMMON WORK RESULTS FOR ELECTRICAL

## SECTION 26 05 01 - INVESTIGATION OF EXISTING ELECTRICAL SYSTEMS

## PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Contractual conditions and Division 1 Specification sections apply to this section.

## 1.2 SUMMARY

A. This section includes the requirements for investigation and reporting on conditions of existing electrical systems.

#### 1.3 DESCRIPTION

- A. Test the essential features of existing electrical power, lighting and systems.
- B. Each system shall be tested once only, and after completion of testing, results given to the Owner. Point out any non-operational function noticed during testing.
- C. Document the existing conditions and operation of the existing electrical systems prior to any work.
- D. Contractor shall be responsible for all non-working systems and their components unless non-working status is verified prior to work on system.

#### 1.4 COORDINATION

A. The testing shall be held at a date to be agreed upon in writing by the Owner.

# PART 2 - PRODUCTS (not applicable)

## PART 3 - EXECUTION

#### 3.1 PERFORMANCE VERIFICATION

- A. The contractor shall investigate all existing systems prior to the beginning any work on site. Test the functionality of each system and report only those items that are non-functional to the Owner.
- B. Demonstrate to the Owner the non-functional items to verify the issue. Owner will at its option correct the deficiency immediately or defer to correct until the construction is completed. Provide a written report to clarify the items and the Owners decisions on correction,

INVESTIGATION OF EXISTING ELECTRICAL SYSTEMS

26 05 01 - 1

- C. Each system shall be retested after completion of renovation to ensure proper operation.
- D. At the completion of construction, the Owner will expect all power, lighting and systems to function for their intended purpose weather new or existing. The contractor will remain responsible for this unless noted otherwise during the initial investigation and documented and demonstrated as such.

# 3.2 MEMO OF INVESTIGATION (TESTING)

A. Submit Existing Facilities Investigation Memo and advise Owner of all deficiencies in system(s) prior to Work. All systems will be assumed to be fully operational if Memo is not received by Owner prior to work on system.

END OF SECTION 26 05 01

# SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

#### 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.

## 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Building wires and cables rated 600 V and less.
  - 2. Connectors, splices, and terminations rated 600 V and less.
  - 3. Sleeves and sleeve seals for cables.
  - 4. Metal Clad cable, Type MC
- B. Related Sections include the following:
  - Division 27 Section "Data Communications Integration" for cabling used for voice and data circuits.

## 1.3 DEFINITIONS

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Provide type and UL listing of each type of conductor, cable, connector and termination to be utilized for the DIVISION 26 scope of work.
- B. Field quality-control test reports.

# 1.5 QUALITY ASSURANCE

- A. Listing and Labeling: Provide wires and cables specified in this Section that are listed and labeled as defined in NFPA 70, Article 100.
- B. Comply with NFPA 70.

#### 1.6 COORDINATION

A. Coordinate layout and installation of cables with other installations.

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

26 05 19 - 1

B. Revise locations and elevations from those indicated, as required to suit field conditions and as approved by Architect.

## PART 2 - PRODUCTS

## 2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Alcan Products Corporation; Alcan Cable Division.
  - 2. American Insulated Wire Corp.; a Leviton Company.
  - 3. General Cable Corporation.
  - 4. Senator Wire & Cable Company.
  - 5. Southwire Company.

#### B. Building wires and cables

- 1. Conductor insulation
  - a. Comply with NEMA WC 70 for Types THHN-THWN
  - b. Service Entrance: Type THHN-THWN CU or XHHW-2 Al, single conductors in raceway.
  - c. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN-THWN, single conductors in raceway.
  - d. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway.
  - e. Feeders Installed below Raised Flooring: Type THHN-THWN, single conductors in raceway.
  - f. Exposed Branch Circuits, Including in Crawlspaces: Type THHN-THWN, single conductors in raceway.
  - g. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway or Metal-clad cable, Type MC (MC may only be utilized in certain specific installations as described elsewhere in this section).
  - h. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway. Minimum #12.
  - i. Branch Circuits Installed below Raised Flooring: Type THHN-THWN, single conductors in raceway. Minimum #12.
  - j. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
  - k. Class 1 Control Circuits: Type THHN-THWN, in raceway.
  - 1. Class 2 Control Circuits: Type THHN-THWN, in raceway.

#### 2. Conductor Material:

- a. Copper Conductors: Comply with NEMA WC 70.
- b. All #10 and smaller conductors shall be solid CU. No stranded conductors are permitted for #10 and smaller.
- c. Aluminum conductors may be used for 1/0 and larger panel board feeders if identified as aluminum on the electrical feeder schedule. Aluminum conductors shall be compact stranded aluminum alloy with XHHW-2 insulation, made of an AA-8000 series electrical grade aluminum alloy conductor material.

# 2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. AFC Cable Systems, Inc.
  - 2. AMP Incorporated
  - 3. Anderson

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

26 05 19 - 2

- 4. O-Z/Gedney; EGS Electrical Group LLC.
- 5. 3M; Electrical Products Division.
- 6. Burndy
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
- C. Aluminum connections shall be made with compression type wire barrels factory prefilled with oxide inhibiting compound. Set screw connectors are not acceptable.

# 2.3 FLEXIBLE METAL CLAD CABLE

- A. Comply with:
  - 1. NFPA 70
  - 2. ANSI/UL 4/UL 83/UL 1479
  - 3. Fed. Specification J-C-30B
- B. Cable material:
  - 1. Jacket material:
    - a. Galvanized Steel or aluminum, interlocked.
  - 2. Conductor covering: Paper wrap.
  - 3. Conductor Material:
    - a. Copper, Solid, THHN
    - b. Minimum #12 gauge
    - c. Maximum #10 gauge
    - d. 90 degree C, 600 volt.
    - e. Full size insulted grounding conductor, green.
    - f. Conductor color coding to match system voltage. Comply with Division 26 Section "Identification".
- C. Fittings:
  - 1. ANSI/NEMA FB 1
  - 2. ANSI/UL 514B
  - 3. Zinc plated Malleable iron, or steel.
    - a. Direct flexible conduit bearing set screw type not acceptable.
    - b. Install insulated bushings or equivalent protection (i.e. Anti-short) between core conductors and outer jacket.

## **PART 3 - EXECUTION**

## 3.1 INSTALLATION OF CONDUCTORS AND CABLES IN RACEWAY

- A. No cables shall be installed in raceways until the raceway system is complete from end to end.
- B. Examine raceways and building finishes to confirm compliance with contract requirements for installation tolerances and other conditions affecting installation of wires and cables. Do not proceed with installation until area is ready and any unsatisfactory conditions have been corrected.
- C. Verify that interior of building has been protected from weather.

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

26 05 19 - 3

- D. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- E. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- F. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."
- G. All branch circuit wire shall be sized for a maximum voltage drop of 3%. The contractor shall size all cables to comply with this requirement. Below are some guidelines that may be followed to achieve the correct voltage drop in lieu of providing custom calculations for each case.
  - 1. Use conductor not smaller than #12 AWG for all 120V 20A branch circuits less than 60' in length from the source breaker to any device.
  - 2. All 120V branch circuit conductors where the length is 61' to 120' from the source breaker to any device shall utilize #10 minimum throughout the circuit, unless otherwise noted.
  - 3. All 120V branch circuit conductors where the length is 121' to 240' from the source breaker to any device shall utilize # 8 minimum throughout the circuit, unless otherwise noted.
  - 4. All 120V branch circuit conductors where the length is greater than 241' from the source breaker to any device shall utilize # 6 minimum throughout the circuit, unless otherwise noted.
  - 5. Use conductor not smaller than #12 AWG for all 277V 20A branch circuits less than 140' in length from the source breaker to any device.
  - 6. All 277V branch circuit conductors where the length is 141' to 220' from the source breaker to any device shall utilize #10 minimum throughout the circuit, unless otherwise noted.
  - 7. All 277V branch circuit conductors where the length is 221' to 340' from the source breaker to any device shall utilize # 8 minimum throughout the circuit, unless otherwise noted.
  - 8. All 277V 20A branch circuit conductors where the length is greater than 341' from the source breaker to any device shall utilize # 6 minimum throughout the circuit, unless otherwise noted.
- H. Provide a dedicated neutral conductor for all dimmer circuits from the load back to the dimmer module or switch.
- I. Provide a dedicated neutral conductor for all computer receptacle circuits from the load back to the branch circuit panel board.
- J. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- K. Conductor sizes indicated on circuit homeruns or in schedules shall be installed over the entire length of the circuit unless noted otherwise on the drawings or in these specifications.
- L. Before installing raceways and pulling wire to any mechanical equipment, verify electrical characteristics with final submittal on equipment to assure proper number and AWG of conductors. (As for multiple speed motors, different motor starter arrangements, etc.).
- M. Coordinate all wire sizes with lug sizes on equipment, devices, etc. Provide/install lugs as required to match wire size.

# 3.2 INSTALLATION REQUIREMENTS FOR METAL CLAD CABLES

A. Metal Clad Cables may be used only as specified, where permitted by NEC, and if approved by the Local Inspecting Authority having Jurisdiction.

- B. MC Cable shall not be run to the panel board or electrical room. All final runs to the panelbpard shall be in conduit to a point at least 10' outside the electrical room. No more than 6 current carrying conductors shall be run in any conduit to a junction box outside the electrical room. No junction box shall contain more than 6 current carrying conductors. Wireways are not permitted for the termination of MC cables.
- C. MC cable shall not be used for any other building system wiring (except power and lighting).
- D. MC cables shall not be used for switch legs.
- E. MC cables shall not be used for feeder circuits or for systems.
- F. Utilize the same sizing requirements for 20A branch circuit conductors as listed for conductors in raceways.
- G. Connectors and supporting components shall be UL Listed for such use. Tie wire is not acceptable for supporting MC cable.
- H. Cut cables with UL listed tools intended for such use. Ream smooth and free of sharp and abrasive areas. Install bushing between conductors and outer jacket. The use of slide cutters or dikes to cut cables is not acceptable.
- I. Maintain minimum 1/2 inch separation between each cable and support per NEC. The practice of bundling cables is not acceptable.
- J. Install cables minimum of 1'-0" from communications cables.
- K. Attachment of cables to ceiling system is prohibited.
- L. Attachment of cables to, on, or from mechanical (HVAC) equipment, supports, etc., is not permitted.
- M. Install cables parallel and perpendicular to building structure.
- N. Zigzagging cables through building elements, as method of support is not acceptable.
- O. Cable with outer metal sheath damaged by construction elements and/or improper installation shall be replaced at no additional cost to owner.

## 3.3 CONNECTIONS

- A. Where oversized conductors are called for (due to voltage drop, etc.) provide/install lugs as required to match conductors, or provide/install splice box, and splice to reduce conductor size to match lug size.
- B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- C. All aluminum connections shall be made with approved compression connectors before being connected to lugs. Conductors shall be cleaned with a wire brush immediately prior to connecting.
- D. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- E. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

- F. Power and lighting conductors shall be continuous and unspliced where located within conduit. Splices shall occur within troughs, wireways, outlet boxes, or equipment enclosures where sufficient additional room is provided for all splices. No splices shall be made in in-ground pull boxes (without written acceptance of engineer).
- G. Splices in lighting and power outlet boxes, wireway, and troughs shall be kept to a minimum, pull conductors through to equipment, terminal cabinets, and devices.
- H. No splices shall be made in junction box, and outlet boxes (wire No. 8 and larger) without written acceptance of Engineer.
- I. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B. A calibrated torque wrench shall be used for all bolt tightening.
- J. All interior power and lighting taps and splices in No. 8 or smaller shall be fastened together by means of "spring type" connectors. All taps and splices in wire larger than No. 8 shall be made with compression type connectors and taped to provide insulation equal to wire. Utilize weatherproof connectors for all splices in exterior boxes.
- K. No splices are permitted in exterior below grade handhole or pull boxes.

# 3.4 FIELD QUALITY CONTROL

- A. After feeders are in place, but before being connected to devices and equipment, test for shorts, opens, and for intentional and unintentional grounds.
- B. Cables 600 volts or less in size #1/0 and larger shall be meggered using an industry approved "megger" with 1000 V internal generating voltage. Readings shall be recorded and submitted to the Engineer for acceptance prior to energizing same. If values are less than recommended NETA values notify Engineer. Submit five copies of tabulated megger test values for all cables.
- C. Cables 250 volts or less in size #1/0 and larger shall be meggered using an industry approved "megger" with 500 V internal generating voltage. Readings shall be recorded and submitted to the Engineer, for acceptance prior to energizing same. Submit five copies of tabulated megger test values for all cables.
- D. Perform Insulation resistance test and turns ratio test. Submit five copies to engineer at substantial completion.
- E. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 26 05 19

## SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

## 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.

## 1.2 SUMMARY

A. This Section includes methods and materials for grounding systems, equipment and common ground bonding with lightning protection system.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.

# 1.4 QUALITY ASSURANCE

- A. Comply with UL 467 for grounding and bonding materials and equipment.
- B. Test all ground rod locations as described to confirm quality standard intent is attained.

## PART 2 - PRODUCTS

#### 2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
  - 1. Solid Conductors: ASTM B 3.
  - 2. Stranded Conductors: ASTM B 8.
  - 3. Tinned Conductors: ASTM B 33.
  - 4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
  - 5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
  - 6. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 4 inches in cross section, unless otherwise indicated; with insulators.

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

# 2.2 CONNECTORS

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
  - 1. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- D. Lugs: Compression of substantial construction, cast copper or cast bronze, with "ground" (micro-flat) surfaces, twin clamp, two-hole tongue, equal to Burndy or equal by T&B or OZ Gedney. Lightweight and "competitive" devices shall be rejected.
- E. Grounding and Bonding Bushings: Malleable iron, Thomas and Betts (T&B), or equal.
- F. Grounding Screw and Pigtail: Raco No. 983 or equal.
- G. Building Structural Steel, Existing: Thompson 701 Series heavy duty bronze "C" clamp with two-bolt vise-grip cable clamp or equal.

## 2.3 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel, sectional type; 5/8 inch by 10 feet in diameter.

#### 2.4 GROUNDING WELL COMPONENTS

- A. All Areas:
  - 1. Well: Minimum 12 inch long by 12 inch wide by 18 inches deep with open bottom.
  - 2. Well Cover: Traffic rated for use with "GROUND" embossed on cover.
  - 3. Material: Composolite.
  - 4. Manufacturer: Quazite.
  - 5. Increase depth, diameter or size as required to provide proper access at installed location.

# 2.5 GROUNDING BARS/GROUND BUS (INCLUDING 'SYSTEMS' GROUND BUS/BARS AND GROUND BUS BARS)

A. Ground bars shall be copper of the size and description as shown on the drawings. If not sized on drawings, bus bar shall be minimum 1/4" x 4" bus grade copper, spaced from wall on insulating 2" polyester molded insulator standoff/supports, and be 12" or greater minimum overall length, allowing 2" length per lug connected thereto. Increase overall length as required to facilitate all lugs required while maintaining 2" spacing. Size of bus bar used in main electrical room shall be similar except minimum of 4" high and 24" long.

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

- B. Provide bolt-tapping lug with two hex head mounting bolts for each terminating ground conductor, sized to match conductors. Mount on bus bar at 2 inches on center spacing. Lugs to be manufactured by Burndy or T&B.
- C. Standoff supports to be 2" polyester as manufactured by Glastic #2015-4C.

#### PART 3 - EXECUTION

#### 3.1 GROUNDING ELECTRODES

- A. All connections shall be exothermic welded unless otherwise noted herein. All connections above grade and in accessible locations may be by exothermic welding or by braising or clamping with devices UL listed as suitable for use except in locations where exothermic welding is specifically specified in these specifications or called for on drawings.
- B. Each rod shall be die stamped with identification of manufacturer and rod length.
- C. Install rod electrodes at locations indicated and/or as called for in these specifications.
- D. Ground Resistance:
  - 1. Main Electrical Service (to each building) and Generator Locations:
    - a. Grounding resistance measured at each main service electrode system and at each generator electrode system shall not exceed 5 ohms.
  - 2. Other Locations:
    - a. Resistance to ground of all non-current carrying metal parts shall not exceed 5 ohms measured at motors, panels, busses, cabinets, equipment racks, light poles, transformers, and other equipment.
  - 3. Lightning Protection system ground locations shall not exceed 5 ohms for the Franklin system measured at ground electrode.
  - 4. Resistance called for above shall be maximum resistance of each ground electrode prior to connection to grounding electrode conductor. Where ground electrode system being measured consists of two (2) or more ground rod electrodes then the resistance specified above shall be the maximum resistance with two (2) or more rods connected together but not connected to the grounding electrode conductor.
- E. Install additional rod electrodes as required to achieve specified resistance to ground (specified ground resistance is for each ground rod location prior to connection to ground electrode conductor). Depending on soil condition, etc. of ground rod locations it has been found that the ground rod lengths required to achieve the specified resistance may range from the minimum specified length to up to 80 feet or more in length.
- F. Verify that final backfill and compaction has been completed before driving rod electrodes.
- G. Install ground rods not less than 1 foot below grade level and not less than 2 feet from structure foundation.

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

# 3.2 EQUIPMENT GROUNDING CONDUCTOR

- A. Provide separate, insulated (bare if with feeder in PVC conduit outside of building(s)) conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
- B. Provide green insulated ground wire for all grounding type receptacles and for equipment of all voltages. In addition to grounding strap connection to metallic outlet boxes, a supplemental grounding wire and screw equal to Raco No. 983 shall be provided to connect receptacle ground terminal to the box.
- C. All plugstrips and metallic surface raceway shall contain a green insulation ground conductor from supply panel ground bus connected to grounding screw on each receptacle in strip and to strip channel. Conductor shall be continuous.
- D. All motors, all heating coil assemblies, and all building equipment requiring flexible connections shall have a green grounding conductor properly connected to the frames and extending continuously inside conduit with circuit conductors to the supply source bus with accepted connectors regardless of conduit size or type. This shall include Food Service equipment, Laundry equipment, and all other "Equipment By Owner" to which an electric conduit is provided under this Division.

## 3.3 MAIN ELECTRICAL SERVICE

- A. Existing Buildings:
  - 1. Verify that each building's electrical service is properly grounded as required by the NEC.
  - 2. Provide and install electrical service grounding at each building as called for herein for all existing services that do not comply with the grounding specified above.
  - 3. Supplement existing electrical service grounding at each building as required to comply with all requirements in these specifications.
  - 4. If exterior ground rod electrode does not exist at each buildings main electrical service, provide and install these ground rods as called for main electrical service, exterior of building. Connect all counterpoise conductors required elsewhere thereto.
- B. Ground electrodes shall be provided for the main service in sufficient number and configuration to secure resistance specified.
- C. Bond to all of the following when available on site:
  - 1. Ground Rods
  - 2. Metal Water Pipe (Interior and Exterior to Building)
  - 3. Building Metal Frame, Structural Steel and/or Reinforced Structural Concrete
  - 4. All Piping Entering or Leaving All Buildings (Including Chilled Water Piping)
  - 5. Encasing Electrodes
  - 6. Ground Ring
  - 7. Site Distribution Counterpoise Ground System
  - 8. Lightning Protection System
- D. A main ground, bare copper conductor, sized per applicable table in NEC, but in no case less than #2/0, shall be run in conduit from the main switchgear of <u>each</u> building to the building steel in respective building. This ground conductor shall also be run individually from the main switchgear and be bonded to the main water service ahead of any union in pipe and must be metal pipe of length as acceptable by authorities having jurisdiction. Provide properly sized bonding shunt around water meter and/or dielectric unions in the water pipe. Also required is the same size ground wire to ground rod electrode as called for below:

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

- 1. Three 30 ft. ground rods in a delta configuration at no less than 30 ft. spacing driven to a minimum depth of 30 ft. plus 1 below grade.
- 2. Bond ground rod electrodes together with a bare copper ground conductor that matches size required by applicable table in NEC 250, but in no case less than #2/0.
- 3. Provide additional rod electrodes as required to achieve specified ground resistance.
- E. Ground/bond neutral per NEC.
- F. Bond grounding electrodes to site counterpoise grounding system and lightning protection system where provided.
- G. Provide and install ground bus bar on wall near main service disconnect/switchboard. Connect to ground bar in disconnect/switchboard bonded to switchboard/disconnect enclosure/neutral with copper grounding conductor sized per applicable table in NEC.

#### 3.4 TRANSFORMER GROUNDING

- A. Ground all transformers and enclosures of 120/208V and 277/480V "separately derived systems" as specified herein.
  - 1. Ground per NEC 250 and these specifications.
  - 2. Bond neutral to transformer frame/enclosure and the equipment grounding conductors of the derived system with copper ground conductor sized per applicable table in NEC.
  - 3. Connect transformer neutral/ground to grounding electrode per NEC with grounding electrode conductor sized per applicable table in NEC.
  - 4. In addition to connection to grounding electrode conductor called for above (i.e. per NEC) provide, install and connect supplemental grounding electrode as follows:
    - a. Where grounding required per NEC is to building steel/structure, supplement this grounding with connection to nearest available effectively grounded metal water pipe.
    - b. Where grounding connection required per NEC is to grounded metal water pipe, supplement this grounding with connection to other electrodes specified in NEC.
    - c. Where supplemental grounding electrodes required above is a ground rod electrode, provide, install and connect two or more 30 ft. ground rod electrodes at no less than 30 ft. spacing, driven vertical to a minimum depth of 30 ft. plus 1 below grade.
  - 5. Where neither building steel nor water pipe grounding electrodes are available (i.e. exterior locations with no available water pipe electrode) provide two (2) ground connections: each to two (2) or more 30 ft. ground rod electrodes at no less than 30 ft. spacing, driven vertical to a minimum depth of 30 ft. plus 1 below grade.
  - 6. Where transformer is mounted exterior to building one (1) of the two (2) ground electrodes required shall be ground rod electrode as called for in 5. above. This ground rod electrode shall also be connected to counterpoise system (wherever counterpoise system is available).
  - 7. Ground to water system service pipe as required by NEC.
- B. Provide additional ground electrodes as required to achieve specified ground resistance.
- C. Where two or more ground electrodes are used at any one required ground location, they shall be bonded together with a copper ground conductor, sized to meet applicable table in NEC, but in no case less than #2/0.
- D. Provide and install ground bus bar on wall near transformer (or in associated electrical room for exterior mounted transformers). Connect to ground lug in transformer bonded to transformer enclosure/neutral with copper ground conductor sized per applicable table in NEC.

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

#### 3.5 GENERATOR GROUNDING

- A. Separately derived systems (i.e. systems where generator neutral is not solidly interconnected to service supplied system neutral such as 4 pole switched neutral transfer switch systems).
  - 1. Ground per NEC and these specifications.
  - 2. Bond neutral to transformer frame/enclosure and the equipment grounding conductors of the derived system with copper ground conductor sized per applicable table in NEC.
  - 3. Connect generator neutral/ground to grounding electrodes per NEC with grounding electrode conductor sized per applicable table in NEC.
  - 4. In addition to connection to grounding electrode conductor called for above (i.e. per NEC) provide, install and connect supplemental grounding electrode as follows:
    - a. Where grounding required per NEC is to building steel/structure, supplement this grounding with connection to nearest available effectively grounded metal water pipe.
    - b. Where grounding connection required per NEC is to grounded metal water pipe, supplement this grounding with connection with connection to other electrodes specified in NEC.
    - c. Where supplemental grounding electrodes required above is a ground rod electrode, provide, install and connect two or mote 30 ft. ground rod electrodes at no less than 30 ft. spacing, driven vertical to a minimum depth of 30 ft. plus 1 below grade.
  - 5. Where neither building steel nor water pipe grounding electrodes are available (i.e. exterior locations with no available water pipe electrode) provide two (2) ground connections: each to two (2) or more 30 ft. ground rod electrodes at no less than 30 ft. spacing, driven vertical to a minimum depth of 30 ft. plus 1 below grade.
  - 6. Where generator is mounted exterior to building one (1) of the two (2) ground electrodes required shall be ground rod electrode as called for in 5. above. This ground rod electrode shall also be connected to counterpoise system.
- B. Non separately derived systems (i.e. systems where generator neutral is solidly interconnected to service supplied system neutral such as 3 pole non-switched neutral transfer switch systems).
  - 1. Do not bond neutral to transformer frame/enclosure or the equipment grounding conductors of the derived system.
  - 2. Connect generator frame/enclosures ground to grounding electrode per NEC with grounding electrode conductor sized per applicable table in NEC .
  - 3. In addition to connection to grounding electrode conductor called for above (i.e. per NEC) provide, install and connect supplemental grounding electrode as follows:
    - a. Where grounding required per NEC is to building steel/structure, supplement this grounding with connection to nearest available effectively grounded metal water pipe.
    - b. Where grounding connection required per NEC is to grounded metal water pipe, supplement this grounding with connection to other electrodes specified in NEC.
    - c. Where supplemental grounding electrodes required above is a ground rod electrode, provide, install and connect two or more 30 ft. ground rod electrodes at no less than 30 ft. spacing, driven vertical to a minimum depth of 30 ft. plus 1 below grade.
  - 4. Where neither building steel nor water pipe grounding electrodes are available (i.e. exterior locations with no available water pipe electrode) provide two (2) ground connections: each to two (2) or more 30 ft. ground rod electrodes at no less than 30 ft. spacing, driven vertical to a minimum depth of 30 ft. plus 1 below grade.
  - 5. Where generator is mounted exterior to building one (1) of the two (2) ground electrodes required shall be ground rod electrode as called for in 5. above. This ground rod electrode shall also be connected to counterpoise system.

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

- C. Provide additional ground electrodes as required to achieve specified ground resistance.
- D. Where two or more ground electrodes are used at any one required ground location, they shall be bonded together with a copper ground conductor, sized to meet applicable table in NEC, but in no case less than #2/0.

#### 3.6 LIGHTNING PROTECTION SYSTEMS

- A. Ground per applicable section on lightning protection system, NFPA 780, and as specified herein. The most stringent requirements shall govern.
- B. Bond lightning protection system grounds to electrical service system ground, all piping entering or leaving all buildings, and counterpoise system ground where provided.
- C. Lightning protection ground rods shall be 20' in length and should not be driven deeper. If additional rods are required to achieve the required resistance to ground, they should be added in parallel with the first at one rod length separation.

# 3.7 EXTERIOR GRADE (OR FREE STANDING ABOVE GROUND) MOUNTED EQUIPMENT

#### A. General:

- 1. All equipment (including chillers, pumps, disconnects, starters, control panels, panels, etc) mounted exterior to building shall have their enclosures grounded directly to a grounding electrode at the equipment location in addition to the building equipment ground connection.
- 2. Bond each equipment enclosure, metal rack support, mounting channels, etc. to ground electrode system at each rack with an insulated copper ground conductor sized to match the grounding electrode conductor required by applicable table in NEC based on equipment feeder size, but in no case shall conductor be smaller than #6 copper or larger than #2 copper. This connection is in addition to grounding electrode connections required for services.
- B. Main electrical service rack mounted equipment.
  - 1. Ground per "MAIN ELECTRICAL SERVICE".
  - 2. Bond all metal parts as noted above.
- C. Electrical sub service rack mounted equipment.
  - 1. Ground per "MAIN ELECTRICAL SERVICE", except do not bond neutral to ground.
  - 2. Bond all metal parts as noted above.
- D. Electrical equipment connection rack mounted equipment.
  - 1. Bond all metal parts as noted above.
- E. Grounding electrodes (ground electrodes system) shall be:
  - 1. Located at each rack location.
  - 2. For service equipment: Ground electrode required per "MAIN ELECTRICAL SERVICE".
  - 3. For equipment connection equipment: Two or more 30 ft. ground rods at no less than 30 ft. spacing, driven vertical to a minimum depth of 1 ft below grade. Bond the two or more ground

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

rods together with a size to meet applicable table in NEC, but no less than a #2 copper ground conductor. Provide additional rod electrodes as required to achieve specified ground resistance.

## 3.8 LIGHTING FIXTURES

- A. All new and removed/reinstalled fixtures in building interior, and exterior fixtures shall be provided with green grounding conductor, solidly connected to unit. Individual fixture grounds shall be with lug to fixture body, generally located at point of electrical connection to the fixture unit.
- B. All suspended fixtures and those supplied through flexible metallic conduit shall have green ground conductor from outlet box to fixture. Cord connected fixtures shall contain a separate green ground conductor.

## C. Pole Light Fixtures:

- 1. Metal Pole Light Fixtures:
  - a. Freestanding pole mounted lighting fixtures shall each have a Class I or Class II lightning protection main copper down conductor connected to grounding electrodes at base of pole.
  - b. Conductor shall be bonded to metal pole via UL Listed ground clamp suitable for use. Locate ground lug opposite to handhole (or adjacent if visible through handhole).

#### 2. Concrete or Non-Metallic Pole:

- a. Freestanding pole mounted lighting fixtures shall each have a Class I or Class II lightning protection main copper down conductor connected to grounding electrodes at base of pole.
- b. Conductor shall be extended from grounding electrode to top of pole and terminate at the top of pole in a Class I or Class II copper lightning protection air terminal.
- c. Each metal part of light fixture assembly, bracket, ballast cabinet, disconnect, transformer, etc. that is mounted to pole shall be bonded to down conductor.
- 3. Fixtures located on elevated roadway ramps shall be specially provided with a connection to lightning counterpoise grounding system, properly installed.
- 4. Grounding electrode(s) at each pole shall be connected (bonded) to site distribution counterpoise system.
- 5. Grounding Electrodes:
  - a. Two or more 10 ft. ground rods at no less than 10 ft. spacing shall be driven vertically to a minimum depth of 10 ft. plus 1 below grade.
  - b. Bond the two or more ground rod electrodes together with a Class I or Class II lightning protection main copper conductor.
  - c. Provide additional rod electrodes as required to achieve specified ground resistance.
  - d. The two (2) or more grounding rod electrodes shall be installed at each light pole.
- 6. Installation shall exceed minimum requirements of NFPA 780.

## 3.9 PULLBOX, MANHOLE, HANDHOLE GROUNDING.

- A. One 30 ft. ground rod electrode shall be driven vertically to a minimum depth of 30 ft. plus 1 ft. below grade in each manhole, handhole or pullbox (in ground).
- B. Bond to counterpoise system (whenever counterpoise system is provided.)

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

C. Bond grounding electrode to all exposed metal parts of manhole, handhole, and pullbox (including metal cover) with #6 copper ground conductor. Connect to ground rod electrode with exothermic weld. Connect to metal cover with exothermic weld. Connect to other metal parts with exothermic weld or UL accepted grounding clamp. Provide 3 ft. or more slack ground cable on cover connection as required to facilitate removal of cover.

## 3.10 GROUND RING

- A. Provide complete underground building perimeter ground ring system, completely encircling each building.
- B. Conductor shall be minimum of Class II lightning protection copper conductor (bare).
- C. Install at not less than 2-1/2 feet depth into earth.
- D. Install ground rods 20 ft. long every 150 feet section of ground ring conductor.
- E. Bond ground ring to building steel every 150 feet of building perimeter, bond to any and all electrical and piping systems that cross the ground ring system, bond to lightning protection down conductors and to any lightning or other earth grounding electrodes that may be present on the premises.
- F. Bond to building service and counterpoise ground systems.

## 3.11 MISCELLANEOUS GROUNDING CONNECTIONS

- A. Provide bonding to meet regulatory requirements.
- B. Required connections to building steel shall be with UL accepted non-reversible crimp type ground lugs exothermically welded to bus bar that is either exothermically welded to steel or bolted to steel in locations where weld will not affect the structural properties of the steel. Required connections to existing building structural steel purlins/I beams shall be with heavy duty bronze "C" clamp with two bolt vise-grip cable clamp.
- C. Grounding conductors shall: be so installed as to permit shortest and most direct path from equipment to ground; be installed in conduit; be bonded to conduit at both ends when conduit is metal; have connections accessible for inspection; and made with accepted solderless connectors brazed (or bolted) to the equipment or to be grounded; in NO case be a current carrying conductor; have a green jacket unless it is bare copper; be run in conduit with power and branch circuit conductors. The main grounding electrode conductor shall be exothermically welded to ground rods, water pipe, and building steel.
- D. All surfaces to which grounding connections are made shall be thoroughly cleaned to maximum conductive condition immediately before connections are made thereto. Metal rustproofing shall be removed at grounding contact surfaces, for 0 ohms by digital Vm. Exposed bare metal at the termination point shall be painted.
- E. All ground connections that are buried or in otherwise inaccessible locations, shall be welded exothermically. The weld shall provide a connection which shall not corrode or loosen and which shall be equal or larger in size than the conductors joined together. The connection shall have the same current carrying capacity as the largest conductor.
- F. Install ground bushings on all metal conduits entering enclosures where the continuity of grounding is broken between the conduit and enclosure (i.e. metal conduit stub-up into a motor control center

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

- enclosure or at ground bus bar). Provide an appropriately sized bond jumper from the ground bushing to the respective equipment ground bus or ground bus bar.
- G. Install ground bushings on all metal conduits where the continuity of grounding is broken between the conduit and the electrical distribution system (i.e. metal conduit stub-up from wall outlet box to ceiling space. Provide an appropriately sized bond jumper from the ground bushing to the respective equipment ground bus or ground bus bar.
- H. Each feeder metallic conduit shall be bonded at all discontinuities, including at switchboards and all subdistribution and branch circuit panels with conductors in accordance with applicable table in NEC 250 for parallel return with respective interior grounding conductor.
- I. Grounding provisions shall include double locknuts on all heavywall conduits.
- J. Bond all metal parts of pole light fixtures to ground rod at base.
- K. Install grounding bus in all existing panelboards of remodeled areas, for connection of new grounding conductors, connected to an accepted ground point.
- L. Bond together reinforcing steel and metal accessories in pool and fountain structures.
- M. Where reinforced concrete is utilized for building grounding system, proper reinforced bonding shall be provided to secure low resistance to earth with "thermite" type devices, and #10AWG wire ties shall be provided to not less than ten (10) full length rebars which contact the connected rebar.

# 3.12 GROUNDING BAR/GROUND BUS (INCLUDING 'SYSTEMS' GROUND BUS/BAR ON GROUND BUS/BAR) INSTALLATION

- A. Where indicated on the drawings, provide and install grounding bar/ground bus (bus bar). These bus installations are intended to provide a low-impedance "earthing" path for surge voltages, which are electrically "clamped" and shunted to earth by variable-impedance surge protective devices. Metal sheaths of underground cables are also to be grounded thereto at points of building entrance.
- B. Mount bolt tapping lugs with hex head bolts to bus bar at 2" o.c. spacing, one for each ground conductor.
- C. Mount bus bar to wall using 2" polyester molded insulator stand-off.
- D. Extend a #2/0 (minimum size) or larger THWN insulated copper ground conductor (if larger size is called for on drawings or required by N.E.C. for service ground, etc.) in PVC conduit to accepted service ground installation or ground bus/bar in main service equipment enclosure.
- E. Extend #6 insulated copper ground wire from respective bus/bar to each 'local' ground bus/bar in each cabinet for Section 27 systems.
- F. 'SYSTEMS' grounding bus/bar must be connected with #2/0 insulated copper conductor to grounding electrodes system as defined in NEC "Article 800.

G.

#### 3.13 COMMUNICATIONS SYSTEMS

- A. Provide and install all grounding as required by NEC Article 800 and where available on project: Articles 810 (Radio and Television Equipment); 820 (Community Antenna Television and Radio Distribution Systems); and 830 (Network-Powered Broadband Communications Systems.
- B. Provide and install grounding electrode at point of entry of communication cables and bond to service entrance grounding electrodes per NEC 800. Install ground bus bar at point of entry of communications cable and connect electrode to ground bus. Connect communications cable metal sheath and surge protection devices to ground bar.

# 3.14 TESTING AND REPORTS

- A. Ground resistance measurements shall be made on each system utilized in the project. The ground resistance measurements shall include building structural steel, driven grounding system, water pipe grounding system and other accepted systems as may be applicable. Ground resistance measurements shall be made in normally dry weather, not less than 24 hours after rainfall, and with the ground under test isolated from other grounds and equipment. Resistances measured shall not exceed specified limits.
- B. Upon completion of testing, the testing conditions and results shall be certified and submitted to the Architect/Engineer.

END OF SECTION 26 05 26

## SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

## 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.

## 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Hangers and supports for electrical equipment and systems.
  - 2. Construction requirements for concrete bases.

## 1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.

# 1.4 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.
- D. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

# 1.5 SUBMITTALS

- A. Product Data: For the following:
  - 1. Unistrut
  - 2. Straps
  - 3. Clamps
  - 4. Rods

- 5. Hangers
- 6. Anchors
- 7. Attachment Devices
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
  - 1. Trapeze hangers. Include Product Data for components.
  - 2. Steel slotted channel systems. Include Product Data for components.
  - 3. Nonmetallic slotted channel systems. Include Product Data for components.
  - 4. Equipment supports.

# 1.6 QUALITY ASSURANCE

A. Comply with NFPA 70.

#### 1.7 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 07 Section "Roof Accessories."

#### PART 2 - PRODUCTS

# 2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Cooper B-Line, Inc.; a division of Cooper Industries.
    - b. ERICO International Corporation.
    - c. Thomas & Betts Corporation.
    - d. Unistrut; Tyco International, Ltd.
    - e. Wesanco, Inc.
  - 2. Metallic Coatings: Exterior of the building utilize stainless steel or hot-dip galvanized after fabrication and applied according to MFMA-4. Interior utilize electro-galvanized steel products.
  - 3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
  - 4. Channel Dimensions: Selected for applicable load criteria.
- B. Nonmetallic Slotted Support Systems: Structural-grade, factory-formed, glass-fiber-resin channels and angles with 9/16-inch diameter holes at a maximum of 8 inches o.c., in at least 1 surface.
  - 1. 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:

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

26 05 29 - 2

- a. Cooper B-Line, Inc.; a division of Cooper Industries.
- b. Fabco Plastics Wholesale Limited.
- c. T & B/Carlon
- d. Seasafe, Inc.
- 2. Fittings and Accessories: Products of channel and angle manufacturer and designed for use with those items.
- 3. Fitting and Accessory Materials: Same as channels and angles, except metal items may be stainless steel.
- 4. Rated Strength: Selected to suit applicable load criteria.
- C. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- D. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- E. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- F. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- G. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
  - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
    - 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) Hilti Inc.
      - 2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      - 3) MKT Fastening, LLC.
      - 4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.
  - 2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
    - 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) Cooper B-Line, Inc.; a division of Cooper Industries.
      - 2) Empire Tool and Manufacturing Co., Inc.
      - 3) Hilti Inc.
      - 4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      - 5) MKT Fastening, LLC.

- 3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
- 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
- 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
- 6. Toggle Bolts: All-steel springhead type.
- 7. Hanger Rods: Threaded steel.

# 2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Division 05 Section "Metal Fabrications" for steel shapes and plates.

## **PART 3 - EXECUTION**

# 3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25percent in future without exceeding specified design load limits.

#### 3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  - 1. To Wood: Fasten with lag screws or through bolts.
  - 2. To New Concrete: Bolt to concrete inserts.
  - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  - 4. To Existing Concrete: Expansion anchor fasteners.

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

26 05 29 - 4

- 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
- 6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts, beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69 or spring-tension clamps.
- 7. To Light Steel: Sheet metal screws.
- 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.
- F. Do not support conduit or raceway with wire, metal banding material, or perforated pipe straps. Remove wire used for temporary supports
- G. Do not attach conduit or raceway to ceiling support wires.
- H. Conduits or raceways shall not be supported from ceiling grid supports, plumbing pipes, duct systems, heating or air conditioning pipes, or other building systems.
- I. Non-bolted conduit clamps, spring type conduit clamps, and tie wire are not acceptable for supports. All conduits must be supported with bolted hangers listed for the specific installed application.

#### 3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Division 05 Section "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

# 3.4 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated but not less than 4 inches (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 03 Section "Cast-in-Place Concrete."
- C. Anchor equipment to concrete base.
  - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
  - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

END OF SECTION 26 05 29

## SECTION 26 05 33 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

# 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.

## 1.2 SUMMARY

- A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.
- B. Related Sections include the following:
  - 1. Division 26 Section "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks, manholes, and underground utility construction.

# 1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. ENT: Electrical nonmetallic tubing.
- C. EPDM: Ethylene-propylene-diene terpolymer rubber.
- D. FMC: Flexible metal conduit.
- E. LFMC: Liquidtight flexible metal conduit.
- F. LFNC: Liquidtight flexible nonmetallic conduit.
- G. NBR: Acrylonitrile-butadiene rubber.
- H. RNC: Rigid nonmetallic conduit.

# 1.4 SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For the following raceway components. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Custom enclosures and cabinets.

- 2. For handholes and boxes for underground wiring, including the following:
  - a. Duct entry provisions, including locations and duct sizes.
  - b. Frame and cover design.
  - c. Grounding details.
  - d. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.
  - e. Joint details.
- C. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
  - 1. Structural members in the paths of conduit groups with common supports.
  - 2. HVAC and plumbing items and architectural features in the paths of conduit groups with common supports.

#### 1.5 REFERENCES

- A. ANSI C80.1 Rigid Steel Conduit Zinc Coated
- B. ANSI C80.3 Electrical Metallic Tubing Zinc Coated
- C. ANSI C80.5 Aluminum Rigid Conduit (ARC)
- D. ANSI/NEMA FB 1 Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing and Cable
- E. ANSI/NEMA OS 1 Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
- F. NEMA 250 Enclosures for Electrical Equipment (1000 Volts Maximum).
- G. ANSI/NFPA 70 National Electrical Code
- H. NECA Standard Practices for Good Workmanship in Electrical Contracting
- I. NEMA RN 1 Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit.
- J. NEMA TC 2 Electrical Polyvinyl Chloride (PVC) Conduit (EPC 40, EPC 80)
- K. NEMA TC 3 -Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing

# 1.6 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

## B. Comply with NFPA 70.

## PART 2 - PRODUCTS

## 2.1 METAL CONDUIT AND TUBING

- A. Minimum Trade Size
  - 1. All Conduit (except switch legs) 3/4"c.
  - 2. Switch legs 1/2"c.
- B. Rigid Metallic Conduit
  - 1. Comply with:
    - a. ANSI C80.1
    - b. UL Spec No. 6
    - c. NEC 344
  - 2. Conduit material:
    - a. Zinc coated or hot dipped galvanized steel.
  - 3. Fittings:
    - a. Threaded.
    - b. Insulated bushings shall be used on all rigid steel conduits terminating in panels, boxes, wire gutters, or cabinets, and shall be impact resistant plastic molded in an irregular shape at the top to provide smooth insulating surface at top and inner edge. Material in these bushings must not melt or support flame.
    - c. Zinc plated or hot dipped galvanized malleable iron or steel.
  - 4. Conduit Bodies:
    - a. Comply with ANSI/NEMA FB 1.
    - b. Threaded hubs.
    - c. Zinc plated or hot-dipped galvanized malleable iron.
- C. Rigid Aluminum Conduit
  - 1. Comply with:
    - a. ANSI C80.5

- b. UL 6
- c. NEC 344
- 2. Conduit material: Aluminum.
- 3. Fittings:
  - a. Threaded.
  - b. Aluminum.
  - c. Insulated bushings on terminations.
- 4. Conduit bodies:
  - a. Comply with ANSI/NEMA FB 1.
  - b. Threaded hubs.
  - c. Aluminum.
- D. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
  - 1. Comply with:
    - a. UL 6
    - b. ANSI C80.1
    - c. NEC. 344
    - d. NEMA RN1
  - 2. Conduit material: Hot-dipped galvanized rigid steel with external PVC coating, 20 mil. thick.
  - 3. Fittings:
    - a. Threaded.
    - b. Insulated bushings on terminations.
    - Zinc plated or hot-dipped galvanized malleable iron or steel with external PVC coating, 20 mil. thick.
  - 4. Conduit bodies:
    - a. Comply with:
    - b. ANSI/NEMA FB 1
    - c. Threaded hubs

- d. Zinc plated or hot-dipped galvanized malleable iron with external PVC coating 20 mil thick.
- E. EMT: ANSI C80.3.
  - 1. Comply with:
    - a. UL 797
    - b. ANSI C80.3
    - c. NEC 358
    - d. ANSI/UL797
  - 2. Conduit material: Galvanized steel tubing.
  - 3. Fittings:
    - a. ANSI/NEMA FB 1
    - b. Set screw, Die Cast for Interior Dry locations
    - c. Compression, Steel for all damp locations
- F. FMC: Zinc-coated steel or aluminum.
  - 1. Comply with:
    - a. NEC 348
    - b. ANSI/UL 1
  - 2. Conduit material: Steel or aluminum, interlocked.
  - 3. Fittings:
    - a. ANSI/NEMA FB 1
    - b. ANSI/UL 514B
    - c. Die Cast
    - d. Threaded rigid conduit to flexible conduit coupling.
    - e. Direct flexible conduit bearing set screw type not acceptable.
- G. LFMC: Flexible steel conduit with PVC jacket.
  - 1. Comply with:
    - a. NEC 350

- b. ANSI/UL 360
- 2. Conduit material:
  - a. Flexible hot-dipped galvanized steel core, interlocked.
  - b. Continuous copper ground built into core up to 1-1/4" size.
  - c. Extruded polyvinyl gray jacket.
- 3. Fittings:
  - a. Threaded for rigid conduit connections.
  - b. Accepted for hazardous locations where so installed.
  - c. Provide sealing washer in wet/damp locations.
  - d. Compression type.
  - e. ANSI/NEMA FB 1.
  - f. ANSI/UL 5148.
  - g. Zinc plated malleable iron or steel.
- 2.2 Nonmetallic Conduit and Tubing
  - A. Minimum Trade Size  $-\frac{3}{4}$ "
  - B. RNC: NEMA TC 2, Schedule-40-PVC, unless otherwise indicated.
    - 1. Comply with:
      - a. NEMA TC-2
      - b. UL 651
      - c. NEC 352
    - 2. Conduit material:
      - a. Shall be high impact PVC tensile strength 55 PSI, flexural strength 11000 PSI.
    - 3. Fittings:
      - a. Comply with: NEMA TC-3 and UL 514.
- 2.3 EXPANSION FITTINGS
  - A. Expansion fittings shall be:

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

26 05 33 - 6

- 1. UL Listed, hot dipped galvanized inside and outside providing a 4" expansion chamber when used with rigid conduit and electrical metallic conduit, or:
- 2. Be polyvinyl chloride and shall meet the requirements of and as specified elsewhere for non-metallic conduit and shall provide a 6" expansion chamber.
- 3. Hot dipped galvanized expansion fitting shall be provided with an external braided grounding and bonding jumper with accepted clamps, UL Listed for the application.
- 4. Expansion fitting, UL Listed for the application and in compliance with the National Electrical Code without the necessity of an external bonding jumper may be considered. Submit fitting with manufacturer's data and UL Listing for acceptance prior to installation.

#### 2.4 METAL WIREWAYS

- 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. Cooper B-Line, Inc.
  - 2. Hoffman.
  - 3. Square D; Schneider Electric.
- B. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 1, unless otherwise indicated.
- C. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Hinged type.
- E. Finish: Manufacturer's standard enamel finish.

## 2.5 SURFACE RACEWAYS

- A. Surface Metal Raceways: Galvanized steel with snap-on covers. Manufacturer's standard enamel finish in color selected by Architect.
  - 1. 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:
    - a. Thomas & Betts Corporation.
    - b. Walker Systems, Inc.; Wiremold Company (The).
    - c. Wiremold Company (The); Electrical Sales Division.
    - d. Mono-Systems, Inc.

# 2.6 BOXES, ENCLOSURES, AND CABINETS

- 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. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
  - 2. EGS/Appleton Electric.
  - 3. Erickson Electrical Equipment Company.
  - 4. Hoffman.
  - 5. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
  - 6. O-Z/Gedney; a unit of General Signal.
  - 7. RACO; a Hubbell Company.
  - 8. Robroy Industries, Inc.; Enclosure Division.
  - 9. Scott Fetzer Co.; Adalet Division.
  - 10. Spring City Electrical Manufacturing Company.
  - 11. Thomas & Betts Corporation.
  - 12. Walker Systems, Inc.; Wiremold Company (The).
  - 13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.
- B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
  - 1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch (13 mm) male fixture studs where required.
  - 2. Concrete Ceiling Boxes: Concrete type.
  - 3. Interior flush outlet boxes shall be one piece galvanized steel constructed with stamped knockouts in back and sides, and threaded holes with screws for securing box coverplates or wiring devices.
  - 4. Ceiling outlet boxes shall be 4" octagonal or 4" square X 1 1/2" deep or larger as required for number and size of conductors and arrangement, size and number of conduits terminating at them.
  - 5. Switch, wall receptacle, telephone and other recessed wall outlet boxes in drywall shall be a minimum of 4" square X 1 1/2" deep. For recessing in exposed masonry, provide one piece 4" square x 1 1/2" deep wall boxes with appropriate 4" square cut tile wall covers. For recessing in furred-out block walls, provide 4" square box with required extension for block depth and required extension for drywall depth.
  - 6. Boxes shall be of such form and dimensions as to be adapted to the specific use and location, type of device or fixtures to be used, and number and size of conductors and arrangement, size and number of conduits connecting thereto.

- 7. Handy boxes shall not be used for any purpose.
- 8. Where a box is used as the sole support for a ceiling paddle fan, the box must be listed for this purpose and the weight of the fan.
- C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.
  - 1. Interior surface outlet boxes and conduit bodies installed from 0" AFF to 90" AFF (including fire alarm device backbox) shall be the heavy cast aluminum or iron with external threaded hubs for power devices and threaded parts for low voltage devices. Trim rings shall also be of one-piece construction.
  - 2. Weatherproof outlet boxes shall be constructed of corrosion-resistant cast metal suited to each application and having threaded conduit hubs, cast metal faceplate with spring-hinged waterproof cap suitable configured, gasket, and corrosion-proof fasteners.
  - 3. Freestanding cast boxes are to be type FSY (with flange). Other cast zinc boxes are not acceptable.

#### D. Floor Boxes:

- 1. For all slab on grade areas except wet locations and wooden floors: Cast iron or steel with epoxy paint, fully adjustable before and after the concrete pour. The cover shall provide protection from water, dirt and debris. The cover will be flanged die cast aluminum with brushed aluminum finish that will accept carpet or tile cutouts to match flooring. The box shall be capable of adapting to most power and communications needs. Provide all activations, barriers and brackets required for the particular installation. Design Selection is Wiremold RFB 4 (based on required outlets) or equal.
- 2. Wood Floors: Cast iron or steel fully adjustable, rectangular, multi-gang box. The cover shall provide protection from water, dirt and debris. The cover will be brass flip lids with appropriate multi gang ring to set flush with wood flooring. The box shall be capable of adapting to most power and communications needs.
- 3. Poke Thru's for all floor boxes in elevated slabs: Flush style round poke thru with combination power (2 duplex) and data (6 Cat6 outlets). Poke Thru shall be UL scrub water exclusion for tile and carpeted floors. Poke thru shall be maintains UL fire rated for up to 2 hour rated floors. Poke thru shall meet FBC and ADA accessibility guidelines.
- E. Sheet Metal Pull and Junction Boxes: NEMA OS 1.
  - 1. Pull and junction boxes (not in-ground type) larger than 25 square inches shall be hinged cover type with flush latches operated with screwdriver.
  - 2. Large Pull Boxes: Boxes larger than 400 cubic inches in volume or 20 inches in any dimension:
    - a. Use continuous hinged enclosures with locking handle.
  - 3. Exterior, damp location and wet location pull and junction boxes shall be Nema 4x stainless steel.
- F. Cabinets (Control and Systems):
  - 1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.

- 2. Hinged door in front cover with flush latch and concealed hinge.
- 3. Metal barriers to separate wiring of different systems and voltage.
- 4. Accessory feet where required for freestanding equipment.

## 2.7 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. Description: Concrete ring with Nema 6P box inside (All Areas)
  - 1. Color of Frame and Cover: Gray.
  - 2. Configuration: Concrete ring shall be designed for flush burial and have open bottom, unless otherwise indicated.
  - 3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural traffic load rating consistent with enclosure.
  - 4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
  - 5. Cover Legend: Molded lettering, "ELECTRIC.", "TELEPHONE." or as indicated for each service.
  - 6. Nema 6P box rated for direct burial enclosure shall be located inside the concrete ring for termination of conduits.
  - 7. Handholes 36 inches wide by 36 inches long and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

#### PART 3 - EXECUTION

# 3.1 RACEWAY LOCATION INSTALLATION REQUIREMENTS

# A. Underground Installations:

- 1. Use rigid non-metallic conduit (PVC) only unless local authority having jurisdiction or applicable codes/utility requirements, etc. require rigid steel conduit.
- 2. All conduits or elbows entering, or leaving the ground shall be rigid steel conduit coated with asphaltic paint.
- 3. All underground raceways (with exception of raceways installed under floor slab) shall be installed in accordance with the NEC except that the minimum cover for any conduit shall be two feet. Included under this Section shall be the responsibility for verifying finished lines in areas where raceways will be installed underground before the grading is complete.
- 4. Where rigid metallic conduit is installed underground as noted above it shall be coated with waterproofing black mastic before installation, and all joints shall be re-coated after installation.

- 5. Utilize rigid steel 90° elbows at each riser and at each change in direction. Elbows shall be coated with black mastic or PVC coating. Bond all metal elbows per NEC.
- 6. All underground service lateral raceways shall be protected as required by the NEC including requirements for installation of warning tape.

# B. In Slab Above or on Grade:

- 1. Use coated rigid steel conduit or rigid non-metallic conduit.
- 2. Coating of metallic conduit to be black asphaltic or PVC.

#### C. Penetration of Slab:

- 1. Exposed Location subject to damage:
  - a. Where penetrating a floor in an exposed location subject to damage from underground or in slab, a black mastic coated or PVC coated galvanized rigid steel conduit shall be used.
- 2. Interior Location not subject to damage:
  - a. Where penetrating a floor in a location concealed in block wall and acceptable by applicable codes, rigid non-metallic conduit may be used up to first outlet box, provided outlet box is at a maximum height of 40" above finished floor.
  - b. Where penetrating a floor in location other than that above, transition to metallic conduit at the floor.

#### D. Outdoor Location:

- 1. Above Grade:
  - Where penetrating the finished grade, black mastic coated or PVC coated galvanized rigid steel conduit shall be used.
  - b. In general all exterior conduit runs shall be rigid steel conduit and threaded connectors as specified elsewhere.
  - c. Electrical metallic tubing (thin wall) is permitted under roof, overhangs, etc. provided it is not subjected to physical damage and is not in direct contact or directly subject to exterior elements including sunlight.

## 2. Metal Canopies:

a. Conduit runs except for canopy lighting raceways are not to be run on (top or bottom) of metal canopies roof systems. All new conduit shown on or at these areas is to be run underground. Clamp back spacers shall be used on all canopies to prevent galvanic action from dissimilar metals. Conduits installed exposed from Building structure to Metal Canopies will not be permitted.

## 3. Roofs:

a. Conduit is not to be installed on roofs, without written authorization by A/E and the Owner for specific conditions.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

26 05 33 - 11

- b. When accepted by written authorization conduit shall comply with the following:
  - 1) Be PVC coated rigid galvanized metal conduit.
  - 2) All fittings, etc. are to be PVC coated.
  - 3) Conduit shall be supported above roof at least 6 inches using accepted conduit supporting devices. Refer to applicable sections of specifications on roofing, etc.
  - 4) Supports to be fastened to roof using roofing adhesive or means compatible with roofing. Confirm the method used will not void the roofing warranty. The use of pitch pockets is not acceptable.

#### E. Interior Dry Locations:

- 1. Concealed: Use rigid galvanized steel conduit and electrical metallic tubing. Rigid non-metallic conduit may be used inside block walls up to first outlet to a maximum of 40" A.F.F. except where prohibited by the NEC (places of assembly, etc.).
- 2. Exposed: Use rigid galvanized steel or electrical metallic tubing. EMT may only be used where not subject to damage, which is interpreted by this specification to be above 90" AFF.
- 3. Concealed or exposed flexible conduit:
  - a. Concealed flexible steel conduit or seal tight flexible steel conduit in lengths not longer than six (6) feet in length with a ground conductor installed in the conduit or an equipment ground conductor firmly attached to the terminating fitting at the extreme end of the flex. Exposed flexible steel conduit or seal tight flexible steel conduit shall not exceed two (2) feet in length, unless written authorization by A/E for specific conditions is granted.
- F. Interior Wet and Damp Locations:
  - 1. Use rigid galvanized steel conduit.
- G. Concrete Columns or Poured in-place Concrete Wall Locations:
  - 1. Use rigid non-metallic conduit. Penetration shall be by accepted metal raceway (i.e. metal conduit as required elsewhere in these specifications).

#### 3.2 RACEWAY INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. All bending, cutting, and reaming shall be completed with tools specifically designed for the specific use.
- C. Expansion fittings shall be installed in the following cases:
  - 1. In each conduit run wherever it crosses an expansion joint in the concrete structure; on one side of joint with its sliding sleeve end flush with joint, and with a length of bonding jumper in expansion equal to at least three times the normal width of joints.
  - 2. In each conduit run which mechanically attached to separate structures to relieve strain caused by shift on one structure in relation to the other.

- 3. In straight conduit run above ground which is more than one hundred feet long and interval between expansion fittings in such runs shall not be greater than 100 feet.
- D. Arrange conduit to maintain headroom and present neat appearance.
- E. Provide rigid steel long radius 90 degree sweeps (bend radius of 10 times the conduit trade size diameter) for all changes in direction (vertical and horizontal) for utility conduits. Comply with all installation requirements of the utility to utilize the conduits.
- F. Utility conduits shall be buried a minimum of 36" deep to the top of the conduit.
- G. Route conduit installed above accessible ceilings or exposed to view parallel or perpendicular to walls. Do not run from point to point.
- H. Do not cross conduits in slab.
- I. Use conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
- J. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- K. Complete raceway installation before starting conductor installation.
- L. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical Systems."
- M. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
- N. Install no more than equivalent of three 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows for bends in metal conduit larger than 2 inch (50 mm) size.
- O. Provide continuous fiber polyline 1000 lb. minimum tensile strength pull string in each empty conduit except sleeves and nipples. This includes all raceways which do not have conductors furnished under this Division of the specifications. Pull cord must be fastened to prevent accidental removal.
- P. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
- Q. Rigid steel box connections shall be made with double locknuts and bushings.
- R. Spare conduit stubs shall be capped and location and use marked with concrete marker set flush with finish grade. Marker shall be 6" round x 6" deep with appropriate symbol embedded into top to indicate use. Also, tag conduits in panels where originating.
- S. Spare conduit stubs shall be capped with a UL listed and accepted cap or plug for the specific intended use and identified with ink markers as to source and labeled "Spare."
- T. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
- U. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- V. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.

- W. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.
- X. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
  - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  - 2. Where otherwise required by NFPA 70.
- Y. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.
- Z. All raceway runs in masonry shall be installed at the same time as the masonry so that no face cutting is required, except to accommodate boxes.
- AA. Raceways shall not be routed through stairwells, elevator shafts, elevator machine rooms or fire pump rooms unless the conduit is for use within that space.
- BB. Raceways installed in hazardous locations shall be installed in accordance with the appropriate provisions of NEC chapter 5 for that location. Confirm the appropriate space rating with life safety plans.
- CC. All raceway runs, whether terminated in boxes or not, shall be capped during the course of construction and until wires are pulled in, and covers are in place. No conductors shall be pulled into raceways until construction work which might damage the raceways has been completed.
- DD. Electrical raceways shall be supported independently of all other systems and supports, and shall in every case avoid proximity to other systems which might cause confusion with such systems or might provide a chance of electrolytic actions, contact with live parts or excessive induced heat.
- EE. Excavate trench bottom to provide firm and uniform support for conduit installed underground. Prepare trench bottom as specified in Division 31 Section "Earth Moving" for pipe less than 6 inches (150 mm) in nominal diameter. Install backfill as specified in Division 31 Section "Earth Moving."
- FF. After installing underground conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Division 31 Section "Earth Moving."

# 3.3 BOX INSTALLATION

- A. Set metal floor boxes level and flush with finished floor surface.
- B. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.
- C. Install electrical boxes as shown on drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- D. Install electrical boxes to maintain headroom and to present neat mechanical appearance.

RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

26 05 33 - 14

- E. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches (150 mm) from ceiling access panel or from removable recessed luminaire.
- F. Install boxes to preserve fire resistance rating of partitions and other elements.
- G. Align adjacent wall-mounted outlet boxes for switches, thermostats, and similar devices with each other.
- H. Outlets for 120V clocks shall be recessed so that the clock will hang flush with the finished surface of the wall.
- I. Use flush mounting outlet boxes in finished areas.
- J. Do not install flush mounting boxes back-to-back in walls; provide minimum 6 inch (150 mm) separation. Provide minimum 24 inches (600 mm) separation in acoustic and fire rated walls.
- K. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
- L. Use stamped steel bridges to fasten flush mounting outlet box between studs.
- M. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- N. Support all outlet boxes from structure with minimum of one (1) 3/8" all-thread rod hangers. Boxes larger than 25 square inches shall be supported with two (2) all-thread rod hangers, minimum.
- O. Do not fasten boxes to ceiling support wires.
- P. Use multi-gang box where more than one device is mounted together. Do not use sectional box.
- Q. Boxes in exterior walls shall be flush mounted. Use cast outlet box in exterior locations and wet locations where flush mounting is not possible.
- R. Install outlets in the locations shown on the drawings; however, the Owner shall have the right to make, prior to rough-in, slight changes in locations to reflect room furniture layouts.
- S. Coordinate work with all divisions so that each electrical box is the type suitable for the wall or ceiling construction provided and suitable fireproofing is inbuilt into fire rated walls.
- T. All boxes shall be installed in a flush rigid manner with box lines at perpendicular and parallel angles to finished surfaces. Boxes shall be supported by appropriate hardware selected for the type of surface from which the box shall be supported. For example, provide metal screws for metal, wood screws for wood, and expansion devices for masonry or concrete.
- U. For locations exposed to weather or moisture (interior or exterior), provide weatherproof boxes and accessories.
- V. As a minimum, provide pull boxes in all raceways over 150 feet long. The pull box shall be located near the midpoint of the raceway length.
- W. Provide knockout closures to cap unused knockout holes where blanks have been removed, and plugs for unused threaded hubs.
- X. Provide conduit locknuts and bushings of the type and size to suit each respective use and installation.

- Y. Boxes and conduit bodies shall be located so that all electrical wiring is accessible.
- Z. Avoid using round boxes where conduit must enter box through side of box, which would result in a difficult and insecure connection with a locknut or bushing on the rounded surface.
- AA. All flush outlets shall be mounted so that covers and plates will finish flush with finished surfaces without the use of shims, mats or other devices not submitted or accepted for the purpose. Add-a-Depth rings or switch box extension rings are <u>not</u> acceptable. Plates shall not support wiring devices. Gang switches with common plate where two or more are indicated in the same location. Wall-mounted devices of different systems (switches, thermostats, etc.) shall be coordinated for symmetry when located near each other on the same wall. Outlets on each side of walls shall have separate boxes. Through-wall type boxes shall not be permitted. Back-to-back mounting shall not be permitted. Trim rings shall be extended to within 1/8" of finish wall surface.
- BB. Outlet boxes mounted in metal stud walls, are to be supported to studs with two (2) screws inside of outlet box to a horizontal stud brace between vertical studs or one side of outlet box supported to stud with opposite side mounted to section of stud or device to prevent movement of outlet box after wall finished.
- CC. All outlet boxes that do not receive devices in this contract are to have blank plates installed matching wiring device plates.
- DD. Height of wall outlets to bottom above finished floors shall be as follows, unless specifically noted otherwise, or unless otherwise required by applicable codes including ADA. Verify with the Architectural plans and shop drawings for installing.

1.	Switches	4'-0" AFF to top

2.	Receptacles	1'-4" AFF to bottom

3. Lighting Panels 6'-6" AFF to centerline of highest breaker/fuse

4. Phone outlets 1'-4" AFF to bottom

5. Intercom Call-in 4'-0"AFF to top

6. Fire Alarm Pull Stations 4'-0" AFF to top

7. Fire Alarm Strobe Lights Lens is not less than 80" AFF and not more than 96" AFF

8. Fire Alarm Audible Only Not less than 90" and not less than 6" below ceiling.

- EE. Bottoms of outlets above counter tops or base cabinets shall be minimum 2" above counter top or backsplash, whichever is highest. Outlets may be raised so that bottom rests on top of concrete block course, but all outlets above counters in same area shall be at same height. It is the responsibility of this Division to secure cabinet drawings and coordinate outlet locations in relation to all cabinets as shown on Architectural plans, prior to rough-in, regardless of height shown on Division 26 drawings.
- FF. Height of wall-mounted fixtures shall be as shown on the drawings or as required by Architectural plans and conditions. Fixture outlet boxes shall be equipped with fixture studs when supporting fixtures.
- GG. Locate special purpose outlets as indicated on the drawings for the equipment served. Location and type of outlets shall be coordinated with appropriate trades involved. The securing of complete information

- for proper electrical roughing-in shall be included as work required under this section of specifications. Provide plug for each outlet.
- HH. Electrical outlet boxes may be installed in vertical fire resistive assemblies classified as fire/smoke and smoke partitions without affecting the fire classification, <u>provided</u> such openings occur on one side only within a 24" wall space and that openings do not exceed 16 sq. inches. All clearances between such outlet boxes and the gypsum board must be completely filled with joint compound.
- II. Fire-Barrier Penetrations: Firestop penetrations under division 07 Section "Firestopping".

# 3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch (12.5-mm) sieve to No. 4 (4.75-mm) sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In all areas, set so cover surface will be flush with finished grade.

## 3.5 INSTALLATION OF WIREWAYS

- A. Do not install wireways as a substitute for proper coordination and layout of conduit stub ups to panels. Prior authorization from the engineer is required prior to installation of any wireways.
- B. Do not make splices in wireways. All wires must be pulled through without splice or termination.
- C. Install wireway to maintain headroom and to present neat mechanical appearance.
- D. Support wireway independently of conduit.
- E. Wireway shall be located so that all electrical wiring is accessible.

END OF SECTION 26 05 33

## SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

## 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.

## 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Identification for raceway and metal-clad cable.
  - 2. Identification for conductors and communication and control cable.
  - 3. Underground-line warning tape.
  - 4. Warning labels and signs.
  - 5. Instruction signs.
  - 6. Equipment identification labels.
  - 7. Miscellaneous identification products.

#### 1.3 SUBMITTALS

- A. Product Data: For each electrical identification product indicated.
- B. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.
- C. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.

# 1.4 QUALITY ASSURANCE

- A. Comply with ANSI A13.1 and ANSI C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.145.

# 1.5 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

City of Fort Lauderdale

- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.

#### PART 2 - PRODUCTS

# 2.1 RACEWAY, BOX AND METAL-CLAD CABLE IDENTIFICATION MATERIALS

- A. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inches (50 mm) long, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action.
- B. Primed and Painted band 4" in length.

# 2.2 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.
- B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

## 2.3 UNDERGROUND-LINE WARNING TAPE

- A. Description: Permanent, bright-colored, continuous-printed, polyethylene tape.
  - 1. Not less than 6 inches (150 mm) wide by 4 mils (0.102 mm) thick.
  - 2. Compounded for permanent direct-burial service.
  - 3. Embedded continuous metallic strip or core.
  - 4. Printed legend shall indicate type of underground line.

## 2.4 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.
- B. Baked-Enamel Warning Signs: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application. 1/4-inch (6.4-mm) grommets in corners for mounting. Nominal size, 7 by 10 inches (180 by 250 mm).
- C. Metal-Backed, Butyrate Warning Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm) galvanized-steel backing; and with colors, legend, and size required for application. 1/4-inch (6.4-mm) grommets in corners for mounting. Nominal size, 10 by 14 inches (250 by 360 mm).
- D. Warning label and sign shall include, but are not limited to, the following legends:

IDENTIFICATION FOR ELECTRICAL SYSTEMS

26 05 53 - 2

- 1. Multiple Power Source Warning: "DANGER ELECTRICAL SHOCK HAZARD EQUIPMENT HAS MULTIPLE POWER SOURCES."
- 2. Workspace Clearance Warning: "WARNING OSHA REGULATION AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

# 2.5 INSTRUCTION SIGNS

- A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. in. (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.
  - 1. Engraved legend with black letters on white face.
  - 2. Punched or drilled for mechanical fasteners.
  - 3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

# 2.6 EQUIPMENT IDENTIFICATION LABELS

- A. Safety Signs: Comply with 29 CFR, 1910.145.
- B. Nameplates shall be laminated phenolic plastic, chamfer edges.
  - 1. For 120/208 Volt System:
    - a. Black front and back with white core, with lettering etched through the outer covering. White engraved letters on Black background.
  - 2. For 277/480 Volt System:
    - Orange front and back with white core with lettering etched through the outer covering.
       White engraved letters on Orange background.
  - 3. For Emergency System:
    - a. Red front and back with white core with lettering etched through the outer covering. White engraved letters on red background.

# 2.7 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.
  - 1. Minimum Width: 3/16 inch (5 mm).
  - 2. Tensile Strength: 50 lb (22.6 kg), minimum.
  - 3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
  - 4. Color: Black, except where used for color-coding.
- B. Paint: Paint materials and application requirements are specified in Division 09 painting Sections.
- C. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

#### PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Identification Materials and Devices: Install at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations with corresponding designations in the Contract Documents or with those required by codes and standards. Use consistent designations throughout Project.
- C. Sequence of Work: If identification is applied to surfaces that require finish, install identification after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before applying.
- E. Install painted identification according to manufacturer's written instructions and as follows:
  - 1. Clean surfaces of dust, loose material, and oily films before painting.
  - 2. Prime surfaces using type of primer specified for surface.
  - 3. Apply one intermediate and one finish coat of enamel.
- F. Caution Labels for Indoor Boxes and Enclosures for Power and Lighting: Install pressure-sensitive, self-adhesive labels identifying system voltage with black letters on orange background. Install on exterior of door or cover.
- G. Circuit Identification Labels on Boxes: Install labels externally.
  - 1. Exposed Boxes: Pressure-sensitive, self-adhesive plastic label on cover.
  - 2. Concealed Boxes: Plasticized card-stock tags.
  - 3. Labeling Legend: Permanent, waterproof listing of panel and circuit number or equivalent.
- H. Paths of Underground Electrical Lines: During trench backfilling, for exterior underground power, control, signal, and communication lines, install continuous underground line marker located directly above line at 6 to 8 inches below finished grade. Where width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches overall, use a single line marker. Install line marker for underground wiring, both direct-buried cables and cables in raceway.
- I. Secondary Service, Feeder, and Branch-Circuit Conductors: Color-code throughout the secondary electrical system.
  - 1. Color-code 208/120-V system as follows:
    - a. Phase A: Black.
    - b. Phase B: Red.
    - c. Phase C: Blue.
    - d. Neutral: White.
    - e. Ground: Green.
    - f. Switchlegs(load side of contactor or relay is not considered a switchleg): Purple
  - 2. Color-code 480/277-V system as follows:
    - a. Phase A: Brown
    - b. Phase B: Orange

- c. Phase C: Yellow
- d. Neutral: White with a colored stripe or gray.
- e. Ground: Green.
- f. Switchleg(load side of contactor or relay is not considered a switchleg): Pink
- 3. Factory apply color the entire length of conductors, except the following field-applied, color-coding methods may be used instead of factory-coded wire for sizes larger than No. 6 AWG:
  - a. Colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Use 1-inch wide tape in colors specified. Adjust tape bands to avoid obscuring cable identification markings.
- J. Power-Circuit Identification: Metal tags or aluminum, wraparound marker bands for cables, feeders, and power circuits in vaults, pull and junction boxes, manholes, and switchboard rooms.
  - 1. Legend: 1/4-inch steel letter and number stamping or embossing with legend corresponding to indicated circuit designations.
  - 2. Tag Fasteners: Nylon cable ties.
  - 3. Band Fasteners: Integral ears.
- K. Apply identification to conductors as follows:
  - 1. Conductors to Be Extended in the Future: Indicate source and circuit numbers.
  - 2. Multiple Power or Lighting Circuits in the Same Enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color-coding to identify circuits' voltage and phase.
  - 3. Multiple Control and Communication Circuits in the Same Enclosure: Identify each conductor by its system and circuit designation. Use a consistent system of tags, color-coding, or cable marking tape.
- L. Apply warning, caution, and instruction signs as follows:
  - 1. Warnings, Cautions, and Instructions: Install to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.
  - 2. Emergency Operation: Install engraved laminated signs with white legend on red background with minimum 3/8-inch high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.
- M. Equipment Requiring Workspace Clearance According to NFPA 70: Unless otherwise indicated, apply to door or cover of equipment but not on flush panelboards and similar equipment in finished spaces.
- N. Instruction Signs:
  - 1. Operating Instructions: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
  - 2. Emergency Operating Instructions: Install instruction signs with white legend on a red background with minimum 3/8-inch- (10-mm-) high letters for emergency instructions at equipment used for power transfer.
- O. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations,

terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

- 1. Labeling Instructions:
  - a. Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high label; where 2 lines of text are required, use labels 2 inches (50 mm) high.
  - b. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
- 2. Equipment to Be Labeled: Include as a minimum the equipment identification (first line ½"): voltage rating and amperage rating (second line 3/8"): where it is fed from (third line 3/8"). (Example :Panel CP1 (Line 1), 208/120V 3ph, 4w, 225A(line 2), fed from swbd MDP-1 (Line 3))
  - a. Panelboards, electrical cabinets, and enclosures.
  - b. Access doors and panels for concealed electrical items.
  - c. Electrical switchgear and switchboards.
  - d. Transformers.
  - e. Electrical substations.
  - f. Emergency system boxes and enclosures.
  - g. Motor-control centers.
  - h. Disconnect switches.
  - i. Enclosed circuit breakers.
  - i. Motor starters.
  - k. Push-button stations.
  - 1. Power transfer equipment.
  - m. Contactors.
  - n. Remote-controlled switches, dimmer modules, and control devices.
  - o. Battery inverter units.
  - p. Battery racks.
  - q. Power-generating units.
  - r. Voice and data cable terminal equipment.
  - s. Master clock and program equipment.
  - t. Intercommunication and call system master and staff stations.
  - u. Television/audio components, racks, and controls.
  - v. Fire-alarm control panel and annunciators.
  - Security and intrusion-detection control stations, control panels, terminal cabinets, and racks.
  - x. Monitoring and control equipment.
  - y. Uninterruptible power supply equipment.
  - z. Terminals, racks, and patch panels for voice and data communication and for signal and control functions.

# 3.2 SWITCHGEAR BREAKERS

A. Provide labels for each breaker to identify the load served.

#### 3.3 CONDUIT/JUNCTION BOX COLOR CODE

A. All conduit system junction boxes (except those subject to view in public areas) shall be color coded as listed below:

IDENTIFICATION FOR ELECTRICAL SYSTEMS

26 05 53 - 6

B. Color Code for Junction Boxes

System Emergency 277/480 volt Orange/Brown 1. 2. System Emergency 120/208 volt Orange/Black Red 3. Fire Alarm Normal Power 277/480 volt Brown 4. Normal Power 120/208 volt Black 5. Fiber Optics Purple 6. Sound System Yellow 7. Clock Light Blue 8. 9. Intercom Blue Computer/Data Gold 10. TVWhite 11. 12. Security/CCTV Beige

13. Ground Fluorescent Green14. Telephone Clover Green

- C. Conduits (not subject to public view) longer than 20 feet shall be painted with above color paint band 30 ft. on center. Paint band shall be 4" in length. Where conduits are parallel and on conduit racking, the paint bands shall be evenly aligned. Paint shall be neatly applied and uniformed. Paint boxes and raceways prior to installation or tape conduits and surrounding surfaces to avoid overspray. Paint overspray shall be removed.
- D. All new and existing junction boxes/cover plates for power, lighting and systems (except those installed in public areas) shall adequately describe it's associated panel and circuit reference number(s) within, (i.e. ELRW-2, 4, 6) or systems within (i.e. fire alarm, intercom. Etc.). Identification shall be by means of black permanent marker. (Paint ½ cover plate with appropriate color as noted in 2.3 above, and mark other ½ with associated panel/circuit or system description as described).

END OF SECTION 26 05 53

# SECTION 26 05 73 – OVERCURRENT DEVICE COORDINATION WITH ARC FLASH ANALYSIS

#### 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.

## 1.2 SUMMARY

- A. This Section includes computer-based, fault-current, overcurrent protective device coordination and Arc Flash studies. Protective devices shall be set based on results of the protective device coordination study.
  - 1. Coordination of series-rated devices is permitted where indicated on Drawings.
  - 2. The study shall verify the adequacy of all equipment implemented under these specifications and to verify the correct application of circuit protective devices and other system components specified.
  - 3. The study shall address the case when the system is being powered from the normal source as well as from on-site generating equipment.
  - 4. Fault conditions of all motors greater than 2 HP shall be considered.
  - 5. Arc-flash study to determine the arc-flash hazard distance and the incident energy to which personnel could be exposed during work on or near all electrical equipment provided or altered as part of the scope of work.
  - 6. Arc Flash study shall comply with the requirements set forth in NFPA 70E Standard for Electrical Safety in the workplace. The arc flash hazard analysis shall be performed according to the IEEE Std. 1584-2002 equations that are presented in NFPA70E-2009, Annex D
  - 7. Requirement for labels on all equipment to identify the arc flash hazard, the arc flash protection boundary and Personal Protective Equipment (PPE) that people within the arc flash protection boundary shall use in accordance with the requirements of NFPA 70E.
  - 8. The study must be completed and approved prior to the purchase of electrical switchgear and distribution equipment

#### 1.3 DEFINITIONS

- A. Arc Flash Hazard. A dangerous condition associated with the possible release of energy caused by an electric arc.
- B. Arc Flash Hazard Analysis. A study investigating a worker's potential exposure to arc-flash energy, conducted for the purpose of injury prevention and the determination of safe work practices, arc flash protection boundary, and the appropriate levels of PPE.
- C. Arc Flash Suit. A complete FR clothing and equipment system that covers the entire body, except for the hands and feet. This includes pants, jacket, and beekeeper-type hood fitted with a face shield.
- D. Boundary, Arc Flash Protection. When an arc flash hazard exists, an approach limit at a distance from a prospective arc source within which a person could receive a second degree burn if an electrical arc flash were to occur.

- E. Boundary, Limited Approach. An approach limit at a distance from an exposed energized electrical conductor or circuit part within which a shock hazard exists.
- F. Boundary, Prohibited Approach. An approach limit at a distance from an exposed energized electrical conductor or circuit part within which work is considered the same as making contact with the electrical conductor or circuit part.
- G. Boundary, Restricted Approach. An approach limit at a distance from an exposed energized electrical conductor or circuit part within which there is an increased risk of shock, due to electrical arc over combined with inadvertent movement, for personnel working in close proximity to the energized electrical conductor or circuit part.
- H. Exposed (as applied to energized electrical conductors or circuit parts). Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to electrical conductors or circuit parts that are not suitably guarded, isolated, or insulated.
- I. Incident Energy. The amount of energy impressed on a surface, a certain distance from the source, generated during an electrical arc event. One of the units used to measure incident energy is calories per centimeter squared (cal/cm2).
- J. Shock Hazard. A dangerous condition associated with the possible release of energy caused by contact or approach to energized electrical conductors or circuit parts.

#### 1.4 REFERENCES

- A. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
  - 1. IEEE 141 Recommended Practice for Electric Power Distribution and Coordination of Industrial and Commercial Power Systems
  - 2. IEEE 242 Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems
  - 3. IEEE 399 Recommended Practice for Industrial and Commercial Power System Analysis
  - 4. IEEE 241 Recommended Practice for Electric Power Systems in Commercial Buildings
  - 5. IEEE 1015 Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems.
  - 6. IEEE 1584 Guide for Performing Arc-Flash Hazard Calculations
- B. American National Standards Institute (ANSI):
  - 1. ANSI C57.12.00 Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers
  - 2. ANSI C37.13 Standard for Low Voltage AC Power Circuit Breakers Used in Enclosures
  - 3. ANSI C37.010 Standard Application Guide for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis
  - 4. ANSI C 37.41 Standard Design Tests for High Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches and Accessories.
- C. The National Fire Protection Association (NFPA)
  - 1. NFPA 70 National Electrical Code, latest edition
  - 2. NFPA 70E Standard for Electrical Safety in the Workplace

## 1.5 SUBMITTALS

A. Product Data: For computer software program to be used for studies.

OVERCURRENT DEVICE COORDINATION WITH ARC FLASH ANALYSIS

- B. Product Certificates: For coordination-study and fault-current-study computer software programs, certifying compliance with IEEE 399, IEEE 1584 and NFPA 70E.
- C. Qualification Data: For coordination-study specialist.
- D. The following submittals shall be made at the same time as the approval process for system protective devices for all new equipment.
  - 1. Coordination-study input data, including completed computer program input data sheets.
  - 2. Study and Equipment Evaluation Reports.
  - 3. Coordination-Study Report.
  - 4. Arc-flash study input data, including completed computer program input data sheets.
  - 5. Arc-flash study report; signed, dated, and sealed by a qualified professional engineer.
- E. Submit a copy of the coordination study and copies of all labels for the arc flash report with the operation and maintenance manual.
- F. Provide an electronic copy of the study project files for future use by the Owner when making modifications to the facility or equipment.

## 1.6 QUALITY ASSURANCE

- A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this Section. Manual calculations are not acceptable.
- B. Coordination-Study Specialist Qualifications: An entity experienced in the application of computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices.
  - 1. Professional engineer, licensed in the state where Project is located, shall be responsible for the study. All elements of the study shall be performed under the direct supervision and control of engineer.
- C. Comply with IEEE 242 for short-circuit currents and coordination time intervals.
- D. Comply with IEEE 399 for general study procedures.

# PART 2 - PRODUCTS

# 2.1 COMPUTER SOFTWARE PROGRAM REQUIREMENTS

- A. Subject to compliance with requirements, available software developers offering software that may be used for the Work include, but are not limited to, the following:
  - 1. Easy Power.
  - 2. SKM Systems Analysis, Inc.
- B. Comply with IEEE 1584 and NFPA 70E.Comply with IEEE 399.
- C. Analytical features of fault-current-study computer software program shall include "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

D. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, timecurrent coordination plots.

# 2.2 ARC-FLASH WARNING LABELS

- A. Produce a 3.5-by-5-inch thermal transfer label of high-adhesion polyester for each work location included in the analysis.
- B. The label shall have an orange header with the wording "DANGER, NO SAFE PPE EXISTS" or "WARNING, ARC-FLASH AND SHOCK HAZARD," and shall include the following information taken directly from the arc-flash hazard analysis:
  - 1. Location designation.
  - 2. Nominal voltage.
  - 3. Flash protection boundary.
  - 4. Hazard risk category.
  - 5. Incident energy.
  - 6. Limited approach distance
  - 7. Restricted approach distance
  - 8. Prohibited approach distance
  - 9. Engineers Name, Engineering report number, and issue date.
- C. Labels shall be machine printed, with no field-applied markings.

#### PART 3 - EXECUTION

## 3.1 DATA GATHERING

- A. All data for the studies shall be gathered by the EOR preparing the report. This includes but is not limited to available fault current, transformer impedance, motor info, feeder lengths, new and existing switchgear/breaker info, etc.
- B. Data collection may require removal of barriers, opening of front panels, etc. while equipment is energized. The Contractor must provide proof (written documentation) that its employees working on the premises have been properly trained in the use and application of personal protective equipment (PPE) and the hazards of working on or near energized equipment. The Contractor must provide its own PPE protection.

## 3.2 EXAMINATION

- A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance.
  - 1. Proceed with coordination study only after relevant equipment submittals have been assembled.

#### 3.3 POWER SYSTEM DATA

A. Gather and tabulate the following input data to support coordination study:

OVERCURRENT DEVICE COORDINATION WITH ARC FLASH ANALYSIS

- 1. Product Data for overcurrent protective devices specified in other Division 26 Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.
- 2. Impedance of utility service entrance.
- 3. Full-load current of all loads.
- 4. Voltage level at each bus.
- 5. For transformers, include kVA, primary and secondary voltages, connection type, impedance, X/R ratio, taps measured in per cent, and phase shift.
- 6. For reactors, provide manufacturer and model designation, voltage rating and impedance.
- 7. For circuit breakers and fuses, provide manufacturer and model designation. List type of breaker, type of trip and available range of settings, SCCR, current rating, and breaker settings.
- 8. Generator short-circuit current contribution data, including short-circuit reactance, rated kVA, rated voltage, and X/R ratio.
- 9. Low-voltage cable sizes, lengths, number, conductor material and conduit material (magnetic or nonmagnetic).
- 10. Medium-voltage cable sizes, lengths, conductor material, and cable construction and metallic shield performance parameters.
- 11. Electrical Distribution System Diagram: In hard-copy and electronic-copy formats, showing the following:
  - a. Circuit-breaker and fuse-current ratings and types.
  - b. Relays and associated power and current transformer ratings and ratios.
  - c. Transformer kilovolt amperes, primary and secondary voltages, connection type, impedance, and X/R ratios.
  - d. Generator kilovolt amperes, size, voltage, and source impedance.
  - e. Cables: Indicate conduit material, sizes of conductors, conductor material, insulation, and length.
  - f. Busway ampacity and impedance.
  - Motor horsepower and code letter designation according to NEMA MG 1.
- 12. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:
  - a. Special load considerations, including starting inrush currents and frequent starting and stopping.
  - b. Transformer characteristics, including primary protective device, magnetic inrush current, and overload capability.
  - c. Motor full-load current, locked rotor current, service factor, starting time, type of start, and thermal-damage curve.
  - d. Generator thermal-damage curve.
  - e. Ratings, types, and settings of utility company's overcurrent protective devices.
  - f. Special overcurrent protective device settings or types stipulated by utility company.
  - g. Time-current-characteristic curves of devices indicated to be coordinated.
  - h. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.
  - i. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.
  - j. Panelboards, switchboards, motor-control center ampacity, and interrupting rating in amperes rms symmetrical.

## 3.4 COORDINATION STUDY

- A. Coordination-Study Report: Prepare a written report indicating the following results of coordination study:
  - 1. Tabular Format of Settings Selected for Overcurrent Protective Devices:

OVERCURRENT DEVICE COORDINATION WITH ARC FLASH ANALYSIS

- a. Device tag.
- b. Circuit-breaker sensor rating; and long-time, short-time, and instantaneous settings.
- c. Fuse-current rating and type.
- d. Ground-fault relay-pickup and time-delay settings.
- 2. Coordination Curves: Prepared to determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:
  - a. Device tag.
  - b. Voltage and current ratio for curves.
  - c. Three-phase and single-phase damage points for each transformer.
  - d. No damage, melting, and clearing curves for fuses.
  - e. Maximum fault-current cutoff point.
- B. Completed data sheets for setting of overcurrent protective devices.

## 3.5 ARC-FLASH HAZARD ANALYSIS

- A. Comply with NFPA 70E and its Annex D for hazard analysis study.
- B. Preparatory Studies:
  - 1. Protective Device Coordination Study and Short Circuit Study Report Contents: As specified in "Protective Device Coordination Study Report Contents" Article in Section 26 05 73 "Overcurrent Protective Device Coordination Study."
- C. Calculate the arc-flash protection boundary and incident energy at locations in the electrical distribution system where personnel could perform work on energized parts.
- D. Safe working distances shall be specified for calculated fault locations based on the calculated arc-flash boundary, considering incident energy of 1.2 cal/sq.cm.
- E. Incident energy calculations shall consider the accumulation of energy over time when performing arcflash calculations on buses with multiple sources. Iterative calculations shall take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators shall be decremented as follows:
  - 1. Fault contribution from induction motors should not be considered beyond three to five cycles.
  - 2. Fault contribution from synchronous motors and generators should be decayed to match the actual decrement of each as closely as possible (e.g., contributions from permanent magnet generators will typically decay from 10 per unit to three per unit after 10 cycles).
- F. Arc-flash computation shall include both line and load side of a circuit breaker as follows:
  - 1. When the circuit breaker is in a separate enclosure.
  - 2. When the line terminals of the circuit breaker are separate from the work location.
- G. Base arc-flash calculations on actual overcurrent protective device clearing time. Cap maximum clearing time at two seconds based on IEEE 1584, Section B.1.2.

#### 3.6 ARC-FLASH STUDY REPORT CONTENT

- A. Incident Energy and Flash Protection Boundary Calculations for each piece of electrical switchgear (includes all panel boards, switchgear, enclosed switches/circuit breakers and controllers)
  - 1. Arcing fault magnitude.
  - 2. Protective device clearing time.

OVERCURRENT DEVICE COORDINATION WITH ARC FLASH ANALYSIS

- 3. Duration of arc.
- 4. Arc-flash boundary.
- 5. Working distance.
- 6. Incident energy.
- 7. Hazard risk category.
- 8. Recommendations for arc-flash energy reduction.
- 9. PPE required for people within the Arc Flash Protection Boundary
- B. Fault study input data, case descriptions, and fault-current calculations including a definition of terms and guide for interpretation of the computer printout.

#### 3.7 LABELING

- A. Apply one arc-flash label for 600-V ac, 480-V ac, and applicable 208-V ac panelboards and disconnects and for each of the following locations:
  - 1. Motor-control center.
  - 2. Low-voltage switchboard.
  - 3. Switchgear.
  - 4. Control panel.

## 3.8 APPLICATION OF WARNING LABELS

A. Install the arc-fault warning labels under the direct supervision and control of the Arc-Flash Study Specialist.

#### 3.9 ADJUSTMENT AND TESTING

A. All protective devices shall be adjusted, tested, and calibrated in the field prior to energizing the equipment, in accordance with the settings listed in the accepted study. This work shall be completed prior to final acceptance by the Owner.

## 3.10 ARC FLASH TRAINING

A. Engage the Arc-Flash Study Specialist to train Owner's maintenance personnel in the potential arc-flash hazards associated with working on energized equipment and the significance of the arc-flash warning labels. Minimum of 4 hours of training.

## END OF SECTION 26 05 73

## SECTION 26 08 16 – DEMONSTRATION OF COMPLETED ELECTRICAL SYSTEMS

#### PART 1 - GENERAL

# 1.1 PERFORMANCE REQUIREMENTS

## A. Purpose:

- 1. This section includes the requirements for demonstration of completed electrical systems; requirements of this section are in addition to any other related section.
- B. Demonstrate to the Owner the essential features of the following electrical systems:
  - 1. Communications Systems
    - a. All systems included in DC Sections 27 and 28.
  - 2. Electrical Entrance Equipment
    - a. Circuit Breakers
    - b. Fuse and fuseholders
    - c. Meters (where applicable)
  - 3. Miscellaneous Electrical Equipment
    - a. Kitchen exhaust hood shut down
    - b. Electrical systems controls and equipment
    - c. Electrical power equipment
    - d. Motor control devices
    - e. Relays
    - f. Special transformers
    - g. Starting devices
    - h. Surge suppression equipment
  - 4. Lighting Fixtures (including relamping and replacing lenses)
    - a. Exit and safety fixtures
    - b. Fixtures, indoor and outdoor
  - 5. Distribution Equipment
    - a. Lighting and appliance panelboards
    - b. Distribution panels
    - c. Switchboards
  - 6. Stand-by Electrical Equipment
    - a. Batteries
    - b. Battery chargers
    - c. Controls and alarms
    - d. Emergency generators, transfer switches
  - 7. Wiring Devices
    - a. Low-voltage controls
    - b. Switches: regular, time
    - c. Upon completion of testing, each system is to be demonstrated only once.
    - d. The demonstration is to be held upon completion of all systems at a date to be agreed upon in writing by the Owner or his representative.
    - e. The demonstration is to be scheduled and performed by this Contractor in the presence of the Owner, and the manufacturer's representative.

# 1.2 DEMONSTRATION

- A. Demonstrate the function and location (in the structure) of each system, and indicate its relationship to the riser diagrams and drawings.
- B. Demonstrate by "start-stop operation" how to work the controls, how to reset protective devices, how to replace fuses, and what to do in case of emergency.

# 1.3 COORDINATION / EXHIBITS

- A. Specification Items:
  - a. Exhibit 1 Check Out Memo Form

END OF 26 08 16

# CHECK OUT MEMO FORM

This form shall be completed and a copy provided to the Owner at the Owner's Performance Verification and Demonstration Meeting. A copy shall also be included in the specification section of each O & M Manual for the equipment checked.

Project Name:	
Type of Equipm	ent Checked:
Equipment Num	ber:
Name of manufa	acturer of equipment:
_	by the manufacturer's authorized representative signifies that the equipment has been satisfactorily ed out on the job by the manufacturer.
1.	The attached Test and Data and Performance Verification information was used to evaluate the equipment installation and operation.
2.	The equipment is properly installed, has been tested by the manufacturer's authorized representative, and is operating satisfactorily in accordance with all requirements, except for items listed below.*
3.	Written operating and maintenance information has been presented to the Contractor, and gone over with him in detail.
4.	Sufficient copies of all applicable operating and maintenance information, parts lists, lubrication checklists, and warranties have been furnished to the contractor for insertion in the Operation and Maintenance Manuals.
Checked By:	(Print or Type Nam of Manufacturer's Representative)
Address:	(Address and Phone No. of Representative)
Signature:	(Title of Representative)
Date Checked:	
Witnessed By:	(Signature and Title of Contractor Representative)
	*Exceptions Noted at Time of Check-Out (use additional page if necessary):

Holiday Park War Memorial Auditorium Renovations

Project 12128

# **EXHIBIT 1**

DEMONSTRATION OF COMPLETED ELECTRICAL SYSTEMS

26 08 16 - 4

## SECTION 26 09 23 - STAND ALONE LIGHTING CONTROL DEVICES

## 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.

## 1.2 SUMMARY

- A. This Section includes the following stand alone lighting control devices:
  - 1. Time switches.
  - 2. Outdoor photoelectric switches.
  - 3. Indoor occupancy sensors.
  - 4. Lighting contactors.
  - 5. Emergency shunt relays.
- B. Related Sections include the following:
  - 1. Division 26 Section "Wiring Devices" for wall-box dimmers, wall-switch occupancy sensors, and manual light switches.

## 1.3 DEFINITIONS

- A. LED: Light-emitting diode.
- B. PIR: Passive infrared.

## 1.4 SUBMITTALS

- A. Product Data: Include dimensions and data on features, components, options, NRTL listings, wiring diagrams, and electrical ratings for each type of product to be utilized.
- B. Shop Drawings: Show installation details for occupancy and light-level sensors.
  - 1. Interconnection diagrams showing field-installed wiring.
- C. Field quality-control test reports.
- D. Operation and Maintenance Data: For each type of product to include in operation and maintenance manuals.

# 1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

STAND ALONE LIGHTING CONTROL DEVICES

26 09 23 - 1

#### 1.6 COORDINATION

- A. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression system, and partition assemblies.
- B. Coordinate features of devices specified in this Section with systems and components specified in other Sections to form an integrated system of compatible components. Match components and interconnections for optimum performance of specified functions

#### 1.7 SPECIAL WARRANTIES

A. Occupancy Sensors shall be provided with a 5 year extended warranty.

# PART 2 - PRODUCTS

#### 2.1 TIME SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Intermatic, Inc.
  - 2. Paragon Electric Co.; Invensys Climate Controls.
  - 3. TORK.
- B. Electromechanical-Dial Time Switches: Type complying with UL 917.
  - 1. Contact Configuration: DPST.
  - 2. Contact Rating: 40-A Tungsten, resistive and general purpose ballast load, 120-277V ac.
  - 3. 24 Hour Program: With skip-a-day mode.
  - 4. Wound-spring reserve carryover mechanism to keep time during power failures, minimum of 16 hours.
  - 5. Provide in NEMA 1 enclosure for indoor timers and NEMA 3R non-metallic for exterior locations.

## 2.2 OUTDOOR PHOTOELECTRIC SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Intermatic, Inc.
  - 2. Paragon Electric Co.; Invensys Climate Controls.
  - 3. TORK.
- B. Description: Solid state, with SPST dry contacts rated for 2000-W tungsten or 1800VA ballast, to operate connected relay, contactor coils, or microprocessor input; complying with UL 773A.
  - 1. Light-Level Monitoring Range: 1.5 to 15 fc (16.14 to 162 lx), with an adjustment for turn-on and turn-off levels within that range, and a sliding light level selector in front of photocell to prevent fixed light sources from causing turn-off.
  - 2. Time Delay: Up to 2 minutes to prevent false operation.
  - 3. Mounting: ½" conduit or box mounting as required to direct sensor to the north sky exposure.
  - 4. Temperature Range: -40 Deg F to +140 Deg F (-40 Deg C to +60 Deg C)
  - 5. Heavy-duty die cast zinc, gasket for maximum weather protection.

# 2.3 INDOOR OCCUPANCY SENSORS

- 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. Hubbell Lighting.
  - 2. Leviton Mfg. Company Inc.
  - 3. Watt Stopper (The).
- B. Line Voltage: Wall or ceiling-mounting, solid-state units with an integral relay unit.
  - 1. Operation: Unless otherwise indicated, turn lights on when covered area is occupied(or via manual momentary contact switch input) and off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 30 minutes.
  - 2. Mounting:
    - a. Sensor: Suitable for mounting in any position on a standard outlet box.
    - b. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
  - Indicator: LED, to show when motion is being detected during testing and normal operation of the sensor.
  - 4. Bypass Switch: Override the on function in case of sensor failure or fail safe in the on position.
  - 5. Sensor: Dual-Technology Type, wall or ceiling mounting; detect occupancy by using a of PIR detection and retain detection with microphonic or ultrasonic detection methods in area of coverage. Particular technology or combination of technologies that controls on-off functions shall be selectable in the field by operating controls on unit.
  - 6. Sensitivity Adjustment: Separate for each sensing technology.
  - 7. Detection Coverage (Standard Room): Detect occupancy anywhere within area of installation at a minimum. See drawings for type of detector to be utilized.
- C. Low Voltage Sensors with Power Pack: Wall or ceiling-mounting, solid-state units with a separate relay unit (Power Pack).
  - 1. Operation: Unless otherwise indicated, turn lights on when covered area is occupied (or via manual momentary contact switch input) and off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
  - 2. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor shall be powered from the relay unit. Up to 14 sensors may control 1 relay unit.
  - 3. Relay Unit: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Power supply to sensor shall be 24-V dc, 150-mA, Class 2 power source as defined by NFPA 70 for up to 14 sensors.
  - 4. Mounting:
    - a. Sensor: Suitable for mounting in any position on a standard outlet box.
    - b. Relay: Externally mounted through a 1/2-inch (13-mm) knockout in a standard electrical enclosure.
    - c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
  - 5. Indicator: LED, to show when motion is being detected during testing and normal operation of the sensor.
  - 6. Bypass Switch: Override the on function in case of sensor failure or fail safe in the on position.
  - 7. Sensor: Dual-Technology Type, wall or ceiling mounting; detect occupancy by using a PIR detector and retain detection with microphonic detection methods in area of coverage. Particular technology or combination of technologies that controls on-off functions shall be selectable in the field by operating controls on unit.
  - 8. Sensitivity Adjustment: Separate for each sensing technology.
  - 9. Detection Coverage (Standard Room): Detect occupancy anywhere within area of installation at a minimum. See drawings for type of detector to be utilized.

#### 2.4 LIGHTING CONTACTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Allen-Bradley/Rockwell Automation.
  - 2. ASCO Power Technologies, LP; a division of Emerson Electric Co.
  - 3. Eaton Electrical Inc.; Cutler-Hammer Products.
  - 4. GE Industrial Systems; Total Lighting Control.
  - 5. Grasslin Controls Corporation; a GE Industrial Systems Company.
  - 6. Square D; Schneider Electric.
  - 7. Siemens
- B. Description: Electrically operated and mechanically held complying with NEMA ICS 2 and UL 508.
  - 1. Current Rating for Switching: Listing or rating consistent with type of load served, including tungsten filament, inductive, and high-inrush ballast (ballast with 15 percent or less total harmonic distortion of normal load current). Provide 20A minimum rating for all contacts.
  - 2. Fault Current Withstand Rating: Equal to or exceeding the available fault current at the point of installation.
  - 3. Enclosure: Comply with NEMA 250.
  - 4. Provide with control and pilot devices as indicated on Drawings, matching the NEMA type specified for the enclosure or as specified.
  - 5. Control Coil Voltage: Match control power source.
  - When multiple contactors are installed with a single enclosure, the assembly shall be UL 508A listed as a control assembly.

#### 2.5 EMERGENCY SHUNT RELAY

- 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. Lighting Control and Design, Inc.
  - 2. Integrated Lighting Control
- B. Description: Normally closed, electrically held relay, arranged for wiring in parallel with manual or automatic switching contacts. Device shall be UL 924 listed.
  - 1. Coil Rating: 120 or 277 V.

## 2.6 EMERGENCY SWITCHING RELAY

- 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. LVS Controls Inc
- B. Description: Automatically connects emergency loads upon utility power interruption regardless of switch position and switches lights with the normal lighting switch under normal conditions (no emergency lighting switch is required). Device shall be UL 924 listed and 20A rated contacts. Coil Rating: 120 or 277 V.
- C. Include an automatic diagnostic which is initiated when the room switch is turned off. This test procedure will turn the emergency luminaires on for at least 2 seconds, indicating that an emergency power source is available & that the device, ballast, & lamp are all functioning correctly. Automatic diagnostic shall be approved to meet periodic testing requirements (NEC 700.3 NFPA 101 7.9.3
- D. Unit shall have regular power indicator LED indicating utility power status.

- E. Unit accepts separate phases on the constant hot & switched hot inputs.
- F. 5 year manufacturers warranty
- G. Basis of design is LVS EPC-A-1

#### 2.7 CONDUCTORS AND CABLES

- A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."
- B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 18 AWG. Comply with requirements in Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

# PART 3 - EXECUTION

#### 3.1 GENERAL INSTALLATION

- A. Install equipment level and plumb and according to manufacturer's written instructions.
- B. Mount lighting control devices according to manufacturer's written instructions and requirements in Division 26 Section "Basic Electrical Materials and Methods."
- C. Mounting heights indicated are to bottom of unit for suspended devices and to center of unit for wall-mounting devices.
- D. Connections: Tighten electrical connectors and terminals according to manufacturer's published torquetightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A
- E. Bundle, train, and support wiring in enclosures.
- F. Ground equipment.

#### 3.2 SENSOR INSTALLATION

- A. Install and aim sensors in locations to achieve not less than 95 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.
- B. Install in accordance with manufacturers recommendations, which shall determine final sensor location. All sensors shall have non-adjustable factory calibrated sensitivity for maximum performance. Set all off time delays for 30 min to avoid nuisance turn off's. Set all motion sensor dip switches to provide for "manual on" function of motion sensors.

## 3.3 CONTACTOR INSTALLATION

A. Mount electrically held lighting contactors with elastomeric isolator pads, to eliminate structure-borne vibration, unless contactors are installed in an enclosure with factory-installed vibration isolators.

STAND ALONE LIGHTING CONTROL DEVICES

26 09 23 - 5

#### 3.4 WIRING INSTALLATION

- A. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- B. Size conductors according to lighting control device manufacturer's written instructions, unless otherwise indicated.
- C. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in terminal cabinets; and equipment enclosures.

## 3.5 IDENTIFICATION

- A. Identify components and power and control wiring according to Division 26 Section "Identification for Electrical Systems."
  - 1. Identify controlled circuits in lighting contactors.
  - 2. Identify circuits or luminaries controlled by photoelectric and occupancy sensors at each sensor.
- B. Label time switches and contactors with a unique designation.
- C. Provide warning labels on all equipment with more than one source of power located within the enclosure in accordance with Division 26 Section "Identification for Electrical Systems".

## 3.6 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
  - 1. After installing time switches and sensors, and after electrical circuitry has been energized, adjust and test for compliance with requirements.
  - 2. Operational Test: Verify operation of each lighting control device, and adjust time delays.

## 3.7 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting sensors to suit occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

## 3.8 DEMONSTRATION

A. Demonstrate products specified in this Section to train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION 26 09 23

#### SECTION 26 22 00 - LOW-VOLTAGE TRANSFORMERS

#### 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.

## 1.2 SUMMARY

- A. This Section includes the following types of dry-type transformers rated 600 V and less, with capacities up to 1000 kVA:
  - 1. Distribution transformers.
  - 2. Harmonic Mitigating Transformers
  - 3. Buck-boost transformers.

## 1.3 SUBMITTALS

- A. Product Data: Include rated nameplate data, capacities, weights, dimensions, minimum clearances, installed devices and features, and performance for each type and size of transformer indicated.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 1. Wiring Diagrams: Power, signal, and control wiring.
- C. Sound-Level Test Reports: Certified copies of manufacturer's sound-level tests applicable to equipment for this Project.
- D. Source quality-control test reports.
- E. Field quality-control test reports.
- F. Operation and Maintenance Data: For transformers to include in emergency, operation, and maintenance manuals.

## 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each transformer type through one source from a single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with IEEE C57.12.91, "Test Code for Dry-Type Distribution and Power Transformers."

LOW-VOLTAGE TRANSFORMERS

26 22 00 - 1

# 1.5 DELIVERY, STORAGE, AND HANDLING

A. Temporary Heating: Apply temporary heat according to manufacturer's written instructions within the enclosure of each ventilated-type unit, throughout periods during which equipment is not energized and when transformer is not in a space that is continuously under normal control of temperature and humidity.

#### 1.6 COORDINATION

- A. Coordinate size and location of concrete bases with actual transformer provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Coordinate installation of wall-mounting and structure-hanging supports with actual transformer provided.

## 1.7 WARRANTY

A. Minimum warranty of 10 years unlimited on harmonic mitigating transformers.

#### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Eaton Electrical Inc.; Cutler-Hammer Products.
  - 2. General Electric Company.
  - 3. Siemens Energy & Automation, Inc.
  - 4. Square D; Schneider Electric.
  - 5. Power Quality International (PQI)

## 2.2 DISTRIBUTION TRANSFORMERS

- A. Description: Factory-assembled and -tested, air-cooled units for 60-Hz service.
- B. Cores:
  - 1. Grain-oriented, non-aging silicon steel.
  - 2. One leg per phase.
- C. Coils: Continuous windings without splices except for taps.
  - 1. Internal Coil Connections: Brazed or pressure type.
  - 2. Coil Material: Copper
- D. Low-Sound-Level Units: Minimum of NEMA ST 20 standard sound levels when factory tested according to IEEE C57.12.91.
- E. Enclosure: Ventilated, NEMA 250, Type 1. Provide N3R rainshield for exterior transformers.

LOW-VOLTAGE TRANSFORMERS

26 22 00 - 2

- 1. Core and coil shall be encapsulated within resin compound, sealing out moisture and air.
- F. Transformer Enclosure Finish: Comply with NEMA 250.
  - 1. Finish Color: Gray.
- G. Taps for Transformers Smaller Than 3 kVA: None.
- H. Taps for Transformers 7.5 to 24 kVA: Two 5 percent taps below rated voltage.
- I. Taps for Transformers 25 kVA and Larger: Two 2.5 percent taps above and four 2.5 percent taps below normal full capacity.
- J. Insulation Class: 220 deg C, UL-component-recognized insulation system with a maximum of 150 deg C rise above 40 deg C ambient temperature.
- K. Energy Efficiency for Transformers Rated 15 kVA and Larger:
  - 1. Complying with TSL 2 standards effective by the DOE on January 1, 2016.
- L. K-Factor Rating: Transformers indicated to be K-factor rated shall comply with UL 1561 requirements for nonsinusoidal load current-handling capability to the degree defined by designated K-factor.
  - Unit shall not overheat when carrying full-load current with harmonic distortion corresponding to designated K-factor.
  - 2. Indicate value of K-factor on transformer nameplate.
- M. Electrostatic Shielding: Each winding shall have an independent, single, full-width copper electrostatic shield arranged to minimize interwinding capacitance.
  - 1. Arrange coil leads and terminal strips to minimize capacitive coupling between input and output terminals.
  - 2. Include special terminal for grounding the shield.
  - 3. Shield Effectiveness:
    - a. Capacitance between Primary and Secondary Windings: Not to exceed 33 picofarads over a frequency range of 20 Hz to 1 MHz.
    - b. Common-Mode Noise Attenuation: Minimum of minus 120 dBA at 0.5 to 1.5 kHz; minimum of minus 65 dBA at 1.5 to 100 kHz.
    - c. Normal-Mode Noise Attenuation: Minimum of minus 52 dBA at 1.5 to 10 kHz.
- N. Wall Brackets: Manufacturer's standard brackets for transformers up to 75KVA.
- O. Fungus Proofing: Permanent fungicidal treatment for coil and core.

## 2.3 HARMONIC MITIGATING TRANSFORMERS

- A. Description: Factory-assembled and -tested, air-cooled units for 60-Hz service. 480V 3phase delta primary to 208/120V 3phase wye secondary.
- B. Cores:
  - 1. Grain-oriented, non-aging silicon steel.
  - 2. One leg per phase.

- C. Coils: Continuous windings without splices except for taps.
  - 1. Internal Coil Connections: Brazed or pressure type.
  - 2. Coil Material: Copper
- D. Low-Sound-Level Units: Minimum of NEMA ST 20 standard sound levels when factory tested according to IEEE C57.12.91.
- E. Enclosure: Ventilated, NEMA 250, Type 1.
  - 1. Core and coil shall be encapsulated within resin compound, sealing out moisture and air.
- F. Transformer Enclosure Finish: Comply with NEMA 250.
  - 1. Finish Color: White.
- G. Taps for Transformers: Two 2.5 percent taps above and two 2.5 percent taps below normal full capacity.
- H. Insulation Class: 220 deg C, UL-component-recognized insulation system with a maximum of 150 deg C rise above 40 deg C ambient temperature.
- I. Energy Efficiency for Transformers Rated 15 kVA and Larger:
  - 1. Exceed NEMA TP 1, Class 1 efficiency levels for linear and moderate (<40% THD) non linear loading.
  - 2. Tested according to NEMA TP 2.
  - 3. E-Rated
  - 4. Linear Load Efficiency: Per US DOE Candidate Standard Level 3 efficiency at 35% load as follows: 15kVA = 97.90%, 30kVA = 98.30%, 45kVA = 98.40%, 75kVA = 98.65%, 112.5kVA = 98.80%, 150kVA = 98.78%, 225kVA = 99.00%, 300kVA = 99.00%, 500kVA = 99.10%.
  - 5. Non-linear Load Efficiency: This requirement is defined as meeting the efficiency requirements of NEMA TP1 under non-linear loading, which has 30% THD. Proof of compliance Type Tests for each transformer rating must be based on the Voltage and Current Difference Measurement Method, with a minimum accuracy of 0.033%. Type Tests are required for each kVA rating. The Power In-Power Out Measurement Method is not an acceptable test because it exceeds the minimum required accuracy.
  - 6. Linear and Non-Linear losses and efficiencies between 25% full load and 100% full load must be plotted for each kVA rating.
- J. Anti-vibration pads shall be used between the core and the enclosure.
- K. Reduce THD to less than 5% at the nonlinear electronic loads.
- L. Provide a medium zero-sequence impedance path for all zero-sequence currents, including all zero-sequence harmonic currents (i.e.  $I_3$ ,  $I_9$ ,  $I_{15}$ ,  $I_{21}$ , --- ), in its secondary three-phase, four-wire subsystem. Transformer shall cancel positive and negative sequence harmonic currents on the common primary bus or within the output secondary windings.
- M. Reduce voltage and current distortion on the primary side of the unit, and voltage distortion on the secondary side of the unit.
- N. Reduce average and peak phase current on the primary side of the unit.
- O. Transformer shall improve power factor and reduce system losses.

- P. Harmonic cancellation shall be by electromagnetic means only. No capacitors or electronics shall be used.
- Q. Basis of Design: PQI type DY Distribution Transfilter E-Rated

## 2.4 BUCK-BOOST TRANSFORMERS

- A. Description: Self-cooled, two-winding dry type, rated for continuous duty and with wiring terminals suitable for connection as autotransformer. Transformers shall comply with NEMA ST 1 and shall be listed and labeled as complying with UL 506 or UL 1561.
- B. Enclosure: Ventilated, NEMA 250, Type 2.
  - 1. Finish Color: Gray.

## 2.5 IDENTIFICATION DEVICES

A. Nameplates: Engraved, laminated-plastic or metal nameplate for each distribution transformer, mounted with corrosion-resistant screws. Nameplates and label products are specified in Division 26 Section "Identification for Electrical Systems."

# 2.6 SOURCE QUALITY CONTROL

- A. Test and inspect transformers according to IEEE C57.12.91.
- B. Factory Sound-Level Tests: Conduct sound-level tests on equipment for this Project if specified levels are below standard ratings.

#### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine conditions for compliance with enclosure- and ambient-temperature requirements for each transformer.
- B. Verify that field measurements are as needed to maintain working clearances required by NFPA 70 and manufacturer's written instructions.
- C. Examine walls, floors, roofs, and concrete bases for suitable mounting conditions where transformers will be installed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION

A. Install wall-mounting transformers level and plumb with wall brackets fabricated by transformer manufacturer.

- B. Install pad mount transformers on a concrete pad with dimensions 3" larger than the transformer footprint.
- C. Mount transformers on vibration isolating pads suitable for isolating the transformer noise from the building structure.
- D. Verify that ground connections are in place and requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" have been met. Maximum ground resistance shall be 5 ohms at location of transformer.
- E. Arrange equipment to provide adequate spacing for access and for circulation of cooling air.
- F. Identify transformers and install warning signs according to Division 26 Section "Identification of Electrical Systems"
- G. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

## 3.3 CONNECTIONS

- A. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- B. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

# 3.4 FIELD QUALITY CONTROL

- A. Tests and Inspections:
  - 1. Perform each visual and mechanical inspection test stated in NETA Acceptance Testing Specification prior to energizing.
- B. Check for damage and tight connections prior to energizing transformer.
- C. Measure primary and secondary voltages and make appropriate tap adjustments.
- D. Remove and replace units that do not pass tests or inspections and retest as specified above.
- E. Infrared Scanning: Two months after Substantial Completion, perform an infrared scan of transformer connections.
  - 1. Use an infrared-scanning device designed to measure temperature or detect significant deviations from normal values. Provide documentation of device calibration.
  - 2. Prepare a certified report identifying transformer checked and describing results of scanning. Include notation of deficiencies detected, remedial action taken, and scanning observations after remedial action.
- F. Output Settings Report: Prepare a written report recording output voltages and tap settings.

Holiday Park War Memorial Auditorium Renovations

Project 12128

# 3.5 CLEANING

A. On completion of installation, inspect components. Remove paint splatters and other spots, dirt, and debris. Repair scratches and mars on finish to match original finish. Clean components internally using methods and materials recommended by manufacturer.

END OF SECTION 26 22 00

#### SECTION 26 24 13 - SWITCHBOARDS

#### 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.

## 1.2 SUMMARY

A. This Section includes service and distribution switchboards rated 600 V and less.

#### 1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. RFI: Radio-frequency interference.
- D. RMS: Root mean square.
- E. SPDT: Single pole, double throw.

# 1.4 REFERENCES AND REGULATORY REQUIREMENTS

- A. The switchboard(s) and overcurrent protection devices referenced herein are designed and manufactured according to the following appropriate specifications:
  - 1. ANSI/NFPA 70 National Electrical Code (NEC)
  - 2. ANSI/IEEE C12.16 Solid State Electricity Metering
  - 3. ANSI C57.13 Instrument Transformers
  - 4. NEMA AB1 Molded Case Circuit Breakers and Molded Case Switches
  - 5. NEMA PB2 Deadfront Distribution Switchboards, File E8681
  - 6. NEMA PB2.1 Proper Handling, Installation, Operation and Maintenance of Deadfront Switchboards Rated 600 Volts or Less
  - 7. NEMA PB 2.2 Application Guide for Ground Fault Protective Devices for Equipment
  - 8. UL 50 Cabinets and Boxes
  - 9. UL 98 Enclosed and Dead Front Switches
  - 10. UL 489 Molded Case Circuit Breakers
  - 11. UL 891 Dead-Front Switchboards
  - 12. UL 943 Ground Fault Circuit Interrupters
  - 13. Federal Specification W-C-375B/Gen-Circuit Breakers, Molded Case, Branch Circuit and Service

#### 1.5 SUBMITTALS

- A. Product Data: For each type of switchboard, overcurrent protective device, transient voltage suppression device, ground-fault protector, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each switchboard and related equipment.
  - 1. Dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings. Include the following:
    - a. Enclosure types and details for types other than NEMA 250, Type 1.
    - b. Bus configuration, current, and voltage ratings.
    - c. Short-circuit current rating of switchboards and overcurrent protective devices.
    - d. Descriptive documentation of optional barriers specified for electrical insulation and isolation.
    - e. Utility company's metering provisions with indication of approval by utility company.
    - f. UL listing for series rating of installed devices.
    - g. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
  - 2. Wiring Diagrams: Power, signal, and control wiring.
- C. Field quality-control test reports including the following:
  - 1. Test procedures used.
  - 2. Test results that comply with requirements.
  - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- D. Operation and Maintenance Data: For switchboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
  - 1. Routine maintenance requirements for switchboards and all installed components.
  - 2. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
  - 3. Time-current curves, including selectable ranges for each type of overcurrent protective device.

## 1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain switchboards through one source from a single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for switchboards including clearances between switchboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with NEMA PB 2, "Deadfront Distribution Switchboards."
- E. Comply with NFPA 70.

# 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in sections or lengths that can be moved past obstructions in delivery path.
- B. Store indoors in clean dry space with uniform temperature to prevent condensation. Protect from exposure to dirt, fumes, water, corrosive substances, and physical damage.
- C. If stored in areas subjected to weather, cover switchboards to provide protection from weather, dirt, dust, corrosive substances, and physical damage. Remove loose packing and flammable materials from inside switchboards; install electric heating (250 W per section) to prevent condensation.
- D. Handle switchboards according to NEMA PB 2.1 and NECA 400.

#### 1.8 PROJECT CONDITIONS

- A. Installation Pathway: Remove and replace access fencing, doors, lift-out panels, and structures to provide pathway for moving switchboards into place.
- B. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:
  - 1. Ambient Temperature: Not exceeding 104 deg F (40 deg C).
- C. Service Conditions: NEMA PB 2, usual service conditions, as follows:
  - 1. Ambient temperatures within limits specified.
  - 2. Altitude not exceeding 6600 feet (2000 m).
- D. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
  - Notify Construction Manager no fewer than 2 days in advance of proposed interruption of electric service.
  - 2. Indicate method of providing temporary electric service.
  - 3. Do not proceed with interruption of electric service without Construction Manager's written permission.

## 1.9 COORDINATION

- A. Coordinate layout and installation of switchboards and components with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

#### PART 2 - PRODUCTS

#### 2.1 MANUFACTURED UNITS

#### A. Manufacturers:

- 1. Eaton Corporation; Cutler-Hammer Products.
- 2. General Electric Co.; Electrical Distribution & Protection Div.
- 3. Siemens Energy & Automation, Inc.
- 4. Square D.
- B. Front-Connected, Front-Accessible Switchboard: Fixed, individually mounted main device, panel-mounted branches, and sections rear aligned.
- C. Main-Bus Continuous: As indicated on one line diagram.
- D. Enclosure: Steel, NEMA 250, Type 1 for indoor applications and type 3R, with interior-lighted walk-in aisle for exterior applications.
- E. Enclosure Finish for Outdoor Units: Factory-applied finish in manufacturer's standard color, undersurfaces treated with corrosion-resistant undercoating.
- F. Enclosure Finish for Indoor Units: Factory-applied finish in manufacturer's standard gray finish over a rust-inhibiting primer on treated metal surface.
- G. Insulation and isolation for main bus of main section and main and vertical buses of feeder sections.
- H. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.
- I. Hinged Front Panels: Allow access to circuit breaker, metering, accessory, and blank compartments.
- J. Buses and Connections: Three phase, four wire, unless otherwise indicated.
  - 1. Phase- and Neutral-Bus Material: Hard-drawn copper of 98 percent conductivity with feeder circuit-breaker line connections.
    - a. Use copper for feeder circuit-breaker line connections.
  - 2. Load Terminals: Insulated, rigidly braced, silver-plated, copper runback bus extensions equipped with pressure connectors for outgoing circuit conductors. Provide load terminals for future circuit-breaker positions at full ampere rating of circuit-breaker position.
  - 3. Ground Bus: 1/4-by-2-inch- (6-by-50-mm-) minimum-size, hard-drawn copper of 98 percent conductivity, equipped with pressure connectors for feeder and branch-circuit ground conductors. For busway feeders, extend insulated equipment grounding cable to busway ground connection and support cable at intervals in vertical run.
  - 4. Contact Surfaces of Buses: Silver plated.
  - 5. Main Phase Buses, Neutral Buses, and Equipment Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends. Bracing shall be for 100,000 amps symmetrical short circuit current.
  - 6. Isolation Barrier Access Provisions: Permit checking of bus-bolt tightness.
  - 7. Neutral Buses: 100 percent of the ampacity of phase buses, unless otherwise indicated, equipped with pressure connectors for outgoing circuit neutral cables. Bus extensions for busway feeder neutral bus are braced.

- K. Switchboards shall be completely self supporting structures, 90" high.
- Provide lugs on bus, distribution panelboard and circuit breakers as required to match conductors being connected/terminated.
- M. Provide full-height wiring gutter doors for quick access to wiring terminals.
- N. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.

# 2.2 OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker: NEMA AB 3, with interrupting capacity to meet available fault currents.
  - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable electronic trip setting for circuit-breaker frame sizes 250 A and larger.
  - 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
  - 3. Electronic trip-unit circuit breakers shall have RMS sensing, field-replaceable rating plug, and the following field-adjustable settings:
    - a. Instantaneous trip.
    - b. Long- and short-time pickup levels.
    - c. Long- and short-time time adjustments.
    - d. Ground-fault pickup level, time delay, and  $I^2$ t response.
  - 4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
  - 5. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker; trip activation on fuse opening or on opening of fuse compartment door.
  - 6. GFCI Circuit Breakers: Single- and two-pole configurations with 30-mA trip sensitivity.
- B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.
  - 1. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor material.
  - 2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
  - 3. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and timedelay settings, push-to-test feature, and ground-fault indicator.
  - 4. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.
  - 5. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1- to 0.6-second time delay.
  - 6. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.

# 2.3 INSTRUMENTATION

A. Instrument Transformers: NEMA EI 21.1, IEEE C57.13, and the following:

- 1. Potential Transformers: Secondary voltage rating of 120 V and NEMA accuracy class of 0.3 with burdens of W, X, and Y.
- 2. Current Transformers: Ratios shall be as indicated with accuracy class and burden suitable for connected relays, meters, and instruments.
- 3. Control-Power Transformers: Dry type, mounted in separate compartments for units larger than 3 kV.
- 4. Current Transformers for Neutral and Ground-Fault Current Sensing: Connect secondaries to ground overcurrent relays to provide selective tripping of main and tie circuit breaker. Coordinate with feeder circuit-breaker ground-fault protection.
- B. Multifunction Digital-Metering Monitor: Microprocessor-based unit suitable for three- or four-wire systems and with the following features:
  - Switch-selectable digital display of the following values with maximum accuracy tolerances as indicated:
    - a. Phase Currents, Each Phase: Plus or minus 1 percent.
    - b. Phase-to-Phase Voltages, Three Phase: Plus or minus 1 percent.
    - c. Phase-to-Neutral Voltages, Three Phase: Plus or minus 1 percent.
    - d. Megawatts: Plus or minus 2 percent.
    - e. Megavars: Plus or minus 2 percent.
    - f. Power Factor: Plus or minus 2 percent.
    - g. Frequency: Plus or minus 0.5 percent.
    - h. Megawatt Demand: Plus or minus 2 percent; demand interval programmable from 5 to 60 minutes.
    - i. Accumulated Energy, Megawatt Hours: Plus or minus 2 percent. Accumulated values unaffected by power outages up to 72 hours.
  - 2. Mounting: Display and control unit flush or semiflush mounted in instrument compartment door.

## 2.4 CONTROL POWER

- A. Control Circuits: 120 V, supplied through secondary disconnecting devices from control-power transformer.
- B. Control-Power Fuses: Primary and secondary fuses for current-limiting and overload protection of transformer and fuses for protection of control circuits.
- C. Control Wiring: Factory installed, with bundling, lacing, and protection included. Provide flexible conductors for No. 8 AWG and smaller, for conductors across hinges, and for conductors for interconnections between shipping units.

#### 2.5 COORDINATION STUDY

A. Manufacturer shall provide a coordination study in accordance with section 26 05 73 to coordinate the tripping of overcurrent protective devices for all new switchboards, distribution boards and panel boards supplied as part of this project. Provide settings of all adjustable trip breakers and confirm that non-adjustable trip breakers are properly coordinated to provide tripping of smaller breakers before the tripping of larger breakers. If non-adjustable trip breakers will not coordinate properly with the upstream breaker, an adjustable trip breaker will be provided to coordinate properly at no additional cost to the Owner. All breakers provided shall provide the correct interrupting capacity required or series protection required to protect the distribution system from faults.

#### PART 3 - EXECUTION

#### 3.1 PROTECTION

A. Temporary Heating: Apply temporary heat to maintain temperature according to manufacturer's written instructions.

#### 3.2 EXAMINATION

- A. Examine elements and surfaces to receive switchboards for compliance with installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

# 3.3 INSTALLATION

- A. Install switchboards and accessories according to NEMA PB 2.1 and NECA 40.
- B. Install and anchor switchboards level on concrete bases, 4-inch (100-mm) nominal thickness. Concrete base is specified in Division 26 Section "Hangers and Supports for Electrical Systems," and concrete materials and installation requirements are specified in Division 03.
  - 1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around full perimeter of base.
  - For switchboards, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
  - 3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  - 4. Install anchor bolts to elevations required for proper attachment to switchboards.
- C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from switchboard units and components.
- D. Operating Instructions: Frame and mount the printed basic operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.
- E. Install overcurrent protective devices and instrumentation.
  - 1. Set field-adjustable switches and circuit-breaker trip ranges.
- F. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- G. Provide rubber insulating mats on floor in front of board for entire length of board. Mats to be minimum of four feet wide (Whether indicated on drawings or not).

#### 3.4 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Identification for Electrical Systems."
- B. Switchboard Nameplates: Label each switchboard compartment with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.

# 3.5 FIELD QUALITY CONTROL

- A. Prepare for acceptance tests as follows:
  - 1. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit.
  - 2. Test continuity of each circuit.
- B. Perform the following field tests and inspections and prepare test reports:
  - 1. Perform each visual and mechanical inspection stated in NETA ATS, Sections 7.1, 7.5, 7.6, 7.9, 7.10, 7.11, and 7.14 as appropriate. Certify compliance with test parameters.
  - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
  - 3. Perform the following infrared scan tests and inspections and prepare reports:
    - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switchboard. Remove front panels so joints and connections are accessible to portable scanner.
    - b. Instruments, Equipment, and Reports:
      - 1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
      - Prepare a certified report that identifies switchboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

#### 3.6 CLEANING

A. On completion of installation, inspect interior and exterior of switchboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

# END OF SECTION 26 24 13

## SECTION 26 24 16 - PANELBOARDS

## 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.

## 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Distribution panelboards.
  - 2. Lighting and appliance branch-circuit panelboards.

## 1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. RFI: Radio-frequency interference.
- D. RMS: Root mean square.
- E. SPDT: Single pole, double throw.

# 1.4 REFERENCES

- A. NECA (National Electrical Contractors Association) "Standard of Installation."
- B. NEMA AB 1 Molded Case Circuit Breakers.
- C. NEMA PB 1 Panelboards.
- D. NEMA PB 1.1 Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
- E. NFPA 70 National Electrical Code.
- F. UL. 67 Panelboards
- G. UL 50 Enclosures for Electrical Equipment
- H. UL 489 Molded Case Circuit Breakers and Circuit Breaker Enclosures

- I. Federal Specification W-P-115C-Type I Class I
- J. Federal Specification W-C-375B/GEN-Circuit Breakers, Molded Case, Branch Circuit and Service

## 1.5 SUBMITTALS

- A. Product Data: For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
  - 1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:
    - a. Enclosure types and details for types other than NEMA 250, Type 1.
    - b. Bus configuration, current, and voltage ratings.
    - c. Short-circuit current rating of panelboards and overcurrent protective devices.
    - d. UL listing for series rating of installed devices.
    - e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
  - 2. Wiring Diagrams: Power, signal, and control wiring.
- C. Operation and Maintenance Data: For panelboards and components to include in operation and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
  - 1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
  - 2. Time-current curves, including selectable ranges for each type of overcurrent protective device.
  - 3. Panelboard Schedules: Submit final versions after load balancing.

# 1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories through one source from a single manufacturer.
- B. Product Options: Drawings indicate size, profiles, and dimensional requirements of panelboards and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with NEMA PB 1.
- E. Comply with NFPA 70.
- F. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum ten years experience.

# 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the environmental conditions that it will be permanently located.
- B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
  - 1. Notify Construction Manager no fewer than two days in advance of proposed interruption of electrical service.
  - 2. Do not proceed with interruption of electrical service without Construction Manager and Owner's written permission.

# 1.8 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Handle panelboards and enclosures carefully to prevent damage.
- B. Store equipment indoors and protect from weather.
- C. Deliver tubs and internal assemblies sufficiently in advance of installation period as necessary to prevent delay of work.

## 1.9 COORDINATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.
- B. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

## 1.10 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Keys: Six spares for each type of panelboard cabinet lock.

#### PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:
    - a. Eaton Corporation; Cutler-Hammer Products.
    - b. General Electric Co.; Electrical Distribution & Protection Div.

- c. Siemens Energy & Automation, Inc.
- d. Square D.

#### 2.2 MANUFACTURED UNITS

- A. Enclosures: Flush- and surface-mounted cabinets. NEMA PB 1, Type 1.
  - 1. Rated for environmental conditions at installed location.
    - a. Outdoor Locations: NEMA 250, Type 3R.
    - b. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
    - c. Other Wet or Damp Indoor Locations: NEMA 250, Type 4X stainless steel.
    - d. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.
  - 2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Provide with flush lock all keyed alike.
  - 3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover ("door in door").
  - 4. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.
  - 5. Directory Card: With transparent protective cover, mounted in metal frame, inside panelboard door.

#### B. Phase and Ground Buses:

- 1. Material: Hard-drawn copper, 98 percent conductivity.
- 2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.
- 3. Isolated Equipment Ground Bus: Adequate for branch-circuit equipment ground conductors; insulated from box.
- 4. Extra-Capacity Neutral Bus: Neutral bus rated 200 percent of phase bus and UL listed as suitable for nonlinear loads. For all panels serving computer loads or noted as 200% neutral.

#### C. Mains

- 1. Provide main lug only (MLO) or main circuit breaker (MCB) as noted on drawings either by riser diagram or by schedule. Where conflict exists, provide MCB.
- 2. Regardless of what is shown on drawings provide the following minimum requirements.
  - a. Main circuit breaker on each panel serving building main if required by applicable codes.
  - b. Main circuit breaker on each panel fed directly from a transformer (unless disconnect with overcurrent devices is installed in feeder between transformer and panel).
- 3. Provide lugs as required for conductors being connected to panelboard lugs, circuit breakers, etc.
- 4. Main circuit breaker is not to be mounted as branch breaker or subfeed breaker.
- D. Conductor Connectors: Suitable for use with conductor material.
  - 1. Main and Neutral Lugs: Mechanical type.
  - 2. Ground Lugs and Bus Configured Terminators: Compression type.
  - 3. Feed-Through Lugs: Mechanical type suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
  - 4. Extra-Capacity Neutral Lugs: Rated 200 percent of phase lugs mounted on extra-capacity neutral bus. For all panels serving computer loads or noted as 200% neutral.

- E. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.
- F. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices. This includes all bussing and hardware less the breaker.
- G. Provide lugs as required for conductors being connected to panelboard lugs, circuit breakers, etc.

## 2.3 PANELBOARD SHORT-CIRCUIT RATING

A. UL label indicating series-connected rating with integral or remote upstream overcurrent protective devices. Include size and type of upstream device allowable, branch devices allowable, and UL series-connected short-circuit rating.

## 2.4 DISTRIBUTION PANELBOARDS

- A. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
- B. Main Overcurrent Protective Devices: Circuit breaker.
- C. Branch Overcurrent Protective Devices:
  - 1. For Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.
  - 2. For Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.
  - 3. Fused switches.

## 2.5 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- B. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.
- C. Kitchen panel boards shall have surge protection integral to the panel. See SPD specification.

# 2.6 EQUIPMENT FOR ELECTRICITY METERING BY OWNER

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. <u>E-Mon; a division of Hunt Power</u>.
  - 2. Osaki Meter Sales, Inc.
  - 3. Square D; a brand of Schneider Electric.
- B. General Requirements for Owner's Meters:
  - 1. Comply with UL 1244.
  - 2. Memory Backup: Self-contained to maintain memory throughout power outages of 72 hours, minimum.

- 3. Sensors: Current-sensing type, with current or voltage output, selected for optimum range and accuracy for meters indicated for this application.
- 4. Building Automation System (BAS) Interface: Match signal to BAS input and arrange to convey the instantaneous, integrated, demand level measured by meter to provide data for processing.
- C. Kilowatt-hour/Demand Meter: Electronic single- and three-phase meters, measuring electricity use and demand. Demand shall be integrated over a 15-minute interval.
  - 1. Voltage and Phase Configuration: Meter shall be designed for use on circuits with voltage rating and phase configuration indicated for its application.
  - 2. Display: LCD with characters not less than 0.25 inch high, indicating accumulative kilowatthours, current time and date, current demand, and historic peak demand, and time and date of historic peak demand. Retain accumulated kilowatt-hour and historic peak demand in a nonvolatile memory, until reset.

## 2.7 OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker: UL 489, with series-connected rating to meet available fault currents.
  - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable electronic trip setting for circuit-breaker frame sizes 250 A and larger.
  - 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
  - 3. Electronic trip-unit circuit breakers shall have RMS sensing; field-replaceable rating plug; and with the following field-adjustable settings:
    - a. Instantaneous trip.
    - b. Long- and short-time pickup levels.
    - c. Long- and short-time time adjustments.
    - d. Ground-fault pickup level, time delay, and I<sup>2</sup>t response.
  - 4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
  - 5. Integrally Fused Circuit Breakers: Thermal-magnetic trip element with integral limiter-style fuse listed for use with circuit breaker; trip activation on fuse opening or on opening of fuse compartment door.
  - 6. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity.
- B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.
  - 1. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
  - 2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
  - 3. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and timedelay settings, push-to-test feature, and ground-fault indicator.
  - 4. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.
  - 5. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1- to 0.6-second time delay.
  - 6. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
  - 7. Multipole units enclosed in a single housing or factory-assembled to operate as a single unit.

### 2.8 COORDINATION STUDY

A. Manufacturer shall provide a coordination study and Arc flash labeling in accordance with section 26 05 73 to coordinate the tripping of overcurrent protective devices for all new switchboards, distribution boards and panel boards supplied as part of this project. Provide settings of all adjustable trip breakers and confirm that non-adjustable trip breakers are properly coordinated to provide tripping of smaller breakers before the tripping of larger breakers. If non-adjustable trip breakers will not coordinate properly with the upstream breaker, an adjustable trip breaker will be provided to coordinate properly at no additional cost to the Owner. All breakers provided shall provide the correct interrupting capacity required or series protection required to protect the distribution system from faults.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Install all panelboards and panelboard enclosures in accordance with the manufacturer's written instructions, NECA's "Standard of Installation", the applicable requirements of the National Electrical Code, and recognized industry practices.
- C. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.
- D. Install overcurrent protective devices and controllers.
  - 1. Set field-adjustable switches and circuit-breaker trip ranges.
- E. Install filler plates in unused spaces.
- F. Stub four 1-inch (27-GRC) empty conduits from flush panelboards into accessible ceiling space or space designated to be ceiling space in the future.
- G. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.
- H. Provide typed circuit directory for each branch circuit panelboard. Mount a typewritten directory showing the actual circuit numbers, type of load and room names/numbers on inside of door. Room names/numbers shall be actual names or numbers used, not necessarily shown on the drawings. Any directory that does not facilitate determination of exactly what room(s) and what load(s) are on a circuit shall be corrected prior to request for substantial completion. Progress Drawings shall show same arrangements as the Directory. Revise directory to reflect circuiting changes required to balance phase loads.
- I. Proper working clearances shall be maintained at every panelboard location. The working space in front of a panelboard shall be as a minimum, 30 inches wide extending 3 feet, 3.5 feet, or 4 feet (per NEC) out perpendicular to the panelboard.
- J. All enclosures shall be firmly anchored to walls and supporting structures (where used) using appropriate hardware. Provide supporting (unistrut type) channels on walls constructed of gypsum board or where otherwise necessary to provide a mechanically secure and permanent installation. Enclosures shall be installed so that the top is 6'-6" above finished floor. Where the size of the enclosure is such that the top cannot be installed at 6'-6", the top of the enclosure shall be kept as low as possible.

- K. Sub-Metering shall be provide on the Kitchen Panelboards with capability of monitoring of the Panelboards entire load by OCPS EMS (whether shown on drawings or not). Coordinate interface with DG 23 09 23 Direct Digital Control for HVAC Systems. Metering devices will be flush mounted next to Panelboard being monitored. Metering devices shall be similar to Emon.
- L. Sub-Metering shall be provided for Lighting Panelboards that serve the lighting in the Kitchen and Cafeteria areas (whether shown on drawings or not). Panelboards with capability of monitoring of the Panelboards individual circuits/loads by OCPS EMS. Coordinate interface with DG 23 09 23 Direct Digital Control for HVAC Systems. Metering devices will be surface mounted in electrical room next to Panelboard being monitored. Metering devices shall be similar to Emon.
- M. Coordinate all raceways and conductors with their respective panelboards so that all connections and conductors routing present an orderly appearance. Conductors in the panelboards shall be laced and arranged in orderly manner.

## 3.2 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Identification for Electrical Systems."
- B. Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
- C. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.
- D. Nameplate shall state panel name, voltage and name of panel that feeds this respective panel, UL short-circuit rating.

## 3.3 CONNECTIONS

- A. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- B. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

## 3.4 FIELD QUALITY CONTROL

- A. Prepare for acceptance tests as follows:
  - Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
  - 2. Test continuity of each circuit.
- B. Perform the following field tests and inspections and prepare test reports:
  - Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.

- 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- C. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.
  - 1. Measure as directed during period of normal system loading.
  - 2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
  - 3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
  - 4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.
- D. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scanning of each panelboard. Remove panel fronts so joints and connections are accessible to portable scanner.
  - 1. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
  - 2. Record of Infrared Scanning: Prepare a certified report that identifies panelboards checked and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

#### 3.5 CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION 26 24 16

#### SECTION 26 27 26 - WIRING DEVICES

## 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.

## 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Receptacles, receptacles with integral GFCI, and associated device plates.
  - 2. Twist-locking receptacles.
  - 3. Isolated-ground receptacles.
  - 4. Snap switches and wall-box dimmers.
  - 5. Solid-state fan speed controls.
  - 6. Pendant cord-connector devices.
  - 7. Cord and plug sets.
  - 8. Floor service outlets, poke-through assemblies, service poles, and multioutlet assemblies.
- B. Related Sections include the following:
  - 1. Division 27 Section "Communications Horizontal Cabling" for workstation outlets.

## 1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.
- E. TVSS: Transient voltage surge suppressor.
- F. UTP: Unshielded twisted pair.

#### 1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing label warnings and instruction manuals that include labeling conditions.

## 1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of wiring device and associated wall plate through one source from a single manufacturer. Insofar as they are available, obtain all wiring devices and associated wall plates from a single manufacturer and one source.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NFPA 70.
- D. Comply with NEMA WD 1.

#### 1.6 COORDINATION

- A. Receptacles for Owner-Furnished Equipment: Match plug configurations.
  - 1. Cord and Plug Sets: Match equipment requirements.

#### 1.7 ALLOWANCES

A. Provide for twenty additional receptacles as directed in field. Allowance includes purchase, delivery and installation of box, receptacle cover plate, wire and 100 feet of conduit for each receptacle.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
  - 1. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
  - 2. Leviton Mfg. Company Inc. (Leviton).
  - 3. Pass & Seymour/Legrand; Wiring Devices & Accessories (Pass & Seymour).

## 2.2 STRAIGHT BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
  - 1. Products: Subject to compliance with requirements, provide one of the following for standard convenience outlets:
    - a. Hubbell; HBL5361 (single), HBL5352 (duplex).
    - b. Leviton; 5351 (single), 5352 (duplex).
    - c. Pass & Seymour; 5361 (single), 5352 (duplex).

- 2. Black Computer Power Duplex Receptacle:
  - a. Pass & Seymour Model PS5352-Black
  - b. Hubbell Model HBL5362-Black
  - c. Leviton Model 5362-Black

## 2.3 GFCI RECEPTACLES

- A. General Description: Straight blade, feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and trip button to indicate when device is tripped. Face will not have power if reverse wired. Visual indication for device has lost capability to provide protection.
- B. Outdoor locations provide weather resistant GFCI convenience receptacles, 125V, 20A Black
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Hubbell #GFR5362WR
    - b. Pass & Seymour; 2095DSWRBK.
    - c. Leviton #W7899-E
- C. Duplex GFCI Convenience Receptacles, 125 V, 20 A:
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Hubbell #GFR5362
    - b. Pass & Seymour; 2095.
    - c. Leviton #6898

## 2.4 HAZARDOUS (CLASSIFIED) LOCATION RECEPTACLES

- A. Wiring Devices for Hazardous (Classified) Locations: Comply with NEMA FB 11 and UL 1010.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Cooper Crouse-Hinds.
    - b. EGS/Appleton Electric.
    - c. Killark; a division of Hubbell Inc.

## 2.5 TWIST-LOCKING RECEPTACLES

- A. Single Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration L5-20R, and UL 498.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Hubbell; HBL2310.
    - b. Leviton; 2310.
    - c. Pass & Seymour; L520-R.

## 2.6 PENDANT CORD-CONNECTOR DEVICES

- A. Description: Matching, locking-type plug and receptacle body connector; NEMA WD 6 configurations L5-20P and L5-20R, heavy-duty grade.
  - 1. Body: Nylon with screw-open cable-gripping jaws and provision for attaching external cable grip.
  - 2. External Cable Grip: Woven wire-mesh type made of high-strength galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.

#### 2.7 CORD AND PLUG SETS

- A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.
  - 1. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and equipment-rating ampacity plus a minimum of 30 percent.
  - 2. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

## 2.8 SNAP SWITCHES

- A. Comply with NEMA WD 1 and UL 20.
- B. Snap switches for general use shall be maintained contact types, and shall be single-pole, double-pole, three-way, or four-way as required for the specific switching arrangements shown on the drawings. They shall be quiet tumbler operation types, having silver alloy contacts, and meeting all NEMA performance standards.
- C. Switches, 120/277 V, 20 A:
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Hubbell; HBL1221 (single pole), HBL1222 (two pole), HBL1223 (three way), HBL1224 (four way).
    - b. Leviton; 1221 (single pole), 1222 (two pole), 1223 (three way), 1224 (four way).
    - c. Pass & Seymour; PS20AC1 (single pole), PS20AC2 (two pole), PS20AC3 (three way), PS20AC4 (four way).
- D. Pilot Light Switches, 20 A:
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Hubbell: HPL1221PL for 120 V and 277 V.
    - b. Leviton; 1221-PLR for 120 V, 1221-7PLR for 277 V.
    - c. Pass & Seymour; PS20AC1RPL for 120 V.
  - 2. Description: Single pole, with neon-lighted handle, illuminated when switch is "off." Provide red handle for switches connected to emergency power.
- E. Key-Operated Switches, 120/277 V, 20 A:

- 1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Hubbell; HBL1221L.
  - b. Leviton; 1221L.
  - c. Pass & Seymour; PS20AC1-L.
- 2. Description: Single pole, with factory-supplied key in lieu of switch handle. All key operated switches shall be keyed alike.
- F. Single-Pole, Double-Throw, Momentary Contact, Center-Off Switches, 120/277 V, 20 A; for use with mechanically held lighting contactors.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Hubbell; HBL1557.
    - b. Leviton; 1257.
    - c. Pass & Seymour; 1251.
- G. Key-Operated, Single-Pole, Double-Throw, Momentary Contact, Center-Off Switches, 120/277 V, 20 A; for use with mechanically held lighting contactors, with factory-supplied key in lieu of switch handle. All keyed switches shall be keyed alike.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Hubbell; HBL1557L.
    - b. Leviton; 1257L.
    - c. Pass & Seymour; 1251L.

## 2.9 WALL-BOX DIMMERS

- A. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
- B. Control: Continuously adjustable toggle switch; with single-pole or three-way switching. Comply with UL 1472.
- C. Incandescent Lamp Dimmers: 120 V; control shall follow square-law dimming curve. On-off switch positions shall bypass dimmer module.
  - 1. 600 W; dimmers shall require no derating when ganged with other devices.
- D. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness.

#### 2.10 FAN SPEED CONTROLS

- A. Modular, 120-V, full-wave, solid-state units with integral, quiet on-off switches and audible frequency and EMI/RFI filters. Comply with UL 1917.
  - 1. Continuously adjustable toggle switch, 5 A.

2. Three-speed adjustable slider, 1.5 A.

#### 2.11 WALL PLATES

- A. Single and combination types to match corresponding wiring devices.
  - 1. Plate-Securing Screws: Metal with head color to match plate finish.
  - 2. All wiring devices shall be provided with standard size one-piece cover plates of suitable configuration for the number and type of devices to be covered.
  - 3. Metallic cover plates shall be used in interior spaces, except as noted below, and shall be fabricated of corrosion-resistant #302 stainless steel, having a nominal thickness of .04", and a brushed finish. Screws securing the plates shall have flush (when installed) heads with finish to match plates. Metallic cover plates shall meet all requirements of the National Electrical Code and Federal Specifications.
  - 4. Cover plates for switches located in corrosive atmospheres (where vaporproof is not indicated) shall be equal to Hubbell #17CM81/#17CM82/#17CM83/#17CM84 one piece neoprene with matching presswitch.
  - 5. Cover plate engraving, where required, shall be accomplished by cover plate manufacturer in accordance with instructions given on the drawings. Metallic plates shall be engraved with black fill. Red plates shall be engraved with white fill.
  - 6. Material for Unfinished Spaces: Galvanized steel.
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant, diecast aluminum with lockable "in use" cover. Cover plates for exterior receptacles shall be gasketed covers with hinge allowing plug and cord to be plugged in and activated with cover closed..

#### 2.12 MULTIOUTLET ASSEMBLIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Hubbell Incorporated; Wiring Device-Kellems.
  - 2. Wiremold Company (The).
  - 3. Mono-systems, Inc.
- B. Components of Assemblies: Products from a single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.
- C. Raceway Material: Metal, with manufacturer's standard finish.
- D. Wire: No. 12 AWG.

## 2.13 SERVICE POLES

- A. Description: Factory-assembled and -wired units to extend power and voice and data communication from distribution wiring concealed in ceiling to devices or outlets in pole near floor.
  - 1. Poles: Nominal 2.5-inch- (65-mm-) square cross section, with height adequate to extend from floor to at least 6 inches (150 mm) above ceiling, and with separate channels for power wiring and voice and data communication cabling.

- 2. Mounting: Ceiling trim flange with concealed bracing arranged for positive connection to ceiling supports; with pole foot and carpet pad attachment.
- 3. Finishes: Manufacturer's standard painted finish and trim combination.
- 4. Wiring: Sized for minimum of five No. 12 AWG power and ground conductors and a minimum of four, 4-pair, Category 3 or 5 voice and data communication cables.
- 5. Power Receptacles: Two duplex, 20-A, heavy-duty, NEMA WD 6 configuration 5-20R units.
- 6. Voice and Data Communication Outlets: Four RJ-45 Category 6 jacks.

## 2.14 FINISHES

- A. Color: Wiring device catalog numbers in Section Text do not designate device color.
  - 1. Wiring Devices Connected to Normal Power System: Gray, unless otherwise indicated or required by NFPA 70 or device listing.
  - 2. Receptacle devices for computer power shall be black color.
  - 3. Wiring Devices Connected to Emergency Power System: Red.
  - 4. Modify any given catalog numbers as required to procure devices and plates of the proper color.

#### **PART 3 - EXECUTION**

### 3.1 INSTALLATION

- A. Coordination with Other Trades:
  - 1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
  - 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
  - 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
  - 4. Install wiring devices after all wall preparation, including painting, is complete.
- B. Install products in accordance with manufacturer's instructions.
- C. Install devices plumb and level.
- D. Install switches with OFF position down.
- E. Provide device coverplates for every device installed. Cover plates shall be installed so that they appear straight with no gaps between plate edges and the wall. Maintain vertical and horizontal to within 1/16 of an inch
- F. Wiring devices shall not be installed in exposed masonry until cleaning of masonry with acids has been completed.
- G. All receptacles and switches shall be grounded by means of a ground wire from device ground screw to outlet box screw and branch circuit ground conductor. Strap alone will not constitute an acceptable ground.

- H. All devices shall be installed so that only one wire is connected to each terminal.
- I. Connect wiring devices by wrapping conductor around screw terminal.
- J. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
- K. Install local room area wall switches at door locations on the lock side of the door, approximately four inches from the jamb. Where locations shown on the drawings are in question, provide written request for information to A/E prior to roughin.

#### L. Conductors:

- 1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
- 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
- 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.

#### M. Device Installation:

- 1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
- 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
- 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
- 4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
- 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
- 6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
- 7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
- 8. Tighten unused terminal screws on the device.
- 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.
- N. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

#### O. Dimmers:

- 1. Install dimmers within terms of their listing.
- 2. Verify that dimmers used for fan speed control are listed for that application.
- 3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.
- P. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on bottom. Group adjacent switches or receptacles under multigang wall plates. Provide proper NEC barriers in boxes which serve devices for both the Normal and Emergency Systems.

Q. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

#### 3.2 CONNECTIONS

- A. Connect wiring device grounding terminal to outlet box with bonding jumper.
- B. Connect wiring device grounding terminal to branch-circuit equipment grounding conductor.
- C. Tighten electrical connectors and terminals according to manufacturers published torque-tightening values. If manufacturers torque values are not indicated, use those specified in UL 486A and UL 486B.

## 3.3 NEUTRAL CONDUCTOR CONNECTIONS

A. At each receptacle "in" and "out" phase and neutral conductors shall have an additional conductor for connection to device. The practice of "looping" conductors through receptacle boxes shall not be acceptable. (IE: The device shall not be used to complete the circuit. Pigtails shall be used from the device)

## 3.4 IDENTIFICATION

- A. Comply with Division 26 Section "Identification for Electrical Systems."
  - 1. Receptacles and Switches: Identify panelboard and circuit number from which served. Use permanent marker to identify on the back of plates or tags within outlet boxes.

## 3.5 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects.
- B. Operate each wall switch with circuit energized and verify proper operation.
- C. Verify that each receptacle device is energized.
- D. Test each receptacle device for proper polarity.
- E. Test each GFCI receptacle device for proper operation.

## 3.6 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

### END OF SECTION 26 27 26

#### **SECTION 26 28 13 - FUSES**

## 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.

## 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Cartridge fuses rated 600 V and less for use in switches, controllers and motor-control centers.

## 1.3 SUBMITTALS

- A. Product Data: Include the following for each fuse type indicated:
  - 1. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
  - 2. Let-through current curves for fuses with current-limiting characteristics.
  - 3. Time-current curves, coordination charts and tables, and related data.
  - 4. Fuse size for elevator feeders and elevator disconnect switches.

## 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain fuses from a single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NEMA FU 1.
- D. Comply with NFPA 70.

#### 1.5 PROJECT CONDITIONS

A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F (5 deg C) or more than 100 deg F (38 deg C), apply manufacturer's ambient temperature adjustment factors to fuse ratings.

## 1.6 COORDINATION

A. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size.

FUSES 26 28 13 - 1

## 1.7 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Fuses: Three (3) of each type installed. Install in spare Fuse Cabinet

#### PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Cooper Bussman, Inc.
  - 2. Eagle Electric Mfg. Co., Inc.; Cooper Industries, Inc.
  - 3. Mersen
  - 4. Tracor, Inc.; Littlefuse, Inc. Subsidiary.

## 2.2 CARTRIDGE FUSES

- A. Characteristics: NEMA FU 1, nonrenewable cartridge fuse; class and current rating indicated; voltage rating consistent with circuit voltage.
- 2.3 SPARE-FUSE CABINET (Provide one in mechanical room closest to the CEP on the first floor)
  - A. Characteristics: Wall-mounted steel unit with full-length, recessed piano-hinged door and key-coded cam lock and pull.
    - 1. Size: Adequate for storage of spare fuses specified with 25 percent spare capacity minimum.
    - 2. Finish: Gray, baked enamel.
    - 3. Identification: "SPARE FUSES" in 1-1/2-inch- (38-mm-) high letters on exterior of door.
    - 4. Fuse Pullers: Provide one for each size of fuse, where applicable and available, from fuse manufacturer.

## PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.
- B. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

FUSES 26 28 13 - 2

## 3.2 FUSE APPLICATIONS

- A. Service Entrance: Class RK1, time delay.
- B. Feeders: Class RK5, time delay.
- C. Motor Branch Circuits: Class RK5, time delay.
- D. Other Branch Circuits: Class RK5, time delay.

## 3.3 INSTALLATION

A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

## 3.4 IDENTIFICATION

A. Install labels indicating fuse replacement information on inside door of each fused switch.

END OF SECTION 26 28 13

FUSES 26 28 13 - 3

## SECTION 26 28 16 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

## 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 the following individually mounted, enclosed switches and circuit breakers:
  - 1. Fusible switches.
  - 2. Nonfusible switches.
  - 3. Bolted-pressure contact switches.
  - 4. High-pressure, butt-type contact switches.
  - 5. Molded-case circuit breakers.
  - 6. Molded-case switches.
  - 7. Enclosures.

## 1.3 DEFINITIONS

- A. GD: General duty.
- B. GFCI: Ground-fault circuit interrupter.
- C. HD: Heavy duty.
- D. RMS: Root mean square.
- E. SPDT: Single pole, double throw.

## 1.4 REFERENCES

- A. UL 98 Enclosed and Dead Front Switches
- B. NEMA KS1 Enclosed Switches
- C. NEMA 250 Enclosures for Electrical Equipment
- D. NFPA 70 National Electric Code

### 1.5 SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
  - 1. Enclosure types and details for types other than NEMA 250, Type 1.
  - 2. Current and voltage ratings.
  - 3. Short-circuit current rating.
  - 4. UL listing for series rating of installed devices.
  - 5. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
- B. Shop Drawings: Diagram power, signal, and control wiring.
- C. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
  - Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.
  - 2. Time-current curves, including selectable ranges for each type of circuit breaker.

## 1.6 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.
- C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

#### 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions, unless otherwise indicated:
  - 1. Ambient Temperature: Not less than minus 22 deg F (minus 30 deg C) and not exceeding 104 deg F (40 deg C).
  - 2. Altitude: Not exceeding 6600 feet (2010 m).

#### 1.8 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

#### PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

#### 2.2 RATING

- A. The size, number of poles, and fusing for each switch shall be as denoted on the drawings. As a minimum, no less than one pole for each ungrounded conductor shall be provided. Switches shall be rated 250 VAC or 600 VAC as required by the circuit to which it is connected.
- B. Switches serving motors with more than one set of windings shall have the number of poles necessary to disconnect all conductors to all windings in a single switch. Switches serving motor loads shall be horsepower rated of sufficient size to handle the load.

## 2.3 SERVICE ENTRANCE EQUIPMENT

A. Switches used as service entrance equipment shall be listed and labeled by U.L. for use as service equipment.

#### 2.4 FUSIBLE AND NONFUSIBLE SWITCHES

#### A. Manufacturers:

- 1. Eaton Corporation; Cutler-Hammer Products.
- 2. General Electric Co.; Electrical Distribution & Control Division.
- 3. Siemens Energy & Automation, Inc.
- 4. Square D/Group Schneider.
- B. Fusible Switch, 1200 A and Smaller: NEMA KS 1, Type HD, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- C. Nonfusible Switch, 1200 A and Smaller: NEMA KS 1, Type HD, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

#### D. Accessories:

- 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
- 2. Neutral Kit: Internally mounted; insulated, capable of being grounded, and bonded; and labeled for copper and aluminum neutral conductors.
- 3. Auxiliary Contact Kit: Auxiliary set of contacts arranged to open before switch blades open.

## 2.5 MOLDED-CASE CIRCUIT BREAKERS AND SWITCHES

#### A. Manufacturers:

- 1. Eaton Corporation; Cutler-Hammer Products.
- 2. General Electric Co.; Electrical Distribution & Control Division.
- 3. Siemens Energy & Automation, Inc.
- 4. Square D/Group Schneider.
- B. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.
  - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
  - 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
  - 3. Electronic Trip-Unit Circuit Breakers: All breakers 400A and larger. RMS sensing; field-replaceable rating plug; with the following field-adjustable settings:
    - a. Instantaneous trip.
    - b. Long- and short-time pickup levels.
    - c. Long- and short-time time adjustments.
    - d. Ground-fault pickup level, time delay, and  $I^2$ t response.
  - 4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller and let-through ratings less than NEMA FU 1, RK-5.
  - 5. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity.

#### C. Molded-Case Circuit-Breaker Features and Accessories:

- 1. Standard frame sizes, trip ratings, and number of poles.
- 2. Lugs: Mechanical style suitable for number, size, trip ratings, and conductor material.
- 3. Application Listing: Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
- 4. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and timedelay settings, push-to-test feature, and ground-fault indicator.
- 5. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.
- 6. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage with field-adjustable 0.1- to 0.6-second time delay.
- 7. Auxiliary Switch: One SPDT switch with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts, "b" contacts operate in reverse of circuit-breaker contacts.
- 8. Key Interlock Kit: Externally mounted to prohibit circuit-breaker operation; key shall be removable only when circuit breaker is in off position.
- 9. Zone-Selective Interlocking: Integral with electronic trip unit; for interlocking ground-fault protection function.

## 2.6 ENCLOSURES

- A. NEMA AB 1 and NEMA KS 1 to meet environmental conditions of installed location.
  - 1. Outdoor Locations: NEMA 250, Type 3R.
  - 2. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
  - 3. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

26 28 16 - 4

4. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.

#### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Comply with applicable portions of NECA 1, NEMA PB 1.1, and NEMA PB 2.1 for installation of enclosed switches and circuit breakers.
- B. All switches shall be firmly anchored to walls and supporting structures (where used) using appropriate installation. Switches shall be installed with the turning axis of their handles approximately 5'-0" above finished floor unless otherwise indicated. Provide rigid steel (galvanized for exterior use) mounting stands, brackets, plates, hardware, and accessories for a complete installation
- C. Switches shall be mounted in accessible locations chosen where the passageway to the switch is not likely to become obstructed. Where a switch serves as the disconnecting means for a load, the switch shall be located as close as practical to the load with the switch handle within sight of the load.
- D. Provide and install lugs on disconnect switch as required to accept conductors called for on drawings.
- E. Disconnect switches shall not be mounted on equipment, unless specifically noted or required and meet all applicable codes, etc. If switches are noted or required to be mounted on equipment they shall have vibrator clips on fuses and be connected to conduit system with liquid tight flexible conduit.
- F. Coordinate all requirements for controls between variable speed drive units and its respective motor with drive specification, manufacturer, provider and installer. Provide auxiliary contacts, relays, etc. as required.
- G. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

## 3.3 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 26 Section "Identification for Electrical Systems."
- B. Enclosure Nameplates: Label each enclosure with engraved metal or laminated-plastic nameplate as specified in Division 26 Section "Identification for Electrical Systems."

### 3.4 CONNECTIONS

- A. Install equipment grounding connections for switches with ground continuity to main electrical ground bus.
- B. Install power wiring. Install wiring between switches and control and indication devices.
- C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

## 3.5 FIELD QUALITY CONTROL

- A. Prepare for acceptance testing as follows:
  - 1. Inspect mechanical and electrical connections.
  - 2. Verify switch and relay type and labeling verification.
  - 3. Verify rating of installed fuses.
  - 4. Inspect proper installation of type, size, quantity, and arrangement of mounting or anchorage devices complying with manufacturer's certification.
- B. Perform the following field tests and inspections and prepare test reports:
  - Perform each visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers.
  - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
  - 3. Infrared Scanning:
    - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each enclosed switch and circuit breaker. Open or remove doors or panels so connections are accessible to portable scanner.
    - b. Instruments, Equipment and Reports:
      - 1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
      - 2) Prepare a certified report that identifies enclosed switches and circuit breakers included and describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

#### 3.6 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.

## 3.7 CLEANING

- A. On completion of installation, vacuum dirt and debris from interiors; do not use compressed air to assist in cleaning.
- B. Inspect exposed surfaces and repair damaged finishes.

Holiday Park War Memorial Auditorium Renovations

Project 12128

END OF SECTION 26 28 16

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

26 28 16 - 7

#### SECTION 26 29 13 - ENCLOSED CONTROLLERS

#### 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.

## 1.2 SUMMARY

- A. This Section includes ac, enclosed controllers rated 600 V and less, of the following types:
  - 1. Across-the-line, manual and magnetic controllers.
  - 2. Reduced-voltage controllers.
  - 3. Multispeed controllers.
- B. Related Sections include the following:
  - 1. Division 26 Section "Variable-Frequency Motor Controllers" for general-purpose, ac, adjustable-frequency, pulse-width-modulated controllers for use on constant torque loads in ranges up to 200 hp.
  - 2. Division 26 Section "Transient-Voltage Suppression for Low-Voltage Electrical Power Circuits" for low-voltage power, control, and communication surge suppressors.

## 1.3 SUBMITTALS

- A. Product Data: For each type of enclosed controller. Include dimensions and manufacturer's technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each enclosed controller.
  - 1. Include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings. Include the following:
    - a. Each installed unit's type and details.
    - b. Nameplate legends.
    - c. Short-circuit current rating of integrated unit.
    - d. Listed and labeled for series rating of overcurrent protective devices in combination controllers by an NRTL acceptable to authorities having jurisdiction.
    - e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices in combination controllers.
  - 2. Wiring Diagrams: Power, signal, and control wiring.
- C. Coordination Drawings: Floor plans, drawn to scale, showing dimensioned layout, required working clearances, and required area above and around enclosed controllers where pipe and ducts are prohibited. Show enclosed controller layout and relationships between electrical components and adjacent structural

**ENCLOSED CONTROLLERS** 

26 29 13 - 1

- and mechanical elements. Show support locations, type of support, and weight on each support. Indicate field measurements.
- D. Operation and Maintenance Data: For enclosed controllers to include in operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
  - 1. Routine maintenance requirements for enclosed controllers and all installed components.
  - 2. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
- E. Load-Current and Overload-Relay Heater List: Compile after motors have been installed and arrange to demonstrate that selection of heaters suits actual motor nameplate full-load currents.
- F. Load-Current and List of Settings of Adjustable Overload Relays: Compile after motors have been installed and arrange to demonstrate that dip switch settings for motor running overload protection suit actual motor to be protected.

## 1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain enclosed controllers of a single type through one source from a single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NFPA 70.
- D. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed controllers, minimum clearances between enclosed controllers, and for adjacent surfaces and other items. Comply with indicated maximum dimensions and clearances.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store enclosed controllers indoors in clean, dry space with uniform temperature to prevent condensation. Protect enclosed controllers from exposure to dirt, fumes, water, corrosive substances, and physical damage.
- B. If stored in areas subject to weather, cover enclosed controllers to protect them from weather, dirt, dust, corrosive substances, and physical damage. Remove loose packing and flammable materials from inside controllers; install electric heating of sufficient wattage to prevent condensation.

#### 1.6 COORDINATION

- A. Coordinate layout and installation of enclosed controllers with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03 Section "Cast-in-Place Concrete."

- C. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 07 Section "Roof Accessories."
- D. Coordinate features of enclosed controllers and accessory devices with pilot devices and control circuits to which they connect.
- E. Coordinate features, accessories, and functions of each enclosed controller with ratings and characteristics of supply circuit, motor, required control sequence, and duty cycle of motor and load.

#### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. ABB Power Distribution, Inc.; ABB Control, Inc. Subsidiary.
  - 2. Eaton Corporation; Cutler-Hammer Products.
  - 3. General Electrical Company; GE Industrial Systems.
  - 4. Rockwell Automation; Allen-Bradley Co.; Industrial Control Group.
  - 5. Siemens/Furnas Controls.
  - 6. Square D.

## 2.2 ACROSS-THE-LINE ENCLOSED CONTROLLERS

- A. Manual Controller: NEMA ICS 2, general purpose, Class A, with "quick-make, quick-break" toggle or pushbutton action, and marked to show whether unit is "OFF," "ON," or "TRIPPED."
  - 1. Overload Relay: Ambient-compensated type with inverse-time-current characteristics and NEMA ICS 2, Class 20 tripping characteristics. Relays shall have heaters and sensors in each phase, matched to nameplate, full-load current of specific motor to which they connect and shall have appropriate adjustment for duty cycle.
- B. Magnetic Controller: NEMA ICS 2, Class A, full voltage, nonreversing, across the line, unless otherwise indicated.
  - 1. Control Circuit: 120 V; obtained from integral control power transformer with a control power transformer of sufficient capacity to operate connected pilot, indicating and control devices, plus 100 percent spare capacity.
  - Overload Relay: Ambient-compensated type with inverse-time-current characteristic and NEMA ICS 2, Class 20 tripping characteristic. Provide with heaters or sensors in each phase matched to nameplate full-load current of specific motor to which they connect and with appropriate adjustment for duty cycle.
  - 3. Adjustable Overload Relay: Dip switch selectable for motor running overload protection with NEMA ICS 2, Class 20 tripping characteristic, and selected to protect motor against voltage and current unbalance and single phasing. Provide relay with Class II ground-fault protection, with start and run delays to prevent nuisance trip on starting.
  - 4. Hand Off Auto Selector Switch: Include with each starter a NEMA ICS 2, heavy duty oil tight selector switch with legend plate.
  - 5. Run Light: Include with each starter a NEMA ICS 2, heavy duty oil tight push to test green pilot light to indicate when the motor is running.
  - 6. Auxiliary Contacts: Include 2 NO/2NC contacts for status of each starter.

- C. Combination Magnetic Controller: Factory-assembled combination controller and disconnect switch.
  - 1. Circuit-Breaker Disconnecting Means: NEMA AB 1, motor-circuit protector with field-adjustable, short-circuit trip coordinated with motor locked-rotor amperes.
  - 2. Control Circuit: 120 V; obtained from integral control power transformer with a control power transformer of sufficient capacity to operate connected pilot, indicating and control devices, plus 100 percent spare capacity.
  - 3. Overload Relay: Ambient-compensated type with inverse-time-current characteristic and NEMA ICS 2, Class 20 tripping characteristic. Provide with heaters or sensors in each phase matched to nameplate full-load current of specific motor to which they connect and with appropriate adjustment for duty cycle.
  - 4. Adjustable Overload Relay: Dip switch selectable for motor running overload protection with NEMA ICS 2, Class 20 tripping characteristic, and selected to protect motor against voltage and current unbalance and single phasing. Provide relay with Class II ground-fault protection, with start and run delays to prevent nuisance trip on starting.
  - 5. Hand Off Auto Selector Switch: Include with each starter a NEMA ICS 2, heavy duty oil tight selector switch with legend plate.
  - 6. Run Light: Include with each starter a NEMA ICS 2, heavy duty oil tight push to test green pilot light to indicate when the motor is running.
  - 7. Auxiliary Contacts: Include 2 NO/2NC contacts for status of each starter.

#### 2.3 REDUCED-VOLTAGE ENCLOSED CONTROLLERS

- A. Star-Delta Controller: NEMA ICS 2, closed transition with adjustable time delay.
- B. Part-Winding Controller: NEMA ICS 2, closed transition with separate overload relays for starting and running sequences.
- C. Autotransformer Reduced-Voltage Controller: NEMA ICS 2, closed transition.
- D. Solid-State, Reduced-Voltage Controller: NEMA ICS 2, suitable for use with NEMA MG 1, Design B, polyphase, medium induction motors.
  - 1. Adjustable acceleration rate control utilizing voltage or current ramp, and adjustable starting torque control with up to 500 percent current limitation for 20 seconds.
  - 2. Surge suppressor in solid-state power circuits providing 3-phase protection against damage from supply voltage surges 10 percent or more above nominal line voltage.
  - 3. LED indicators showing motor and control status, including the following conditions:
    - a. Control power available.
    - b. Controller on.
    - c. Overload trip.
    - d. Loss of phase.
    - e. Shorted silicon-controlled rectifier.
  - 4. Automatic voltage-reduction controls to reduce voltage when motor is running at light load.
  - 5. Motor running contactor operating automatically when full voltage is applied to motor.
  - 6. Hand Off Auto Selector Switch: Include with each starter a NEMA ICS 2, heavy duty oil tight selector switch with legend plate.
  - 7. Run Light: Include with each starter a NEMA ICS 2, heavy duty oil tight push to test green pilot light to indicate when the motor is running.
  - 8. Auxiliary Contacts: Include 2 NO/2NC contacts for status of each starter.

## 2.4 MULTISPEED ENCLOSED CONTROLLERS

- A. Multispeed Enclosed Controller: Match controller to motor type, application, and number of speeds; include the following accessories:
  - 1. Compelling relay to ensure that motor will start only at low speed.
  - 2. Accelerating relay to ensure properly timed acceleration through speeds lower than that selected.
  - 3. Decelerating relay to ensure automatically timed deceleration through each speed.
  - 4. Hand Off Auto Selector Switch: Include with each starter a NEMA ICS 2, heavy duty oil tight selector switch with legend plate.
  - 5. Run Light: Include with each starter a NEMA ICS 2, heavy duty oil tight push to test green pilot light to indicate when the motor is running.
  - 6. Auxiliary Contacts: Include 2 NO/2NC contacts for status of each starter.

#### 2.5 ENCLOSURES

- A. Description: Flush- or surface-mounting cabinets as indicated. NEMA 250, Type 1, unless otherwise indicated to comply with environmental conditions at installed location.
  - 1. Outdoor Locations: NEMA 250, Type 4X.
  - 2. Kitchen Areas: NEMA 250, Type 4X, stainless steel.
  - 3. Other Wet or Damp Indoor Locations: NEMA 250, Type 4x.
  - 4. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.

## 2.6 FACTORY FINISHES

A. Finish: Manufacturer's standard paint applied to factory-assembled and -tested enclosed controllers before shipping.

#### PART 3 - EXECUTION

## 3.1 EXAMINATION

- A. Examine areas and surfaces to receive enclosed controllers for compliance with requirements, installation tolerances, and other conditions affecting performance.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 APPLICATIONS

- A. Select features of each enclosed controller to coordinate with ratings and characteristics of supply circuit and motor; required control sequence; duty cycle of motor, controller, and load; and configuration of pilot device and control circuit affecting controller functions.
- B. Select horsepower rating of controllers to suit motor controlled.

### 3.3 INSTALLATION

- A. For control equipment at walls, bolt units to wall or mount on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks complying with Division 26 Section "Hangers and Supports for Electrical Systems."
- B. Install freestanding equipment on concrete bases.

## 3.4 CONCRETE BASES

- A. Coordinate size and location of concrete bases. Verify structural requirements with structural engineer.
- B. Concrete base is specified in Division 26 Section "Hangers and Supports for Electrical Systems," and concrete materials and installation requirements are specified in Division 03.

#### 3.5 IDENTIFICATION

A. Identify enclosed controller, components, and control wiring according to Division 26 Section "Identification for Electrical Systems."

#### 3.6 CONTROL WIRING INSTALLATION

- A. Install wiring between enclosed controllers according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."
- B. Bundle, train, and support wiring in enclosures.
- C. Connect hand-off-automatic switch and other automatic-control devices where applicable.
  - 1. Connect selector switches to bypass only manual- and automatic-control devices that have no safety functions when switch is in hand position.

#### 3.7 CONNECTIONS

- A. Conduit installation requirements are specified in other Division 26 Sections. Drawings indicate general arrangement of conduit, fittings, and specialties.
- B. Coordinate conduit installation with acceptable conduit entrance locations of the supplied controller.
- C. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

## 3.8 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
  - Perform each visual and mechanical inspection, except optional tests, stated in NETA ATS, Motor Control - Motor Starters.
  - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

**ENCLOSED CONTROLLERS** 

26 29 13 - 6

Holiday Park War Memorial Auditorium Renovations

Project 12128

# 3.9 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.

END OF SECTION 26 29 13

## SECTION 26 32 13 - PACKAGED STANDBY NATURAL GAS GENERATOR

#### 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 packaged engine-generator sets for emergency standby power supply with the following features:
  - 1. Natural gas engine.
  - 2. Unit-mounted cooling system.
  - 3. Unit-mounted control and monitoring.
  - 4. Performance requirements for sensitive loads.
  - 5. Load banks testing.
  - Outdoor enclosure.
- B. Related Sections include the following:
  - 1. Division 26 Section "Transfer Switches" for transfer switches including sensors and relays to initiate automatic-starting and -stopping signals for engine-generator sets.

## 1.3 DEFINITIONS

- A. Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.
- B. LP: Liquid petroleum.

### 1.4 SUBMITTALS

- A. Product Data: For each type of packaged engine generator indicated. Include rated capacities, operating characteristics, and furnished specialties and accessories. In addition, include the following:
  - 1. Thermal damage curve for generator.
  - 2. Time-current characteristic curves for generator protective device.
- B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 1. Dimensioned outline plan and elevation drawings of engine-generator set and other components specified.
  - 2. Design Calculations: Signed and sealed by a qualified professional engineer. Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.

- 3. Vibration Isolation Base Details: Signed and sealed by a qualified professional engineer. Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include base weights.
- 4. Wiring Diagrams: Power, signal, and control wiring.
- C. Qualification Data: For manufacturer.
- D. Source quality-control test reports.
  - 1. Certified summary of prototype-unit test report.
  - 2. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.
  - 3. Certified Summary of Performance Tests: Certify compliance with specified requirement to meet performance criteria for sensitive loads.
  - 4. Report of factory test on units to be shipped for this Project, showing evidence of compliance with specified requirements.
  - 5. Report of sound generation.
  - 6. Report of exhaust emissions showing compliance with applicable regulations.
  - 7. Certified Torsional Vibration Compatibility: Comply with NFPA 110.
- E. Field quality-control test reports.
- F. Operation and Maintenance Data: For packaged engine generators to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section "Operation and Maintenance Data," include the following:
  - 1. List of tools and replacement items recommended to be stored at Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.
- G. Warranty: Special warranty specified in this Section.

## 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
  - 1. Maintenance Proximity: Not more than 2 hours normal travel time from Installer's place of business to Project site.
  - 2. Engineering Responsibility: Preparation of data for vibration isolators and seismic restraints of engine skid mounts, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Source Limitations: Obtain packaged generator sets and auxiliary components through one source from a single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with ASME B15.1.
- E. Comply with NFPA 37.
- F. Comply with NFPA 70.
- G. Comply with NFPA 99.

- H. Comply with NFPA 110.
- I. Comply with UL 2200.
- J. Engine Exhaust Emissions: Comply with applicable state and local government requirements.
- K. Noise Emission: Comply with applicable state and local government requirements for maximum noise level at adjacent property boundaries due to sound emitted by generator set including engine, engine exhaust, engine cooling-air intake and discharge, and other components of installation.

#### 1.6 PROJECT CONDITIONS

- A. Environmental Conditions: Engine-generator system shall withstand the following environmental conditions without mechanical or electrical damage or degradation of performance capability:
  - 1. Ambient Temperature: 0 Deg F to 105 Deg F
  - 2. Relative Humidity: 0 to 100 percent.
  - 3. Altitude: Sea level to 1000 Feet.

## 1.7 COORDINATION

- Coordinate size and location of concrete bases for package engine generators. Cast anchor-bolt inserts into bases.
- B. Stub conduits up under the circuit breaker compartment as required by generator manufacturer.

### 1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: **5 years** from date of Substantial Completion.

## 1.9 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, provide **60 months** full maintenance by skilled employees of manufacturer's designated service organization. Include routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Provide parts and supplies same as those used in the manufacture and installation of original equipment.

## 1.10 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Filters: One set each of lubricating oil, fuel, and combustion-air filters.

#### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Detroit Diesel
  - 2. Caterpillar; Engine Div.
  - 3. Kohler Co.: Generator Division.
  - 4. Onan/Cummins Power Generation; Industrial Business Group.

## 2.2 ENGINE-GENERATOR SET

- A. Factory-assembled and -tested, engine-generator set.
- B. Mounting Frame: Maintain alignment of mounted components without depending on concrete foundation; and have lifting attachments.
  - 1. Rigging Diagram: Inscribed on metal plate permanently attached to mounting frame to indicate location and lifting capacity of each lifting attachment and generator-set center of gravity.
- C. Capacities and Characteristics:
  - 1. Power Output Ratings: Nominal ratings as indicated
  - 2. Output Connections: Three-phase, four wire.
  - 3. Nameplates: For each major system component to identify manufacturer's name and address, and model and serial number of component.

#### D. Generator-Set Performance:

- Steady-State Voltage Operational Bandwidth: 3 percent of rated output voltage from no load to full load.
- 2. Transient Voltage Performance: Not more than 20 percent variation for 50 percent step-load increase or decrease. Voltage shall recover and remain within the steady-state operating band within three seconds.
- 3. Transient Frequency Performance: Less than 5 percent variation for 50 percent step-load increase or decrease. Frequency shall recover and remain within the steady-state operating band within five seconds.
- 4. Output Waveform: At no load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for single harmonics. Telephone influence factor, determined according to NEMA MG 1, shall not exceed 50 percent.
- 5. Sustained Short-Circuit Current: For a 3-phase, bolted short circuit at system output terminals, system shall supply a minimum of 250 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.
- 6. Start Time: Comply with NFPA 110, Type 10, system requirements.

#### 2.3 ENGINE

1/10/2018 6:36 AM

- A. Fuel: Natural Gas
- B. Rated Engine Speed: 1800 rpm.
- C. Maximum Piston Speed for Four-Cycle Engines: 2250 fpm (11.4 m/s).

Page 322 of 476

- D. Lubrication System: The following items are mounted on engine or skid:
  - 1. Filter and Strainer: Rated to remove 90 percent of particles 5 micrometers and smaller while passing full flow.
  - 2. Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
  - 3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.
- E. Engine Fuel System:
  - 1. Main Fuel Pump: Mounted on engine. Pump ensures adequate primary fuel flow under starting and load conditions.
  - Relief-Bypass Valve: Automatically regulates pressure in fuel line and returns excess fuel to source.
- F. Coolant Jacket Heater: Electric-immersion type, factory installed in coolant jacket system. Comply with NFPA 110 requirements for Level 1 equipment for heater capacity.
- G. Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine-generator-set mounting frame and integral engine-driven coolant pump.
- H. Muffler/Silencer: Critical type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.
  - 1. Minimum sound attenuation of 25 dB at 500 Hz.
  - 2. Sound level measured at a distance of 10 feet (3 m) from exhaust discharge after installation is complete shall be 85 dBA or less.
- I. Air-Intake Filter: Heavy-duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.
- J. Starting System: 12-V electric, with negative ground.
  - 1. Components: Sized so they will not be damaged during a full engine-cranking cycle with ambient temperature at maximum specified in Part 1 "Project Conditions" Article.
  - 2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
  - 3. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35-A minimum continuous rating.
  - 4. Battery Charger: Current-limiting, automatic-equalizing and float-charging type. Unit shall comply with UL 1236 and include the following features:
    - a. Operation: Equalizing-charging rate of 10 A shall be initiated automatically after battery has lost charge until an adjustable equalizing voltage is achieved at battery terminals. Unit shall then be automatically switched to a lower float-charging mode and shall continue to operate in that mode until battery is discharged again.
    - b. Automatic Temperature Compensation: Adjust float and equalize voltages for variations in ambient temperature from minus 40 deg C to plus 60 deg C to prevent overcharging at high temperatures and undercharging at low temperatures.
    - c. Automatic Voltage Regulation: Maintain constant output voltage regardless of input voltage variations up to plus or minus 10 percent.
    - d. Ammeter and Voltmeter: Flush mounted in door. Meters shall indicate charging rates.
    - e. Safety Functions: Sense abnormally low battery voltage and close contacts providing low battery voltage indication on control and monitoring panel. Sense high battery voltage and loss of ac input or dc output of battery charger. Either condition shall close contacts that provide a battery-charger malfunction indication at system control and monitoring panel.
    - f. Enclosure and Mounting: NEMA 250, Type 1, wall-mounted cabinet.

## 2.4 CONTROL AND MONITORING

- A. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of generator set. When mode-selector switch is switched to the on position, generator set starts. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down generator set.
- B. Manual Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts generator set. The off position of same switch initiates generator-set shutdown. When generator set is running, specified system or equipment failures or derangements automatically shut down generator set and initiate alarms. Operation of a remote emergency-stop switch also shuts down generator set.
- C. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common control and monitoring panel mounted on the generator set. Mounting method shall isolate the control panel from generator-set vibration.
- D. Configuration: Operating and safety indications, protective devices, basic system controls, and engine gages shall be grouped in a common wall-mounted control and monitoring panel.
- E. Configuration: Operating and safety indications, protective devices, basic system controls, engine gages, instrument transformers, generator disconnect switch or circuit breaker, and other indicated components shall be grouped in a combination control and power panel. Control and monitoring section of panel shall be isolated from power sections by steel barriers. Panel features shall include the following:
  - 1. Wall-Mounting Cabinet Construction: Rigid, self-supporting steel unit complying with NEMA ICS 6. Power bus shall be copper. Bus, bus supports, control wiring, and temperature rise shall comply with UL 891.
  - 2. Current and Potential Transformers: Instrument accuracy class.
- F. Indicating and Protective Devices and Controls:
  - 1. AC voltmeter.
  - 2. AC ammeter.
  - 3. AC frequency meter.
  - 4. DC voltmeter (alternator battery charging).
  - 5. Engine-coolant temperature gage.
  - 6. Engine lubricating-oil pressure gage.
  - 7. Running-time meter.
  - 8. Ammeter-voltmeter, phase-selector switch(es).
  - 9. Generator-voltage adjusting rheostat.
  - 10. Fuel low-pressure alarm.
  - 11. Fuel tank high-pressure shutdown of fuel supply alarm.
  - 12. Generator overload.
- G. Indicating and Protective Devices and Controls:
  - 1. AC voltmeter.
  - 2. AC ammeter.

1/10/2018 6:36 AM

- 3. AC frequency meter.
- 4. DC voltmeter (alternator battery charging).
- 5. Engine-coolant temperature gage.
- 6. Engine lubricating-oil pressure gage.
- 7. Running-time meter.

Page 324 of 476

- 8. Ammeter-voltmeter, phase-selector switch(es).
- 9. Start-stop switch.
- 10. Overspeed shutdown device.
- 11. Coolant high-temperature shutdown device.
- 12. Coolant low-level shutdown device.
- 13. Oil low-pressure shutdown device.
- 14. Fuel tank high-pressure shutdown of fuel supply alarm.
- 15. Generator overload.
- H. Supporting Items: Include sensors, transducers, terminals, relays, and other devices and include wiring required to support specified items. Locate sensors and other supporting items on engine or generator, unless otherwise indicated.
- I. Common Remote Audible Alarm: Signal the occurrence of any events listed below without differentiating between event types. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset.
  - 1. Engine high-temperature shutdown.
  - 2. Lube-oil, low-pressure shutdown.
  - 3. Overspeed shutdown.
  - 4. Remote emergency-stop shutdown.
  - 5. Engine high-temperature prealarm.
  - 6. Lube-oil, low-pressure prealarm.
  - 7. Fuel tank, low-pressure..
  - 8. Low coolant level.
- J. Remote Alarm Annunciator: Comply with NFPA 99. An LED labeled with proper alarm conditions shall identify each alarm event and a common audible signal shall sound for each alarm condition. Silencing switch in face of panel shall silence signal without altering visual indication. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset. Cabinet and faceplate are surface- or flush-mounting type to suit mounting conditions indicated.
- K. Remote Emergency-Stop Switch: Weather proof enclosure. Surface or flush; wall mounted, unless otherwise indicated; and labeled. Push button shall be protected from accidental operation.

#### 2.5 GENERATOR OVERCURRENT AND FAULT PROTECTION

- A. Generator Circuit Breaker: Molded-case, thermal-magnetic type; 100 percent rated; complying with NEMA AB 1 and UL 489.
  - 1. Tripping Characteristic: Designed specifically for generator protection.
  - 2. Trip Rating: Matched to generator rating.
  - 3. Shunt Trip: Connected to trip breaker when generator set is shut down by other protective devices.
  - 4. Mounting: Adjacent to or integrated with control and monitoring panel.

# 2.6 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

- A. Comply with NEMA MG 1.
- B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.
- C. Electrical Insulation: Class H or Class F.

- D. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.
- E. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity.
- F. Enclosure: Dripproof.
- G. Instrument Transformers: Mounted within generator enclosure.
- H. Voltage Regulator: Solid-state type, separate from exciter, providing performance as specified.
- I. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.

# 2.7 OUTDOOR GENERATOR-SET ENCLOSURE

- A. Description: Vandal-resistant, weatherproof steel housing, sound attenuated, (HVHZ) High Velocity Hurricane Zone and missile impact rated as identified by the Florida Building Code. Multiple panels shall be lockable and provide adequate access to components requiring maintenance. Panels shall be removable by one person without tools. Instruments and control shall be mounted within enclosure. Provide sound attenuated enclosure to allow a maximum of 85DBA.
- B. Engine Cooling Airflow through Enclosure: Maintain temperature rise of system components within required limits when unit operates at 110 percent of rated load for 2 hours with ambient temperature at top of range specified in system service conditions.
  - 1. Louvers: Fixed-engine, cooling-air inlet and discharge. Storm-proof and drainable louvers prevent entry of rain and snow.
  - 2. Automatic Dampers: At engine cooling-air inlet and discharge. Dampers shall be closed to reduce enclosure heat loss in cold weather when unit is not operating.

# 2.8 VIBRATION ISOLATION DEVICES

- A. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic restraint.
  - 1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to wind loads or if weight is removed; factory-drilled baseplate bonded to 1/4-inch- (6-mm-) thick, elastomeric isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
  - 2. Outside Spring Diameter: Not less than 80 percent of compressed height of the spring at rated load.
  - 3. Minimum Additional Travel: 50 percent of required deflection at rated load.
  - 4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
  - 5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.

### 2.9 FINISHES

A. Indoor and Outdoor Enclosures and Components: Manufacturer's standard finish over corrosion-resistant pretreatment and compatible primer.

Page 326 of 476

# **PART 3 - EXECUTION**

# 3.1 EXAMINATION

- A. Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine-generator performance.
- B. Examine roughing-in of piping systems and electrical connections. Verify actual locations of connections before packaged engine-generator installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

# 3.2 INSTALLATION

- A. Comply with packaged engine-generator manufacturers' written installation and alignment instructions and with NFPA 110.
- B. Install packaged engine generator to provide access, without removing connections or accessories, for periodic maintenance.
- C. Install packaged engine generator with elastomeric isolator pads having a minimum deflection of 1 inch (25 mm). Secure sets to anchor bolts installed in concrete bases. Concrete base construction shall be in accordance with all manufacturers' recommendations and requirements.
- D. Coordinate natural gas connections with local gas utility company prior to installation.

# 3.3 CONNECTIONS

- A. Provide all piping connections from the local gas utility company to the generator for a fully operational system.
- B. Ground equipment according to Division 26 Section "Grounding and Bonding."
- C. Connect wiring according to Division 26 Section "Conductors and Cables."

### 3.4 IDENTIFICATION

A. Identify system components according to Division 26 Section "Electrical Identification."

# 3.5 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.
- B. Coordinate tests with tests for transfer switches and run them concurrently.

- C. Test instruments shall have been calibrated within the last 12 months, traceable to standards of NIST, and adequate for making positive observation of test results. Make calibration records available for examination on request.
- D. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
- E. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- F. Exhaust Emissions Test: Comply with applicable government test criteria.
- G. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations. Attach a label or tag to each tested component indicating satisfactory completion of tests.
- H. Provide 4 hour load bank test at the site after completed installation. Record test results and provide copy to the Owner. Test shall simulate a 100% generator panel load.

# 3.6 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators. Refer to Division 1 Section "Demonstration and Training."

END OF SECTION 26 32 13

### SECTION 26 36 00 - TRANSFER SWITCHES

### 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.

# 1.2 SUMMARY

- A. This Section includes transfer switches rated 600 V and less, including the following:
  - 1. Automatic transfer switches.
  - 2. Bypass/isolation switches.
  - 3. Nonautomatic transfer switches.
  - 4. Remote annunciation systems.
  - 5. Remote annunciation and control systems.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, weights, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings: Dimensioned plans, elevations, sections, and details showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each switch specified.
  - 1. Single-Line Diagram: Show connections between transfer switch, bypass/isolation switch, power sources, and load; and show interlocking provisions for each combined transfer switch and bypass/isolation switch.
- C. Operation and Maintenance Data: For each type of product to include in operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
  - 1. Features and operating sequences, both automatic and manual.
  - 2. List of all factory settings of relays; provide relay-setting and calibration instructions, including software, where applicable.

# 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Maintain a service center capable of providing training, parts, and emergency maintenance repairs within a response period of less than eight hours from time of notification.
- B. Source Limitations: Obtain automatic transfer switches, bypass/isolation switches, nonautomatic transfer switches and remote annunciator and control panels through one source from a single manufacturer.

- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with NEMA ICS 1.
- E. Comply with NFPA 70.
- F. Comply with NFPA 99.
- G. Comply with NFPA 110.
- H. Comply with UL 1008 unless requirements of these Specifications are stricter.

### 1.5 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

### PART 2 - PRODUCTS

# 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Transfer Switches:
    - a. Caterpillar; Engine Div.
    - b. Emerson; ASCO Power Technologies, LP.
    - c. Generac Power Systems, Inc.
    - d. GE Zenith Controls.
    - e. Kohler Power Systems; Generator Division.
    - f. Onan/Cummins Power Generation; Industrial Business Group.
    - g. Russelectric, Inc.
    - h. Spectrum Detroit Diesel.
  - 2. The automatic transfer switches shall be manufactured by the generator manufacturer or standard supplied by generator manufacturer.

# 2.2 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS

- A. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.
- B. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.

- 1. Where transfer switch includes internal fault-current protection, rating of switch and trip unit combination shall exceed indicated fault-current value at installation location.
- C. Transfer switch shall be double throw, actuated by two electrical operators, momentarily energized and connected to the transfer mechanism by a simple overcenter linkage with time delay relays to control contact transition time on transfer to either source, adjustable 0-300 seconds. Time delay between the opening of the closed contacts and the closing of the open contacts shall be adjusted to allow for voltage decay before transfer as required to allow re-energization of motor and transformer loads at normal in rush currents. Single throw, actuated by single electric operator shall be allowed in lieu of double throw operator if in phase monitor is used which allows for re-energization as noted above.
- D. Transfer switch shall be capable of transferring successfully in either direction with 70% of the rated voltage applied to the switch terminals. Normal and emergency contacts shall be positively interlocked mechanically and electrically to prevent simultaneous closing. Main contacts shall be mechanically locked in position in both the normal and emergency positions without the use of hooks, latches, magnet, or springs and shall be silver-tungsten alloy protected by arcing contacts, with magnetic blowouts on each pole. Parallel main contacts are not acceptable.
- E. Transfer switch shall be equipped with a safe manual operator designed to be operated in the loaded condition and to prevent injury to operating personnel. Manual operator shall provide the same contact-to-contact transfer speed as the electrical operator to prevent a flashover from switching the main contacts slowly.
- F. Engine starting contacts shall be provided in transfer switch to start the generating plant if any phase of the normal source drops below 80% of rated voltage, after an adjustable time delay period of 0.5-3 seconds, to allow for momentary dips. The transfer switch shall not transfer to emergency until the generator source voltage and frequency have reached 90% of rated. After restoration of normal power on all phases to 90% of rated voltage, adjustable time delay period of 0-25 minutes shall delay transfer to normal power until it has had time to stabilize. If the emergency power source should fail during the time delay period, the time delay shall be by-passed, and the switch shall return immediately to the normal source. Whenever the switch has retransferred to normal, the engine-generator shall be allowed to operate at no load for a fixed period of time (5 minutes) to allow it to cool before shut-down. Transfer switch shall include a test switch to simulate normal power failure with actual load transfer. Pilot lights shall be included on the cabinet door to indicate the main switch closed on normal or emergency, and two auxiliary contacts on the main shaft; one closed on normal, the other closed on emergency. In addition, two sets of relay contacts shall be provided to open and close upon loss of the normal power supply. All relays, timers, control wiring and accessories to be front accessible and be rated for the load and voltage as required for auxiliary control functions.
- G. Transfer switch shall include an exerciser with 7-day dial to automatically exercise the generating plant in the loaded condition. Exerciser shall be adjustable in 15 minute increments and shall be set for 20 minutes minimum each week unless otherwise noted.
- H. When more than one emergency branch is shown, time delay relays shall be provided on the transfer to emergency operation for critical and equipment branch transfer switches. Time delay shall be adjustable 1-300 seconds and shall be adjusted in stages with the limits of the N.E.C. and as follows:
  - 1. Life Safety Branch no time delay on transfer to emergency.
  - 2. Critical Branch shall transfer to emergency after life safety branch has transferred to emergency and generator has recovered to 90% of rated voltage and frequency.
  - 3. Equipment Branch shall transfer to emergency after critical branch has transferred to emergency and generator has recovered to 90% of rated voltage and frequency.
  - 4. NOTE: These time delays shall not effect or be a function of contact transition time as required above.

- I. Solid-State Controls: Repetitive accuracy of all settings shall be plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.
- J. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.
- K. Electrical Operation: Accomplish by a nonfused, momentarily energized solenoid or electric-motor-operated mechanism, mechanically and electrically interlocked in both directions.
- L. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.
  - 1. Limitation: Switches using molded-case switches or circuit breakers or insulated-case circuit-breaker components are not acceptable.
  - 2. Switch Action: Double throw; mechanically held in both directions.
  - 3. Contacts: Silver composition or silver alloy for load-current switching. Conventional automatic transfer-switch units, rated 225 A and higher, shall have separate arcing contacts.
- M. Neutral Switching. Where four-pole switches are indicated, provide neutral pole switched simultaneously with phase poles.
- N. Neutral Terminal: Solid and fully rated, unless otherwise indicated.
- O. Oversize Neutral: Ampacity and switch rating of neutral path through units indicated for oversize neutral shall be double the nominal rating of circuit in which switch is installed.
- P. Heater: Equip switches exposed to outdoor temperatures and humidity, and other units indicated, with an internal heater. Provide thermostat within enclosure to control heater.
- Q. Annunciation, Control, and Programming Interface Components: Devices at transfer switches for communicating with remote programming devices, annunciators, or annunciator and control panels shall have communication capability matched with remote device.
- R. Factory Wiring: Train and bundle factory wiring and label, consistent with Shop Drawings, either by color-code or by numbered or lettered wire and cable tape markers at terminations. Color-coding and wire and cable tape markers are specified in Division 26 Section "Identification for Electrical Systems."
  - 1. Designated Terminals: Pressure type, suitable for types and sizes of field wiring indicated.
  - 2. Power-Terminal Arrangement and Field-Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.
  - 3. Control Wiring: Equipped with lugs suitable for connection to terminal strips.
- S. Enclosures: General-purpose NEMA 250, Type 1 for indoors and 3R for exterior, complying with NEMA ICS 6 and UL 508, unless otherwise indicated.

# 2.3 AUTOMATIC TRANSFER SWITCHES

- A. Comply with Level 1 equipment according to NFPA 110.
- B. Switching Arrangement: Double-throw type, incapable of pauses or intermediate position stops during normal functioning, unless otherwise indicated.

- C. Manual Switch Operation: Under load, with door closed and with either or both sources energized. Transfer time is same as for electrical operation. Control circuit automatically disconnects from electrical operator during manual operation.
- D. Manual Switch Operation: Unloaded. Control circuit automatically disconnects from electrical operator during manual operation.
- E. Signal-Before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval is adjustable from 1 to 30 seconds.
- F. Digital Communication Interface: Matched to capability of remote annunciator or annunciator and control panel.
- G. Transfer Switches Based on Molded-Case-Switch Components: Comply with NEMA AB 1, UL 489, and UL 869A.
- H. Automatic Closed-Transition Transfer Switches: Include the following functions and characteristics:
  - 1. Fully automatic make-before-break operation.
  - 2. Load transfer without interruption, through momentary interconnection of both power sources not exceeding 100 ms.
  - 3. Initiation of No-Interruption Transfer: Controlled by in-phase monitor and sensors confirming both sources are present and acceptable.
    - a. Initiation occurs without active control of generator.
    - b. Controls ensure that closed-transition load transfer closure occurs only when the 2 sources are within plus or minus 5 electrical degrees maximum, and plus or minus 5 percent maximum voltage difference.
  - 4. Failure of power source serving load initiates automatic break-before-make transfer.
- I. In-Phase Monitor: Factory-wired, internal relay controls transfer so it occurs only when the two sources are synchronized in phase. Relay compares phase relationship and frequency difference between normal and emergency sources and initiates transfer when both sources are within 15 electrical degrees, and only if transfer can be completed within 60 electrical degrees. Transfer is initiated only if both sources are within 2 Hz of nominal frequency and 70 percent or more of nominal voltage.
- J. Motor Disconnect and Timing Relay: Controls designate starters so they disconnect motors before transfer and reconnect them selectively at an adjustable time interval after transfer. Control connection to motor starters is through wiring external to automatic transfer switch. Time delay for reconnecting individual motor loads is adjustable between 1 and 60 seconds, and settings are as indicated. Relay contacts handling motor-control circuit inrush and seal currents are rated for actual currents to be encountered.
- K. Programmed Neutral Switch Position: Switch operator has a programmed neutral position arranged to provide a midpoint between the two working switch positions, with an intentional, time-controlled pause at midpoint during transfer. Pause is adjustable from 0.5 to 30 seconds minimum and factory set for 0.5 second, unless otherwise indicated. Time delay occurs for both transfer directions. Pause is disabled unless both sources are live.
- L. Automatic Transfer-Switch Features:
  - 1. Undervoltage Sensing for Each Phase of Normal Source: Sense low phase-to-ground voltage on each phase. Pickup voltage shall be adjustable from 85 to 100 percent of nominal, and dropout

- voltage is adjustable from 75 to 98 percent of pickup value. Factory set for pickup at 90 percent and dropout at 85 percent.
- 2. Adjustable Time Delay: For override of normal-source voltage sensing to delay transfer and engine start signals. Adjustable from zero to six seconds, and factory set for one second.
- 3. Voltage/Frequency Lockout Relay: Prevent premature transfer to generator. Pickup voltage shall be adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90 percent. Pickup frequency shall be adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.
- 4. Time Delay for Retransfer to Normal Source: Adjustable from 0 to 30 minutes, and factory set for 10 minutes to automatically defeat delay on loss of voltage or sustained undervoltage of emergency source, provided normal supply has been restored.
- 5. Test Switch: Simulate normal-source failure.
- 6. Switch-Position Pilot Lights: Indicate source to which load is connected.
- 7. Source-Available Indicating Lights: Supervise sources via transfer-switch normal- and emergency-source sensing circuits.
  - a. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
  - b. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."
- 8. Unassigned Auxiliary Contacts: Two normally open, single-pole, double-throw contacts for each switch position, rated 10 A at 240-V ac.
- Transfer Override Switch: Overrides automatic retransfer control so automatic transfer switch will
  remain connected to emergency power source regardless of condition of normal source. Pilot light
  indicates override status.
- Engine Starting Contacts: One isolated and normally closed, and one isolated and normally open; rated 10 A at 32-V dc minimum.
- 11. Engine Shutdown Contacts: Instantaneous; shall initiate shutdown sequence at remote engine-generator controls after retransfer of load to normal source.
- 12. Engine Shutdown Contacts: Time delay adjustable from zero to five minutes, and factory set for five minutes. Contacts shall initiate shutdown at remote engine-generator controls after retransfer of load to normal source.
- 13. Engine-Generator Exerciser: Solid-state, programmable-time switch starts engine generator and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable from 7 to 30 days. Running periods are adjustable from 10 to 30 minutes. Factory settings are for 7-day exercise cycle, 20-minute running period, and 5-minute cool-down period. Exerciser features include the following:
  - a. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.
  - b. Push-button programming control with digital display of settings.
  - c. Integral battery operation of time switch when normal control power is not available.

### 2.4 NONAUTOMATIC TRANSFER SWITCHES

- A. Operation: Electrically actuated by push buttons designated "Normal Source" and "Alternate Source." Switch shall be capable of transferring load in either direction with either or both sources energized.
- B. Double-Throw Switching Arrangement: Incapable of pauses or intermediate position stops during switching sequence.
- C. Nonautomatic Transfer-Switch Accessories:

- 1. Pilot Lights: Indicate source to which load is connected.
- 2. Source-Available Indicating Lights: Supervise sources via transfer-switch normal- and alternate-source sensing circuits.
  - a. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
  - b. Emergency Power Supervision: Red light with nameplate engraved "Alternate Source Available."
- 3. Unassigned Auxiliary Contacts: One set of normally closed contacts for each switch position, rated 10 A at 240-V ac.

# 2.5 REMOTE ANNUNCIATOR SYSTEM

- A. Functional Description: Remote annunciator panel shall annunciate conditions for indicated transfer switches. Annunciation shall include the following:
  - 1. Sources available, as defined by actual pickup and dropout settings of transfer-switch controls.
  - 2. Switch position.
  - 3. Switch in test mode.
  - 4. Failure of communication link.
- B. Annunciator Panel: LED-lamp type with audible signal and silencing switch.
  - 1. Indicating Lights: Grouped for each transfer switch monitored.
  - Label each group, indicating transfer switch it monitors, location of switch, and identity of load it serves.
  - 3. Mounting: Flush, modular, steel cabinet, unless otherwise indicated.
  - 4. Lamp Test: Push-to-test or lamp-test switch on front panel.

# 2.6 REMOTE ANNUNCIATOR AND CONTROL SYSTEM

- A. Functional Description: Include the following functions for indicated transfer switches:
  - Indication of sources available, as defined by actual pickup and dropout settings of transfer-switch controls.
  - 2. Indication of switch position.
  - 3. Indication of switch in test mode.
  - 4. Indication of failure of digital communication link.
  - 5. Key-switch or user-code access to control functions of panel.
  - 6. Control of switch-test initiation.
  - 7. Control of switch operation in either direction.
  - 8. Control of time-delay bypass for transfer to normal source.
- B. Malfunction of annunciator, annunciation and control panel, or communication link shall not affect functions of automatic transfer switch. In the event of failure of communication link, automatic transfer switch automatically reverts to stand-alone, self-contained operation. Automatic transfer-switch sensing, controlling, or operating function shall not depend on remote panel for proper operation.
- C. Remote Annunciation and Control Panel: Solid-state components. Include the following features:
  - 1. Controls and indicating lights grouped together for each transfer switch.

- 2. Label each indicating light control group. Indicate transfer switch it controls, location of switch, and load it serves.
- 3. Digital Communication Capability: Matched to that of transfer switches supervised.
- 4. Mounting: Flush, modular, steel cabinet, unless otherwise indicated.

# 2.7 SOURCE QUALITY CONTROL

A. Factory test and inspect components, assembled switches, and associated equipment. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

# PART 3 - EXECUTION

# 3.1 INSTALLATION

- A. The transfer switch shall be installed as shown on the plans, in accordance with the manufacturer's recommendations and all applicable codes. Provide all associated control wiring to generator as required.
- B. Provide all interface control wiring and conduit as required to provide required emergency operation of equipment on project as applicable, i.e. elevators, etc.
- C. Floor-Mounting Switch: Anchor to floor by bolting.
  - 1. Concrete Bases: 4 inches (100 mm) high, reinforced, with chamfered edges. Extend base no more than 4 inches (100 mm) in all directions beyond the maximum dimensions of switch, unless otherwise indicated or unless required for seismic support. Construct concrete bases according to Division 26 Section "Hangers and Supports for Electrical Systems."
- D. Annunciator and Control Panel Mounting: Flush in wall, unless otherwise indicated.
- E. Identify components according to Division 26 Section "Identification for Electrical Systems."
- F. Set field-adjustable intervals and delays, relays, and engine exerciser clock.

### 3.2 CONNECTIONS

- A. Wiring to Remote Components: Match type and number of cables and conductors to control and communication requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.
- B. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- C. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

# 3.3 FIELD QUALITY CONTROL

A. SITE TEST

1. An installation check and building load test shall be performed by the manufacturer's local representative. The engineer, regular operators and the maintenance staff shall be notified of the time and date of the site test. The tests shall include Automatic start-up by means of simulated power outage to test remote-automatic starting, transfer of the load and automatic shutdown. Prior to this test, all transfer switch timers shall be adjusted for proper system coordination.

#### B. LOAD BANK TEST

- 1. After the building load test, a load bank test will be performed. This test shall be done with resistive dry load banks, in the presence of the engineer and owner. Test shall be performed during regular working hours and days only Monday Friday, 8:00 AM to 4:00 PM.
  - a. 1 hour 50%
  - b. 1 hour 75%
  - c. 3 hours 100%
  - d. 10 minutes cool down
- 2. During test a written log shall be maintained at 15-minute intervals with the following:
  - a. Ambient Air Temperature
  - b. Amperes
  - c. Hertz
  - d. Oil Pressure
  - e. Water Temperature
  - f. Battery Charging
  - g. Exhaust Stack Temperature
  - h. Noise Level in dba (each side)
- 3. Fuel for load test to be included in bid.

# 3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment as specified below. Refer to Division 01 Section "Demonstration and Training."
- B. Coordinate this training with that for generator equipment.

END OF SECTION 26 36 00

### SECTION 26 43 13 – SURGE PROTECTION DEVICES

### 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.

# 1.2 SUMMARY

A. Surge Protection Devices (SPD) includes all electrical systems and devices specifically installed in facility electrical systems to protect all electrical circuits, electronic equipment and building mechanical systems from the effects of lightning induced voltages, external switching transients and internally generated switching transients.

### 1.3 APPLICATION

- A. Surge suppression, grounding and bonding shall effectively protect the systems to which they are applied against lightning, transients, internal spikes, and other surge transients throughout the useful life of the systems, and shall be designed and installed in such a manner that normal operation, performance ratings and listing of the system is not impaired by the installation of such devices, wiring or connections.
- B. Surge suppression devices shall be installed on all service entrance equipment (to include distribution panels and panelboards in separate buildings that perform the function of service entrance equipment for that particular building), distribution panels, lighting and appliance panelboards that may feed any electronic equipment (to include personal computers, copiers, printers, fire alarm panels, building management systems, intercom systems, etc.) and any circuits leaving the building; e.g. outdoor lighting and all signal circuits (data, telephone, fire alarm, intercom, etc.) leaving or entering a building.

# 1.4 DEFINITIONS

- A. ATS: Acceptance Testing Specifications.
- B. VPR: Voltage protection rating.
- C. SPD: Surge Protection Devices

#### 1.5 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating weights, operating characteristics, furnished specialties, and accessories.
- B. General: SPD wiring, bonding and grounding connections shall be indicated on the wiring diagrams for each system. Include installation details demonstrating mechanical and electrical connections to equipment to be protected.

SURGE PROTECTION DEVICES

- C. Testing: The test data submitted shall be specific for the actual method on installation proposed. Submittals will not be reviewed unless they include proper project related data. Interpretation of standard manufacturer's published data will not be acceptable unless the data coincides with the actual installation procedure.
- D. Manufacturer's certified test data indicating the ability of the product to meet or exceed requirements of this specification, including 10 x 1000 µs recognized independent lab testing.
- E. List and detail all protection systems such as fuses, disconnecting means and protective materials.
- F. Product Certificates: For SPD signed by product manufacturer certifying compliance with the following standards:
  - 1. UL 1449 3rd Edition
- G. Operation and Maintenance Data: For SPD to include in operation, and maintenance manuals.
- H. Warranties: Special warranties specified in this Section.

# 1.6 REFERENCE STANDARDS AND PUBLICATIONS

- A. ANSI/IEEE C62.33 Standard for Test Specifications for Varistor Surge Protection Devices
- B. ANSI/IEEE C62.35 Standard for Test Specification for Avalanche Junction Semiconductor Surge Protective Devices
- C. ANSI/IEEE C62.36 IEEE Standard for Test Methods for Surge Protectors Used in Low-Voltage AC Power Circuits
- D. ANSI/IEEE C62.41 2002 Guide for Surge Voltages in Low-Voltage AC Power Circuits Categories A, B,
   & C and Table 8, High Exposure 10 x 1000 μs waveform testing
- E. ANSI/IEEE C62.45 2002 Guide on Surge Testing for Equipment Connected Low Voltage AC Power Circuits
- F. IEEE Standard 142 Recommended Practice for Grounding
- G. IEEE Standard 518 Recommended Guide on Electrical Noise
- H. IEEE Standard 1100 Recommended Practice for Powering and Grounding Electronic Equipment
- I. UL 1283 Standard for Safety Electromagnetic Interference Filters
- J. UL 1449, 3rd Edition, Standard for Surge Protective Devices
- K. NFPA 70 National Electrical Code
- L. NFPA 75 Standard for the Protection of Electronic Computer/Data Processing Equipment
- M. NFPA 780 Standard for the Installation of Lightning Protection Systems
- N. Military Standard 220A
- O. Federal Information Processing Standards (FIPS) Publication 94

SURGE PROTECTION DEVICES

P. CCITT Rec. K-I 7 Waveform Specification for Electronic Systems

# 1.7 QUALITY ASSURANCE

- A. Source Limitations: Obtain suppression devices and accessories through one source from a single manufacturer.
- B. Product Options: Drawings indicate size, dimensional requirements, and electrical performance of suppressors and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with IEEE C62.41, "IEEE Guide for Surge Voltages in Low Voltage AC Power Circuits," and test devices according to IEEE C62.45, "IEEE Guide on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits."
- E. Comply with UL 1449 3rd Edition, "Safety Standard for Surge Protection Devices"

# 1.8 MANUFACTURER QUALIFICATIONS

- A. Manufacturer: Company specializing in surge suppression equipment of the type herein specified with a minimum ten years documented experience.
- B. Repair: The surge protection device manufacturer shall offer factory repair service and/or replacement for all units. The manufacturer shall provide this service within four working days and provide replacement components shipped to the Owner for installation within the allocated response time.
- C. Installation Certification: Submit in the close out documents a letter from the surge protection manufacturer stating that the installation has been inspected by the manufacturer or the manufacturer's representative. The certification letter must state that the installation has been done in accordance with the manufacturers requirements and the warranty is in effect. Submit five copies to the Engineer for review.

# 1.9 PROJECT CONDITIONS

- A. Service Conditions: Rate surge protection devices for continuous operation under the following conditions, unless otherwise indicated:
  - 1. Maximum Continuous Operating Voltage: Not less than 115 percent of nominal system operating voltage.
  - 2. Operating Temperature: 30 to 120 deg F (0 to 50 deg C).
  - 3. Humidity: 0 to 85 percent, noncondensing.
  - 4. Altitude: Less than 20,000 feet (6090 m) above sea level.

### 1.10 COORDINATION

A. Coordinate location of field-mounted surge suppressors to allow adequate clearances for maintenance.

#### 1.11 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of surge suppressors that fail in materials or workmanship within ten years from date of Substantial Completion.
- B. Replacement: Any suppressor which shows evidence of failure or incorrect operation during the warranty period shall be repaired or replaced at no expense to the Owner including labor and materials. Since "Acts of Nature" or similar statements include the lightning threat to which these suppression devices shall be exposed, any such clause limiting warranty responsibility in the general conditions of this specification shall not apply to this section. The warranty shall cover the entire device.
- C. Installation: Installation of SPDs on electrical distribution equipment shall in no way compromise or violate equipment listing, labeling, or warranty of the distribution equipment.

### PART 2 - PRODUCTS

# 2.1 SERVICE ENTRANCE SUPPRESSORS

- A. Surge Protection Device Description: Modular design with field-replaceable modules, sine-wave-tracking type with the following features and accessories:
  - 1. Fabrication using bolted compression lugs for internal wiring.
  - 2. Redundant replaceable modules.
  - 3. Arrangement with wire connections to phase buses, neutral bus, and ground bus.
  - 4. LED indicator lights for power and protection status.
  - 5. Audible alarm, with silencing switch, to indicate when protection has failed.
  - 6. One set of dry contacts rated at 5 A and 250-V ac, for remote monitoring of protection status. Coordinate with building power monitoring and control system.
- B. Peak Single-Impulse Surge Current Rating: 240 kA per phase.
- C. SPD shall be type 2 rated 20KA or more nominal discharge current (In) and labeled for lightning protection installations.
- D. Connection Means: Permanently wired.
- E. Protection modes and UL 1449 VPR for grounded wye circuits with voltages of 480Y/277, 208Y/120, 3-phase, 4-wire circuits shall be as follows:
  - 1. Line to Neutral: 1200 V for 480Y/277: 600 V for 208Y/120.
  - 2. Line to Ground: 1200 V for 480Y/277: 600 V for 208Y/120.
  - 3. Neutral to Ground: 1200 V for 480Y/277: 600 V for 208Y/120.
- F. Protection modes and UL 1449 VPR for 240/120-V, single-phase, 3-wire circuits shall be as follows:
  - 1. Line to Neutral: 600 V.
  - 2. Line to Ground: 600 V.
  - 3. Neutral to Ground: 600 V.
- G. Protection modes and UL 1449 VPR for 240/120-V, 3-phase, 4-wire circuits with high leg shall be as follows:

SURGE PROTECTION DEVICES

- 1. Line to Neutral: 600 V, 800 V from high leg.
- 2. Line to Ground: 600 V.
- 3. Neutral to Ground: 600 V.
- H. Short Circuit Withstand Rating: The device shall have a short circuit withstand rating identical or higher than the equipment that it is connected. Rating shall be permanently marked on the device.
- I. Power Interruption: During normal suppression operation, the unit shall not short circuit or crowbar the power flow that would result in an interruption to the load. Building power shall not require interruption for maintenance.
- J. Approved manufacturers:
  - 1. LEA International
  - 2. Advanced Protection Technologies
  - 3. Liebert
  - 4. PQ Protection

# 2.2 PANELBOARD SUPPRESSORS

- A. Surge Protection Device Description: Non-modular, sine-wave-tracking type with the following features and accessories:
  - 1. LED indicator lights for power and protection status.
- B. Peak Single-Impulse Surge Current Rating: 80 kA per phase.
- C. Protection modes and UL 1449 VPR for grounded wye circuits with voltages of 480Y/277, 208Y/120, 3-phase, 4-wire circuits shall be as follows:
  - 1. Line to Neutral: 1200 V for 480Y/277: 600 V for 208Y/120.
  - 2. Line to Ground: 1200 V for 480Y/277: 600 V for 208Y/120.
  - 3. Neutral to Ground: 1200 V for 480Y/277: 600 V for 208Y/120.
- D. Protection modes and UL 1449 VPR for 240/120-V, single-phase, 3-wire circuits shall be as follows:
  - 1. Line to Neutral: 600 V.
  - 2. Line to Ground: 600 V.
  - 3. Neutral to Ground: 600 V.
- E. Protection modes and UL 1449 VPR for 240/120-V, 3-phase, 4-wire circuits with high leg shall be as follows:
  - 1. Line to Neutral: 600 V, 800 V from high leg.
  - 2. Line to Ground: 600 V.
  - 3. Neutral to Ground: 600 V.
- F. Connection Means: Permanently wired through a 3-P breaker (the size of the breaker shall be as recommended by the SPD manufacturer). The breaker shall be installed in the panelboard and shall be rated with the same electrical characteristics of the panel board.
- G. Short Circuit Withstand Rating: The device shall have a short circuit withstand rating identical to the equipment that it is connected. Rating shall be permanently marked on the device.

- H. SPD for Kitchen panels shall be installed integral to the panel board. No externally mounted surge is acceptable.
- I. Approved manufacturers:
  - 1. LEA International
  - 2. Advanced Protection Technologies
  - 3. Cooper Crouse-Hinds MTL, Inc
  - 4. Liebert
  - 5. PO Protection
  - 6. Switchgear manufacturer.

# 2.3 ENCLOSURES

A. NEMA 250, with type matching the enclosure of panel or device being protected.

# 2.4 COMMUNICATIONS

- A. Entrance SPD shall be type 2 rated 20KA or more nominal discharge current (In) and labeled for lightning protection installations.
- B. Communication Lines: The following standard for separately mounted telephone and signal line suppressors shall apply. All protectors shall be securely mounted at protected equipment location. All suppressors shall provide common (L-G) and normal (L-L) protection. Suppressors shall be tested in accordance with IEEE C62.45 2002 as a minimum. Protective interfacing with the telephone wire pairs shall be listed to UL 497A.
- C. Data Line Protection: Solid state, silicon avalanche diode circuitry for protection from over voltages on long cable runs employing standard RS-232, 9, 15, or 25-pin "D" connectors utilized to interface a remote station with a host CPU. Unit shall have 2 built-in or ribbon cable attached connectors (in and out) and an external ground lug or cable. Connect ground lug or cable to CPU or terminal grounding system with a No. 12 copper green insulated stranded ground wire as short as possible. Select pins requiring protection based on protected equipment wiring requirements. Protectors shall be designed to be easily installed on multiplex panels with connector spacing at a minimum of 1.0-inch centers.
  - 1. Signal line voltage (max) 15 V peak
  - 2. Leakage at signal voltage <5 mA
  - 3. Voltage protection level 16 V peak
  - 4. Response time 5 nanoseconds or less
  - 5. Impedance per line 40 ohm max.
  - 6. Peak power dissipation 15,000 watts (10/1000 Test Wave form)
  - 7. Temperature range  $-20^{\circ}$  C to  $+65^{\circ}$ C
  - 8. Capacitance:
    - a. Data rates <20,000 baud <2,000 pf
    - b. Data rates 20,000 baud to 2 MHz <100 pf
    - c. Data rates >2 MHz to 100 MHz <40 pf
  - 9. UL 497B listed.
  - 10. Approved Manufacturers: EDCO, Transtector, or Atlantic Scientific
- D. Signal line protection (telephone) solid state, silicon avalanche diode circuitry for protection from over voltages on 2 or 4 wire signal lines such as balanced pair telephone, metallic pair telephone, buried and

SURGE PROTECTION DEVICES

overhead field cable, remote radio equipment, and control systems. Unit shall have an external ground lug or wire. Connect ground lug or wire to protected equipment grounding system with a No. 12 green insulated stranded ground wire as short as possible.

1.	L-L & L-G Voltage (peak)	L-L & L-G VPL
	13	16
	27	33
	54	67
	120	150
	160	200
2.	L-L and L-G Leakage	
	@ max L-L and L-G voltage	<5 μΑ
3.	Response time	<5 nanoseconds
3.	Series impedance (each line)	33 Ohm max.
4.	Peak power dissipation (L-L) or (L-G)	15,000 watts (10 x 1000 Test Wave
		Form)
6.	Temperature Range	-20°C to +65°C

- 7. U.L. 497B listed
- 8. Approved Manufacturers: EDCO, Transtector, or Atlantic Scientific.
- E. Modem protector for leased lines solid-state silicon avalanche diode circuitry for non-faulting/non-interrupting protection from over voltages on leased phone lines. Full duplex protection shall be provided for both send and receive channels. Terminals shall be provided for 4-wire leased line input and output to equipment plus ground. Connect ground terminal to equipment ground.

1.	Signal line voltage (max)	160V peak
2.	Leakage @ signal voltage	5 μa
3.	Clamp point	200V peak
4.	Response time	<5 nanoseconds.
5.	Series impedance	33 Ohm max.
6.	Peak power dissipation	15,000 watts
7.	Operating Temperature	-20°C to +65°C
R	Approved Manufacturers:	EDCO Transfector or Atlantic

- 8. Approved Manufacturers: EDCO, Transtector, or Atlantic Scientific.
- F. Modular, twisted pair protection solid state, silicon avalanche diode circuitry for protection from over voltages on twisted pair data or audio lines. Protectors shall clip mount on 66 punch down blocks furnished with grounding bar or studs and shall be totally enclosed. Units shall be securely mounted at terminal locations where shown and shall be grounded to the main building ground with a minimum No. 8 stranded copper green insulated ground conductor as short as possible. Terminals shall be screw insertion lug type. No crimp fork or ring type permitted.

Response time
 Peak power dissipation (1 ms)
 Temperature range
 5 nanoseconds
 15,000 watts
 -20° C to +50°C

- 4. Maximum voltage protection levels (peak) utilizing a 10 x 1000 μs waveform for normal and common mode protection shall be 240-380V or 45V as indicated on the drawings.
- 5. Peak repetitive pulse current
  - a. 1 x 2 μs 225 amp
  - b. 8 x 20 μs 150 amp
  - c. 10 x 1000 µs –100 amp
- 6. Approved Manufacturers: EDCO, Transtector, or Atlantic Scientific.
- G. 75 ohm coaxial cable protectors Solid state, silicon avalanche diode circuitry for non-interrupting over-voltage protection of RG-59/U coaxial cable. Unit shall be provided with one female input connector for "F" series male connector, one output RG-59/U coax cable terminated with an "F" series male cable end connector and A #16 stranded, 18 inch long grounding wire on output end of unit or similar arrangement.

SURGE PROTECTION DEVICES

Securely mount adjacent to protection equipment and ground to equipment or local building ground if an equipment ground is not available.

Normal Operating Characteristics

a. Voltage
b. Current
c. Frequency
d. Insertion Loss
5.8V max
500 ma max
DC to 10 MHz
3.5 dB @ 4 MHz

2. Protection Requirements

a. Transient suppression level
 b. Transient response
 c. Operating temp
 7.5 v VPL
 5 nanoseconds
 -20°C to +50°C

d. Energy dissipation 15,000 watts (10X1000 Test Wave)

3. Approved Manufacturers: EDCO, Transtector, or Atlantic Scientific.

### **PART 3 - EXECUTION**

# 3.1 INSTALLATION OF SURGE PROTECTION DEVICES

- A. Installation at Service and Distribution Panels: Suppressors shall be installed at Service Entrance switchboards or switch-gear as close as practical to distribution equipment to be protected consistent with the available space, however, do not exceed three feet.
- B. Installation at Lighting and Appliance Panelboards: The SPD shall be installed as close as practical to the electrical panel or electronic equipment to be protected, consistent with available space. Pre-wired leads shall be field cut to minimize the length between panel connection point. SPD leads shall be routed as straight as possible and as short as possible to the panelboard breaker. In no case shall leads exceed 18" length.
- C. Workmanship: SPDs shall be installed in a neat, workmanlike manner. Lead dress shall be consistent with recommended industry practices for the system on which these devices are installed.
- D. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- E. Disconnect SPD via circuit breaker connection prior to megger testing of service entrance.
- F. Install devices at service entrance on load side, with ground lead bonded to service entrance ground.
- G. Install devices for panel board and auxiliary panels with conductors or buses between suppressor and points of attachment as short and straight as possible, but in no case shall the leads be more than 24 inches. Do not exceed manufacturer's recommended lead length, but in no case shall the leads be more than 24 inches. Do not bond neutral and ground.
  - 1. Provide multipole, 30A (for panelboards) 60A (for service entrance equipment) circuit breaker as a dedicated disconnect for suppressor whether shown on drawings or not. Size shall be as required by the SPD manufacturers installation instructions.

### 3.2 PLACING SYSTEM INTO SERVICE

A. Do not energize or connect service entrance equipment, panelboards, control terminals, or data terminals to their sources until surge protection devices are installed and connected.

SURGE PROTECTION DEVICES

# 3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect equipment installation, including connections.
  - 1. Verify that electrical wiring installation complies with manufacturer's written installation requirements.
  - 2. Perform each visual and mechanical inspection stated in NETA ATS, "Surge Arresters, Low-Voltage Surge Protection Devices" Section.
- B. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 26 43 13

April 21, 2017 100% Construction Documents

### SECTION 26 51 00 – INTERIOR AND BUILDING-MOUNTED LIGHTING

# 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.

### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Interior lighting fixtures, lamps, and ballasts.
  - 2. Emergency lighting units.
  - 3. Exit signs.
  - 4. Lighting fixture supports.
- B. Related Sections include the following:
  - Division 26 Section "Stand Alone Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.
  - 2. Division 26 Section "Wiring Devices" for manual wall-box dimmers for incandescent lamps.

# 1.3 DEFINITIONS

- A. BF: Ballast factor.
- B. CRI: Color-rendering index.
- C. CU: Coefficient of utilization.
- D. HID: High-intensity discharge.
- E. LER: Luminaire efficacy rating.
- F. Luminaire: Complete lighting fixture, including ballast housing if provided.
- G. RCR: Room cavity ratio.

# 1.4 SUBMITTALS

- A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:
  - 1. Physical description of lighting fixture including dimensions.

April 21, 2017 100% Construction Documents

- 2. Emergency lighting units including battery and charger.
- 3. Ballast.
- 4. Energy-efficiency data.
- 5. Life, output, and energy-efficiency data for lamps.
- 6. Photometric data, in IESNA format, based on laboratory tests of each lighting fixture type, outfitted with lamps, ballasts, and accessories identical to those indicated for the lighting fixture as applied in this Project.
- B. Shop Drawings: Show details of nonstandard or custom lighting fixtures. Indicate dimensions, weights, methods of field assembly, components, features, and accessories.
  - 1. Wiring Diagrams: Power and control wiring.
  - 2. Detail wiring for fixtures and differentiate between manufacturer-installed and field-installed wiring.
- C. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:
  - 1. Lighting fixtures.
  - 2. Suspended ceiling components.
  - 3. Structural members to which suspension systems for lighting fixtures will be attached.
  - 4. Other items in finished ceiling including the following:
    - a. Air outlets and inlets.
    - b. Speakers.
    - c. Sprinklers.
    - d. Smoke and fire detectors.
    - e. Occupancy sensors.
    - f. Access panels.
    - g. Projectors
    - h. IR Sensors
    - i. Wireless Access Points
- D. Samples for Verification: Interior lighting fixtures designated for sample submission in Interior Lighting Fixture Schedule. Each sample shall include the following:
  - 1. Lamps: Specified units installed.
  - 2. Accessories: Cords and plugs.
- E. Product Certificates: For each type of ballast for bi-level and dimmer-controlled fixtures, signed by product manufacturer.
- F. Operation and Maintenance Data: For lighting equipment and fixtures to include in operation, and maintenance manuals.
- G. Warranties: Special warranties specified in this Section.

# 1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

April 21, 2017 100% Construction Documents

- B. Comply with NFPA 70.
- C. FMG Compliance: Lighting fixtures for hazardous locations shall be listed and labeled for indicated class and division of hazard by FMG.
- D. NFPA 101 Compliance: Comply with visibility and luminance requirements for exit signs and emergency lighting.
- E. Mockups: Provide interior lighting fixtures for room or module mockups, complete with power and control connections.
  - 1. Obtain Architect's approval of fixtures for mockups before starting installations.
  - 2. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
  - 3. Approved fixtures in mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

### 1.6 COORDINATION

A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

### 1.7 ADDITIONAL DEVICES FOR JURSDICTION COMPLIANCE

- A. Provide in the GMP bid for ten additional exit signs as directed in field. Allowance includes purchase, delivery and installation of box, exit sign, wire and 50 feet of conduit for each sign.
- B. Provide in the GMP bid for fifteen additional emergency battery units as directed in field. Allowance includes purchase, delivery and installation of box, battery unit, wire and 50 feet of conduit for each emergency battery unit.
- C. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. LED drivers and boards: 3% extra of each type and rating installed. Furnish at least one of each type.
  - 2. Plastic Diffusers and Lenses: One for every 100 of each type and rating installed. Furnish at least one of each type.

### 1.8 WARRANTY

- A. Special Warranty for Emergency Lighting Batteries: Manufacturer's standard form in which manufacturer of battery-powered emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period for Emergency Lighting Unit Batteries: 10 years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for the remaining nine years.

April 21, 2017 100% Construction Documents

- 2. Warranty Period for Emergency Fluorescent Ballast and Self-Powered Exit Sign Batteries: Five years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for the remaining four years.
- B. Special Warranty for Ballasts: Manufacturer's standard form in which ballast manufacturer agrees to repair or replace ballasts that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period for Electronic Ballasts: Five years from date of Substantial Completion.

#### PART 2 - PRODUCTS

# 2.1 MANUFACTURERS

A. Lighting Fixture Products: Subject to compliance with requirements, products that may be incorporated into the Work include the products indicated in the Lighting Fixture Schedule.

# 2.2 LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. Metal Parts: Free of burrs and sharp corners and edges.
- C. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.
- D. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- E. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
  - 1. White Surfaces: 85 percent.
  - 2. Specular Surfaces: 83 percent.
  - 3. Diffusing Specular Surfaces: 75 percent.
  - 4. Laminated Silver Metallized Film: 90 percent.
- F. Plastic Diffusers, Covers, and Globes:
  - 1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
    - a. Lens Thickness: At least 0.125 inch (3.175 mm) minimum unless different thickness is indicated.
    - b. UV stabilized.
  - 2. Glass: Annealed crystal glass, unless otherwise indicated.

April 21, 2017 100% Construction Documents

G. Electromagnetic-Interference Filters: Factory installed to suppress conducted electromagnetic-interference as required by MIL-STD-461E. Fabricate lighting fixtures with one filter on each ballast indicated to require a filter.

# 2.3 EXIT SIGNS

- A. Description: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.
- B. Internally Lighted Signs:

1.

- 2. Lamps for AC Operation: LEDs, 70,000 hours minimum rated lamp life.
- 3. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
  - a. Battery: Sealed, maintenance-free, nickel-cadmium type.
  - b. Charger: Fully automatic, solid-state type with sealed transfer relay.
  - c. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
  - d. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
  - e. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
  - f. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and flashing red LED.

### 2.4 LED LUMINAIRES

- A. Manufacturers: LED Lamps (PCB), Provide LED specified in lighting fixture schedule.
- B. Component descriptions:
  - 1. LEDs are semi-conductor diodes that emit light.
  - 2. The PCB contains all electronic circuitry required for LED operation. The printed board can contain two types of devices surface mounted and through-hole.
  - 3. DEVICE. PCB's can house two types of "Devices."
  - 4. "Surface Mounted" Device. Surface mounted to the Printed Circuit Board.
  - 5. "Through-Hole" Device. Epoxy encapsulation with two wire leads which pierce through the printed circuit board.
  - 6. Driver: Provides the required DC current output for the LED lamps to operate optimally. Conforms to manufacturer's published requirements for LED performance.
- C. LEDs luminaires: Minimum CRI 75, CCT range within +/-250K of specified CCT on lighting fixture schedule, average life of 50,000 hours tested at IESNA LM-80-2008 for 70% lumen output or greater.
- D. LED lamp (PCB) data shall include:
  - 1. Color dominant wavelength (nm) and method of color mixing.

April 21, 2017 100% Construction Documents

- 2. Distribution range (degrees).
- 3. Quantity of LEDs per PCB.
- 4. Lumen rating of fixture per IESNA LM-79 testing.
- 5. Required current, voltage and maximum input watts.
- 6. Limitations on wiring configurations or maximum PCB current rating.
- E. LED luminaires shall meet LED lamp manufacturer's recommendations for:
  - Thermal dissipation.
  - 2. Operating temperature range for both the LED and Power Supply.
  - 3. Storage temperature range for both the LED and Power Supply.
  - 4. Operating Voltage and Current.
  - 5. Peak Pulse Forward Current.
- F. LED fixture manufacturers shall provide a driver (power supply) that supplies stable DC current with voltage range covering the forward voltage as well as variability.
- G. Fixtures shall be constructed to allow for the PCB, driver and electrical components to be easily accessed and replaced without being removed from the mountings or disassembling adjacent construction.
- H. LEDs and fixture components (including fixtures for wet location) shall be listed by a nationally recognized testing laboratory such as U.L., E.T.L., or C.U.L.

# 2.5 SAFETY REQUIREMENTS FOR INDIVIDUAL LIGHTING FIXTURES

- A. Fixtures located overhead shall have at least 1 redundant point of support. That is if one support fails the fixture shall not be capable of falling to the ground. Provide aircraft cable with nico press crimps for redundant support of fixtures with only 1 point of connection.
- B. Fluorescent fixtures with lamps exposed shall have wire guards and clear tube guards to prevent the lamps or glass from falling.
- C. All exit and emergency fixtures located in Gymnasium or locker room areas shall be equipped with a wire cage to prevent damage.

#### PART 3 - EXECUTION

# 3.1 INSTALLATION

- A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.
- B. Support for Lighting Fixtures in or on Grid-Type Suspended Ceilings: Use grid as a support element.
  - 1. Install a minimum of two ceiling support system rods or wires for each fixture. Locate not more than 6 inches (150 mm) from lighting fixture corners.

April 21, 2017 100% Construction Documents

- 2. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.
- 3. Fixtures supported by suspended ceiling systems shall be securely fastened to the ceiling framing member by mechanical means, such as bolts, screws, or rivets. Ceiling framing members must be securely attached to each other and to the building structure as required by all applicable codes and standards. Use of integral clips is not permitted.
- C. Suspended Lighting Fixture Support:
  - 1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.
  - 2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
  - 3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
  - 4. Provide redundant support for all suspended lighting fixtures.
  - 5. Provide threaded swivel support for fixtures mounted on sloped ceilings.
- D. Adjust aimable lighting fixtures to provide required light intensities.
- E. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."
- F. Install wire guards and clear tube guards on all exposed lamp fluorescent fixtures.

### 3.2 CONNECTIONS

- A. Ground equipment.
  - 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

# 3.3 FIELD QUALITY CONTROL

- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.
- B. Inspect each installed fixture for damage. Replace damaged fixtures and components.
- C. Advance Notice: Give dates and times for field tests.
- D. Provide instruments to make and record test results.
- E. Tests: As follows:
  - 1. Verify normal operation of each fixture after installation.
  - 2. Emergency Lighting: Interrupt electrical supply to demonstrate proper operation.
  - 3. Verify normal transfer to battery source and retransfer to normal.
  - 4. Report results in writing.

April 21, 2017 100% Construction Documents

- F. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.
- G. Corrosive Fixtures: Replace during warranty

# 3.4 CLEANING

- A. Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.
- В.

# 3.5 TRAINING

A. Instruct Owner on testing and maintenance responsibilities required by NFPA 101 related to normal egress lighting, emergency battery units and exit fixtures.

END OF SECTION 26 51 00

# **ELECTRICAL SCHEDULE OF VALUES**

The following is a Schedule of Values for Unit items that have been used in this project. These values include the costs of material, labor, equipment and overhead. If extra work is added, or part of the work deleted, the values will be used to justify all changes.

Contractor shall complete all items in the Schedule of Values. These items are not part of the bid price.

ITEM	ITEM	DESCRIPTION	UNIT	UNIT PRICE
NO.		DEGOM! HOW		OHIT I MOL
1	3/4"c	Furnish all	LF	\$
		materials, labor, and equipment to		
		install 3/4"c		
		including all		
		connectors,		
		brackets,		
		supports, and associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond, overhead and		
		profit, and all		
		other fixed costs.		
2	1"c	Furnish all	LF	\$
		materials, labor,		
		and equipment to install 1"c		-
		including all		
		connectors,		
		brackets,		
		supports, and		
		associated materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond, overhead and		
		profit, and all		
		other fixed costs.		
3	1 1/4"c	Furnish all	LF	\$
		materials, labor, and equipment to		
		install 1 1/4"c		
		including all		
		connectors,		
		brackets,		
		supports, and associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond, overhead and		
		profit, and all		
		other fixed costs.		
4	1 1/2"c	Furnish all materials, labor,	LF	\$
		and equipment to		
		install 1 1/2"c		
		including all		
		connectors,		
		brackets,		
	I	supports, and	I	CAM # 18-0510

è			•	
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
5	2"c	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install 2"c		
		including all		
		connectors,		
		brackets,		
		supports, and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond, overhead and		
		profit, and all		
	0.4/0	other fixed costs.	<u> </u>	
6	2 1/2"c	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install 2 1/2""c		
		including all		
		connectors,		
		brackets,		
		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
7	3"c	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install 3"c		
		including all		
		connectors,		
		brackets,		
		supports, and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
<u></u>		other fixed costs.	<b>_</b>	
8	3 1/2"c	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install 3 1/2"c		
		including all		
		connectors,		
		brackets,		
1		supports, and		
1		associated		
1		materials. All		
		proposed line		
		items shall	[	

		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
9	Surface	Furnish all	LF	\$
9			L'	9
	raceway	materials, labor,		
		and equipment to		,
		install 1" surface		
		raceway		
		including all		
		connectors,		
		brackets,		
		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
ITEM	ITEM	DESCRIPTION	UNIT	UNIT PRICE
NO.				
10	4"c	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install 4"c		
		including all		
		connectors,		
		brackets,		
		supports, and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
11	#12	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		and equipment to install #12		
		and equipment to install #12 conductors		
		and equipment to install #12 conductors including all		
		and equipment to install #12 conductors including all connectors,		
		and equipment to install #12 conductors including all connectors, brackets,		
		and equipment to install #12 conductors including all connectors, brackets, supports and		
		and equipment to install #12 conductors including all connectors, brackets, supports and associated		
		and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All		
		and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line		
		and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall		
		and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include		
		and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond,		
		and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and		
		and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all		
		and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and		
12	#10	and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all	LF	\$
12	#10	and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.	LF	\$
12	#10	and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.	LF	\$
12	#10	and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to	LF	\$
12	#10	and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install #10	LF	\$
12	#10	and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install #10 conductors	LF	\$
12	#10	and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install #10 conductors including all	LF	\$
12	#10	and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install #10 conductors including all connectors,	LF	\$
12	#10	and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install #10 conductors including all connectors, brackets,	LF	\$
12	#10	and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install #10 conductors including all connectors, brackets, supports and	LF	\$
12	#10	and equipment to install #12 conductors including all connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install #10 conductors including all connectors, brackets,	LF	\$

		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
13	#8	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install #8		
		conductors		
		including all		
		connectors,		
		brackets,		
		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
	110	other fixed costs.		+
14	#6	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install #6		
		conductors		
		including all		
		connectors,		
		brackets,		
		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
15	#4	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install #4		
		conductors		
		including all		
		connectors,		
		brackets,		
		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
16	#1	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install #1		
		conductors		
		including all		
		connectors,		
		brackets,		
		supports and		
		associated		
		I motoriala All	I	1
		materials. All		

		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
17	#1/0	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install #1/0		
		conductors		
		including all		
		connectors,		
		brackets,		
		supports, and		
		associated materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
1-	l va va	other fixed costs.	<del> </del>	
18	#2/0	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install #2/0		
		conductors		
		including all		
		connectors,		
		brackets,		
		supports, and		
		associated		
		materials. All		
		proposed line		
		proposed line		
		items shall		
		items shall		
		items shall include		
		items shall include insurance, bond,		
		items shall include insurance, bond, overhead and		
ITEM		items shall include insurance, bond, overhead and profit, and all		
ITEM	ITEM	items shall include insurance, bond, overhead and profit, and all	UNIT	UNIT PRICE
ITEM NO.	ITEM	items shall include insurance, bond, overhead and profit, and all other fixed costs.	UNIT	UNIT PRICE
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION		
	ITEM #4/0	items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all	<b>UNIT</b> LF	UNIT PRICE
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor,		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors,		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets,		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall include		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall include insurance, bond,		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall include insurance, bond, overhead and		
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all		
NO. 19	#4/0	items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.	LF	\$
NO.		items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all		
NO. 19	#4/0	items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor,	LF	\$
NO. 19	#4/0	items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to	LF	\$
NO. 19	#4/0	items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install #300	LF	\$
NO. 19	#4/0	items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install #300 conductors	LF	\$
NO. 19	#4/0	items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install #300 conductors including all	LF	\$
NO. 19	#4/0	items shall include insurance, bond, overhead and profit, and all other fixed costs.  DESCRIPTION  Furnish all materials, labor, and equipment to install #4/0 conductors including all connectors, brackets, supports, and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install #300 conductors	LF	\$

		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
21	#350	Furnish all	LF	¢
21	#330		LF	\$
		materials, labor,		
		and equipment to		-
		install #350		
		conductors		
		including all		
		connectors,		
		brackets,		
		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
22	#500	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install #500		
		conductors		
		including all		
		connectors,		
		brackets,		
		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
23	#600	Furnish all	LF	\$
		materials, labor,		
		and equipment to		
		install #600		
		conductors		
		including all		
		connectors,		
		brackets,		
		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
24	Existing	Furnish all	LF	\$
24			"	Ψ
	raceway	materials, labor,		
		and equipment to		
		remove		
		abandoned		
		raceway,		
		including all		
	I	wiring,	1	1

		connectors,	1	
		brackets,		
		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
25	Recessed	Furnish all	EACH	\$
	Lighting	materials, labor,		
	switches	and equipment to		
	ownoned	install new		
		recessed wall		
		lighting switches,		
		including j-boxes,		
		all relays,		
		connectors,		
		brackets,		
		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
26	Surface	Furnish all	EACH	\$
	Lighting	materials, labor,		
	switches	and equipment to		
	owner or a second	install new		
		surface mounted		
		wall lighting		
		wall lighting switches,		
		wall lighting switches,		
		wall lighting switches, including j-boxes,		
		wall lighting switches, including j-boxes, all relays,		
		wall lighting switches, including j-boxes, all relays, connectors,		
		wall lighting switches, including j-boxes, all relays, connectors, brackets,		
		wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and		
		wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated		
		wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and		
		wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated		
		wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All		
		wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall		
		wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include		
		wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond,		
		wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and		
		wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all		
		wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.		
27	Wall vacancy /	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all	EACH	\$
27	Wall vacancy / occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.	EACH	\$
27		wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches,	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-boxes, relays,	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-boxes, relays, connectors,	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-boxes, relays, connectors, brackets,	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-boxes, relays, connectors, brackets, supports, and	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-boxes, relays, connectors, brackets, supports, and associated	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-boxes, relays, connectors, brackets, supports, and associated materials. All	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-boxes, relays, connectors, brackets, supports, and associated materials. All proposed line	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-boxes, relays, connectors, brackets, supports, and associated materials. All proposed line items shall	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-boxes, relays, connectors, brackets, supports, and associated materials. All proposed line	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-boxes, relays, connectors, brackets, supports, and associated materials. All proposed line items shall include	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-boxes, relays, connectors, brackets, supports, and associated materials. All proposed line items shall include insurance, bond,	EACH	\$
27	occupancy	wall lighting switches, including j-boxes, all relays, connectors, brackets, supports and associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new wall mounted sensor/switches, including all j-boxes, relays, connectors, brackets, supports, and associated materials. All proposed line items shall include	EACH	\$

<u></u>		other fixed costs.	<u> </u>	
ITEM NO.	ITEM	DESCRIPTION (LIGHTING)	UNIT	UNIT PRICE
28	Ceiling Lighting	Furnish all	EACH	\$
	vacancy /	materials, labor,		
	occupancy	and equipment to		
	sensors	install new ceiling mounted		
		sensor/switches,		
		including all j-		
		boxes, relays,		
		connectors,		
		brackets,		
		supports and		
		associated materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
	1.10	other fixed costs.	EAOL:	
29	Lighting Fixtures	Furnish all	EACH	\$
	1 IALUI CS	materials, labor, and equipment to	1	
		install new		
		lighting fixture,		
		including all		
		connectors,		
		brackets,		
		supports and associated		
		materials.		
		Provide separate		
		schedule of		
		value line item for		
		each type of		
		fixture (A, A1, B,		
		BA, B1, C, C1, D,		
		D1, D2, E, F, H, J, K, L, M, N, O, P,		
		P1, R, S, SL U,		
		V1, V2, W, X1,		
		X2, X3), per		
		drawings and		
		specifications. All		
		proposed line		
		items shall include	1	
		insurance, bond,	1	
		overhead and		
		profit, and all	1	
		other fixed costs.		
30	Recessed	Furnish all	EACH	\$
	Receptacles	materials, labor, and equipment to	1	
		install new	1	
		recessed	1	
		receptacles,	1	
		including		
		associated j-box,	1	
		connectors,	1	
		brackets, supports and		
		associated	1	
		materials. All	1	
		proposed line		
		items shall	1	
		include	1	
1	I	insurance, bond,	I	CAM # 18-0510

		overhead and	1	1
		profit, and all		
		other fixed costs.		
31	Surface	Furnish all	EACH	\$
31			LACIT	9
	Receptacles	materials, labor,		
		and equipment to		1
		install new		
		surface mounted		
		receptacles,		
		including		
		associated j-box,		
		connectors,		
		brackets,		
		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all other fixed costs.		
20	Turiet Leek		FAOU	•
32	Twist Lock	Furnish all	EACH	\$
	Receptacles	materials, labor,		
		and equipment to		
		install new 50A,		
		2P twist lock		
		receptacles,		
		including		
		associated j-box,		
		connectors,		
		brackets,		
		supports and		
		associated		
		materials. All		
		proposed line		
		items shall		
		include		
		insurance, bond,		
		overhead and		
		profit, and all		
		other fixed costs.		
33	Circuit	Furnish all	EACH	\$
	breakers	materials, labor,		
		and equipment to		
		install new 20A,		
		1P circuit	1	
		breaker, including	1	
		associated		
		materials. All		
		proposed line		
		items shall		
	•			
		include		
		include insurance bond		
		insurance, bond,		
		insurance, bond, overhead and		
		insurance, bond, overhead and profit, and all		
		insurance, bond, overhead and profit, and all other fixed costs.	5.00	
34	Circuit	insurance, bond, overhead and profit, and all other fixed costs. Furnish all	EACH	\$
34	Circuit breakers	insurance, bond, overhead and profit, and all other fixed costs. Furnish all materials, labor,	EACH	\$
34		insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to	EACH	\$
34		insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new 20A,	EACH	\$
34		insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new 20A, 2P circuit	EACH	\$
34		insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new 20A,	EACH	\$
34		insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new 20A, 2P circuit	EACH	\$
34		insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new 20A, 2P circuit breaker, including	EACH	\$
34		insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new 20A, 2P circuit breaker, including associated materials. All	EACH	\$
34		insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new 20A, 2P circuit breaker, including associated materials. All proposed line	EACH	\$
34		insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new 20A, 2P circuit breaker, including associated materials. All proposed line items shall	EACH	\$
34		insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new 20A, 2P circuit breaker, including associated materials. All proposed line items shall include	EACH	\$
34		insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new 20A, 2P circuit breaker, including associated materials. All proposed line items shall include insurance, bond,	EACH	\$
34		insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new 20A, 2P circuit breaker, including associated materials. All proposed line items shall include	EACH	\$

	1	other fixed costs	I	1
35	Circuit breakers  Circuit breakers	other fixed costs.  Furnish all materials, labor, and equipment to install new 20A, 3P circuit breaker, including associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.  Furnish all materials, labor, and equipment to install new 30A, 3P circuit	EACH	\$
		breaker, including associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.		
NO.	ITEM	DESCRIPTION (LIGHTING)	UNIT	UNIT PRICE
37	Circuit breakers	Furnish all materials, labor, and equipment to install new 50A, 2P circuit breaker, including associated materials. All proposed line items shall include insurance, bond, overhead and profit, and all other fixed costs.	EACH	\$
38	Circuit breakers	Furnish all materials, labor, and equipment to install new 100A, 3P circuit breaker, including associated materials. All proposed line items shall include insurance, bond, overhead and	EACH	\$

Note: All of the above items <u>must be completed.</u> Failure to do so will result in the bid being considered non-responsive.

# **LABOR RATES**

ITEM	TRADE	TITLE	UNIT	RATE (\$/HR)	
1	GENERAL	PROJECT MANAGER	HOURLY	\$	
2	GENERAL GENERAL SUPERINTENDENT		HOURLY	\$	
3	GENERAL CARPENTER		HOURLY	\$	
4	GENERAL	PAINTER	HOURLY	\$	
5	ELECTRICAL	PROJECT SUPERVISOR / SUPERINTENDENT	HOURLY	\$	
6	ELECTRICAL	FOREMAN	HOURLY	\$	
7	ELECTRICAL	ELECTRICIAN	HOURLY	\$	
8	ELECTRICAL	JOURNEYMAN	HOURLY	\$	
9	ELECTRICAL APPRENTICE		HOURLY	\$	
10	MECHANICAL	PROJECT SUPERVISOR / SUPERINTENDENT	HOURLY	\$	
11	MECHANICAL	HVAC TECHNICIAN/MECHANIC	HOURLY	\$	
12	MECHANICAL	SHEET METAL WORKER	HOURLY	\$	
13	MECHANICAL	INSTALLER	HOURLY	\$	
14	PLUMBING	PLUMBER	HOURLY	\$	
15	PLUMBING	APPRENTICE/HELPER	HOURLY	\$	



5751 Miami Lakes Drive Miami Lakes, Florida 33014 Tel (305) 374-8300 Fax (305) 374-9004 www.eeandg.com

September 5, 2017 EE&G Project #: 2017-2518

Ms. Irina Tokar, RA, NCARB, Senior Project Manager City of Fort Lauderdale 100 N. Andrews Avenue Fort Lauderdale, FL 33301

Subject: Limited Pre-Renovation Asbestos Survey

**City of Fort Lauderdale – War Memorial Auditorium** 

Electrical Upgrades 2017 CFL P/N# 12128

800 NE 8<sup>th</sup> Street Fort Lauderdale, FL

Dear Ms. Tokar:

EE&G Environmental Services, LLC (EE&G) was retained by the City of Fort Lauderdale (Client) to conduct an asbestos survey of the War Memorial Auditorium located at the above-referenced address. The survey was performed on August 28 and September 1, 2017, by Bob Miro and David Soto of EE&G (both certified under the Asbestos Hazard Emergency Response Act, (AHERA). The purpose of the project was to identify the presence of asbestos-containing materials (ACM) in the interior areas as per the planned renovations referenced address (See attached figures). The sampling was performed in order to comply with the Environmental Protection Agency (EPA) National Emissions Standards for Hazardous Air Pollutants (NESHAP), Broward County and applicable State and Federal Guidelines.

# **SUMMARY**

EE&G collected a total of 35 samples of gray plaster wall, white drywall system white duct mastic, white 2' x 4' dot circle ceiling tiles, white 12"x12" dot dot ceiling tile, white 2'x2' rough ceiling tile, white 2'x2' drywall ceiling tile, gray duct mastic and gray interior stucco. Asbestos was not detected in the sampled materials and therefore are not considered to be ACM. See the attachment for laboratory results.

## **INSPECTION METHODS**

The accessible interior renovation areas as depicted on the provided plans were inspected for suspect ACM, unless otherwise noted. Each observed suspect material was assigned a homogenous area number, described, and measured. Each observed suspect material was either sampled or assumed to be asbestos-containing. Samples of suspect ACM were collected using procedures established by the United States (US) Environmental Protection Agency (EPA) Code of Federal Regulations (CFR) Title 40 Part 763.

Samples were sent to EMSL Analytical, Inc. in Pompano Beach, Florida for analysis. Upon arrival at the laboratory, the samples were logged-in and stored for analysis. Analyses were performed using the polarized light microscopy (PLM) method of asbestos detection using guidelines and procedures established in the Method for the Determination of Asbestos in Bulk Building Materials (EPA-600/R-93-116 July, 1993). Results were provided as percent (%)

Miami Melbourne Orlando Tampa

Ms. Irina Tokar September 5, 2017 Page 2

asbestos by volume. Samples found to contain greater than 1% asbestos were considered positive and listed as ACM.

## LIMITATIONS OF SURVEY

This asbestos inspection report has been prepared by EE&G in a manner consistent with industry standards exercised by members of the profession practicing under similar conditions. No other warranty, expressed or implied is made. The intent of this survey report is to assist the owner or client in locating ACM that may be disturbed during pending repairs and remediation. Under no circumstances is this survey to be utilized as a proposal or a project specification document without the expressed written consent of EE&G.

The survey was conducted to identify suspect ACM in the renovaiton areas of the War Memorial Auditorium prior to renovation. If other areas at this location are to be impacted during planned or future remediation or renovations, a separate asbestos survey of these areas will be required. Some ACM may not have been discovered due to inaccessibility. Suspect materials discovered subsequent to the issue of this survey report should be sampled and analyzed to determine asbestos content and to initiate appropriate responses.

Analyses were carried out by PLM. While the most commonly accepted analytical method for detecting asbestos in bulk materials, PLM is known to have limited resolution and may not detect extremely small asbestos fibers. Certain materials, notably vinyl floor tiles, may contain extremely fine asbestos fibers that are beyond the resolution of PLM.

EE&G's interpretations and recommendations are based upon the results of sample collection and analyses in compliance with environmental regulations, quality control and assurance standards, and the scope of work as indicated in EE&G's proposal. The results, conclusions, and recommendations contained in this report pertain to conditions observed at the time of the survey. Other conditions elsewhere in the subject building(s) may differ from those in the inspected/surveyed locations and, such conditions are unknown, may change over time, and have not been considered.

This report was prepared solely for the use of EE&G's client, and is not intended for use by third party beneficiaries. The client shall indemnify and hold EE&G harmless against liability for loss arising out of or relating to reliance by a third party on work performed thereunder, or the contents of this report. EE&G will not be held responsible for the interpretation or use by others of data developed pursuant to the compilation of this report, or for use of segregated portions of this report.

## SURVEY AREA DESCRIPTION AND OBSERVATIONS

# City of Fort Lauderdale – War Memorial Auditorium – Electrical Upgrades

The interior walls were observed to be finished with drywall system and plaster. The floors were vinyl flooring or concrete, and the ceilings were finished with lay-in ceiling tiles. Upon inspection for suspect ACM, EE&G designed this survey to include and be limited to sampling of the following materials:

Multiple interior walls.

Ms. Irina Tokar September 5, 2017 Page 3

- Ceilings.
- Floors.

## **RESULTS**

The results of the PLM analyses and assessment of suspect ACM are as follows:

# Asbestos-containing materials (ACM)

ACM was not found in the materials sampled that may be impacted by the proposed renovation.

# **Nonasbestos-containing materials**

Asbestos was not detected in the gray plaster wall, white drywall system white duct mastic, white 2' x 4' dot circle ceiling tiles, white 12"x12" dot dot ceiling tile, white 2'x2' rough ceiling tile, white 2'x2' drywall ceiling tile, gray duct mastic and gray interior stucco. The original laboratory reports and photographs are attached.

# **CONCLUSIONS AND RECOMMENDATIONS**

ACM was not detected in the samples collected in the War Memorial Auditorium; therefore, no further asbestos-related action is required at this time. See attachments for the laboratory results and photographs.

If other specific areas at this location are to be impacted during planned renovations an asbestos survey of these areas will be required. Suspect materials discovered after this inspection should be sampled and analyzed to determine asbestos content and to initiate appropriate responses.

Notification to the Broward County Department of Regulatory and Economic Resources (DRER) of intent to renovate is not necessary, however, the general contractor should have a copy of this survey at the site during the entire project as proof of compliance with 40 CFR 61 (NESHAP).

EE&G appreciates the opportunity to provide you and your organization with environmental consulting services. If you have any questions or require further clarifications, please do not hesitate to contact us at (305) 374-8300.

Sincerely,

**David Soto** 

Certified AHERA Building Inspector

EE&G

Attachments: Laboratory Report

Figures
Photographs
Certificates

WMA ASBS SURVEY

Reviewed by

Jay W. Sall, CIH

IH Practice Director, EE&G

Asbestos Consultant #AX0000011

# **PLM LABORATORY RESULTS**

AAL

American Asbestos Laboratories

Tuesday, Sep 5 2017, 10:19 AM

# REPORT

SENT CITY OF FORT LAUDERDALE

TO: 100 NORTH ANDREW AVENUE FORT LAUDERDALE, FL 33301

DANICA GRUJICIC

Phone: (954) 828-5055 Fax:

(954) 828-5074

Email:

DGrujicic@fortlauderdale.gov

Thank you for your business.

PREPARED AAL

BY: Asbestos Department

5005 WEST LAUREL STREET

SUITE 110

TAMPA, FL 33607

NVLAP Lab Code 101775

(813) 287-1005

Analysis:

Polarized Light Microscopy (PLM) with dispersion staining techniques according to the

United States (US) Environmental Protection Agency (EPA) 'Method for the Determination of

Asbestos in Bulk Building Materials', EPA/600/R-93-116, July 1993.

Sample Type:

# of Samples:

BULK

35

Date in:

Wednesday, August 30, 2017

Date out:

Tuesday, Sep 5 2017

Work Order#

T1708099

AAL Project#

2017-2518

Transported:

FEDEX

Sampled by:

**BOB MIRO/DAVID SOTO** 

Received by:

KIA

Project:

CFL WAR MEMORIAL AUDITORIUM

Authorized Analyst KHANDAKER ANAM

2. d. On

2. d. Mr

Laboratory Manager KHANDAKER ANAM

Due to the small size of asbestos fibers associated with vinyl floor tiles, TEM analysis is recommended for all floor tiles containing <1% or no detectable asbestos by visual estimation.

This report may not be reproduced except in full, without the written approval of AAL. AAL will not be held responsible for the use of its reports issued in part to third parties or authorized agents of the client.

This report shall not be used by the client to claim product endorsement by NVLAP nor any agency of the United States Government. All NVLAP reports displaying NVLAP logo must have at least one signature to be valid.

Page 1 of 6

# 4 US 1710:19 AM VA 9:90 Sep 5 2017, 10:19 AM

# LABORATORY BULK SAMPLE ANALYSIS REPORT

CITY OF FORT LAUDERDALE CLIENT:

CFL WAR MEMORIAL AUDITORIUM PROJECT:

Asbestos analysis of bulk materials via EPA 600/R/93/116 Method using Polarized Light Miscroscopy (PLM). Work Order: T1708099

							City	/ 01 1	OIT L	auue	luale			
	%NON-ASB	FIBERS	Cellulose: 1-2		Cellulose: 1-2		Cellulose: 1-2		Cellulose: 1-2		Cellulose: 1-2		Cellulose: 1-2	
	ON%	NON FIB FIBERS	Other: 08 00	, , , , , , , , , , , , , , , , , , ,		Other: 98-99		Other: 98-99		Other: 98-99		Other: 98-99		Other: 98- 99
2		CHRY AMOS CROC TREM ANTH OTHER												
	FIBERS	ANTH	TED		TED		TED		TED		TED		TED	
	ESTOS	TREM	OS DETEC		OS DETEC		OS DETEC		OS DETEC		S DETEC		S DETEC	
	PERCENT ASBESTOS FIBERS	CROC	NO ASBESTOS DETECTED		NO ASBESTOS DETECTED		NO ASBESTOS DETECTED		NO ASBESTOS DETECTED		NO ASBESTOS DETECTED		NO ASBESTOS DETECTED	
	PER	AMOS	z		Z		Z		Z		Ž		Ž	
		CHRY												
		Sample No.	170828BMHA1-1		170828BMHA1-2		170828BMHA1-3		170828BMHA1-4	200	170828BMHA1-5		170828BMHA1-6	
		LOCATION	MEETING ROOM		MEETING ROOM		MEETING ROOM		FRONT AREA EAST		FRONT AREA EAST		FRONT AREA EAST	
		DESCRIPTION	GREY PLASTER WALL FINISH		GREY PLASTER WALL FINISH		GREY PLASTER WALL FINISH		GREY PLASTER WALL FINISH		GREY PLASTER WALL FINISH		GREY PLASTER WALL FINISH	
		ANA	KIA		ΚΙΆ		ΚΙΑ		KIA		KIA		KIA	
	Dash	NO.	01 A		01 B		01 C		02 A		02 B		02 C	

Page 2 of 6

CITY OF FORT LAUDERDALE ©LIENT: CITY OF FORT LA PROJECT: CFL WAR MEMOR

CFL WAR MEMORIAL AUDITORIUM

Work Order: T1708099

# LABORATORY BULK SAMPLE ANALYSIS REPORT CONTINUED

I			City o	of Fort Laude	erdale	
%NON-ASB FIB FIBERS		Cellulose: 10- 15	Cellulose: 10- 15	Cellulose: 10- 15	Cellulose: 10- 15	Cellulose: 1-2
%NO!	Other: 85- 90	Other: 85- 90	Other: 85- 90	Other: 85-90	Other: 85- 90	Other: 98- 99
ОТНЕК						
PERCENT ASBESTOS FIBERS AMOS CROC TREM ANTH	SCTED	эстер	эстер	эстер	CTED	CTED
BESTO	OS DETI	OS DETI	оз рет	OS DETI	OS DETI	OS DETI
CENT AS	NO ASBESTOS DETECTED	NO ASBESTOS DETECTED	NO ASBESTOS DETECTED	NO ASBESTOS DETECTED	NO ASBESTOS DETECTED	NO ASBESTOS DETECTED
PER AMOS	Z	z	Ż	Ž	Ž	Ž
CHRY						
Sample No.	170828BMHA2-7	170828BMHA2-8	170828BMHA2-9	170828BMHA210	170828BMHA211	170828BMHA312
LOCATION	BATHROOM REAR HITE DRYWALL HITE JOINT COMPOUND	KITCHEN REAR HITE DRYWALL HITE JOINT COMPOUND	CENTER BATH ITTE DRYWALL ITTE JOINT COMPOUND	FRONT KITCHEN IITE DRYWALL IITE JOINT COMPOUND	BATH IITE DRYWALL IITE JOINT COMPOUND	REAR OFFICE
DESCRIPTION	WHITE DRYWALL SYSTEM LAYER: NO ASBESTOS DETECTED IN WHITE DRYWALL LAYERS: NO ASBESTOS DETECTED IN WHITE JOINT COMPOUND	WHITE DRYWALL SYSTEM LAyer!: NO ASBESTOS DETECTED IN WHITE DRYWALL Layer2: NO ASBESTOS DETECTED IN WHITE JOINT COMPOUND	WHITE DRYWALL SYSTEM LAYER: NO ASBESTOS DETECTED IN WHITE DRYWALL LAYER: NO ASBESTOS DETECTED IN WHITE JOINT COMPOUND	WHITE DRYWALL SYSTEM LAYER: NO ASBESTOS DETECTED IN WHITE DRYWALL LAYER: NO ASBESTOS DETECTED IN WHITE JOINT COMPOUND	WHITE DRYWALL SYSTEM LAyer!: NO ASBESTOS DETECTED IN WHITE DRYWALL Layer2: NO ASBESTOS DETECTED IN WHITE JOINT COMPOUND	WHITE HVAC DUCT MASTIC
ANA	KIA	KIA	KIA	KIA	KIA	KIA
Dash No.	03 A	03 B	03 C	03 D	03 E	04 A

Page 3 of 6

aduesday, September 05, 2017
©CLIENT: CITY OF FORT LAU
PROJECT: CFL WAR MEMOR

CITY OF FORT LAUDERDALE

CFL WAR MEMORIAL AUDITORIUM

Work Order: T1708099

LABORATORY BULK SAMPLE ANALYSIS REPORT CONTINUED

			r	25 C	ity of Fort La	uderdale	, χ <sub>0</sub>
%NON-ASB	FIBERS	Cellulose: 1-2	Cellulose: 1-2	Glass: 30- 35 Cellulose: 30- 35	City of Fort La	Glass: 30- 35 Cellulose: 30- 35	Glass: 30-35 Cellulose: 30-35
%NO/	NON FIB	Other: 98- 99	Other: 98-99	Other: 30-40	Other: 30-40	Other: 30-40	Other: 30- 40
	OTHER						0
S FIBERS	CROC TREM ANTH OTHER	CTED	CTED	CTED	СТЕВ	СТЕД	стер
PERCENT ASBESTOS FIBERS	C TREA	NO ASBESTOS DETECTED	NO ASBESTOS DETECTED	NO ASBESTOS DETECTED	NO ASBESTOS DETECTED	NO ASBESTOS DETECTED	NO ASBESTOS DETECTED
PERCENT	AMOS CRO	NO ASBE	NO ASBI	NO ASBE	NO ASBE	NO ASBE	NO ASBE
	CHRY All						
	Sample No.	170828BMHA313	170828BMHA314	170828BMHA415	170828BMHA416	170828BMHA417	170828BMHA418
	LOCATION	REAR STAGE	REAR STAGE	FOYER MENS ROOM	FOYER MENS ROOM	FOYER MENS ROOM	PRODUCTION ROOM
7 (20 %) and a second distribution of the second	DESCRIPTION	WHITE HVAC DUCT MASTIC	WHITE HVAC DUCT MASTIC	WHITE 2'X4' DOT CIRCLE CEILING TILE			
	ANA	KI A	KIA	KIA	KIA	KIA	KIA
Dash	<i>No.</i>	04 B	04 C	05 A	05 B	05 C	05 D

Cellulose: 10- 15

Other: 85-90

NO ASBESTOS DETECTED

170828BMHA624

CENTER BATHROOM

WHITE 2'x2' DRYWALL CEILING TILE

ΚĀ

07 A

NO ASBESTOS DETECTED

170828BMHA625

CENTER BATHROOM

WHITE 2'x2' DRYWALL CEILING TILE

Υ

07 B

Cellulose: 10- 15

Other: 85-90

Page 4 of 6

CFL WAR MEMORIAL AUDITORIUM

Work Order: T1708099

CITY OF FORT LAUDERDALE

ad uesday, September 05, 2017

SCLIENT:

PROJECT: CFL WAR MEMOR

LABORATORY BULK SAMPLE ANALYSIS REPORT CONTINUED

I			35	1	52	Cit	y of Fort L	auderdale
%NON-ASB	NON FIB FIBERS	Glass: 30- 35	Cellulose: 30- 35	Glass: 30-35	Cellulose: 30- 35	Glass: 50-55	Glass: 50- 55	Glass: 50-55
ON%	NON FIB		Other: 30-40		Other: 30- 40	Other 45- 50	Other: 45-50	Other: 45- 50
	OTHER		J		0			
TBERS	ANTH	ŒD		Œ		ED	ED	Œ
ESTOS I	TREM	S DETECT		S DETECT		DETECT	DETECT	DETECT
PERCENT ASBESTOS FIBERS	CROC	NO ASBESTOS DETECTED		NO ASBESTOS DETECTED		NO ASBESTOS DETECTED	NO ASBESTOS DETECTED	NO ASBESTOS DETECTED
PERCI	CHRY AMOS CROC TREM ANTH OTHER	NO /		NO /		NOV	NO	NON
	CHRY							
	Sample No.	170828BMHA419		170828BMHA420		170828BMHA521	170828BMHA522	170828BMHA523
	LOCATION	PRODUCTION ROOM		PRODUCTION ROOM		LOBBY WALL	LOBBY WALL	LOBBY WALL
	DESCRIPTION	WHITE 2'X4' DOT CIRCLE CEILING TILE		WHITE 2'X4' DOT CIRCLE CEILING TILE		WHITE 12"X12" DOT DOT CELLING TILE	WHITE 12"X12" DOT DOT CEILING TILE	WHITE 12"X12" DOT DOT CEILING TILE
	ANA	KIA		KIA		ΚΙΑ	KIA	KIA
Dash	No.	05 E		05 F		06 A	90 B	O 90

Report Continued on Next Page

CAM # 18-0510 Exhibit 3 Page 374 of 476

Page 5 of 6

duesday, September 05, 2017

©CLIENT: CITY OF FORT LA
PROJECT: CFL WAR MEMOR

CITY OF FORT LAUDERDALE

CFL WAR MEMORIAL AUDITORIUM

LABORATORY BULK SAMPLE ANALYSIS REPORT CONTINUED

Cellulose: 10-15 NON FIB FIBERS %NON-ASB OTHER ANTHPERCENT ASBESTOS FIBERS NO ASBESTOS DETECTED TREMCROC SOME CHRY 170828BMHA626 Sample No. CENTER BATHROOM LOCATION Layer1: NO ASBESTOS DETECTED IN WHITE DRYWALL WHITE 2'x2' DRYWALL CEILING TILE DESCRIPTION T1708099 Work Order: ANA ΚĀ Dash 07 C No.

NO ASBESTOS DETECTED NO ASBESTOS DETECTED NO ASBESTOS DETECTED NO ASBESTOS DETECTED J70828BMHA728 170828BMHA729 170828BMHA830 170828BMHA831 FRONT MAINTENANCE R FRONT OFFICE BREAK R FRONT OFFICE BREAK R FRONT MAINTENANCE R GREY PLASTER WALL FINISH GREY PLASTER WALL FINISH GREY HVAC DUCT MASTIC GREY HVAC DUCT MASTIC

City of Fort Lauderdale

Cellulose: 1-2

Other: 98-99

Cellulose: 1-2

Other: 98-99

Cellulose: 1-2

Other: 98-99

NO ASBESTOS DETECTED

170828BMHA832

FRONT MAINTENANCE R

GREY PLASTER WALL FINISH

ΚĀ

O 60

Cellulose: 1-2

Other: 98-99

Cellulose: 1-2

Other: 98-99

NO ASBESTOS DETECTED

170828BMHA727

FRONT OFFICE BREAK R

Layer2: NO ASBESTOS DETECTED IN WHITE JOINT COMPOUND

GREY HVAC DUCT MASTIC

ΑĀ

08 A

ΧĀ

В

90

ΚĀ

08 C

ΚĀ

09 A

KA

B

60

Other: 85-90

Cellulose: 1-2

Other: 98-99

CITY OF FORT LAUDERDALE duesday, September 05, 2017

©LIENT: CITY OF FORT LAY
PROJECT: CFL WAR MEMOR

CFL WAR MEMORIAL AUDITORIUM

Work Order: T1708099

# LABORATORY BULK SAMPLE ANALYSIS REPORT CONTINUED

-ASB	FIBERS	Cellulose: 1-2		Cellulose: 1-2		Cellulose: 1-2	
%NON-ASB	CHRY AMOS CROC TREM ANTH OTHER NON FIB FIBERS		Other: 98-99		Other: 98-99	0	Other: 98- 99
	OTHER				Ŭ		
FIBERS	ANTH	TED		LED		LED	
BESTOS	TREM	OS DETECT		OS DETECT		OS DETECT	
PERCENT ASBESTOS FIBERS	CROC	NO ASBESTOS DETECTED		NO ASBESTOS DETECTED		NO ASBESTOS DETECTED	
PER	AMOS	z		Ż		Z	
	CHRY	~		7		15	
	Sample No.	170828BMHA933		170828BMHA934		170828BMHA935	
	LOCATION	EXTERIOR NORTH		EXTERIOR EAST		EXTERIOR SOUTH	
	No. ANA DESCRIPTION	10 A KIA GREY STUCCO COAT		GREY STUCCO COAT		GREY STUCCO COAT	
	ANA	KIA		10 B KIA		10 C KIA	
Dash	No.	10 A		10 B		10 C	

# Quality Control Officer

ANA = Analyst; ASB = Asbestos; CHRY = Chrysotile; AMOS = Amosite; CROC = Crocidolite; TERM = Term/Act; ANTH = Anthophylite; 

PAI = Paint; PAP = Paper; PL = Plaster, PLAS = Plastic; PWDR = Powder, RCF = Refractory Ceramic Fiber, RUB = Rubber; SIL = Silver; SR = Sheet Rock; S = Synthetic; SUB = Substance; TEXT = Textured; TR = Trace; TRAN = Transite; TREM = Tremolite; VERM = Vermiculite; VYL = Vinyl; W = Wollastonite; WH = White; YEL = Yellow. CEM = Cement; COV = Cover; DEB = Debris; FG = Fiberglass; FIB = Fibrous; MAS = Mastic; MAT = Material; MIC = Micaceous; MW = Mineral Wool; ORG = Orange; ACT = Actinolite; AL = Aluminum; BLK = Black; BACK = Backing; BL = Blue; BRN = Brown; C = Cellulose; CALC = Calcareous; CPT = Carpet; CTL = Ceiling Tile;

Page 376 of 476

717080



EE&G Environmental Services, LLC 5751 Miami Lakes Drive East Miami Lakes, Florida 33014

# **BULK TRANSMITTAL FORM CHAIN OF CUSTODY**

CF			C =:		^	
CLIENT:			PROJECT: CFL			
CLIENT CONTACT:	DANICA CI	RUJICIC	PROJECT NO./BILL	GROUP: 2017	-2518	
DATE COLLECTED:_	Aug 28'	7	PROJECT PHASE:_	14 sur	<b>y</b>	
DATE SENT: Aug	1. 28 17		DATE VERBAL NEEDED: 2 4 HZ TAT			
STOP AT FIRST POSIT	ΓΙVE: Y N (c	circle one)	DATE WRITTEN NEE	DED		
			705			
SAMPLE PREFIX 17		3				
SAMPLE NUMBER	COLOR	SAMPLE DE			LOCATION	
1. HA! 1	(1,204	Plaster	WALL FINISH	MEETING	em	
2			<del></del>			
	-			<u> </u>		
4. <del>7</del> 5. 5	<del></del>			most the	a Eagr	
6. b	4	4			1	
7. HA 2 7	White	DWSYSTER	^^	Ba Hustown	n Rear	
8.		1		Kitaven		
9. 9				Center		
10				Front 1		
11	4	7		BAth		
12. 14 3 12	write	HVAC DU	CTMASTIC	REAR	office	
1313					5MAGIE	
14	4		<u> </u>	<del>\</del>	4	
15. HA 4 15	Maite	2×4'CT	lor circle	FOYER	Meus Rm	
16						
17		-		- k	, D	
18	-	· · · · · · · · · · · · · · · · · · ·		Produc	Tion Room	
20						
CHAIN OF CUSTODY:						
DATE/TIME	PRINT NAME/SIG	_		$\rightarrow$	PURPOSE	
8-28-17	BAS Min	0 + DAVE S	OTO M	$\sim$	C T A	
2-29-17		- TO TAMPO		ST 1 ST 17 17 18	Mc (T)	
	100 -		10) 12	G I I W	WC TA	
	C= 1	Collection T= Transpo	ortation A= Analysis	AUG -30 2017	CTA	
	<b>.</b>	Conconon 1- manapo	A- Allalysis 1	1/		
10/2018 6·36 AM				CAM	I # 18-0510	





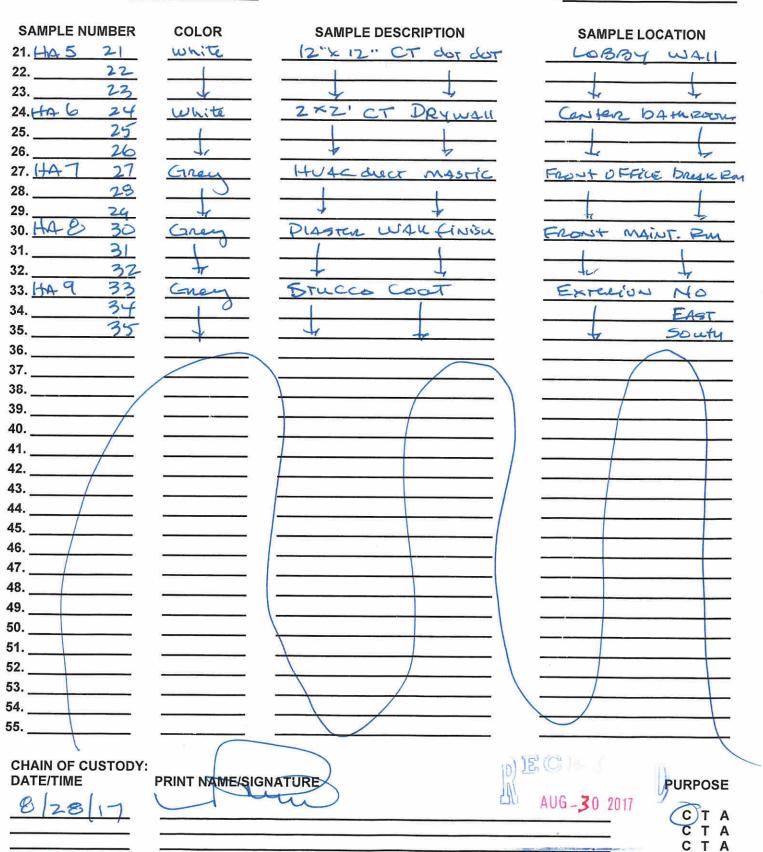
SAMPLE PREFIX 170828 BM

CONTINUATION OF BULK TRANSMITTAL FORM CHAIN OF CUSTODY

Page 2 of 2

PROJECT NUMBER: 2017 - 2518

BILL GROUP/PHASE: 14 547 J







# **EMSL** Analytical, Inc.

2700 W. Cypress Creek Rd. Ste. C108 Fort Lauderdale, FL 33309

Tel/Fax: (954) 786-9331 / (954) 941-4145

http://www.EMSL.com / pompanobeachlab@emsl.com

Attention: Rich Grupenhoff

EE & G

5751 Miami Lakes Drive East

Miami Lakes, FL 33014

Project: War Mem Elec. - 2017-2518

EMSL Order: 561703445 Customer ID: EEG50

**Customer PO:** Project ID:

> (305) 970-8609 Phone:

> > Fax: (305) 374-1666

Received Date: 09/01/2017 10:08 AM

**Analysis Date:** 09/01/2017 Collected Date: 09/01/2017

# Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized **Light Microscopy**

			Non-Asbes	stos	Asbestos	
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Type	
170901BM-1	Ceiling Tile	Gray Fibrous	20% Cellulose 70% Min. Wool	10% Non-fibrous (Other)	None Detected	
561703445-0001		Homogeneous				
170901BM-2	Ceiling Tile	Gray	20% Cellulose	10% Non-fibrous (Other)	None Detected	
		Fibrous	70% Min. Wool			
561703445-0002		Homogeneous				
170901BM-3	Ceiling Tile	Gray	15% Cellulose	5% Non-fibrous (Other)	None Detected	
		Fibrous	80% Min. Wool			
561703445-0003		Homogeneous				

Analyst(s)

Claudia Gonzalez (1) Megan Hennessey (2) Catalina Lachowski, Laboratory Manager or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. Fort Lauderdale, FL NVLAP Lab Code 500085-0

Initial report from: 09/01/2017 16:25:41

EE&G

EE&G Environmental Services, LLC 5751 Miami Lakes Drive Miami Lakes, Florida 33014

961703445 961703445 1001111

# BULK TRANSMITTAL FORM CHAIN OF CUSTODY

CLIENT: CFL PROJECT WAR MEM Elec.			Elec.
CLIENT CONTACT: DANICA GRUIICIC PROJECT NUMBER: 2017-2518			
DATE COLLECTED:	Sept. 1 17	DATE VERBAL NEEDED:	24 HR TAT
DATE SENT: SE		DATE WRITTEN NEEDED:	
STOP AT FIRST POSITIVE: Y N (circle one)			
SAMPLE PREFIX (7	ador BW		
SAMPLE NUMBER		MPLE DESCRIPTION	SAMPLE LOCATION
1	White CEIL	na tile	LOBBY CEILING
2			
3	4 +		<u>+</u> +
4			
5		<del></del>	<del>\</del>
6		<del></del>	
9		<del></del>	
10.			
11			
12			
13			
14			
15		<del></del>	
16			
17.			
18 19			
20.		<u></u>	
CHAIN OF CUSTODY: DATE/TIME PRINT NAME/SIGNATURE PURPOSE			
Q 1 - 4 T		Aug )	
7-17-1	Bob Miro delivered to		C T A
9- (-1)		EMSL	C(T_A
09/01/17 @ 10:0		.1.	C T A
C= Collection T= Transportation A= Analysis			

# **FIGURES**



# CITY OF FORT LAUDERDALE

# PROJECT #12128 WAR MEMORIAL AUDITORIUM RENOVATIONS

800 N.E.8TH STREET FORT LAUDERDALE, FLORIDA

# GENERAL SCOPE OF WORK

THE OBJECTIVES OF THIS PROJECT AS IDENTIFIED ON THE DRAWINGS, INCLUDES:

- 1. REMOVE AND REPLACE AUDITORIUM AND BUILDING LIGHTING FIXTURES WITH NEW LED LIGHTING FIXTURES.
- 2. REMOVE AND REPLACE WIRING ASSOCIATED WITH LIGHTING WITH NEW WIRING, CONDUIT TO REMAIN AND BE REUSED IF IN GOOD CONDITION AND MEETS NEC.
- 3. PROVIDE NEW LIGHTING CONTROL SYSTEMS FOR THE AUDITORIUM AND OFFICE / LOBBY AREAS
- 4. PROVIDE NEW CONDUITS AND RACEWAYS AS REQUIRED.
- 5. REPLACE PANEL BOARDS AND FEEDERS WITH NEW AS INDICATED.
- 6. PROVIDE NEW PANEL BOARDS AND FEEDERS AS INDICATED.
- 7. REMOVE PANEL BOARDS AND FEEDERS AND INDICATED.
- 8. REPLACE SELECTED RECEPTACLES, AND SWITCHES, AND ASSOCIATED BRANCH CIRCUITS AS INDICATED
- 9. REMOVE TWO GENERATORS AND ASSOCIATED TRANSFER SWITCHES AND REPLACE WITH ONE NEW GENERATOR AND ONE
- a. REPLACE EXTERIOR MOUNTED WALL PACK FIXTURES "W" WITH NEW LED FIXTURES. b. REPLACE EXTERIOR SURFACE MOUNTED CANOPY FIXTURES "C1" WITH NEW LED FIXTURES.
- c. REPLACE ROOF FLOOD LIGHT "V1" LIGHTS WITH NEW LED FIXTURES d. PROVIDE NEW EXTERIOR LINEAR LED LIGHTING "SL" TO ILLUMINATE BUILDING IDENTIFICATION LETTERS ON ROOF. FIXTURE SHALL BE PROGRAMMABLE FOR COLOR CHANGING.
- a. PROVIDE NEW INTERIOR IMAGE PROJECTION FIXTURES "O" OVER LOBBY AND AUDITORIUM ENTRY DOORS. FIXTURE SHALL BE PROGRAMMABLE FOR CONTINUOUS ROTATING, ZOOM, AND COLOR, IMAGE AND PATTERN CHANGING.
- a. PROVIDE NEW EXTERIOR IMAGE PROJECTORS "V2" ON CANOPY. FIXTURE SHALL BE PROGRAMMABLE FOR CONTINUOUS ROTATING, ZOOM, AND COLOR, IMAGE AND PATTERN CHANGING.
- a. ADD ADJUSTABLE COLOR TEMPERATURE CHANGING CAPABILITIES TO NEW INTERIOR AUDITORIUM FIXTURES "A" & "A1".
- ALT BID #5
  a. REPLACE THREE WINDOWS LOCATED IN THE THREE NORTH OFFICES WITH NEW.

14. <u>ALT. BID #6</u>
a. REPLACE STAINED OR DAMAGED CEILING TILES IN THE CENTRAL PART OF THE PERIPHERAL CORRIDOR — WEST AND IN THE TRIBUTE DISPLAY IN THE LOBBY WITH NEW TO MATCH EXISTING CONDITIONS. EXISTING CEILING GRID TO REMAIN. THIS BRIEF DESCRIPTION OF THE SCOPE OF WORK IS NOT ALL INCLUSIVE AND IS COMPLIMENTED BY THE SET OF CONSTRUCTION DOCUMENTS AND SPECIFICATIONS.

# **CODES**

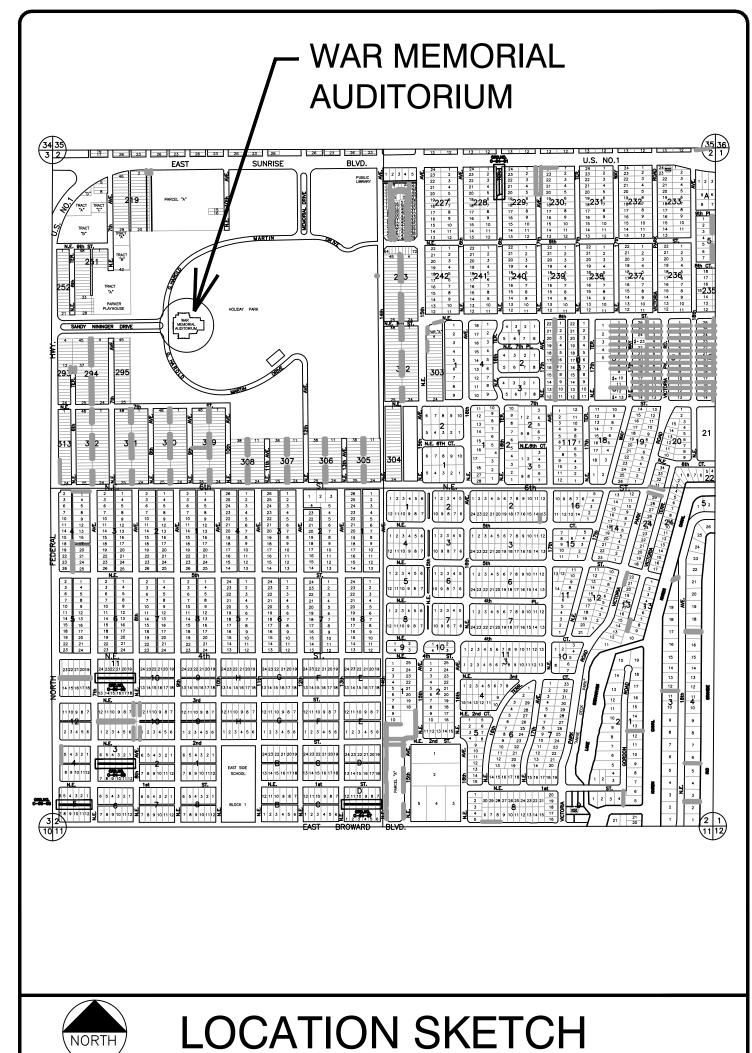
ALL ELECTRICAL WORK AND MATERIALS SHALL BE IN COMPLIANCE WITH ALL GOVERNING CODES AND STANDARDS. THIS SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING.

- A. NFPA 70 NATIONAL ELECTRICAL CODE (2011 EDITION)
- B. FLORIDA BUILDING CODE (2014 FIFTH EDITION) C. NFPA 72 NATIONAL FIRE CODE (2010 EDITION)
- D. FLORIDA FIRE PREVENTION CODE (2014 FIFTH EDITION) E. LOCAL REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION

# **CONSTRUCTION SCHEDULING**

- 1. COORDINATE AND SCHEDULE ALL POWER SHUTDOWNS WITH BUILDING MANAGEMENT A MINIMUM OF TWO WEEKS PRIOR TO DATE OF EXPECTED SHUTDOWN.
- 2. ALL PRE-WORK AND WORK PREPERATION SHALL BE IN PLACE PRIOR TO SHUTDOWN TO MINIMIZE TIME REQUIRED FOR ANY POWER SHUTDOWNS.
- PROVIDE TEMPORARY POWER AS REQUIRED TO MINIMIZE INTERRUPTIONS OF DAILY
- 4. PROVIDE TEMPORARY POWER AS REQUIRED TO PROVIDE SERVICE FOR SCHEDULED
- 5. EXISTING STAGE LIGHTING PANELBOARD SWD SHALL REMAIN IN SERVICE.
- 6. EXISTING THEATRICAL AND DIMMER SYSTEM SHALL REMAIN IN SERVICE.

1 East Broward Blvd Ft. Lauderdale, Fl. 333 -NGINEERING € Tel: (954) 421-1944 EP CONSULTING FNGINFERS M #: 2016-221 Copyright© 2017 SGM Engineering, I



PROJECT #12128 WAR MEMORIAL AUDITORIUM RENOVATIONS

800 N.E.8TH STREET

CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT ENGINEERING & ARCHITECTURE

100 North Andrews Avenue, Fort Lauderdale, Florida 33301

# FORT LAUDERDALE CITY COMMISSION

MAYOR JOHN P. "JACK" SEILER COMMISSIONER - DISTRICT I BRUCE G. ROBERTS

DEAN J. TRANTALIS COMMISSIONER - DISTRICT II ROBERT L. McKINZIE COMMISSIONER - DISTRICT III

ROMNEY ROGERS COMMISSIONER - DISTRICT IV

IRINA TOKAR, R.A. - SENIOR PROJECT MANAGER 954-828-6891 954-828-5055 DANICA GRUJICIC - PROJECT MANAGER I BOBBY SHAHNAMI P.E. - S.G.M. PROJECT MANAGER 954-421-1944 MANUEL HERNANDEZ P.E. - S.G.M. ELECTRICAL ENGINEER 954-421-1944

DATE: 7/12/2017

CAD FILE: 12128-000-000COVR

DRAWING FILE No.: 4-140-11

PERMIT SET

RECEPTION #106, OFFICES #104 AND #105 AND REPLACED WITH NEW SINGLE HUNG IMPACT RESISTANT WINDOWS OR EQUAL SEE PLANS AND ELEVATIONS FOR LOCATIONS. PATCH, REPAIR AND PAINT TO MATCH ORIGINAL, ALL SURFACES DAMAGED BY ANY REMOVAL OR IN AREA OF WINDOWS TO BE

PATCH TO MATCH ORIGINAL, ANY EXISTING SURFACE AS REQUIRED TO INSTALL NEW WINDOWS IN ACCORDANCE WITH THE FLORIDA BUILDING

CODE AND THE MIAMI-DADE NOTICE OF ACCEPTANCE (NOA). ALL NEW WINDOWS TO MEET THE REQUIRED MINIMUM DESIGN

\*WINDOW TYPE A: +72.31/-94.42 PSF •WINDOW TYPE B: +72.48/-78.76 PSF NEW WINDOWS TO BE PGT SERIES "SH-800" ALUMINUM SINGLE

PRESSURES:

HUNG WITH PRODUCT APPROVALS AS SHOWN ON SCHEDULE. ADJOINING WINDOWS WILL REQUIRE CONNECTION MULLIONS PER MANUFACTURER REQUIREMENTS. THESE MULLS SHALL BE AS PER

Kd Directional Factor = 0.85

WINDOW SCHEDULE MIN. DESIGN | IMPACT | MIAMI-DADE | REMARKS PRESSURE RESISTANT HEIGHT ALUMINUM/IMPACT GLASS SINGLE HUNG IMPACT WINDOW WITH SCREEN. SINGLE HUNG IMPACT WINDOW WITH SCREEN. 16-0714.01  $\langle B \rangle = 4'-5"\pm = 4'-1"\pm = ALUMINUM/IMPACT GLASS$ +72.48/-78.76 CLIPPED EXTRUDED ALUMINUM TUBE 16-0218.03 NOTE: SIZES NOTED ARE APPROXIMATE BASED ON FILED MEASUREMENTS AND SHALL BE VERIFIED BY CONTRACTOR

MATCH EXISTING CONDITIONS, EXISTING CEILING GRID TO REMAIN.

GRID PRIOR TO ORDERING MATERIALS).

SHOP DRAWINGS

(CONTRACTOR TO VERIFY THAT NEW TILES ARE COMPATIBLE WITH EXISTING

18. CONTRACTOR SHALL COMPLY WITH ALL SOUTH FLORIDA BUILDING CODE AND OSHA REQUIREMENTS.

REFER TO SEPARATE SET OF SPECIFICATIONS FOR SHOP DRAWING REQUIREMENTS.

NO MATERIAL SHALL BE ORDERED UNTIL THE SHOP DRAWINGS HAVE BEEN SUBMITTED AND APPROVED BY THE CITY ARCHITECT. IF SCHEDULING IS CRITICAL,

ADVANCE. THIS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

BEEN PREVIOUSLY REVIEWED AND STAMPED APPROVED BY THE CONTRACTOR.

SHOP DRAWING APPROVAL SHALL NOT RELIEVE THE G.C. OF THE CONTRACT

INFORM THE CITY ARCHITECT AND REQUEST APPROVAL OF MATERIAL ORDERING IN

SHOP DRAWINGS WILL ONLY BE REVIEWED BY THE CITY ARCHITECT, IF THEY HAVE

WINDOW ELEVATION

ASSEMBLY GROUP A-1 (SPRINKLERED)

ALTERATION LEVEL 1 (WORK AREA

CLASS C = FLAME SPREAD 76-200; SMOKE DEVELOPED INDEX 0-450

CLASS B = FLAME SPREAD 26-75

SMOKE DEVELOPED INDEX 0-450

U-FACTOR; ≤ 0.65 OPERABLE

SHGC: ≤ 0.25

NEW WINDOW MARK (FOR NEW IMPACT RATED HURRICANE

WINDOWS). SEE WINDOW SCHEDULE ON THIS SHEET.

FENESTRATION

COMPLIANCE METHOD)

ALL RENOVATIONS SHALL COMPLY WITH FLORIDA BUILDING CODE 5th

IMPACT—RESISTANT GLAZING: LAMINATED INSULATED WITH LOW E—COATING

BUILDING CODE INFORMATION:

EDITION 2014.

EXISTING BUILDING:

INTERIOR FINISHES:

ENERGY REOUIREMENTS:

LEGEND

CLASSIFICATION OF WORK:

SCALE: NTS

Bid 12089-183

S & S OOR PLAN 8

CAD FILE: 12128-D01\_7,10.2017 DRAWING FILE NO.

PORCH

DROP OFF DRIVE

PLANT'R

PLANT'R

**AREA OF WORK** 

REMOVE AND DISPOSE EXISTING WINDOWS AND WINDOW FRAMES AND REPLACE WITH NEW IMPACT

REPLACE EXISTING CEILING TILES (STAINED OR

CONDITIONS. EXISTING CEILING GRID TO REMAIN.

(CONTRACTOR TO VERIFY THAT NEW TILES ARE

DAMAGED) WITH NEW TO MATCH EXISTING

COMPATIBLE WITH EXISTING GRID PRIOR TO

ORDERING MATERIALS).

1/10/2018 6:36 AM

PAINT TO MATCH EXISTING CONDITIONS.

RESISTANT WINDOWS. REPAIR STUCCO AS NEEDED.

1'x4' FIXTURE

2'x2' FIXTURE

2'x4' FIXTURE

4' STRIP FIXTURE

BATTERY/EMERGENCY

TRACK FIXTURE

LINEAR LED STRIP LIGHTS

FLOOD LIGHT FIXTURE

EMERGENCY LIGHT FIXTURE

POLE MOUNTED LUMINAIRE

4' WALL MOUNT FIXTURE

4' WALL MOUNT FIXTURE, EMERGENCY

1'x4' FIXTURE, BATTERY/EMERGENCY

2'x2' FIXTURE, BATTERY/EMERGENCY

2'x4' FIXTURE, BATTERY/EMERGENCY

4' STRIP FIXTURE, BATTERY/EMERGENCY

CEILING MOUNTED RECESSED, DOWN LIGHT

CEILING MOUNTED RECESSED, EMERGENCY DOWN LIGHT

WALL MOUNTED SCONCE FIXTURE, BATTERY/EMERGENCY

SINGLE FACE EXIT LIGHT FIXTURE ARROW INDICATES DIRECTION OF EGRESS

DOUBLE FACE EXIT LIGHT FIXTURE ARROW INDICATES DIRECTION OF EGRESS

CEILING MOUNTED RECESSED, WALL WASHER (ARROW

4' STRIP FIXTURE, WALL MOUNTED

4' STRIP FIXTURE, WALL MOUNTED,

INDICATES DIRECTION OF WASH)

SURFACE MOUNTED LIGHTING FIXTURE

COMBINATION EXIT / EMERGENCY FIXTURE

BOLLARD OR PENDANT LIGHT FIXTURE

BOLLARD OR PENDANT LUMINAIRE, EMERGENCY

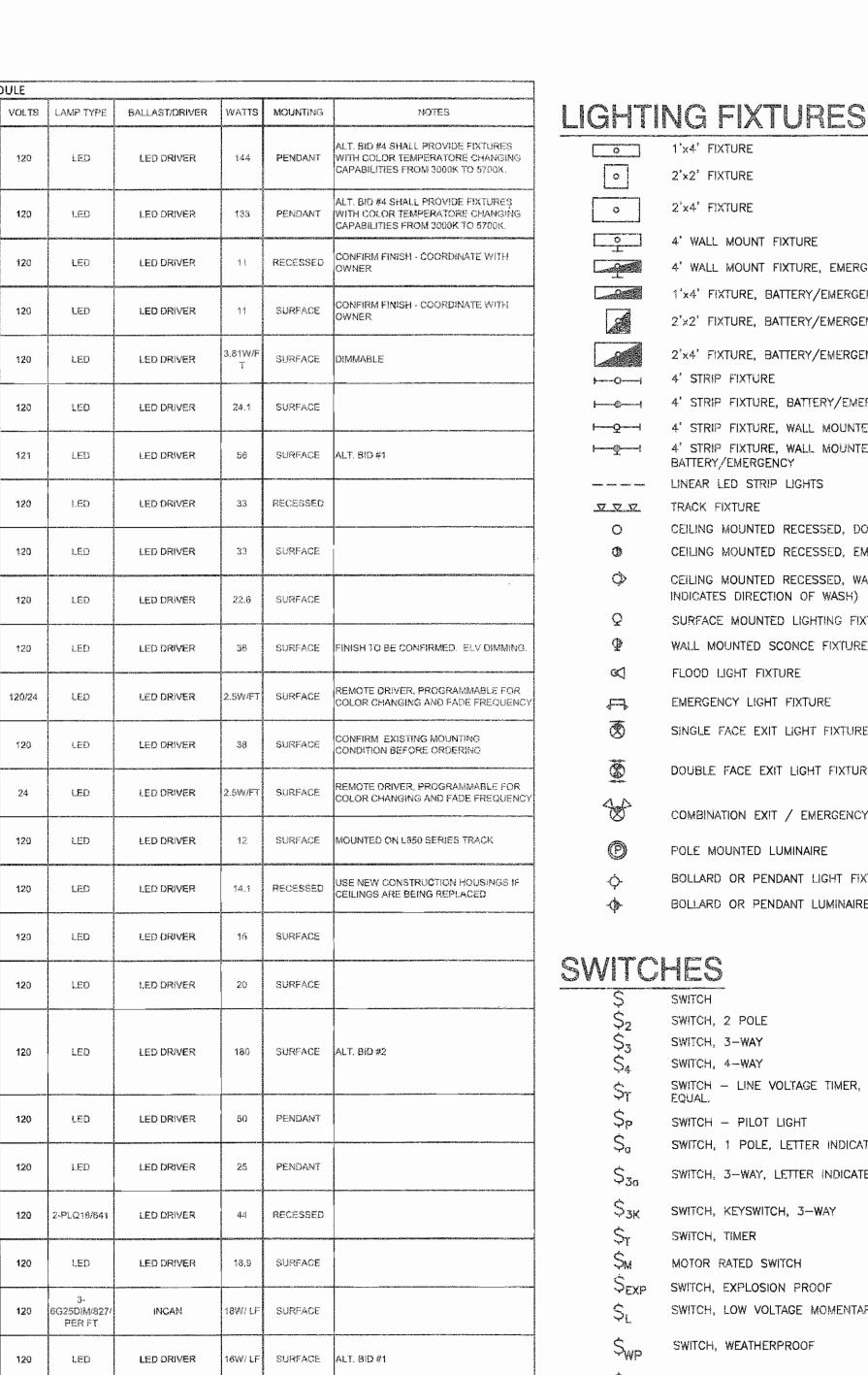
Bid 12089-183

SHEET NO. COTAL:

CAD FILE: 12128-E01-LEGN

DRAWING FILE NO.

1 EAST BROWARD BLVD. #1503 FT. LAUDERDALE, FL. 33301 Tel: (954) 421-1944 NGINEERING CA~00006208 WWW.sgmengineering.com SGM #: 2016-221 COPYRIGHT® 2017 SGM ENGINEERING, INC.



SURFACE MEN AND WOMEN RESTROOM SIGNAGE

SURFACE ALT. BID #1

SURFACE ALT, BID #1

180 SURFACE ALT. BID #3

UNIV

RECESSED

SURFACE OR

PENDANT

LIGHTING FIXTURE SCHEDULE

LED

LED

LEO

LED

LED

LEO

LED

LED

LED

LED

LED

LED

LED

LED

LEO

LED

LEO

LED

LED

LED

LED

PERFT

LED

LED

LED

LED

LED

LED

LED

LEO

120

120

120

120 2-PLQ18/841

120 LED

LEO DRIVER

LED ORIVER

LED DRIVER

MODEL NUMBER

PRODH22LEDGV-180L-35K-E1-XX-

RDDH22LEDGV-150L-35K-E1-XX-

ULE-40722-11WLED-S-W30-XX-F

ULE-40722-11W-LED-W30-XX-F-SMB

6.SSS.1.PMC.NR.35KHO.HRXX.3.DIM

HVL8-4-LD4-1-LO-35-UNV-O-EDC-1-S

24CZ-LD4-40-S-UNV-L835-CD1-U

24CZ-LD4-40-S-UNV-L835-CD1-SK24

2CZ-LD4-24-S-UNV-L835-CD1-SK24

LL54-31K-SL-NC-NC-XX/SL7-XX-F-SA

L80808FL9030P-LNC-LVR

VIC4N-L2-40-1-RW-UN-WH

VIC4N-L1-40-1-RW-UN-WH

ALX1-MB-D-4-PAT-S-

OT130LE

SWLED-LD4-16SL-LW-UNV-L840-CD1-

GLEON-AF-04-LED-E1-T2-BZ-ADJS

GLEON-AF-04-LED-E1-T2-BZ-ADJS

(2) - CONTRACTOR RESPONSIBLE FOR COORDINATION OF FLANGE TYPES, FITTINGS AND HARDWARE TO INSTALL LIGHTING FIXTURES INTO CEILING GRIDS, DRYWALL CEILINGS AND OTHER CONSTRUCTION MATERIALS AS REQUIRE

(8) - THE SPECIFIED LIGHT FIXTURES WERE SELECTED, PLACED AND CIRCUITED BY TYPE, PHOTOMETRIC PERFORMANCE, LUMEN OUTPUT, AND TOTAL WATTAGE. ANY PROPOSED SUBSTITUTIONS TO ANY PART OF THESE

SELECTIONS OR DESIGN MUST BE SUBMITTED TO THE A/E VIA AN APPROVED BIDDING GENERAL CONRTACTOR 14 DAYS PRIOR TO THE BID DATE, AND MUST INCLUDE FULL SUBMITTAL DATA INCLUDING LM-79 AND LM-80 ITL TEST

SIMILAR TO: E-SPOT IR

L30WET-31K-SL-NC-XX/SL7-XX-F-SA 120/24

LD6AR10-D010TR-ERM6A10830-6LM0H 120

QUAWS-HLO-LED-90-550-30-4-120-LA2-

CLCSLED-55

FM-1414XX

LF5-30-WT-1

TYPE QTY.

42

DESCRIPTION

54 AUDITORIUM PENDANT-HIGH MOUNT - DIMMABLE

AUDITORIUM PENDANT-LOWER MOUNT

SAME AS 'B', EXCEPT SURFACE MOUNTED

ILLUMINATED HANDRAIL FOR ENTRY STAIR -

4'0 ARCHITECTURAL VANDAL RESISTANT

LUMINAIRE FOR RESTROOMS

10 2X4 LED TROFFER FOR OFFICE AREA

15 SAME AS 'D' EXCEPT SURFACE MOUNTED

SURFACE MOUNTED EXTERIOR LED SQUARE

5" DIAMETER CEILING MOUNT CYLINDER OVER

TRACK LIGHTING FOR MEMORIAL ALCOVE -

RECESSED REMODEL LED DOWNLIGHTS -

19 HIGH CRI DRESSING ROOM LIGHT - DIMMABLE

IMAGE AND PATTERN CHANGING

R 11 LED UTILITY STRIP LIGHT WO/INTEGRAL SENSOR

AT EACH STATION - DIMMABLE

15 EXTERIOR LINEAR LED FIXTURE, RGB WHITE

MIXING, 4', IP 65 RATED, DMX 512 ON ROOF

2 EDGE LIT IDENTIFICATION SIGN WRED LETTERS.

4 EXTERIOR LED FLOOD FIXTURES ON CANOPY

17 EXTERIOR LED FLOOD FIXTURES ON WALL

15 THERMOPLASTIC EXIT SIGN W/GREEN LETTERS

1 EDGE-LIT EXIT SIGN WGREEN LETTERS

22 EDGE-LIT EXIT SIGN WIGREEN LETTERS

(6) - ALL LIGHTING FIXTURES SHALL BE ULLISTED.

EXTERIOR IMAGE PROJECTION FIXTURE ON

CANOPY, FIXTURE SHALL BE PROGRAMMABLE

IMAGE AND PATTERN CHANGING, IP 65 RATED

FOR CONTINUOUS ROTATING, ZOOM, AND COLOR,

(1) - REFER TO SPECIFICATIONS FOR ADDITIONAL LIGHTING FIXTURE REQUIREMENTS.

(4) - REFER TO PLANS FOR MOUNTING HEIGHT/ORIENTATION AND CONSTRUCTION MATERIAL.

(7) - EXIT FIXTURES AND THE EMERGENCY FIXTURES SHALL BE FED WITH A NON SWITCHED EMERGENCY CIRCUIT

REPORTS, IES FILES, AND COMPLETE AND MODELED NORMAL AND EMERGENCY PHOTOMETRIC PLANS FOR REVIEW OF EQUALITY.

(9) - QUANTITIES LISTED ARE FOR REFERENCE ONLY, CONTRACTOR IS RESPONSIBLE TO VERIFY ACTUAL QUANTITIES REQUIRED.

(5) - THE FINAL FIXTURE HOUSING AND REFLECTOR FINISH SHALL BE SELECTED BY A/E.

STORAGE AREAS

1 EXHAUST FAN/LIGHT

V2

GENERAL NOTES:

34 4'0 LED UTLITY LUMINAIRE FOR WAREHOUSE

SAME AS 'P', EXCPET LOWER WATTAGE FOR

THEATRICAL MAKE-UP LIGHTING AROUND MIRROR

WALL MOUNT LED BACK OF HOUSE TASK LIGHT

NTERIOR IMAGE PROJECTION FIXTURE OVER

LOBBY AND AUDITORIUM ENTRY DOORS, AND IN

GALLERY, FIXTURES SHALL BE PROGRAMMABLE

FOR CONTINUOUS ROTATING, ZOOM, AND COLOR,

2 LOW PROFILE CANOPY FIXTURE

4 SAME AS 'D1', EXCEPT 2X2

450 LF LINEAR LED EXTERIOR COVE LIGHTING

160 LF LINEAR LED CEILING LIGHTING IN LOBBY

LUMINAIRE - DIMMABLE

TICKET WINDOW

19 AUDITORIUM STEPLIGHT - DIMMABLE

MANUFACTURER

SPECTRUM

SPECTRUM

FAIL-SAFE

LUMARK

METALUX

METALUX

WAC

CSL

LUMINII

HALO

KUZCO

ACCLAIM

NEW STAR

NEW STAR

BROAN

METALUX

BOCA

SURE-LITES

MCGRAW-EDISON

ACCLAIM

MCGRAW-EDISON

SURE-LITES

SURE-LITES

SURE-LITES

(3) - ALL DIMENSIONS LISTED ABOVE ARE NOMINAL SIZES. SLIGHT VARIATIONS IN SHAPE OR SIZE WILL BE CONSIDERED BASED ON THE PROJECT REQUIREMENTS.

(10) - CONTRACTOR RESPONSIBLE FOR COORDINATING FIXTURE MOUNTING REQUIREMENTS WITH CEILING TYPE FOR SURFACE, PENDANT, OR RECESSED APPLICATIONS.

SWITCH SWITCH, 2 POLE SWITCH, 3-WAY SWITCH, 4-WAY SWITCH - LINE VOLTAGE TIMER, 120/277 VAC. WATTSTOPPER TS-400 OR SWITCH - PILOT LIGHT SWITCH, 1 POLE, LETTER INDICATES SWITCHLEG CONTROLLED. SWITCH, 3-WAY, LETTER INDICATES SWITCHLEG CONTROLLED SWITCH, KEYSWITCH, 3-WAY SWITCH, TIMER MOTOR RATED SWITCH SWITCH, EXPLOSION PROOF **⇒**EXÞ SWITCH, LOW VOLTAGE MOMENTARY SWITCH, WEATHERPROOF YVS INFRA RED (IR) VACANCY SENSOR LIGHTING CONTROL DEVICES PHOTOCELL TC TIMECLOCK LIGHTING CONTACTOR

\*PIR-WALL MOUNT SENSOR, LOW TEMP, 24 VDC/AC, 20mA. WATTSTOPPER CB-100 OR EQUAL. \*PIR-CEILING MOUNT SENSOR 24 VDC/VAC, 11mA, WATTSTOPPER CI-205 OR \*DUAL ULTRASONIC/PIR-CEILING MOUNT SENSOR, 24 VDC/VAC, 35mA. WATTSTOPPER DT-305 OR EQUAL. \*DUAL ULTRASONIC/PIR-WALL MOUNT SENSOR, 24 VAC/VDC, 35mA. WATTSTOPPER DT-205 OR EQUAL. \*ULTRASONIC-CEILING CORRIDOR MOTION SENSOR, 24 VDC/VAC, 40mA. WATTSTOPPER WT--2250 OR EQUAL.

PIR-WALL SWITCH DECORATOR MOTION SENSOR, 120/277 VAC, 800/1200W. WATTSTOPPER PW-100 OR EQUAL. DUAL ULTRASONIC/PIR-WALL SWITCH DECORATOR MOTION SENSOR, 120/277VAC, 800/1200W. WATTSTOPPER DW-100 OR EQUAL. DUAL ULTRASONIC/PIR-DUAL RELAY WALL SWITCH DECORATOR MOTION SENSOR, 120/277VAC, 800/1200W. WATTSTOPPER DW-200 OR EQUAL.

UL 924 LISTED FAILSAFE EMERGENCY SWITCHING RELAY, LVS EPC-A OR EQUAL. LOWER CASE LETTER NEXT TO DEVICE INDICATES SWITCHLEG

\*FOR LOW VOLTAGE OCCUPANCY SENSORS, PROVIDE POWER PACK(S) 120/277 VAC; 20 AMPS, 225mA SECONDARY AS NEEDED FOR ZONE/AREA CONTROL. WATTSTOPPER BZ-150 OR EQUAL.

POWER PACK 120/277 VAC; 20 AMPS, 225mA SECONDARY. WATTSTOPPER

POWER DISTRIBUTION

120/208V PANELBOARD, RECESSED 120/208V PANELBOARD, SURFACE MOUNT 277/480V PANELBOARD, SURFACE MOUNT

277/480V PANELBOARD, RECESSED FEEDER OR BRANCH CIRCUIT CONCEALED IN WALL, CEILING OR FLOOR

HOMERUN CONSISTING OF ONE SINGLE-PHASE, 1-POLE CIRCUIT, SEE SPECIFICATIONS AND/OR FEEDER SCHEDULES FOR WIRE SIZES. PANELBOARD AND CIRCUIT DESIGNATION ARE INDICATED.

HOMERUN CONSISTING OF ONE SINGLE-PHASE, 2-POLE CIRCUIT: SEE SPECIFICATIONS AND/OR FEEDER SCHEDULES FOR WIRE SIZES. PANELBOARD AND CIRCUIT DESIGNATIONS ARE INDICATED.

HOMERUN CONSISTING OF TWO SINGLE-PHASE CIRCUITS: SEE SPECIFICATIONS AND/OR FEEDER SCHEDULES FOR WIRE SIZES. PANELBOARD AND CIRCUIT DESIGNATION ARE INDICATED.

HOMERUN CONSISTING OF THREE SINGLE—PHASE CIRCUITS: SEE 1R1-1,3,5 SPECIFICATIONS AND/OR FEEDER SCHEDULES FOR WIRE SIZES. PANELBOARD AND CÍRCUIT DESIGNATIONS ARE INDICATED.

HOMERUN CONSISTING OF ONE THREE-PHASE CIRCUITS: SEE 1M1-1:3:5 SPECIFICATIONS AND/OR FEEDER SCHEDULES FOR WIRE SIZES. PANELBOARD AND CIRCUIT DESIGNATIONS ARE INDICATED.

# POWER DEVICES

SINGLE RECEPTACLE DUPLEX RECEPTACLE DOUBLE DUPLEX RECEPTACLE

ABOVE COUNTER DUPLEX RECEPTACLE DUPLEX RECEPTACLE, HALF SWITCHED

SPECIAL PURPOSE RECEPTACLE SINGLE 250V NON-LOCKING TYPE RECEPTACLE DUPLEX RECEPTACLE FOR COMPUTER WORKSTATION

QUAD RECEPTACLE FOR COMPUTER WORKSTATION DUPLEX RECEPTACLE FOR TV LOCATED AT 84" AFF UNLESS NOTED

DUPLEX RECEPTACLE FOR TV LOCATED AT 18"AFF. LOCATE IN COMMON BOX

CEILING MOUNTED RECEPTACLE RECESSED FLOOR RECEPTACLE

DUPLEX RECEPTACLE, GROUND FAULT DUPLEX RECEPTACLE, GROUND FAULT, ABOVE COUNTER

QUAD RECEPTACLE, GROUND FAULT DUPLEX RECEPTACLE, GROUND FAULT WITH CAST ALUMINUM WEATHERPROOF "IN USE"

> QUAD RECEPTACLE, GROUND FAULT WITH CAST ALUMINUM WEATHERPROOF "IN USE"

DUPLEX RECEPTACLE, GROUND FAULT LOCATE WITHIN ELECTRIC WATER COOLER PER MANUFACTURER'S INSTRUCTIONS

**CLOCK** POWER/DATA POLE POWER POLE

DISCONNECT SWITCH MOTOR STARTER

STARTER/DISCONNECT SWITCH VARIABLE FREQUENCY DRIVE

JUNCTION BOX FLOOR MOUNTED JUNCTION BOX

**EQUIPMENT CONNECTION** 

DOOR BELL PUSH BUTTON TRANSFORMER

DOOR BELL

SHUNT TRIP. MTD. AT 6'-5" AFF/AFG TO TOP OF ENCLOSURE f.

# **GENERAL NOTES**

₩OTOR

**GENERATOR** 

LOCKBOX

E200 SCALE:

XX

GROUND BUS BAR

----- DETAIL NUMBER

- DETAIL NUMBER

AUDIO ENHANCEMENT

ABOVE FINISHED CEILING

ABOVE FINISHED FLOOR

ABOVE FINISHED GRADE

AMPERES INTERUPTING

AMERICAN WIRE GAUGE

BELOW FINISHED CEILING

BELOW FINISHED GRADE

CURRENT TRANSFORMERS

ENCLOSED CIRCUIT BREAKER

ELECTRICAL METALLIC TUBING

ELECTRIC UNIT HEATER

EXPLOSION PROOF

FRONT OF HOUSE

FULL LOAD AMPERES

GROUND FAULT CIRCUIT

GROUND FAULT PROTECTION

HIGH INTENSITY DISCHARGE

HIGH PRESSURE SODIUM

FIRE ALARM

FLUORESCENT

INTERRUPTER

GROUND

HEIGHT

ELECTRIC WATER COOLER

ELECTRIC WATER HEATER

CAPACITY

ALUMINUM

CONDUIT

CEILING

DWG

ECB

EXH

EXIST

FLUOR

FOH

GND

HGT

CENTERLINE

DRAWING(S)

EXHAUST FAN

EQUIPMENT

EXHAUST

DISCONNECT(ING)

- DETAIL TITLE REFERENCE

GROUND ROD WITH TEST INSPECTION WELL. SEE SPECIFICATIONS.

SURGE PROTECTION DEVICE, SEE SPECIFICATIONS.

MISCELLANEOUS SYMBOL LEGEND

SHEET NUMBER WHERE DETAIL IS REFERENCED

HOA

HVAC

kWH

LTG

MMS

PNL

RGS

SPD

XFMR

TEL

HAND-OFF-AUTOMATIC

HEATING/VENTILATING/

KILO-VOLTS-AMPERES

MAIN CIRCUIT BREAKER

MOTOR CONTROL CENTER

MOTOR CIRCUIT PROTECTOR

MANUAL MOTOR STARTER SW

NOTIFICATION APPLIANCE CIRCUIT

NATIONAL ELECTRICAL CODE

NIGHT LIGHT, UNSWITCHED

KILO-WATT-HOURS

KILO-VOLTS-AMPERES REACTIVE

AIR CONDITIONING

HORSEPOWER

HIGH VOLTAGE

INCANDESCENT

JUNCTION BOX

KILO-VOLTS

KILO-WATTS

LIGHTING

METER

MILLIMETER

MANUFACTURER

MISCELLANEOUS

NOT IN CONTRACT

PULL STATION INSIDE POLYVINYL CHLORIDE

RIGID GALVANIZED STEEL

SURGE PROTECTION DEVICE

UNLESS OTHERWISE NOTED

VARIABLE FREQUENCY DRIVE

RECEPTACLE

TELEPHONE

VOLT-AMPERES

WEATHER PROOF

TRANSFORMER

TYPICAL

WATTS

METAL HALIDE

MINIMUM

MOTOR

PANFI

MOUNTED

MOUNTING

a. THE CONTRACT DOCUMENTS FOR THIS PROJECT CONSIST OF DRAWINGS AND BOOK SPECIFICATIONS. GENERAL NOTES ON A DRAWING SHEET ALSO PERTAIN TO THE ENTIRE SET OF SHEETS.

b. PROTECT BUILDING SYSTEMS AT ALL TIMES DURING CONSTRUCTION. MAINTAIN CONTINUITY OF SYSTEMS TO REMAIN. IF NECESSARY PROVIDE TEMPORARY OR PERMANENT RE-WIRING TO RECONNECT SYSTEM DEVICES TO THE BUILDING SYSTEMS SO SERVICES ARE NOT INTERRUPTED DURING CONSTRUCTION.

c. COORDINATE WORK WITH ALL OTHER TRADES BEFORE ANY ROUGH-INS.

d. PATCH AND REPAIR WALLS, FLOORS AND CEILINGS AFFECTED BY DEMOLITION OR NEW WORK AS REQUIRED TO MATCH EXISTING

e. CONTRACTOR SHALL PERFORM CIRCUIT TRACE ON ALL BRANCH CIRCUITS IN PANEL BEING REPLACED AND PROVIDE AN UPDATED TYPEWRITTEN PANEL SCHEDULE IDENTIFYING CIRCUITS FED AND LOCATION AND/OR ROOM NUMBER.

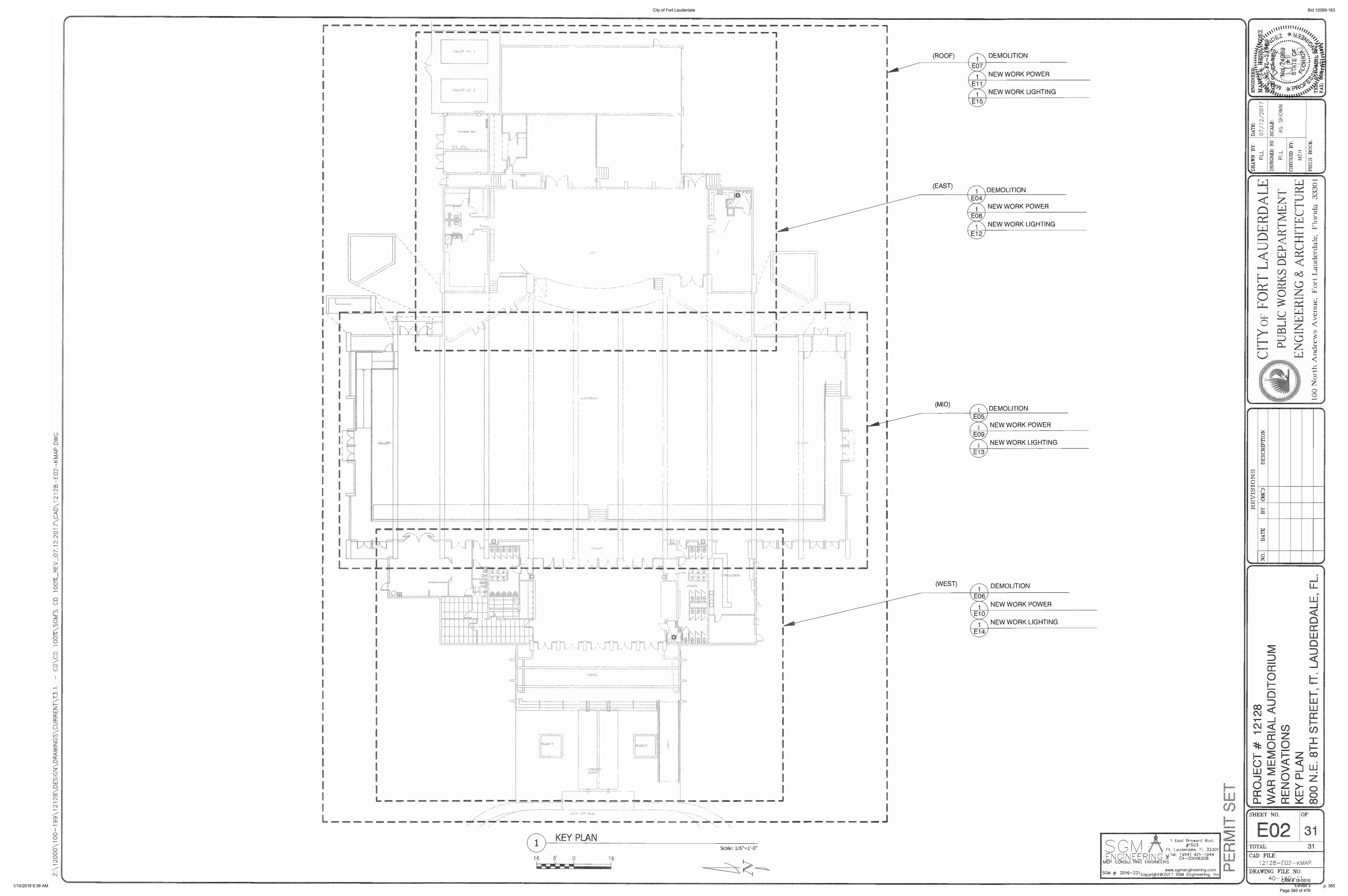
CONTRACTOR TO CHECK PHASE ROTATION PRIOR TO DISCONNECTION AND AFTER RECONNECTION OF POWER.

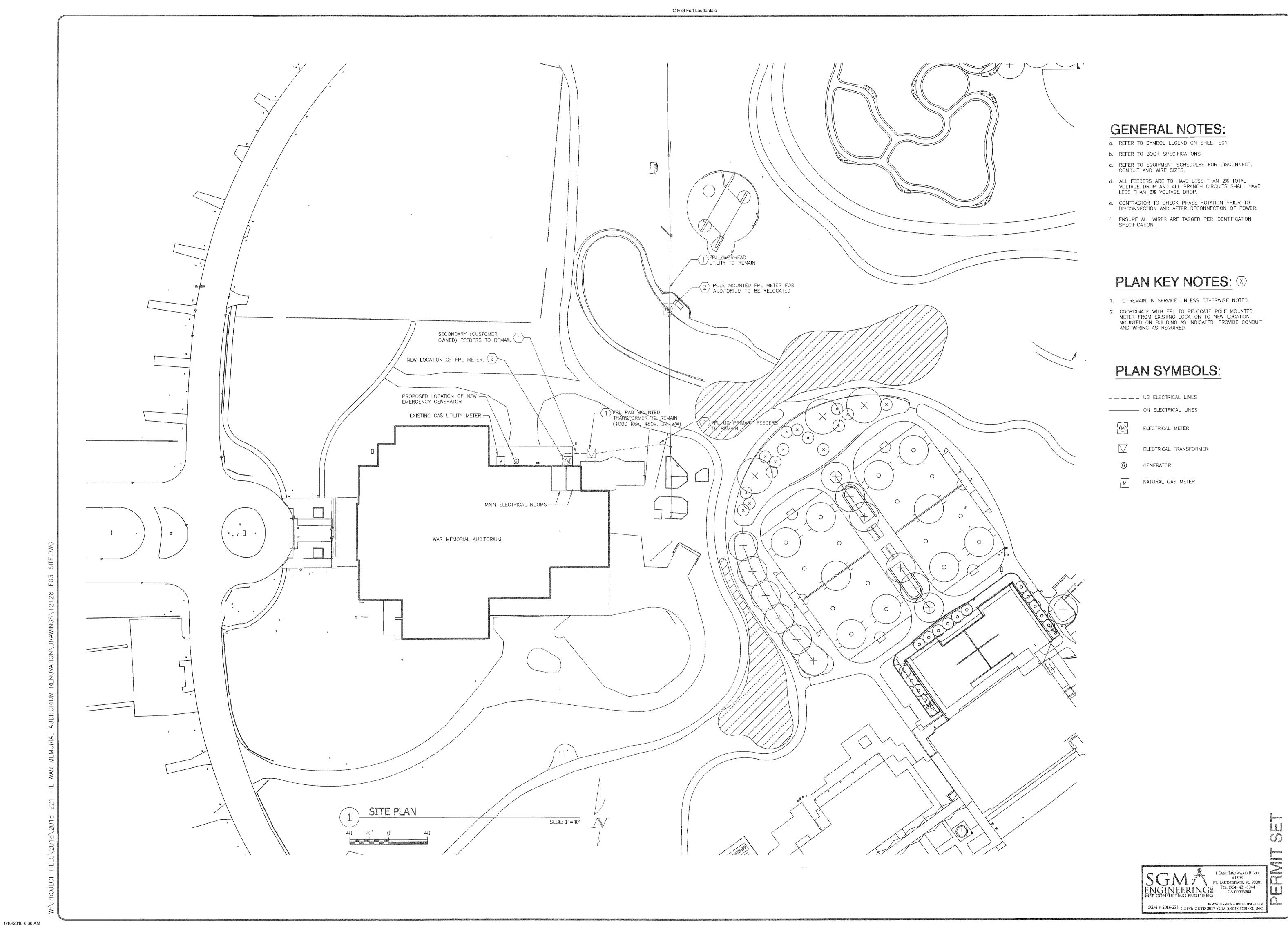
g. IF CIRCUITS ARE COMBINED AND RUN AS MULTI-WIRE BRANCH CIRCUITS SHARING A COMMON NEUTRAL, THEN EACH UNGROUNDED CONDUCTOR MUST BE DISCONNECTED SIMULTANEOUSLY BY A COMMON TRIP CIRCUIT BREAKER CONTRACTOR MAY, AT THEIR OPTION, PROVIDE EITHER COMMON TRIP MULTI-POLE CIRCUIT BREAKERS OR UTILIZE MANUFACTURERS LISTED HANDLE TIES IN ORDER TO PROVIDE THE SIMULTANEOUS TRIP. THESE DEVICES ARE NOT SHOWN IN THE PANEL SCHEDULES AND MUST BE PROVIDED BY THIS SCOPE OF WORK, NO MORE THAN 3 CIRCUITS MAY BE COMBINED IN A SINGLE RACEWAY WITHOUT PRIOR APPROVAL BY THE ENGINEER.

1/10/2018 6:36 AM

4-140-11 Exhibit 3 p. 384 Page 384 of 476

|OF|







Bid 12089-183

AUDERDALE

DEPARTMENT WORKS NGINEERING

1 EAST BROWARD BLVD. #1503 Ft. LAUDERDALE, FL. 33301 TEL: (954) 421-1944 CA-00006208

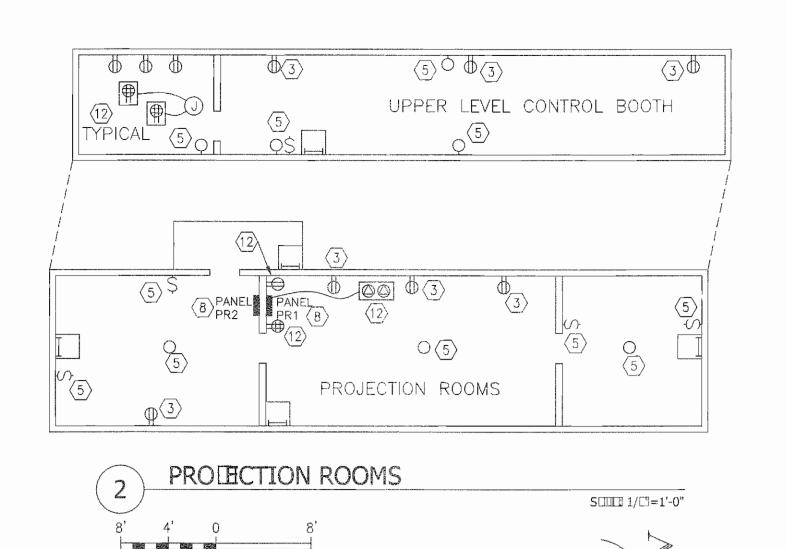
12128-E03-SITE DRAWING FILE NO. 4-140-11

Exhibit 3 p. 386
Page 386 of 476

1/10/2018 6:36 AM

31 12128-E04-DEMO

Page 387 of 476



**GENERAL NOTES:** 

a. REFER TO SYMBOL LEGEND ON SHEET E01

b. REFER TO BOOK SPECIFICATIONS.

FOR NEW WORK.

c. COORDINATE ALL WORK SCHEDULING WITH OWNER.

d. CONTRACTOR TO CHECK PHASE ROTATION PRIOR TO DISCONNECTION AND AFTER RECONNECTION OF POWER.

e. ENSURE ALL WIRES ARE TAGGED PER IDENTIFICATION

SPECIFICATION. f. UTILIZE EXISTING RACEWAY AND J-BOXES AS POSSIBLE

g. EXISTING PANEL BOARDS, J-BOXES, LIGHT FISXTURES SWITCHES, AND EXPOSED RACEWAY AFFECTED BY DEMOLITION NOT BEING REUSED DURING NEW WORK, SHALL BE REMOVED ENTIRELY. UNUSED RACEWAY STUB-OUTS OF CONCEALED CONDUITS SHALL BE

h. PATCH AND FINISH IMMEDIATE AREA AFFECTED BY DEMOLITION AS REQUIRED TO MATCH PRE-CONSTRUCTION SURROUNDING AREA CONDITIONS.

i. PERFORM CIRCUIT TRACE ON ALL BRANCH CIRCUITS IN PANEL BEING REPLACED AND PROVIDE AN UPDATED TYPEWRITTEN PANEL SCHEDULE IDENTIFYING CIRCUITS FED AND LOCATION AND/OR ROOM NUMBER.

j. SEGREGATE ALL GROUNDS AND NEUTRALS ONTO THE CORRECT BUS.

k. CONFIRM THERE IS A GROUND CONDUCTOR FOR EACH LOAD OR THAT THE CONDUIT PATH GROUND IS CONTINUOUS FOR EACH LOAD.

I. IDENTIFY CONDUITS EXITING PANEL WITH CIRCUIT NUMBER INFORMATION.

m. DEVICES ARE SHOWN IN APPROXIMATE LOCATIONS.

LOCATE DEVICES WITHOUT INTERFERENCE OF DOORS AND OTHER EQUIPMENT, COORDINATE WITH ALL OTHER TRADES PRIOR TO ROUGH-IN.

# PLAN KEY NOTES: 🗵

1. REMOVE PENDANT LIGHTING FIXTURES, MOUNTING BRACKETS, SWITCHES AND WIRING BACK TO SOURCE.

2. MECHANICAL EQUIPMENT AND CONNECTIONS TO REMAIN.

3. REMOVE RECEPTACLES SHOWN. REMOVE WIRING BACK TO

4. REMOVE RECESSED LIGHTING FIXTURE AND WIRING BACK

5. REMOVE SURFACE MOUNTED LIGHTING FIXTURE, SWITCHES, AND WIRING BACK TO SOURCE.

6. SURFACE WALL SCONCE TO REMAIN. REMOVE WRING TO

7. REMOVE SURFACE MOUNTED LIGHTING FIXTURE, J-BOX, RACEWAY, AND WIRING BACK TO SOURCE.

8. PANEL BOARD TO REMAIN IN SERVICE.

TO SOURCE.

REMOVE RECESSED RECEPTACLE, J-BOX, AND WIRING TO SOURCE, PATCH AND PAINT WALL TO MATCH EXISTING CONDITIONS.

10. REMOVE TWIST LOCK RECEPTACLES SHOWN, REMOVE WIRING BACK TO SOURCE. STORE TWIST LOCK RECEPTACLES FOR REINSTALLATION DURING NEW WORK.

11. REMOVE SAFETY SWITCH AND WIRING BACK TO SOURCE.

12. RECEPTACLE TO REMAIN IN SERVICE.

13. ALT BID #1 - REMOVE LIGHTING FIXTURE INCLUDING ASSOCIATED MOUNTING BRACKETS AND WIRING TO



**DEMOLITION PLAN - MID** 

SIII 1/I = 1'-0"

Bid 12089-183

OER OER RING

AUDITORIUM

1 EAST BROWARD BLVD. #1503 FT. LAUDERDALE, FL. 33301 G TEL: (954) 421-1944 CA-00006208

www.sgmengineering.com sgm #: 2016-221 Copyright® 2017 sgm engineering. Inc.

COTAL: CAD FILE: 12128-E05-DEMO DRAWING FILE NO. 4-140-11 CAM#18-0510

Exhibit 3 Page 388 of 476

1/10/2018 6:36 AM

# **INSPECTION PHOTOGRAPHS**



Photo 1: War Memorial Auditorium located at 800 NE 8<sup>th</sup> Street



Photo 2: Typical nonACM gray plaster finishes.





Photo 4: Typical nonACM white 2'x4' dot circle ceiling tiles.



Photo 5: NonACM white 2'x2' and 12"x12" ceiling tiles in lobby.



Photo 6: Typical nonACM gray duct mastic.

# **CERTIFICATES**



Certificate # MEB4512491CECD413

# **David Soto**

has on 4/25/2017, in Miami, FL completed the requirements for asbestos accreditation under Section 206 of TSCA Title II, 15 USC 2646

# 4-hr. Asbestos Building Inspector Refresher

as approved by FL and the US EPA under 40 CFR 763 (AHERA) from 4/25/2017 to 4/25/2017 and passed the associated exam on 4/25/2017 with a score of at least 70%



Training Provider #: FL49-0001221 Course #: 170425ASBIRFL719

> SSN: XXX-XX-8187 Expiration: 4/25/2018

Lawrence, KS. 66044

P.O. Box 786

www.metaenvironmental.net

Ma Sum

Bill Young Instructor

Thomas Mayhew

President

800.444.6382



# STATE OF FLORIDA DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

ASBESTOS LICENSING UNIT 2601 BLAIR STONE ROAD TALLAHASSEE FL 32399-0783 (850) 487-1395

SALL, JAY WALTER EE & G ENVIRONMENTAL SERVICES LLC 5751 MIAMI LAKES DRIVE MIAMI LAKES FL 33014

Congratulations! With this license you become one of the nearly one million Floridians licensed by the Department of Business and Professional Regulation. Our professionals and businesses range from architects to yacht brokers, from boxers to barbeque restaurants, and they keep Florida's economy strong.

Every day we work to improve the way we do business in order to serve you better. For information about our services, please log onto www.myfloridalicense.com. There you can find more information about our divisions and the regulations that impact you, subscribe to department newsletters and learn more about the Department's initiatives.

Our mission at the Department is: License Efficiently, Regulate Fairly. We constantly strive to serve you better so that you can serve your customers. Thank you for doing business in Florida, and congratulations on your new license!



ASBESTOS CONSULTANT SALL, JAY WALTER EE & G ENVIRONMENTAL SERVICES LLC

IS LICENSED under the provisions of Ch. 469 FS. Expiration date: NOV 30, 2018 L1610250005421

DETACH HERE

RICK SCOTT, GOVERNOR

KEN LAWSON, SECRETARY

# STATE OF FLORIDA DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION ASBESTOS LICENSING UNIT

# LICENSE NUMBER

AX0000011

The ASBESTOS CONSULTANT Named below IS LICENSED Under the provisions of Chapter 469 FS. Expiration date: NOV 30, 2018

> SALL, JAY WALTER EE & G ENVIRONMENTAL SERVICES LLC 2922 FLAMINGO DRIVE MIAMI BEACH FL 33140





CAM # 18-0510

# United States Department of Commerce National Institute of Standards and Technology



# Certificate of Accreditation to ISO/IEC 17025:2005

**NVLAP LAB CODE: 101775-0** 

# American Asbestos Laboratories, Inc.

Tampa, FL

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

# **Asbestos Fiber Analysis**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2017-04-01 through 2018-03-31

Effective Dates



For the National Voluntary Laboratory Accreditation Program

CAM # 18-0510



# United States Department of Commerce National Institute of Standards and Technology



#### Certificate of Accreditation to ISO/IEC 17025:2005

**NVLAP LAB CODE: 500085-0** 

#### EMSL Analytical, Inc.

Fort Lauderdale, FL

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

#### **Asbestos Fiber Analysis**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2016-07-01 through 2017-06-30

Effective Dates



For the National Voluntary Laboratory Accreditation Program



#### SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

#### EMSL Analytical, Inc.

2700 West Cypress Creek Road Bldg. B, Suite 111 Fort Lauderdale, FL 33309 Ms. Amrita Paul

Phone: (954) 786-9331 Fax: (954) 941-4145

Email: apaul@emsl.com http://www.emsl.com

#### ASBESTOS FIBER ANALYSIS

#### **NVLAP LAB CODE 500085-0**

#### **Bulk Asbestos Analysis**

<u>Code</u> <u>Description</u>

18/A01 EPA 600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples

18/A03 EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

For the National Voluntary Laboratory Accreditation Program



# CITY OF FORT LAUDERDALE

# PROJECT #12128 WAR MEMORIAL AUDITORIUM RENOVATIONS

800 N.E.8TH STREET FORT LAUDERDALE, FLORIDA

#### GENERAL SCOPE OF WORK

THE OBJECTIVES OF THIS PROJECT AS IDENTIFIED ON THE DRAWINGS, INCLUDES:

- 1. REMOVE AND REPLACE AUDITORIUM AND BUILDING LIGHTING FIXTURES WITH NEW LED LIGHTING FIXTURES.
- 2. REMOVE AND REPLACE WIRING ASSOCIATED WITH LIGHTING WITH NEW WIRING, CONDUIT TO REMAIN AND BE REUSED IF IN GOOD CONDITION AND MEETS NEC.
- 3. PROVIDE NEW LIGHTING CONTROL SYSTEMS FOR THE AUDITORIUM AND OFFICE / LOBBY AREAS
- 4. PROVIDE NEW CONDUITS AND RACEWAYS AS REQUIRED.
- 5. REPLACE PANEL BOARDS AND FEEDERS WITH NEW AS INDICATED.
- 6. PROVIDE NEW PANEL BOARDS AND FEEDERS AS INDICATED.
- 7. REMOVE PANEL BOARDS AND FEEDERS AND INDICATED.
- 8. REPLACE SELECTED RECEPTACLES, AND SWITCHES, AND ASSOCIATED BRANCH CIRCUITS AS INDICATED
- 9. REMOVE TWO GENERATORS AND ASSOCIATED TRANSFER SWITCHES AND REPLACE WITH ONE NEW GENERATOR AND ONE
- a. REPLACE EXTERIOR MOUNTED WALL PACK FIXTURES "W" WITH NEW LED FIXTURES. b. REPLACE EXTERIOR SURFACE MOUNTED CANOPY FIXTURES "C1" WITH NEW LED FIXTURES.
- c. REPLACE ROOF FLOOD LIGHT "V1" LIGHTS WITH NEW LED FIXTURES d. PROVIDE NEW EXTERIOR LINEAR LED LIGHTING "SL" TO ILLUMINATE BUILDING IDENTIFICATION LETTERS ON ROOF. FIXTURE SHALL BE PROGRAMMABLE FOR COLOR CHANGING.
- a. PROVIDE NEW INTERIOR IMAGE PROJECTION FIXTURES "O" OVER LOBBY AND AUDITORIUM ENTRY DOORS. FIXTURE SHALL BE PROGRAMMABLE FOR CONTINUOUS ROTATING, ZOOM, AND COLOR, IMAGE AND PATTERN CHANGING.
- a. PROVIDE NEW EXTERIOR IMAGE PROJECTORS "V2" ON CANOPY. FIXTURE SHALL BE PROGRAMMABLE FOR CONTINUOUS ROTATING, ZOOM, AND COLOR, IMAGE AND PATTERN CHANGING.
- a. ADD ADJUSTABLE COLOR TEMPERATURE CHANGING CAPABILITIES TO NEW INTERIOR AUDITORIUM FIXTURES "A" & "A1".
- ALT BID #5
  a. REPLACE THREE WINDOWS LOCATED IN THE THREE NORTH OFFICES WITH NEW.
- 14. <u>ALT. BID #6</u>
  a. REPLACE STAINED OR DAMAGED CEILING TILES IN THE CENTRAL PART OF THE PERIPHERAL CORRIDOR WEST AND IN THE TRIBUTE DISPLAY IN THE LOBBY WITH NEW TO MATCH EXISTING CONDITIONS. EXISTING CEILING GRID TO REMAIN. THIS BRIEF DESCRIPTION OF THE SCOPE OF WORK IS NOT ALL INCLUSIVE AND IS COMPLIMENTED BY THE SET OF CONSTRUCTION DOCUMENTS AND SPECIFICATIONS.

#### **CODES**

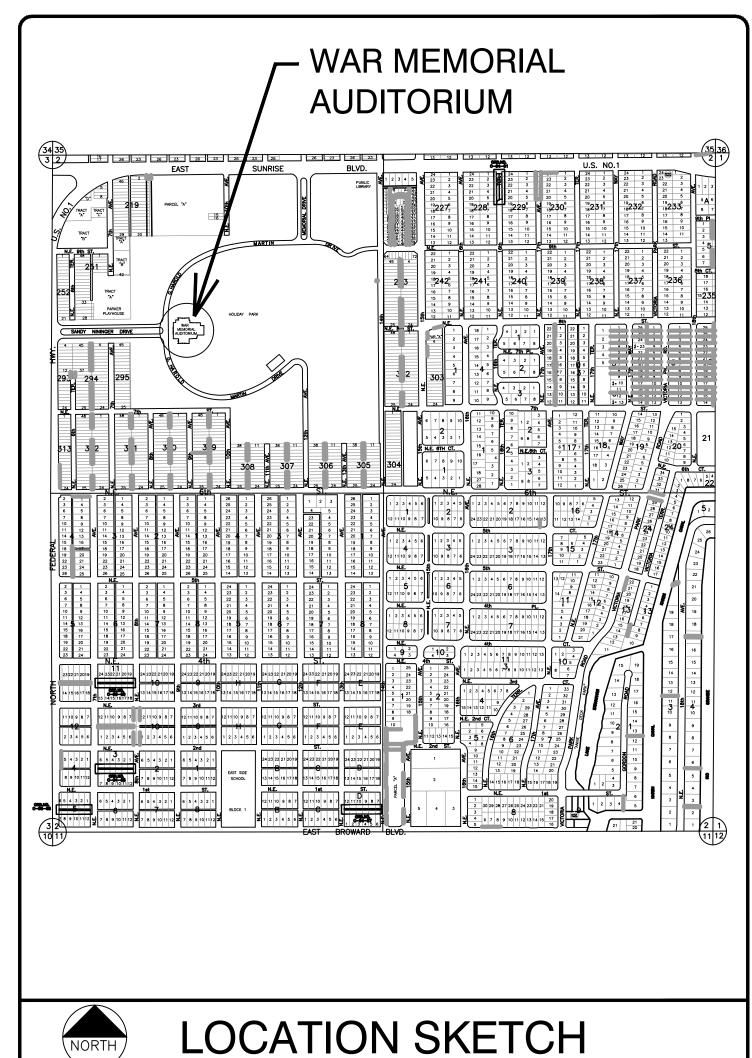
ALL ELECTRICAL WORK AND MATERIALS SHALL BE IN COMPLIANCE WITH ALL GOVERNING CODES AND STANDARDS. THIS SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING.

- A. NFPA 70 NATIONAL ELECTRICAL CODE (2011 EDITION)
- B. FLORIDA BUILDING CODE (2014 FIFTH EDITION) C. NFPA 72 NATIONAL FIRE CODE (2010 EDITION)
- D. FLORIDA FIRE PREVENTION CODE (2014 FIFTH EDITION) E. LOCAL REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION

#### **CONSTRUCTION SCHEDULING**

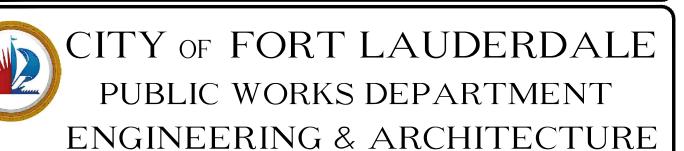
- 1. COORDINATE AND SCHEDULE ALL POWER SHUTDOWNS WITH BUILDING MANAGEMENT A MINIMUM OF TWO WEEKS PRIOR TO DATE OF EXPECTED SHUTDOWN.
- 2. ALL PRE-WORK AND WORK PREPERATION SHALL BE IN PLACE PRIOR TO SHUTDOWN TO MINIMIZE TIME REQUIRED FOR ANY POWER SHUTDOWNS.
- PROVIDE TEMPORARY POWER AS REQUIRED TO MINIMIZE INTERRUPTIONS OF DAILY
- 4. PROVIDE TEMPORARY POWER AS REQUIRED TO PROVIDE SERVICE FOR SCHEDULED
- 5. EXISTING STAGE LIGHTING PANELBOARD SWD SHALL REMAIN IN SERVICE.
- 6. EXISTING THEATRICAL AND DIMMER SYSTEM SHALL REMAIN IN SERVICE.

1 East Broward Blvd Ft. Lauderdale, Fl. 333 -NGINEERING € Tel: (954) 421-1944 EP CONSULTING FNGINFERS M #: 2016-221 Copyright© 2017 SGM Engineering, I



## PROJECT #12128 WAR MEMORIAL AUDITORIUM RENOVATIONS

800 N.E.8TH STREET



100 North Andrews Avenue, Fort Lauderdale, Florida 33301

#### FORT LAUDERDALE CITY COMMISSION

MAYOR JOHN P. "JACK" SEILER COMMISSIONER - DISTRICT I BRUCE G. ROBERTS

DEAN J. TRANTALIS COMMISSIONER - DISTRICT II ROBERT L. McKINZIE COMMISSIONER - DISTRICT III

ROMNEY ROGERS COMMISSIONER - DISTRICT IV

IRINA TOKAR, R.A. - SENIOR PROJECT MANAGER 954-828-6891 954-828-5055 DANICA GRUJICIC - PROJECT MANAGER I BOBBY SHAHNAMI P.E. - S.G.M. PROJECT MANAGER 954-421-1944 MANUEL HERNANDEZ P.E. - S.G.M. ELECTRICAL ENGINEER 954-421-1944

DATE: 7/12/2017

DRAWING FILE No.: 4-140-11

CAD FILE: 12128-000-000COVR

PERMIT SET

PATCH, REPAIR AND PAINT TO MATCH ORIGINAL, ALL SURFACES DAMAGED BY ANY REMOVAL OR IN AREA OF WINDOWS TO BE

PATCH TO MATCH ORIGINAL, ANY EXISTING SURFACE AS REQUIRED TO INSTALL NEW WINDOWS IN ACCORDANCE WITH THE FLORIDA BUILDING CODE AND THE MIAMI-DADE NOTICE OF ACCEPTANCE (NOA). ALL NEW WINDOWS TO MEET THE REQUIRED MINIMUM DESIGN PRESSURES:

\*WINDOW TYPE A: +72.31/-94.42 PSF •WINDOW TYPE B: +72.48/-78.76 PSF

NEW WINDOWS TO BE PGT SERIES "SH-800" ALUMINUM SINGLE HUNG WITH PRODUCT APPROVALS AS SHOWN ON SCHEDULE. ADJOINING WINDOWS WILL REQUIRE CONNECTION MULLIONS PER MANUFACTURER REQUIREMENTS. THESE MULLS SHALL BE AS PER

Kd Directional Factor = 0.85

WINDOW SCHEDULE MIN. DESIGN IMPACT MIAMI-DADE REMARKS FINISH GLASS MATERIAL PRESSURE RESISTANT WIDTH | HEIGHT ALUMINUM/IMPACT GLASS SINGLE HUNG IMPACT WINDOW WITH SCREEN. SINGLE HUNG IMPACT WINDOW WITH SCREEN. 16-0714.01  $\langle B \rangle$  | 4'-5"± | 4'-1"± | ALUMINUM/IMPACT GLASS | +72.48/-78.76 YES CLIPPED EXTRUDED ALUMINUM TUBE 16-0218.03 NOTE: SIZES NOTED ARE APPROXIMATE BASED ON FILED MEASUREMENTS AND SHALL BE VERIFIED BY CONTRACTOR

18. CONTRACTOR SHALL COMPLY WITH ALL SOUTH FLORIDA BUILDING CODE AND OSHA REQUIREMENTS.

REFER TO SEPARATE SET OF SPECIFICATIONS FOR SHOP DRAWING REQUIREMENTS.

INFORM THE CITY ARCHITECT AND REQUEST APPROVAL OF MATERIAL ORDERING IN

SHOP DRAWINGS WILL ONLY BE REVIEWED BY THE CITY ARCHITECT, IF THEY HAVE

ADVANCE. THIS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

BEEN PREVIOUSLY REVIEWED AND STAMPED APPROVED BY THE CONTRACTOR.

SHOP DRAWING APPROVAL SHALL NOT RELIEVE THE G.C. OF THE CONTRACT

NO MATERIAL SHALL BE ORDERED UNTIL THE SHOP DRAWINGS HAVE BEEN SUBMITTED AND APPROVED BY THE CITY ARCHITECT. IF SCHEDULING IS CRITICAL,

SHOP DRAWINGS

REQUIREMENTS.

SCALE: NTS

ASSEMBLY GROUP A-1 (SPRINKLERED)

CLASS C = FLAME SPREAD 76-200; SMOKE DEVELOPED INDEX 0-450

CLASS B = FLAME SPREAD 26-75;

SMOKE DEVELOPED INDEX 0-450

U-FACTOR: ≤ 0.65 OPERABLE

FENESTRATION

**BUILDING CODE INFORMATION:** 

EDITION 2014.

EXISTING BUILDING:

INTERIOR FINISHES:

ORRIDOR FINISHES:

ENERGY REQUIREMENTS:

LEGEND

ID ROOM NUMBER

ALL RENOVATIONS SHALL COMPLY WITH FLORIDA BUILDING CODE 5th

COMPLIANCE METHOD)

SHGC: ≤ 0.25

NEW WINDOW MARK (FOR NEW IMPACT RATED HURRICANE

WINDOWS). SEE WINDOW SCHEDULE ON THIS SHEET.

CLASSIFICATION OF WORK: ALTERATION LEVEL 1 (WORK AREA

IMPACT-RESISTANT GLAZING: LAMINATED INSULATED WITH LOW E-COATING

SHEET NO. CAD FILE: 12128-D01\_7.10.2017 DRAWING FILE NO.

PROJECT # P WAR MEMORIA RENOVATIONS FLOOR PLAN 8

1/10/2018 6:36 AM

REMOVE AND DISPOSE EXISTING WINDOWS AND

REPLACE EXISTING CEILING TILES (STAINED OR

CONDITIONS. EXISTING CEILING GRID TO REMAIN

(CONTRACTOR TO VERIFY THAT NEW TILES ARE

COMPATIBLE WITH EXISTING GRID PRIOR TO

FLOOR PLAN

ORDERING MATERIALS).

DAMAGED) WITH NEW TO MATCH EXISTING

PAINT TO MATCH EXISTING CONDITIONS.

WINDOW FRAMES AND REPLACE WITH NEW IMPACT

RESISTANT WINDOWS. REPAIR STUCCO AS NEEDED.

W ∞ W

Page 401 of 476

Bid 12089-183

PORCH

DROP OFF DRIVE

PLANT'R

PLANT'R

SCALE: 1/16"=1'-0"

TYPE	QTY.	DESCRIPTION	MANUFACTURER	LIGHTING FIXTURE SCHEI	OULE VOLTS	LAMP TYPE	BALLAST/DRIVER	WATTS	MOUNTING	NOTES
IYPE	QIY.	DESCRIPTION	MANUFACTURER	MODEL NOWBER	VOLIS	LANTE	BALLASIMRIVER	WATIS	WOUNTING	
Α	54	AUDITORIUM PENDANT-HIGH MOUNT - DIMMABLE	SPECTRUM	PRODH22LEDGV-180L-35K-E1-XX- PR22-CNF	120	LED	LED DRIVER	1. A.4.	PENDANT	ALT. BID #4 SHALL PROVIDE FIXTURES WITH COLOR TEMPERATORE CHANGING CAPABILITIES FROM 3000K TO 5700K.
Α1	42	AUDITORIUM PENDANT-LOWER MOUNT - DIMMABLE	SPECTRUM	PRDDH22LEDGV-150L-35K-E1-XX- PR22-CNF	120		LEO DRIVER	133	PENDANT	ALT. BID #4 SHALL PROVIDE FIXTURES WITH COLOR TEMPERATORE CHANGING CAPABILITIES FROM 3000K TO 5700K.
8	19	AUDITORIUM STEPLIGHT - DIMMABLE	LIGMAN	ULE-40722-11WLED-S-W30-XX-F	120		LED DRIVER	11	RECESSED	CONFIRM FINISH - COORDINATE WITH OWNER
BA	8	SAME AS 'B', EXCEPT SURFACE MOUNTED - DIMMABLE	LIGMAN	ULE-40722-11W-LED-W30-XX-F-SMB	120		LED DRIVER	11	SURFACE	CONFIRM FINISH - COORDINATE WITH OWNER
<b>6</b> 1	25 LF	ILLUMINATED HANDRAIL FOR ENTRY STAIR - DIMMABLE	Ю	06.SSS.1.PMC.NR.35KHO.HRXX.3.DIM	120	LED	LED DRIVER	3.81W/F	SURFACE	DIMMABLE
C	25	4'0 ARCHITECTURAL VANDAL RESISTANT LUMINAIRE FOR RESTROOMS	FAIL-SAFE	HVL8-4-LD4-1-LO-35-UNV-O-EDC-1-S	120	LED	LED DRIVER	24.1	SURFACE	
C)	2	LOW PROFILE CANOPY FIXTURE	LUMARK	CLCSLED-55	121	LED	LED DRIVER	58	SURFACE	ALT. 8f0 #1
D	10	2X4 LED TROFFER FOR OFFICE AREA	METALUX	24CZ-LD4-40-S-UNV-L835-CD1-U	120	LED	LED DRIVER	33	RECESSED	
<b>D</b> 1	15	SAME AS 'D' EXCEPT SURFACE MOUNTED	METALUX	24CZ-LD4-40-S-UNV-L835-CD1-SK24	120		LED DRIVER	33	SURFACE	
D2	4	SAME AS 'D1', EXCEPT 2X2	METALUX	22CZ-LD4-24-S-UNV-L835-CD1-SK24	120	LED	LED DRIVER	22.6	SURFACE	
	39	SURFACE MOUNTED EXTERIOR LED SQUARE LUMINAIRE - DIMMABLE	WAC	FM-1414XX	120	LEO	LED DRIVER	38	SURFACE	FINISH TO BE CONFIRMED. ELV DIMMING.
F	450 LF	LINEAR LED EXTERIOR COVE LIGHTING	LUMINII	LL30WET-31K-SL-NC-XX/SL7-XX-F-SA	120/24	LEC	LED DRIVER	2.5W/FT	SURFACE	REMOTE DRIVER, PROGRAMMABLE FOR COLOR CHANGING AND FADE FREQUENCY
ļ. ģ	6	5" DIAMETER CEILING MOUNT CYLINDER OVER TICKET WINDOW	CSL	LF5-30-WT-1	120	(ED)	LED DRIVER	38	SURFACE	CONFIRM EXISTING MOUNTING CONDITION BEFORE ORDERING
J	160 LF	LINEAR LED CEILING LIGHTING IN LOBBY	LUMINII	LL54-31K-SL-NC-NC-XX/SL7-XX-F-SA	24	LED	LED DRIVER	2.5W/FT	SURFACE	REMOTE DRIVER, PROGRAMMABLE FOR COLOR CHANGING AND FADE FREQUENCY
Þζ	***************************************	TRACK LIGHTING FOR MEMORIAL ALCOVE - DIMMABLE	HALO	L80808FL9030P-LNC-LVR	120	LED	LED DRIVER	12	SURFACE	MOUNTED ON L650 SERIES TRACK
<b>1</b>	2	RECESSED REMODEL LED DOWNLIGHTS - DIMMABLE	PORTFOLIO	LD6AR10-D010TR-ERM6A10830-6LM0H	120	LEO	LED DRIVER	14.1	RECESSED	USE NEW CONSTRUCTION HOUSINGS IF CEILINGS ARE BEING REPLACED
M	4	WALL MOUNT LED BACK OF HOUSE TASK LIGHT - DIMMABLE	KUZCO	WS6606WH	120	LED	LED DRIVER	15	SURFACE	
N	19	HIGH CRI DRESSING ROOM LIGHT - DIMMABLE	LUMENWERX	QUAWS-HLO-LED-90-550-30-4-120-LA2- 1-DRC	120	LED	LED DRIVER	20	SURFACE	and the second s
o	5	INTERIOR IMAGE PROJECTION FIXTURE OVER LOBBY AND AUDITORIUM ENTRY DOORS, AND IN GALLERY. FIXTURES SHALL BE PROGRAMMABLE FOR CONTINUOUS ROTATING, ZOOM, AND COLOR, IMAGE AND PATTERN CHANGING	ACCLAIM	E-SPOT III	120	LED	LED DRIVER	180	SURFACE	ALT. BID #2
þ	34	4'0 LED UTLITY LUMINAIRE FOR WAREHOUSE	NEW STAR	VIC4N-L2-40-1-RW-UN-WH	120	1ED	LED DRIVER	50	PENDANT	
P1	38	SAME AS 'P', EXCPET LOWER WATTAGE FOR STORAGE AREAS	NEW STAR	VIC4N-L1-40-1-RW-UN-WH	120	LED	LED DRIVER	25	PENDANT	
Q	1	EXHAUST FAN/LIGHT	BROAN	OT130LE	120	2-PLQ18/841	LED DRIVER	44	RECESSED	
F.	11	LED UTILITY STRIP LIGHT WO/INTEGRAL SENSOR	METALUX	2SWLED-LD4-16SL-LW-UNV-L840-CD1- SVPD1	120		LED DRIVER	48,9	SURFACE	
\$	21	THEATRICAL MAKE-UP LIGHTING AROUND MIRROR AT EACH STATION - DIMMABLE	PRIMUS	ALX1-MB-D-4-PAT-S-	120	3- 6G25DIM/827/ PER FT	INCAN	18W/LF	SURFACE	
SL	15	EXTERIOR LINEAR LED FIXTURE. RGB WHITE MIXING, 4', IP 65 RATED.DMX 512 ON ROOF	воса	FLASHER	120		LED DRIVER	16W/LF	SURFACE	ALT. BID #1
C	2	EDGE LIT IDENTIFICATION SIGN WRED LETTERS.	SURE-LITES	EUX6R	120	LED	LED DRIVER	0.9	SURFACE	MEN AND WOMEN RESTROOM SIGNAGE
V1	4	EXTERIOR LED FLOOD FIXTURES ON CANOPY	MCGRAW-EDISON	GLEON-AF-04-LED-E1-T2-BZ-ADJS	120	LED	LED DRIVER	2.31	SURFACE	ALT. BID #1
V2	4	EXTERIOR IMAGE PROJECTION FIXTURE ON CANOPY. FIXTURE SHALL BE PROGRAMMABLE FOR CONTINUOUS ROTATING, ZOOM, AND COLOR, IMAGE AND PATTERN CHANGING, IP 85 RATED	ACCLAIM	SIMILAR TO: E-SPOT III	120	LED	LED DRIVER .	180	SURFACE	ACT. BID #3
W	17	EXTERIOR LED FLOOD FIXTURES ON WALL	MCGRAW-EDISON	GLEON-AF-04-LED-E1-T2-BZ-ADJS	120	T.E.D	LED DRIVER	2.31	SURFACE	ALT. BID #1
X1	15	THERMOPLASTIC EXIT SIGN WIGREEN LETTERS	SURE-LITES	APX7G	120	LED	LED DRIVER	3	UNIV	
XZ	<b>4</b>	EDGE-LIT EXIT SIGN WGREEN LETTERS	SURE-LITES	EUR70G	120	Œ	LED DRIVER	\$	RECESSED	
ХЗ	22	EDGE-LIT EXIT SIGN WGREEN LETTERS	SURE-LITES	EUR70G	120		LED DRIVER	3	SURFACE OR PENDANT	

(1) - REFER TO SPECIFICATIONS FOR ADDITIONAL LIGHTING FIXTURE REQUIREMENTS. (2) - CONTRACTOR RESPONSIBLE FOR COORDINATION OF FLANGE TYPES, FITTINGS AND HARDWARE TO INSTALL LIGHTING FIXTURES INTO CEILING GRIDS, DRYWALL CEILINGS AND OTHER CONSTRUCTION MATERIALS AS REQUIRE (3) - ALL DIMENSIONS LISTED ABOVE ARE NOMINAL SIZES. SLIGHT VARIATIONS IN SHAPE OR SIZE WILL BE CONSIDERED BASED ON THE PROJECT REQUIREMENTS. (4) - REFER TO PLANS FOR MOUNTING HEIGHT/ORIENTATION AND CONSTRUCTION MATERIAL. (5) - THE FINAL FIXTURE HOUSING AND REFLECTOR FINISH SHALL BE SELECTED BY A/E. (6) - ALL LIGHTING FIXTURES SHALL BE UL LISTED.

(7) - EXIT FIXTURES AND THE EMERGENCY FIXTURES SHALL BE FED WITH A NON SWITCHED EMERGENCY CIRCUIT (8) - THE SPECIFIED LIGHT FIXTURES WERE SELECTED, PLACED AND CIRCUITED BY TYPE, PHOTOMETRIC PERFORMANCE, LUMEN OUTPUT, AND TOTAL WATTAGE. ANY PROPOSED SUBSTITUTIONS TO ANY PART OF THESE SELECTIONS OR DESIGN MUST BE SUBMITTED TO THE A/E VIA AN APPROVED BIDDING GENERAL CONRTACTOR 14 DAYS PRIOR TO THE BID DATE, AND MUST INCLUDE FULL SUBMITTAL DATA INCLUDING LM-79 AND LM-80 ITL TEST REPORTS, IES FILES, AND COMPLETE AND MODELED NORMAL AND EMERGENCY PHOTOMETRIC PLANS FOR REVIEW OF EQUALITY.

(9) - QUANTITIES LISTED ARE FOR REFERENCE ONLY. CONTRACTOR IS RESPONSIBLE TO VERIFY ACTUAL. QUANTITIES REQUIRED. (10) - CONTRACTOR RESPONSIBLE FOR COORDINATING FIXTURE MOUNTING REQUIREMENTS WITH CEILING TYPE FOR SURFACE, PENDANT, OR RECESSED APPLICATIONS. LIGHTING FIXTURES

1'x4' FIXTURE 2'x2' FIXTURE

2'x4' FIXTURE ٥

4' WALL MOUNT FIXTURE

4' WALL MOUNT FIXTURE, EMERGENCY

1'x4' FIXTURE, BATTERY/EMERGENCY 2'x2' FIXTURE, BATTERY/EMERGENCY

2'x4' FIXTURE, BATTERY/EMERGENCY

4' STRIP FIXTURE, BATTERY/EMERGENCY

4' STRIP FIXTURE, WALL MOUNTED 4' STRIP FIXTURE, WALL MOUNTED,

BATTERY/EMERGENCY ---- LINEAR LED STRIP LIGHTS

4' STRIP FIXTURE

TRACK FIXTURE CEILING MOUNTED RECESSED, DOWN LIGHT

CEILING MOUNTED RECESSED, EMERGENCY DOWN LIGHT

CEILING MOUNTED RECESSED, WALL WASHER (ARROW INDICATES DIRECTION OF WASH)

SURFACE MOUNTED LIGHTING FIXTURE

WALL MOUNTED SCONCE FIXTURE, BATTERY/EMERGENCY

FLOOD LIGHT FIXTURE

EMERGENCY LIGHT FIXTURE

SINGLE FACE EXIT LIGHT FIXTURE ARROW INDICATES DIRECTION OF EGRESS

DOUBLE FACE EXIT LIGHT FIXTURE ARROW INDICATES DIRECTION OF EGRESS

COMBINATION EXIT / EMERGENCY FIXTURE

POLE MOUNTED LUMINAIRE

**BOLLARD OR PENDANT LIGHT FIXTURE** BOLLARD OR PENDANT LUMINAIRE, EMERGENCY

SWITCH SWITCH, 2 POLE SWITCH, 3-WAY

SWITCH, 4-WAY SWITCH - LINE VOLTAGE TIMER, 120/277 VAC. WATTSTOPPER TS-400 OR

SWITCH - PILOT LIGHT

SWITCH, 1 POLE, LETTER INDICATES SWITCHLEG CONTROLLED.

SWITCH, 3-WAY, LETTER INDICATES SWITCHLEG CONTROLLED

SWITCH, KEYSWITCH, 3-WAY

SWITCH, TIMER

MOTOR RATED SWITCH

SWITCH, EXPLOSION PROOF

SWITCH, LOW VOLTAGE MOMENTARY

SWITCH, WEATHERPROOF

YS INFRA RED (IR) VACANCY SENSOR

LIGHTING CONTROL DEVICES

PHOTOCELL

LIGHTING CONTACTOR

CB-100 OR EQUAL.

TIMECLOCK

\*PIR-WALL MOUNT SENSOR, LOW TEMP, 24 VDC/AC, 20mA. WATTSTOPPER

\*PIR-CEILING MOUNT SENSOR 24 VDC/VAC, 11mA, WATTSTOPPER CI-205 OR

\*DUAL ULTRASONIC/PIR-CEILING MOUNT SENSOR, 24 VDC/VAC, 35mA. WATTSTOPPER DT-305 OR EQUAL.

\*DUAL ULTRASONIC/PIR-WALL MOUNT SENSOR, 24 VAC/VDC, 35mA. WATTSTOPPER DT-205 OR EQUAL.

\*ULTRASONIC-CEILING CORRIDOR MOTION SENSOR, 24 VDC/VAC, 40mA. WATTSTOPPER WT-2250 OR EQUAL.

PIR-WALL SWITCH DECORATOR MOTION SENSOR, 120/277 VAC, 800/1200W. WATTSTOPPER PW-100 OR EQUAL. DUAL ULTRASONIC/PIR-WALL SWITCH DECORATOR MOTION SENSOR,

120/277VAC, 800/1200W. WATTSTOPPER DW-100 OR EQUAL. DUAL ULTRASONIC/PIR-DUAL RELAY WALL SWITCH DECORATOR MOTION

UL 924 LISTED FAILSAFE EMERGENCY SWITCHING RELAY, LVS EPC-A OR EQUAL. LOWER CASE LETTER NEXT TO DEVICE INDICATES SWITCHLEG

POWER PACK 120/277 VAC; 20 AMPS, 225mA SECONDARY. WATTSTOPPER

SENSOR, 120/277VAC, 800/1200W. WATTSTOPPER DW-200 OR EQUAL.

BZ-150 OR EQUAL. \*FOR LOW VOLTAGE OCCUPANCY SENSORS, PROVIDE POWER PACK(S) 120/277 VAC; 20 AMPS, 225mA SECONDARY AS NEEDED FOR ZONE/AREA CONTROL. WATTSTOPPER BZ-150 OR EQUAL.

POWER DISTRIBUTION

120/208V PANELBOARD, RECESSED 120/208V PANELBOARD, SURFACE MOUNT

277/480V PANELBOARD, SURFACE MOUNT 277/480V PANELBOARD, RECESSED

FEEDER OR BRANCH CIRCUIT CONCEALED IN WALL,

CEILING OR FLOOR HOMERUN CONSISTING OF ONE SINGLE-PHASE, 1-POLE CIRCUIT, SEE SPECIFICATIONS AND/OR FEEDER SCHEDULES FOR WIRE SIZES. PANELBOARD AND CIRCUIT DESIGNATION ARE INDICATED.

HOMERUN CONSISTING OF ONE SINGLE-PHASE, 2-POLE CIRCUIT: SEE SPECIFICATIONS AND/OR FEEDER SCHEDULES FOR WIRE SIZES. PANELBOARD AND CIRCUIT DESIGNATIONS ARE INDICATED.

HOMERUN CONSISTING OF TWO SINGLE-PHASE CIRCUITS: SEE SPECIFICATIONS AND/OR FEEDER SCHEDULES FOR WIRE SIZES. PANELBOARD AND CÍRCUIT DESIGNATION ARE INDICATED.

HOMERUN CONSISTING OF THREE SINGLE-PHASE CIRCUITS: SEE 1R1-1.3.5 SPECIFICATIONS AND/OR FEEDER SCHEDULES FOR WIRE SIZES. PANELBOARD AND CIRCUIT DESIGNATIONS ARE INDICATED.

HOMERUN CONSISTING OF ONE THREE-PHASE CIRCUITS: SEE 1M1-1:3:5 SPECIFICATIONS AND/OR FEEDER SCHEDULES FOR WIRE SIZES. PANELBOARD AND CIRCUIT DESIGNATIONS ARE INDICATED.

POWER DEVICES

SINGLE RECEPTACLE DUPLEX RECEPTACLE

DOUBLE DUPLEX RECEPTACLE

ABOVE COUNTER DUPLEX RECEPTACLE DUPLEX RECEPTACLE, HALF SWITCHED

SPECIAL PURPOSE RECEPTACLE

SINGLE 250V NON-LOCKING TYPE RECEPTACLE

DUPLEX RECEPTACLE FOR COMPUTER WORKSTATION QUAD RECEPTACLE FOR COMPUTER WORKSTATION

DUPLEX RECEPTACLE FOR TV LOCATED AT 84" AFF UNLESS NOTED

DUPLEX RECEPTACLE FOR TV LOCATED AT 18"AFF. LOCATE IN COMMON BOX

CEILING MOUNTED RECEPTACLE

RECESSED FLOOR RECEPTACLE

DUPLEX RECEPTACLE, GROUND FAULT

DUPLEX RECEPTACLE, GROUND FAULT, ABOVE COUNTER

QUAD RECEPTACLE, GROUND FAULT

DUPLEX RECEPTACLE, GROUND FAULT WITH CAST ALUMINUM WEATHERPROOF "IN USE"

QUAD RECEPTACLE, GROUND FAULT WITH CAST ALUMINUM WEATHERPROOF "IN USE"

DUPLEX RECEPTACLE, GROUND FAULT

LOCATE WITHIN ELECTRIC WATER COOLER PER MANUFACTURER'S INSTRUCTIONS

CLOCK POWER/DATA POLE

POWER POLE

DISCONNECT SWITCH MOTOR STARTER

STARTER/DISCONNECT SWITCH VARIABLE FREQUENCY DRIVE

JUNCTION BOX

FLOOR MOUNTED JUNCTION BOX

**EQUIPMENT CONNECTION** DOOR BELL PUSH BUTTON

TRANSFORMER

SHUNT TRIP. MTD. AT 6'-5" AFF/AFG TO TOP OF ENCLOSURE f. CONTRACTOR TO CHECK PHASE ROTATION PRIOR TO

## GENERAL NOTES

MOTOR

**GENERATOR** 

LOCKBOX

GROUND BUS BAR

----- DETAIL NUMBER

---- DETAIL NUMBER

AUDIO ENHANCEMENT

ABOVE FINISHED CEILING

ABOVE FINISHED FLOOR

ABOVE FINISHED GRADE

AMPERES INTERUPTING

AMERICAN WIRE GAUGE

BELOW FINISHED CEILING

BELOW FINISHED GRADE

CURRENT TRANSFORMERS

ENCLOSED CIRCUIT BREAKER

ELECTRICAL METALLIC TUBING

ELECTRIC UNIT HEATER

EXPLOSION PROOF FIRE ALARM

FRONT OF HOUSE

FLUORESCENT

INTERRUPTER

GROUND

FULL LOAD AMPERES

GROUND FAULT CIRCUIT

GROUND FAULT PROTECTION

HIGH INTENSITY DISCHARGE

HIGH PRESSURE SODIUM

ELECTRIC WATER COOLER

ELECTRIC WATER HEATER

CAPACITY

**ALUMINUM** 

CONDUIT

CFILING

CT's

ECB

EQUIP

EUH

GND

CENTERLINE

DRAWING(S)

EXHAUST FAN

EQUIPMENT

DISCONNECT(ING)

GROUND ROD WITH TEST INSPECTION WELL. SEE SPECIFICATIONS.

- SHEET NUMBER WHERE DETAIL IS REFERENCED

kVAR

kW

LTG

MIN

MMS

PNL

RGS

SPD

XFMR

- SHEET NUMBER TO WHERE DETAIL IS REFERENCED

HAND-OFF-AUTOMATIC

HEATING/VENTILATING/

KILO-VOLTS-AMPERES

MAIN CIRCUIT BREAKER

MOTOR CONTROL CENTER

MOTOR CIRCUIT PROTECTOR

MANUAL MOTOR STARTER SW

NOTIFICATION APPLIANCE CIRCUIT

NATIONAL ELECTRICAL CODE

NIGHT LIGHT, UNSWITCHED

PULL STATION INSIDE

POLYVINYL CHLORIDE

RIGID GALVANIZED STEEL

SURGE PROTECTION DEVICE

UNLESS OTHERWISE NOTED

VARIABLE FREQUENCY DRIVE

RECEPTACLE

TELEPHONE

VOLT-AMPERES

WEATHER PROOF

TRANSFORMER

TYPICAL

WATTS

KILO-VOLTS-AMPERES REACTIVE

AIR CONDITIONING

HORSEPOWER

HIGH VOLTAGE

INCANDESCENT

KILO-VOLTS

KILO-WATTS

LIGHTING

METER

MILLIMETER

MANUFACTURER

MISCELLANEOUS

METAL HALIDE

MINIMUM

MOUNTED

MOUNTING

MAXIMUM

KILO-WATT-HOURS

JUNCTION BOX

SURGE PROTECTION DEVICE, SEE SPECIFICATIONS.

— DETAIL TITLE REFERENCE

\_\_\_\_ ADDITIONAL SHEET REFERENCES

MISCELLANEOUS SYMBOL LEGEND

a. THE CONTRACT DOCUMENTS FOR THIS PROJECT CONSIST OF DRAWINGS AND BOOK SPECIFICATIONS. GENERAL NOTES ON A DRAWING SHEET ALSO PERTAIN TO THE ENTIRE SET OF SHEETS.

b. PROTECT BUILDING SYSTEMS AT ALL TIMES DURING CONSTRUCTION. MAINTAIN CONTINUITY OF SYSTEMS TO REMAIN. IF NECESSARY PROVIDE TEMPORARY OR PERMANENT RE-WIRING TO RECONNECT SYSTEM DEVICES TO THE BUILDING SYSTEMS SO SERVICES ARE NOT INTERRUPTED DURING CONSTRUCTION.

c. COORDINATE WORK WITH ALL OTHER TRADES BEFORE ANY ROUGH-INS. d. PATCH AND REPAIR WALLS, FLOORS AND CEILINGS AFFECTED BY

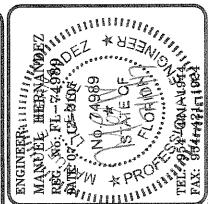
DEMOLITION OR NEW WORK AS REQUIRED TO MATCH EXISTING e. CONTRACTOR SHALL PERFORM CIRCUIT TRACE ON ALL BRANCH CIRCUITS IN PANEL BEING REPLACED AND PROVIDE AN UPDATED

TYPEWRITTEN PANEL SCHEDULE IDENTIFYING CIRCUITS FED AND LOCATION AND/OR ROOM NUMBER.

DISCONNECTION AND AFTER RECONNECTION OF POWER.

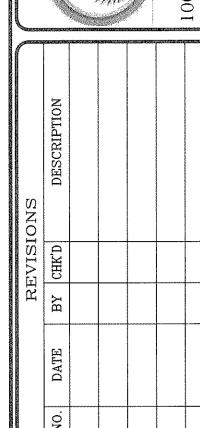
g. IF CIRCUITS ARE COMBINED AND RUN AS MULTI-WIRE BRANCH CIRCUITS SHARING A COMMON NEUTRAL, THEN EACH UNGROUNDED CONDUCTOR MUST BE DISCONNECTED SIMULTANEOUSLY BY A COMMON TRIP CIRCUIT BREAKER CONTRACTOR MAY, AT THEIR OPTION, PROVIDE EITHER COMMON TRIP MULTI-POLE CIRCUIT BREAKERS OR UTILIZE MANUFACTURERS LISTED HANDLE TIES IN ORDER TO PROVIDE THE SIMULTANEOUS TRIP. THESE DEVICES ARE NOT SHOWN IN THE PANEL SCHEDULES AND MUST BE PROVIDED BY THIS SCOPE OF WORK. NO MORE THAN 3 CIRCUITS MAY BE COMBINED IN A SINGLE RACEWAY WITHOUT PRIOR APPROVAL BY THE ENGINEER.

> 1 EAST BROWARD BLVD. FT. LAUDERDALE, FL. 33301 TEL: (954) 421-1944 NGINEERING CA-00006208 SGM #: 2016-221 COPYRIGHT® 2017 SGM ENGINEERING, INC.



T

Б Б SAS 

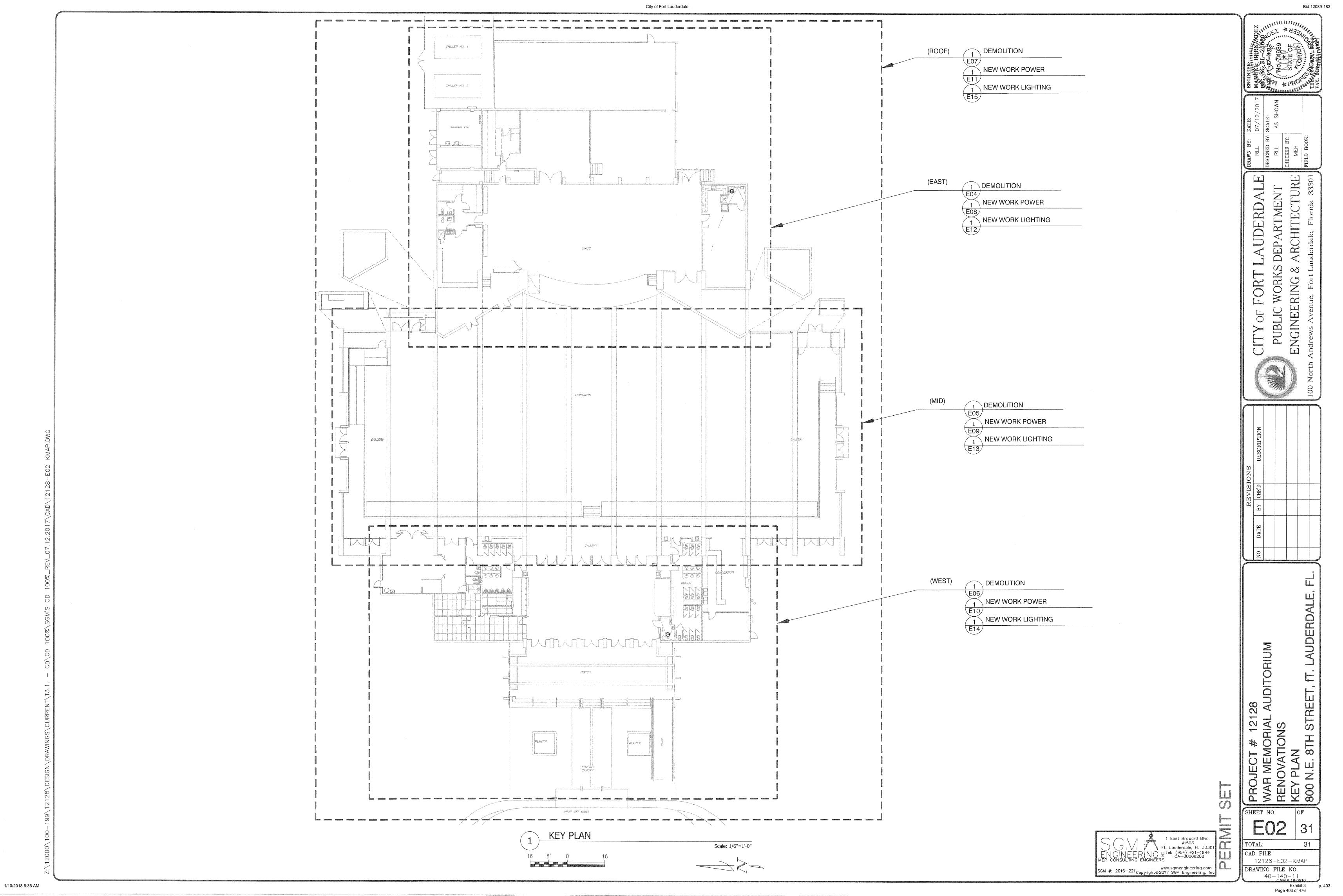


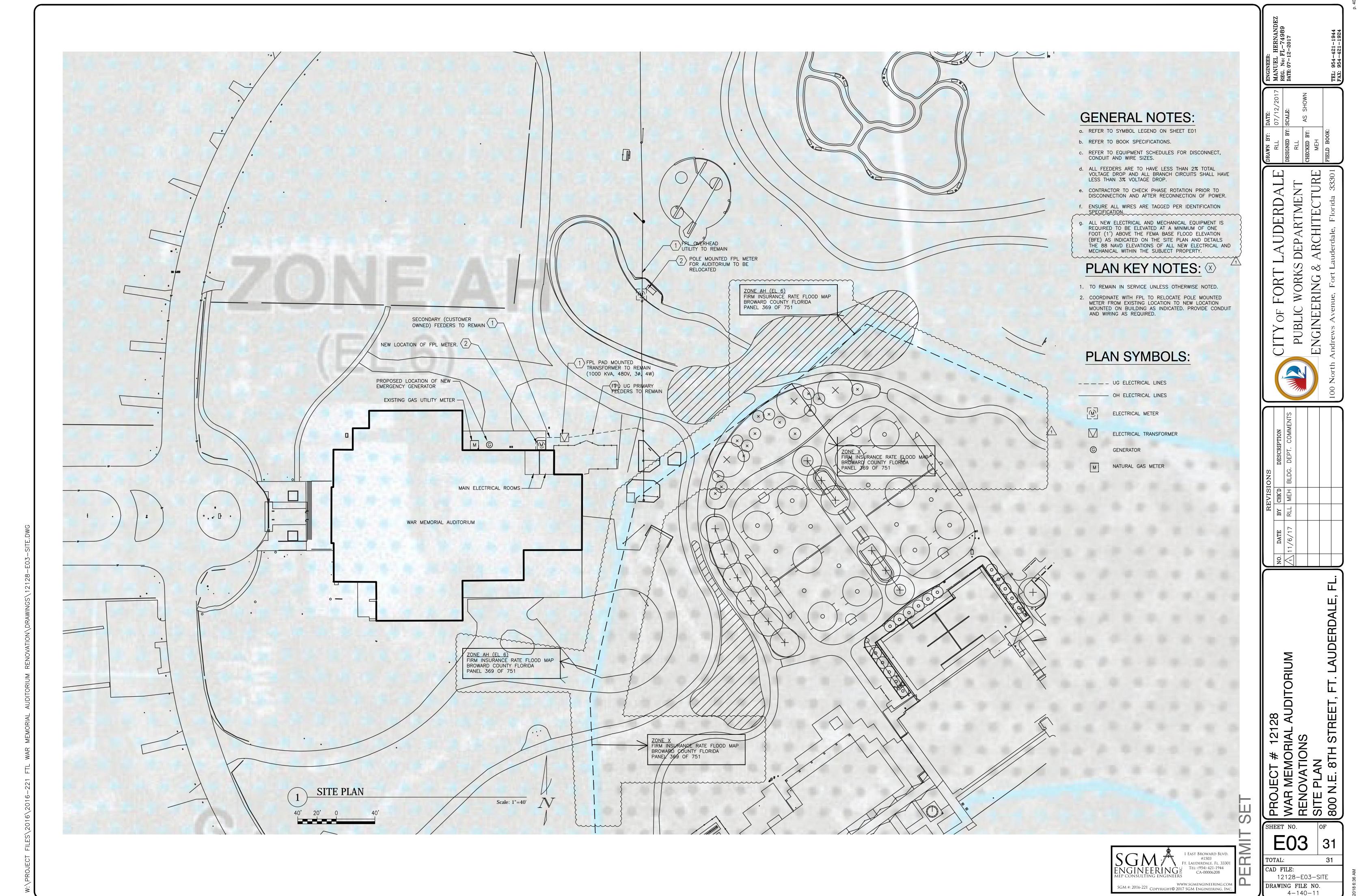
SHEET NO.

12128-E01-LEGN DRAWING FILE NO. 4-140-11

1/10/2018 6:36 AM

Exhibit 3 p. 402 Page 402 of 476





CAM # 18-0510 Exhibit 3 Page 404 of 476

Bid 12089-183

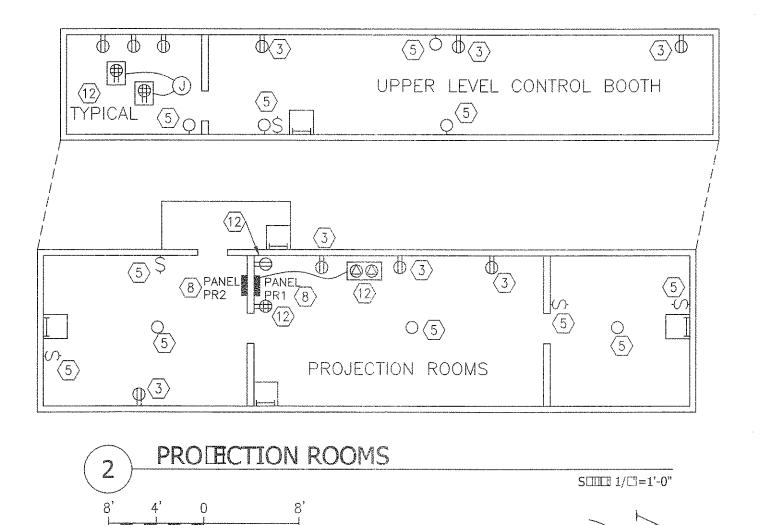
ARCHITECTURE

ORKS

RING 

SHEET NO.

Page 405 of 476



a. REFER TO SYMBOL LEGEND ON SHEET E01

b. REFER TO BOOK SPECIFICATIONS.

c. COORDINATE ALL WORK SCHEDULING WITH OWNER.

d. CONTRACTOR TO CHECK PHASE ROTATION PRIOR TO DISCONNECTION AND AFTER RECONNECTION OF POWER.

e. ENSURE ALL WIRES ARE TAGGED PER IDENTIFICATION SPECIFICATION.

f. UTILIZE EXISTING RACEWAY AND J-BOXES AS POSSIBLE FOR NEW WORK.

g. EXISTING PANEL BOARDS, J-BOXES, LIGHT FISXTURES SWITCHES, AND EXPOSED RACEWAY AFFECTED BY DEMOLITION NOT BEING REUSED DURING NEW WORK, SHALL BE REMOVED ENTIRELY. UNUSED RACEWAY STUB-OUTS OF CONCEALED CONDUITS SHALL BE

h. PATCH AND FINISH IMMEDIATE AREA AFFECTED BY DEMOLITION AS REQUIRED TO MATCH PRE-CONSTRUCTION SURROUNDING AREA CONDITIONS.

 PERFORM CIRCUIT TRACE ON ALL BRANCH CIRCUITS IN PANEL BEING REPLACED AND PROVIDE AN UPDATED TYPEWRITTEN PANEL SCHEDULE IDENTIFYING CIRCUITS FED AND LOCATION AND/OR ROOM NUMBER.

j. SEGREGATE ALL GROUNDS AND NEUTRALS ONTO THE CORRECT BUS.

k. CONFIRM THERE IS A GROUND CONDUCTOR FOR EACH LOAD OR THAT THE CONDUIT PATH GROUND IS

CONTINUOUS FOR EACH LOAD. I. IDENTIFY CONDUITS EXITING PANEL WITH CIRCUIT NUMBER INFORMATION.

m. DEVICES ARE SHOWN IN APPROXIMATE LOCATIONS. OTHER EQUIPMENT. COORDINATE WITH ALL OTHER 1. REMOVE PENDANT LIGHTING FIXTURES, MOUNTING BRACKETS, SWITCHES AND WIRING BACK TO SOURCE.

2. MECHANICAL EQUIPMENT AND CONNECTIONS TO REMAIN.

3. REMOVE RECEPTACLES SHOWN. REMOVE WIRING BACK TO

4. REMOVE RECESSED LIGHTING FIXTURE AND WIRING BACK

5. REMOVE SURFACE MOUNTED LIGHTING FIXTURE, SWITCHES, AND WIRING BACK TO SOURCE.

6. SURFACE WALL SCONCE TO REMAIN. REMOVE WRING TO

7. REMOVE SURFACE MOUNTED LIGHTING FIXTURE, J-BOX, RACEWAY, AND WIRING BACK TO SOURCE.

8. PANEL BOARD TO REMAIN IN SERVICE.

9. REMOVE RECESSED RECEPTACLE, J-BOX, AND WIRING TO SOURCE, PATCH AND PAINT WALL TO MATCH EXISTING CONDITIONS.

10. REMOVE TWIST LOCK RECEPTACLES SHOWN. REMOVE WIRING BACK TO SOURCE. STORE TWIST LOCK RECEPTACLES FOR REINSTALLATION DURING NEW WORK.

11. REMOVE SAFETY SWITCH AND WIRING BACK TO SOURCE. 12. RECEPTACLE TO REMAIN IN SERVICE.

13. ALT BID #1 - REMOVE LIGHTING FIXTURE INCLUDING ASSOCIATED MOUNTING BRACKETS AND WIRING TO



1 EAST BROWARD BLVD. #1503 FT. LAUDERDALE, FL. 33301 TEL: (954) 421-1944 CA-00006208 SGM #: 2016-221 COPYRIGHT® 2017 SGM ENGINEERING. INC.

AUDITORIUM

CAD FILE: 12128-E05-DEMO DRAWING FILE NO. 4-140-11

2

RING

Exhibit 3 Page 406 of 476

AUDERDALE

S□□□ 1/□=1'-0"

**DEMOLITION PLAN - MID** 

1/10/2018 6:36 AM

#### **GENERAL NOTES:**

- a. REFER TO SYMBOL LEGEND ON SHEET E01
- b. REFER TO BOOK SPECIFICATIONS.

- DISCONNECTION AND AFTER RECONNECTION OF POWER.
- e. ENSURE ALL WIRES ARE TAGGED PER IDENTIFICATION
- f. UTILIZE EXISTING RACEWAY AND J-BOXES AS POSSIBLE
- g. EXISTING PANEL BOARDS, J-BOXES, LIGHT FIXTURES, SWITCHES, AND EXPOSED RACEWAY AFFECTED BY DEMOLITION NOT BEING REUSED DURING NEW WORK, SHALL BE REMOVED ENTIRELY. UNUSED RACEWAY STUB-OUTS OF CONCEALED CONDUITS SHALL BE
- PATCH AND FINISH IMMEDIATE AREA AFFECTED BY DEMOLITION AS REQUIRED TO MATCH PRE-CONSTRUCTION SURROUNDING AREA CONDITIONS.
- PERFORM CIRCUIT TRACE ON ALL BRANCH CIRCUITS IN PANEL BEING REPLACED AND PROVIDE AN UPDATED TYPEWRITTEN PANEL SCHEDULE IDENTIFYING CIRCUITS
- SEGREGATE ALL GROUNDS AND NEUTRALS ONTO THE
- k. CONFIRM THERE IS A GROUND CONDUCTOR FOR EACH LOAD OR THAT THE CONDUIT PATH GROUND IS CONTINUOUS FOR EACH LOAD.
- I. IDENTIFY CONDUITS EXITING PANEL WITH CIRCUIT NUMBER INFORMATION.
- m. DEVICES ARE SHOWN IN APPROXIMATE LOCATIONS. LOCATE DEVICES WITHOUT INTERFERENCE OF DOORS AND OTHER EQUIPMENT. COORDINATE WITH ALL OTHER TRADES PRIOR TO ROUGH-IN.

#### PLAN KEY NOTES: 🗵

- 1. REMOVE ALL LIGHTING FIXTURES SHOWN, MOUNTING BRACKETS, J-BOXES, ASSOCIATES SWITCHES AND WIRING
- 2. DISCONNECT EQUIPMENT. REMOVE WIRING BACK TO SOURCE. EQUIPMENT TO REMAIN AND RECONNECTED DURING NEW WORK.
- 3. REMOVE ALL RECEPTACLES SHOWN. REMOVE WIRING
- 4. PANEL TO REMAIN IN SERVICE.
- 5. REMOVE GENERATOR AND PAD, TRANSFER SWITCH, AND ALL ASSOCIATED COMPONENTS. REMOVE WIRING BACK TO
- 6. DISCONNECT SAFETY SWITCH AND RECEPTACLE. REMOVE WIRING BACK TO SOURCE. SAFETY SWITCH AND RECEPTACLE TO REMAIN AND RECONNECTED DURING
- 7. REMOVE PANEL, AND ALL WIRING BACK TO SOURCE.
- 8. REMOVE RECEPTACLE(S) AND STORE FOR REUSE DURING
- 9. REMOVE SAFETY SWITCH(ES) AND ALL WIRING BACK TO
- 10. J-BOX(ES) TO REMAIN.
- 11. REMOVE RECESSED RECEPTACLE(S), J-BOXES, AND WIRING TO SOURCE.
- AS REQUIRED DURING NEW WORK.
- 13. PENDANT FIXTURES TO BE REMOVED AND RETROFITTED TO ACCEPT NEW L.E.D. LAMPS FOR REINSTALLATION DURING NEW WORK.
- 14. WALL MOUNTED FIXTURES TO BE REMOVED AND RETROFITTED TO ACCEPT NEW L.E.D. LAMPS FOR REINSTALLATION DURING NEW WORK.
- 15. REMOVE ABANDONED LIGHT FIXTURES AND CONDUITS.
- 16. HOOD CONTROL PANEL TO BE DISCONNECTED AND RECONNECTED DURING NEW WORK.
- 17. FRESH AIR FAN TO BE DISCONNECTED AND RECONNECTED DURING NEW WORK.
- 18. ALT BID #1 REMOVE LIGHTING FIXTURE INCLUDING ASSOCIATED MOUNTING BRACKETS AND WIRING TO
- 19. FLAG POLE LIGHTING FIXTURE TO REMAIN AND RECONNECTED TO NEW PANEL DURING NEW WORK.
- 20. AREA LIGHTS TO REMAIN AND RECONNECTED TO NEW
- 21. REMOVE CEILING EXHAUST FAN/LIGHT INCLUDING MOUNTING BRACKETS, J-BOXES, ASSOCIATES SWITCHES AND WIRING BACK TO SOURCE.

1 EAST BROWARD BLVD. #1503 Ft. Lauderdale, Fl. 33301 TEL: (954) 421-1944 CA-00006208 www.sgmengineering.com SGM #: 2016-221 COPYRIGHT® 2017 SGM ENGINEERING, INC

Bid 12089-183

ARCHITECTURE ARTMEN AUDER WORKS  $\circ \delta$ NGINEERING

AUROLON

SHEET NO.

12128-E06-DEMO

DRAWING FILE NO.

4 - 140 - 11Exhibit 3 p. 407 Page 407 of 476

ARCHITECTURE anderdale, Florida 33301 UDERDALE PARTIMENT 日 WORKS NGINEERING

PUBLIC 

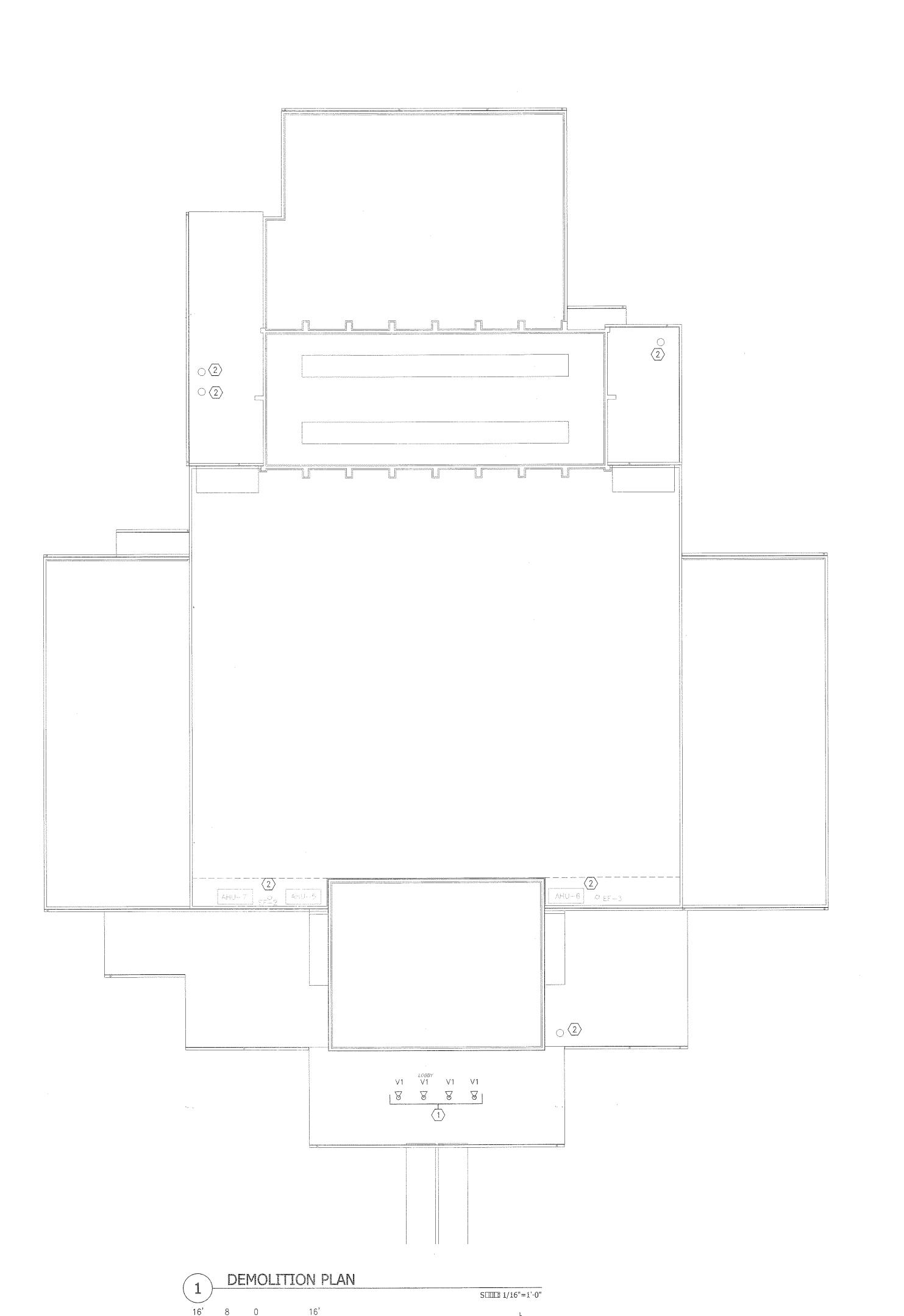
CAD FILE: 12128-E07-DEMO

DRAWING FILE NO. 4-140-11

CAIM # 18-0510 Exhibit 3 p. 408 Page 408 of 476

1 EAST BROWARD BLVD.
#1503
FT. LAUDERDALE, FL. 33301
FDGINEERING
CA-00006208

TEL: (954) 421-1944
CA-00006208 www.sgmengineering.com SGM #: 2016-221 COPYRIGHT® 2017 SGM ENGINEERING, INC.



1/10/2018 6:36 AM

**GENERAL NOTES:** 

a. REFER TO SYMBOL LEGEND ON SHEET E01

b. REFER TO BOOK SPECIFICATIONS.

c. COORDINATE ALL WORK SCHEDULING WITH OWNER. d. CONTRACTOR TO CHECK PHASE ROTATION PRIOR TO

e. ENSURE ALL WIRES ARE TAGGED PER IDENTIFICATION SPECIFICATION.

DISCONNECTION AND AFTER RECONNECTION OF POWER.

f. UTILIZE EXISTING RACEWAY AND J-BOXES AS POSSIBLE FOR NEW WORK.

g. EXISTING PANEL BOARDS, J-BOXES, LIGHT FIXTURES, SWITCHES, AND EXPOSED RACEWAY AFFECTED BY DEMOLITION NOT BEING REUSED DURING NEW WORK, SHALL BE REMOVED ENTIRELY. UNUSED RACEWAY STUB—OUTS OF CONCEALED CONDUITS SHALL BE CAPPED.

h. PATCH AND FINISH IMMEDIATE AREA AFFECTED BY DEMOLITION AS REQUIRED TO MATCH PRE-CONSTRUCTION SURROUNDING AREA CONDITIONS.

i. PERFORM CIRCUIT TRACE ON ALL BRANCH CIRCUITS IN PANEL BEING REPLACED AND PROVIDE AN UPDATED TYPEWRITTEN PANEL SCHEDULE IDENTIFYING CIRCUITS FED AND LOCATION AND/OR ROOM NUMBER.

j. SEGREGATE ALL GROUNDS AND NEUTRALS ONTO THE CORRECT BUS.

k. CONFIRM THERE IS A GROUND CONDUCTOR FOR EACH LOAD OR THAT THE CONDUIT PATH GROUND IS CONTINUOUS FOR EACH LOAD.

IDENTIFY CONDUITS EXITING PANEL WITH CIRCUIT NUMBER INFORMATION.

m. DEVICES ARE SHOWN IN APPROXIMATE LOCATIONS. LOCATE DEVICES WITHOUT INTERFERENCE OF DOORS AND OTHER EQUIPMENT. COORDINATE WITH ALL OTHER TRADES PRIOR TO ROUGH-IN.

## PLAN KEY NOTES:

1. ALT BID #1 - REMOVE ALL LIGHTING FIXTURES AS SHOWN, MOUNTING BRACKETS, J-BOXES, ASSOCIATES SWITCHES AND WIRING BACK TO SOURCE.

2. MECHANICAL EQUIPMENT AND CONNECTIONS TO REMAIN IN SERVICE.

Bid 12089-183

ARCHITECTURE

UDERDAL DEPARTMEN WORKS Q

NGINEERING 

CAD FILE: 12128-E08-POWR DRAWING FILE NO. 4-140-11

Page 409 of 476

Exhibit 3 p. 410
Page 410 of 476

## **GENERAL NOTES:**

- a. REFER TO SYMBOL LEGEND ON SHEET E-01
- b. REFER TO BOOK SPECIFICATIONS.
- c. REFER TO EQUIPMENT SCHEDULES FOR DISCONNECT,
- CONDUIT AND WIRE SIZES. d. ALL FEEDERS ARE TO HAVE LESS THAN 2% TOTAL
- VOLTAGE DROP AND ALL BRANCH CIRCUITS SHALL HAVE LESS THAN 3% VOLTAGE DROP.
- DISCONNECTION AND AFTER RECONNECTION OF POWER.
- f. ENSURE ALL WIRES ARE TAGGED PER IDENTIFICATION SPECIFICATION.
- g. ALL WIRING J-BOXES, AND EXPOSED RACEWAY AFFECTED BY DEMOLITION OR NEW WORK NOT BEING REUSED DURING NEW WORK, SHALL BE REMOVED IN ITS ENTIRETY.
- h. NEW RACEWAY IN FINISHED SPACES SHALL BE SMR.
- i. ALL RECEPTACLES SHALL BE REPLACED WITH NEW UNLESS OTHERWISE NOTED.
- PERFORM CIRCUIT TRACE ON ALL BRANCH CIRCUITS IN PANEL BEING REPLACED AND PROVIDE AN UPDATED
- k. SEGREGATE ALL GROUNDS AND NEUTRALS ONTO THE CORRECT BUS.
- I. CONFIRM THAT THERE IS A GROUND CONDUCTOR FOR EACH LOAD OR THAT THE CONDUIT PATH GROUND IS CONTINUOUS FOR EACH LOAD.
- m. CONTRACTOR TO IDENTIFY CONDUITS EXITING PANEL WITH CIRCUIT NUMBER INFORMATION.
- n. ENSURE NEW PANEL HEIGHT DOES NOT RESULT IN EXCEEDING 6'-7" TO HIGHEST BREAKER.
- o. DEVICES ARE SHOWN IN APPROXIMATE LOCATIONS.

  LOCATE DEVICES WITHOUT INTERFERENCE OF DOORS AND OTHER EQUIPMENT. COORDINATE WITH ALL OTHER TRADES PRIOR TO ROUGH-IN.

#### PLAN KEY NOTES: (X)

- 1. EXISTING PANEL TO REMAIN IN SERVICE.
- 2. EXISTING MECHANICAL EQUIPMENT TO REMAIN IN
- 3. PROVIDE NEW RECEPTACLES AT NEW LOCATION. LOCATION AND INSTALLATION HEIGHT OF THE NEW RECEPTACLES IN BOX OFFICE SHALL BE DETERMINED BY
- 4. REINSTALL EXISTING TWIST LOCK RECEPTACLES AND PROVIDE NEW WIRING TO SOURCE.
- 5. EXISTING SAFETY SWITCH TO REMAIN IN SERVICE.
- 6. EXISTING RECEPTACLES TO REMAIN IN SERVICE.
- 7. EXISTNG EWH. PROVIDE NEW SAFETY SWITCH AND
- 8. RECONNECT EXHAUST FAN TO LIGHTING CIRCUIT IN SAME ROOM. PROVIDE NEW STARTER, AND EXTEND BRANCH CIRCUIT AS REQUIRED.
- 9. RECONNECT EXHAUST HOOD CONTROL PANEL.
- 10. LINE VOLTAGE TIMER. WATTSTOPPER TS-400-24 OR
- 11. COORDINATE WITH OWNER FOR EXACT LOCATION PRIOR
- 12. PROVIDE 8 POLE, 30A LIGHTING CONTACTOR AND TIME CLOCK ADJACENT TO PANEL FOR CONTROL OF EXTERIOR
- 13. PROVIDE NEW GFI WITH IN-USE WP COVER IN EXISTING LIGHT POLE. PROVIDE NEW WIRING TO EXISTING CIRCUIT AT PANEL AS INDICATED.
- 14. PROVIDE NEW WIRING TO EXISTING CIRCUIT AT PANEL AS

Bid 12089-183

RCHITECTURE K DEPARTIMENT OERO. < WORK

NGINEERING PUBLIC

31

12128-E10-POWR DRAWING FILE NO.

4-14CAM1#118-0510 Page 411 of 476

1 East Broward Blvd. #1503 Ft. Lauderdale, Fl. 33301 TEL: (9S4) 421-1944 ENGINEERING CA-00006208 SGM #: 2016-221 COPYRIGHT® 2017 SGM ENGINEERING, INC

**GENERAL NOTES:** 

a. REFER TO SYMBOL LEGEND ON SHEET E-01

b. REFER TO BOOK SPECIFICATIONS.

REFER TO EQUIPMENT SCHEDULES FOR DISCONNECT, CONDUIT AND WIRE SIZES.

d. ALL FEEDERS ARE TO HAVE LESS THAN 2% TOTAL VOLTAGE DROP AND ALL BRANCH CIRCUITS SHALL HAVE LESS THAN 3% VOLTAGE DROP.

e. CONTRACTOR TO CHECK PHASE ROTATION PRIOR TO DISCONNECTION AND AFTER RECONNECTION OF POWER.

f. ENSURE ALL WIRES ARE TAGGED PER IDENTIFICATION SPECIFICATION.

g. ALL WIRING J—BOXES, AND EXPOSED RACEWAY AFFECTED BY DEMOLITION OR NEW WORK NOT BEING REUSED DURING NEW WORK, SHALL BE REMOVED IN ITS

h. PERFORM CIRCUIT TRACE ON ALL BRANCH CIRCUITS IN PANEL BEING REPLACED AND PROVIDE AN UPDATED TYPEWRITTEN PANEL SCHEDULE IDENTIFYING CIRCUITS FED AND LOCATION AND/OR ROOM NUMBER.

SEGREGATE ALL GROUNDS AND NEUTRALS ONTO THE CORRECT BUS.

j. CONFIRM THAT THERE IS A GROUND CONDUCTOR FOR EACH LOAD OR THAT THE CONDUIT PATH GROUND IS CONTINUOUS FOR EACH LOAD.

k. CONTRACTOR TO IDENTIFY CONDUITS EXITING PANEL WITH CIRCUIT NUMBER INFORMATION.

ENSURE NEW PANEL HEIGHT DOES NOT RESULT IN EXCEEDING 6'-7" TO HIGHEST BREAKER.

m. DEVICES ARE SHOWN IN APPROXIMATE LOCATIONS.

LOCATE DEVICES WITHOUT INTERFERENCE OF DOORS AND OTHER EQUIPMENT. COORDINATE WITH ALL OTHER TRADES PRIOR TO ROUGH-IN.

PLAN KEY NOTES: (X)

1. EXISTING MECHANICAL EQUIPMENT TO REMAIN IN SERVICE.

Bid 12089-183

S DEPARTMENT
ARCHITECTURE
Lauderdale, Florida 33301

WORKS  $\propto$ S ENGINEERING 

D M M

SGM
1 EAST BROWARD BLVD.

#1503

FT. LAUDERDALE, FL. 33301

TEL: (954) 421-1944

CA-00006208

www.sgmengineering.com SGM #: 2016-221 Copyright© 2017 SGM Engineering, Inc.

12128-E11-POWR

DRAWING FILE NO. 4-140-11

CAM # 18-0510 Exhibit 3 p. 412 Page 412 of 476

Bid 12089-183

ARCHITECTURE

12128-E12-LITE

4-14Qm # 18-0510 Page 413 of 476

4-140-11

Exhibit 3 p. 414

PLAN - MID FT. LAUDERDALE

Page 414 of 476

Bid 12089-183

ARCHIECTURE

 $\propto$ 

a. REFER TO SYMBOL LEGEND ON SHEET E-01

b. REFER TO BOOK SPECIFICATIONS.

c. REFER TO EQUIPMENT SCHEDULES FOR DISCONNECT, CONDUIT AND WIRE SIZES.

d. ALL FEEDERS ARE TO HAVE LESS THAN 2% TOTAL VOLTAGE DROP AND ALL BRANCH CIRCUITS SHALL HAVE LESS THAN 3% VOLTAGE DROP.

e. CONTRACTOR TO CHECK PHASE ROTATION PRIOR TO DISCONNECTION AND AFTER RECONNECTION OF POWER.

f. ENSURE ALL WIRES ARE TAGGED PER IDENTIFICATION SPECIFICATION.

h. ALL MOTION SENSOR DEVICES SHALL BE CONNECTED AHEAD OF ALL LOCAL SWITCHES.

MOTION SENSOR LOCATIONS ARE SHOWN FOR GENERAL INFORMATION. LOCATE IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. LOCATE MOTION SENSORS A MINIMUM OF 4' AWAY FROM ANY A/C

## PLAN KEY NOTES: #

1. RETROFIT EXISTING PENDANT FIXTURE AS REQUIRED FOR NEW FOR NEW L.E.D. LAMPS.

RETROFIT EXISTING WALL SCONCE FIXTURE AS REQUIRED FOR NEW FOR NEW L.E.D. LAMPS.

3. SEE POWER PLAN FOR RECEPT CIRCUIT FOR THESE FIXTURES. RECEPTS ARE BASE BID, FIXTURES O ARE ALT BID #2.

4. PROVIDE NEW TOUCH SCREEN CONTROLLERS FOR FOH LIGHTING CONTROL, AND AUDITORIUM LIGHTING CONTROL. COORDINATE LOCATION WITH OWNER.

5. TO LIGHTING CONTACTOR AND TIME CLOCK.

6. SWITCH LOCATED IN BOX OFFICE.

INDICATED, INCLUDING NEW WIRING TO SOURCE.

9. EXISTING AREA LIGHTS TO REMAIN AND RE-FED FROM

PANEL AS INDICATED.

11. TO LIGHTING CONTROLLER.

12. PROVIDE NEW LIGHTING CONTROL PANEL FOR FRONT OF HOUSE (FOH) LIGHTING CONTROL. COORDINATE MOUNTING LOCATION WITH OWNER.

13. MOUNT LIGHTING CONTROLLER IN LOCKABLE NEMA 1 ENCLOSURE.

14. PROVIDE COMBINATION LIGHT/EXHAUST FAN. UTILIZE LIGHTING CIRCUIT POWER. PROVIDE EXHAUST DUCT FROM FIXTURE TO EXHAUST DUCT IN SAME AREA.

## **CEILING LEGEND**

C1 ACOUSTICAL LAY IN CEILING.

C2 SOLID GYPSUM, CONCRETE OR PLASTER.

C3 OPEN BEAMS / RAFTERS.

Bid 12089-183

DEPARTMENT RCHIEC 

ORKS NGINEE PUBLIC

PLAN - WEST FT. LAUDERDALE AUDITORUN

1 EAST BROWARD BLVD.
#1503
FT. LAUDERDALE, FL. 33301
G TEL: (954) 421-1944
I CA-00006208
RS

CAD FILE: 12128—E14—LITE DRAWING FILE NO. 4-140-11

Exhibit 3
Page 415 of 476

a. REFER TO SYMBOL LEGEND ON SHEET E-01

b. REFER TO BOOK SPECIFICATIONS.

REFER TO EQUIPMENT SCHEDULES FOR DISCONNECT, CONDUIT AND WIRE SIZES.

d. ALL FEEDERS ARE TO HAVE LESS THAN 2% TOTAL VOLTAGE DROP AND ALL BRANCH CIRCUITS SHALL HAVE LESS THAN 3% VOLTAGE DROP.

e. CONTRACTOR TO CHECK PHASE ROTATION PRIOR TO DISCONNECTION AND AFTER RECONNECTION OF POWER.

f. ENSURE ALL WIRES ARE TAGGED PER IDENTIFICATION

g. ALL WIRING, J—BOXES, AND EXPOSED RACEWAY
AFFECTED BY DEMOLITION OR NEW WORK NOT BEING
REUSED DURING NEW WORK, SHALL BE REMOVED IN ITS

ALL MOTION SENSOR DEVICES SHALL BE CONNECTED AHEAD OF ALL LOCAL SWITCHES.

 MOTION SENSOR LOCATIONS ARE SHOWN FOR GENERAL INFORMATION. LOCATE IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS. LOCATE MOTION SENSORS A MINIMUM OF 4' AWAY FROM ANY A/C

## PLAN KEY NOTES:

 ALT BID #1:
 a. REPLACE LIGHT FIXTURE WTH NEW FIXTURE AS INDICATED, INCLUDING WIRING TO SOURCE. UTILIZE EXISTING CIRCUIT.

b. PROVIDE NEW LINEAR LIGHTING FOR ILLUMINATION OF BUILDING ROOF MOUNTED IDENTIFICATION LETTERING. PROVIDE NEW BRANCH CIRCUITS AS REQUIRED. CONTROLLED BY NEW FOH LIGHTING CONTROL SYSTEM.

 ALT BID #3: PROVIDE NEW EXTERIOR IMAGE PROJECTORS "V2" ON CANOPY, INCLUDING MOUNTING BRACKETS, J-BOXES, AS REQUIRED. FIXTURES TO BE CONTROLLED BY NEW FOH LIGHTING CONTROL SYSTEM.

Bid 12089-183

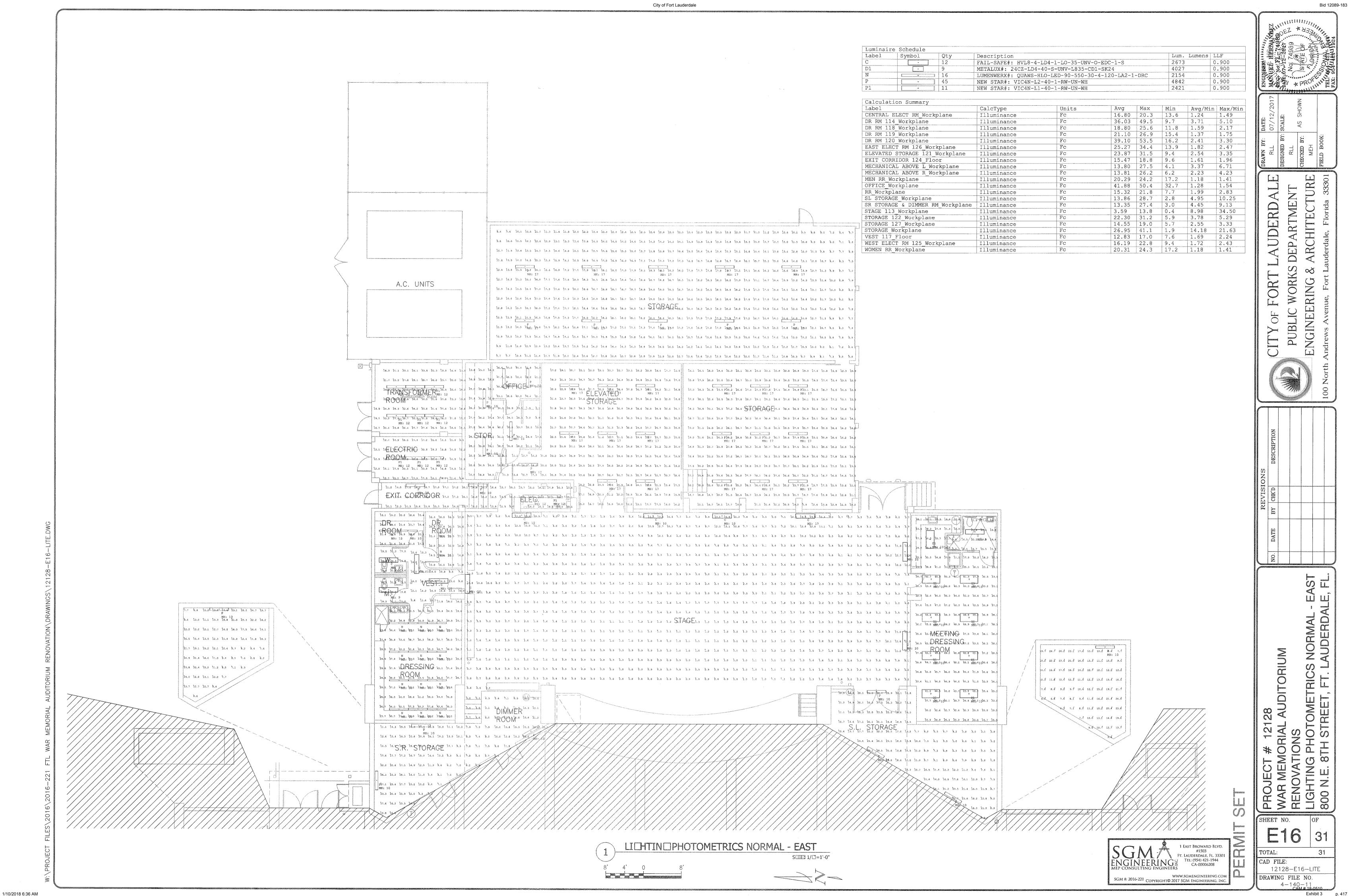
ARCHITECTURE DEPARTMENT 4 WORKS  $\infty$ FORJ

NGINEERING PUBLIC

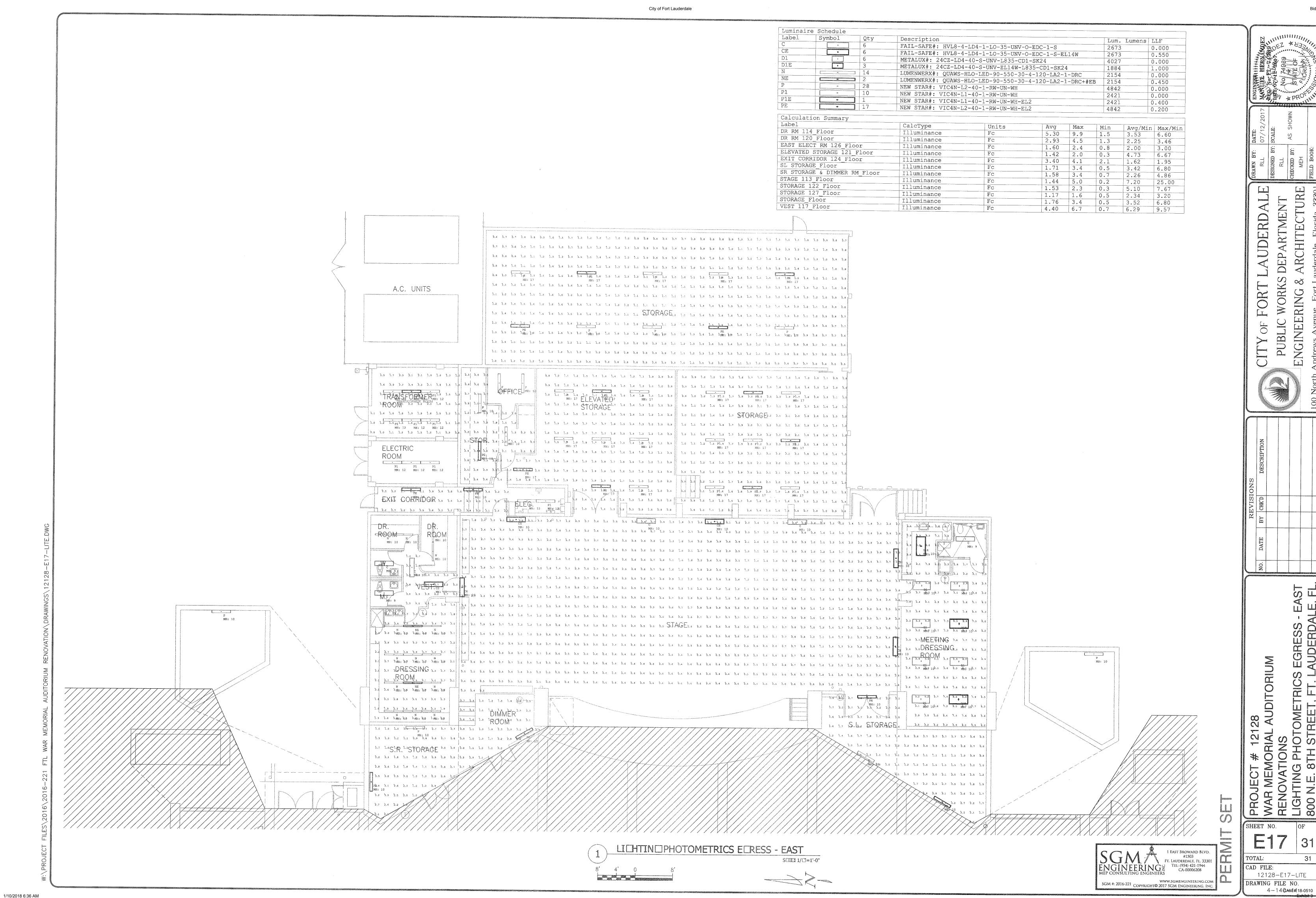
CAD FILE:

12128-E15-LITE DRAWING FILE NO. 4-140-11

1 EAST BROWARD BLVD. #1503 FT. LAUDERDALE, FL. 33301 G TEL: (954) 421-1944 ES CA-00006208 WWW.SGMENGINEERING.COM SGM #: 2016-221 COPYRIGHT® 2017 SGM ENGINEERING, INC.



Page 417 of 476



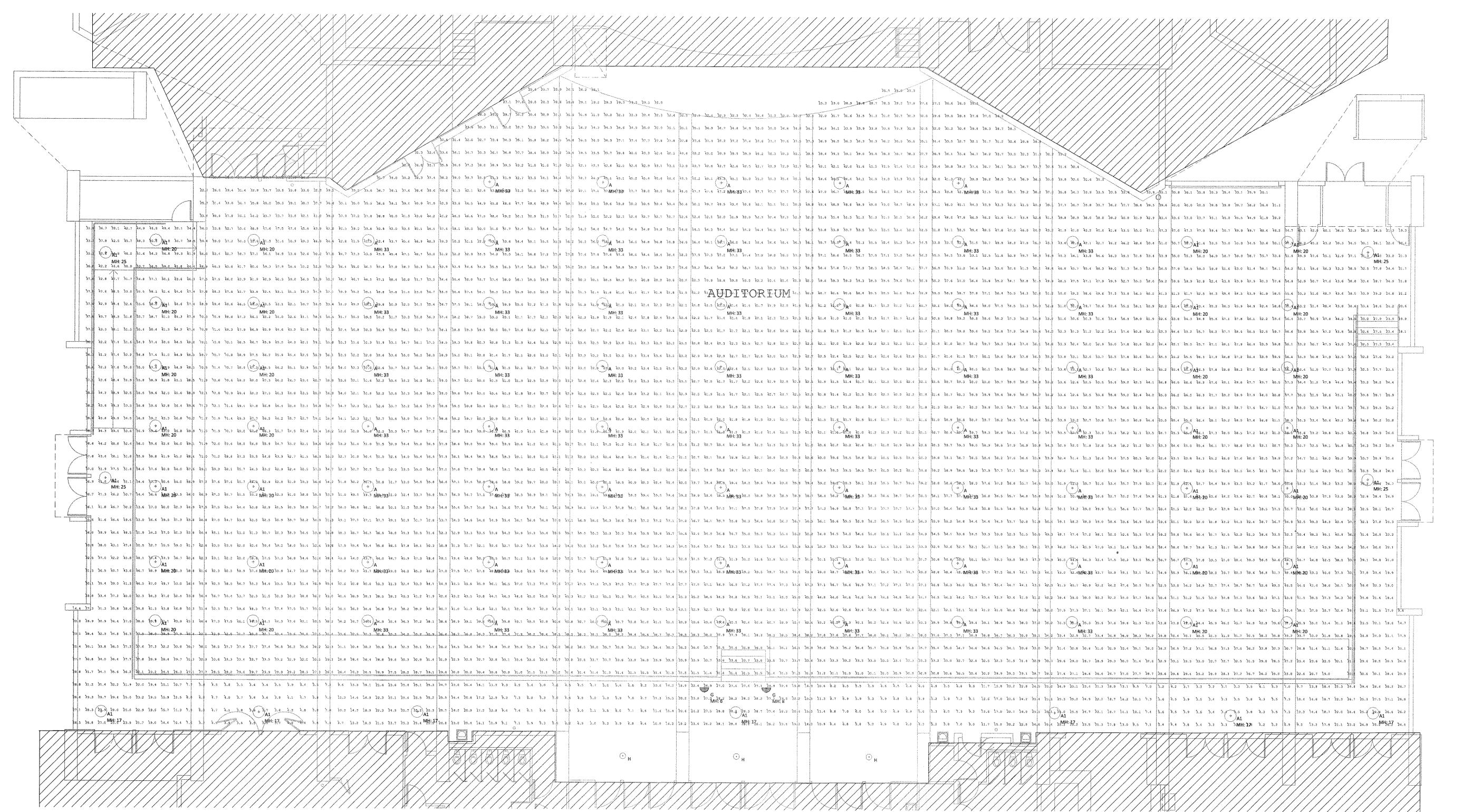
Bid 12089-183

Page 418 of 476

Auditorium alone	Alley left	Alley right	Gallery corridor
Illuminance (Fc)	Illuminance (Fc)	Illuminance (Fc)	Illuminance (Fc)
Average = 50.92	Average = 39.34	Average = 28.28	Average = 14.05
Maximum = 72.8	Maximum = 54.5	Maximum = 40.7	Maximum = 32.2
Minimum = 18.1	Minimum = 14.4	Minimum = 9.6	Minimum = 3,1
Avg/Min Ratio = 2.81	Avg/Min Ratio = 2.73	Avg/Min Ratio = 2.95	Avg/Min Ratio = 4.5
Max/Min Ratio = 4.02	Max/Min Ratio = 3.78	Max/Min Ratio = 4.24	Max/Min Ratio = 10

Symbol	Qty	Label	Description	Lum. Watts	Total Watts	LLF	Lum. Lumens
+	54	A	SPECTRUM: PRDDH22LEDGV-180L-35K-EX-XX-XX/PR22-CNFR-XX	142	7668	0.900	13221
+	37	A1	SPECTRUM: PRDDH22LEDGV-150L-35K-EX-XX-XX/PR22-CNFR-XX	117	4329	0.900	11008
	2	G	CAMMAN: W217-24-LN	23.36	46.72	0.900	1478

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Auditorium_Workplane	Illuminance	Fc	46.80	72.8	3.1	15.10	23.48
Alley left	Illuminance	Fc	39.34	54.5	14.4	2.73	3.78
Alley right	Illuminance	Fc	28.28	40.7	9.6	2.95	4.24
Auditorium alone	Illuminance	Fc	50.92	72.8	18.1	2.81	4.02
Gallery corridor	Illuminance	Fc	14.05	32.2	3.1	4.53	10.39



LICHTINCPHOTOMETRICS NORMAL - MID

1 EAST BROWARD BLVD. #1503 Ft. Lauderdale, Fl. 33301 TEL: (954) 421-1944 CA-00006208 WWW.SGMENGINEERING.COM SGM #: 2016-221 COPYRIGHT® 2017 SGM ENGINEERING, INC

CAD FILE: 12128-E18-LITE DRAWING FILE NO.

1/10/2018 6:36 AM

Page 419 of 476

Page 420 of 476

SGM #: 2016-221 COPYRIGHT® 2017 SGM ENGINEERING, INC

Bid 12089-183

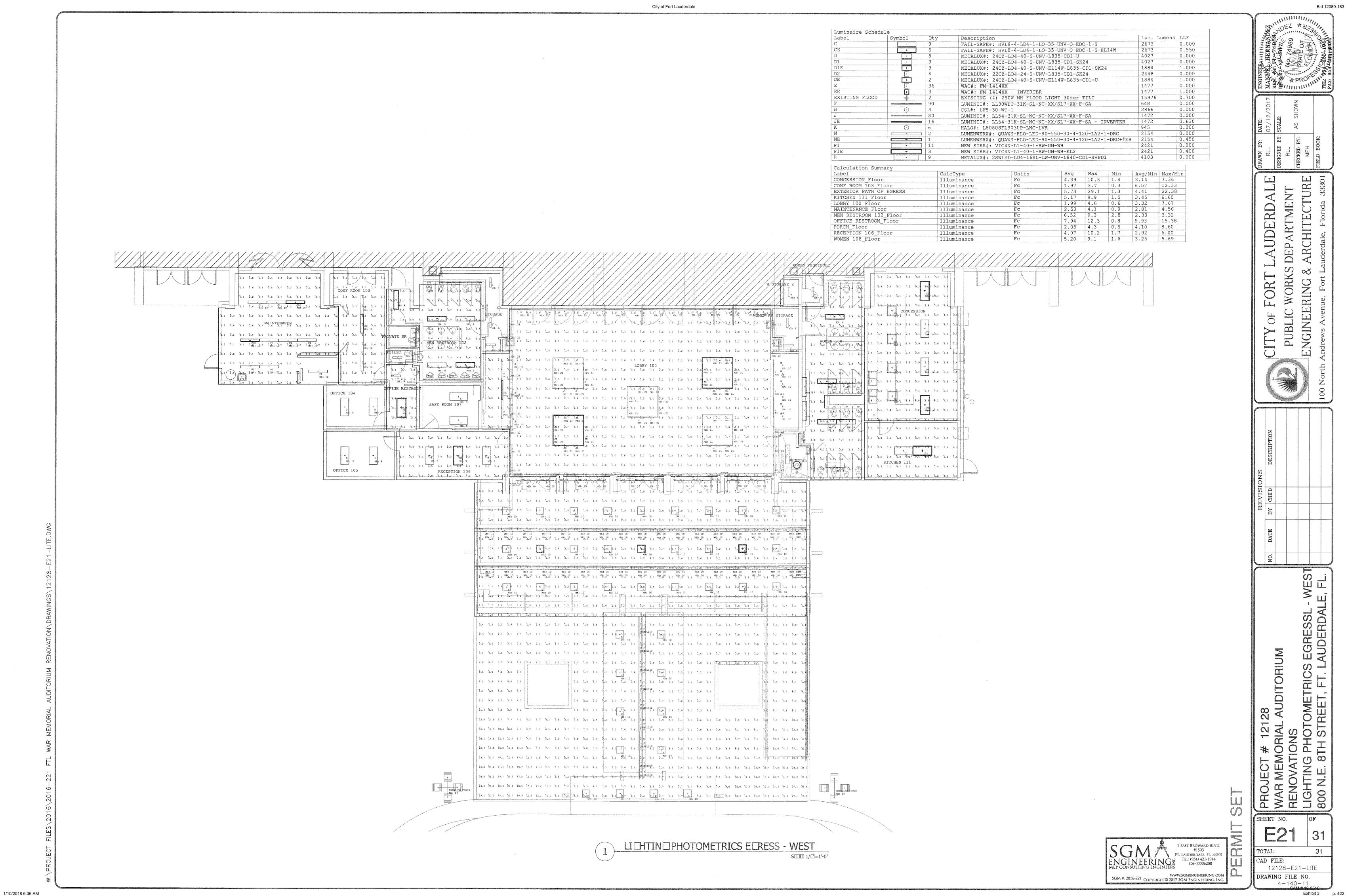
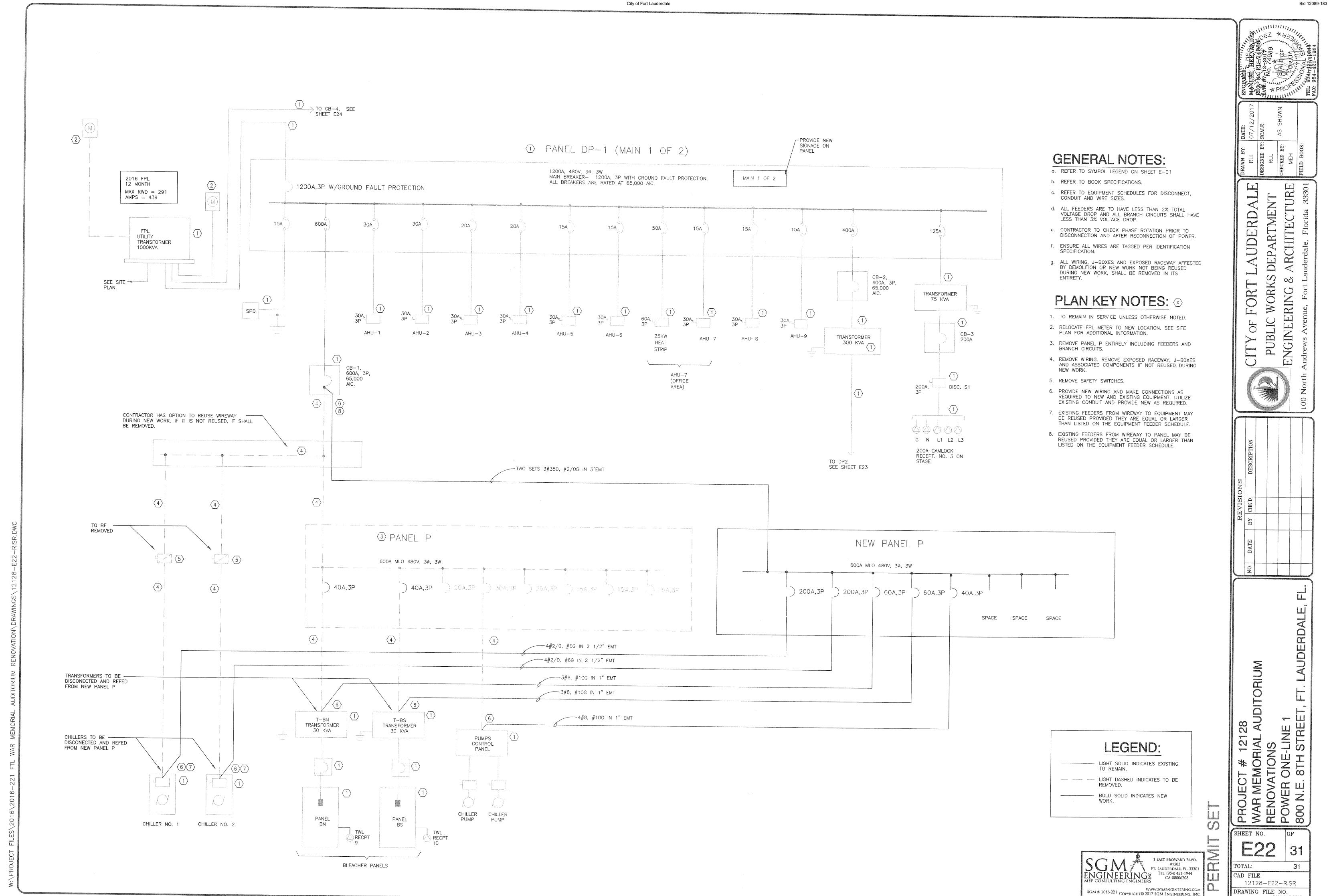


Exhibit 3 p. 422

Page 422 of 476



DRAWING FILE NO.
4-14 CAM # 18-0510
Exhibit 3
Page 423 of 476

Bid 12089-183

## GENERAL NOTES:

a. REFER TO SYMBOL LEGEND ON SHEET E-01

b. REFER TO BOOK SPECIFICATIONS.

c. REFER TO EQUIPMENT SCHEDULES FOR DISCONNECT, CONDUIT AND WIRE SIZES.

d. ALL FEEDERS ARE TO HAVE LESS THAN 2% TOTAL VOLTAGE DROP AND ALL BRANCH CIRCUITS SHALL HAVE LESS THAN 3% VOLTAGE DROP.

e. CONTRACTOR TO CHECK PHASE ROTATION PRIOR TO DISCONNECTION AND AFTER RECONNECTION OF POWER.

f. ENSURE ALL WIRES ARE TAGGED PER IDENTIFICATION SPECIFICATION.

g. ALL WIRING, J-BOXES AND EXPOSED RACEWAY AFFECTED BY DEMOLITION OR NEW WORK NOT BEING REUSED DURING NEW WORK, SHALL BE REMOVED IN ITS

## PLAN KEY NOTES: (X)

1. TO REMAIN IN SERVICE UNLESS OTHERWISE NOTED.

2. REMOVE SAFETY SWITCHES.

ENTIRETY.

 REMOVE WIRING. REMOVE EXPOSED RACEWAY, J-BOXES AND ASSOCIATED COMPONENTS IF NOT REUSED DURING NEW WORK.

4. PROVIDE NEW WIRING AND MAKE CONNECTIONS AS REQUIRED TO NEW AND EXISTING EQUIPMENT. UTILIZE EXISTING CONDUIT AND PROVIDE NEW AS REQUIRED.

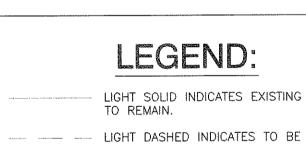
5. REMOVE CAM LOCK CABLES AND PLUGS FROM SAFETY SWITCHES BEING REMOVED. RELOCATE TO NEW SAFETY SWITCHES. PROVIDE NEW NEUTRAL CAM LOCK PLUG AND CABLE TO MATCH RELOCATED G, L1, L2, L3 CABLES AND PLUGS.

6. REMOVE DIMMER PANEL ENTIRELY INCLUDING FEEDERS AND BRANCH CIRCUITS..

7. PROVIDE NEW CONDUIT AND WIRING, MAKE ALL CONNECTIONS.

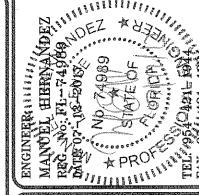
8. REMOVE CONTACTOR.

9. EXISTING FEEDERS FOR L1, L2, L3 & G MAY BE REUSED FROM PANEL DP2 PROVIDED THEY A MINIMUM EQUAL IN SIZE AS LISTED ON THE PANEL FEEDER



BOLD SOLID INDICATES NEW

REMOVED.



ARCHITECTURE DEPARTMENT

WORKS NGINEERING 

12128-E23-RISR

DRAWING FILE NO. 4-140-11 Exhibit 3 p. 424

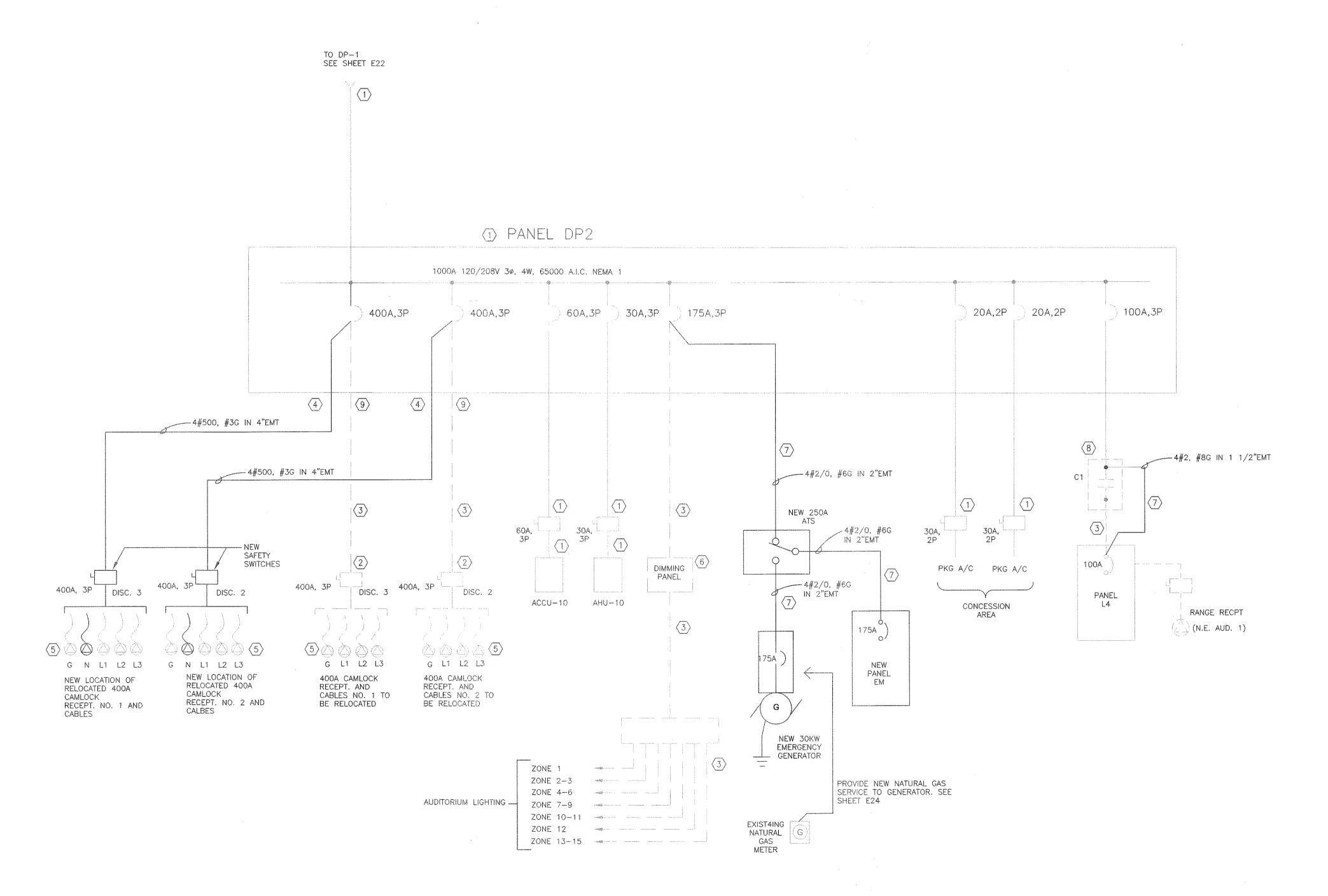
Page 424 of 476

FT. LAUDERDALE, FL. 33301 ENGINEERINGS TEL: (954) 421-1944

MEP CONSULTING ENGINEERS

TEL: (954) 421-1944

CA-00006208 WWW.SGMENGINEERING.COM SGM #: 2016-221 COPYRIGHT® 2017 SGM ENGINEERING, INC.



1/10/2018 6:36 AM

Exhibit 3 p. 425 Page 425 of 476

12128-E24-RISR

PUBLIC WORKS DEPARTIMENT
ENGINEERING & ARCHITECTURE
Andrews Avenue, Fort Lauderdale, Florida 33301 CTV OF FORT LA UDERDALE

PROJECT # 12128
WAR MEMORIAL AUDITORIUM
RENOVATIONS
PANEL FEEDER SCHEDULE
800 N.E. 8TH STREET, ft. LAUDERDALE, F

CAD FILE:

I EAST BROWARD BLVD.
#1503
FT. LAUDERDALE, FL. 33301
FT. LAUDERDALE, FL. 33301
TEL: (954) 421-1944
CA-00006208 www.sgmengineering.com SGM #: 2016-221 Copyright© 2017 SGM Engineering, Inc.

PANEL FEEDER

SCHEDULE

EQUIPMENT FEEDER SCHEDULE

ANEL FEEDER	SCHEDULE:	į.	*LO	ADAN	IPS AN	D DISTA	WOES	HOWN	FORVO	CALCU	LATION C	MLY.	SEE PANE	L SCHEDU	EFOR,	ACTUAL	LOAD.	ACTUAL	DISTAN	ICEMAY VAI	RY DEPEND	ENT ON F	ROUT
FE	XER.	VOLTS	PH	NEUT	200%	GRND	ISO	MAIN	LOAD		DISCONN	ECT		WIRE	NEUT	ADD	GND	160	莽	TUCKCO	APPROX	VOLT	
DESCR	PTION				NEUT		GND	SIZE	AMPS*		SIZE FI	JSE N	IEWA	PER	WIRE	NEUT	WIRE	GND	OF	SIZE	DIST.*	DROP	NC
SOURCE	ŁOAD		Table to the	Y/N	YIN	Y/N	YIN	Parkin Koloriin tünümmilen	2000 0000000000000000000000000000000000	Contrato de Lorenza tarta	***************************************	eralistedistra sings		PHASE	and to statistics and training	Pacing All and Act of Section 1 (Co.	27 conferred dates control		RUNS		FT	VD%	T
<b>CB-1</b>	PANEL P	480	3	Ŋ	N	Y	N	600	480					#350			#2/0		2	3"	25	0.08%	
PANELP	T-BN	480	3	N	N	Y	N	60	36					#6			#10		4	- दृष	40	0.25%	
PANEL P	T-BS	480	3	Ŋ	N	Y	N	60	36					#6			#10		31	ąv.	40	0.25%	lacksquare
PANEL DP2	ATS	208	3	Y	N	Y	N	1 <i>7</i> 5	140					#2/0	#2/0		#6		4	2°	100	1.17%	+
ATS	PANELEM	208	3	Υ	N	Ý	N	175	140					#2/0	#2/0		#6		1	2*	25	0.29%	
GENERATOR	ATS	208	3_	γ	N:	Y	N	175	140					#2/0	#2/0		#6		1	2"	75	0.87%	1
PANEL DP2	PANEL 1.4	208	3	Y	N	Y	N	100	80					#2	#2		#8		<b>i</b> f	1-1/2"	50	0.67%	+
PANEL DP2	DISC 2	208	3	Υ	N.	Y	N	400	320					#500	#500		#3		1	49	150	1.16%	-
PANEL DP2	DISC. 3	208	3	γ	N	γ	N	400	320		<u> </u>			#500	#500	-	#3		1	4"	150	1.16%	+
PANEL DP3	PANEL SWD	240	1	Ÿ	N	Y	N	600	480		****	-	<del></del>	350	350		#3		2	3"	150	1.19%	+
PANEL DP3	PANEL C1	240	1	Υ	N	Y	N	225	180					#4/0	#4/0		#4		4	2"	350	3.31%	
PANEL DP3	PANEL DP4	240	4	Y Y	N	¥	N	600	480			_		#350	#350		#1		2	34	100	0.78%	
PANEL DP3	PANEL FA	240	34	Ÿ	N	Y	N	225	180					#4/0	#4/0		#4		4)	2"	100	0.95%	+
PANEL DP4	PANEL B	240	1	Ý	N	v	N	100	80					#2/0	#2/0		#4		17	2"	150	1.00%	+
PANEL DP4	PANEL WP	240	1	Ϋ́	N	Ý	N	150	120					#500	#500		#2/0		ai i	A <sup>p</sup>	350	1.02%	+
PANEL DP4	PANEL PR1	240	1	Y	N	Ý	N	100	80					#300	#300		#1		增	3"	400	1.20%	+
PANEL DP4	PANEL J	240	- 1	¥	N	γ.	- N	100	80			_		#300	#300		#1		*	3"	350	1.05%	+
PANEL DP4	PANEL AB	240	1	Y	N	ÿ	N	400	320					#600	#600		#2/0		2	.4 <sup>n</sup> :	350	1.17%	+
PANEL DP4	PANELK	240	4	¥	N	¥	N	100	80					#2	#2		#8		# T	1-1/4"	30	0.40%	+
PANEL SWID	PANELFA	240	1	Y	N	Ϋ́	N	225	180					#4/0	#4/0		#4		1	2*	10	0.09%	+
PANEL J	PANEL NW	240	1	γ	IN:	Υ	N	100	80					#(/0	#1/0		#4		1	1-1/2"	100	0,80%	1
mirnal XIAT											A (s	OTES		3.	***************************************	ŝ				***************************************			
ENERAL NOTI		l	i ilimaa m	maker 10	i i ese		in desired			som weren				- Kal- 1 163	cara a rar	OTIONAL L	INSTANCE.	KATUPAN	<u> </u>				4
	SW: AT ALL PECI I FOR REFERENCE	er mengagangan apit mengelakan teram	processor for the	mangagas pagalik ka saga	and the second second second		- water dept. The section	segment responsible to the	and the experience of the state	gan and an agent		e. Suitante establista de mata	September 1997 and the second september 1997	DNE-LINE F A CONTROL		Selected a complete the abite North	HNEADIAN	MILIN		je nikosenie militarnika j	ļ	,	
	ana	and the second													LEVILA				ļ	***************************************			
	OUTDOOR RATE	and a comment of the second	ووقور فصوره		again, Johnson	أرب بأرب ويحجون سأو		NAICTA C		<b>10.</b>		A CONTRACTOR OF THE PROPERTY O	WECT VI	and and an establishment and an establishment	tengaga nagawan, atpartisa an ga Ka							erezerezerez eta alemaker	
and the commence of the participation of the commence of the c	STARTER TYPE WI	above attention apple to consider	Constant of Spec	and the second section	App algeorettic become	for tweeton to the properties.	Carrest of Charles	Action of Assessed	las samenas en managenes la Richipenas en ministrativo (n. 1.	kdor ir	or marionism and figure	Saranggaran	repairment to and references and a Argon	STARJEN	demonstration and the second	colored annual colores no color	da falo ipolysasiansi isoya mer	. To the second	man di Administrativi di Administrati	te to record to expensely of severe of silver some	and a second of constant of	sand the second of the	
qualitativite di integrati est minut esta partitud de atribita del color	THAT CB FORC	and resolution to the strain of the state of	dalarinia Silari	Promotory and account	en dan elaktradakeren.	time services in ordinaria	and the second of green fi	Applicable Securities (	أستريامة ومنكرية فاستشه	NEL I	વ્યાપા વાગમાનન ને નોલિયન	ment de constitution de la const	ear Sealand gear and commen	NDSC.SW	deli eta lo soldini eta lossolaren et	gazari desemblica	Color nation des Colors	ali i i anti i anti	private consist oblinos	enderfallener och et men i i	) 	kongelerjerjergerjes 1908)	20 July
e se como mener un ello se responso a sociano como menero en	STARTING C.B. TC	end determinent of south a country	en Samuel		habban meesmen dabi		arlicon arco	Sandan to consignation when	anonvois overanes.	saa-ness	POST OF THE PROPERTY OF THE PR	international process.	gryngeligenynymens framaniellibral	LSIZENEU	ALTERIO CON PERIODO DO CAS	and the same of the same						,	20.00
Education of groups and continue to the continue of the contin	SHOWN AND OVER HOWN AND OVER	مومات سوسوس وربوش وساكم	ويحضميهم	angeriga ayan seriya ya	ليجيها والمستحدث ليستحوث	ستجيئت سعدونان يستي		التشفيري بروساسي ومحب	40,000 and 100 and 100 and 100 \$					T OVERLO A STARTER									
		HUUF I. L	CHARS	149 00	. III ISS VAI	ME FUI	Y Z E EN	CHAZO	no:		strans outstand on the second	Second and some	and which the contract of the second contract of	HOOD CO	***********	\$20				e dadam megan bir mengan merili sebah salah sebah S		es de comerciales de la constanção de come	
BBREVIATION	3. IRCUIT BREAKER, I	Eilec ∕∕∕ii	F SKAR	LBADIO	ree n	OTA KE	o orac							STARTER				AZAT				a garante de Para de La caracter de la caracter de la carbo	
and a contract of the contract	IRLUIT BREAKER, T UIT PROT. WI COM	and requirement interpretation of the property		N HINLING	A IEO IS	NCANE	N OILE	/	ļ					STARTER CONNECT					DWITH.	FOUR			
g. 1880 - 1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2	TARTER SW. W/ C	NOT A PARTY OF THE PARTY OF THE PARTY OF			ļ,	<u>.</u> ,		y			[4.87]	i - disto	ONLL PARKE	CAMPINIAN I	LACINITY	<u></u>	-3-3-12 (T	reas sende it.	W 8 413 1 1	inital			
FD=VARIABLE F		er opus	tEirNi-Z ₹		<u> </u>	K.,	-			.,			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		tarana dan terti yanan da k		The season of the special section is						
F. = NON-FUSED	und Land Land	<u>t</u>		<u> </u>			e (2. and and 1877 and 1 1		<u> </u>			and the second		and the second second second	CELTACION SIMIL STAFFORMAN		laine describer métromp	petromation action in School				etanat oo alka qot oo oo aa aa aa aa aa a	
: NEMA LENCLOSI	IRF	<u> </u>		ļ										· .	***************************************				1		<u> </u>		
		Ļ		i	(	ļ	······································		ļ		-				Q-00-4-1				<u> </u>				
R = NEWA 3R ENCI	OSURE	į.	:		1 1					i i		- 31	ķ.	į.				i i	9		1		2

EQUIPMENT	VOLTS	PH	NEUT	MO	FOR	ADDIT	IONAL	H	EAT	MISC	TOTAL	!	DISCO	NNECT		WIRE	NEUT	GND	#	CONDUIT	APPROX	VOLT	į
DESCRIPTION	na i sanga danggangalembera		Y/N	(LAR	SEST)	MOT	ORS	ST	RIPS	AMPS	AMPS	SIZE	FUSE	SIZE	NEMA	PER	WIRE	WIRE	OF	SZE	DIST.*	DROP	NOTE
e see dagaan daa daa daa daa daa daa daa daa daa				HP.	FLA	HP	FLA	KW	AMPS	aharipa, Yapakereka	ainega tinga phagainm ana ba	dia nyaétan meranang anna		ang manahing ng magadikang	Anna in critic comme	PHASE	ئيمه پيپورته پير پردرد د پيد	والمعطبينات ووليو	RUNS	and a same of the training of the second	FI	VD%	ajeunika ang rilayi
CHILLER 1	480	3	¥	60.00	77.00	60.00	77.00				154.0					#2/0	#2/0	#6	1	2-1/2"		0.00%	a
CHILLER 2	480	3	Y								0,0	,	(			#12	#12	#12	1	3/4"	100	0.00%	а
CHILLER PUMP 1 & 2 CP	480	3	¥	15:00	21.00	45.00	10.00	: 			31.0	·	:			#8	#8	#10	1	\$n	100	0.87%	a
EMH.	240	· À	Ϋ́					5.0	20.8		20.8	· ·	:			#10	#10	#10	1	3/4"	100	2.08%	
TWL REOPT, 1 (STAGE)	240	King.	¥		<del> </del>					50.0	50.0		:			#4	#4	#8	1	1-1/2"	75	0.97%	
TWL RECPT. 2 (STAGE)	240	模	¥					<u> </u>		50.0	50.0					#4	#4	#8	4	1-1/2"	25	0.32%	
TWL RECPT 3 (AUD. NE)	240	- 3	Y							50.0	50.0		: :			#4	#4	#8	.4	1-1/2"	25	0.32%	
TWL RECPT, 4 (AUD. N.E.)	240	4	Ϋ́		***************************************					50.0	50.0					#4	#4	#8	3	1-1/2"	75	0.97%	Í
TWL RECPT 5 (AUD. S.E.)	240	igger)	¥	1	<del> </del>					50.0	50.0					#4	#4	#8	4	1-1/2"	75	0.97%	
TWL RECPT: 6 (AUD. S.E.)	240	4	Y		***************************************			÷		50.0	50.0	:	<u> </u>	*****		#4	#4	#8	1	1-1/2"	75	0.97%	
TWL RECPT, 7 (AUD, S.E.)	240	1	Υ					·	***************************************	50.0	50:0			***************************************		#4	#4	棉	1	1-1/2"	100	1.29%	
TWL RECPT. 8 (AUD. S.E.)	240	4	¥							50.0	50.0					#4	#4	#8	4	1-1/2"	125	1.61%	
TWL RECPT. 9 (AUD. N.W.)	240	X.	Y							50.0	50.0	:				#4	#4	榔	4	1-1/2"	50	0.65%	
TWL RECPT. 10 (AUD. S.W.)	240	1	Y					***************************************	***************************************	50.0	50.0			***************************************		#4	#4	#8	-3	1-1/2"	50	0.65%	
TWL RECPT 11 - (PANEL NW)	240	ij	Y			-				50.0	50.0					#4	#4	#8	1	1-1/2"	5	0.06%	
TWL RECPT 12 - (PANEL NW)	240	1	¥					:		50.0	50.0					#4	#4	#8	1	1-1/2"	5	0.06%	
BENERAL NOTES:								:	ê							NOTES	4						
) - PROVIDEDISC, SW. AT ALL PIEK	eo oe eo	i neach	CATTE	vi (Anti	KICKOLE	i Exiletil	- PSV PELEW	Windere K	it inconsti	erense in	MENT OF THE			grafi samu mina in ana sinta		and of the second section of the section of the second section of the section of the second section of the section of t	and the second second	NAED (IN	E I KE F	JAGRAMS		τε κίδι	
1 ) - FILORIUE DIOU DIV. A FALL MED 2) - FUSES SHOWN FOR REFERENCI	ala na galaka nangi yan magaba	أبو سرو درنيت	design of the second	engale in the engineering of the engineering of the	ing pione grainbanc	i kanana yayaan saani saani	na plake magazaran ba	in a superior superio	magisar della circle	K PIVE E promogrami !		e inscree querment spe	já v osqui ozvejstyulot	el or year or joyerna	gaperosoppione p	and the second	INFORM	alatela and a particular properties	METERNAL L		ORABA	HOIVIL	jegorani za
3) - PROVIDE NEMA OUTDOOR RATI	D ENCLO	SURE	S FOR	ALL DIS	C SWS	MOUNT	ED OUT	COORS	Š.	}													}
4) - COORDINATE STARTER TYPE W	THMECH	ANIC	ALEO	JEMENT		and on the year own years.	y symple is be an board.	game terpedisentes		<u> </u>	\$ \$			5.4			i aaran qaaaqaa soo		5-,	nada ana na Anana na halipaga mend		J	
5) - COORDINATE ALL OVERCURRE	W PROTE	STIVI	E DEVI	JES WIT	HTHEA	CTUALI	EQUEME	NT BEI	NG SUPP	LIED. NK	OTHEY TH	EENG	INEER				A			en der i vinder et andersen dit anne et dese an			Control Control
IF DESCREPINGES ARE FOUND.	juliju juliju ju		garizating kanalawan		e industrial	gigundarijasymėtį (jas jas Š	i Antonio provinciam in majorità	proper since constraints	ens automobile de presidente.	g Salam de simone son de preside	i Balantan i da eta misian Balantan i	e ni el minero quili	in wyd speed to seek t	e in the second sections	Street Verband Control	esioni amiliari ai assuni	indeathin the	Section of the Property of the Control	arrest classic grand relative and a	were read party the scattered real street,		2 - Jane Corraindor	
3) - DISCONNECTS BETWEENS MOT	ORS AND	VFC'	S SHA	LLBER	ROVIDE	HTWC	WALK	ARY (	XXITACT	CAND		. 1, , <sup>1</sup> 1,	gaivaiv. Au		ng tha Hanna A Ananna		. V die een bedienen be			and the second second second			L
WIRED TO THE E-STOP OF THE \	/FD		grand transl.		riandar interneta			dada tanda		F . 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		variorini del					A to any attended the streng			er in fast designation of security			L
7) - TWL = TWST LOCK	aparamenta		formasi verso	Para searan rasanga		E E commencement in the ex-	de la composition della compos	ra nom ja nje ir na progri	n of the manner and the month and the			A menunian was	Sarbara anno an aire stan tan	40.00-0.00	ļ, ,. ,,		kan manganan menganan pang	] {	Acres per consultation	ok bo wond as will a sum a boso invasi	je samo se samo se sa		į

FPL 12 MONTH HISTORY MAX KWD AT 480V	<u>III</u>	KVA	AAAES
1/2016 THRU 12/2016	<u>291.00</u>	<u>363.75</u>	438.04
EXISTING LIGHTING LOADS REMOVED	66.60	83.25	100.25
TOTAL REMAINING LOAD	224.40	280.50	<u> </u>
NEW LIGHTING LOADS ADDED	29.11	36.39	43.87
TOTAL REMAINING LOAD ON PANEL	291.00	363.75	438.04
NEW GENERATOR 30KW 120/208V 3PH, 4W	*W	KVA	AMPS
NEW PANELEM	12.64	15.80	43.91

CALCULATIONS

NEW PANEL PANEL NAME: MANUFACTURER: MAIN OPTIONS REQUIRED AB NEW SIEMENS LOCATION: MAINT, ELECT. NGOD MCB: 225 AMPS AIC RATING: KAMPS MOUNTING: SURFACE VOLTS L-N. S.E.RATED: N/A NEMA TYPE: 20.00 5.75 VOLTS L-L: WIDTH SHUNT TRIP: N/A PHASE DEPTH: IDENTIFICATION IDENTIFICATION LOAD/PHASE (KVA) CIRCUIT BREAKER LOAD/PHASE (KVA) FOVER, M & W RR LTS OFFICE LTS LOBBY ACCENTILITS MONUMENT LIGHTS TICKET BOOTH RECPTS 0.50 FIXTURE O RECPTS - LOBBY TICKET BOOTH RECPTS TICKET BOOTH RECPTS FIXTURE O RECPTS - LOBBY FIXTURE O REOPTS - LOBBY TICKET BOOTH RECPTS 0.50 TICKET BOOTH RECPTS FIXTURE O RECPTS - LOBBY TICKET BOOTH RECPTS ₹ 0.18 CANOPY LTS SAFE ROOM RECPTS CANOPY ACCENTATE SAFE ROOM RECPTS HVAC CONTROL CANOPY LTS CANOPY ACCENTILITS RECEPTION RECPTS CANOPY IMAGE PROJECTORS RECEPTION RECPTS CONV.RECPTS CANOPY IMAGE PROJECTORS R 0.72 0.36 OFFICE RECPTS 1R 0.36 0.36 OFFICE RECPTS OFFICE RECPTS 0.75 COFFEE COFFEE TOFFICE, BOX, TICKET BOOTH 1 MICROWAVE LOBBY RECPTS MAINTENANCE RECPTS CANOPY IMAGE PROJECTORS MAINTENANCE RECPTS CANOPY IMAGE PROJECTORS MAINTENANCE RECPTS BLDG LETTERING LIGHTING BLDG LETTERING LIGHTING LOBBY RECPT FOR TV FIXTURE O RECPTS - GALLLERY SPARE SPARE SPARE SPARE SPARE SUB FEED LUGS AS INDICATED, IF BLANK (NOT USED) 9.1 10.3 TOTAL CONNECTED KVA: 33.82 TOTAL CONNECTED AMPS/PH: TOTAL DEMAND KVA: 34. LIGHTING (L) 12.05 1.25

RECEPTACLES 1ST 10 KVA(R) 10.00 1.00

RECEPTACLES OVER 10KVA(R) 5.02 0.50

HVAC EQUIPMENT (H) 0.00 1.00 TOTAL DEMAND AMPS/PH: 1. PROVIDE ARC FLASH LABELING FOR THE PANEL IN ACCORDANCE WITH NFPA 70 & 70E APPLIANCES (A) AS SPECIFIED. EQUIPMENT (E) 3:00 1:00 3:00 LARGEST MOTOR (M) 0:00 1:25 0:00 OTHER (O) 0:00 1:00 0:00 SPARE (S) 0:00 1:00 0:00 SCHEDULE NOTES: a. ALT BID#1 b, ALT BID #3

EXISTING PANEL PANEL NAME: BEXIST MANUFACTURER: CUILER-HAMMER MAIN OPTIONS REQUIRED MCB: NA AMPS LOCATION: S.L. STORAGE AIC RATING: **KAMPS** MOUNTING: 65 MLO: 100 AMPS SURFACE VOLTS L-N 120 SERATED NA NEMA TYPE: VOLTS L-L: 240 WIDTH 20.00 5.75 SHUNT TRIP: N/A PHASE DEPTH IDEMIFICATION LOAD/PHASE (KVA) | CIRCUIT BREAKER LOAD/PHASE (KVA) IDENTIFICATION TRIP PP TRIP 50A RECPT AUD 50A REOPT AUD 1.44 1.44 1.44 50A RECPT AUD 50A RECPT AUD 1.44 RECPT'S W. CORNER AUD RECPTS E. CORNER AUD 0.18 RECPT S.W. CORNER AUD REGPT S.E. CORNER AUD 0.18 0.18 RECPT 6. AUD RECPT S. AUD 0.36 R 0.36 RECPT S. AUD RECPT S. AUD 1.00 TOTAL CONNECTED KVA: 14.96 CONN. LOAD DEVAND DEMAN TOTAL CONNECTED AMPS/PH: (KVA) FACTOR (KVA) TOTAL DEMAND KVA: 16.49 LIGHTING (L) 6.12 1.25 TOTAL DEMAND AMPS/PH: 69 RECEPTACLES 1ST 10 KVA(R) 1.36 1.00 RECEPTACLES OVER 10KVA(R) 0.00 0.50 GENERAL NOTES: HVAC EQUIPMENT (H) 0.00 1.00 1 EXISTING = LIGHT / NEW WORK = BOLD APPLIANCES (A) 2.88
EQUIPMENT (E) 0.00 EQUIPMENT (E) SCHEDULE NOTES: LARGEST MOTOR (M) 0.00 1.25 a. EXISTING BREAKER TO REMAIN OTHER (O) 0.00 b PROVIDE NEW BREAKER AS INDICATED

C. UTILIZE EXISTING SPARE BREAKER AS INDICATED

SPARE (S) 4.60 1.00 4.60

LINKED PANEL (P) INCLUSED IN ABOVE TOTALS

NEW PANEL PANEL NAME: C1 NEW MAIN OPTIONS REQUIRED MANUFACTURER: SIEMENS MCB: 225 AMPS LOCATION: CONCESSION KIT. TYPE GODN SURFACE MOUNTING: AIC RATING: 65 MLO: N/A AMPS S.E.RATED NA NEMA TYPE: VOLTS L-N. 120 WIDTH: 20.00 240 VOLTS L-L: 5.75 PHASE SHUNT TRIP: N/A DEPTH: LOAD/PHASE (KVA) | CIRCUIT BREAKER | LOAD/PHASE (KVA) IDENTIFICATION IDENTIFICATION TRIP PP TRIP 2 50 PIZZA OVEN 3.60 SPD 3,60 PIZZA WARMER 0.45 REFRIG PRETZLE WARMER 0.45 COOLER A 1.20 0.50 OUTSIDE ICE BOX FOOD WARMER 1.80 CONCESSION LIGHTING SPARE 0.20 MICROWAVE S. WALL RECPT 0:36 S. WALL RECPT FREEZER 0.36 1.60 S, WALL RECPT FRESH AIR FAN 0.36 F SPARE RECPT R 0.36 SPARE BEER COOLER SPARE PENDANT LIGHTS SPARE NACHOS SODA COMPRESSOR SPARE A 0,50 SPARE SODA COMPRESSOR 0.50 SPARE POPCORN A 1.40 SPARE COFFEE 1.50 SPARE HOT CHOCOLATE A 0.14 SPARE HOT DOGS A 0.45 SPARE COUNTER RECPT R 1.00 TOTAL CONNECTED KVA: 27.78

CONN LOAD DEMAND DEMAN (KVA) FACTOR LOAD LIGHTING (L) 0.20 1.25
RECEPTACLES 1ST 10 KVA(R) 2.44 1.00 RECEPTACLES OVER 10KVA(R) 0.00 0.50 0.00 HVAC EQUIPMENT (H) 0.65 1.00 0.65 APPLIANCES (A) 23,99 1.00 23,99 EQUIPMENT (E) 0.50 1.00 0.50 LARGEST MOTOR (M) 0.00 1.25 0.00 OTHER (0) 0.00 1.00 0.00 SPARE (S) 0.00 1.00 0.00 LINKED PANEL (P) INCLUDED IN ABOVE TOTALS

TOTAL CONNECTED AMPS/PH TOTAL DEMAND KVA: 27.83 TOTAL DEMAND AMPS/PH: 11

GENERAL NOTES: 1. PROVIDE ARC FLASH LABELING FOR THE PANEL IN ACCORDANCE WITH NFPA 70 & 70E AS SPECIFIED.

SCHEDULE NOTES: a. PROVIDE SHUNT TRIP BREAKER

NEW PANEL

PANEL NAME: MANUFACTURER: SIEMENS MAIN OPTIONS REQUIRED MLO: 600 ÁMPS AIC RATING: 65 K AMPS MOUNTING: SURFACE NEMA TYPE: 120 S.E.RATED: N/A VOLTS L-N: VOLTS L-L: 240 WIDTH: 20.00 SHUNTTRIP: N/A DEPTH: 5,75 PHASE CKT IDENTIFICATION LOAD/PHASE (KVA) | CIRCUIT BREAKER | LOAD/PHASE (KVA) IDENTIFICATION TRIP P P TRIP 30 2 2 100 13.20 PANEL AB PANEL B PANEL K E 2.00 2.00 4.80 PANEL WP N.E. AUD. RECPT E 2.00 RECEPTS 2.00 4.80 🗟 PANEL PRI N.E. AUD. RECPT 2.00 RECEPTS 2.00 UP STAGE RECPT PANEL J E 2.00 RECEPTS 2.00 SPARE UP STAGE RECPT 4,80 SPARE RECEPTS SPARE SPACE SPARE SPACE SPARE SPACE SPARE SPACE CONN LOAD DEMAND DEMAND LOAD (KVA) TOTAL CONNECTED KVA: 90.00 TOTAL CONNECTED AMPS/PH: 375 TOTAL DEMAND KVA: 75.80 LIGHTING (L) 0.00 1.25 0.00 RECEPTACLES 1ST 10 KVA(R) 10.00 1.00 10.00 TOTAL DEMAND AMPS/PHI: 316 RECEPTACLES OVER 10KVA(R) 28.40 0.50 14.20 HVAC EQUIPMENT (H) 0.00 1.00 0.00 APPLIANCES (A) 0.00 1.00 0.80 EQUIPMENT (E) 51.60 1.00 51.60 1. PROVIDE ARC FLASH LABELING FOR THE PANEL IN ACCORDANCE WITH NFPA 70 & 70E LARGEST MOTOR (M) 0.00 1.25 0.00 OTHER (O) 0.00 1.00 0.00 SPARE (S) 0.00 1.00 0.00

LINKED PANEL (P) NOLUDED IN A BOVE TOTALS

NEW PANEL

		MANUFACTURER; SIEMENS TYPE: NGOD AICRATING: VOLTS L-N: 120 VOLTS L-E: 208 PHASE 3	K/V	MPS			S.E.R GFI	MCB: MLO: ATED: PROT:	225 N/A					ANEL NAME: EM LOCATION: S.R. STORAGE MOUNTING: SURFACE NEMA TYPE: 1 WIDTH: 20.00 DEPTH: 5.75	W W	
N T E S C	- 1	MENTIFICATION	L O A D	LOA	D/PHASE				EAKER	LOAD/PI	HASE		L O A D	IDENTIFICATION	СК	- 1
NC 1	). 	AUD PENDANTS	L	A 0.86	В	G	TRIP 20	P   P   1	TRIP	A	B	O	0		NO.	-
3		AUD PENDANTS AUD PENDANTS	L		1.00	0.84	29 20	1 3	30				0	SPD	4	
7	7	AUD PENDANTS	L	1.00			20	1/1	<u> </u>	0.18			R	STAGE MGR RECPTS	8	
1		AUD PENDANTS AUD PENDANTS			0.98	0.86	20	1 1			36	0.18	R	STORAGE RECPTS STAGE RECPTS	10	·∳-
1;		AUD PENDANTS	L	0.57		9.00	20	1111	20	0.18		2.30	R	RECPT AT GENERATOR AND ATS	14	
1		AUDENIS	L	1	0.20		20	1 1			3.36		R	OFFICE COOR SAFE RM RECPTS	16	-1
1	- +	STOR, ELECT, BK STGE LTS N & S DRSSNG, MECH, LTS	L	0.70		0.85	20	1 1		0.20		0,36	R	RECPT, MAINT, RECPTS BOX OFFICE RECPTS	18 20	-1.
1 2		STOR ELECT, DRSSNG BK STG EXITS	L	0.70	0.20	<u> </u>	20	1 1		0.36	0.36		R	CONG RECPTS	22	······•
2	inano in <b>f</b> in	OFFIGE, M. RR AREA LTS	L			0.42	20	1 1	devine in when the war			1.20	R	CONC. HOOD CONTROL PANEL	24	
2		LOBBY LTS	L	0.40			20	1 1		0,50			E	AUDITORIUM LIGHTING CONTROL PANEL	26	<u></u> }-
2		CONC, W. RR AREA LTS	l.		0.33		20	1 1			).78	2 -2	L	EXTERIOR WALL PACK LIGHTS FOH LIGHTING CONTROL PANEL	28	<del>}</del> -
$\frac{2}{3}$	······••	OFFICE, LOBBY CONC EXTS  CANOPY LTS	L	0.25		0.20	20	1 1	<u> </u>		**********	0.50	S	SPARE	30 32	┉╬
3		STAGE LTS	H	U.Z.		1.0000000	20	111					8	SPARE	34	
3		EXTERIOR AREA LIGHTS	L			1.60	50	2 1	20				8	SPARE	36	
3			L	1.60				1	20				s	SPARE	38	
3		SPARE SPARE	S				20	1 1	1				5	SPARE SPARE	40	
4	1: <u> </u>	SCARGE	S	5.4	2.7	4.8		1.184 31	20	1.2	19	2.2	s	STASE	42	
		LIGHTING (L) RECEPTACLES 1ST 10 KVA(R) RECEPTACLES OVER 10KVA(R) HVAC EQUIPMENT (H) APPLIANCES (A) EQUIPMENT (E) LARGEST MOTOR (M) OTHER (O) SPARE (S) LINKED PANEL (P)		CONN. LOAD (KVA) 13.63 3.54 0.00 0.00 0.00 1.00 0.00 0.00 0.00	DBWAND FACTOR 1.25 1.00 1.00 1.25 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	(KVA) 17.04 3.54 0.00 0.00 0.00 1.00 0.00 0.00 0.00	and the control of th	TOTAL  TOTAL  GENI  1. PE	L CONNE TOTAL DTAL DE ERAL NO	RC FLASH	S/PH: KVA: S/PH:	50 21,58 60	## # # # # # # # # # # # # # # # # # #	HE PANEL IN ACCORDANCE WITH NFPA 7	0 & 70	OE.

			MANUFACTURER: SIEMENS TYPE: NGOD AIC RATING: 65 VOLTS L-N: 120 VOLTS L-L: 240 PHASE 1	KA V V	MPS			MAIN OI S.E.R SHUNT	MC MLI ATE	B: O: D:	225	RED AMPS AMPS			PA	NEL NAME: LOCATION: MOUNTING: NEMA TYPE: WIDTH: DEPTH:	K NEW STAGE SURFACE 1 20.00 5.75	IN IN	anagka daga
Ŧ		CKT NO.	IDENTIFICATION	O A D	LOAE	//PHASE	(KVA)	CIRCL TRIP	ЛГВ		KER	LOAE	/PHASE	E (KVA)	L D A	IDENTIFICA	MON	GKT NO.	O T E S
	-	3 5	SPD	000				30		1	20 20 20		0.45	0.45	L	W. STORAGE R E. STORAGE, ELEVA STORAGE & ME	TED ROOM LTS	4 6	
	-	7 9	STAGE MGR OFFICE A/C	A	1.00	1.00		20 20	1	1	20 20		0.18	0.36	R	STORAGE & MECH S. AUD RECPT IN RE	CESSED BOX	8 10	
		11 13	STAGE MGR OFFICE RECPTS  STAGE MGR OFFICE RECPTS  STAGE MGR , STOR, EXIT CORRUTS	R	0.18	0.18		20 20 30	1 1	1.	30 20 30		0.18		R R	S. AUD RECPT IN RE N. AUD RECPT IN RE	ECESSED BOX	12 14 16	
		15   17   19	BACK STAGE BENCH RECPTS  BACK STAGE BENCH RECPTS	RR	0.18	0.20		20 20	1	1	20 20		0.18		R R	N, AUD RECPT I	BY N DOOR	18 20	
	- Armania de la composição de la composi	21 23	BACK STAGE BENCH RECPTS STORAGE RECPTS	R	0.18	0.36		20 20	1	1	20 30		0.48	1.20	R R	N, AUD RE GOLF CART CHAR GOLF CART CHAR	KGING RECPT	22 24	<del></del>
		25 27 29	BACK STAGE LTS  N. SHORE RECPTS  N. SHORE RECPTS	L R	0.20 1.20	1.20		20 20 20	1	1	20 20 20		1.20	4,20 1	R R S	GOLF CART CHAR SPARI	IGING RECPT	26 28 30	<del>-</del>
		31 33	N. SHORE RECPTS S. SHORE RECPTS	R	1.20	1,20		20 20	1	1	20 20				8	SPARI SPARI		32 34	-
STATE OF THE PARTY		35 37 39	S. SHORE RECPTS S. SHORE RECPTS SPARE	RRS	1.20	1.20		20 20 20	1 1	1	20 20 20				S S	SPARI SPARI SPARI	<b>5</b> .	36 38 40	
		41	SPARE	0 0	5.3	5.5		20	1		20		2.8	The second second second second	S	SPARI		42	
			LIGHTING (L) RECEPTACLES 1ST 10 KVA(R) RECEPTACLES OVER 10KVA(R) HVAC EQUIPMENT (H) APPLIANCES (A) EQUIPMENT (E) LARGEST MOTOR (M) OTHER (O) SPARE (S		1,70 10,00 4,40 0,00 2,00 0,00 0,00 0,00 0,00	DEMAND FACTOR 1,25 1,00 0,50 1,00 1,00 1,25 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,0			<u>GE</u> 1. I	AL ( TOT NEF PRO AS :	EONNI TOTA AL DE EAL NE VIDE : SPECI	ARC FLAS	APS/PH ND KVA APS/PH	75 16.33 68	THE	PANEL IN ACCORDA	NCE WITH NFPA	70 & 70	洰

AB	В	C1
DP4	EM	K



ARCHITECTURE  $\triangleleft$  $\infty$ WORK 8 

AUDERDAL PROJECT # 12128
WAR MEMORIAL AU
RENOVATIONS
PANEL SCHEDULES
800 N.E. 8TH STREE

12128-E26-LEGN DRAWING FILE NO. 4-140-11 Exhibit 3 p. 427

COTAL:

CAD FILE:

1/10/2018 6:36 AM

Page 427 of 476

31

31

ENGINE	7 MANUT	CO ME CO		PF			
DATE:	07/12/2017	BY: SCALE:	AS SHOWN				
DRAWN BY: DATE: ENGINE	RL	DESIGNED BY:	RLL	снескер ву:	MEH	FIELD BOOK:	
A COUNTY	en e gebreid en Tilleurister (1900	i samijadi Roduktiva	giane areatora pi	- 25 of 140 (50 (50 )) - 25 of 140 (50 (50 ))	eledekedek Semerkika		200 200
腺質	7	8		- 1	7	-	

	DRAWN BY:	DATE:
	RL	07/12/201
A D. Married Broad	DESIGNED BY: SCALE:	SCALE;
	RE	AS SHOWN
	CHECKED BY:	
	MEH	
da 33301	FIELD BOOK:	***************************************
	502	

DEPARTME T WORKS 

 $\circ \circlearrowleft$ NGINEERING PBLC 

AUDERDALE

AUDHOTON PROJECT # 12128
WAR MEMORIAL AUD
RENOVATIONS
PANEL SCHEDULES
800 N.E. 8TH STREET

CAD FILE: 12128-E27-LEGN

P	BS		
SGA	A-AGERING:	1 EAST BROWARD BLVD. #1503 FT. LAUDERDALE, FL. 33301 J TEL: (954) 421-1944 CA-00006208	
MEP CONSULTI SGM #: 2016-221	W	S  WW.SGMENGINEERING.COM	

EXISTING PANEL PANEL NAME: L4 EXIST MANUFACTURER: SIEWENS MAIN OPTIONS REQUIRED TYPE. LOCATION: SR STORAGE NOOD MCB: 100 AMPS AIC RATING 10 KAMPS MOUNTING: SURFACE MLO: 100 AMPS

	VOLTS L-N: 120 VOLTS L-L: 208 PHASE 3	¥				S.E.R. GFM SHUNT	⊃F{(	or:						NEMA TYPE: 1 WIDTH: 20:00 DEPTH: 5.75	IN IN	
T	IDENTIFICATION	L O A D	LOĀ	D/PHASE	(KVA)	CIRCU	T.	BRE	EAKER	LÒÀE	VPHASE	(KVA)	J 0 A D	IDENTIFICATION	ска	TO THE WA
7			A	В	6	TRIP	P	P	TRIP	A	В	; · Q:	A Control of the Cont		NO.	
	GALLERY STEP LTS	L	0.26			20	1						0		2	
	AUD (38	L.		00.ř		20	1	3	30				0	SPD	7.46	b
	AUD LTS	L.			1,00	20	1	₽ :		- 616	9000		0		'6∵	
	AUD LTS	L	0.86			20	1	2	20				S	SPARE	8	Ç
	AUD LTS	L		0.88		20	1						S		10	
	AUD LTS	L	4 6 6		1.00	20	1	2	20	0.00			S	SPARE	12	Š
	AUD LTS	T	0.86	60 100 0		20	1	TO CONTRACT					S		14	in a
	FOYER AND WALL SCONCE LTS	S		0.26		20	2	2	20				S	SPARE	16	3
	FOYER AND WALL SCONGE LTS	S		0.68	N. Company			CONTROL OF			A tomas		S		18	ì
	SPARE	S				20	2	2	20			1000000	S	SPARE	20	£
		S											S		22	
	SPARE	S				20	2	2	20				S	SPARE	24	3
		S					:			2.			S		26	
	SPARE	S				20	2	2	20				S	SPARE	28	S
	r 	8					-	COLUMN TO THE REAL PROPERTY.	•				s		30	
	SPACE	S	wasta strain salahan				1	1	pilimeniarmone romeno				S	SPACE	32	

DEMANO TOTAL CONNECTED KVA: 6.11 LOAD DEWAND LOAD TOTAL CONNECTED AMPS/PH | LIGHTING (L) | S.85 | 1.25 | 7.32 |
RECEPTACLES 1ST 10 KVA(R)	0.00	1.00	0.00
REGEPTACLES OVER 10KVA(R)	0.00	0.50	0.00
HVAC EQUIPMENT (H)	0.00	1.00	0.00
ADDITIONAL CES (A)	0.00	1.00	0.00

1 EXISTING = LIGHT / NEW WORK = BOLD b. PROVIDE NEW BREAKER AS INDICATED c. PROVIDE NEW SPD LINKED PANEL (P) INCLUDED IN ABOVE TOTALS

EXISTING PANEL

SPACE

SPAGE

SPAGE

SPACE

SPACE

EXISTING PANEL

MANUFACTURER:

AIC RATING:

VOLTS L-N:

**VOLTS L-L** 

PHASE

IDENTIFICATION

SPACE

SPACE

RECPT BEHIND S. BLEACHERS

AUDITORIUM RECPT

AUDITORIUM RECPT

AUDITORIUM RECPT

SPACE

SPACE

SPACE

BLEACHER POWER

25 27

38

40 42

TYPE

NOOD

120

208

K AMPS

R 4.16

R 0.18

E 2.88

LIGHTING (L) 0.00 1.25 0.00

RECEPTACLES 1ST 10 KVA(R) 8.86 1.00 8.86

RECEPTACLES OVER 10KVA(R) 0.00 0.50 0.00

HVAC EQUIPMENT (H) 0.00 1.00 0.00

APPLIANCES (A) 0.00 1.00 0.00

EQUIPMENT (E) 10.54 1.00 10.54

LARGEST MOTOR (M) 8.64 1.25 10.80 OTHER (O) 4.20 1.00 4.20 SPARE (S) 0.00 1.00 0.00 LINKED PANEL (P) INCLUDED IN ABOVE TOTALS

4.16

0.18

2.88

LOAD DEMAND LOAD (KVA) FACTOR (KVA)

2.88

0.18 20

						MAIN O	PTK	SMC	REQUIR	æD			P	ANEL NAME: BS	
	TYPE: NGOD AIC RATING: 65 VOLTS L-N: 120 VOLTS L-L: 208 PHASE 3	K AI V V	MPS			S.E.F GFI SHUN	MI RATI	LO: ED: OT:	250 N/A N/A	AMPS AMPS				LOCATION: S. GALLERY MOUNTING: SURFACE NEMA TYPE: 1 WIDTH: 20:00 DEPTH: 5.75	IN IN
CKT	IDENTIFICATION	J 0 & D	Eoai Ā	D/PHASE	(KVA)	CIRCI		BRE	AKER TRIP	LOAD	/PHASE	(KVA)	LOAD	IDENTIFICATION	CK NO
		140	7 17 7 7	D	-	) Lear	1,81		3 PARE		13	<u> </u>	s	SPACE	2
3	DOOR OPENER	M M	3.84	3.84		40	12		· · · · · · · · · · · · · · · · · · ·				S	SPACE	4
5	DOEM OF LINEA.	M		3.04	3.84	70		1	V-V-2-V-V-V-V-V-V-V-V-V-V-V-V-V-V-V-V-V				8	SPACE	6
7	RECPT BEHIND S. BLEACHERS	R	4.16		3,04	50	2	11 1		<u> </u>			S	SPACE	8
9		R	7. 14	4.16			1		***************************************					SPACE	10
111	AUDITORIUM RECPT	R		70	0.18	20	1						S	SPACE	12
13	AUDITORIUM RECPT	R	0.18			20	1	1					S	SPAGE	1/4
15	AUDITORIUM RECPT	R		0.18		20	1	1					s	SPACE	16
17	SPACE	S					1		20			1.90	E	NOT LABELED	18
19	SPACE	9	**********				1			2.88			Е		20
21	SPAGE	S					1	3	30		2.88		E	NOTLABELED	22
23	SPACE	S					1					2.88	E		24
25	SPACE	S					1	Çerrore		2.88			Е		26
27	HALLWAY RECPT	R		1.67		20	2	3	30		2.88		E	BLEACHER POWER	28
29		R	8.2	9.9	1.67 5.7			200		5.8	5.8	2.68	E		30
	LIGHTING I RECEPTACLES 1ST 10 KVA( RECEPTACLES OVER 10KVA( HVAC EQUIPMENT ( APPLIANCES ( EQUIPMENT (	(1) (1) (2) (3) (4) (4) (4) (4) (4) (4) (4)	ONN. OAD (VA) J.00 0.00 2.20 J.00 J.00 9.18	DEMAND FACTOR 1,25 1,00 0,50 1,00 1,00	DEMAND LOAD (KVA) 0.00 10.00 1,10 0.00 0.00		<u>S(</u>	TAL TO CHE UT	CONNE TOTA TAL DEI DULE N LIZE SP		APS/PH ND KVA APS/PH ) PROV	139 44,66 124 DE NEV	)    -   BRE	EAKER AS INDICATED. ACE	

 	 	_	-

PANEL NAME: L2 EXIST

NEMA TYPE:

WIDTH:

DEPTH:

LOCATION: NIDRESSING RM

1

20.00

5.75

SCKT

b 13 b 15

SPACE

SPACE

SPACE

SPACE

MOUNTING: SURFACE

IDENTIFICATION

GAS WHIN DRESSING RM 1

DRESSING RM 2 RECPT

DRESSING RM 3 RECPT

DRESSING RM 3 RECPT

SPARE

SPACE

SPACE

SPACE

SPACE

SPACE

SPACE

		MANUFACTURER: TYPE: AIC RATING: VOLTS L-N: VOLTS L-L: PHASE	SIEMENS NGOD 65 120 240 1	K / V V	AMPS:			MÁIN OI S.E.R SHUNT	MCE MLC ATEC	225 N/A	RED AMPS AMPS			P	ANEL NAME: LOCATION: MOUNTING: NEMA TYPE: WIDTH: DEPTH:	NW NEW N.W.EXTERIOR SURFACE 4x 20.00 5.75	ÎN ÎN	A THE RESIDENCE OF THE PERSON
Z O T E S	CKT NO	IDENTIFICAT	NON	D O L	LOAD	/PHASE	(KVA)	CIRCL	JIT BI	EAKER	LOAD	IPHASE	(KVA)	LOAD	IDENTIFI	CATION	OKT NO.	NOTES
	5 5			İ	A	В		TRIP	PF	A 1 - 24/12	*	Α	В					
	1	VENDOR RECPT	T BELOW	0	2.40			50	2 1					L	SP)	AGE	2	
	3			0		2.40								L	SP/	VCE	4	
	15	VENDOR RECPT	TBELOW .	Q	2.40			50	2					R	SP/	ACE	6	
	7			L		2,40								R	SP)	NOE .	8	
	9	CONV RECPT I	BELOW	L	0.18			20	1 1					R	SP	YCE	10	
	111	SPARE		L				20	1					S	SPA	ACE:	12	
					NN LOAD (KVA)	OEWAND FACTOR			TOT#	AL CONNE	ONNECTE CTED AN	APS/PH:	41					
1			LIGHTING (	L.)	2,58	1.25	3.23	1	: - <del> </del>	OTAL DE	MAND AN	/PS/PH	4.3	i.				
			S 1ST 10 KVA(		0.00	1.00	0.00											and the last
		191 19 191	S OVER 10KVA	· · · · · · · · · · · · · · · · · · ·	0.00	0.50	0.00	-	. www.news.news.news.news.news.news.news.n	IERAL NO			n district and comment					38M
		*****	C EQUIPMENT (	-	0.00	1.00	0.00	-	1.00		and a best of the	SH LABE	LING FO	urc of	E PANEL IN ACCORT	DANGE WITH NEPA	7U & 7C	t.
			APPLIANCES ( EQUIPMENT (		0.00	1,00 1,00	0.00	And Property	<i>.</i> !!	S SPECI	r (ELL)							
		LAR	) EGGIPNIEN IGEST MOTOR		0.00	1.25	0,00	1	sc⊢	EDULE N	IOTES:							
		نو چون پېسو.	OTHER (		7.20	1.00	7.20	1	a.	ري بنيون به خدست	rope the series				4			
			SPARE (		0.00	1.00	0.00	1										
		1	INKED PANEL (		orsi Turking	N A PINTE	TOTALO	1										

MAIN OPTIONS REQUIRED

S.E.RATED: N/A

SHUNT TRIP: N/A

LOAD/PHASE (KVA) CIRCUIT BREAKER LOAD/PHASE (KVA)

20 1 1 20

MCB: 100 AMPS MLO: 100 AMPS

TRIP PP TRIP A B

0.10

0.18

0:3 0:2

TOTAL CONNECTED KVA: 5.08

TOTAL DEMAND KVA: 5.83

1 EXISTING = LIGHT / NEW WORK = BOLD

C. UTILIZE EXISTING SPARE BREAKER AS INDICATED

TOTAL CONNECTED AMPS/PH:

TOTAL DEMAND AMPS/PH:

**a. EXISTING BREAKER TO REMAIN** 

b. PROVIDE NEW BREAKER AS INDICATED

GENERAL NOTES:

SCHEDULE NOTES:

as to a debate comment of contract and below to the contract contract to the c		MANUFACTURER: EXISTING TYPE: EXISTING AIC RATING: VOLTS L-N: 277 VOLTS L-L: 480 PHASE 3	* V	AMPS			S.E.R	MCB: MLO: ATED: PROT:	NVA 400 NVA NVA	RED AMPS AMPS				ANEL NAME: P NEW LOCATION: XFMR RM MOUNTING: SURFACE NEMA TYPE: 1 WIDTH: DEPTH:	W W	HEZOXXIII SAVQUUKANI SIXCE HARRENO OPETO AFRICEN KUMIN
CTES	CKT	IDENTIFICATION	L O A D	LOA	D/PHASE			wystric to the same and	EAKER	LOAD	PHASE	(KVA)	L O A D	IDENTIFICATION:	CKT	0 T E 8
	NO.			Α	8	- 0	TRIP	PP	TRIP	A	8	C			NO.	
	3 5	CHILLER#1					200	3 3	40					XFMR FOR BLEACHER PANEL BN	2 4 6	B SEED HOLD WAS A SEED OF THE
	7 9 11	CHILER#2					200	, co	40			-		XFMR FOR BLEACHER PANEL BS	8 10 12	A COLUMN TO THE OWNER OF THE OWNER OF THE OWNER
	13 15 17	CHILLER PUMP					30	3 3						SPACE	14 16 18	AND STREET STREET, STR
	19 21 23	CHILLER PUMP					30	3 3						SPACE	20 22 24	PERCENTAGE STATES OF THE STATE
		LIGHTING (L) RECEPTACLES 1ST 10 KVA(R) RECEPTACLES OVER 10KVA(R) HVAC EQUIPMENT (H) APPLIANCES (A) EQUIPMENT (E) LARGEST MOTOR (M)		CONN. LOAD (AVA) 0.00 0.00 0.00 0.00 0.00 0.00 0.00	DEWAND FACTOR 1,25 1,00 0,50 1,00 1,00 1,25	0.00 (KVA) 9.00 0.00 0.00 0.00 0.00		GENI 1 PR 4 AX 2 EX	CONNE TOTAL DEAL DE ERAL NO SOVIDE A S SPECII STING =	RC FLAS FIED. : LIGHT / f	IPS/PH: ID KVA: IPS/PH: H LABE!		T T D OR TH	e panel in accordance with NFPA 7	0 & 701	
		OTHER (0) SPARE (S) HINKED DANEL (D)		6.00 0.00	1.90 1.90	9.00 0.00		SCHE a	<u>DULE N</u>	OIES:						ANY OF THE PERSON NAMED IN

LINKED PANEL (P) INCLUDED IN ABOVE TOTALS

NW

PANEL NAME:

2.10 O

1.90 £

a UTILIZE SPACE AND PROVIDE NEW BREAKER AS INDICATED.

2.10

2.88

2.88

TOTAL CONNECTED KVA: 32.24

TOTAL DEMAND KVA: 34.40

b. PROVIDE NEW 20A, 1P BREAKER IN SPACE

TOTAL CONNECTED AMPS/PH: 90

TOTAL DEMAND AMPS/PH:

LOCATION:

WIDTH:

DEPTH:

IDENTIFICATION

SPACE

SPACE

SPACE

SPACE

SPACE

BLEACHER CONTROL

SPACE

NOTLABELED

BLEACHER MOTOR

MOUNTING:

NEMA TYPE:

MAIN OPTIONS REQUIRED

S.E RATED: N/A

GFI PROT NA

SHUNT TRIP: N/A

LOAD/PHASE (KVA) CIRCUIT BREAKER LOAD/PHASE (KVA)

30 3 3 30

A B C TRIP PP TRIP A B C

MCB: N/A AMPS

MLO: 250 AMPS

BN

N. GALLERY

SURFACE

20.00

5.75

EXISTING PANEL

MANUFACTURER: GUTLER-HAMMER

NQOD

65

120

240

K AMPS

9.20

0.50

₹ 0.36

₹ 0.18

0.18

R 0.18

2.2 2.4

GONN LOAD DEMAND LOAD LOAD (KVA)

LIGHTING (L) 3.00 1.25 3.75

RECEPTACLES 1ST 10 KVA(R) 3.98 1.00 1.98

RECEPTACLES OVER 10KVA(R) 0.00 0.50 0.00

HVAC EQUIPMENT (H) 0.00 1.00 0.00

APPLIANCES (A) 0.10 1.80 0.10

EQUIPMENT (E) 0.00 1.00 0.00

LARGEST MOTOR (M) 0.00 1.25 0.00

OTHER (O) 0.00 1.00 0.00

SPARE (S) 0.00 1.00 0.00

LINKED PANEL (P) INCLUDED IN ABOVE TOTALS

LINKED PANEL (P) INCLUDED IN ABOVE TOTALS

0.60

0.50

1.00

0.18

0.18

0.18

0.18

TYPE:

AIC RATING:

VOLTS L-N:

VOLTS L-L:

PHASE

IDENTIFICATION

DRESSING RM 1 & 2 LTS

CORRIDOR & ORESSING RM LTS

DRESSING RM 3 LTS

DRESSING RW 1 VANITY LIGHTS

DRESSING RM 2 VANITY LIGHTS

DRESSING RM 3 VANITY LIGHTS

DRESSING RM 1 RECPTS

SPACE

NEW PANEL

1/10/2018 6:36 AM

DRAWING FILE NO. 4-140-11 Exhibit 3 p. 428
Page 428 of 476

NEW	PANEL	
-----	-------	--

IDENTIFICATION:	L				SERVINA	TRIP	Nii Nii	A A					LOCATION: MAINT ELECT. MOUNTING: SURFACE NEMA TYPE: 1 VIDTH: 20:00 DEPTH: 5.75	IN IN
	A D	LØAE	)/PHASI	E (KVA)	CIRCL	IIT SF	REAKE	R	LOAD	PHASE	(KVA)	LOAD	IDENTIFICATION	CKT NO.
		Α	В		JRIP	(p) (c)			50.45	A	8			-
is parts					30	1 . 1	2   350	,		10.27	6.46	1 2		2
<b>3</b> 17.42					30	1 1	20	j		വരം	6000			6
TICKET BOOTH RECPTS			0.18		20	<b>†</b>					0.30		MONUMENT LIGHTS	8
		n 18	1		20	141	20	). ·		0.50	G86 122 1305	Ē	FIXTURE O RECPTS - LOBBY	10
TICKET BOOTH RECPTS			0.18		20	1 1	20	)			0.50	E	FIXTURE Ø REOPTS - LOBBY	12
TICKET BOOTH RECPTS	R	0.18			20		20			0,50		E	FIXTURE O REOPTS - LOBBY	14
TICKET BOOTH: RECPTS	R		0.18		30	11 1	20	}			0.50	E	FIXTURE O RECPTS - LOBBY	18
TICKET BOOTH RECPTS	R	0.18			20	1. 1	20	)			dun ze	ш	ATM	18
SAFE ROOM RECPTS	R		0.18		20	7 7	ti 20	)			1,40	1.	CANOPY LTS	20
SAFE ROOM RECPTS		0.36			<u> </u>					1,30	650000000			22
			0.50								0.25	1		24
		0.36			22	-	-			0.25		1-1-		26
	_	0.70	0.36							a on	1:50	<del>  </del>		30
		<b>U.</b> /∠	0.20	-						1.00	0.76	<del> </del>		32
		0.36	<b>U.30</b>		20					n 75	442-3-42			34
OFFICE RECPTS		0,00	0.36		20	4		vinscinass.		0170	0.75	frammårn:	EWE .	36
COFFEE	FR.	1.20			20	1 1	1 20	)		0.75	\$60 mg - 185	A	EWH	38
COFFEE	R		1.20		20	1 1	1 20	)			0:75	A	EWH	40
MICROWAVE	R	1.50			20	1 1	1 20	)	5 8 8 4	0.20	25000.00	L.	FRT OFFICE, BOX, TICKET BOOTH LTS	42
MAINTENANCE RECPTS	R	1000	0.36		20						0.72	B	LOBBY RECPTS	44
		La contra de  la contra de la contra del la contra del la contra de la contra de la contra del l			23	<del></del> }				1.50				46
			0.36	_	504					0.45	1.50	1 1		48 50
VE ÁRLI.			2 00	-	30	1 1			0.000	0.90	0.45		BLOG LETTERING LIGHTING	52
RR REOPTS					20	- <del>[</del> [	<del></del>		0.000	0.50		E	FIXTURE O RECPTS - GALLLERY	54
LOBBY REGPT FOR TV			0.50		20	1	_ بردسینیسیلیت	*****			0,50	E	2000 20	66
	_				***************************************					200				58 60
						and the state of the state of	Carl						SPARE	62
SFARE		ŀ			20		****					s	SPARE	64
SPARE					20					NIWOTI LANGERAGE		8		66
					×4									68 70
SPARE					20								SPARE	72
			SUB F	EED LUC	SS AS INC	TASIC	EO. (F	BLA	NK (NOT	r USED)				
Market Witter   1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1		CONTRACTOR NO				2								
		7.9	87		23					9.1	10.3	1		
	TICKET BOOTH RECPTS TICKET BOOTH RECPTS TICKET BOOTH RECPTS SAFE ROOM RECPTS SAFE ROOM RECPTS SAFE ROOM RECPTS HVAC CONTROL RECEPTION RECPTS CONV. RECPTS OFFICE RECPTS OFFICE RECPTS OFFICE RECPTS OFFICE RECPTS COFFEE MICROWAVE MAINTENANCE RECPTS MAINTENANCE RECPTS EWH  RR RECPTS LOBBY RECPT FOR TIV SPARE SPARE SPARE SPARE SPARE SPARE SPARE SPARE	TICKET BOOTH RECPTS L TICKET BOOTH RECPTS R SAFE ROOM RECPTS R SAFE ROOM RECPTS R HVAC CONTROL R RECEPTION RECPTS R CONV. RECPTS R CONV. RECPTS R OFFICE RECPTS R OFFICE RECPTS R OFFICE RECPTS R COFFEE R MICROWAVE R MAINTENANCE RECPTS R MAINTENANCE RECPTS R RR RECPTS R SPARE S	SPED O O O O O O O O O O O O O O O O O O O	SPD O O O O O O O O O O O O O O O O O O O	SPED O O O O O O O O O O O O O O O O O O O	SPD O O SOLUTION SPARE SPARE S SUB FEED LUGS AS INIT 1999 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SPD O O O O O O O O O O O O O O O O O O O	SPD. O 30 1 2 2 30  TICKET BOOTH REOPTS L 0.18 20 1 1 2 20  TICKET BOOTH REOPTS R 0.18 20 1 1 2 20  TICKET BOOTH REOPTS R 0.18 20 1 1 2 20  TICKET BOOTH REOPTS R 0.18 20 1 1 2 20  TICKET BOOTH REOPTS R 0.18 20 1 1 2 20  TICKET BOOTH REOPTS R 0.18 20 1 1 2 20  TICKET BOOTH REOPTS R 0.18 20 1 1 2 20  SAFE ROOM REOPTS R 0.36 20 1 1 2 20  SAFE ROOM REOPTS R 0.36 20 1 1 2 20  RECEPTION REOPTS R 0.36 20 1 1 2 20  RECEPTION REOPTS R 0.36 20 1 1 2 20  RECEPTION REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  OFFICE REOPTS R 0.36 20 1 1 2 20  MINIMENANCE REOPTS R 0.36 20 1 1 2 20  MAINTENANCE REOPTS R 0.36 20 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS R 0.36 20 1 1 1 2 20  FRIEGEPTS	SPD. O 30 1 2 30 1 2 20 1 1 1	SPD O O O O O O O O O O O O O O O O O O O	SPD O O O O O O O O O O O O O O O O O O O	SPD O 30. 1 2 30 0.27 0.40 0.40 0.40 0.40 0.40 0.40 0.40 0.4	SPD O 30 1 2 30 0.27 0.40 L  ROKET BOOTH RECPTS L 0.18 20 1 20 0.60 L  TICKET BOOTH RECPTS R 0.18 20 1 1 20 0.60 E  TICKET BOOTH RECPTS R 0.18 20 1 1 20 0.60 E  TICKET BOOTH RECPTS R 0.18 20 1 1 20 0.60 E  TICKET BOOTH RECPTS R 0.18 20 1 1 20 0.60 E  TICKET BOOTH RECPTS R 0.18 20 1 1 20 0.60 E  TICKET BOOTH RECPTS R 0.18 20 1 1 20 0.60 E  TICKET BOOTH RECPTS R 0.18 20 1 1 20 0.60 E  SAFE ROOM RECPTS R 0.18 20 1 1 20 0.60 E  SAFE ROOM RECPTS R 0.18 20 1 1 20 0.60 E  SAFE ROOM RECPTS R 0.36 20 1 1 20 1.40 L  RECEPTION RECPTS R 0.36 20 1 1 20 0.25 L  RECEPTION RECPTS R 0.36 20 1 1 20 0.25 L  RECEPTION RECPTS R 0.36 20 1 1 20 0.25 L  RECEPTION RECPTS R 0.36 20 1 1 20 0.25 L  OFFICE RECPTS R 0.36 20 1 1 20 0.25 L  OFFICE RECPTS R 0.36 20 1 1 20 0.25 L  OFFICE RECPTS R 0.36 20 1 1 20 0.25 L  OFFICE RECPTS R 0.36 20 1 1 20 0.25 L  OFFICE RECPTS R 0.36 20 1 1 20 0.25 L  OFFICE RECPTS R 0.36 20 1 1 20 0.25 L  OFFICE RECPTS R 0.36 20 1 1 20 0.25 L  OFFICE RECPTS R 0.36 20 1 1 20 0.75 A  OFFICE RECPTS R 0.36 20 1 1 20 0.75 A  OFFICE RECPTS R 0.36 20 1 1 20 0.75 A  OFFICE RECPTS R 0.36 20 1 1 20 0.75 A  OFFICE RECPTS R 0.36 20 1 1 20 0.75 A  OFFICE RECPTS R 0.36 20 1 1 20 0.75 A  OFFICE RECPTS R 0.36 20 1 1 20 0.75 A  OFFICE RECPTS R 0.36 20 1 1 20 0.75 A  OFFICE RECPTS R 0.36 20 1 1 20 0.75 A  OFFICE RECPTS R 0.36 20 1 1 20 0.75 A  OFFICE RECPTS R 0.36 20 1 1 20 0.75 A  OFFICE RECPTS R 0.36 20 1 1 20 0.75 A  MAINTENANCE RECPTS R 0.36 20 1 1 20 0.90 A  MAINTENANCE RECPTS R 0.36 20 1 1 20 0.90 A  MAINTENANCE RECPTS R 0.36 20 1 1 20 0.90 A  MAINTENANCE RECPTS R 0.36 20 1 1 20 0.90 A  MAINTENANCE RECPTS R 0.36 20 1 1 20 0.90 A  MAINTENANCE RECPTS R 0.36 20 1 1 20 0.90 A  MAINTENANCE RECPTS R 0.36 20 1 1 20 0.90 A  MAINTENANCE RECPTS R 0.36 20 1 1 20 0.90 A  MAINTENANCE RECPTS R 0.36 20 1 1 20 0.90 A  MAINTENANCE RECPTS R 0.36 20 1 1 20 0.90 A  MAINTENANCE RECPTS R 0.36 20 1 1 20 0.90 A  MAINTENANCE RECPTS R 0.36 20 1 1 20 0.90 A  MAINTENANCE RECPTS R 0.36 20 A  MAINTENANCE RECPTS R 0.36 20 A  MAINTENANCE RECPTS R 0.36 20 A  M	SPD. C

	articular and a second			MANUFACTURER:	<b>CUTLER-HAMMER</b>	:				MAIN O	PTIONS	REQU	RED			PA	WEL NAME:	BEXIST		
	abition and substitute of the Anthropological and the following of the fol	rafie a Administrator de Camara de Camar		T(PE; AIC RATING; VOLTS LIN; VOLTS L-L; PHASE	NGOB 65 120 240 1	A X	AMPS				MCB: MLO: VATED: TTRIP:	100 N/A	AMPS AMPS				LOCATION: MOUNTING: NEMA TYPE: WIDTH: DEPTH:	1 20.00	湖	
		ZOTES	CKT NO.	IDENTIFIC/	ATION	L O A	LOAC	VPHASE	(KVA)		······································	AKER	LOAE	VPHASE.	(KVA)	L O A	JOENT	FICATION	NO" CRI	o m + 0 ≥
							A	В		TRIP	PP	JRIP		Α.	В					<u> </u>
1		а	4	50A RECP	TAUD	£	1.44			50	2 1	20		1.44		S	50A R	EGPT AUD	2	- a
_			3:		many dr. of Same	1	67 (\$c. 6)	1.44			1	20			1,44	S	- E-2-K - E-1	ECPT AUD	4	-
-	- Commission	a	5:   7:	50A RECE	TAUD	L	1,44	1.44		50:	2 2	30		1.44	1,44	A	DUA K	ECPEAND	8	a
	-	a	9	REGPT S.E. CC	RIVER AUD	<u>[</u> _	0.18		0.0000000	20	1 1	20		0.18		s	RECPT S.W	CORNER AUD	10	a
	Depart of the last	а	11	REOPT S.E. CC	KNER AUD	Ŀ	9.90 (67)	0.18		20	1 1	20			0.18	S	RECPT S.W	CORNER AUD		
	-	b	13	RECPT S.	. AUD	R	0.36			20	1 1	20		0.36		s	RECF	TS AUD	14	<del></del>
	and the same	b	15	RECPTS	. AUD	R		1.00		30	4	30			1,00	s	RESP	TS. AUD	16	b
	that represents and reserve to come standard and the state of the state of				LIGHTING (L		3:4 NN:LOAD (KVA) 6.12	DEMAND FACTOR		The second of th	TOTAL	CONNI TOTA	ONNECT ECTED A L DEMA MAND A	MPS/PH ND KVA:	62 16.49	**************************************				
	энсэгжийсэг эхийн хамагахийн байнаа			RECEPTACL	LES 1ST 10 KVA(R ES OVER 10KVA(R AC EQUIPMENT (H APPLIANCES (A	) ) ) )	1.36 0.00 0.00 2.88	1,00 0,50 1,00 1,00	1.36 0.00 0.00 2.88	مسخم سسيساس ميسين السسيسية سائسسم رايا	GENE	ERAL NO	OTES: = LIGHT/		V	-				
Œ	WITH YOU WITH THE PROPERTY AND A CONTRACT OF THE PROPERTY OF T				EQUIPMENT (E RGEST MOTOR (N OTHER (O SPARE (S LINKED PANEL (P	) ) )	0.00 0.00 0.00 4.60 VCLUDED	1.00 1.25 1.00 1.00 NABOVE	0.00 0.00 0.00 4.60 TOTALS		g E) b. PF	ROVIDE	BREAKEI NEW BRI	EAKER A	S INDIC	2007	NDICATED			

EXISTING PANEL

		MANUFACTURER: CUTLER-HAMMER TYPE NOOD AIC RATING 65 VOLTS L-N: 120 VOLTS L-L: 240 PHASE 1	K AMPS V V			MAIN C S,EF SHUN	MCB MLO (ATED	100 100 N/A	AMPS			PA	ANEL NAME: L2 EXIST LOCATION: N DRESSING RM MOUNTING: SURFACE NEMA TYPE: 1 WIDTH: 20.00 DEPTH: 5.75	IN IN	
	CKT NO.	IDENTIFICATION	Đ	/PHASE	(KVA)		-	REAKER		)/PHASE		L O A D	identification	OKI NO.	Z O T E S
			A	8		TRIP	PF	1		A	В				ــــــــــــــــــــــــــــــــــــــ
a	1	DRESSING RM 1 & 2 LTS	L 0.20			20	1 1	<u> </u>		1		s	SPARE	2	1
а	. 3	CORRIDOR & DRESSING RM LTS		9.20		20	1111	20			1	S	SPÄRE	4	1_
а	. 5	DRESSING RM3 LTS	L 0,60			20	1 2	30		2.50		A	EWH IN N. DRESSING RM	6	ŀ
b	. 7	DRESSING RM 1 VANITY LIGHTS	Logica	0.50		20	1 1				2.50	A		8	1
b	9	DRESSING RM 2 VANITY LIGHTS	L 0.50		200 (88 (58 f)	20	1 1					S	SPACE	10	1
b	11	DRESSING RILLS VANITY LIGHTS	L	1,00		20	4					<u>  S </u>	SPACE	12	4
b	13	DRESSING RM 1 RECPTS	R 0.36			20	1 1				No.	S	SPÂCĒ	14	<u> </u>
b	15	DRESSING RM 2 RECPTS	R	0.36	8.00 (4.00)	20	4		ic since				SPACE	16	1
b	17	DRESSING RM 3 RECPTS	R 0.36			20	1					S	SPACE	18	1
	19	SPACE					1 1	F	500000	Vianos var		S	SPACE	20	1
	21	SPACE					4 1				35/35/34	S	SPACE	22	
	23	SPACE	15 13 4 8 1 T				1 1					S	SPACE	24	1
	25	SPACE					1 1		200	and the same of th		8	SPACE	26	1_
	27	SPACE					11 1	and the state of t	72.(2020)			S	SPACE	28	1
	29	SPACE	T T				11 1				250 (19.55)	s	SPACE	30	T
	<u> </u>		2,0	2.1			,	1.5mg/gay		2.5	2.5	The state of the s			
			GONN LOAD (KYA)	DEMAND FACTOR		***************************************		L CON	GONNECT JECTED A TAL DEMA	MPS/PH	: 38	Y.			
		LIGHTING (L)		1.25	3.75		3	OTALE	EMAND A	MPS/PH	4				
		RECEPTACLES 1ST 10 KVA(R)	1.0	1.00	1.08	-	entires.	grigana a	ക്രത്ത്						
		RECEPTACLES OVER 10KVA(R)		0,50 1.00	0.00	-	-	ERAL!	<u>IOTES:</u> 5 = EIGHT /	r negaver va	mek - t	ini e			
		HVAG EQUIPMENT (H) APPLIANCES (A)		1.00	5.00	-	) <u>F</u>	www.caw	- ENOFER	sacas A	i swiiziiz	الخيفة منية خنج اله			
		EQUIPMENT (E		1.00	0.00	1	SCH	EDULF	NOTES:				•		
		LARGEST MOTOR (M)		1.25	0.00	7			BREAKE	R TO RE	MAIN				
		OTHER (O		1.00	0.00	]	b. P	ROVIDE	IEW BREAK	ER AS INC	NCATED				
		SPARE (S	***************************************	1.00	0.00	_	c t	ITILIZE I	EXISTING	SPARE	BREAKE	RASI	NDICATED		
1		I INKED DANET YOU	INDEED TO SERVE	NEA minor	CONTRACT CO.	1									

PANEL NAME:

FA

NEW PANEL

MANUFACTURER SIEMENS

LINKED PANEL (P) INCLUDED IN ABOVE TOTALS

	TYPE: NOOD  AIC RATING: 65  VOLTS L-N: 120  VOLTS L-L: 240  PHASE 1	K A V	MPS			SER SHUM	MC ML ATE	B O D	REGUII 225 N/A N/A	AMPS AMPS			. F.	LOCATION: STAGE MOUNTING: SURFACE NEMA TYPE: 1 WIDTH: 20:00 DEPTH: 5,75	IN N
N CKT NO. E	IDENTIFICATION	L O A D	LOAE	VPHASE	(KVA)	ORC		BRE	AKER	LOAD	/PHASE	(KVA)	E O A D	IDENTIFICATION	CKT O NO. E S
The state of the s			A	8		TRIP	p	p	TRIP		A	В			
1		О	<del>wherehilms there side w</del> ater	1000000		***************************************	1	1	20		0.36		R	STORAGE RECPTACLES	2:
3	SPD	O				30	3	1	20		V.C. 16,77 E.	0.36	R	STOPAGE RECPTACLES	4
5		0						1	20		0.36	5 6 6	R	STORAGE RECPTACLES	6
7	STAGE ELECT RM RECPT	R		0.18		20	1	1	20			0.36	R	STORAGE REOPTACLES	8
97	STAGE REOPT	R	0.18	2/3/3/3		20	1	1	20				S	SPARE	10
111	STAGE RECPT	R		0.36		.20	1	1	20		6 12 E		S	SPARE	12
13	STAGE REOPT	R	0.18			20	4	1	20			Config. ii.	\$	SPARE	14
15	STAGE RECPT	R		0.36		20	1	1	20				S	SPARE	46
17	STAGE REOPT	R	0.36			20	1	1	20				S	SPARE	18
19	STAGE RECPT	R	9-31	0.18		20	1	1	20		22.132.45		S	SPÄRE	20
21	STAGE RECPT	R	0.18			20	1	1	20				S	SPARE	22
23	SPARE	S				20	1	1	20		5.5		S	SPÄRE .	24
25	SPARE	S				20	1	4	20				S	SPARE	26
27	SPARE	S				20	1	1	20				S	SPARE	28
29	SPARE	S		10.00		20	1	**				S. 16 48	S	SPACE	30
31	SPARE	Ş				20	1	1					S	SPACE	32
33	SPARE	S				20	1		·			\$2.00° 450	S	SPACE	34
35	SFARE	S				20	4	1					S	SPACE	36
37	SFARE	S				20	1	1				3000 50	S	SPÄCE	38
39	SPARE	S	800			20	1	1					S	SPACE	40
41	SPARE	S		45.3		20	1	1				September 1	S	SPACE	42
	LIGHTING ( RECEPTACLES 1ST 10 KVA( RECEPTACLES OVER 10KVA(	(L) R) R)	0.00 3.42 0.00	1.1 PACTOR 1.25 1.00 0.50	(KVA) 0.00 3.42 0.00	manufactures and described to see that the second contraction of the s	N	TAL TQ DTE	CONNE TOTA TAL DE 'S:	ONNECTI CTED AI L DEMAI MAND AI	MPS/PH ND:KVA: MPS/PH:	3.48 3.48 14		DANEI TRACCOONANCE WITH NEDI	70° R. 701=
	HVAC EQUIPMENT ( APPLIANCES ( EQUIPMENT (	A)	0.00 0.00 0.00	1.00 1.00 1.00	0.00		***		OVIDE / SPECIFIE		ori LABE	LING F.	K lit	EPANEL IN ACCORDANCE WITH NFPA	NO A TUE

MAIN OPTIONS REQUIRED

NEW PANEL

NO.			MANUFACTURER: SIEMENS TYPE: NQOD AIC RATING: 65 VOLTS L-N: 120 VOLTS L-L: 240 PHASE 1		AMPS			SER	MCB MLO ATED	N/A	RED AMPS AMPS			<i>E1</i>	ANEL NAME: C1 NEW LOCATION: CONCESSION KIT. MOUNTING: SURFACE NEMA TYPE: 1 WIDTH: 20.00 DEPTH: 5.75	IN IN
1   SPB   O   O   SPB   O   O   O   O   O   O   O   O   O	0 T E		IDENTIFICATION	A	LOAE	//PHASE	(KVA)	GIRCU	IT BR	EAKER	LOAD	VPHASE	(KVA)	А	IDENTIFICATION	GKT NO.
3   SPD   O   30   1   20   0.45   A   PIZZA WARMER   6     7   REFRIG   A   1.20   20   1   1   20   0.45   A   PREZLE WARMER   6     9   COOLER   A   1.20   20   1   1   20   0.50   E   TV   40     14   FODD WARMER   A   1.00   20   1   1   20   0.50   E   TV   40     13   SPARE   S   20   1   1   20   0.50   E   TV   41     15   MICROWAVE   A   1.50   20   1   1   20   0.36   R   S. WALL RECPT   16     17   FREEZER   A   1.60   20   1   1   20   0.36   R   S. WALL RECPT   16     18   FRESHAIRFAN   H   0.65   20   1   1   20   0.36   R   S. WALL RECPT   18     21   RECPT   R   0.36   20   1   1   20   0.36   R   S. WALL RECPT   20     22   RECPT   R   0.36   20   1   1   20   0.36   R   S. WALL RECPT   22     23   BEER COOLER   A   1.60   20   1   1   20   S   SPARE   22     25   PENDANT LIGHTS   L   20   1   1   20   S   SPARE   22     27   NACHOS   A   1.50   20   1   1   20   S   SPARE   22     29   SODA COMPRESSOR   A   0.50   20   1   1   20   S   SPARE   33     31   SODA COMPRESSOR   A   0.50   20   1   1   20   S   SPARE   33     33   POPCORN   A   1.40   20   1   1   20   S   SPARE   34     34   SODA COMPRESSOR   A   0.50   20   1   1   20   S   SPARE   34     33   FOPCORN   A   1.40   20   1   1   20   S   SPARE   34     34   SODA COMPRESSOR   A   0.50   20   1   1   20   S   SPARE   35     35   COFFEE   A   1.50   20   1   1   20   S   SPARE   36     36   SPARE   39   HOT DOGS   A   0.45   20   1   1   20   S   SPARE   38     36   CONTERED   R   1.00   20   1   1   20   S   SPARE   36     37   HOT CHOCOLATE   A   0.44   20   1   1   20   S   SPARE   36     34   COUNTER RECPT   R   1.00   20   1   1   20   S   SPARE   40     44   COUNTER RECPT   R   1.00   20   1   1   20   S   SPARE   40					Α	В		TRIP	P P	IRIP		A	В			
1   20   0.45   A   PIZZA WARMER   6		1		Ó					2	50		3,60		A	PIZZA OVEN	2
7 REFRIG A 1.20 20 1 1 20 0.45 A PRETZLE WARMER 8 9 COOLER A 1.20 20 1 1 20 0.50 E TV 40 11 FOOD WARMER A 1.00 20 1 1 20 0.50 E TV 40 11 FOOD WARMER A 1.00 20 1 1 20 0.50 E TV 40 11 SPARE S 20 1 1 20 0.20 L CONCESSION LIGHTING 14 15 MICROWAVE A 1.50 20 1 1 20 0.36 R S. WALL RECPT 46 17 FREEZER A 1.60 20 1 1 20 0.36 R S. WALL RECPT 16 18 FRESHAIR FAN H 0.65 20 1 1 20 0.36 R S. WALL RECPT 20 21 RECPT R 0.36 20 1 1 20 0.36 R S. WALL RECPT 20 22 RECPT R 0.36 20 1 1 20 0.36 R S. WALL RECPT 20 25 PENDANT LIGHTS L		3	SPD	Q				30	1	1			3.60	A		4
9 COOLER A 1.20 20 1 1 20 0.50 E TV 10 10 11 11 FOOD WARMER A 1.00 20 1 1 20 0.50 E TV 10 10 11 FOOD WARMER A 1.00 20 1 1 20 0.50 E TV 10 10 11 11 FOOD WARMER A 1.00 20 1 1 20 0.50 E TV 10 10 11 11 11 11 11 11 11 11 11 11 11		5		Ó						,		0.45		A	to see the set of the party and	6
11   FOOD WARMER   A   1,00   20   1   1   20   1.80   A   OUTSIDE ICE BOX   12	·	7	REFRIG	А		1.20		20					0.45	<del></del>		
13   SPARE   S   20   f   f   20   0.20   L   CONCESSION-LIGHTING   14		9	COOLER	Α	1.20			20				0,50		E	X-0	10
15         MICROWAVE         A         1.50         20         1         1         20         0.36         R         S.WALLRECPT         16           17         FREEZER         A         1.60         20         1         1         20         0.36         R         S.WALLRECPT         18           19         FRESHAIR FAN         H         0.65         20         1         1         20         0.36         R         S.WALLRECPT         18           21         RECPT         R         0.36         20         1         1         20         0.36         R         S.WALLRECPT         20           21         RECPT         R         0.36         20         1         1         20         0.36         R         S.WALLRECPT         20           21         RECPT         R         0.36         20         1         1         20         S         SPARE         22           23         BEER COOLER         A         1.60         20         1         1         20         S         SPARE         24           25         PENDANT LIGHTS         L         20         1         1         20         S		17	FOOD WARMER	А		1.00		20	تالىل				1.80	Α	14,411 - 14-14	
17 FREEZER A 1.60 20 1 1 20 0.36 R S.WALLRECPT 18 19 FRESHAIR FAN H 0.65 20 1 1 20 0.36 R S.WALLRECPT 20 21 RECPT R 0.36 20 1 1 20 S S SPARE 22 23 BEER COOLER A 1.60 20 1 1 20 S SPARE 24 25 PENDANT LIGHTS L		13	SPARE					20				0.20		L	AND	_
19 FRESHAIR FAN H 0.65 20 1 1 20 0.36 R S.WALL RECPT 20 21 RECPT R 0.36 20 1 1 20 S SPARE 22 S SPARE 22 S PENDANT LIGHTS L 20 1 1 20 S SPARE 26 27 NACHOS A 1.50 20 1 1 20 S SPARE 28 29 SODA COMPRESSOR A 0.50 20 1 1 20 S SPARE 30 SPARE 30 SPARE 31 SODA COMPRESSOR A 0.50 20 1 1 20 S SPARE 32 SPARE 34 35 COFFEE A 1.50 20 1 1 20 S SPARE 34 35 COFFEE A 0.14 20 1 1 20 S SPARE 34 35 SPARE 34 35 SPARE 34 36 SPARE 34 37 HOT CHOCOLATE A 0.14 20 1 1 20 S SPARE 38 SPARE 38 39 HOT DOGS A 0.45 20 1 1 20 S SPARE 40 41 COUNTER RECPT R 1.00 20 1 1 20 S SPARE 42	į	15	MICROWAVE	A		1.50			1 1				0.36			
21 RECPT R 0.36 20 1 1 20 S SPARE 22  2 3 BEER COOLER A 1.60 20 1 1 20 S SPARE 24  25 PENDANT LIGHTS L		17	FREEZER	А	1.60			000 E				0.36		4	17.37.163	
21		19	FRESHAIR FAN	H		0,65		RG1					0.36	R		20
25   PENDANT LIGHTS   L		21	RECPT	R	0.36			20	1 1	20				ន	T PC 17 T. 1-1	22
27         NACHOS         A         1.50         20         1         1         20         S         SPARE         28           29         SODA-COMPRESSOR         A         0.50         20         1         1         20         S         SPARE         30           31         SODA-COMPRESSOR         A         0.50         20         1         1         20         S         SPARE         32           33         POPCORN         A         1.40         20         1         1         20         S         SPARE         34           8         35         COFFEE         A         1.50         20         1         1         20         S         SPARE         36           9         HOT CHOCOLATE         A         0.45         20         1         1         20         S         SPARE         38           39         HOT DOGS         A         0.45         20         1         1         20         S         SPARE         40           41         COUNTER RECPT         R         1.00         20         1         1         20         S         SPARE         42	a	23	BEER COOLER	А		1.60		20	11	20		1		s	-11 - 4 - 14 - 14 - 14 - 14 - 14 - 14 -	24
27         Autorities		25	PENDANT LIGHTS	Ĩ.				20	1 1	20		Ĭ		S		26
31   SODA COMPRESSOR   A   0.50   20   1   1   20   S   SPARE   32		27	NACHOS	A		1.50		20		<u>1</u>						28
33         POPCORN         A 1.40         20 1 1 20         S SPARE         34           8 35         COFFEE         A 1.50         20 1 1 20         S SPARE         36           a 37         HOT CHOCOLATE         A 0.14         20 1 1 20         S SPARE         38           39         HOT DOGS         A 0.45         20 1 1 20         S SPARE         40           41         COUNTER RECPT         R 1.00         20 1 1 20         S SPARE         42		29	SODA-COMPRESSOR	A	0.50			VX.	1 1	20						30
8         35         COFFEE         A         1.50         20         1         1         20         S         SPARE         36           a         37         HOT CHOCOLATE         A         0.14         20         1         1         20         S         SPARE         38           39         HOT DOGS         A         0.45         20         1         1         20         S         SPARE         40           41         COUNTER RECPT         R         1.00         20         1         1         20         S         SPARE         42		31	SODA COMPRESSOR	A		0.50		20	1 1 11					S	SPARE	32
a 37         HOT CHOCOLATE         A 0.14         20 1 1 20         S SPARE         38           39         HOT DOGS         A 0.45         20 1 1 20         S SPARE         40           41         COUNTER RECPT         R 1.00         20 1 1 20         S SPARE         42		33	POPCORN	A	1,40			20	1 1						A SAME AND	34
39   HOT DOGS   A   0.45   20   1   1   20   S   SPARE   40   41   COUNTER RECPT   R   1.00   20   1   1   20   S   SPARE   42	а	35	COFFEE	A		1.50		20	1 1	20			Ì	1 1	, a 11 %	36
41 COUNTER RECPT R 1.00 20 1 1 20 S SPARE 42	а	37	HOT CHOCOLATE	A	0.14	(1) (1) (2)		20	11	20				4		38
4) CONVENIENCE R ROUS LESS IN DESCRIPTION OF THE ROUS IN THE ROUS		39	HOT DOGS	A		0.45		201								40
		41	COUNTER RECPT	R	1.00	100.00		20	1 1	20				s	SPARE	42

**************************************	(KWA)	FACTOR	(KV
LIGHTING (L)	0.20	1.25	0.2
RECEPTACLES 1ST 10 KVA(R)	2,44	1.00	2.4
RECEPTACLES OVER 10KVA(R)	0.00	0.50	0.1
HVAC EQUIPMENT (H)	0.65	1.00	0.6
APPLIANCES (A)	23,99	1.00	23.
EQUIPMENT (E)	0.50	1,00	0.5
LARGEST MOTOR (M)	0.00	1.25	0.0
OTHER (O)	0.00	1,00	0.0
SPARE (S)	0.00	1.00	0.0
LINKED PANEL (P)	INCLUDED	IN ABOVE	OTA

TOTAL CONNECTED KVA: 27.78 TOTAL CONNECTED AMPS/PH: TOTAL DEMAND KVA: 27.8 TOTAL DEMAND AMPS/PH: 1 GENERAL NOTES:
1. PROVIDE ARC FLASH LABELING FOR THE PANEL IN ACCORDANCE WITH NFPA 70 & 70E AS SPECIFIED.

SCHEDULE NOTES: a. PROVIDE SHUNT TRIP BREAKER

NEW	PANEI	
-----	-------	--

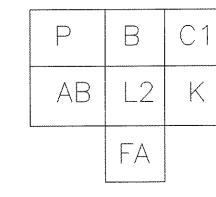
		MANUFACTURER: SIEMENS TYPE: NQQD AIC RATING: 65 VOLTS L-N: 120 VOLTS L-L: 240 PHASE 1	K∦ V V	AMPS			MAIN OF S.E.R SHUNT	MCB MLO ATED	225 225 NA	RED AMPS AMPS			₽	ANEL NAME: K NEW LOCATION: STAGE MOUNTING: SURFACE NEWA TYPE: 1 WIDTH: 20,00 DEPTH: 5,75	N
N O T E S	CKT NO.	IDENTIFICATION	L O O	LOAE	)/PHASE	(KVA)	OIRCL	UT BR	EAKER	LOAD	/PHASE	(KVA)	L O A D	IDENTIFICATION	CK:
i i v				A	В		TRIP	PE	TRIP	*	A	В			
ilan wat	1		О					1	20		0.45			W. STORAGE ROOM LTS	2
	3	SPO	0				30	13 [1	1			0,45		E. STORAGE, ELEVATED ROOM LTS	4
, in	5		O								0.40			STORAGE & MECH RM LTS	8
	7	STAGE MGR OFFICE A/C	A		1.00		20	111	1	19765		0,36	R	STORAGE & MECHRM RECPTS	- 8
and the same	9		A	1.00			20	1 1	1		0.18		R	S. AUD RECPTIN RECESSED BOX	1
	11	STAGE MGR OFFICE RECPTS	R		0.18		20	4 1				0.72	R	S. AUD RECPTIN RECESSED BOX	- 1
-	13	STAGE MGR OFFICE RECPTS	R	0.18			20	1 1			0.18		R	N, AUD RECPTIN RECESSED BOX	1/4
	15	STAGE MGR., STOR, EXIT CORR LTS	L		0.20		30	1 1				0.36	R	N. AUD RECPT IN RECESSED BOX	16
	17	BACK STAGE BENCH RECPTS	R	0.18			20	1 1			0.18		R	N. AUD RECPT BY N DOOR	19
	19	BACK STAGE BENCH RECPTS	R	estimation and con-	0.18		20				100000000000000000000000000000000000000	0.18	R	N, AUD RECPT	20
	21	BACK STAGE BENCH RECPTS	R	0.18	52 (6)	515000	20	1 1	•		0.18		R	N. AUD RECPT	2
	23	STORAGE RECPTS	R		0.36		20	1 1				1.20	R	GOLF CART CHARGING RECPT	2
	25	BACK STAGE LTS	L	0.20			20	11 1			1.20		R	GOLF CART CHARGING RECPT	2
	27	N. SHORE RECPTS	R		1.20		20	1 1			0.00	1.20	R	GOLF CART CHARGING RECPT	20
	29	N. SHORE RECPTS	R	1.20			20				XX 20100 Y U. (C. (1) XX 44 4 11	000000000000000000000000000000000000000	S	SPARE	30
	31	N SHORE RECPTS	R		1.20		20	111					S	SPARE	3
ĺ	33	S. SHORE RECPTS	R	1.20		100	20	]]]]					S	SPARE	3
laivvv=	35	S. SHORE RECPTS	R		1.20		20	1 1				SCHOOL SECTION SERVICE	8	SPARE	36
-	37	S. SHORE RECPTS	R	1.20			20	1 1					s	SPARE	38
- Parking	39	SPARE	8				20	11 1					8	SPARE	4
	41	SPARE	S				20	1 1	20		2.8	4.5	S	SPARE	4

,	CONN: LOAD (NVA)	DEMAND FACTOR	DEMAND LOAD (KVA)
LIGHTING (L)	1,70	1.25	2.13
RECEPTACLES 1ST 10 KVA(R)	10.00	1,00	10.00
RECEPTAGLES OVER 10KVA(R)	4.40	0.50	2.20
HVAC EQUIPMENT (H)	0.00	1.00	0.00
APPLIANCES (A)	2.00	1.00	2:00
EQUIPMENT (E)	0.00	1.00	0.00
LARGEST MOTOR (M)	0.00	1.25	0.00
OTHER (O)	0.00	1.00	0.00
SPARE (S)	0.00	1.00	0.00
LINKED PANEL (P)	INCLUDED I	V.ABOVE	TOTALS

TOTAL DEMAND KVA: 16.33 TOTAL DEMAND AMPS/PH: 68

1. PROVIDE ARC FLASH LABELING FOR THE PANEL IN ACCORDANCE WITH NFPA 70 & 70E AS SPECIFIED.

SCHEDULE NOTES:



1 EAST BROWARD BLVD.
#1503
FT. LAUDERDALE, FL. 33301
FNGINEERING CA-00006208

WWW.SGMENT

WWW.SGMENT www.sgmengineering.com sgm #: 2016-221 Copyright® 2017 sgm Engineering, Inc.

DRAWING FILE NO. 4-140-11 Exhibit 3 p. 429

LAUDERDALE,

Bid 12089-183

DEPARTMENT ARCHITECTURE

 $\infty$ 

NGINEERING

WORKS

AUDERDAL

CTVOF

12128-E28-LEGN

PROJECT # 12128
WAR MEMORIAL AUDITORIUM
RENOVATIONS
PANEL SCHEDULES
800 N.E. 8TH STREET, ff. LAUDE

SHEET NO.

1/10/2018 6:36 AM

Page 429 of 476

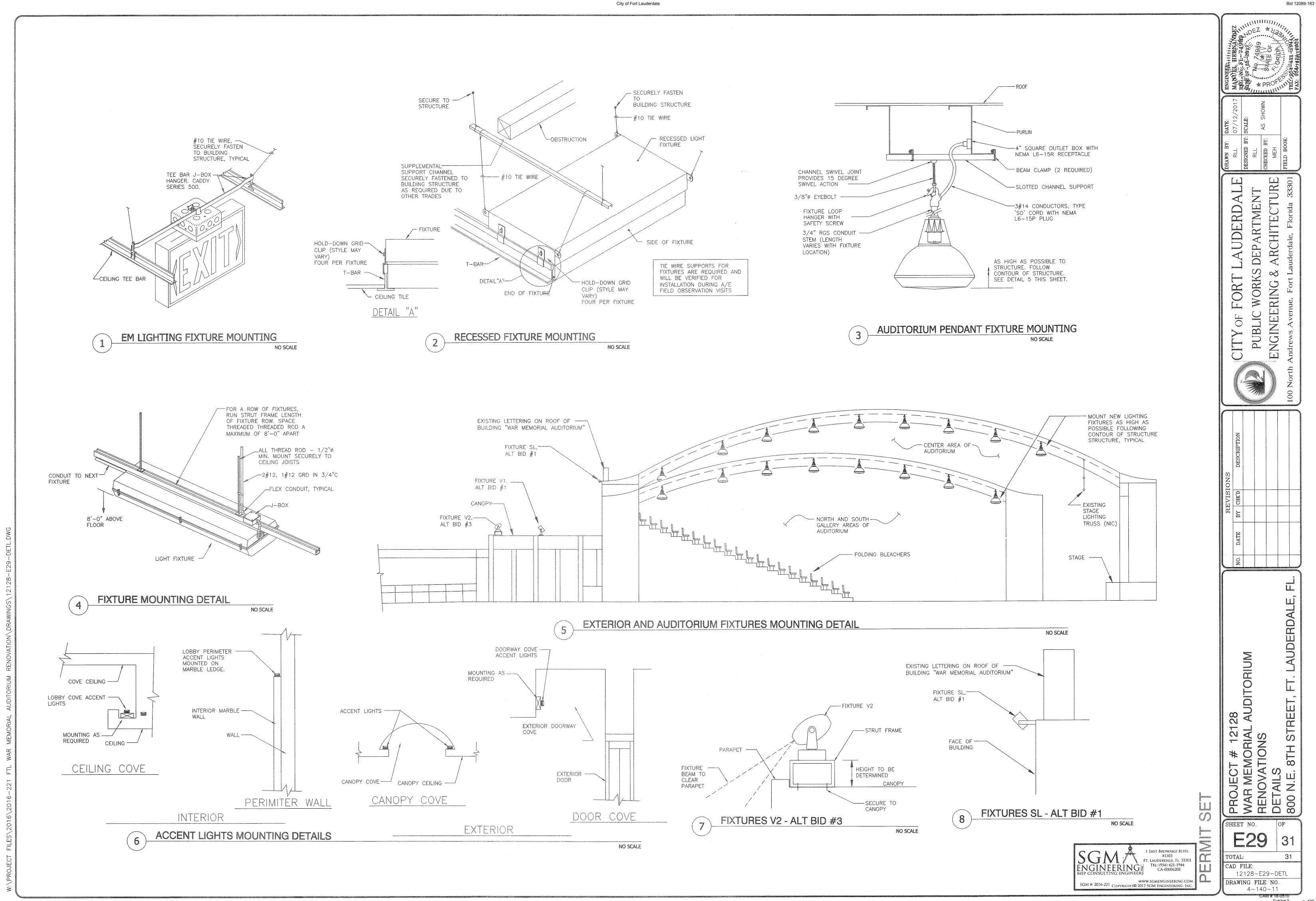


Exhibit 3 p. 430

Page 430 of 476

1/10/2018 6:36 AM

SWITCH OR SENSOR

POWER

POWER TO LIGHTING

FIXTURES

PANEL

POWER TO LIGHTING FIXTURES

PANEL

AUDITORIUM LIGHTING

IN S.R. STORAGE

CONTROL SYSTEM DIAGRAM

LTS ON NORMAL POWER CIRCUIT

CONTROL TO LIGHTING FIXTURE

ZONES 1-18

LIGHTING

CONTROL

PANEL

CONTROL RELAYS

EM LIGHTING CONTROL SCHEMATIC

TOUCH SCREEN CONTROLLER PROJECTION

CONTROL ROOM

TOUCH

SCREEN

CONTROLLE

STAGE

TOUCH

SCREEN

CONTROLLER

FOYER

TOUCH

SCREEN

CONTROLLER

RECEPTION

LIGHTS ON EMERG POWER CIRCUIT

NO SCALE

PRESET SCENE CONTROL

5. OWNER SELECTED

OWNER SELECTED

OWNER SELECTED

DIMMABLE FROM 0% TO 100%.

AND BA) SHALL OPERÂTE AS

24/7.

NO SCALE

ZONES 1 AND 18 - (FIXTURES B

SECURITY LIGHTING A D OPERATE

8. OWNER SELECTED

9. OWNER SELECTED

10. OWNER SELECTED

3. ZONES 2, 7, 12 4. ZONES 13, 14, 15, 16

EACH PRESET SCENE SHALL ALSO BE

1. ALL ON 2. ALL OFF

1. WHEN NORMAL POWER GOES OFF, THE NORMALLY CLOSED

CONTACT CLOSES, KEEPING POWER TO THE EMERG LIGHTS.

2. RELAYS ARE SHOWN IN A

RELAXED STATE (DENERGIZED)

3. VACANCY OR OCCUPANCY SENSORS SHALL UTILIZE INFRARED TECHNOLOGY.

AUDERDALE ARCHITECTURE DEPARTIMENT WORKS 

NGINEERING 

NO SCALE

SWITCHED Pack Power CONSTANT PHASE RECEPTACLE RECEPTACLE CIRCUIT TYPICAL OFFICE AND RECEPTACLE CONTROL NO SCALE CONTROL TO LIGHTING FIXTURE

SWITCH

D1 SWITCH TO BE SET FOR MANUAL-ON OPERATION, 15 MINUTE DELAY OFF

LIGHTING CIRCUIT

NEUTRAL

SWITCHLEG

0-10V WIRING

POWER TO LIGHTING POWER TO LIGHTING ZONES 1-18 **FIXTURES FIXTURES** TOUCH SCREEN LIMITED ACCESS: PRESET SCENE CONTROL CONTROLLER 1. ALL ON ALL OFF RECEPTION LOBBY COVE AND PERIMETER ACCENT LIGHTS PANEL PANEL LOBBY PENDANTS AND SCONCES EM CONTROL LOBBY O FIXTURES PANEL EXTERIOR CANOPY COVE ACCENT LIGHTS TOUCH EXTERIOR CANOPY LIGHTS SCREEN OWNER SELECTED IN S.R. CONTROLLER OWNER SELECTED STORAGE IN MAINTENANCE ROOM LOBBY 10. OWNER SELECTED EACH PRESET SCENE SHALL ALSO BE DIMMABLE FROM 0% TO 100%.

> FRONT OF HOUSE (FOH) LIGHTING CONTROL SYSTEM SCHEMATIC

LIGHTING CONTROL SYSTEMS NOTES

LIGHTING CONTROL SYSTEMS SHALL INCLUDE:

<u>CONTROL PANEL -</u>

A. ON/OFF AND DIMMING CONTROL OF MULTI VOLT, 120V, 0-10V, DMX 512 FIXTURES. B. DIMMING MODULES

C. ON/OFF RELAY MODULES

ZONES AND SCENES.

D. DMX 512 MODULE WITH INPUT/OUTPUT PLUGS FOR AUXILIARY CONTROL BY A "ROAD SHOW" PANEL TO PERMIT LIMITED CONTROL OF AUDITORIUM LIGHTS. LIMITED CONTROL SHALL CONSIST OF OWNER SELECTED PRE-SET SCENE DIMMING. E. PROGRAMMABLE FOR SINGLE AND MULTI ZONE AND SCENE CONFIGURATIONS WITH

ON/OFF AND DIMMING OF FIXTURES.

F. PROGRAMMABLE TO COMBINE AND DELETE ZONES AND SCENES. G. RE-PROGRAMMABLE FOR ZONES, SCENES, AND REMOTE CONTROL STATIONS. H. MULTI LEVEL PASS CODES FOR VARIOUS LEVELS OF PROGRAMMING ACCESS. I. PROGRAMMABLE TIMER FOR AUTOMATIC SCHEDULED SWITCHING AND DIMMING BY

TOUCH SCREEN CONTROL STATIONS —
A. MULTI LEVEL PASSWORD ACCESS FOR <u>LIMITED CONTROL</u> AND <u>FULL CONTROL</u>. B. <u>LIMITED CONTROL</u> SHALL ONLY PERMIT OPERATOR TO TURN ON/DIM/OFF PRESET

C. <u>FULL CONTROL</u> SHALL PERMIT OPERATOR FULL PROGRAMMING ACCESS. LIGHTING

D. FULL PROGRAMMING ACCESS TO INCLUDE RE-PROGRAMMING AND GROUPING OF

ZONES AND SCENES.

1 East Broward Blvd. SGINEERING ENGINEERS

MEP CONSULTING ENGINEERS #1503 FT. LAUDERDALE, FL. 33301 TEL: (954) 421-1944 CA-00006208

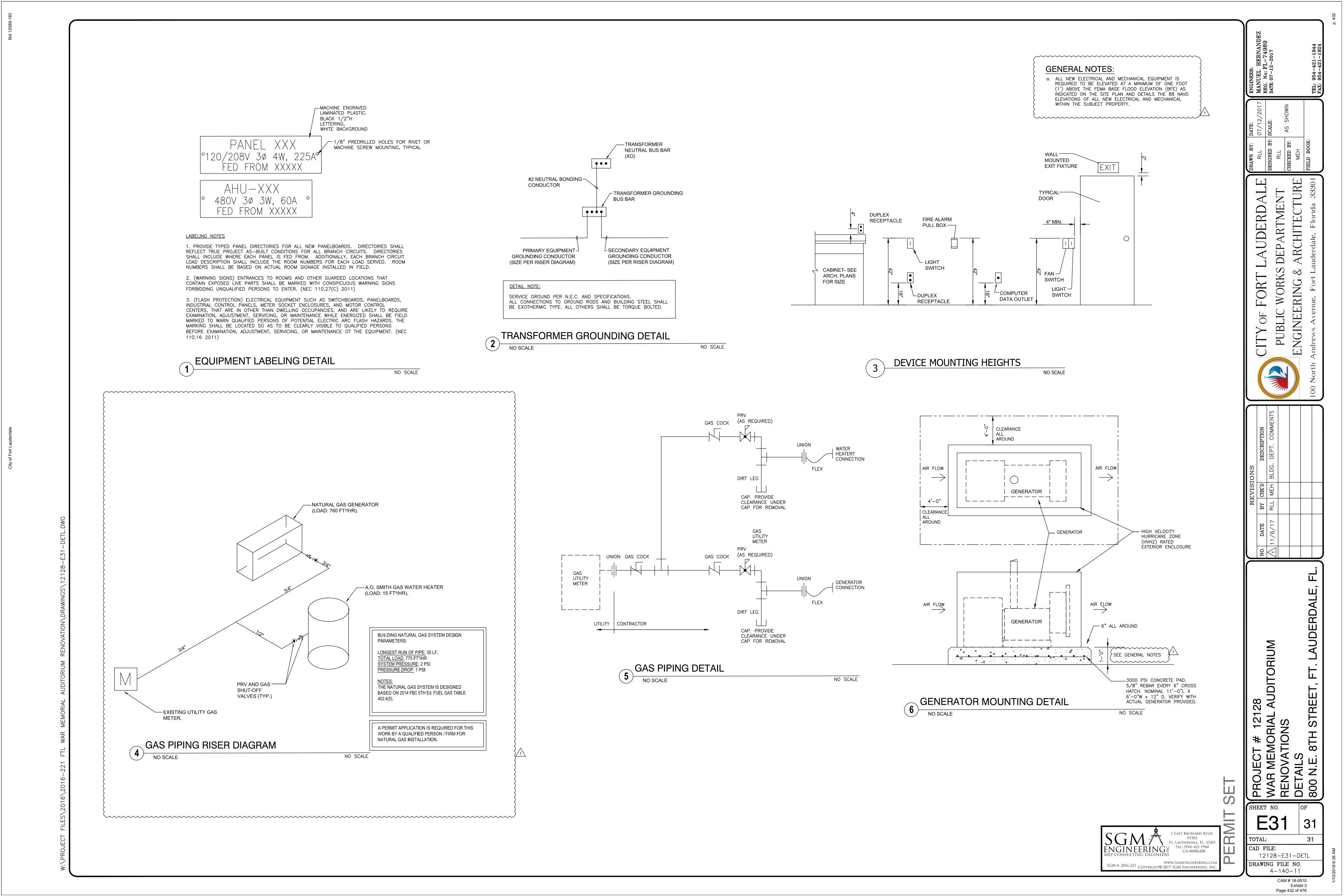
SGM #: 2016-221 COPYRIGHT® 2017 SGM ENGINEERING, INC

12128-E30-DETL DRAWING FILE NO. 4-140-118-0510 Page 431 of 476

31

PROJECT # 12128
WAR MEMORIAL AUDITORIUM
RENOVATIONS
DETAILS
800 N.E. 8TH STREET, FT. LAUD

1/10/2018 6:36 AM



## **AGREEMENT**

Between

## **BROWARD COUNTY**

and

CITY OF FORT LAUDERDALE, FLORIDA

for

# BROWARD CULTURAL COUNCIL CULTURAL INCENTIVE PROGRAM

FY 2016

INCENTIVE PROGRAM
Tourist Development Tax
Capital Challenge Grant (TDT-CCGP)

INCENTIVE NUMBER TDT-CCGP01-2016

**AMOUNT** \$377,016

This Agreement ("Agreement") is entered into by and between BROWARD COUNTY, a political subdivision of the State of Florida ("County"), and CITY OF FORT LAUDERDALE, FLORIDA, a municipal organization in the State of Florida ("Recipient" or "City").

## **RECITALS**

The Broward Cultural Council recommends funding to assist the Recipient with services and approved expenses as specifically set forth in Article 4 and Exhibit A.

The Broward County Board of County Commissioners ("Board") has determined that these expenditures serve a public purpose.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

# ARTICLE 1 DEFINITIONS AND IDENTIFICATIONS

1.1 <u>Agreement</u> - Agreement shall mean this document, the exhibits attached hereto, and any documents expressly incorporated by reference.

Broward and Fort Lauderdale

1.2 <u>Contract Administrator</u> - The Director of the County's Cultural Division, or his or her successor as designated by the County in writing.

# ARTICLE 2 SCOPE OF SERVICES

2.1 Scope of Services. Recipient shall perform all work specified in this Agreement inclusive of Exhibit A. Unless stated otherwise in this Agreement, the work required of Recipient includes all labor, materials, and tasks, whether or not enumerated in the Agreement, that are such an inseparable part of the work expressly stated in the Agreement that exclusion thereof would render Recipient's performance impractical, illogical, or unconscionable.

The project(s) consists of the services described in Exhibit A. Recipient shall provide a Project Evaluation Report on the form attached as Exhibit B for each project funded through this Agreement. Recipient shall provide the completed form to the Contract Administrator no later than thirty (30) calendar days after the completion of the term of the project or program on Exhibit A, the expiration or earlier termination of the Agreement, or at the time of the submittal of the final invoice, whichever is earliest. The required completed form shall be submitted along with any and all other documentation that is required under the Agreement but has not previously been submitted. Failure of the Recipient to timely submit a completed Project Evaluation Report shall disqualify the Recipient from consideration for any future grants under the County's Cultural Incentive Program and shall entitle the County to withhold payment of the final invoice without accrual of interest until Recipient has met all requirements of this Agreement and the specific program guidelines under which the Recipient qualified for the funding for the project.

- 2.2 Recipient shall not subcontract any portion of the required services except as may be expressly provided in Exhibit A or as approved in advance by the Contract Administrator, in his or her sole discretion, through a written Change Order or written contract amendment.
- 2.3 <u>Change of Scope Procedures</u>. Recipient acknowledges that Contract Administrator has no authority to make changes that would increase, decrease, or otherwise modify the scope of services to be provided under this Agreement except as expressly provided herein.

Upon written request by the Recipient, the Contract Administrator may, if authorized by the County's Administrative Code, approve in writing changes in the categories of expenditures listed in Exhibit A; however, the total amount payable to Recipient may not be modified except pursuant to a written amendment executed by the County Administrator after any required Board approval of funding.

Broward and Fort Lauderdale

-2-

# ARTICLE 3 TERM AND TIME OF PERFORMANCE

- 3.1 Term. The Agreement shall become effective on October 1, 2015 (the "Effective Date"), and shall end on September 30, 2020 ("Term"). The construction capital improvement phase activities as provided on Exhibit A ("Construction Phase") shall commence on October 1, 2015 through June 30, 2018. The programming phase activities as provided on Exhibit A ("Programming Phase") shall commence on June 30, 2018 through September 30, 2020.
- 3.2 <u>Extensions</u>. The County Administrator is authorized to enter in a written amendment extending this Agreement.
- 3.3 <u>Fiscal Year</u>. The continuation of this Agreement beyond the end of any County fiscal year shall be subject to both the appropriation and the availability of funds, in accordance with Chapter 129, Florida Statutes. The County's fiscal year commences on October 1 and ends September 30 of the following year.
- 3.4 Time is of the essence for all performance required under this Agreement.

# ARTICLE 4 COMPENSATION

4.1 For the Term as defined in Article 3, County will pay Recipient up to a maximum of Three Hundred Seventy-seven Thousand Sixteen Dollars (\$377,016). Payment shall be made only for services actually performed and completed pursuant to this Agreement, as set forth in this Article and Exhibit A, which amount shall be accepted by Recipient as full compensation for all such services. The Recipient acknowledges that the amounts set forth herein are the maximum amounts payable and constitute a limitation on County's obligation to compensate the Recipient for its services under this Agreement. These maximum amounts, however, do not constitute a limitation of any sort upon Recipient's obligation to perform all items of services required under this Agreement. Recipient agrees to provide matching funds as more specifically shown in Exhibit A.

## 4.2 METHOD OF BILLING AND PAYMENT

4.2.1 Invoices. Recipient may submit invoices only for services completed in accordance with Exhibit A. An original of each invoice shall be submitted no more than once monthly, except that the final invoice must be submitted no later than sixty (60) days after all services are completed. Payments will be made only on a reimbursement basis after expenses incurred for any required services performed, and the required documentation in Exhibit A submitted with proper invoice to the County.

Broward and Fort Lauderdale

-3-

There is no reimbursement for travel expenses or expenses which are not approved expenses as shown on Exhibit A. Invoices shall be submitted on an approved invoice form provided by the County. If Exhibit A contains a match requirement, the County's obligation under the Agreement is conditioned upon Recipient obtaining and providing that match.

- 4.2.2 County shall pay Recipient within thirty (30) days of receipt of Recipient's proper invoice, as required by the "Broward County Prompt Payment Ordinance" (Broward County Ordinance No. 89-49, as amended and codified in Section 1-51.6, Broward County Code of Ordinances). To be deemed proper, an invoice must comply with all requirements set forth in this Agreement and must be submitted pursuant to any instructions prescribed by the Contract Administrator. County shall have the right to withhold payment of the invoice based on Recipient's failure to comply with any term, condition, or requirement of this Agreement. The parties agree that any amounts so withheld shall not be subject to payment of any interest by County.
- 4.3 Payment shall be made to Recipient at:

City of Fort Lauderdale, Florida Attn: Gina Rivera, Grants & Special Projects Coordinator 1350 West Broward Blvd. Fort Lauderdale, FL 33312

Recipient may change the information in this section by providing written notice of such change to the Contract Administrator in accordance with the "Notices" Section in Article 9.

## ARTICLE 5 FINANCIAL STATEMENTS

The Recipient shall submit to the County all information required by the Agreement, including the Project Evaluation Report, Exhibit B, and any financial information required by Exhibit B within thirty (30) calendar days after completion of the project or the conclusion of the term of the project or program period, as described in this Agreement. The Recipient is not subject to audited annual financial statement requirements. The Contract Administrator shall be responsible for verifying that services are provided in accordance with any required documentation and the requirements of the Agreement prior to the issuance of any payment to Recipient.

Broward and Fort Lauderdale

-4-

# ARTICLE 6 GOVERNMENTAL IMMUNITY

Recipient represents to County for County's reliance that Recipient is a state agency or political subdivision as defined in Section 768.28, Florida Statutes, and Recipient agrees to be fully responsible for the acts and omissions of its agents or employees to the extent permitted by law. Nothing herein is to be construed as consent to be sued by third parties in any matter arising out of this Agreement or any other contract.

# ARTICLE 7 INSURANCE

- 7.1 Recipient represents that it is a state agency or political subdivision as defined in Section 768.28, Florida Statutes, and agrees to furnish the County, upon execution of this Agreement, with written verification of liability protection in accordance with state of Florida laws. Additionally, if Recipient elects to purchase any additional liability coverage, including excess liability coverage, Recipient agrees that "Broward County" shall be listed as the certificate holder and included as an additional named insured on the certificate.
- 7.2 If Recipient hires subcontractor(s) to perform services, its subcontractor(s) shall be required to endorse "Broward County" as an additional insured on any general liability and excess liability policies.

# ARTICLE 8 TERMINATION

- This Agreement may be terminated for cause based on any breach that is not cured within ten (10) days after written notice from the aggrieved party identifying the breach. This Agreement may also be terminated for convenience by the Board or County Administrator upon providing written notice to Recipient of the termination date, which shall be not less than thirty (30) days after the date such written notice is provided. If County erroneously, improperly, or unjustifiably terminates for cause, such termination shall, to the full extent permissible under applicable law, be deemed a termination for convenience, which shall be effective thirty (30) days after such notice of termination for cause is provided.
- 8.2 County may terminate this Agreement if Recipient is found to have submitted a false certification pursuant to Section 287.135, Florida Statutes, if Recipient has 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 if Recipient has failed to promptly implement corrective action for audit deficiencies upon reasonable notice by County. Notwithstanding anything contained in this Agreement to the contrary, the rights and obligations of the

Broward and Fort Lauderdale

-5-

- parties under this paragraph shall be governed by Section 287.135, Florida Statutes, to the full extent applicable.
- 8.3 Recipient represents that neither it nor any of its affiliates has been placed on the discriminatory vendor list, as defined by Section 287.134, Florida Statutes. County may terminate this Agreement effective immediately, without any further obligation to Recipient, upon learning that such representation is false or if Recipient or any of its affiliates is placed on the discriminatory vendor list.
- 8.4 This Agreement may also be terminated as provided in Sections 9.4 (Public Entity Crime Act), 9.8 (Assignment and Performance), 9.21 (Contingency Fee), and 9.23 (Force Majeure).
- 8.5 Notice of termination shall be provided in accordance with the "Notices" section of this Agreement.
- 8.6 In the event this Agreement is terminated for convenience by County, Recipient shall be paid for any services properly performed through the termination date specified in the written notice of termination. Recipient acknowledges that it has received good, valuable and sufficient consideration from County, the receipt and adequacy of which are hereby acknowledged by Recipient, for County's right to terminate this Agreement for convenience, and Recipient hereby waives, to the full extent permissible under applicable law, any and all rights to challenge the adequacy of such consideration or the validity of County's right to terminate for convenience.

# ARTICLE 9 MISCELLANEOUS

- 9.1 Rights in Documents and Work. Any and all reports, photographs, surveys, media, and other data and documents provided, created or funded in connection with this Agreement shall be and remain the property of County and, if a copyright is claimed, Recipient hereby grants to County a non-exclusive perpetual license to use the copyrighted item(s), to prepare derivative works, and to make and distribute copies to the public. In the event of expiration or earlier termination of this Agreement, any reports, photographs, surveys, media, and other data and documents prepared by Recipient, whether finished or unfinished, shall become the property of County and shall be delivered by Recipient to the Contract Administrator within seven (7) days of expiration or earlier termination of this Agreement by either party.
- 9.2 <u>Audit Right and Retention of Records</u>. Recipient shall, by written contract, require its subcontractors to agree to all the requirements and obligations contained in this section.

Broward and Fort Lauderdale

-6-

- 9.2.1 County shall have the right to audit the books, records, and accounts of Recipient and its subcontractors that are related to this Agreement. Recipient and its subcontractors shall keep such books, records, and accounts as may be necessary in order to record complete and correct entries related to this Agreement. Recipient and its subcontractors shall preserve and make available at reasonable times, for examination and audit by County, all financial records, supporting documents, statistical records, and any other documents pertinent to this Agreement for the required retention period of the Florida Public Records Act, Chapter 119, Florida Statutes, if applicable, or for three (3) years after termination of this Agreement, whichever is longer. If any audit has been initiated and audit findings have not been resolved at the end of the applicable retention period, the books, records, and accounts shall be retained until resolution of the audit findings.
- 9.2.2 As applicable or as may be required by Chapter 119, Florida Statutes, the Recipient shall comply with Florida's Public Records Law. Specifically, the Recipient shall: (a) keep and maintain public records that ordinarily and necessarily would be required by the County in order to perform the service; (b) provide the public with access to such public records on the same terms and conditions that the County would provide the records and at a cost that does not exceed that provided in Chapter 119, Florida Statutes, or as otherwise provided by law; (c) ensure that public records that are exempt or that are confidential and exempt from public record requirements are not disclosed except as authorized by law; (d) meet all requirements for retaining public records; and (e) transfer to the County, at no cost, all public records in possession of the Recipient upon termination of the contract and destroy any duplicate public records that are exempt or confidential and exempt. All records stored electronically must be provided to the County in a format that is compatible with the information technology systems of the County. The failure of Recipient to comply with the provisions of this section shall constitute a default and breach of this Agreement, entitling the County to exercise any remedy available under this Agreement or under applicable law.
- 9.3 <u>Truth-In-Negotiation Representation</u>. Recipient represents that the information supplied is accurate, complete, and current at the time of contracting. County shall be entitled to recover any damages it incurs to the extent such representation is untrue.
- 9.4 Public Entity Crime Act. Recipient represents that it is familiar with the requirements and prohibitions under the Public Entity Crime Act, Section 287.133, Florida Statutes, and represents that its entry into this Agreement will not violate that Act. In addition to the foregoing, Recipient further represents that

Broward and Fort Lauderdale

-7-

there has been no determination that it committed a "public entity crime" as defined by Section 287.133, Florida Statutes, and that it has not been formally charged with committing an act defined as a "public entity crime" regardless of the amount of money involved or whether Recipient has been placed on the convicted vendor list. Notwithstanding any provision in this Agreement to the contrary, if any representation stated in this paragraph is false, County shall have the right to immediately terminate this Agreement and recover all sums paid to Recipient under this Agreement.

- 9.5 <u>Independent Contractor</u>. Recipient is an independent contractor under this Agreement. Recipient shall not have the right to bind County to any obligation not expressly undertaken by County under this Agreement.
- 9.6 <u>Third Party Beneficiaries</u>. The parties acknowledge that there are no third party beneficiaries under this Agreement.
- 9.7 <u>Notices</u>. In order for a notice to a party to be effective under this Agreement, notice must be sent via U.S. first-class mail with a contemporaneous copy via email to the addresses listed below and shall be effective upon mailing. The addresses for notice shall remain as set forth herein unless and until changed by providing notice of such change.

### Notice to County:

Broward County, Cultural Division
Attn: Earl Bosworth, Director
100 S. Andrews Ave., 6th Floor
Fort Lauderdale, Florida 33301
Email address: EBosworth@broward.org
With simultaneous copy of e-mail to JShermer@broward.org

## Notice to Recipient:

City of Fort Lauderdale, Florida
Parks and Recreation Department
Attn: Phil Thornburg, Director of P&RD
1350 West Broward Blvd.
Fort Lauderdale, FL 33312
Email address: pthornburg@fortLauderdale.gov
With simultaneous copy of e-mail to GRivera@fortLauderdale.gov

9.8 <u>Assignment and Performance</u>. Except for subcontracting approved by County as provided in Article 2 or any written amendment hereto, neither this Agreement nor any right or interest herein may be assigned, transferred, subcontracted, or encumbered by Recipient without the prior written consent of County. If

Broward and Fort Lauderdale

-8-

Recipient violates this provision, County shall have the right to immediately terminate this Agreement. Recipient represents that each person and entity that will provide services under this Agreement is duly qualified to perform such services by all appropriate governmental authorities, where required, and is sufficiently experienced and skilled in the area(s) for which such person or entity will render services. Recipient agrees that all services under this Agreement shall be performed in a skillful and respectful manner, and that the quality of all such services shall equal or exceed prevailing industry standards for the provision of such services.

- 9.9 Conflicts. Recipient agrees that neither it nor its employees will have or hold any continuing or frequently recurring employment or contractual relationship that is substantially antagonistic or incompatible with Recipient's loyal and conscientious exercise of the judgment and care required to perform under this Agreement. Recipient further agrees that none of its officers or employees shall, during the term of this Agreement, serve as an expert witness against County in any legal or administrative proceeding in which he, she, or Recipient is not a party, unless compelled by court process. Further, such persons shall not give sworn testimony or issue a report or writing, as an expression of his or her expert opinion, which is adverse or prejudicial to the interests of County in connection with any such pending or threatened legal or administrative proceeding unless compelled by court process. The limitations of this section shall not preclude Recipient or any person from in any way representing themselves, including giving expert testimony in support thereof, in any administrative or legal proceeding. Recipient agrees that each of its contracts with subcontractors performing under this Agreement shall contain substantively identical language to ensure that each subcontractor and its officers and employees meet the obligations contained in this paragraph.
- 9.10 Waiver of Breach. The failure of either party to enforce any provision of this Agreement shall not be deemed a waiver of such provision or modification of this Agreement. A waiver of any breach under this Agreement shall not be deemed a waiver of any subsequent breach.
- 9.11 <u>Compliance With Laws</u>. Recipient shall comply with all applicable federal, state, and local laws, codes, ordinances, rules, and regulations in performing under this Agreement.
- 9.12 <u>Severability</u>. In the event any part of this Agreement is found to be unenforceable by any court of competent jurisdiction, that part shall be deemed severed from this Agreement and the balance of this Agreement shall remain in full force and effect.
- 9.13 <u>Joint Preparation</u>. This Agreement has been jointly prepared by the parties hereto, and shall not be construed more strictly against either party.

Broward and Fort Lauderdale

-9

- 9.14 Headings and Interpretation. The headings contained in this Agreement are for reference purposes only and shall not in any way affect the meaning or interpretation of this Agreement. All personal pronouns used in this Agreement shall include the other gender, and the singular shall include the plural, and vice versa, unless the context otherwise requires. Terms such as "herein," "hereof," "hereunder," and "hereinafter," refer to this Agreement as a whole and not to any particular sentence, paragraph, or section where they appear, unless the context otherwise requires.
- 9.15 Governing Law, Venue, and Waiver of Jury Trial. This Agreement shall be interpreted and construed in accordance with, and governed by, the laws of the state of Florida. The parties agree that the exclusive venue for any lawsuit arising from, related to, or in connection with this Agreement shall be in the state courts of the Seventeenth Judicial Circuit in and for Broward County, Florida. If any claim arising from, related to, or in connection with this Agreement must be litigated in federal court, the parties agree that the exclusive venue for any such lawsuit shall be in the United States District Court or United States Bankruptcy Court for the Southern District of Florida. BY ENTERING INTO THIS AGREEMENT, RECIPIENT AND COUNTY HEREBY EXPRESSLY WAIVE ANY AND ALL RIGHTS EITHER PARTY MAY HAVE TO A TRIAL BY JURY OF ANY CAUSE OF ACTION OR CLAIM ARISING FROM, RELATED TO, OR IN CONNECTION WITH THIS AGREEMENT.
- 9.16 Amendments. No modification or amendment to this Agreement shall be effective unless it is in writing and executed by authorized representatives of each party, including as provided in Exhibit A if applicable. Without limiting the foregoing, the terms of this Agreement shall prevail over and against any additional or contrary terms and conditions in any format or medium unless expressly agreed to in writing by an amendment hereto executed by authorized representatives of each party.
- 9.17 <u>Prior Agreements</u>. This Agreement represents the final and complete understanding of the parties regarding the subject matter hereof and supersedes all prior and contemporaneous negotiations and discussions regarding that subject matter. There is no commitment, agreement, or understanding concerning the subject matter of this Agreement that is not contained in this written document.

### 9.18 Payable Interest.

9.18.1 Payment of Interest. County shall not be liable to pay any interest to Recipient for any reason, whether as prejudgment interest or for any other purpose, and in furtherance thereof Recipient waives, rejects, disclaims, and surrenders any and all entitlement it has or may have to receive

Broward and Fort Lauderdale

-10-

interest in connection with a dispute or claim arising from, related to, or in connection with this Agreement. This paragraph shall not apply to any claim interest, including for post-judgment interest, if such application would be contrary to applicable law.

- 9.18.2 <u>Rate of Interest</u>. If, for whatever reason, Section 9.18.1 is determined to be invalid or unenforceable by a court of competent jurisdiction, the annual rate of interest payable by County under this Agreement, whether as prejudgment interest or for any other purpose, shall be, to the full extent permissible under applicable law, 0.25% (one quarter of one percent) simple interest (uncompounded).
- 9.19 <u>Incorporation by Reference</u>. Any and all Recital clauses stated above are true and correct and are incorporated herein by reference.
- 9.20 Representation of Authority. Each individual executing this Agreement on behalf of a party hereto represents and warrants that he or she is, on the date of execution, duly authorized by all necessary and appropriate action to execute this Agreement on behalf of such party and does so with full legal authority.
- 9.21 Contingency Fee. Recipient represents that it has not paid or agreed to pay any person or entity, other than a bona fide employee working solely for Recipient, any fee, commission, percentage, gift, or other consideration contingent upon or resulting from the award or making of this Agreement. If County learns that this representation is false, County shall have the right to terminate this Agreement without any further liability to Recipient. Alternatively, if such representation is false, County, at its sole discretion, may deduct from the compensation due Recipient under this Agreement the full amount of such fee, commission, percentage, gift, or consideration.
- 9.22 <u>Nondiscrimination</u>. Recipient may not discriminate on the basis of race, color, sex, religion, national origin, disability, age, marital status, political affiliation, sexual orientation, pregnancy, or gender identity and expression in the performance of this Agreement, except that any project assisted by U.S. Department of Transportation funds shall comply with the non-discrimination requirements in 49 C.F.R. Parts 23 and 26. Recipient shall include substantially similar language in its contracts with any and all permitted subcontractor(s) or sub-consultants.
- 9.23 Force Majeure. If the performance of this Agreement, or any obligation hereunder, is prevented by reasons of hurricane, earthquake, or other casualty caused by nature, or by labor strike, war, or by law, order, proclamation, regulation, or ordinance of any governmental agency, the party so affected, upon giving prompt notice to the other party, shall be excused from such performance provided that the party so affected shall first have taken reasonable steps to

Broward and Fort Lauderdale

-11-

avoid and remove such cause of non-performance and shall continue to take reasonable steps to avoid and remove such cause, and shall promptly notify the other party in writing and resume performance hereunder whenever and to the full extent such causes are removed. However, if such non-performance exceeds sixty (60) days, the party that is not prevented from performance by the force majeure event shall have the right to immediately terminate this Agreement upon written notice to the party so affected. This section shall not supersede or prevent the exercise of any right the parties may otherwise have to terminate this Agreement.

The Contract Administrator, in his or her sole discretion, may approve in writing payment for reasonable and documented expenses on Exhibit A which were incurred by Recipient up to and including the date of the event resulting in the non-performance by Recipient.

9.24 <u>Multiple Originals</u>. Multiple copies of this Agreement may be executed by all parties, each of which, bearing original signatures, shall have the force and effect of an original document.

(The remainder of this page is intentionally left blank.)

AGREEMENT BETWEEN BROWARD COUNTY AND CITY OF FORT LAUDERDALE, FLORIDA, FOR BROWARD CULTURAL COUNCIL, TDT-CCGP01-2016

IN WITNESS WHEREOF, the parties hereto have made and executed this Agreement: BROWARD COUNTY, signing by and through the County Administrator, authorized to execute same by Board action, and the Recipient, CITY OF FORT LAUDERDALE, FLORIDA, signing by and through its \_\_\_\_\_\_, duly authorized to execute same.

## **COUNTY**

WITNESSES:		BROWARD COUNTY, through its County Administrator
Signature above Print Name:		By County Administrator
Signature above Print Name:		day of, 2016
Insurance requirements approved by Broward County Risk Management Division		Approved as to form by Joni Armstrong Coffey Broward County Attorney Governmental Center, Suite 423 115 South Andrews Avenue Fort Lauderdale, Florida 33301 Telephone: (954) 357-7600 Telecopier: (954) 357-7641
BySignature (Date)		ByAndrea S. Froome (Date) Senior Assistant County Attorney
Print Name and Title above		
ASF:dp 2016-04-04 TDT 01-2016 City of Fort Lauderdale Broward.A01 04/04/16 #16-110		
Broward and Fort Lauderdale	-13-	FY 2016 TDT Agreement

# AGREEMENT BETWEEN BROWARD COUNTY AND CITY OF FORT LAUDERDALE, FLORIDA, FOR BROWARD CULTURAL COUNCIL TDT-CCGP01-2016

## **RECIPIENT**

	CITY OF FORT LAUDERDALE, FLORIDA
WITNESSES:	
Signature above	(Authorized Signature)
Print Name:	
	(Print name and title of Authorized Signature for Recipient above)
Signature above	
Print Name:	, 2016
ATTEST:	Reviewed and approved as to form:
City Clerk	City Attorney
(SEAL)	

Broward and Fort Lauderdale

-14-

# EXHIBIT A SCOPE OF SERVICES

FOR AGREEMENT BETWEEN BROWARD COUNTY AND CITY OF FORT LAUDERDALE, FLORIDA, FOR BROWARD CULTURAL COUNCIL TDT-CCGP01-2016

CITY OF FORT LAUDERDALE, FLORIDA ("Recipient" or "City"), has been awarded incentive funds under the following incentive program and in the amount specified:

Tourist Development Tax
Capital Challenge Grant (TDT-CCGP)
TDT-CCGP01- 2016

\$377,016

Funding for the program shall be paid to Recipient by County in accordance with the following:

Project Start Date: October 1, 2015 - Project End Date: September 30, 2020

Construction Phase - As defined in Section 3.1. - Commencing on October 1, 2015 through June 30, 2018.

Programming Phase - As defined in Section 3.1. - Commencing on June 30, 2018 through September 30, 2020.

- I. Project Title: Renovation and expansion of the War Memorial Auditorium Project.
- II. SCOPE OF SERVICES: During the Construction Phase of the Term (as defined in Section 3.1), the Recipient shall provide for, and complete, a construction project for the municipal-owned and operated War Memorial Auditorium Project, located at 800 NE 8th St., Fort Lauderdale, Florida 33304.

The Tourist Development Tax Capital Challenge award will be used to support the replacement of the auditorium's electrical and lighting systems, and a new telescopic seating system component.

Auditorium: War Memorial Auditorium (WMA or Auditorium) is a multi-disciplinary, multi-purpose facility located within the City's Holiday Park. The venue is owned and operated by the City of Fort Lauderdale. The auditorium was built in 1948 and opened to the public on January 14, 1950. Historic War Memorial Auditorium is an asset to the community and continues to generate tourists, visitors, and revenue. The existing 39,954 square foot facility can accommodate a capacity of 2,100 event patrons. The venue currently hosts tradeshows, seminars, boxing and wrestling events, graduations, and concerts.

Broward and Fort Lauderdale

Page 1 of 9

Interior renovations will allow the facility to be used for a wider variety of cultural arts events, attract a greater number of tourists to Broward County and enhance the auditorium's position as a tourist destination. This project will include replacements of the electrical, lighting and seating systems. The new telescopic seating will allow the venue to accommodate 2,110 patrons in combination with the existing floor seating.

Phase One: Funds will be used to replace the existing platform seating with new semi-automatic operation chairs (i.e., portable retractable seating unit fold-down and fold-up space-saving systems) with an estimated capacity of 1,698 patrons. In total, the auditorium will be able to accommodate 2,110 patrons.

Phase Two: Funds will be used to upgrade the electrical services to the building including re-wiring and lighting replacement with low-energy efficient LED lighting fixtures for the entire building.

Part (A) of Construction Phase One: REPLACEMENT OF THE EXISTING PLATFORM SEATING WITH NEW SEMI-AUTOMATIC OPERATION CHAIRS WITH ESTIMATED CAPACITY 1,698 people. The seating system at the War Memorial Auditorium was installed in the summer of 1983. In September 2000, the seating system had major repair work. Seats have been replaced as needed. but the entire system will eventually need to be replaced as the mechanics which operate the system are beginning to wear out. Staff has had to condemn entire blocks of seats as unsellable/unusable due to this hazard. This detracts from the ability to rent the auditorium and negatively affects revenue. The City will purchase a retractable seating system to replace the current aging system. Hours will also be saved using the mechanical system versus manually setting up or breaking down seating for events. The existing seating consists of risers capable of seating 1,700 people. Floor seating can accommodate 400 persons. The replacement of the existing telescopic seating system is estimated to cost \$660,000 and will accommodate 1,698 visitors. In total, the new seating systems when combined with the existing floor seating will be able to accommodate 2,110 patrons. During the Term, the City shall ensure that the attendance capacity for the Auditorium (WMA) does not exceed 4,999 patrons unless a written amendment is executed between the City (through its City Commission or City Manager) and the County (through its Board or its County Administrator) after the Contract Administrator's review and discussions with the County Administrator's management level staff and the Office of the County Attorney.

Part (B) of Construction Phase Two: UPGRADE OF THE EXISTING ELECTRICAL SYSTEMS IN THE BUILDING INCLUDING RE-WIRING AND INTERIOR LIGHTING REPLACEMENT WITH LOW-ENERGY EFFICIENT LED LIGHTING FIXTURES. The project includes the re-wiring and various electrical upgrades due to 60+ years of deterioration and continuous use. The lighting will consist of low-energy efficient LED lighting. The electrical upgrades also include

Broward and Fort Lauderdale

Page 2 of 9

three phase 600 amps service upgrade. The budget for the electrical system upgrade is \$1,019,612.

CONSTRUCTION PHASE (as defined in Section 3.1): The Recipient shall ensure that the required construction-related activities are completed within the Construction Phase as follows:

Parts A and B: - Project Start Date: October 1, 2015 through September 30, 2020.

#### Project timeline:

October 2015 - TDT-CCGP funding period begins.

October 2015 - June 2016 - Planning: Evaluate the existing systems, preliminary estimation of the costs for seating and electrical upgrades.

June 2016 - November 2016 - Seating replacement, design of electrical upgrades.

October 2016 - December 2017 - Bidding phase for the electrical improvements.

December 2017 - January 2017 - Contract award phase for the electrical improvements.

January 2017 - January 2018 - Construction phase for the electrical improvements.

January 2018 - WMA TDT-CCGP project complete.

September 2020 - TDT-CCGP funding period ends.

Except as stated herein, the Recipient shall provide for, and be responsible for, the capital expenses associated with the design, development of the architectural engineering services, site preparation, construction costs, and programs for the new construction of the War Memorial Auditorium Project.

#### III. FUNDS:

- a. County's maximum not-to-exceed total funds: \$377,016.
- b. Recipient's total funds: \$754,032.
- c. Match requirements: Dollar for dollar (two dollars of Recipient's cash-to-every one dollar cash match of County).

The Recipient shall provide for a minimum cash match in funds in the amount of Seven Hundred Fifty-four Thousand Thirty-two Dollars (\$754,032).

Broward and Fort Lauderdale

Page 3 of 9

- a. County's maximum not-to-exceed total funds: Three Hundred Thousand Seventy-seven and Sixteen Dollars (\$377,016).
- b. Recipient's total funds: Seven Hundred Fifty-four Thousand Thirty-two Dollars (\$754,032) (two-to-one cash match).
- c. Match requirements: Recipient shall provide a two-to-one cash match.

The Recipient shall provide a two-to-one cash match in any combination of the following forms: The cash matching portion shall be used solely for the project for which the County's TDT Capital Challenge Grant funds are awarded to Recipient. The cash match may include: Recipient's available cash-on-hand earmarked for the project (as determined on the date the Recipient filed its incentive (grant) application with the County on February 16, 2015) and any additional received or added after such date; irrevocable contributions of cash that will be received by the Recipient and obligated by the end of the project period as shown above; the cost of site acquisition (for City-owned property) if acquired within three (3) years prior to the date of the incentive (grant) application filed on February 16, 2015, or the Broward County Property Appraiser's official assessed valuation if acquired more than three (3) years prior to the date of application filed on the date stated above.

The budgeted funds shall be committed by the Recipient for at least three (3) years after the project start date provided in this Agreement in order to guarantee that the matching funds will be available to complete the "project." The County's funding shall only be paid on a reimbursable basis after receipt by Contract Administrator of proper documentation as further provided in Article 4.

The Recipient shall first expend required match and County's funds before invoicing for the County's reimbursement share. The County shall not make advance payments to Recipient. No County grant may be used as matching funds for another County grant. Recipient must show proof of spending on qualified expenses described in the Paragraph IV below.

Unless such expenditures are specifically authorized in the program guidelines or in this Agreement, funding restrictions are applicable to this Agreement, which is one of the Broward Cultural Council's incentive programs. Recipient may use certain cost categories, as approved in writing by the Contract Administrator, as Recipient's match. Recipient shall refer to the eligible project funding categories described in the table in Section VI of this Exhibit.

# IV. DEFINITION OF UNIT(S) OF SERVICE(S):

The County agrees to purchase and will reimburse Recipient for reimbursable project and construction expenses associated with the project up to \$377,016, as

Broward and Fort Lauderdale

Page 4 of 9

described above in Section II. Part (A) and Part (B) reimbursements will only be available after the Recipient has satisfied its two-to-one cash match obligation and provided written documentation as proof to County of such satisfaction.

Grant funds will be used to support:

Part (A): \$194,000 REPLACEMENT OF THE EXISTING PLATFORM SEATING WITH NEW SEMI-AUTOMATIC OPERATION CHAIRS (i.e., portable retractable seating unit fold-down and fold-up space-saving systems) WITH AN ESTIMATED CAPACITY OF 1,698 patrons (Total cost \$660,000).

Part (A) of Construction Phase: The County will purchase and reimburse Recipient for reimbursable project construction expenses associated with Part (A) up to \$194,000 for Part (A) as described above in Section II. Part (A) reimbursements will only be available after the Recipient has satisfied its two-to-one cash match obligation and provided written documentation as proof to County of such satisfaction for County's review and approval in the discretion of its Contract Administrator.

Part (B): \$183,016 UPGRADE OF THE EXISTING ELECTRICAL SYSTEMS IN THE BUILDING INCLUDING RE-WIRING AND INTERIOR LIGHTING REPLACEMENT WITH LOW-ENERGY EFFICIENT LED LIGHTING FIXTURES (Total cost \$1,019,612).

Part (B) of Construction Phase: The County will purchase and will reimburse Recipient for reimbursable project construction expenses associated with Part (B) up to \$183,016, as described above in Section II. Part (B) reimbursements will only be available after Recipient has satisfied its two-to-one cash match obligation and provided written documentation as proof to County of such satisfaction for County's review and approval in its discretion of its Contract Administrator.

	TDT Funds	Receipient Cash Match 2:1	Total Project
Part A. Seating system	\$194,000	\$388,000	\$660,000
Part B. Auditorium, Stage electrical	\$183,016	\$366,032	\$1,019,612
and lighting systems			
Total	\$377,016	\$754,032 .	\$1,679,612

During the Construction Phase of the Term (as defined in Section 3.1), the County will purchase and will reimburse Recipient for reimbursable project and construction expenses associated with the project, as described in Section II, up to \$377,016 for the construction phase(s) as described above in Section II, only after the Recipient has satisfied its funds' (cash) match obligation, and provided written documentation as proof to County of such satisfaction for County's review and approval in its discretion of its Contract Administrator.

Broward and Fort Lauderdale

Page 5 of 9

The award of the funds by County and the expenditures by the Recipient of the awarded funds (consisting of tourist development tax funds) shall comply with the express authorized use(s) of such funds pursuant to Section 125.0104, Florida Statutes. The Recipient shall ensure that the actual use of the awarded funds are solely used for the expenditures approved by the County under this Agreement as expressly permitted by Section 125.0104, Florida Statutes. The Recipient shall provide documentation sufficient to substantiate same to County upon request.

Additionally, the Recipient shall promote and advertise tourism locally within Broward County and the state of Florida and nationally (within the United States of America) and internationally (outside the United States of America). Such promotion and advertisement of tourism may be performed through the Recipient's website and internet, the ArtsCalendar.com, other electronic medium, or other advertising medium. If Recipient uses any of the awarded funds for any activity, service, venue, or event as specifically approved by the County in this Agreement, then the Recipient shall ensure that such activity, service, venue, or event must have as one of its main purposes the attraction of tourists as evidenced by the promotion of the activity, service, venue, or event to tourists.

## V. REQUIRED DOCUMENTATION OF SERVICES RENDERED:

Additionally, Recipient shall document the expenditure of the TDT incentive funds and the Recipient's equivalent two-to-one cash match in the qualifying funding categories for each unit of service expended.

Recipient shall provide, as an attachment to each Units of Service Invoice, a brief narrative description of services provided during the billing period and copies of paid invoices for the costs associated with each of the project's construction phases: (i.e., building construction; architectural; engineering; site preparation; structural).

Recipient shall provide a detailed outline of the activities tied to each construction phase completed and invoiced, along with the copies of paid invoices, and corresponding materials documenting the work completed, and provided, during the period covered in the Units of Service invoice.

The Recipient's cash match, in the qualifying funding categories for each unit of service expended, be grouped by the same activity categories as those appearing in the scope of services section. The final invoice shall include documentation of the completion of all items not previously submitted, as described in Section II.

Exhibit B - The Project Evaluation Report is due as provided in Article 2.

Broward and Fort Lauderdale

Page 6 of 9

# VI. FUNDING CATEGORIES FOR WHICH COUNTY'S AND RECIPIENT'S MATCHING FUNDS MAY BE USED:

FUNDING C	CATEGORIES	
County's TDT-CCGP Program Funds	Recipient's Funds or Match	
Outside Professional Services	Outside Professional Services	
Outside Professional Services	Outside Professional Services	
Architectural	Architectural	
Engineering	Engineering	
Site Preparation	Site Preparation	
Exterior Work	Exterior Work	
HVAC and/or Plumbing	HVAC and/or Plumbing	
Electrical and/or Fire Protection	Electrical and/or Fire Protection	
Structural and/or Doors and Windows	Structural and/or Doors and Windows	
Special Systems, and/or Conveying Systems	Special Systems and/or Conveying Systems	
Acoustical and/or Finishes and/or Woods and/or Plastics	Acoustical and/or Finishes and/or Woods and/or Plastics	
Furniture and/or Equipment	Furniture and/or Equipment	
Thermal and Moisture Protection	Thermal and Moisture Protection	
General Conditions	General Conditions	
nterior Work	Interior Work	
HVAC and/or Plumbing	HVAC and/or Plumbing	
Electrical and/or Fire Protection	Electrical and/or Fire Protection	
Structural and/or Doors and Windows	Structural and/or Doors and Windows	
Special Systems, Lighting Systems, and/or Conveying Systems	Special Systems, Lighting Systems, and/or Conveying Systems	
Acoustical and/or Finishes and/or Woods and/or Plastics	Acoustical and/or Finishes and/or Woods and/or Plastics	
Furniture and/or Seating Systems, and/or Equipment	Furniture, and/or Seating Systems, and/or Equipment	
Thermal and Moisture Protection	Thermal and Moisture Protection	
General Conditions	General Conditions	
MAXIMUM NOT-TO-EXCEED TOTAL:	TOTAL:	

Broward and Fort Lauderdale

Page 7 of 9

\$377,016. \$754,032.

VII. FUNDED ACTIVITIES: All funded activities are to occur exclusively in Broward County and solely for the construction-related activities for the Construction Phase of the Term as stated in Section 3.1 except if otherwise expressly stated herein. Notwithstanding the date that this Agreement is fully executed by both parties, the Agreement (including all payment obligations) shall commence on the Effective Date stated in Section 3.1 but only after it is fully executed by both parties. The County represents that the Recipient cannot rely upon the funding provided in this Agreement until the Recipient is in receipt of a fully executed Agreement executed by the County, through its County Administrator or Board.

County will not make any payments to the Recipient for the programming activities relating to the Programming Phase; however, the programming requirements are essential terms of this Agreement, and Recipient shall comply with them.

If at any time after the commencement of the Programming Phase (as defined in Section 3.1), the Recipient does not cooperate with the County's GFLCVB as required herein, the County (in the sole discretion of its Contract Administrator) may withhold all or part of any funds due to Recipient in grant agreement or other agreements processed through the County's Cultural Division.

Recipient shall notify in writing (by e-mail or otherwise) the following two (2) County representatives of all meetings, project communications, and reports throughout the Term (including the Construction Phase and the Programming Phase): Earl Bosworth, Cultural Division's Director (Contract Administrator (ebosworth@broward.org), and Kim Butler, Greater Fort Lauderdale Visitors and Convention Bureau ("GFLCVB") (KimButler@broward.org).

VIII. PROGRAMMING PHASE (as defined in Section 3.1): The Recipient shall conduct the following activities in order to ensure that there is sufficient programming available during the post construction period, including the following:

Program Marketing: In order to ensure sufficient programming (including tourist-related activities) upon final completion of the construction project(s) (facility), Recipient will design and provide a national, regional, and local marketing and advertising campaign to support and promote the project (facility) and the related programming activities and events. Recipient will provide: International marketing which may be performed through the Recipient's website, the internet, and the ArtsCalendar.com website. Recipient will be required by the County to track room night data as a result of the project and to cooperate with the GFLCVB to increase room nights generated by the project.

Broward and Fort Lauderdale

Page 8 of 9

Market Research: With assistance of the GFLCVB, the Recipient shall perform market research, evaluation and development services, including, but not limited to, survey of patrons and tourists, program attendees, and the local general public, in order to monitor the number of hotel nights generated from the funded project and its subsequent activities and events, to evaluate how the promotional, advertisements activities and events impacted tourists and tourism during the period as described in Section 3.1, and to develop an evaluation report with relation to the programs and project (facility).

The goal of the marketing research is to strengthen the Recipient's ability to work with Broward's county-wide cultural community hospitality interests, tourism industry, and commercial establishments.

Additionally, the Recipient shall use any subsequent funding through the County's Cultural Tourism Program (CTP), if awarded, by the County to promote and advertise tourism locally within Broward County and the state of Florida and nationally (within the United States of America) and internationally (outside the United States of America). Such promotion and advertisement of tourism may be performed through the Recipient's website and internet, the ArtsCalendar.com, other electronic medium, or other advertising medium. If Recipient uses any of the subsequently awarded funds for any activity, service, venue, or event as specifically approved by the County in this Agreement, or in another County Agreement, then the Recipient shall ensure that such activity, service, venue, or event must have as one of its main purposes the attraction of tourists as evidenced by the promotion of the activity, service, venue, or event to tourists.

## IX. AMENDMENTS IN ACCORDANCE WITH ARTICLE 9:

In accordance with the "Amendments" section in Article 9, amendments to the Agreement (including Exhibit A, Section 3.1, and Section 4.1) may be approved and executed by the County, (through the County Administrator or the Board) and by the Recipient or City (through its City Commission or City Manager).

[The remainder of this page is intentionally left blank.]

Broward and Fort Lauderdale

Page 9 of 9

# EXHIBIT B BROWARD CULTURAL COUNCIL Tourist Development Tax (TDT-CCGP) PROJECT EVALUATION REPORT

The Recipient shall submit to the County all information required by the Agreement, including the Project Evaluation Report, Exhibit B, and any financial information required by Exhibit B within thirty (30) calendar days after completion of the project or the conclusion of the term of the project/program period, as described in this Agreement.

Mailing address:			
Project Director: Fitle:		Telephone: Fax:	Ext.
Award: \$	· · · · · · · · · · · · · · · · · · ·	BCC Project #	
Date project began:		Date project ended:	
Trows.			
Provide a summary construction phase(s)	of the different amounts) during this reporting	s of TDT funds and match fund	ls expended during th
Provide a summary	of the different amounts) during this reporting	s of TDT funds and match fund period.  Recipient Cash Match Funds 2:1	ls expended during th Total Project
Provide a summary construction phase(s  Project Category, or	s) during this reporting	period.  Recipient Cash Match	
Provide a summary construction phase(s  Project Category, or Project Phase  otes:	TDT Funds	period.  Recipient Cash Match	

Tourist Development Tax (TDT-CCGP) Project Evaluation Report - Page 1 of 5

organization?
Notes:

Provide the total Full-Time Equivalent (FTE) calculation for all positions involved (employees and contractual services personnel, consultants). (For the purposes of this calculation, use 2,080 hours as the definition of a full-time annual schedule).

Number	Administrative	Artistic	Consultants (Others) %	TÖTALS . 2
Full-time				
Part-time				
Contractual				
TOTALS				

## For Post Construction and Programming Phase Reporting, only:

Marketing: Upon final completion of the construction project(s) (facility), TDT Recipient will design and provide a national, regional, and local marketing and advertising campaign to support and promote the project (facility) and the related programming activities and events. Recipient will provide: International marketing may be done through the Recipient's website, the internet and the ArtsCalendar.com website. Recipient will be required by the County to track room night data as a result of the project and to cooperate with the Greater Fort Lauderdale and Visitors' Bureau (GFLCVB) to increase room nights generated by the project.

Market Research Evaluation: with assistance of the Greater Fort Lauderdale and Visitors' Bureau, the Recipient shall perform market research, evaluation and development services, including, but not limited to, survey of patrons and tourists, program attendees, and the local general public, in order to monitor the number of hotel nights generated from the funded project and its subsequent activities and events, to evaluate how the promotional, advertisements activities and events impacted tourists and tourism during the project period.

1. Describe your marketing activities specifically designed to attract tourists. Please be inclusive. Indicate whether your organization, the Cultural Tourism Director's office, or another agency was responsible for each activity.

Notes:	

Tourist Development Tax (TDT-CCGP) Project Evaluation Report - Page 2 of 5

Describe your organization's marketing activities specifically designed to Please be inclusive. Indicate whether your organization, the Greater Fort Lat Convention and Visitors Bureau, or another agency was responsible for each	attract tourists.
Please be inclusive. Indicate whether your organization, the Greater Fort La	attract tourists.
	ıderdale
Marketing Activity Responsible Par	ty
What were the most effective elements of your marketing plan? Did you f particular media placements generated better response? Identify.	ind that
AUDIENCE AND TOURISM IMPACT INFORMATION	
How many individuals attended the organization's TDT project activities?	
What percentage of these attendees were tourists?	_%
How did you determine each of these statistics? Describe the method of com attendance and the method for determining the percentage tourists	puting total
·	
f programs, or events: (Be sure to count the different events, or programs, nances of the same event).	Programs:
f performances: (For example, a musical performed 10 times is one event, ve, with 10 performances that the audience participated). List the total ALL funded performances.	Performances:
	What were the most effective elements of your marketing plan? Did you is particular media placements generated better response? Identify.  AUDIENCE AND TOURISM IMPACT INFORMATION  How many individuals attended the organization's TDT project activities?  What percentage of these attendees were tourists?  How did you determine each of these statistics? Describe the method of comattendance and the method for determining the percentage tourists  Topograms, or events: (Be sure to count the different events, or programs, nances of the same event).  Topogramses: (For example, a musical performed 10 times is one event, e, with 10 performances that the audience participated). List the total

Tourist Development Tax (TDT-CCGP) Project Evaluation Report - Page 3 of 5

8. Provide numbers for all applicable categories:

	Participants/ Performers	Number of Hatel/Motel	Audience	Number of
		Room Nights	in the second	Hotel/Motel room nights
Broward County Residents				
Dade County Residents				
Palm Beach County Residents				
Other Florida (non- Broward)				,
Out-of-state				
Foreign				
TOTAL				

nese statistics?	
· · · · · · · · · · · · · · · · · · ·	
THE CONTRACT OF THE CONTRACT O	

# 10. **REQUIRED ATTACHMENTS:**

Enclose EITHER two (2) quality black and white, OR two (2) color first generation an original, not a copy) photographs. Electronic/digitized images that clearly document the organization's funded activity are preferred.
Copies of media buys, including print ads and recordings of electronic media ads.
Copy of the organization's promotional materials with the Broward County logo
Greater Fort Lauderdale and Visitors' Bureau logos and funding statement.  Attach the geographic location template (excel).

#### CERTIFICATION

It is certified by the undersigned that the infor solely for the purpose of the approved referen	mation provided is true and correct, and the expenditures were incurred ced grant activity.
Signature	Signature
(Name Typed)	(Name typed)
Chief Administrative Officer	Project Director
Date:	Date:

Tourist Development Tax (TDT-CCGP) Project Evaluation Report - Page 4 of 5

## To submit this Project Evaluation Report.

## Exhibit B, ONLINE

Go to your ACCOUNT profile page, and log on:

<hattps://www.GrantRequest.com/SID\_391?SA=AM>

In your Account profile....Click on REQUIREMENTS tab (next to Applications tab) and click on the 'OPEN Requirement' link to launch the "Exhibit B Project Report" template published to your award. Complete the input fields with your data, and upload with the Attachment files, and submit.

Some of the fields in the report are already pre-populated with data associated with this request.

If you have questions about the online Requirement process, please contact

Broward Cultural Division Incentives Section 100 South Andrews Avenue, 6<sup>th</sup> Floor Fort Lauderdale, FL 33301-1829

James Shermer, Grants Administrator 954-357-7502 ishermer@broward.org

Adriane Clarke, Grants Management Specialist 954-357-7530 <u>aclarke@broward.org</u> <u>http://www.broward.org/arts/Pages/Default.aspx</u>

Tourist Development Tax (TDT-CCGP) Project Evaluation Report - Page 5 of 5

#### **EXHIBIT C**

## Minimum Insurance Requirements

## Commercial General Liability Insurance

Combined single limit for bodily injury and property damage: \$1,000,000.00 (One Million Dollars) minimum limits per occurrence \$2,000,000.00 (Two Million Dollars) minimum limits per aggregate



# CITY OF FORT LAUDERDALE

December 28, 2015

Broward County Cultural Division 100 South Andrews Avenue, 6<sup>th</sup> Floor Fort Lauderdale, FL 38301-1829 Attn: James Shermer, Grants Administrator

Re: Cultural Tourism Program

Dear Mr. Shermer:

The City of Fort Lauderdale is self-insured for all general and automobile liability exposures. Accordingly, claims made against the City are handled under the City's self-funded liability program as provided for by Florida Statute 768,28.

Please feel free to contact me if you have any questions or need additional information.

Sincepely

Guy Hine Risk Manager

> HIEK MANAGEMENT 100 N. Andrews Avenue, Third Floor, Fort Laudendale, Florida 33301 Telephone:(954) 628-5177 FAX:(954) 828-5439



#### **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.

<u>NAME</u>	RELATION	ISHIPS
-		

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.

3

CAM # 18-0510 Exhibit 3 Page 463 of 476

#### LOCAL BUSINESS PREFERENCE

Section 2-199.2, Code of Ordinances of the City of Fort Lauderdale, (Ordinance No. C-12-04), provides for a local business preference.

In order to be considered for a local business preference, a bidder must include the Local Business Preference Certification Statement of this ITB, as applicable to the local business preference class claimed at the time of bid submittal:

Upon formal request of the City, based on the application of a Local Business Preference the Bidder shall within ten (10) calendar days submit the following documentation to the Local Business Preference Class claimed:

- A) Copy of City of Fort Lauderdale current year business tax receipt, **or** Broward County current year business tax receipt, **and**
- B) List of the names of all employees of the bidder and evidence of employees' residence within the geographic bounds of the City of Fort Lauderdale or Broward County, as the case may be, such as current Florida driver license, residential utility bill (water, electric, telephone, cable television), or other type of similar documentation acceptable to the City.

Failure to comply at time of bid submittal shall result in the bidder being found ineligible for the local business preference.

# THE COMPLETE LOCAL BUSINESS PREFERENCE ORDINANCE MAY BE FOUND ON THE CITY'S WEB SITE AT THE FOLLOWING LINK:

http://www.fortlauderdale.gov/purchasing/index.htm

**Definitions:** The term "Business" shall mean a person, firm, corporation or other business entity which is duly licensed and authorized to engage in a particular work in the State of Florida. Business shall be broken down into four (4) types of classes:

- Class A Business shall mean any Business that has established and agrees to maintain a permanent place of business located in a non-residential zone and staffed with full-time employees within the limits of the City and shall maintain a staffing level of the prime contractor for the proposed work of at least fifty percent (50%) who are residents of the City.
- 2. Class B Business shall mean any Business that has established and agrees to maintain a permanent place of business located in a non-residential zone and staffed with full-time employees within the limits of the City or shall maintain a staffing level of the prime contractor for the proposed work of at least fifty percent (50%) who are residents of the City.
- 3. Class C Business shall mean any Business that has established and agrees to maintain a permanent place of business located in a non-residential zone **and** staffed with full-time employees within the limits of Broward County.
- 4. Class D Business shall mean any Business that does not qualify as either a Class A, Class B, or Class C business.

#### LOCAL BUSINESS PREFERENCE CERTIFICATION STATEMENT

The Business identified below certifies that it qualifies for the local BUSINESS 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)		Lauderdal copy of th Business - employees	<b>s A</b> Business as defined e Ordinance No. C-12-04 he City of Fort Lauderda Fax Receipt <u>and</u> a complet and their addresses shall be r days of a formal request be	, Sec.2-199.2. A ale current year ete list of full-time be provided withir
(2)	Business Name  Business Name	is a <b>Class</b> Lauderdal copy of the full-time e	B Business as defined in e Ordinance No. C-12-04 Business Tax Receipt or mployees and their addithin 10 calendar days of a	n the City of For I, Sec.2-199.2. A a complete list o resses shall be
(3)	Business Name	Lauderdal copy of the	c C Business as defined in e Ordinance No. C-12-04 Broward County Business digital within 10 calendar days of	, Sec.2-199.2. A Tax Receipt shal
(4)	Business Name	defined in t	a <b>Conditional Class A</b> he City of Fort Lauderdale :.2-199.2. Written certificated within 10 calendar days of	Ordinance No. C tion of intent shal
(5)		defined in t	a <b>Conditional Class B</b> he City of Fort Lauderdale 2-199.2. Written certificated within 10 calendar days of	Ordinance No. C tion of intent shal
(6)	Business Name  Business Name	of Fort La	ed a <b>Class D</b> Business as uderdale Ordinance No. d does not qualify for Loon.	C-12-04, Sec.2
BIDDE	ER'S COMPANY:			
AUTH	ORIZED COMPANY PERSON:	NAME	SIGNATURE	DATE

## **CONSTRUCTION BID CERTIFICATION**

<u>Please Note:</u> 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/).

3007.1301 (VISIL	Tittp://www.dos.sta	itc.ii.u <i>si j</i> .					
Company: (Lega	al Registration)						
Address:							
City:		State:		Zip:			
Telephone No.	FA	X No.	Email:				
Does your firm	qualify for MBE or	WBE status: M	BE □ WBE □				
	state the name of t				artnership, state the	names of all par	tners. If a trade
Name		Title		Name		Title	
Name		 Title		 Name		 Title	
ADDENDUM AC	CKNOWLEDGEME	:NT - Bidder ack	nowledges that the	following adder	nda have been rece	eived and are inc	luded in the bid:
Addendum	Date	Addendum	Date	Addendum	Date	Addendum	Date
No.	Received	No.	Received	No.	Received	No.	Received
Additional page contained in the statement is cor	the space provided as may be attached be space provided be ntained in the below be variances, simply on.	if necessary. Nelow. The City of space, it is here	o variances will be does not, by virtue eby implied that yo	deemed to be of submitting a ur response is ir	part of the bid subi variance, necessa n full compliance wi	mitted unless sudirily accept any with this competitive	ch is listed and variances. If no ve solicitation. If
					5		
authorized to do and to sustain a unit prices indicand and has not col accuracy of all attempting to s exemplary dam advertisement, Dollars (\$500.0	atory affirms that he be business in the State of the expense incurated if awarded a cluded with any oth statements and assubmit a bid, that hages, expenses, obid conferences, sind). This limitation is competitive solici	ate of Florida. The red in doing the contract. The belier bidder or par nswers contain in no event shaper lost profits arte visits, evaluation shall not apply the contract of	ne below signatory e work set forth in some signatory has raties to this bid what ed in this bid. The all the City's liabil ising out of this cottons, oral presentations.	agrees to furnisistrict accordance tot divulged to, continued to the second accordance to the se	h all labor, tools, me with the bid plans discussed, or comparmore, the undersity also hereby agridirect, indirect, inciditation process, incorproceedings exce	aterial, equipmer and contract do ared this bid with igned guarantee ees, by virtue o dental, conseque cluding but not lied the amount o	nt and supplies, ocuments at the n other bidders, es the truth and f submitting or ential, special or mited to public f Five Hundred
Submitted by:							

Signature

Name (printed)

Date: Title

#### CONSTRUCTION BID CERTIFICATION

	ds below must be comploartment of state, in acc					orporation, you may b	e required to obtain a co	ertificate of
Company: (Legal Reg	istration)							
Address:								
City:			State:	Zip:				
Telephone No.	FAX No.	E	Email:					
Does your firm qualify	for MBE or WBE status	s: MBE 🔲 WBE 🗀	]					
If a corporation, state business under the tra	the name of the Presid ade name.	ent, Secretary and Re	esident Agent. If a part	nership, state the nar	nes of all partners. If a	trade name, state the	e names of the individua	als who do
Name		Title		Name		Title		
Name		Title		Name		Title		
Name		Title		Name		Name		
ADDENDUM ACKNOW	/LEDGEMENT - Bidder a	acknowledges that the	e following addenda ha	ave been received an	d are included in the b	id: Addendum No.	Date Received	]
in the space provided submitted unless suc contained in the below	ake exception or have vaid below all variances on the is listed and contains w space, it is hereby imply through BIDSYNC yo	ontained on other pa ed in the space provi plied that your respor	ges within your bid. Added below. The City dase is in full compliance	dditional pages may loes not, by virtue of with this competitive	be attached if necessions be attached if necessions because the submitting a variance	ary. No variances will , necessarily accept	l be deemed to be part any variances. If no sta	t of the bid atement is
below signatory agree and contract documer with any other bidder signatory also hereby exemplary damages, presentations, or awa	affirms that he has or will be to furnish all labor, to nots at the unit prices ind or parties to this bid w y agrees, by virtue of s expenses, or lost profits and proceedings exceed trained in this competitive	ols, material, equipm icated if awarded a contact that soever. Furthermoubmitting or attemption arising out of this contact the amount of Five H	ent and supplies, and to ontract. The below signore, the undersigned gong to submit a bid, that one title solicitation pro-	o sustain all the expe latory has not divulge uarantees the truth a it in no event shall th ocess, including but n	nse incurred in doing to d to, discussed, or con and accuracy of all sta e City's liability for bo ot limited to public adve	the work set forth in st inpared this bid with of tements and answers dder's direct, indirect, i ertisement, bid confer	rict accordance with the ther bidders, and has no contained in this bid. incidental, consequential ences, site visits, evalua	e bid plans ot colluded The below I, special or ations, oral
,		٦						
Name (printed)		_	Signature					

Date:

Date:

#### **BID/PROPOSAL CERTIFICATION**

<u>Please Note:</u> 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	on)		
Address:			
City:	State: Zip:		
Telephone No.	FAX No.	Email:	
Total Bid Discount (section	er receipt of Purchase Order (s 1.05 of General Conditions BE or WBE status (section 1	):	
ADDENDUM ACKNOWLED and are included in the prop	•	vledges that the following	addenda have been received
Addendum No. Date Issi	ued Addendum No.	Date Issued Ad	ddendum No. Date Issued
requirement in this competibelow or reference in the s Additional pages may be a response submitted unless virtue of submitting a varia space, it is hereby implied t	tive solicitation you must spectage provided below all variant tached if necessary. No excessuch is listed and contained note, necessarily accept any nat your response is in full cook N/A. If submitting your response is a specific pour response is a spec	ecify such exception or variances contained on other ceptions or variances will d in the space provided by variances. If no statement in the space with this compe	cification, scope of service, or ariance in the space provided pages within your response. be deemed to be part of the pelow. The City does not, by ent is contained in the below titive solicitation. If you do not hrough BIDSYNC you must

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 <b>Class A</b> 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 <u>and</u> 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 <b>Class B</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 <b>or</b> 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 <b>Class C</b> 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 <b>Conditional Class A</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.
(5)	Business Name	requests a <b>Conditional Class B</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 <b>Class D</b> Business as defined in the City of For Lauderdale Ordinance No. C-17-26, Sec.2-186 and does not qualify for Local Preference consideration.
BIDDER'S	COMPANY:	
AUTHORI COMPAN' PERSON:	( L	

CAM # 18-0510 Exhibit 3 Page 471 of 476

# 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.

<u>Contracts.</u> 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:

- 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	

# CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT

## MINORITY BUSINESS ENTERPRISE (MBE) - WOMEN BUSINESS ENTERPRISE (WBE)

#### PRIME CONTRACTOR IDENTIFICATION FORM

In order to assist us in identifying the status of those companies doing business with the City of Fort Lauderdale, this form <u>must be completed and returned</u> with your bid package.

Name of Firm:		
Address of Firm:		
Telephone Number:		
Name of Person Completing Form:		
Title:		
Signature:		
Date:		
City Project Number:		
City Project Description:		
Please check the item(s) which prop	erly identify the status of your firm:	
Our firm is not a MBE or WBE.		
<ul><li>Our firm is a MBE, as at least economically disadvantaged</li></ul>	51 percent is owned and operated individuals.	d by one or more socially and
☐ American Indian ☐ Asia	an ☐ Black ☐ Hispanic	
☐ Our firm is a WBE, as at least \$	51 percent is owned and operated	by one or more women.
☐ American Indian ☐ Asia	an 🗌 Black 🗎 Hispanic	

#### MBE/WBE CONTRACTOR INFORMATION

The City, in a continuing effort, is encouraging the increased participation of minority and womenowned businesses in Public Works Department related contracts. Along those lines, we are requiring that each firm provide documentation detailing their own programs for utilizing minority and women-owned businesses.

Submit this information as a part of this bid package and refer to the checklist, to ensure that all areas of concern are covered. The low responsive bidder may be contacted to schedule a meeting to discuss these objectives. It is our intention to proceed as quickly as possible with this project, so your cooperation in this matter is appreciated.

#### CONTRACTOR CHECKLIST

List Previous City of Fort Lauderdale Contracts
<u>5</u>
Number of Employees in your firmPercent ( %) WomenPercent ( %) Minorities
Job Classifications of Women and Minorities
Use of minority and/or women subcontractors on past projects.
Nature of the work subcontracted to minority and/or women-owned firms.
How are subcontractors notified of available opportunities with your firm?

	Anticipated amount to be subcontracted on this project.
	5
	6
	Anticipated amount to be subcontracted to minority and/or women-owned businesses on this
Ш	project.
	5
	6

# Question and Answers for Bid #12089-183 - Holiday Park War Memorial Auditorium Renovations P12128

#### **Overall Bid Questions**

There are no questions associated with this bid.