Event # 568-2

Name: Sunrise Middle School – Park Improvements Phase II

Description: The City of Fort Lauderdale, Florida (City) is seeking bids from qualified bidders, hereinafter referred to as the Contractor, to provide construction services for the City's Parks and Recreation Department, in accordance with the terms, conditions, and specifications contained in this Invitation to Bid (ITB).

This project is located at 1750 NE 14th Street in the City of Fort Lauderdale. The work includes, but is not limited to, furnishing and installing a new pavilion, constructing concrete curbing and foundations, installing an artificial turf field, and performing associated drainage and site electrical work. The Contractor is also responsible for implementing environmental and protective measures, including tree protection fencing and erosion control.

Drawing Plans: This Project consists of 55 Drawings sheets.

Licensing Requirements: Florida Certified General Contractor License or Florida Certified Building Contractor or any other State or County License(s), Certification(s), or Registration(s) deemed legally permissible by the City to conduct the nature of the work required in this solicitation.

Buyer: PASCUAL, YESENIA

Status: Pending Award

Event Type: IFB

Currency: USD

Sealed Bid: Yes

Respond To All Lines: Yes

Q & A Allowed: Yes

Number Of Amendments: 2

Display Bid Tabulation: Display When Event Awarded And Closed Or Canceled

Event Dates

Preview:

Q & A Open: 01/20/2026 04:01:00 PM

Open: 01/20/2026 04:00:00 PM

Q & A Close: 02/09/2026 05:00:00 PM

Close: 02/18/2026 02:00:00 PM

Dispute Close:

Questions

Question	Response Type	Attachment
Did you sign and attach all the Required Forms?	Yes No	Event 568- Required Forms.pdf
The attached Anti-Human Trafficking Affidavit will be requested by the city from the awarded Bidder.	Yes No	Event 568 - Anti-Human Trafficking Affidavit Sample.pdf

Event # 568-2: Sunrise Middle School – Park Improvements Phase II

Question	Response Type	Attachment
Licensing Requirements: Do you meet the licensing requirements of this solicitation? Please upload supporting documentation here.	Yes No	
Insurance Requirements: Do you meet the insurance requirements of this solicitation? Please upload supporting documentation here. Supporting documentation may include a prior insurance certificate or other evidence listing the insurance companies' name(s) for all coverage required, and the dollar amounts of the coverage - confirming/demonstrating your firm's ability to comply with the insurance requirements of this solicitation.	Yes No	
Have you provided the required minimum of three (3) references, including contact names and email addresses?	Yes No	Event 568- Reference Form.pdf

Attachments

Name	Description	Attachment
Event 568- Plan and Drawings Phase II.pdf		Event 568- Plan and Drawings Phase II.pdf
Event 568-Technical Specifications - VOL 1.pdf		Event 568-Technical Specifications - VOL 1.pdf
Event 568-Technical Specifications - VOL 2.pdf		Event 568-Technical Specifications - VOL 2.pdf
Event 568- Sunrise Middle-Solicitation.pdf		Event 568- Sunrise Middle-Solicitation.pdf
Addendum #1.pdf		Addendum #1.pdf
Addendum #2..pdf	Addendum #2 including Geotechnical Report and Updated Plan and Drawing Sheets	Addendum #2..pdf

Contacts

Name	Email Address
YESENIA PASCUAL	ypascual@fortlauderdale.gov

Commodity Codes

Commodity Code	Description
155-40	Gazebos, Kiosks (Including Informational Type), and Pavilion
906-38	General Construction - Architectural
906-72	Recreation Facilities (Parks, Marinas, etc.) - Architectural
909-16	Athletic Facility Construction
909-27	Building Construction, Educational
909-30	Building Construction (Not Otherwise Classified)
912	CONSTRUCTION SERVICES, GENERAL (INCL. MAINTENANCE AND REPAIR
914	CONSTRUCTION SERVICES, TRADE (NEW CONSTRUCTION)
925	ENGINEERING SERVICES, PROFESSIONAL
988-14	Erosion Control Services
988-54	Lighting Services for Parks, Athletic Fields, Parking Lots,
988-63	Park Area Construction/Renovation

Line Details

Line 1: MOBILIZATION

Description: All environmental compliance matters except for erosion control system shall be included in Mobilization. Mobilization includes, but is not limited to, bonds, videos, insurance, site cleanup, sanitary facilities, labor associated with permit acquisition, contractors staging area, project signs, project coordination, and demobilization.

Item: MOBILIZATION All environmental compliance matters except for erosion cont

Commodity Code: 906-38 General Construction - Architectural

Manufacturer Code: MFC **Division:** DIV

Quantity: 2.0000 **Unit of Measure:** LS

Requested Delivery Date: 04/01/2026

Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 2: Pavilion 30'x44' (including footings and installation)

Description: Measurement and payment for furnishing and installing the pavilion including the subbase and foundation will be based upon City approval of the installing in accordance with the requirements of the Contract Documents.

Item: PAVILION 30'X44' (INCLUDING FOOT Measurement and payment for furnishing and installing the pa
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 1.0000
Unit of Measure: LS
Requested Delivery Date: 04/01/2026
Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 3: PAVILION SLAB (6" CONCRETE)

Description: Measurement and payment for furnishing and installing the pavilion slab will be based upon the actual yardage of concrete poured in accordance with the requirements of the Contract Documents.

Item: PAVILION SLAB (6" CONCRETE) Measurement and payment for furnishing and installing the pa
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 37.0000
Unit of Measure: SY
Requested Delivery Date: 04/01/2026

Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 4: LIGHTING TYPE S1

Description: Measurement and payment for furnishing and installing the light fixtures will be based upon the actual quantity installed in accordance with the requirements of the Contract Documents.

Item: LIGHTING TYPE S1 Measurement and payment for furnishing and installing the li
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 4.0000
Unit of Measure: EA
Requested Delivery Date: 04/01/2026
Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 5: LIGHTING TYPE S2

Description: Measurement and payment for furnishing and installing the light fixtures will be based upon the actual quantity installed in accordance with the requirements of the Contract Documents.

Item: LIGHTING TYPE S2 Measurement and payment for furnishing and installing the li
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 1.0000
Unit of Measure: EA
Requested Delivery Date: 04/01/2026

Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 6: Electrical - Receptacles (W/Boxes, tubbing, Wire,etc)

Description: Measurement and payment for furnishing and installing the electrical receptacles will be based upon the actual quantity installed in accordance with the requirements of the Contract Documents.

Item: ELECTRICAL - RECEPTACLES (W/BOXE Measurement and payment for furnishing and installing the el
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 4.0000
Unit of Measure: EA
Requested Delivery Date: 04/01/2026
Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 7: DISCONNECT SWITCH FUSED 30AMP

Description: Measurement and payment for furnishing and installing the electrical disconnect will be based upon the actual quantity installed in accordance with the requirements of the Contract Documents.

Item: DISCONNECT SWITCH FUSED 30AMP Measurement and payment for furnishing and installing the el
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 1.0000
Unit of Measure: EA
Requested Delivery Date: 04/01/2026

Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 8: PAVILION GROUNDING

Description: Measurement and payment for furnishing and installing the grounding system will be based upon the actual quantity installed in accordance with the requirements of the Contract Documents.

Item: PAVILION GROUNDING Measurement and payment for furnishing and installing the gr
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 1.0000
Unit of Measure: LS
Requested Delivery Date: 04/01/2026
Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 9: 1" CONDUIT

Description: Measurement and payment for furnishing and installing the 1" conduit will be based upon the actual quantity installed in accordance with the requirements of the Contract Documents.

Item: 1" CONDUIT Measurement and payment for furnishing and installing the 1"
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 39.0000
Unit of Measure: LF
Requested Delivery Date: 04/01/2026

Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 10: #8 GROUND WIRE

Description: Measurement and payment for furnishing and installing the #8 ground wire will be based upon the actual quantity installed in accordance with the requirements of the Contract Documents.

Item: #8 GROUND WIRE Measurement and payment for furnishing and installing the #8
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 406.0000
Unit of Measure: LF
Requested Delivery Date: 04/01/2026
Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 11: #8 WIRE

Description: Measurement and payment for furnishing and installing the #8 wire will be based upon the actual quantity installed in accordance with the requirements of the Contract Documents.

Item: #8 WIRE Measurement and payment for furnishing and installing the #8
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 812.0000
Unit of Measure: LF
Requested Delivery Date: 04/01/2026

Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 12: PULL BOX

Description: Measurement and payment for furnishing and installing the pull boxes will be based upon the actual quantity installed in accordance with the requirements of the Contract Documents.

Item: PULL BOX Measurement and payment for furnishing and installing the pu
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 3.0000
Unit of Measure: EA
Requested Delivery Date: 04/01/2026
Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 13: CIRCUIT BREAKER

Description: Measurement and payment for furnishing and installing the circuit breaker will be based upon the actual quantity installed in accordance with the requirements of the Contract Documents.

Item: CIRCUIT BREAKER Measurement and payment for furnishing and installing the ci
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 1.0000
Unit of Measure: EA
Requested Delivery Date: 04/01/2026

Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 14: Installation of Turf Field - Field, base, drainage, and curb

Description: Measurement and payment for furnishing and installing the turf field, subbase, drainage and concrete curb will be based upon City approval of the installation in accordance with the requirements of the Contract Documents.

Item: INSTALLATION OF TURF FIELD - FIE Measurement and payment for furnishing and installing the tu
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 1.0000
Unit of Measure: LS
Requested Delivery Date: 04/01/2026
Require Response: Yes
Price Breaks Allowed: No
Allow Alternate Responses: No
Add On Charges Allowed: No

Line 15: Tree Protection and Erosion Control Allowance

Description: Measurement for payment for the tree protection fencing and erosion control will be based upon the actual cost of the time and materials required by the CONTRACTOR to satisfy the various agencies having jurisdiction for construction of the project, all in accordance with the Contract Documents.

Item: TREE PROTECTION AND EROSION CONT Measurement for payment for the tree protection fencing and
Commodity Code: 906-38 General Construction - Architectural
Manufacturer Code: MFC
Division: DIV
Quantity: 1.0000
Unit of Measure: LS
Requested Delivery Date: 04/01/2026

Event # 568-2: Sunrise Middle School – Park Improvements Phase II

Require Response: Yes

Price Breaks Allowed: No

Allow Alternate Responses: No

Add On Charges Allowed: No

CITY OF FORT LAUDERDALE

CONTRACT AND SPECIFICATIONS PACKAGE

BID/EVENT NO. 568

PROJECT NO. P12777

SUNRISE MIDDLE SCHOOL- PARK IMPROVEMENTS PHASE II

YESENIA PASCUAL
SR. PROCUREMENT SPECIALIST
Telephone: (954) 828-5257 E-mail: ypascual@fortlauderdale.gov

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

Affidavit of Compliance with Foreign Entity Laws
CITB Questionnaire Sheet
Construction Bid Certification Page
Contract Payment Method
Disadvantaged Business Enterprise Preference Certification
Drug Free Workplace Certification
E-Verify Statement
Local Business Preference Certification
Non-Collusion Statement
Non-Discrimination Certification Form
Specific References Form
Trench Safety Form

INVITATION TO BID

Sealed bids will be received electronically until **2:00 p.m.**, local time, on **February 18, 2026,** and opened online immediately thereafter for **BID/EVENT NO. 568, PROJECT NO. P12777, Sunrise Middle School – Park Improvements Phase II.**

Please be advised that effective immediately, and until further notice, all Invitation to Bids, Request for Proposals, Request for Qualifications, and other solicitations led by the City of Fort Lauderdale will be opened electronically via the City's on-line strategic sourcing platform at the date and time indicated on the solicitation. All openings will be held on the City's on-line strategic sourcing platform.

In the event of any conflict or discrepancy between bid price(s) submitted by bidder electronically into the City's online strategic sourcing platform Unit Price field(s), any other forms or attachments (whether part of the City's solicitation documents or documents created and uploaded by the bidder, or another section/field of the System, the online unit price(s) **inputted** electronically into the System by the bidder shall govern.

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

Anyone requesting assistance or having further inquiry in this matter must contact the Procurement Specialist indicated in the solicitation, via the Question and Answer (Q&A) forum on the City's online strategic sourcing platform before the Last Day for Questions indicated in the Solicitation.

This project is located at 1750 NE 14th Street in the City of Fort Lauderdale. The work includes, but is not limited to, furnishing and installing a new pavilion, constructing concrete curbing and foundations, installing an artificial turf field, and performing associated drainage and site electrical work. The Contractor is also responsible for implementing environmental and protective measures, including tree protection fencing and erosion control.

THE FOLLOWING IS APPLICABLE TO THIS SOLICITATION IF CHECKED:

☐ **LUMP SUM BID** - City shall pay awarded bidder the Contract Price for the performance of work described in this Invitation for Bid. Payment shall be at the lump sum price stated in this Invitation to Bid and/or resultant contract. This price shall be full compensation for all costs, including overhead and profit, associated with completion of all work in full conformity with the requirements as stated or shown, or both, in the contract documents. The cost of any item of work not covered in this solicitation shall still be provided and the cost borne by the contractor. NO CHANGE ORDERS WILL BE ALLOWED UNLESS IT IS OWNER-DRIVEN AND INITIATED BY THE CITY.

Drawing Plans: This Project consists of 55 Drawing sheets. Drawing plans may be obtained **free of charge** at the City's online strategic sourcing platform.

Licensing Requirements: Possession of a State of Florida Certified General Contractor License,

OR

State of Florida Certified Building Contractor License,

OR

Any other State or County License(s), Certification(s) or Registration(s) deemed legally permissible by the City to conduct the nature of the work required in this solicitation.

Any sub-contractors employed by the Proposer shall be licensed and insured in accordance with this solicitation. Additionally, it is the Proposer's responsibility for ensuring that any sub-contractors' work meets the requirements of this solicitation at all times.

NOTE: Payment on this contract will be made by Visa or MasterCard

Pre-Bid Conference/Site visit: There will not be a pre-bid conference and/or site visit for this Invitation to Bid.

Bid Security: A certified check, cashier's check, bank officer's check or bid bond for **TEN** **percent (10%)** of the bid amount, made payable to the City of Fort Lauderdale, Florida, shall accompany each offer.

Bid Bonds:

Bidders can submit bid bonds **three** different ways.

1) Bidders may **upload** their original executed bid bond on the City's online strategic sourcing platform to accompany their electronic bids and deliver the original, signed and sealed hard copy to the Finance Department, Procurement Services Division, 101 NE 3rd Avenue, Suite 1650, Fort Lauderdale, Florida 33301-1016, **within five (5) business days** after bid opening, with the company name, bid number and title clearly indicated on the envelope.

2) Bidders can **hand deliver** their original, signed and sealed bid bond in a sealed envelope to the Finance Department, Procurement Services Division, 101 NE 3rd Avenue, Suite 1650, Fort Lauderdale, Florida 33301-1016, **before time of bid opening**, with the company name, bid number and title clearly indicated on the envelope.

3) Bidders can **mail** their original, signed and sealed bid bond to the Finance Department, Procurement Services Division, 101 NE 3rd Avenue, Suite 1650, Fort Lauderdale, Florida 33301-1016, **before time of bid opening**, with the company name, bid number and title clearly indicated on the envelope. NOTE: Bond must be received in Procurement and time stamped before bid opening.

It will be the sole responsibility of the bidder to ensure that its 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 THE CITY'S ONLINE STRATEGIC SOURCING PLATFORM.**

Certified Checks, Cashier's Checks and Bank Drafts:
These **CANNOT** be submitted via the City's online strategic souring platform, 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, 101 NE 3rd Avenue, Suite 1650, Fort Lauderdale, Florida 33301-1016, with the bid number and title clearly indicated on the envelope.

It is the bidder's sole responsibility to ensure that its bid bond or other bid security is received by the Procurement Services Division before the 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 Q&A platform provided on the City's online strategic sourcing platform. 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. **Bidders 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 bidder 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 – https://www.fortlauderdale.gov/government/departments-a-h/finance/procurement-services
For general inquiries, please call (954) 828-5933.

-END OF SECTION-

INSTRUCTIONS TO BIDDERS

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

QUALIFICATIONS OF BIDDERS – No bid 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.

CONCERNING SUB-CONTRACTORS, SUPPLIERS, AND OTHERS - The amount of work that is sublet by the Bidder shall be limited by the condition that the Bidder shall, with his own organization, perform at least forty percent (40%) of the total dollar amount of the Work to be performed under the Agreement.

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

INCONSISTENCIES – Any inconsistency between different provisions of the plans, specifications, bid or contract, or any point requiring explanation must be inquired by the bidder, in writing, at least ten (10) days prior to the time set for opening bids. After bids 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 the City's online strategic sourcing platform. 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 addenda have been issued in the City's online strategic sourcing platform.** Failure of any bidder to receive any such addenda or interpretation shall not relieve any bidder from any obligation under its bid as submitted. All addenda so issued shall become a part of the contract document. **Bidder** shall verify in the City's online strategic sourcing platform that it has all addenda before submitting a bid.

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

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

FORMS OF BIDS - Each bid and its accompanying statements MUST BE SUBMITTED ELECTRONICALLY, IN GOOD ORDER WITH ALL BLANKS COMPLETED, and must show the name of the bidder and a statement as to its contents. In the event of any conflict or discrepancy between bid price(s) submitted by bidder electronically into the City's online strategic sourcing platform Unit Price

field(s), any other forms or attachments (whether part of the City's solicitation documents or documents created and uploaded by the bidder, or another section/field of the System, the online unit price(s) **inputted** electronically into the System by the bidder shall govern.

The bid 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 bid. No bid will be accepted, for any reason whatsoever, which is not submitted to the City as stated above, within the specified time.

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

BID BOND - A certified check, cashier's check or bank officer's check made payable to the City of Fort Lauderdale, or a bid bond in favor of the City of Fort Lauderdale shall accompany each bid as evidence of the good faith and responsibility of the bidder. The amount of the check or bond shall be retained by the City as liquidated damages in the event the bidder whose bid is accepted refuses to or fails to enter into a contract for the execution of the work solicited in this Invitation to Bid.

The bid bond or check shall be a guarantee that the successful bidder will promptly execute a contract satisfactory to the City for the work solicited in this Invitation to Bid and furnish good and sufficient bonds.

Following the full execution of a contract for the work solicited in this Invitation to Bid and the successful bidder's provision of good and sufficient bonds, in the event bid security was provided by check, the amount of the bid security accompanying the successful bidder's bid will be refunded to the successful bidder, or in the event bid security was provided by a bond, the bond accompanying the successful bidder's bid will be returned to the successful bidder. In the event the successful bidder fails to enter into, execute, and deliver a contract and furnish the required bonds within ten (10) days after the City provides notice to the successful bidder to deliver the executed contract and the required bonds, the bid bond shall immediately be payable to the City of Fort Lauderdale, or in the case of a check, the City shall retain the amount of the check, as liquidated damages. The City's retention of such amount shall not be construed as a penalty or forfeiture.

FILLING IN BIDS - All prices must be electronically submitted in the bid pages, and bids must fully cover all items for which prices are asked and no other. 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 bid. In the event of any conflict or discrepancy between bid price(s) submitted by bidder electronically into the City's online strategic sourcing platform Unit Price field(s), any other forms or attachments (whether part of the City's solicitation documents or documents created and uploaded by the bidder, or another section/field of the System, the online unit price(s) **inputted** electronically into the System by the bidder shall govern.

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

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

ADDITIONAL ITEMS OR SERVICES: The City may require additional items or services of a similar nature, but not specifically listed in the contract. The Contractor agrees to provide such items or services and shall provide the City prices on such additional items or services. If the price(s) offered are not acceptable to the City, and the situation cannot be resolved to the satisfaction of the City, the City reserves the right to procure those items or services from other vendors, or to cancel the contract upon giving the Contractor thirty (30) days written notice.

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

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

TERMINATION FOR UNAPPROPRIATED FUNDS**:** The obligation of the City for payment to a Contractor is limited to the availability of funds appropriated in a current fiscal period, and continuation of the contract into a subsequent fiscal period is subject to appropriation of funds, unless otherwise authorized by law.

CAUSES FOR REJECTION - No bid will be canvassed, considered or accepted which, in the opinion of the City 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 bid informal.

REJECTION OF BIDS - The City reserves the right to reject any bid if the evidence submitted by the bidder, or if the investigation of such bidder, fails to satisfy the City that such bidder is properly qualified to carry out the obligations and to complete the work contemplated. Any or all bids will be rejected, if there is reason to believe that collusion exists among bidders. A bid 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 bids and to waive such technical errors as may be deemed best for the interests of the City.

BID PROTEST PROCEDURE: Any 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 Department – Procurement Director, 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: Notices of Intent to Award/Reject | City of Fort Lauderdale, FL

The complete protest ordinance may be found on the City's website at the following link:
ARTICLE V. - FINANCE | Code of Ordinances | Fort Lauderdale, FL | Municode Library

WITHDRAWALS - Any bidder may, without prejudice to himself, withdraw its bid at any time prior to the expiration of the time during which bids 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 bid. After expiration of the period for receiving bids, no bids can be withdrawn, modified, or explained.

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

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

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

DRAWING PLANS - Drawing plans may be obtained **free of charge** from the City's on-line strategic sourcing platform.

SURETY BOND – The Contractor shall execute and record in the public records of Broward County, Florida, a payment and performance bond in an amount at least equal to the Contract Price with a surety insurer authorized to do business in the State of Florida as surety, ("Bond"), in accordance with Section 255.05, Florida Statutes (2026), 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 (2026), 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 hold harmless the City of Fort Lauderdale to the extent of any and all payments in connection with carrying out of the contract, which the City may be required to make under the law.

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

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

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

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

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

PERIODIC ESTIMATE FOR PARTIAL PAYMENT - After the Contractor has submitted a periodic estimate for partial payment, approved and certified by the Public Works Department, the City shall make payment in the manner provided in the Contract Documents and in accordance with Florida's Prompt Payment Act, Section 218, Florida Statutes (2026).

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.

LOCAL BUSINESS PREFERENCE **-** Section 2-186, Code of Ordinances of the City of Fort Lauderdale, provides for a local business preference. In order to be considered for a local business preference, a proposer 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 Proposer 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 proposer 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 Proposer being found ineligible for the local business preference.

Definitions:

a. The term "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, staffed with full-time employees within the limits of the city, and shall maintain a staffing level for the proposed work of at least fifty percent (50%) who are residents of the City of Fort Lauderdale.

b. The term "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, staffed with full-time employees within the limits of the city, or shall maintain a staffing level for the proposed work of at least fifty percent (50%) who are residents of the City of Fort Lauderdale.

c. The term "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, staffed with full-time employees within the limits of Broward County.

c. The term "Class D business" shall mean any business that does not qualify as a Class A, Class B, or Class C business.

The complete local business preference ordinance may be found on the City's web site at the following link:
https://library.municode.com/fl/fort_lauderdale/codes/code_of_ordinances?nodeId=COOR_CH2AD_ARTVFI_DIV2PR_S2-186LOBUPR

DISADVANTAGED BUSINESS ENTERPRISE PREFERENCE - Section 2-185, Code of Ordinances of the City of Fort Lauderdale, provides for a disadvantaged business preference. In order to be considered for a disadvantaged business preference, a proposer must include a certification from a government agency, as applicable to the disadvantaged business preference class claimed at the time of Bid submittal:

Upon formal request of the City, based on the application of a Disadvantaged Business Preference the Proposer shall within ten (10) calendar days submit the following documentation to the Disadvantaged Business Enterprise Preference Class claimed:

a. Copy of City of Fort Lauderdale current year business tax receipt, or the Tri-County (Broward, Dade, West Palm Beach) current year business tax receipt, or proof of active Sunbiz status and

b. List of the names of all employees of the proposer and evidence of employees' residence within the geographic bounds of the City of Fort Lauderdale or the Tri-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 Proposer being found ineligible for the Disadvantaged Business Enterprise Preference business preference.

The complete Disadvantaged Business Preference ordinance may be found on the City's website at the following link: https://www.fortlauderdale.gov/home/showpublisheddocument?id=56883

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

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-11-42 & Resolution No. 07-101, Lobbying Activities. Copies of Ordinance No., C-11-42, and Resolution No. 07-101, may be obtained from the City Clerk's Office at 1 East Broward Boulevard, Suite 444, Fort Lauderdale, Florida 33301.

The Ordinance may also be viewed on the City's website at https://www.fortlauderdale.gov/home/showdocument?id=6036.

-END OF SECTION-

GENERAL CONDITIONS

Unless otherwise modified in the Project's 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 bid 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.

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

"Contractor" – shall mean the successful Bidder who has been employed by the City to perform the construction and related 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. In the case of any inconsistency in or between any parts of this Contract, the Project Manager shall determine which shall prevail.

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

"Engineer" - shall include the terms "professional engineer" and "licensed engineer" and means a person who is licensed to engage in the practice of engineering under Florida Statute, Chapter 471. An Engineer may be a City employee or a consultant hired by the City.

"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 a professional designated by the City to manage the Project under the supervision and direction of the Public Works Director or designee.

"Public Works Director" – shall mean the Public Works Director of the City of Fort Lauderdale.

"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 Project Manager.

"Sub-contractor" - 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, field conditions, 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.

Any failure by the Contractor to acquaint itself with all the Site conditions shall not relieve Contractor from responsibility for properly estimating the difficulty or cost thereof under the Contract Documents.

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 Contractor 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. The following requirements shall be met in order for the substitution to be considered:

1. Requests for substitution shall be accompanied by such technical data, as the party making the request desires to submit. The Project Manager will consider reports from

reputable independent testing laboratories, verified experience records from previous users and other written information valid in the circumstances; and

2. 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

3. 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

4. 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.

If a proposed substitution is approved by the Project Manager, 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 – CONSTRUCTION RESOURCES – Contractor shall provide all labor and equipment necessary to complete the installation within a timely manner. Contractor shall provide details as to manpower and equipment to be dedicated to the project in its Work Plan. Contractor is responsible for making arrangements, obtaining and purchasing construction water services if required to complete the work.

GC - 05 - CONTROL OF THE WORK - The Project Manager shall have full control and direction of the Work in all respects. The Project Manager 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 Project Manager may desire respecting the quality of the Work and materials and the manner of conducting the Work. Should the Contractor be 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 Project Manager 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 Project Manager, 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 Project Manager, as will ensure 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.

GC - 06 - SUB-CONTRACTOR - The Contractor shall not sublet, in whole or any part of the Work without the written consent and approval of the Project Manager. Within ten (10) days after official notification of starting date, the Contractor must submit in writing, to the Project Manager, a list of all Sub-contractors. No Work shall be done by any sub-contractor until such Sub-contractor has been officially approved by the Project Manager. A sub-contractor not appearing on the original list will not be approved without written request submitted to the Project Manager and approved by the Public Works Director. In all cases, the Contractor shall give his personal attention to the Work of the Sub-contractors and the Sub-contractor is liable to be discharged by the Contractor, at the direction of the Project Manager, for neglect of duty, incompetence or misconduct.

Acceptance of any sub-contractor, other person, or organization by the Project Manager shall not constitute a waiver of any right of Project Manager to reject defective Work or Work not in conformance with the Contract Documents.

Contractor shall be fully responsible for all acts and omissions of its Sub-contractors 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 sub-contractor 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 sub-contractor or other person, or organization, except as may otherwise be required by law.

GC - 07 - QUANTITIES - Contractor recognizes and agrees that the quantities shown on plans and Bid/Price Schedule are estimates only and may vary during actual construction. No change shall 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 Project Manager 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 Public Works Director 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 - 08 - 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 - 09 - PERMITS AND PROTECTION OF PUBLIC – Permits on file with the City and/or those permits to be obtained by the Contractor, 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.

Contractor shall secure all permits and licenses required for completing the Project. Contractor will obtain the necessary State, County, and City construction/work permits if required.

The Contractor shall comply with all applicable Codes, Standards, Specifications, etc. related to all aspects of the Project.

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 to all affected parties prior to proceeding with the Work.

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.

GC - 10 - DISEASE REGULATIONS - The Contractor shall enforce all sanitary regulations and take all precautions against infectious diseases as the Project Manager 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 - 11 - CONTRACTOR TO CHECK PLANS, SPECIFICATIONS, AND DATA - The Contractor shall verify all dimensions, quantities, and details shown on the plans, supplementary drawings, schedules, and shall notify the Project Manager 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 therefrom nor from rectifying such condition at its own expense.

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

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

GC - 14 - RESTROOM FACILITIES - Contractor shall provide portable toilet facilities for employee's use at a location within the Work site to be determined by the City.

GC - 15 - PROGRESS MEETINGS - Weekly Status meetings will be conducted with representatives from the City and the Contractor. Contractor shall budget time to participate in such meetings. A well-run Project should result in short meetings.

GC - 16 - ISSUE RESOLUTION - Should Contractor become engaged in a dispute with a resident or a City employee, the Contractor shall report the situation to the Project Manager immediately. It shall be mandatory that the City participate in any dispute resolution. Failure of Contractor personnel to notify the City shall obligate Contractor to replace the offending employee immediately if requested by the City.

GC - 17 - CITY SECURITY-CONTRACTOR AND SUBCONTRACTOR EMPLOYEE INFORMATION - Prior to commencing work, Contractor shall provide to the City a list of all personnel and sub-contractors on site. The list will include the name, address, birth date and driver's license number for all personnel. All personnel and subcontractors on site will have on their person a company

photo ID during all stages of the construction. Contractor shall provide standard required personal information per current City procedures.

GC - 18 - POST-CONSTRUCTION SURVEY - The Contractor shall provide as-built survey, sealed and signed by a registered surveyor in the State of Florida, as a condition of final payment.

GC – 19 - KEY PERSONNEL - Contractor shall provide as part of the Work Plan, resumes for all key project personnel providing supervision and project management functions. Resumes shall include work history and years of experience performing this type of work.

GC - 20 - EXISTING UTILITY SERVICE - All existing utility service shall be maintained with a minimum of interruption at the expense of the Contractor.

GC - 21 - 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 - 22 - 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 bodily injury and property damage insurance in amounts satisfactory to the Florida East Coast Company. This insurance requirement shall be verified by the contractor with the Florida East Coast Company prior to commencing work, and maintained during the life of the Contract.

GC - 23 - 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 Project Manager 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 - 24 - 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 - 25 - 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 the cost of other parts of the Work.

Should the Contractor fail to abate a dust nuisance the Project Manager may stop the Work until the issue is resolved to the City's satisfaction.

GC - 26 - SITE CLEANUP AND RESTORATION – The Contractor shall remove all debris and unused or discarded materials from the work site daily. Contractor shall clean the work site to remove all directional drilling "Driller's Mud" materials. No "Driller's Mud" residue shall be allowed to remain in the soil or on the surface of the land or vegetation. All debris and drilling materials must be disposed of offsite at an approved location.

The Contractor shall promptly restore all areas disturbed that are outside the Project limits in equal or better condition at no additional cost to the City.

GC - 27 - COURTEOUS BEHAVIOR AND RESPECT FOR RESIDENTS AND PROPERTY – The Contractor and its employees, associates and sub-contractors shall maintain courteous behavior at all times and not engage in yelling, loud music, or other such activities. Contractor's employees shall not leave trash or other discarded items at the Work Site, especially on any private property. In the event complaints arise, Contractor shall immediately remove such offending employees from the project if requested to do so by the Project Manager. Contractor's employees shall not trespass on any private property unless necessary to complete the work but with prior permission from the owner.

Contractor shall notify and obtain permission from the residents 24 hours in advance when planning to work within the resident's property. In addition, Contractor shall notify the resident prior to entering their property to perform work or inspect/investigate the work site. Contractor shall not block residents' driveways unnecessarily. Contractor shall not park equipment on landscaped areas when the vehicle is not needed for the current construction activities. Contractor shall be responsible for repair and/or replacement of all damaged landscaping within 48 hours including repairing vehicle wheel impressions, irrigation systems, lighting systems, structures, or any other items of resident's property. Contractor shall not destroy, damage, remove, or otherwise negatively impact any landscaping within or outside the right-of-way without prior approval from the Project Manager.

GC - 28 - PLACING BARRICADES AND WARNING LIGHTS - The Contractor shall furnish and place, at Contractor's 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 Project Manager 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 - 29 - TRAFFIC CONTROL - The Contractor shall coordinate all Work and obtain, through the City's Transportation and Mobility Department, Broward County, Florida Department of

Transportation, as applicable, any permits required to detour traffic or close any street before starting to work in the road.

All traffic control devices, flashing lights, signs and barricades shall be maintained in working condition at all times and conform to Manual of Uniform Traffic Control Devices (MUTCD), latest edition.

GC - 30 - COORDINATION - The Contractor shall notify all utilities, transportation department, etc., in writing, with a copy to the Project Manager before construction is started and shall coordinate its 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 its Work and dispose of its materials so as to not interfere with the operation of other contractors engaged upon adjacent work, and to join its Work to that of others in a proper manner, and to perform its Work in the proper sequence in relation to that of other contractors as may be directed by the Project Manager.

Each Contractor shall be responsible for any damage done by it or its agents to the work performed by another contractor.

GC - 31 - 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 - 32 - SCRUTINIZED COMPANIES OR OTHER ENTITIES - *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 Iran Terrorism Sectors List, created pursuant to Section 215.473, Florida Statutes (2026), as may be amended or revised, and that it does not have business operations in Cuba or Syria, as provided in Section 287.135, Florida Statutes (2026), as may be amended or revised.

The Contractor also certifies that it is not participating in a boycott of Israel, as provided in Section 287.135, Florida Statutes (2026).

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 (2026), as may be amended or revised, or been placed on the Scrutinized Companies with Activities in Sudan List, or been placed on a list created pursuant to Section 215.473, Florida Statutes (2026), as may be amended or revised, or been placed on the Scrutinized Companies with Activities in Sudan List, or been placed on a list created pursuant to Section 215.473, Florida Statutes (2026), as may be amended or revised, relating to scrutinized active business operations in Iran, or been placed on the Scrutinized Companies or Other Entities that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2026), as may be amended or revised, 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 (2026), as may be amended or revised.

In addition, if the Contractor is found to have submitted a false certification as provided under subsection (5) of Section 287.135, Florida Statutes (2026), as may be amended or revised, the

Contractor may be subject to such penalties as provided in Section 287.135, Florida Statutes (2026), as may be amended or revised.

GC - 33 - 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 - 34 - 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 Bidder's response to the Solicitation purporting to require confidentiality of any portion of the Bidder'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 Bidder submits any documents or other information to the City which the Bidder claims is Trade Secret information and exempt from Florida Statutes Chapter 119.07 ("Public Records Laws"), the Bidder shall clearly designate that it is a Trade Secret and that it is asserting that the document or information is exempt. The Bidder 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 Bidder's response to the Solicitation constitutes a Trade Secret. The City's determination of whether an exemption applies shall be final, and the bidder 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. In addition, the bidder agrees to defend, indemnify, and hold harmless the City and the City's officers, employees, and agents, against any loss or damages incurred by any person or entity as a result of the City's treatment of records as exempt from disclosure or confidential. Bids purporting to be subject to copyright protection in full or in part will be rejected. The bidder authorizes the City to publish, copy, and reproduce any and all documents submitted to the City bearing copyright symbols or otherwise purporting to be subject to copyright protection.

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 (2026), TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

Telephone Number: (954) 828-5002

Mailing Address: **City Clerk's Office**
1 East Broward Boulevard, Suite 444
Fort Lauderdale, FL 33301

E-mail: **prrcontract@fortlauderdale.gov**

Contractor shall:

1. Keep and maintain public records 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 (2026), 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 Agreement if the Contractor does not transfer the records to the City.

4. Upon completion of the Agreement, 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 Agreement, 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 Agreement, 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.

GC – 35 - ANTI-HUMAN TRAFFICKING, KIDNAPPING, CUSTODY AND RELATED OFFENSES - Bidder, proposer, quoter, or any other respondent to any City solicitation/notice or serving as a City consultant, contractor, vendor or otherwise entering into any contract (including, without limitation, contract renewal, extension, amendment as applicable) with the City affirms and stipulates that it is not in violation of Section 787.06(13) of the 2026 Florida Statutes entitled "Kidnapping; Custody Offenses; Human Trafficking and Related Offenses." The entity (which includes any business entity however formed/ incorporated) intending to provide goods or services by submitting a response to a city solicitation further affirms to the City as a governmental entity defined in Section 287.138(1) of the 2026 Florida Statutes that it does not use coercion for labor or services as defined in Section 787.06 of the 2026 Florida Statutes.

GC- 36 E-Verify

In accordance with Section 448.095, Florida Statutes (2026), as may be amended or revised, the Contractor and its subcontractors shall register with and use the E-Verify system to electronically verify the employment eligibility of newly hired employees.

1. The Contractor shall require each of its subcontractors, if any, to provide the Contractor with an affidavit stating that the subcontractor does not employ, contract with, or subcontract with an unauthorized alien. The Contractor shall maintain a copy of the subcontractor's affidavit for the duration of this Agreement and in accordance with the public records requirements of this Agreement.

2. The City, the Contractor, or any subcontractor who has a good faith belief that a person or entity with which it is contracting has knowingly violated Subsection 448.09(1), Florida Statutes (2026), as may be amended or revised, shall terminate the contract with the person or entity.

3. The City, upon good faith belief that a subcontractor knowingly violated the provisions of Subsection 448.095(5), Florida Statutes (2026), as may be amended or revised, but that the Contractor otherwise complied with Subsection 448.095(5), Florida Statutes (2026), as may be amended or revised, shall promptly notify Contractor and order the Contractor to immediately terminate the contract with the subcontractor, and the Contractor shall comply with such order.

4. A contract terminated under Subparagraph 448.095(5)(c)1. or 2., Florida Statutes (2026), as may be amended or revised, is not a breach of contract and may not be considered as such. If the City terminates this contract under Paragraph 448.095(5)(c), Florida Statutes (2026), as may be amended or revised, the Contractor may not be awarded a public contract for at least one year after the date on which the contract was terminated. The Contractor is liable for any additional costs incurred by the City as a result of termination of this Agreement.

5. Contractor shall include in each of its subcontracts, if any, the requirements set forth in this Section, including this subparagraph, requiring any and all subcontractors, as defined in Subsection 448.095(1)(e), Florida Statutes (2026), as may be amended or revised, to include all of the requirements of this Section in their subcontracts. Contractor shall be responsible for compliance by any and all subcontractors, as defined in Subsection 448.095(1)(e), Florida Statutes (2026), as may be amended or revised, with the requirements of Section 448.095, Florida Statutes (2026), as may be amended or revised.

-END OF SECTION-

SPECIAL CONDITIONS

01. PURPOSE

The City of Fort Lauderdale, Florida (City) is seeking bids from qualified, experienced, and licensed firm(s), hereinafter referred to as the Contractor, Bidder, or Proposer, to provide Construction Services for the City's Parks and Recreation Department, in accordance with the terms, conditions, and specifications contained in this Invitation to Bid (ITB).

02. TRANSACTION FEES

The City uses the City's on-line strategic sourcing platform INFOR, 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 its bid is submitted electronically through the City's on-line strategic sourcing platform, and that any bid security reaches the City of Fort Lauderdale, Procurement Services Division, 101 North East 3rd Avenue, Suite 1650, Fort Lauderdale, Florida 33301-1016, 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 SUBMITTALS WILL NOT BE ACCEPTED. PLEASE SUBMIT YOUR BID RESPONSE ELECTRONICALLY.** In the event of any conflict or discrepancy between bid price(s) submitted by bidder electronically into the City's online strategic sourcing platform Unit Price field(s), any other forms or attachments (whether part of the City's solicitation documents or documents created and uploaded by the bidder, or another section/field of the System, the online unit price(s) **inputted** electronically into the System by the bidder shall govern.

04. INFORMATION OR CLARIFICATION

For information concerning procedures for responding to this solicitation, contact Sr. Procurement Specialist Yesenia Pascual at (954) 828-5257 or email at ypascual@fortlauderdale.gov. Such contact shall be for clarification purposes only.

For information concerning technical specifications, please utilize the question / answer feature provided by the City's on-line strategic sourcing platform. 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. Contractors please note: Bids shall be submitted as stated in PART IV – Submittal Requirements. No part of your proposal 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 themselves 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 the City's on-line strategic sourcing platform 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 **TEN (10)** calendar days of the date of the Notice to Proceed.

5.2 The Work shall be Substantially Completed within **ONE HUNDRED (100)** 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 **ONE HUNDRED THIRTHY (130)** calendar days after the Contract Time commences to run as provided in the Notice to Proceed.

06. BID SECURITY

A certified check, cashier's check, bank officer's check or bid bond for **TEN percent (10%)** of the bid amount, made payable to the City of Fort Lauderdale, shall accompany each offer.

07. REQUIRED LICENSES/CERTIFICATIONS

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

State of Florida General Contractor License

OR

State of Florida Building Contractor License

OR

Any other State or County License(s), Certification(s) or Registration(s) deemed legally permissible by the City to conduct the nature of the work required in this solicitation.

Any sub-contractors employed by the Proposer shall be licensed and insured in accordance with this solicitation. Additionally, it is the Proposer's responsibility for ensuring that any sub-contractors' work meets the requirements of this solicitation at all times.

Note: Contractor must have proper licensing and shall submit evidence of same with its bid response.

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 the bid response.

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

NOTE: REFERENCES SHALL INCLUDE ONLY ONE (1) CITY OF FORT LAUDERDALE EMPLOYEE OR WORK PERFORMED FOR THE CITY. THE CITY IS ALSO INTERESTED IN WORK EXPERIENCE AND REFERENCES FROM ENTITIES OTHER THAN THE CITY OF FORT LAUDERDALE.

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's permit fees exceed the allowance indicated, the City will reimburse the contractor the actual amount of the City's permit fees required for project completion.

Allowances	Amount
Permit fees and testing allowance	$10,000.00
TOTAL:	**$10,000.00**

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

Insurance

As a condition precedent to the effectiveness of this Agreement, during the term of this Agreement and during any renewal or extension term of this Agreement, Contractor shall, at its sole expense, provide insurance of such types and with such terms and limits as noted below. Providing proof of and maintaining adequate insurance coverage are material obligations of Contractor. Contractor shall provide the City a certificate of insurance evidencing such coverage. Contractor's insurance coverage shall be primary insurance for all applicable policies, in respect to the City's interests for this Agreement. The limits of coverage under each policy maintained by Contractor shall not be interpreted as limiting Contractor's liability and obligations under this Agreement. All insurance policies shall be through insurers authorized or eligible to write policies in the State of Florida and possess an A.M. Best rating of A-, VII or better, subject to approval by the City's Risk Manager.

The coverages, limits, and/or endorsements required herein protect the interests of the City, and these coverages, limits, and/or endorsements shall in no way be relied upon by Contractor for assessing the extent or determining appropriate types and limits of coverage to protect Contractor against any loss exposures, whether as a result of this Agreement or otherwise. The requirements contained herein, as well as the City's review or acknowledgement, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by Contractor under this Agreement.

The following insurance policies and coverages are required:

Commercial General Liability
Coverage must be afforded under a Commercial General Liability policy with limits not less than:

- $2,000,000 each occurrence and $2,000,000 aggregate for Bodily Injury, Property Damage, and Personal and Advertising Injury
- $2,000,000 each occurrence and $2,000,000 aggregate for Products and Completed Operations

Policy must include coverage for contractual liability and independent contractors.

The City, a Florida municipality, its officials, employees, and volunteers are to be included as an additional insured with a CG 20 26 04 13 Additional Insured – Designated Person or

Organization Endorsement or similar endorsement providing equal or broader Additional Insured Coverage with respect to liability arising out of activities performed by or on behalf of Contractor. The coverage shall contain no special limitation on the scope of protection afforded to the City, its officials, employees, and volunteers.

Inland Marine/Installation Floater

Coverage shall be purchased for all risks of damage or other loss, including transport, storage, loading and unloading, and installation, to materials or movable property while in the care, custody, and control of Contractor. Coverage form must be on a direct primary basis with limits equal to the highest possible replacement cost value of materials or movable property in the care, custody, and control of Contractor.

Business Automobile Liability

Coverage must be afforded for all Owned, Hired, Scheduled, and Non-Owned vehicles for Bodily Injury and Property Damage in an amount not less than $1,000,000 combined single limit each accident.

If Contractor does not own vehicles, Contractor shall maintain coverage for Hired and Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

Workers' Compensation and Employer's Liability

Coverage must be afforded per Chapter 440, Florida Statutes. Any person or entity performing work for or on behalf of the City must provide Workers' Compensation insurance. Exceptions and exemptions will be allowed by the City's Risk Manager, if they are in accordance with Florida Statute. Contractors ineligible for a State exemption certificate agree that they are excluded from any benefits, from the City, afforded under Chapter 440, Florida Statutes.

Contractor waives, and Contractor shall ensure that Contractor's insurance carrier waives, all subrogation rights against the City, its officials, employees, and volunteers for all losses or damages. The City requires the policy to be endorsed with WC 00 03 13 Waiver of our Right to Recover from Others or equivalent.

Contractor must be in compliance with all applicable State and federal workers' compensation laws.

Insurance Certificate Requirements

a. Contractor shall provide the City with valid Certificates of Insurance (binders are unacceptable) no later than ten (10) days prior to the start of work contemplated in this Agreement.
b. Contractor shall provide to the City a Certificate of Insurance having a thirty (30) day notice of cancellation; ten (10) days' notice if cancellation is for nonpayment of premium.
c. In the event that the insurer is unable to accommodate the cancellation notice requirement, it shall be the responsibility of Contractor to provide the proper notice. Such notification will be in writing by registered mail, return receipt requested, and addressed to the certificate holder.
d. In the event the Agreement term or any surviving obligation of Contractor following expiration or early termination of the Agreement goes beyond the expiration date of the insurance policy, Contractor shall provide the City with an updated Certificate of Insurance no later than ten (10) days prior to the expiration of the insurance currently in effect. The City reserves the right to suspend the Agreement until this requirement is met.

e. The Certificate of Insurance shall indicate whether coverage is provided under a claims-made or occurrence form. If any coverage is provided on a claims-made form, the Certificate of Insurance must show a retroactive date, which shall be the effective date of the initial contract or prior.

f. The City shall be included as an Additional Insured on all liability policies, with the exception of Workers' Compensation.

g. The City shall be granted a Waiver of Subrogation on Contractor's Workers' Compensation insurance policy.

h. The title of the Agreement, Bid/Contract number, or other identifying reference must be listed on the Certificate of Insurance.

The Certificate Holder should read as follows:
City of Fort Lauderdale
Attn: Procurement Services
401 SE 21st Street
Fort Lauderdale, FL 33316

Contractor has the sole responsibility for all insurance premiums and shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, co-insurance penalty, or self-insured retention; including any loss not covered because of the application of such deductible, co-insurance penalty, self-insured retention, or coverage exclusion or limitation. Any costs for including the City as an Additional Insured shall be at Contractor's expense.

If Contractor's primary insurance policy/policies do not meet the minimum requirements as set forth in this Agreement, Contractor may provide evidence of an Umbrella/Excess insurance policy to comply with this requirement.

Contractor's insurance coverage shall be primary insurance in respect to the City's interests for this Agreement, its officials, employees, and volunteers. Any insurance or self-insurance maintained by the City shall be non-contributory.

Any exclusion or provision in any insurance policy maintained by Contractor that excludes coverage required in this Agreement shall be deemed unacceptable and shall be considered breach of contract.

All required insurance policies must be maintained until the Agreement work has been accepted by the City, or until this Agreement is terminated, whichever is later. Any lapse in coverage may be considered breach of contract. In addition, Contractor must provide to the City confirmation of coverage renewal via an updated certificate of insurance should any policies expire prior to the expiration of this Agreement. The City reserves the right to review, at any time, coverage forms and limits of Contractor's insurance policies.

Contractor shall provide notice of any and all claims, accidents, and any other occurrences associated with this Agreement to Contractor's insurance company or companies and the City's Risk Management office as soon as practical.

It is Contractor's responsibility to ensure that any and all of Contractor's independent contractors and subcontractors comply with these insurance requirements. All coverages for independent contractors and subcontractors shall be subject to all of the applicable requirements stated herein. Any and all deficiencies are the responsibility of Contractor. The City reserves the right to adjust insurance limits from time to time at its discretion with notice to Contractor.

NOTE: CITY PROJECT NUMBER, PROJECT NAME AND BID NUMBER MUST APPEAR ON EACH CERTIFICATE, AND THE CITY OF FORT LAUDERDALE MUST BE NAMED ON THE CERTIFICATE AS AN "ADDITIONAL INSURED" ON REQUIRED LIABILITY POLICIES.

A Sample Insurance Certificate shall be included with the bid 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.

11. PERFORMANCE AND PAYMENT BOND: 100%

12. CITY PROJECT MANAGER

The Project Manager is hereby designated by the City as Marc Isaac, whose address is 101 NE 3rd Avenue Suite 2100, Fort Lauderdale, FL 33301, telephone number: (954) 828-5230, and email address is MIsaac@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.

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 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 sample Agreement, Article 16, Liquidated Damages)

14. PAYMENT (*See Article 7, Payment, of the Contract for other details*)

The City shall make payment to the Contractor through utilization of the City's P-Card Program. The City has implemented a Purchasing Card (P-Card) Program utilizing both the VISA and MASTERCARD networks. Purchases from this contract will be made utilizing the City's Purchasing Card. Contractor will receive payment from the purchasing card in the same manner as other credit card purchases. Accordingly, Contractor must presently have the ability to accept these credit cards or take whatever steps necessary to implement the ability before the start of the contract term, or contract award by the City. All costs associated with the Contractor's participation in this purchasing program shall be borne by the Contractor. The City reserves the right to revise this program as necessary.

PCI (Payment Card Industry) Compliance

Contractor agrees to comply with all applicable state, federal and international laws, as well as industry best practices, governing the collection, access, use, disclosure, safeguarding and destruction of Protected Information.

Contractor and/or any subcontractor that handles credit card data must be, and remain, PCI compliant under the current standards and will provide documentation confirming compliance

upon request by the City of Fort Lauderdale, failure to produce documentation could result in termination of the contract.

15. WORK SCHEDULE (including overtime hours):

Regular work hours: **8:00 am to 5:00 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.

16. INSPECTION OVERTIME COST: $100/hr.

-END OF SECTION-

CITY OF FORT LAUDERDALE
CONSTRUCTION AGREEMENT

THIS CONSTRUCTION AGREEMENT ("Agreement") made and entered into this _____ day of _____, 2026, by and between the City of Fort Lauderdale, a Florida municipal corporation ("City") and _____, a Florida company/corporation ("Contractor"), ("Party" or collectively "Parties");

WHEREAS, the City desires to retain a contractor for the Project as expressed in its Invitation to Bid No. 568, Project Number P12777, which was opened on _____; and

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

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

ARTICLE 1 – DEFINITIONS

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

1.1 Agreement – This written Agreement between the City and the Contractor covering the work to be performed including other Contract Documents that are attached to or incorporated in the Agreement.

1.2 Application for Payment – The form accepted by the City which is to be used by the Contractor in requesting progress or final payment and which is to include such supporting documentation as is required by the Contract Documents.

1.3 Approve – The word approve is defined to mean review of the material, equipment or methods for general compliance with design concepts and with the information given in the Contract Documents. It does not imply a responsibility on the part of the City to verify in every detail conformance with plans and specifications.

1.4 Bid – The offer or Bid of the Contractor submitted on the prescribed form setting forth the total prices for the Work to be performed.

1.5 Bid Documents – Advertisement for Invitation to Bids, the Instructions to Bidders, the Bid Form (with supplemental affidavits and sample agreements), the Contract Forms, General Conditions, the Supplementary Conditions, the Specifications, and the Plans, which documents all become an integral part of the Contract Documents.

1.6 Certificate of Substantial Completion - Certificate provided by the City certifying that all Work, excluding the punch list items, has been completed, inspected, and accepted by the City.

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1.7 Change Order - A written document executed by both Parties ordering a change in the Contract Price or Contract Time or a material change in the Work.

1.8 City – The City of Fort Lauderdale, Florida, including but not limited to its employees, agents, officials, representatives, contractors, subcontractors, and volunteers, with whom the Contractor has entered into the Agreement and for whom the Work is to be provided.

1.9 Contract Documents – The Contract Documents shall consist of this Agreement, Exhibits to this Agreement, Public Construction Bond, Performance Bond, Payment Bond and Certificates of Insurance, Notice of Award and Notice to Proceed, General Conditions, 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, work directive changes issued on or after the Effective Date of the Agreement, as well as any additional documents that are required to be submitted under the Agreement.

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

1.10 Contract Price – The amount established in the bid submittal and award by the City's City Commission, as may be amended by Change Order.

1.11 Contract Time – The number of calendar days stated in the Agreement for the completion of the Work. The dates on which the work shall be started and shall be completed as stated in the Notice to Proceed.

1.12 Contractor – The person, firm, company, or corporation with whom the City has entered into the Agreement, including but not limited to its employees, agents, representatives, contractors, subcontractors, their subcontractors and their other successors and assigns.

1.13 Day – A calendar day of twenty-four (24) hours ending at midnight.

1.14 Defective – 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 Agreement.

1.16 Final Completion Date – The date the Work is completed, including completion of the final punch list, and delivered along with those items specified in the Contract Documents and is accepted by the City.

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1.17 Hazardous Materials (HAZMAT) - Any solid, liquid, or gaseous material that is toxic, flammable, radioactive, corrosive, chemically reactive, or unstable upon prolonged storage in quantities that could pose a threat to life, property, or the environment defined in Section 101(14) of Comprehensive Environmental Response, Compensation and Liability Act of 1980 and in 40 CFR 300.6. Also defined by 49 CFR 171.8 as a substance or material designated by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and which has been so designated.

1.18 Hazardous Substance - As defined by Section 101(14) of the Comprehensive Environmental Response, Compensation and Liability Act; any substance designated pursuant to Section 311(b) (2) (A) of the Clean Water Act; any element, compound, mixture, solution or substance designated pursuant to Section 102 identified under or listed pursuant to Section 3001 of the Solid Waste Disposal Act {but not including any waste listed under Section 307[a] of the Clean Water Act}; any hazardous air pollutant listed under Section 112 of the Clean Air Act; and any imminently hazardous chemical substance or mixture pursuant to Section 7 of the Toxic Substances Control Act. The term does not include petroleum, including crude oil or any fraction thereof, which is not otherwise specifically listed or designated as a hazardous substance in the first sentence of this paragraph, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

1.19 Hazardous Waste - Those solid wastes designated by OSHA in accordance with 40 CFR 261 due to the properties of ignitability, corrosivity, reactivity, or toxicity. Any material that is subject to the Hazardous Waste Manifest requirements of the EPA specified in 40 CFR Part 262.

1.20 Holidays - Those designated non-workdays as established by the City Commission of the City of Fort Lauderdale.

1.21 Inspection – The term “inspection” and the act of inspecting as used in this Agreement is defined to mean the examination of construction to ensure that it conforms to the design concept expressed in the plans and specifications. This term shall not be construed to mean supervision, superintending and/or overseeing.

1.22 Notice of Award - The written notice by City to the Contractor stating that upon compliance by the Contractor with the condition’s precedent enumerated therein, within the time specified that the City will sign and deliver this Agreement.

1.23 Notice to Proceed – A written notice to Contractor authorizing the commencement of the activities identified in the notice or as described in the Contract Documents.

1.24 Plans - The official graphic representations of this Project that are a part of the Contract Documents.

1.25 Premises (otherwise known as Site or Work Site) – means the land, buildings, facilities, etc. upon which the Work is to be performed.

1.26 Project – The construction project described in the Contract Documents, including the

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Work described therein.

1.27 Project Manager - The employee of the City, or other designated individual who is herein referred to as the Project Manager, will assume all duties and responsibilities and will have the rights and authorities assigned to the Project Manager in the Contract Documents in connection with completion of the Work in accordance with this Agreement. The Project Manager, or designee, shall be the authorized agent for the City unless otherwise specified.

1.28 Punch List - The City's list of Work yet to be done or be corrected by the Contractor, before the Final Completion date can be determined by the City.

1.29 Record Documents - A complete set of all specifications, drawings, addenda, modifications, shop drawings, submittals and samples annotated to show all changes made during the construction process.

1.30 Record Drawings or "As-Builts" - A set of drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the Contractor. These documents will be signed and sealed by a Professional Engineer, or a Professional Land Surveyor licensed in the State of Florida and employed by the Contractor at no cost to the City.

1.31 Substantially Completed Date – A date when written notice is provided by the City to the Contractor stating that the Work is substantially completed. If, at the time of inspection, it is determined the project is substantially completed, the City will also issue a letter of Substantial Completion along with a punch list of incomplete or deficient items to be completed prior to requesting a Final Completion inspection.

1.32 Work – The construction and services required by the Contract Documents, whether completed or partially completed, and includes all labor, materials, equipment, and services provided or to be provided by Contractor to fulfill Contractor's obligations. The Work may constitute the whole or a part of the Project.

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:

SUNRISE MIDDLE SCHOOL- PARK IMPROVEMENTS PHASE II
ITB EVENT No. 568 PROJECT #P12777

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

PROJECT DESCRIPTION

This project is located at 1750 NE 14th Street in the City of Fort Lauderdale. The work includes, but is not limited to, furnishing and installing a new pavilion, constructing concrete curbing and foundations, installing an artificial turf field, and performing associated drainage and site electrical work. The Contractor is also responsible for

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implementing environmental and protective measures, including tree protection fencing and erosion control.

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 all personnel employed. 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 Marc Isaac, whose address is 101 NE 3rd Avenue Suite 2100, Fort Lauderdale, FL 33301, telephone number: (954) 828-5230, and email address is MIsaac@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, include this Agreement and the following documents listed below which comprise the entire Agreement between the City and Contractor, and these documents listed below are hereby incorporated herein, even if they are not attached to this Agreement. The Contract Documents consist of the following:

4.1 This Agreement.

4.2 Exhibits to this Agreement: (Plans sheets [1] to [55] inclusive).

4.3 Public Construction Bond, Performance Bond, Payment Bond and Certificates of Insurance.

4.4 Notice of Award and Notice to Proceed.

4.5 General Conditions and Special Conditions.

4.6 Technical Specifications.

4.7 Plans/Drawings.

4.8 Addenda number _____ through _____, inclusive.

4.9 Bid Form and supplement Affidavits and Agreements.

4.10 All applicable provisions of State and Federal Law.

4.11 Invitation to Bid No. 568, Instructions to Bidders, and Bid Bond.

4.12 Contractor's response to the City's Invitation to Bid No.568, dated _____.

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4.13 Schedule of Completion.

4.14 All amendments, modifications and supplements, change orders and work directive changes, issued on or after the Effective Date of the Agreement.

4.15 Any additional documents that are required to be submitted under the Agreement.

4.16 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.

4.17 Foreign Entity Affidavit.

4.18 Kidnapping and Custody Affidavit.

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

a. Approved change orders, addenda or amendments.

b. Specifications and Drawings.

c. Special Conditions.

d. General Conditions.

e. This Agreement dated _____, and any attachments.

f. Invitation to Bid No. 568, and the specifications prepared by the City.

g. Contractor's response to the City's Invitation to Bid No. 568, dated _____.

h. Schedule of Values.

i. 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, within five (5) calendar days, and before proceeding with the Work affected shall obtain a written interpretation or clarification from the City.

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

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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 **TEN (10)** calendar days of the date of the Notice to Proceed.

5.2 The Work shall be Substantially Completed within **ONE HUNDRED (100)** 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 **ONE HUNDRED THIRTY (130)** 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.

6.2 The Parties expressly agree that the Contract Price, which shall not exceed the amount of $_____, constitutes the total maximum compensation payable to Contractor for performing the Work, plus any Work done pursuant to a Change Order. The Contract Price is in accordance with the line items unit prices listed in the Bid. Line items are based on a unit price cost multiplied by a defined quantity. Any additional duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change to the Contract Price.

6.3 The Contract Price constitutes the compensation payable to Contractor for performing the Work plus any Work done pursuant to a Change Order. All duties, responsibilities and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change in the Contract Price.

ARTICLE 7 – PAYMENT

7.1 Contractor shall submit Applications for Payment in accordance with the Contract Documents. Applications for Payment will be processed by City as provided for 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 (1st) and the tenth (10th) 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.

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7.3 Prior to Final Completion, progress payments will be made in an amount equal to ninety-five percent (95%) 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 five percent (5%) 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 (2026), as amended or revised, provided, however, complete and error free pay application is submitted.

7.7 The City shall make payment to the Contractor through utilization of the City's Purchasing Card (P-Card) Program. The City has implemented a P-Card Program utilizing the MASTERCARD and VISA networks. Purchases from this contract will be made utilizing the City's P-Card. Contractor will receive payment from the purchasing card in the same manner as other credit card purchases. Accordingly, Contractor must presently have the ability to accept these credit cards or take whatever steps necessary to implement the ability before the start of the contract term, or contract award by the City. <u>All costs associated with the Contractor's participation in this purchasing program shall be borne by the Contractor</u>. The City reserves the right to revise this program as necessary.

7.8 PCI (Payment Card Industry) Compliance

Contractor agrees to comply with all applicable state, federal and international laws, as well as industry best practices, governing the collection, access, use, disclosure, safeguarding and destruction of Protected Information.

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Contractor and/or any subcontractor that handles credit card data must be, and remain, PCI compliant under the current standards and will provide documentation confirming compliance upon request by the City of Fort Lauderdale. Failure to produce documentation could result in termination of the contract.

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, water table condition, moisture conditions and all year-round local weather and climate conditions (past and present), and 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 within the Contract Time as defined in this Agreement.

Furthermore, Contractor warrants and confirms that it 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 on its own, 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 Bid Price and that the Project can be completed for the Bid 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 it 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.

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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 it 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 Agreement in accordance with Article 17.

8.8.4 Where required and necessary, the Contractor shall, at all times, have a certified "competent person" assigned to the job site. The Contractor shall assign personnel to the job site that have successfully completed training programs related to trench safety, confined space work, and maintenance of traffic (MOT). Personnel certified by the International Municipal Signal Associations with Florida Department of Transportation qualifications are required relative to MOT. Any other certifications that may be required by applicable permitting agencies for the Work shall also be complied with by the Contractor. Failure to pursue the Work with the properly certified supervisory staff may result in notice to stop work or terminate the Agreement in accordance with Article 17.

8.9 Materials:

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

8.9.2 All materials 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.

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8.10 Work Hours: Except in connection with the safety or protection of persons, or the Work, or property at the site or adjacent thereto, and except as otherwise indicated in the Supplementary Conditions, all work at the site shall be performed during regular working hours between 8 a.m. and 5:00 p.m., Monday through Friday.

Unless approved by the City in advance, the Contractor will not perform 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. For any overtime inspection required by City personnel, 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., Monday through Friday, and any work requiring inspection oversight being performed outside of this timeframe shall be paid for by the Contractor as Inspector overtime at a rate of $100.00 per hour.** 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 itself to indemnify and hold 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 bids. It shall be the responsibility of the Contractor to secure and pay for all necessary licenses and permits of a temporary nature necessary for the prosecution of Work.

8.13 Law and Regulations: The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the Work, including Florida Law, the City Code of Ordinances, and any other applicable law. If the Contractor observes that the specifications or plans are in conflict, the Contractor shall give the Project Manager prompt written notice thereof within five (5) calendar days, 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, standards, specifications and regulations, and without such notice to the Project Manager, the Contractor shall bear all costs arising therefrom.

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8.14 Taxes: The Contractor shall pay all sales, consumer, use and other similar taxes required to be paid by him in accordance with the laws of the City of Fort Lauderdale, County of Broward, and the State of Florida.

8.15 Contractor Use of Premises: The Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workmen to areas permitted by law, ordinances, permits and/or the requirements of the Contract Documents, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment.

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

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

The Contractor will preserve and protect all existing vegetation such as trees, shrubs and grass on or adjacent to the site which do not reasonably interfere with the construction, as determined by the Project Manager. The Contractor will be responsible for repairing or replacing any trees, shrubs, lawns and landscaping that may be damaged due to careless operation of equipment, stockpiling of materials, tracking of grass by equipment or other construction activity. The Contractor will be liable for or will be required to replace or restore at no expense to the City all properties and areas 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 accumulation of waste materials, rubbish and debris resulting from the Work. At the completion of the Work, the Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials and shall leave the site clean and ready for occupancy by the City. The Contractor shall restore to their original condition those portions of the site not designated for alteration by the Contract Documents at no cost to the City.

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

8.16.1 Flow of material and equipment from suppliers.
8.16.2 The interrelated work with affected utility companies.
8.16.3 The interrelated work with the City where tie-ins to existing facilities are required.
8.16.4 The effort of independent testing agencies.
8.16.5 Notice to affected property owners as may be directed by the Project Manager.

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8.16.6 Coordination with and scheduling of all required inspections from all permitting agencies.

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 electronic drawings files. All costs associated with survey work required for construction layout and as-built preparation shall be the responsibility of the Contractor.

8.18 Safety and Protection:

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

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

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

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

8.18.2 The Contractor shall comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss; and shall erect and maintain all necessary safeguards for such safety and protection. The Contractor shall notify owners of adjacent property and utilities when execution of the Work may affect them at least seventy-two (72) hours in advance (unless otherwise required). All damage, injury or loss to any property caused, directly or indirectly, in whole or in part by the Contractor, any subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, shall be remedied by the Contractor. The Contractor's duties

and responsibilities for safety and protection of the Work shall continue until such time as all the Work is completed and accepted by the City.

8.19 Emergencies: In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the City, is obligated to act to prevent threatened damage, injury or loss. The Contractor shall give the Project Manager prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby.

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8.20 Risk of Loss: The risk of loss, injury or destruction shall be on the Contractor until acceptance of the Work by the City. Title to the Work shall pass to the City upon acceptance of the Work by the City.

8.21 Environmental: The Contractor has fully inspected the Premises and agrees, except as to the presence of any asbestos, to accept the Premises in an "as is" physical condition, without representation or warranty by the City of any kind, including, without limitation, any and all existing environmental claims or obligations that may arise from the presence of any "contamination" on, in or about the Premises. Further, Contractor and all entitles claiming by, through or under the Contractor, releases and discharges the City from any claim, demand, or cause of action arising out of or relating to the Contractor's use, handling, storage, release, discharge, treatment, removal, transport, decontamination, cleanup, disposal and/or presence of any hazardous substances including asbestos on, under, from or about the Premises. The Contractor shall have no liability for any pre-existing claims or "contamination" on the Premises.

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

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

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

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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

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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 it 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 purpose, such acts or circumstances shall include, but not be limited to weather conditions affecting performance, floods, epidemics, pandemics, war, act of Governmental Authority, state of emergency, 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 sub-contractors, 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 ninety-six (96) hours after such an occurrence. The Contractor shall use its reasonable efforts to minimize such delays. The

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Contractor shall promptly provide an estimate of the anticipated additional time required to complete the Project.

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

Additionally, the Contractor assures that it, the sub-recipient or its subcontractors shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Agreement. 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 Agreement, which may result in the termination of this Agreement 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 Contractor under the Contract Documents promptly and shall make payments to the Contractor in accordance with the terms of the agreement herein.

9.2 After the Contractor meets the City's requirements in the Code of Ordinances, and any other applicable law, the City shall provide public rights-of-way and easement, where available, for the installation of conduits, transformers pads and related appurtenances only.

9.3 Technical Clarifications and Interpretations:

9.3.1 The City shall issue 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

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than five (5) days after the occurrence of event and written supporting data will be submitted to the other Party within five (5) days after such occurrence. All written decisions of the City on any claim or dispute will be final and binding.

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

9.5 Cancellation for Unappropriated Funds**:** The obligation of the City for payment to a Contractor is limited to the availability of funds appropriated in a current fiscal period, and continuation of the Agreement into a subsequent fiscal period is subject to appropriation of funds, unless otherwise authorized by law.

ARTICLE 10 – BONDS AND INSURANCE

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

10.1.1 Performance Bond: The Contractor shall execute and record in the public records of Broward County, Florida, a payment and performance bond in an amount at least equal to the Contract Price with a surety insurer authorized to do business in the State of Florida as surety, ("Bond"), in accordance with Section 255.05, Florida Statutes (2026), as may be amended or revised, as security for the faithful performance and payment of all of the Contractor's obligations under the Contract Documents.

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

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

10.3 Insurance

As a condition precedent to the effectiveness of this Agreement, during the term of this Agreement and during any renewal or extension term of this Agreement, Contractor shall, at its sole expense, provide insurance of such types and with such terms and limits as noted below. Providing proof of and maintaining adequate insurance coverage are material obligations of Contractor. Contractor shall provide the City a certificate of insurance evidencing such coverage. Contractor's insurance coverage shall be primary insurance for all applicable policies, in respect to the City's interests for this Agreement. The limits of coverage under each policy maintained by Contractor shall not be interpreted as limiting Contractor's liability and obligations under this Agreement. All insurance policies shall be through insurers authorized or eligible to write policies in the State of Florida and possess an A.M. Best rating of A-, VII or better, subject to approval by the City's Risk Manager.

The coverages, limits, and/or endorsements required herein protect the interests of the City, and these coverages, limits, and/or endorsements shall in no way be relied upon by Contractor for assessing the extent or determining appropriate types and limits of coverage to protect Contractor against any loss exposures, whether as a result of this Agreement or otherwise. The requirements contained herein, as well as the City's review or acknowledgement, are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by Contractor under this Agreement.

The following insurance policies and coverages are required:

Commercial General Liability
Coverage must be afforded under a Commercial General Liability policy with limits not less than:

- $2,000,000 each occurrence and $2,000,000 aggregate for Bodily Injury, Property Damage, and Personal and Advertising Injury
- $2,000,000 each occurrence and $2,000,000 aggregate for Products and Completed Operations

Policy must include coverage for contractual liability and independent contractors.

The City, a Florida municipality, its officials, employees, and volunteers are to be included as an additional insured with a CG 20 26 04 13 Additional Insured – Designated Person or Organization Endorsement or similar endorsement providing equal or broader Additional Insured Coverage with respect to liability arising out of activities performed by or on behalf of Contractor. The coverage shall contain no special limitation on the scope of protection afforded to the City, its officials, employees, and volunteers.

Inland Marine/Installation Floater
Coverage shall be purchased for all risks of damage or other loss, including transport, storage, loading and unloading, and installation, to materials or movable property while in the care, custody, and control of Contractor. Coverage form must be on a direct primary basis with limits equal to the highest possible replacement cost value of materials or movable property in the care, custody, and control of Contractor.

Business Automobile Liability

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Coverage must be afforded for all Owned, Hired, Scheduled, and Non-Owned vehicles for Bodily Injury and Property Damage in an amount not less than $1,000,000 combined single limit each accident.

If Contractor does not own vehicles, Contractor shall maintain coverage for Hired and Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Auto Liability policy.

Workers' Compensation and Employer's Liability

Coverage must be afforded per Chapter 440, Florida Statutes. Any person or entity performing work for or on behalf of the City must provide Workers' Compensation insurance. Exceptions and exemptions will be allowed by the City's Risk Manager, if they are in accordance with Florida Statute. Contractors ineligible for a State exemption certificate agree that they are excluded from any benefits, from the City, afforded under Chapter 440, Florida Statutes.

Contractor waives, and Contractor shall ensure that Contractor's insurance carrier waives, all subrogation rights against the City, its officials, employees, and volunteers for all losses or damages. The City requires the policy to be endorsed with WC 00 03 13 Waiver of our Right to Recover from Others or equivalent.

Contractor must be in compliance with all applicable State and federal workers' compensation laws.

Insurance Certificate Requirements

i. Contractor shall provide the City with valid Certificates of Insurance (binders are unacceptable) no later than ten (10) days prior to the start of work contemplated in this Agreement.

j. Contractor shall provide to the City a Certificate of Insurance having a thirty (30) day notice of cancellation; ten (10) days' notice if cancellation is for nonpayment of premium.

k. In the event that the insurer is unable to accommodate the cancellation notice requirement, it shall be the responsibility of Contractor to provide the proper notice. Such notification will be in writing by registered mail, return receipt requested, and addressed to the certificate holder.

l. In the event the Agreement term or any surviving obligation of Contractor following expiration or early termination of the Agreement goes beyond the expiration date of the insurance policy, Contractor shall provide the City with an updated Certificate of Insurance no later than ten (10) days prior to the expiration of the insurance currently in effect. The City reserves the right to suspend the Agreement until this requirement is met.

m. The Certificate of Insurance shall indicate whether coverage is provided under a claims-made or occurrence form. If any coverage is provided on a claims-made form, the Certificate of Insurance must show a retroactive date, which shall be the effective date of the initial contract or prior.

n. The City shall be included as an Additional Insured on all liability policies, with the exception of Workers' Compensation.

o. The City shall be granted a Waiver of Subrogation on Contractor's Workers' Compensation insurance policy.

p. The title of the Agreement, Bid/Contract number, or other identifying reference must be listed on the Certificate of Insurance.

The Certificate Holder should read as follows:

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City of Fort Lauderdale
Attn: Procurement Services
401 SE 21st Street
Fort Lauderdale, FL 33316

Contractor has the sole responsibility for all insurance premiums and shall be fully and solely responsible for any costs or expenses as a result of a coverage deductible, co-insurance penalty, or self-insured retention; including any loss not covered because of the application of such deductible, co-insurance penalty, self-insured retention, or coverage exclusion or limitation. Any costs for including the City as an Additional Insured shall be at Contractor's expense.

If Contractor's primary insurance policy/policies do not meet the minimum requirements as set forth in this Agreement, Contractor may provide evidence of an Umbrella/Excess insurance policy to comply with this requirement.

Contractor's insurance coverage shall be primary insurance in respect to the City's interests for this Agreement, its officials, employees, and volunteers. Any insurance or self-insurance maintained by the City shall be non-contributory.

Any exclusion or provision in any insurance policy maintained by Contractor that excludes coverage required in this Agreement shall be deemed unacceptable and shall be considered breach of contract.

All required insurance policies must be maintained until the Agreement work has been accepted by the City, or until this Agreement is terminated, whichever is later. Any lapse in coverage may be considered breach of contract. In addition, Contractor must provide to the City confirmation of coverage renewal via an updated certificate of insurance should any policies expire prior to the expiration of this Agreement. The City reserves the right to review, at any time, coverage forms and limits of Contractor's insurance policies.

Contractor shall provide notice of any and all claims, accidents, and any other occurrences associated with this Agreement to Contractor's insurance company or companies and the City's Risk Management office as soon as practical.

It is Contractor's responsibility to ensure that any and all of Contractor's independent contractors and subcontractors comply with these insurance requirements. All coverages for independent contractors and subcontractors shall be subject to all of the applicable requirements stated herein. Any and all deficiencies are the responsibility of Contractor. The City reserves the right to adjust insurance limits from time to time at its discretion with notice to Contractor.

NOTE: CITY PROJECT NUMBER, PROJECT NAME AND BID NUMBER MUST APPEAR ON EACH CERTIFICATE, AND THE CITY OF FORT LAUDERDALE MUST BE NAMED ON THE CERTIFICATE AS AN "ADDITIONAL INSURED" ON REQUIRED LIABILITY POLICIES.

A Sample Insurance Certificate shall be included with the bid 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.

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

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11.1 Warranty: The Contractor warrants and guarantees to the City that all Work will be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects shall be given to the Contractor. All defective work, whether or not in place, may be rejected, corrected or accepted as provided in this Article.

11.1.1 Warranty of Title: The Contractor warrants to the City that it possesses good, clear and marketable title to all equipment and materials provided and that there are no pending liens, claims or encumbrances against the equipment and materials.

11.1.2 Warranty of Specifications: The Contractor warrants that all equipment, materials and workmanship furnished, whether furnished by the Contractor, its subcontractors or suppliers, will comply with the specifications, drawings and other descriptions supplied or adopted and that all services will be performed in a workmanlike manner.

11.1.3 Warranty of Merchantability: The Contractor warrants that any and all equipment to be supplied pursuant to this Agreement is merchantable, free from defects, whether patent or latent in material or workmanship, and fit for the ordinary purposes for which it is intended.

11.2 Tests and Inspections: Contractor shall retain the services of an independent, certified, testing lab to perform all testing as required by the specifications, contract drawings, and any applicable permitting agency. Contractor shall provide evidence of certification to the City before the work and testing is done. Testing results shall be submitted to the Project Manager 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 Paragraphs 11.2.1 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,

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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 it makes a claim therefore as provided in Articles 14 and 15.

11.4 City May Stop the Work: If the Work is defective, or the Contractor fails to supply sufficient skilled supervisory personnel or workmen or suitable materials or equipment or the work area is deemed unsafe, the City may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City to stop the Work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor or any other Party. The City will not award any increase in Contract Price or Contract Time if the Work is stopped due to the circumstances described herein.

11.5 Correction or Removal of Defective Work Before Final Payment: If required by the Project Manager, the Contractor shall promptly, without cost to the City and as specified by the Project Manager, either correct any defective Work, whether or not fabricated, installed or completed, or if the Work has been rejected by the City remove it from the site and replace it with non-defective Work.

11.6 One Year Correction Period After Final Payment: If within one (1) year after the date of final acceptance, or such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, any work is found to be defective, the Contractor shall promptly, without cost to the City and in accordance with the City's written instructions, either correct such defective Work, or, if it has been rejected by the City, remove it from the site and replace it with non-defective Work.

If the Contractor does not promptly comply with the terms of such instructions or in an emergency where delay would cause serious risk of loss or damage, the City may have the defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs for such removal and replacement, including compensation for additional professional services, shall be paid by the Contractor.

11.7 Acceptance of Defective Work, Deductions: If, instead of requiring correction or removal and replacement of defective Work, the City, at the City's sole option, prefers to accept it, the City may do so. In such a case, if acceptance occurs prior to the Project Manager's recommendation of final payments, a Change Order shall be issued incorporating the necessary revisions in the Contract's Documents, including appropriate reduction in the Contract Price; or if the acceptance occurs after such recommendation, an appropriate amount shall be paid by the Contractor to the City.

11.8 City May Correct Defective Work: If the Contractor fails within a reasonable time after written notice of the Project Manager to proceed to correct defective Work or to remove and replace rejected Work as required by the Project Manager in accordance with Paragraph 11.5, or if the Contractor fails to perform the Work in accordance with the Contract Documents, the City may, after seven (7) days' written notice to the Contractor, correct and remedy any such deficiency. In exercising its rights under this paragraph, the City shall proceed expeditiously. To the extent necessary to complete corrective and

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remedial action, the City may exclude the Contractor from all or part of the site, take possession of all or part of the Work, suspend the Contractor's services related thereto and take possession of the Contractor's tools, construction equipment and materials stored at the site or elsewhere. The Contractor shall allow the City's representative agents and employees such access to the site as may be necessary to enable the City to exercise its rights under this paragraph. All direct and indirect costs of the City in exercising such rights shall be charged against the Contractor in an amount verified by the Project Manager, and a Change Order shall be issued incorporating the necessary revisions in the Contract Documents and a reduction in the Contract Price. Such direct and indirect costs shall include, in particular but without limitation, compensation for additional professional services required and costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of the Contractor's defective Work. The Contractor shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by the City of the City's right hereunder.

ARTICLE 12 – INDEMNIFICATION

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

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

12.2.1 Contractor shall, at its sole cost and expense, indemnify and hold harmless the City, its representatives, agents, volunteers, 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, suppliers, employees or laborers; (c) any and all bodily injuries, sickness, disease or death; (d) injury to or destruction of tangible property, including any resulting loss of use; (e) other such damages, liabilities, or losses received or sustained by any person or persons during or on account of any operations connected with the construction of this Project including the warranty period; (f) the use of any improper materials; (g) any construction defect including both patent and latent defects; (h) failure to timely complete the work; (i) the violation of any federal, state, county or City laws, ordinances or regulations by Contractor, its subcontractors, agents, servants, independent contractors or employees; (j) the breach or alleged breach by Contractor of any term of the Agreement, including the breach or alleged breach of any warranty or guarantee.

12.2.2 Contractor agrees to indemnify, defend, and hold harmless the City, its representatives, agents, volunteers, employees, and appointed and elected officials from all damages, liabilities, losses, claims, fines and fees, and from any

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and all suits and actions of every name and description that may be brought against City, its officers, agents and employees, on account of any claims, fees, royalties, or costs for any invention or patent and/or for the infringement of any and all copyrights or patent rights claimed by any person, firm, or corporation.

12.2.3 Contractor shall pay all claims, losses, liens, settlements or judgments of any nature in connection with the foregoing indemnifications including, but not limited to, reasonable attorney's fees and costs for trials and appeals.

12.2.4 If any subcontractor, supplier, laborer, or materialmen of Contractor or any other person directly or indirectly acting for or through Contractor files or attempts to file a mechanic's or construction lien against the real property on which the work is performed or any part or against any personal property or improvements thereon or make a claim against any monies due or to become due from the City to Contractor or from Contractor to a subcontractor, for or on account of any work, labor, services, material, equipment, or other items furnished in connection with the Work or any change order, Contractor agrees to satisfy, remove, or discharge such lien or claim at its own expense by bond, payment, or otherwise within five (5) days of the filing or from receipt of written notice from the City.

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

12.2.5 The Contractor and the City agree that Section 725.06(2), Florida Statutes (2026), as may be amended or revised, 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 fully executed 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

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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 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

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rental agreements approved by the City, and the costs of transporting, loading, unloading, installation, dismantling and removal. The rental of any such equipment, machinery or parts shall cease when the use is no longer necessary for the Work.

14.1.3.3 Sales, consumer, use or similar taxes related to the Work and for which the Contractor is liable, imposed by laws and regulations.

14.1.3.4 Royalty payments and fees for permits and licenses.

14.1.3.5 The cost of utilities, fuel and sanitary facilities at the Work site.

14.1.3.6 Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

14.1.3.7 Cost of premiums for additional bonds and insurance required because of changes in the Work.

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

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

14.3.1 Payroll costs and other compensation of the Contractor’s officers’ executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditor, accountants, purchasing and contracting agents, 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.

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

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

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

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

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

14.4.1 A mutually acceptable negotiated fee:

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

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

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

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

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

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

14.5.2 Whenever a change involves the Contractor and one (1) or more subcontractors and the change is an increase in the agreed compensation, the overhead and

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profit percentage for the Contractor and each subcontractor shall be itemized separately.

ARTICLE 15 – CHANGE OF THE CONTRACT TIME

15.1 The Contract Time may only be changed by an approved and fully executed 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 therefore 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, pandemics, act of Governmental Authority, state of emergency, or acts of God.

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

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

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

ARTICLE 16 – LIQUIDATED DAMAGES

16.1 Upon failure of the Contractor to complete the Work within the time specified for completion, the Contractor shall pay to the City the sum of **Two Hundred 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

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amount retained by the City is insufficient to pay in full such liquidated damages, the Contractor shall pay all liquidated damages in full. The Contractor shall be responsible for reimbursing the City, in addition to liquidated damages or other damages for delay, for all costs of engineering, architectural fees, and inspection and other costs incurred in administering the construction of the Project beyond the completion date specified or beyond an approved extension of time granted to the Contractor whichever is later. Delays caused by or resulting from entities, contractors or subcontractors who are not affiliated with the Contractor shall not give rise to a claim by Contractor for damages for increase in material and/or labor costs. Such entities, contractors and subcontractors include, but are not limited to, the City's contractors and subcontractors, Florida Power and Light Company, AT&T, and Florida East Coast Railway, LLC.

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

ARTICLE 17 – SUSPENSION OF WORK AND TERMINATION

17.1 City May Suspend Work: The City may, at any time and without cause, suspend the Work or any portion of the Work for a period of not more than ninety (90) days by notice in writing to the Contractor which shall fix the date on which Work shall be resumed. The Contractor shall resume the Work on the date fixed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension, if the Contractor makes a claim as provided in Articles 14 and 15.

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

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

17.2.2 If a trustee, receiver, custodian or agent of the Contractor is appointed under applicable law or under Agreement, 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.

17.2.3 If Contractor fails to begin the Work within fifteen (15) calendar days after the date set forth in the Notice to Proceed, or fails to perform the Work with sufficient

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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.

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

17.2.5 If the Contractor repeatedly disregards proper safety procedures.

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

17.2.7 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 notice 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 below in Section 17.5.

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

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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 U.S.C. 506(b). Such fees shall be allowed and payable as an administrative expense. Further, in the event the Contractor has less than five (5) years of payments remaining on the Note, the Contractor agrees that the treatment afforded to the claim of the City under any confirmed plan of reorganization shall provide that the remaining payments shall be satisfied in accordance with the Note, and that the remaining payments or claim shall not be extended or amortized over a longer period than the time remaining under the Note.

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

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

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17.5 Termination for Convenience: This Agreement 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 accepted by the City and costs reasonably incurred by Contractor relating to commitments which had become firm prior to the termination. No payment shall be made for profit for work/services which have not been performed or accepted.

17.6 Where the Contractor's service has 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 City Project Manager and Contractor shall be submitted to the City Manager or his designee and Contractor's representative for resolution. Prior to any litigation being commenced, for any disputes which remain unresolved, within sixty (60) days after final completion of the Work, the Parties shall participate in mediation to address all unresolved disputes to a mediator agreed upon by the Parties. Should any objection not be resolved in mediation, the Parties retain all their legal rights and remedies provided under the laws of Florida. Failure by a Party to comply in strict accordance with the requirements of this Article, then said Party specifically waives all of its rights provided hereunder, including its rights and remedies under the laws of Florida.

18.1.1 All non-technical administrative disputes (such as billing and payment) shall be determined by Contract Administrator.

18.1.2 During the pendency of any dispute and after a determination thereof, Contractor 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.

18.1.3 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

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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:

_____
Marc Isaac
Project Manager
City of Fort Lauderdale
101 NE 3rd Ave.
Fort Lauderdale, Florida 33301
Telephone: (954) 828-5230
E-mail: MIsaac@fortlauderdale.gov

with copies to:

City Manager
City of Fort Lauderdale
401 SE 21st Street
Fort Lauderdale, FL 33316

and

City Attorney
City of Fort Lauderdale
1 East Broward Blvd, Suite 1605
Fort Lauderdale, FL 33301-1016

To the Contractor:

_____
_____
_____
Telephone: _____
E-mail: _____

ARTICLE 20 – LIMITATION OF LIABILITY

20.1 The City desires to enter into this Agreement only if in so doing the City can place a limit on the City's liability for any cause of action arising out of this Agreement, so that the City's liability for any breach never exceeds the sum of $1,000. For other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Contractor expresses its willingness to enter into this Agreement with the knowledge that the Contractor's recovery from the City to any action or claim arising from the Agreement is limited to a maximum amount of $1,000, which amount shall be reduced by the amount actually paid by the City to the Contractor pursuant to this Agreement, for any action or claim arising out of this Agreement.

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20.2 Sovereign Immunity: Nothing contained in this paragraph or elsewhere in this Agreement is in any way intended either to be a waiver of the Sovereign Immunity limitation placed upon the City's liability as set forth in Section 768.28, Florida Statutes (2026), as may be amended or revised, or to extend the City's liability beyond the limits established in said Section 768.28, Florida Statutes (2026), as may be amended or revised; and no claim or award against the City shall include attorney's fees, investigative costs, expert fees, suit costs or pre-judgment interest.

20.3 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; WAIVER OF JURY TRIAL

21.1 The 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 claims 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 in Broward County. **BY ENTERING INTO THIS AGREEMENT, THE PARTIES HEREBY EXPRESSLY WAIVE ANY AND ALL RIGHTS EITHER PARTY MIGHT HAVE TO A TRIAL BY JURY REGARDING THIS AGREEMENT OR ANY ISSUES RELATED TO THIS AGREEMENT. IF A PARTY FAILS TO WITHDRAW A REQUEST FOR A JURY TRIAL IN A LAWSUIT ARISING OUT OF THIS AGREEMENT AFTER WRITTEN NOTICE BY THE OTHER PARTY OF VIOLATION OF THIS SECTION, THE PARTY MAKING THE REQUEST FOR JURY TRIAL SHALL BE LIABLE FOR THE REASONABLE ATTORNEYS' FEES AND COSTS OF THE OTHER PARTY IN CONTESTING THE REQUEST FOR JURY TRIAL, AND SUCH AMOUNTS SHALL BE AWARDED BY THE COURT.**

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

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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 as independent contractor and not agents or employees of the City with respect to all of the acts and services performed by and under the terms of this Agreement. This Agreement shall not in any way be constructed to create a partnership, association or any other kind of joint undertaking or venture between the Parties.

22.4 The City reserves the right to audit the records of the Contractor relating in any way to the Work to be performed pursuant to this Agreement at any time during the performance and term of this Agreement and for a period of three (3) years after completion and acceptance by the City. If required by the City, the Contractor agrees to submit to an audit by an independent certified public accountant selected by the City. The Contractor shall allow the City to inspect, examine and review the records of the Contractor at any and all times during normal business hours during the term of this Agreement.

22.5 The remedies expressly provided in this Agreement to the City shall not be deemed to be exclusive but shall be cumulative and in addition to all other remedies in favor of the City now or later existing at law or in equity.

22.6 Should any part, term or provisions of this Agreement be decided by the courts to be invalid, illegal or in conflict with any state or federal law, the validity of the remaining portion or provision shall not be affected.

22.7 Scrutinized Companies or other Entities: *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 Iran Terrorism Sectors List, created pursuant to Section 215.473, Florida Statutes (2026), as may be amended or revised, and that it does not have business operations in Cuba or Syria, as provided in Section 287.135, Florida Statutes (2026), as may be amended or revised.

The Contractor also certifies that it is not participating in a boycott of Israel, as provided in Section 287.135, Florida Statutes (2026).

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 (2026), as may be amended or revised, or been placed on the

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Scrutinized Companies with Activities in Sudan List, or been placed on a list created pursuant to Section 215.473, Florida Statutes (2026), as may be amended or revised, or been placed on the Scrutinized Companies with Activities in Sudan List, or been placed on a list created pursuant to Section 215.473, Florida Statutes (2026), as may be amended or revised, relating to scrutinized active business operations in Iran, or been placed on the Scrutinized Companies or Other Entities that Boycott Israel List created pursuant to Section 215.4725, Florida Statutes (2026), as may be amended or revised, 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 (2026), as may be amended or revised.

In addition, if the Contractor is found to have submitted a false certification as provided under subsection (5) of Section 287.135, Florida Statutes (2026), as may be amended or revised, the Contractor may be subject to such penalties as provided in Section 287.135, Florida Statutes (2026), as may be amended or revised.

22.8 Public Entity Crimes: In accordance with the Public Crimes Act, Section 287.133, Florida Statutes (2026), as may be amended or revised, 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 (2026), as may be amended or revised, for category two purchases for a period of thirty-six (36) months from the date of being placed on the convicted vendor list. Violation of this section by Contractor shall result in cancellation of the City purchase and may result in Contractor debarment.

22.9 Attorney Fees: In the event it becomes necessary for either party herein to seek legal means to enforce the terms of the Agreement, the prevailing Party shall be entitled to its reasonable attorney fees.

22.10 Public Records

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES (2026), TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT PRRCONTRACT@FORTLAUDERDALE.GOV, 954-828-5002, CITY CLERK'S OFFICE, 1 EAST BROWARD BOULEVARD, SUITE 444 FORT LAUDERDALE, FLORIDA 33301.

Contractor shall:

1. Keep and maintain public records required by the City in order to perform the service.

SAMPLE CONSTRUCTION AGREEMENT

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 (2026), 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 Agreement if the Contractor does not transfer the records to the City.

4. Upon completion of the Agreement, 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 Agreement, 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 Agreement, 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.

22.12 Non-Discrimination: The Contractor shall not discriminate against its employees based on the employee's race, color, religion, gender, gender identity, gender expression, marital status, sexual orientation, national origin, age, disability, or any other protected classification as defined by applicable law.

1. The Contractor certifies and represents that the Contractor offers the same health benefits to the domestic partners of its employees as are offered its employees' spouses or offers its employees the cash equivalent of such health benefits because it is unable to provide health benefits to its employees' domestic partners, and that the Contractor will comply with Section 2-187, Code of Ordinances of the City of Fort Lauderdale, Florida, as may be amended or revised, ("Section 2-187"), during the entire term of this Agreement.

2. The failure of the Contractor to comply with Section 2-187 shall be deemed to be a material breach of this Agreement, entitling the City to pursue any remedy stated below or any remedy provided under applicable law.

3. The City may terminate this Agreement if the Contractor fails to comply with Section 2-187.

4. The City may retain all monies due or to become due until the Contractor complies with Section 2-187.

5. The Contractor may be subject to debarment or suspension proceedings. Such proceedings will be consistent with the procedures in Section 2-183 of the Code of Ordinances of the City of Fort Lauderdale, Florida.

22.13 E-Verify: As a condition precedent to the effectiveness of this Agreement, pursuant to Section 448.095, Florida Statutes (2026), as may be amended or revised, the

SAMPLE CONSTRUCTION AGREEMENT

Contractor and its subcontractors shall register with and use the E-Verify system to electronically verify the employment eligibility of newly hired employees.

1. The Contractor shall require each of its subcontractors, if any, to provide the Contractor with an affidavit stating that the subcontractor does not employ, contract with, or subcontract with an unauthorized alien. The Contractor shall maintain a copy of the subcontractor's affidavit for the duration of this Agreement and in accordance with the public records requirements of this Agreement.

2. The City, the Contractor, or any subcontractor who has a good faith belief that a person or entity with which it is contracting has knowingly violated Subsection 448.09(1), Florida Statutes (2026), as may be amended or revised, shall terminate the contract with the person or entity.

3. The City, upon good faith belief that a subcontractor knowingly violated the provisions of Subsection 448.095(5), Florida Statutes (2026), as may be amended or revised, but that the Contractor otherwise complied with Subsection 448.095(5), Florida Statutes (2026), as may be amended or revised, shall promptly notify Contractor and order the Contractor to immediately terminate the contract with the subcontractor, and the Contractor shall comply with such order.

4. A contract terminated under Subparagraph 448.095(5)(c)1. or 2., Florida Statutes (2026), as may be amended or revised, is not a breach of contract and may not be considered as such. If the City terminates this contract under Paragraph 448.095(5)(c), Florida Statutes (2026), as may be amended or revised, the Contractor may not be awarded a public contract for at least one year after the date on which the contract was terminated. The Contractor is liable for any additional costs incurred by the City as a result of termination of this Agreement.

5. Contractor shall include in each of its subcontracts, if any, the requirements set forth in this Section, including this subparagraph, requiring any and all subcontractors, as defined in Subsection 448.095(1)(e), Florida Statutes (2026), as may be amended or revised, to include all of the requirements of this Section in their subcontracts. Contractor shall be responsible for compliance by any and all subcontractors, as defined in Subsection 448.095(1)(e), Florida Statutes (2026), as may be amended or revised, with the requirements of Section 448.095, Florida Statutes (2026), as may be amended or revised.

22.14 Anti-Human Trafficking:

As a condition precedent to the effectiveness of this Agreement, the Contractor shall provide the City with an affidavit signed by an officer or a representative of the Contractor under penalty of perjury attesting that the Contractor does not use coercion for labor or services as defined in Section 787.06, Florida Statutes (2026), as may be amended or revised.

22.15 Foreign Countries of Concern:

As a condition precedent to the effectiveness of this Agreement, the Contractor shall provide the City with an affidavit signed by an officer or representative of the Contractor under penalty of perjury attesting that the Contractor does not meet any of the criteria in

SAMPLE CONSTRUCTION AGREEMENT

paragraphs (2)(a)-(c) of Section 287.138, Florida Statutes (2026), as may be amended or revised.

22.16 Default:

In the event the Contractor fails to comply with the provisions of this Agreement, the City may declare the Contractor in default and notify it in writing, giving a reasonable time to cure the default, but in no event shall this time period exceed five (5) calendar days unless otherwise agreed to by the parties. In such event, the Contractor shall only be compensated for any services completed as of the date written notice of default is served.

22.17 Severability:

If any portions of this Agreement shall be held invalid or unenforceable, such invalidity or unenforceability shall not affect any other provisions hereof, and this Agreement shall be construed and enforced as if such provisions had not been included.

[THIS SPACE WAS INTENTIONALLY LEFT BLANK]

SAMPLE CONSTRUCTION AGREEMENT

CITY

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

CITY OF FORT LAUDERDALE, a Florida municipal corporation

By: _____
Rickell Williams
City Manager

Date: _____

ATTEST:

By: _____
DAVID R. SOLOMAN
City Clerk

Approved as to Legal Form and correctness:
Shari L. McCartney, City Attorney

By: _____
Patricia SaintVil-Joseph
Assistant City Attorney

SAMPLE CONSTRUCTION AGREEMENT

CONTRACTOR

WITNESSES:

CONTRACTOR.,
a Florida company/corporation.

_____ By:_____

_____ Print Name:_____
Print Name

Title:_____

ATTEST:

_____

_____
Print Name

By:_____
Secretary

(CORPORATE SEAL)

STATE OF _____:

COUNTY OF _____:

The foregoing instrument was acknowledged before me by means of ❑ physical presence or ❑ online notarization, this _____ day of _____, 2026, by _____, (NAME OF AUTHORIZED OFFICER) as _____ (TITLE OF AUTHORIZED OFFICER), for _____ (NAME OF COMPANY), a Florida _____(TYPE OF COMPANY).

_____
(Signature of Notary Public - State of Florida)

_____
(Print, Type, or Stamp Commissioned Name of Notary Public)

Personally Known_____ OR Produced Identification_____
Type of Identification Produced: _____

SAMPLE CONSTRUCTION AGREEMENT

DIVISION 01 – GENERAL REQUIREMENTS

City of Fort Lauderdale Park Improvements

For

Sunrise Middle School

Issued on Behalf of:
Parks and Recreation
701 South Andrews Avenue
Fort Lauderdale, Florida 33316

Marc Isaac, Project Manager

Sr. Procurement Specialist
Yesenia Pascual
Telephone: (954)828-5257
Ypascual@fortlauderdale.gov

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For

PARKS BOND AND PARKS MASTER PLAN DESIGN IMPLEMENTATION SERVICES

SUNRISE MIDDLE SCHOOL

Task Order No. 29 - P12777

AECOM Project No: 60711655

Bid Set

November 26, 2024

PARKS BOND AND PARKS MASTER PLAN DESIGN IMPLEMENTATION SERVICES

SUNRISE MIDDLE SCHOOL TASK ORDER NO. 29

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SECTION 01001 - GENERAL REQUIREMENTS

PART 1 - PROJECT DESCRIPTION

1.1 GENERAL

A. A brief description of the Work is stated in the INVITATION TO BID. To determine the full scope of the project or any particular part of the project, coordinate the applicable information in these Contract Documents and review the available project drawings.

B. The Work under this Contract shall be performed by the Contractor as required by the City of Fort Lauderdale (City). Work will be authorized by a Notice to Proceed (NTP) issued to the Contractor. The Contractor shall complete all work within the number of calendar days stipulated in the Contract unless an extension in the time of completion is granted by the CITY'S PROJECT MANAGER, as stated in the Instructions to Bidders. Upon satisfactory completion of the work and compliance with applicable provisions in the Contract Documents, the Contractor will receive final payment for all work done.

C. The following additional information, though not all-inclusive, is given to assist contractors in their evaluation of the work required to meet the project objectives.

D. The Contractor shall become familiar with the existing operating conditions of the City's water system, sewage transmission system and pumping stations and take such into consideration in planning and scheduling work. No extra claims shall be made for work required to achieve conditions beyond those obtainable under normal operation of the existing transmission, collection and pumping facilities necessary to accomplish the Work.

E. Contractor shall be required to submit a Maintenance of Traffic (MOT) plan for work in the county and state highways and City streets. Contractor shall coordinate with MOTs for nearby or highway work and obtain approval for all traffic control as required by the permits contained elsewhere in this Section.

PART 2 - SEQUENCE OF OPERATIONS

2.1 SCHEDULING

A. General: Prepare and submit schedule in accordance with the provisions of Section 01311 "Construction Progress Documentation".

B. Plan the work and carry it out with minimum interference to the operation of the existing facilities. Prior to starting the work, confer with the CITY'S PROJECT MANAGER AND SCHOOL BOARD to develop an approved work schedule, which will permit the facilities to function normally as practical. It may be necessary to do certain parts of the construction work outside normal working hours in order to avoid undesirable conditions. The Contractor shall do this work at such times and at no additional cost to the City. Do not make connections between existing work and new work until necessary inspection and tests have been completed on the new work and it is found to conform in all respects to the requirements of the Contract Documents.

C. No work shall be started until the Contractor has received Manufacturer's approved shop drawings, established material/delivery dates for all equipment, and received approval

of the construction schedule from the ENGINEER. The Contractor shall have sufficient manpower, equipment, and material to complete the project.

No work shall commence without express consent of the CITY AND SCHOOL BOARD.

D. If a privately owned staging area is required, no work shall commence until approval of the facility is obtained from City Planning and Zoning in accordance with Section 47-19.2 of the Unified Land Development Regulations. Submit a copy of the approval and agreement to the SCHOOL BOARD.

2.2 MOBILIZATION AND DEMOBILIZATION

A. Contractor shall be responsible for mobilization and demobilization of labor, materials and equipment. Payment for mobilization and demobilization shall be included in the lump sum price indicated in the Proposal for the project.

2.3 COORDINATION

A. Contractor shall coordinate with SCHOOL BOARD of separate activities in a manner that will provide the least interference with the Owner's operations and other contractors and utility companies working in the area, and in the interfacing and connection of the separate elements of the overall project work.

B. If any difficulty or dispute should arise in the accomplishment of the above, the problem shall be brought immediately to the attention of the CITY'S ENGINEER.

2.4 OPERATION OF EXISTING SYSTEM PROHIBITED

A. At no time is the Contractor to undertake to close off any utility lines or open valves or take any other action, which would affect the operation of existing systems. The City's operations crew will operate all valves. Provide at least one business day notice to City prior to any operations.

PART 3 - SITE CONDITIONS

3.1 SITE INVESTIGATION AND REPRESENTATION

A. The Contractor acknowledges satisfaction as to the general nature and location of the work, the general and local conditions, particularly those bearing upon availability of transportation, availability of labor, water, electric power, roads, and uncertainties of weather, river stages, or similar physical conditions, the character 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 this Contract.

B. Failure by the Contractor to become acquainted with the physical conditions and all the available information will not relieve the Contractor from responsibility for properly estimating the difficulty or cost of successfully performing the Work.

C. The Contractor warrants that as a result of examination and investigation of all the aforesaid data, the Contractor can perform the work in a good and workmanlike manner and to the satisfaction of the City. The City assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this Contract, unless (1) such representations are expressly stated in the Contract; and (2) the Contract expressly provides that the responsibility therefore is assumed by the City.

3.2 INFORMATION ON SITE CONDITIONS

A. General: Information obtained by the SCHOOL BOARD regarding site conditions, subsurface information, groundwater elevations, existing construction of site facilities, as applicable, and similar data will be available for inspection at the office of the SCHOOL BOARD upon request. Such information is offered as supplementary information only. The CITY'S ENGINEER AND SCHOOL BOARD does not assume any responsibility for the completeness or interpretation of such supplementary information.

3.3 UTILITIES

A. The Contractor shall be responsible for determining and/or confirming, at his cost, the locations of all utilities within the project area, and shall be responsible for contacting each utility for location and notification prior to commencing work.

B. The Contractor shall contact potentially affected utilities as provided in Section 01060 "Regulatory Requirements & Permits".

C. The Contractor shall contact Sunshine State One Call at 811 or visit www.callsunshine.com at least 2 business days (10 business days for water crossings) prior to any excavation and make arrangements for locating all utilities in the project area.

3.4 CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTIES AND SERVICE

A. Where the Contractor's operations could cause damage or inconvenience to utilities, telephone, television, power, water, or sewer systems, the operations shall be suspended until all arrangements necessary for the protection of these utilities and services have been made by the Contractor with the owner of the utility affected.

B. Notify all utility offices, which are affected by the construction operation at least 2 business days in advance. Under no circumstances expose any utility without first obtaining permission from the appropriate agency. Once permission has been granted, locate, expose, and provide temporary support for all existing underground utilities.

C. The Contractor shall be solely and directly responsible to the Owner and operators of such properties for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage, which may result from the construction operations under this Contract.

D. Neither the Owner nor its officers or agents shall be responsible to the Contractor for damages as a result of the Contractor's failure to protect utilities encountered in the Work.

E. In the event of interruption to domestic water, sewer, storm drain, or other utility services as a result of accidental breakage due to construction operations, promptly notify the proper authority. Cooperate with said authority in restoration of service as promptly as possible and bear all costs of repair. In no case shall interruption of any water or utility service be allowed to exist outside working hours unless prior approval is granted.

F. In the event the Contractor encounters water service lines or sewer laterals that interfere with trenching, he may, by obtaining prior approval of the property owner, and the SCHOOL BOARD, cut the service, dig through, and restore the service with similar and equal materials at the Contractor's expense.

G. The Contractor shall replace, at his own expense, all existing utilities or structures removed or damaged during construction, unless otherwise provided for in these Contract documents or ordered by the PROPERTY OWNER.

H. Telephone and communications drops and signal systems may extend throughout the project area. Properly located cable, conduit, interface equipment, pull or junction boxes and other signal or systems equipment damaged by the Contractor shall be replaced at the Contractor's expense.

1. Damaged cable shall be replaced as an entire run, from junction box to junction box.

2. Notify Broward County Engineering two business days in advance of the need to remove traffic detection loops.

3. Contractor shall verify marked cables and signal systems prior to excavation.

3.5 INTERFERING STRUCTURES

A. Take necessary precautions to prevent damage to existing structures whether on the surface, aboveground, or underground.

B. Protect underground and aboveground existing structures from damage, whether or not they lie within the limits of the easements obtained by the City. Where such existing fences, gates, sheds, buildings, or any other structure must be removed in order to properly carry out the construction, or are damaged during construction, restore to their original condition to the satisfaction of the property owner involved at the Contractor's own expense. Notify the City of any damaged underground structure, and make repairs or replacements before backfilling.

C. Without additional compensation, the Contractor may remove and shall replace in a condition as good as or better than original, such small miscellaneous structures as fences, mailboxes, and signposts that interfere with the Contractor's operations.

3.6 EASEMENTS AND WORK ON PRIVATE PROPERTY

A. Where portions of the work are located on public or private property, easements and permits will be obtained by the City, except as otherwise noted in these Specifications. Easements will provide for the use of property for construction purposes to the extent indicated on the easements. Copies of these easements and permits are available upon request to the City. It shall be the Contractor's responsibility to determine the adequacy of the easement obtained in every case and to abide by all requirements and provisions of the easement. The Contractor shall confine his construction operations to within the easement limits or street right-of-way limits or make special arrangements with the property owners or appropriate public agency for the additional area required. Any damage to property, either inside or outside the limits of the easements provided by the City or street rights-of-way, shall be the responsibility of the Contractor as specified herein. The Contractor shall provide immediate notice to the owner of any damage to fencing and provide temporary fencing as required to provide a functionally similar level of security. The Contractor shall remove, protect, and replace all fences or other items encountered on public or private property. Before final payment will be authorized by the City's Engineer, the Contractor will be required to furnish the City with written releases from property owners or public agencies where side agreements or special easements have been made by the Contractor or where the Contractor's

operations, for any reason, have not been kept within the construction right-of-way obtained by the City or the street right-of-way.

B. The Contractor shall be responsible for all damage to private property where work related activities have occurred without proper easement or authorization. The City may withhold payment to the Contractor pending resolution of any claims by private owners.

C. It is anticipated that the required easements and permits will be obtained before construction is started. However, should the procurement of any easement or permit be delayed, the Contractor shall schedule and perform the work around these areas until such a time as the easement or permit has been secured.

D. Prior to removing an existing structure or item, provide written notice to the Owner at least 14 days in advance of the anticipated removal.

E. The Contractor shall not engage in private construction activities within the project area without the presence of a contract with the private owner of the property containing a hold harmless clause protecting the City from any and all damages that occur during the performance of the privately authorized work.

PART 4 - SAFETY AND CONVENIENCE

4.1 SAFETY AND ACCESS

A. The Contractor shall do all work necessary to protect the general public from hazards, including, but not limited to, surface irregularities or unramped grade changes in pedestrian sidewalk or walkway, and trenches or excavations in roadway. Barricades, lanterns, and proper signs shall be furnished in sufficient amount to safeguard the public and the work. All barricades and signs shall be clean and serviceable, in the opinion of the City and School Board.

B. During construction, the Contractor shall construct and at all times maintain satisfactory and substantial temporary chain link fencing, solid fencing, railing, barricades or steel plates, as applicable, at all openings, obstructions, or other hazards in streets, sidewalks, floors, roofs, and walkways. All such barriers shall have adequate warning lights as necessary, or required, for safety. All lights shall be regularly maintained, and in a fully operational state at all times.

C. The Contractor shall notify all residences and businesses of planned construction at least 5 (five) business days prior to the start of work in the block where they are located. Such notices shall be brochures or door-hangers with sufficient information to describe the extent and duration of the planned work. Notification activities shall be coordinated with the City and School Board.

D. Homeowners and business owners shall be provided reasonable access. The Contractor shall provide temporary sidewalks, bridges or driveway access, including safe passage over open excavations as required.

4.2 ACCIDENT REPORTS

A. In addition, the Contractor must promptly report in writing to the CITY'S ENGINEER all accidents whatsoever arising out of, or in connection with, the performance of the work whether on, or adjacent to, the site, giving full details and statements of witnesses. If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the ENGINEER.

B. If a claim is made by anyone against the contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the CITY'S ENGINEER, giving full details of the claim.

4.3 SAFE ACCESS BY FEDERAL, STATE, AND LOCAL GOVERNMENT OFFICIALS

A. Authorized representatives of the state, federal, or local governmental agencies, shall at all times have safe access to the work, and the Contractor shall provide proper facilities for such access and inspection.

4.4 PROTECTION OF PROPERTY

A. Protect stored materials located adjacent to the proposed work. Notify property owners affected by the construction at least two business days in advance of the time construction begins. During construction operations, construct and maintain such facilities as may be required to provide access by all property owners to their property. No person shall be cut off from access to his residence or place of business for a period exceeding 2 hours, unless the Contractor has made special arrangements with the affected persons.

B. The Contractor shall identify and isolate his active work zone in such a manner as to exclude all personnel not employed by him, the CITY'S ENGINEER, and the City.

4.5 FIRE PREVENTION AND PROTECTION

A. The Contractor shall perform all work in a fire-safe manner. He shall supply and maintain on the site adequate fire-fighting equipment capable of extinguishing incipient fires. The Contractor shall comply with applicable federal, state, and local fire-prevention regulations. Where these regulations do not apply, applicable parts of the National Fire Prevention Standard for Safeguarding Building Construction Operations (NFPA No. 241) shall be followed.

4.6 ACCESS FOR POLICE, FIRE, AND POSTAL SERVICE

A. Notify the fire department and police department before closing any street or portion thereof. No closing shall be made without the Owner's approval of MOT plan. Notify said departments when the streets are again passable for emergency vehicles. Do not block off emergency vehicle access to consecutive arterial crossings or dead-end streets, in excess of 300 linear feet, without special written permission from the fire department. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. MOT plans that result in restricted access for emergency vehicles must be submitted and approved 2 weeks prior to the proposed closing with separate and specific notification made to the ENGINEER to provide for appropriate agency coordination.

B. The Contractor shall leave a night emergency telephone number or numbers with the police department, the Engineer, and the Owner, so that contact may be made easily at all times in case of barricade and flare trouble or other emergencies.

C. Maintain postal service facilities in accordance with the requirements of the U.S. Postal Service. Move mailboxes to temporary locations designated by the U.S. Postal Service, and at the completion of the work in each area, replace them in their original location and in a condition satisfactory to the U.S. Postal Service.

PART 5 - PRESERVATION, RESTORATION, AND CLEANUP

5.1 SITE RESTORATION AND CLEANUP

A. At all times during the work, keep the premises clean and orderly, and upon completion of the Work, repair all damage caused by equipment and leave the project free of rubbish or excess materials of any kind.

B. Stockpile excavated materials in a manner that will cause the least damage to adjacent lawns, grassed areas, gardens, shrubbery, or fences, regardless of whether these are on private property, or on state, county, or city rights-of-way. Remove all excavated materials from grassed and planted areas, and leave these surfaces in a condition equivalent to their original condition. Replace excavated areas, raked and graded to conform to their original contours.

5.2 FINISHING OF SITE, BORROW, AND STORAGE AREAS

A. Upon completion of the project, all areas used by the Contractor shall be properly cleared of all temporary structures, rubbish, and waste materials and properly graded to drain and blend in with the abutting property. Areas used for the deposit of waste materials shall be finished to properly drain and blend with the surrounding terrain. Grassed areas shall be restored as specified.

5.3 HISTORIC PRESERVATION

A. The Contractor shall coordinate with the historic preservation representative supplied by the owner for initial excavation operations. If the project work should uncover prehistoric or historic artifacts associated with Native American cultures, early colonial cultures, or American settlements, all project activities in the area shall cease immediately.

B. All such discoveries shall be reported to the Division of Historical Resources. Review and Compliance Section at (800) 847-7278.

C. Project activities in the affected area cannot resume without authorization from the Division of Historic Resources.

PART 6 - PERMITS

6.1 GENERAL

A. City has prepared the following application for the Contractor to submit and obtain Permit:
   1. Permit number: 2302510876 via Broward County Schools Building Department

B. Permits to be obtained by the Contractor include, but are not limited to the following:
   1. Local, County, and State contracting licenses as required.
   2. MOT approval from local, county, and state agencies as required.
   3. Broward County Planning and Environmental Regulation Division (BCPERD): Dewatering permit, including National Pollution Discharge Elimination System (NPDES) permit if required.
   4. Environmental Recourse Permit if necessary.

C. The Contractor shall comply with all applicable permit conditions.

END OF SECTION 01001

SECTION 01005 - TECHNICAL PROVISIONS

PART 1 - GENERAL

1.1 SCOPE

A. Work under this contract includes furnishing materials, labor, tools equipment, supervision and incidentals necessary to construct infrastructure improvements.

1.2 ITEMS SPECIFIED ON DRAWINGS

A. Items of material, equipment, machinery and the like may be specified on the Drawings and not in the Technical Specifications. The CONTRACTOR shall provide such items in accordance with the General Notes on the Drawings.

1.3 FIELD LAYOUT OF THE WORK AND RECORD DRAWINGS

A. After completion of construction, the CONTRACTOR shall provide three (3) sets of signed & sealed. As-Built Drawings with all the As-Built information; all locations, coordinates, dimensions and elevations of the constructed facilities, certified, signed and sealed thereon by a Land Surveyor registered in the State of Florida. All elevations shall refer to N.A.V.D. 88 (North American Vertical Datum of 1988) and all state plane coordinates shall be NAD 83 (with 1990 adjustment). The cost of such field layout and recording work shall be the responsibility of the CONTRACTOR. The As-Built utility information shall meet the requirements of the City of Fort Lauderdale and any other permitting agencies having jurisdiction on this project.

1.4 SALVAGE

A. Any existing equipment or material, including but not limited to valves, pipes, fittings, couplings, etc., which is removed as a result of construction under this project may be designated as salvage by the CONTRACT ADMINISTRATOR, and if so, shall be delivered clean to the CITY at a location directed by the CONTRACT ADMINISTRATOR. Any equipment or material not worthy of salvaging shall be disposed of by the CONTRACTOR at a suitable location in accordance with all applicable regulations, ordinances and laws at no additional cost to the CITY.

1.5 POWER

A. The CONTRACTOR shall furnish and pay for all electrical power required for the construction, testing and trial operation, prior to final acceptance by the CITY.

1.6 WATER SUPPLY

A. All water required for testing, flushing, and construction shall be furnished by the CITY and paid for by the CONTRACTOR. The purchase price shall be the prevailing rate as published by the CITY. The quantity of water used shall be determined by reading the meter at the start and at the finish of construction. The CONTRACTOR shall make all arrangements and incur all expense involved in having the CITY provided with a vacuum relief or backflow preventer which shall meet the requirements of ASA A40.6, latest revision, and the local administrative authority.

1.7 MAINTENANCE

A. The CONTRACTOR shall fully cooperate at all times with the CITY in order to maintain the operation of the existing water and/or sewer system with the least amount of interference and interruption possible. The schedule plans and work of the CONTRACTOR shall at all times be subject to alteration and revision if necessary for public health and safety considerations. The creation of a public nuisance will not be permitted.

B. It may be necessary to interrupt the operation of the existing water and/or sewer system. In all cases where the CONTRACTOR must cause an interruption, CONTRACTOR shall prepare and submit to the City and School Board four (4) working days prior to commencing the work, a complete description of the proposed procedure and a time schedule, which CONTRACTOR will guarantee. At least forty-eight (48) hours prior to the time proposed for starting the work, the City and School Board will notify the CONTRACTOR whether or not the work will be permitted as proposed.

1. The CITY'S ENGINEER reserves the right to require the CONTRACTOR to work 24 hours per day in all cases where, in ENGINEER'S opinion, interference with operation of the system may result in dangerous health hazards or offensive conditions.

2. In no case will the CONTRACTOR be permitted to interfere with the existing system until all materials, supplies, equipment, tools and incidentals necessary to complete the work are on the site. Backup equipment on key equipment items shall be required on work necessitating interference with the existing system.

1.8 SITE RESTORATION

A. The CONTRACTOR shall remove all excess material and shall clean up and restore the site to its original condition or better. All damage, as a result of work under this Contract, done to existing structures, pavement, driveways, paved areas, curbs and gutters, sidewalks, shrubbery, grass, trees, utility poles, utility pipe lines, conduits, drains, catch basins, flagstones, rocked, graveled, or stabilized areas of driveways, and including all obstructions not specifically named herein, shall be repaired, or replaced, as determined by the City and School Board. Site restoration shall be done in a timely manner as the work progresses. Site restoration work shall be completed on private property within 30 days after being disturbed.

1.9 SANITARY FACILITIES

A. The CONTRACTOR shall provide temporary facilities at the site as directed by the CITY'S ENGINEER.

1.10 STANDARDS

A. Wherever in these TECHNICAL SPECIFICATIONS or in the drawings name and/or number refer to certain standards or regulations, the applicable publication shall be the latest revision thereof. Reference by abbreviation is made in accordance with the Section 01070, "Abbreviations of Institutions."

1.11 QUALITY OF ITEMS

A. All material furnished for this project shall be new and unused. Any material, which has become excessively weathered or damaged since manufacture, shall not be considered

as new. CITY'S ENGINEER shall be the sole judge as to what constitutes excessive weathering or damage.

1.12 TESTING

A. The City of Fort Lauderdale Engineering Minimum Design and Construction Standards may require that materials and equipment supplied meet given standards and testing to demonstrate conformance to the standards is a part of those standards. The cost of these tests shall be the obligation of the CONTRACTOR and no extra charge shall be made to the CITY on account of such testing.

B. The CONTRACTOR shall select a recognized, independent testing laboratory to make tests on concrete, asphalt, soils and other materials for the construction phase, to test for conformity with the TECHNICAL SPECIFICATIONS, FDOT and BROWARD COUNTY Construction Standards, and any other applicable testing/Quality control standards as required by all permitting agencies having jurisdiction over this project. The CONTRACTOR shall supply the necessary samples for this testing without cost to the CITY. The costs for actual testing shall be paid by the CONTRACTOR and scheduling of all required tests will be the responsibility of the CONTRACTOR.

C. Construction in areas where installation and restoration must satisfy the additional requirements of a local, state or federal authority may require testing to demonstrate conformance. The CONTRACTOR shall ascertain the extent of testing required by regulatory agencies within these areas. The CONTRACTOR is responsible for performing such tests, including but not limited to, tests of compaction, and all costs for these tests shall be the obligation of the CONTRACTOR and no extra charge shall be made to the CITY on account of such testing.

1.13 UTILITY CROSSINGS

A. It is intended that wherever existing utilities must be crossed that the pipe may be deflected up to 75% of the manufacturer's recommended limits, but shall not exceed the allowable limits of the CITY. Adequate cover shall be used to adequately clear the obstruction. However, when in the opinion of the CITY'S ENGINEER, this procedure is not feasible CITY'S ENGINEER may direct the use of fittings to clear a utility crossing as detailed on the Drawings. The cost of such crossing including joint restraints shall be on the basis of the schedule of pay items applied.

B. Deflections and adjustments of the proposed water and/or sewer mains to avoid all other existing utilities shall be verified/determined in the field during construction.

1.14 BASIS OF MEASUREMENT

A. Where mains are to be paid for on a unit price per linear foot basis, the number of linear feet will be determined by measurement along the centerline of the pipe in place, including fittings. Square yardage will be determined by the actual number of square yards installed.

1.15 ADJUSTMENT AND RELOCATION OF EXISTING LINES

A. When the drawings indicate that existing lines must be deflected, the pipe may be deflected up to 75% of the manufacturer's recommended limits but shall not exceed the allowable limits of the CITY. The CONTRACTOR will need to be directed by the ENGINEER. If the ENGINEER determines that the use of new pipe and fittings is required for deflection, the CONTRACTOR will be directed to use this method. The price

for either method shall be based upon the unit prices bid. This does not apply to connections to existing system (Paragraph 1.17, this Section).

1.16 CONNECTION TO EXISTING SYSTEM

A. The CONTRACTOR shall perform all work necessary to locate, excavate and prepare for connection to the existing mains as shown on the Drawings. The cost of this work and for the actual connection to the existing main shall be based upon the unit prices for installing the pipe and appurtenances and shall not result in any additional cost to the CITY. The cost of ductile iron sleeves shall be included in the fittings unit price.

B. Additional valves used for the CONTRACTOR's convenience shall not be considered as an extra cost payable by the CITY for the tie-in to the existing system.

C. During all phases of the work, (i.e. installation, testing and restoration), the CONTRACTOR shall ensure at all times the safe operation of the existing water and/or sewage systems. Service to the customers shall be maintained with the least amount of interference and interruption as possible.

1.17 RELOCATIONS

A. The CONTRACTOR shall be responsible for the relocation of structures that are shown on the drawings, including, but not limited to, light poles, signs, fences, piping, conduits and drains that interfere with the proposed positioning of the water/sewer mains. The cost of all such relocations shall be included in the prices bid for the appropriate items.

1.18 UTILITIES

A. Existing utilities are shown on the Drawings insofar as information is reasonably available; however, it will be the responsibility of the CONTRACTOR to preserve all existing utilities whether shown on the Drawings or not. If utility conflicts are encountered by the CONTRACTOR during construction, CONTRACTOR shall give sufficient notice to the CITY so that they may make the necessary adjustments. Damage to any utility, which in the opinion of the CITY is caused by carelessness on the part of the CONTRACTOR, shall be repaired at the expense of the CONTRACTOR.

1.19 GUARANTEE

A. The CONTRACTOR shall guarantee the equipment, material and labor performed under the Contract against any and all failures in proper use and operation for a period of one (1) year from date of written acceptance by the CITY.

B. The CONTRACTOR shall also obtain warranties from manufacturers for each piece of equipment furnished so that the manufacturer's warranty fully covers the equipment for a period of one (1) year from the date of written acceptance by the CITY, unless otherwise specified in the specifications.

1.20 PERFORMANCE OF WORK

A. The CONTRACTOR shall provide all personnel and equipment required to complete all work specified herein and on the Drawings. In an emergency situation, if the CITY determines that it must provide staff and/or equipment to assist the CONTRACTOR in the satisfactory performance of the Contract terms and conditions, the CONTRACTOR at the applicable prevailing wage rates shall reimburse the CITY.

B. CONTRACTOR shall provide forty-eight (48) hours advance written notice to the CITY for approval of CONTRACTOR'S intention to work overtime on weekdays or to work on the weekends.

1.21 BARRICADING (SAFETY)

A. The CONTRACTOR shall be responsible for the furnishing and maintaining of all required barricades, either the lighted or the reflector type, to ensure the public's safety during open trench work or for any other potentially unsafe or hazardous construction activities. Barricades shall be located and displayed in conformance with the most stringent regulations required by the governing agencies. All costs for barricading, including any permits, shall be the responsibility of the CONTRACTOR.

B. All work in public rights-of-way and on private property shall be done in strict compliance with these specifications and Florida Department of Transportation Minimum Standards. Failure to so comply will result in cessation of operations and the removal of project related obstructions from the right-of-way until compliance is achieved.

1.22 EMERGENCY ACCESS AND SECURITY

A. In order to provide protection to the workers and residents, the CONTRACTOR shall maintain emergency access to the property at all times during construction. These access ways shall be protected and delineated with lighted barricades or other such devices as approved by the regulatory agency. Both ends of the emergency access way shall be blocked in accordance with the MOT permit approved by the CITY with signage indicating that this access way is to be used by emergency vehicles only.

B. No trenches or holes shall be left open after working hours. In the event a trench must be left open after hours, it shall be done so only with the express written permission from the ENGINEER, and it shall be the CONTRACTOR'S responsibility to provide proper protection of the open trench or hole as required by the regulatory agency. In addition, the CONTRACTOR shall provide a security guard at the site whenever the CONTRACTOR'S personnel are not present, 24 hours per day/ 7 days per week. It shall be the Security Guard's responsibility to protect the open trench or hole from trespassers and to direct emergency personnel on site. The Security Guard shall not have any other responsibilities such as operating pumps or equipment but shall be dedicated to protecting the trench or open hole. The Security Guard shall be equipped with a wireless telephone capable of calling 911 to report an emergency and shall keep that telephone on their person at all times. In addition to this provision the CONTRACTOR shall maintain trench safety and comply with current OSHA regulations and the Trench Safety Act. The CONTRACTOR shall maintain and keep all safety barricades, signage, flashers, and detours, in operating condition. A copy of the approved MOT plans, and details, shall be on site at all times.

C. All roads are to be maintained during the described construction as to always allow Emergency Access. This item will be paid for under the bid item for Mobilization as named in the Bid Schedule.

1.23 VIBRATORY COMPACTION

A. The use of vibratory compaction equipment shall be limited to a total gross weight of three (3) tons. The use of vibratory equipment shall be limited to compacting backfill of utility trenches and subgrade of paved areas only. If approved in writing by the

ENGINEER, larger vibratory compaction equipment may be allowed if operated in a static mode only.

1.24 REPORTING OF DAMAGE CLAIMS

A. The CONTRACTOR shall keep the CITY informed of any damage claims made against the CONTRACTOR during the construction period. All claims for automobile damage, property damage/bodily injury will be reported to the CONTRACT ADMINISTRATOR within 24 hours of receipt of notice. CONTRACTOR will conduct a timely investigation of the claim and determine if they will honor the claim and/or report to their insurance carrier. CONTRACTOR will advise the City of Fort Lauderdale in writing of their decision/referral to carrier.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01005

SECTION 01010 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 SCOPE

A. Section Includes:

1. Project information.
2. Notice to Bidders.
3. Site Investigation.
4. Work By Others.
5. Work Sequence.
6. Work Schedule.
7. Computation Of Contract Time.
8. Contractor Use of Premises.
9. Pre-Construction Conference.
10. Utility Locations.
11. Line And Grade.
12. Protection And Restoration of Survey Monuments.
13. Equipment.
14. Storage Sites.
15. Ownership Of Existing Materials.
16. Excess Material.
17. Audio-Visual Preconstruction Record.
18. Environmental Protection.
19. Maintenance And Protection of Traffic
20. Maintenance And Protection of Existing Drainage System
21. Application For Payment for Stored Materials
22. Special Conditions for Construction by Other Agencies.
23. Specification and Drawing conventions.

1.2 PROJECT INFORMATION

A. Project Identification: Parks Bond and Parks Master Plan Design Implementation Services.

1. AECOM Project No. 60667503 Task Order No.6 - for the following parks:
    a. Bayview (P12645).
    b. Florence Hardy (P12651).
    c. Mills Pond(P12663).
2. AECOM Project No. 60667539 - Task Order No.7 for the following parks:
    a. Bass (P12644).
    b. Hortt (P12655).
    c. Riverside (P12668).
3. AECOM Project No. 60672854 – Task Order No. 8 - for the following parks:
    a. Annie Beck (P12643).
    b. Dottie Mancini (P12649).
    c. Warfield (P12680).

4. AECOM Project No. 60672929 – Task Order No.12 – for Carter Park.
5. AECOM Project No. 60686375 – Task Order No.13 - Holiday Park Design (P12633).
6. AECOM Project No. 60711655 – Task Order No. 29 – Sunrise Middle School (P12777).

B. Owner: Fort Lauderdale Parks and Recreation Department.

1. Owner's Representative: Marc Isaac.

C. Architect: AECOM Technical Services, Inc..

1. Architect's Representative: Maria Rivera and John Crumpton.

D. Architect's Consultants: Architect has retained the following design professionals, who have prepared designated portions of the Contract Documents:

1. HAMMOND & ASSOCIATES.
2. BCC ENGINEERING.
3. CURTIS+ROGERS.
4. PDS.
5. GEOSOL.
6. CORRADINO GROUP.

1.3 NOTICE TO BIDDERS

A. The successful bidder, in order to be considered responsive, must possess the appropriate License as described in the Contract Documents.

B. It should also be noted that the successful bidder will, at the time of the pre- construction conference, be required to show that each of the CONTRACTOR'S subcontractors is in compliance with the City's Code of Ordinances.

1.4 SITE INVESTIGATION

A. The CONTRACTOR, by virtue of signing the Contract, acknowledges that CONTRACTOR and all subcontractors have satisfied themselves to the nature and location of the work, the general and local conditions including, but not restricted to: those bearing upon transportation; disposal, handling and storage of materials; access roads to the site; the conformation and conditions of the work area; and the character of equipment and facilities needed preliminary to and during the performance of the work. Failure on the part of the CONTRACTOR to completely or properly evaluate the site conditions shall not be grounds for additional compensation.

B. Soil boring information will not be furnished to the CONTRACTOR. The CONTRACTOR, by virtue of signing the Contract, acknowledges that CONTRACTOR and subcontractors have satisfied themselves as to the nature and extent of soil and (underground) water conditions on the project site. No additional payment will be made to the CONTRACTOR because of differences between actual conditions and those shown by the boring logs.

1.5 WORK BY OTHERS

A. Concurrent Work by Other CONTRACTORS. The CONTRACTOR'S attention is directed to the fact that other CONTRACTORS may conduct work at the site during the performance of the WORK under this Contract. The CONTRACTOR shall conduct its

operations so as to cause little or no delay to WORK of such other CONTRACTORS, and shall cooperate fully with such CONTRACTORS to provide continued safe access to their respective portions of the site, as required to perform work under their respective contracts.

B. Interference with Work on Utilities. The CONTRACTOR shall cooperate fully with all utility forces of the OWNER or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities which interfere with the progress of the WORK, and shall schedule the WORK so as to minimize interference with said relocation, altering, or other rearranging of facilities.

1.6 WORK SEQUENCE

A. The CONTRACTOR shall schedule and perform the work in such a manner as to result in the least possible disruption to the public's use of the parking and park facilities, roadways, driveways, and utilities. Utilities shall include but not be limited to water, sewerage, drainage structures, ditches and canals, gas, electric, television and telephone. Prior to commencing with the WORK, CONTRACTOR shall perform a location investigation of existing underground utilities and facilities in accordance with Section 01530 entitled "Protection of Existing Facilities" and shall have obtained all required permits and permissions, CONTRACTOR shall also deliver written notice to the CITY, ENGINEER, ARCHITECT and property occupants (private and public) of all planned disruption to roadway, driveways, temporary displacement of fences, mailboxes, street signs and traffic signs, and utilities 72 hours in advance of disruption.

1.7 WORK SCHEDULE

A. Time is of the essence in completing this project. Because time is of the essence the CONTRACTOR shall commit the necessary resources to this project to complete it in a timely manner. Those resources may include multiple working crews, working overtime, etc. Because time is of the essence, the CONTRACTOR'S construction progress will be monitored closely on a weekly basis. The Construction progress will be measured with the construction schedule submitted by the CONTRACTOR. If the ENGINEER/ARCHITECT determines that the CONTRACTOR does not meet the Critical Path Method (CPM) as specified in Section 01311 "Construction Progress Documentation", the CONTRACTOR will be required to commit those resources necessary to ensure the completion of the project in a timely manner including working overtime, adding other work crews, etc. All costs incurred to implement measure to complete the work in timely manner will be borne by the CONTRACTOR at no additional cost to the OWNER.

B. REQUIRED PERIODS OF WORK SUSPENSION

1. CONTRACTOR shall shut down operations for all City Holidays, terminating production work by noon on the day preceding the holiday (or the weekend before said holiday) and not resuming operations until the start of the following week (or the day after the holiday, whichever is later). The CONTRACTOR shall ensure that the site is restored per Sections 01001 and 01010 and all areas that are off limits to the public will be clearly delineated and protected. For a full list of holidays, please refer to the City; however these include, but are not limited to New Year's Eve and Day, Martin Luther King's Birthday, Memorial Day, the 4th of July, Labor Day, Thanksgiving Day and the day after Thanksgiving Day, Christmas Eve and Christmas.

2. The CONTRACTOR shall include these provisions in the schedule required in 01311 "Construction Progress Documentation" and there shall be no additional time granted for these work suspensions.

3. No additional compensation shall be granted for demobilization, cleaning and remobilization as a result of these work suspensions.

4. During the work suspensions, the CONTRACTOR shall remain liable for the safety and security of the project site and be available 24 hours per the Contract Documents. CONTRACTOR shall have personnel visit the site daily during these suspensions to ensure the safety and security of the site.

C. SCHEDULE

1. CONTRACTOR shall submit scheduling information for the work as required in Section 01311 "Construction Progress Documentation".

2. No separate payment shall be made for preparation and/or revision of the schedule.

D. On-Site Work Hours: Work hours shall be defined at the pre-construction meeting and shall comply with all permit conditions. Except otherwise indicated, work shall be performed during normal business working hours of 8:00 a.m. to 5:00 p.m., Monday through Friday. Also, contractor must be aware of both residential and commercial surroundings (traffic and operations).

1.8 COMPUTATION OF CONTRACT TIME

A. It is the CONTRACTOR'S responsibility to provide clear and convincing documentation to the ENGINEER/ARCHITECT as to the effect additional work will have with respect to additional contract time extension that may be justified. If additional quantities of work can be carried out concurrent with other existing construction activities without disrupting the critical path of the project, then no contract time extension will be granted. The CONTRACTOR is obligated to provide documentation to the ENGINEER/ARCHITECT if additional elements of work affect the critical path of the project. If work set forth in the original scope of the project is deleted, the contract time may be reduced. This contract is a calendar day contract. While the CONTRACTOR may be granted time to suspend work operations for vacations or holidays, contract time will not be suspended. During suspensions, the CONTRACTOR shall be responsible for all maintenance of traffic and liability without additional compensation from the CITY.

1.9 CONTRACTOR USE OF PREMISES

A. The CONTRACTOR's use of the project site shall be limited to its construction operations. The CONTRACTOR will arrange for storage of materials and a copy of an agreement for use of other property shall be furnished to the ENGINEER/ARCHITECT.

1.10 PRE-CONSTRUCTION CONFERENCE

A. After the award of Contract, a Pre-construction Work Conference will be held between the CONTRACTOR, the ENGINEER/ARCHITECT, the CITY, other interested Agencies, representatives of Utility Companies and others affected by the work. The ENGINEER/ARCHITECT will set the time and place of this conference. The CONTRACTOR shall bring to the conference a copy of the proposed work schedule for the approval by the ENGINEER/ARCHITECT of the proposed methods and manner of

executing the work including sequences of operation and time schedule. The work shall be performed in accordance with such schedule or approved amendments thereto.

1.11 UTILITY LOCATIONS

A. As far as possible, all existing utility lines in the project area have been shown on the plans. However, the CITY does not guarantee that all lines are shown, or that said lines are in their true location. It shall be the CONTRACTOR'S responsibility to identify and locate all underground or overhead utility lines or equipment affected by the project. No additional payment will be made to the CONTRACTOR because of discrepancies in actual and plan location of utilities and damages suffered as a result thereof.

B. The CONTRACTOR shall notify each utility company involved at least thirty (30) days prior to the start of construction to arrange for positive underground location, relocation or support of its utility where that utility may be in conflict with or endangered by the proposed construction. The CONTRACTOR shall pay for relocation of water mains or other utilities for the convenience of the CONTRACTOR. The CONTRACTOR shall pay for all charges by utility companies for temporary support of its utilities. All costs of permanent utility relocations to avoid conflict shall be the responsibility of the CONTRACTOR and the utility company involved.

C. The CONTRACTOR shall schedule and coordinate their work in such a manner that they are not delayed by the utility companies relocating or supporting their utilities. No compensation will be paid to the CONTRACTOR for any loss of time or delay.

D. All overhead, surface, and underground structures and/or utilities encountered are to be carefully protected from damage or displacement. All damage to said structures and/or utilities is to be completely repaired within a reasonable time; needless delay will not be tolerated. The CITY reserves the right to remedy any damage by ordering outside parties to make repairs at the expense of the CONTRACTOR. All repairs made by the CONTRACTOR are to be made to the satisfaction of the utility owner and shall be inspected by a representative of the utility owner and the ENGINEER.

E. The CONTRACTOR should be aware of the Sunshine State One Call Center, which has a free locating service for CONTRACTORS and excavators. Within forty-eight hours before excavating, dial toll free 1-800-432-4770, and a locator will be dispatched to the work location. CONTRACTOR shall reasonably notify other utility companies not notified by Sunshine State One Call Center.

F. The permits listed below will be obtained for the project by the CITY prior to beginning construction. The CONTRACTOR is responsible for compliance with any and all permit conditions. In the event that the CITY must obtain permits in addition to those listed below, the CONTRACTOR shall not have any claim for damages arising from any delay caused by the CITY'S obtaining said additional permits.

1. Permit number: 2302510876 via Broward County Schools Building Department

G. Permits to be obtained by the CONTRACTOR include, but are not limited to the following:

1. Local, county and State contracting licenses.

1.12 LINE AND GRADE

A. The ENGINEER has provided vertical and horizontal control for layout of the work in the form of benchmarks and reference points located adjacent to the work. From these controls provided, the CONTRACTOR shall develop and make all detailed surveys needed for construction as-built purposes and shall establish all working points, lines and elevations necessary to perform the work. A Professional Land Surveyor registered in the State of Florida shall supervise this surveying work.

1.13 PROTECTION AND RESTORATION OF SURVEY MONUMENTS

A. The CONTRACTOR shall carefully protect from disturbance all survey monuments, stakes and bench marks, whether or not established by CONTRACTOR, and shall not remove or destroy any surveying point until it has been properly witnessed by the ENGINEER. All major survey monuments that have been damaged by the CONTRACTOR such as section corners, 1/4 section corners; property corners or block control points shall be replaced at the CONTRACTOR'S expense with markers of a size and type approved by the ENGINEER. The replacement shall be under the supervision of a Florida Registered Land Surveyor where directed by the ENGINEER.

1.14 EQUIPMENT

A. All equipment necessary and required for the proper construction of all facilities shall be on the construction site, in first-class working condition.

1.15 STORAGE SITES

A. The CONTRACTOR shall furnish, at CONTRACTOR's expense, properly zoned areas suitable for field office, material storage and equipment service and storage. No material may be stored in the public right of way without prior authorization by the agency having jurisdiction. The CONTRACTOR shall keep these areas in a clean and orderly condition so as not to cause a nuisance or sight obstruction to motorists or pedestrians.

1.16 OWNERSHIP OF EXISTING MATERIALS

A. All materials removed or excavated from the job site shall remain the property of the CITY until released by the Contract Administrator, at which time it shall become the property of the CONTRACTOR, who shall dispose of it in a manner satisfactory to the ENGINEER/ARCHITECT.

1.17 EXCESS MATERIAL

A. Upon direction of the ENGINEER, all vegetation, debris, concrete or other unsuitable materials shall be disposed of in areas provided by the CONTRACTOR and approved by the ENGINEER. Any excess material desired to be retained by the CITY shall be delivered by the CONTRACTOR to a designated area within a 5-mile radius of the project, at no extra cost to the CITY.

1.18 AUDIO-VISUAL PRECONSTRUCTION RECORD

A. General

1. Prior to beginning the work, the CONTRACTOR shall have a continuous color audio-video recording taken along the entire length of the project to serve as a record of preconstruction conditions. No construction shall begin prior to review

and approval of the video covering the construction area by the ENGINEER/ARCHITECT. The ENGINEER/ARCHITECT shall have the authority to reject all or any portion of the videos not conforming to the specifications and order that it be redone at no additional charge. The CONTRACTOR shall reschedule unacceptable coverage within five days after being notified. The ENGINEER/ARCHITECT shall designate those areas, if any, to be omitted from or added to the audio-video coverage.

1.19 ENVIRONMENTAL PROTECTION

A. The CONTRACTOR shall furnish all labor and equipment and perform all work required for the prevention of environmental pollution during and as a result of the work under this contract. For the purpose of this contract, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life, affect other species of importance to man, or degrade the utility of the environment for aesthetic and recreational purposes. The control of environmental pollution requires consideration of air, water, land and involves noise, solid waste management and management of radiant energy and radioactive materials, as well as other pollutants. Environmental pollution prevention shall be in accordance with NPDES requirements with no additional cost to the CITY.

1.20 MAINTENANCE AND PROTECTION OF TRAFFIC

A. The CONTRACTOR shall provide all necessary traffic control devices in order to redirect, protect, warn or maintain existing vehicular and pedestrian traffic during the course of construction.

1. Construction Phasing Requirements

a. Contractor shall arrange the schedule to maintain minimum of 11' travel lane for each direction at all time.

B. TRAFFIC CONTROL

1. The CONTRACTOR is required to submit a conceptual Traffic Control Plan at the Pre-Construction Conference. This preliminary plan should identify the phases of construction that the CONTRACTOR plans to proceed with and identify traffic flows during each phase. The ENGINEER will have ten (10) days to notify the CONTRACTOR of any comments. Once the conceptual plan for maintaining traffic has been approved, the CONTRACTOR will be required to submit a detailed plan showing each phase's Maintenance and Protection Plan prior to starting construction of any phase.
2. The "Maintenance of Traffic" plan shall include pedestrian traffic as well as vehicular traffic. It shall be the responsibility of the CONTRACTOR for any necessary Construction, Pavement Marking and Signage or any Pedestrian Signalization and/or Signal Modification to accommodate an alternate safe walk route.
3. The CONTRACTOR, at all times, shall conduct the work in such a manner as to insure the least obstruction to traffic as is practical. Convenience of the general public and of the residents adjacent to the work shall be provided for in a satisfactory manner, as determined by the ENGINEER.
4. Sidewalks, gutters, drains, fire hydrants and private drives shall, insofar as practical, be kept in condition for their intended uses. Fire hydrants on or adjacent

to the work shall be kept accessible to fire apparatus at all times, and no material or obstruction shall be placed within twenty (20) feet of any such hydrant.

5. All existing stop and street name signs will be maintained as long as deemed necessary by the ENGINEER.
6. The CONTRACTOR shall furnish a sufficient number of protective devices to protect and divert the vehicular and pedestrian traffic from working areas closed to traffic, or to protect any new work. Failure to comply with this requirement will result in the ENGINEER shutting down the work until the CONTRACTOR provides the necessary protection.
7. Any time traffic is diverted for a period of time that will exceed one-work day temporary pavement markings will be required. Existing pavement markings that conflict with the new work zone traffic pattern must be obliterated. Painting over existing pavement markings (black out) is not permitted.

1.21 MAINTENANCE AND PROTECTION OF EXISTING DRAINAGE SYSTEM

A. It shall be the responsibility of the contractor to maintain positive drainage on the surface and to ensure that the existing underground drainage system continues to function as intended during the construction. The contractor shall follow the plans to ensure that existing catch basins and manholes are being protected during the entire phase of construction.

1.22 APPLICATION FOR PAYMENT FOR STORED MATERIALS

A. Application for payment for stored materials may not be made by the CONTRACTOR.

1.23 SPECIAL CONDITIONS FOR CONSTRUCTION BY OTHER AGENCIES

A. It will be the CONTRACTOR'S responsibility to coordinate construction schedules with other contractors so as to minimize disruptions, and inconveniences. The project site shall be safe at all times for construction workers and marina visitors.

1.24 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.

C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.

2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings and published as part of the U.S. National CAD Standard.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01010

SECTION 01025 - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUBMITTALS

A. See Section 01340 "Submittal Procedures", and all other references to document submittals. Submittals shall include, but are not limited to:

1. Schedule of Values: Submit schedule on OWNER's form.
2. Application for Payment.
3. Final Application for Payment.

1.2 SCHEDULE OF VALUES

A. Prepare a schedule of values for the Work.

B. Lump Sum Work:

1. Contractor to provide a detailed schedule of values (SOV) included in conformed Bid Form.
2. List Bonds and insurance premiums, mobilization, demobilization, facility startup, and contract closeout separately.
3. Break down by Divisions 2 through 33 with appropriate subdivision of each Specification.

C. An unbalanced or front-end loaded schedule will not be acceptable.

D. The owner's representative will review and provide comments on the SOV. Contractor must complete changes to SOV as per comments provided and no pay app shall be submitted for payment until final approval of SOV as approved by the owner.

E. Lump sum line items on the approved SOV must be provided separately and with detailed descriptions to justify monthly requirements. The descriptions must be quantifiable for tracking and validation purposes. These line items do not release the contractor from the overall lump sum contract.

F. Summation of the complete schedule of values representing all the Work shall equal the Contract Price.

1.3 APPLICATION FOR PAYMENT

A. Transmittal Summary Form: Attach one Summary Form with each detailed Application for Payment and include Request for Payment of Materials and Equipment on Hand as applicable. Execute certification by authorized officer of CONTRACTOR.

B. Use detailed Application for Payment Form provided by OWNER.

C. Include accepted schedule of values for each portion of Work and the unit price breakdown for the Work to be paid on unit price basis, and a listing of OWNER-selected equipment, if applicable, and allowances, as appropriate.

D. Preparation:

1. Round values to nearest dollar.
2. List each Change Order and Written Amendment executed prior to date of submission as separate line item. Totals to equal those shown on the Transmittal Summary Form.
3. Submit Application for Payment, including a Transmittal Summary Form and detailed Application for Payment Form, a listing of materials on hand as applicable, and such supporting data as may be requested by OWNER.

1.4 MEASUREMENT - GENERAL

A. Weighing, measuring, and metering devices used to measure quantity of materials for Work shall be suitable for purpose intended and conform to tolerances and Specifications as specified in National Institute of Standards and Technology, Handbook 44.

B. Whenever pay quantities of material are determined by weight, material shall be weighed on scales furnished by CONTRACTOR and certified accurate by state agency responsible. Weight or load slip shall be obtained from weigher and delivered to CONSTRUCTION MANAGER or OWNER's representative at point of delivery of material.

C. If material is shipped by rail, car weights will be accepted provided that actual weight of material only will be paid for and not minimum car weight used for assessing freight tariff, and provided further that car weights will not be acceptable for material to be passed through mixing plants.

D. Vehicles used to haul material being paid for by weight shall be weighed empty daily and at such additional times as required by CONSTRUCTION MANAGER. Each vehicle shall bear a plainly legible identification mark.

E. Materials that are specified for measurement by the cubic yard measured in the vehicle shall be hauled in vehicles of such type and size that actual contents may be readily and accurately determined. Unless all vehicles are of uniform capacity, each vehicle must bear a plainly legible identification mark indicating its water level capacity. Vehicles shall be loaded to at least their water level capacity. Loads hauled in vehicles not meeting above requirements or loads of a quantity less than the capacity of the vehicle, measured after being leveled off as above provided, will be subject to rejection, and no compensation will be allowed for such material.

F. Where measurement of quantities depends on elevation of existing ground, elevations obtained during construction will be compared with those shown on Drawings. Variations of 1 foot or less will be ignored, and profiles shown on Drawings will be used for determining quantities.

G. Units of measure shown on Bid Form shall be as follows, unless specified otherwise. All methods of measurement shall be approved by the CONSTRUCTION MANAGER.

Item	Method of Measurement
AC	Acre - Field Measure
CY	Cubic Yard - Field Measure within limits specified or shown, or measured in vehicle by volume, as specified
EA	Each - Field Count
GAL	Gallon - Field Measure
HR	Hour

LB	Pound(s) - Weight Measure by Scale
LF	Linear Foot - Field Measure
LS	Lump Sum - Unit is one; no measurement will be made
SF	Square Foot
SY	Square Yard
TON	Ton - Weight Measure by Scale (2,000 pounds)

1.5 PAYMENT

A. General:

1. Progress payments will be made monthly.
2. The date for CONTRACTOR's submission of monthly Application for Payment.

1.6 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

A. Payment will not be made for following:

1. Loading, hauling, and disposing of rejected or unused material.
2. Quantities of material wasted or disposed of in manner not called for under Contract Documents.
3. Rejected loads of material, including material rejected after it has been placed by reason of failure of CONTRACTOR to conform to provisions of Contract Documents.
4. Material not unloaded from transporting vehicle.
5. Defective Work not accepted by OWNER.
6. Material remaining on hand after completion of Work.

1.7 MOBILIZATION

A. See Section 01505 "Mobilization", for payment limitations. All environmental compliance matters except for erosion control system shall be included in Mobilization.

B. Payment for mobilization will be made at an allowance price named in the Bid Schedule. Payment for mobilization will be made in equal monthly amounts during the duration of the original contract time.

1.8 MAINTENANCE OF TRAFFIC (M.O.T.)

A. See Section 01570 "Traffic Regulations", and all other references to traffic control and maintenance, as well as parking control and maintenance in this document and any regulatory requirements.

B. Payment for maintenance of traffic will be made at an allowance price named in the Bid Schedule. Payment for maintenance of traffic and parking activities will be made in equal monthly amounts during the duration of the original contract time.

1.9 DEMOLITION

A. Measurement for payment to remove and dispose of existing hardscape and landscape elements will be based on a lump sum inclusive of all work on the Demolition drawings.

B. This lump sum for removal and disposal of existing hardscape elements as indicated on the Design Drawings shall constitute full compensation for the removal and disposal of all concrete, asphalt or structures. This includes, but is not limited to sidewalks, curbs, aprons, concrete collars, brick pavers, and all other miscellaneous concrete as directed by the ENGINEER/LANDSCAPE ARCHITECT. Existing structures will not be compensated under this line item.

1.10 PAVING AND DRAINAGE

A. Measurement for payment to furnish and install drainage structures, inlets or top slabs, connections, and paving in addition to all required connections, modifications and cleaning of drainage facilities will be based on the line items provided for each item of work for all work to be performed on the applicable drawings, all in accordance with the requirements of the Contract Documents.

B. Payment for furnishing and installing, modifying or cleaning all drainage appurtenances in the design drawings which price shall constitute full compensation for the completed installation of the structure including but not limited to excavation, backfill, compaction, modifications, disposal, cleaning, all required dewatering and full compliance with the Trench Safety Act.

1.11 WATER AND SEWER

A. Measurement for payment to furnish and install all water and sewer items will be lump sum for all work to be performed on the applicable drawings, all in accordance with the requirements of the Contract Documents.

B. Payment for furnishing and installing all water and sewer items shall constitute full compensation for the completed installation of the structure including but not limited to excavation, backfill, compaction, modifications, disposal, cleaning, all required dewatering and full compliance with the Trench Safety Act.

1.12 STRUCTURES

A. Measurement for payment to furnish and install all shade structures and other structures, will be lump sum for all work to be performed on the applicable drawings, all in accordance with the requirements of the Contract Documents.

B. Payment for furnishing and installing shade structures and other structures shall constitute full compensation for the completed installation of the structure including but not limited to excavation, dewatering, backfill, compaction, modifications, disposal and cleaning.

1.13 AMENITIES

A. Measurement for payment to furnish and install all amenities will be lump sum for all work to be performed on the applicable drawings, all in accordance with the requirements of the Contract Documents.

B. Payment for furnishing and installing all amenities shall constitute full compensation for the completed installation of the structure including but not limited to excavation, dewatering, backfill, compaction, modifications, disposal and cleaning.

1.14 LANDSCAPING

A. Measurement for payment to furnish and install but not limited to the following: trees, sod, groundcover and irrigations. These items will be lump sum for all work to be performed on the applicable drawings, all in accordance with the requirements of the Contract Documents.

B. Payment for furnishing and installing all trees, sod, groundcover and irrigations, shall constitute full compensation for the completed installation of the structure including but not limited to excavation, dewatering, backfill, compaction, modifications, disposal and cleaning.

1.15 ELECTRICAL

A. Measurement for payment to furnish and install all electrical equipment and conduits will be lump sum for all work to be performed on the applicable drawings, all in accordance with the requirements of the Contract Documents.

B. Payment for furnishing and installing all electrical equipment and conduits shall constitute full compensation for the completed installation of the structure including but not limited to excavation, dewatering, backfill, compaction, modifications, disposal and cleaning.

1.16 PERMIT FEES

A. Measurement for payment for permit fees will be based upon the actual permit fees required by the CONTRACTOR from the various agencies having jurisdiction for construction of the project, all in accordance with the Contract Documents. The allowance for permit fee amounts shown on the bid schedule is an estimate of permit fees required for the project and is a cost pass through item. The permit fees are based on allowances and OWNER will reconcile the actual cost with the CONTRACTOR by change order. The CONTRACTOR shall produce documentation upon request verifying actual cost. Only permit fees substantiated and approved by the ENGINEER will be paid as part of this bid item.

B. Because payment for permit fees will be paid as part of this bid item, payment for permit fees will not be paid as part of mobilization.

1.17 CONSIDERATION FOR INDEMNIFICATION (OWNER/ENGINEER)

A. Measurement for payment for indemnification of the OWNER and ENGINEER/ARCHITECT will be based upon the sum named for such work, all in accordance with the requirements of the contract documents.

B. Payment will be twenty-five dollars for consideration for indemnification named in the bid schedule and shall constitute full compensation for indemnifying the OWNER and ENGINEER as specified in the contract documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01025

SECTION 01031 - ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 REQUIREMENTS

A. Coordinate work of trades and schedule elements of alterations and renovation work by procedure and methods to expedite completion of the work.

B. In addition to demolition and that specifically shown, cut, move or remove items necessary to provide access or to allow alterations and new work to proceed. Include such items as:

1. Repair or removal of hazardous or unsanitary conditions.
2. Removal of abandoned items and items serving no useful purpose, such as abandoned piping, conduit and wiring.
3. Removal of unsuitable or extraneous materials not marked for salvage, such as abandoned furnishings and equipment, and debris such as rotted wood, rusted metals and deteriorated concrete, shall be removed from the site expeditiously.
4. Cleaning of surfaces and removal of surface finished as needed to install new work and finishes.
5. Protection as required for existing trees to remain.
6. For purposes of all existing underground utilities work, coordinate as required by use of special telephone number shown on engineering drawings.
7. Site storage for all existing benches, signals, signs, light poles, fire hydrants, manhole covers and grates to be relocated.

C. Patch, repair and refinish existing items to remain, to the specified condition for each material, with a professional transition to adjacent new items of construction.

1.2 RELATED REQUIREMENTS

A. All applicable sections of the Specifications.

B. Conditions of the Contract.

1.3 DEFINITIONS

A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.

B. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

C. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.

D. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

E. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

F. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

G. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.

H. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.

I. Retain: To keep an element or detail secure and intact.

J. Strip: To remove existing finish down to base material unless otherwise indicated.

1.4 COORDINATION

A. Alteration Work Subschedule: A construction schedule coordinating the sequencing and scheduling of alteration work for entire Project, including each activity to be performed, and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for alteration work.

1. Schedule construction operations in sequence required to obtain best Work results.
2. Coordinate sequence of alteration work activities to accommodate the following:
    a. Owner's continuing occupancy of portions of existing building.
    b. Owner's partial occupancy of completed Work.
    c. Other known work in progress.
    d. Tests and inspections.
3. Detail sequence of alteration work, with start and end dates.
4. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
5. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use in existing structure. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.

1.5 PROJECT MEETINGS FOR ALTERATION WORK

A. Preliminary Conference for Alteration Work: Before starting alteration work, conduct conference at Project site.

1. Attendees: In addition to representatives of Owner, Architect, and Contractor, testing service representative, specialists, and chemical-cleaner manufacturer(s) shall be represented at the meeting.
2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:
    a. Alteration Work Subschedule: Discuss and finalize; verify availability of materials, specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
    b. Fire-prevention plan.

c. Governing regulations.
d. Areas where existing construction is to remain and the required protection.
e. Hauling routes.
f. Sequence of alteration work operations.
g. Storage, protection, and accounting for salvaged and specially fabricated items.
h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
i. Qualifications of personnel assigned to alteration work and assigned duties.
j. Requirements for extent and quality of work, tolerances, and required clearances.
k. Embedded work such as flashings and lintels, special details, collection of waste, protection of occupants and the public, and condition of other construction that affects the Work or will affect the work.

3. Reporting: Record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.

1.6 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain Owner's property.

1. Carefully dismantle and salvage each item or object in a manner to prevent damage and protect it from damage, then promptly deliver it to Owner where directed at Project site.

1.7 INFORMATIONAL SUBMITTALS

A. Alteration Work Subschedule:

1. Submit alteration work subschedule within 30 days of date established for commencement of alteration work.

B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements that are to remain, including finish surfaces, that might be misconstrued as damage caused by Contractor's alteration work operations.

C. Alteration Work Program: Submit 30 days before work begins.

D. Fire-Prevention Plan: Submit 30 days before work begins.

1.8 QUALITY ASSURANCE

A. Alteration Work Program: Prepare a written plan for alteration work for whole Project, including each phase or process and protection of surrounding materials during operations. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project alteration work program with specific requirements of programs required in other alteration work Sections.

1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.

2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.

B. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.

C. Safety and Health Standard: Comply with ANSI/ASSP A10.6.

1.9 STORAGE AND HANDLING OF SALVAGED MATERIALS

A. Salvaged Materials:

1. Clean loose dirt and debris from salvaged items unless more extensive cleaning is indicated.
2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

B. Salvaged Materials for Reinstallation:

1. Repair and clean items for reuse as indicated.
2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.

1.10 FIELD CONDITIONS

A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of measured drawings and preconstruction photographs.

1. Comply with requirements specified in Section 01380 "Construction Photographs."

B. Discrepancies: Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

1.11 ALTERATIONS, CUTTING AND PROTECTION

A. Assign the work of moving, removal, cutting, patching and protection to trades qualified to perform the work in a manner to cause least damage to each type of work, and provide means of returning surfaces to appearance of new work.

B. Perform cutting and removal work to remove minimum necessary, and in a manner to avoid damage to adjacent work.

1. Cut finish surfaces such as paving, masonry, tile, plaster or metals, by methods to terminate surfaces in a straight line at a natural point of division.

C. Perform cutting and patching as specified in Section 01045 “Cutting and Patching”.

D. Protect existing finishes, equipment, and adjacent work which are scheduled to remain, from damage.

1. Protect existing and new work from weather and extremes of temperature.

PART 2 - PRODUCTS

2.1 PRODUCTS FOR PATCHING, EXTENDING AND MATCHING

A. General Requirements that work be complete:

1. Provide same products or types of construction as that in existing structure, as needed to patch, extend or match existing work.

a. Contract Documents will not define products or standards of working conduct present in existing construction; CONTRACTOR shall determine products in inspection and any necessary testing by use of the existing as a sample of comparison.

2. Presence of a product, finish, or type of construction, requires that patching, extending or matching shall be performed as necessary to make work complete and consistent to existing identical standards of quality.

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.

1. Use only proven protection methods, appropriate to each area and surface being protected.
2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
3. Erect temporary barriers to form and maintain fire-egress routes.
4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.

3.2 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated.
2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
3. If combustible material cannot be removed, provide fire blankets to cover such materials.

3.3 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.

B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.

C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.

D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.

E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.4 PERFORMANCE

A. Patch and extend existing work using skilled mechanics who are capable of matching existing quality. Quality of patched or extended work shall be not less than that specified for new work.

3.5 DAMAGED SURFACES

A. Patch and replace any portion of an existing finished surface with the exception of concrete curb or gutter which is found to be damaged, lifted, discolored, or shows other imperfections. Damaged curbing shall be replaced in sections as directed by the engineer.

1. Provide adequate support of substrate prior to patching the finish.

2. Refinish patched portions of painted or coated surfaces in a manner to produce uniform color and texture over entire surface.

3. When existing surface finish cannot be matched, refinish entire surface to nearest intersections.

3.6 TRANSITION FROM EXISTING TO NEW WORK

A. When new work abuts or is finished flush with existing work, make a smooth transition. Patched work shall match existing adjacent work in texture and appearance so that the patch of transition is invisible at a distance of five feet.

1. When finished surfaces are cut in such a way that a smooth transition with new work is not possible, terminate existing surface in a neat manner along a straight line at a natural line of division, and provide trim appropriate to finished surface.

3.7 CLEANING

A. Perform periodic and final cleaning as specified in Section 01710.

1. Clean Owner-occupied areas daily.
2. Clean spillage, overspray, and heavy collection of dust in OWNER occupied areas immediately.

B. At completion of work of each trade, clean area and make surfaces ready for work of successive trades.

C. At completion of alterations work in each area, provide final cleaning and return space to a condition suitable for use by OWNER.

3.8 GENERAL ALTERATION WORK

A. Have specialty work performed only by qualified specialists.

B. Ensure that supervisory personnel are present when work begins and during its progress.

C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs. Comply with requirements in Section 01380 "Construction Photographs."

D. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.

E. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

END OF SECTION 01031

SECTION 01040 - COORDINATION

PART 1 - GENERAL

1.1 SUBMITTALS

A. Informational

1. Statement of Qualification (SOQ) for land surveyor or civil engineer.
2. Statement of Qualification (SOQ) for professional videographer.

B. Photographs

1. Color Prints
    a. Submit two copies within 5 days of being taken.
2. Video Recordings
    a. Submit two copies within 5 days of being taken.

1.2 UTILITY NOTIFICATION AND COORDINATION

A. Coordinate the Work with various utilities within Project limits. Notify applicable utilities prior to commencing Work.

B. Contact the City of Fort Lauderdale Public Services Department at 954-828-8000 for water and sewer utility locations.

C. Contact Sunshine State One Call at 1-800-432-4770 at least 2 business days prior to any excavation.

D. If damage occurs, or if conflicts or emergencies arise during Work, contact the appropriate utility.

1. Electricity Company: Florida Power and Light.
    a. Contact Person: Trouble Center (or police/fire – 911).
    b. Telephone: (954)321-2056
2. Telephone Company: AT&T Distribution
    a. Contact Person: Otis Keeve
    b. Telephone: 954-723-2540
3. Water and Sewer Department: Fort Lauderdale Public Services Department.
    a. Contact Person: Emergency Hotline.
    b. Telephone: 954-828-8000
4. Gas Company: TECO Peoples Gas
    a. Contact Person: Danny Rivera / Max Chamorro
    b. Telephone: (954)931-9742 / (954)453-0812
5. Telecom: Comcast.
    a. Contact: John Matonti
    b. Telephone: 954-447-8486

6. Telecom: Hotwire
    a. Contact: Walter Sancho-Davila
    b. Telephone: 954-699-0900
7. Broward County Traffic Engineering Division (For Traffic SignalCommunications Systems Underground Cable and Traffic Loops):
    a. Contact: Tony Casas
    b. Telephone: (954)847-2752

1.3 PROJECT MEETINGS

A. General

1. Contract: Schedule physical arrangements for meetings throughout progress of Work, prepare meeting agenda with City/Construction Manager and Contractor input and distribute with written notice of each meeting, preside at meetings, record minutes to include significant proceedings and decisions, and reproduce and distribute copies minutes after each meeting to participants and parties affected by meeting decisions.
2. Representatives of City/Construction Manager, Contractor, and Subcontractors shall attend meetings as needed.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Attendees: Authorized representatives of Owner/Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:
    a. Responsibilities and personnel assignments.
    b. Tentative construction schedule.
    c. Critical work sequencing and long lead items.
    d. Designation of key personnel and their duties.
    e. Lines of communications.
    f. Use of web-based Project software.
    g. Procedures for processing field decisions and Change Orders.
    h. Procedures for RFIs.
    i. Procedures for testing and inspecting.
    j. Procedures for processing Applications for Payment.
    k. Distribution of the Contract Documents.
    l. Submittal procedures.
    m. Preparation of Record Documents.
    n. Use of the premises and existing building.
    o. Work restrictions.
    p. Working hours.
    q. Owner's occupancy requirements.
    r. Responsibility for temporary facilities and controls.

s. Procedures for moisture and mold control.
t. Procedures for disruptions and shutdowns.
u. Construction waste management and recycling.
v. Parking availability.
w. Office, work, and storage areas.
x. Equipment deliveries and priorities.
y. First aid.
z. Security.
aa. Progress cleaning.

1) Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect/Construction Manager of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Possible conflicts.
i. Compatibility requirements.
j. Time schedules.
k. Weather limitations.
l. Manufacturer's written instructions.
m. Warranty requirements.
n. Compatibility of materials.
o. Acceptability of substrates.
p. Temporary facilities and controls.
q. Space and access limitations.
r. Regulations of authorities having jurisdiction.
s. Testing and inspecting requirements.
t. Installation procedures.
u. Coordination with other work.
v. Required performance results.
w. Protection of adjacent work.
x. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner/Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
    a. Preparation of Record Documents.
    b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
    c. Submittal of written warranties.
    d. Requirements for preparing operations and maintenance data.
    e. Requirements for delivery of material samples, attic stock, and spare parts.
    f. Requirements for demonstration and training.
    g. Preparation of Contractor's punch list.
    h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
    i. Submittal procedures.
    j. Owner's partial occupancy requirements.
    k. Installation of Owner's furniture, fixtures, and equipment.
    l. Responsibility for removing temporary facilities and controls.
4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

E. Progress Meetings: Conduct progress meetings at weekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner/ Construction Manager, 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 meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. 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. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required

to ensure that current and subsequent activities will be completed within the Contract Time.

1) Review schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site use.
8) Temporary facilities and controls.
9) Progress cleaning.
10) Quality and work standards.
11) Status of correction of deficient items.
12) Field observations.
13) Status of RFIs.
14) Status of Proposal Requests.
15) Pending changes.
16) Status of Change Orders.
17) Pending claims and disputes.
18) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

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.

F. Coordination Meetings: Conduct Project coordination meetings at monthly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner/ Construction Manager, 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 meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined 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.

b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

c. Review present and future needs of each contractor present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site use.
8) Temporary facilities and controls.
9) Work hours.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.
13) Status of RFIs.
14) Proposal Requests.
15) Change Orders.
16) Pending changes.

G. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

H. Other Meetings

1. In accordance with the Contract Documents and as may be required by the City and Engineer/Architect.

1.4 FACILITY OPERATIONS

A. Continuous operation of City's facilities is of critical importance. Schedule and conduct activities to enable existing facilities to operate continuously, unless otherwise specified.

B. Perform Work continuously during critical connections and changeovers, and as required to prevent interruption of City's operations.

C. When necessary, plan, design, and provide various temporary services, utilities, connections, temporary piping and heating, access, and similar items to maintain continuous operations of City's facilities.

D. Do not close lines, open or close valves, or take other action which would affect the operation of existing systems, except as specifically required by the Contract Documents and after authorization by City and Engineer. Such authorization will be considered within 48 hours after receipt of Contractor's written request.

E. Provide **7** days advance written request for approval of need to shut down a process or facility to City/Construction Manager.

F. Power outages will be considered upon 48 hours written request to City. Describe the reason, anticipated length of time, and areas affected by the outage. Provide temporary provisions for continuous power supply to critical facility components.

G. Do not proceed with Work affecting a facility's operation without obtaining City's advance approval of the need for and duration of such Work.

H. Relocation of Existing Facilities:

1. During construction, it is expected that minor relocations of Work will be necessary.

2. If Contractor determines that in order to expedite construction of new water and or sewer mains it would be necessary to temporarily remove and replace existing water services and/or sewer service connections, he will be responsible for the removal and replacement of such service connections at his own cost and effort. The City will not provide additional compensation for any costs associated with such effort. All labor and material costs associated with means and methods of construction will be compensated as part of the bid item(s) cost submitted by the Contractor. Additionally, the Contractor will have to coordinate and inform utility owner(s) and any City resident(s) impacted by such activities and must repair such utilities in a timely manner to minimize disruption of service.

3. Provide complete relocation of existing structures and Underground Facilities, including piping, utilities, equipment, structures, electrical conduit wiring, electrical duct bank, traffic loop detectors and other necessary items.

4. Use only new materials for relocated facility. Match materials of existing facility, unless otherwise shown or specified.

5. Perform relocations to minimize downtime of existing facilities.

6. Install new portions of existing facilities in their relocated position prior to removal of existing facilities, unless otherwise accepted by City.

1.5 BYPASS PUMPING

A. Where the Work includes connections or modifications to existing sanitary sewer systems, wastewater flows shall be controlled through the pipeline sections and pump stations where work is being performed. Under no circumstances, can portions of the system be removed from service for periods of time in excess of that approved by the City. The Contractor shall be responsible to assess conditions and capacities of the existing sewer lines and pump stations in order to implement an acceptable bypass plan at no additional cost to the City. Bypass pumping will be required for all sewers and pump station construction that would result in shutdown of existing facilities. The Contractor shall supply the necessary pumps, conduits, and other equipment to not only divert flow around the pump station, manhole, or pipe section in which work is to be performed, but also to transmit the flow in downstream sewer lines and/or pump stations without surcharge. The bypass systems shall be of sufficient capacity to handle existing flows plus additional flows that may occur during periods of high tide or rainfall. Emergency backup pumping capability must be available in addition to the primary bypass system. The Contractor will be responsible for furnishing the necessary labor, power, and supervision to set up and operate the pumping and bypass systems. When pumping is in operation, all engines shall be equipped in a manner to keep the pump noise to a minimum and to comply with applicable noise ordinances.

B. Contractor shall be responsible for any damage to properties or buildings connected to the sewer system, and to the pipeline, which result from the flow control activities.

C. Contractor shall submit a bypass pumping plan for all proposed bypass pumping operations.

1.6 PHYSICAL CONDITIONS

A. Exercise reasonable care to verify locations of existing subsurface structures and underground facilities.

B. Thoroughly check immediate and adjacent areas subject to excavation by visual examination (and by electronic metal and pipe detection equipment, as necessary) for indications of subsurface structures and underground facilities.

C. Make exploratory excavations where existing underground facilities or structures may potentially conflict with proposed underground facilities or structures. Conduct exploratory excavations in presence of Engineer and sufficiently ahead of construction to avoid possible delays to Contractor's Work.

1.7 ADJACENT FACILITIES AND PROPERTIES

A. Examination

1. After Effective Date of the Agreement and before Work at site is started, Contractor, City/Construction Manager, and affected property owners and utility owners shall make a thorough examination of pre-existing conditions including existing buildings, structures, and other improvements in vicinity of Work, as applicable, which could be damaged by construction operations.

2. Periodic reexamination shall be jointly performed to include, but not limited to, cracks in structures, settlement, leakage, and similar conditions.

B. Documentation

1. Record and submit documentation of observations made on examination inspections in accordance with paragraphs Construction Photographs and Audio-Video Recordings.

2. Upon receipt, Engineer will review, sign, and return one record copy of documentation to Contractor to be kept on file in field office.

3. Such documentation shall be used as indisputable evidence in ascertaining whether and to what extent damage occurred as a result of Contractor's operations, and is for the protection of adjacent property owners, Contractor, and City.

1.8 CONSTRUCTION PHOTOGRAPHS

A. Photographically document all unique portions of the construction including tie-ins to existing pipelines or facilities, crossings of existing utilities, buried valve and piping intersections, and other work items that will not otherwise be visible after completion of construction.

B. Film or file handling and development shall be done by a commercial laboratory.

C. City and Engineer shall have the right to select the subject matter and vantage point from which photographs are to be taken.

D. Construction Progress Photos

1. Photographically demonstrate progress of construction, showing every aspect of site and adjacent properties as well as interior and exterior of new or impacted structures.

2. Monthly: Take 24 exposures digital photographs of comparable quality, unless otherwise approved by the PCM.

1.9 AUDIO-VIDEO RECORDINGS

A. Prior to beginning Work on construction site or of a particular area of the Work, and again within 10 days following date of Substantial Completion, videotape construction site and property adjacent to construction site.

B. In the case of preconstruction recording, no Work shall begin in the area prior to City/Construction Manager's review and approval of content and quality of video for that area.

C. Particular emphasis shall be directed to physical condition of existing vegetation, structures, and pavements within pipeline alignment and areas adjacent to and within the right-of-way or easement, and on Contractor storage and staging areas.

D. City/Construction Manager and Engineer shall have right to select subject matter and vantage point from which videos are to be taken.

E. Videotaping shall be by a professional commercial videographer, experienced in shooting construction videos.

F. Video Format and Quality

1. Video

a. Produce bright, sharp, and clear images with accurate colors, free of distortion and other forms of picture imperfections.

b. Electronically, and accurately display the month, day, year, and time of day of the recording.

2. Audio

a. Audio documentation shall be done clearly, precisely, and at a moderate pace.

b. Indicate date, Project name, and a brief description of the location of taping, including

1) Facility name;
2) Street names or easements;
3) Addresses of private property; and
4) Direction of coverage, including engineering stationing, if applicable.

G. The Following Shall be Included with the Video Documentation

1. Coverage is required within and adjacent to the rights-of-way, easements, storage, and staging areas where the work is being constructed.

2. Documentation of the conditions of the adjacent properties or any affected structures as a result of the impending construction.

3. Certification as to date work done and by whom.

4. All videos shall be keyed to the construction drawings, provided with an index and a written narrative.

H. Preconstruction and Post-Construction Videos Shall be Submitted as follows:

1. Preconstruction videos shall be presented to the City at the preconstruction conference.

2. Post-construction videos shall be submitted prior to final project closeout. This submittal is contingent to final payment.

I. Payment for the work in this Section will be included as part of the lump sum price for mobilization/demobilization.

1.10 REFERENCE POINTS, SURVEYS, AND RECORD DRAWINGS

A. Location and elevation of benchmarks are shown on Drawings.

B. Contractor's Responsibilities:

1. Provide all survey efforts required to layout the Work.
2. Check and establish exact location of existing facilities prior to construction of new facilities and any connections thereto.
3. In event of discrepancy in data or benchmarks, request clarification before proceeding with Work.
4. Retain a professional land surveyor or civil engineer registered in the State of Florida who shall perform or supervise all surveying necessary for construction staking and layout and obtaining record information for as-built and record drawing preparation.
5. Maintain complete accurate log of survey Work as it progresses as a Record Document. The Contractor is responsible for the quality control of horizontal location and vertical elevations of the installed project.
6. On request of City/Construction Manager, submit documentation.
7. Provide competent employee(s), tools, stakes, and other equipment and materials as City/Construction Manager may require to:

a. Establish control points, lines, and easement boundaries.

b. Check layout, survey, and measurement Work performed by others.

c. Measure quantities for payment purposes.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CUTTING, FITTING, AND PATCHING

A. Cut, fit, adjust, or patch Work and work of others, including excavation and backfill as required, to make Work complete.

B. Obtain prior written authorization of Engineer before commencing Work to cut or otherwise alter:

1. Structural or reinforcing steel, structural column or beam, elevated slab, trusses, or other structural member.

2. Weather - or moisture-resistant elements.
3. Efficiency, maintenance, or safety of element.
4. Work of others.

C. Refinish surfaces to provide an even finish.

1. Refinish continuous surfaces to nearest intersection.
2. Refinish entire assemblies.
3. Finish restored surfaces to such planes, shapes, and textures that no transition between existing work and Work is evident in finished surfaces.
    a. Restore existing work, Underground Facilities, and surfaces that are to remain in completed Work including concrete-embedded piping, conduit, and other utilities as specified and as shown.
    b. Make restorations with new materials and appropriate methods as specified for new Work of similar nature; if not specified, use recommended practice of manufacturer or appropriate trade association.

END OF SECTION 01040

SECTION 01045 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. CONTRACTOR shall be responsible for all cutting, fitting and patching, including attendant excavation and backfill, required to complete the work or to:

1. Make its several parts fit together properly.
2. Uncover portions of the work to provide for installation of ill-timed work.
3. Remove and replace defective work.
4. Remove and replace work not conforming to requirements of Contract Documents.
5. Remove samples of installed work as specified for testing.
6. Provide routine penetrations of nonstructural surfaces for installation of piping and electrical conduit.

1.2 RELATED REQUIREMENTS

A. All applicable sections of the Specifications.

B. Conditions of the Contract.

1.3 SUBMITTALS

A. Submit a written request to ENGINEER well in advance of executing any cutting or alteration, which affects:

1. Work of the OWNER or any separate CONTRACTOR.
2. Structural value of integrity of any element of the project.
3. Integrity of effectiveness of weather-exposed or moisture-resistant elements or systems.
4. Efficiency, operational life, maintenance or safety of operational elements.
5. Visual qualities of sight-exposed elements.

B. Request shall include:

1. Identification of the project.
2. Description of the affected work.
3. The necessity for cutting, alteration or excavation.
4. Effect on work of OWNER or any separate CONTRACTOR, or on structural or weatherproof integrity of project.
5. Description of proposed work
    a. Scope of cutting, patching, alteration, or excavation.
    b. Trades who will execute the work.
    c. Products proposed to be used.
    d. Extent of refinishing to be done.
6. Alternatives to cutting and patching.
7. Cost proposal, when applicable.
8. Written permission of any separate CONTRACTOR whose work will be affected.

C. Should conditions of work or the schedule indicate a change of products from original installation, CONTRACTOR shall submit request for substitution as specified in Section 01600 "Material and Equipment".

D. Submit written notice to ENGINEER designating the date and time the work will be uncovered.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with specifications and standards for each specific product involved.

PART 3 - EXECUTION

3.1 INSPECTION

A. Inspect existing conditions of project, including elements subject to damage or to movement during cutting and patching.

B. After uncovering the work, inspect conditions affecting installation of products, or performance of work.

C. Report unsatisfactory or questionable conditions affecting installation of products, or performance of work.

3.2 PREPARATION

A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of work.

B. Provide devices and methods to protect other portions of project from damage.

C. Provide protection from elements for that portion of the project, which may be exposed by cutting and patching, work, and maintain excavations free from water.

3.3 PERFORMANCE

A. Execute cutting and demolition by methods, which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.

B. Execute excavating and backfilling by methods, which will prevent settlement or damage to other work.

C. Employ original Installer or Fabricator to perform cutting and patching for:

1. Weather-exposed or moisture-resistant elements.
2. Sight-exposed finished surfaces.

D. Execute fitting and adjustment of products to provide a finished installation to comply with specified product, functions, tolerances and finishes.

E. Restore work which has been cut or removed; install new products to provide completed work in accordance with requirements of Contract Documents.

F. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

G. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:

1. For continuous surfaces, refinish to nearest intersection.
2. For an assembly, refinish entire unit.

END OF SECTION 01045

SECTION 01050 - PROJECT MANAGEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. Coordination Drawings.
2. Special Project Procedures
3. Administrative and supervisory personnel.
4. Requests for Information (RFIs).

B. Related Sections include the following:

1. Section 01200, "Project Meetings"
2. Section 01311, "Construction Progress Documentation"
3. Section 01340, "Submittal Procedures"
4. Section 01780, "Contract Closeout "

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. Memoranda:

1. 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.

    a. Prepare similar memoranda for City and separate contractors if coordination of their Work is required.

C. Administrative Procedures:

1. 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:

    a. Preparation of Contractor's Construction Schedule.

    b. Preparation of the Schedule of Values.

    c. Installation and removal of temporary facilities and controls.

    d. Delivery and processing of submittals.

    e. Progress meetings.

    f. Project closeout activities.

1.5 SUBMITTALS

A. Key Personnel Names

1. Within 5 days of notice to proceed, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site including:

    a. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers.

    b. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1.6 SPECIAL PROJECT PROCEDURES

A. Discrepancies, Errors

1. 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.

2. 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.

B. Dimensions and Measurements

1. 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.

2. 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.

3. 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:

1. 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.

a. 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.

b. 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

1. All Subcontractors and Suppliers must submit, through the General Contractor to the City's 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:

a. Has received or reviewed a FULL set of approved plans and specifications for the project,

b. 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

c. 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's 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 COORDINATION DRAWINGS

A. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

1. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
2. Coordinate the addition of trade-specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
3. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
4. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
5. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
6. Indicate required installation sequences.
7. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms, showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:
    a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    c. Fire-rated enclosures around ductwork.

7. Electrical Work: Show the following:
    a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
    b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
    c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
    d. Location of pull boxes and junction boxes, dimensioned from column center lines.
8. Fire-Protection System: Show the following:
    a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
9. Review: Architect will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 01340 "Submittal Procedures."

C. Coordination Drawing Process: Prepare coordination drawings in the following manner:

1. Schedule submittal and review of Fire Sprinkler, Plumbing, HVAC, and Electrical Shop Drawings to make required changes prior to preparation of coordination drawings.
2. Commence routing of coordination drawing files with HVAC Installer, who will provide drawing plan files denoting approved ductwork. HVAC Installer will locate ductwork and piping on a single layer, using orange color. Forward drawings to Plumbing Installer.
3. Plumbing Installer will locate plumbing and equipment on a single layer, using blue color.
4. Fire Sprinkler Installer will locate piping and equipment, using red color. Fire Sprinkler Installer shall forward drawing files to Electrical Installer.
5. Electrical Installer will indicate service and feeder conduit runs and equipment in green color. Electrical Installer shall forward drawing files to Communications and Electronic Safety and Security Installer.
6. Communications and Electronic Safety and Security Installer will indicate cable trays and cabling runs and equipment in purple color. Communications and Electronic Safety and Security Installer shall forward completed drawing files to Contractor.
7. Contractor shall perform the final coordination review. As each coordination drawing is completed, Contractor will meet with Architect to review and resolve conflicts on the coordination drawings.

1.8 REQUESTS FOR INTERPRETATION (RFIs)

A. General:

1. 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.

a. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
b. 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:

1. Include a detailed, legible description of item needing interpretation and the following:

a. City Project Number
b. City Project Name.
c. Date.
d. Name of Contractor.
e. RFI number, numbered sequentially.
f. Specification Section number and title and related paragraphs, as appropriate.
g. Drawing number and detail references, as appropriate.
h. Field dimensions and conditions, as appropriate.
i. 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.
j. Contractor's signature.
k. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

1) Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

l. Identify each page of attachments with the RFI number and sequential page number.

C. Software-Generated RFIs

1. Software-generated form with substantially the same content as indicated above.

a. Word Template is available upon request from the City's Engineer's Office.
b. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Engineer's Action. Engineer will review each RFI, determine action required, and return it. Allow seven working days for Engineer'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 Engineer's actions on submittals.
f. Incomplete RFIs or RFIs with numerous errors.

2. Engineer's action may include a request for additional information, in which case Engineer's time for response will start again.

3. Engineer'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 Engineer in writing within 10 days of receipt of the RFI response.

E. On receipt of Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer within seven days if Contractor disagrees with response.

F. RFI Log.

1. Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log bi-weekly. Include the following:

    a. Project name.
    b. Name and address of Contractor.
    c. RFI number including RFIs that were dropped and not submitted.
    d. RFI description.
    e. Date the RFI was submitted.
    f. Date Engineer's response was received.
    g. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01050

SECTION 01060 - REGULATORY REQUIREMENTS & PERMITS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. CONTRACTOR shall comply with all building codes appropriate to the project, including but not limited to:

1. National Electric Code.
2. Florida Building Code. (Latest Revision)

B. CONTRACTOR shall comply with these codes, laws, regulations, rules, directives of all agencies, boards, districts, and governmental bodies having jurisdiction.

C. CONTRACTOR shall obtain and pay the cost of all building permits, fees, tie-in or connection charges associated with the project.

D. The CONTRACTOR shall obtain construction permits from Broward County Planning and Environmental Regulation Division license(s), Florida Department of Environmental Protection, School Board of Broward County and file a NOI with FDEP for NPDES compliance. Fort Lauderdale Building Permit will be available for pickup by CONTRACTOR once Notice to Proceed has been granted.

1.2 RELATED REQUIREMENTS

A. All applicable sections of the Specifications.

B. Conditions of the Contract.

1.3 MEASUREMENT AND PAYMENT

A. CONTRACTOR shall be reimbursed for permit fees as described in Section 01025.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01060

SECTION 01070 - ABBREVIATIONS OF INSTITUTIONS

PART 1 - GENERAL

1.1 GENERAL

A. Wherever in these Specifications references are made to the standards, specifications, or other published data of the various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. As a guide to the user of these Specifications, the following acronyms or abbreviations, which may appear in these Specifications, shall have the meanings indicated herein.

1.2 ABBREVIATIONS

AAMA	Architectural Aluminum Manufacturer's Association
AAR	Association of American Railroads
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ACI	American Concrete Institute
AFBMA	Anti-Friction Bearing Manufacturer's Association, Inc.
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AHAM	Association of Home Appliance Manufacturers
AI	The Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANS	American Nuclear Society
ANSI	American National Standards Institute, Inc.
APA	American Plywood Association
API	American Petroleum Institute
APWA	American Public Works Association
ASA	American Standards Association
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers

ASLE	American Society of Lubricating Engineers
ASME	American Society of Mechanical Engineers
ASQC	American Society for Quality Control
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWPA	American Wood Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BBC	Basic Building Code, Building Officials & Code Administrators International
BCPERD	Broward County Planning and Environmental Regulation Division
BCHCED	Broward County Highway Construction and Engineering Division
BCHD	Broward County Health Department
BCTED	Broward County Traffic Engineering Division
BCWRMD	Broward County Water Resource Management Division
BCWWS	Broward County Water & Wastewater Services Division
BHMA	Builders Hardware Manufacturer's Association
CBM	Certified Ballast Manufacturers
CEMA	Conveyors Equipment Manufacturer's Association
CGA	Compressed Gas Association
CLFMI	Chain Link Fence Manufacturer's Institute
CMA	Concrete Masonry Association
CRSI	Concrete Reinforcing Steel Institute
DIPRA	Ductile Iron Pipe Research Association
EIA	Electronic Industries Association
ETL	Electrical Test Laboratories
EPA	Environmental Protection Agency
FBC	Florida Building Code
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FM	Factory Mutual System
FPL	Florida Power & Light
FS	Federal Specifications
HI	Hydraulics Institute

IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IME	Institute of Makers of Explosives
IP	Institute of Petroleum (London)
IPC	Institute of Printed Circuits
IPCEA	Insulated Power Cable Engineers Association
ISA	Instrument Society of America
ISO	International Organization for Standardization
ITE	Institute of Traffic Engineers
MBMA	Metal Building Manufacturer's Association
MPTA	Mechanical Power Transmission Association
MSS	Manufacturers Standardization Society
MTI	Marine Testing Institute
NAAMM	National Association of Architectural Metal Manufacturer's
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards
NCCLS	National Committee for Clinical Laboratory Standards
NEC	National Electrical Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association
NLGI	National Lubricating Grease Institute
NMA	National Microfilm Association
NSF	National Sanitation Foundation
NWMA	National Woodwork Manufacturers Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PPI	Plastics Pipe Institute
RCRA	Resource Conservation and Recovery Act
RIS	Redwood Inspection Service
RVIA	Recreational Vehicle Industry Association
RWMA	Resistance Welder Manufacturer's Association
SAE	Society of Automotive Engineers

SAMA	Scientific Apparatus Makers Association
SB	Southern Bell
SFWMD	South Florida Water Management District
SMA	Screen Manufacturers Association
SMACCNA	Sheet Metal and Air Conditioning Contractors National Association
SPI	Society of the Plastics Industry, Inc.
SPIB	Southern Pine Inspection Bureau
SPR	Simplified Practice Recommendation
SSA	Swedish Standards Association
SSBC	Southern Standard Building Code, Southern Building Code Congress
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Construction
TAPPI	Technical Association of the Pulp and Paper Industry
TFI	The Fertilizer Institute
UL	Underwriters Laboratories, Inc.
WCLIB	West Coast Lumber Inspection Bureau
WCRSI	Western Concrete Reinforcing Steel Institute
WEF	Water Environment Federation
WIC	Woodwork Institute of California
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01070

SECTION 01090 - REFERENCE STANDARDS

PART 1 - GENERAL

1.1 GENERAL

A. Titles of Sections and Paragraphs

1. Captions accompanying specification sections and paragraphs are for convenience of reference only, and do not form a part of the Specifications.

B. Applicable Publications

1. Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the WORK is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of, or omission from, said standards or requirements.

C. Specialists, Assignments

1. In certain instances, specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the CONTRACTOR has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of building codes and similar regulations governing the WORK; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of contract requirements remains with the CONTRACTOR.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of the Specifications, all work specified herein shall conform to or exceed the requirements of applicable codes and the applicable requirements of the following documents.

B. References herein to "Building Code" shall mean "Florida Building Code". References to "Mechanical Code" or "Uniform Mechanical Code," "Plumbing Code" or "Uniform Plumbing Code," "Fire Code" or "Uniform Fire Code," shall mean Uniform Mechanical Code, Uniform Plumbing Code and Uniform Fire Code of the International Conference of the Building Officials (ICBO). "Electric Code" or "National Electric Code (NEC)" shall mean the National Electric Code of the National Fire Protection Association (NFPA). The latest edition of the codes as approved by the Municipal Code and used by the local agency as of the date that the WORK is advertised for bids, as adopted by the agency having jurisdiction, shall apply to the WORK herein, including all addenda, modifications, amendments, or other lawful changes thereto.

C. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the ENGINEER/ARCHITECT for clarification and directions prior to ordering or providing any materials or furnishing labor. The CONTRACTOR shall bid for the most stringent requirements.

D. The CONTRACTOR shall construct the WORK specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed herein.

E. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

F. References herein to "OSHA Standards" shall mean Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

1.3 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format. The Specifications are organized into Divisions and Sections using the CSI/CSC's "MasterFormat" numbering system.

1. Section Identification

a. The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.

2. Division 01

a. Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.

B. Specification Content

1. The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

a. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

b. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

1) The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.4 REGULATIONS RELATED TO HAZARDOUS MATERIALS

A. The CONTRACTOR is responsible that all work included in the Contract Documents, regardless if shown or not, shall comply with all EPA, OSHA, RCRA, NFPA, and any other Federal, State, and Local Regulations governing the storage and conveyance of hazardous materials, including petroleum products.

B. Where no specific regulations exist, all chemical, hazardous, and petroleum product piping and storage in underground locations must be installed with double containment piping and tanks, or in separate concrete trenches and vaults, or with an approved lining which cannot be penetrated by the chemicals, unless waived in writing by the OWNER.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01090

SECTION 01152 - APPLICATIONS FOR PAYMENT

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 "Alteration Project 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. 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.
2. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
3. 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. For items stored off-site include evidence of insurance or bonded warehousing.
4. 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.
5. 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.
6. 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.

7. 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 Condition's expense, at Contractor's option.

8. 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.

1.4 APPLICATIONS FOR PAYMENT

A. The General Contractor must meet with the City Representative and Architect on or about the 25th of each month. This date shall be the last day for any activity to be considered for payment for that pay period. 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 an update construction schedule. Schedule must include a narrative of the work that has been completed, work that is expected to be completed through the next payment application period, activities throughout the critical path until final completion and any affected activities on the critical path with the recovery plan.

D. 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.

E. For each payment application requesting payment for undergrounding allowance for undergrounding work for overhead utilities, written authorization of payment from each utility being requested must be received with payment application.

F. 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.

G. 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.

H. Each Application for Payment shall be consistent with previous applications and payments as certified by and paid for by City.

I. 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.

J. 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.

K. Initial Application for Payment. Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Products list.
5. Submittals Schedule (preliminary if not final).
6. List of Contractor's staff assignments.
7. Copies of building permits.
8. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
9. Initial progress report.
10. Report of preconstruction conference.

L. Final Payment Application. Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. Evidence that claims have been settled.
5. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01152

SECTION 01230 - ALTERNATES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the PROCUREMENT AND CONTRACTING REQUIREMENTS and all Sections within DIVISION 01, GENERAL REQUIREMENTS, which are made a part of this Section of the Specifications.

1.2 SUMMARY

A. A. For each of the alternates Scheduled at the end of this Section, state the amount in the proposal to be added to or deducted from the Contract Sum for the work.

1.3 ALTERNATES

A. Definition: "Alternates" are alternate products, materials, equipment, systems, methods, units of work or major elements of the construction, which may, at the Owner's option and under the terms established by the Contract or Agreement, be selected for the work in lieu of the corresponding requirements of the Contract Documents. Selection may occur prior to the Contract Date, or may, by the Agreement, be deferred for possible selection at a subsequent date.

B. Alternate Requirements: **A** Schedule of **A**lternates is included at the end of this Section. Each alternate is defined using abbreviated language, recognizing that the Contract Documents define the requirements. Coordinate related work to ensure that work affected by each alternate is complete and properly interfaced with work of each selected alternate.

C. Provide written proposals for each alternate on the Form of Proposal for Owner's consideration. Each proposal amount shall include the entire cost of the alternate portion of the work including overhead, profit, and other costs including cost of interfacing and coordinating the alternate with related and adjacent work.

D. Selection of Alternates: Selection of alternates to be included in the work will be by the Owner.

E. Notification: Immediately following award of Contract, prepare and distribute to each entity a notification of status of each alternate. Indicate which alternates have been accepted, rejected, or deferred for consideration at a later date. Include full description of negotiated modifications to alternates, if any.

1.4 DESCRIPTION OF ALTERNATES

A. Alternates shall include the following:

1. Bid Alternate 1:
   N/A

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01230

SECTION 01311 - 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. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
3. Submittals Schedule.
4. Daily construction reports.
5. Material location reports.
6. Field condition reports.
7. Special reports.

B. Related Sections include the following:

1. Section 01152 – Applications for Payment
2. Section 01050 – Project Management
3. Section 01340 – Submittal Procedures
4. Section 01380 – Construction Photographs
5. Section 01400 – Quality Control

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. 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.

C. Critical Path. The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Event. The starting or ending point of an activity.

E. 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.

F. Fragment. A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

G. Milestone. A key or critical point in time for reference or measurement.

H. Network Diagram. A graphic diagram of a network schedule, showing activities and activity relationships.

I. Resource Loading. The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

A. Submittals Schedule. Submit three copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Engineer's final release or approval.

B. Preliminary Construction Schedule. Submit three opaque copies.

1. Approval of cost-loaded preliminary construction schedule will not constitute approval of Schedule of Values for cost-loaded activities.

C. Preliminary Network Diagram. Submit three opaque copies, large enough to show entire network for entire construction period. Show logic ties for activities.

D. Contractor's Construction Schedule. Submit three opaque copies of initial schedule, large enough to show entire schedule for entire construction period.

E. 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, 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.

F. Daily Construction Reports. Submit two copies at monthly intervals.

G. Material Location Reports. Submit two copies at monthly intervals.

H. Field Condition Reports. Submit two copies at time of discovery of differing conditions.

I. Special Reports. Submit two copies at time of unusual event.

1.5 COORDINATION

A. 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. Include submittals required during the first 20 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.

3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. 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.

C. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

1. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following: 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 procurement process activities for the following long lead items and major items as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

4. Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
5. Where materials require more than one (1) week fabrication or order time, this order/fabrication time shall be shown.

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. 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.
2. Work Restrictions. Show the effect of the following items on the schedule:

    a. Use of premises restrictions.
    b. Environmental control.

3. 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. Fabrication.
    e. Sample testing.
    f. Deliveries.
    g. Installation.
    h. Tests and inspections.
    i. Adjusting.
    j. Curing.

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. General conditions activities included on the schedule of values paid upfront by the contractor such as bonds and insurances can be requested for payment after the SOV has been approved as described in 01025. Receipts and backup should be provided to match the requested amounts.

G. The total dollar amount of additional general conditions activities included on the schedule of values such as MOT, mobilization(s), erosion control should up to 10% of the total contract amount. Any other dollar amount should be applied to each individual construction activity within the schedule of values. Active general conditions activities throughout the life of the project should be paid proportionately monthly, if applicable.

H. The contractor must provide a detailed base-line time schedule to be reviewed, and subsequent revised monthly schedules showing at minimum: tied predecessors, tied successors, order within the critical or non-critical path, and floating time, when applicable. Construction general conditions activities such as MOT, mobilizations, erosion control activities included on the schedule of values should also be part of the of the time schedule.

I. Review. The schedule shall be reviewed by owner's representative and comments will be provided. Contractor to complete revisions to the schedule as per comments. No pay app to be submitted for payment before owner's final approval of the schedule.

J.

K. 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.

L. Computer Software. Prepare schedules using a program that has been developed specifically to manage construction schedules.

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 10 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.

2.4 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Emergency procedures.
12. Orders and requests of authorities having jurisdiction.
13. Change Orders received and implemented.
14. Construction Change Directives received and implemented.
15. Services connected and disconnected.
16. Equipment or system tests and startups.
17. Partial Completions and occupancies.
18. Substantial Completions authorized.

B. Material Location Reports. At weekly 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.

2.5 SPECIAL REPORTS

A. General. Submit special reports directly to City within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events. When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, 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. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Engineer, 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 01311

SECTION 01312 - FIELD ENGINEERING

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. CONTRACTOR shall provide and pay for field Engineering and Survey services required for the project.
B. CITY PROJECT MANAGER will identify existing control points and property line corner stakes indicated on the DRAWINGS, as required.

1.2 QUALIFICATIONS OF SURVEYOR

A. Qualified Registered Professional Surveyor & Mapper, acceptable to CITY PROJECT MANAGER.

1.3 SURVEY REFERENCE POINTS

A. CITY PROJECT MANAGER will provide basic horizontal and vertical control points for the construction project including:

1. Permanent coordinate reference points with horizontal and vertical control, located and staked as shown on the plans.

B. The CONTRACTOR shall locate and protect control points prior to starting site construction WORK, and preserve all permanent reference points during construction.

1. Make no changes or relocations without prior written notice to CITY PROJECT MANAGER.
2. Report to CITY PROJECT MANAGER when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
3. CONTRACTOR's surveyor shall replace project control points which may be lost or destroyed.

a. Establish replacements based on original survey control.

1.4 PROJECT SURVEY REQUIREMENTS

A. CONTRACTOR's surveyor shall establish a minimum of two permanent benchmarks on site, referenced to data established by survey control points.

B. CONTRACTOR shall establish lines and levels, locate and lay out, prepare a HORIZONTAL AND VERTICAL CONTROL PLAN for the purpose of construction staking by instrumentation and similar appropriate means:

1. Stakes for grading and fill placement.
2. Controlling lines and levels as required.

C. From time to time, verify layouts by same methods.

D. Horizontal and vertical control plan shall be made available to CITY PROJECT MANAGER in ACAD 2017 format or most current release.

E. Any plan released to the CONTRACTOR via electronic media is for as-built use only. They have not been geometrically calculated by a Surveyor. This applies to all aspects of the plans including, but not limited to, right-of-way, road utilities and drainage.

1.5 RECORDS

A. Maintain a complete, accurate log of all control and survey WORK as it progresses.

B. On completion of construction WORK, prepare a certified survey showing all dimensions, locations and elevations of project.

1.6 SUBMITTALS

A. Submit name and address of Professional Surveyor & Mapper and Professional Engineer to CITY PROJECT MANAGER.

B. On request of CITY PROJECT MANAGER, submit documentation to verify accuracy of field Engineering WORK.

C. Submit certificate signed by Registered Engineer or Professional Surveyor & Mapper certifying that elevation and locations of WORK are in conformance, or non-conformance, with Contract Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01312

SECTION 01340 - 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 1 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. Section 01152, Applications for Payment
2. Section 01050, Project Management
3. Section 01311, Construction Progress Documentation
4. Section 01380, Construction Photographs
5. Section 01400, Quality Control
6. Section 01720, Project Record Documents
7. Section 01780, Contract Closeout
8. Divisions 02 through 33 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that requires Engineer's/Architect's responsive action.

B. Informational Submittals. Written and graphic information and physical samples that does not require Engineer's/Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. 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. City reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. 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.

C. Processing Time. Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No

extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review. Allow 10 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review. If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review. Allow 10 days for review of each resubmittal.

D. 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 (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by City.
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., 061000.01). 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.

E. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.

F. Additional Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer 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.
l. Signature of transmitter.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. 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".

I. 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.

J. Use for Construction: Use only final submittals with mark indicating "Approved as submitted" or "Approved as noted" by Engineer.

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.
l. 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. Engineer 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.

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.
   k. Notation of coordination requirements.
   l. 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).

3. Number of Copies. Submit five opaque copies of each submittal. City will retain three copies; remainder will be returned.

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. City 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 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. City 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. City 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 of Copies. Submit four copies of subcontractor list, unless otherwise indicated. City will return two copies.

a. Mark up and retain one returned copy as a Project Record Document.

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. City 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. 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.

E. Product Certificates. Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

F. Material Certificates. Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

G. 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.

H. 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.

I. 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.

J. Construction Photographs. Comply with requirements specified in Section 01380.

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 Engineer.

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

3.2 ENGINEER'S/ARCHITECT'S ACTION

A. General. Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals. Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. Approved as submitted
2. Approved as noted
3. Revise and resubmit
4. Rejected.

C. Informational Submittals. Engineer/Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

D. Partial 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 01340

SECTION 01380 - CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.1 GENERAL

A. Employ competent photographer to take construction record photographsperiodically, monthly at a minimum, during course of the work.

1.2 RELATED REQUIREMENTS

A. Section 01010: Summary of Work.

B. Section 01720: Project Record Documents.

1.3 PHOTOGRAPHY REQUIRED

A. Provide photographs taken on cutoff date for each scheduled application for Payment.

B. Provide photographs taken at each major stage of construction.

C. Provide photographs taken of change order work.

1.4 COSTS OF PHOTOGRAPHY

A. CONTRACTOR shall pay costs for specified photography and prints.

1. Parties requiring additional photography or prints will pay photographer directly.

1.5 DIGITAL PHOTOGRAPHY

A. At OWNER and ENGINEER's/ARCHITECT's discretion, digital photography may be used for all construction photographs except aerial progress photographs.

PART 2 - PRODUCTS

2.1 PRINTS

A. Resolution:

1. Minimum 5.0 Megapixels.

PART 3 - EXECUTION

3.1 TECHNIQUE

A. Factual presentation.

B. Correct exposure and focus.

1. High resolution and sharpness.
2. Maximum depth-of-field.
3. Minimum distortion.

3.2 VIEWS REQUIRED

A. Photograph from locations to adequately illustrate condition of construction and state of progress.

B. Photographs shall include aerial photographs showing the entire construction area.

C.

END OF SECTION 01380

SECTION 01400 - QUALITY CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspection 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 quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, City or authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITION

A. Specific quality control requirements for the WORK are indicated throughout the Contract and Permit Documents. The requirements of this Section are primarily related to performance of the WORK beyond furnishing of manufactured products. The term "Quality Control" includes inspection, sampling and testing, and associated requirements.

B. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

C. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

D. 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, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).

E. Mockups: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.

1. Mockups are used for one or more of the following:

a. Verify selections made under Sample submittals.
b. Demonstrate aesthetic effects.
c. Demonstrate the qualities of products and workmanship.
d. Demonstrate successful installation of interfaces between components and systems.
e. Perform preconstruction testing to determine system performance.

2. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
3. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.

F. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.

G. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

H. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).

I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."

J. 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.

K. 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. Contractor's quality-control services do not include contract administration activities performed by Architect or Construction Manager.

1.3 DELEGATED DESIGN SERVICES

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 Services Statement: Submit 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, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.4 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is 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 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Reports: Prepare and submit certified written reports and documents as specified.

D. Permits, Licenses, and Certificates: For Owner's record, 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 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, telephone number, and email address 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 inspection.
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.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of technical 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 of whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement of whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

1.7 QUALITY ASSURANCE

A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. 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. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

C. 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.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, 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.

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 is similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists will satisfy qualification requirements indicated and engage in the activities indicated.

1. Requirements of authorities having jurisdiction supersede requirements for specialists.

G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.8 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
2. Payment for these services will be made from testing and inspection allowances specified in Section 012100 "Allowances," as authorized by Change Orders.
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, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.

1. 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.
2. Engage a qualified testing agency to perform quality-control services.

a. Contractor will not employ same entity engaged by Owner, unless agreed to in writing by Owner.

3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Testing Agency Responsibilities: Cooperate with Architect, or Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect, or Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the locations 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 release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform duties of Contractor.

D. 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 Section 01340 "Submittal Procedures."

E. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

F. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives 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 inspection. 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 inspection equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.9 INSPECTION AT PLACE OF MANUFACTURE

A. Unless otherwise indicated, all products, materials, and equipment shall be subject to inspection by the ENGINEER/ARCHITECT at the place of manufacture.

B. The presence of the ENGINEER/ARCHITECT at the place of manufacturer, however, shall not relieve the CONTRACTOR of the responsibility for furnishing products, materials, and equipment, which comply with all requirements of the Contract Documents. Compliance is a duty of the CONTRACTOR, and said duty shall not be avoided by any act or omission on the part of the ENGINEER/ARCHITECT.

1.10 SAMPLING AND TESTING

A. Unless otherwise indicated, all sampling and testing shall be in accordance with the methods prescribed in the current standards of the ASTM, as applicable to the class and nature of the article or materials considered.

B. Any waiver by the OWNER of any specific testing or other quality assurance measures, whether or not such waiver is accompanied by a guarantee of substantial performance as a relief from the specified testing or other quality assurance requirements as originally specified, and whether or not such guarantee is accompanied by a performance bond to assure execution of any necessary corrective or remedial WORK, shall not be construed as a waiver of any requirements of the Contract Documents.

C. Notwithstanding the existence of such waiver, the ENGINEER/ARCHITECT reserves the right to make independent investigations and tests, and failure of any portion of the WORK to meet any of the requirements of the Contract Documents, shall be reasonable cause for the ENGINEER/ARCHITECT to require the removal or correction and reconstruction of any such work in accordance with the General Conditions.

1.11 INSPECTION AND TESTING LABORATORY SERVICE

A. Inspection and testing laboratory service shall comply with the following:

1. CONTRACTOR shall appoint, employ, and pay for services of an independent firm to perform inspection and testing.
2. The independent testing firm will perform inspections, testings and other services specified in individual specification sections and as required by the ENGINEER/ARCHITECT or OWNER.

3. Reports will be submitted to the ENGINEER/ARCHITECT in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
4. The CONTRACTOR shall cooperate with the OWNER and independent testing firm and furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
5. The CONTRACTOR shall notify ENGINEER/ARCHITECT and any applicable permitting agencies 48 hours prior to the expected time for operations requiring inspection and laboratory testing services, so they can be present at the time of testing
6. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the ENGINEER/ARCHITECT. The CONTRACTOR shall bear all costs from such retesting at no additional cost to the OWNER.
7. For samples and tests required for CONTRACTOR'S use, the CONTRACTOR shall make arrangements with an independent firm for payment and scheduling of testing. The cost of all sampling and testing shall be included in the Contract Price.
8. CONTRACTOR shall bear all costs incurred should the materials for testing not be ready for testing at time specified/scheduled by CONTRACTOR for test.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 INSTALLATION

A. Inspection. The CONTRACTOR shall inspect materials or equipment upon the arrival on the job site and immediately prior to installation, and reject damaged and defective items.

B. Measurements. The CONTRACTOR shall verify measurements and dimensions of the WORK, as an integral step of starting each installation.

C. Manufacturer's Instructions. Where installations include manufactured products, the CONTRACTOR shall comply with manufacturer's applicable instructions and recommendations for installation, to whatever extent these are more explicit or more stringent than applicable requirements indicated in Contract Documents.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, 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 or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01045 “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 01400

SECTION 01410 - TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. CONTRACTOR will employ and pay for the services of an Independent Testing laboratory to perform all required testing: (All required testing services under the Contract and Permit Documents shall be provided by the CONTRACTOR through an independent testing firm.

1. CONTRACTOR shall cooperate with the laboratory to facilitate the execution of its required services.

2. Employment of the laboratory by the CONTRACTOR for specific testing shall in no way relieve the CONTRACTOR's obligations to perform the work of the Contract as specified.

3. The tests to be provided by the CONTRACTOR shall include, but not be limited to, the following

a. Density
b. Proctor
c. Limerock Bearing Ratio (LBR)
d. Carbonate Content
e. Gradation
f. Plastic Index and Liquid Limit
g. Organic Content
h. Concrete Compressive Strength and Slump
i. Asphalt Extraction
j. Any other tests as required to satisfy an permitting agency requirements.

B. CONTRACTOR shall pay for all required testing, including bacteriological testing.

1.2 RELATED REQUIREMENTS

A. All applicable sections of the Specifications.

B. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.

1.3 QUALIFICATION OF LABORATORY

A. Meet "Recommended Requirements for Independent Laboratory Qualification", published by American Council of Independent Laboratories.

B. Meet basic requirements of ASTM E-329.

C. Authorized to operate in the state in which the project is located.

D. Submit copy of report of inspection of facilities made by Materials Reference Laboratory of Natural Bureau of Standards during the most recent tour of inspection, with memorandum of remedies of any deficiencies reported by the inspection.

E. Testing Equipment

1. Calibrated at reasonable intervals by devices of accuracy traceable to either:

a. National Bureau of Standards.

b. Accepted values of natural physical constants.

1.4 LABORATORY DUTIES

A. Cooperate with OWNER's Representative and CONTRACTOR; provide qualified personnel after due notice.

B. Perform specified inspections, sampling and testing of materials and methods of construction:

1. Comply with specified standards.
2. Ascertain compliance of materials with requirements of Contract Documents.

C. Promptly notify OWNER's Representative and CONTRACTOR of observed irregularities of deficiencies of work or products.

D. Promptly submit written report of each test and inspection; one copy each to OWNER's Representative, OWNER, CONTRACTOR, and one copy to Record Document File. Each report shall include:

1. Date issued.
2. Project title, OWNER'S project number and Parcel number.
3. Testing laboratory name, address and telephone number.
4. Name and signature of laboratory inspector.
5. Date and time of sampling or inspection.
6. Record of temperature and weather conditions.
7. Date of test.
8. Identification of fill product and specification section.
9. Location of sample or test in the project area (i.e. station and offset or other relevant dimensioning).
10. Type of inspection or test.
11. Results of tests and compliance with Contract Documents.
12. Interpretation of test results, when requested by OWNER's Representative.

E. Perform additional tests as required by the OWNER's Representative.

1.5 LIMITATION OF AUTHORITY OF TESTING LABORATORY

A. Laboratory is not authorized to:

1. Release, revoke, alter or enlarge on requirements of Contract documents.
2. Approve or accept any portion of the work.
3. Perform any duties of the CONTRACTOR.

1.6 CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with laboratory personnel and provide access to work.

B. Secure and deliver to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.

C. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other material mixes, which require control by the Testing Laboratory.

D. Furnish copies of Products test reports as required.

E. Furnish incidental labor and facilities:

1. To provide access to work to be tested.
2. To obtain and handle samples at the project site or at the source of the product to be tested.
3. To facilitate inspections and tests.
4. For storage of test samples.

F. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

1. When tests or inspections cannot be performed after such notice, reimburse OWNER for laboratory personnel and travel expenses incurred due to CONTRACTOR's negligence.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01410

SECTION 01505 - MOBILIZATION

PART 1 - GENERAL

1.1 GENERAL

A. Mobilization shall include the obtaining of all permits; moving onto the site of all equipment; temporary buildings, and other construction facilities; and implementing security requirements; all as required for the proper performance and completion of the WORK. Mobilization shall include the following principal items:

1. Moving on to the site of all CONTRACTOR's equipment required for first month operations.
2. Installing temporary construction power, wiring, and lighting facilities.
3. Developing construction water supply.
4. Providing field office trailers for the CONTRACTOR, complete with all specified furnishings and utility services including telephones, telephone appurtenances, and copying machine.
5. Providing all on-site communication facilities, including telephones and radio pagers.
6. Providing on-site sanitary facilities and potable water facilities.
7. Arranging for and erection of CONTRACTOR's work, site access, and storage.
8. Obtaining all required permits (including Notice of Intent (NOI) and Stormwater Pollution Prevention Plan (SWPPP) permits as needed).
9. Having all OSHA required notices and establishment of safety programs.
10. Having the CONTRACTOR's superintendent at the job site full time.
11. Submitting initial submittals.
12. Audio-Visual preconstruction record as described in Section 01010.
13. Project identification and signs.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PAYMENT FOR MOBILIZATION

A. The CONTRACTOR's attention is directed to the condition that no payment for mobilization or any part thereof will be approved for payment under the Contract until all mobilization items listed in Paragraph 1.01.A. above have been completed as specified.

END OF SECTION 01505

SECTION 01510 - TEMPORARY UTILITIES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Types. The types of utility services required for general temporary use at the project site include the following:

1. Water service (potable for certain uses)
2. Storm sewer
3. Sanitary sewer
4. Electric power service
5. Telephone service

B. It shall be the CONTRACTOR's responsibility to provide equipment that is adequate for the performance of the WORK under this Contract within the time specified. All equipment shall be kept in satisfactory operating condition, shall be capable of safety and efficiently performing the required WORK, and shall be subject to inspection and approval by the OWNER's representative at any time within the duration of the Contract. All work hereunder shall conform to the applicable requirements of the OSHA Standards for Construction.

1.2 JOB CONDITIONS

A. Scheduled Uses. The CONTRACTOR shall, in conjunction with establishment of job progress schedule, establish a schedule for implementation and termination of service for each temporary utility or facility; at earliest feasible time, and when acceptable to OWNER and ENGINEER/ARCHITECT change over from use of temporary utility service to permanent service.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 INSTALLATION OF POWER DISTRIBUTION SYSTEM

A. Power. The CONTRACTOR shall provide all necessary power required for its operations under the Contract, and shall provide and maintain all temporary power lines required to perform the WORK in a safe and satisfactory manner.

3.2 INSTALLATION OF LIGHTING

A. Construction Lighting. All WORK conducted at night or under conditions of deficient daylight shall be suitable lighted to insure proper WORK and to afford adequate facilities for inspection and safe working conditions.

3.3 WATER SUPPLY

A. General. The OWNER will furnish reasonable quantities of water required by the CONTRACTOR in performance of the WORK under the Contract; however, the CONTRACTOR shall provide all facilities necessary to convey the water from the

OWNER-designated source to the points of use in accordance with the requirements of the Contract Document. The CONTRACTOR shall pay all permit and water charges.

B. Potable Water. All drinking water on the site during construction shall be furnished by the CONTRACTOR and shall be bottled water or water furnished in acceptable metal dispensers. Notices shall be posted conspicuously throughout the site warning the CONTRACTOR's personnel that piped water may be contaminated.

C. Water Connections. The CONTRACTOR shall not make connection to, or draw water from, any fire hydrant or pipeline without first obtaining permission of the authority having jurisdiction over the use of said fire hydrant or pipeline and from the agency owning the affected water system. For each such connection made, the CONTRACTOR shall first attach to the fire hydrant or pipeline a valve and a meter, if required by the said authority, of a size and type acceptable to said authority and agency. The CONTRACTOR shall pay all permit and water charges.

D. Removal of Water Connections. Before final acceptance of the WORK on the project, all temporary connections and piping installed by the CONTRACTOR shall be entirely removed, and all affected improvements shall be restored to their original condition, or better, to the satisfaction of the ENGINEER and to the agency owning the affected utility.

3.4 INSTALLATION OF SANITARY FACILITIES

A. Toilet Facilities. Fixed or portable chemical toilets shall be provided wherever needed for the use of CONTRACTOR's employees. Toilets at construction job sites shall conform to the requirements of Subpart D, Section 1926.51 of the OSHA Standards for Construction.

B. Sanitary and Other Organic Wastes. The CONTRACTOR shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the CONTRACTOR or organic material wasted from any other source related to the CONTRACTOR's operations shall be disposed of away from the site in a manner satisfactory to the ENGINEER and in accordance with all laws and regulations pertaining thereto.

3.5 INSTALLATION OF FIRE PROTECTION

A. Fire Protection. The construction of the WORK shall be connected with the CONTRACTOR's water supply system and shall be adequately protected against damage by fire. Hose connections and hose, water casks, chemical equipment, or other sufficient means shall be provided for fighting fires in the temporary structures and other portions of the WORK, and responsible persons shall be designated and instructed in the operation such fire apparatus so as to prevent or minimize the hazard of fire. The CONTRACTOR's fire protection program shall conform to the requirements of Subpart F of the OSHA Standards for Construction.

3.6 INSTALLATION OF COMMUNICATIONS

A. Telephone Services. The CONTRACTOR shall provide and maintain at all time during the progress of the WORK not less than one telephone in good working order, at its own field construction office, at or near the site of the WORK included in the Contract. Each such telephone shall be connected to an established exchange for toll service and with all other telephones utilized by the CONTRACTOR.

B. Telephone Use. The CONTRACTOR shall permit the ENGINEER/ARCHITECT, the OWNER, or their authorized representatives or employees free and unlimited use of said telephone facilities for all calls that do not involve published toll charges. Calls originated by the ENGINEER/ARCHITECT, the OWNER, their authorized representatives or employees who involve toll or the CONTRACTOR at the rates charged by the telephone company shall bill message unit charge to the OWNER.

END OF SECTION 01510

SECTION 01520 - CONSTRUCTION AIDS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Furnish, install and maintain required construction aids, remove on completion of work.

1.2 RELATED REQUIREMENTS

A. All applicable sections of the Specifications.

B. Conditions of the Contract.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Materials may be new or used, suitable for the intended purpose, but must not violate requirements of applicable codes and standards.

2.2 CONSTRUCTION AIDS

A. Provide construction aids and equipment required by personnel and to facilitate execution of the work; scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes and other such facilities and equipment.

1. Refer to respective sections for particular requirements for each trade.

2. Provide protective coverings for finished surfaces.

B. Maintain facilities and equipment in first-class condition.

PART 3 - EXECUTION

3.1 PREPARATION

A. Consult with OWNER's Representative, review site conditions and factors which affect construction procedures and construction aids including adjacent properties and public facilities which may be affected by execution of the work.

3.2 GENERAL

A. Comply with applicable requirements specified in sections of Division 2 through 4 (as applicable).

B. Relocate construction aids as required by progress of construction, by storage or work requirements, and to accommodate legitimate requirements of OWNER and other Contractors employer at the site.

3.3 REMOVAL

A. Completely remove temporary materials, equipment and services:

1. When construction needs can be met by use of permanent construction.

2. At completion of project.

B. Clean, repair damage caused by installation or by use of temporary facilities.

1. Remove foundations and underground installations for construction aids.

2. Grade areas of site affected by temporary installations to required elevations and slopes, and clean the area.

C. Restore permanent facilities used for temporary purposes to specified condition.

END OF SECTION 01520

SECTION 01530 - PROTECTION OF EXISTING FACILITIES

PART 1 - GENERAL

1.1 GENERAL

A. The CONTRACTOR shall protect all existing utilities and improvements not designated for removal and shall restore damaged or temporarily relocated utilities and improvements to a condition equal to or better than they were prior to such damage or temporary relocation, all in accordance with requirements of the Contract Documents.

B. The CONTRACTOR shall verify the exact locations and depths of all utilities shown and the CONTRACTOR shall make exploratory excavations of all utilities that may interfere with the WORK. All such exploratory excavations shall be performed as soon as practicable after award of the contract and, in any event, a sufficient time in advance of construction to avoid possible delays to the CONTRACTOR's work. When such exploratory excavations show the utility location as shown to be in error, the CONTRACTOR shall so notify the ENGINEER.

C. The number of exploratory excavations required shall be that number which is sufficient to determine the alignment and grade of the utility.

1.2 RIGHTS-OF-WAY

A. The CONTRACTOR shall not do any work that would affect any oil, gas, sewer, or water pipeline; any telephone, telegraph, or electric transmission line; any fence; or any other structure, nor shall the CONTRACTOR enter upon the rights-of-way involved until notified by the ENGINEER that the OWNER has secured authority from the proper party. After authority has been obtained, the CONTRACTOR shall give said party due notice of its intention to begin work, if required by said party, and shall remove, shore, support or otherwise protect such pipeline, transmission line, ditch, fence, or structure or replace the same. When two or more contracts are being executed at one time on the same or adjacent land in such manner that work on one contract may interfere with that on another, the OWNER shall determine the sequence and order of the WORK. When the territory of one contract is the necessary or convenient means of access for the execution of another contract, such privilege of access or any other reasonable privilege may be granted by the OWNER to the CONTRACTOR so desiring, to the extent, amount, in the manner, and at the times permitted. No such decision as to the method or time of conducting the WORK or the use of territory shall be made the basis of any claim for delay or damage, except as provided for temporary suspension of the WORK in the General Conditions of the Contract.

1.3 PROTECTION OF STREET OR ROADWAY MARKERS

A. The CONTRACTOR shall not destroy, remove, or otherwise disturb any existing survey markers or other existing street or roadway markers without proper authorization. No pavement breaking or excavation shall be started until all survey or other permanent marker points that will be disturbed by the construction operations have been properly referenced. All survey markers or points disturbed by the CONTRACTOR shall be accurately restored after all streets or roadway resurfacing has been completed.

1.4 RESTORATION OF PAVEMENT

A. General. All paved areas including asphaltic concrete berms cut or damaged during construction shall be replaced with similar materials and of equal thickness to match the existing adjacent undisturbed areas, except where specific resurfacing requirements have been called for in the Contract Documents or in the requirements of the agency issuing the permit. All temporary and permanent pavement shall conform to the requirements of the affected pavement OWNER. All pavements which are subject to partial removal shall be neatly saw cut in straight lines.

B. Temporary Resurfacing. Wherever required by the public authorities having jurisdiction, the CONTRACTOR shall place temporary surfacing promptly after backfilling and shall maintain such surfacing for the period of time fixed by said authorities before proceeding with the final restoration of improvements.

C. Permanent Resurfacing. In order to obtain a satisfactory junction with adjacent surfaces, the CONTRACTOR shall saw cut back and trim the edge so as to provide a clean, sound, vertical joint before permanent replacement of an excavated or damaged portion of pavement. Damaged edges of pavement along excavations and elsewhere shall be trimmed back by saw cutting in straight lines. All pavement restoration and other facilities restoration shall be constructed to finish grades compatible with adjacent undisturbed pavement.

D. Restoration of Sidewalks or Private Properties. Wherever sidewalks or private properties and driveways have been removed for purposes of construction, the CONTRACTOR shall place suitable temporary sidewalks or driveways promptly after backfilling and shall maintain them in satisfactory condition for the period of time fixed by the authorities having jurisdiction over the affected portions before proceeding with the final restoration or, if no such period of times is so fixed, the CONTRACTOR shall maintain said temporary sidewalks or driveways until the final restoration thereof has been made. The CONTRACTOR shall restore all private properties within thirty (30) days after a complaint is received by the OWNER.

1.5 EXISTING UTILITIES AND IMPROVEMENTS

A. General. The CONTRACTOR shall protect all Underground Utilities and other improvements which may be impaired during construction operations. It shall be the CONTRACTOR's responsibility to ascertain the actual location of all existing utilities and other improvements that will be encountered in its construction operations, and to see that such utilities or other improvements are adequately protected from damage due to such operations. The CONTRACTOR shall take all possible precautions for the protection of unforeseen utility lines to provide for uninterrupted service and to provide such special protection as may be necessary.

B. Utilities to be Moved. In the case it shall be necessary to move the property of any public utility or franchise holder, such utility company or franchise holder will, upon request of the CONTRACTOR, be notified by the OWNER to move such property within a specified reasonable time. When utility lines that are to be removed are encountered within the area of operations, the CONTRACTOR shall notify the ENGINEER a sufficient time in advance for the necessary measures to be taken to prevent interruption of service.

C. Where the proper completion of the WORK requires the temporary or permanent removal and/or relocation of an existing utility or other improvement which is indicated,

the CONTRACTOR shall remove and, without unnecessary delay, temporarily replace or relocate such utility or improvement in a manner satisfactory to the ENGINEER and the OWNER of the facility. In all cases of such temporary removal or relocation, restoration to former location shall be accomplished by the CONTRACTOR in a manner that will restore or replace the utility or improvement as nearly as possible to its former locations and to as good or better condition than found prior to removal.

D. OWNER's Right of Access. The right is reserved to the OWNER and to the OWNERs of public utilities and franchises to enter at any time upon any public street, alley, right-of-way, or easement for the purpose of making changes in their property made necessary by the WORK of this Contract.

E. Underground Utilities Indicated. Existing utility lines that are indicated or the locations of which are made known to the CONTRACTOR prior to excavation and that are to be retained, and all utility lines that are constructed during excavation operations shall be protected from damage during excavation and backfilling and, if damaged, shall be immediately repaired or replaced by the CONTRACTOR.

F. Underground Utilities Not Indicated. In the event that the CONTRACTOR damages any existing utility lines that are not indicated or the locations of which are not made known to the CONTRACTOR prior to excavation, a written report thereof shall be made immediately to the ENGINEER. If directed by the ENGINEER, repairs shall be made by the CONTRACTOR under the provisions for changes and extra work contained in the General Conditions.

G. All costs of locating, repairing damage not due to failure of the CONTRACTOR to exercise reasonable care, and removing or relocating such utility facilities not shown in the Contract Documents with reasonable accuracy, and for equipment on the project which was actually working on that portion of the work which was interrupted or idled by removal or relocation of such utility facilities, and which was necessarily idled during such work will be paid for as extra work in accordance with the provisions of the General Conditions.

H. Approval of Repairs. All repairs to a damaged utility or improvement are subject to inspection and approval by an authorized representative of the utility or improvement OWNER and the ENGINEER before being concealed by backfill or other work.

I. Maintaining in Service. All oil and gasoline pipelines, power, and telephone or the communication cable ducts, gas and water mains, irrigation lines, sewer lines, storm drain lines, poles, and overhead power and communication wires and cables encountered along the line of the WORK shall remain continuously in service during all the operations under the Contract, unless other arrangements satisfactory to the ENGINEER are made with the owner of said pipelines, duct, main, irrigation line, sewer, storm drain, pole, or wire or cable. The CONTRACTOR shall be responsible for and shall repair all damage due to its operations, and the provisions of this Section shall not be abated even in the event such damage occurs after backfilling or is not discovered until after completion of the backfilling.

J. Existing Water Services. CONTRACTOR shall protect and provide temporary support for existing water services. Any water service damaged by the CONTRACTOR shall be replaced at the CONTRACTOR's expense, with a new water service complete with new water main tap.

1.6 TREES WITHIN STREET RIGHTS-OF-WAY AND PROJECT LIMITS

A. General. The CONTRACTOR shall exercise all necessary precautions so as not to damage or destroy any trees or shrubs, including those lying within street rights-of-way and project limits, and shall not trim or remove any trees unless such trees have been approved for trimming or removal by the jurisdictional agency or OWNER. All existing trees and shrubs which are damaged during construction shall be trimmed or replaced by the CONTRACTOR or a certified tree company under permit from the jurisdictional agency and/or the OWNER. Tree trimming and replacement shall be accomplished in accordance with the following paragraphs.

B. Trimming. Symmetry of the tree shall be preserved; no stubs or splits or torn branches left; clean cuts shall be made close to the trunk or large branch. Spikes shall not be used for climbing live trees. All cuts over 1-1/2 inches in diameter shall be coated with an asphaltic emulsion material.

C. Replacement. The CONTRACTOR shall immediately notify the jurisdictional agency and/or the OWNER if any tree is damaged by the CONTRACTOR's operations. If, in the opinion of said agency or the OWNER, the damage is such that replacement is necessary, the CONTRACTOR shall replace the tree at CONTRACTOR's own expense. The tree shall be of a like size and variety as the tree damaged, or, if of a smaller size, the CONTRACTOR shall pay to the OWNER of said tree a compensatory payment acceptable to the tree OWNER, subject to the approval of the jurisdictional agency or OWNER. The size of the trees shall be not less than 1-inch diameter nor less than 6 feet in height.

1.7 NOTIFICATION BY THE CONTRACTOR

A. Prior to any excavation in the vicinity of any existing underground facilities, including all water, sewer, storm drain, gas, petroleum products, or other pipelines; all buried electric power, communications, or television cables; all traffic signal and street lighting facilities; and all roadway and state highway rights-of-way the CONTRACTOR shall notify the respective authorities representing the OWNERs or agencies responsible for such facilities not less than 3 days nor more than 7 days prior to excavation so that a representative of said OWNERs or agencies can be present during such work if they so desire. The CONTRACTOR shall also notify the Sunshine State One Call Center 1-800-432-4770 at least 2 days, but no more than 14 days, prior to such excavation.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Materials may be new or used, suitable for the intended purpose, but must not violate requirements of applicable codes and standards.

2.2 FENCING

A. Materials to CONTRACTOR's option, minimum fence height = 6 feet.

2.3 BARRIERS

A. Materials to CONTRACTOR's option, as appropriate to serve required purpose.

PART 3 - EXECUTION

3.1 GENERAL

A. Install facilities of a neat and reasonable uniform appearance, structurally adequate for required purposes.

B. Maintain barriers during entire construction period.

C. Relocate barriers as required by progress of construction.

3.2 TREE AND PLANT PROTECTION

A. Preserve and protect existing trees and plants adjacent to work areas.

B. Consult with OWNER's Representative and remove agreed-on roots and branches which interfere with work.

1. Employ qualified tree surgeon to remove branches, and to treat cuts.

C. Protect root zones of trees and plants.

1. Do not allow vehicular traffic and parking.
2. Do not store materials or products.
3. Prevent dumping of refuse or chemically injurious materials or liquids.
4. Prevent puddling or continuous running water.

D. Carefully supervise all work to prevent damage.

E. Replace trees and plants which are damaged or destroyed due to work operations under this contract.

3.3 REMOVAL

A. Completely remove barricades, including foundations, when construction has progressed to the point that they are no longer needed, and when approved by OWNER's Representative.

B. Clean and repair damage caused by installation, fill and grade areas of the site to required elevations and slopes, and clean the area.

END OF SECTION 01530

SECTION 01550 - SITE ACCESS AND STORAGE

PART 1 - GENERAL

A. HIGHWAY LIMITATIONS:

B. The CONTRACTOR shall make its own investigation of the condition of available public and private roads and of clearances, restrictions, bridge load limits, and other limitations affecting transportation and ingress and egress to the site of the WORK. It shall be the CONTRACTOR's responsibility to construct and maintain any haul roads required for its construction operations.

1.2 TEMPORARY CROSSINGS:

A. General. Continuous, unobstructed, safe, and adequate pedestrian and vehicular access shall be provided to fire hydrants, commercial and industrial establishments, churches, schools, parking lots, service stations, motels, fire and police stations, and hospitals. Safe and adequate public transportation stops and pedestrian crossings at intervals not exceeding 300 feet shall be provided. The CONTRACTOR shall cooperate with parties involved in the delivery of mail and removal of trash and garbage so as to maintain existing schedules for such services. Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access for reasonable periods of time.

B. Temporary Bridges. Wherever necessary, the CONTRACTOR shall provide suitable temporary bridges or steel plates over unfilled excavations, except in such cases as the CONTRACTOR shall secure the written consent of the individuals or authorities concerned to omit such temporary bridges or steel plates, which written consent shall be delivered to the ENGINEER prior to excavation. All such bridges or steel plates shall be maintained in service until access is provided across the backfilled excavation. Temporary bridges or steel plates for street and highway crossing shall conform to the requirements of the authority having jurisdiction in each case, and the CONTRACTOR shall adopt designs furnished by said authority for such bridges or steel plates, or shall submit designs to said authority for approval, as may be required.

C. Street Use. Nothing herein shall be construed to entitle the CONTRACTOR to the exclusive use of any public street, alleyway, or parking area during the performance of the WORK hereunder, and it shall so conduct its operations as not to interfere unnecessarily with the authorized work of utility companies or other agencies in such streets, alleyways, or parking areas. No street shall be closed to the public without first obtaining permission of the ENGINEER and proper governmental authority. Where excavation is being performed in primary streets or highways, one lane in each direction shall be kept open to traffic at all times unless otherwise indicated. Toe boards shall be provided to retain excavated material if required by the ENGINEER or the agency having jurisdiction over the street or highway. Fire hydrants on or adjacent to the WORK shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the CONTRACTOR to assure the use of sidewalks and the proper functioning of all gutters, storm drain inlets, and other drainage facilities.

D. Traffic Control

1. For the protection of traffic in public or private streets and ways, the CONTRACTOR shall provide, place, and maintain all necessary barricades, traffic cones, warning signs, lights, and other safety devices in accordance with the

requirements of Broward County and the "Manual of Uniform Traffic Control Devices, Part VI - Traffic Controls for Street and Highway Construction and Maintenance Operations," published by U.S. Department of Transportation, Federal Highway Administration (ANSI D6.1).

2. The CONTRACTOR shall take all necessary precautions for the protection of the WORK and the safety of the public. All barricades and obstructions shall be illuminated at night, and all lights shall be kept burning from sunset until sunrise. The CONTRACTOR shall station such guards or flaggers and shall conform to such special safety regulations relating to traffic control as may be required by the public authorities within their respective jurisdictions. All signs, signals, and barricades shall conform to the requirements of the Florida Department of Transportation.

3. The CONTRACTOR shall submit 3 copies of a traffic control plan to the ENGINEER for approval a minimum of 2 weeks prior to construction. The ENGINEER reserves the right to observe these traffic control plans in use and to make any changes as field conditions warrant. Any changes shall supersede these plans and be done solely at the CONTRACTOR's expense.

4. The CONTRACTOR shall remove traffic control devices when no longer needed, repair all damage caused by installation of the devices, and shall remove post settings and backfill the resulting holes to match grade.

E. Temporary Driveway Closure. The CONTRACTOR shall notify the OWNER or occupant (if not Owner-occupied) of the closure of the driveways to be closed more than one eight-hour work day at least 3 working days prior to the closure. The CONTRACTOR shall minimize the inconvenience and minimize the time period that the driveways will be closed. The CONTRACTOR shall fully explain to the OWNER/occupant how long the work will take and when closure is to start. Total closure time shall not exceed 5 days.

1.3 CONTRACTOR'S WORK AND STORAGE AREA:

A. The CONTRACTOR shall designate and arrange for the use of a portion of the property, adjacent to the WORK for its exclusive use during the term of the Contract as a storage and shop area for its construction operations relative to this Contract.

B. The CONTRACTOR shall make its own arrangements for any necessary off-site storage or shop areas necessary for the proper execution of the WORK.

C. The CONTRACTOR shall construct and use a separate storage area for hazardous materials used in constructing the WORK.

1. For the purpose of this paragraph, hazardous materials to be stored in the separate area are all products labeled with any of the following terms: Warning, Caution, Poisonous, Toxic, flammable, Corrosive, Reactive, or Explosive. In addition, whether or not so labeled, the following materials shall be stored in the separate area: diesel fuel, gasoline, new and used motor oil, hydraulic fluid, cement, paints and paint thinners, two-part epoxy coatings, sealants, asphaltic products, glues, solvents, wood preservatives, sand blast materials, and spill absorbent.
2. Hazardous materials shall be stored in groupings according to the Material Safety Data Sheets.
3. The CONTRACTOR shall develop and submit to the ENGINEER a plan for storing and disposing of the materials above.

4. The CONTRACTOR shall obtain and submit to the ENGINEER a single EPA number for wastes generated at the site.
5. The separate storage area shall meet all the requirements of all authorities having jurisdiction over the storage of hazardous materials.
6. All hazardous materials which are delivered in containers shall be stored in the original containers until use. Hazardous materials which are delivered in bulk shall be stored in containers which meet the requirements of authorities having jurisdiction.

1.4 PARKING:

A. The CONTRACTOR shall:

1. Provide temporary parking areas for ENGINEER/ARCHITECT and OWNER's use.
2. The CONTRACTOR shall direct its employees to park in designated areas secured by the CONTRACTOR.
3. Traffic and parking areas shall be maintained in a sound condition, free of excavated material, construction equipment, mud, and construction materials. The CONTRACTOR shall repair breaks, potholes, low areas which collect standing water, and other deficiencies.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01550

SECTION 01560 - TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Provide and maintain methods, equipment, and temporary construction, as necessary, to provide controls over environmental conditions at the construction site and related area under CONTRACTOR's control; remove physical evidence of temporary facilities at completion of work.

1.2 RELATED REQUIREMENTS

A. All applicable sections of the Specifications.

B. Conditions of the Contract.

1.3 NOISE CONTROL

A. Provide all necessary requirements for noise control during the construction period.

1. Noise procedures shall conform to all applicable OSHA requirements and local ordinances having jurisdiction on the work.
2. Noise levels during nighttime hours shall not exceed 55 db measured at the property line of a residence.

1.4 DUST CONTROL

A. Provide positive methods and apply dust control materials to minimize raising dust from construction operations and provide positive means to prevent air-borne dust from dispersing into the atmosphere.

1.5 WATER CONTROL

A. Provide methods to control surface water to prevent damage to the project, the site, or adjoining properties.

1. Control fill, grading and ditching to direct surface drainage away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper runoff.

B. Provide, operate and maintain hydraulic equipment of adequate capacity to control surface and water.

C. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas.

1.6 PEST CONTROL

A. Provide pest control as necessary to prevent infestation of construction or storage area.

1. Employ methods and use materials which will not adversely affect conditions at the site or on adjoining properties.
2. Should the use of pesticides be considered necessary, submit an informational copy of the proposed program to OWNER with a copy to ENGINEER. Clearly indicate:

a. The area or areas to be treated.
b. The pesticide to be used, with a copy of the manufacturer's printed instructions.
c. The pollution preventative measures to be employed.

B. The use of any pesticide shall be in full accordance with the manufacturer's printed instructions and recommendations.

1.7 RODENT CONTROL

A. Provide rodent control as necessary to prevent infestation of construction or storage area.

1. Employ methods and use materials, which will not adversely affect conditions at the site or on adjoining properties

2. Should the use of rodenticide be considered necessary, submit an informational copy of the proposed program to OWNER with a copy to OWNER's Representative. Clearly indicate:

a. the area or areas to be treated.

b. the rodenticide to be used, with a copy of the manufacturer's printed instructions.

c. the pollution preventative measures to be employed.

B. The use of any rodenticide shall be in full accordance with the manufacturer's printed instructions and recommendations.

1.8 DEBRIS CONTROL

A. Maintain all areas under CONTRACTOR's control free of extraneous debris.

B. Initiate and maintain a specific program to prevent accumulation of debris at construction site, storage and parking area, or along access roads and haul routes.

1. Provide containers for deposit of debris as specified in Section 01710 - Cleaning.
2. Prohibit overloading of trucks to prevent spillage on access and haul routes.
3. Provide periodic inspection of traffic areas to enforce requirements.

C. Schedule periodic collections and disposal of debris as specified in Section 01710 - Cleaning.

1. Provide additional collections and disposal of debris whenever the periodic schedule is to prevent accumulation.

1.9 POLLUTION CONTROL

A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.

B. Provide equipment and personnel, perform emergency measures required to contain any spillage, and to remove contaminated soils or liquids.

1. Excavate and dispose of any contaminated earth off-site and replace with suitable compacted fill and topsoil.

C. Take special measures to prevent harmful substances from entering public waters.

1. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams or in sanitary or storm sewers.

D. Provide systems for control of atmospheric pollutants.

1. Prevent toxic concentrations of chemicals.
2. Prevent harmful dispersal of pollutants into the atmosphere.

1.10 EROSION CONTROL

A. Plan and execute construction and earthwork, by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas to prevent erosion and sedimentation.

1. Hold the areas of bare soil exposed at one time to a minimum
2. Provide temporary control measures such as berms, dikes and drains.
3. Provide silt screens as required preventing surface water contamination.

B. Construct fills and waste areas by selective placement to eliminate surface silts or clays, which will erode.

C. Periodically inspect earthwork to detect any evidence of the start of erosion, apply corrective measures as required to control erosion.

D. All erosion control procedures must comply with the National Pollutant Discharge Elimination System (NPDES).

1.11 TEMPORARY TREE AND PLANT PROTECTION

1.12 GENERAL PROVISIONS

A. Attention is directed to the PROCUREMENT AND CONTRACTING REQUIREMENTS and all Sections within DIVISION 01, GENERAL REQUIREMENTS, which are made a part of this Section of the Specifications.

1.13 WORK INCLUDED

A. Protection of existing trees and plants from damage as a result of the Construction Manager's operations including, but not limited to:

1. Tree protection fencing.
2. Root pruning and construction pruning.
3. Fencing of areas designated for tree removals by the Owner.

B. Refer to “Tree Protection and Relocation Notes” included on the Drawings.

1.14 RELATED REQUIREMENTS

A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. Section 02200, SITE PREPARATION.
2. Section 311300, SELECTIVE TREE REMOVAL AND TRIMMING’ Includes stump removal of trees removed by the Owner in designated fenced areas.

3. Section 312300, SITE EXCAVATING, BACKFILLING ANDCOMPACTING: Excavation and backfill.
4. Section 329300, PLANTING: New plant material.
5. Section 329600, TRANSPLANTING.

1.15 REFERENCED STANDARDS

A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

1. American National Standards Institute (ANSI): Z133.1
2. Safety Requirements for Pruning, Trimming, Repairing, Maintaining and Removing Trees, and for Cutting Brush.
3. International Society of Arboriculture (ISA): Guide for Establishing Values of Trees and Other Plants
4. National Arborist Association (NAA): Ref. 1
5. Pruning Standards for Shade Trees

1.16 SUBMITTALS

A. Prepare and submit drawings indicating the extent of tree protection fencing required.

B. Proposed methods, and schedule for effecting tree and plant protection shall be submitted for approval.

C. Proposed methods, materials, and schedule for root pruning, construction pruning, and tree fertilization by Certified Arborist shall be submitted for approval.

D. Certified Arborist Qualifications shall be submitted for Architect's review and approval.

1.17 QUALITY ASSURANCE

A. Work of this section shall be completed by a professional ISA Certified Arborist with a minimum five years experience, who has successfully completed an exam and education program equal to the International Society of Arboriculture (ISA) Certification Program, sponsored by the International Society of Arboriculture 2009, P.O. Box 3129, Champaign, IL 61826 (217) 355-9411; Email: isa@isa-arbor.com.

B. Arborist shall have the following minimum qualifications:

1. Membership in:
   a. NAA – National Arborist Association
   b. ISA – International Society of Arborists
2. Meet state requirements for insurance.
3. Licenses for application and use of pesticides.

1.18 DAMAGE PENALTIES

A. Certain specimen trees within the construction areas and in other key locations will be identified by the Owner and the Architect, and marked with red tags. Loss of any of these trees will result in fines assessed at $10,000 per tree. Damage to all other trees on the property will be assessed at the rate of $200 per inch caliper of the tree.

B. A fine of $1,000 will be levied against the Construction Manager for each incident of construction inside tree protection areas.

C. Damages to trees, shrubs, and other vegetation will be assessed by the Architect and Owner in accordance with the ISA Guide.

D. Trees or roots visibly damaged will cause the Owner to withhold from the Construction Manager an assessed amount conforming to the requirements stipulated above for a period of two years. After that period the impact of the damage to any tree will be assessed accordingly.

E. If any trees or shrubs designated to be saved are damaged and replacement is required, a number and diameter of trees or shrubs of the same species and variety, as specified by the Owner and Architect, shall be furnished and planted by the Construction Manager. The total inch diameter of the replacement trees or shrubs shall equal the diameter of the tree or shrub to be replaced.

PART 2 - PRODUCTS

2.1 TREE PROTECTION FENCING

A. Tree protection fencing, including fencing of areas designated for tree removals by the Owner, shall be the following:

1. Polyethylene mesh fencing, chain link fencing, or other Owner approved material; height as indicated on the Drawings.

2. Fabric shall be fluorescent orange, high density polyethylene 1-1/2 in. square mesh.

3. Stakes shall be pressure treated pine.

B. Stakes for fencing shall be driven into the ground, except above utility locations where surface anchors shall be used. Posts shall be spaced 16 ft. on center maximum.

C. For fencing within the drip line of trees, surface mounted post anchors may be acceptable. Review with Architect and arborist and obtain written approval prior to installing. Post installation shall not damage tree root systems.

2.2 ROOT PRUNING

A. Peat moss and mulch materials shall be as specified under Section 329300, PLANTING.

B. Liquid fertilizer to be applied to root pruned and construction pruned trees shall be Peters M-77 Sequestered-Chelated Soluble Fertilizer manufactured by W.R. Grace and Co., Cambridge, MA 02140, Gold Start Liquid Fertilizer, manufactured by Nutra-Flo Company, 1919 Grand Ave, Sioux City, IA 51106-5708; Phone: 712-277-2011; 800-831-4815; Fax: 712-279-1946; Agro- Culture Liquid Fertilizer, manufactured by

Agro-Culture Liquid Fertilizers, 3055 W. M-21, P.O. Box 150, St. Johns, Michigan 48879; 1-800-678-9029, or approved equal. Liquid fertilizer shall be approved by Certified Arborist.

C. Dormant oil spray shall be a dormant miscible spray equal to Sunspray, Scalecide, or Volck Oil.

D. Insecticide shall be Isotox manufactured by Ortho; QuickPRO, manufactureed by Monsanto; LESCO Sevin Brand SL, #019106, manufactured by LESCO, or approved equal. Insecticide shall be approved by Certified Arborist.

PART 3 - EXECUTION

3.1 MEASUREMENT AND PAYMENT

A. There shall be no special measurement or payment for the work under this section; it shall be included in the price of all other work.

3.2 PROTECTION FOR EXISTING TREES TO BE PRESERVED:

A. All trees to be preserved on the property shall be protected against damage from construction operations.

1. Includes associated understory.

B. Only those trees located within the limits of improvements to be constructed as indicated, shall be removed.

1. All trees to remain shall be flagged for review after the location of improvements to be constructed are staked in the field.

2. Any tree to be removed shall be reviewed by the Architect and Owner for approval prior to removal.

3. Trees to be preserved are represented by a solid line. Trees to be removed are represented by a dashed or ghosted line. Trees to be planted are graphically differentiated from existing trees.

4. Obtain approval of installation of tree barricade fencing from Owner and Architect prior to the initiation of any removal of vegetation and construction.

C. Erect fencing and armor protection prior to beginning any clearing, demolition or construction activity, and unless otherwise instructed, maintain in place until construction is completed.

1. Tree protection barricade shall be erected at the edge of the dripline where possible; in extreme circumstances and with the approval of the Architect, fencing may be located at the edge of the root protection zone.

a. For trees 10-inch caliper and less, the minimum distance the barrier shall be erected is ten (10) feet from the trunk of tree or clump of trees.

2. Trees immediately adjacent to and within one hundred feet (100) of any construction activities are to be protected by barricade fencing; subject to approval of the Architect and Owner.

3. Trees exposed to construction activity within the dripline or within twenty-five (25) feet of any construction activity are to have trunks protected with tree armor in addition to barricade fencing.
4. The tree protection barricade shall be placed before any excavating or grading is begun and maintained in repair for the duration of the construction work unless otherwise directed.
5. No material shall be stored or construction operation shall be carried on within the tree protection barricade.
6. Tree protection barricade shall remain until all work is completed.
7. Remove tree protection barricade at commencement of finish grading.
8. Remove tree armor immediately prior to Substantial Completion.

D. Protect tree trunk with tree armor to a height of 8' or to the limits of lower branching (when exposed to construction activity within the drip line) with 2x4's butted side to side completely around trunk.

1. Wire wrap do not nail, around trees.

E. Protect trees that are to remain, whether within barricade fencing or not, from the following:

1. Compaction of root area by equipment or material storage; construction materials shall not be stored closer to trees than the farthest extension of their limbs (dripline).
2. The proposed finished grade within the root protection zone of any preserved tree shall not be raised or lowered more than three (3) inches.
    a. Retaining methods can be used to protect and/or provide lateral support to the area outside the root protection zone.
3. Trunk damage by moving equipment, material storage, nailing or bolting.
4. Strangling by tying ropes or guy wires to trunks or large branches.
5. Poisoning by pouring solvents, gas, paint, etc., on or around trees and roots.
6. Cutting on roots by excavating, ditching, etc.
    a. Prior to excavation within the tree drip lines or the removal of trees adjacent to other trees that are to remain, make a clean cut between the disturbed and undisturbed root zones with a rock saw or similar equipment to minimize root damage.
    b. Refer to EXCAVATION AROUND TREES for additional information.
7. Damage of branches by improper pruning.
8. Drought from failure to water or by cutting or changing normal drainage pattern past roots. Construction Manager shall provide means as necessary to ensure positive drainage.
9. Changes of soil pH factor by disposal of lime base materials such as concrete, plaster, lime treatment at pavement subgrade, etc. When installing concrete adjacent to the root zone of a tree, use a minimum 6 mil. plastic vapor barrier behind the concrete to prohibit leaching of lime into the soil.

10. Do not cut roots 3/4" in diameter or over without approval of Owner's Representative. All excavation and earthwork within the PRZ of trees shall be done by hand.
11. Protect all existing trees near areas to be stabilized from underground contaminations by placing a 6 mil. Plastic film barrier along exposed vertical cut extending a minimum 12" into undisturbed subgrade below depth of stabilization.
12. No vehicular traffic shall occur within the drip line of any tree; including parking of vehicles.
13. No soil shall be spread, spoiled or otherwise disposed of under any tree within the PRZ.

F. Any damage done to existing tree crowns or root systems shall be repaired by the Arborist to the satisfaction of the Architect and Owner's Representative.
1. Broken branches shall be cut cleanly.
2. Any roots cut shall be cut cleanly with a saw other means approved by the Architect and Owner's Representative.

G. Damages to trees caused through negligence of Construction Manager or his employees will be assessed by Owner and Project Arborist as described in Paragraph 1.06.

3.3 PROTECTED ROOT ZONE:

A. The PROTECTED ROOT ZONE (PRZ).
1. No disturbance shall occur closer to the tree than one-half the radius of the PRZ or within five (5) feet of the tree whichever is greater.

3.4 PROTECTED ROOT ZONE IMPACTS:

A. Those trees to remain which have some encroachment on their protected root zone shall have the following maximum allowable impacts:
1. Minimum Protection Criteria 'A': No disturbance of natural grade, e.g. trenching or excavation, can occur closer to the tree than one-half the radius of the PRZ or within five (5) feet of the tree whichever is greater.
2. Minimum Protection Criteria 'B': No cut or fill greater than three (3) inches will be located closer to the tree trunk than ½ the PRZ radius distance.

B. Trees impacted shall have a minimum of a six (6) inch layer of mulch placed and maintained over the root protection zone and the undisturbed area within the dripline.
1. Immediate pruning and fertilization shall occur per the pruning and fertilization sections of this specification.
2. Provide water in a slow drip manner to impacted trees as approved by the Architect and Owner's Representative.
3. Provide water to apply equivalent to 1 inch once per week to deeply soak in over the area within the dripline of the tree during periods of hot, dry weather.
4. Spray tree crowns periodically to reduce dust accumulation on the leaves.

3.5 EXCAVATING AROUND TREES

A. Excavate within the dripline of trees only where required and when absolutely necessary.

1. Any excavation within the PRZ of trees shall be under the direction of the Arborist.
2. Arborist shall be at site at all times while excavation is occurring within the PRZ.
3. Air spade all removals within the PRZ.
4. Refer to PROTECTED ROOT ZONE.

B. When excavating for new construction is required within the PRZ, air spade and hand excavate to minimize damage to root systems.

1. Use narrow tine spading forks and comb soil to expose roots.
2. Relocate roots back into backfill areas wherever possible.
3. If large main lateral roots are encountered, expose beyond excavation limits as required to bend and relocate without breaking.
4. If root relocation is not practical, clean cut roots approximately three (3) inches back from new construction.

C. Where existing grade is above new finish grade, carefully excavate within the dripline to the new finish grade.

1. Carefully hand excavate an additional six (6) inches below the finish grade.
2. Use narrow tine spading forks to comb the soil to expose the roots, and prune the exposed root structure as recommended by the Arborist.
3. Keep the exposed roots damp.
4. Treat the cut roots as specified and as recommended by the Arborist.
5. After pruning and treatment of the root structure is complete, backfill to finish grade with eight (8) inches of approved plant mix, or structural soil.

D. Where noted on plan, use airspade to expose roots for required cutting to accommodate hardscape elements. Architect to verify all cuts prior to proceeding.

E. Temporarily support and protect roots against damage until permanently relocated and covered with recommended landscape material.

3.6 INSTALLATION OF FENCING

A. Prior to start of demolition work and clearing and grubbing operations, tree protection fencing shall be installed in accordance with the following:

1. Fencing shall be installed at the tree protection areas indicated on the Drawings.
2. Fencing shall be installed a minimum of 15 ft. beyond the drip line of trees to be protected, unless otherwise approved by the Architect.

B. Tree protection fencing to be installed over utility locations shall be installed using surface anchors. No poles or stakes shall be driven into the ground at these locations.

3.7 ROOT PRUNING

A. Where construction will within drip line of existing trees designated to remain, roots shall be pruned.

B. All root pruning shall be done by Certified Arborist only. Air spade is the preferred tool for root pruning. Trenching, vibrating plow, and stump grinding are NOT suitable means for root pruning.

C. Roots greater than 1 in. diameter shall be pruned by means of a hand saw, or other approved means.

D. Install root protection measures as prescribed by Certified Arborist.

3.8 CONSTRUCTION PRUNING

A. Construction pruning shall conform to NAA Ref.1 for Class IV - Crown Reduction Pruning. Work shall conform to the requirements of ANSI Z133.1, and shall be reviewed in the field with the Architect and Certified Arborist prior to start of work.

3.9 FERTILIZATION AND INSECT SPRAYING

A. Root pruned and construction pruned tree shall be treated with liquid fertilizer, dormant oil spray, and insecticide as prescribed by Certified Arborist.

B. Liquid fertilizer shall be applied at a rate recommended by the manufacturer and as required by NAA Ref. 2.

C. Dormant oil spray shall be applied in early spring before buds begin to swell at a rate recommended by the manufacturer.

D. Insecticide spray shall be applied twice to root pruned trees following application of dormant oil spray. Spray insecticide at rates recommended by spray manufacturer at intervals appropriate for effective insect control.

3.10 REMOVAL OF PROTECTION

A. All protection shall remain in place throughout the construction period. Remove protection devices only after written permission has been granted by the Architect.

END OF SECTION 01560

SECTION 01570 - TRAFFIC REGULATIONS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Provide, operate and maintain equipment, services and personnel, with traffic control and protective devices, as required to expedite vehicular traffic flow to provide safe and expeditious movement of traffic through and on haul routes, at site entrances, in construction zones, on-site access roads, and parking areas including driving and/or walking public.

B. Remove temporary equipment and facilities when no longer required, restore grounds to original, or specified conditions.

C. The requirements specified herein are in addition to the plan for Maintenance of Traffic as specified in Section 01500.

1.2 RELATED REQUIREMENTS

A. All applicable sections of the Specifications.

B. Conditions of the Contract.

1.3 TRAFFIC SIGNALS AND SIGNS

A. Provide and operate traffic control and directional signals or signs required to direct and maintain an orderly flow of traffic in all areas under CONTRACTOR's control, or affected by CONTRACTOR's operations.

1.4 FLAGPERSON

A. Provide qualified and suitably equipped flag-person when construction operations encroach on traffic lanes, as required for regulation of traffic.

1.5 FLARES AND LIGHTS

A. Provide flares and lights during periods of low visibility:

1. To clearly delineate traffic lanes and to guide traffic.
2. For use of flag-person in directing traffic.

B. Provide illumination of critical traffic and parking areas.

1. Maintain free vehicular access to and through parking areas.
2. Prohibit parking on or adjacent to access roads, or in non-designated areas.

1.6 HAUL ROUTES

A. Consult with OWNER and governing authorities, establish public thorough fares which will be used as haul routes and site access.

B. Confine construction traffic to designated haul routes.

C. Provide traffic control at critical areas of haul routes to expedite traffic flow, to minimize interference with normal public traffic.

1.7 EMERGENCY ACCESS

A. In order to provide protection to the workers and residents, the Contractor shall maintain emergency access to all adjacent properties at all times during construction. If a road is required to be closed to vehicular traffic and the distance of the closure exceeds 150 feet between stabilized surfaces, or prevents access to properties for a distance that exceeds 150 feet, the Contractor shall provide a 10 foot wide stabilized access way on one side of the trench capable of supporting a Fire Truck. Contractor shall also provide stabilized access ways across the trench or un-stabilized area a minimum of 6 feet in width at a spacing not to exceed 100 feet capable of supporting foot traffic. These access ways shall be protected and delineated with lighted barricades or other such devices as approved by the regulatory agency. Both ends of the emergency access way shall be blocked in accordance with the MOT permit approved by the City of Fort Lauderdale and FDOT with signage indicating that this access way is to be used by emergency vehicles only.

No trenches or holes shall be left open after working hours. In the event a trench must be left open after hours, it shall be done so only with the express written permission from the Engineer, and it shall be the Contractor's responsibility to provide proper protection of the open trench or hole as required by the regulatory agency. In addition the Contractor shall provide a security guard at the site whenever the Contractor's personnel are not present, 24 hours per day/ 7 days per week. It shall be the Security Guard's responsibility to protect the open trench or hole from trespassers and to direct emergency personnel on site. The Security Guard shall not have any other responsibilities such as operation pumps or equipment but shall be dedicated to protecting the trench or open hole. The Security Guard shall be equipped with a wireless telephone capable of calling 911 to report an emergency and shall keep that telephone on their person at all times. In addition to this provision the contractor shall maintain trench safety and comply with current OSHA regulations and the Trench Safety Act. The contractor shall maintain and keep all safety barricades, signage, flashers, and detours, in operation condition. A copy of the approved MOT plans, and details, shall be on site at all times.

B. Measurement and payment for security guard services shall be included in the utility pipe installation unit price. Measurement for temporary emergency access ways will be paid for under the specified line item at the unit price described in the bid schedule.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01570

SECTION 01590 - PROJECT SIGN

PART 1 - GENERAL

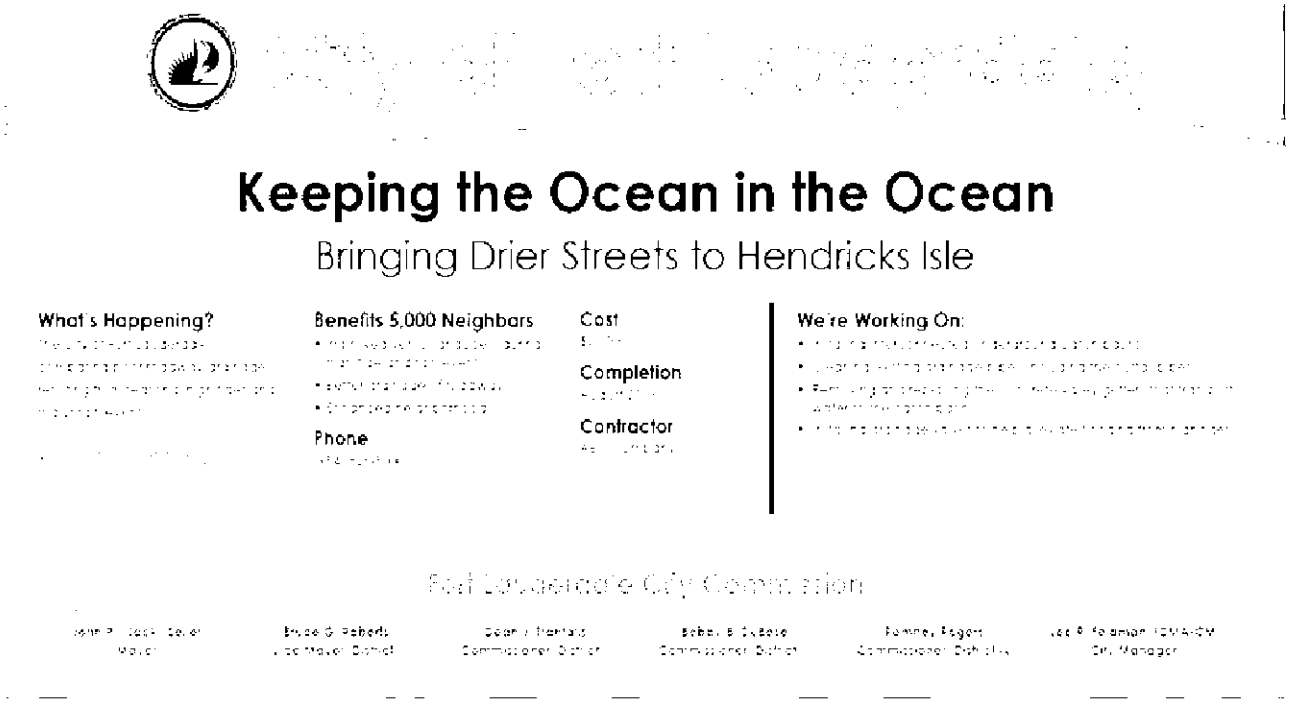
1.1 REQUIREMENTS INCLUDED

A. Contractor shall furnish two 4' x 8' sign, below is a sample, not specific to the project.

B. Sign shall be made to be weather resistant and on display for entire length of contract.

C. Shop drawings must be submitted prior to sign construction.

D. The exact style and design of the sign will be provided during the preconstruction meeting.



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

END OF SECTION 01590

Construction Sign Request Form

Title (Bold):

Title (Not Bold):

What's Happening?

Benefits:

Number of Neighbors Benefitted:

Cost:

Month and Year of Expected Completion:

Contractor:

Phone: 954-828-8000

We're Working On:

Project Manager Signature	Date

Senior Project Manager Signature	**Date**

SECTION 01600 - MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Material and equipment incorporated into the work:

1. Conform to applicable specifications and standards.
2. Comply with size, make, type and quality specified, or as specifically approved in writing by the OWNER's Representative.
3. Manufactured and fabricated products:

    a. Design, fabricate and assemble in accord with the best engineering and shop practices.
    b. Manufacture like parts of duplicate units to standard sizes and gauges to be interchangeable.
    c. Two or more items of the same kind shall be identical, by the same manufacturer.
    d. Products shall be suitable for service conditions.
    e. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.

4. Do not use material or equipment for any purpose other than that for which it is designed or is specified.

1.2 RELATED REQUIREMENTS

A. All applicable sections of the Specifications.

B. Conditions of the Contract.

1.3 MANUFACTURER'S INSTRUCTIONS

A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two copies to OWNER's Representative. Maintain one set of complete instructions at the job site during installation and until completion.

B. Handle, install, connect, clean, condition and adjust products in strict accordance with such instructions and in conformity with specified requirements.

1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with OWNER's Representative for further instructions.
2. Do not proceed with work without clear instructions.

C. Perform work in accord with manufacturer's instructions. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents.

1.4 TRANSPORTATION AND HANDLING

A. Arrange deliveries of products in accordance with construction schedules, coordinate to avoid conflict with work and conditions at the site. Products shall be delivered to the job site on an "as needed" basis.

1. Deliver products in undamaged condition, in manufacturers' original containers or packaging, with identifying labels intact with legible markings.
2. Immediately upon delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals, and that products are properly protected and undamaged.
3. Pipe and materials shall not be strung out along installation routes for longer than two (2) weeks prior to installation.

B. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

C. Coordinate deliveries to avoid conflict with Work and conditions at site:

1. Work of other contractors, or OWNER.
2. Limitations of storage space.
3. Availability of equipment and personnel for handling products.
4. OWNER's use of premises.

D. Deliver products in undamaged condition in original containers or packaging, with identifying labels intact and legible.

E. Partial deliveries of component parts of equipment shall be clearly marked to identify the equipment, to permit easy accumulation of parts and to facilitate assembly.

F. Immediately on delivery, inspect shipment to assure:

1. Product complies with requirements of Contract Documents and reviewed submittals.
2. Quantities are correct.
3. Containers and packages are intact, labels are legible.
4. Products are properly protected and undamaged.

G. Provide equipment and personnel necessary to handle products, including those provided by OWNER, by methods to prevent soiling or damage to products or packaging.

H. Provide additional protection during handling as necessary to prevent scraping, marring or otherwise damaging products or surrounding surfaces.

I. Handle products by methods to prevent bending or overstressing.

J. Lift heavy components only at designated lifting points.

1.5 STORAGE

A. Store products in accord with manufacturer's instructions, with seals and labels intact and legible.

1. Store products subject to damage by the elements in weather-tight enclosures.
2. Maintain temperature and humidity within the ranges required by manufacturer's instructions.
3. Store unpacked products on shelves, in bins or in neat piles, accessible for inspection.

B. Exterior Storage

1. Provide substantial platforms, blocking or skids to support fabricating products above ground, prevent soiling or staining.

a. Cover products, subject to discoloration or deterioration from exposure to the elements, with impervious sheet coverings. Provide adequate ventilation to avoid condensation.

2. Store loose granular materials on solid surface such as paved areas, or provide plywood or sheet materials to prevent mixing with foreign matter.

a. Provide surface drainage to prevent flow or ponding of rainwater.
b. Prevent mixing of refuse or chemically injurious materials or liquids.

1.6 MAINTENANCE OF STORAGE

A. Maintain periodic system of inspection of stored products on scheduled basis to assure that:

1. State of storage facilities is adequate to provide required conditions.
2. Required environmental conditions are maintained on continuing basis.
3. Surfaces of products exposed to elements are not adversely affected.

a. Any weathering of products, coatings and finishes is not acceptable under requirements of Contract Documents.

B. Mechanical and electrical equipment which requires servicing during long term storage shall have complete manufacturer's instructions for servicing accompanying each item, with notice of enclosed instructions shown on exterior of package.

1.7 PROTECTION AFTER INSTALLATION

A. Provide protection of installed products to prevent damage from subsequent operations. Remove when no longer needed, prior to completion of work.

B. Control traffic to prevent damage to equipment and surfaces.

C. Provide coverings to protect finished surfaces from damage.

1. Cover projections, wall corners, and jambs, sills and soffits of openings, in areas used for traffic and for passage of products in subsequent work.
2. Protect finished floors and stairs from dirt and damage.

a. In areas subject to foot traffic, secure heavy paper, sheet goods, or other materials in place.
b. For movement of heavy products, lay planking or similar materials in place.
c. Cover wall and floor surfaces in the vicinity of construction personnel activities and all finished surfaces used by construction personnel.

D. Waterproofed surfaces

1. Prohibit use of surfaces for traffic of any kind, and for storage of any products.
2. When some activity must take place in order to carry out the Contract, obtain recommendations of installer for protection of surface.

a. Install recommended protection; remove on completion of that activity.
b. Restrict use of adjacent unprotected areas.

E. Lawns and landscaping

1. Prohibit traffic of any kind across planted lawn and landscaped areas.

F. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.

1.8 SUBSTITUTIONS AND PRODUCT OPTIONS

A. Limitations on substitutions.

1. During bidding period, Instructions to Bidders govern times for submitting requests for substitutions under requirements specified in this section.
2. Substitutions will not be considered when indicated on shop drawings or product data submittals without separate formal request, when requested directly by Subcontractor or supplier, or when acceptance will require substantial revision of Contract Documents.
3. Substitute products shall not be ordered or installed without written acceptance.
4. Only one (1) request for substitution for each product will be considered. When substitution is not accepted, provide specified product.

B. Products List

1. Within 15 days after Contract Date submit to ENGINEER/Architect a complete list of major products proposed to be used, with the name of the manufacturer and the installing Subcontractor.

C. Contractors Options

1. For products specified only by reference standard, select any product meeting that standard.
2. For products specified by naming several products or manufacturers, select any one of the products or manufacturers named or approved equal, which complies with the Specifications.
3. For products specified by naming one or more products or manufacturers and "or approved equal," CONTRACTOR must submit a request as for substitutions for any product or manufacturer not specifically named.

D. Substitutions for Cause:

1. For a period of 15 days after Contract Date, ENGINEER/Architect will consider written request from CONTRACTOR for substitution of products.
2. Identify product by specification Section and Article Numbers. Provide manufacturer's name and address, trade name of product, and model of catalog number. List fabricators and suppliers as appropriate.
3. List similar projects using product, dates of installation, and names of ENGINEER/Architect and OWNER.
4. List availability of maintenance services and replacement materials.
5. Submit a separate request for each product, supported with complete data, with drawings and samples as appropriate, including:

    a. Comparison of the qualities and performance of the proposed substitution with that specified.
    b. Changes required in other elements of the work because of the substitution.
    c. Effect on the construction schedule.
    d. Cost data comparing the proposed substitution with the product specified.
    e. Any required license fees or royalties.

f. Availability of maintenance services, and source of replacement materials.

6. The burden of proof as to the type, function, and quality of any such substitute material or equipment shall be upon the CONTRACTOR.
7. The ENGINEER/Architect will be the sole judge as to the type, function, and quality of any such substitute material or equipment and the ENGINEER's decision shall be final.
8. The ENGINEER/Architect may require the CONTRACTOR to furnish at the CONTRACTOR's expense additional data about the proposed substitute.
9. The OWNER may require the CONTRACTOR to furnish at the CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute.
10. Acceptance by the ENGINEER/Architect of a substitute item proposed by the CONTRACTOR shall not relieve the CONTRACTOR of the responsibility for full compliance with the Contract Documents and for adequacy of the substitute item.
11. The CONTRACTOR shall be responsible for resultant changes and all additional costs which the accepted substitution requires in the CONTRACTOR work, the work of its Subcontractors and of other Contractors, and shall effect such changes without cost to the OWNER.

E. Substitutions for Convenience: Not allowed unless otherwise indicated.

F. Contractors Representation:

1. A request for a substitution constitutes a representation that CONTRACTOR:

a. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.
b. Will provide the same guarantees or bonds for the substitution as for the product specified.
c. Will coordinate the installation of an accepted substitution into the work, and make such other changes as may be required to make the work complete in all respects.
d. Waives all claims for additional costs, under CONTRACTOR'S responsibility, which may subsequently become apparent.

G. Submittal Procedures:

1. Submit three (3) copies of request for substitution.
2. ENGINEER/Architect will review requests for substitutions with reasonable promptness, and notify CONTRACTOR, in writing, of the decision to accept or reject the requested substitution.
3. During the bidding period, ENGINEER/Architect will record acceptable substitutions in Addenda.
4. After award of Contract, ENGINEER/Architect will notify CONTRACTOR, in writing, of decision to accept or reject requested substitutions in Addenda.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01600

SECTION 01710 - CLEANING

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Execute cleaning, during progress of the Work, and at completion of the Work, as required by the General Conditions.

1.2 RELATED REQUIREMENTS

A. All applicable sections of the Specifications.

B. Conditions of the Contract.

1.3 DISPOSAL REQUIREMENTS

A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.1 DURING CONSTRUCTION

A. Execute periodic cleaning to keep the work, the site and adjacent properties free from accumulation of waste material, rubbish and windblown debris, resulting from Construction Work.

B. Provide on-site containers for the collection of waste materials, debris and rubbish.

C. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas away from the site.

D. The OWNER's Representative reserves the right to direct the CONTRACTOR to remove waste materials

E. Mechanical Sweeping. CONTRACTOR shall maintain on site a mechanical sweeping device for removing debris from existing, temporary and permanent pavement.

3.2 DUST CONTROL

A. Perform operations so that dust and other contaminants resulting from Construction Work operations will not cause any damages or maintenance problems to adjacent properties.

B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

3.3 FINAL CLEANING

A. Employ skilled workmen for final cleaning.

B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.

C. Polish glossy surfaces to a clear shine.

D. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

E. Prior to final completion, or OWNER occupancy, CONTRACTOR shall conduct an inspection of sight-exposed interior and exterior surfaces, and all work areas, to verify the entire work is clean.

F. All storage and staging areas shall be cleaned and returned to prior conditions or better as per requirements of this section.

END OF SECTION 01710

SECTION 01720 - 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.

1.3 SUBMITTALS

A. Record Drawings. Comply with the following:

1. Number of Copies. Submit one set of marked-up Record Prints.

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.
2. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
3. Accurately record information in an understandable drawing technique.
4. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.

    a. Document with photographs.

5. 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.
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. Changes made by Change Order or Work Change Directive.
i. Changes made following Engineer's written orders.
j. Details not on the original Contract Drawings.
k. Field records for variable and concealed conditions.
l. Record information on the Work that is shown only schematically.

6. 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.
7. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
8. Mark important additional information that was either shown schematically or omitted from original Drawings.
9. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
10. Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Engineer. 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. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
2. 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 Engineer'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 OWNER and shall comply with the latest approved version of the CADD City Standards.

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

END OF SECTION 01720

SECTION 01780 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 SUBMITTALS

A. Informational Submittals:

1. Submit prior to application for final payment.

a. Record Documents.
b. As-built drawings (signed and sealed hardcopies and electronic format – PDF and CAD files)
c. Special Bonds, Special Guarantees, and Service Agreements.
d. Consent of Surety to Final Payment.
e. Releases or Waivers of Liens and Claims.
f. Releases from Agreements.
g. Final Application for Payment: Submit in accordance with procedures and requirements stated in Section 01025 "Measurement and Payment".
h. Spare Parts, Special Tools and Extra Materials: As required by individual Specification sections.

B. Subcontractor Identification Form:

1. Submit form with final pay request.
2. Submit a separate form for each subcontractor used.
3. For Capital Improvement Projects, submit form along with final pay request to the PCM.
4. Form is attached as a Supplement to this Section.

1.2 RECORD DOCUMENTS

A. Quality Assurance:

1. Furnish qualified and experienced person, whose duty and responsibility shall be to maintain record documents.
2. Accuracy of Records:

a. Coordinate changes within record documents, making legible and accurate entries on each sheet of Drawings and other documents where such entry is required to show change.
b. Purpose of Project record documents is to document factual information regarding aspects of the Work, both concealed and visible, to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.

3. Make entries within 24 hours after receipt of information that a change in the Work has occurred.
4. Prior to submitting each request for progress payment, request PCM's review and approval of current status of record documents. Failure to properly maintain, update, and submit record documents may result in a deferral by PCM to recommend whole or any part of Contractor's Application for Payment, either partial or final.

1.3 RELEASES FROM AGREEMENTS

A. Furnish Owner written releases from property owners or public agencies where side agreements or special easements have been made, or where Contractor's operations have not been kept within the Owner's construction right-of-way.

B. In the Event Contractor is Unable to Secure Written Releases:

1. Inform PCM of the reasons.
2. Owner or its representatives will examine the site, and Owner will direct Contractor to complete the Work that may be necessary to satisfy terms of the side agreement or special easement.
3. Should Contractor refuse to perform this Work, Owner reserves right to have it done by separate contract and deduct cost of same from Contract Price, or require Contractor to furnish a satisfactory Bond in a sum to cover legal claims for damages.
4. When Owner is satisfied that the Work has been completed in agreement with Contract Documents and terms of side agreement or special easement, right is reserved to waive requirement for written release if:

a. Contractor's failure to obtain such statement is due to grantor's refusal to sign, and this refusal is not based upon any legitimate claims that Contractor has failed to fulfill terms of side agreement or special easement, or
b. Contractor is unable to contact or has had undue hardship in contacting grantor.

1.4 AS-BUILT DRAWINGS

A. Quality Assurance:

1. As-built drawings must meet all minimum City of Fort Lauderdale CAD standards and be submitted in the latest version of AutoCAD available at the time the contract is signed.
2. As-built drawings will be submitted in both electronic and hard copy forms as follow:

a. 3 hard copy sets of as-builts will be submitted on 24x36 paper signed, sealed, and dated by a Florida Professional Licensed Surveyor (PLS).
b. 1 CD or jump drive which will include both DWG files for the package and a PDF document including the surveyors signature and seal.

3. As-built drawings will include the following:

a. PLS name, business name, license numbers, address, and telephone number
b. The following statement must be included:

1) "I hereby certify that the as-built location information of the potable water, reclaimed water, wastewater and drainage facilities shown on these drawings conforms to the minimum technical standards for land surveying in the State of Florida, Chapter 5J-17.050(10)(i) (Florida Administrative Code), as adopted by the Department of Agriculture and Consumer Services, Board of Professional Surveyors and Mappers, and that said as-builts are true and correct to the best of our knowledge and belief."

c. As-built drawings will contain the information on the design drawings (plan and profile views) plus document changes between the design and construction including correcting all information that is incorrect due to changes during construction. Incorrect or no longer relevant information will be erased or struck through. All location changes constructed materially different (one-tenth foot horizontal, one tenth vertical) than the design location will have their design location struck through and will be redrafted at the constructed location. Design drawing dimensioning will be corrected as necessary.

d. Drawing will be a complete set including cover sheet, index, and any other sheets included in the approved design set. Standard detail sheets are not necessary.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 MAINTENANCE OF RECORD DOCUMENTS

A. General:

1. Promptly following commencement of Contract Times, secure from Engineer, at no cost to Contractor, one complete set of Contract Documents. Drawings will be full size.
2. Delete Engineer title block and seal from all documents.
3. Label or stamp each record document with title, "RECORD DOCUMENTS," in neat large printed letters.
4. Record information concurrently with construction progress and within 24 hours after receipt of information that change has occurred. Do not cover or conceal Work until required information is recorded. Contractor is responsible for maintaining up-to-date "red-lined" markups, on site, of all changes including revised locations of buried features and provides access to the City for review at any time.
5. All piping inserts, fittings, and valve locations shall be located by a Florida Licensed Surveyor in accordance with City of Fort Lauderdale surveying standards and per NAVD 88. Contractor shall provide adequate notice to the surveyor to ensure that all locations are accessible, prior to backfill.

B. Preservation:

1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
2. Make documents and Samples available at all times for observation by PCM or Engineer.

C. Making Entries on Drawings:

1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe change by graphic line and note as required.

a. Color Coding:

1) Green when showing information deleted from Drawings.
2) Red when showing information added to Drawings.

3) Blue and circled in blue to show notes.

2. Date entries.
3. Call attention to entry by "cloud" drawn around area or areas affected.
4. Legibly mark to record actual changes made during construction, including, but not limited to:

   a. Depths of various elements of foundation in relation to finished first floor data if not shown or where depth differs from that shown.
   b. Horizontal and vertical locations of existing and new Underground Facilities and appurtenances, and other underground structures, equipment, or Work. Reference to at least two measurements to permanent surface improvements.
   c. Location of internal utilities and appurtenances concealed in the construction referenced to visible and accessible features of the structure.
   d. Locate existing facilities, piping, equipment, and items critical to the interface between existing physical conditions or construction and new construction.
   e. Changes made by Addenda and Field Orders, Work Change Directive, Change Order, Written Amendment, and Engineer's written interpretation and clarification using consistent symbols for each and showing appropriate document tracking number.

5. Dimensions on Schematic Layouts: Show on record drawings, by dimension, the centerline of each run of items such as are described in previous subparagraph above.
   a. Clearly identify the item by accurate notes such as "cast iron drain," "galv. water," and the like.
   b. Show, by symbol or note, vertical location of item ("under slab," "in ceiling plenum," "exposed," and the like).
   c. Make identification so descriptive that it may be related reliably to Specifications.

D. Coordination with Florida Licensed surveyor:

1. Contractor shall not cover any bends, valves, or fittings installed until they have been located by the survey crews for the purpose of preparing as-built and/or Record Drawings.
2. If the above conditions are not met, for any reason, Contractor shall bear the cost of potholing the constructed installation to allow for the locations.

3.2 FINAL CLEANING

A. At completion of the Work or of a part thereof and immediately prior to Contractor's request for certificate of Substantial Completion; or if no certificate is issued, immediately prior to Contractor's notice of completion, clean entire site or parts thereof, as applicable.

1. Leave the Work and adjacent areas affected in a cleaned condition satisfactory to Owner and PCM.
2. Remove grease, dirt, dust, paint or plaster splatter, stains, labels, fingerprints, and other foreign materials from exposed surfaces.
3. Repair, patch, and touch up marred surfaces to specified finish and match adjacent surfaces.
4. Clean all windows.

5. Clean and wax wood, vinyl, or painted floors.
6. Broom clean exterior paved driveways and parking areas.
7. Hose clean sidewalks, loading areas, and others contiguous with principal structures.
8. Rake clean all other surfaces.
9. Replace air-handling filters and clean ducts, blowers, and coils of ventilation units operated during construction.
10. Leave water courses, gutters, and ditches open and clean.

B. Use only cleaning materials recommended by manufacturer of surfaces to be cleaned.

C. Meet all requirements of Section 02575, Surface Restoration.

3.3 SUPPLEMENTS

A. The supplements listed below, following "END OF SECTION," are part of this Specification.

1. Subcontractor Identification Form (See next page).

END OF SECTION 01780

SUBCONTRACTOR IDENTIFICATION FORM

This form shall be completed by all City of Fort Lauderdale Prime Contractors who subcontracted out any portion of his/her City contract. The form shall be forwarded to the City of Fort Lauderdale's Public Services Department (Engineering and Architectural Services) with the prime contractor's final pay request. A separate form is to be completed and submitted for each subcontractor. Please telephone (954) 761-5057 or 761-5083, if you have any questions regarding this form.ee

1) CITY OF FORT LAUDERDALE PROJECT NO. _____

2) PROJECT DESCRIPTION

3) SUBContractor

_____
Business Name

_____
Address

_____
Telephone & Fax Nos.

_____
Email Address/Company Wesbsite (if applicable)

4) SUBCONTRACTOR'S PRINCIPAL OFFICER

5) CLASSIFICATION OF WORK SUBCONTRACTED OUT ____

6) COST OF WORK SUBCONTRACTED OUT __

7) Please check the item(s) which properly identify the ownership status of the subcontractor's

☐ firm: Subcontractor firm is not a MBE or WBE

☐ Subcontractor firm is a MBE, as at least 51 percent is owned and operated by one or more socially and economically-disadvantaged individuals:

☐ American Indian ☐ Asian ☐ Black ☐ Hispanic ☐ White

☐ Subcontractor firm is a WBE, as at least 51 percent is owned and operated by one or more women.

☐ American Indian ☐ Asian ☐ Black ☐ Hispanic ☐ White

8) **PRIME Contractor __**

NAME & TITLE OF PRIME CONTRACTOR'S REPRESENTATIVE COMPLETING THIS FORM
(*Please Print*)

(Telephone No.) *(Fax No.)* *(Email Address)*

SIGNATURE_____**DATE**_____
Prime Contractor's Representative

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For

PARKS BOND AND PARKS MASTER PLAN DESIGN IMPLEMENTATION SERVICES

SUNRISE MIDDLE SCHOOL

Task Order No. 29 - P12777

AECOM Project No: 60711655

Bid Documents

September 16, 2025

VOL 2 OF 2

TECHNICAL SPECIFICATIONS

PARKS BOND AND PARKS MASTER PLAN DESIGN IMPLEMENTATION SERVICES
SUNRISE MIDDLE SCHOOL TASK ORDER NO. 29

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For

Parks Bond and Parks Master Plan Design Implementation Services

For

Sunrise Middle School Project Manual

AECOM Project No: 60711655

Task Order No. 06 - P12777

Prime Consultant: AECOM	

Electrical: Professional Engineer, State of Florida Shahzad S. Ahmed License No.: 68863	Shahzad Ahmed Digitally signed by Shahzad Ahmed DN: cn=Shahzad Ahmed, o=AECOM TECHNICAL SERVICES INC, email=shahzad.ahmed@aecom.com Date: 2025.09.17 11:47:27 -04'00'

Consultants:	

Civil: bcc engineering	
Professional Engineer, State of Florida: Roberto Lamazares License No. 87238	Roberto Lamazares Digitally signed by Roberto Lamazares DN: CN=Roberto Lamazares, dnQualifier=A01410C00000198EBF24868000073C4, O=Unaffiliated, C=US Date: 2025.09.17 16:07:39-04'00'
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SECTION 260010 - SUPPLEMENTAL REQUIREMENTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Supplemental requirements generally applicable to the Work specified in Division 26. This Section is also referenced by related Work specified in other Divisions.

1.2 REFERENCES

A. Abbreviations and Acronyms for Electrical Terms and Units of Measure:

1. A: Ampere, unit of electrical current.
2. AC or ac: Alternating current.
3. AFCI: Arc-fault circuit interrupter.
4. AIC: Ampere interrupting capacity.
5. AL, Al, or ALUM: Aluminum.
6. ASD: Adjustable-speed drive.
7. ATS: Automatic transfer switch.
8. AWG: American wire gauge; see ASTM B258.
9. BAS: Building automation system.
10. BIL: Basic impulse insulation level.
11. BIM: Building information modeling.
12. CAD: Computer-aided design or drafting.
13. CATV: Community antenna television.
14. CB: Circuit breaker.
15. cd: Candela, the SI fundamental unit of luminous intensity.
16. CO/ALR: Copper-aluminum, revised.
17. COPS: Critical operations power system.
18. CU or Cu: Copper.
19. CU-AL or AL-CU: Copper-aluminum.
20. dB: Decibel, a unitless logarithmic ratio of two electrical, acoustical, or optical power values.
21. dB(A-weighted) or dB(A): Decibel acoustical sound pressure level with A-weighting applied in accordance with IEC 61672-1.
22. dB(adjusted) or dBa: Decibel weighted absolute noise power with respect to 3.16 pW (minus 85 dBm).
23. dBm: Decibel absolute power with respect to 1 mW.
24. DC or dc: Direct current.
25. DCOA: Designated critical operations area.
26. DDC: Direct digital control (HVAC).
27. EGC: Equipment grounding conductor.
28. ELV: Extra-low voltage.
29. EMI: Electromagnetic interference.

30. EPM: Electrical preventive maintenance.
31. EPS: Emergency power supply.
32. EPSS: Emergency power supply system.
33. fc: Footcandle, an internationally recognized unit of illuminance equal to one lumen per square foot or 10.76 lx. The simplified conversion 1 fc = 10 lx in the Specifications is common practice and considered adequate precision for building construction activities. When there are conflicts, lux is the primary unit; footcandle is specified for convenience.
34. FLC: Full-load current.
35. ft: Foot.
36. ft-cd: Foot-candle, the antiquated U.S. Standard unit of illuminance, equal to one international candle measured at a distance of one foot, that was superseded in 1948 by the unit "footcandle" after the SI unit candela (cd) replaced the international candle; see "fc,"
37. GEC: Grounding electrode conductor.
38. GFCI: Ground-fault circuit interrupter.
39. GFPE: Ground-fault protection of equipment.
40. GND: Ground.
41. HACR: Heating, air conditioning, and refrigeration.
42. HDPE: High-density polyethylene.
43. HID: High-intensity discharge.
44. HP or hp: Horsepower.
45. HVAC: Heating, ventilating, and air conditioning.
46. Hz: Hertz.
47. IBT: Intersystem bonding termination.
48. inch: Inch. To avoid confusion, the abbreviation "in." is not used.
49. IP: Ingress protection rating (enclosures); Internet protocol (communications).
50. IR: Infrared.
51. IS: Intrinsically safe.
52. IT&R: Inspecting, testing, and repair.
53. ITE: Information technology equipment.
54. kAIC: Kiloampere interrupting capacity.
55. kcmil or MCM: One thousand circular mils.
56. kV: Kilovolt.
57. kVA: Kilovolt-ampere.
58. kVAr or kVAR: Kilovolt-ampere reactive.
59. kW: Kilowatt.
60. kWh: Kilowatt-hour.
61. LAN: Local area network.
62. lb: Pound (weight).
63. lbf: Pound (force).
64. LCD: Liquid-crystal display.
65. LCDI: Leakage-current detector-interrupter.
66. LED: Light-emitting diode.
67. Li-ion: Lithium-ion.
68. lm: Lumen, the SI derived unit of luminous flux.
69. LNG: Liquefied natural gas.
70. LP-Gas: Liquefied petroleum gas.
71. LRC: Locked-rotor current.
72. LV: Low voltage.
73. lx: Lux, the SI derived unit of illuminance equal to one lumen per square meter.

74. m: Meter.
75. MIDI: Musical instrument digital interface.
76. MLO: Main lugs only.
77. MVA: Megavolt-ampere.
78. mW: Milliwatt.
79. MW: Megawatt.
80. MWh: Megawatt-hour.
81. NC: Normally closed.
82. Ni-Cd: Nickel-cadmium.
83. Ni-MH: Nickel-metal hydride.
84. NIU: Network interface unit.
85. NO: Normally open.
86. NPT: National (American) standard pipe taper.
87. OCPD: Overcurrent protective device.
88. ONT: Optical network terminal.
89. PC: Personal computer.
90. PCS: Power conversion system.
91. PCU: Power-conditioning unit.
92. PF or pf: Power factor.
93. PoE: Power over Ethernet.
94. PV: Photovoltaic.
95. PVC: Polyvinyl chloride.
96. pW: Picowatt.
97. RFI: (electrical) Radio-frequency interference; (contract) Request for interpretation.
98. RMS or rms: Root-mean-square.
99. RPM or rpm: Revolutions per minute.
100. SCADA: Supervisory control and data acquisition.
101. SCR: Silicon-controlled rectifier.
102. SPD: Surge protective device.
103. sq.: Square.
104. SWD: Switching duty.
105. TCP/IP: Transmission control protocol/Internet protocol.
106. TEFC: Totally enclosed fan-cooled.
107. TR: Tamper resistant.
108. TVSS: Transient voltage surge suppressor.
109. UL: (standards) Underwriters Laboratories, Inc.; (product categories) UL, LLC.
110. UL CCN: UL Category Control Number.
111. UPS: Uninterruptible power supply.
112. USB: Universal serial bus.
113. UV: Ultraviolet.
114. V: Volt, unit of electromotive force.
115. V(ac): Volt, alternating current.
116. V(dc): Volt, direct current.
117. VA: Volt-ampere, unit of complex electrical power.
118. VAR: Volt-ampere reactive, unit of reactive electrical power.
119. VFC: Variable-frequency controller.
120. VOM: Volt-ohm-multimeter.
121. VPN: Virtual private network.
122. VRLA: Valve regulated lead acid; also called "sealed lead acid (SLA)" or "valve regulated sealed lead acid."

123. W: Watt, unit of real electrical power.
124. Wh: Watt-hour, unit of electrical energy usage.
125. WPT: Wireless power transfer.
126. WPTE: Wireless power transfer equipment.
127. WR: Weather resistant.

B. Abbreviations and Acronyms for Electrical Raceway Types:

1. EMT: Electrical metallic tubing.
2. EMT-A: Aluminum electrical metallic tubing.
3. EMT-S: Steel electrical metallic tubing.
4. EMT-SS: Stainless steel electrical metallic tubing.
5. ENT: Electrical nonmetallic tubing.
6. ERMC: Electrical rigid metal conduit.
7. ERMC-A: Aluminum electrical rigid metal conduit.
8. ERMC-S: Steel electrical rigid metal conduit.
9. ERMC-S-G: Galvanized-steel electrical rigid metal conduit.
10. ERMC-S-PVC: PVC-coated-steel electrical rigid metal conduit.
11. ERMC-SS: Stainless steel electrical rigid metal conduit.
12. FMC: Flexible metal conduit.
13. FMC-S: Steel flexible metal conduit.
14. FMT: Steel flexible metallic tubing.
15. FNMC: Flexible nonmetallic conduit. See "LFNC."
16. PVC: Rigid PVC conduit.
17. PVC-40: Schedule 40 rigid PVC conduit.
18. PVC-80: Schedule 80 rigid PVC Conduit.
19. PVC-A: Type A rigid PVC concrete-encased conduit.
20. PVC-EB: Type EB rigid PVC concrete-encased underground conduit.
21. RGS: See ERMC-S-G.
22. RMC: See ERMC.
23. RTRC: Reinforced thermosetting resin conduit.

C. Abbreviations and Acronyms for Electrical Single-Conductor and Multiple-Conductor Cable Types:

1. AC: Armored cable.
2. MC: Metal-clad cable.
3. MC-HL: Metal-clad cable, hazardous location.
4. NM: Nonmetallic sheathed cable.
5. NMC: Nonmetallic sheathed cable with corrosion-resistant nonmetallic jacket.
6. NMS: Nonmetallic sheathed cable with signaling, data, and communications conductors, plus power or control conductors.
7. RHH: (high heat) Thermoset rubber, heat-resistant cable.
8. RHW: Thermoset rubber, moisture-resistant cable.
9. SA: Silicone rubber cable.
10. SE: Service-entrance cable.
11. SER: Service-entrance cable, round.
12. SEU: Service-entrance cable, flat.
13. SIS: Thermoset cable for switchboard and switchgear wiring.
14. TBS: Thermoplastic cable with outer braid.
15. THW: Thermoplastic, heat- and moisture-resistant cable.

16. THHN: Thermoplastic, heat-resistant cable with nylon jacket outer sheath.
17. THHW: Thermoplastic, heat- and moisture-resistant cable.
18. THWN: Thermoplastic, moisture- and heat-resistant cable with nylon jacket outer sheath.
19. TW: Thermoplastic, moisture-resistant cable.
20. UF: Underground feeder and branch-circuit cable.
21. USE: Underground service-entrance cable.
22. XHH: Cross-linked polyethylene, heat-resistant cable.
23. XHHW: Cross-linked polyethylene, heat- and moisture-resistant cable.

D. Definitions:
1. Cable: In accordance with NIST NBS Circular 37 and IEEE standards, in the United States for the purpose of interstate commerce, the definition of "cable" is (1) a conductor with insulation, or a stranded conductor with or without insulation (single-conductor cable); or (2) a combination of conductors insulated from one another (multiple-conductor cable).
2. Conductor: In accordance with NIST NBS Circular 37 and IEEE standards, in the United States for the purpose of interstate commerce, the definition of "conductor" is (1) a wire or combination of wires not insulated from one another, suitable for carrying an electric current; (2) (National Electrical Safety Code) a material, usually in the form of wire, cable, or bar, suitable for carrying an electric current; or (3) (general) a substance or body that allows a current of electricity to pass continuously along it.
3. Direct Buried: Installed underground without encasement in concrete or other protective material.
4. Enclosure: The case or housing of an apparatus, or the fence or wall(s) surrounding an installation, to prevent personnel from accidentally contacting energized parts or to protect the equipment from physical damage. Types of enclosures and enclosure covers include the following:

    a. Cabinet: An enclosure that is designed for either surface mounting or flush mounting and is provided with a frame, mat, or trim in which a swinging door or doors are or can be hung.
    b. Concrete Box: A box intended for use in poured concrete.
    c. Conduit Body: A means for providing access to the interior of a conduit or tubing system through one or more removable covers at a junction or terminal point. In the United States, conduit bodies are listed in accordance with outlet box requirements.
    d. Conduit Box: A box having threaded openings or knockouts for conduit, EMT, or fittings.
    e. Cutout Box: An enclosure designed for surface mounting that has swinging doors or covers secured directly to and telescoping with the walls of the enclosure.
    f. Device Box: A box with provisions for mounting a wiring device directly to the box.
    g. Junction Box: A box with a blank cover that joins different runs of raceway or cable and provides space for connection and branching of the enclosed conductors.
    h. Outlet Box: A box that provides access to a wiring system having pryout openings, knockouts, threaded entries, or hubs in either the sides or the back, or both, for the entrance of conduit, conduit or cable fittings, or

cables, with provisions for mounting an outlet box cover, but without provisions for mounting a wiring device directly to the box.

i. Pedestal Floor Box Cover: A floor box cover that, when installed as intended, provides a means for typically vertical or near-vertical mounting of receptacle outlets above the floor's finished surface.

j. Pull Box: A box with a blank cover that joins different runs of raceway and provides access for pulling or replacing the enclosed cables or conductors.

k. Raised-Floor Box: A floor box intended for use in raised floors.

l. Ring: A sleeve, which is not necessarily round, used for positioning a recessed wiring device flush with the plaster, concrete, drywall, or other wall surface.

m. Ring Cover: A box cover, with raised center portion to accommodate a specific wall or ceiling thickness, for mounting wiring devices or luminaires flush with the surface.

n. Termination Box: An enclosure designed for installation of termination base assemblies consisting of bus bars, terminal strips, or terminal blocks with provision for wire connectors to accommodate incoming or outgoing conductors, or both.

5. Fault Limited: Providing or being served by a source of electrical power that is limited to not more than 100 W when tested in accordance with UL 62368-1.

   a. The term "fault limited" is intended to encompass most Class 1, 2, and 3 power-limited sources complying with Article 725 of NFPA 70; Class ES1 and ES2 electrical energy sources that are Class PS1 electrical power sources (e.g., USB); and Class ES3 electrical energy sources that are Class PS1 and PS2 electrical power sources (e.g., PoE). See UL 62368-1 for discussion of classes of electrical energy sources and classes of electrical power sources.

6. Receptacle Outlet: One or more receptacles mounted in a box with a suitable protective cover.

7. Sheath: A continuous metallic covering for conductors or cables.

8. UL Category Control Number (CCN): An alphabetic or alphanumeric code used to identify product categories covered by UL's Listing, Classification, and Recognition Services.

9. Voltage Class: For specified circuits and equipment, voltage classes are defined as follows:

   a. Line Voltage: (1) (controls) Designed to operate using the supplied low-voltage power without transformation. (2) (transmission lines, transformers, SPDs) The line-to-line voltage of the supplying power system.

   b. Low Voltage (LV): Having electromotive force between any two conductors, or between a single conductor and ground, that is rated above 30 V but not exceeding 1000 V.

10. Wire: In accordance with NIST NBS Circular 37 and IEEE standards, in the United States for the purpose of interstate commerce, the definition of "wire" is a slender rod or filament of drawn metal. A group of small wires used as a single wire is properly called a "stranded wire." A wire or stranded wire covered with insulation is properly called an "insulated wire" or a "single-conductor cable." Nevertheless, when the context indicates that the wire is insulated, the term "wire" will be understood to include the insulation.

1.3 COORDINATION

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions:

1. Notify Owner no fewer than seven days in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without Owner's written permission.
3. Coordinate interruption with systems impacted by outage including, but not limited to, the following:

a. Exercising generators.
b. Emergency lighting.
c. Elevators.
d. Fire-alarm systems.

B. Arrange to provide temporary electrical service or power in accordance with requirements specified in Division 01

1.4 PREINSTALLATION MEETINGS

A. Electrical Preconstruction Conference: Schedule conference with Architect and Owner, not later than 10 days after notice to proceed. Agenda topics include, but are not limited to, the following:

1. Electrical installation schedule.
2. Status of power system studies.
3. Value analysis proposals and requests for substitution of electrical equipment.
4. Utility work coordination and class of service requests.
5. Commissioning activities.

1.5 SEQUENCING

A. Conduct and submit results of power system studies before submitting Product Data and Shop Drawings for electrical equipment.

1.6 ACTION SUBMITTALS

A. Coordination Drawings for Structural Supports: Show coordination of structural supports for equipment and devices, including restraints and bracing for control of seismic and wind loads, with other systems, equipment, and structural supports in the vicinity.

B. Coordination Drawings for Ceiling Areas: Where indicated on drawings, provide reflected ceiling plan(s), supplemented by sections and other details, drawn to scale, in accordance with Section 013100 "Project Management and Coordination," on which

the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Suspended ceiling components.
2. Structural members to which equipment and suspension systems will be attached.
3. Elevation, size, and route of conduit.
4. Elevation and size of wall-mounted and ceiling-mounted equipment.
5. Access panels.
6. Sprinklers.
7. Air inlets and outlets.
8. Control modules.
9. Luminaires.
10. Communications devices.
11. Speakers.
12. Security devices.
13. Fire-alarm devices.
14. Indicate clear dimensions for maintenance access in front of equipment.
15. Indicate dimensions of fully-open access doors.

C. Coordination Drawings for Conduit Routing: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:

1. Structural members in paths of conduit groups with common supports.
2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

1.7 INFORMATIONAL SUBMITTALS

A. Electrical Installation Schedule: At preconstruction meeting, and periodically thereafter as dates change, provide schedule for electrical installation Work to Owner and Architect including, but not limited to, milestone dates for the following activities:

1. Submission of power system studies.
2. Submission of specified coordination drawings.
3. Submission of action submittals specified in Division 26.
4. Orders placed for major electrical equipment.
5. Arrival of major electrical equipment on-site.
6. Preinstallation meetings specified in Division 26.
7. Utility service outages.
8. Utility service inspection and activation.
9. Closing of walls and ceilings containing electrical Work.
10. System startup, testing, and commissioning activities for major electrical equipment.
11. System startup, testing, and commissioning activities for emergency lighting.
12. System startup, testing, and commissioning activities for automation systems (lighting, HVAC, fire alarm, fire pump, etc.).
13. Pouring of concrete housekeeping pads for electrical equipment and testing of concrete samples.

14. Requests for special inspections.
15. Requests for inspections by authorities having jurisdiction.

B. Delegated Design Drawings for Structural Masonry Wall Penetrations: Where indicated on Drawings, provide reflected ceiling plan(s), supplemented by elevations, sections, and other details, drawn to scale, signed and sealed by a qualified structural professional engineer, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Location and dimensions of structural members supporting wall.
2. Location and dimensions of columns near penetrations.
3. Location and dimension of headers and lintels.
4. Doors and windows near penetrations.
5. Location and dimensions of penetrating cuts.
6. Sprinkler piping and sleeves.
7. Plumbing piping and sleeves.
8. Ductwork and sleeves.
9. Cable tray and sleeves.
10. Conduit and sleeves.
11. Firestopping assemblies for rated penetrations.
12. Structural supports for piping, ductwork, and conduit on both sides of wall.

C. Welding certificates.

D. Seismic-Load Performance Certificates: Provide special certification for designated seismic systems as indicated in Paragraph 13.2.2 "Special Certification Requirements for Designated Seismic Systems" of ASCE/SEI 7-05 for all designated seismic-load systems identified on Drawings or in the Specifications.

1. Include the following information:

a. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
b. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
c. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
d. Detailed description of conduit support devices and interconnections on which the certification is based and their installation requirements.
e. Provide equipment manufacturer's written certification for each designated active electrical seismic device and system, stating that it will remain operable following the design earthquake. Certification must be based on requirements of ASCE/SEI 7, including shake table testing per ICC-ES AC156 or a similar nationally recognized testing standard procedure acceptable to authorities having jurisdiction.
f. Provide equipment manufacturer's written certification that components with hazardous contents maintain containment following the design earthquake by methods required in ASCE/SEI 7-05.
g. Submit evidence demonstrating compliance with these requirements for approval to authorities having jurisdiction after review and acceptance by qualified structural professional engineer.

h. Hangers and supports specified in Section 260529 "Hangers and Supports for Electrical Systems."
i. Conduits and their mounting provisions specified in Section 260533.13 "Conduits for Electrical Systems."
j. Boxes and their mounting provisions specified in Section 260533.16 "Boxes and Covers for Electrical Systems."
k. Surface raceways and their mounting provisions specified in Section 260533.23 "Surface Raceways for Electrical Systems."
l. Equipment, accessories, and components specified in Section 262213 "Low-Voltage Distribution Transformers."
m. Equipment, accessories, and components specified in Section 262416 "Panelboards."
n. Luminaires, accessories, and components specified in Section 265119 "LED Interior Lighting."
o. Luminaires, accessories, and components specified in Section 265213 "Emergency and Exit Lighting."
p. Poles and support components specified in Section 265613 "Lighting Poles and Standards."
q. Luminaires, accessories, and components specified in Section 265619 "LED Exterior Lighting."

E. Wind-Load Performance Certificates: Provide special certification for systems and components designated on Drawings or in the Specifications to be subject to high wind exposure and impact damage.

1. Include the following information:

a. Provide equipment manufacturer's written certification for each designated system and component, stating that it will remain in place and operable following the design wind event and comply with requirements of authorities having jurisdiction.
b. Certification must be based on ICC-ES or similar nationally recognized testing standard procedures acceptable to authorities having jurisdiction.

2. The following systems and components require written special certification of resistance to effects of high wind-load and impact damage by manufacturer:

F. Qualification Statements:

1. For qualified regional manufacturer.
2. For structural professional engineer.
3. For electrical professional engineer.
4. For lighting professional engineer.
5. For welder.
6. For ERMC-S-PVC raceway Installer.
7. For electrical power monitoring Installer.
8. For lightning protection system Installer.
9. For low-voltage electrical testing agency and on-site electrical testing supervisor.
10. For power-limited electrical testing agency and on-site power-limited testing supervisor.
11. For structural testing and inspecting agency.

12. For outdoor pole testing and inspecting agency.
13. For luminaire photometric testing laboratory.
14. For lighting testing and inspecting agency.

1.8 CLOSEOUT SUBMITTALS

A. Facility EPM Program Binders:

1. Complete Set: On approved online or cloud solution.
2. Volumes 2 and 8: Reproducible hardcopy on archival quality, 28 lb (105 GSM), acid-free, bond paper.

B. Operation and Maintenance Data:

1. Provide emergency operation, normal operation, and preventive maintenance manuals for each system, equipment, and device listed below:

2. Include the following information:

a. Manufacturer's operating specifications.
b. User's guides for software and hardware.
c. Schedule of maintenance material items recommended to be stored at Project site.
d. Detailed instructions covering operation under both normal and abnormal conditions.
e. Time-current curves for overcurrent protective devices and manufacturer's written instructions for testing and adjusting their settings.
f. List of load-current and overload-relay heaters with related motor nameplate data.
g. List of lamp types and photoelectric relays used on Project, with ANSI and manufacturers' codes.
h. Manufacturer's instructions for setting field-adjustable components.
i. Manufacturer's instructions for testing, adjusting, and reprogramming microprocessor controls.
j. EPSS: Manufacturer's system checklists, maintenance schedule, and maintenance log sheets in accordance with NFPA 110.
k. Exterior pole inspection and repair procedures.

C. Software and Firmware Operational Documentation: Provide software and firmware operational documentation, including the following:

1. Software operating and upgrade manuals.
2. Names, versions, and website addresses for locations of installed software.
3. Device address list.
4. Printout of software application and graphic screens.
5. Testing and adjusting of panic and emergency power features.
6. For lighting controls, include the following:

a. Adjustments of scene preset controls, adjustable fade rates, and fade overrides.

b. Operation of adjustable zone controls.

D. Software:

1. Program Software Backup: Provide username and password for approved online or cloud solution.

1.9 QUALIFICATIONS

A. Electrical Professional Engineer: Professional engineer possessing active qualifications specified in Section 014000 "Quality Requirements," with expertise in electrical engineering, including electrical power system modeling and analysis of electrical safety in accordance with NFPA 70E.

B. Lighting Professional Engineer: Professional engineer possessing active qualifications in accordance with Section 014000 "Quality Requirements" and the following:

1. Expertise in electrical engineering, lighting design, and structural requirements for exterior poles and standards.
2. Lighting Certified (LC) Professional by the National Council on Qualifications for the Lighting Professions (NCQLP).

C. ERMC-S-PVC Installers: Installer possessing active qualifications specified in Section 014000 "Quality Requirements," and able to present unexpired certified Installer credentials issued by ERMC-S-PVC manufacturer prior to starting installation.

D. Lightning Protection System Installers: Installer possessing active qualifications specified in Section 014000 "Quality Requirements," and able to present unexpired UL-Listed Installer, UL Category Control Number OWAY, credentials prior to starting installation.

E. Low-Voltage Electrical Testing and Inspecting Agency: Entities possessing active credentials from a qualified electrical testing laboratory recognized by authorities having jurisdiction.

1. On-site electrical testing supervisors must have documented certification and experience with testing electrical equipment in accordance with NETA testing standards.

F. Medium-Voltage Electrical Testing and Inspecting Agency: Entities possessing active credentials from a qualified electrical testing laboratory recognized by authorities having jurisdiction.

1. On-site electrical testing supervisors must have documented certification and experience with testing electrical equipment in accordance with NETA testing standards.

G. Power-Limited Electrical Testing Agency: Entity possessing active credentials from a qualified electrical testing laboratory recognized by authorities having jurisdiction.

1. On-site power-limited testing supervisor must have BICSI Registered Communications Distribution Designer certification and documented training and experience with testing power-limited equipment in accordance with NETA testing standards.

H. Outdoor Pole Testing and Inspecting Agency: Entity possessing active qualifications specified in Section 014000 "Quality Requirements" with documented training and experience in accordance with ASTM C1093 for foundation testing and inspections.

I. Luminaire Photometric Testing Laboratory: Entity possessing active qualifications specified in Section 014000 "Quality Requirements" accredited under the NVLAP for Energy Efficient Lighting Products, and complying with applicable IES testing standards.

J. Lighting Testing and Inspecting Agency: Entity possessing active qualifications specified in Section 014000 "Quality Requirements" with documented training and experience with testing and inspecting lighting installations in accordance with IES LM-5.

1.10 FIELD CONDITIONS

A. Modeling, analysis, product selection, installation, and quality control for Work specified in Division 26 must comply with requirements specified in Section 260011 "Facility Performance Requirements for Electrical."
   a. Unusual space limitations.

PART 2 - PRODUCTS

2.1 SUBSTITUTION LIMITATIONS FOR ELECTRICAL EQUIPMENT

A. Substitution requests for electrical equipment will be entertained under the following conditions:

1. Substitution requests may be submitted for consideration prior to the Electrical Preconstruction Conference if accompanied by value analysis data indicating that substitution will comply with Project performance requirements while significantly increasing value for Owner throughout life of facility.
2. Substitution requests may be submitted for consideration concurrently with submission of power system study reports when those reports indicate that substitution is necessary for safety of maintenance personnel and facility occupants.
3. Contractor is responsible for sequencing and scheduling power system studies and electrical equipment procurement. After the Electrical Preconstruction Conference, insufficient lead time for electrical equipment delivery will not be considered a valid reason for substitution.

2.2 FACILITY ELECTRICAL PREVENTIVE MAINTENANCE (EPM) PROGRAM BINDERS

A. Description: Set of binders containing operation and maintenance data for facility's electrical equipment that was compiled during analysis of installed electrical Work for Facility EPM Program development.

B. Applicable Standards:

1. Regulatory Requirements: Comply with recommendations in NFPA 70B.
2. General Characteristics:

a. Volume 1 - Introduction:

1) Summarize how Facility EPM Program Analysis was performed, how data were collected, and how volumes are organized.
2) Describe Facility EPM Program and provide recommended policies and procedures for implementing the program and keeping it current.
3) Provide place for Owner to identify contact information for employees responsible for implementing and maintaining Facility EPM Program.

b. Volume 2 - Facility Safety, Hazards Awareness, and Emergency Procedures:

1) Include training requirements for employees and contractors.
2) Include list of known facility hazards impacting IT&R activities.
3) Include approval and permitting procedures for IT&R activities.
4) Include incident emergency response procedures.
5) Include emergency shutdown procedures.
6) Include electrical disaster recovery procedures.

c. Volume 4 - Facility Diagrams and Schedules:

1) Include single-line diagrams.
2) Include grounding and bonding diagrams.
3) Include essential wiring diagrams.
4) Include system automation diagrams (lighting, HVAC, etc.).
5) Include records of switchgear, switchboard, and panelboard schedules.
6) Include time-current curves for overcurrent protective devices.
7) Include list of load-current and overload-relay heaters with related motor nameplate data.

d. Volume 5 - Inventory of Facility Equipment Using Electrical Power:

1) Include simplified floor plans showing equipment locations.
2) Identify critical equipment (electrical or otherwise).
3) Include identifying designations and nameplate data.
4) Include warranty and maintenance contract information.

e. Volume 6 - Inventory of Facility Tools, Supplies, and Personnel Protective Equipment:

1) Include schedules of maintenance material items recommended to be stored at facility.
2) Include list of lamp types and photoelectric relays used in facility with ANSI and manufacturers' codes.
3) Include calibration and servicing data for each item.

f. Volume 7 - Inspection, Testing, and Repair (IT&R) Plan:

1) Include tables showing frequency of activities for each item.
2) Include annual schedule with activities mapped to specific days of the year.
3) Include exterior pole inspection and repair procedures.

g. Volume 9 - Inspection, Testing, and Repair (IT&R) Procedures:

h. Volume 10 - Spare Parts List:

1) Include list of all parts required to perform IT&R procedures.
2) Identify quantities of which parts are recommended to be stored on-site.
3) Include source contact information and budget cost for each item.

i. Volume 11 - Construction Project Closeout Record Documentation:

1) Include records of power system studies and photometric studies.
2) Include records of risk assessment studies.
3) Include records of electrical system startup and commissioning activities.
4) Include records of baseline inspections and tests.
5) Include records of baseline infrared photographs with normal light photographs showing the location, direction, angle, and conditions necessary for reproducing each infrared photograph.
6) Include records of baseline settings for adjustable equipment and devices.

PART 3 - EXECUTION

3.1 DEVELOPMENT OF FACILITY EPM PROGRAM

A. Facility EPM Program must be developed by qualified EPM specialist.

B. Conduct Facility EPM Program analysis in accordance with NFPA 70B recommendations.

1. Renovation Projects:

a. Facility diagrams must include connected existing equipment for entire facility where known. Areas of uncertainty should be clearly indicated.

b. Obtain copies of existing operation and maintenance data and existing Facility EPM Program information from Owner.
c. Facility EPM Program analysis should identify existing equipment that does not have available operation and maintenance data, and should explain the Owner's risks because this equipment is not included in Facility EPM Program.
d. Data for existing equipment outside scope of Project may be inserted in Facility EPM Program Binders without analysis.
e. Data for existing equipment impacted by scope of Project should be analyzed and documented similar to Project's new equipment data as much as possible.

C. Compile operation and maintenance data from Facility EPM Program analysis and submit Facility EPM Program Binders.

3.2 INSTALLATION OF ELECTRICAL WORK

A. Unless more stringent requirements are specified in the Contract Documents or manufacturers' written instructions, comply with NFPA 70 and NECA NEIS 1 for installation of Work specified in Division 26. Consult Architect for resolution of conflicting requirements.

3.3 SYSTEM STARTUP

A. Commissioning Activities:

3.4 FIELD QUALITY CONTROL

A. Administrant for Low-Voltage Electrical Tests and Inspections:

1. Owner will engage qualified low-voltage electrical testing and inspecting agency to administer and perform tests and inspections.
2. Engage qualified low-voltage electrical testing and inspecting agency to administer and perform tests and inspections.
3. Engage factory-authorized service representative to administer and perform tests and inspections on components, assemblies, and equipment installations, including connections.
4. Administer and perform tests and inspections with assistance of factory-authorized service representative.

B. Administrant for Field Tests and Inspections of Lighting Installations:

1. Owner will engage qualified lighting testing and inspecting agency to administer and perform tests and inspections.
2. Engage qualified lighting testing and inspecting agency to administer and perform tests and inspections.

3. Engage factory-authorized service representative to administer and perform tests and inspections on components, assemblies, and equipment installations, including connections.
4. Administer and perform tests and inspections with assistance of factory-authorized service representative.

3.5 CLEANING

3.6 CLOSEOUT ACTIVITIES

A. Demonstration: Demonstrate to Owner's maintenance and clerical personnel how to operate the following systems and equipment:

1. Lighting control devices specified in Section 260923 "Lighting Control Devices."

B. Training: Train Owner's maintenance personnel on the following topics:

1. How to implement Facility EPM Program.
2. How to adjust, operate, and maintain devices specified in Section 260923 "Lighting Control Devices."
3. How to adjust, operate, and maintain devices specified in Section 264313 "Surge Protective Devices for Low-Voltage Electrical Power Circuits."
4. How to adjust, operate, and maintain luminaires and photoelectric controls specified in Section 265619 "LED Exterior Lighting."

END OF SECTION 260010

SECTION 2601 00 - ELECTRICAL, GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The General Requirements, Division 01, are made a part of this section as fully as if repeated herein.

B. This section applies to all sections of Division 26 - Electrical, Division 27 - Communications, and Division 28 - Electronic Safety and Security.

1.2 QUALITY ASSURANCE

A. Criteria:

1. Reference Standards: Comply with standards referenced in each section for design, manufacture, method of installation, and testing of all materials, apparatus, and equipment unless specified otherwise herein and following standards:

a. National Electrical Code (NEC) (2017).

b. National Fire Alarm Code (2016).

c. Florida Building Code (2020).

d. Florida Fire Protection Code (2020).

e. Florida Building Code Energy Conservation (2020).

f. NECA (INST) - Standard of Installation; National Electrical Contractors Association.

g. National Electrical Manufacturers Association (NEMA) Standards.

h. Institute of Electrical and Electronics Engineers (IEEE) Standards.

i. All applicable codes and standards adopted by the Authority Having Jurisdiction.

1.3 DEFINITIONS

A. Furnish, Install, and Provide:

1. Furnish: Purchase and deliver to the jobsite.

2. Install: Mount, connect, complete, and leave ready for operation.

3. Provide: Furnish and install.

B. Products: Items obtained 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.

C. 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.

D. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.

E. Comparable Product (or Approved Equal): Product that is demonstrated and approved through submittal process 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.

F. Basis-of-Design Product: A specification or drawing in which a specific manufacturer’s product is named and accompanied by the words “basis-of-design product,” including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

G. Action Submittals: Written and graphic information and physical samples that require Engineer’s responsive action. Action submittals are those submittals indicated in individual specification sections as “action submittals” and are required submittals.

H. Informational Submittals: Written and graphic information and physical samples that do not require Engineer’s responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual specification sections as “informational submittals” and are not required submittals for approvals, but serve to confirm Subcontractor or Vendor proposed product or procedure, and/or are required for Operation and Maintenance Manuals.

1.4 SUBSTITUTIONS

A. Where allowed by these specifications, substitutions may be offered by the Subcontractor for material and/or installation methods, for consideration by the Engineer as an approved equal. For all substitutions, the burden of proof of equality is upon the Subcontractor and his Vendors/suppliers. Submit adequate documentation to allow verification of characteristics of the product specified as well as the substitution. If the documentation provided for the substitution is inadequate for analysis, this may be grounds for rejection of the substitution.

1.5 SUBMITTALS

A. Mark submittals to clearly indicate exact proposed product and applicable options and accessories. Submittals too general and with multiple products, options and/or accessories shown but not marked to be job specific will be REJECTED.

C. Provide ½" scale dimensioned plan view layout of submitted electrical gear for each electrical room. Dimensioned plan view layouts shall indicate all NEC clearances. Hand drawn sketches on graph paper will be acceptable. Any deviations from the contract documents of gear due to physical constraints shall be subject to engineer approval. Submittals that do not contain dimensioned plan view layouts of electrical rooms including items, whether electrical or provided by others, may require resubmission of shop drawings

1.6 RECORD DOCUMENTS

A. Prepare record documents in accordance with the requirements in General and Supplementary Conditions and Division 01. In addition to the requirements specified in Division 01, indicate installed conditions for:

1. Major Raceway Systems: Size and locations, for both exterior and interior; locations of control devices; distribution and branch electrical circuitry, including match-up of panel schedules circuits numbers and plan circuits numbers; and fuse and circuit breaker size and arrangements.

2. Equipment Locations (Exposed and Concealed): Dimensioned from prominent building lines.

3. Approved Substitutions: Contract Modifications and actual equipment and materials installed.

1.7 RECORD DRAWINGS/DIGITAL DATA FILES:

A. Immediately before inspection for Certificate of Final Acceptance, review marked-up record prints with Engineer and Construction Manager. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

B. Format: DWG, Version 2008 or later AutoCad, operating system.

C. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.

D. Refer instances of uncertainty to Engineer through Construction Manager for resolution.

1.8 OPERATION AND MAINTENANCE MANUAL

A. Furnish three (3) complete manuals covering entire electrical system, including following:

1. General:

a. Equipment function.

b. Normal operating characteristics.

c. Limiting conditions.

d. Engineering data and tests.

2. Installation Instructions:

a. Assembly.

b. Installation.

c. Adjustment.

d. Checking.

3. Operation Instructions:

a. Sequence of operation.

b. Control diagrams.

c. Start-up.

d. Routine and normal operation.

e. Regulation and control.

f. Stopping.

g. Shutdown.

h. Emergency.

4. Maintenance Instructions:

a. Routine.

b. Preventative.

c. Troubleshooting.

d. Disassembly.

e. Repair.

f. Reassembly.

g. Adjusting.

h. Servicing instructions.

i. Lubrication charts and schedules.

5. Parts List: Complete nomenclature and commercial numbers of replacement.

6. Shop Drawings:

a. Outlines.

b. Cross sections.

c. Wiring diagrams.
d. Assemblies.

e. Manufacturer's warranties.

1.9 JOB CONDITIONS

A. Drawings: Architectural and structural drawings take precedence over electrical drawings for building construction, dimensions, and specific locations. Electrical drawings are diagrammatic and schematic and show approximate locations and orientations. Refer to details, specifications, and other drawings for exact placement.

B. Where headroom or space conditions appear inadequate, notify Engineer before proceeding with installation.

C. Do not attach or suspend items from joist bridging or roof decking.

D. Do not install any electrical raceway of cable within 6 inches of the roof deck.

E. Perform all excavation, trenching, and backfill to install electrical components in accordance with sections referenced in specification sections.

1.10 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Carefully handle, properly store, and adequately protect all equipment and materials from damage before and during installation.

B. Repair or replace damaged or defective items as directed by Engineer.

C. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 COORDINATION WITH OTHER TRADES

A. General: Sequence, coordinate, and integrate the various elements of electrical systems, materials, and equipment.

B. Unless otherwise shown or specified, furnish and install all electrical equipment shown on drawings and/or specified in Division 26 - Electrical and referenced other division specifications.

C. Conform to following procedure for making power connections to all mechanical equipment shown on drawings and/or specified in Division 22 - Plumbing and Division 23 - Heating, Ventilating, and Air-Conditioning.

1. Electrical Subcontractor: Make all connections and provide and/or install starters and disconnect switches where indicated.

2. Mechanical Subcontractor: Provide motor starters (where not indicated as being provided under this division), disconnect switches (where not indicated as being provided under this division), control power, 120V from panelboard (except where indicated on drawings as provided under this division), wiring diagrams and supervise all connections.

D. Coordinate the wiring lugs of all equipment with the conductors connected to the equipment supplied by either electrical divisions or other divisions.

E. Furnish and install all 120V power for control supply, where shown on drawings, for all mechanical control equipment and dampers.

F. Coordinate electrical testing of electrical, mechanical, and architectural items, so equipment and systems that are functionally interdependent are tested to demonstrate successful interoperability.

3.2 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Comply with NECA 1.

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

2. 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.

3. 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. Install

raceways, wireways, cable trays, busways, and cables in a manner to maintain working areas and access areas around equipment clear of obstructions.

4. Right-of-Way: Give to raceways and piping systems installed at a required slope.

3.4 ROUGH-IN

A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.

B. Refer to equipment specifications in all other divisions for rough-in requirements.

C. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.

D. Coordinate the installation of required supporting devices and set sleeves in poured-in-place concrete, masonry and other structural components, as they are constructed.

E. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the work. Give particular attention to large equipment requiring positioning prior to closing in the building.

F. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.

G. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Engineer.

H. Install systems, materials and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished areas.

I. Install systems, materials, and equipment giving a right-of-way priority to systems required to be installed at a specified slope.

3.5 CUTTING AND PATCHING

A. General: Perform cutting and patching in accordance with Division 01 - Section 01 73 00, “Execution; Cutting and Patching.” In addition to the requirements specified in Division 01, the following requirements apply:

1. Performing cutting, fitting, and patching of electrical equipment and

materials required to:

a. Uncover work to provide for installation of ill-timed work.

b. Remove and replace defective work.

c. Remove and replace work not conforming to requirements of the Contract Documents.

d. Remove samples of installed work as specified for testing.

e. Install equipment and materials in existing structures.

f. Upon written instructions from the Engineer, uncover and restore work to provide for Engineer observation of concealed work.

2. Cut, remove, and legally dispose of selected electrical equipment, components, and materials as indicated, including but not limited to removal of electrical items indicated to be removed and items made obsolete by the new work.

B. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

C. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

D. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

E. Patch existing finished surfaces and building components using new materials matching existing materials and using experienced installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

1. Refer to Division 01 sections for definition of experienced "installer."

3.7 MULTI-BONDED NEUTRAL TEST

A. Perform multi-bonded neutral test to verify no downstream connections of neutrals and grounds:

1. Test the resistance between the neutral bus and the ground bus by disconnecting the neutral bonding jumper.

2. If the utility transformer neutral is bonded, disconnect the service neutral prior to testing.

3. Perform the test at two intervals during the course of construction:

4. Test #1 - Before the power system is energized and prior to any branch circuit wiring being terminated in the panel(s).

5. Test #2 - After service is energized and after branch circuit wiring is complete.

6. In buildings with step-down transformers provide a similar test at the secondary of each transformer.

7. If infinite resistance is NOT obtained in each test, lift one neutral at a time until the measured resistance becomes infinite. Once the “problem” neutral(s) is found, trace out that circuit(s) until the problem is found. Fix all shorted or miswired neutrals and retest.

8. Reinstall bonding jumper at completion of each test.

3.8 SUBSTANTIAL AND FINAL COMPLETION

A. Submit record documents.

B. Submit Operation and Maintenance manuals.

C. Clean all electrical/electronic items/components/equipment/devices inside and outside prior to inspection.

D. Certify that all punch list items are complete.

E. Certify that all testing requirements are complete.

END OF SECTION 260100

SECTION 260519 - 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. Section Includes:

1. Copper building wire rated 600 V or less.
2. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS

A. RoHS: Restriction of Hazardous Substances.

B. VFC: Variable-frequency controller.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: Indicate type, use, location, and termination locations.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer’s authorized service representative.

B. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA.

1. Testing Agency’s Field Supervisor: Certified by NETA to supervise on-site testing.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

C. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.

D. Conductor Insulation:
1. Type RHW: Comply with UL 44.
2. Type THHN and Type THWN: Comply with UL 83.
3. Type XHHW: Comply with UL 44.

2.2 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.

C. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.

1. Material: Copper, Aluminum, or Bronze.
2. Type: One or Two hole with standard or long barrels.
3. Termination: Compression or Crimp.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Feeders: Copper for feeders smaller than No. 4 AWG; copper or aluminum for feeders No. 4 AWG and larger. Conductors shall be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

C. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

D. Branch Circuits: Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

E. VFC Output Circuits Cable: Extra-flexible stranded for all sizes.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW, single conductors in raceway.

B. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to “Raceways and Boxes for Electrical Systems” prior to pulling conductors and cables.

C. 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.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

3.4 CONNECTIONS

A. 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-486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

A. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

D. Perform tests and inspections with the assistance of a factory-authorized service representative.

1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.

2. Perform each of the following visual and electrical tests:

a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
b. Test bolted connections for high resistance using one of the following:

1) A low-resistance ohmmeter.
2) Calibrated torque wrench.
3) Thermographic survey.

c. Inspect compression-applied connectors for correct cable match and indentation.
d. Inspect for correct identification.
e. Inspect cable jacket and condition.
f. Insulation-resistance test on each conductor for ground and adjacent conductors. Apply a potential of 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable for a one-minute duration.

g. Continuity test on each conductor and cable.
h. Uniform resistance of parallel conductors.

3. Initial Infrared Scanning: After Substantial Completion, but before Final Acceptance, perform an infrared scan of each splice in conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.

   a. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
   b. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

4. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switch 11 months after date of Substantial Completion.

E. Cables will be considered defective if they do not pass tests and inspections.

F. Prepare test and inspection reports to record the following:

1. Procedures used.
2. Results that comply with requirements.
3. Results that do not comply with requirements, and corrective action taken to achieve compliance with requirements.

END OF SECTION 260519

SECTION 260526 - 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. Section includes grounding and bonding systems and equipment.

B. Section includes grounding and bonding systems and equipment, plus the following special applications:

1. Underground distribution grounding.
2. Ground bonding common with lightning protection system.
3. Foundation steel electrodes.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans showing dimensioned locations of grounding features specified in “Field Quality Control” Article, including the following:

1. Test wells.
2. Ground rods.
3. Ground rings.
4. Grounding arrangements and connections for separately derived systems.

B. Qualification Data: For testing agency and testing agency’s field supervisor.

C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 “Operation and Maintenance Data,” include the following:

    a. Plans showing as-built, dimensioned locations of system described in “Field Quality Control” Article, including the following:

        1) Test wells.
        2) Ground rods.
        3) Ground rings.
        4) Grounding arrangements and connections for separately derived systems.

    b. Instructions for periodic testing and inspection of grounding features based on NETA MTS.

        1) Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
        2) Include recommended testing intervals.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Certified by NETA.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 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 B3.
2. Stranded Conductors: ASTM B8.
3. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
4. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

5. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

C. Grounding Bus: Predrilled rectangular bars of annealed copper. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.3 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

C. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

D. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.

E. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

F. Cable Tray Ground Clamp: Mechanical type, zinc-plated malleable iron.

G. Conduit Hubs: Mechanical type, terminal with threaded hub.

H. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.

I. Lay-in Lug Connector: Mechanical type, copper rated for direct burial terminal with set screw.

J. Service Post Connectors: Mechanical type, bronze alloy terminal, in short- and long-stud lengths, capable of single and double conductor connections.

K. Signal Reference Grid Clamp: Mechanical type, stamped-steel terminal with hex head screw.

L. Straps: Solid copper. Rated for 600 A.

M. Tower Ground Clamps: Mechanical type, copper or copper alloy, terminal two-piece clamp.

N. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.

O. Water Pipe Clamps:

1. Mechanical type, two pieces with zinc-plated bolts.

a. Material: Die-cast zinc alloy.
b. Listed for direct burial.

2. U-bolt type with malleable-iron clamp and copper ground connector rated for direct burial.

2.4 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet (19 mm by 3 m).

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Underground Grounding Conductors: Install bare No. 2/0 AWG minimum.

1. Bury at least 30 inches (750 mm) below grade.
2. Duct-Bank Grounding Conductor: Bury 12 inches (300 mm) above duct bank when indicated as part of duct-bank installation.

C. Grounding Conductors: Green-colored insulation.

D. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

E. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus horizontally, on insulated spacers 2 inches (50 mm) minimum from wall, 6 inches (150 mm) above finished floor unless otherwise indicated.
2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

F. Conductor Terminations and Connections:

1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
3. Connections to Ground Rods at Test Wells: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING AT THE SERVICE

A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 GROUNDING SEPARATELY DERIVED SYSTEMS

A. Generator: Install grounding electrode(s) at the generator location. The electrode shall be connected to the equipment grounding conductor and to the frame of the generator.

3.4 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

B. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches (150 mm) from the foundation.

3.5 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.6 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
2. Use exothermic welds for all below-grade connections.
3. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

D. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Section 260543 “Underground Ducts and Raceways for Electrical Systems,” and shall be at least 12 inches (300 mm) deep, with cover.

1. Install at least one test well for each service unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

F. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building’s main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

G. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.

H. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet (18 m) apart.

I. Concrete-Encased Grounding Electrode (Ufer Ground): Fabricate according to NFPA 70; use a minimum of 20 feet (6 m) of bare copper conductor not smaller than No. 4 AWG.

J. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

D. Perform tests and inspections with the assistance of a factory-authorized service representative.

E. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at individual ground rods. Make tests at ground rods before any conductors are connected.

    a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.

b. Perform tests by fall-of-potential method according to IEEE 81.

4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

F. Grounding system will be considered defective if it does not pass tests and inspections.

G. Prepare test and inspection reports.

H. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
4. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohms.

I. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

SECTION 260533.13 - CONDUITS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Type EMT-A and Type EMT-SS duct raceways and elbows.
2. Type EMT-S duct raceways and elbows.
3. Type ENT duct raceways and fittings.
4. Type ERMC-A and Type ERMC-SS duct raceways, elbows, couplings, and nipples.
5. Type ERMC-S duct raceways, elbows, couplings, and nipples.
6. Type FMC-S and Type FMC-A duct raceways.
7. Type PVC duct raceways and fittings.
8. Type RTRC-AG duct raceways and fittings.
9. Type RTRC-BG duct raceways and fittings.
10. Fittings for conduit, tubing, and cable.
11. Electrically conductive corrosion-resistant compounds for threaded conduit.

B. Related Requirements:

1. Section 260010 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.
2. Section 260519 "Low-Voltage for Electrical Power Conductors and Cables" for nonmetallic underground conduit with conductors (Type NUCC).
3. Section 260543 "Underground Ducts and Raceways for Electrical Systems" for exterior duct banks, manholes, and underground utility construction.

1.2 DEFINITIONS

A. Conduit: A structure containing one or more duct raceways.

B. Duct Raceway: A single enclosed raceway for conductors or cable.

C. Duct Bank: An arrangement of conduit providing one or more continuous duct raceways between two points.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Type EMT-A and Type EMT-SS duct raceways and elbows.
2. Type EMT-S duct raceways and elbows.
3. Type ENT duct raceways and fittings.

4. Type ERMC-A and Type ERMC-SS duct raceways, elbows, couplings, and nipples.
5. Type ERMC-S duct raceways, elbows, couplings, and nipples.
6. Type FMC-S and Type FMC-A duct raceways.
7. Type PVC duct raceways and fittings.
8. Type RTRC-AG duct raceways and fittings.
9. Type RTRC-BG duct raceways and fittings.
10. Fittings for conduit, tubing, and cable.
11. Electrically conductive corrosion-resistant compounds for threaded conduit.

1.4 INFORMATIONAL SUBMITTALS

A. Manufacturers' Published Instructions:

1. Type EMT-A and Type EMT-SS duct raceways and elbows.
2. Type EMT-S duct raceways and elbows.
3. Type ENT duct raceways and fittings.
4. Type ERMC-A and Type ERMC-SS duct raceways, elbows, couplings, and nipples.
5. Type ERMC-S duct raceways, elbows, couplings, and nipples.
6. Type FMC-S and Type FMC-A duct raceways.
7. Type PVC duct raceways and fittings.
8. Type RTRC-AG duct raceways and fittings.
9. Type RTRC-BG duct raceways and fittings.
10. Fittings for conduit, tubing, and cable.
11. Electrically conductive corrosion-resistant compounds for threaded conduit.

PART 2 - PRODUCTS

2.1 TYPE EMT-A AND TYPE EMT-SS DUCT RACEWAYS AND ELBOWS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN FJMX; including UL 797A.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

a. Minimum Trade Size: Metric designator 21 (trade size 3/4).
b. Colors: As indicated on Drawings.

2.2 TYPE EMT-S DUCT RACEWAYS AND ELBOWS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN FJMX; including UL 797.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

2.3 TYPE ENT DUCT RACEWAYS AND FITTINGS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN FKHU; including UL 1653.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL FKHU - Electrical Nonmetallic Tubing (ENT) and Fittings:
1. Options:

a. Minimum Trade Size: Metric designator 21 (trade size 3/4).
b. Fittings:

1) Mechanically Attached Fittings: UL 1653.
2) Solvent-Attached Fittings: UL 651.

2.4 TYPE ERMC-A AND TYPE ERMC-SS DUCT RACEWAYS, ELBOWS, COUPLINGS, AND NIPPLES

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN DYWV; including UL 6A.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL DYIX - Galvanized-Steel Electrical Rigid Metal Conduit (ERMC-S-G), Elbows, Couplings, and Nipples:
1. Exterior Coating: Zinc.
2. Options:

a. Interior Coating: Zinc.
b. Minimum Trade Size: Metric designator 21 (trade size 3/4).
c. Colors: As indicated on Drawings.

D. UL DYIX - PVC-Coated-Steel Electrical Rigid Metal Conduit (ERMC-S-PVC), Elbows, Couplings, and Nipples:
1. Options:

a. Exterior Coating: PVC complying with NEMA RN 1.
b. Interior Coating: Zinc.
c. Minimum Trade Size: Metric designator 21 (trade size 3/4.
d. Colors: As indicated on Drawings.
e. Conduit Fittings for Hazardous (Classified) Locations: UL 1203.
f. Expansion and Deflection Fittings: UL 651 with flexible bonding jumper.

2.5 TYPE FMC-S AND TYPE FMC-A DUCT RACEWAYS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN DXUZ; including UL 1.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL DXUZ - Steel Flexible Metal Conduit (FMC-S):
1. Material: Steel.
2. Options:

a. Minimum Trade Size: Metric designator 21 (trade size 3/4).
b. Colors: As indicated on Drawings.

D. UL DXUZ - Aluminum Flexible Metal Conduit (FMC-A):
   1. Options:

      a. Minimum Trade Size: Metric designator 16 (trade size 1/2).
      b. Colors: As indicated on Drawings.

2.6 TYPE FMT DUCT RACEWAYS

A. Performance Criteria:

   1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
   2. Listing Criteria: UL CCN ILJW; including UL Subject 1652.

B. Source Quality Control:

   1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
   2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL ILJW - Steel Flexible Metallic Tubing (FMT):
   1. Options:

      a. Minimum Trade Size: Metric designator 21 (trade size 3/4).
      b. Colors: As indicated on Drawings.

2.7 TYPE IMC DUCT RACEWAYS

A. Performance Criteria:

   1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
   2. Listing Criteria: UL CCN DYBY; including UL 1242.

B. Source Quality Control:

   1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
   2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. Source Quality Control:

   1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
   2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

2.8 TYPE PVC DUCT RACEWAYS AND FITTINGS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN DZYR; including UL 651.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL DZYR - Schedule 40 Rigid PVC Conduit (PVC-40) and Fittings:
1. Dimensional Specifications: Schedule 40.
2. Options:

a. Minimum Trade Size: Metric designator 21 (trade size 3/4).
b. Markings: For use with maximum 90 deg C wire.

D. UL DZYR - Schedule 80 Rigid PVC Conduit (PVC-80) and Fittings:
1. Dimensional Specifications: Schedule 80.
2. Options:

a. Minimum Trade Size: Metric designator 21 (trade size 3/4).
b. Markings: For use with maximum 90 deg C wire.

E. UL DZYR - Type A Rigid PVC Concrete-Encased Conduit (PVC-A) and Fittings:
1. Dimensional Specifications: Type A.
2. Options:

a. Minimum Trade Size: Metric designator 21 (trade size 3/4).

F. UL DZYR - Type EB Rigid PVC Concrete-Encased Underground Conduit (PVC-EB) and Fittings:
1. Dimensional Specifications: Type EB.
2. Options:

a. Minimum Trade Size: [\Metric designator 53 (trade size 2).

2.9 TYPE RTRC-AG DUCT RACEWAYS AND FITTINGS`

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria:

a. Aboveground RTRC: UL CCN DZKT; including UL 2515.
b. Extra Heavy Wall RTRC: UL 2515A.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

2.10 TYPE RTRC-BG DUCT RACEWAYS AND FITTINGS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN DZKT; including UL 2420.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

2.11 FITTINGS FOR CONDUIT, TUBING, AND CABLE

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL DWTT - Fittings for Type ERMC, Type IMC, Type PVC, Type HDPE, Type EPEC, and Type RTRC Duct Raceways:
1. Listing Criteria: UL CCN DWTT; including UL 514B.
2. Options:

a. Material: Steel.
b. Coupling Method: Compression coupling.
c. Expansion and Deflection Fittings: UL 651 with flexible bonding jumper.

D. UL FKAV - Fittings for Type EMT Duct Raceways:
   1. Listing Criteria: UL CCN FKAV; including UL 514B.
   2. Options:

      a. Material: Steel
      b. Coupling Method: Compression coupling.
      c. Expansion and Deflection Fittings: UL 651 with flexible bonding jumper.

E. UL ILNR - Fittings for Type FMC Duct Raceways:
   1. Listing Criteria: UL CCN ILNR; including UL 514B.

2.12 ELECTRICALLY CONDUCTIVE CORROSION-RESISTANT COMPOUNDS FOR THREADED CONDUIT

A. Performance Criteria:

   1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
   2. Listing Criteria: UL CCN FOIZ; including UL Subject 2419.

B. Source Quality Control:

   1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
   2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

2.13 NTS

A. Performance Criteria:

   1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
   2. Listing Criteria: UL CCN DWTT; including UL 514B.

B. Source Quality Control:

   1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.

   2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

PART 3 - EXECUTION

3.1 SELECTION OF CONDUITS FOR ELECTRICAL SYSTEMS

A. Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with NFPA 70 for selection of duct raceways. Consult Architect for resolution of conflicting requirements.

B. Outdoors:

1. Exposed and Subject to Severe Physical Damage: PVC Schedule 80.
2. Exposed and Subject to Physical Damage: PVC Schedule 80.

    a. Locations less than 2.5 m (8 ft) above finished floor.

3. Exposed and Not Subject to Physical Damage: EMT or PVC-40.
4. Concealed Aboveground: EMT.
5. Direct Buried: PVC-40.
6. Concrete Encased Not in Trench: PVC-4.
7. Concrete Encased in Trench: PVC-40.

C. Indoors:

1. Exposed and Subject to Severe Physical Damage: ERMC. Locations include the following:

    a. Loading docks.
    b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
    c. Mechanical rooms.
    d. Gymnasiums.

2. Exposed and Subject to Physical Damage: EMT. Locations include the following:

    a. Locations less than 2.5 m (8 ft) above finished floor.
    b. Stub-ups to above suspended ceilings.

3. Exposed and Not Subject to Physical Damage: PVC-80.
4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Damp or Wet Locations: ERM.

D. Duct Fittings: Select fittings in accordance with NEMA FB 2.10 guidelines.

1. ERMC and IMC: Provide threaded-type fittings unless otherwise indicated.

3.2 INSTALLATION OF CONDUITS FOR ELECTRICAL SYSTEMS

A. Comply with manufacturer's published instructions.

B. Reference Standards for Installation: Unless more stringent installation requirements are specified in Contract Documents or manufacturers' published instructions, comply with the following:

1. Type EMT-A: Article 358 of NFPA 70 and NECA NEIS 102.
2. Type EMT-S: Article 358 of NFPA 70 and NECA NEIS 101.
3. Type ENT: Article 362 of NFPA 70 and NECA NEIS 102.
4. Type ERMC-A: Article 344 of NFPA 70 and NECA NEIS 102.
5. Type ERMC-SS: Article 344 of NFPA 70 and NECA NEIS 101.
6. Type ERMC-S: Article 344 of NFPA 70 and NECA NEIS 101.
7. Type FMC-S: Article 348 of NFPA 70 and NECA NEIS 101.
8. Type FMC-A: Article 348 of NFPA 70 and NECA NEIS 102.
9. Type FMT: Article 360 of NFPA 70 and NECA NEIS 101.
10. Type IMC: Article 342 of NFPA 70 and NECA NEIS 101.
11. Type PVC: Article 356 of NFPA 70 and NECA NEIS 111.
12. Type RTRC: Article 355 of NFPA 70 and NECA NEIS 111.
13. Expansion Fittings: NEMA FB 2.40.
14. Consult Architect for resolution of conflicting requirements.

C. Special Installation Techniques:

1. General Requirements for Installation of Duct Raceways:

    a. Complete duct raceway installation before starting conductor installation.
    b. Provide stub-ups through floors with coupling threaded inside for plugs, set flush with finished floor. Plug coupling until conduit is extended above floor to final destination or a minimum of 2 ft (0.6 m) above finished floor.
    c. Install no more than equivalent of three 90-degree bends in conduit run except for control wiring conduits, for which no more than equivalent of two 90-degree fewer bends are permitted. Support within 12 inch (300 mm) of changes in direction.
    d. Make bends in duct raceway using large-radius preformed ells except for parallel bends. Field bending must be in accordance with NFPA 70 minimum radii requirements. Provide only equipment specifically designed for material and size involved.
    e. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
    f. Support conduit within 12 inch (300 mm) of enclosures to which attached.
    g. Install duct sealing fittings at accessible locations in accordance with NFPA 70 and fill them with listed sealing compound. For concealed duct raceways, install fitting in flush steel box with blank cover plate having finish similar to that of adjacent plates or surfaces. Install duct sealing fittings in accordance with NFPA 70.
    h. Install devices to seal duct raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal interior of duct raceways at the following points:

        1) Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.

2) Where an underground service duct raceway enters a building or structure.
3) Conduit extending from interior to exterior of building.
4) Conduit extending into pressurized duct raceway and equipment.
5) Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
6) Where otherwise required by NFPA 70.

i. Do not install conduits within 2 inch (50 mm) of the bottom side of a metal deck roof.
j. Keep duct raceways at least 6 inch (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal duct raceway runs above water and steam piping.
k. Cut conduit perpendicular to the length. For conduits metric designator 53 (trade size 2) and larger, use roll cutter or a guide to make cut straight and perpendicular to the length. Ream inside of conduit to remove burrs.
l. Install pull wires in empty duct raceways. Provide polypropylene or monofilament plastic line with not less than 200 lb (90 kg) tensile strength. Leave at least 12 inch (300 mm) of slack at both ends of pull wire. Cap underground duct raceways designated as spare above grade alongside duct raceways in use.
m. Install duct raceways square to the enclosure and terminate at enclosures without hubs with locknuts on both sides of enclosure wall. Install locknuts hand tight, plus one-quarter turn more.

1) Termination fittings with shoulders do not require two locknuts.

n. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to metric designator 35 (trade size 1-1/4) and insulated throat metal bushings on metric designator 41 (trade size 1-1/2) and larger conduits terminated with locknuts.

2. Types EMT-A, ERMC-A, and FMC-A: Do not install aluminum duct raceways or fittings in contact with concrete or earth.
3. Types ERMC and IMC:

a. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound that maintains electrical conductivity to threads of duct raceway and fittings before making up joints. Follow compound manufacturer's published instructions.

4. Type ERMC-S-PVC:

a. Follow manufacturer's installation instructions for clamping, cutting, threading, bending, and assembly.
b. Provide PVC-coated sealing locknut for exposed male threads transitioning into female NPT threads that do not have sealing sleeves, including transitions from PVC couplings/female adapters to Type ERMC-S-PVC elbows in direct-burial applications. PVC-coated sealing locknuts must not be used in place of conduit hub. PVC-coated sealing locknut must cover exposed threads on Type ERMC-S-PVC duct raceway.

c. Coat field-cut threads on PVC-coated duct raceway with manufacturer-approved corrosion-preventing conductive compound prior to assembly.

5. Types FMC:

a. Provide a maximum of 36 inch (915 mm) of flexible conduit for recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

6. Types PVC, HDPE, and EPEC:

a. Do not install Type PVC, Type HDPE, or Type EPEC conduit where ambient temperature exceeds 122 deg F (50 deg C). Conductor ratings must be limited to 75 deg C except where installed in a trench outside buildings with concrete encasement, where 90 deg C conductors are permitted.
b. Comply with manufacturer's published instructions for solvent welding and fittings.

7. Type RTRC: Do not install Type RTRC conduit where ambient temperature exceeds 230 deg F (110 deg C).
8. Duct Raceways Embedded in Slabs:

a. Run duct raceways larger than metric designator 27 (trade size 1) below concrete slab] [Run duct raceways larger than metric designator 27 (trade size 1) parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place duct raceway close to slab support. Secure duct raceways to reinforcement at maximum 10 ft (3 m) intervals.
b. Arrange duct raceways to cross building expansion joints with expansion fittings at right angles to the joint.
c. Arrange duct raceways to ensure that each is surrounded by minimum of 1 inch (25 mm)] [2 inch (50 mm) of concrete without voids.
d. Do not embed threadless fittings in concrete unless locations have been specifically approved by Architect.
e. Change from ENT to PVC-80 before rising above floor.

9. Stub-ups to Above Recessed Ceilings:

a. Provide EMT, IMC, or ERMC for duct raceways.
b. Provide a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

10. Duct Raceway Terminations at Locations Subject to Moisture or Vibration:

a. Provide insulating bushings to protect conductors, including conductors smaller than 4 AWG. Install insulated throat metal grounding bushings on service conduits.

11. Duct Fittings: Install fittings in accordance with NEMA FB 2.10 guidelines.

a. ERMC-S-PVC: Provide only fittings listed for use with this type of conduit. Patch and seal joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Provide sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
b. EMT: Provide steel fittings. Comply with NEMA FB 2.10.
c. Flexible Conduit: Provide only fittings listed for use with flexible conduit type. Comply with NEMA FB 2.20.

12. Expansion-Joint Fittings:

a. Install in runs of aboveground PVC that are located where environmental temperature change may exceed 30 deg F (17 deg C) and that have straight-run length that exceeds 25 ft (7.6 m). Install in runs of aboveground ERMC and EMT conduit that are located where environmental temperature change may exceed 100 deg F (55 deg C) and that have straight-run length that exceeds 100 ft (30 m).
b. Install type and quantity of fittings that accommodate temperature change listed for the following locations:

1) Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F (70 deg C) temperature change.
2) Outdoor Locations Exposed to Direct Sunlight: 155 deg F (86 deg C) temperature change.
3) Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
4) Attics: 135 deg F (75 deg C) temperature change.

c. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F (0.0115 mm per meter of length of straight run per deg C) of temperature change for metal conduits.
d. Install expansion fittings at locations where conduits cross building or structure expansion joints.
e. Install expansion-joint fitting with position, mounting, and piston setting selected in accordance with manufacturer's published instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

13. Duct Raceways Penetrating Rooms or Walls with Acoustical Requirements: Seal duct raceway openings on both sides of rooms or walls with acoustically rated putty or firestopping.
14. Identification: Provide labels for conduit assemblies, duct raceways, and associated electrical equipment.

a. Provide warning signs.

D. Interfaces with Other Work:

1. Coordinate with Section 078413 "Penetration Firestopping" for installation of firestopping at penetrations of fire-rated floor and wall assemblies.
2. Coordinate with Section 260529 "Hangers and Supports for Electrical Systems" for installation of conduit hangers and supports.

3.3 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533.13

SECTION 260533.16 - BOXES AND COVERS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metallic outlet boxes, device boxes, rings, and covers.
2. Nonmetallic outlet boxes, device boxes, rings, and covers.
3. Junction boxes and pull boxes.
4. Cover plates for device boxes.
5. Hoods for outlet boxes.

B. Related Requirements:

1. Section 260010 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Metallic outlet boxes, device boxes, rings, and covers.
2. Nonmetallic outlet boxes, device boxes, rings, and covers.
3. Junction boxes and pull boxes.
4. Cover plates for device boxes.
5. Hoods for outlet boxes.

B. Shop Drawings:

1. Shop drawings for floor boxes.

C. Sustainable design submittals.

1. Nonmetallic outlet boxes, device boxes, rings, and covers.
2. Junction boxes and pull boxes.
3. Cover plates for device boxes.

1.3 INFORMATIONAL SUBMITTALS

A. Manufacturers' Published Instructions:

1. Metallic outlet boxes, device boxes, rings, and covers.
2. Nonmetallic outlet boxes, device boxes, rings, and covers.
3. Junction boxes and pull boxes.

4. Cover plates for device boxes.
5. Hoods for outlet boxes.

PART 2 - PRODUCTS

2.1 METALLIC OUTLET BOXES, DEVICE BOXES, RINGS, AND COVERS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
2. Listing Criteria: UL CCN QCIT; including UL 514A.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.
3. Samples:

    a. Floor Box Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors and flooring inserts for each type of floor box.
    b. Raised Floor Box Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors and flooring inserts for each type of floor box.
    c. Recessed Access-Floor Box Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors and flooring inserts for each type of floor box.
    d. Concrete Box Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors and flooring inserts for each type of floor box.

C. UL QCIT - Metallic Outlet Boxes and Covers:

1. Description: Box having pryout openings, knockouts, threaded entries, or hubs in either the sides of the back, or both, for entrance of conduit, conduit or cable fittings, or cables, with provisions for mounting outlet box cover, but without provisions for mounting wiring device directly to box.
2. Options:

    a. Material: Sheet steel**.**
    b. Sheet Metal Depth: Minimum 2 inch (50 mm).
    c. Luminaire Outlet Boxes and Covers: Nonadjustable, listed and labeled for attachment of luminaire weighing up to 50 lb (23 kg).
    d. Paddle Fan Outlet Boxes and Covers: Nonadjustable, designed for attachment of paddle fan weighing up to 70 lb (32 kg).

D. UL QCIT - Metallic Conduit Bodies:

1. Description: Means for providing access to interior of conduit or tubing system through one or more removable covers at junction or terminal point. In the United States, conduit bodies are listed in accordance with outlet box requirements.

E. UL QCIT - Metallic Device Boxes:

1. Description: Box with provisions for mounting wiring device directly to box.
2. Options:

a. Material: Sheet steel.
b. Sheet Metal Depth: minimum 2 inch (50 mm).

F. UL QCIT - Metallic Extension Rings:

1. Description: Ring intended to extend sides of outlet box or device box to increase box depth, volume, or both.

G. UL QCIT - Metallic Floor Boxes and Floor Box Covers:

1. Description: Box mounted in floor with floor box cover and other components to complete floor box enclosure.

H. UL QCIT - Metallic Raised-Floor Boxes and Floor Box Covers:

1. Description: Box mounted in raised-floor with floor box cover and other components to complete floor box enclosure.

I. UL QCIT - Metallic Recessed Access-Floor Boxes and Recessed Floor Box Covers:

1. Description: Floor box with provisions for mounting wiring devices below floor surface and floor box cover with provisions for passage of cords to recessed wiring devices mounted within floor box.

J. UL QCIT - Metallic Concrete Boxes and Covers:

1. Description: Box intended for use in poured concrete.

2.2 NONMETALLIC OUTLET BOXES, DEVICE BOXES, RINGS, AND COVERS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.

2. Listing Criteria: UL CCN QCMZ; including UL 514C.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Sustainable Design Submittals: Prepare and submit the following documentation for adhesive solvents:

3. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.
4. Samples:

    a. Floor Box Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors and flooring inserts for each type of floor box.
    b. Raised Floor Box Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors and flooring inserts for each type of floor box.
    c. Recessed Access-Floor Box Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors and flooring inserts for each type of floor box.
    d. Concrete Box Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors and flooring inserts for each type of floor box.

C. UL QCMZ - Nonmetallic Outlet Boxes and Covers:

1. Description: Box having pryout openings, knockouts, threaded entries, or hubs in either the sides or the back, or both, for entrance of conduit, conduit or cable fittings, or cables, with provisions for mounting outlet box cover, but without provisions for mounting wiring device directly to box.

D. UL QCMZ - Nonmetallic Conduit Bodies:

1. Description: Means for providing access to interior of conduit or tubing system through one or more removable covers at junction or terminal point. In the United States, conduit bodies are listed in accordance with outlet box requirements.

E. UL QCMZ - Nonmetallic Device Boxes:

1. Description: Box with provisions for mounting wiring device directly to box.

F. UL QCMZ - Nonmetallic Extension Rings:

1. Description: Ring intended to extend sides of outlet box or device box to increase box depth, volume, or both.

G. UL QCMZ - Nonmetallic Floor Boxes and Floor Box Covers:

1. Description: Box mounted in floor with floor box cover and other components to complete floor box enclosure.

H. UL QCMZ - Nonmetallic Raised-Floor Boxes and Floor Box Covers:

1. Description: Box mounted in raised-floor with floor box cover and other components to complete floor box enclosure.

I. UL QCMZ - Nonmetallic Recessed Access-Floor Boxes and Recessed Floor Box Covers:

1. Description: Floor box with provisions for mounting wiring devices below floor surface and floor box cover with provisions for passage of cords to recessed wiring devices mounted within floor box.

J. UL QCMZ - Nonmetallic Floor Nozzles:

1. Description: Enclosure intended primarily as housing for receptacle, provided with means, such as collar, for surface-mounting on floor, which may or may not include stem to support it above floor level, and is sealed against the entrance of scrub water at floor level.

K. UL QCMZ - Nonmetallic Concrete Boxes and Covers:

1. Description: Box intended for use in poured concrete.

2.3 JUNCTION BOXES AND PULL BOXES

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. Listing Criteria: UL CCN BGUZ; including UL 50 and UL 50E.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Sustainable Design Submittals: Prepare and submit the following documentation for adhesive solvents:

3. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL BGUZ - Indoor Sheet Metal Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
2. Options:

a. Degree of Protection: Type 1.

D. UL BGUZ - Indoor Cast-Metal Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.

2. Options:

    a. Degree of Protection: Type 1.

E. UL BGUZ - Indoor Polymeric Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
2. Options:

    a. Degree of Protection: Type 1.

F. UL BGUZ - Outdoor Sheet Metal Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
2. Options:

    a. Degree of Protection: Type 3.

G. UL BGUZ - Outdoor Cast-Metal Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
2. Options:

    a. Degree of Protection: Type 3.

H. UL BGUZ - Outdoor Polymeric Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
2. Options:

    a. Degree of Protection: Type 3.

2.4 COVER PLATES FOR DEVICES BOXES

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. Listing Criteria: UL CCN QCIT or UL CCN QCMZ; including UL 514D.
3. Wallplate-Securing Screws: Metal with head color to match wallplate finish.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Sustainable Design Submittals: Prepare and submit the following documentation for adhesive solvents:

3. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL QCIT or QCMZ - Metallic Cover Plates for Device Boxes:
1. Options:

a. Damp and Wet Locations: Listed, labeled, and marked for location and use. Provide gaskets and accessories necessary for compliance with listing.
b. Wallplate Material: 0.032 inch (0.8 mm) thick, Type 302/304 non-magnetic stainless steel with brushed finish.

D. UL QCIT or QCMZ - Nonmetallic Cover Plates for Device Boxes:
1. Options:

a. Damp and Wet Locations: Listed, labeled, and marked for location and use. Provide gaskets and accessories necessary for compliance with listing.
b. Wallplate Material: 0.060 inch (1.5 mm) thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device.
c. Color: As indicated on architectural Drawings.

E. UL QCIT or QCMZ - Illuminating Cover Plates for Device Boxes:
1. Options:

a. Damp and Wet Locations: Listed, labeled, and marked for location and use. Provide gaskets and accessories necessary for compliance with listing.
b. Wallplate Material: 0.060 inch (1.5 mm) thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device.
c. Color: As indicated on architectural Drawings.

2.5 HOODS FOR OUTLET BOXES

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. Listing Criteria:

a. UL CCN QCIT or UL CCN QCMZ; including UL 514D.
b. Receptacle, Hood, Cover Plate, Gaskets, and Seals: UL 498 Supplement SA when mated with box or enclosure complying with UL 514A, UL 514C, or UL 50E.

3. Mounts to box using fasteners different from wiring device.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL QCIT or QCMZ - Retractable or Reattachable Hoods for Outlet Boxes:
   1. Options:.

      a. Provides gray weatherproof, "while-in-use" cover.

D. UL QCIT or QCMZ - Extra-Duty, While-in-Use Hoods for Outlet Boxes:
   1. Additional Characteristics: Marked "Extra-Duty" in accordance with UL 514D.
   2. Options:

      a. Provides gray weatherproof, "while-in-use" cover.
      b. Manufacturer may combine nonmetallic device box with hood as extra-duty rated assembly.

PART 3 - EXECUTION

3.1 PREPARATION

A. Shop Drawings: Prepare and submit the following:

   1. Shop Drawings for Floor Boxes: Show that floor boxes are located to avoid interferences and are structurally allowable. Indicate floor thickness at location where boxes are embedded in concrete floors and underfloor clearances where boxes are installed in raised floors.

3.2 SELECTION OF BOXES AND COVERS FOR ELECTRICAL SYSTEMS

A. Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with NFPA 70 for selection of boxes and enclosures. Consult Architect for resolution of conflicting requirements.

B. Degree of Protection:

   1. Outdoors:

      a. Type 3R unless otherwise indicated.
      b. Locations Exposed to Hosedown: Type 4.
      c. Locations Subject to Potential Flooding: Type 6P.
      d. Locations Aboveground Where Mechanism Must Operate When Ice Covered: Type 3S.

   2. Indoors:

      a. Type 1 unless otherwise indicated.
      b. Damp or Dusty Locations: Type 4.
      c. Surface Mounted in Kitchens and Other Locations Exposed to Oil or Coolants: Type 12.
      d. Flush Mounted in Kitchens and Other Locations Exposed to Oil or Coolants: Type 12K.
      e. Locations Exposed to Airborne Dust, Lint, Fibers, or Flyings: Type 4.

f. Locations Exposed to Hosedown: Type 4.

C. Exposed Boxes Installed Less Than 2.5 m (8 ft) Above Floor:

1. Provide cast-metal boxes.
2. Provide exposed cover. Flat covers with angled mounting slots or knockouts are prohibited.

3.3 INSTALLATION OF BOXES AND COVERS FOR ELECTRICAL SYSTEMS

A. Comply with manufacturer's published instructions.

B. Reference Standards for Installation: Unless more stringent installation requirements are specified in Contract Documents or manufacturers' published instructions, comply with the following:

1. Outlet, Device, Pull, and Junction Boxes: Article 314 of NFPA 70.
2. Consult Architect for resolution of conflicting requirements.

C. Special Installation Techniques:

1. Provide boxes in wiring and raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures.
2. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to top of box unless otherwise indicated.
3. 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. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box, whether installed indoors or outdoors.
4. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
5. Locate boxes so that cover or plate will not span different building finishes.
6. Support boxes in recessed ceilings independent of ceiling tiles and ceiling grid.
7. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for purpose.
8. Fasten junction and pull boxes to, or support from, building structure. Do not support boxes by conduits.
9. Set metal floor boxes level and flush with finished floor surface.
10. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.
11. Do not install aluminum boxes, enclosures, or fittings in contact with concrete or earth.
12. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to ensure a continuous ground path.
13. Boxes and Enclosures in Areas or Walls with Acoustical Requirements:

    a. Seal openings and knockouts in back and sides of boxes and enclosures with acoustically rated putty.

b. Provide gaskets for wallplates and covers.

14. Identification: Provide labels for boxes and associated electrical equipment.

a. Identify field-installed conductors, interconnecting wiring, and components.
b. Provide warning signs.
c. Label each box with engraved metal or laminated-plastic nameplate.

D. Interfaces with Other Work:

1. Coordinate installation of new products for electrical systems with existing conditions.

2. Coordinate with Section 260573.13 "Short-Circuit Studies" for determining available fault current on input feeder.

3.4 CLEANING

A. Remove construction dust and debris from boxes before installing wallplates, covers, and hoods.

3.5 PROTECTION

A. After installation, protect boxes from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

END OF SECTION 260533.16

SECTION 260553 - 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. Section Includes:

1. Color and legend requirements for raceways, conductors, and warning labels and signs.
2. Labels.
3. Bands and tubes.
4. Tapes and stencils.
5. Tags.
6. Signs.
7. Cable ties.
8. Paint for identification.
9. Fasteners for labels and signs.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.

B. Samples: For each type of label and sign to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of identification products.

C. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

D. Delegated-Design Submittal: For arc-flash hazard study.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with ASME A13.1[and IEEE C2].

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

2.2 COLOR AND LEGEND REQUIREMENTS

A. Color-Coding for 600 V or Less:
   1. Colors for 208/120-V Circuits:
      a. Phase A: Black.
      b. Phase B: Red.
      c. Phase C: Blue.
      d. Neutral: White
      e. Ground: Green
   2. Colors for 240-V Circuits:
      a. Phase A: Black.
      b. Phase B: Red.
      c. Neutral: White
      d. Ground: Green
   3. Colors for 480/277-V Circuits:
      a. Phase A: Brown.
      b. Phase B: Orange.
      c. Phase C: Yellow.
      d. Neutral: Gray
      e. Ground: Green
   4. Colors for Isolated Grounds: Green with yellow stripe.

B. Warning labels and signs shall include, but are not limited to, the following legends:
   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).”

C. Equipment Identification Labels:
   1. Black letters on a white field.

2.3 LABELS

A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.

B. Snap-around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters and that stay in place by gripping action.

C. Self-Adhesive Wraparound Labels: Preprinted, 3-mil- (0.08-mm-) thick, vinyl flexible label with acrylic pressure-sensitive adhesive.
   1. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized such that the clear shield overlaps the entire printed legend.
   2. Marker for Labels: Permanent, waterproof, black ink marker recommended by tag manufacturer.
   3. Marker for Labels: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.

D. Self-Adhesive Labels: Vinyl, thermal, transfer-printed, 3-mil- (0.08-mm-) thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.
   1. Minimum Nominal Size:

      a. 1-1/2 by 6 inches (37 by 150 mm) for raceway and conductors.
      b. 3-1/2 by 5 inches (76 by 127 mm) for equipment.
      c. As required by authorities having jurisdiction.

2.4 TAPES AND STENCILS

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide; compounded for outdoor use.

C. Underground-Line Warning Tape:
   1. Tape:

      a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications lines.
      b. Printing on tape shall be permanent and shall not be damaged by burial operations.
      c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.

   2. Color and Printing:

      a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
      b. Inscriptions for Red-Colored Tapes: “ELECTRIC LINE, HIGH VOLTAGE”
      c. Inscriptions for Orange-Colored Tapes: “TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE”.

2.5 TAGS

A. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch (50 by 50 by 1.3 mm), with stamped legend, punched for use with self-locking cable tie fastener.

B. Nonmetallic Preprinted Tags: Polyethylene tags, 0.015 inch (0.38 mm) thick, color-coded for phase and voltage level, with factory printed permanent designations; punched for use with self-locking cable tie fastener.

2.6 SIGNS

A. Laminated Acrylic or Melamine Plastic Signs:
   1. Engraved legend.
   2. Thickness:

      a. For signs up to 20 sq. in. (129 sq. cm), minimum 1/16 inch (1.6 mm) thick.
      b. For signs larger than 20 sq. in. (129 sq. cm), 1/8 inch (3.2 mm) thick.
      c. Engraved legend with white letters on a black background.
      d. Punched or drilled for mechanical fasteners with 1/4-inch (6.4-mm) grommets in corners for mounting or Self-adhesive.
      e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.7 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

C. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, and self-locking.
   1. UL 94 Flame Rating: 94V-0.

2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

B. 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 PREPARATION

A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.

G. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.

1. Secure tight to surface of conductor, cable, or raceway.

H. System Identification for Raceways and Cables over 600 V: Identification shall completely encircle cable or conduit. Place adjacent identification of two-color markings in contact, side by side.

1. Secure tight to surface of conductor, cable, or raceway.

I. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

J. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.

1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches (150 mm) where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.

K. Underground Line Warning Tape:

1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches (150 to 200 mm) below finished grade. Use multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches (400 mm) overall.
2. Limit use of underground-line warning tape to direct-buried cables.
3. Install underground-line warning tape for direct-buried cables and cables in raceways.

L. Metal Tags:

1. Place in a location with high visibility and accessibility.
2. Secure using cable ties.

M. Nonmetallic Preprinted Tags:

1. Place in a location with high visibility and accessibility.
2. Secure using cable ties.

N. Laminated Acrylic or Melamine Plastic Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

2. 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 sign; where two lines of text are required, use labels 2 inches (50 mm) high.

O. Cable Ties: General purpose, for attaching tags, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

END OF SECTION 260553

SECTION 260923 - LIGHTING CONTROL DEVICES

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. Section Includes:

1. Time switches.
2. Photoelectric switches.
3. Lighting contactors.

B. Related Requirements:

1. Section 260943.23 “Relay-Based Lighting Controls”.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Interconnection diagrams showing field-installed wiring.
2. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and elevations, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Suspended ceiling components.
2. Structural members to which equipment will be attached.

B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each type of lighting control device to include in operation and maintenance manuals.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.

2. Program Software Backup: On USB media. Provide names, versions, and website addresses for locations of installed software.
3. Device address list.
4. Printout of software application and graphic screens.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace lighting control devices that fail(s) in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Faulty operation of lighting control software.
b. Faulty operation of lighting control devices.

2. Warranty Period: Two year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

A. Products: Subject to compliance with requirements, provide one of the following:

1) Cooper.
2) Hubbell.
3) Leviton.
4) Pass & Seymour.
5) PLC MULTIPOINT, INC.
6) Wattstopper.

2.2 TIME SWITCHES

A. Electronic Time Switches: Solid state, programmable, with alphanumeric display; complying with UL 917.

1. Listed and labeled as defined in NFPA 70 and marked for intended location and application.

2.3 OUTDOOR PHOTOELECTRIC SWITCHES

A. Description: Solid state, with dry contacts rated for to operate connected relay, contactor coils, or microprocessor input; complying with UL 773A, and compatible with ballasts and LED lamps.

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Light-Level Monitoring Range: 1.5 to 10 fc (16.14 to 108 lux), with an adjustment for turn-on and turn-off levels within that range and a directional lens in front of the photocell to prevent fixed light sources from causing turn-off.

3. Time Delay: Fifteen-second minimum, to prevent false operation.
4. Surge Protection: Metal-oxide varistor.
5. Mounting: Twist lock complies with NEMA C136.10, with base-and-stem mounting or stem-and-swivel mounting accessories as required to direct sensor to the north sky exposure.
6. Failure Mode: Luminaire stays ON.

2.4 LIGHTING CONTACTORS

A. Description: Electrically operated and mechanically held, combination-type lighting contactors with non-fused disconnect, 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 THD of normal load current).
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.

2.5 CONDUCTORS AND CABLES

A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 260519 “Low-Voltage Electrical Power Conductors and Cables.”

B. Classes 2 and 3 Control Cable: Multi-conductor cable with stranded-copper conductors not smaller than No. 18 AWG. Comply with requirements in Section 260519 “Low-Voltage Electrical Power Conductors and Cables.”

C. Class 1 Control Cable: Multi-conductor cable with stranded-copper conductors not smaller than No. 14 AWG. Comply with requirements in Section 260519 “Low-Voltage Electrical Power Conductors and Cables.”

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.

B. Examine walls and ceilings for suitable conditions where lighting control devices will be installed.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SENSOR INSTALLATION

A. Comply with NECA 1.

B. 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 systems, and partition assemblies.

C. Install and aim sensors in locations to achieve not less than 90-percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.3 CONTACTOR INSTALLATION

A. Comply with NECA 1.

B. 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.

3.4 WIRING INSTALLATION

A. Comply with NECA 1.

B. Wiring Method: Comply with Section 260519 “Low-Voltage Electrical Power Conductors and Cables.” Minimum conduit size is 1/2 inch (13 mm).

C. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and non-power-limited conductors according to conductor manufacturer's written instructions.

D. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.

E. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.5 IDENTIFICATION

A. Identify components and power and control wiring according to Section 260553 “Identification for Electrical Systems.”

1. Identify controlled circuits in lighting contactors.
2. Identify circuits or luminaires controlled by photoelectric and occupancy sensors at each sensor.

B. Label time switches and contactors with a unique designation.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate lighting control devices and perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Lighting control devices will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

3.7 ADJUSTING

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

1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.
2. For daylighting controls, adjust set points and deadband controls to suit Owner's operations.
3. Align high-bay occupancy sensors using manufacturer's laser aiming tool.

3.8 SOFTWARE SERVICE AGREEMENT

A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.

B. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.

1. Upgrade Notice: At least 30 days to allow Owner to schedule and access the system and to upgrade computer equipment if necessary.

3.9 DEMONSTRATION

A. Coordinate demonstration of products specified in this Section with demonstration requirements for low-voltage, programmable lighting control systems specified in Section 260943.23 “Relay-Based Lighting Controls.”

B. Train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION 260923

SECTION 262726 - 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. Section Includes:
   1. GFCI receptacles, 125 V, 20 A.

1.3 DEFINITIONS

A. AFCI: Arc-fault circuit interrupter.

B. BAS: Building automation system.

C. EMI: Electromagnetic interference.

D. GFCI: Ground-fault circuit interrupter.

E. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

F. RFI: Radio-frequency interference.

G. SPD: Surge protective device.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Comply with NFPA 70.

C. RoHS compliant.

D. Comply with NEMA WD 1.

E. Device Color:

1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
2. Wiring Devices Connected to Essential Electrical System: Red.
3. SPD Devices: Blue.
4. Isolated-Ground Receptacles: Orange.

F. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

G. Weather-Resistant Duplex Receptacle, 125 V, 20 A:

1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, “Receptacles in Damp or Wet Locations” Article.

2.2 GFCI RECEPTACLES, 125 V, 20 A

A. Duplex GFCI Receptacles, 125 V, 20 A:

1. Description: Integral GFCI with “Test” and “Reset” buttons and LED indicator light. Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

2.3 WALL PLATES

A. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Protect installed devices and their boxes. 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 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.

C. Conductors:

1. Do not strip insulation from conductors until right 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 comply with NFPA 70, Article 300, without pigtails.
4. Existing Conductors:

    a. Cut back and pigtail, or replace all damaged conductors.
    b. Straighten conductors that remain and remove corrosion and foreign matter.
    c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that 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, two-thirds to three-fourths of the way around terminal screw.

6. Use a torque screwdriver when a torque is recommended or required by 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.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the left.

F. 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.

G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top.

3.2 IDENTIFICATION

A. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black lettering on face of plate.

3.3 FIELD QUALITY CONTROL

A. Tests for Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault-current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

END OF SECTION 262726

SECTION 262726.33 - GENERAL-GRADE DUPLEX STRAIGHT-BLADE RECEPTACLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Duplex straight-blade receptacles.

B. Related Requirements:

1. Section 260010 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.
2. Section 262726.31 "General-Grade Single Straight-Blade Receptacles" for single receptacles.
3. Section 262726.37 "Receptacles with Arc-Fault and Ground-Fault Protective Devices" for AFCI and GFCI receptacles.
4. Section 262726.39 "Locking Receptacles" for twist-locking receptacles.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Duplex straight-blade receptacles.
2. Duplex straight-blade receptacles with integral switching means.

B. Shop Drawings:

1. Wiring diagrams for duplex straight-blade receptacles with integral switching means.

C. Samples:

1. One for each kind of duplex straight-blade receptacle and cover plate accessory specified, in each finish and color specified.

D. Field quality-control reports.

1.3 INFORMATIONAL SUBMITTALS

A. Manufacturers' Instructions: Record copy of official installation and testing instructions issued to Installer by manufacturer for the following:

1. Duplex straight-blade receptacles.

1.4 CLOSEOUT SUBMITTALS

A. Warranty documentation.

B. Sustainable Design Closeout Documentation:

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Extra Stock Items: Furnish extra materials to Owner that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. SPD Receptacles: Equal to 10 percent of quantity installed for each kind specified, but no fewer than one units.
2. Controlled Receptacles: Equal to 10 percent of quantity installed for each kind specified, but no fewer than one units.

B. Special Tools: Proprietary equipment and software required to maintain, repair, adjust, or implement future changes to controlled receptacles.

1.6 WARRANTY

A. Special Manufacturer Extended Warranty: Manufacturer warrants that devices perform in accordance with specified requirements and agrees to provide repair or replacement of devices that fail to perform as specified within extended warranty period.

1. Initial Extended Warranty Period: Five years from date of Substantial Completion; prorated coverage for labor, materials, and equipment.
2. Follow-On Extended Warranty Period: Eight years from date of Substantial Completion; prorated coverage for materials that failed because of transient voltage surges only, free on board origin freight prepaid.

PART 2 - PRODUCTS

2.1 DUPLEX STRAIGHT-BLADE RECEPTACLES

A. Description: General-grade duplex receptacles for use in wiring systems recognized by NFPA 70.

B. Performance Criteria:

1. Regulatory Requirements:

a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.

2. General Characteristics:

a. Reference Standards:

1) UL CCN RTRT and UL 498.
2) Surge Protective Devices: UL 1449, Type 3.

C. Duplex Straight-Blade Receptacle drawing E401:
1. Options:

a. Device Color: As indicated on architectural Drawings.
b. Configuration:
1) Heavy-duty, NEMA 5-20R.

2. Accessories:

a. Cover Plate: 0.060 inch (1.5 mm) thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

D. Tamper-Resistant Duplex Straight-Blade Receptacle drawing E401.
1. Options:

a. Device Color: As indicated on architectural Drawings.
b. Configuration:

1) Heavy-duty, NEMA 5-20R.

2. Accessories:

a. Cover Plate: 0.060 inch (1.5 mm) thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

E. Weather-Resistant Duplex Straight-Blade Receptacle drawing E401:
1. Options:

a. Device Color: As indicated on architectural Drawings.
b. Configuration:
1) Heavy-duty, NEMA 5-20R.

2. Accessories:

a. Cover Plate: 0.060 inch (1.5 mm) thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

F. Weather-Resistant, Tamper-Resistant Duplex Straight-Blade Receptacle drawing E401:
   1. Options:

      a. Device Color: As indicated on architectural Drawings.
      b. Configuration:
         1) Heavy-duty, smooth face, NEMA 5-20R.

   2. Accessories:

      a. Cover Plate: 0.060 inch (1.5 mm) thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
      b. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that receptacles to be procured and installed for Owner-furnished equipment are compatible with mating attachment plugs on equipment.

3.2 SELECTION OF CONTROLLED AND UNCONTROLLED RECEPTACLES

3.3 INSTALLATION

A. Comply with manufacturer's instructions.

B. Reference Standards:

   1. Unless more stringent requirements are specified in Contract Documents or manufacturers' instructions, comply with installation instructions in NECA NEIS 130.
   2. Mounting Heights: Unless otherwise indicated in Contract Documents, comply with mounting heights recommended in NECA NEIS 1.
   3. Receptacle Orientation: Unless otherwise indicated in Contract Documents, orient receptacle to match configuration diagram in NEMA WD 6.
   4. Consult Architect for resolution of conflicting requirements.

C. Identification:

   1. Identify cover or cover plate for device with panelboard identification and circuit number in accordance with Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

A. Field tests and inspections must be witnessed by authorities having jurisdiction.

B. Tests and Inspections:

1. Insert and remove test plug to verify that device is securely mounted.
2. Verify polarity of hot and neutral pins.
3. Measure line voltage.
4. Measure percent voltage drop.
5. Measure grounding circuit continuity; impedance must be not greater than 2 ohms.

C. Nonconforming Work:

1. Device will be considered defective if it does not pass tests and inspections.
2. Remove and replace defective units and retest.

D. Assemble and submit test and inspection reports.

E. Manufacturer Services:

1. Engage factory-authorized service representative to support field tests and inspections.

3.5 PROTECTION

A. Schedule and sequence installation to minimize risk of contamination of wires and cables, devices, device boxes, outlet boxes, covers, and cover plates by plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other materials.

B. After installation, protect wires and cables, devices, device boxes, outlet boxes, covers, and cover plates from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

END OF SECTION 262726.33

SECTION 262813 - 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. Section Includes:

1. Cartridge fuses rated 600 V ac and less for use in the following:
   a. Enclosed switches.

2. Spare-fuse cabinets.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for spare-fuse cabinets. Include the following for each fuse type indicated:

1. Ambient Temperature Adjustment Information: If ratings of fuses have been adjusted to accommodate ambient temperatures, provide list of fuses with adjusted ratings.

   a. For each fuse having adjusted ratings, include location of fuse, original fuse rating, local ambient temperature, and adjusted fuse rating.
   b. Provide manufacturer's technical data on which ambient temperature adjustment calculations are based.

2. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
3. Current-limitation curves for fuses with current-limiting characteristics.
4. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse. Submit in PDF format.
5. Coordination charts and tables and related data.
6. Fuse sizes for elevator feeders and elevator disconnect switches.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fuses to include in emergency, operation, and maintenance manuals, include the following:

1. Ambient temperature adjustment information.
2. Current-limitation curves for fuses with current-limiting characteristics.
3. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse used on the Project. Submit in PDF format.
4. Coordination charts and tables and related data.

1.5 FIELD 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.

2.2 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, current-limiting, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.

1. Service Entrance and Feeders:
   a. Type L, time delay for 800 amps and greater.
   b. Type RK1, time delay for 600 amps or less.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Comply with NEMA FU 1 for cartridge fuses.

D. Comply with NFPA 70.

E. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

2.3 SPARE-FUSE CABINET

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 (3) spare fuses of each type and amperage installed.
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: For each size of fuse, where applicable and available, from fuse manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.

B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.

C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.

D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

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

B. Install spare-fuse cabinet(s) in location shown on the Drawings or as indicated in the field by Owner.

3.3 IDENTIFICATION

A. Install labels complying with requirements for identification specified in Section 260553 “Identification for Electrical Systems” and indicating fuse replacement information inside of door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 262813

SECTION 26 2816 - 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. Section Includes:

1. Fusible switches.
2. Nonfusible switches.
3. Enclosures.

1.3 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

1. Enclosure types and details for types other than NEMA 250, Type 1.
2. Current and voltage ratings.
3. Short-circuit current ratings (interrupting and withstand, as appropriate).
4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.

B. Shop Drawings: For enclosed switches and circuit breakers.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include wiring diagrams for power, signal, and control wiring.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals:

a. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.
b. Time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in PDF electronic format.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.

B. 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.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.

D. Comply with NFPA 70.

2.2 FUSIBLE SWITCHES

A. Type HD, Heavy Duty:

1. Single or Double throw.
2. Three pole.
3. 600-V ac.
4. 1200 A and smaller.

B. 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; labeled for copper and aluminum neutral conductors.
3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
4. Auxiliary Contact Kit: One NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open. Contact rating as required to integrate with equipment provided by other divisions.

5. Lugs: suitable for number, size, and conductor material.
6. Service-Rated Switches: Labeled for use as service equipment.

2.3 NONFUSIBLE SWITCHES

A. Type HD, Heavy Duty, Three Pole, Single Throw, 600-V ac, 200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

B. 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; labeled for copper and aluminum neutral conductors.
3. Lugs: type, suitable for number, size, and conductor material.

2.4 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

B. Enclosure Finish: The enclosure shall be:
1. Gray baked enamel paint, electrodeposited on cleaned, phosphatized steel (NEMA 250 Type 1).
2. Gray baked enamel paint, electrodeposited on cleaned, phosphatized galvannealed steel (NEMA 250 Types 3R, 12)
3. A brush finish on Type 304 stainless steel (NEMA 250 Type 4-4X stainless steel).

C. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts..

D. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.

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 of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

1. Commencement of work shall indicate Installer's acceptance of the areas and conditions as satisfactory.

3.2 PREPARATION

3.3 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.

1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
2. Outdoor Locations: NEMA 250, Type 3R or Type 4X.
3. Kitchen and Wash-Down Areas: NEMA 250, Type 4X.

3.4 INSTALLATION

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

B. Temporary Lifting Provisions: Remove temporary lifting of eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

C. Install fuses in fusible devices.

D. Comply with NFPA 70 and NECA 1.

3.5 IDENTIFICATION

A. Comply with requirements of "Identification for Electrical Systems."

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

END OF SECTION 26 2816

SECTION 265619 - LED EXTERIOR 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. Section Includes:

1. Exterior solid-state luminaires that are designed for and exclusively use LED lamp technology.
2. Luminaire supports.
3. Luminaire-mounted photoelectric relays.

1.3 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color rendering index.

C. Fixture: See "Luminaire."

D. IP: International Protection or Ingress Protection Rating.

E. Lumen: Measured output of lamp and luminaire, or both.

F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of luminaire.

1. Arrange in order of luminaire designation.
2. Include data on features, accessories, and finishes.
3. Include physical description and dimensions of luminaire.
4. Lamps, include life, output (lumens, CCT, and CRI), and energy-efficiency data.
5. Photometric data and adjustment factors based on laboratory tests, complying with IES Lighting Measurements Testing and Calculation Guides, of each luminaire type. The adjustment factors shall be for lamps and accessories identical to those indicated for the luminaire as applied in this Project IES LM-79

a. Manufacturer's Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the NVLAP for Energy Efficient Lighting Products.
b. Testing Agency Certified Data: For indicated luminaires, photometric data certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.

6. Wiring diagrams for power, control, and signal wiring.
7. Photoelectric relays.
8. Means of attaching luminaires to supports and indication that the attachment is suitable for components involved.

B. Shop Drawings: For nonstandard or custom luminaires.

1. Include plans, elevations, sections, and mounting and attachment details.
2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

C. Product Schedule: For luminaires and lamps. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Luminaires.
2. Structural members to which luminaires will be attached.
3. Underground utilities and structures.
4. Existing underground utilities and structures.
5. Above-grade utilities and structures.
6. Existing above-grade utilities and structures.
7. Building features.
8. Vertical and horizontal information.

B. Qualification Data: For testing laboratory providing photometric data for luminaires.

C. Product Certificates: For each type of the following:

1. Luminaire.

D. Product Test Reports: For each luminaire, for tests performed by manufacturer and witnessed by a qualified testing agency.

E. Source quality-control reports.

F. Sample warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires to include in operation and maintenance manuals.

1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.
2. Provide a list of all photoelectric relay types used on Project; use manufacturers' codes.

1.7 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturers' laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.

B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7, accredited under the NVLAP for Energy Efficient Lighting Products and complying with applicable IES testing standards.

C. Provide luminaires from a single manufacturer for each luminaire type.

D. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

E. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

F. Mockups: For exterior luminaires, complete with power and control connections.

1. Obtain Architect's approval of luminaires in mockups before starting installations.
2. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed work.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering prior to shipping.

1.9 FIELD CONDITIONS

A. Verify existing and proposed utility structures prior to the start of work associated with luminaire installation.

B. Mark locations of exterior luminaires for approval by Architect prior to the start of luminaire installation.

1.10 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures, including luminaire support components.
b. Faulty operation of luminaires and accessories.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: 2 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

2.2 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.

C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

D. UL Compliance: Comply with UL 1598 and listed for wet location.

E. Lamp base complying with ANSI C81.61.

F. Bulb shape complying with ANSI C79.1.

G. CRI of minimum 80 CCT of 4100 K.

H. L70 lamp life of 50,000 hours.

I. Lamps dimmable from 100 percent to 0 percent of maximum light output.

J. Internal driver.

K. Nominal Operating Voltage: As shown in drawings.

L. In-line Fusing: On the primary for each luminaire Lamp Rating: Lamp marked for outdoor use.

M. Source Limitations: Obtain luminaires from single source from a single manufacturer.

2.3 LUMINAIRE-MOUNTED PHOTOELECTRIC RELAYS

A. Comply with UL 773 or UL 773A.

B. Contact Relays: Factory mounted, single throw, designed to fail in the on position, and factory set to turn light unit on at 1.5 to 3 fc (16 to 32 lx) and off at 4.5 to 10 fc (48 to 108 lx) with 15-second minimum time delay. Relay shall have directional lens in front of photocell to prevent artificial light sources from causing false turnoff.

1. Relay with locking-type receptacle shall comply with ANSI C136.10.
2. Adjustable window slide for adjusting on-off set points.

2.4 MATERIALS

A. Metal Parts: Free of burrs and sharp corners and edges.

B. Sheet Metal Components: Corrosion-resistant aluminum Form and support to prevent warping and sagging.

C. 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. Doors shall be removable for cleaning or replacing lenses.

1. Lens Thickness: At least 0.125 inch (3.175 mm) minimum unless otherwise indicated.

D. Lens and Refractor Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

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.

F. Housings:

1. Rigidly formed, weather- and light-tight enclosure that will not warp, sag, or deform in use.
2. Provide filter/breather for enclosed luminaires.

G. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp characteristics:

a. "USE ONLY" and include specific lamp type.
b. Lamp diameter, shape, size, wattage and coating.
c. CCT and CRI for all luminaires.

2.5 FINISHES

A. Variations in Finishes: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

C. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20 requirements; and seal aluminum surfaces with clear, hard-coat wax.
3. Class I, Clear-Anodic Finish: AA-M32C22A41 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
4. Class I, Color-Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker), complying with AAMA 611.

a. Color: By Architect.

D. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
   a. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for luminaire electrical conduit to verify actual locations of conduit connections before luminaire installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Comply with NECA 1.

B. Install lamps in each luminaire.

C. Fasten luminaire to structural support.

D. Supports:

1. Sized and rated for luminaire weight.
2. Able to maintain luminaire position after cleaning and relamping.
3. Support luminaires without causing deflection of finished surface.
4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.

E. Wiring Method: Install cables in raceways. Conceal raceways and cables.

F. Install luminaires at height and aiming angle as indicated on Drawings.

G. Coordinate layout and installation of luminaires with other construction.

H. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources, favoring a north orientation.

I. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" and Section 260533 "Raceways and Boxes for Electrical Systems" for wiring connections and wiring methods.

3.3 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.

B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
2. Verify operation of photoelectric controls.

C. Illumination Tests:

1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IES testing guide(s):

   a. IES LM-5.
   b. IES LM-50.
   c. IES LM-52.
   d. IES LM-64.
   e. IES LM-72.

2. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.

D. Luminaire will be considered defective if it does not pass tests and inspections.

E. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.5 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain luminaires and photocell relays.

3.6 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to two visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.

1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
3. Adjust the aim of luminaires in the presence of the Architect.

END OF SECTION 26 5619

SECTION 13100 (26 41 00)

LIGHTNING PROTECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the Lightning Protection System work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

B. The system: installed by a Lightning Protection Contractor actively engaged in the installation of Underwriters' Master Label lightning protection systems or LPI–IP Certified Lightning Protection Systems and be so listed by the LPI or UL.

C. The system, as installed: comply with the latest issue of the "Installation Requirements for a UL Master Labeled Lightning Protection System or an LPI-IP Master Certification.

D. Lightning Protection Contractor: Upon completion of this work, deliver to the Owner, the Master Label issued by Under-writers' Lab, Inc. or an LPI Master Certification issued by the LPI-IP Inspection Program.

1.2 RELATED WORK

A. Section 16080 - Electrical Inspection and Testing.

B. Section 16060 – Grounding.

C. Section 16132 - Conduits, Fittings, and Supports.

1.3 SUBMITTALS

A. Conform under provisions of Section 01330, “Submittal Procedures”

B. Submit complete shop drawings showing the type, size, and locations of all equipment, grounds and cable routings for approval prior to start of work.

C. Certification: secure and deliver a U.L. Master Label or an LPI Master Certification from the LPI-IP upon completion of the installation.

D. Record of actual location of all terminals, grounding electrodes, bonding connections, and routing of system conductors in Project Record Documents.

1.4 QUALITY ASSURANCE

A. Conform under provisions of Section 01430, “Quality Assurance”.

B. The Lightning Protection Contractor: submit to the Project Consultant all evidence to establish that materials are manufactured, furnished and recommended for their intended use by a reputable lightning protection manufacturer who is a Manufacturer

Member of the Lightning Protection Inst. All materials used in this installation will bear the inspection label of Underwriters' Lab., Inc.

C. The installation: accomplished by an experienced installer listed with Underwriter's Lab., as qualified and who is also a Certified Master Installer of the Lightning Protection Institute. The installer shall be authorized by the manufacturer with a minimum of 3 years documented experience.

1.5 REFERENCE STANDARDS

A. Conform under provisions of Section 01410, “Regulatory Requirements”.

B. Conform under provisions of Lightning Protection Institute Installation (LPI) – Standards of Practice, LPI-175.

C. Conform under provisions of NFPA 780 – Standards for the Installation of Lightning Protection Systems.

D. Conform under provisions of Underwriters Laboratories (UL) UL96A – Installation Requirements for Lightning Protection systems.

E. Conform under provisions of UL 96 – Standards for Lightning Protection Components

F. Conform under provisions of LPI-176 Lightning Protection System Material and Components Standard.

G. Conform under LPI-177 Inspection Guide for LPI Certified Systems.

H. National Electrical Code latest adopted edition by the Florida Building Code.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Thompson Lightning Protection, Inc.

B. East Coast Lightning Equipment

C. ERICO (ERITECH) International Corp.

D. Harger Lightning Protection, Inc.

2.2 MATERIALS

A. In addition to conformance to U.L. 96 Materials Standard, the system furnished under this specification shall be the standard product of a manufacturer regularly engaged in the production of lightning protection equipment and a member of LPI. Equipment shall be the manufacturer’s latest approved design of construction to suit the application where it is to be used in accordance with accepted industry standards and with NFPA, LPI, and UL requirements. Material should also be the type listed below:

1. Copper Lightning Protection System:

(a) Conductors: Electrical grade copper with 29 strands, 17 gage minimum.

(b) Air terminals: Solid copper, not less than 3/8-inch diameter, with sharp nickel-plated points.

(c) Ground Rods: Copper clad steel, not less than 3/4-inch diameter by 10 feet long.

(d) Provide adjustable hinged connector to provide vertical positioning of air terminal on roof slope.

(e) Provide miscellaneous bolts, nuts and screws of brass, bronze or stainless steel. Cable fasteners: of substantial construction, electrolytically compatible with the conductor and mounting surface and space under provisions of U.L. code requirements.

(f) Provide bonding devices, cable splicers and miscellaneous connectors of cast bronze with bolt pressure connections to cable. Cast or stamped crimp fittings are not acceptable.

(g) Copper lightning components shall not be installed directly on aluminum or external galvanized steel surfaces.

2. Aluminum Lightning Protection System:

(a) Main Roof Conductors: Aluminum, Class 1, UL Labeled 24 strands, 14 gage minimum, 102 lbs/1000 feet, 98,640 CM.

(b) Down Conductors: Electrical grade copper (only) with 29 strands, 17 gage minimum.

(c) Air terminals: Aluminum not less than 1/2-inch diameter blunt type air terminals, at least 10 inches high but no more than 36 inches. If over 24 inches high, air terminals shall be suitably braced.

(d) Ground Rods: Copper clad steel, not less than 3/4-inch diameter by 10 feet long.

(e) Provide adjustable hinged connector to provide vertical positioning of air terminal on roof slope.

(f) Provide miscellaneous bolts, nuts and screws of brass, bronze or stainless steel. Cable fasteners: of substantial construction, electrolytically compatible with the conductor and mounting surface and space under provisions of U.L. code requirements.

(g) Provide bonding devices, cable splicers and miscellaneous connectors of cast bronze with bolt pressure connections to cable. Cast or stamped crimp fittings are not acceptable.

(h) Cable fasteners: of substantial construction, electrolytically compatible with the conductor and mounting surface and space

under provisions of UL requirements. Aluminum adhesive type cable holder secure in place with an application of M-1 structural sealant.

PART 3 EXECUTION

3.1 INSTALLATION

A. Installation:
   1. Comply with LPI Code 175, NFPA 780, UL 96A.
   2. Made by or under the supervision of an LPI Certified Master Installer.

B. All points: Within 2 feet of outside building edge.
   1. Maximum spacing: Do not exceed 20 feet
   2. Minimum projection above object protected: Not less than 10 inches.

C. Connect lightning protection cables to all metallic projections above roof. Support all exposed cable at 3 feet on center.

D. Aluminum shall not be used underground, in contact with ground or where air may be laden with corrosive elements, such as ocean air.

E. When an aluminum system is joined with copper or copper-clad grounds, the union shall be made with approved bimetal connectors.

F. Precaution be taken at connections with dissimilar metals.

G. Aluminum shall not be used for down leads or connection to the grounding system.

H. Down conductors, which are continuation of roof conductors shall be of copper material only.

I. Aluminum should never be used where it will come in contact with white wash, calcium, alkali-based paint, embedded in concrete or masonry, or installed in a location subject to excessive moisture.

J. Aluminum should never be placed where leaves or moisture will collect and remain for a long period of time.

K. Maintain horizontal or downward coursing of main conductor and insure that all bends have at least an 8 inches radius and do not exceed 90 degrees. Down conductors for both copper and aluminum lightning protection systems shall be sleeved copper with approved connectors.

L. Provide through roof connectors with solid rods or conduit through pitch pockets. Provide ground drops in 1-1/4 inch plastic pipe with supports every second floor and connect to ground rods.

M. Ground electrodes: no less than 1 foot below grade and 2 feet from foundation wall. Make thermoweld connections between ground rods and connecting conductors.

N. Interconnect lightning protection ground to electric and other building ground systems as shown or as required by U.L. and LPI Codes.

O. Bond to water service and other piping systems as shown or as required by U.L. and LPI Codes.

P. Secure and deliver a U.L. Master Label or an LPI Master Certification from the LPI-IP inspection program to the Owner upon completion of the installation.

Q. Install conductors and complementary parts in a concealed system so completed work is unobtrusive and does not detract from appearance.

R. The roofing contractor will be responsible for sealing and flashing all lightning protection roof penetrations as per the roof manufacturer's recommendations. The lightning protection roof penetrations and/or method of conductor attachment should be addressed in the roofing section of the specifications.

S. LPI Certification or the UL Certification requires inspection by their third-party field staff and owners representatives at various stages of the installation and after completion of the installation. Upon completion of the lightning protection installation, the installing contractor shall provide to the owner an as-built drawing of the system, along with the LPI or UL Certificates of completion.

3.2 AIR TERMINALS

A. Locate required number of air terminals no less than 10 inches high at no more than 20-foot intervals as indicated on drawings.

3.3 GROUNDS

A. Connect each down conductor to a suitable, properly located ground as determined by soil conditions encountered.

B. Provide hand hole at all ground rod terminations for future testing and inspection.

C. Grounding shall comply with NEC 250.106.

3.4 CONDUCTORS

A. Interconnect conductors to provide at least two (2) electric paths to ground. Avoid an upward direction for lateral conductors interconnecting air terminals. Turn conductors with a radius of at least 8 inches at an included angle not more acute than a right angle. Space down conductors around buildings periphery as evenly as permitted. Conceal down conductors from air terminals to grounds within the reinforced concrete columns. Bond all reinforcing steel within the columns and within a radius no less than 6 feet from the columns to the down conductor.

3.5 FASTENERS

A. Place fasteners amply strong for rigid, permanent support no more than 3 feet on center of vertical on down conductors and horizontal conductors.

B. Air terminals shall be adhered to all mechanical roof top mounted equipment using M-1 Structural Sealant or approved equal.

3.6 CONDUCTOR GUARDS

A. Protect exposed down conductors to 8 feet above ground with schedule 80 PVC, copper or brass pipe firmly fixed to masonry. Connect top of metal guard electrically to conductor.

3.7 GROUNDING METAL ELEMENTS

A. Bond into protection system all metal caps, breechings, or other metal masses that are a permanent part of the construction, as required by Underwriters' Lab. Code.

3.8 GROUNDING OF METAL ELEMENTS

A. Interconnect and ground to the conductor system all metal ventilators, bent stacks, pipes, roofing or siding, spandrels, ridge rolls, valleys, crickets, eaves, troughs, down-spouts, ducts, clothes chutes, cold water supply piping, and any other metallic object or surface of a size presenting a capacitance hazard. Protection telephone lines, electric service, radio, television or other masts or wires entering the building by establishing a common ground and use of a proper lightning arrester.

3.9 METAL USED

A. All conductor materials: braided copper conductors, or copper clad steel conductors or aluminum for roof conductors only (refer to section 2.2.A.2).

B. Aluminum conductors will be allowed on the roof top only with copper down conductors. Provide proper bimetal fittings as needed for every transition.

C. Metal flashing will not be allowed to be a substitute for secondary conductors.

3.10 COORDINATION WITH OTHER TRADES

A. Lightning Protection Contractor: coordinate the placement of his work with the General Contractor and Electrical Contractor.

3.11 BONDING

A. It is the responsibility of the lightning protection installer to assure a sound bond to the main water service and to assure interconnection with other building ground systems, including both telephone and electrical and also to insure that proper arresters have been installed on the power service.

END OF SECTION

SECTION 16010 (26 02 00)

GENERAL PROVISIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the General Provisions work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as “NIC ITEMS”.

B. Including but not necessarily limited to the following:
   1. A complete electrical system as shown on the drawings and specified herein and described as follows:
      (a) Temporary electrical service for all trades.
      (b) Complete distribution system for lighting and power, wiring devices, equipment, and equipment by others, controls and panel boards.
      (c) Complete raceway system.
      (d) Transformer vault, bus stabs, underground duct bank, grounding, etc. rework as required for primary and secondary power system under the provisions of Florida Power and Light Company.
      (e) Empty raceway system and cabinets for the telephone system as indicated on drawings.
      (f) New Clock and Program System.
      (g) New Fire Alarm and Detection System.
      (h) New Instructional Television System (ITV).
      (i) New Intercom / Paging System.
      (j) All conduit, outlets and junction boxes for a Security System.
      (k) Emergency Standby Generator, Transfer Switches. Fuel transfer pump(s), day tank, muffler, battery charger, control panel and related equipment rework as required for new addition.
      (l) Normal and Emergency Lighting System and Luminaries.
      (m) Interior and Exterior Light and Control Systems.
      (n) Conduit and wiring system for air conditioning electrical controls.
      (o) Marking of all junction boxes with system voltage inside and outside of box.
      (p) Contractor: connect all equipment furnished by Owner or other subcontractors and provide caps and cords and materials required to complete the installation.
      (q) Painting of electrical and special equipment.
      (r) Furnishing and installing necessary access panels.
      (s) Complete electrical testing.

1.2 RELATED WORK

A. Division 15 – All applicable sections.
   1. All motors, unless otherwise specified herein: furnish and set in place under provisions of Division 16.
   2. Temperature control equipment and water heater: furnished, installed and tested under provisions of Division 15 and wiring under provisions of Division 16.

1.3 DRAWINGS AND SPECIFICATIONS

A. Follow closely as possible, the Drawings and risers indicated in diagrammatic form the arrangements desired for the equipment fixtures, principal apparatus, kitchen equipment, etc.
   1. Contractor: Include any additional conduit, boxes and wiring due to structural or other obstructions at no extra cost to the Owner.

1.4 CONNECTION TO WORK OF OTHERS

A. Appropriate trades responsible for the connection of all equipment even when furnished by others. Control wiring under the supervision of sub-contractor furnishing equipment. Contractor installs and wires starters and control devices, pulls control wiring and wires.

B. Check other sections of the Specifications for equipment to be connected under the Contract. Wire all electrical equipment under this Contract. Extras not allowed; for failure on the Contractor's part to comply with above.

C. Air conditioning and ventilating equipment power and control connections.
   1. Air Conditioning Contractor, under provisions of Division 15, provides the following:
      (a) Control wiring diagrams.
      (b) Motor Starters.
      (c) Contactors.
      (d) Thermostats.
      (e) Firestats (each fan and AHU).
      (f) Damper motors.
      (g) Control devices, etc.
   2. Contractor, under provisions of Division 16, provides the following:
      (a) Safety Switches.
      (b) Junction Boxes.
      (c) Wiring.
      (d) Material for connection of all equipment and controls.

D. Kitchen equipment and wiring instructions.
   1. Furnished by others, including motor starters, contactors, and control devices.
   2. Verify outlet locations prior to installation and connection.
   3. Provide cord sets as required.

E. Plumbing and Heating equipment power and control connections.
   1. Plumbing Contractor, under provisions of Division 15, provides the following:
      (a) Wiring diagrams.
      (b) Motor Starters.
      (c) Control devices, etc.
   2. Contractor, under provisions of Division 16, provides the following:
      (a) Safety switches.
      (b) Junction boxes.
      (c) Wiring.
      (d) Material for connection of all equipment.

1.5 CODES AND STANDARDS

A. The latest edition and revision as approved by the most current State Department of Education SREF of the following codes and standards are considered minimum requirements for materials, workmanship and safety where not covered elsewhere in these specifications.
   1. Florida Building Code.
   2. The National Electric Code.
   3. Where materials and equipment are available under the continuing inspection and laboring service of Under-writer's Laboratories, Inc., furnish materials and equipment bearing such labels.
   4. Public Law 91-596 Occupational Safety and Health Act.
   5. Ordinances of the Local Authority having jurisdiction.
   6. NFPA, Life Safety Code.
   7. ANSI A117.1.
   8. SREF (State Requirements for Educational Facilities), current adopted edition.
   9. ADA Requirements.

1.6 SHOP DRAWINGS

A. Submit under provisions of 01330, "Submittal Procedures".

B. Submit at one (1) time, within thirty (30) days of notice to proceed, in loose-leaf bond form and indexed at least ten (10) copies of shop and detail drawings, factory certified prints and material lists for items included by not limited to those listed below:
   1. Switchboards and Panelboards.
   2. Disconnect switches, motor starters, fuses, time clocks, contactors and relays.
   3. Transformers.
   4. Terminal cabinets.
   5. Wiring devices and plates.
   6. Luminaires, dimmers and accessories.
   7. Conduit, fittings, supports, pull boxes, wire and cable.
   8. Clock and Program System.
   9. Fire Alarm System.
   10. Instructional Television (ITV) System.
   11. Intercom/Paging System.
   12. Emergency Generator and Transfer Switches System.

1.7 PAINTING

A. Field painting of exposed conduit and hangers is specified under provisions of Section 09900, "Painting".
   1. Clean all surfaces and hanger rods free of grease, scale, rust and other foreign matter ready for painting.
   2. Touch up all factory-finishes marred in construction with factory touch-up kits.

1.8 COORDINATION

A. This Contractor:
   1. Responsible for thorough review of all plans and specifications affecting this project.
   2. Coordinate with other trades before the commencement of work so that routing of systems and clearances is adequate.

3. Notify Project Consultant of any conflicts or deviations immediately. Do not proceed until approval is granted by consultant.

B. Special attention given but not to be limited to the following systems:
1. Conduit, raceway, for the telephone system.
2. Air conditioning ductwork, piping, condensate and waste.
3. Fire sprinkler system, waste and vent lines, hot and old water lines and rain water leaders.
4. Equipment and systems by others.

C. Construction Responsibility:
1. Specifications are sectionalized for convenience only and do not attempt to define divisions of construction responsibility.
2. The Contractor: place a competent superintendent on the job as soon as practicable and keep the same superintendent throughout the job.
3. This Contractor: responsible for the full coordination of this work with that of all other contractors required to complete the project.
4. Provide quality mechanics, install materials and equipment in neat, workmanlike manner. Remove and replace any material or equipment, which is improperly installed at Contractor's expense.
5. Coordinate work with Power Company and Telephone Company.
6. Any company conducting any electrical work in the District shall submit verification of compliance with OSHA requirements for Lock Out/Tag Out procedures.

1.9 SUBSITUTIONS

A. Submit under provisions of Section 01630, "Product Substitutions Procedures".

PART 2 PRODUCTS

2.1 HARDWARE

A. All hardware and accessory fittings: of a type designed, intended or appropriate for the use, and complement the items with which they are used, and have corrosion protection suitable for the atmosphere in which they are installed. All such hardware: U. S. Standard Size.

2.2 EQUIPMENT

A. Ensure that equipment of a similar nature is identical. Example: All panelboards: of the same manufacturer and of the same style.

B. All materials: bear the label of the Underwriter's laboratory for the intended or appropriate for the use, and complement the items with which they are used, and have corrosion protection suitable for the atmosphere in which they are installed.

2.3 MATERIAL PROTECTION

A. Store and protect all materials from injury prior to installation. Do not store materials directly on the ground or floor and keep as clean and dry as possible and free from damage or deteriorating elements. Do not install damaged materials.

2.4 ELECTRIC SHOCK PROTECTION

A. Provide ground fault protection in all temporary service.

PART 3 EXECUTION

3.1 INSTALLATION

A. Factory paint or finish all enclosures, panels, cabinets, relays, safety switches, fixtures, gutters and other exposed equipment or accessories except as indicated otherwise.

B. Group mounted items: similar in finish and color.

3.2 IDENTIFICATION

A. Tag all conductors and identify major conduits in or at wire-ways, panels, pull boxes, switchboards, motor controllers, cabinets and similar items to assist in future circuit tracing. Conductor tags: non-conductive.

B. Identify all circuits and equipment to correspond with the plans and specifications.

C. Use Paint markers, or other approved methods except as indicated otherwise.

D. All junction box covers: labeled on both sides indicating type of system and voltage.

E. All gutters, terminal cabinets, starters, transformers, switchboards, panels and disconnects: Identify with stencil labels indicating type system, voltage, panel circuit designation and equipment being serviced. Provide screw on engraved white on black lamacoid nameplates or permanent labeling (not marker).

3.3 TESTS

A. Show by demonstration in service that all circuits and devices are in good condition to operate.

B. Test that each item of control equipment will function not less than five (5) times.

C. Test all circuits for grounds, shorts and continuity.

D. Provide all materials and equipment necessary for testing.

3.4 DEMONSTRATION

A. Demonstration: Demonstrate the essential features of the following electrical systems upon completion of satisfactory testing:
   1. Emergency System.
   2. Lighting System.
   3. Motor Control.
   4. Contactors.
   5. Clock and Program System.
   6. Instructional Television System/Sound Enhancement.
   7. Intercom/Paging System.
   8. Electrical Motors and Starters.
   9. Fire Alarm System.

B. The demonstration by the Contractor: Held in the presence of the Owner or his designated representatives to show junction boxes, locations and relationships to the plans.
   1. Demonstrate how to “start-stop”, reset, replace and emergency procedures.
   2. Demonstrate one system at a time.

END OF SECTION

SECTION 16020 (26 03 00)

COMPLETION OF WORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the Completion of Work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as “NIC ITEMS”.

B. Including but not necessarily limited to the following:
   1. Prior to final acceptance of the work, install, adjust and test all electrical systems and equipment to assure proper operation for the service intended.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide all materials and equipment under provisions of these specifications, drawing schedules and submittals.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. Identify all cables in junction boxes with name of equipment served.

3.2 OPERATING INSTRUCTIONS, MANUALS & CHARTS

A. Furnish all operating instructions, maintenance instructions, literature and information pertaining to all equipment.

B. Provide three sets of all the above in loose-leaf bond form and indexed.

C. Demonstrate operation of equipment to Owner’s representative at time of project acceptance. Submit Certificate of Demonstration to Project Consultant counter-signed by Owner.

D. All above must be submitted and approved by Project Consultant prior to final acceptance.

3.3 GUARANTEES & TESTS

A. Furnish guarantees and certificate of test for all equipment as listed below. This contractor: responsible for maintenance, parts and labor for a period of one year from project acceptance.
   1. Luminaires, dimmers, wiring devices, etc.

B. All tests: done in presence of Project Consultant's representative and submit three typewritten copies to same upon completion.

C. Inspection and acceptance of the facility by the Owner or his representative does not relieve the Contractor from compliance with the above guarantee.

3.4 AS-BUILT DRAWINGS

A. See General Conditions and Section 16010.

3.5 CUTTING AND PATCHING

A. Lay out openings for General Contractor as required. Contractor: provide all openings and close same.

B. If General Contractor is not properly informed, this Division will provide openings at his expense.

3.6 CLEAN-UP

A. Keep premises free from accumulations of waste material or rubbish. Leave premises and work in clean, orderly condition acceptable to the Project Consultant. Clean all materials and equipment of dirt, dust, paint spots, stains, soil marks, etc. Any material in less than new condition replaced at Contractor's expense.

END OF SECTION

16050 (26 05 00)

BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the Basic Materials and Methods work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

B. Including but not necessarily limited to the following:
   1. This section details equipment and methods common to more than one section of Division 16, Electrical, including:
      (a) Excavation.
      (b) Foundations and Supports.
      (c) Vibration Isolation.
      (d) Accessibility.
      (e) Painting.

1.2 RELATED WORK

A. Division 1 – General Requirements (all applicable sections).

B. Division 2 – Site work (all applicable sections).

C. Division 16 – Electrical (all applicable sections).

1.3 QUALITY ASSURANCE

A. Design Criteria:
   1. The drawings are diagrammatic and due to small scale do not show in detail all required features of the work, and be supplemented by the Contractor's knowledge and experience, and all items which are required to properly execute the full intent and meaning shall be considered as being shown and/or specified.
   2. Right is reserved to make reasonable changes in outlet locations prior to roughing-in.

1.4 SUBMITTALS

A. Submit the following under provisions of Section 01330, "Submittal Procedures".
   1. Schematics and Interconnection Diagrams.
   2. Detail Drawings and Shop Drawings.
   3. Assembly, Operation and Maintenance Drawings & Manuals.
   4. Manufacturer's Data.

1.5 DELIVERY, STORAGE AND HANDLING

A. Conform to Section 01663, "Product Delivery, Storage and Handling Requirements".
   1. Keep all openings closed with plugs or caps to prevent intrusion of foreign matter.

2. Manufacturer's Nameplates: Insure visible location of nameplate for each major component of equipment with manufacturer's name, address, model number and rating.

1.6 JOB CONDITIONS

A. Sequencing Scheduling:
1. Coordinate adequate clearances for installation and maintenance of equipment and physical and electrical requirements of items and or equipment requiring connections.
2. Perform all necessary work to join with or receive other work, provide electrical service, extend conduits and make all necessary connections as required to prevent interruptions of service in any area.
3. Provide and extend as necessary, temporary electrical service for timely completion of Work for the Project.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide equipment to meet requirements of each respective section as indicated and suitable for installation shown.

B. Where two or more units of same equipment class are furnished, provide each from same manufacturer.

C. Provide raceways and enclosures for conductors throughout all systems as shown and specified.

D. Provide equipment and devices appropriate for environment and service intended, which are not constructed with housings for mounting and enclosing all live parts.

PART 3 EXECUTION

3.1 INSTALLATION

A. Excavation:
1. Conform to requirements of Section 02300, "Earthwork".
2. Pitch all ducts away from building.

B. Foundations and Supports:
1. Mount equipment, conduit, duct and raceway on or suspended from building structure as indicated and specified.
2. Provide mounting boards for electrical equipment and telephone as follows:
   (a) For telephone and terminal cabinets provide backboards: Marine grade, plywood, 3/4 inch new and painted on all sides and edges with 2 coats of flame retardant flat gray oil paint for terminal cabinets and voice/data backboards.
   (b) For electrical panels provide hot dipped galvanized unistruct supports.
3. Assure adequate clearance in front equipment per N. E. C. Article 110-26.

C. Accessibility:

1. Locate with reference to finished buildings the installation of pull boxes, wire ways and other items requiring inspection, removal or replacement.

D. Painting:
   1. Refer to Section 09900, “Painting” and manufacturer’s recommendations.
   2. Recoat shop coat damaged in delivery or during construction.
   3. Do not paint any nameplate, label or tag of any equipment.

E. Coordination with Existing Facilities Operation:
   1. Alterations affecting any functioning existing facilities must not be started until all materials, supplies, equipment, labor, etc. is available so that continuous progress will be made to complete that work in the shortest time possible.
   2. Work interfering with the existing facilities will be immediately suspended on request of the owner’s authorized representative and scheduled to such time as required without additional cost, unless such time involves overtime. In this case additional payment will be made as otherwise provided for herein.

F. Ownership of Items Removed During Construction:
   1. Conform to Section 01110, “Summary of Work”.

END OF SECTION

SECTION 16060 (26 05 26)

GROUNDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the Grounding work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS."

B. Power System grounding.

C. Communication System grounding.

1.2 RELATED WORK

A. Section 16120 - Wires and Cables.

B. Section 16129 - Terminal Lugs.

C. Section 16132 - Conduits, Fittings and Supports.

D. Section 16088 – Acceptance Test and Performance Verification.

1.3 REGULATORY REQUIREMENTS

A. Submit under provisions of Section 01410, “Regulatory Requirements”.

B. Install complete grounding system in accordance with National Electrical Code Article 250.

C. Maximum resistance to ground shall not exceed 5 ohms. Refer to 16088 for acceptance test and performance verification.

1.4 SUBMITTALS

A. Submit shop drawings and product data under provisions of Sections 01330, “Submittal Procedures”.

1.5 TESTS

A. Submit under provisions of Section 01430, “Quality Assurance”.

B. Measure ground grid resistance with earth test megger and install additional ground rods and conductors as required until resistance to ground does not exceed 5 ohms.

PART 2 PRODUCTS

2.1 GROUND BUS

A. 4 inches x 1/4 inch copper minimum, mounted on insulating standoff, complete with lugs for connecting grounding cables.

2.2 GROUND RODS

A. Ground rods shall be copper clad steel, 3/4 inch in diameter x 10 feet long minimum.

PART 3 EXECUTION

3.1 POWER SYSTEM GROUNDING

A. Supplement the grounded neutral of the secondary distribution system by an equipment grounding system. Arrange the equipment grounding system so that all non-current carrying items in close proximity with electrical circuits are maintained continuously at ground potential and provided with a low impedance path for ground fault currents. The system: comply with the National Electric Code Article 250, modified as indicated and as specified.

B. The basic grounding system: utilize the reinforcing bars in the footings of the building supplemented by ground rods and a connection to a cold water pipe where required to meet the test requirements specified.

C. Provide, in conduit, a green insulated copper ground conductor as shown to the main metallic water service entrance and connect to the supply side of same by means of ground clamps. The conduit: bonded to the ground conductor at each end.

D. Low voltage system neutrals: grounded at the related transformers to the feeder ground and to the nearest cold water line all in accordance with the National Electric Code.

E. Ground conductors and Connections:
   1. The equipment grounding conductors and straps:
      (a) Provide under provisions of the National Electric Code.
      (b) Equipment grounding conductors: provided with green insulation's, same type as the associated phase conductors, but not exceeding 600 volts.
      (c) The related feeder grounding conductors: Connect to the grounding bar with compression indent type connectors as specified under Section 16129 - Terminal Lugs, Paragraph 2.01.
      (d) A feeder serving several panel boards: provide a continuous grounding conductor which is connected to each related cabinet grounding bar.
   2. Low voltage distribution systems: provide with a separate green insulated equipment-grounding conductor for each three-phase feeder or single-phase feeder. The required grounding conductor: installed in the common conduit with the related phase conductors. Where there are parallel feeders installed in more than one raceway, provide each raceway with a green insulated equipment ground conductor.
   3. Single phase branch circuits required for lighting and receptacles: consist of phase neutral and ground conductors installed in common metallic conduits. Provide flexible metallic conduit equipment connections utilized in conjunction with the branch circuits with approved grounding terminals at each end. Provide single phase branch circuits required for special

equipment and all branch circuits installed in nonmetallic conduits with a separate grounding conductor.

4. Provide in panel boards and other electrical equipment the number and size of pressure connectors on all equipment grounding bars required for the termination of the equipment grounding conductors. In addition to the active circuits, provide pressure connectors for all spares and spaces.
5. Provide each electrical expansion fitting with a flexible copper ground securely bonded by approved grounding straps on each end of the fitting.
6. Provide ground conductor from equipment ground bus in motor control center through conduit and flexible metallic conduit to ground terminal in connection box mounted on motor. Where motor has separate starter and disconnect device, the ground conductor originates at the ground bar in the panel board or switchboard supplying these motors and be bonded to each starter and disconnect device enclosure.
7. Where electric devices such as electric heaters are installed in air ducts, provide a green insulated equipment ground conductor size based on the rating of the over current device supplying the unit. Bond the conductor to each unit air duct, and to the ground in the panel board.
8. For conduit ground continuity, locknuts, bushings, joiners and similar conduit fittings: made up sufficiently tight to assure a continuous and permanent metal-to-metal flow throughout each system. Where conduits terminate without mechanical connection to a metallic housing of electrical equipment, provide each conduit with a ground bushing and each bushing connected with a bar copper conductor to the ground bus in the electrical equipment.
9. Provide an unspliced main bonding jumper to connect the equipment grounding conductor and the service-equipment enclosure to the grounded conductor of the system within the service equipment or within the service conductor enclosure.

3.2 COMMUNICATION GROUNDING

A. Voice/Data
   1. Provide one (1) #6 from main ground bus to ground bus on telephone equipment board.

B. Fire Alarm and Detection:
   1. Provide one (1) #8 to nearest ground bus.
   2. Equipment ground required through entire system.

C. Television Distribution System:
   1. Provide one (1) #8 to nearest ground bus.

D. Public Address System:
   1. Provide one (1) #8 to nearest ground bus.

3.3 INSTALLATION

A. End-to-End Luminaires: continuously bonded.

B. Grounding contacts of receptacles: connect to a system-grounding conductor (not the system neutral) by a stranded copper wire not smaller than #12 AWG. The resistance between the contacts and solid earth ground: do not exceed 3 ohms.

C. Bond all metal parts. Make equipment and bus connections with suitable lugs or clamps. Cadweld all wire-to-ground rod joints. Cadweld all wire-to-wire joints #1/0 and over.

D. Bond all conduits stubbing under switchboards, transformer and similar locations using bonding bushings.

E. Provide a bond wire in all flexible metal conduits and connect to the boxes at each end in an approved manner.

F. Use PVC for outdoor applicationsfor sleeving grounding electrode conductors, except that where sleeves are subject to extreme injury use rigid metal conduit bonded at both ends.

G. The TV antenna ground wire shall be connected to the main grounding system.

H. Paint buried joints with red glyptal.

I. Ground all transformer secondaries under provisions of NEC-250 unless shown otherwise on the drawings.

J. The resistance to ground: tested and logged by the Electrical Contractor in the presence of the Project Consultant or his authorized agent in order to assure less than 5 ohms resistance. Conduct this test after the complete system has been fully grounded. Conduct this test under provisions of N.E.C. and I.E.E.E. standard 142 recommended practice.

K. Lighting: Provide a ground rod driven near pole bases and cadweld a #8 wire to the top of the rod and extend the wire to a grounding lug in the base and bond to all metal parts.

L. Provide a insulated copper conductor, sized in accordance with NEC article #250-122, in each power or lighting raceway.

END OF SECTION

SECTION 16070 (26 05 30)

EQUIPMENT BASES, MATS AND SUPPORTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Division 3 – Concrete (all applicable sections).

1.2 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01330, “Submittal Procedures”.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Provide bases, insulation mats, steel supports, anchor bolts and inserts, for all equipment and apparatus, provided under provisions of Division 16.

PART 3 EXECUTION

3.1 INSTALLATION

A. Where equipment supports are on concrete construction, take care not to weaken concrete or penetrate waterproofing.

B. Obtain prior approval for installation method of structural steel required to frame into building structural members for the support of the equipment and conduit. Welding will be permitted only when approved by the Project Consultant.

C. Coordinate dimensions of concrete housekeeping pads with requirements for equipment supplied.

END OF SECTION

SECTION 16072 (26 05 29)

ELECTRICAL SUPPORTING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the electrical supporting devices work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as “NIC ITEMS”.

1.2 RELATED WORK

A. Section 16053 – Provisions for Interior Finishing.

B. Section 16138 – Outlet Boxes.

1.3 SUBMITTALS

A. Submit product data under provisions of Section 01330, “Submittal Procedures”.

1.4 DEVICES

A. Devices, including anchors, fasteners, hangers and supports: of a type designed or fabricated for the purpose and adequately and safely secure the material and equipment and present a neat appearance.

B. Make job fabricated hangers or supports from standard structural shapes and hardware.

C. All bolts, screws, nuts and other threaded devices: provide UL standard threads and heads as appropriate.

D. Select devices using the following criteria:
1. Amount and type of load: The weight of hangers of supports and of enclosed materials is part of the load. Devices: suitable for shear, straight pull, vibration, impact or external load as applicable.
2. Safe Working Load: Obtain determination of safe working load of devices or job fabricated support assemblies from the published load data of the manufacturer.
3. Atmosphere: Use devices with corrosion-resistant characteristics for the atmospheric conditions in which they are installed.

PART 2 PRODUCTS

2.1 HANGERS & SUPPORTS

A. Use equipment as manufactured by Unistrut, Powerstrut, Superstrut.

2.2 BACKBOARDS

A. Use hot dipped galvanized unistructure supports for the electrical panels. Marine grade, plywood, 3/4 inch new and painted on all sides and edges with 2 coats of flame retardant flat gray oil paint for terminal cabinets and voice/data backboards.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install equipment, including switches, controllers, fixtures and transformers such that removal or replacement may be readily accomplished without damage to equipment or fasteners.

B. Drill holes for devices under provisions of the manufacturer's recommendations, including diameter and depth.

C. All parts of hanger and support assemblies, including all accessory hardware: Of types designed to be used together.

D. Internal and external threads of parts that are screwed or bolted together: Of the same material including coatings and the method of applying coatings. For example, if the threads of bolts or rods are hot dipped galvanized, the nuts must also be galvanized.
   1. If they are electro-galvanized, the nuts must also be electro-galvanized.
   2. All threads: fully engaged.
   3. All parts so intended: made up tight using tools intended for the purpose.

E. Use backboards for voice/data terminations and for surface mounting grouped electrical equipment. Paint the wall side of the backboards with an asphaltum coating when the walls are constructed of masonry.

3.2 FASTENERS

A. Fasten all materials and equipment with approved devices. Generally fasteners, provide as follows:
   1. Wood: Fasten to wood with screws except nail may be used on wood partitions for outlet boxes and raceways up to 1-inch diameter.
   2. Masonry: Fasten to masonry with threaded metal inserts, metal expansion screws, toggle bolts, powder-actuated fasteners or other approved means.

END OF SECTION

SECTION 16080 (26 08 10)

ELECTRICAL INSPECTION and TESTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Conform to Section 01450, “Quality Control”.

B. Section 16132 – Conduits, Fittings and Supports.

C. Section 16225 – Motors and Motor Controls.

D. Section 16400 – Service and Distribution.

PART 2 PRODUCTS -“NOT USED”

PART 3 EXECUTION

3.1 TESTING

A. Install under provisions of the manufacturer’s instructions, applicable requirements of local authorities, the utility company and applicable codes and standards before equipment is tested or operated for any purpose. In addition to the tests in the preceding part of this document and in the following part of this document specified, all electrical wiring systems shall be tested in accordance with the manufacturer’s recommendations and as required by the Project Consultant.

B. Furnish necessary meters, instruments, temporary wiring and labor to perform all required tests and adjustments of equipment and wiring installed and connected under this contract, including electrical equipment furnished under other sections, to determine proper polarity, phasing, freedom from grounds and shorts.

C. Wiring System Tests:
   1. Ground resistance tests:
      (a) Made at all test points as required by code and also as required by the Project Consultant.
   2. System and equipment grounds: Checked for proper value of resistance using the Megger ground tester in accordance with manufacturer’s standard instructions.
   3. Overall resistance of the ground system: No greater than as specified in the following part of this document. Inspect the grounding system to insure all above ground cables and connections are suitably protected.
   4. Megger test phase and neutral cables rated 100 amps and larger for adequate insulation resistance to ground.
   5. Correct or replace any nominal current-carrying circuit that is defective or grounded and also correct all other troubles encountered by these tests. Correct all defects, whether through faulty workmanship or material furnished.

6. Voltage Drop Tests: Size all wiring to provide a maximum voltage drop of 2 percent feeders and a total of 3 percent to the farthest device in a circuit. Indicate all such wiring in "As-built" drawings, properly identified, etc.
   (a) Contractor: Take particular care when sizing conductors for long runs.
   (b) Contractor: Test circuits for voltage drop as specified above and if below standards, increased in gauge as required and replaced.
7. Lighting and Receptacles:
8. Check all luminaires and receptacles for proper operation, wiring configuration, grounding, etc.
9. Motor Tests: Make the following tests on all motors before start-up. Check motor nameplates for HP, speed, phase and voltage. Check all bearings to see that they are properly filled with oil or grease. Check coupling alignment and shaft endplay.
   (a) Check shaft rotation, bearing temperature and smooth operation.
   (b) Take current reading at full load using a clamp-on ammeter. If ammeter reading is over the rated full load current, determine the reason for the discrepancy and take the necessary corrective action.
   (c) Following established procedures, equipment shall be energized after certification by the Contractor that the installation is satisfactory.
   (d) Overload elements in motor starters: Adjusted and checked for suitability to the motor characteristics. Replace any overload element that is inadequate. Investigate the cause of any motor operating above full load rating and remove the cause instead of increasing the overload trip rating.
   (e) These final operational tests determine that the installation is correct. These tests shall not be made without permission of the Project Consultant.
10. Grounding System:
   (a) The completed equipment grounding system: Subject to a megger test at each power distribution and motor control arrangement enclosure ground bar to insure that the ground resistance does not exceed five (5) ohms. The ground resistance at individual items of utilization equipment shall not exceed ten (10) ohms. Make measurements with a vibroground or round ohmmeter using the three-probe fall of potential method before energizing equipment.
11. Miscellaneous:
   (a) Demonstrate that all control devices function properly.
   (b) Replace all burned out lamps, ballasts, transformers, etc.
   (c) Demonstrate that all power operating devices function properly.
   (d) Demonstrate that all switches, relays, transfer switches, remote control switches, etc., function properly.
   (e) Demonstrate that all systems function properly.

END OF SECTION

SECTION 16085 (26 08 20)

CABLES, SPLICES AND TERMINATIONS TESTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the testing and start-up work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as “NIC ITEMS”.

1.2 RELATED WORK

A. Section 16400 – Service and Distribution.

1.3 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01330, “Submittal Procedures”.

1.4 DESCRIPTION

A. Upon completion of the installation and at such time as designated by the Project Consultant, make field test on all equipment, materials and systems under provisions of the manufacturer’s recommendations, testing standards of the Institute of Electrical and Electronic Engineers (IEEE) and the American National Standards Institute (ANSI).

B. Conduct tests in the presence of the Owner for the purpose of demonstrating the equipment or systems’ compliance with specifications. In general, demonstrate all electrical and mechanical tests to the Owner that the entire installation is functioning properly and that all circuits, including power, control, instrumentation, relaying and communication, will function properly and as specified.

C. Provide and maintain all tools, instruments, material, test equipment, test connections and power. Furnish all personnel including supervision and “stand-by” labor required for the testing, setting and adjusting of all electrical facilities and component parts including putting the above into operation.

D. Make tests with proper regard for the protection of equipment and personnel.

E. After equipment has been tested, checked for operation, and accepted by the Owner, protect equipment from subsequent testing of other equipment and systems.

F. Record all test values of equipment, giving both “as-found” and “as-left” conditions.

G. The witnessing of any test by the Owner does not relieve the Contractor of warranties for material, equipment and workmanship, as specified in the General Conditions.

H. Current transformers not used shall be short-circuited at the respective terminal boards to eliminate a hazardous condition.

I. Check control circuits for conformance with the wiring diagrams furnished by the Owner and manufacturers.

1.5 HIGH VOLTAGE CABLES

A. Test all cable systems operating above 1000 volts phase-to-phase, under provisions of the methods specified before they are energized. Provide the cable system with cables, cable splices and terminations.

1.6 QUALITY ASSURANCE

A. Perform test under provisions of the instructions and the applicable Standards listed below:
   1. Paper-insulated Lead Covered Cable, AEIC No. 1-68.
   2. Rubber-insulated Wire and Cable for the Transmission and Distribution of Electrical Energy IPCEA S-19-81, NEMA WC3.
   3. Varnished Cloth-insulated Wire and Cable, IPCEA S-65-375, NEMA WC4.
   4. Thermoplastic-insulated Wire and Cable for the Transmission and Distribution of Electrical Energy IPCEA S-61-402, NEMA WC5.
   5. Cross-linked thermosetting polyethylene insulated Wire and Cable for the Transmission and Distribution of Electrical Energy IPCEA S-66-524, NEMA WC7.
   6. Ethylene Propylene-insulated ozone-resistant Wire and Cable, for the Transmission and Distribution of Electrical Energy IPCEA S-68-516, NEMA WC8.

1.7 SUBMITTALS

A. Submit the following:
   1. Name and address of testing agency.
   2. Nameplate data on the test set.
   3. Name and qualifications of the test set operator.

B. Provide the above data to the Project Consultant two (2) weeks before any tests are scheduled.

C. Provide the Project Consultant with a twenty-four hour notice in writing before any tests are conducted.

PART 2 PRODUCTS

PART 3 ##NOT USED##

PART 4 EXECUTION

4.1 SPECIFIC TESTS

A. Make the following tests when applicable to the equipment installed:
   1. Insulation Resistance Tests: Made on all electrical equipment, using a self-contained instrument such as the direct-indicating ohmmeter of the generator type, or “Megger”, as manufactured by J. G. Biddle Company.

(a) Apply the following test voltages for one minute, except where otherwise specified herein, under provisions of the procedure recommended by the manufacturer of test equipment and as specified herein.

(b)

Rated Voltage	Circuit Voltage (d-c)	Minimum Megger Reading
600 lts	**500 volts**	**600 kilohms**
1,000 volts	**500 volts**	**1megohm**
15,000 volts	**1,000 volts**	**15 megohms**

(c) Apply Insulation Resistance Test to power and control wires and cables. Insulation resistance values: at least 75 percent of shop test records.

2. Power and Control Wires and Cables: Perform an Insulation Resistance Test of each cable and record for official record purposes, before making terminal connections of each power and control wire and cable. Test each conductor of multi-conductor power and control cable individually, to each other and to ground. Test single conductor power and control cables to ground.

(a) Obtain insulation resistance for multi-conductor cables, where several single conductors are run in the same conduit.

(b) Provide further tests to isolate the poor insulation if the value of resistance obtained do not meet the specified requirements.

(c) Replace and install new cable and test, the entire cable involved, if the insulation resistance cannot be raised to meet minimum requirements.

3. 15 KV Cables: After installation and before connecting to equipment perform the test prescribed in the IPCEA Publication S-19-81, AEIC Publication No. 1-68, as described. Perform test in the presence of the Owner and certified to the Owner in writing before acceptance of the cable. Replace, at no additional cost to the Owner, any sections of cable failing to comply with the test requirements.

(a) 15 KV cables: have their sheaths and shielding solidly grounded during these tests, and after final “megger” tests, positively ground the conductors to the station ground system for at least two (2) hours if DC test voltage is used.

(b) Use proper safety precautions in conducting all high potential tests.

4. At completion of all high potential dielectric tests, remove intentional grounds from the tested equipment and the appurtenant apparatus, leaving equipment in a safe, operable condition.

5. Miscellaneous Tests:

(a) Wiring: Check all control circuits for continuity and conformance with the wiring diagrams furnished by the Owner and manufacturers.

(b) Polarity Tests: Perform continuity and polarity tests on all current and potential transformers to determine whether the polarity is as indicated on the drawings and the circuit is continuous.

(c) Phasing Tests: Identify phases of all switchgear and power cables by stenciling the switchgear and tagging the cables with approved tags, so

that the phases can be identified for connecting to proper phase sequence.

(d) Relay Settings: Initially set, test and adjust protective relays associated with the equipment and its auxiliary systems. Set the relays under provisions of the settings furnished by the Owner.

4.2 RESISTANCE TEST

A. "DC Proof Tests Form"
1. Provide a resistance test as outlined on the "DC Proof Tests Form" attached, for all high voltage cable systems after installation and before being given the DC acceptance.
2. Record all phase-to-phase and phase-to-ground readings on the "DC Proof Tests Form".
3. Conduct the test with an instrument that measures the insulation resistance at an applied voltage of 1000 volts to the system being tested.
4. Resistance readings taken at a voltage less than 1000 volts will not be acceptable.

4.3 DC ACCEPTANCE TEST

A. Provide a DC Acceptance Test, under provisions of the applicable Standard listed, for all high voltage cable systems, after installation and before being energized.

B. High voltage cables: have their sheaths, shielding and any cables in the group not being tested at this time, solidly grounded during the test. After testing is completed, solidly ground all cables for a period of not less than two (2) minutes.

C. First, test each cable system by a step-voltage method using time intervals and voltage increments selected by the Project Consultant at the time of the test. Select voltage increments so that no increment is greater numerically than the voltage for which the cable is rated. Start time and quickly raise the voltage to the first step and then hold constant for the required interval and record the leakage current at the end of the interval. Repeat this process until the maximum test voltage is reached. Maintain the maximum test voltage for ten (10) minutes for a constant potential test and record leakage currents at the end of every minute. Reduce the voltage to zero at a rate not exceeding 1000 volts per second.

D. The results of the step-voltage test, when plotted on James G. Biddle Company Kilovolt Megohm Paper, Catalog No. 220000, should show a smooth curve with no break points. The constant voltage test should show no increase in current during the constant voltage test period. Any discontinuity in the kilovolt-megohm curve is sufficient reason to stop the test. Any perceptible increase in the leakage current during the constant potential test will be interpreted to indicate incipient failure of the electrical system being tested and constitutes a failure of that system to pass the test. Corona at unprotected cable terminations, particularly under conditions of high humidity, can mask leakage current measurements and result in a discontinuous curve and failure of the test.

E. Correct and re-rest, at no additional cost to the Owner, all systems that fail the proof test until a satisfactory proof test is achieved.

4.4 TEST SET AND OPERATOR

A. Provide DC proof testing equipment with a qualified operator on the job site.
   1. Equipment: include a constant-voltage transformer of sufficient capacity to supply the Hi-Pot equipment and be capable of regulation within 1 percent for line variations up to 15 percent, with a response time of 1-1/2 Hertz at 60 Hertz.
   2. Provide sufficient power cable to reach a stable source of commercial power.
   3. No portable generators permitted.

B. Furnish the DC Hi-Pot test set with a DC microammeter minimum scale 0-5 microamperes. Conceal the high voltage output terminals from the atmosphere and shielded.

C. Test sets that have been found to conform to these specifications are as follows:
   1. Associated Research, Inc.
      Model 5321
      Output – 0-100 KV DC @ 5 MA
      Output MA Metering – 0/5/50/500/5000 microamperes.
   2. James G. Biddle Company
      Catalog No. 220220
      Output – 0-100 KV DC @ 4.5 MA
      Output Metering – 0/5/50/500 microamperes, 5-50 miliamps.

D. Submit for review: Experience records and qualifications of the operator plus complete nameplate data on the DC test. No testing permitted prior to, and without, the Project Consultant having reviewed the submittals and indicated, in writing, conformance to the specifications on the operator and test equipment.

E. Conduct the DC proof test in the presence of a representative of the Owner. Report the proof test results using forms available on request from the Project Consultant.

END OF SECTION

SECTION 16088 (26 08 30)

ACCEPTANCE TESTS AND PERFORMANCE VERIFICATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Contractor:
   1. Engage the services of a recognized independent electrical testing firm to perform short circuit and coordination studies as specified.
   2. Engage the services of a recognized corporately and financially independent testing firm for the purpose of performing inspections and tests on all new electrical equipment supplied in this contract and on existing equipment affected by the new addition or as specified.

B. Testing Firm: Provide all material, equipment, labor and technical supervision to perform such tests and inspections.

C. It is the purpose of these tests to assure that all tested electrical equipment, is operational and within industry and manufacturer's tolerances and is installed under provisions of design specifications.

D. The test and inspections determine suitability for energization.

E. An itemized description of existing equipment to be inspected and tested is as follows:
   1. Provide as-built one-line diagrams from the point of connection on the Utility Company transformer to the point of the first electrical sub-panel or disconnecting device (located outside the main electrical room throughout the facility) fed from the main electrical switchgear room indicated on the drawings. The one-line diagrams include:
      (a) Switchgear and panel manufacturers and specifications.
      (b) Equipment frame size.
      (c) Overcurrent protection device rating, type and interrupting capacity.
      (d) Conduit size and type.
      (e) Conductor size, length and type.
      (f) Transformer size, type and specifications.
   2. Provide plan view drawing indicating locations throughout the facility for all equipment indicated on the one-line diagram.
      (a) Provide routing of all feeders shown on the one-line diagram with emphasis on exact location of underground feeders.
      (b) Electronically locate routings with signal tracer equipment.
      (c) Provide expanded scale, 3/4 inch = 1 foot, plan view drawings of the existing main electrical switchgear room and expanded scale drawings of the wall elevations of the main switchgear room.
      (d) Ensure equipment identifications are consistent with that as shown on the one-line diagram.
   3. Provide peak and average demand loads of all panels and major distribution equipment over a one (1) week period during the normal occupied times. Indicate the test result information on the one-line diagram.
   4. Provide testing for the following:
      (a) All feeder cables indicated on the one-line diagram.

(b) All circuit breakers indicated on the one-line diagram.
(c) All dry type transformers indicated on the one-line diagram.

5. Provide the one-line diagram and plan view equipment location drawings on standard 24 inch x 36 inch media; drawn with a computer aided design package.
   (a) Computer aided design package: AUTOCAD Version 12 (minimum).
   (b) Partial site plan backgrounds of the facility shown on the contract documents will be available to the contractor on request.
   (c) Submittals: Include reproducible plots of the drawings on paper velum of mylar and 3-1/2 inch floppy disk copies using IBM compatible DOS format.
   (d) Submit testing report on 8-1/2 inch x 11-inch paper bound with all field test data in appendix form.
   (e) Report: Signed and sealed by a registered Professional Engineer licensed in the State of Florida.
6. Submit the above report and drawings within 30 days after the notice to proceed. Feeder routing information may be required prior to the submittal date to coordinate with building foundation construction.
7. Use the above existing facility report and drawings in the development of the final as built drawings and report encompassing all new electrical equipment and testing and submitted with the operation and maintenance manuals prior to substantial completion of the project.

1.2 REFERENCES

A. Ensure all inspections and test are under provisions of the following codes and standards except as provided otherwise.
   1. National Electrical Manufacturer's Association - NEMA
   2. American Society for Testing and Materials - ASTM
   3. Institute of Electrical and Electronic Engineers - IEEE
   4. International Electrical Testing Association - NETA Acceptance Testing Specifications – ATS.
   5. American National Standards Institute - ANSI C2: National Electrical Safety Code.
   6. State and local codes and ordinances
   7. Insulated Cable Engineers Association - ICEA
   8. Association of Edison Illuminating Companies - AEIC
   9. Occupational Safety and Health Administration - OSHA
   10. National Fire Protection Association - NFPA
      (a) ANSI/NFPA 70: National Electrical Code
      (b) ANSI/NFPA 70B: Electrical Equipment Maintenance
      (c) NFPA 70E: Electrical Safety Requirements for Employee Workplaces
      (d) ANSI/NFPA 78: Lightning Protection Code
      (e) ANSI/NFPA 101: Life Safety Code

B. Inspections and Test: Utilize the following references.
   1. Project design specifications
   2. Project design drawings
   3. Manufacturer's instruction manuals applicable to each particular apparatus

1.3 QUALITY ASSURANCE

A. Contractor:

1. Perform routine insulation-resistance, continuity, and rotation test for all distribution and utilization equipment prior to and in addition to tests performed by the testing firm specified herein.
2. Supply a suitable and stable source of electrical power to each test site.
3. Notify the testing firm when equipment becomes available for acceptance tests. Coordinate Work to expedite project scheduling.

B. Testing Firm:
1. Notify Engineer prior to commencement of any testing.
2. Report any system, material or workmanship, which is found defective on the basis of acceptance test to the Engineer.
3. Maintain a written record of all tests and, upon completion of project, assemble and certify a final test report.

C. Safety and Precautions:
1. Safety practices include, but are not limited to, the following requirements:
   (a) Occupational Safety and Health Act.
   (b) Accident Prevention Manual for Industrial Operations, National Safety council
   (c) Applicable state and local safety operating procedures
   (d) Owner's safety practices
   (e) National Fire Protection Association - NFPA 70E
   (f) American National Standards for Personnel Protection
2. Perform all test with apparatus de-energized. Exceptions must be thoroughly reviewed to identify safety hazards and devise adequate safeguards.
3. Testing Firm: Provide a designated safety representative on the project to supervise the testing operations with respect to safety.

1.4 QUALIFICATIONS

A. Testing Firm:
1. An independent testing organization, which can function as an unbiased testing authority, professionally independent of the manufacturers, supplier, and installers of equipment or systems evaluated by the testing firm.
2. Regularly engaged in the testing of electrical equipment devices, installations, and systems.
3. Meet OSHA criteria for accreditation of testing laboratories, Title 29, Part 1907, or be a Full Member company of the International Electrical Testing Association.
4. Utilize engineers and technicians who are regularly employed by the firm for testing services.
5. Submit proof of the above qualifications when requested.

B. The Lead, On-site, Technical Person: Currently certified by the International Electrical Testing Association (NETA) or National Institute for Certification in Engineering Technologies (NICET) in electrical power distribution system testing.

C. The terms used herein, such as test agency, test contractor, testing laboratory, or contractor Test Company, shall be construed to mean the testing firm.

D. NETA certified pre-qualified testing firms for this project are:
1. Industrial Electrical Testing, Inc. (904) 260-8378 / (954) 456-7020
2. Electrical Reliability Services Inc. (239) 693-7100/ (305) 669-0048 / (407) 246-0058 / (813) 225-3426

E. Other firms will be considered by the Engineer on submittal of qualifications on or before ten (10) days prior to bid.

PART 2 PRODUCTS

2.1 TESTS

A. General:
1. Suitability of Test Equipment:
(a) Ensure all test equipment is in good mechanical and electrical condition.
(b) Digital multimeters: RMS sensing when the variable measured contains harmonics or DC offset or any deviation from a pure sine wave.
(c) Ensure the accuracy of metering in test equipment is appropriate for the test being performed but not in excess of 2 percent of the scale used.
2. Test Instrument Calibration:
(a) Testing Firm: Provide a calibrating program, which assures that all applicable test instruments are maintained within rated accuracy.
(b) Accuracy: Directly traceable to the National Institute of Standards and Technology.
(c) Field instruments: Calibrated at six (6) month intervals.
(d) Ensure dated calibration is visible on all test equipment.
3. Test report:
(a) Include the following:
(b) Summary of project
(c) Listing of equipment tested
(d) Test results
(e) Recommendations
(f) Furnish copies of the complete report to the Engineer as directed.

B. Short-circuit Analysis and Coordination Study: For all new electrical equipment and all existing electrical equipment shown on the as-built one-line diagram as defined above.
1. Scope of services:
(a) Provide a current and complete short-circuit study, equipment interrupting or withstand evaluation, and a protective device coordination study for the electrical distribution system.
(b) The studies include all portions of the electrical distribution system from the normal and alternate sources of power throughout the low-voltage distribution system. Thoroughly cover a normal system operating method, alternate operation, and operations, which could result in maximum fault conditions in the study.
2. Submittals: Submit the studies to the project electrical engineer prior to granting final approval of the distribution equipment shop drawings and prior to release of equipment for manufacture.
3. Short circuit study:
(a) Ensure the study is under provisions of applicable ANSI and IEEE Standards.
(b) Include the utility company's short circuit single and three-phase contribution, with the X/R ratio, the resistance and reactance components of each branch impedance, motor and generator

contributions, base quantities selected, and all other applicable circuit parameters.

(c) Calculate the short circuit momentary duties and interrupting duties on the basis of maximum available fault current at each switchgear bus, switchboard, motor control center, distribution panel board, pertinent branch circuit panel boards, and other significant locations through the system.

4. Equipment evaluation study:
   (a) Perform an equipment evaluation study to determine the adequacy of circuit breakers, controllers, surge arresters, busways, switches, and fuses by tabulating and comparing the short circuit ratings of these devices with the available fault currents.
   (b) Document any problem areas or inadequacies in the equipment in the report.
   (c) Testing Company: Coordinate what the supplier of the new switchgear to assure all specifications of the new equipment meet or exceed the ratings required by the study at no additional cost to the Owner.
5. Protective device coordination study:
   (a) Perform a protective device coordination study to select or to check the selections of power fuse rating, protective relay characteristics and settings, ratios and characteristics of associated voltage and current transformers, and low-voltage breaker trip characteristics and settings.
   (b) Include all voltage classes of equipment from the utilities incoming line protective device down to and including each motor control center and panel board. Include the phase and ground overcurrent protection, as well as, settings for all other adjustable protective devices.
   (c) Plot the time current characteristics of the specified protective devices on appropriate log-log paper.
   (d) Include the following:
   (e) Complete titles
   (f) Representative one-line diagram and legends
   (g) Associated power company’s relays of fuse characteristics
   (h) Significant motor staring characteristics
   (i) Complete parameters of transformers
   (j) Complete operating bands of low voltage circuit breaker trip curves
   (k) Fuse curves
   (l) Coordination Plots: Indicate the types of protective devices selected, proposed relay taps, time dial and instantaneous trip settings, ANSI transformer magnetizing in rush and withstand curves per ANSI C37.91, cable damage curves, symmetrical and asymmetrical fault currents.
   (m) Adhere to all requirements of the current National Electric Code.
   (n) Maintain reasonable coordination intervals and separation of characteristic curves.
   (o) Provide the coordination plots for phase and ground protective devices on a complete system basis.
   (p) Use sufficient curves to clearly indicate the coordination achieved to each utility main breaker, primary feeder breaker, unit substation primary protective device rated or more.
   (q) Provide a maximum of eight (8) protective devices per plot.
   (r) Provide the selection and settings of the protective devices separately in a tabulated form using a circuit identification, IEEE device number, current transformer ratios, manufacturer, type, range

of adjustment and recommended settings. Provide a tabulation of the recommended power fuse selection for all fuses in the system. Coordinate the discrepancies, problem areas or inadequacies with the equipment suppliers and resolved with in the scope of the project and at no additional cost to the Owner.

6. Study Report:
   (a) Summarize the results of the power system study in a final report and make a part of the operation and maintenance manuals.
   (b) Include the following sections in the report:
   (c) Description, purpose, basis written scope, and a single line diagram of the portion of the power system, which is included within the scope of study.
   (d) Tabulations of circuit breaker, fuse and other equipment ratings versus calculated short circuit duties, and commentary regarding same.
   (e) Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip settings, fuse selection and commentary regarding same.
   (f) Fault current tabulations including a definition of terms and a guide for interpretation.
7. Implementation:
   (a) Contractor's Certified Testing Firm: Responsible for the inspection, setting, testing, and calibrating the protective relays, circuit breakers, fuses and other applicable devices as recommended in the power systems study report.

PART 3 EXECUTION

Acceptance Testing

Prior to energization, the Independent Testing Firm shall perform visual and mechanical inspections and electrical tests on all newly installed equipment supplied within this contract and included within the list of equipment types below. Alll inspections and tests shall be in accordance with the indicated test standard and section, the manufacturer's instruction manual, and the project design specifications.

3.1 Equipment Type and Test Standard

A. Switchgear and switchboard assemblies rated less that 600V as per 1999 NETA ATS Section 7.1.

B. Switchgear and switchboard assemblies rated greater than 600 V as per 1999 NETA ATS Section 7.1.

C. Transformers dry type rated less that 600 V and equal to or greater than 112.5 kVA as per 1999 NETA ATS Section 7.2.1.1.

D. Transformers dry typed rated less than 600 V and greater than 500 kVA as per 1999 NETA ATS Section 7.2.1.2.

E. Cables rated less than 600V and equal to or greater than size 1/0 AWG as per 1999 NETA ATS Section 7.3.2.

F. Cables rated greater than 600V as per 1999 NETA ATS Section 7.3.3.

G. Metal Enclosed Busways as per NETA ATS Section 7.4.

H. Switches rated less than 600V and equal to or greater than 100 amps as per 1999 NETA ATS Section 7.5.1.1.

I. Circuit breakers insulated case or molded case type rated less than 600V and equal to or greater than 400 amps as per 1999 NETA ATS Section 7.6.1.1.

J. Circuit breakers draw out type rated less than 600V as per 1999 NETA ATS Section7.6.1.2.

K. Protective relays and associated transformers as per 1999 NETA ATS Section 7.9.

L. Meters and associated instrument transformers as per 1999 NETA ATS Section 7.10.

M. Grounding system as per 1999 NETA ATS Section 7.13.

N. Ground Fault protection 1999 NETA ATS Section 7.14.

O. Motors related equal to or greater that (specify) horse power as per 1999 NETA ATS Section7.15.

P. Motor starters rated less than 600V and equal to or greater than size (specify) as per 1999 NETA ATS Section 7.16.1.1.

Q. Motor control centers as per 1999 NETA ATS Section 7.16.2.

R. Batteries as per 1999 NETA ATS Section 7.18.1.

S. Surge arrestors rated less than 600V as per 1999 NETA ATS Section 7.19.1.

T. Emergency/ Standby generators as per 1999 NETA ATS Section 7.22.1.

U. Uninterruptable Power Systems as per 1999 NETA ATS Section 7.22.2.

V. Automatic Transfer Switches as per 1999 NETA ATS Section 7.22.3.

3.2 System Function Testing

A. Upon completion of equipment Acceptance Testing, the Independent Testing Firm shall perform system function tests on all new equipment supplied within this contract in the list of equipment type above and existing affected equipment to prove the correct interaction of all sensing, processing and action devices and evaluate the performance of all integral components and their functioning as a complete unit to effect the design result.

B. Manufacturers recommended test to be done on switchgear and GFCI protection equipment before the 1 year warranty expiration shall be done by the contractor at his expense before the termination of the warranty period.

3.3 Correction Of Deficiencies Found

A. Any deficiencies identified by initial Acceptance Testing rectified by the Contractor and retested by the Independent Testing firm at Contractors expense until specified requirements are met. Final acceptance of the electrical power system by the Engineer is contingent upon the satisfactory compliance of the Acceptance Testing.

3.4 Thermo graphic Survey

A. After substantial completion, but not more than 2 months after Final Acceptance, the Independent Testing Firm shall perform an infrared thermo graphic survey of all newly installed equipment supplies within this contract and included in the list of the equipment types below. Thermographic Survey and Reprot shall be in accordance with NETA ATS 1999, Section 9.
   1. Equipment Type
      (a) Switchgear
      (b) Bus Ducts
      (c) Transformers
      (d) Points of Power connection rated equal to or greater than (specify) amp
      (e) Motor Control Centers
      (f) Distribution Panels
      (g) Load Centers

END OF SECTION

SECTION 16090 (26 04 00)

ALTERATIONS AND ADDITIONS TO EXISTING WORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the alterations and additions work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as “NIC ITEMS”.

1.2 RELATED WORK

A. Section 16132 – Conduit, Fittings and Supports.

B. Section 16400 – Service and Distribution.

C. Section 16510 – Interior Luminaires.

1.3 SUBMITTALS

A. Submit shop drawings and product data under provisions of with Section 01330, “Submittal Procedures”.

1.4 DESCRIPTION

A. These provisions are in addition to the requirements of building modifications as specified in other Sections of the specification.

B. Existing buildings will be occupied during construction.

C. Provide all additions and alterations to existing work required to maintain a complete and proper electrical installation. Relocate existing electrical work for other trades required to complete the work and to maintain building in service.

D. Relocate luminaires, pull boxes, electrical ducts and other similar items, to permit the installation of new equipment.

E. Install new conduits, conductors, wiring and wiring devices, to maintain temporary and permanent use of electrical facilities.

F. Remove existing surface mounted work that is not used and blank off concealed outlets.

G. Reconnect existing work to be maintained and all outlet boxes and devices accessible after installation of all trades.

H. Expose new work in existing areas on walls in unfinished areas and concealed in new construction. Where cutting and patching is to be provided, match finishes with existing surface finishes. In existing finishes areas, conceal all work in finishes.

PART 2 PRODUCTS

##NOT USED##

PART 3 EXECUTION

3.1 SEQUENCE OF WORK

A. Schedule electrical feeders, branch wiring, signal wiring and other similar work to correspond with the sequence of work necessary to demolish, remove and construct new work.

3.2 OPENINGS IN EXISTING WORK

A. Verify exact locations and materials before performing work. Project Consultant must give written approval for cutting of structural members and bearing walls.

3.3 VERIFICATION OF EXISTING WORK

A. Where shown on drawings, work which is "existing" is assumed to be in place and suitable for the necessary alterations and additions required. Field check Items and alterations included as may be necessary for proper installation.

3.4 REMOVAL AND OWNERSHIP OF EXISTING WORK

A. Conform under provisions of Section 01110, "Summary of Work".

B. Remove existing electrical work where necessary. Unless otherwise specified, or indicated by Owner as obsolete or unusable, equipment and materials remain the property of the Owner.

C. Deliver property of Owner to a location where directed by the Owner and promptly remove other items from the job site.

END OF SECTION

SECTION 16120 (26 05 20)

WIRE AND CABLES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete for the Wire and Cables work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as “NIC ITEMS”.

1.2 REFERENCES

A. Provide wire and cable comprised of copper conductors under provisions of ASTM and IPCEA Standards.

1.3 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01330, “Submittal Procedures”.

1.4 DELIVERY, STORAGE AND HANDLING

A. Conform to Section 01663, “Product Delivery, Storage and Handling Requirements”.

B. Deliver, store and handle all wire and cable in complete coils, boxes, or reels with manufacturer’s name and approval tag attached. Tag to indicate wire size and type of insulation.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide a No. 14 AWG galvanized steel fish wire or a plastic line having a tensile strength of not less than 200 pounds in each empty conduit.

B. 600 Volt Wire and Cable:
1. Lighting and receptacle branch circuit protected at no more than 20 amperes. All control and alarm wiring: type THHN/THWN stranded rated 600 volts, 75 degrees Centigrade in dry and wet locations.
2. Unless otherwise specified or shown, all other branch or feeder conductors: stranded copper having THHN/THWN insulation, in trade sizes No. 10 AWG TO 600 MCM, inclusive. In lieu of THHN/THWN, conductors with thermosetting insulation derived from filled, chemically cross-linked polyethylene rated 600 volts and 90 degrees Centigrade may be substituted in dry locations only.
3. Provide, where required, the following types of insulation and meet the requirements specified below:

(a) Type AVA: under provisions of Federal Specifications J-C-30.

(b) Type SF-2: 2/64 inch thick silicone-rubber, 125º C minimum, with outer covering of heat-resisting glass braid.

4. Provide distinctive markings for the covering of wires and cables designed to meet the above specification so that they may be readily identified in the field. Provide a distinctive color code for the covering of the individual conductors for identification of individual conductors.
5. Color Code secondary service feeder and branch circuit conductors throughout the electrical system as follows:

208/120 Volts	Phase	480/277 Volts
Black	**A**	**Brown**
Red	**B**	**Purple**
Blue	**C**	**Yellow**
White	**Neutral**	**Gray**
Green	**Ground**	**Green**

On existing schools electrician shall match color of phase wiring.

All conductors shall be pulled for rough-in inspection.

6. Conductors:

(a) As manufactured by Colonial Wire and Cable, Southwire Company, or American Insulated Wire and conform under provisions of NFPA and IPCEA.

(b) 98 percent conductive copper under provisions of Matheisen's Standard rated for 600 volts.

(c) Aluminum conductors are not acceptable.

(d) Stamped for voltage, type, temperature, size, etc.

C. Cable Splicing and Terminations:

1. Joints in branch circuit wiring No. 6 AWG and smaller: made with solderless connectors such as "Scotch Lock".
2. Splices, joints or terminations for conductors larger than No. 6 AWG: made with pressure indent type connectors.
3. For cable terminations, provide connectors under provisions of Section 16129 – Terminal Lugs.
4. Insulating materials for splices and connections: of the type for the particular use, location, voltage and applied and installed under provisions of the manufacturer's recommendations.
5. Waterproof seal all splices in hand holes and manholes.

(a) For conductors AWG #18 thru #6 use Scotchlok #3570 Connector Sealing Packs or approved equal.

(b) For conductors AWG #4 and larger use Scotch Resin Splice Kits.

D. Arc/Proofing Tape:

1. The tape: consists of a flexible, conformable fabric of organic composition coated one side with a flame retardant elastomer.

   (a) Does not support combustion, self-extinguishing and retain not less than 65 percent of its original tensile strength when tested by the cut-strip method of ASTM.

   (b) Test: include exposure to distilled water, 3 percent salt water, ultraviolet light and sunlight.
2. Arc-proofing tape: 3M/7700, Bishop No. 43, Plymouth No. 3318.

E. Control Wiring:
1. Control conductors for 100 to 600 volts: #14 AWG stranded, THW or THWN as required, copper stranded and color-coded.
2. Control conductors for 50 volts or less: #18 AWG stranded copper.
3. Wiring: comply with NEC Art. 725 Class 1, Class 2, Class 3 Remote Control, Signaling and power limited circuits.
4. Communication, sound and intercommunication conductors: 100 percent shielded.

F. Portable Cords:
1. Stranded copper UL listed and resistant to water, acid, and alkalies.
2. Provide each cord with one (1) green covered conductor to be used as the grounding conductor.
3. 300 Volt: #14 AWG Type SJ.
4. 600 Volt: #14 AWG Type SO.

PART 3 EXECUTION

3.1 INSTALLATION

A. Wires and cables connected to equipment operating at 100 to 480 volts are rated at 600 volts minimum unless otherwise indicated or specified. Where specified or where the operating voltage is less than 100 volts, the wires or cables may be insulated for 300 volts provided they are completely isolated from other higher voltage systems. Cables for wiring the various special distribution systems, are individually specified under their respective paragraph headings.

B. Wires and cables for secondary service, feeders and branch circuit: provide single conductor unless otherwise specified. Branch circuit wiring, connected to receptacles and lighting switches employing No. 12 AWG wires: provide solid conductor.

C. Commercially produced wire lubricant may be utilized to ease wire pulling. Lubricant: of a type to produce no deteriorating effect on conductor installation or on the interior of associated wire way and shall be approved by the wire manufacturer.

D. Wire Pulling and Cable Supports:
1. Provide installation equipment to prevent cutting and abrasion of conduits during the pulling of feeders.
2. Ropes used for pulling of feeders: made of polyethylene or other non-metallic material.
3. Fish wires and lines: free of splices and have ample exposed length at each end.

4. Pulling lines: attached to conductor cables by means of either woven basket grips or pulling eyes attached directly to the conductors. Rope hitches are not acceptable. Pull in all cables to be in stalled in a single conduit together.
5. Cable supports and boxes: installed for all vertical feeders under provisions of the schedule in the National Electrical Code. Boxes: built of heavy steel plates not less than No. 10 USS gauge riveted to an angle iron frame with removable covers secured by brass machine screws. For cables without a metallic sheath, the cable support: of the split wedge composition type with clamps each individual conductor firmly and tightens due to the weight of the cable. All boxes: hot-dipped galvanized after fabrication.

E. Cable Splicing and Terminations:
1. No splices or joints will be permitted in either feeder or branch circuits except at outlets or accessible junction boxes.
2. Connectors: insulated by integral or separate covers by means of taping with plastic or rubber and friction tapes to provide insulating value equal to that of the conductors being joined.
3. Employ the tool designed for the purpose by the manufacturer of the particular size and type of connector utilized, unless the design of the connector incorporates an integral built-in means of ensuring adequate pressure being exerted in fabrication of the splice.
4. In the making of a splice, connectors shall be brought up upon the conductors so that all the conductors are equally engaged, the insulation is not ruptured, no bare wires are exposed or have backed-off due to application of pressure and the connector will not loosen due to cycling or vibration, in order to insure an efficient splice.

F. Securely fasten Non-ferrous identifying tags to all cables, in pull and splice boxes and at terminations. Stamp or emboss tags to correspond with markings on drawings or marked so that cable may be readily identified. If suspended type tags are provided, attach by approximately 1/32 inch diameter nylon 55 pound test mono-filament line attached to tag, using three twist, clinch knot or especially designed slip-free plastic cable lacing unit.

G. Make conductor length for parallel feeders identical.

H. Install wire in conduit runs after concrete and masonry work is complete and moisture is swabbed from conduits. Conform to section 16132 – Conduit, Fittings and Supports.

I. All conductors shall be pulled prior to rough inspection.

3.2 CONDUCTORS

A. All conductors: stranded copper.

B. Bonding conductors size #10 and smaller: provide a green covering and the same size as the circuit conductors unless indicated otherwise.

C. Installation of conductors: made only in completed raceway systems and all conductors in any conduit pulled in together.

D. Run all low voltage wiring in conduit unless otherwise specified.

E. Run all communications wiring in conduit unless otherwise specified.

3.3 GENERAL WIRING METHODS

A. Provide wiring complete from point of service connection to all receptacles, luminaires, power outlets, outlets for future extensions and other devices as shown. Provide slack wire for all future connections. Unless otherwise specified, branch circuit conductors, provide No. 12 AWG or larger. In outlet boxes for future installations, tape ends of wires and blank covers installed. Provide additional "green wire" ground for all electronic equipment receptacles.

B. Do not bend cables either permanently or temporarily during installation to radii less than that recommended by the manufacturer.

C. Bundle conductors not larger than No. 10 AWG located in branch circuit panel boards, signal cabinets, signal control boards, switchboards and motor control centers. Cable in individual circuits, conductors larger than No. 10 AWG located in switchboards, motor control centers and pullboxes.
   1. Bundling and cabling: done with straps made of self-extinguishing nylon.
   2. Each strap: constructed with a locking hub or head on one end and a taper on the other.
   3. Apply Arc-proofing, as specified, after cabling.

D. Where the length of a homerun, from panel to first circuit, exceeds 75 feet for a 120 volt circuit or 175 feet for a 277 volt circuit, the conductor size: provide No. 10 AWG. All exit lighting and emergency power and signal systems wiring: minimum No. 10 AWG.

E. Where homerun circuit numbers are shown, follow such numbers in connecting circuits to panel boards. Connect each branch circuit homerun containing two or more circuits with a common neutral to the circuit breaker or switch in a three or four-wire branch circuit panel board so that no two of the circuits will be fed from the same phase. Where panel board cabinets are recessed, stubb up concealed conduits with sufficient capacity to carry the number and size of future conductors for spare branch circuit protective devices and spaces in the panelboard to a junction box for future connections and extensions located as follows:
   1. In an area with removable ceiling, provide accessibility above the suspended ceiling for the junction box.
   2. In an area with non-removable ceiling, recess the junction box in the ceiling directly over the panel board location.
   3. In an area without suspended ceiling but with finished wall, recess the junction box in the wall directly above the panel board location at the ceiling line.
   4. In an area without suspended ceiling but with unfinished wall, expose the junction box on the ceiling directly over the panel board location.

F. Do not utilize channel support members for suspended type fluorescent lighting fixtures for building branch circuit wiring unless specified otherwise. Connections between units in continuous rows, made within the fixture wireway.

G. Provide all wiring to and between motors, starters, line voltage control devices, disconnect switches and other related electrical equipment except where such items are factory wired.

H. Electrically operated overhead doors, sliding doors, door operators and control devices will be provided under another division. Provide power, and all wiring connections to the control devices.

I.

J. Provide power wiring to and between motors, starters, line voltage control devices, disconnect switches and other related electrical equipment except where such items are factory wired.

K. Provide dedicated neutral conductors for computer power outlets.

3.4 PHASING AND IDENTIFICATION

A. The plans designation of all secondary conductors are the same and are indicated in or on all 3 phases outlets, transformers, panel boards and disconnect switches, and they shall be connected with uniform phase sequence.

B. Maintain A, B, C phase relation left to right when viewed from the front.

3.5 SIGNAL SYSTEMS

A. Fire alarm, sound and intercom terminations: made in enclosed telephone type panel boards with suitable terminal strips mounted on plywood backboards. Each system: in separate terminal cabinet.

END OF SECTION

SECTION 16129 (26 05 34)

TERMINAL LUGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the Terminal Lugs work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as “NIC ITEMS”.

1.2 RELATED WORK

A. Section 16120 – Wires and Cables.

B. Section 16220 – Motor Starters.

C. Section 16400 – Services and Distribution.

D. Section 16413 – Safety Switches.

E. Section 16430 – Low Voltage Switchgear.

F. Section 16440 – Panelboards.

1.3 SUBMITTALS

A. Submit product data under provisions of Section 01330, “Submittal Procedures”.

PART 2 PRODUCTS

2.1 MATERIALS

A. Terminal lugs: of the pressure indent type requiring the use of a special tool and UL rated for copper conductors.

B. Branch circuit conductor terminal lugs for stranded wire sizes No.10 AWG and smaller: the uninsulated ring or spade type.
1. T & B “STA-KON”.
2. Burndy “HYLUG”.
3. 3M “SCOTCHLOK” crimp terminals.

C. Branch or feeder circuit conductor terminal lugs for wire sizes No. 8 AWG to No. 2 AWG:
1. T & B “COLOR-KEYED”.
2. Burndy “HYLUG”.
3. Anderson “VERSA-CRIMP”.

D. Branch or feeder circuit conductor terminal lugs for wire sizes No. 1 AWG and larger: of the two-bolt whole type having bolt spacing conforming to NEMA Standards. Lugs:
1. T & B “COLOR-KEYED”.

2. Burndy “HYLUG”.
3. Anderson “VERSA-CRIMP”.

PART 3 EXECUTION

3.1 INSTALLATION

A. Provide complete installation under strict provisions of manufacturer’s standard printed specifications, instructions and recommendations.

END OF SECTION

SECTION 16130 (26 05 33)

RACEWAYS & BOXES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This Section includes basic materials and electrical methods for all Division 16, Electrical and related work.

PART 2 PRODUCTS

2.1 RIGID METAL CONDUIT

A. Rigid metal conduit: hot dipped galvanized.
   1. Fittings: galvanized steel.

2.2 ELECTRICAL METALLIC TUBING (EMT)

A. Electrical Metallic Tubing (EMT): Galvanized steel.
   1. (EMT) fittings: Of similar metal to the conduit they are used with. Only rolled steel, gland, rolled steel setscrew, and ring compression type is permitted. Non-ferrous, cast or pot metal type fittings are not acceptable.

2.3 FLEXIBLE METAL CONDUIT

A. Flexible metal conduit: made of galvanized steel, rounded, interlocking convolutions.
   1. Fittings: Straight or angle type, set screw, 2-screw or hinge type, malleable iron/ galvanized as manufactured by Steel City, T & B, Appleton.

B. Liquid tight flexible metal conduit: Conform to NEC Article 350.
   1. Fittings: as manufactured by Midwest, Robroy, T & B, & Appleton.

2.4 ALUMINUM CONDUIT: NOT PERMITTED

2.5 IMC (INTERMEDIATE METAL CONDUIT): NOT PERMITTED

2.6 TELE-POWER POLES

A. Provide and install a combination of power and communication wiring Legrand tele-power poles in accordance with manufacturer's instructions.

2.7 BOXES AND ACCESSORIES

A. Minimum size outlet box: 4 inches square by 1-1/2 inch deep, unless approved or indicated otherwise.

B. For voice data systems refer to communication's outlet box defined in Section 16707.

C. Use cast iron metal outlets with gasketed covers for all exterior and for all damp locations.

D. Cast outlet boxes: threaded conduit entrances and gasketed covers.
   1. Aluminum type not permitted.
   2. Boxes: A minimum of two hubs on the bottom. Appleton or Crouse-Hinds.

PART 3 EXECUTION

3.1 RACEWAYS

A. Use rigid metal conduit as follows unless noted otherwise: in the ground, in all slabs, outdoors, and for all panel feeders.

B. Use EMT above ground in ceiling space, in walls. Not permitted in concrete.

C. Use PVC underground, in duct banks, exposed when protected from physical damage and from sun exposures. PVC is not allowed above grade. PVC schedule 80 (UV resistant) shall be used above grade when exposed to chemical agents such as chiller yard cooling tower installations, and pump houses in compliance with NEC 110-11.

D. For renovations surface mounted raceways may be allowed with approval from SBBC Design Services.

3.2 MISCELLANEOUS

A. Provide cable supports as indicated and in accordance with the drawings and NEC.

END OF SECTION

SECTION 16137 (26 05 32)

PULL AND JUNCTION BOXES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the Pull and Junction Boxes, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as “NIC ITEMS”.

B. Utilize pull boxes, splice boxes, wire ways, gutters to supplement the raceway system required due to equipment layout, space limitations, wiring requirements, etc.

C. Pull boxes, splice boxes, wire ways, gutters may not be indicated on the drawings at every point in the wiring system where they may be needed or required.

1.2 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01330, “Submittal Procedures”.

PART 2 PRODUCTS

2.1 JUNCTION BOXES

A. Junction boxes having internal volumes of not over 150 cubic inches as specified under Section 16138 – Outlet Boxes, including grounding terminal, but not including other details applicable only to luminaires, switch or receptacle outlet boxes. Provide blank covers.

B. Junction boxes having internal volume of more than 150 cubic inches are specified under “PULL BOXES” of corresponding sizes.

2.2 PULL BOXES

A. Conform to the requirements of the National Electrical Code. Unless otherwise specified, pull boxes having internal volumes of not more than 150 cubic inches are as specified under Section 16138 – Outlet Boxes, except that they are provided with blank covers. Details applicable only to boxes for lighting fixtures, receptacles and switches do not apply. Unless otherwise specified, pull boxes having internal volumes of more than 150 cubic inches: constructed as specified under “CABINETS”, except that covers are of the same thickness as the boxes and secured by corrosion-resistant screws or bolts.

B. Pull boxes connected to concealed conduits: provided with access by means of an approved access door.

C. All ferrous pull boxes: hot-dipped galvanized.

D. Metal Boxes: as manufactured by Appleton, Steel City or Raco.

E. Pull boxes and junction boxes larger than 4-11/16 inches: constructed of galvanized steel under provisions of NFPA-70, Articles #314. Boxes: as manufactured by Hoffman, Keystone or approved equal.

2.3 IDENTIFICATION

A. Pull, splices, and terminal boxes: provide screw on engraved white on black lamicoid nameplates or permanent labeling (not marker).
   1. Nameplates:
      (a) 3-1/2 inches L (min.) x 1-1/4 inches H x 1/16 inch thick.
      (b) Beveled edges and list all mains, feeders or branch circuits passing through the box with 1/8 inch high letters.
      (c) Mounted with 2 countersunk Phillips head brass machine screws.

2.4 POLYMER CONCRETE PULL BOXES

A. Provide and install rectangular polymer concrete pull boxes with polymer concrete covers at locations listed below. Pull boxes: as manufactured by Quazite or approved equal by School Engineer. Covers to be also UL Listed Polymer concrete of the same manufacturer heavy duty with 2 bolts.
   1. Maximum of 200 foot on center or from panel or origin.
   2. All wiring or cable installed below grade.
   3. At each lighting post.
   4. At each group of grade mounted luminaires.
   5. Covers shall be labeled according to the system they are housing.
   6. At each marquee sign connection.

2.5 WIREWAYS AND AUXILIARY GUTTERS

A. Galvanized steel with removable covers unless indicated as hinged. Components: as manufactured by:
   1. Square “D”.
   2. Hoffman.
   3. Keystone.
   4. General Electric.

B. Comply under provisions of NEC Article 376.

PART 3 EXECUTION

3.1 INSTALLATION

A. Junction Boxes.
   1. Install so that covers are readily accessible after completion of the installation.
   2. Do not install above suspended ceilings, except where the ceiling is of the removable type or definite provision is made for access at a point close to each box.
   3. Junction boxes from which flexible connections are run to lighting fixtures in suspended ceilings are to face to the side of the access opening and be independently suspended from the floor construction above.
   4. All Junction Boxes: For clocks, sound, E.M.S. systems provide with marked terminal strips. Identify and terminate all wires in a crimp type solderless lug

and fastened under terminal screws. Loop conductors through all pull boxes. Wire nut splices will not be accepted.

B. All enclosures: sized to accommodate the specified terminal lugs so that conductors are bent to radii not less than that recommended by the cable manufacturer.

C. Where concealed conduits are to be connected to a surface mounted cabinet, provide a flush cabinet backplate with an accessible opening of size to match the pull box.

D. Provide additional pull boxes where necessary to meet Code requirements for maximum lengths of conduit runs and maximum number of bends as specified under Section 16132-Conduit, Fittings and Supports.

E. Provide each pull box with clamps, grids or other supports to which cables are secured so that no cable will have an unsupported length of more than 30 inches.

F. Sheet metal pull box: supported to maintain shape. Larger boxes: formed of structural steel bracing welded into a rigid assembly to maintain alignment in shipment and installation.

G. Should the Utility Company or NEC require barriers between groups of feeders in pull boxes, provide them.

H. All pull boxes (open or closed bottom) shall have a minimum of 6” to 8” of grave based on the bottom.

END OF SECTION

SECTION 16140 (26 27 26)

WIRING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the wiring devices work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

1.2 RELATED SECTIONS

A. Section 16053 - Provisions for Interior Finishing

B. Section 16138 - Outlet Boxes

1.3 SUBMITTALS

A. Submit product data under provisions of Section 01330, “Submittal Procedures”.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide, where indicated, specification grade wiring devices conforming to NEMA requirements and UL approved devices.

B. Switches as follows:
1. Single Pole Switches 20 Amp. 120/277 Volts, Specification Grade, Back and Side Wired, toggle type, and ground screw.

2. Three-way Switches 20 Amp. 120/277 Volts

3. Double Pole Switches 20 Amp. 120/277 Volts

4. Four-way Switches 20 Amp. 120/277 Volts

5. Lighted Handle Pilot Switches 20 Amp. 120/277 Volts (Lights when switch is in the ON position)

C. Receptacles as follows:
1. Duplex Receptacles 20 Amp, 125 Volts grounding type, Specification Grade, Back and Side Wired and with ground screw.

2. Single Receptacles 20 Amp.

3. Ground Fault Interrupter 20 Amp.

4. Combined switch and receptacles: two separate devices utilizing a two-gang box and single cover plate.
5. Surge suppression/audible-visual alarm to be used for computer outlets when outlets are not connected to a computer panel shall be UL1449 listed:

6. Weatherproof receptacles & switch plates: Sierra, WPH-8L.

D. Device plates:
1. 0.040 inch minimum, with struck-up beveled edges, void of sharp corners and multi-gang where required.
2. Unless indicated otherwise, all plates in interior spaces, color: ivory.
3. Plates for exposed work: stainless steel and conform to the dimensions of the cast box.
4. Plates for special finish areas: Hubbell No. 93000-0 Series with No. 8 mirror finish.
5. Chrome plated brass plate are not acceptable.
6. Finish of screws: match finish of plate.
7. Cover plates in food preparation areas, and shops or mechanical areas: stainless steel.
8. Plates for communication/data power outlets: Gray in color.
9. Plates for emergency power outlets: Red in color.
10. Plates for laptop charging carts: Royal blue in color.
11. Provide vinyl plates (non-breakable) in all other areas not mentioned above.

E. Device Color: Selected by the Project Consultant prior to placing orders with device manufacturers. Communication/data power shall be gray in color, emergency power shall be red in color, laptop charging carts shall be royal blue.

F. Tele-Power Poles: Provide and install a combination of power and communication wiring Legrand tele-power poles in accordance with manufacturer's instruction.

G. Emergency Pushbuttons: Red mushroom head, single pole, maintained contact.

H. Time Clocks as follows:
1. Manufacturers
(a) Intermatic
(b) Paragon
(c) Tork or approved equal

2. Enclosure: Type as required to meet conditions of installation unless indicated on the drawings.
3. Type clock to be a 7 day 24 hour, day skipping with minimum 12 hour carryover.

I. Photocell switch:
1. Manufacturers:
(a) Intermatic
(b) Paragon
(c) Tork or approved equal

PART 3 EXECUTION

3.1 INSTALLATION

A. Coordinate wiring device mounting with architectural drawings.

B. Receptacle Devices: in separate circuits from Luminaires.

C. Where 120 volt and 277 volt circuits appear in the same box, provide isolating barrier.

3.2 OUTLETS

A. Install plates and covers on all outlets. Install all devices uniformly in each area.

B. Use 20-ampere switches and receptacles everywhere except as noted.

C. General purpose outlets in Concession areas shall be GFI.

3.3 GROUNDING

A. Grounding contacts of receptacles: connected to a system-grounding conductor (not system neutral) by an insulated copper wire not smaller than #12 AWG, stranded.

B. The resistance between the contact and solid earth ground: not exceed 3 ohms. A bolt and nut connections with washers is an acceptable means to bond to the box.

3.4 MOUNTING

A. Mounting heights (to center line of box):
1. Generally mount outlets 18 inches AFF, unless otherwise noted. Mount switches and dimmers at 44 inches O.C. Mount outlet over counters and centered it he back splash where it occurs and receptacles horizontal.

B. Adjust outlet heights in ceramic tile walls to be entirely in or entirely out of the tile. Outlets to be horizontal to most space conditions.

C. Test each socket of each outlet within a device intended for the purpose. Gang switches and dimmers where feasible.

3.5 SWITCH

A. Group the switches in locations indicated on plans and identify unless otherwise noted.

B. Provide pilot lights and labels for all group toilet light switches located in a remote location.

END OF SECTION

SECTION 16410 (26 28 16)

CIRCUIT BREAKERS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to complete the circuit breaker work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS."

1.2 RELATED WORK

A. Section 16220 - Motor Starters.

B. Section 16230 – Motor Control Centers.

C. Section 16400 - Service and Distribution.

D. Section 16413 - Safety Switches.

E. Section 16430 – Low Voltage Switchgear

F. Section 16440 – Switchboards and Panel boards.

1.3 SUBMITTALS

A. Submit product data under provisions of Section 01330, “Submittal Procedures”.

1.4 SUBSTITUTIONS

A. Submit under provisions of 01630, “Product Substitution Procedures”.

B. Substitutions may be considered when a product becomes unavailable through no fault of the contractor.

1.5 REFERENCES

A. NEMA AB 1 1993 – (National Electrical Manufacturers Association) Molded Case Circuit Breakers and Molded Case Switches

B. UL 489 – (Underwriters Laboratories Inc.) Molded Case Circuit Breaker Enclosures

C. UL943 – Standard for Ground Fault Circuit Interrupters

D. CSA C22.2 No. 5.1 – M91 – (Canadian Standard Association) Molded Case Circuit Breakers

E. Federal Specification W- C – 375b/GEN – Circuit Breakers, Molded Case; Branch Circuit and Services

F. National Fire Protection Association NFPA – 70 (National Electric Code)

PART 2 PRODUCTS

2.1 Manufacturers

A. Square D Company, General Electric, Siemens/ITE, Cutler-Hammer.

B. Circuit breakers:
1. Conform to Federal Specification W-C-375a and NEMA Standard AB-1, unless indicated otherwise.
2. Of the ampere rating, voltage rating, number of poles and class of interrupting capacity (I.C.) as indicated, Interrupting ratings are in root mean square (RMS), symmetrical amperes based on NEMA test procedures.
3. Lugs and terminals: UL approved for copper-aluminum.
4. Accessories: 120 volt.

C. Each circuit breaker: provide a trip unit for each pole with elements providing inverse time delay under overload conditions and instantaneous magnetic trip for short circuit protection, unless indicated as non-automatic. Trip elements: operate a common trip bar to open all elements.

D. All circuit breakers shall be bolted-in type, consisting of the number of poles and ampere ratings as noted on the drawings.

E. Two and three pole breakers shall be of the common trip type.

2.2 Molded Case Circuit Breakers

A. Molded Case Circuit Breakers Characteristics – General
1. Cicuit Breakers shall be constructed using glass reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.
2. Circuit breakers shall have an over center, trip free, toggle operating mechanism which will provide quick – make, quick – break contact action. The circuit breaker shall have common tripping of all poles.
3. The circuit breaker handle shall reside in a tripped position between on and off to provide local trip indication. Circuit breaker escutcheon shall be clearly marked on and off in addition to providing International I/O markings.
4. The maximum ampere and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker.
5. Circuit breakers shall be factory sealed with a hologram quality mark and shall have date code on face of circuit breaker.
6. Circuit breaker/ circuit breaker combinations for series connected interrupting ratings shall be listed by UL as a recognized component combinations. Any series rated combination used shall be marked on the end use equipment along with the statement “Caution – Series Rated System_____A Available. Identical Replacement Component Required.”
7. Circuit breakers shall be equipped with UL Listed electrical accessories as noted on the associated electrical drawings. Circuit breaker handle accessories shall provide provisions for locking handle in the On and Off position.
8. All circuit breakers shall be UL Listed for reverse connection without restrictive line and load markings and be suitable for mounting in any position.

B. Thermal – Magnetic Circuit Breakers
   1. Circuit breakers shall have a permanent trip unit containing individual thermal and magnetic trip elements in each pole.
   2. Thermal trip elements shall be factory preset and scaled. Circuit breakers shall be true rms sensing and thermally responsive to protect circuit conductor(s) in a 40 degree ambient temperature.
   3. Circuit breaker frame sizes above 100 amperes shall have a single magnetic trip adjustment located on the front of the circuit breaker (except type Q2, Q2H, and Q2 – H).
   4. Provide UL Listed HACR circuit breakers where required.

C. Electronic Trip Circuit Breakers With Standard Function Trip System 2000amp maximum
   1. Circuit breaker trip system shall be a micro compressor – based true rms sensing design with sensing accuracy through the thirteenth (13^{th}) harmonic. Sensor ampere ratings shall be as indicated on the associated electrical drawings.
   2. The integral trip system shall be independent of any external power source and shall contain no less than industrial grade electronic components.
   3. The ampere rating of the circuit breaker shall be determined by the combination of an interchangeable rating plug, the sensor size and the long time pickup adjustment on the circuit breaker. The sensor size, rating plug and the adjustment positions shall be clearly marked on the face of the circuit breaker. Circuit breakers shall be Ul Listed to carry 80% or 100% (if service entrance main breaker) of their ampere rating continuously as specified or designed on the associated electrical drawings.
   4. The following time/ current response adjustments shall be provided. Each adjustment shall have discrete settings and shall be independent of all other adjustments.
      (a) Long Time Pickup Instantaneous Pickup
      (b) Long Time Delay (Ground Fault Pickup)
      (c) Short Time Pickup (Ground Fault Delay (I2t OUT only))
      (d) Short Time Delay
      (e) Ground Fault Pickup {Service Entrance Main if required or designed.}
      (f) Ground Fault Pickup {Service Entrance Main if required or designed.}
   5. A means to seal the trip unit adjustments in accordance with NEC Section 240-6(b) shall be provided.
   6. Local visual trip indication for overload, short circuit and ground fault trip occurrences shall be provided.
   7. Long Time Pickup indication to signal when loading approaches or exceeds the adjusted ampere rating of the circuit breaker shall be provided.
   8. Circuit breaker trip system shall be equipped with an externally accessible test port for use with a Universal Test Set. Disassembly of the circuit breaker shall not be required for testing. Test set shall be capable of verifying the operation of all trip functions with or without tripping the circuit breaker.

D. Insulated Case Circuit Breaker With Full Function Trip System 25000 amp and Above.
   1. Circuit breaker trip system shall be a microprocessor – based true rms sensing design with sensing accuracy through the thirteenth (13^{th}) harmonic. Sensor ampere ratings shall be as indicated on the associated [schedules], [drawings].
   2. The integral trip system shall be independent of any external power source and shall contain no less than industrial grade electronic components.

3. Circuit breakers shall be equipped with back-up thermal and magnetic trip system.
4. The ampere rating of the circuit breaker shall be determined by the combination of an interchangeable rating plug, the sensor size and the long – time pickup adjustment on the circuit breaker. The sensor size, rating plug and switch adjustments shall be clearly marked on the face of the circuit breaker. Circuit breakers shall be UL Listed and carry 100% of their ampere rating continuously.
5. The following time/current response adjustments shall be provided. Each adjustment shall have discrete settings and shall be independent from all other adjustments.
   (a) Long Time Pickup Instantaneous Pickup
   (b) Long Time Delay
   (c) Short Time Pickup
   (d) Short Time Delay
   (e) Ground Fault Pickup
   (f) Ground Fault Delay
6. A means to seal the rating plug and trip unit adjustments in accordance with NEC Section 240 – 6(b) shall be provided.
7. Local visual trip indication for overload, short circuit and ground fault trip occurrences shall be provided..
8. Long Time Pickup indication to signal when loading approaches or exceeds the adjusted ampere rating of the circuit breaker shall be provided.
9. Circuit breaker trip system shall be equipped with an externally accessible test port for use with a Universal Test set. Disassembly of the circuit breaker shall not be required for testing. Test set shall be capable of verifying the operation of all trip functions with or without tripping the circuit breaker.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install all circuit breakers as required where indicated on the drawings and where required by the National Electrical Code.

B. Circuit breaker pick-up level and time delay settings shall be adjusted to values indicated on the associated electrical drawings, schedules, coordination study, and or as indicated by the Engineer of Record.

END OF SECTION

SECTION 16413 (26 28 16)

SAFETY SWITCHES

PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to complete the Safety Switches work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS."

1.2 RELATED WORK

A. Section 16225 – Motors and Motor Controls.

B. Section 16230 – Motor Control Centers.

C. Section 16490 - Fuses.

1.3 QUALITY ASSURANCE

A. Conform to National Electrical Code and applicable inspection authority.

1.4 REFERENCES

A. Underwriter's Laboratory, Inc. Annual Product Directories.

B. Classification of standard types of non-ventilated enclosures for Electric Controllers, National Electrical Manufacturer's Association.

1.5 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01330, “Submittal Procedures”.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS & MATERIALS

A. Provide, where indicated, NEMA type HD heavy-duty safety type disconnecting switches in NEMA 1 enclosures. Provide NEMA 3R enclosures for enclosures exposed to wet or rain conditions.

B. Safety switches: Square 'D', ITE, General Electric, Cutler-Hammer, Siemens/ITE heavy duty with enclosures modified to accept the cable connectors as specified under Section 16129 - Terminal Lugs.

C. Switches up to and including 600 amperes: horsepower rated.

D. Provide switches with a quick-make, quick-break operating handle and mechanism, which is an integral part of the enclosure, not the cover.

E. Provide interlocks to prevent opening the cover with the switch in the "On" position or closing of the switch with the door open.

F. Switches: capable of withstanding the available fault or let-through current before the fuse operates without damage or change in rating.

G. Fuse clips, where required: of the rejection type and accommodate dual element, current limiting fuses only. Fuses: as specified under Section 16490 - Fuses.

H. Disconnect or safety switches: provide 2-1/4 inches L (min.) x 3/4 inch H x 1/16 inch thick laminated white core phenolic label plates fastened with screws with the name of the controlled equipment, circuit number, panel and voltage engraved in 3/16 inch high letters.

I. Switches: finished and be painted in the same manner as panel boards and as indicated for normal and emergency power services.

J. Provide complete with padlock hasp.

K. Switches shall have “R” type fuse holders.

PART 3 EXECUTION

3.1 INSTALLATION

A. Provide a horsepower rated disconnect switch adjacent to all motors or packaged equipment. Mount switch in a NEMA 1 enclosure.

B. Mount all switches, disconnects, and controls on back-boards or unistrut.

C. Generally, mount switches and disconnects minimum 4 feet and maximum 6 feet 7 inches AFF (when the handle is at its highest position) readily accessible. Refer to NEC (2008) 404.8 (A).

D. Coordinate with other sections so as not to interfere with service or maintenance accessibility.

E. Mount switches as close as possible to equipment served.

F. Maintain working space as required by NEC.

G. Roof mounted switches: a minimum of 18 inches AFF.

END OF SECTION

SECTION 16490 (26 28 13)

FUSES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the Fuses work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS."

1.2 RELATED WORK

A. Section 16220 - Motor starters.

B. Section 16400 - Service and Distribution.

C. Section 16413 - Safety switches.

D. Section 16440 – Panel boards

1.3 SUBMITTALS

A. Submit product data under provisions of Section 01330, “Submittal Procedures”.

1.4 SUBSTITUTIONS

A. Submit under provisions of Section 01630, “Product Substitution Procedures”.

B. Substitutions may be considered when a product becomes unavailable through no fault of the contractor.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide rejection fuses for all fusible equipment regardless of which section has furnished such equipment.

B. Fuses: of the ratings shown on the drawings, U.L. listed and shall be Bussmann Manufacturing Co., Gould-Shawmut Company, CEFCO, Little Fuse.

C. All fuses: current limiting and have an interrupting capacity of at least 200,000 amperes RMS symmetrical.

D. The time-current characteristics and ratings: such that positive selective coordination is assured.

E. Fuses, 601 amperes and larger: Conform to U.L. Class L standard and be Bussman Type A4BQ, Low Peak, or Gould-Shawmut Form 480 "Amp-trap."

F. Fuses, 600 amperes and lower: where applied to general feeder and branch circuit protection, conform to UL Class RK-1 standards and be Bussmann Type LPN-RK, LPS-RK,"Low Peak", Gould-Shawmut dual element "Amp-Trap."

G. Individual motor circuit fuses: sized at approximately 125 percent of motor full load current.
   1. Fuses, below 600 ampere: conform to UL Class RK-1, time delay, dual element standards and be Bussmann Type LPN-RK, LPS_RK, "Low-Peak", Gould-Shawmut dual element "Amp-trap."
   2. Fuses, 601 amperes and larger: conform to UL Class L standards and be Bussmann Type KRP-C "Low-Peak", Gould-Shawmut Form 480 "Amp-Trap."

H. Fuses, where required for circuit breaker protection: conform to U.L. Class RK-1 standards and be Bussmann Type RPN-RK or LPS-RK, Low Peak, or Gould-Shawmut Class RK1 "Amp-trap".

I. Coordination and current limitation for the protection of each part of the electrical system must be designed around the type and class and manufacturer selected for that type and class.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install all fuses as required where indicated on the drawings and where required by the National Electrical Code, special attention given to air conditioning equipment.

B. Provide 10 percent spares (minimum of three) of each size and type of fuses furnished. Spare fuses: placed in a wall-mounted cabinet, Bussmann SFC which is located in the switchgear room.

END OF SECTION

SECTION 16520 (26 56 00)

EXTERIOR LUMINAIRES

PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide all labor, materials, necessary equipment and services to complete the Luminaires work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS."

1.2 RELATED SECTION

A. Section 03300 – Cast – In – Place Concrete

B. Section 03415 – Precast Prestressed Concrete

C. Section 16050 – Basic Materials and Methods

D. Section 16060 – Grounding

E. Section 16080 – Electrical Inspection and Testing

F. Section 16120 - Wires and Cables.

G. Section 16130 – Raceways and Boxes

H. Section 16132 - Conduits, Fittings and Supports.

I. Section 16138 - Outlet Boxes.

1.3 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01330, “Submittal Procedures”.

B. At the Project Consultant's request, submit for review and approval one representative sample of any luminaire or luminaire component required under the contract. Tag the luminaires or components with the name of the project and ship to the address specified by the Project Consultant. After review, the luminaire or luminaires will be shipped to the Project Consultant at the project for use as a standard. All charges for these shipments, prepaid by the Contractor. Luminaires under the contract: identical with the approved luminaire. No luminaire used as a sample will be allowed to be installed on the project. In the event the submissions are disapproved, the luminaires will be returned to the Contractor who immediately makes a new submission of luminaire or luminaires meeting the contract requirements.

C. Provide Photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing & Calculation Guides, of each lighting fixture type. The adjustment factors shall be for lamps, ballasts, and accessories identical to those indicated for the lighting fixture as applied in this

Project. Solid state LED lighting photometric data based on IES LM-79 laboratory tests of each luminaire type, complete with indicated LED engines, power supplies, operating current in milliamps (mA), and accessories.

D. Provide LED engines, including life based on IES LM-80, output based on IES LM-79 testing methods, CCT, CRI, lumens, operating current in milliamps (mA), and energy-efficiency data.

E. Provide a list of all LED light engine and driver types used on Project; use manufacturers' codes.

F. Provide recommended LED light engine and driver replacement schedule for each lamp type based on manufacturer's listed lamp life ratings

G. The Contractor: submit shop drawings for the Project Consultant's approval of a sufficient size to show necessary detail for each luminaire type, and its components. Catalog cuts or scale drawings will not be acceptable.

H. Shop drawings include but not be limited to:
   1. Manufacturer's dimensioned scale drawings showing in complete detail the fabrication of all luminaires including finishes, metal thickness, fabrication methods, support method, ballasts, sockets type of shielding, reflectors, provisions for relamping, EPA for, and all other information to show compliance with the Contract Documents.
   2. Submit shop drawings and samples as requested of luminaires for approval before fabrication. Luminaire details may vary slightly from those shown on drawings provided the changes do not adversely affect size of installation, durability of luminaire, luminaire performance or appearance. Submitted samples may be subjected to photometric testing at an independent testing laboratory, refer to Section 01430, “Quality Assurance”.
   3. Shop drawing sheets and supporting calculations that contain structural information shall be signed and sealed by a Florida Registered Professional Engineer.

1.4 QUALITY ASSURANCE

A. Conform under provisions of Section 01430, “Quality Assurance”.

B. Materials, equipment and appurtenances as well as workmanship provided under this section: conform to the highest commercial standard and as specified and as indicated on drawings. Luminaire parts and components not specifically identified or indicated: made of materials most appropriate for their use or function and as such resistant to corrosion and thermal and mechanical stresses encountered in the normal application and functioning of the luminaires.

C. All cast parts, including die-cast members: of uniform quality, free from blow holes, pores, hard spots, shrinkage defects, cracks or other imperfections that affect strength and appearance, or are indicative of inferior metals or alloys. Exterior surfaces which do not otherwise receive a finishing coating: machined, sanded or similarly treated areas, such as extruded metal parts. All such finished castings: given a minimum of one (1) coat of baked-on clear methacrylate lacquer unless a painted finish is specified.

D. Manufacturer shall have a minimum of 10 years of experience in the design and production of their products listed in this section.

1.5 REFERENCES

A. Conform under provisions of Section 01420, “References”.

B. Luminaires and components made under provisions of the N.E.C. and bear the UL label.

C. PCI Design Handbook, 6th edition, PCI MNL – 120-04.

D. Manual for Quality Control for Plants and Production of Structural Precast Concrete Products, PCI MNL – 116.

E. Guide for the Design of Prestressed Concrete Poles, PCI JR – 412.

F. AASHTO Standard Specification for Highway Bridges.

G. ACI Building Code Requirements for Structural Concrete – ACI – 318.

H. ASTM International (ASTM)
1. A-36 Specifications for Carbon Structural Steel.
2. A-82 Specifications for Steel Wire Plain for Concrete Reinforcement.
3. A-153 Standard Specifications for Zinc Coating (Hot Dip) on Iron and Steel Hardware.
4. A-416 Standard Specifications for Steel Strand, Uncoated Seven Wire for Prestressed Concrete.
5. A-615 Specifications for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
6. B-246 Standard Specifications for Zinc and Zinc-aluminum (ZA) alloys in ingot form for foundry and die.
7. C-494 Standard Specifications for Chemical Ad Mixtures for concrete.
8. C-618 Standard Specifications for Coal Fly Ash and Raw or Calcined Natural Pozzulan for use in concrete.

1.6 DELIVERY, STORAGE AND HANDLING

A. Conform under provisions of Section 01663, “Product Delivery, Storage and Handling Requirements”.

B. Luminaires and lighting equipment: delivered, stored and handled to the project complete, including mounting devices, lamps and components necessary for the proper operation of the equipment.

C. It is the Contractor's sole responsibility for proper shop drawing submittal, order and release of orders for any and all luminaires, assurance of delivery dates by manufacturers, etc., in order as to not delay the project in any manner.

1.7 APPLICABLE DOCUMENTS

The Latest adopted edition of the following codes or standards shall apply to the design and fabrication of the products and equipment to be supplied by this Section.

A. Latest edition of Illuminating Engineering Society of North America (IESNA) handbook.

B. ANSI C78.379—Electric Lamps—Incandescent and High-Intensity Discharge Reflector Lamps—Classification of Beam Patterns

C. ANSI C82.1—Ballasts for Fluorescent Lamps—Specifications

D. ANSI C82.4—Ballasts for High-Intensity Discharge Lamps (Multiple Supply Type).

E. ANSI C82.16—American National Standard for Light Emitting Diode Drivers—Method of Measurement

F. ANSI/NFPA 70—National Electrical Code

G. ANSI/NFPA 101—Life Safety Code

H. UL 8750—Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products

I. UL 8750 Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products

J. UL 1012 – Standard for Light Emitting Diode (LED) drivers

K. State Requirements for Educational Facilities – SREF

1.8 QUALIFICATIONS

A. Photometric data of independent, nationally recognized testing agencies will be accepted.

B. Photometric data of testing laboratories of luminaire manufacturer's may be accepted if certified and approved by the Project Consultant.

C. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.
   1. LED Fixtures: Test in accordance with IES LM79 & LM80.

1.9 PARKING LOT LIGHTING

A. Minimum of one (1) maintained foot-candle with a maximum of 12/1 and not to exceed 0.05-watts/sq ft.

B. Indicate light loss factor.
   1. Suggested MH Luminaires LLF = 0.75. HPS Luminaires LLF = 0.90
   2. SBBC reserves the right of actual performance verification.
   3. Computer analysis shall be based on a ten (10) ft grid.

1.10 WARRANTY

A. Warranty all equipment and the installation to be free of faulty workmanship.

B. Lamps and ballast shall be warranted as a combination installation for a minimum of five (5) years from the date of final Substantial Completion.

C. LED luminaires and drivers shall be warranted for (5) years from the date of Final Substantial Completion.

1.11 SUBSTITUTIONS

A. Conform under provisions of Section 01630, “Product Substitution Procedures”.

B. Substitutions may be considered when a product becomes unavailable through no fault of the contractor.

PART 2 PRODUCTS

2.1 MATERIALS

A. Concrete- The pole shall achieve a minimum 28-day compressive strength of 8,000 psi. Cement shall conform to the latest requirements of Type III Portland Cement in accordance with ASTM-C150. Maximum size aggregate may be 3/4 inch (19mm) or 3/4 of the clear spacing between reinforcing steel and surface of pole. Any water reducers, retarders, or accelerating admixtures shall conform to ASTM-C494. Water shall be free from foreign materials in amounts harmful to concrete and embedded steel. Fly ash if used shall conform to ASTM-C618.

B. Reinforcing Steel- Deformed steel reinforcement shall conform to requirements of ASTM-A615 for Grade 60 Rebar.

C. Prestressing Steel- Prestressing steel reinforcement shall conform to uncoated 7-wire, stress-relieved strand; ASTM-A416.

D. Spiral Reinforcement- Steel spiral reinforcement shall conform to the requirements of ASTM-A82 and shall not be less than .150-inch diameter.

E. Hardware- All structural steel shall conform to ASTM-A36 and zinc alloy AC41A shall conform to ASTM-B240. The finish shall be hot dipped galvanized in accordance with ASTM-A153.

F. Anchor Bolts – Conform to ASTM A36, galvanized per ASTM A153. Threaded end to be HDG for minimum of 12-inch nuts, washers and spacers to be HDG Steel.

2.2 FINISHES

A. Luminaire finishes:
   1. Applied in a manner that will assure a durable wear-resistant surfacing.
   2. Prior to finishing, hot clean surface by accepted chemical means and receive corrosion inhibiting (phosphating) treatment assuring positive paint adhesion.
   3. Exposed metal surfaces, except chromium plated parts: given an even coat of high-grade methacrylate lacquer, or transparent epoxy.
   4. Aluminum surfaces exposed to weather: receive a duranidic finish for corrosion resistance.
   5. Sheet steel luminaire housings, iron and steel parts, which have not received phosphating treatment ("Bonderizing" or similar process) as outlined above or are to be utilized in exterior applications: made corrosion resistant by zinc or cadmium plating, or hot-dip zinc galvanizing after completion of all forming, welding, or drilling operations.
   6. Minimum thickness of above protective coatings:
      (a) Hot galvanized zinc coating - .0005 inch.
      (b) Cadmium plating - .0001 inch. Electroplate parts operated under temperatures injurious to hot-dipped galvanizing.

B. Painted reflectors:
   1. Completely formed before application of primer and enamel color coat or coats.
   2. Reflectors and reflector bodies for fluorescent lamp luminaires having baked-on white synthetic enamel finish: made of steel of the thickness specified and given a suitable primer and white color coat or coats properly applied.

C. When requested by the Project Consultant, submit a sufficient quantity of flat steel panels having the identical primer and color coat or coats applied in the same manner as proposed for the contract items, for subjection to any one or all of the tests listed herein by an owner approved independent testing laboratory. The panels: suitable size and drilled as necessary for a particular test procedure. The Contractor: bear the cost of all required tests.

2.3 LAMPS

A. Provide electric lamps as shown on reviewed shop drawings plus 10 percent additional spare lamps of all types to the Owner at project site upon completion.

B. Lamps as specified for the individual luminaires or lighting equipment: delivered and installed in luminaires and lighting equipment leaving these completely lamped and in normal operating condition.

C. Lamps produced by the following manufacturers are acceptable:
   1. General Electric.
   2. Osram/Sylvania Lighting.
   3. Phillips.
   4. Lithonia
   5. BCPS approved equal

D. Fluorescent lamps: rapid start, 32-watt, T8 (2900 Lumens) cool white, energy savings unless specifically noted otherwise.

E. Incandescent lamps – Not allowed:
   1. Avoid using incandescent light fixtures unless is absolutely necessary

F. LED lamps:
   1. Minimum CRI of 80 with a color temperature of 4000-4500ºK for exterior fixture, unless otherwise noted in the Contract Documents.
   2. Minimum rated life of 60,000 hours at 25ºC ambient temperature.
   3. LED lighting fixtures shall be assembled in the USA with minimum 80% materials content from the USA.
   4. LED fixtures shall be provided with a minimum 5-year warranty on entire fixture (all components).
   5. Luminaires must be rated for -40°C to +50°C operation.
   6. Minimum Color Rendering Index (CRI) of 80.
   7. Fixtures shall be Energy Start or Design Lights Consortium "DLC" labeled / qualified.

2.4 LED DRIVER REQUIREMENTS

A. Power Supply Units (PSUs) including drivers must meet the following requirements:
   1. Must have a minimum efficiency of 85%.
   2. Must be rated to operate between -40°C to +50°C
   3. Input Voltage: capable of 120 to 277 (±10%) volt, single phase as required by the site.
   4. Power supplies can be UL Class I or II output.

5. Operating frequency must be 60 **Hz.**
6. LED driver and LED module shall be accessible and replaceable from below.
7. Drivers must have a Power Factor **(PF)** of 0.95 or higher. with integral short circuit, open circuit and overload protection.
8. Drivers must have a Total Harmonic Distortion **(THD)** of <20%.
9. Drivers must comply with FCC 47 CFR part 15 non-consumer RFI/EMI standards.
10. Drivers must be Reduction of Hazardous Substances (RoHS) compliant.

2.5 REFLECTORS

A. Reflectors and reflecting cones or baffles: fabricated from #12 aluminum reflector sheets, 0.57: (15 gage) or heavier, all absolutely free of any tooling marks including spinning lines, and be free of any marks or indentations caused by riveting or other assembly techniques. Ensure that no rivets, springs or other hardware are visible after installation.

B. Reflectors and baffles: of first quality polished, buffed and anodized finish, "Alzak" or approved equal, and be of specular finish color as selected by Architect. Reflector and baffles: modified elliptical contour and produce no apparent brightness from nadir to 40 degrees above nadir, nor the lamp image nor any part of the lamp be visible from nadir to 40 degrees above nadir.

C. Full Cutoff Classification. Luminaire will not emit light 90 degrees above nadir.

D. Other aluminum reflectors, where required:
1. Formed and finished as noted on drawings and elsewhere in the specifications.
2. The reflectors: free from blemishes, scratches, or indentations which would distort their reflective function, and finished by means of the "Alzak" process, or approved equal unless otherwise noted.

E. Submit samples of colored aluminum finished (black, brass, bronze, etc.), for approval before fabrication.

2.6 LAMP HOLDERS

A. Lamp sockets: rigidly and securely attached to luminaire enclosure or husk.
1. Incandescent and metallic vapor lamp sockets: of heavy-duty heat-resistant porcelain type.
2. Plastic or metal sheet sockets: do not use unless specified.
3. Fluorescent lamp sockets operating with an open circuit voltage in excess of 300 volts: of the safety type and open the supply circuit when the lamp is removed from the sockets.

2.7 LUMINAIRE-MOUNTED PHOTOELECTRIC RELAYS (Allowed only when EMS is not available)

A. Comply with UL 773 or UL 773A

B. Contact Relays: Factory mounted, single throw, designed to fail in the on position, and factory set to turn light unit on at 1.5 to 3 fc and off at 4.5 to 10 fc with 15-second minimum time delay.
1. Relay with locking-type receptacle shall comply with ANSI C136.10.
2. Adjustable window slide for adjusting on-off set points.

2.8 WIRING

A. Wiring between fluorescent lamp holders and associated operating and starting equipment: of similar or heavier gauge than the leads furnished with the approved types of ballasts and have equal or better insulating and heat resisting characteristics. All wiring within luminaire or from the luminaire to the splice with the building wiring: as specified under Section 16120 - Wire and Cables.

B. Wire within housing: entirely covered with flexible woven fiberglass sleeve. Protect wiring with tape or tubing at all points where abrasion may occur. Conceal wiring within luminaire construction except where the luminaire design or mounting dictates otherwise.

C. Connections of wires to terminals of lamp holders and other accessories must be made in a neat and workmanlike manner and be electrically and mechanically secure with no protruding loose strands. The number of wires extending to or from the terminals of a lamp holder or other accessory shall not exceed the number that the accessory is designed to accommodate.

D. Joints in wiring within luminaires and connections of the luminaire wiring to the wiring of the building are as specified under Section 16120 - Wire and Cables.

E. Wiring channels and wire ways: free from projections and rough or sharp edges throughout, and all points or edges over which conductors must pass and may be subject to injury or wear shall be rounded or bushed.

F. Insulated bushings: installed at points of entrance and exit of flexible wiring.

G. Manufacture junction boxes attached to luminaires under provisions of National Electrical Code and approved for the number of conductors indicated on the drawings. Supplementary junction boxes: installed where required to comply with Code.

2.9 EXTERIOR LIGHTING

A. Provide a fuse holder and fuse in the primary side of each ungrounded conductor for all ballasts, at the hand hole of each exterior pole mounted luminaire or junction box for each wall mounted luminaire.

B. Ballasts: CWA for designated voltage.

C. Advance, Jefferson, GE, Sola, Universal.

2.10 PARKING LOT ILLUMINATION

A. Provide illuminance computer printouts for all parking lots.

B. Provide one (1) minimum maintained footcandle with a maximum to minimum ratio of 12/1.

2.11 FACADE ILLUMINATION

A. Illumination of facade: accomplished with multiple controlled beam floodlights as shown on luminaire schedule. Floodlights: contained in aluminum-fabricated housings mounted vertically on the face of each pole.

B. Luminaires: provide five (5) foot-candles average with a maximum to minimum of 4:1.

C. Provide computer printout of point-by-point vertical foot-candles with the shop drawings and prior to fabrication.

D. All exterior canopy lighting to be vandal resistant.

2.12 LIGHTING CONTACTOR

A. Electrically operated, mechanically held, double break silver alloy contacts. Fully rated for tungsten lamp loads, fluorescent lamp loads and general use loads. Interrupting capacity: 300 percent of rated current. NEMA I enclosure except otherwise specified. A manufactured by: Asco-920RC, Square 'D' - Class 8903, General Electric - CR160MB, Westinghouse A202.

2.13 MODULAR RELAY PANEL

A. Comply with UL 508 and UL 916; factory assembled with modular single pole relays, power supplies, and accessory components required for specified performance.
   1. Cabinet: Steel with hinged, locking door.
      (a) Barriers separate low-voltage and line-voltage components
      (b) Directory: Mounted on back of door. Identifies each relay as to load groups controlled and each programmed pilot device if any.
      (c) Control Power Supply: Transformer and full-wave rectifier with filtered dc output.
   2. Single-Pole Relays: Mechanically held unless otherwise indicated; split-coil, momentary-pulsed type.
      (a) Low-Voltage Leads: Plug connector to the connector strip in cabinet and pilot light power where indicated.
      (b) Rated capacity (Mounted in Relay Panel): 20A, 125V AC for tungsten filaments; 20A, 277V AC for ballasts.
      (c) Endurance: 50,000 cycles at rated capacity.
      (d) Mounting: Provision for easy removal and installation in relay cabinet.

2.14 POLES

A. General
   1. Concrete poles shall be prestressed and the concrete placed in steel molds by the centrifugal spinning process, or by static casting methods.
   2. Poles shall be designed to conform to ACI – 318.
   3. Concrete poles shall have a smooth natural form finish, soft gray in color.
   4. Defects that will not impair the functional use or expected life of the precast poles may be repaired by a method that does not impair the product. Proprietary repair methods shall be used in accordance with the manufacturer’s directions.
   5. Poles shall be designed and constructed so that all wiring and grounding facilities are concealed within the pole. All hand holes, couplings, inserts for step bolts, thru-bolt holes and ground wire shall be cast into the pole during the manufacturing process.
   6. Poles shall be round or square in cross section and provide a continuous taper of a minimum.18" per foot of length to maximum of 0.25” per foot and provide a minimum 1 1/4” of concrete coverage over the reinforcing steel, but not less than ACI-318 requirements.

7. All cable entry holes shall be in accordance with the location and sizes as required by the buyer and shall be free from sharp edges for passages of electrical wiring. All hand hole frames shall be composed of a non-metallic, non-conductive injection molded material.

B. Wind Loading:
1. Poles, façade, base, anchorage and foundations shall be designed considering application of wind load and dead load, in accord with ASCE 7-10 with V=180 mph and Exposure C.
2. The moment at any point along the length of the pole is the sum of the moments resulting from dead loads and forces from wind loads. The wind force is equal to the wind pressure multiplied by the effective projected area (EPA) of the objects involved.
3. Design: Per the Florida Building Code-2010.
4. Submit computations signed and sealed by a Licensed Florida Engineer of wind loading for approval showing compliance with wind loading requirements.

C. Material: Concrete, as specified.

D. Bases: Cast – in – Place or Precast Concrete

E. For additional requirements for the manufacture and installation of concrete poles, refer to applicable portions of Section 03415.

2.15 FOUNDATIONS

A. Design of Foundation and/or precast base shall be based on soil conditions and recommendations of the Geotechnical Engineer and shall be included in the design calculations required under 2.13(B)(4) above.

B. For direct embedment, backfill shall be type A-3 granular material, compacted with 12” lifts or concrete flowable fill.

C. Provide pull boxes in compliance with Section 16137 – Pull and Junction Boxes.

D. Electrical Contractor: responsible for providing concrete foundations for all poles.

E. Provide one PVC conduit for a grounding conductor.

2.16 GROUNDING

A. Ground all poles under provisions of Section 16060 - Grounding.

2.17 IDENTIFYING DEVICES

A. An aluminum nameplate cast into the wall of the pole approximately 4' 5" above the ground line identifying the manufacturer, manufacture date, length, weight, class, customer, fabrication # and P.O. #.

PART 3 EXECUTION

3.1 INSTALLATION

A. Luminaire locations as indicated on the drawings are generalized and approximate. Carefully verify future locations with Architectural Plans and other reference data prior to installation. Check for adequacy and non-interference with other equipment.

B. Install LED engines in each luminaire if not factory installed.

C. Fasten luminaire to indicate structural supports.

D. Manufactured poles shall be lifted and supported during manufacturing, stockpiling, transporting and erection operations only at the points shown on the shop drawings.

E. Transportation, site handling, and erection shall be performed with acceptable equipment and methods, and by qualified personnel.

F. Upon completion of the installation, the luminaires and lighting equipment must be in first class operating order and free from defects in condition and finish. At time of final inspection, all luminaires and equipment must be fully lamped, and be complete with required lenses of diffusers, reflectors, side panels, louvers or other components necessary for the functioning of the luminaires. Luminaires and equipment: clean and free from dust, plaster or paint spots. Any reflectors, lenses, diffusers, side panels or other parts damaged prior to the final inspection must be replaced by the Contractor.

G. Housings installed directly in concrete: fabricated of hot dip galvanized steel or cast aluminum. Where cast aluminum housings are used, provide two coats of asphaltum paint prior to installation.

H. Provide 1/8-inch thick x 2-inch diameter solid neoprene grommets at every mounting point for all luminaires surface mounted to concrete structure to prevent direct contact of housing to concrete.

I. Adjust all directional luminaires to obtain the most uniform distribution. Orient all similar luminaires consistently. Coordinate luminaires with speakers, air grilles, pipes and ductwork.

J. Following construction of poles and any ancillary construction the surrounding area shall be restored to its original condition or better to the satisfaction of the owner.

K. Provide all necessary hangers and mounting accessories for a complete installation.

3.2 ADJUSTMENT

A. After the installation of luminaires is completed, adjust luminaires after dark under the supervision of the Project Consultant at no additional cost to the Owner.

B. Upon the completion of the installation of all luminaires, turn on for a continuous period of 48 hours and during that time; replace any burned-out lamps, defective ballasts or fuses, etc.

END OF SECTION

SECTION 16528 (26 56 68)

SPORTS LIGHTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the Sports Lighting work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

B. Provide luminaires complete with lamps, required ballast's, lighting arrestors, poles and all required accessories.

C. Submit shop drawings and catalog cuts for each item scheduled, including but not limited to, dimensioned drawings, photometric characteristics, ballast specifications, finish, mounting accessories and lamp requirements.

D. Submit the luminaire manufacturer's computer point-by-point diagram indicating the foot-candle readings to be achieved after completion of the installation and aiming of the fixtures for all sports field lighting.

E. Submit the luminaire manufacturer's degree aiming diagram for use by the Project Consultant for all sports field lighting.

1.2 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01330, "Submittal Procedures".

B. Shop Drawings: Materials shall not be purchased until approved. Include copy of ballast warranty for each type of ballast required.

C. Manufacturer's Data: Fixture brochures shall contain manufacturer's name, catalog illustration and number, dimensions, details, ballast and diffuser information, metal gages, pre-treatment and paint data, UL-ETL approval and connection details. Provide EPA wind loading for each type of pole specified.

D. Shop Drawings and supporting calculations relating to illumination, foundation and wind pressure loading shall be signed and sealed by a Florida Licensed Professional Engineer.

1.3 PRODUCT HANDLING

A. Conform under provisions of Section 01663, "Product Delivery, Storage and Handling Requirements".

B. Deliver fixtures and poles sufficiently in advance of installation to prevent delay of work.

C. Store all materials in closed building, in original packaging, protect from damage and the elements.

1.4 SPORTS FIELD CONTROLS

A. Each sports field lighting system: Automatic time based control to turn on and off thru electrically operated mechanically held lighting contactors as detailed on the drawings with manual override capablility. Provides the following function from a single control station, with multiple control stations as indicated:
   1. Control Station: Key-operated master switch, manual push-button controls, and system status indicator lights. (Refer to 1.8.B.5)

1.5 RELATED WORK

A. Section 02586 - Exterior Electrical Work Underground.

B. Section 16120 - Wire and Cables.

C. Section 16137 - Pull and Junction Boxes.

D. Section 16138 - Outlet Boxes.

1.6 QUALITY ASSURANCE

A. Conform under provisions of Section 01430, “Quality Assurance”.

B. All luminaires: UL labeled.

C. Fuse all ballast with dual element type fuses or manufacturer’s required fuse.

D. Ballast’s to conform to N.E.C., high power factor, CBM and ETL approved, non-attenuating voltage as required or specified.
   1. Selection and application of ballast’s by luminaire manufacturer to conform to ambient temperature of luminaire and luminaire quantity.
   2. Provide fuses as specified in addition to any required internal thermal protection.

E. Sports field luminaire manufacturer to guarantee that the foot-candle levels indicated on his computer point by point diagrams will be achieved after proper aiming of the luminaires under provisions of manufacturer's degree aiming diagram.
   1. If after installation, aiming and adjustment, the sports lighting does not provide the foot-candle levels indicated on the computer point diagrams, the sports luminaire manufacturer/contractor will, at no additional cost to the Owner, provide additional luminaires provided under this Contract and take any other action necessary (i.e. replace/add poles, wiring, switchgear, etc.) to remedy the lighting performance to achieve the guaranteed foot-candle levels.
   2.

F. Complete luminaire assembly shall resist wind pressures calculated per ASCE 7-05 for 140 mph wind, Category C, I= 1.15.

1.7 SUBSTITUTIONS

A. Submit under provisions of Section 01630, “Product Substitution Procedures”.

B. Substitutions may be considered when a product becomes unavailable through no fault of the contractor.

1.8 LIGHTING PERFORMANCE

A. The manufacturer: supply lighting equipment to meet or exceed the following performance criteria:
   1. Name of Facility:
      (a) The performance criteria requires lighting equipment which will provide constant light levels guaranteed for 25 years.

Area of Lighting	Average Constant Light Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Baseball Infield	50 footcandles	2:0:1.0	25	30’ x 30’
Baseball Outfield	30 footcandles	2.5:1.0	TBD	30’ x 30’
Softball Infield	50 footcandles	2:0:1.0	25	20’ x 20’
Softball Outfield	30 footcandles	2.5:1.0	TBD	20’ x 20’
Football	50 footcandles	2.5:1.0	72	30’ x 30’
Track	30 footcandles	3:0:1.0	48	10’ x 10’
Soccer	30 footcandles	3.0:1.0	TBD	30’ x 30’
Basketball	30 footcandles	3.0:1.0	50	10’ x 10’
Tennis	50 footcandles	2.0:1.0	15	10’ x 10’

   2. Spill/Glare Light - Designated Areas
      (a) Maximum spill light values - light levels: Do not exceed the designated maximum foot-candles or average foot-candles.

B. LIFE CYCLE COSTS
   1. Energy Consumption: The average kWh consumption for the field lighting system shall be (enter value according to project type) or less. Maximum kW consumption shall not exceed (enter value according to project type) .
   2. Complete Lamp Replacement: Manufacturer shall include all group lamp replacements required to provide 25 years of operation based upon (enter value according to project type) usage hours per year.
   3. Preventative and Spot Maintenance: Manufacturer shall provide all preventative and spot maintenance, including parts and labor for 25 years from the date of equipment shipment. Individual lamp outages shall be repaired when the usage of any field is materially impacted. Owner agrees to check fuses in the event of a luminaire outage. Manufacturer will, however, provide additional fuses (parts only) in order to comply with 25 year warranty.
   4. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The manufacturer shall notify the owner of outages within 24 hours, or the next business day. The controller shall determine switch position (Manual or Auto) and contactor status (open or closed).
   5. Remote Lighting Control System: System shall allow owner and users with a security code to schedule on/off system operation via a web site, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.

      The owner may assign various security levels to schedulers by function

and/or fields. This function must be flexible to allow a range of privileges such as full scheduling capabilities for all fields, to only having permission to execute "early off" commands by phone.

Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.

6. Management Tools: Manufacturer shall provide a web-based database of actual field usage and provide reports by facility and user group.
7. Communication Costs: Manufacturer shall include communication costs for operating the controls and monitoring system for a period of 25 years.
8. 25-Year Life Cycle Cost: Manufacturer shall submit 25-year life cycle cost calculations as follows. Equipment price and total life cycle cost shall be entered separately on bid form.

a.	**Luminaire energy consumption** # luminaires x __kW demand per luminaire x .22(obtained from FPL) kW rate x <Enter #> annual usage hours x 25 years		
b.	**Cost for spot relamping and maintenance over 25 years** Assume <Enter # or assume 7.5 > repairs at $ <Enter $ or assume $1000 > each if not included	+	
c.	**Cost to relamp all luminaires during 25 years** <Enter #> annual usage hours x 25 years / lamp replacement hours x $125 lamp & labor x # fixtures	+	
d.	**Extra energy used without base bid automated control system** $ Energy consumption in item a. less base bid energy consumption of <Enter (a) from above x 15% > .	+	
	TOTAL 25-Year Life Cycle Operating Cost	=	

1.9 ALTERNATE SYSTEM REQUIREMENTS

A. Compliance to Specifications: Acceptance of a bid alternate does not negate the contractor and lighting manufacturer's responsibility to comply fully with the requirements of these specifications. Any exceptions to the specifications must be clearly stated in the prior approval submittal documents.

B. Light Level Requirements: Manufacturer shall provide computer models guaranteeing light levels on the field over 25 years. If a constant light level cannot be provided, a maximum Recoverable Light Loss Factor of 0.70 shall be applied to the initial light level design to achieve the maintained light levels according to project type. For alternate systems, scans for both initial and maintained light levels shall be submitted.

C. Revised Electrical Distribution: Manufacturer shall provide revised electrical distribution plans to include changes to service entrance, panel and wire sizing if maximum kW consumption is not met.

D. Controls and Monitoring: Alternate manufacturer shall provide one hour meter per field in order to accurately measure field usage hours for the purpose of proactive scheduling of lamp changeouts.

PART 2 PRODUCTS

2.1 LUMINAIRE ASSEMBLY

A. General Description:
1. The luminaire assembly: consist of lamp, lamp socket, reflector, lens, lamp cone, reinforcing retaining ring, adjustable aiming mounting device, ballast, steel cross arms, integral wiring enclosed in rigid raceway, pole clamps and be Sportscluster Green/Light Structure Green luminaries as manufactured by Musco Sports Lighting, LLC or approved equal.
2. The structural coating: hot dipped galvanized ASTM A-123.
3. Spill-Light Control Devices: Internal louvers and external baffles furnished by manufacturer and designed for secure attachment to specific luminaire.

B. Items to be submitted for consideration of an alternate luminaire assembly and lighting layout: as listed below. Failure to provide any of the following information with the alternate submittal will be grounds for rejection of the alternate. Provide each item listed below in the form of clear and concise statements and plans and drawings, which can be easily read and clearly lettered to correspond with the following list. Provide all items assembled in the order indicated and secured or bound in a neat and orderly fashion for easy use and reference. Bidders requesting to use equipment other than that specified: submit ten (10) days prior to bid opening the following:
1. Layout Drawing: Overall lighting layout design showing luminaire mounting heights.
2. Aiming Drawing: Light aiming point plan showing focus points and reflector types.
3. Luminaire Assembly Drawing: A drawing of the luminaire assembly and its interface to the required poles. The drawing shows size, strength, type of material, coating of all components, and hardware meet the following specifications:
   (a) Structural Strength: Ensure the luminaire assembly, as show in the manufacturer's submittal, complies with SREF, current adopted edition, ASCE 7-05 and the Florida Building Code.
   (b) Coatings:
   (c) All component surfaces of the completed assembly, except for the reflector, hardware and fasteners: shall be not dipped galvanized ASTM A-123 or as ASTM A-153 as applicable.
   (d) Reflector: of die cast aluminum.
   (e) Hardware: of an approved corrosion resistant material or coating.
   (f) Fasteners shall be stainless steel.
   (g) Reflector and lamp supports: Fasten the reflector to the lamp cone with a reinforcing retaining ring containing an acrylic compressed fiber ring which centers and stabilizes the lamp in the reflector and provides a heat shield to protect the lamp socket from heat.
   (h) Lens:
   (i) Attach a removable lens to the reflector and be impact and thermal resistant glass.
   (j) The lens rim: stainless steel and attached to the reflector with hinged cable or chain.
   (k) Aiming:
   (l) The manufacturer: provide a memory positioning device for each luminaire on the assembly which will be set at the factor by the manufacturer based upon computer calculated aiming information such that each assembly is delivered to the job site as one composite light source.
   (m) The device: provide positions for the initial installation and provide for repositioning of the aiming after relamping.

(n) The manufacturer: supply drawings showing the aiming point locations of each luminaire.

(o) Field Alignment: Provide luminaire assembly from the factory to the job site as a unit, which may be universally oriented in a manner that the entire luminaire assembly can be field aimed as a single unit.

(p) Computer Models - Field Light Values:

(q) Manufacturer: submit a computer derived lighting scan, with spill/glare control showing point by point horizontal foot-candle levels, maximum to minimum ration, number of luminaires and initial lamp lumens.

(r) Manufacturer: submit with this computer derived lighting scan, information on the number and type of fixtures being used and kilowatt consumption for the lighting system.

(s) Computer Model - Extended Scans:

(t) Manufacturer: submit a computer derived lighting scan with spill/glare control showing the following:

(u) Point by point horizontal foot-candles.

(v) Point by point maximum foot-candles as explored in any plane.

(w) Manufacturer: submit these scans showing the above reading on a line 150 feet from the Boundary of the playing field. Starting at the lower left hand corner of the field, the point by point foot-candle reading: show every 30 feet on the line and the maximum reading to be found anywhere on the line will be shown. Also, show the average foot-candles on the line. These scans: reflect the spill light readings as defined in the spill light performance section.

(x) Equipment Model Numbers: Written statements of model number and manufacturer for all equipment. Submit a packet of descriptive literature on all equipment bid, as well as drawings and specifications of the luminaire assembly.

(y) Luminaire Assembly Warranty: Written warranty from the manufacturer covering luminaire assembly and equipment replacement policy for a period of 25 years from the date of installation.

(z) Aiming Alignment Warranty: Written warranty from the manufacturing company headquarters covering the aiming alignment of the luminaire assembly for a period of 25 years from the date of installation.

(aa) Wind Load Engineer's Certification: By Florida Licensed Structural Engineer, independent of manufacturer, verify and stamp wind load test of luminaire assembly to meet or exceed structural wind pressures as specified in this section.

(bb) Bidder: supply for the owner's review, a copy of the Underwriters Laboratory report covering the luminaire assembly being bid.

(cc) Verification of demonstrated Field Technology: The manufacturer must submit in writing documented proof showing a minimum of five (5) such similar lighting projects where the specifications outlined above for spill/glare control, field illumination values, and energy consumption have been met. Include the project name, contact person and telephone numbers to reference such work.

(dd) Manufacturer's Guarantee: The manufacturer: submit in writing a letter guaranteeing compliance as to the above specifications. Provide a written explanation prior to bidding as to specified criteria for which non-compliance is anticipated and an explanation as to why the criteria should be waived.

2.2 LAMPS

A. Lamps: 1500 watt Metal Halide and meet ANSI designation M48PC-1500 BU and be Philips #MH1500BU or approved equal.

2.3 BALLAST

A. Remote: Provide individual ballast for each luminaire.
   1. A lead peak auto-regulating ballast and be available for use with 480-volt supply.
      (a) Located remote from the luminaire crossarm and placed approximately fifteen (15) feet above ground level.
   2. Ballast box must be a NEMA 3R ALUMINUM enclosure and must be manufactured by the luminaire assembly manufacturer and include all mounting hardware with the ballast box assembly.

B. Locate the remote ballast system described above on the same pole as the luminaire assembly in the NEMA 3R ALUMINUM enclosure with the capacitors and the capacitors will operate in ambient air not to exceed 70 degrees C as established by U.L. Test Standards. Adapt the assembly design to various standard ballast and must retain UL listing. The ballast box: contain the lightning arrestors.

2.4 WIRING AND OVERCURRENT PROTECTION

A. All wiring on the luminaire assembly: meet National Electrical Code and pass from each luminaire on the assembly through protective enclosures to join in a common enclosure. Provide each luminaire with individual supplemental fuse protection located in ballast boxes or in adjacent metal enclosure. Fusing must be U.L. listed. In-line fusing will NOT be acceptable.

2.5 SPECIAL CONDITIONS

A. Codes: Luminaire assembly; UL listed and meet National Electrical Code and NEMA Publication FA-1. Pole clamps are not UL listed.

B. Replacement Parts: The contractor/manufacturer; furnish 5 percent or 3 extra lamps and 6 extra fuses to the customer.

2.6 POLES

A. Wire Harness:
   1. Strain Relief: Support the wiring harness at the top of the pole by a stainless steel wire mesh grip matched to the size of the harness. Provide no more than 13 conductors supported by a single wire mesh grip. If harness is longer than 65 feet, locate an interim wire mesh grip support approximately half way down the pole.
   2. Strain Relief Slippage: Provide protection around the conductors, in addition to the insulation to protect from damage from the wire mesh grip and also to avoid slippage of the grip on the wire harness. Clamp the wire mesh grip to the harness with a cable tie at the bottom of the grip to avoid loosening.
   3. Pole Attachment: Mechanically attach the wire mesh grip to the pole to an enclosed mounting loop so that it cannot accidentally be removed in any direction.
   4. Spiral Winding: The harness being supported by the wire mesh grip consists of multiple 14 gage THHN conductors and be continuously spiral wound and bound with mylar wrap to prevent slippage of individual conductors within the

wiring harness. Additionally, tightly wrap a cable tie around the harness at not more than 10-foot increments.

5. Wire Harness Casing: Provide at 2 feet below the wire mesh grip and then covering the entire length of the wire harness an abrasion protective plastic casing attached around the wiring harness to protect the harness from striking and being abraded by the interior surface of the pole.
6. Labeling: Color-code and clearly label all wiring harness conductors.
7. Plug-Ins: Terminate each end of the wire harness into a plug-in with conductors sequenced consistent with the pattern of the wiring schematic provided by the manufacturer.
8. Testing: Test all conductors and plug-ins for resistance under load, for continuity, schematic sequence, and for insulation integrity. Manufacturer: ship a copy of the test results with the wire harness.
9. Grounding: Include within the wiring harness one conductor for use as a grounding conductor. The grounding conductor: equal in size to the load carrying conductors.

B. Electrical Component Enclosure (ECE):

1. NEMA 3R ALUMINUM: Provide a NEMA 3R ALUMINUM rated gasketed enclosure to house the ballasts, capacitors, fuses, disconnect and distribution lugs.
2. Two Compartments: Divide the ECE into two (2) compartments.
   (a) The upper compartment: houses the ballasts, capacitors, and fuses.
   (b) The lower compartment: provide for the disconnect, distribution lugs, and connection of all circuits coming into and out of the ECE.
3. Galvanize: heavy hot dip galvanized to ASTM A-123 standards after fabrication to a thickness of not less than 3 mils. Continuous galvanized materials will not be accepted.
4. Stainless Steel: All latches, hinges, and non-current carrying fasteners, either outside or inside the enclosure and further be coated with a clear thermoset polymer coating such as Empigard to prevent galvanic interaction.
5. Hinged Door Access: Attach the access door to the ECE by a full-length stainless steel hinge and secured when closed by lockable stainless steel latches.
6. Pole Attachment: Attach the ECE to the pole by means of a device, which is sufficient to align the ECE and support its weight. Provide a sealed joint with a non-threaded connection to provide wiring access from the pole to the ECE for both the primary and secondary circuits. The connection: gasketed for watertight protection. Protect all wire passages to prevent wire abrasion or damage.
7. Capacitors: In the ECE, capacitor cases: made from zinc coated steel or aluminum and top coated with enamel. Provide each capacitor with a ground terminal welded to its case and connect such terminal to ground via a grounding wire. The capacitor case: make direct contact with surface of the ECE.
8. Disconnecting Device: provide within the ECE a UL listed disconnect such that electrical power to all equipment on the pole served by the feeder circuit is disengaged by the operation of one switch. The breaker: locate in a compartment separated from any capacitors or ballasts.
9. Lugs: The breaker: provide landing lugs for the conductors, which provide power to the pole.
10. Distribution Terminal Blocks: Manufacturer: provide a set of distribution terminal blocks which will be factory wired from the breaker to the blocks. These blocks: provide for termination of all ballast connection wiring.
11. Fusing: provide an individual fuse for each ballast conductor except neutral conductors, which will not be fused or switched.

12. Plug-In: Color-code and label all lamp supply circuits in the ECE and terminate into a UL recognized plug-in device in the lower compartment of the ECE in a manner suitable for plug-in to the wiring harness.
13. Wire Harness Connection: Attach the wiring harness circuits from the lamps to the ECE circuits by UL recognized plug-in connectors.
14. Grounding: provide in the ECE located in the lower compartment of the enclosure one equipment-grounding lug rigidly fastened to the enclosure, sized to accept up to a 1/0 conductor. Also, provide provisions in the upper compartment for a ground terminal of sufficient size to permit connection of the grounding conductors from the capacitors and the ground wire from the wiring harness.
15. Ballast Type:
    (a) Provide an individual ballast, for each luminaire.
    (b) Provide a lead peak auto-regulating ballast and be available for use with _____ volt supply.
    (c) Locate the ballast remote from the luminaire cross arm and place approximately 15 feet above ground level.
    (d) Ballast box must be a NEMA 3R ALUMINUM enclosure and must be manufactured by the luminaire assembly manufacturer and include all mounting hardware with the ballast box assembly.
    (e) The remote ballast system described above: locate on the same pole as the luminaire assembly in the NEMA 3R ALUMINUM enclosure with the capacitors and the capacitors operate in ambient air not to exceed 70 degrees C as established by UL Test Standards.
    (f) The assembly design: adaptable to various standard ballasts and must retain UL listing.
16. Drawings Attached:
    (a) The manufacturer: provide an electrical schematic of the ECE circuits, which schematic will be of a drable material and affixed to the inside of the ECE door for use by maintenance personnel.
17. Location: Attach the ECE to the pole with the lower end approximately 20 feet above grade at the pole foundation.
18. UL Listing: List the ECE by U.L. both for use with 90 degrees C rated supply conductors and as suitable for use in wet locations.
19. Surge arrestors: UL labeled and rated for 277/480V - 3 O - 4W as manufactured by General Electric or approved equal.

C. Pole Structure:
1. Safety Factors: Use AASHTO structural design criteria or ASCE 7-05 loading and ACI-318 criteria whichever is more stringent to determine the pole structural capacity.
2. Wind Factors: Design the pole and foundations to withstand wind loads per FBC latest edition.
3. Height and EPA: Design the pole to provide a mounting height above the surface at its foundation as shown on drawings and to be of sufficient strength to support the effective projected area (EPA) of the pole and all of the attached devices including, as applicable, light fixtures, cross arms, mounting brackets, ballast boxes, and any other devices which are to be attached to the pole.
4. Pole Material
    (a) For Steel Poles:
    (b) The pole shaft: high strength low allow tapered tubular steel with galvanized coating inside and out.
    (c) All connections of pole sections: By slip fitting the top section over the lower section by a length of atleast 1 1/2 diameters.
    (d) For Concrete Poles:

(e) Round spun concrete of sufficient strength to meet structural and installation strengths.
(f) Single Piece Construction.

5. Resistance to Corrosion:
   (a) Steel components of the pole: hot dip galvanized ASTM A-123, or ASTM A-153 as applicable.
   (b) Steel portions of the pole: constructed such that all segments of the pole can be readily heated to like temperatures in commercially available galvanizing methods.
   (c) To avoid problems of galvanize adherence to differing steel alloys, all steel components used for the pole must be of the same type steel.
   (d) All exposed steel components of the pole: maintain at least 18 inches above the surface of the ground to avoid exposure of the steel to the heavily moisture and oxygen laden air, both above and below the surface.
   (e) Provide a cap to cover the top of the pole so that rain will not enter the interior of the pole.
   (f) To avoid stress corrosion of the pole: no critical stress points of the steel portion of the pole within 18 inches of the ground.

D. Foundation:
1. Safety Factor: Use Broms safety factor of three (or UBC) in the foundation design.
2. Foundation Strength: Allow concrete to harden on any concrete portions of the pole in which steel components that provide tension strength are contained, for a minimum of 28 days before design loads of pole attachment are applied.
3. Concrete Material:
   (a) The foundation of the pole: constructed of not less than 2,500 psi.
   (b) Pre-stressed centrifically cast concrete poles: 9,500 psi concrete.
   (c) The steel reinforcement within the concrete: protected from slippage and exposure to oxidation through voids in the concrete or exposure of the steel through porous concrete material. Provide cover as specified in ACI-318.
4. Soil Conditions: The design criteria for these specifications are based on soil conditions with 2000 psf soil at the surface. It is the contractor's responsibility to notify the Owner of soil conditions other than sand, sand with 5 percent organic maximum and limerock. Excavate and remove material containing more than 5 percent organic encountered in area 6 feet diameter by 4 feet deep and fill with clean sand and compact.

E. Safety - Special Conditions
1. U.L. Listing: Provide a U.L. lighting for all electrical components from this connection to the feeder conductors, to its completion at the lamp socket including all connections. Base this listing upon U.L. testing and evaluation of the compatibility of the enclosures and the components for use in combination in this application in addition to the individual components being U.L. listed or recognized.
2. U.L. Test Report: Bidder: supply in advance of bid a copy of the complete Underwriters Laboratory report covering the entire luminaire assembly being bid for the Owner's review and retention. Partial U.L. files will not be accepted per the requirements of U.L.
3. Codes: Sports Lighting Structure: meet National Electrical code and NEMA publication FA-1.
4. Warranty:

(a) Manufacturer's Warranty: Luminaire assembly; warranted in writing by the manufacturer for a period of twenty-five years and submit with the bid. Any parts that are found defective will be replaced free of any material or labor charges to the customer.

(b) Lamps are warranted not to fail for twenty-five years from installation date. If either 10% of lamps are out or any lamp outage impacts the playability of the field then lamps must be replaced, parts and labor included by the manufacturer.

(c) Aiming Alignment Warranty: The alignment of the luminaires; warranted by the manufacturer against movement of the luminaire assembly for a period of twenty-five years from the date of installation. Manufacturer: responsible for labor charges for re-aiming during the warranty period.

(d) Warranty shall cover wind damage to fixtures up to 150 mph. Impact damage, however, is not included as part of the warranty.

(e) Manufacturer: furnish to the Owner of the facility 5 percent extra lamps and six (6) extra fuses for future use.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install lighting poles and standards as indicated, under provisions of the manufacturer's written instructions and with recognized industry practices to ensure that poles and standards comply with requirements and serve intended purposes.

B. Where poles/standards are indicated to be embedded in soil, set poles approximately 1/6 of pole length, but not less than 5'-6" depth below finish grade.

C. Set poles and standards plumb. Support adequately during backfilling or where anchored to foundations.

D. Grounding: See details on the drawings.

E. Weight and Size: To permit ease of handling of material at the job site and to avoid damage to the existing facility, assure no single component of the pole is in excess of 12,000 pounds, nor be greater than 41 feet in length.

F. Backfill: Install the pole base in an excavation as prescribed by the Broms standards for foundation design. Concrete backfill is required.

G. Metal Poles: Foundation shall be designed to provide resistance as required by Broms Analysis, F.S. = 3.0.

H. Foundation: Shall be designed and documented by a Florida Licensed Structural Engineer.

I. Assembly: Separate the pole base from the pole such that the base may be installed, properly plumbed, and enlarged as to the bearing surface by concrete backfill allowing for inspection prior to the attachment of the steel pole.

J. Electrical Wiring: Design the pole and the luminaires such that all wiring remains underground before entering the base of the pole and that no wiring is exposed to sun or weather as it transitions through the pole and to the ballast and on to each

lamp. Provide a non-threaded hot-dip galvanized steel or concrete enclosed raceway for transition of the pole feeder conductors from the trench to the ECE.

K. Field Connections: Achieve all field electrical connections on the pole by UL listed plug-in or lug method of attachment from the load side of the breaker/disconnect to the lamp socket. Connect the feeder and grounding conductors from the service entrance to the pole at the pole by landing lugs.

3.2 ILLUMINATION LEVELS TESTING

A. Upon completion of installation and testing, demonstrate to the Project Consultant that the foot-candle readings as called for on the lighting fixture manufacturer's computer point by point diagram have been achieved. Initial foot candles reading shall be taken after 100 hours of lamp continuous operation. An additional test shall be performed at 400 hours of usage in order to validate specified, guaranteed light levels.

1. Provide appropriate grid spacing per IES for specified venue, take a test at each grid point and recorded. Take illumination readings at 36 inches above surface as per IES recommendations. Proof of photometer calibration within 6 months of test must be submitted before conducting test. The Owner reserves the right of actual performance verification.
2. Demonstration to be scheduled after dark at a mutually agreeable time and date. Provide skilled personnel with proper equipment necessary to measure the foot-candle levels at the site of installation and to reaim the fixtures as required to achieve the specified foot-candle levels.
3. Non- recoverable factors: Non-recoverable factors are defined by IES as those factors that are “usually not controlled by lighting maintenance procedures.”
   (a) Ballast Factor is the depreciation in light output from the lamp as a result of the ballast efficiency and operating conditions.
   (b) Voltage factor is the loss or increase of light as a result of the fixture being supplied with a voltage other than its design specifies.
   (c) Ambient Temperature is the loss of light as a result of the ambient temperature at which the fixture operates, once installed.
   (d) Lamp Tilt Factor is the reduction of light output from a light source as a result of its operating position.
4. Recoverable Factors:
   (a) Lamp Lumen Depreciation Factor is the loss of light on the playing surface as a result of the lumen output of the lamp decreasing over the course of the lamp’s useful life. IES suggests that lamps be replaced after 70% of their average rated life has expired.
   (b) Luminaire Dirt Depreciation Factor is used to predict loss of light as a result of dirt accumulation on the reflector lens.
5. Initial Light levels are based on the foot-candle or lux calculations derived from the photometric report of the luminaire (per lamp manufacturer’s 100 hour lamp lumens) multiplied by all the non-recoverable light loss factors.
6. If manufacturer is not providing constant light levels then, target (or maintained) light levels are based on initial light levels multiplied by the recoverable light loss factors.
7. Total Light loss Factor (LLF) is simply the result of all the light loss factors multiplied together.

B. Testing Equipment:

1. Testing Equipment: Testing equipment for measurement of foot-candle levels provided by United Technology's Digital Model #61, a Gossen Panalux

Electronic 2 Minolta TI and must show proof of calibration prior to testing as required by the manufacturer.

2. Testing and Measurement Procedures - Spill/Glare Light Values - Designated Areas:
   (a) Measurement of Ambient Light Levels: Measure ambient light levels at the designated test stations as specified. Technician is to record the maximum ambient foot-candle level explored in all planes for each test stations. Once the maximum spill light readings as defined in Part 1.08 - A.2.a have been recorded, subtract the ambient light readings from the respective foot-candle readings at each test station.
   (b) Spill/Glare Test Stations - Test station for measurement of the maximum foot-candles explored in any plane are to be set at the locations as specified by the table in Part 1.08 - A.2.a.
   (c) Horizontal Foot-candle Readings - Position the test cell horizontal 36 inches above grade for all horizontal spill/glare foot-candle readings.

C. Final Approval:
   1. Manufacturer: For final approval of the project, provide a final report from the test results that include the following items:
      (a) Identification of number and location of the test stations.
      (b) Identification of the acceptable metering devices with documentation of calibration requirements and most recent calibration date and location from the meter manufacturer.

D. Inspection:
   1. Provide access to the work at all times for the Project Consultant or its authorized representative for inspection wherever it is in preparation or progress. Fabricator: provide proper facilities for such access and inspection without additional cost to the Engineer.
   2. All material will be subject to "Job Site Inspection". Material may be rejected at the time of first inspection or at any time defects are found during the progress of the erection or installation.
   3. Inspection by the Engineer, or waiving of inspection does not relieve the Fabricator from the responsibility for furnishing products that conform to the requirements of these specifications, nor invalidate any claim that Engineer may make because of defective or unsatisfactory material and workmanship.

E. Rejection:
   1. Failure by the Fabricator to comply with all drawings and specifications will be sufficient reason for rejection of any or all material affected.
   2. All material that is rejected by the Engineer or its authorized representative will be corrected so as to comply with all drawings and specifications or replaced by the Fabricator; or will be replaced or corrected by the Contractor at the Fabricator's expense, as may be required to maintain construction schedules.

F. Exceptions & Deviations:
   1. No exceptions or deviations from these specifications.

END OF SECTION

SECTION 16555 (26 55 62)

AUDITORIUM STAGE LIGHTING AND DIMMING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions, Special Conditions and Division-1 Specification sections, apply to work specified in this section.

1.02 RELATED WORK AND REQUIREMENTS

A. Section 16010 – General Provisions

B. Section 16060 – Grounding

C. Section 16120 – Building Wire and Cables

D. Section 16132 – Conduit, Fittings and Supports

E. Section 16138 – Outlet Boxes

1.03 SCOPE

A. This section requires the fabrication, furnishing, delivery, installation and testing of the lighting system as indicated on the drawings and specified herein.

B. The contractor shall provide all materials, equipment, labor, tools, scaffolds, and incidentals necessary to perform the scope of work.

C. It is the intention of these specifications that the contractor provide a professional quality, complete and properly operating system in every respect and detail.

D. The contractor shall assume full responsibility for a complete operating installation, in the required location, in accordance with the contract documents.

E. Coordinate fully with the Division 16 Contractor.

1.04 WORK INCLUDED

A. The Contractor shall examine the plans in detail to familiarize himself with the scope of work.

B. The Contractor shall provide the required manufacturers' shop drawings.

C. The Contractor shall provide all the necessary specialty equipment for the complete lighting and dimming system installation as specified herein, and shown on the drawings.

D. The Contractor shall coordinate the system control wire conduit and device locations with the Division 16 Contractor.

E. The Contractor shall deliver to the job site, and coordinate the installation of, the specialty equipment with the Division 16 Contractor.

F. The Contractor shall provide, install and terminate all system control wires.

G. The Contractor shall provide and install all system control devices.

H. The Contractor shall uncrate, assemble, lamp, hang and aim all the stage lighting fixtures as shown on the drawings.

I. The Contractor shall provide for the system activation.

J. The Contractor shall provide the system manuals.

K. The Contractor shall provide the system warranty.

L. It is the Contractor's responsibility to ensure that the system, and all of the system components, fixtures, equipment, devices, wire, terminations, field assemblies (including custom assemblies), etc pass all required inspections by the local authority having jurisdiction.

M. Procurement of all required permits.

1.05 WORK NOT INCLUDED

A. The following work, although in another section, has a significant impact on the scope of this work. The Contractor is responsible for the successful coordination of the following:
1. System conduit.
2. Installation and termination of Line supply.
3. Installation and termination of Load wire.
4 Dimmer rack installation.
5. Distribution installation.

1.06 CONTRACTOR'S QUALIFICATIONS

A. The work of this section will be contracted to a single firm, referred to as the contractor.

B. The contractor shall be a lighting system contractor who regularly engages in the furnishing, installation and servicing of systems of similar nature, size, scope and complexity to that contemplated by this specification. The contractor shall have done so for a period of not less than five years preceding the bid date.

C. The contractor shall have maintained for the five years preceding the bid date, a suitably staffed and equipped service organization which has continuously offered maintenance and repair services for systems of the nature, size, scope and complexity to that contemplated by this specification.

D. The contractor shall maintain for the duration of this contract all required business and professional licenses and insurance.

E. The contractor shall demonstrate to the satisfaction of the owner, through exhibits presented with his bid, that the contractor has a history to indicate the following:

1. Four installations of the type and size contemplated by these specifications, currently in
use as originally installed, and the following information regarding such installations:
    a. Adequate plant, equipment, test facilities and inventory to pursue the work properly and in a timely fashion.
    b. Sufficient staff and technical experience.
    c. Name and address of each installation facility.
    d. Facility owner and telephone number.
    e. Name, address, and phone number of a person regularly employed by the owner, who is familiar with the operation of the systems and who has no connection or business connections with the contractor except as the contractor shall fully disclose.

F. Without prejudice to other contractors desiring to be qualified, the following are considered qualified:

Miami Stagecraft
2855 E. 11th Ave.
Hialeah, FL 33013
(305) 836-9356
Contact: Steve Welsh

Stage Equipment and Lighting
12250 N.E. 13th Court
Miami, FL 33161
(305) 891-2010
Contact: Rick Rudolph

Candela Controls
711 Business Park Blvd., Suite 101
Winter Garden, FL 34787
(407) 654-2420
Contact: Steve Helliker

Murphy Lighting Systems
621 Brookhaven Drive
Orlando, FL 32803
(407) 895-7475
Contact: Chris Murphy

Barbizon Delta
2254 NW 93rd Ave
Miami, FL 33172
Contact: Scott Stipetic

PART 2 PRODUCTS

2.01 GENERAL

A. When this document lists several acceptable manufacturers for a particular item of equipment, more than one of which is to be provided, the Contractor shall supply all of those similar items of equipment from one manufacturer.

B. Dimmer racks, dimmer modules, lighting controls and lighting consoles shall be from the same manufacturer.

C. Any item of equipment or hardware that may not be specifically shown on the drawings or specified herein, but required for proper system operation or installation, shall be furnished and installed and be of the highest quality available.

D. All materials and equipment used in this project shall be new, unused and of the latest models and design. Refurbished materials and equipment are not permitted.

E. The performance of all equipment must meet the most recently published manufacture's data sheet.

F. UL Labels: All equipment, where applicable standards have been established, shall be listed by Underwriters' Laboratories, Inc., and shall bear UL label when delivered to the job.

G. If so required by the local authority having jurisdiction, anything not arriving at the job bearing a UL label shall be field inspected and label by a nationally recognized testing laboratory recognized and approved by the local authority having jurisdiction.

2.02 ACCEPTABLE MANUFACTURERS

A. The stage lighting and control manufacturer shall be one who has been continuously engaged in the manufacture of stage lighting control equipment, wiring devices, theatre hoists systems and electronic dimmers for ten years or more.

B. Except where otherwise noted in this specification, the following are the approved manufacturers:

Electronic Theatre Controls, Inc.
3030 Laura Lane
Middleton, Wisconsin 53562
(800) 688-4116

Strand Lighting, Inc.
6603 Darian Way
Cypress, CA 90630
(714) 230-8200

De Sisti Rigging and Automation
1109 Grand Avenue
North Bergen, NJ 07047
(201) 866-5800

Altman Stage Lighting Company, Inc.
57 Alexander Street
Yonkers, New York 10701
(914) 476-7987

SSRC
11 Freedom Court
Greer, SC 29650
(864) 848-9770

Lowell Manufacturing Company
100 Integram Drive
Pacific, Missouri 63069
(636) 257-3400

Lycian Stage Lighting
PO Box D
Kings Hwy
Sugar Loaf, NY 10981-0214
(845) 469-2285

C. Alternatives: In no case will equipment or materials of lesser design or workmanship be acceptable. Only those materials and equipment listed in this specification will be considered unless prior approval is sought and received.
1. Substitutions: When a specific piece of equipment specified has been discontinued and/or replaced by a new model, substitution will be acceptable when:
a. Submission of complete data on the new model or substitute has been approved by the owner prior to equipment acquisition.
1. Substitute equipment or the replacement of rejected equipment shall be
at the sole expense of the contractor.
b. Substitutes shall be considered only when they are submitted fourteen days prior to bid date, and are accompanied by sufficient catalog data, specifications, and technical information for evaluation.
1. Summarize proposal with a list of equipment catalog or series numbers. Substitute bids shall include a system riser diagram detailing components and any deviation of functionality from the drawings and specifications herein.
a. The bidder shall include the name, address, and phone number of at least two- (2) factory authorized Field Warranty centers within a 250-mile radius of the job site as a part of the submittal documents.
b. On the lighting fixtures, the bidder submitting other equipment shall include performance data taken and reported in compliance with the “Recommended Practice for Reporting Photometric Performance of Incandescent Filament Lighting Units used in Theatre and Television Production,” approved as the official standard by the U.S. Institute for Theatre Technology, the Illuminating Engineering Society, the Society of Motion Picture and Television Engineers, and the American Theatre Association. For purposes of establishing the validity of such submissions, the manufacturer shall supply this data from an independent testing laboratory. Proposals that fail to meet this requirement shall not be considered.
c. On the dimming system, the bidder submitting other equipment shall include pertinent performance data, charts and drawings showing in what respect the system will function in accordance with specification, and in what way it will deviate from the specification. This submittal shall include, but not be limited to the following:

1. Rated ampacity, peak single cycle surge current rating, I^2t rating, and transient voltage rating of the output devices employed in the dimmers.
2. Laboratory verification of minimum current rise time at a 90-degree conductive angle, with the dimmer operating at the maximum load.
3. Description of the air-cooling and air filtration systems.
4. Description of the packaging and ease of replacement for all spare parts required in this specification.
5. Original Manufacturer's catalog data sheets for all major components of the dimmer system.

c. On the control system, the bidder shall submit the name of the manufacturer,
and list of ten (10) or more operating systems in the State of Florida of the type specified which meet the performance control functions designed, with contact names and telephone numbers for references. This information shall be
mandatory as a basis for determining the bidder's intent in meeting the full requirements of this specification, and shall be submitted at least fourteen days in advance of bidding.

1. It is understood that any additions or revisions of wiring required by the use of substitute equipment, whether such wiring is part of this contract or of the prime electrical contract, shall be the responsibility of the bidder making the substitution.
   a. If required by the Owner, the Consultant, or Architect, the bidder
      shall provide working samples of substitute equipment including lamps for any lighting fixtures, to be delivered to the premises designated, for examination by Architects, Consultants, and such representatives as the Owner may direct. Handling, shipping and delivery to, or removal from site, of any sample required shall be at the cost of the Contractor. The Contractor shall be responsible for the arrangement of the cost of the electrical supply required to properly test any lighting instruments or item of equipment. Proposals which fail to address specification requirements or review comments will be rejected.
   b. Prior approval submittal review and approval shall not be considered to be shop drawing review. Prior approval in no way relieves the Contractor of responsibility to fully meet the requirements and intent of this specification.
   c. Should the contractor proposed and receive approval for the use of alternative or substitute equipment which requires additional or modified conduit, the contractor will be solely responsible for the installation of such conduit.

B. AUDITORIUM DIMMER BANKS

1. Furnish the quantity of dimmer racks and related equipment from one of the following approved manufacturers:

a. Electronic Theatre Controls, Inc.

QTY.	CAT. #	DESCRIPTION
1	SR-48	Stage lighting dimmer rack. Sensor dimmer rack configured for 96, 20amp circuits.
1	DR6-12-120	House lighting dimmer rack. Unison dimmer rack configured for 12, 20amp circuits

b. Strand Lighting, Inc.

QTY.	CAT. #	DESCRIPTION
1	75600-xxxx	Stage lighting dimmer rack. Ethernet ready SLD dimmer rack configured for 96, 20amp circuits.
1	74016	House lighting dimmer rack. Digital Environ dimmer rack configured for 12, 20amp circuits.

C. DIMMER MODULES

1. Furnish the quantity of dimmer modules from one of the following approved manufacturers:
   a. Electronic Theatre Controls, Inc.

QTY.	CAT. #	DESCRIPTION
49	D20	Stage lighting dimmer modules. Dual 20 amp dimmer modules for production circuits #1 thru #96 (one spare).
7	D20	House lighting dimmer modules. Dual 20 amp dimmer modules for house light dimmers 1-12 (one spare)

   b. Strand Lighting, Inc.

QTY.	CAT. #	DESCRIPTION
49	75710	Stage lighting dimmer modules. Dual 20 amp dimmer modules for production circuits #1 thru #96 (one spare).
7	72003	House lighting dimmer modules. Dual 20 amp dimmer modules for house light dimmers 1-12 (one spare)

D. CONTROL MODULES
1. Furnish the quantity of dimmer control modules from one of the following approved manufacturers:
   a. Electronic Theatre Controls, Inc.

QTY.	CAT. #	DESCRIPTION
2	CEM-96	Stage lighting dimmer rack control module. Sensor 96 channel control module (one spare).
2	CMEd	House lighting dimmer rack control module with Unison station processor (one spare).

b. Strand Lighting, Inc.

QTY.	CAT. #	DESCRIPTION
2	75690-xxxx	96 Way Ethernet ready module control processor assembly,(one spare).
2	79100	House lighting dimmer rack control module. Digital Environ (one spare)

E. SPARES

1. Provide the following additional spare parts:
   a. Six- (6) power cubes.

F. MAIN LIGHTING CONTROL CONSOLE

1. Furnish the quantity of main lighting control consoles and accessories from one of the following approved manufacturers:
   a. Electronic Theatre Controls, Inc.

QTY.	CAT. #	DESCRIPTION
1	EXP 48/96	Express 48/96
1	VGA	17” VGA color monitor- NEC 8700+
1	-	10’ DMX cable
1	-	10’ LINK cable
1	-	10’ RFU cable (console)
1	-	25’ RFU cable (RFU)
1	RFU	Remote Focus Unit
1	-	EXP 48/96 dust cover.
1	-	17” monitor dust cover
1	650 kVA UPS	Uninterrupted Power Source.
1	Printer	Laser Printer
1	-	Printer Dust Cover
1	-	12’ Printer cable
1	-	Console keyboard
2	-	Console “Littlite”

b. Strand Lighting, Inc.

QTY.	CAT. #	DESCRIPTION

1	95702	48/96 300 Series Memory Console
1	VGA	17" VGA color monitor. NEC 8700+
1	-	10' DMX cable
1	-	10' Dimmer feedback cable
1	-	10' RFU cable.
1	66041	Handheld remote control unit
1	66071	25' HHR cable
1	-	Console dust cover
1	-	17" monitor dust cover
1	Printer	Laser Printer
1	-	Printer dust cover
1	-	12' printer cable
1	650 kVA UPS	Uninterrupted Power Source
1	-	Console keyboard
2	-	Console "Littlite"

G. LIGHTING PLUGGING STATIONS

1. Furnish the following lighting plugging stations:

LOCATION	CONDUIT RISER DEVICE	QTY.	TYPE	DESCRIPTION
Control Booth Main Console Plug In Station, 6 gang wallplate	CPS1	1	DMX IN	DMX input Receptacle
		1	FB	Dimmer feedback receptacle-console
		1	HLC	House light control – pendant station
		1	RFU	Remote focus unit receptacle- console
Down Stage Right	RFU	1	RFU	Remote focus unit receptacle – remote
FOH Catwalk, single gang plate	RFU	1	RFU	Remote focus unit receptacle – remote

H. HOUSE LIGHT CONTROL

1. General Description:
   a. Control shall be low-voltage type as specified here and as listed below and/or shown on the drawings. Controls shall use low-voltage Class II electrical wiring. All controls shall be able to access and control house light dimmers.
2. Furnish and install the following equipment and accessories:
   a. Electronic Theatre Controls, Inc.

QTY.	CAT. #	DESCRIPTION

1	U30407	1 master, 3 fader, 7 button pendant station / portable enclosure, control booth.
1	U30407	1 master, 3 fader, 7 button panel mount station located down stage right.
4	U10001	On/Off Entry stations inside keyed enclosure. Coordinate station color with architect.

b. Strand Lighting, Inc.

QTY.	CAT. #	DESCRIPTION
1	63003	1 master, 3 fader, 11 button pendant station / portable enclosure, control booth.
1	63003	1 master, 3 fader, 11 button panel mount station located down stage right.
4	63021	On/Off Entry stations inside keyed enclosure. Coordinate station color with architect.

I. AUXILLIARY STAGE LIGHT CONTROL

1. General Description:
   a. Control shall be low-voltage type as specified here and as listed below and/or shown on the drawings. Controls shall use low-voltage Class II electrical wiring. All controls shall be able to access and control house light dimmers.
2. Furnish and install the following equipment and accessories:
   a. Electronic Theatre Controls, Inc.

QTY.	CAT. #	DESCRIPTION
1	U61307	1 master, 9 fader, 7 button lighting controller in Back Stage Control Panel
1	ER4-RM + CME	Unison external processing, rack mount, with midrange control module. Install to auxiliary rack in dimmer room.

b. Strand Lighting, Inc.

QTY.	CAT.#	DESCRIPTION
1	61009	1 master, 9 fader, 7 button lighting controller in Back Stage Control Panel

J. CONTROL WIRE & SPECIALITY CONNECTORS

1. Furnish, install and terminate all necessary lengths of control wire runs between the stage lighting fixtures, plugging stations, local control devices, network

interfaces, remote focus units, and dimmers. The control wire shall be of the type and amounts acceptable to the manufacturer.
   a. Installation type cable for use in conduit, racks and cabinets.
2. ETC Systems:
   a. DMX cable = Belden 9729
   b. RFU cable = Belden 9728 + 2 @ 16 AWG stranded THHN
   c. House light control cable = Belden 8471 + 1 @ 14 AWG stranded THHN
   d. Dimmer feedback cable = Belden 9729 + 2 @ 16 AWG stranded THHN
3. Strand Systems:
   a. DMX cable: Belden 9829
   b. RFU cable = Belden 9829
   c. House light control cable = Belden 9773
   d. Dimmer feedback cable = Belden 9829

K. LIGHTING CONNECTOR STRIPS
1. This assembly shall be fabricated of 16-gauge steel with removable covers and shall be 4" x 4" in cross section in lengths specified herein. Terminal strips shall be supplied for feed conduit and wire extending to 18" long pigtails, except where noted differently, which shall be 3-conductor type SO cable. The pigtails shall be securely fastened to housing body by means of strain relief clamps. Strip finish shall be fine-texture, scratch resistant, black powder-coat. One steel hanging bracket shall be supplied for each 5-foot section of connector strip with a minimum of 2 brackets per strip. The terminal blocks shall be a barrier screw clamp type. Strips with 12 or more circuits shall have terminals located in an auxiliary terminal box sized as specified. Outlets, pigtails, and both sides of the enclosure shall be identified by 2" high black on yellow numerals. Wire nuts and crimped connectors are not acceptable.
   a. Furnish the following connector strips:
      1. One (LCS-1) at twenty four feet-seven inches long with seven (7) 20 amp circuits with seven (7) 20A grounded stage pin female pigtails installed, (see drawing for circuit numbering and spacing). Furnish necessary catwalk mount hanging brackets to attach the connector strip to the catwalk.
      2. One (LCS-2) at twenty four feet long with nine (9) 20 amp circuits with nine (9) 20A grounded stage pin female pigtails installed, (see drawing for circuit numbering and spacing). Furnish necessary catwalk mount hanging brackets to attach the connector strip to the catwalk.
      3. One (LCS-3) at twenty four feet-seven inches long with nine (9) 20 amp circuits with nine (9) 20A grounded stage pin female pigtails installed, (see drawing for circuit numbering and spacing). Furnish necessary catwalk mount hanging brackets to attach the connector strip to the catwalk.
      4. One (LCS-4) at fifty two feet long with twenty (20) 20 amp circuits with twenty two (22) 20A grounded stage pin female pigtails installed, (see drawing for circuit numbering and spacing). Furnish necessary double pipe hanging brackets to attach the connector strip to the primary stage rigging pipe.
      5. Two (LCS-5, LCS-6) at fifty two feet long with thirteen (13) 20 amp circuits with twenty three (23) 20A grounded stage pin female pigtails installed, (see drawing for circuit numbering and spacing). Furnish necessary double pipe hanging brackets to attach the connector strip to the primary stage rigging pipe.

6. One (LCS-7) at fifty two feet long with ninteen (19) 20 amp circuits with nineteen (19) 20A grounded stage pin female pigtails installed, (see drawing for circuit numbering and spacing). Furnish necessary double pipe hanging brackets to attach the connector strip to the primary stage rigging pipe.

L. PLUGGING BOXES

1. Outlet boxes are fabricated from 16-gauge steel with a fine-texture, scratch-resistant, powder-coat finish. Outlets are 3-pole grounding of 20A grounded stage pin female connectors. Circuits are individually indicated with ¾" white die cut adhesive labels. Boxes are equipped with grounding lugs. All faceplates to match outlet box enclosure dimensions with no sharp edges exposed.
2. Furnish the following plugging boxes:
   a. PB-1and PB-2 shall be surface mounted two circuit outlet boxes with 20 amp grounded stage pin connectors. See lighting device locations drawing for placement, and distribution detail drawing for circuit designation.
   b. PB-3 and PB-4 shall be surface mounted one circuit outlet boxes with 20 amp grounded stage pin connectors. See lighting device locations drawing for placement, and distribution detail drawing for circuit designation.

M. GRID IRON JUNCTION BOXES

1. This assembly shall be fabricated of 16-gauge, cold-rolled steel with removable covers. Standard box size shall be minimum 14"W x 14"H x 4"D with four mounting holes. Terminal Strips shall be a barrier screw clamp type. Two terminals shall be provided for each circuit. Terminals shall be sized for the circuit amperage as required. Finish shall be fine-texture, scratch resistant, black powder-coat. Provide ground bussing as required for backbox.
2. Furnish four gridiron junction boxes in accordance with the requirements of each connector strip.

N. BACKBOXES

1. The following backboxes are provided by the lighting contractor for installation by the electrical contractor:
   a. 1 @ SLC (locates DSR for auxiliary stage light control station)
   b. 1 @ HLC (located DSR for house light controller station)
   c. 4 @ ES (locking enclosure for entry stations).

O. DIMMER ROOM AUXILIARY EQUIPMENT RACK

1. Provide swing open access wall mount auxiliary rack as indicated on drawing. Provide rack backbox to electrical contractor and coordinate installation. Fill all unused rack spaces with blank panels.

2. One wall mount equipment rack for Auxiliary Rack. Include Blank panels as required.
   a. Lowell Manufacturing Company L50-12

P. THEATRICAL LIGHTING FIXTURES

1. All theatrical lighting fixtures are to include a C-clamp, a color frame, a safety cable w/spring clip (two for strip lights and far cycs), 36" 3-wire leads and 20A grounded stage pin male connector installed.
2. Furnish and install the following theatrical lighting fixtures in the auditorium:

QTY.	CAT.#	DESCRIPTION
3	Electronic Theatre Controls, Inc. Cat. # 410 OR Strand Lighting, Inc. Cat. # SL10	Ten degree, 115 volt ellipsoidal reflector spotlights.
22	Electronic Theatre Controls, Inc. Cat. # 419 OR Strand Lighting, Inc. Cat. # SL19	Nineteen degree, 115 volt ellipsoidal reflector spotlights.
6	Electronic Theatre Controls, Inc. Cat. # 426 OR Strand Lighting, Inc. Cat. # SL26	Twenty-Six degree, 115 volt ellipsoidal reflector spotlights
14	Electronic Theatre Controls, Inc. Cat. # 436 OR Strand Lighting, Inc. Cat. # SL36	Thirty-Six degree,115 volt ellipsoidal reflector spotlight
6	Electronic Theatre Controls, Inc. Cat. # 450 OR Strand Lighting, Inc. Cat. # SL50	Fifty degree,115 volt ellipsoidal reflector spotlight
13	Altman Stage Lighting Cat.# 75Q	Eight inch die cast theater fresnel spotlight.
8	Altman Stage Lighting Cat. # ZS-4	Eight foot six inch long, 4-circuit strip lights
4	Altman Stage Lighting Cat. # SKY-CYC-04	4-circuit cyc unit
2	Lycian Stage Lighting Cat.#1266	400 watt Followspot and base.

Q. THEATRICAL STAGE LAMPS

1. Approved manufacturers for stage lamps are General Electric, Sylvania, or Ushio.
2. Furnish and install the following stage lamps for the auditorium stage lighting fixtures:
   a. Fifty-Seven (57) HPL575/115X, for 115V ETC ellipsoidals and S4PAR. Subsitute GLA 575W for Strand ellipsoidals.
   b. Fifteen (15) BVT, 1000 watt for 8" fresnels.
   c. Three-Hundred Sixty (360) EYF 65 watt MR-16 for zip strips.
   d. Twenty (20) FFT, 1500 watt for far cycs
   e. Four (4) Osram HTI 400/24 metal halide for followspots.
   f. Turn over ALL spares Lamps to the Owner.

R. THEATRICAL STAGE LIGHTING ACCESSORIES

1. Furnish the following stage lighting accessories for the auditorium:
   a. Twenty-five (25) 5', 12 AWG, type S extension cables w/male and female 2P&G connectors installed.
   b. Thirty-six (36) 10', 12 AWG, type S extension cables w/male and female 2P&G connectors installed.

c. Twenty-five (25) 25', 12 AWG, type S extension cables w/male and female 2P&G connectors installed.
d. Ten (10) 50', 12 AWG, type S extension cables w/male and female 2P&G connectors installed.
e. Twenty (20) 2-Fers for interconnection of fixtures.
f. Thirteen (13) 8", four way barn doors for stage fresnels.
g. All gel shown on the light plot.
h. In additional to all gel shown on light plot provide one hundred (100) additional sheets assorted color media as follows:
    1. 6 sheets Roscolux 33
    2. 6 sheets Lee 202
    3. 8 sheets Roscolux 119
    4. 4 sheets Roscolux 54
    5. 8 sheets Lee 152
    6. 1 sheet Lee 203
    7. 8 sheets Roscolux 68
    8. 4 sheets Roscolux 55
    9. 4 sheets Roscolux 52
    10. 4 sheets Roscolux 364
    11. 2 sheets Roscolux 114
    12. 10 sheets Roscolux 81
    13. 10 sheets GAM 685
    14. 10 sheets GAM 235
    15. 5 sheets Roscolux 321
    16. 5 sheets Roscolux 385
    17. 5 sheets Roscolux 39
i. Twenty (20) pattern holders for ellipsoidal spotlights.
j. Twenty (20) patterns as follows:
    1. Eight (8) GAM #222
    2. Eight (8) GAM #294
    3. Two (2) GAM #201
    4. Two (2) GAM #204

S. POWER DISTRIBUTION
1. Front of House – Series of self climbing hoists with L5-20 receptacles and one DMX output connector per hoist. Exact requirements to be determined by each project. Hoist to have up to six 20 amp circuits.
2. Stage Electric connector strips each with a Stage Hoist with L5-20 receptacles and one DMX output connector per hoist. Exact requirements to be determined for each project.
3. Side Boom plugging boxes. Exact requirements to be determined for each project.
4. Lot, wall boxes. Exact requirements to be determined for each project.
5. HOIST NOTES:
    a. Each hoist MUST BE UL LISTED AS AN ASSEMBLY.
    b. Each hoist includes festoon style drop cable with integral support wired to an overhead junction box.
    c. Hoist system to be controlled by a central control panel with UP/Down control for each hoist, a master shut off button and keyswitch.

PART 3 EXECUTION

3.01 STANDARDS COMPLIANCE

A. Comply with all local building codes

B. In the absence of specific local codes, comply with the National Electrical Code (NFPA-70) as applicable to installation and construction of stage lighting and control equipment.

C. Where not in conflict with local building codes or the National Electrical Code comply with industry standard professional practices.

D. Installation practices shall be in accordance with OSHA Safety and Health Standards.

3.02 SHOP DRAWINGS

A. Submit within thirty (30) days of the bid acceptance, for review and approval by the Owner, Architect, and Consultant:
   1. Complete shop drawings and data sheets for all items specified.
   2. Complete shop drawings for all components, assemblies, sub-assemblies, cabinets, wiring devices and hardware required to implement the work.
   3. Riser diagrams showing all quantities, types and sizes of inter-connection wires to be installed by others.
   4. Schematics of all block assemblies and sub-assemblies, including pin out identification of all low voltage cable connectors.
   5. In addition to drawings, the Contractor may elect to submit catalog cuts for certain standard equipment items. These shall contain full information on dimensions, construction, applications, etc. to permit proper evaluation. In addition, they shall be properly identified as to their intended use and any options or variations shall be clearly noted.
   6. Samples may be requested by the Architect and shall be provided for inspection at the Architect's office, at the Contractor's sole expense.
   7. Prior to the commencement of fabrication and delivery, the Contractor shall submit for approval, to the Architect, an outline of a proposed commencement and completion schedule of project requirements.

3.03 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver stage lighting equipment and controls to job site securely wrapped in containers.

B. Coordinate delivery dates with the Division 16 contractor

C. All equipment shall be stored in a clean, dry space.

D. Discrepancies in quantities or missing equipment shall be noted, in writing, and brought to the attention of the manufacturer within five days of receipt.

E. Replacement of missing or damaged equipment shall be the responsibility of the Contractor.

F. Handle equipment and controls carefully to prevent breakage, denting and scoring finish.

G. Replace and return damaged units to equipment manufacturer immediately.

H. Store in original cartons and protect from dirt, physical damage, weather, and construction traffic.

3.04 INSTALLATION

A. The Contractor shall furnish, deliver, install and terminate all system control wires.
   1. All cables shall be permanently labeled at every termination. The label shall not be hand written. Clear heat shrink shall cover the label.
   2. Service loops of not less than 6" will be present at all terminations to equipment,
   3. All pulls to be made be hand, care will be taken not to nick cable jackets, and any nicked or damaged cable will be replaced.
   4. A pull string will be left in all conduits after wire is installed.
   5. NO SPLICES WHATSOEVER IN CONDUIT!
   6. Include spare cables with all field runs. Quantity to be 10% or 1 which ever is greater unless otherwise specified.
   7. Where shielded cable is in use leave shield drain wire the same length as the circuit conductor(s), sleeve shield drain wire in green pvc tubing. Cap where the cable jacket was removed with heat shrink. Where the shield drain wire is to be lifted follow the above and fold back over cable jacket. Then cap end with heatshrink. Do not use a single piece of heatshrink for this use two smaller ones.
   8. All soldering will be clean and neat and not exhibit evidence of a " cold" joint, were necessary heat sinks will be used. Use only rosin core "electronic type " solder.
   9. Wire nuts will be not allowed.

B. The Contractor shall provide and install all system control devices.

C. The Contractor shall hang and aim the stage fixture hanging plot.
   1. Provide the Theatre Consultant fourteen (14) days notice prior to this work being scheduled. The Theatre Consultant shall verify the aiming of the stage fixtures.

D. The installation of all work shall be neat.

E. All boxes, equipment, etc shall be plumb and square.

F. The installation shall conform to the plans and spec.

G. The contractor shall not commence the installation of equipment and devices, other than the pulling of cable, until all areas are clean, painted and finished to a point that they are completely dust, dirt, lint, fiber and airborne particle free. The air conditioning system must be operating to its design level and be able to keep all areas with control equipment stable.

3.05 INSTALLATION COORDINATION

A. The Contractor shall specifically coordinate the placement and sizes of conduit relating to this work and shall specifically review and approve the conduit rough-in in time to advise all parties of needed changes, omissions, etc.

B. The Contractor shall report this successful coordination in writing to the Architect.

C. If any conflicts or omissions occur as a result of the Contractor's unsuccessful coordination of the above mentioned work, it shall be the Contractor's responsibility to correct, provide and install any additional material that may be required.

D. The contractor shall at all times coordinate his work with the other trades to ensure smooth progress of work and satisfactory final results.

E. The Contractor shall examine areas and conditions under which stage lighting and controls are to be installed and notify the Architect in writing of conditions detrimental to proper installation and operation.

3.06 MANUFACTURER'S SERVICES

A. The Contractor shall provide for:
   1. A manufacturer's field service engineer to perform initial system activation. Under no circumstances shall power be provided to any equipment prior to initial system activation.
   2. The manufacturer's field service engineer shall inspect and confirm that all low voltage terminations are correct.
   3. Such engineering services shall be furnished within twenty-one (21) days of a written request by The Contractor.

3.07 TRAINING AND INSTRUCTION

A. The Contractor shall furnish sixteen (16) hours of on site instruction to Owner designated persons. This instruction shall happen on four occasions.
   1. The first occasion shall take place at the time of initial system activation and be performed by the manufacturer's field service engineer. The duration of this occasion shall be not less than three (3) hours. This instruction shall cover all aspects of operation and maintenance required by this system
   3. All other occasions shall be coordinated with the owner representative and Contractor with (21) days written notice. This instruction shall be an overall review of the system operation and detailed console operations. The finial occasion shall take place within the first six months following system activation.

B. Provide operational assistance for the first usage of the system. This is to be on the owners time
schedule but, not to exceed 8 hours.

3.08 MANUALS: Prepare four identical copies of owners manuals. The owner is to receive two, the consultant receives one and the contractor retains one. Before distribution of manuals submit one copy to consultant for approval. Each manual is to contain the following:

A. System one line drawing including all labeling and changes (" as builts ").

B. Owners manual for each piece of equipment.

C. Schematic diagram for each piece of equipment.

D. Contractors service phone number in a conspicuous place.

E. All test reports.

3.09 WARRANTIES

A. Contractor will warrant the system to be free from defects in materials and workmanship for a period of one year from the date of acceptance. Acts of God and owner abuse or neglect are not covered.

B. During the warranty period the contractor will respond to and correct any call for service within one day of the call.

C. Loaner equipment will be provided if necessary.

D. The manufacturer of the stage lighting and control equipment shall warranty the electrical distribution, dimming and control equipment to be free from defects of material or workmanship for a period of two years from the date of acceptance.

E. The manufacturer shall warranty all fixtures and accessories (except lamps) to be free from defects of material or workmanship for a period of one year from the date of acceptance. During the period of this warranty, equipment that proves to be defective shall be repaired or replaced at no charge (excluding freight). Unauthorized local repairs of equipment during the warranty period shall relieve the manufacturer of his responsibilities under this warranty.

F. Include the name, address, and phone number of at least two- (2) factory authorized Field Warranty centers within a 250-mile radius of the job site in the operation and maintenance manual.

3.10 FINAL ACCEPTANCE

A. The following conditions must be met before final acceptance will be granted:
1. Inventory of all equipment by the project Architects or his representative.
2. All inventoried portable equipment is in secure storage, accessible only by the Owner.
3. Approval of final tests and inspections by the project Architects, Theatre Consultant, and Owner.
4. Submittal to the Architect of three (3) signed copies of the warranty(ies).
5. Satisfactory completion of all punch list items.
6. At the date of system activation, the Contractor shall furnish and replace all lamps in stage lighting fixtures, which are observed to be noticeably dimmed, as judged by the Architect or his representative.

END OF SECTION

SECTION 16910 (26 09 00)

ELECTRIC SYSTEM CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the electrical system control work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS."

1.2 RELATED WORK

A. Section 15900 – HVAC Instrumentation and Controls for New Phase Replacement Facilities.

B. Section 15901 – HVAC Instrumentation and Controls for Building Addition to Existing Facilities.

C. Section 15902 – HVAC Instrumentation and Controls for ATC Replacement to Existing Facilities.

D. Section 16220 - Motor Starters.

E. Section 16510 - Interior Luminaires.

F. Section 16520 - Exterior Luminaires.

G. Section 16912 - Mechanical Systems Controls.

1.3 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01330, “Submittal Procedures”.

PART 2 PRODUCTS

2.1 RELAYS

A. Relays: conform to NEMA IC-1 and be heavy type, UL listed, rated at 25 Amps, 120 volts and mounted in NEMA 1 enclosures.

B. Grouped units may be in a common enclosure with a plywood backboard.

C. Relays: as manufactured by Potter & Brumfield of the type as follows:
1. Single Pole Double Throw (SPDT) - #PR5AY.
2. Double Pole Double Throw (DPDT) - #PR11AY.
3. Four Pole Double Throw (4PDT) - #PM17AY.

2.2 CONTACTORS

A. Contactors: conform to NEMA Standard IC-1. Contactor size and ratings: based on Tables in Part II of IC-1 for enclosed units. Coils: rated 120 volts.

B. Contactor characteristics of size, number of poles, voltage and current: as required or indicated for the load served.

C. Mount units in an individual NEMA 1 enclosure except the units indicated in the panel boards. Contactors electrically operated and mechanically held unless indicated otherwise.

D. Provide a local "open-close" control in, on or by the contactor. Units: as manufactured by Square 'D', General Electric, Westinghouse or Asco. Provide remote control switches with pilot light for each contactor.

PART 3 EXECUTION

3.1 WIRING

A. Use #14 stranded copper wiring for all controls unless noted otherwise.

B. Wiring: comply with N.E.C. Article 725, Class 1, Class 2, Class 3 remote control, signaling and power limited circuits.

C. All wiring: in conduit, except it could be run in the cable tray when available.

END OF SECTION

SECTION 02110 (31 10 00)

SITE CLEARING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Remove surface debris.

B. Remove paving, curbs, and rock base in areas shown on drawings.

C. Clear immediate building/construction site of plant life and grass.

D. Remove designated trees and shrubs including root systems.

1.2 RELATED SECTIONS

A. Section 02200-Earthwork.

B. Section 02222-Building Demolition.

C. Section 02371-Erosion and Sediment Control.

D. Section 02931-Sodding.

E. Section 02950-Trees, Plants, and groundcovers.

1.3 REGULATORY REQUIREMENTS

A. Coordinate clearing work with utility companies.

B. Conform to applicable Municipal and Broward County codes for legal disposal of debris and environmental protection. Contractor shall pay all fees.

C. Conform to applicable Municipal and Broward County codes limiting generation of noise.

1.4 QUALITY ASSURANCE

A. Certified Arborist: utilize a ISA (International Society of Arboriculture) Certified Arborist to:
   1. Provide tree protection plan to avoid damage to during construction
   2. Perform trimming of branches and root pruning with clearing limits.
   3. Extend pruning operation to restore natural shape of entire tree.
   4. Trim branches from trees, which are to remain, if required to provide horizontal and vertical clearance for construction equipment.
   5. Perform tree repair work for damages incurred by new construction.

1.5 SUBMITTALS

A. Certification: Submit written certification by a Certified Arborist that trees indicated to remain have been protected during the course of construction under provisions of recognized standards of the industry. Indicate that damaged trees were promptly and properly treated. Indicate which damaged trees, if any, are incapable of retaining full growth potential and are recommended to be replaced.

B. Certification: Submit copy of demolition firm's current license to operate in Broward County, Florida. Tree demolition shall be conducted/supervised by a Certified Arborist (CA), Florida Certified Landscape Contractor (FCLC) or Landscape Architect.

1.6 TRAFFIC AND SITE OCCUPANCY

A. During site clearing operations, ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

B. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from the Owner and applicable municipal authorities for areas outside the Owner's property line.

C. Provide traffic control devices, flagmen and other controls to ensure safe passage of traffic and pedestrians.

1.7 TEMPORARY PROTECTIONS

A. Temporary protection: Protect streets, roads, adjacent property, active utilities, and existing landscape materials and other site improvements designated to remain from damage through the use of temporary fencing, barricades, or guards.

B. Protect root systems. Do not store construction materials, debris, or excavated material within the drip line, which is the outer perimeter of branches. Do not permit vehicles within the drip line. Restrict foot traffic to prevent excessive compaction of soil over root systems.

C. Protect tree root systems from damage due to noxious materials in solution caused by run-off or spillage during mixing and placement of construction materials or drainage from stored materials. Protect root systems from flooding, erosion, or excessive wetting resulting from dewatering operations.

D. Burning of plants or fires of any kind is strictly prohibited.

PART 2 PRODUCTS

2.1 MATERIALS

A. Tree pruning compound: Waterproof, antiseptic, elastic and free of kerosene, coal tar, creosote, and other substances harmful to plants.

B. Drainage Fill: Selected stone or gravel graded to pass a 2.0-inch sieve and retained on a 0.5-inch sieve.

C. Topsoil: under provisions of Section 02900-Landscape Planting.

PART 3 EXECUTION

3.1 PREPARATION

A. Verify that existing plant life and features designated to remain, be located or removed are tagged or identified.

3.2 INSPECTION OF SITE

A. Visit the site and gain thorough familiarity with existing conditions such as existing grades, locations of buildings, poles, trees and landscape elements, and other site improvements, which may impact the Work.

3.3 PROTECTION

A. Protect utilities that remain from damage.

B. Protect trees, plant growth, and features designated to remain as final landscaping.

C. Protect benchmarks and existing structures from damage or displacement.

D. Relocate and protect large boulders and rocks identified by Owner to remain as final landscaping elements.

3.4 CLEARING

A. Clear areas required for access to site and execution of Work.

B. Remove paving, curbs, and rock base from areas indicated.

C. Remove trees and shrubs as indicated. Remove stumps, main root ball, root system to a depth of 24 inches, and surface rock not to remain as final landscaping.

D. Clear undergrowth and deadwood without disturbing subsoil.

E. Apply herbicide to remaining stumps to inhibit growth.

F. Carefully and cleanly cut roots and branches of trees indicated to remain, where roots and branches obstruct new construction, with sharp pruning instruments. Do not break or chop roots or branches. Paint cuts over 1/2 inch in size with tree pruning compound.

G. Remove all topsoil containing roots and organic material, grass roots, organic soil, trees, shrubs, brush, grass, weeds, and other debris.

H. Selective Clearing: In areas where trees are to remain, remove all undergrowth, dead trees, stumps, roots, vines, and other debris.

I. Grubbing: Scarify the areas where vegetation or other unsuitable materials occur to a minimum depth of 6 inches until all such materials are loosened and remove from the site.
   1. Use only hand methods for grubbing inside the drip line of trees indicated to remain.

2. Fill depressions caused by clearing and grubbing operations with satisfactory soil materials and compact and grade under provisions of Section 02300-Earthwork.

J. Topsoil: Strip topsoil to whatever depths encountered by methods, which will avoid the intermingling of topsoil with underlying subsoil's or other objectionable materials. Stockpile topsoil in area on site as directed by the Project Consultant. Construct piles to freely drain surface water. Securely cover topsoil piles to prevent wind-blown dust.
1. Topsoil is defined as friable clay loam sandy surface soil found in a depth of not less than 4 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 1 inch in diameter and without weeds, roots, and other objectionable material.
2. Remove heavy growths of grass from areas before stripping.
   (a) Where trees are indicated to remain, stop topsoil stripping a sufficient area from the tree to prevent damage to the main root system.

3.5 EXCAVATION AROUND TREES

A. Do not excavate within drip line of trees.

B. Where trenching for utilities is required within the drip line, tunnel around roots by hand digging. Do not cut main lateral roots or tap roots; cut smaller roots, which interfere with installation of new work. Cut roots with sharp pruning instruments: do not break or chop.

C. Do not allow exposed roots to dry out before permanent backfill is placed; provide temporary earth cover, or pack with peat moss and wrap with burlap. Water and maintain in moist condition and temporarily support and protect from damage until permanently relocated and covered with earth. Prune branches to balance loss to root system caused by damage or cutting of root system.

3.6 GRADING AND FILLING AROUND TREES

A. Maintain existing grade within drip line of trees, unless otherwise indicated.

B. Lowering grades: Where existing grade is above new finish grade shown around trees, carefully hand excavate within drip line to new finish grade. Cut roots exposed by excavation or provide permanent protections as recommended by tree surgeon.

3.7 RAISING GRADES

A. Minor filling: Where existing grade is 6 inches or less below elevation of finish grade shown, use a topsoil fill material. Place in single layers and compact as required; hand grade to required finish elevations.

B. Moderate filling: Where existing grade is more than 6 inches, but less than 12 inches, below finish grade elevation, place a layer of drainage fill on existing grade prior to placing topsoil. For balance of area, place drainage fill to an elevation 6 inches below grade and complete fill with a layer of topsoil to finish grade elevation. Do not compact gravel or topsoil layers receiving vacatitive cover; hand grade to required elevations.

3.8 REPAIR AND REPLACEMENT OF TREES

A. Repair trees damaged by construction operations. Make repairs promptly after damage occurs to prevent progressive deterioration of damaged trees.

B. Remove and replace dead and damaged trees, which are determined by the SBBC Arborist to be incapable of restoration to normal growth pattern.

C. Provide replacement trees 1.5 times the canopy of those trees to be replaced. Replacement trees should be the same species as selected by the Project Consultant/SBBC Arborist.

3.9 REMOVAL

A. Remove debris, rock, and extracted plant life from site on a daily basis.

B. Do not allow accumulations of debris.

C. Burning of debris is not allowed.

D. Use of blowers to distribute dust is not allowed.

END OF SECTION

SECTION 02200 (31 00 00)

EARTHWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Excavating.

B. Filling.

C. Backfilling.

D. Compacting.

E. Site grading.

F. Soil compaction control.

G. Dewatering.

H. Other required earthwork operations.

1.2 RELATED SECTIONS

A. Section 02110-Site Clearing

B. Section 02280-Soil Treatment

C. Section 02371-Erosion and Sediment Control.

D. Section 02510-Asphaltic Concrete Paving for Parking and Drives

E. Section 02811-Landscape/Irrigation.

F. Section 02931-Sodding.

G. Section 02950-Trees, Plants, and Groundcovers.

H. Applicable sections of Division 15 of Division 16.

1.3 QUALITY ASSURANCE

A. Job Conditions
1. Bench Marks and Monuments: Protect existing benchmarks, monuments and other reference points. If disturbed or destroyed, replace as directed at no cost to Owner.
2. Disposition of Utilities: Protect active utilities.
3. Remove abandoned utilities encountered during excavation. Utilities that are less than 18 inches from cleared surfaces must be relocated.
4. Provide dewatering and drainage as required by Department of Environmental Protection and State FDR SWPPP Program.

1.4 BENCH MARKS

A. Bench Marks: Employ an experienced and competent State of Florida licensed surveyor to establish the benchmarks, determine all lines and grades.

1.5 FINISHED GRADES

A. Finished Grades: Finished grades mean the final grade of elevations as indicated on drawings. Slope uniformly between grades shown. Provide vertical curves or rounding at abrupt changes in the grades indicated.

1.6 TRENCH SAFETY

A. Trench Safety: Comply with the Trench Safety Act, Sections 553.60 through 553.64 Florida Statutes. Where projects include trenching which exceeds a depth of five (5) feet comply with the trench safety standards as required by Section 553.63 and 553.64 Florida Statute.

PART 2 PRODUCTS

2.1 FILL

A. "Satisfactory Fill Materials" include materials classified in ASTM D2487-90 as GW, GP, SW and SP properly worked by Contractor to obtain optimum moisture and compaction, and 12% maximum passing #200 sieve.
   1. For Buildings:
      (a) Within 2 feet of the surface of indicated grade, limit rock size to 2 inches.
      (b) Below 2 feet of the surface of indicated grade limit rock size to 6 inches.
   2. For Physical Education Fields, Other Grasses or Landscaped Areas and Paved Areas.
      (a) Within 2 feet of the surface of indicated grade, limit rock size to 1 inch.
      (b) Below 2 feet of the surface of indicated grade limit rock size to 6 inches.

B. "Unsatisfactory Materials" include materials containing high levels of organics, clay, rubbish and contaminated matter. Materials of any classification determined by testing laboratory as too wet or too soft for providing a stable foundation for structure, paving, and walks will be classified as "unsatisfactory".

2.2 TOPSOIL MIXTURE

A. 80 percent (medium grade) fresh water sand, 20 percent sandy organic soil much thoroughly mixed before installation.
   1. Site mixing is allowed when submitted and approved by owner and engineer of record.
   2. Mixture shall be free of rocks, limbs, roots, and other deleterious matter.

2.3 BASEBALL AND SOFTBALL FIELDS

A. Sludge: Fine residual from oolite rock crushing operation at rock processing plant.

B. Clay: Florida red clay, free from rocks or owner-accepted equivalent not exceeding ¼ inch particle size.

C. Sand: Fine white sand; 100 percent passing through #50 sieve according to ASTM C136-84A.

2.4 PRIMARY PLAY AND PHYSICAL EDUCATION AREAS

A. Fine white sand designated “trap sand”, minimum 12 inch depth.

B. Material shall pass through wire-cloth screens of different sizes according to ASTM C136-84A and yield the following:

SCREEN SIZE	PERCENT (%) PASSING THROUGH SCREEN
#70	100%

PART 3 EXECUTION

3.1 JOB CONDITIONS

A. Condition of Premises; Accept site as found. Excavate, fill, compact, and backfill site as indicated on drawings and specified in this section.

B. Protection
1. Adjacent Structures and Property:
   (a) Take precautions to guard against movement, settlement, injury or loss to existing structures or to equipment and furnishings housed therein arising directly or indirectly in connection with this contract according to General Conditions.
   (b) Provide and place bracing or shoring as necessary or proper according to General Conditions.
   (c) Be responsible for the safety and support of such structures and facilities and be liable for any movement or settlement, damage, or injury caused by or resulting there from.
   (d) If, at any time, the safety of any adjacent structures or facilities appears to be in doubt, cease operations and take immediate precautions to support such structures and facilities and notify owner at once.
   (e) * Protects Record Professional.
   (f) Resume operations only after permission has been granted by owner.
2. Adjacent Sidewalks and Streets:
   (a) Take precautions to guard against movement, settlement, or collapse of any sidewalks, curbs, or street passages on adjoining sites and be liable for any such movement, settlement, or collapse according to General Conditions
   (b) Repair such damage promptly when so ordered at no cost to the Board.
   (c) Install School Board of Broward County necessary shoring, including sheet piling as may be required, to protect banks, adjacent paving, structures, and utilities during excavations.
   (d) Be responsible for any damage to existing structures, equipment, and furnishings due directly or indirectly to construction operations.

Except where removal is needed by site grading or location of new buildings, use every possible precaution to prevent injuries to landscaping, drives, curbs, and walks on or next to site of the work and replace at no expense to the Board, any of the above destroyed.

3. Existing Landscaping, Drives, Curbs and Walks: Except where removal is required by site grading or location of new buildings, take every possible precaution to prevent injuries or loss to individual trees, groups of trees, and other existing landscaping, drives, curbs and walks on or next to the site of the work according to General Conditions, and replace any such damaged or destroyed at no cost to the Board.

3.2 SITE CONDITIONS

A. Determine location and nature of work, character of equipment, and facilities needed for performance of work, general, and local conditions prevailing at site, and other matters affecting work under this contract.

B. Subsurface data, including soil borings, ground water elevations, or conditions, if provided are presented only as information available indicating conditions found and limited to exact locations and shall not be interrupted as an indication of conditions that may actually develop during construction.
   1. Make deductions of subsurface conditions that may affect methods or cost of construction and agree that no claim for damages or other compensation shall be made, except as are provided for in the agreement, should conditions be found during construction different from those as calculated or anticipated by the Contractor.
   2. The School Board will not be held responsible for variations found to exist between the subsurface data referred to above and actual field conditions that may develop during construction.

C. Where existing grades, utility lines, or substructures are shown on drawings, the Board assumes no responsibility for correctness of existing conditions indicated.
   1. Contractor shall locate indicated existing utility lines or substructures that may be affected by this Project, and shall be responsible for any damage or injury they may sustain as a result from working on or near these existing utilities or substructures not specified to be removed or demolished.

D. Bench Marks and Monuments:
   1. Maintain existing bench marks, monuments, and other reference points, and if disturbed or destroyed, replace at no additional cost to the owner.

3.3 FIELD QUALITY CONTROL

A. Public Safety: Accomplish work in a manner providing for the safety of the public and workers and the protection of the property.

B. Construction: Do not close, obstruct, or store material or equipment in streets, sidewalks, alleys, or passageways without a permit according to local ordinances, regulations, codes, and the Engineer/SBBC Arborist approval.

C. Interference: Conduct operations with minimum interference with roads and other facilities.

D. Removal:
   1. Unless otherwise noted or specified to be relocated or stored, materials removed become property of Contractor and shall be removed completely away from site.
   2. Do not store or allow debris to accumulate on site.
   3. If Contractor fails to remove excess debris promptly, School Board of Broward County, Florida (SBBC) reserves the right to remove the debris at Contractor's expense.

E. Temporary Structures: Remove temporary structures when no longer required.

F. Repair:
   1. Clean up, repair or replace, at no cost to the Board, property damages arising in connection with this Contract.
   2. Patch and repair work shall match existing and be performed in a neat and professional manner by worker skilled in the trade involved.
   3. This applies to damage to the newly graded areas within the building area limits and damage to adjacent properties by eroded materials.

G. Erosion Repair:
   1. Take every precaution and temporary measure to prevent damage from erosion of freshly graded areas.
      (a) Repair and reestablish grades to required elevations and slopes where settlement or washing occurs before acceptance of work at no cost to the Board.
      (b) This applies to school damage to the newly graded areas within the building area limits and damage to adjacent properties by eroded materials.

3.4 LOCATIONS AND ELEVATIONS

A. Contractor shall be responsible for surveys, measurements, any layouts required for proper execution of the work.
   1. Lay out lines and grades from existing survey control system and as shown on drawings.

3.5 CLEARING AND GRUBBING

A. Within limits of areas designated for building area, grading and site construction work, remove trees, brush, stumps, wood debris, and other deleterious materials not required to remain as part or finished work.

B. Removal of grass, plants, vegetation, and organic material from same area to be approved by SBBC Arborist.

C. Burning of materials is not allowed on the site.

D. Remove accumulated material daily or as necessary to prevent fire hazard condition.

3.6 STRIPPING

A. Strip turf, organic material, surface litter, rubble and overburden for entire depth of root system of grass or other vegetarian within areas indicated on Site Plan.

B. Stockpile topsoil on site.

C. Remove full depth of muck or organic material from beneath building and five (5) feet beyond footing. Clean potholes, larger than 6 inches in any horizontal direction, in rock filled with muck of organic material.

3.7 EXCAVATION

A. Begin excavation after stripping, clearing, and grubbing has been completed.

B. Excavate to grades required to accommodate the proposed construction.

C. Dewater as specified

D. Excavations for structures shall conform to dimensions and elevations indicated for each building.
   1. Extend excavations a sufficient distance from walls and footings to allow for placing and removal of forms and installation of services.
   2. Excavation below general machine excavation for footings and foundations shall be hand worked.
   3. Bottoms of footings shall be on level plans.

E. Excavate in such a manner that quick and efficient drainage of storm water will occur.

F. Remove all "unsatisfactory materials" encountered from the building areas.

G. Classify excavated materials. Separately stockpile suitable soils for use as backfill materials. If sufficient quantities of excavated materials meeting requirements for backfill are not available on site, provide materials meeting these requirements.

3.8 DEWATERING

A. Dewater excavation for inspection and for construction. Concrete or fill shall not be placed in water. Concrete less than 8 hours of age shall not be subjected to ground water pressure.
   1. Keep excavations free of water while backfilling or construction takes place.
   2. Dispose of water resulting from dewatering operations according to city, county, state, and federal regulations.
   3. Conduct operations to insure storm water runoff sediment is not discharged to the adjacent lakes, waterways, sewers, streets, and adjacent properties.

3.9 FILLING AND BACKFILLING

A. Filling and Backfilling:
   1. Materials: "Satisfactory Fill Materials" shall be used in fills and backfills.
   2. Place "Satisfactory Fill Material" in horizontal layers not exceeding 12 inches in loose depth.
      (a) Compact as specified in this section.
      (b) Do not place materials on muddy surfaces.

B. Reconditioning of Subgrade:
   1. Where approved compacted subgrades are disturbed by the Contractor's subsequent operations or adverse weather, scarify and compact the subgrade as specified to required density before further construction occurs.
   2. Use power driven hand tampers for recompaction over underground utilities.

C. Backfilling:

1. Do not begin backfilling until construction below finished grade has been accepted, underground utilities systems have been inspected, tested and accepted, forms have been removed, and excavation cleaned of trash and debris.
2. Bring backfill to indicated finished grade
3. Backfill materials and compaction shall be as specified.
4. Do not place backfill in wet areas.
5. Do not operate heavy equipment for spreading and compacting fill closer to foundation or retaining walls than a distance equal to height of backfill above top of footage.
6. Compact the area remaining by power-driven hand tampers suitable for material being compacted.
7. Place backfill carefully around pipes to avoid damage to the pipes.

D. Protection:
1. Settlement or washing occurring in backfilled areas before acceptance of work shall be repaired and grades reestablished to required elevation and slope.

3.10 STABILIZATION AND COMPACTION

A. Where the Geotechnical Engineer recommends the site to receive special treatment, include his recommendation within this section written in positive direction spelling what is to be done.

B. Densities under buildings, pavements and sidewalks: Taken on existing soil in each lift at a minimum rate of 1 per 2500 square feet.

C. Densities under buildings and structure footings and foundations: Taken at each isolated area and at 75 feet o.c. in continuous compacted areas.

D. All excavations and compaction work: Monitored by a qualified Geotechnical Engineer or Soils Technician, who will be selected and retained by the Owner. Coordinate work schedule with and cooperate with this Engineer or his Representative who maintains field logs of this work. Submit field log to the Owner's Project Representative upon its completion.

3.11 COMPACTION

A. Compact existing earth surfaces (exclude rock) after excavation and backfilling required levels with "Suitable Backfill Materials".
1. Compact with equipment suited for soil compaction.
2. Moisten or aerate material, as necessary, to provide moisture content to facilitate obtaining specified compaction with equipment being used.
3. Compact each layer to not less than percentage of maximum density specified below, determined according to ASTM D1557-91, Method D;
4. Insure compaction of previously prepared fill areas has been maintained before placing new layers.

LOCATION	PERCENTAGE
Understructures and building slabs, including footings, each layer.	98%
Under pavements and sidewalk areas each layer.	98%
Under landscaped areas, each layer including physical education fields.	90%

3.12 DISPOSAL OF EXCESS EXCAVATED MATERIALS

A. Excess "Satisfactory Fill Materials" and "Unsatisfactory Materials" shall become the property of the Contractor.
   1. Remove from Site.

3.13 FILL AND GRADING FOR PHYSICAL EDUCATION FIELDS, FOOTBALL AND PLAYING FIELDS, AND OTHER GRASSED AREAS:

A. Physical Education Fields and Other Grassed Areas: Clean, satisfactory fill, free from rock and debris and of such quality to not interfere with future installation of grass.

B. Playing Fields:
   1. Rough grade: 8 inches minimum below finish topsoil grade in preparation for fill consisting of:
      (a) Base: 4 inches of fine, compacted satisfactory fill material with no rocks larger than 1 inch. Crown and contour according to Construction Documents.
      (b) Topping: 4 inches minimum of compacted 80-20 topsoil mix as specified in Section 02900. No rocks.
      (c) Grass: Sod as specified in Section 02900.
      (d) Gradient: 12 inch crown at center with 1.0 to 1.5 percent to sides.

C. Other Grassed Areas:
   1. Rough grade: 5 inches minimum below finish topsoil grade in preparation for topping consisting of 4 inches minimum of compacted 80-20 top soil mix as specified in Section 02900.
   2. Grass: As specified in Section 02900.
   3. Gradient: According to grading plan,

D. Landscaped Areas other than Grass:
   1. Fill and Grade according to "Other Grassed Areas" as specified with variations per specific plant material.
   2. Gradient according to grading plan,

3.14 FILL AND GRADING FOR BASEBALL AND SOFTBALL FIELDS

A. Rough grade in preparation for infield and outfield fill is as follows:
   1. Clay Infield Areas:
      (a) Excavate to a depth of 10 to 12 inches.
      (b) Base Course: Spread sand base course material uniformly, scarify and then shape to produce the required grades and cross section after compaction.
      (c) Sand base shall be rough graded, rolled, finish graded, and then water bound and rolled, until thoroughly bonded, unyielding and compact base is obtained.
      (d) Thickness 8 inches after compaction.
      (e) Sand base shall be compacted to an average density of not less than 98% of the maximum density obtainable under AASHO T-180 latest addition.
      (f) Grades shall be maintained and all irregularities greater than ¼ inch in 15 feet shall be corrected.
      (g) Red Clay: Apply red clay finish 4 inch thickness. Home base, Pitcher's mound, First, Second and Third bases and running lanes

shall receive a thickness of 6 inch, 6 feet diameter at all bases and pitcher's mound and 3 feet wide at running lanes. Infields, when noted to receive clay, shall be 4 inch thick.

B. Outfield Grass Area:
   1. Rough Grade: 12 inches minimum below finish grade.
   2. Base: 8 inches of fine, compacted specified sand with no rocks larger than 1 inch. Crown and contour according to Construction Documents.
   3. Toping: 4 inches minimum of compacted 80-20 topsoil mix as specified in Section 02900. No rocks.
   4. Grass: Sod as specified in Section 02900.

C. Finish Grade:
   1. Grade infield and outfield areas in concentric circles from a radius center at homeplate or pitcher's mound as indicated on the drawings.
      (a) Infield: Make finish grade smooth and even. Blade after compaction to give skinned finish.
      (b) Outfield: Make finish grade smooth and even in preparation for grassing as specified in Section 02900, Landscaping.
   2. Infield skinned area gradient: 1.0 to 1.25 percent.
   3. Infield turf area gradient: 1.0 to 1.25 percent.
   4. Outfield turf area gradient:
      (a) Baseball: 1.25 to 1.5 percent
      (b) Softball: 1.5 percent

3.15 TOPSOIL MIXTURE

A. Place 80 percent sand 20 percent muck topsoil mixture in all grass areas.
   1. Depth of Topsoil Mixture: Not less than 4 inches, except as otherwise shown.
   2. Grade topsoil mixture two ways (at right angles) as required to meet finished grades shown on plan.

B. Spread the topsoil mixture in open accessible areas with motor graders.
   1. Hand finish areas not accessible to motor graders.

C. Disking, if used, shall consist of not less than 4 passes over area with each pass at right angles to preceding one.

3.16 CLEANING

A. Remove trash and unsuitable materials from the site on a daily basis.

END OF SECTION

SECTION 02220 (31 23 10)

EXCAVATION AND FILL FOR UTILITY SYSTEMS

PART 1 GENERAL

1.1 SYSTEM DESCRIPTION

A. Clearing, excavating, grading and backfilling as required for the construction of piped and other underground utility systems and appurtenances.

1.2 QUALITY ASSURANCE

A. Comply with Chapter 90-96 of the Laws of Florida (The Trench Safety Act) and OSHA Standard 29 CFR, Section 1926.650 Subpart P.

B. References:
   1. American Society for Testing and Materials (ASTM):
      (a) D1556-90; Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
      (b) D1557-91; Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.
      (c) D2487-90; Classification of Soils for engineering Purposes.

PART 2 PRODUCTS

2.1 PRODUCTS AND MATERIALS

A. Bedding Material:
   1. For use below the water table or in wet trenches: pea rock, 3/4 inch washed rock, or similar material.
   2. Pipe bedding material for use in dry trenches: lime rock screenings, sand or other fine inorganic material.

B. Additional Backfill Material:
   1. “Satisfactory Fill Materials” include materials classified in ASTM D2487 as GW, GP, SW, and SP properly worked by Contractor to obtain optimum moisture and compaction. Maximum size of rock limited to 3 inches. Use 2-inch maximum size for the top 2 feet below the finish indicated grade.
   2. Stones or rocks:
      (a) Not larger than three inches in diameter.
      (b) When placed within one foot of piping and appurtenances: Not larger than two inches in diameter.
      (c) When placed within one foot of PVC piping: Not larger than one inch in diameter.

C. Fill Brought From Off-site: Provide test results and source certification that fill materials do not contain any hazardous materials such as heavy metals, organics, petroleum products.

2.2 PREPARATION

A. Perform all clearing necessary for the proper installation of all piping and appurtenances.

B. Transplant, relocate, protect and preserve plantings, shrubbery, trees, or other landscape materials subject to damage resulting from excavation and other site operations. Replace damaged landscape materials and plant materials.

C. Relocate, brace, protect and preserve utility poles, structures, and other site improvements subject to damage resulting from excavation and other site operations. Repair damaged site improvements.

2.3 PROJECT CONDITIONS

A. Existing Utilities:
1. Protect existing utilities from movement, settlement, or other damages according to Instructions to Bidders and General Conditions.

B. Trench Safety Act: Provide trench safety systems at all trench excavations where workers may be exposed to moving ground or cave-ins regardless of depth of trench. Ensure all trenches more than 5 feet in depth comply with OSHA “Trench Safety Act”.

2.4 FIELD QUALITY CONTROL

A. Excavations:
1. Perform all excavations of every description and of whatever substances encountered, including rock excavations, to the dimensions and depth necessary for installation of utility systems as specified or to remove deleterious materials.
2. All excavations: Made by open cut.
3. Trench walls:
   (a) Kept vertical.
   (b) Sheeted and braced as necessary to protect the safety of workmen, the general public, this or other work or structures, or to maintain specified trench widths.
   (c) Wood sheeting or certain designs of steel sheeting: cut off sheeting at a level 2 feet above the top of the installed pipe and leave in place that portion below that level.
   (d) Interlocking steel sheeting: remove sheeting after use providing removal can be accomplished without disturbing the bedding, pipe or pipe alignment.
   (e) Damage to the pipe bedding, pipe or alignment of the constructed utility caused by removal of sheeting: Replace affected portion of the Work at no additional cost to Owner.
   (f) Open trench ahead of pipe laying operations: Not more than 100 linear feet.
   (g) Slope trench sides to a stable angle of repose of the excavated material in areas where trench widths are not limited by Right-of-Way and easement widths, property line restrictions, existing adjacent improvements, including pavements, structures and other utilities, or maintenance of traffic.
   (h) Safely constructed movable shield, "box" or "mole": use in place of sheeting when the trench is opened immediately ahead of the shield and closed immediately behind the shield as pipe laying proceeds inside the shield.
4. Trench Access: Provide ladders or steps.

5. Pipe trenches for utility lines:
   (a) Excavate to a width within the limits of the top of the pipe and the trench bottom to provide a clearance on each side of the pipe barrel, measured to the face of the excavation or sheeting, if used, of 8 inches to 12 inches.
   (b) Manhole excavations: Of sufficient depth to permit their construction on the undisturbed bottom of the excavation.
6. Materials removed from the trenches:
   (a) Store and dispose of excavated materials in a manner that will not interfere with traffic on public streets and sidewalks.
   (b) Do not store or place excavated materials on public or private property outside the Owner's property line.
   (c) Properly dispose of unsuitable materials such as muck and organically contaminated fill off site.
   (d) Materials suitable for use as backfill: Hauled to and use in areas where not enough suitable material is available from the excavation.

B. Excess suitable material: Dispose of within the limits of the project as directed by the Project Consultant. Finish grade disposal area.
1. Excavation of Unclassified Material:
   (a) Materials encountered during the excavating to the depth and extent specified and indicated on drawings may include rock, concrete, masonry, or other similar materials.
   (b) No adjustment will be made in the Contract Price because of the presence (or absence) of rock, concrete, masonry, or other similar materials.

C. Removal of Water:
1. All excavations:
   (a) Free from water before pipe or structures are installed.
   (b) Extreme Water Conditions: Contractor may elect to utilize extreme water conditions methods specified elsewhere in this document.
2. Control water flow on site:
   (a) Meet State and Federal "SWPPP" flow containment programs and approvals. Restrict flow from one site area to another by installing temporary dams or plugs within the pipe provided they are suitably removed and do not damage the lining of the pipe.
   (b) All work shall be conducted in strict accordance with the proposed "SWPPP" plan prepared by the engineer of records.
   (c) Installed lines, except for water distribution lines: May be used to convey trench water, provided the pipe lining is not damaged and the line is cleaned out prior to acceptance of the work.
3. Dewatering:
   (a) Provide all necessary pumps, under drains, well-point systems, and other means for removing water from trenches and other parts of the Work.
   (b) Continue dewatering operations until the backfill has progressed to a sufficient depth over the pipe to prevent flotation or movement of the pipe in the trench and so that it is above the natural water table.
4. Water Disposal:
   (a) Do not cause injury to public health, to public or private property, to the work completed or in progress, to the surface of the streets, or cause any interference with the use of the same by the public.
   (b) All disposal of surface water shall be based on "SWPPP" approved plan.

(c) Do not start excavation until receiving approval of proposed water disposal method.

D. Pipe Bedding:
1. Excavate pipe trenches to a level of 8 inches below the outside bottom of the proposed pipe barrel.
2. Backfill resulting excavation with pipe bedding material, up to the level of the lower one-half of the proposed pipe barrel.
3. Tamped and compact backfill to provide proper bedding for the pipe and then shape bed to receive the pipe.
4. Provide bedding under the branch of all fittings to furnish adequate support and bearing under the fitting.
5. Excavations below the levels required for installation of the pipe bedding, except for "Additional Excavation": Backfill with bedding material, tamp, compact and shape to provide proper support for the proposed pipe, at no additional cost to the Owner.

E. Backfill under Manholes, Inlets and Meter Vaults:
1. Fill excavations below the levels required for the proper construction of manholes or meter vaults with 3/4 inch washed rock.

F. Trench Stabilization:
1. No claim for extras, or additional payment will be considered for cost incurred in the stabilization of trench bottoms, which are rendered soft or unstable as a result of construction methods, such as improper or inadequate sheeting, dewatering or other causes.
2. Do not install pipe when such conditions exist.
3. Contractor: correct such conditions so as to provide proper bedding or foundations for the proposed installation at no additional cost to the Owner.

G. Backfill:
1. Backfilling of utility trenches: not allowed until the work has been approved by the Project Consultant and Building Department Inspector, and other jurisdictional inspectors as applicable.
2. Provide pressure tests as required by codes and jurisdictional authorities.
3. Uncover any work, which is covered or concealed without approved inspections by the Building Department Inspector at no cost to the Owner.
4. Partial backfill: May be made to restrain the pipe during pressure testing.
5. Provide additional or supplemental backfill materials as necessary from on-site or off-site sources.
6. Placing Backfill:
   (a) Place selected backfill material containing no stone or rocks larger than 2 inches in 12-inch layers and thoroughly tamp to a depth of 12 inches over the top of the pipe.
   (b) Provide thorough support for the branch of all service connection fittings.
   (c) Preserve the alignment and gradient of the installed pipe.
   (d) Waterlines or Force Main Pipes: Place remainder of the backfill in layers, not to exceed 12 inches, and compact with mechanical tampers or other suitable equipment to obtain a density of not less than 95 percent of its maximum density.
   (e) Sewer Pipes:
      1. Backfill to a depth of 30 inches over the pipe by placing backfill material in 12 inch layers and thoroughly compact with

mechanical tampers to obtain a density of not less than 95 percent of maximum density.

2. Place remainder of backfill in layers not to exceed 12 inches, and compact with mechanical tampers or other suitable equipment to obtain a density of not less than 95 percent of maximum density.

(f) Within paved areas of trench excavation: construct base and surfacing constructed as based upon ASTM D1557-91 and compacted to 98 percent maximum density.

(g) Partially backfill no more than 100 feet of trench with pipe in place at any time.

H. Compaction and Densities:

1. Methods of control and testing of backfill construction are:
   (a) Maximum density of the material in trenches: Conform to AASHTO Designation T 180-74.
   (b) Field density of the backfill material in place: Conform to AASHTO Designation T 238-79.
2. Laboratory and field density tests necessary to establish compliance with the compaction requirements of these specifications will be conducted at the Owner's expense at intervals to be determined by the Owner. Tests will be made at depths and locations selected by the Owner.
3. Rework and recompact trench backfill, which does not comply with the specified densities until the required compaction is secured, at no additional cost to the Owner. Costs for retesting such work: Paid for by the Contractor.

I. Additional Excavation and Backfill:

1. Remove and dispose of organic material, such as roots, muck, or other vegetative matter, or other material encountered below the level of proposed pipe bedding material.
2. Install sheeting as necessary to maintain pipe trenches within the specified limits.
3. Backfill resulting excavation with suitable backfill material, placed in 12-inch layers tamped and compacted up to the level of the bottom of the proposed pipe bedding material.
4. Sufficiently compact this material to protect the pipe against settlement.
5. Provide pipe bedding as specified above.

J. Trenching in Extreme Water Conditions:

1. General:
   (a) A combination of conditions in the substrata, water table, or method of disposal may be encountered during the course of the work, which make dewatering impossible, or only possible through the use of unusual methods.
   (b) When such conditions are encountered, but only after all reasonable means to dewater the excavation have been employed without success, the Contractor, with the concurrence of the Project Consultant, may elect to employ the following method of construction.
   (c) Obtain the concurrence of the Project Consultant in writing and limit the use of this method of construction to such specific portions of the work as the Project Consultant determines.
   (d) Standards of construction quality previously specified apply to this alternate method for this method of achieving the Work.
2. Removal of Water: The installation of pipe, manholes and appurtenances under water will be permitted.

3. Excavation:
   (a) Perform excavation of pipe trenches to the level of the bottom of the proposed pipe bedding as specified above:
      1. If rock, such as lime rock or other similar hard, cemented material providing firm, unyielding trench bottoms is encountered at the level of the bottom of the proposed pipe bedding: no additional excavation required.
      2. If material such as sand, marl, or other material which cannot be classified as rock, is encountered at the level of the bottom of the proposed pipe bedding: Excavate pipe trench to an additional depth of 10 inches minimum, below that level.
      3. Provide additional excavation, and related additional backfilling made necessary by deleterious materials encountered.
   (b) Excavate for manholes to be installed under water to a depth, below the outside bottom of the proposed structure to provide a minimum space of 12 inches in rock, or 24 inches in sand for the placement of drain field lime rock.
   (c) Provide longitudinally sloping plane bottom surface for the placement of pipe bedding material from the bottom of the manhole excavation, at its extremity, to a line of intersection with the bottom of the typical excavation of 10 feet measured horizontally, from the vertical plane of the manhole excavation.
4. Pipe and Manhole Bedding:
   (a) Backfill pipe trench or manhole excavation to receive the pipe or manhole with drain field lime rock up to the level of the lower one-third (1/3) of the proposed pipe barrel, or to the outside bottom of the proposed manhole as applicable.
   (b) Tamp and compact backfill to provide proper bedding for the pipe or manhole.
   (c) Do not utilize material other than drain field lime rock as bedding material for underwater construction.
5. Backfill:
   (a) Backfill after the pipe is installed with drain field lime rock around the pipe and to a level even with the top of the pipe bell.
   (b) Carefully lift all backfill material, including drain field lime rock, into trench and release to fall freely when the bucket or container is at or just above water level:
   (c) Do not dump or push backfill material into trenches containing water.
   (d) Carefully ram backfill material into place in uniform layers below the existing water level.
   (e) Place and compact backfill material above the water level to densities specified above.

K. Restoration of Existing Surfaces: Restore paved and grassed areas disturbed by the operations required under this Section as indicated on the Drawings and specified herein.

L. Testing:
1. Call directly for tests the Board contracted Testing Laboratory to perform specified tests at the Board's Expense.
2. Tests of Materials as follows;
   (a) Laboratory Tests for Moisture Content and Density: Under provisions of ASTM D1557-91, one test for each material encountered or proposed to be used.

(b) Field Tests for Moisture Content and Density: Under provisions of ASTM D1556- 90, one test per layer per 100 linear feet of ditch.

END OF SECTION

SECTION 321724 – PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Pavement markings required in proposed parking lot area

B. Quality Assurance

1. Safety data sheets shall be submitted for each product utilized.

2. Volatile organic content (VOC) of pavement markings used must conform to federal, state and local regulations.

C. Delivery and Storage

1. All paint materials shall be delivered to the site in original sealed containers that plainly show the designated name, specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer.

2. The Contractor shall provide any necessary storage areas at the site for maintaining materials at temperatures recommend by the manufacturer.

PART 2 - PRODUCTS

2.1 STANDARD PAINT

A. Standard paints shall include water reducible products that are single packaged and ready mixed. The paint shall have the capability of being cleaned and flushed from the pavement marking machines using regular tap water and any required rust inhibitors.

B. Refer to FDOT Section 971-3.2 for composition and 971-3.3 for physical requirements of paint.

PART 3 - EXECUTION

3.1 GENERAL

A. All pavement markings shall be applied in conformance with FDOT Section 710 Painted Pavement Markings.

B. Pavement markings shall be applied to clean, dry surfaces, and unless otherwise approved by the City. All pavement surfaces must be dry such as after water has been used for cleaning or rainfall has occurred prior to striping or marking.

C. Standard paint shall be applied when the ambient air and surface temperature is at least 40ºF and rising.

D. Painted pavement markings shall not be applied when winds are sufficient to cause spray dust.

E. The Contractor shall utilize equipment which produces continuous uniform dimensions of pavement markings of varying widths and meets the following requirements:

1. Capable of traveling at a uniform, predetermined rate of speed, both uphill and downhill, in order to produce a uniform application of paint and capable of following straight lines and making normal curves in a true arc.

2. Capable of spraying paint to the required thickness and width without thinning of the paint. Equip the paint tank with nozzles equipped with cut-off valves, which will apply broken or skip lines automatically.

F. Paint shall be mixed thoroughly prior to pouring into the painting machine. Apply paint to the pavement by spray or other means approved by the Engineer.

G. Apply all pavement markings prior to opening of road traffic. The Contractor shall ensure that all newly applied pavement markings are sufficiently dry before any traffic or vehicles pass over markings. The Contractor shall remove and replace any portion of the pavement markings damaged by passing traffic or from any other cause, at no additional cost to the City.

H. The Contractor shall notify the City prior to placement of marking or striping.

I. Apply standard paint to attain a minimum wet film thickness in accordance with the manufacturer's recommendations.

END OF SECTION 321724

SECTION 02747 (32 18 23.10)

ASPHALTIC CONCRETE PAVING FOR PLAY COURTS AND TRACKS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Asphaltic Concrete Paving for Playcourts, Tennis Courts and Tracks.

B. Surface Sealer.

C. Wearing Binder or Base Course.

1.2 RELATED SECTIONS

A. Section 02791-Color Surface for Play Courts.

1.3 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):
1. AASHTO T-180-74 (82): Moisture-Density Relations of Soils Using a 10 pound hammer and an 18-inch Drop and 1983 interim revision.

B. American Society for Testing Materials (ASTM)
1. ASTM A615-86, Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

C. Florida Department of Transportation (DOT):
1. Standard Specifications for Road and Bridge Construction.

1.4 QUALITY ASSURANCE

A. Perform work under provisions of State of Florida Department of Transportation "Standard Specifications for Road and Bridge Construction". Mixing Plant: Conform to State of Florida DOT Standards.

B. Obtain materials from same source throughout.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Do not place asphaltic when base or surface is wet or when base surface temperature is less than 40 degrees Fahrenheit.

1.6 JOB CONDITIONS

A. After final rolling, protect newly placed material from traffic by barricades or other suitable methods until it has hardened, and in no case less than 24 hours.

B. After final rolling prohibit vehicular traffic of any kind. Completed areas shall not be used for storage or staging areas of any kind.

PART 2 PRODUCTS

2.1 MATERIALS

A. Paving Materials:
   1. Fill: Sand and/or rock, containing not over 40 percent rock, 2 inches maximum size.
   2. Lime rock Base Course: Miami Oolite Lime rock, 60 percent lime content, free from sand, marl, roots, boulders, and other unsuitable material.
   3. Prime Coat: Cut back asphaltic, DOT grade RC-70 or RC-250.
   4. Tack Coat: Asphaltic Cement, Penetration Grade 85-100 percent or emulsified asphaltic, DOT grade RS-2.
   5. Wearing Surface Coarse: Asphaltic Concrete, Type S-III for track, outside basketball courts, tennis courts.

PART 3 EXECUTION

3.1 GENERAL

A. Connections to Existing Pavements: Saw cut with joints neat and as inconspicuous as possible.

B. Patching Existing Pavements: Repair existing pavement if damaged or removed due to construction activities as directed by the Owner.

3.2 EXAMINATION

A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

C. Beginning of installation means acceptance of substrate.

3.3 PLANT CONTROL

A. Grass and Weed Extermination:
   1. Apply weed killer over entire lime rock base course area to be surfaced, prior to the installation of the prime coat.
   2. Use Round-Up or approved equal as per manufacturer's recommendations for non-crop areas. Provide a second application layer around the full perimeter, 2 feet wide, of the paved area.
   3. Repeat as required to eliminate plant growth.
   4. Coordinate and arrange for owner inspection of areas to be treated during treatment of the surface.

3.4 PAVING INSTALLATION

A. Subgrade Preparation:
   1. Bring top of subgrade between outer limits of base course to a surface conforming to grades, lines and cross sections as indicated on drawings.
   2. Machine compact existing subgrade to 98 percent of maximum dry density as determined by AASHTO T-180.

3. Provide additional fill where required under paved areas and compact as specified above. Apply in layers not to exceed 12 inches.
4. Stabilize all subgrade material within the limits indicated on the drawings, which provide a Lime rock Bearing Ratio of not less than 40 under provisions of Section 160 of the DOT Standard Specifications.
5. After the subgrade has been properly shaped (and stabilized), bring it to a firm unyielding surface by rolling or hand tamping.
   (a) If the subgrade material does not contain sufficient moisture at the time of rolling to insure proper compaction, water as directed by the Owner and then compact.
   (b) Permit subgrade material containing excess moisture to dry to the proper consistency before compacting.
   (c) Compact the top 12 inches of the subgrade, including cut and fill sections, to a density of not less than 100 percent of the maximum density as determined by AASHTO T-180.
6. After the substrate has been prepared, maintain it free of ruts, depressions, and damage resulting from the hauling and handling of any material, equipment, tools, etc.
   (a) Construct and maintain ditches or drains along the completed subgrade section to keep it from becoming waterlogged.
   (b) Just before the base course is laid, test the subgrade as to crown and elevation.
   (c) The elevation of the subgrade is to be within 1/4 inch of the required elevation.

B. Base Course:
1. Base Course Construction: Conform to DOT Standard Specification, Section 200. Construct base course on the prepared subgrade conforming to the lines, grades, notes, and cross sections indicated in the Drawings.
2. Spread base material uniformly, scarify and then shape to produce required grades and cross sections after completion.
3. Rough grade, roll, finish grade and then water and roll base until a thoroughly bonded, unyielding, and compact base is obtained.
4. Thickness after compaction: Six inches minimum unless otherwise indicated.
5. Compact base course to 98 percent maximum density under provisions of AASHTO T-180.
6. Maintain grades shown on drawings. Correct all irregularities greater than 1/4 inch in 10 feet.

C. Prime Coat:
1. After base course has completely cured and is dry, remove loose material, dust, dirt, and foreign material, which might prevent bonding of prime coat.
2. Apply prime coat at rate of not less than 1 gallon per 10 square yards.

D. Tack Coat:
1. If the primed base has become dirty and cannot be cleaned, or in areas where prime coat has cured and lost bonding ability, apply a tack coat at rate of 1 gallon per 10 square yards.
2. When weather conditions delay installation of wearing surface, seal the surface with emulsified asphaltic at the rate of 2 gallons per 10 square yards.

E. Surface Course:
1. Place to a minimum thickness of 1 inch unless otherwise indicated. Apply when surface is dry and weather conditions are suitable.
2. Place asphaltic concrete at an average rate of 20 square yards per ton. Spread mixture with mechanical spreaders.

(a) Seal roll mixture using tandem steel rollers weighing between 5 and 12 tons and following as close behind spreader as possible.
(b) Roll with self-propelled pneumatic tire rollers covering every portion of surface with at least 12 passes.
(c) Roll asphaltic in the direction of water drainage sheet flow. Seams in the finished surface resulting from rolling operations shall be parallel to the direction of drainage sheet flow.
(d) Final roll surfaces with 8 to 12 ton tandem steel rollers before temperature of mixture has dropped below 140 degrees Fahrenheit. Continue rolling until all roller and tire marks have been eliminated.

3. Saw cut all edges straight and true.
4. Finish surface not to vary more than 1/4 inch in 10 feet when measured in any direction. Provide for free drainage of water.
5. Rework, including pavement removal and replacement, areas that pocket water to a depth of more than 1/16 inch.

3.5 INSTALLATION TOLERANCES

A. In the presence of the Owner, flood the resurfaced area to confirm that all water drains off properly with no "bird baths".

B. Rework areas that pocket water to a depth of more than 1/16 inch until proper slope for the section and cross drainage is achieved.

3.6 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Section 01450, “Quality Control”.

B. Include inspection and testing of sub grade and base course to verify obtained densities after compaction; and to verify thickness of completed base and surface courses.

END OF SECTION

SECTION 02790 (32 18 23.39)

RUBBER SURFACING FOR RUNNING TRACKS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. A rubber granular mat system with polyurethane binders for installation over asphalt base and subbase.

1.2 RELATED SECTIONS

A. Section 02747-Asphaltic Concrete Paving for Courts and Tracks.

B. Section 02791-Color surface for Play Courts.

1.3 REFERENCES

A. National Federation of State High School Association (NFHS).

1.4 PERFORMANCE REQUIRMENTS

A. The rubber surfacing system shall exhibit the following minimum performance standards (ASTM):

1.	Shore A Hardness:	55 $\pm$ 5 (ASTM D-2240)
2.	Elongation at Break:	~90% (ASTM D-412)
3.	Tensile Strength:	0.75 N/mm2 (ASTM D-412)
4.	Compression Set Recovery:	90%-95% over 24hr period (ASTM D-412)
5.	Abrasion Resistance:	0.25 grams loss after 1000 cycles (ASTM D-501)
6.	Coefficient of Friction:	Dry: 0.7-0.75, Wet: 0.6-0.65 (ASTM D-1984)
7.	Resilience:	37%-39% (ASTM D-2632)
8.	Tear Resistance:	50-65 psi (ASTM D-624)

1.5 SUBMITTALS

A. Submit manufacturer's literature, specifications, installation instructions and maintenance instructions.

B. Sample: 6 inch x 6 inch of the same synthetic track surfacing system to be installed on this project.

1.6 QUALITY ASSURANCE

A. Manufacturer: Submit documentation that manufacturer has been regularly engaged in the production of products as specified for a minimum of 5 years.

B. Installer: Submit documentation that firm regularly engaged in construction or re-surfacing for a minimum 4 years previous experience in construction or re-surfacing of all weather tennis courts, play courts, tracks, or similar athletic surfaces in the form of a list of past installations including:

1. Facility Owner.
2. Location of court/surface.

3. Size and type of court/surface.
4. Year construction or re-surfacing was performed.

1.7 DELIVERY, STORAGE, and HANDLING

A. Store materials under provisions of Manufacturer's Instructions: Protect from extremes of weather, temperature, moisture, and other damage.

B. Deliver materials to site in manufacturer's original sealed containers with proper labels attached.

1.8 WARRANTY

A. Provide warranty against defects in the materials and workmanship for a period of 5 year from the date of final acceptance.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with specified requirements, provide track surfacing from one of the following:
1. Mfr.: Atlas Track and Tennis; Product: Poly 2000 Modified.
2. (Basis of Design) Mfr.: Beynon; Product: BSS 200 (formerly know as Defargo, Ameritan MSI).
3. Mfr.: Child Safe Products; Product: Fastrack 400 Modified.
4. Mfr.: Fisher Tracks; Product: Poly Mat ISS.
5. Mfr.: Hellas; Product: Sport Track 300.

B. Substitutions:
1. Will be considered by the A/E and Owner when submitted per requirements of Division-0, Division-1, and Section 01630-Product Substitution Procedure.

2.2 MATERIALS

A. Primer: Composed of polyurethane-based materials specifically formulated to be compatible with the base and track surfacing material.

B. Base Course: Recycled black SBR rubber granules shall be processed and chopped to 1-3 mm size, containing less than 1 percent dust.

C. Binder: Polyurethane methylene dephenyl isocyanate (MDI)-based, mono-component, black pigmented, polyurethane binding agent. The binding agent shall not have a free toluene diphenyl isocyante (TDI) monomer level above 0.2 percent, black or clear color and solvent free. The binding agent must be specially formulated for compatibility with SBR crumb.

D. EPDM Wear Course: EPDM granules shall be man-made and ensure a minimum 20 percent EPDM, with a specific gravity of 1.5 ± 0.1, processed and chopped 0.5-1.5 mm.
1. Color: Red.

E. Structural Spray Coating: A single-component, moisture-cured, 100 percent solids, pigmented-polyurethane, specially formulated to be compatible with EPDM granules.

F. Seal Coat: The resin for the impermeable layer shall be pigmented, thixotropis, 2-component, polyol and isocyanate, moisture-cured, urethane compound. No rubber dust is to be used in the sealing application.

G. Line Marking Paint: Polyurethane-based specifically manufactured to be compatible with the manufacturer's recommendations for polyurethane synthetic track surfaces.

PART 3 EXECUTION

3.1 EXAMINATION-SITE VERIFICATION of CONDITIONS

A. Installation shall not take place if adjacent or concurrent construction generates excessive dust, abrasives or any other by-product that, in the opinion of the installer, would be harmful to the track material, until completion of such works.

B. If in the opinion of the installer of the synthetic material, the weather and/or climatic conditions are detrimental to the proper installation of the surfacing materials, work shall be delayed until conditions are acceptable. Preferred installation temperature is fifty degrees Fahrenheit and rising. Installation shall be executed only in dry conditions.

3.2 INSTALLATION-ASPHALT BASE and SUBBASE

A. The Rubber Surfacing System shall be laid on an approved subbase. The General Contractor shall provide compaction test with results complying with compaction requirements of Section 02747-"Asphaltic Concrete Paving for Courts and Tracks" for the installed asphalt base course.

B. Unless otherwise stated in the NFHS guidelines, the following criteria must be followed: The track surface, i.e. asphalt base, shall not vary from planned cross slope by more than + 0.2 percent, with a maximum lateral slope outside to inside of 2 percent, and a maximum slope of 0.1 percent in any running direction. The finished asphalt shall not vary under a 10 feet straight edge more than 1/8 inch.

C. It should be the responsibility of the asphalt-paving contractor to flood the surface immediately after the asphalt is capable of handling traffic, but within 24 hours. If after 20 minutes of drying time, there are birdbaths evident, it shall be the responsibility of the Project Consultant, in conjunction with the surfacing contractor to determine the method of correction. No cold tar patching, skin patching or sand mix patching will be acceptable.

D. Any oil spills (hydraulic, diesel, motor oil, etc.) must be completely removed, either by chipping out or removing and replacing with new, keyed in asphalt. The minimum depth of any asphalt replacement shall be one inch. The curing time for the asphalt base is 28 days. It shall be the responsibility of the surfacing contractor to determine if the asphalt base has cured sufficiently prior to the application of polyurethane surfacing system.

E. It shall be the responsibility of the General Contractor to determine if the asphalt base meets all design specifications, i.e. cross slopes, planarity and specific project criteria. After all the above conditions are met, the synthetic surfacing contractor must, in writing, accept the planarity of the asphalt receiving base, before work can commence.

3.3 INSTALLATION-RUBBER SYSTEM

A. Follow manufacturer's printed installation instructions and recommendations.

B. Thickness: Black mat shall be 1/2 inch (13 mm).

C. Apply the primer over the entire area to be surfaced per the manufacturer's written instructions.

D. Equipment: Rubber Surfacing System components shall be processed and installed by specially designed machinery and equipment. A mechanically operated paver with variable regulated speed and thermostatically controlled screed shall be used in the installation of the base mat. The wearing course shall be installed using automatic electronic portioning, which provides continuous mixing and feeding for an accurate, quality controlled installation.

E. Base Course: The SBR granules and structural coating shall be mixed together on site to regulate the ratio/quantity of SBR, not to exceed 82 percent by weight in the base mat portion of the system. The structural coating shall be mixed with the SBR rubber so that a minimum of 20 percent, by weight, exists in the final mixture. This mixture is then mechanically installed using the paver.

F. Seal Coat: The components are mixed at the prescribed ratio homogeneously with a suitable mixing device. The coating is squeegee applied to the base mat at a rate of 2.9 lbs/square yard, making it impermeable.

G. Wear Course: The EPDM granules shall be mixed with the structural spray coating.
   1. Mixture composition of the structural spray coatings shall be as follows:
      (a) Structural Spray 60 percent by weight
      (b) EPDM 40 percent by weight
   2. Mix the materials for the structural spray wearing course per manufacturer's written instructions. The spray shall be applied using manufacturer approved air spray equipment designed to handle the rubber mixture. The structural spray coating is applied in applications utilizing 1.80 pounds per square yard for each application.
   3. The entire track surface shall receive two uniform coats of spray.
   4. The thickness of the finished structural spray shall not be less than 1/8 inch.

H. Linemarking:
   1. Line striping and event markings must be laid out per the drawings and in accordance with NFHS rules.
   2. Apply striping so lines are uniform, straight, and with even edges.
   3. Lines and other markings shall receivepaint coating, amount as recommended by the manufacturer. Use paint directly from original containers and no thinning is allowed.

I. Certification: Upon completion of the installation, the owner shall be supplied with all necessary computations and drawings as well as a letter of certification attesting to the accuracy of the markings.

3.4 FIELD QUALITY CONTROL

A. Site Test

3.5 PROTECTION

A. Erect appropriate temporary barriers to protect the coatings during drying and curing periods.

B. After finish coating, prohibit and protect from vehicular traffic of any kind. Completed areas shall not be used for storage or staging areas of any kind. Any damage shall be prepared at no cost to the owner.

3.6 MANUFACTURER'S INSPECTION

A. Manufacturer's Inspection: Conduct an inspection with representatives of the court-surfacing manufacturer in the presence of the Owner.

B. Manufacturer's Installation Report: Submit results of Manufacturer's Inspection to the Project Consultant and Owner. Include noted deficiencies and recommendations for corrective action.

3.7 CLEANING

A. Remove all containers, surplus materials and debris and dispose off site. Brush clean all spills and excess material.

B. Leave site in clean and orderly condition.

END OF SECTION

SECTION 02830 (32 31 13)

CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fence framework, fabric, and accessories.

B. Excavation for post bases and concrete foundations for posts.

C. Concrete anchorage for posts.

1.2 SECTION INCLUDES

A. Section 01572-Construction Waste Management.

1.3 SUBMITTALS

A. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components.

B. Product Data: Provide data on fabric, posts, accessories, fittings and hardware, and the following information:
   1. Recycled Content:
      (a) Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
      (b) Indicate relative dollar value of recycled content product to total dollar value of product included in project.
      (c) If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
      (d) If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

C. Samples: Submit two samples of fence fabric, 12 inches x 12 inches in size illustrating construction and finish.

D. Manufacturer's Installation Instructions: Indicate installation requirements, post foundation requirements.

1.4 QUALITY ASSURANCE

A. References:
   1. ASTM A53-Standard Specification for Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
   2. ASTM A123-Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
   3. ASTM A392-Standard Specification for Zinc Coated Steel Chain-Link Fence Fabric.
   4. ASTM A641-Zinc coated (Galvanized) Carbon Steel Wire.
   5. ASTM C94-Ready-mixed Concrete.
   6. ASTM F567-Standard Practice of Installation of Chain-Link Fence.

7. ASTM F668-Poly (Vinyl Chloride) (PVC) and Other Organic Polymer-Coated Steel Chain Link Fence Fabric.
8. ASTM F900 Standard Specification for Industrial & Commercial Swing gates.
9. ASTM F1083-Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.

B. Manufacturer: Company specializing in commercial quality chain link fencing with minimum 3 years experience.

C. Perform work complying with provisions of ASTM F567, and as specified in this section.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the specified requirements, provide products by one of the following manufacturers:
1. Stephens Pipe & Steel, LLC.
2. Master-Halco.
3. Merchants Metals a Division of MMI Products, Inc.

B. Substitutions:
1. Will be considered by the A/E and Owner when submitted per requirements of Division-0, Division-1, and Section 01630-Product Substitution Procedures.

2.2 MATERIALS

A. All chain link fabric, posts, accessories, fittings, and hardware products shall contain recycled content.

2.3 CHAIN LINK FENCE

A. Fabric:
1. Wire: No. 9 gage (.148 inch diameter), 2-inch mesh galvanized fabric with knuckled selvages top and bottom.
   (a) Wire at Site Perimeter Fences: No. 11 gage (.120 inch diameter), 2 inch galvanized mesh fabric with knuckled selvages top and bottom.
   (b) Wire at Baseball Backstops: No. 6 gage (.192 inch diameter), 2 inch galvanized mesh fabric with knuckled selvages top and bottom.
2. Galvanized Base Coating: Under provisions of ASTM A641.71a, 1.2 ounces/square foot.
3. Fusion-Bonded Vinyl Coating: Where vinyl coated fencing is specified or indicated on the Drawings it shall be fusion-bonded type, comply with ASTM F668, Standard Industrial, Class 2B, with thickness of vinyl coating between 0.006 and 0.010 inches. Core wire to be 6 or 9 gage galvanized in accordance with ASTM A641. Color: Black
   (a) Fence System Color: When vinyl coated fabric is used, the remainder of the fence system (such as posts, rails, braces, frames, wires, caps, gates, gate hardware, accessories, etc.) shall receive polyester powder coating, with the color to match the chain-link fabric.

B. Bottom Tension Wire: 6 gage (.192 inch diameter), attached to fence fabric with hog rings at 24 inches on center. Tension wire and hog rings: Finish shall match fabric.

C. Posts, top rails, braces, and gate frames: Schedule 40, type E or S, grade B galvanized pipe per ASTM A53, sizes as follows:

1. Line Posts (maximum spacing 10 feet), End or Corner Posts (Braces to be provided at both) as listed in the table below:

Fence height	Line posts:	End or corner posts:
4 ft	2" nominal diameter (2 3/8" O.D.)	2½" nominal diameter (2 7/8" O.D.)
6 ft	2" nominal diameter (2 3/8" O.D.)	2½" nominal diameter (2 7/8" O.D.)
8 ft	**3" nominal diameter (3 ½" O.D.)**	**3½" nominal diameter (4" O.D.)**
10 ft	**3½" nominal diameter (4" O.D.)**	6" nominal diameter (6 5/8" O.D.)
12 ft	6" nominal diameter (6 5/8" O.D.)	6" nominal diameter (6 5/8" O.D.)

2. Gate Posts: As scheduled below (see 2.2.E).
3. Top Rails: 1-1/4 inch nominal diameter (1-5/8 inch O.D. - 2.27 lbs/foot).
4. Mid Rails: 1-1/4 inch nominal diameter (1-5/8 inch O.D. - 2.27 lbs/foot).
5. Bottom Rails: 1-1/4 inch nominal diameter (1-5/8 inch O.D. - 2.27 lbs/foot).
6. Braces: 1-1/4 inch nominal diameter (1-5/8 inch O.D. - 2.27 lbs/foot).
7. Fences greater than 12 feet in height (and their foundations) shall be designed by a Florida Licensed Professional Engineer in accordance with the provisions of the Florida Building Code. Provide an Engineered Shop Drawing and/or supporting calculations.

D. Gate Frames: ASTM F900, for fabrication only, use 1-1/2 inch nominal, 1-7/8 inch O.D. schedule 40 galvanized pipe with welded corner connections and welded diagonal 1-1/4 inch nominal diameter (1-5/8 inch O.D.) pipe bracing. Paint all welds with galvanic paint, 2 coats.

E. Gate Posts for swing gates:

1. Use pipes of nominal sizes as listed on table below for each fence height and gate leaf width:

Fence height	Gate leaf width:	Gate post (Schedule 40, type E or S, grade B galvanized pipe - ASTM A53):
4 ft or 6 ft	up to 6ft wide (inclusive)	2½" nominal diameter (2 7/8" O.D.)
4 ft or 6 ft	over 6ft to 12ft wide (inclusive)	3" nominal diameter (3 1/2" O.D.)
4 ft or 6 ft	over 12ft to 18ft wide (inclusive)	3½" nominal diameter (4" O.D.)
8 ft	**up to 12ft wide (inclusive)**	**3½" nominal diameter (4" O.D.)**
8 ft	**over 12ft to 18ft wide (inclusive)**	6" nominal diameter (6 5/8" O.D.)
10ft or 12ft	**up to 18ft wide (inclusive)**	**6" nominal diameter (6 5/8" O.D.)**

F. Fabric Connections:

1. Securely fasten fabric to all terminal posts with 3/16 inch x 5/8-inch tension bars and beveled edge 11-gage tension bands.
2. Number of tension bands: One band less than the height of the fabric in feet for each tension bar.
3. Fasten all fabric to intermediate posts with vinyl coated 9-gage galvanized wires not to exceed 12 inches apart. Fasten tie wire to fence fabric with 1-1/2 inch full turns minimum.

4. Tie fabric to top rail with 9-gage galvanized wire not to exceed 24 inches apart. Fasten tie wires to fabric with 1-1/2 inch full turns minimum.
5. Fasten bottom edge of fabric to bottom tension wire using hog rings at intervals not to exceed 24 inches on center.
6. Aluminum ties are not acceptable.

G. Braces:
1. Securely fastened to posts by 11 gage pressed steel beveled bands and malleable fittings, then securely trussed from the line post to base of terminal post with a 3/8 inch truss rod and tightener.
2. Braces are required only in heights of 6 feet and higher.
3. Brace pipe: the same as top rail and installed midway between the top rail and the ground and extend from the terminal post to the first adjacent line post.
4. Truss bracing: Provided in panels adjoining all end, corner and gate posts.

H. Intermediate Post Tops: Malleable iron with no points on top.

I. Hinges: Malleable Iron, hot dipped galvanized:
1. Heavy 90 degrees Industrial Box Hinge, with 180 degree offset adaptor.

J. Latches: Malleable Iron, hot dipped galvanized
1. Industrial Fork Latch combined with back latch attached.

K. Gate Holdbacks w/ Duck Bill: One per each gate leaf.

L. Fence and Gate Height: As shown on drawing. Gates to be same height as fence.

2.4 CONCRETE FOR POST SETTING: ASTM C94; normal Portland cement, 3,000 psi strength at 28 days, 4 inch slump.

PART 3 EXECUTION

3.1 INSTALLATION

A. Post Installation:
1. Provide posts for fencing along lines indicated. Space posts evenly, maximum 10 feet on center, carefully aligned and plumb in every direction.
2. Post Setting: Extend post to six inches from foundation bottom. Extend foundation to 2 inch below finish grade. Trowel crown and slope foundation away from post.
3. Coordinate with Project Consultant concerning any obstacles or obstructions in line of fencing.
4. At foundations that will be located under a concrete slab, provide sleeves for future fence foundations, if fence will be installed after the concrete slab.

B. Adjust hardware for smooth operation and lubricate where necessary.

C. Foundation Size
1. Concrete foundation size for line or terminal posts shall comply with the following table based on fence height:

Fence height	footing dimensions (inches)	
	diameter	depth

4 ft or 6 ft	12	30
8 ft	18	36
10 ft	21	42
12 ft	24	42

Note: Fences greater than 12 feet in height (and their foundations) shall be designed by a Florida Licensed Professional Engineer in accordance with the provisions of the Florida Building Code. Provide an Engineered Shop Drawing and/or supporting calculations.

2. Concrete foundation size for gate posts shall comply with the following based on Gate Leaf width and maximum allowable height:

Fence height	Gate leaf widths	footing dimensions (inches)	
		diameter	depth
4 ft or 6ft	up to 6ft wide (inclusive)	12	30
4 ft or 6ft	over 6ft to 18ft wide (inclusive)	18	36
8 ft	up to 6ft wide (inclusive)	18	36
8 ft	over 6ft to 12ft wide (inclusive)	21	42
8 ft	over 12ft to 18ft wide (inclusive)	24	42
10 ft	up to 6ft wide (inclusive)	21	42
10 ft	over 6ft to 12ft wide (inclusive)	24	42
10 ft	over 12ft to 18ft wide (inclusive)	27	48
12 ft	up to 6ft wide (inclusive)	24	42
12 ft	over 6ft to 12ft wide (inclusive)	27	48
12 ft	over 12ft to 18ft wide (inclusive)	30	54

Note: A Florida Licensed Professional Engineer shall design gates, gate posts and their foundations with a leaf width and height outside these parameters. Design shall be in accordance with the provisions of the Florida Building Code. Provide and Engineered Shop Drawing and/or Supporting Calculations.

D. Top and Bottom Rail:
   1. Provide continuous top rail through line posts.
   2. Rigidly connect top rail to all end, corner, and gate posts.
   3. Level site: Install top rail level. Varying ground slopes: Install top rail with continuous even gradient from corner to corner. Roller coaster installation: Not permitted.
   4. Provide bottom rail at bus barriers.

E. Mid Rail:
   1. At 8 feet high and over fences provide mid rails.

F. Chain Link Fabric:
   1. Install with fabric top flush to top rail with bottom of fabric 1 inch (+/- 1/2 inches) above finished grade.
   2. Stretch fabric tightly to eliminate sags and buckles.
   3. Refer to paragraph 2.2 above for fabric fastening.

G. Gates:
   1. Fabricate and install gates to prevent sagging conditions.
   2. Install gates square, level, and plumb.
   3. Install ground-set items in concrete for anchorage.

4. Permanently fasten hasp and staple combination for locking gates and hold open feature in place.

H. Bottom Tension Wire
1. Install bottom tension wire and mechanically tension for very tight installation.
2. Use tension bands for attachment of tension wire to end and corner posts at each straight run of fence.

END OF SECTION

SECTION 02931 (32 92 23)

SODDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Preparation of subsoil and topsoil.

B. Topsoil bedding.

C. Sod Installation.

D. Fertilizer.

E. Maintenance.

1.2 RELATED SECTIONS

A. Section 02200-Earthwork.

B. Section 02811-Landscape Irrigation.

C. Section 02950-Trees, Plants and Groundcovers.

1.3 REFERENCES

A. American National Standards Institute, Inc. (ANSI)
1. ANSI Z60.1-Nursery Stock

B. American Joint Committee on Horticultural Nomenclature (AJCHN):
1. Standardized Plant Names, latest edition.

C. Florida Department of Agriculture (FDOA):
1. Grades and Standards for Nursery Plants, latest edition.

1.4 DEFINITIONS

A. Weeds: Includes, but not limited to, Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perrenial Sorrel, and Brome Grass.

B. Plants: Living plants specified in this Section, and described in ANSI Z60.1

1.5 OPERATION AND MAINTENANCE DATA

A. Submit instructions for continuing Owner Maintenance under provisions of Section 01830, “Operation and Maintenance”.

1.6 QUALITY ASSURANCE

A. Installer: Company specializing in installing sod specified in this Section with minimum 3 years experience to be supervised by a Certified Arborist (CA), a Florida Certified Landscape Contractor (FCLC) or a Landscape Architect (LA).

B. Sod Producer: Company specializing in sod production and harvesting with a minimum 5 years experience, and certified by the State of Florida.

1.7 SUBMITTALS

A. Submit sod certification for grass species and location of sod source to owner.

B. Submit guarantee for grass plant materials to owner.

1.8 REGULATORY REQUIREMENTS

A. Comply with regulatory requirements for fertilizer composition.

B. Plant Materials: Certified by Florida Department of Agriculture: free of disease or hazardous insects.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Digging
1. Do not dig sod at the nursery or other approved source until ready to transport sod to the Project site or approved storage location.
2. Before stripping sod, mow to a uniform height of 2 inches.
3. Cut sod to specified thickness and to standard width and length desired.

B. Transporting
1. Deliver sod on pallets. Protect sod against dehydration, contamination and heating during transport and delivery. Sod transported to the Project in open vehicles shall be covered with tarpaulins or other suitable covers securely fastened to the body of the vehicle to prevent injury to the sod material and to protect root system from exposure to wind or sun. Closed vehicles shall be adequately ventilated to prevent overheating of the sod. Evidence of inadequate protection against drying out in transit shall be the cause for rejection.
2. Sod shall be kept moist, fresh, and protected at all times, under shade or covered with moistening burlap. Such protection shall encompass the entire period during which the sod is in transit, being handled, or in temporary storage. Do not pile sod more than 2 ft. deep.
3. Upon arrival at the temporary storage location or the site of the work, sod shall be inspected for proper shipping procedures. Should the roots be dried out, the Architect/SBBC Arborist will reject the sod. When sod has been rejected, the Contractor shall remove it at once from the area of the work and replace it.
4. Unless otherwise authorized by the Architect/SBBC Arborist, the Contractor shall notify the Architect/SBBC Arborist at least 48 hours in advance of the anticipated delivery date of the sod material. A legible copy of the invoice showing species and variety of sod included for each shipment shall be submitted to the Architect/SBBC Arborist. Certificate of inspection, when required, must accompany each sod shipment.

C. Storage of Sod
1. Do not deliver more sod than can be installed within 24 hours.

2. Sod shall be kept moist and stored in a compact group to prevent drying out.

D. Handling of Sod
1. Contractor shall take extreme care in handling of sod material to avoid breaking, stretching, tearing, and dropping strips. Sod that has been damaged by poor handling may be rejected by the Architect/SBBC Arborist.

1.10 JOB CONDITIONS

A. Protection
1. Underground Utilities: Investigate and verify the location and existence of underground utilities and other obstructions in the field. Protect existing utilities and structures from damage.
2. Protect all materials from mechanical damage, and, if required by Owner, provide protective barriers and signage as may be deemed necessary.
(a) Notify Owner in writing of damage identifiable as having been caused by others. Where appropriate, provide Owner with photographs of damage.

B. Environmental Conditions:
1. Do not install sod materials when ambient temperature may drop below 35 degrees Fahrenheit or above 90 degrees Fahrenheit.
2. Do not install sod when wind velocity exceeds 30 miles per hour.

C. Quantities and Locations: The Owner reserves the right to make adjustments in locations and quantities of sod from the drawings to meet actual field/site conditions and situations. If changes are made in plant material quantities, the contract amount will be changed by Change Order.

1.11 SEQUENCING AND SCHEDULING

A. Coordinate work under provisions of Section 01110, “Summary of Work”.

B. Coordinate the work of this Section with installation of underground irrigation system, utilities, piping and water heads. Do not start sod installation until completion of irrigation installation, including installation of sprinkler heads.

1.12 SUBSTANTIAL COMPLETION

A. The Architect/SBBC Arborist will inspect all work for Substantial Completion upon written notice of completion. The request shall be received at least ten calendar days before the anticipated date of inspection.

B. Acceptance of material by the Architect/SBBC Arborist will be for general conformance to specified requirements and shall not diminish responsibility for full conformance with the Contract Documents.

C. Upon completion and re-inspection of all repairs or renewals necessary in the judgment of the Architect/SBBC Arborist, the Architect/SBBC Arborist will recommend to the Owner that the work of this Section be accepted as Substantially Complete.

D. Sod and seed areas will be accepted as substantially complete when in compliance with the following conditions:
1. Roots are thoroughly knit to the soil;

2. Absence of visible joints;
3. All areas show a uniform stand of the specified grass in a healthy condition.

E. Acceptance in Part:
1. The work may be accepted in parts when it is deemed to be in the Owner's best interest to do so, and when permission is given to the Contractor in writing to complete the work in parts.
2. Acceptance and use of such areas by the Owner shall not waive any other provisions of this Contract.

1.13 GUARANTEE

A. Guarantee sod for a period of one (1) year after the date of Substantial Completion.

B. Replacement sod under this guarantee shall be guaranteed for an additional one (1) year from the date of installation.

C. Repair any damage to sod caused by sod replacement at no cost to the Owner.

1.14 QUALITY GUARANTEE

A. Sod shall be uniform in color, leaf texture, leaf and root density, and free from weeds, diseases, and other visible imperfections at acceptance.

B. Guarantee does cover damage as a result of fertilizers, pesticides, or other applications not supervised by the Contractor.

1.15 MAINTENANCE SERVICE

A. Maintenance Services: Performed by installer.

B. Maintain sod for one (1) year after date of Substantial Completion of the project. Minimally cut lawn twenty-four (24) times after substantial completion during the maintenance period.

C. Maintenance to include:
1. Lawn Cutting
2. Application of herbicides for weed control under provisions of manufacturer's instructions. Remedy damage resulting from use of herbicides.
3. Application of pesticides under provisions of manufacturer's instructions. Remedy damage from use of pesticides.
4. Disease control.

1.16 MATERIAL OPTIONS

A. Substitutions for specified sod will not be accepted.

PART 2 PRODUCTS

2.1 SOIL MATERIAL

A. Topsoil: 80 percent sand and 20 percent muck, loose, friable, free from all rock, roots, stones, and other extraneous material. Use topsoil stockpiled on site or imported to site as required. Place topsoil materials at all grassed areas.

1. Sand: sand shall be a well washed, medium to coarse sand free of silt and sludge. Cyclone sand is not acceptable.
2. Muck: Muck shall be peat material removed from areas marked "Florida Everglades Peat" on Soil Conservation Service Soil Maps. Much shall be suitable for plant growth, capable of sustaining vigorous plant growth, and specifically pulverized for agricultural use. Florida peat shall be free of deleterious materials that would be harmful to plant growth, shall be free of nematodes, shall be uniform in quality, and shall have a pH of between 5.5 and 6.5 as determined by ASTM E70. Muck shall be sterilized to make it free of all viable nut grasses and other undesirable weeds.

2.2 SOD

A. Sod shall be nursery grown on cultivated mineral agricultural soils. Sod shall have been mowed regularly and carefully and otherwise maintained until harvest. Sod to be not less than two (2) years old. Provide sod capable of growth and development when planted (viable, not dormant).

B. Grass Species as shown on the drawings:

C. St. Augustine "Floratam" or Zoysia "UltimateFlora."

D. Bahia "Argentine" or Zoysia "UltimateFlora."

E. Thickness of cut: Sod shall be machine cut at a uniform soil thickness of 5/8 inch. Measurement of thickness shall exclude top growth and thatch.

F. Strip Size: Sod shall be cut to the suppliers standard width and length. Maximum allowable deviation from standard widths and lengths shall be plus or minus 1/2 inch on width and 5 percent on length. Broken strips and torn or uneven ends will not be accepted.

G. Strength of Sod Strips: Sod strips shall be strong enough to support their own weight and retain their size and shape if suspended vertically when grasped in the upper 10% of the section.

H. Moisture Content: Sod shall not be harvested or transplanted when moisture content (excessively wet or dry) may adversely affect its survival.

I. Time Limitations: Sod shall be harvested, delivered, and transplanted within a 30-hour period unless a suitable preservation method is approved by the Architect prior to delivery. Sod not transplanted within this period shall be inspected and approved by the Architect prior to its installation.

J. Thatch: Sod shall be relatively free of thatch. A maximum of 1/2 inch (uncompressed) thatch will be permitted.

K. Diseases, Nematodes, and Insects: Sod shall be free of disease, nematodes, and soil borne insects and pests. State Nursery and Plant Laws require that all sod be inspected and approved for sale. The inspection and approval must be made by the State Agriculture Department, Office of the State Entomologist.

L. Weeds: Sod shall be free of grassy and broadleaf weeds.

2.3 SOIL AMENDMENT MATERIALS

A. Domestic Peat Moss or "Florida Muck": Shredded, loose, free of lumps, rocks, roots, inorganic material or acidic materials.

B. Bone Meal: Raw, finely ground, commercial grade, minimum of 3 percent nitrogen and 20 percent phosphorous.

C. Lime: Ground natural limestone, containing not less than 85 percent of total carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.

D. Water: Clean, fresh and free of substances or matter, which could inhibit vigorous growth of plants.

E. Super Phosphate: Soluable mixture treated minerals, 20 percent available phosphoric acid.

F. Fertilizers For Grass and Sod Areas:
1. Starter Fertilizer such as 5-15-15 delivering 2 lbs/1,000sq.ft after 30 days turf areas to receive a complete nutritionally balanced fertilizer product with a 50 percent slow release nitrogen source such as 26-3-11.
2. All fertilizer is to comply with State of Florida fertilizer laws and be uniform in composition and dry. Granular fertilizer must be free flowing and delivered in unopened containers or boxes. Manufacturer's labels and analysis breakdowns to remain on containers.

2.4 WATER

A. Free of substances harmful to plant growth, objectionable odor or staining agents.

2.5 HERBICIDES

A. Post-emergent Herbicide: Round up as manufactured by Monsanto Corp. or approved equal.

B. Pre-emergent Herbicide: Ron-Star or approved equal.

C. Certify that herbicide and application technique will not damage plant material prior to application, and replace or repair damage to any plants injured by herbicide application at no cost to the Owner.

PART 3 EXECUTION

3.1 PREPARATION OF SUB GRADE

A. Existing sub grade shall be examined to ensure that the rough grading is correct and that suitable sub grade materials exist prior to start of sodding work. Start of work shall constitute acceptance of the sub grade.

B. Existing sub grade shall be loosened or scarified to a minimum depth of 3 inches prior to spreading of topsoil. Sub grade shall be brought to true and uniform grade, and shall be cleared of all stones greater than 1 inch, sticks and other extraneous material.

C. Soil in compacted areas shall be tilled to a depth of 12 inches to produce a loose friable soil.

3.2 SPREADING OF TOPSOIL

A. Sub grade shall be damp when topsoil is spread.

B. Areas where sod is to be planted shall have a sub grade 5 inches lower than the finish grade. A four-inch layer of topsoil shall be added prior to laying of sod.

C. Topsoil in areas to receive lawns and grasses shall be fine graded with a drag or rake. Remove all sticks, stones, rubbish and extraneous matter. Grading shall round out all breaks in grade, smooth down all lumps and ridges, and fill in all holes and crevices. Grade shall be maintained until installation of sod.

3.3 WEED CONTROL

A. Apply post-emergent herbicide per manufacturer's rate and method of application to all areas to receive sod.

B. Apply pre-emergent herbicide landscape beds areas manufacturers' specifications and apply as necessary throughout required maintenance period to prevent weed seed germination.

C. Verify that the herbicide and application technique will not damage sod prior to application, and replace, and/or repair damage to any sod injured by herbicide at not cost to the Owner.

3.4 SODDING

A. Preparation:
   1. Disturbed Land Areas:
      (a) Where grass and sod areas have been stripped of topsoil, loosen sub grade to a minimum depth of 3 inches. Remove stones over 1 inch in size and all sticks, roots, rubbish, and other debris.
      (b) Limit preparation of areas to those, which will be planted promptly after preparation.
      (c) Spread topsoil and till into existing soil.
      (d) Topsoil depth: A minimum of 4 inches of such as to meet grade lines and elevations indicated on drawings after natural settlement and rolling as required.
      (e) Finish grades receiving sod are to be such as to allow for sod finish grade to be a maximum of 1 inch below adjacent hard surface areas.

   2. Undisturbed Land Areas:
      (a) Where grass and sod are to be planted in areas that have not been altered or disturbed by filling, grading, excavation, or stripping operations, the following steps are to be followed.
      (b) If unchanged areas are heavily vegetated with grasses, weeds, and shrubbery growth, remove such material prior to tilling. An application of a herbicide (such as "Roundup") is acceptable if it facilitates faster, more complete results in ridding areas of undesirable vegetation. Dispose of unwanted vegetation material off site. Do not till this material into soil being prepared for grass and sod planting, remove from site.

(c) Fill to minimum depth of 5 inches.
(d) Finish grade, removing high and low areas, giving a uniform, smooth grade.
(e) Apply soil amendments and initial fertilizer per analysis recommendation.
(f) Add 4 inches of topsoil and till or mix into soil to a homogeneous mixture of find texture, free of lumps, rocks, stones, roots, and other debris or extraneous matter.
(g) Moisten prepared areas prior to grass and sod operations if soil is dry. Water thoroughly and allow surface to dry prior to planting. Do not work in soil, which is in muddy condition.
(h) Restore preparation soil areas, which are damaged or eroded after fine grading but prior to grass or sod planting.

B. Installation
1. Weather Conditions
(a) Schedule work for periods of favorable weather.
(b) Sod placement on days, which, in the judgement of the Architect, are too hot, sunny, dry, or windy for optimal installation may be prohibited.
2. Begin sodding at the bottom of slopes.
3. Lay first row of sod in straight line.
4. Butt side and end joints. Ensure that joints are tight, thereby eliminating the need to patch and/or top dress to eliminate gaps. Must be supervised.
5. Lateral joints shall be staggered.
6. Do not lay sod inside of tree saucers. Keep and maintain a mulch area of 24 inches to 36 inches, in either round or square shapes.
7. Where necessary to prevent slippage of newly installed sod, peg or pin sod securely using 1 inch x 1 inch X 6 inch wood pegs, driven flush with top of sod.
8. Do not stretch or overlap rows.
9. As sodding is completed in any one section, the entire area shall be rolled. Roll sod, except on pegged areas, with roller weighing no more than 150 lbs. per foot of roller width to eliminate air pockets. Following tamping, screened topsoil shall be used to fill all cracks and excess soil shall be worked into the sod with rakes or other suitable equipment. Sod shall not be smothered with too much top dressing of topsoil.
10. Watering
(a) Immediately after top dressing thoroughly water to a depth sufficient that the underside of the new sod strips and the soil immediately below the sod are thoroughly wet, or a minimum of 6 inches.
(b) Provide an adequate supply of water to and during transplanting of the sod.

3.5 MISCELLANEOUS INSTALLATION

A. Install gravel edging, and other associated items as indicated on the drawings and specified herein.

3.6 CLEAN-UP

A. During landscape installation, store materials and equipment in a mutually agreed location. Keep pavements clean and work areas orderly.

B. Dispose of all trash, debris, and other objectionable materials created through planting operations and landscape construction off-site on a daily basis. A temporary on-site "holding areas" may be used if approved in advance by the Owner.

C. Dispose of excess soils on-site only in a prearranged location as approved by the Owner.

3.7 MAINTENANCE

A. Maintenance of sodded areas shall begin immediately after sod installation and shall continue until one (1) year after Substantial Completion.

B. Maintenance shall consist of protecting, watering, weeding, cutting, and fertilizing. Repairing of eroded areas, and re-sodding and reseeding which in the opinion of the Architect/SBBC Arborist is required to establish a uniform strand of grass.

C. Mowing
1. Whenever grass reaches a height of 3 inches, it shall be cut back to 2 inches. With a minimum of twenty-four (24) cuts.
2. After two mowings or thirty days, the Contractor shall top dress the sod with an application of nutritionally balanced fertilizer product with a 50 percent slow release nitrogen source such as 26-3-11 at a rate of one pound per 1,000sq/ft.

3.8 FINAL INSPECTION AND ACCEPTANCE

A. The work will be accepted by the Owner upon satisfactory completion of all work, excluding the replacement of sod under the guarantee period.

END OF SECTION

SECTION 02950 (32 90 00)

TREES, PLANTS AND GROUNDCOVERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. All labor, materials, necessary equipment, services and included but not limited to all related work to complete the Trees, Plants and Groundcovers work, as indicated on the Drawings, as specified herein or both, except for items specifically indicated as "NIC ITEMS".

B. Installation: All plant materials shall be of the specific size and quantity indicated on the drawings and in these specifications and shall be installed in strict accordance with sound nursery practices and shall include maintenance and watering for all work outlined on the drawings and specifications until acceptance.

C. Quantities and Locations: The Design Consultant and School Board of Broward County (SBBC) Arborist (CA) reserve the right to adjust the number and locations of the designated types and species to be used at any of the locations shown, in order to provide for any modifications which might become necessary.

1.2 EQUIPMENT

A. Maintain all equipment, tools and machinery while on the project in sufficient quantities and capacity for proper execution of the work.

1.3 RELATED SECTIONS

A. Section 02200-Earthwork.

B. Section 02811-Landscape Irrigation.

C. Section 02931-Sodding.

1.4 REFERENCES

A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
1. American National Standards Institute, Inc. (ANSI)
2. American Society for Testing Materials (ASTM):
   C136 Sieve Analysis of Fine and Course Aggregates.
   E 11 Wire-Cloth Sieves for Testing Purposes.
3. "Hortus Third", A concise Dictionary of Plants Cultivated in the United States and Canada, Cornell University, L.H. Bailey Hortorium, MacMillan Publishing Company, New York, New York.
4. State of Florida Department of Agriculture and Consumer Services (FDOA):
   Ref. 1 Grades and Standards for Nursery plants
   Ref. 2 Grades and Standards for Nursery Plants – Part II Palms and Trees

1.5 DEFINITIONS

A. Weeds: Includes, but not limited to, Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, , Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, , Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, Brome Grass, Dollar Weed, and Virginia Creeper.

1.6 SUBMITTALS

A. Certificate of inspection of plant material by State Authorities.

B. Samples: Submit the following samples:

	Material	Sample Size or Quantity
1.	Mulch	1 Cu. Ft.
2.	Peat	1 Cu. Ft
3.	Planting Soil	1 Cu. Ft.
4.	Topsoil from Off-site Sources	1 Cu. Ft.
5.	Palm tree	1 Unit
6.	Webbing Tape	1 Yard
7.	Pre-Emergent Herbicide	1 Unit of each type to be used

C. Certificates: Certificates of Conformance/Labels from the manufacturer's container certifying that the product meets the specified requirements shall be submitted for the following materials:
1. Plant Materials (Dept Of Agriculture certification by State Nursery Inspector declaring material to be free from insect and disease.)
2. Commercial fertilizer.
3. Lime
4. Peat

D. Manufacturer's Literature and Data:
1. Anti desiccant Commercial fertilizer
2. Herbicides: Pre emergent and post emergent herbicide

E. Licenses: Florida Certified Landscape Contractor (FCLC), Landscape Architect (LA) or Certified Arborist (CA) shall be submitted to Project Consultant and/or SBBC Arborist.

F. Soil laboratory testing results and any soil amendment recommendations from the Contractor.

G. The Contractor shall demonstrate specification compliance by providing invoices to SBBC to prove the purchase of Agriform (or equal) tablets and Diehard Transplant (or equal) mix and a pre-emergent herbicide in sufficient quantities to cover the project at the recommended application rates. Project Consultant/SBBC Arborist may request the empty bags/containers of the fertilizer tablets, pre-emergent herbicide and/or the mycorrhizal inoculant as additional proof of application.

H. Test Reports: Test reports from an approved testing agency indicating compliance with the specifications shall be submitted for topsoil, peat, planting soil mixture, and any other materials designated by the Project Consultant/SBBC Arborist.

I. Contractor to provide photos of nursery stock items, letter of warranty and list of all sources for all plant material to be approved by Project Consultant/SBBC Arborist.

J. Maintenance Instruction: Prior to the end of the maintenance period, furnish three copies of written maintenance instructions to Owner and Project Consultant or SBBC Arborist for maintenance and care of installed plants throughout their full growing season.

1.7 OWNER'S INSPECTION AND TESTING

A. Work will be subject to inspection at all times by the Architect. The Owner reserves the right to engage an independent testing laboratory in accordance with requirements of the conditions of the Contract to analyze and test materials used in construction of the work. Where directed by the Project Consultant/SBBC Arborist, the testing laboratory will make materials analysis and will report to the Project Consultant whether materials conform to the requirements of this specification.
   1. Cost of tests and materials analyses made by the testing laboratory will be borne by the Owner when they indicate compliance with the specification and by the Contractor when they indicate non-compliance.
   2. Testing equipment will be provided by and tests performed by the testing laboratory. Upon request by the Project Consultant/SBBC Arborist, the Contractor shall provide such auxiliary personnel and services needed to accomplish the testing work.
   3. Gradation of granular material shall be determined in accordance with ASTM C 136. Sieves for determining material gradation shall be as described in ASTM E-11.

1.8 CONTRACTOR'S INSPECTION AND TESTING

A. Testing analysis, and inspection required by the Contractor for his own information or guidance shall be at his own expense.

B. Inspection:
   1. Contractor shall inspect and photograph typical or representative plant material at the source nurseries/growing site
   2. Inspection at growing site does not preclude right of rejection at project site.

C. All plant materials shall meet or exceed specification of Federal, State and County laws requiring inspection for plant disease and insect control.

D. The Contractor shall engage an independent testing agency, acceptable to the Architect, to perform the following tests and analyses;
   1. Material: Tests and Analysis Required.
   2. Topsoil: Determination of pH, organic content, and nutrient content.
   3. Tests to include: typical existing soil conditions in all major new planting areas upon completion of rough grading, representative mixed samples of each proposed soil material, top soil, planting soil.

E. Recommendation shall be made by the testing agency as to the type and quantity of soil additives required to bring nutrient content and pH to satisfactory levels for planting.

F. Peat Determination of moisture absorption, capacity, organic matter content, and pH.

1.9 STANDARDS FOR PLANT MATERIAL

A. Identification of plant names shall be as in "Hortus Third".

B. All material is to comply with the required inspections, grading standards, and plant regulations as set forth by Florida Department of Agriculture (FDOA) "Grades and Standards for Nursery Plants" or by superseding specifications as indicated on the Drawings, plant list, or specifications. In the event that it becomes apparent that any nursery supplying plants for this work has knowingly and consistently represented the grade of plant material as being higher than their actual grades as determined under these provisions, all plants already delivered from such sources shall be removed from the job at the subcontractor's expense. No further plants will be accepted from such nursery until written evidence is submitted and confirmed that all material for delivery has been inspected and approved by inspectors of the State Plant Board as being of the grade represented.

C. Plants listed in "Grades and Standards for Nursery Plants" to conform to a Florida No. 1 as to:
1. Health and Vitality.
2. Condition of Foliage.
3. Root System.
4. Damage from Pest and Mechanical Damage.
5. Heavily branched and densely foliated under provisions of the normal accepted shape of species or variety.

1.10 SOURCE QUALITY CONTROL

A. Nursery: Company specializing in growing and cultivating the plants specified in this Section with minimum 3 years experience.

B. Installer: Installation should be overseen by a Florida Certified Landscape Contractor (FCLC), Landscape Architect (LA) or a Certified Arborist (CA). The landscape contractor's superintendent shall be well versed in Florida Plant material, planting operations, landscape plan/blueprint reading and coordination with other performing services in the job/construction site. The superintendent and foremen shall be fluent in English.

C. Obtain written acceptance from the Architect for any variation from specified requirements before proceeding. All changes/substitutions to the approved planting plan must be coordinated with the Project Consultant/SBBC Arborist.

D. Selection of plant materials.
1. Submit to the Project Consultant/SBBC Arborist the names and locations of nurseries proposed as sources of acceptable plant material. Inspect all nursery materials to determine that the materials meet the requirements of this Section. Proposed materials shall be flagged at the nurseries by the Contractor prior to viewing by the Project Consultant.
2. Schedule with the Project Consultant/SBBC Arborist a time for viewing plant material at the nursery. Trips to nurseries shall be efficiently arranged to allow Project Consultant/SBBC Arborist to maximize his viewing time. A minimum of six weeks shall be allowed for this viewing prior to the time that the plants are to be dug.
3. Project Consultant/SBBC Arborist may choose to attach his seal to each plant, or representative samples.
4. Where requested by the Project Consultant/SBBC Arborist, photographs of plant material or representative samples of plants shall be submitted to the Project Consultant/SBBC Arborist.
5. Viewing and/or sealing of plant materials by the Project Consultant/SBBC Arborist at the nursery does not preclude the Project Consultant's right to reject material at the site of planting.

1.11 LANDSCAPE MATERIAL QUALITY

A. All landscape material will be judged and evaluated under methods and criteria established by the State of Florida Department of Agriculture, Florida State Plant Board.

B. Where applicable, shipment of materials requiring Certificates of Inspection, certification, or validation as to species or quality will be provided by the source supplier.

C. Discrepancies or questionable grades of plant materials are to be submitted to and judged by approved inspectors of the State Plant Board or local County Agricultural Agent. Provide the Owner with such verification at the Contractor's expense.

D. If the grades represented by the supplier are higher than the actual grades determined, then the Owner reserves the right to insist that all plants provided by the supplier be removed from the job site and replaced with acceptable materials at the Contractor's expense.

E. All plant material: Grown in a recognized licensed nursery in accordance with good horticultural practices. Provide healthy plants with vigorous vegetative and root growth, free of disease and insects and superficial knots, sunscald, abrasions, injuries, and disfigurement.

F. Sizes: All sizes are minimum sizes acceptable on the project. If pruning or shaping of the vegetative portion is required, then field measurement is to be taken after such work. Proportionately sized root balls are to be dug in accordance with plant sizes as per Code of Standards, AAN Bulletin No. Z-60.1

1.12 PLANT INSPECTIONS

A. If the quality of materials is in accordance with the specifications there will be no plant rejections. Where quality, sizes, damage, or improper planting technique are found, the Owner will identify and reject such material for removal from site. Remove unacceptable material from the site immediately and replace with acceptable material at the Contractor's expense.

1.13 UNAVAILABILITY OF PLANT MATERIAL

A. Before changes of substitutions can be made due to unavailability of plant material, submit satisfactory evidence that he has advertised for one month in a trade journal such as the "Landscape Information Services", with no response, or has undertaken other methods of locating plant material satisfactory to the Project Consultant/SBBC Arborist.

B. Prior to bidding, the Contractor shall verify that all materials can be supplied. If materials are not obtainable the Contractor shall submit written proof of non-availability to Architect together with a proposal for use of an equivalent product. No substitutions shall be made with written consent of the Architect/SBBC Arborist.

C. Any changes or substitutions initiated by the contractor shall first be approved by the Project Consultant/SBBC Arborist. Any additional costs or quantity of plants required to make up for the requirements, shall be incurred at the expense of the Contractor.

1.14 DELIVERY, STORAGE, AND HANDLING

A. Digging Plant Material
   1. Plants shall not be dug at the nursery or approved source until the Contractor is ready to transport them from their original locations to the site of the work or acceptable storage location.

B. Transportation of Plant Material
   1. Movement of nursery stock shall comply with all Federal, State and local laws and regulations. Therefore, required inspection certification shall accompany each shipment and shall be filed with the Project Consultant/SBBC Arborist.
   2. Protect plants during delivery to prevent damage to root balls or desiccation of leaves. Protect trees during transport by tying in the branches and covering all exposed branches. Tie and secure plant materials within allowable heights and widths permitted by law for the transportation on public roads.
   3. Plants transported to the project in open vehicles shall be covered with tarpaulins or other suitable covers securely fastened to the body of the vehicle to prevent injury to the plants. Closed vehicles shall be adequately ventilated to prevent overheating of the plants.
   4. Plants shall be kept moist, fresh, and protected at all times. Such protection shall encompass the entire period during which the plants are in transit, being handled, or are in temporary storage.
   5. Unless otherwise authorized by the Project Consultant, notify the Project Consultant/SBBC Arborist at least two working days in advance of the anticipated delivery date of any plant material. A legible copy of the bill of lading, showing quantities, kinds, and sizes of materials included for each shipment shall be furnished to the Project Consultant.
   6. Deliver fertilizer and soil amendments to the site in the original, unopened containers bearing the manufacturer's guaranteed chemical analysis, name, trade name or trademark and in conformance to state and federal law. In lieu of containers, fertilizer and soil amendments may be furnished in bulk and a certificate indicating the above information shall accompany each delivery.

C. Storage
   1. Unless specific authorization is obtained from the Project Consultant/SBBC Arborist, plants shall no remain on the site of the work longer than two days prior to being planted.
   2. Plants that are not planted immediately shall be protected as follows:
      (a) Earth balls shall be kept moist and their solidity carefully preserved.
      (b) Plants shall not be allowed to dry out.
      (c) Shade and protect plants from wind when stored outside
      (d) Heel in bare root plants
      (e) Keep soil amendments and fertilizer in dry storage away from contaminants.
      (f) Water proof labels with water resistant ink shall be used and remain legible for a least 90 days to identify plant name as denoted on plant list.
   3. Both the duration and method of storage of plant materials shall be subject to the approval of the Project Consultant/SBBC Arborist.

D. Handling of Plant Materials
   1. Field-dug material to be balled and burlapped, tied with jute cord or hog wire under provisions of ball size.
   2. Handle balled and burlapped (B & B) material by ball itself. Cracked or broken ball or loose roots within burlapped area will be rejected.

3. Container grown plants are to be handled by the container and not the foliage. Plants having “root bound” or “pot bound” root systems will not be accepted.
4. Containers having tight fits with root system will be cut away and not pounded to break root compactness.

1.15 REJECTION OF MATERIALS

A. Evidence of inadequate protection following digging, carelessness while in transit, or improper handling or storage, shall be cause for rejection.

B. Upon arrival at the temporary storage location or the site of the work, plants shall be inspected for proper shipping procedures. Should the roots be dried out, large branches be broken, balls of earth broken or loosened, or areas of bark be torn, the Project Consultant/SBBC Arborist will reject the injured plant.

C. When a plant has been rejected, remove it from the areas of work and replace it with one of the required size and quality.

1.16 JOB CONDITIONS

A. Protection
1. Underground Utilities: Investigate and verify the location and existence of underground utilities and other obstructions in the field. Protect existing utilities and structures from damage.
2. Protect all materials from mechanical damage, and, if required, provide protective barriers and signage as may be deemed necessary.
   (a) Notify Owner in writing of damage identifiable as having been caused by others. Where appropriate, provide photographs of damage.

B. Tree and palm relocations and removals shall be conducted under the supervision of a Certified Arborist (CA) or a Florida Certified Landscape Contractor (FCLC).

1.17 PLANTING SEASON

A. Planting shall be performed when weather and soil conditions are suitable for planting the material specified, in accordance with locally accepted practice.

1.18 SUBSTANTIAL COMPLETION

A. The Project Consultant/SBBC Arborist will inspect all work for Substantial Completion upon written notice of completion. The request shall be received at least (10) calendar days before the anticipated date of inspection.

B. Acceptance of plant material by the Project Consultant/SBBC Arborist will be for general conformance to specified size, character, and quality, and shall not diminish responsibility for full conformance with the Contract Documents.

C. Upon completion and re-inspection of all repairs or renewals necessary in the judgment of the Project Consultant, the Project Consultant/SBBC Arborist will recommend to the Owner that the work of this Section be accepted as Substantially Complete.

D. Acceptance in Part

1. The work may be accepted in parts when it is deemed to be in Owner's best interest to do so, and when permission is given to the Contractor in writing to complete the work in parts.
2. Acceptance and use of such areas by Owner shall not waive any other provisions of this Contract.

1.19 MAINTENANCE

A. Maintain plant material as described in PART 3 of this Section.

1.20 GUARANTEE

A. Plants and temporary bracing/guys/supports shall be guaranteed for a period of one year after the date of Final Acceptance.
   1. When the work is accepted in parts, the guarantee periods shall extend from each of the partial acceptances to the terminal date of the last guarantee period. Thus all guarantee periods terminate at one time.

B. Make as many periodic inspections as necessary during the guarantee period, at no additional cost to Owner, to inspect the condition of all plant material and temporary bracing supports. Submit a written report of each inspection to the SBBC Arborist and the Project Consultant/SBBC Arborist outlining corrective measures required in order to keep the guarantee valid.

C. The Contractor shall be responsible for the installation, maintenance, evaluation and removal of all temporary bracing, guys, and supports.

D. Plants shall be healthy, free of pests and disease, and in flourishing condition at the end of the guarantee period. Plants shall be free of dead and dying branches and branch tips, and shall bear foliage of normal density, size and color.

E. Replace dead plants and all plants not in a vigorous, thriving condition, as determined by the Project Consultant, during and at the end of the guarantee period, without cost to the Owner, as soon as weather conditions permit and within the specified planting period.
   1. Replacements shall closely match adjacent specimens of the same species. Replacements shall be subject to all requirements stated in these specifications.
   2. Make all necessary repairs caused by plant replacement activities. Such repairs shall be done at no cost to the Owner.
   3. The guarantee of all replacement plants shall extend for an additional one-year period from the date of their acceptance after replacement. In the event that a replacement plant is not acceptable during or at the end of the said extended guarantee period, the Owner may elect either one more replacement, with guarantee, or credit for each item.

F. At the end of the guarantee period, and no less than ten (10) days prior to final inspection or as approved by the Owner, staking and guying materials, and tree wrap and ties shall be removed from the site by the installing Contractor.

G. At the end of the guarantee period, the Project Consultant/SBBC Arborist will, upon written notice of the end of the guarantee period inspect the work. Request shall be received at least ten calendar days prior to the anticipated date for Final Inspection.

H. Upon completion and re-inspection of full repairs or replacements necessary in the judgment of the Project Consultant/SBBC Arborist. The Project Consultant/SBBC Arborist will recommend to the Owner that Final acceptance of the work of this Section be given.

PART 2 PRODUCTS

2.1 PLANTS

A. Except as other wise specified, size and shape of plant material shall conform to FDOA Ref 1 and Ref 2. Where size exceeds that indicated in FDOA Ref 1 or Ref 2, the ball size shall be proportionally larger.

B. Plant material shall be Florida No. 1 or better in accordance with "Florida Grades and Standards". Plants shall have outstanding form; symmetrical, heavily branched with an even branch distribution, densely foliated and/or budded, and a strong, straight, distinct leader where this is a characteristic of the species. Plants shall possess a normal balance between height and spread. The Project Consultant will be the final arbiter of the acceptability of plant form.

C. Plants not listed in "Grades and Standards for Nursery Plants shall conform to a Florida No. 1 as to:
1. Health and Vitality
2. Condition of Foliage
3. Root System
4. Freedom from pest or mechanical damage
5. Heavily branched and densely foliated according to the accepted normal shape for the species.

D. Plants shall be healthy and vigorous, and free of disease, insects and pests and their eggs, and larvae.

E. Plants shall have a well-developed fibrous root system.

F. Plants shall be free of physical damage such as scrapes, broken or split branches, scars, bark abrasions, sunscalds, fresh limb cuts, disfiguring knots, or other defects.

G. Plants shall meet the size requirements indicated on the plant list. Plants larger or smaller than specified may be used only if accepted by the Architect and SBBC Arborist.

H. Where a caliper or size range is specified, at least 80 percent of the material shall be closer to the top of the range stated.

I. Plants shall not be pruned before delivery. Prune a sample of each tree or shrub for Architect's approval prior to commencing pruning operations.

J. Plants indicated as "B & B" shall be balled and burlapped.
1. Balled and burlapped plant ball sizes and ratios will conform to ANSA Z60.1, consisting of firm, natural balls of soil wrapped firmly with burlap or strong cloth and tied.
2. Unless otherwise permitted by the Project Consultant plants shall be nursery grown.

3. Plants shall be grown for at least two years under climatic conditions similar to those in the local of the Project.
4. Nursery grown plants shall be freshly dug. No healed in plants or plants from cold storage will be accepted unless otherwise permitted by the Project Consultant.

K. Container Grown Plants : ANSI Z60.1
1. Grown under climatic conditions similar to locality of the project
2. Container grown stock:
   a. Growing in container for minimum 90 days before deliver.
   b. Not root bound or with root systems hardened off.
3. Use only groundcover plants well established in removable containers, integral containers or formed homogenous soil sections.

L. When existing plants are to be relocated ball sizes shall conform to requirements for collected plants in ANSI Z60.1 and plants shall be dug, handled and replanted in accordance with applicable sections of these specifications.

M. The minimum acceptable sizes of all plants, measured before pruning with branches in normal position shall conform to the measurements designated. Plants larger in size may be used with approval of the Project Consultant/SBBC Arborist with no change in contract price.

N. Provide nursery grown plant material conforming to the requirements and recommendations of ANSI Z60.1 Dig and prepare plants for shipment in a manner that will not cause damage to branches, shape and future development after planting.

O. Bare-root (BR) plants shall have the root system substantially intact but with the earth carefully removed. Cover roots with a thick coating of mud by “puddling” after the plants are dug.

2.2 SOIL MATERIALS

A. Sand: Shall be a well washed, medium to coarse sand free of silt and sludge. Cyclone sand is not acceptable.

B. Muck: Shall be peat material removed from areas marked “Florida Everglades Peat” on Soil Conservation Service Soils Maps. Muck shall be suitable for plant growth, capable of sustaining vigorous plant growth, and specifically pulverized for agricultural use. Florida peat shall be free of deleterious materials that would e harmful to plant growth, shall be free of nematodes, shall be uniform in quality, and shall have a pH of between 5.5 and 6.5 as determined by ASTM E70. Muck shall be sterilized to make it free of all viable nut grasses and other undesirable weeds.

2.3 PLANTING SOIL

A. Topsoil: 80 percent sand and 20 percent muck, loose, friable, free from all rocks, roots, stones and other extraneous material.

B. Planting Soil for Trees and Palms: Planting soil shall be a mixture of 60 percent sand and 40 percent muck, by volume except for palms. Palms shall receive a mixture of 80 percent sand and 20 percent muck.

C. Before planting materials are installed, test planting soil and amend planting soil as recommended by the Testing Laboratory such that planting soil pH falls within the range of 5.5 to 6.5 pH.

2.4 WATER

A. Water shall be suitable for irrigation and shall be free from ingredients harmful to plant life, objectionable odor or staining agents.

2.5 ALUMINUM SULFATE

A. Aluminum sulfate shall be unadulterated and shall be delivered in containers with the name of the manufacturer and net weight of containers.

2.6 COMMERCIAL FERTILIZER

A. Fertilizer content shall conform to the following:

	Constituent	Percent	Present by Weight
2.	Nitrogen (N)	10	(50percent in slow release form)
3.	Phosphorus (P)	5	----------
4.	Potassium (K)	8	(50 percent in slow release form)

(a) 50 percent of nitrogen shall be derived from natural organic source of ureaform. 50 percent of nitrogen shall be derived from slow release nitrogen.

(b) Available phosphorus shall be derived from superphosphate, bone meal, or tankage.

(c) Potassium shall be derived from sulfur-coated potassium. 50 percent of potassium shall be derived from slow release potassium.

B. Fertilizer shall be delivered in manufacturer's standard container printed with manufacturer's name, material weight and guaranteed analysis.

C. Controlled-release fertilizer shall be equal to the following:

	Product	Manufacturer
2.	Palm Mix and General Fertilizer	Atlantic F.E.C.- 18375 S.W. 260 Street Homestead, FL 33031
3.	Agriform 20-10-5 Planting Tables	Sierra Chemical Co., Milpitas, CA 95035.

2.7 MULCH

A. Mulch shall be shredded Grade "A" Eucalyptus or melaleuca mulch, manufactured by Action Nursery Products, Inc., Fort Myers, FL 33911, or approved equal.

B. Cypress mulch and painted red mulch are prohibited unless approved by SBBC Arborist..

C. Minimum organic matter by weight on an oven dry basis:85%

2.8 GUYING AND STAKING MATERIALS

A. Wood Stakes: Straight, sound, rough sawn lumber not less than 2 X 2 in. steel pins or rebar are acceptable.

B. Black Webbing Tape: As supplied by Terra International, Inc., Miami, Florida, Landscape Supplies, Miami, Florida or approved equal. Wire or cable shall not be acceptable.

C. Deadmen: Sound, rough sawn lumber 2 inch x 4 inch or other material approved by the Architect/SBBC Arborist.

D. Flags to be fastened to guys shall be surveyors plastic tape, orange or red in color and 6 inches in length.

E. Arrow shaped or auger iron anchors shall be non-corrosive and sized according to manufacturer's recommendation.

F. After one year staking must be removed by original contractor.

2.9 WATER

A. Contractor is responsible for assuring new plant material and relocated material gets properly watered. Newly planted or transplanted trees shall receive 2-3 gallons of water per inch of trunk diameter per application. For the first month following installation, trees shall be irrigated/watered twice each day. For the following two months, newly planted trees less than 6 inch caliper shall be watered 3 times per week while trees greater than 6" caliper shall be watered daily

2.10 FUNGICIDE

A. Fungicide shall be zinc ethylene bisdithiocarbonate (Zineb) or equal.

PART 3 EXECUTION

3.1 EXAMINATION OF SUB GRADE

A. Examine the sub-grade, verify the elevations, and observe conditions under which work is to be performed. If unsatisfactory conditions exist, notify the Project Consultant/SBBC Arborist prior to proceeding with the work.

B. Beginning to installation means acceptance of existing conditions.

3.2 DRAINAGE OF SOILS

A. The Contractor shall notify the Project Consultant/SBBC Arborist, in writing, of all soil or drainage conditions that he considers detrimental to growth of plant material.

3.3 LAYOUT OF PLANTING AREAS

A. Individual tree and palm (per plant list on the drawings) locations and outlines of shrub and groundcover areas to be planted shall be staked by the Contractor in ample time to allow inspection by the Project Consultant/SBBC Arborist.

B. Digging shall not begin until locations are approved by the Project Consultant/SBBC Arborist.

C. Spacing of Ground Covers and Shrubs in Mass:

1. Locate plant in plant beds on a triangular method versus a rectangular spacing format. Plants adjacent to walks, grass areas, etceteras to made up of the fullest plants available and planted with sufficient distance from limiting conditions so that the plants may mature properly.
   (a) Excavation for Planting:
      (1) Plant holes to be roughly cylindrical in shape with nearly vertical sides. Plant holes to be deep enough to allow for planting soil beneath and around plant roots as follows.

Ball Size	Depth Below Roots	Dim. Between Root and Hole Size
Up to 2 feet Diameter	18 inches	10 inches
to 4 feet Diameter	24 inches	16 inches
4 feet and greater	30 inches	24 inches

      (2) Excavated material from plant holes and beds is not be used to backfill plant holes. Dispose of such excavated material on or off site. Verify on-site location with Owner prior to disposal.
      (3) Plant hole sizes for shrubs are:

Root Size/Container	Depth Planting Soil Below Roots	Soil Around Roots
Rooted Cuttings 6 inches	Continuous Bed Planting Soil	----------
1 gallon or 6 inches in diameter	6 inches	4 inches
2-3 gallons or up to 10 inch diameter	10 inches	6 inches
4 gallons & up	12 inches	9 inches
Hedge Materials	10 inches method acceptable	6 inches trench

3.4 EXCAVATION FOR PLANTING

A. Prior to excavating for plant pits and beds, verify the location of any underground utilities. Damage to utility lines will be repaired at the Contractor's expense. Where lawns have been established prior to planting operation, cover the surrounding turf before excavations are made in a manner that will protect turf areas. Barricade existing trees, shrubbery and beds that are to be preserved in a manner that will effectively protect them during the project construction.

3.5 PREPARATION OF SUB GRADE

A. Sub grade of planting areas shall be loosened or scarified to a minimum depth of 3 inches prior to spreading planting soil. Sub grade shall be brought to true and uniform grade and shall be cleared of stones greater than 2 inches, sticks, and other extraneous material.

3.6 SPREADING OF PLANTING SOIL

A. Planting soil shall be spread and placed to required depths.

B. Surfaces shall be graded and smoothed, eliminating all sharp breaks by rounding, scraping off bumps and ridges, and filling in holes and cuts.

3.7 PLANTING

A. General
   1. Irrigation shall be 100% operational prior to plant material installation or provisions for watering material should be in place.
   2. Remove burlap from top 1/2 of rootball.

3. Center plant in pit or trench.
4. Face for best effect, or as directed by the Project Consultant/SBBC Arborist.
5. Set plant plumb and hold rigidly in position until soil has been tamped firmly around planting ball.
6. Use only planting soil backfill as specified herein before.
7. Place sufficient planting soil under plant to bring top of planting ball to finish grade.
8. Backfill pit or trench with planting soil in 9 in. layers and water each layer thoroughly to settle soil and work soil completely around roots and planting ball.
9. For the final or top 9 in. layer (nearest the surface), apply fertilizer as needed and distribute agriform tablets as needed. This final 9-in. layer should extend out beyond the rootball and, typically, be twice the diameter of the rootball for trees and palms.
10. After soil settles fill pit with planting soil, water, and leave pit surface even with finish grade.
11. Topsoil berm/ Water Saucer:
    (a) Construct a topsoil berm 6 in. above finish grade forming a watering basin with a level bottom around each palm or tree.
    (b) Size: 1 ft. greater than diameter of planting ball.
    (c) Leave saucer for 3 months. At the end of 3 months, re-grade area and re-mulch 12" out from trunk (or planting bed) for all plantings. Remove excess from basin and clean area. Replace any damaged plant material or sod.
12. Braces shall be installed, as specified herein, while the tree is supported by machinery.
13. Protective tree guards shall be installed on all newly planted trees.

A. Balled and Burlapped Plants (B & B):
1. Place in pit on planting soil backfill material that has been hand-tamped prior to placing plant.
2. Place with burlap intact so location of ground line at top of ball is same as at nursery where grown.
3. Remove binding at top half of the planting ball and cut off exposed burlap.
4. Do not pull wrapping from under planting ball.
5. Do not plant if planting ball is cracked, broken or showing evidence of voids before or during planting process. Replace with plant of same species, size, and specification.

B. Relocated Trees and Palms

1. Refer to Section 02915-Tree Relocation and Protection

C. Container Grown Plants
1. Can removal:
    a. Cut cans on two sides with an acceptable can cutter if cutting is required.
    b. Do not injure planting ball.
    c. Do not cut cans with spade or ax.
    d. Do not cut sides on knockout cans.
    e. Carefully remove plants without injury or damage to planting ball.
    f. After removing plant. Superficially cut edge roots with knife on three sides.
2. Dig planting holes to size as shown.
3. Hand place plants which are in containers less than one gallon in size.
4. Hand backfill and hand tamp leaving slight depression around bases of

plants.

5. Do not cover top of root ball.
6. Water for settlement and replace required planting soil.

D. Set ground covers and container-grown stock in similar fashion with proper amounts of planting and native soil mixture beneath and around plant roots. Dispose of containers off site.

E. Protect trunks and vegetation, which are mechanically handled during planting with burlap, straps, and battens as required. Neglect and physical damage to plant material are grounds for rejection.

F. Palm trees handled by trunks to be burlap wrapped and provided with battens, held securely by metal straps. Use the battens to fasten bracing supports securely to tree later on.

G. Fertilization of Plantings:

	Container Size	Number of Tablets
1.	1 Gallon	1
2.	3 Gallons	2
3.	5 Gallons	3
4.	7 Gallons	5

H. Ten Gallons or Greater: One Tablet for 1/2 inch of sizes and B & B trunk caliper measured 7 inches materials finish grade for each foot of height of spread of plant. Note: Five tablets minimum. Ground Covers: Four cups of granular fertilizer per 100 square feet of plant area mechanically applied for uniform application.

I. Dish or saucer plantings to allow for mulching and water retention.

3.8 STAKING AND GUYING

A. Staking: Stake trees as shown on the drawings.

1. Stake installation:
   a. Drive stakes perpendicularly, 3 ft. into ground at edge of root ball. Do not drive stake through root ball or soil separator or drainage gravel if present.

   b. Number of stakes as shown on details

2. Tying and cross-bracing:
   a. For trees over 4 in. in caliper.
      (1) Stake and tie firmly with 1-1/4" sisal strapping as shown.

   b. For trees under 4 in. in caliper.
      (1) Tie sisal strapping to vertical stakes.

3. Support tree with machinery until bracing is complete.

4. Maintenance: Trees and palm to remain braced continuously during duration of project.

3.9 MULCH

A. Within 48 hours after planting, mulch all tree saucers, planting beds, and hedgerows to thickness indicated on drawings. Apply mulch uniformly to a finish level/grade with adjacent grades.
B. Prior to Mulching but following plant material installation, apply a pre-emergent herbicide such as Princep or Ronstar, over the planting beds and proposed mulch beds. Apply per manufacturer's specifications and guidelines.
C. Mulch within 48 hours after planting and applying a pre-emergent herbicide.
D. Top mulch planting pits, trenches, and areas within two days after planting.
E. Cover watering basin or bed with 3 inches of the specified top mulch material. Do not mulch directly around the trunk (leave 6" radius around the trunk uncovered). Apply only 1 inch of mulch directly on the rootball.
F. Water thoroughly, immediately after mulching.
G. Hose down planting area with fine spray to wash leaves of plants at least twice a until final acceptance.

3.10 PRUNING

A. New Plant Material: Thin, shape, and prune to remove broken or injured branches and dead material and suckers under provisions of standard horticultural practices. Natural habit of plant is not to be altered by pruning. After pruning, all plants are to meet or exceed specified heights and spreads. Normal practices do not encourage tree leaders to be cut. All cuts, wounds, etceteras are to be treated with commercial tree paint.

B. Relocated Plant Material:
1. Necessary pruning shall have been done prior to delivery to the site.
2. Prune minimum necessary to remove branches and twigs injured by delivery, storage, and installation.

C. Existing Plant Material:
1. Prune branches and twigs of existing plants to remain so as to enhance the natural form of the plant material; remove injured branches, deadwood, and suckers; insure adequate clearance from new and proposed structures, and provide for a healthy growing state for new growth. Trim as specifically directed by the Project Consultant/SBBC Arborist in special conditions.

D. Weeding:
1. Remove weeds and other undesirable vegetation that grows in or around planted areas. After weeding, touch up mulched areas that require top dressing. All areas are to be weed free at the time of Owner's final acceptance.
2. If plant material and planting soil is highly contaminated with weeds, seeds, vegetation, or roots and rhizomes, replace the contaminated materials as instructed by the Owner at the Contractor's expense.

3.11 MAINTENANCE OF PLANTING

A. Maintenance by Contractor shall begin immediately after each plant is planted and shall continue until 1 year after Final Acceptance.

B. Maintenance shall consist of pruning, watering, cultivating, weeding, mulching, and removal of dead material, repairing and replacing of tree stakes. Tightening and repairing of guys, resetting plants to proper grades and upright position, and furnishing and applying such sprays as are necessary to keep plants free of insects and disease, and in a healthy growing condition.

C. Provide all equipment and means for proper application of water to those planted areas not yet provided with an irrigation system. Water when soil moisture is below optimum level for plant growth.

D. All sodded areas that do not show satisfactory growth shall be re-fertilized as directed by the Project Consultant/SBBC Arborist until a satisfactory stand of turf grass is established. Lawns shall be considered established when they are reasonably free from weeds and the grass in vigorous condition and growing well.

3.12 CLEANING

A. Fill all pits and depressions in holding areas and rough grade to meet surrounding elevations. Remove any debris resulting from the planting process.

B. Daily Clean-up: Sweep and wash down paved surfaces. Remove all waste material and planting debris from project site.

C. Disposal of Excess Soil: Use acceptable excess excavated topsoil to form watering basins around plants, where specified, or waste over nearby low or rough grass areas as directed.

3.13 REPLACEMENTS

A. At the end of maintenance period, plant material shall be in a healthy growing condition.

B. During maintenance period immediately replace any plants showing weakness and probability of failure with a new, healthy plant of the same type and size, without additional cost to the Owner.

C. Extension of Maintenance Period: Continue maintenance period, at no additional cost to the Owner, for additional 45 days after any noted deficiencies have been corrected. Warranty period shall commence upon written Final Acceptance of planting at the end of the maintenance period.

D. The Contractor shall conclude maintenance (exclusive of replacement within warranty period) upon written Final Acceptance of the Project Consultant/SBBC Arborist the end of the maintenance period or, as provided for above, at the end of the extended maintenance period for replacement plantings.

3.14 WARRANTY

A. The Contractor shall warranty trees, plants, palms, and lawns for specified time period after Final Acceptance. Any planting that fails or dies within that period shall be replaced and replanted immediately without expense to the NCA, provided that the Contractor shall not be held responsible for losses beyond his control arising from "Acts of Providence"; acts of vandalism; or loss arising from documented neglect on the part of NCA to properly care for planting after acceptance. Trees and palms shall be warranted for one year; shrubs and groundcover for one (1) year; warranty of lawns shall be one (1) year.

B. The Contractor shall make at least four periodic reviews of the planting, at no extra cost to the Owner, during the warranty period to determine what changes, if any, should be made in Owner's maintenance program. Proposed changes shall be submitted, in writing, to the Owner.

C. At conclusion of the one year warranty period, the Project Consultant/SBBC Arborist shall make a construction review to determine the condition of planting. Plants that have died or, in the opinion of the Project Consultant/SBBC Arborist, are in an unhealthy or badly impaired condition for reasons other than vandalism, “Acts of Providence", or documented neglect by the Owner, shall be replaced by the Contractor without expense to the Owner, within 30 days of the inspection unless otherwise authorized by the Project Consultant.

END OF SECTION

SECTION 02953 (32 01 16.76)

ASPHALT PAVING FOR RESURFACING EXISTING PLAY COURTS AND TRACKS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all materials, equipment and labor to complete the resurface paving work shown on plans.

PART 2 PRODUCTS

2.1 MATERIALS

A. Use first grade products of reputable manufacturers or suppliers. Any substitution must be approved for use by the Owner prior to installation.

2.2 TACK COAT

A. Asphalt cement, Penetration Grade 85-100 for emulsified asphalt, Grade RS-2.

2.3 WEARING SURFACE

A. Asphaltic Concrete, Type S-III, Modified for track, outside basketball courts, tennis courts. Conform to Florida State Road Department Standard Specifications for Road and Bridge Construction, latest edition.

PART 3 EXECUTION

3.1 PREPARATION OF EXISTING PAVEMENT

A. Grass and Weed Extermination:
   1. Apply weed killer over entire asphalt surface to be re-surfaced. Use Round Up or approved equal as per manufacturer's recommendations for noncrop areas. Repeat as required.

B. Patching and Leveling:
   1. Prior to resurfacing, patch the existing asphalt surface and level as required to assureproper drainage.

3.2 INSTALLATION

A. Tack Coat: Apply a tackcoat at rate of 1 gallon per 10 square yards.
   1. When weather conditions delay installation of wearing surface, seal the surface with emulsified asphalt at rate of 2 gallons per 10 square yards.

B. Wearing Surface: minimum 1 inch thickness and laid only when the surface is dry and when weather conditions are suitable.

1. Spread mixture by an approved mechanical spreader.
2. Spreading by hand is approved only in areas where it is impracticable to use equipment.
3. Compacting mixture: Done by rolling with the following equipment and sequence:
   (a) Seal rolling: using tandem steel rollers weighing between 5 tons to 8 tons, and following as close behind the spreaders as possible.
   (b) Final rolling: Done with 5 ton to 8 ton tandem steel rollers and done after the seal rolling is completed, but before the temperature has dropped below 140 degrees Fahrenheit. Continue this rolling until all roller marks have been eliminated.
4. Open edges: sawcut straight.
5. Upon completion of the resurfacing:
   (a) The finished surface: such that it will not vary more than 1/4 inch in 15 feet when measured in any direction.
   (b) Contractor: flood the resurfaced area to confirm that all water drains off properly with no “bird baths”.
   (c) Perform this procedure in the presence of the Owner.
   (d) Rework areas that pocket water to a depth of more than 1/16 inch until positive drainage is achieved.
6. Testing: Compaction tests and other testing as required by the specification and as directed by the Owner are under the direction of a Professional Engineer or Testing Laboratory, registered and licensed in Florida. Testing costs will be paid for by the Owner, except those tests failing to meet requirements and all retesting required as a result of failure to meet specifications. The Contractor is to recompact unsatisfactory work and pay for retesting.

END OF SECTION

SECTION 02987 (32 01 18)

RESURFACING OF EXISTING TRACKS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cleaning, patching and treatment of existing surfaces.

B. Seal coating.

C. Tack coating and asphalt wearing course application.

D. Polyurethane bound color surface.

1.2 RELATED WORK

A. Section 02747-Asphaltic Concrete Paving for Courts and Tracks.

B. Section 02791-Color Surface for Play Courts.

C. Section 02951-Asphaltic Concrete Patching.

1.3 QUALITY CONTROL

A. The Owner reserves the right to conduct compaction and other testing to verify specification compliance. Compaction tests and other testing as directed by the Owner and under the direction of a Professional Engineer or Testing Laboratory under provisions of Section 01450, “Quality Control”.

B. The Contractor is to re-execute unsatisfactory work.

1.4 WARRANTY

A. Contractor will provide warranty against defects in material and workmanship for a period of 1 year from date of final project acceptance.

1.5 MATERIAL HANDLING AND STORAGE

A. Deliver, protect and apply all material as recommended by the manufacturer with proper material handling and application documents and shop drawings.

PART 2 PRODUCTS

2.1 TACK COAT

A. Asphalt cement, Penetration Grade 85-100 for emulsified asphalt, Grade RS-2.

2.2 WEARING SURFACE

A. Asphaltic Concrete, Type S-III, for track, outside basketball courts, tennis courts.

B. Conform to Florida State Road Department Standard Specifications for Road and Bridge Construction, latest edition.

2.3 SYNTHETIC SURFACE

A. Two-component polyurethane compound formed from polyol and isocyanate. The polyurethane is based on 100 percent methylene diphenyle isocyanate with no fillers.

B. Finished surface for tracks: 12 mm thick peroxide cured rubber granuals of 1 mm – 2 mm in size embedded in polyurethane of premixed UV stabilized wearing course.

PART 3 EXECUTION

3.1 PREPARATION OF EXISTING PAVEMENT

A. Grass and Weed Extermination:
1. Apply weed killer over entire asphalt surface to be re-surfaced.
2. Use Round-Up or approved equal as per manufacturer's recommendations for noncrop areas.
3. Repeat as required to eliminate plant growth.

B. Patching and Leveling:
1. Patch and level existing asphalt surfaces to assure proper drainage and to remove cracks, potholes and depressions.
2. Saw cut and remove up to 12 inches of asphalt surrounding any surface cracks, loose or broken asphaltic surfaces, potholes or depressions. Ensure any unsound asphalt is removed.
3. Repair base course as necessary to provide solid level finished surface.
4. Compact base and apply prime and tack coat.
5. Apply structural course and final wearing surfaces.

3.2 INSTALLATION

A. Tack Coat: Apply at rate of 1 gallon per 10 square yards.
1. When weather conditions delay installation of wearing surface, seal the surface with emulsified asphalt at rate of 2 gallons per 10 square yards.

B. Wearing Surface:
1. Minimum Thickness: 1 inch.
2. Install only when substrate surface is dry and when weather conditions are suitable.
3. Spreading:
   (a) Spread mixture by mechanical spreader.
   (b) Hand Spreading: Use only in areas where machine spreading is inhibited or impracticable.
4. Roller Compacting Sequence:
   (a) Seal Rolling: Use tandem steel rollers weighing between 5 to 8 tons. Follow immediately behind spreaders.
   (b) Final Rolling:
   (c) Use 5 to 8 ton tandem steel rollers after the seal rolling is completed.
   (d) Complete final rolling before the asphalt mix temperature has dropped below 140º F.

(e) Continue final rolling until all roller marks have been eliminated.
(f) Trim all open edges straight.

3.3 INSTALLATION TOLERANCES

A. Finished surface: Slope surface uniformly to drain with on variance of more than 1/6 inch in 10 feet when measured in any direction.

B. In the presence of the Owner, flood the resurfaced area to confirm that all water drains off properly with no “bird baths”.

C. Re-work, including removing and replacing, areas that pocket water to a depth of more than 1/6 inch until sections proposed slope and cross drainage is achieved.

END OF SECTION

SECTION 330501 – TRENCHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Trenching related to pipeline installation.

B. Related Work

1. Section 330502 – Buried Piping Installation

C. Work Includes

1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals required to perform all excavating, filling, and grading, and disposing of earth materials as shown, specified, and required for construction of underground utilities and related construction required to complete the Work.

2. Preparation of subgrade is included under this Section.

3. Classification of excavated materials as to the material being classified as suitable or unsuitable material shall be made jointly with the CONTRACTOR and ENGINEER. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof.

4. CONTRACTOR shall be responsible for providing all required suitable backfill material and shall be responsible for removing and disposing of all unsuitable material.

1.2 REFERENCES

A. Standards referenced in this Section are:

1. ASTM D422, Test Method for Particle-Size Analysis of Soils.

2. ASTM D698, Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft3 (600 kN-m/m3)).

3. ASTM D1556, Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.

4. ASTM D1557, Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).

5. ASTM D2216, Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.

6. ASTM D4253, Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

7. ASTM D4254, Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

8. ASTM D4318, Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

9. ASTM D4832, Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders.

10. ASTM D6023, Test Method for Density (Unit Weight), Yield, Cement Content, and Air Content (Gravimetric) of Controlled Low-Strength Material (CLSM).

11. ASTM D6103, Test Method for Flow Consistency of Controlled Low Strength Material (CLSM).

12. ASTM D6938, Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

13. ASTM E329, Specification for Agencies Engaged in Construction Inspection and/or Testing.

1.3 TERMINOLOGY

A. The following words or terms are not defined but, when used in this Section, have the following meaning:

1. “Subgrade” is the uppermost surface of native soil material unmoved from cuts; the bottom of excavation.

1.4 QUALITY CONTROL

A. Qualifications

1. CONTRACTOR’s Testing Laboratory

a. Retain the services of independent testing laboratory to perform testing and determine compliance with the Contract Documents of the materials specified in this Section.
b. Do not employ the same laboratory hired by OWNER for field quality control testing under the field quality control Article of this Section.
c. Testing laboratory shall comply with ASTM E329.
d. Testing laboratory shall be experienced in the types of testing required.
e. Selection of testing laboratory is subject to ENGINEER's acceptance.

B. Quality Control Testing

1. Quality control testing is in addition to field quality control testing required under Part 3 of this Section.

2. Materials used in the Work may require testing and retesting, as directed by ENGINEER, during the Project. Allow free access to material stockpiles and facilities at all times. Tests not specifically indicated to be performed at OWNER's expense, including retesting of rejected materials and installed Work, shall be performed at CONTRACTOR's expense.

3. CONTRACTOR's Testing Laboratory Scope

   a. Collect samples and perform testing of proposed fill materials in the laboratory and in the field to demonstrate compliance of the Work with the Contract Documents.
   b. Testing laboratory shall perform testing required to obtain data for selecting moisture content for placing and compacting fill materials.
   c. Design controlled low-strength material (CLSM) mixes in accordance with requirements of CLSM Article in Part 2 of this Section. Perform concrete materials evaluation tests and testing of CLSM mixes.
   d. Submit to ENGINEER and CONTRACTOR written report results of each test.

4. Required Quality Assurance Material Testing by CONTRACTOR's Testing Laboratory

   a. Gradation in accordance with ASTM D422. Perform one test for every 1,000 cubic yards of each of the following types of material incorporated into the Work: select fill, general fill, subbase material, drainage fill, and pipe bedding material.
   b. Atterberg limits in accordance with ASTM D4318. Perform one test for every 1,000 cubic yards of the following types of materials incorporated into the Work: general fill, and pipe bedding material.
   c. Moisture/density relations in accordance with ASTM D698, ASTM D1557, ASTM D4253, or ASTM D4254, as applicable. Perform one test for every 5,000 cubic yards of the following types of materials incorporated into the Work: select fill, general fill, subbase material, drainage fill, and pipe bedding material.
   d. Moisture content of stockpiled or borrow material in accordance with ASTM D2216. Perform one test for every 1,000 cubic yards of the following types of material incorporated into the Work: select fill, general fill, subbase material, drainage fill, and pipe bedding material.

C. Regulatory Requirements

1. Perform excavation work in compliance with requirements of authorities having jurisdiction and Laws and Regulations, including:

   a. OSHA, 29 CFR Part 1926, Section .650 (Subpart P – Excavations), Existing Utilities

1.5 SUBMITTALS

A. Action Submittals: Submit the following:

1. Shop Drawings

a. Modifications to the Work proposed due to design of sheeting, shoring, bracing, cofferdams, and similar excavation supports.

B. Informational Submittals: Submit the following:

1. Procedure Submittals

a. Excavation Plan: Prior to starting excavation operations, submit written plan to demonstrate compliance with OSHA 29 CFR Part 1926.650. As a minimum, excavation plan shall include:

1) Name of CONTRACTOR's "competent person" in responsible charge of excavation and fill Work.
2) Copies of "manufacturer's data" or other tabulated data if protective system(s) are designed on the basis of such data.
3) Copies of required permits and approvals, from authorities having jurisdiction and affected utility owners, for excavation methods proposed.

b. Proposed compaction procedure and compaction equipment proposed for use. Where different procedures or equipment will be used for compacting different types of material or at different locations at the Site, indicate where each procedure and equipment item will be used.

2. Delivery Tickets

a. Copy of delivery ticket for each load of aggregate and borrow material delivered to the Site. Each delivery ticket shall indicate project and contract by name and number, date, material type, department of transportation item number when applicable, and quantity delivered.

3. Quality Assurance Test Results Submittals

a. Submit results of quality assurance testing performed by in accordance with Paragraph 1.4.B of this Section, unless included as part of another submittal under this Section. Submit results for the following quality assurance testing:

1) Tests on borrow fill material.
2) Optimum moisture – maximum dry density curve for each type of fill material.

4. Field Quality Control Submittals

a. Submit results of testing and inspection performed in accordance with the field quality control Article in Part 3 of this Section, including:

1) Field density testing.

5. Qualifications Statements

a. Quality Assurance Testing laboratory. Submit name and qualifications of testing laboratory to be employed, and qualifications of testing laboratory's personnel that will perform quality assurance testing required in this Section.
b. Field Quality Control Testing Laboratory: Names and qualifications of testing laboratory employed, and qualifications of testing laboratory's personnel that will perform field quality control testing as required under this Section.

1.6 SITE CONDITIONS

A. Existing Structures & Underground Utilities:

1. The Contract Documents show or indicate certain structures and underground utilities adjacent to the Work. Such information was obtained from existing records and is not guaranteed to be correct or complete. CONTRACTOR shall explore ahead of the excavation to determine the exact location of all existing structures and underground utilities. Existing structures and underground utilities shall be supported and protected from damage by CONTRACTOR. Immediately repair and restore existing structures and underground utilities damaged by CONTRACTOR without additional cost to OWNER.

2. Movement or operation of construction equipment over underground utilities shall be at CONTRACTOR's sole risk and only after CONTRACTOR has prepared and submitted to ENGINEER and utility owners (as applicable), and received acceptance therefrom, a plan describing CONTRACTOR's analysis of the loads to be imparted and CONTRACTOR's proposed measures to protect structures and underground utilities during the Project.

3. Coordinate with utility owners for shut-off of services in active piping and conduits. Completely remove buried piping and conduits indicated for removal and not otherwise indicated as being abandoned or to remain in place.

4. In general, existing water service lines and sanitary sewer laterals to individual houses and businesses are not shown; however, CONTRACTOR shall assume that a service exists for each utility owner to each house, business, and property.

5. Do not interrupt existing utilities serving facilities occupied and used by OWNER or others, except when such interruption is indicated in the Contract Documents or when allowed in writing by ENGINEER after acceptable temporary utility services are provided by CONTRACTOR for the affected structure or property.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Select Fill:

1. Material shall be well-graded, crushed aggregate, free of organic material, complying with the following:

Sieve Sizes (Square Openings)	Percentage by Weight Passing Sieve
1.25-inch	100
No. 4	38 to 65
No. 8	25 to 60
No. 30	10 to 40
No. 200	3 to 12

B. General Fill:

1. Material shall be free of rock and gravel larger than three inches in any dimension, debris, waste, frozen materials, organic material, and other deleterious matter.

2. Fill shall have a liquid limit not greater than 45, and plasticity index not greater than 25.

3. Previously-excavated materials complying with the Contract Documents requirements for general fill may be used for general fill.

4. When on-Site materials are found unsuitable for use as general fill, provide select fill or approved off-Site general fill materials. Prior to using off-Site material as general fill, furnish submittal for and obtain ENGINEER's approval of the material proposed for use.

C. Subbase Material:

1. Material shall be naturally- or artificially-graded mixture of natural or crushed gravel, crushed stone, or natural or crushed sand, complying with the gradation requirements below. Crushed slag is unacceptable.

Sieve Sizes (Square Openings)	Percentage by Weight Passing Sieve
2-inch	100
1-inch	70 to 100
3/4-inch	50 to 90
No. 4	30 to 60
No. 30	9 to 33
No. 200	0 to 15

2. Material shall be naturally- or artificially-graded mixture of natural or crushed gravel, crushed stone, or natural or crushed sand. Crushed slag is unacceptable. Material shall be in accordance with FDOT guidance.

D. Drainage Fill:

1. Material shall be washed, uniformly-graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing 1.5-inch sieve and not more than five percent passing a No. 4 sieve.

E. Pipe Bedding Material:

1. Aggregate material shall be crushed stone and gravel, free of rock or gravel larger than one-inch in any dimension, debris, waste, frozen materials, organic material and other deleterious matter. Material shall comply with gradation requirements below in addition to FDOT guidance:

Sieve Sizes (Square Openings)	Percentage by Weight Passing Sieve
1-inch	100
3/8-inch	30 to 65
No. 4	25 to 55
No. 10	15 to 40
No. 40	8 to 20
No. 200	2 to 8

2. Sand material, where required, shall consist of natural or manufactured granular material and shall contain no organic material. Sand shall be non- plastic, when tested in accordance with ASTM D4318, 100 percent shall pass a 1/2-inch screen and not more than five percent shall pass a No. 200 screen.

2.2 SOURCE QUALITY CONTROL

A. Perform quality assurance testing, and submit results to ENGINEER, in accordance with the ‘Quality Assurance” Article in Part 1 of this Section.

PART 3 - EXECUTION

3.1 INSPECTION

A. Provide ENGINEER with sufficient notice and with means to examine areas and conditions under which excavating, filling, and grading will be performed. ENGINEER will advise CONTRACTOR in writing when ENGINEER is aware of conditions that may be detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

3.2 TEST PITS

A. General:

1. In advance of the construction, excavate, make observations, determine soil type and possible groundwater table elevations, and measurements, and fill test pits to determine conditions or location of the existing underground utilities and structures. Perform all work required in connection with excavating, stockpiling, maintaining, sheeting, shoring, filling, and replacing pavement for test pits. CONTRACTOR shall be responsible for the definite location of each existing underground utility involved within the area of excavation for the Work. Exercise care during such location work to avoid damaging and disrupting the affected underground utility or structure. CONTRACTOR shall be responsible for repairing, at his expense, damage to underground utility or structure caused during the Work.

3.3 PREPARATION

A. Site Preparation:

1. Clear areas to be occupied by permanent construction of all trees, brush, roots, stumps, logs, wood and other materials and debris. Clean and strip vegetation, sod, topsoil, and organic matter from subgrades where fills will be placed, and from areas where structures will be constructed. Remove from the Site and properly dispose of all waste materials.

2. Burning is not allowed at the Site.

B. Use of Explosives:

1. Use of explosives is not allowed.

3.4 DEWATERING

A. Dewatering – General:

1. The CONTRACTOR shall be responsible to provide all dewatering required for the complete installation of the water distribution system shown within the plans and shall make their own onsite investigations as to the elevations of the existing groundwater table to satisfy their dewatering requirements. No additional payments shall be made for any seasonal water table fluctuations that may require additional dewatering in order to keep a dry trench.

2. Provide and maintain all necessary dewatering equipment to remove and dispose of all surface water and ground water entering excavations, or other parts of the Work and work areas. Keep all excavations dry during excavation, and continually thereafter until the underground utilities to be built therein are acceptable to ENGINEER/OWNER and backfilling operations are completed and acceptable to ENGINEER/OWNER.

3. Keep all working areas at the Site free of surface water at all times. Provide temporary drainage ditches and temporary dikes, and provide required temporary pumping and other work necessary for diverting or removing rainfall and all other accumulations of surface water from excavations and fill areas impacted by the work. Perform diversion and removal of surface water in manner that prevents accumulation of water behind permanent or temporary structures and at any other locations in the construction area where such accumulations may be detrimental.

4. CONTRACTOR shall be responsible for condition of existing piping, catch basins/manholes, and channels used for surface water control (drainage) and such piping shall be clean and free of sediment upon completion of the work.

5. Remove water from excavations as fast as water collects.

B. Temporary Dewatering System:

1. CONTRACTOR shall design, provide, and operate dewatering system to include sufficient trenches, sumps, pumps, hose, piping, well points, deep wells, and similar facilities, necessary to depress and maintain groundwater level no less than five-inches below the base of each excavation during all stages of construction operations.

2. Design and operate dewatering system to avoid settlement and damage to existing structures and underground utilities.

3. Groundwater table shall be lowered in advance of excavation for a sufficient period of time to allow dewatering of fine grain soils.

4. Maintain groundwater level at excavations two feet below lowest subgrade excavation until the structure or underground utility, as applicable, has sufficient strength and weight to withstand horizontal and vertical soil and water pressures from natural groundwater.

5. Operate dewatering system continuously, 24 hours per day, seven days per week. Provide standby pumping facilities and personnel to maintain the continued effectiveness of the system. Do not discontinue dewatering operations without first obtaining ENGINEER's acceptance for such discontinuation.

6. If, in ENGINEER's opinion, the water levels are not being lowered or maintained as required, provide additional or alternate temporary dewatering devices as necessary, at no additional cost to OWNER.

7. Locate elements of temporary dewatering system to allow continuous dewatering operation without interfering with the Work to the extent practicable.

8. Where portions of dewatering system are located in the area of permanent construction, submit to and obtain ENGINEER's acceptance of details of proposed methods of constructing the Work at such location. Control of ground water shall continue until the permanent construction provides sufficient dead load to withstand hydrostatic uplift of the normal groundwater, until concrete has attained sufficient strength to withstand earth and hydrostatic loads.

9. Perform pumping of water from excavations in a manner that prevents carrying away of unsolidified concrete materials, and that avoids damaging the subgrade.

10. Before discontinuing dewatering operations or permanently allowing rise of groundwater level, prepare computations to demonstrate that structures affected by the water level rise are protected by fill or other means to sustain uplift. Use a safety factor of 1.25 when preparing such calculations.

C. Disposal of Water Removed by Dewatering System:

1. CONTRACTOR's dewatering system shall discharge to suitable location acceptable to OWNER and owners of other properties potentially affected by water discharge, including owners adjacent to and downstream of dewatering system discharge. Operation dewatering system and disposal of water shall be in accordance with Laws and Regulations.

2. Convey water from excavations in closed conduits. Do not use trench excavations as temporary drainage ditches.

3. Dispose of water removed from excavations in a manner that does not endanger health and safety, property, the Work, and other portions of the Project.

4. Dispose of water in manner that causes no inconvenience to OWNER, others involved in the Project, and adjacent and downstream properties.

3.5 EXCAVATION

A. Perform all excavation required to complete the Work as shown, specified, and required. Excavations shall include removing and handling of earth, sand, clay, gravel, hardpan, soft, weathered or decomposed rock, pavements, rubbish, and other materials within the excavation limits.

B. Excavation Protection:

1. Provide excavation protection system(s) in accordance with Laws and Regulations to prevent injury to persons and property, including underground utilities.

2. Excavation Less Than Five Feet Deep: Excavations in stable rock or in soil conditions where there is no potential for a cave-in may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded, or shored and braced.

3. Excavations Greater Than Five Feet Deep: Excavations in stable rock may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded, or shored and braced.

4. Provide and maintain excavation protection system(s) in accordance with submittals accepted by ENGINEER and required under Paragraph 1.5.B of this Section.

C. Maintain excavations in dry condition in accordance with "Dewatering" Article in Part 3 of this Section.

D. Elevations of piping, conduit, and similar other underground utilities shall be as shown or indicated on the Contract Documents.

E. When excavations are made below required grades without written order of ENGINEER, fill such excavations with compacted select fill material, as directed by ENGINEER, at CONTRACTOR's expense.

F. Extend excavations sufficiently on each side of structures, footings, and similar construction to allow setting of forms, installation of shoring and bracing, and the safe sloping of banks, as necessary.

G. Subgrades – General:

1. Subgrades shall be firm, dense, and thoroughly compacted and consolidated; shall be free from mud, muck, and other soft or unsuitable materials; and shall remain firm and intact under all construction operations. Subgrades that are otherwise solid but become soft or mucky on top due to construction operations shall be reinforced. Finished elevation of stabilized subgrades shall not be above subgrade elevations shown.

2. If, in ENGINEER's opinion, subgrade becomes softened or mucky because of construction delays, failure to dewater properly, or other cause within CONTRACTOR's control, subgrade shall be excavated to firm material, trimmed, and backfilled with select fill material at CONTRACTOR's expense.

H. Pipe Trench Preparation:

1. Not more than 150 feet of trench may be opened in advance of installing pipe in trench.

2. Trench width shall be minimized to greatest extent practical, and shall comply with the following:

   a. Trench width shall be sufficient to provide space for installing, jointing and inspecting piping. Refer to Drawings for trench requirements. In no case should trench be wider at top of pipe than pipe barrel OD plus two feet, unless otherwise shown or indicated.
   b. Enlargement of trench width at pipe joints may be made when required and approved by ENGINEER.
   c. Trench width shall be sufficient for shoring and bracing, or shielding and dewatering.
   d. Trench width shall be sufficient to allow thorough compaction of fill adjacent to bottom half of pipe.
   e. Do not use excavating equipment that requires the trench to be excavated to excessive width.

3. Depth of trench shall be as shown or indicated. If required and approved by ENGINEER in writing, depths may be revised.

4. Where ENGINEER considers existing material beneath bedding material unsuitable, remove and replace such unsuitable material with select fill material.

I. Excavated Materials to be Used as Fill:

1. Stockpile excavated materials that are acceptable for use as fill.

2. As excavation proceeds, keep stockpiles of excavated materials suitable for use as fill separate from unsuitable materials and waste materials.

3. Place, grade, and shape stockpiles for proper drainage.

4. Locate and retain soil materials away from edge of excavations.

5. Dispose of excess soil material and waste materials as specified in this Section.

6. Stockpiled excavated soils for use as select fill or general fill shall be tested and classified by laboratory as on-Site select fill or on-Site general fill. Perform required quality assurance testing for material verification on stockpiled materials as soon as possible to demonstrate compliance of excavated materials with the Contract Documents.

7. When all excavated material cannot be stored in the right-of-way or other lands provided by OWNER in such manner as to maintain traffic conditions as specified, remove surplus material from the Site and store such material appropriately. After laying pipe or completing the underground utility or structure being built in the trench, bring back to trench sufficient quantity of suitable excavated material required for backfilling the trench.

8. In built-up work areas and in streets where traffic conditions require, remove material excavated from initial opening of excavation as soon as the material is excavated; use suitable material subsequently excavated to backfill trenches in which underground utilities have been installed or structures built. Do not store excavated material or construction materials on streets or sidewalks.

3.6 UNAUTHORIZED EXCAVATION

A. All excavations outside lines and grades shown or indicated and that are not approved by ENGINEER, together with removing and disposing of the associated material, shall be at CONTRACTOR's expense. Fill unauthorized excavations with properly-compacted select fill material at CONTRACTOR’s expense.

3.7 EROSION AND SEDIMENT CONTROLS

A. Provide temporary erosion and sediment controls in accordance with the Drawings. When applicable, also comply with requirements of the erosion and sediment control plan approved by authorities having jurisdiction.

3.8 SHEETING, SHORING, AND BRACING

A. General:

1. Design and provide sheeting, shoring, bracing, cofferdams, and similar excavation supports as shown, specified, and required for the Work.

2. Clearances and types of temporary sheeting, shoring, bracing, and similar excavation supports, insofar as they may affect the finished character of the Work and the design of sheeting to be left in place, will be subject to the ENGINEER's approval; but CONTRACTOR is responsible for adequacy of all sheeting, shoring, bracing, cofferdams, and similar excavation supports.

3. Materials:

   a. Previously-used materials shall be in good condition, and shall not be damaged or excessively pitted. All steel or wood sheeting designated to remain in place shall be new. New or used sheeting may be used for temporary sheeting, shoring, and bracing.
   b. All steel work for sheeting, shoring, bracing, cofferdams and other excavation supports, shall be in accordance with ANSI/AISC 360, except that field welding will be allowed.
   c. Provide permanent steel sheet piling or pressure-creosoted timber sheet piling where subsequent removal of sheet piling might allow lateral movement of soil under adjacent structures

4. As excavation progresses, carry down shoring, bracing, cofferdams, and similar excavation supports to required elevation at bottom of excavation.

5. Comply with Laws and Regulations regarding sheeting, shoring, bracing, cofferdams, and similar excavation supports.

6. Maintain sheeting, shoring, bracing, bracing, and other excavation supports in excavations regardless of time period excavations will be open.

7. Unless otherwise shown, specified, or directed, remove materials used for temporary construction when the Work is completed. Perform such removal in manner not injurious to the structures and underground utilities, their appearance, and adjacent construction.

B. Removal of Sheeting and Bracing

1. Remove sheeting and bracing from excavations, unless otherwise directed by ENGINEER in writing. Perform removal to avoid damaging the Work and adjacent construction. Removal shall be equal on both sides of excavation to ensure no unequal loads on structures and underground utilities.

2. Defer removal of sheeting and bracing, where removal may cause soil to come into contact with concrete, until concrete has cured for not less than seven days.

3.9 TRENCH SHIELDS

A. Excavation of earth material below bottom of trench shield shall not exceed the limits established in Laws and Regulations.

B. When using a shield for installing piping

1. Portions of trench shield extending below the mid-diameter of an installed, rigid pipe, such as prestressed concrete pipe and other types of rigid pipe, shall be raised above the pipe's mid-diameter elevation prior to moving the shield along the trench for further construction.

2. Bottom of shield shall not at any time extend below mid-diameter of installed pipe that is flexible or has flexing capability, such as steel, ductile iron, PVC, CPVC, polyethylene, and other pipe that has flexing capability.

C. When using a shield for installing structures, including structures that are underground utilities, bottom of the shield shall not extend below the top of the bedding for the structures.

D. When removing the shield or moving the shield ahead, exercise extreme care to prevent moving piping, structures, and other underground utilities, and prevent disturbance of bedding material for piping, structures, and other underground utilities. When piping, structures, or other underground utilities are disturbed, remove and reinstall the disturbed items in accordance with the Contract Documents.

3.10 FILL AND COMPACTION – GENERAL PROVISIONS

A. Provide and compact all fill required for the finished grades as shown and as specified in this Section.

B. Place fill in excavations as promptly as progress of the Work allows, but not until completing the following:

1. ENGINEER's authorization after observation of construction below finish grade.

2. Inspection, testing, approval, and recording of locations of underground utilities.

3. Removal of formwork.

4. Removal of shoring and bracing, and filling of voids with satisfactory materials.

5. Removal of trash and debris.

6. Field testing of underground utilities including piping and conduits, in accordance with Section 330502, Buried Piping Installation, when nature of the test requires observation of pipe exterior during testing.

C. Fill that includes organic materials or other unacceptable material shall be removed and replaced with approved fill material in accordance with the Contract Documents.

D. Placement – General:

1. Place fill to the grades shown or indicated. Bring up evenly on all sides fill around structures and underground utilities.

2. Place fill materials at moisture content and density as specified in this Article's requirements on compaction density. Furnish and use equipment capable of adding measured amounts of water to the fill materials to bring fill materials to a condition within required moisture content range. Furnish and use equipment capable of discing, aerating, and mixing the fill materials to ensure reasonable uniformity of moisture content throughout the fill materials, and to reduce moisture content of borrow materials by air drying, when necessary. When subgrade or lift of fill materials requires moisture-conditioning before compaction, fill material shall be sufficiently mixed or worked on the subgrade to ensure uniform moisture content throughout the lift of material to be compacted. Materials at moisture content in excess of specified limit shall be dried by aeration or stockpiled for drying.

3. Perform compaction with equipment suitable for the type of fill material placed. Select and use equipment capable of providing the minimum density required in the Contract Documents. Use light compaction equipment, with equipment gross weight not exceeding 7,000 pounds within horizontal distance of ten feet from the wall of completed, below-grade structures. Furnish and use equipment capable of compacting in restricted areas next to structures and around piping and other underground utilities. Effectiveness of the equipment selected by CONTRACTOR shall be tested at start of compacted fill Work by constructing a small section of fill within the area where fill will be placed. If tests on the test section of fill indicate that required compaction is not obtained, do one or more of the following: increase the amount of coverages, decrease the lift thicknesses, or use different compactor equipment.

4. Place fill materials in horizontal, loose lifts, not exceeding specified uncompacted thickness. Place fill in a manner ensuring uniform lift thickness after placing. Mechanically compact each lift, by not less than two complete coverages of the compactor. One coverage is defined as the conditions reached when all portions of the fill lift have been subjected to the direct contact of compactor's compacting surface. Compaction of fill materials by inundation with water is unacceptable.

5. Do not place fill materials when standing water is present on surface of the area where fill will be placed. Do not compact fill when standing water is present on the fill to be compacted. Do not place or compact fill in a frozen condition or on top of frozen material. Fill containing organic materials or other unacceptable material previously described shall be removed and replaced prior to compaction.

6. If required densities are not obtained because of improper control of placement or compaction procedures, or because of inadequate or improperly-functioning compaction equipment, CONTRACTOR shall perform all work required to provide the required densities. Such work shall include, at no additional cost to OWNER, complete removal of unacceptable fill areas and replacement and re-compaction until acceptable fill is provided.

7. Repair, at CONTRACTOR's expense, observed or measured settlement. Make repairs and replacements as required within 30 days after being so advised by ENGINEER.

E. Fill in Pipe Trenches:

1. Piping trenches will be backfilled prior to testing of piping.

2. Pipe Bedding: Pipe bettering material shall be as follows:

    a. Install all water main piping on a 6-inch layer of ¾" aggregate or #57 stone as denoted on the plan details.
    b. Unless otherwise shown, install other types of piping, such as water services/casings on not less than a two-inch layer of clean sand. The clean sand pipe bedding material shall extend 12 inches above top of the pipe/casing. Refer to the plan detail.

3. Placing and Compacting Pipe Trench Fill: Unless otherwise shown, placement and compaction of pipe trench fill materials shall comply with the following:

    a. Pipe bedding material shall be spread and the surface graded to provide a uniform and continuous support beneath piping at all points between bell holes or pipe joints. Slight disturbance of installed pipe bedding material surface during withdrawal of pipe slings or other lifting tackle is acceptable.
    b. After each pipe's bedding material has been graded, and the piping has been aligned, joined in accordance with the Contract Documents, and placed in final position on bedding material, provide and compact sufficient pipe trench fill material under and around each side of the pipe and back of the bell or end thereof to hold piping in proper position and maintain alignment during subsequent pipe jointing and embedment operations. Deposit and compact pipe trench fill material uniformly and simultaneously on each side of piping to prevent lateral displacement of piping. Place and compact pipe trench fill material to an elevation 12 inches above top of pipe, unless otherwise shown or specified.
    c. Each layer of pipe trench fill material shall be compacted by at least two complete coverages of all portions of surface of each lift using appropriate compaction equipment.
    d. Method of compaction and compaction equipment used shall be appropriate for material to be compacted and shall not transmit damaging shocks to the piping.

F. Drainage Fill Placement:

1. Provide drainage fill material where shown to the limits shown or indicated.

2. Place drainage fill material in compacted layers of uniform thickness not exceeding depth of six inches each. Compact lifts of drainage fill using suitable compaction equipment.

G. Compaction Density Requirements:

1. Minimum density for fill materials shall be 100 percent of maximum density obtained in the laboratory in accordance with ASTM D698. Compaction of fill materials less than five feet below final grade, behind concrete walls, and pipe bedding materials when not located below structures or pavement shall be 95 percent of maximum density.

2. Place fill in trenches below piping or paved areas in horizontal uncompacted layers not greater than eight inches deep, and thoroughly compact each layer before next layer is placed. In other pipe trenches, horizontal uncompacted layers shall not be greater than six inches deep.

3. Fill shall be wetted and thoroughly mixed to achieve optimum moisture content plus-or-minus three percent, with the following exceptions:

   a. On-site clayey soils: Optimum to plus three percent.

4. Replace natural, undisturbed soils or compacted soil subsequently disturbed or removed by construction operations with materials compacted as indicated.

5. Field quality control testing for density to verify that specified density was obtained, will be performed during each day of compaction Work. Responsibility for field quality control testing is specified in the “Field Quality Control” Article in Part 3 of this Section.

6. When field quality control testing indicates unsatisfactory compaction, provide additional compaction necessary to obtain the specified compaction. Perform additional compaction Work at no additional cost to OWNER until specified compaction is obtained. Such work includes complete removal of unacceptable (as determined by ENGINEER) fill areas and replacement and re-compaction until acceptable fill is provided in accordance with the Contract Documents.

H. Replacement of Unacceptable Excavated Materials: In cases where over- excavation to replace unacceptable soil materials is required, backfill the excavation to required subgrade with select fill material and thoroughly compact in accordance with “Compaction Density Requirements” of this Article and the associated “Compaction Density Requirements” in this Article. Slope the sides of excavation in accordance with the maximum inclinations specified for each structure location.

3.11 GRADING

A. General:

1. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas.

2. Smooth subgrade surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

3. Blend grading over trench to elevations shown or indicated; where elevations are not shown or indicated, blend finished grade with existing grade on each side of trench.

B. Compaction:

1. After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

3.12 DISPOSAL OF EXCAVATED MATERIALS

A. General:

1. CONTRACTOR shall haul away material removed from excavations that does not comply with requirements for fill, or is in excess of the quantity required for fill.

2. Disposal of materials shall be in compliance with Laws and Regulations, at no additional cost to OWNER.

3. All refuse/other material to be removed/hauled away shall be done by the CONTRACTORS equipment/personnel or through the City's contracted refuse service, if available and as coordinated in advance with the City.

3.13 TEMPORARY BARRIERS

A. General:

1. Provide temporary barrier surrounding excavations and excavation work areas for protection of persons and property.

2. Provide temporary barriers where shown or indicated, and where necessary to protect persons and property. At minimum, provide temporary barriers for all excavations that remain open overnight or longer.

3.14 FIELD QUALITY CONTROL

A. Site Tests: CONTRACTOR will employ a testing laboratory to perform field quality control testing.

1. Testing Laboratory Scope

   a. Perform field moisture content and density tests to ensure that the specified compaction of fill materials has been obtained.
   b. Tests of actual unconfined compressive strength or bearing tests on each stratum.
   c. Report results of each test to ENGINEER and CONTRACTOR.

2. Required Material Tests

   a. Compaction: Comply with ASTM D1556 and ASTM D6938, as applicable.

3. Authority and Duties of Testing Laboratory

   a. Technicians representing the testing laboratory shall inspect the materials in the field, perform testing, and report findings to ENGINEER and CONTRACTOR. When materials furnished or the Work performed does not comply with the Contract Documents, technician will direct attention of ENGINEER and CONTRACTOR to such failure.

b. Technician will not act as foreman or perform other duties for CONTRACTOR. Work will be checked as it progresses, but failure to detect defective Work or non-complying materials shall not in any way prevent later rejection when defect is discovered, nor shall it obligate ENGINEER for Substantial Completion or final acceptance. Technicians are not authorized to revoke, alter, relax, enlarge, or release requirements of the Contract Documents, or to approve or accept any portion of the Work.

4. Responsibilities and Duties of CONTRACTOR

a. Use of testing laboratory shall in no way relieve CONTRACTOR of the responsibility to provide materials and Work in full compliance with the Contract Documents.
b. To facilitate testing laboratory, CONTRACTOR shall advise testing laboratory at least two days in advance of filling operations to allow for completion of field quality control testing and for assignment of personnel.
c. It shall be CONTRACTOR's responsibility to accomplish the specified compaction for fill and other earthwork. CONTRACTOR shall control construction operations by confirmation tests to verify and confirm that CONTRACTOR has complied, and is complying at all times, with the Contract Documents relative to compaction, control.
d. CONTRACTOR shall demonstrate adequacy of compaction equipment and procedures before exceeding one or more of the following quantities of earthwork. Each test location shall include tests for each layer, type, or class of fill to finish grade.

1) 200 linear feet of fill in trenches, except subbase material.
2) 10 cubic yards of select fill other than that placed in trenches.
3) 100 cubic yards of general fill other than that placed in trenches.
4) 50 cubic yards of subbase material.

5. Testing laboratory will inspect and indicate acceptable subgrades and fill layers before construction work is performed thereon. Testing of subgrades and fill layers shall be taken as follows:

a. Trenches for underground utilities

1) In Open Fields: Two locations every 1,000 linear feet.
2) Along Dirt or Gravel Roads or Off Traveled Right-of-Way: Two locations every 500 linear feet.
3) Crossing Paved Roads: Two locations along each crossing.
4) Under Pavement Cuts or Within Two Feet of Pavement Edges: One location every 400 linear feet.

b. Subbase Material: One per 100 linear feet on every compacted lift.

6. Periodic compliance tests will be made by ENGINEER to verify that compaction is complying with the requirements specified, at no cost to CONTRACTOR. CONTRACTOR shall remove the overburden above the level at which ENGINEER wishes to test and shall fill and re-compact the excavation after testing is complete.

7. If testing laboratory reports or inspections indicate subgrade, fills, or bedding compaction below specified density, CONTRACTOR shall remove unacceptable materials as necessary and replace with specified materials and provide additional compaction at CONTRACTOR's expense until subgrades, bedding, and fill are acceptable. Costs for retesting of subgrade, fills, or bedding materials that did not originally comply with specified density shall be paid by CONTRACTOR.

END OF SECTION 330501

SECTION 330502 – BURIED PIPING INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Water service and related components

B. Related Work

1. Section 330501 – Trenching

C. Work Includes

1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals for the Work identified herein and on the Plans as shown, specified, and required to install and test all buried piping, fittings, services and appurtenances. The Work includes but is not limited to the following:

   a. All types and sizes of buried piping as noted on the Plans.
   b. Work on or affecting existing buried piping.
   c. Supports and restraints.
   d. Field quality control, including testing.
   e. Cleaning and disinfecting.
   f. Incorporation of valves, meters, hydrants and appurtenant items shown or specified into piping systems in accordance with the Contract Documents and as required.

D. Coordination:

1. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before buried piping Work.

1.2 REFERENCES

A. Standards referenced in this Section are:

1. ANSI/AWWA C111, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

2. ANSI/AWWA C600, Installation of Ductile-Iron Water Mains and Their Appurtenances.

3. ANSI/AWWA C651, Disinfecting Water Mains.

4. AWWA M41, Ductile-Iron Pipe and Fittings.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements

1. Comply with requirements and recommendations of authorities having jurisdiction over the Work, including:

   a. City of Fort Lauderdale Utilities Department
   b. City of Fort Lauderdale Engineering Department
   c. Florida Department of Health
   d. Broward County Traffic Engineering Division

2. Obtain required permits for Work in roads, rights-of-way, railroads, and other areas of the Work.

1.4 SUBMITTALS

A. Action Submittals: Submit the following:

1. Shop Drawings:

   a. Details of piping, specials, joints, harnessing and thrust blocks, and connections to piping, structures, equipment, and appurtenances.

2. Product Data:

   a. Manufacturer's literature and specifications, as applicable, for products specified in this Section.

3. Testing Procedures:

   a. Submit proposed testing procedures, methods, apparatus, and sequencing. Obtain ENGINEER's approval prior to commencing testing.

B. Informational Submittals: Submit the following:

1. Certificates:

   a. Certificate signed by manufacturer of each product certifying that product conforms to applicable referenced standards.

2. Field Quality Control Submittals:

   a. Results of each specified field quality control test.

C. Closeout Submittals: Submit the following:

1. Record Documentation:

a. Maintain accurate and up-to-date record documents showing modifications made in the field, in accordance with approved submittals, and other Contract modifications relative to buried piping Work. Submittal shall show actual location of all piping Work and appurtenances at same scale as the Drawings.

b. Show piping with elevations referenced to Project datum and dimensions from permanent structures. For each horizontal bend in piping, include dimensions to at least three permanent structures, when possible. For straight runs of piping provide offset dimensions as required to document piping location.

c. Include profile drawings with buried piping record documents when the Contract Documents include piping profile drawings.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery:

1. Deliver materials to the Site to ensure uninterrupted progress of the Work.

2. Upon delivery inspect pipe and appurtenances for cracking, gouging, chipping, denting, and other damage and immediately remove from Site and replace with acceptable material.

B. Storage:

1. Store materials to allow convenient access for inspection and identification. Store material off ground using pallets, platforms, or other supports. Protect packaged materials from corrosion and deterioration.

2. Pipe and fittings other than PVC and CPVC may be stored outdoors without cover. Cover polyethylene pipe and fittings stored outdoors.

C. Handling:

1. Handle pipe, fittings, specials, and accessories carefully in accordance with pipe manufacturer's recommendations. Do not drop or roll material off trucks. Do not drop, roll or skid piping.

2. Avoid unnecessary handling of pipe.

3. Keep pipe interiors free from dirt and foreign matter.

4. Protect interior linings and exterior coatings of pipe and fittings from damage. Replace pipe and fittings with damaged lining regardless of cause of damage.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipe

1. High density polyethylene pipe

a. All pipe and fittings shall conform to ANSI/AWWA C901. Pipe shall use PE4710 and have a minimum cell class of PE 445574C CC3.
b. All fittings shall conform to ASTM D3216.
c. All potable water service piping and fittings shall be NSF 61 certified with a minimum pressure rating of 200 psi.
d. Acceptable manufactures:

1) JM Eagle
2) Or equal

2. Polyvinyl chloride (PVC) pipe

a. Sewer

1) All sewer pipe shall confirm to ASTM D3034.
2) Pipe shall be SDR-35.
3) Acceptable manufactures:

a) JM Eagle
b) Or equal

4) Joints shall conform to ASTM D3212.
5) Gaskets shall conform to ASTM F477

B. General:

1. Pipe Markings:

a. Manufacturer shall cast or paint on each length of pipe and each fitting pipe material, diameter, and pressure or thickness class.
b. All pipe and fitting shall be color coded in accordance with 62- 555.320(21)(b) 3, F.A.C.

2.2 BURIED PIPING IDENTIFICATION

A. Polyethylene Underground Warning Tape for Pipelines:

1. Tracer tape shall be of inert, acid- and alkali-resistant, polyethylene, four mils thick, six inches wide, and suitable for direct burial. Tape shall be capable of stretching to twice its original length.

2. Message shall read, “CAUTION (service type) PIPE BURIED BELOW”, with bold letters approximately two inches high. Messages shall be printed at maximum intervals of two feet.

3. Acceptable manufacturers:

   a. Brady Corporation
   b. Seton Identification Products
   c. Marking Services, Inc.
   d. Or equal.

2.3 WATER SERVICES

A. Service taps shall be of a type approved by the City of Fort Lauderdale in accordance with their typical water services details as shown on the plans.

B. Replacement of all service lines is required with polyethylene tubing in accordance with the City of Fort Lauderdale requirements.

C. All corporation stops, meter stops, couplings and casings shall be in accordance with the City of Fort Lauderdale standards.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General

1. Install piping as shown, specified, and as recommended by pipe and fittings manufacturer.

2. In event of conflict between manufacturer’s recommendations and the Contract Documents, request interpretation from ENGINEER before proceeding.

3. ENGINEER will observe excavations and bedding prior to laying pipe by CONTRACTOR. Notify ENGINEER in advance of excavating, bedding, pipe laying, and backfilling operations.

4. Minimum cover over buried piping shall be 30 inches, unless otherwise shown or approved by ENGINEER.

5. Excavation in excess of that required or shown, and that is not authorized by ENGINEER shall be filled at CONTRACTOR’s expense with granular material furnished, placed, and compacted.

6. Comply with NFPA 24 for “Outside Protection”, where applicable to water piping systems used for fire protection.

7. All PVC piping and fittings shall be installed in accordance with the requirements of ASTM D2321 and the manufacturer's instructions. All PVC pipe joints shall be assembled in accordance with the requirements of ASTM D2321.

8. HDPE piping shall be installed in accordance with AWWA M55, ASTM D2774 and the manufacturer's installation instructions.

9. All plain-end HDPE pipe shall be joined via heat fusion in accordance with ASTM F2620 and comply with comply with AWWA C906, ASTM F3190, and ASTM F2620 for butt and socket fusion. Electrofusion shall be carried out in accordance with AWWA M55 & ASTM F1290. No offset in alignment between adjacent pipe joints or fittings shall be permitted.

B. Separation of Sewers and Potable Water Piping

1. Horizontal Separation

a. Where possible, existing and proposed potable water mains and service lines, and sanitary storm sewers shall be separated horizontally by a clear distance (face to face) of six (6) feet (minimum) with ten (10) feet separation being preferred.

2. Vertical Separation

a. Provide minimum vertical distance of 18 inches between outside of potable water main and outside of sewer when sewer crosses over potable water main.
b. Center a full section of potable water main pipe over sewer so that sewer joints are equidistant from potable water main joints.
c. Provide adequate structural support where potable water main crosses under sewer. At minimum, provide compacted select backfill for ten (10) feet on each side of crossing.
d. The CONTRACTOR shall use the City's standard utility crossing deflection for shallow installation to meet sanitary sewer lateral minimum vertical separation as required by 62-555.314 F.A.C.

C. Plugs

1. Temporarily plug installed pipe at end of each day of work or other interruption of pipe installation to prevent entry of animals, liquids, and persons into pipe, and entrance or insertion of deleterious materials into pipe.

2. Install standard plugs in bells at dead ends, tees, and crosses. Cap spigot and plain ends.

3. Fully secure and block plugs and caps installed for testing to withstand specified test pressure.

4. Where plugging is required for phasing of the Work or subsequent connection of piping, install watertight, permanent type plugs or caps acceptable to ENGINEER.

D. Bedding Pipe

1. Bed pipe as specified and in accordance with details on the Drawings.

2. Where ENGINEER deems existing bedding material unsuitable, remove and replace existing bedding with approved granular material furnished, placed, and compacted.

3. Where pipe is installed in rock excavation, provide minimum of three inches of granular bedding material underneath pipe smaller than four-inch nominal diameter, and minimum of six inches of granular bedding material underneath pipes four-inch nominal diameter and larger.

4. Excavate trenches below bottom of pipe by amount shown and indicated in the Contract Documents. Remove loose and unsuitable material from bottom of trench.

5. Carefully and thoroughly compact pipe bedding with handheld pneumatic compactors.

6. Do not lay pipe until ENGINEER approves bedding condition.

7. Do not bring pipe into position until preceding length of pipe has been bedded and secured in its final position.

E. Laying Pipe:

1. Conform to manufacturer's instructions and requirements of standards and, as applicable:

2. Install pipe accurately to line and grade shown and indicated in the Contract Documents, unless otherwise approved by ENGINEER. Remove and reinstall pipes that are not installed correctly.

3. Slope piping uniformly between elevations shown.

4. Keep groundwater level in trench at least 5-inches inches below bottom of pipe before laying pipe. Do not lay pipe in water. Maintain dry trench conditions until jointing and backfilling are complete. Keep clean and protect interiors of pipe, fittings, valves, and appurtenances.

5. Start laying pipe at lowest point and proceed towards higher elevations, unless otherwise approved by ENGINEER.

6. Place bell and spigot-type pipe so that bells face the direction of laying, unless otherwise approved by ENGINEER.

7. Excavate around joints in bedding and lay pipe so that pipe barrel bears uniformly on trench bottom.

8. Deflections at joints shall not exceed 50 percent of amount allowed by pipe manufacturer, unless otherwise approved by ENGINEER.

9. Carefully examine pipe, fittings, valves, and specials for cracks, damage, and other defects while suspended above trench before installation. Immediately remove defective materials from the Site and replace with acceptable products.

10. Inspect interior of all pipe, fittings, valves, and specials and completely remove all dirt, gravel, sand, debris, and other foreign material from pipe interior and joint recesses before pipe and appurtenances are moved into excavation. Bell and spigot-type mating surfaces shall be thoroughly wire brushed and wiped clean and dry immediately before pipe is laid.

11. Field cut pipe, where required, with machine specially designed for cutting the type of pipe being installed. Make cuts carefully, without damage to pipe, coating or lining, and with smooth end at right angles to axis of pipe. Cut ends on push-on joint type pipe shall be tapered and sharp edges filed off smooth. Do not flame-cut pipe.

12. Do not place blocking under pipe, unless specifically approved by ENGINEER for special conditions.

13. Touch up protective coatings in manner satisfactory to ENGINEER prior to backfilling.

14. Notify ENGINEER in advance of backfilling operations.

15. Thrust Restraint: Where required, provide thrust restraint conforming to Article 3.2 of this Section.

F. Backfilling:

1. Conform to applicable requirements of Section 330501 (Trenching).

2. Place backfill as Work progresses. Backfill by hand and use power tampers until pipe is covered by at least one foot of backfill.

G. Connections to Valves and Hydrants:

1. Install valves and hydrants as shown and indicated in the Contract Documents.

2. Provide suitable adapters when valves or hydrants and piping have different joint types.

3. Provide double thrust restraint at all hydrants and at valves located at pipeline terminations.

H. Transitions from One Type of Pipe to Another

1. Provide necessary adapters, specials, and connection pieces required when connecting different types and sizes of pipe or connecting pipe made by different manufacturers as shown in the plans.

I. Closures

1. Provide closure pieces shown or required to complete the Work.

3.2 THRUST RESTRAINT

A. Provide double thrust restraint on pressure piping systems at all tees, valves and fittings where a change in direction (horizontal/vertical) occurs in accordance with City standards.

B. Thrust restraint may be accomplished by using restrained pipe joints only.

C. Restrained Pipe Joints

1. Pipe joints shall be restrained by means suitable for the type of pipe being installed.

D. Provide double thrust restraint on piping where new mains are tied into existing mains to ensure the integrity of the existing main is not compromised.

3.3 WORK AFFECTING EXISTING PIPING

A. Location of Existing Underground Utilities

1. Locations and elevations of existing Underground Utilities shown on the Drawings should be considered approximate.

2. Determine the true location of existing Underground Utilities to which connections are to be made, crossed, and that could be disturbed, and determine location of Underground Utilities that could be disturbed during excavation and backfilling operations, or that may be affected by the Work.

B. Taking Existing Pipelines and Underground Utilities Out of Service

1. Do not take pipelines or Underground Utilities out of service unless coordinated with Owner's Representative or approved by ENGINEER.

2. Notify Owner's Representative or ENGINEER in writing prior to taking pipeline or Underground Utilities out of service. Shutdown notification shall be provided in advance of the shutdown.

C. Work on Existing Pipelines or Underground Utilities

1. Cut or tap piping or Underground Utilities as shown or required with machines specifically designed for cutting or tapping pipelines or Underground Utilities, as applicable.

2. Install temporary plugs to prevent entry of mud, dirt, water, and debris into pipe.

3. Provide necessary adapters, sleeves, fittings, pipe, and appurtenances required to complete the Work.

3.4 FIELD QUALITY CONTROL

A. General:

1. Test all piping in accordance to City of Fort Lauderdale Standards and Florida Department of Health.

2. When authorities having jurisdiction are to witness tests, notify ENGINEER and authorities having jurisdiction in writing at least 48 hours in advance of testing.

3. Conduct all tests in presence of ENGINEER.

4. Remove or protect pipeline-mounted devices that could be damaged by testing.

5. Provide all apparatus and services required for testing, including:

   a. Test pumps, hoses, calibrated gages, meters, test containers, valves, fittings, and temporary pumping systems required to maintain OWNER's operations.
   b. Temporary bulkheads, bracing, blocking, and thrust restraints.

6. Unless otherwise specified, OWNER will provide fluid required for hydrostatic testing. CONTRACTOR shall provide means to convey fluid for hydrostatic testing into piping being tested. CONTRACTOR shall provide fluid for other types of testing required.

7. Repair observed leaks and repair pipe that fails to meet acceptance criteria. Retest after repair.

B. Disinfection

1. Prior to disinfection, the Contractor shall provide proposed disinfection procedures for review and approval by the City.

2. All new water piping and existing water piping affected by the Contractor's operations shall be disinfected in accordance with AWWA Standard C651.

C. Bacteriological Testing:

1. Provide analysis of treated water to meet standards and received acceptance from the Florida Department of Health.

2. Test samples in accordance with AWWA Standard C651.

3. Quality Assurance: Testing Laboratory: Certified for examination of drinking water in compliance with applicable legislation of the State of Florida.

4. Regulatory Requirements: Conform to Chapter 17-22 of the Florida Administrative Code.

5. Submittals

   a. Submit name of testing laboratory and evidence of qualification.
   b. Submit three copies of reports.

6. Project Record Documents

   a. Submit reports under provisions of Sections entitled "Submittals", "Project Closeout", and "Project Record Documents and Survey".
   b. Bacteriological report; accurately record:
      1) Date issued, project name, and testing laboratory name, address, and telephone number.
      2) Time and date of water sample collection.
      3) Name of person collecting sample.

4) Test locations.
5) Initial and twenty-four- hour disinfectant residuals in ppm for each outlet tested.
6) Coliform bacteria test results for each outlet tested.
7) Certification that water conforms or fails to conform to bacterial standards of State of Florida.
8) Bacteriologist's signature.

D. Flushing

1. All bacteriological tests shall be performed prior to flushing. Flush solution from the system with domestic water until the maximum residual chlorine content is within the range of 0.2 to 0.5 mg/L or the residual chlorine content of the distribution system is matched.

END OF SECTION 330502

SECTION 330503 – VALVES AND MISCELLANEOUS WATER SERVICE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Valves such as gate, air release, and tapping valves.
2. Valve operators
3. Valve boxes
4. Corporation stops
5. Service saddles
6. Back flow preventors

B. Related Work

1. Section 330503 – Buried Piping Installation

C. Work Includes

1. The CONTRACTOR shall furnish and install all valving equipment and other miscellaneous components as shown on the drawings and as specified.

1.2 REFERENCES

A. The WORK under this Contract shall be in strict accordance with the following codes and standards:

1. Local, county and municipal codes
2. American Society for Testing and Materials (ASTM)
3. American National Standards Institute (ANSI)
4. American Water Works Association Standards (AWWA)
5. Florida Department of Transportation Specifications (DOT)
6. Federal Specifications

1.3 MATERIALS AND EQUIPMENT

A. Unless otherwise specified or shown on the drawings, materials and equipment shall be the standard product of a manufacturer and shall comply with the Contract Documents and applicable standards for such materials or equipment.

B. Prior to the start of the WORK, the CONTRACTOR shall submit a list of the manufacturers of all equipment and materials to be incorporated in the WORK that conform a standard, code or as specified.

PART 2 - PRODUCTS

2.1 VALVE OPERATORS

A. General:

1. The rated torque capability of each operator shall be sufficient to seat; unseat and rigidly hold in any intermediate position the valve disc it controls under the test conditions specified. All valves shall be equipped with adjustable mechanical stop-limiting devices to prevent over-travel of the valve disc in the open and closed positions. Operator housings supports and connections to the valve shall be designed with a minimum safety factor of five based on the ultimate strength or based on three on the yield strength of materials used. The rated torque capability of each cylinder portion of a cylinder operator shall be sufficient to seat, unseat and rigidly hold in any intermediate position the valve disc or plug it controls under the operating conditions specified. Operators to be buried shall be watertight. Above grade operators shall be weatherproof. The position of the operator shall be as shown on the shop drawings. The piece mark of the valves, the location, the size, the type of operator, the maximum working head, and the closing time (of pneumatically or electrically actuated valves) shall be tabulated on the shop drawings. Unless otherwise noted, all non-buried valves shall be equipped with handwheel operators unless the valve has an electric operator with manual override. A valve key of suitable length shall be provided for buried operators. The CONTRACTOR shall be responsible for dimensionally confirming the required orientation of the valve operators (both manual and electric). Any required extensions or fabrications necessary to accommodate the installation of the operators in the locations indicated shall be provided and installed subject to the ENGINEER’s approval.

B. Gearing:

1. All gear operators or traveling-nut operators shall be self-locking and designed to transmit twice the required operator torque without damage to the faces or the gear teeth or the contact faces of the screw or nut. Upon request, the manufacturer shall furnish the purchaser with certified copies of reports describing the procedures and results of the tests for each model and torque rating of operator to be furnished.

C. Operators composed of worm gearing shall be totally enclosed in a gear case and shall have worm gears of bronze and worms of hardened steel that operate in a lubricant.

D. Operators of the traveling-nut type shall have threaded reach rods of steel and shall have a bronze or ductile iron nut with internal threads. Operators shall be enclosed.

E. Manual Operators:

1. Manual operators shall have all gearing totally enclosed. Operators shall be designed to produce the specified torque with a maximum pull of 80 lbs on handwheel or chainwheel operators and a maximum input of 150 foot-lb on operating nuts. Stop-limiting devices shall be provided in the operators for the open and closed position. All operator components between the input and these stops shall be designed to withstand, without damage, a pull of 200 lbs for handwheel or chainwheel operators and an input torque of 300 foot-lb for operating nuts. An arrow and the word "open" or "close" shall be cast on the handwheel to indicate the direction to turn said handwheel. All operating nuts shall be designed so that counterclockwise movement of the handwheel will open the valve and clockwise movement of the handwheel will close the valve.

2.2 RESILIENT SEATED GATE VALVES

A. Resilient seated gate valves shall conform to the latest edition of ANSI/AWWA C509 or C515. Valves shall provide bidirectional bubble tight sealing at 150 psi differential. Valves shall be as manufactured by American Flow Products, Mueller, Kennedy Valve/ McWane, M&H or Clow/ McWane.

2.3 AIR RELEASE VALVES

A. Air release valves shall be of the size shown and shall have screwed ends. The body, cover, lever, fame, float, seat and needle linkage shall be Type 316 stainless steel. All other moving/wetted/non-wetted parts shall be of 316 stainless steel. All other moving/wetted/non-wetted parts shall be of 316 stainless steel. Valves shall be designed for not less than 150 psi water working pressure. Pipe nipples and isolation valves connecting the air release valve to the pipe shall be 316 stainless steel. Air release valves shall be as manufactured by Crispin, Val-Matic, or DeZurik/APCO, or Golden Anderson.

2.4 VALVE BOXES

A. Valve boxes shall be cast iron, adjustable, as manufactured by Tyler/ Union/ McWane or Bingham Taylor, with cast iron drop cover. All buried valves shall be equipped with a valve box. Covers shall be marked “Water” for potable systems.

2.5 CORPORATION STOPS

A. Corporation stops shall be Mueller, Ford Meter Box, or AY McDonald, threaded on the inlet side with Mueller threads and the outlet side fitted with connections to suit connecting pipe or tubing. Brass ball valve type conforms to ANSI/ AWWA C800. Iron pipe threads by PJ/110 compression.

2.6 SERVICE SADDLE

A. Saddles shall be Mueller, Ford Meter Box, or AY McDonald. Bronze saddle with brass bales, iron pipe thread.

2.7 TAPPING VALVES AND SLEEVES

A. Tapping valves and sleeves shall be 304SS with 304SS bolts as manufactured by JCM , Mueller, Smith Blair or Ford.

2.8 BACKFLOW PREVENTOR

A. Wetted surface of backflow preventor contacted by consumable water contains less than 0.25% of lead by weight.

B. Backflow preventor shall conform to requirements of ASSE 1015.

C. Approved manufacturers shall be Watts, Apollo, Febco, or equal.

PART 3 - EXECUTION

3.1 Refer to Section 330502, Buried Piping Installation

END OF SECTION 330503

SECTION 334101 – STORM DRAINAGE FACILITIES

1.1 SUMMARY

A. Section Includes

1. French drains/exfiltration trenches.

2. Yard drains/drain basin.

3. Drainage inlets/catch basins.

4. Stormwater manholes.

B. Related Work

1. Section 334102 – Exfiltration Trench Drains

C. Work Includes

1. All labor, materials, necessary equipment, and services to complete the Storm Drainage Facilities work, as indicated on the drawings, as specified herein or both.

2. Clearing or installation of pipe and all drainage structures shall be confined within the working limits of the trenches. Trees, utility poles, survey monuments, underground and overhead utilities shall be suitably protected and preserved.

D. Existing Utilities

1. Furnish temporary support, adequate protection and maintenance of all underground and surface utility structures, drains, sewers, cables, etc., and other obstructions encountered in the progress of the work.

2. When the grade of alignment of the pipe is obstructed by existing utility structures, such as conduits, ducts, pipes, branch connections to water or sewer mains, and other obstructions, the obstructions shall be permanently supported, relocated, removed, or reconstructed by the CONTRACTOR in cooperation with the owners of such structures. No deviation shall be made from the required line or grade except as directed in writing by the ENGINEER.

3. It shall be the responsibility of the CONTRACTOR to notify the owners of existing utilities in the area of construction a minimum of forty-eight (48) hours prior to any excavation adjacent of such utilities, so that field locations of said utilities may be established. CONTRACTOR must comply with Florida Statute 556.101-111, Underground Facility Drainage Prevention and Safety Act, latest edition.

4. It shall be the responsibility of the CONTRACTOR to maintain in working order all existing storm drain lines encountered along the line of the WORK. All such drain lines shall remain continuously in service during all the operations under the contract. All existing storm sewers shall be thoroughly cleaned before final acceptance by the ENGINEER.

PART 2 - PRODUCTS

2.1 PIPE

A. Metal Pipe

1. Pipe material shall be full round or spiral, hy-flo aluminum culvert pipe, as specified in A.S.T.M. B209 and A.A.S.H.T.O. M-196. Aluminum pipe shall be in accordance with FDOT Specification Sections 443 and 945.

2. Metal pipe shall be jointed according to the pipe manufacturer's specifications for the pipe manufacturer's watertight joint. Corrugated metal band or coupling with bolts as recommended and furnished by the pipe manufacturer shall be used for joints. No pipe or pipe fittings which have been dented, scratched, or marred in any way shall be accepted. The CONTRACTOR must receive written approval to backfill before placing any backfill over the pipe. The metal pipe shall be furnished in standard laying lengths of twenty (20) or forty (40) feet.

3. Perforated corrugated metal pipe shall be aluminum full round or spiral pipe as specified in A.S.T.M. B209 and A.A.S.H.T.O. M-196, perforated corrugated metal underdrain pipe shall be referred to as P.C.M.P.

B. Reinforced Concrete Culvert Pipe

1. Pipe shall be in accordance with FDOT Specifications 443 and 449.

2. Concrete pipe shall be produced by a reputable manufacturer engaged in the full-time business of manufacturing concrete pipe. Pipe manufacturer shall produce the pipe from an approved, permanent plant acceptable to the ENGINEER.

3. Concrete pipe may be either bell and spigot, tongue and groove or modified tongue and groove.

4. Cement grout joints shall be completely watertight and acceptable to the OWNER's Representative. A full bed of mortar shall be placed in the bell and/or groove and on the tongue and/or spigot. The annular space in the pipe joint shall be wiped with cement mortar to ensure the joint is filled and to present a smooth surface. The complete exterior periphery of the joint shall have a standard cement grout diaper joint. Diaper shall be installed within the aid of an approved cloth ring. Cement mortar joints shall be made in the dry. Mortar and grout shall be one part Portland Cement to two parts by weight of sand. Mortar shall have enough water to make a stiff mixture that can be molded and worked. Cement mortar joints shall not be covered until inspected and approved by the OWNER's Representative.

C. High Density Polyethylene Pipe

1. High Density Polyethylene Pipe (HDPE) sizes twelve (12) – thirty-six (36) inches, shall be corrugated type, smooth interior, conforming to ASTM F667, AASHTO M252 and AASHTO M294 as manufactured by Advanced Drainage Systems or approved equal. Pipe shall be in accordance with FDOT Specification 443 and 948.

2. Pipe resin shall conform to ASTM D3350 with a minimum cell classification 435400C and be between 2% to 4% carbon black.

3. Basic Material

   a. Extruded Pipe and Blow Molded Fittings: Pipe and fittings shall be made of virgin PE compounds which conform with the requirements for Type III, Category 4 or 5, Grade P33, Class C; or Grade P34, Class C, as defined and described in ASTM D 1248.

   b. Rotational Molded Pipe and Fittings: Pipe and fittings shall be made of virgin PE compounds which conform with the requirements of Type III, Category 3, Grade P33, Class C; or Grade P34, Class C, as defined and described in ASTM D 1248.

4. Corrugated Polyethylene Pipe shall meet the requirements as describe in ASTM D 2412 for pipe stiffness.

5. Fitting Requirements

   a. The fittings shall not reduce or impair the overall integrity or function of the pipeline.

   b. Couplings shall be corrugated to match the pipe corrugations and shall provide sufficient longitudinal strength to preserve pipe alignment and prevent separation at the joints. Couplings shall be bell and spigot, split collar, or screw-on collar. Split collar couplings shall engage at least one full corrugation on each pipe section and screw on collars shall be in width at least one-half the nominal diameter of the pipe.

   c. HDPE pipe joints shall be of a rubber or neoprene gasket designed to secure a soil tight joint.

PART 3 - EXECUTION

3.1 EXCAVATIONS

A. Trenching

1. Trenches shall be kept as nearly vertical as possible and, if required, shall be properly sheeted and braced. Where, in the opinion of the ENGINEER, damage could result from withdrawing sheeting, the sheeting shall be left in place. Not more than one hundred (100) feet of trench shall be opened at any one time or in advance of pipe laying unless permitted by the ENGINEER.

2. Except in rock, water-bearing earth or where a granular or concrete base is to be used, mechanical excavation of trenches shall be stopped above the final grade elevation so that the pipe may be laid on a firm, undisturbed native earth bed. If over digging occurs, all loosened earth shall be removed, and the trench bottom brought back to grade with granular material.

3. Excavations and trenches in rock shall be carried to a depth of not less than eight (8) inches below the pipe bottom. This space shall be filled with granular material or washed rock.

4. Width of trenches shall be such as to provide adequate space for placing and jointing pipe properly, but in every case the trench shall be kept to a minimum width equal to the pipe outside diameter plus two (2) feet.

5. Any unstable soil encountered shall be removed and replaced with gravel, crushed rock or rock and sand suitably compacted.

6. Trench Bottom Preparation

   a. Water shall not be allowed in the trenches while the trench bottom is being prepared or while pipe is being installed, unless directed by the ENGINEER.

   b. A continuous trough shall be shaped to receive the bottom quadrant of the pipe barrel. Bell holes shall be excavated so that after placement, only the barrel of the pipe receives bearing pressure from the trench bottom.

   c. Preparation of the trench bottom and placement of the pipe shall be placed in the trench bottom a minimum of eight (8) inches below the bottom of the pipe, and a trough as described above shall be formed to uniformly support the bottom quadrant of the pipe barrel.

B. Drainage Pipe Installation

1. Pipe shall be protected during handling against impact shocks and free falls. Pipe shall be kept clean at all times and no pipe shall be used that does not conform to the Specifications.

2. The laying of the pipe shall be commenced at the lowest point with spigot ends pointing in the direction of flow. All pipe shall be laid with ends abutting and true to line and grade. They shall be laid in accordance with manufacturer's requirements as approved by the ENGINEER.

3. Pipe shall be laid accurately to the line and grade as designated on the plans. Preparatory to making pipe joints, all surfaces of the portions of the pipe to be jointed or of the factory-made jointing material shall be clean and dry. Lubricant, primers, adhesive, etc., shall be used as recommended by the pipe or joint manufacturer's specifications. The jointing materials or factory fabricated joints shall then be placed, fitted, joined, and adjusted in such a manner as to obtain a watertight line. As soon as possible after the joint is made, sufficient backfill material shall be placed along each side of the pipe to prevent movement of pipe offline and grade.

4. The exposed ends of all pipe shall be suitably plugged to prevent earth, water, or other substances from entering the pipe when construction is not in progress.

C. Trench Backfilling

1. No trenches or excavations shall be backfilled until the trench and installation has been inspected and written approval given by the OWNER's Representative. Under no circumstances shall water be permitted to rise in unbackfilled trenches after pipe has been placed. Trenches shall be backfilled with approved material, free of large clods, stones or rocks and carefully deposited in layers not to exceed 6" until enough fill has been placed to provide a cover of not less than 1' above the pipe. Each layer shall be placed, then carefully and uniformly tamped, so as to eliminate the possibility of pipe displacement. The remainder of backfill materials shall then be placed, moistened, and compacted 6" layers to 98% maximum A.A.S.H.T.O. T-180 density.

2. Whenever the trenches have been improperly filled or if settlement occurs, they shall be refilled, compacted, smoothed off and made to conform to grade. Unless otherwise directed or shown on the plans, backfill in trenches in or through roadways shall be made as specified above, except that the entire fill above 1' over the pipe shall be deposited in layers not to exceed 8" in thickness, moistened, and compacted to density equal to or greater than that of adjacent material so that pavement can be placed immediately.

D. Concrete Encasement of Drainage Pipe

1. Trenches in which encasement for pipe are to be placed, may be excavated completely with mechanical equipment. Prior to formation of the encasement, temporary supports consisting of timber wedges or masonry shall be used to support the pipe in place. Temporary supports shall have minimum dimensions and shall support the pipe at no more than two places, one at the bottom of the barrel of the pipe adjacent to the shoulder of the socket and the other near the spigot end.

E. Drainage Structures

1. All structures shall be built to the line and grade shown on drawings. All reinforced concrete work shall be in strict conformance with the concrete specifications contained herein. After erection of the forms and placing of the steel, the CONTRACTOR must have inspection and approval from the ENGINEER before placing any concrete. After removal of the forms, the CONTRACTOR shall backfill around each structure with approved granular fill. The fill shall be placed in layers not exceeding 8" in depth measured loose and compacted to 98% of the maximum density as determined by the modified proctor, A.A.S.H.T.O. T-180. No defects of any kind in the pipe section will be accepted. All pipe stubs shall be made of the same type of pipe. Pipe stubs shall be sealed with a concrete plug, watertight. The ends of the pipes which enter masonry shall be neatly cut to fit the inner face of the masonry. Cutting shall be done before the pipes are built in.

F. Infiltration and Exfiltration Tests

1. Tests for watertightness shall be made by the CONTRACTOR. Leakage of completed storm sewer system shall not exceed 500 U.S. gallons per day per inch diameter per mile of pipe under minimum hydrostatic pressure of two (2) feet. Test shall be conducted in a manner satisfactory to the ENGINEER. Any portion of the project not conforming to the above requirements shall be corrected by the CONTRACTOR, at the CONTRACTOR’s own expense, prior to acceptance by the ENGINEER.

A. Restoration of Surfaces and/or Structures

1. The CONTRACTOR shall restore and/or replace paving, curbing, sidewalks, fences and survey points, or any other disturbed surfaces or structures to a condition equal to that before the work was begun and to the satisfaction of the ENGINEER. Relative to restoration of surfaces and/or structures, the CONTRACTOR shall comply with all requirements of governing agencies including city, town, county, and state.

END OF SECTION 334101

SECTION 334102 – EXFILTRATION TRENCH DRAINS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. French drains/exfiltration trenches.

B. Related Work

1. Section 334101 – Storm Drainage Facilities

C. Work Includes

1. All labor, materials, necessary equipment, and services to complete the Storm Drainage Facilities work, as indicated on the drawings, as specified herein or both. In addition to the specifications included in this section, exfiltration trench drains shall also conform to FDOT Specification 443.

D. Existing Utilities

1. Locate and stake all existing underground utilities that may be in the area of the Drainage System.

E. Submittals

1. Submit Plan Drawings showing the locations of all piping and underground utilities that may be in conflict with the Drainage System and adding those utilities newly discovered by the subterranean investigation.

2. Submit samples of the 1-1/2" washed rock for exfiltration trenches for approval.

3. Submit samples and product data of filter fabric.

4. Submit shop drawings for the perforated drainage pipe.

PART 2 - PRODUCTS

2.1 DRAINAGE PIPE AND EXFILTRATION ROCK

A. Drainage pipe shall be in conformance with material as specified in Section 334101 (Storm Drainage Facilities) and have the maximum number of perforations allowable per the manufacturer’s recommendations.

B. Exfiltration rock shall be from fresh water and washed free of deleterious matter and shall meet the requirements of FDOT No. 4 coarse aggregate.

C. Trench liner shall be meet the requirements stated in 2.1 below.

2.2 TRENCH LINER

A. Filter fabric shall be a non-woven fabric consisting of polypropylene fibers treated to resist biological degradation.

B. Approved Manufacturers or Equal

1. Mirafi 140 NC

2. Trevira 1115

3. Amoco Propox 4545

PART 3 - EXECUTION

3.1 INSTALLATION

A. Lay out exfiltration trenches as shown on the Plans.

B. The bottom of the trench shall provide a minimum of twelve (12) inches of ballast rock below the drainpipe.

C. Drainpipes shall terminate a minimum of two (2) feet beyond the end of the trench or connect to a catch basin as required.

D. Cover temporary pipe ends with No.10 galvanized or aluminum screen with openings no larger than 1/2" x 1/2".

E. Sides and top of trench to be lined with trench lining material with a minimum of two (2) feet of overlap at the top of the trench.

F. A minimum of five (5) feet of solid drain pipe shall be installed between drainage structures and the beginning of the trench.

END OF SECTION 334102

SECTION 02586 (33 71 49.23)

EXTERIOR ELECTRICAL WORK UNDERGROUND

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide all labor, materials, necessary equipment and services to complete the Conduits, Fittings and Supports work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as "NIC ITEMS".

1.2 RELATED SECTIONS

A. Section 02300-Earthwork.

B. Section 16137-Pull and Junction Boxes.

1.3 DESCRIPTION

A. Provide site electrical work to include excavating and backfilling as necessary for a complete exterior electrical system in accordance with drawings and specifications.

1.4 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01330, “Submittal Procedures”.

1.5 QUALITY ASSURANCE

A. Conform under provisions of Section 01430, “Quality Assurance”.

B. Perform the work under provisions of the NEC.

C. Perform earthwork under provisions of Section 02315 - Excavation and Fill.

1.6 COORDINATION

A. Prior to beginning trenching operations, establish exact locations and clearances for all underground work. Adjust position of underground utilities or adjust runs as necessary for proper coordination of other trades. Phase work to minimize interference with other work performed under this Contract.

PART 2 EXECUTION

2.1 GENERAL

A. Do not excavate for electrical work until the work is ready to proceed without delay, so that the total time lapse from excavation to completion of backfilling will be minimum.

B. Restore the surface disturbed during the installation of duct or cable to its original elevation and condition.

2.2 UNDERGROUND UTILITIES

A. Provide trenching and backfilling for all utility company feeders. Coordinate trenching requirements with utility company.

B. Locate markers denoting utility company feeders at the beginning and ends of all runs, at approximately every 200 feet along the run, and at each change in direction.

2.3 INSTALLATION

A. Underground Conduit Banks.

1. Coordinate all work with other Divisions.
2. All conduits: Slope continuously away from building, minimum 3 inches at 100 feet, unless otherwise specified.
3. Provide temporary plugs to prevent entrance of grout into the ducts and duct spaces during the pouring of concrete.
4. Make duct turn-ups and 90 degree elbows through top of concrete envelope, foundation met or finish grade with rigid galvanized steel conduit and fittings.
5. Reinforce all duct bank concrete envelopes passing under roads and paved areas with steel rods to prevent shearing or cracking.
6. All conduits: enclosed in Class C, 2500/pounds/inch concrete envelopes not less than 3 inches thick beyond exterior surfaces of any conduit with a minimum spacing or 3 inches between conduits.
7. Use pre-formed, non-metallic separators to secure the required minimum uniform spacing between surfaces of all conduits. Space separators to prevent sagging and breaking of watertight seals of conduits and couplings. Provide reinforcing rods with 3 feet exposed at the ends of locations where concrete envelopes and conduits are terminated outside the building line for extension.
8. Trenches in which concrete envelopes are poured shall be provided with an adequate concrete base to assure alignment and support of conduits during installation. Permit the base to set before conduits are installed. Sidewall forms for concrete envelopes are not required if cut is clean, even and free of loose materials. Completely remove all loose dirt and extraneous materials accumulating in trenches before and during concrete placement to insure a "clean" concrete envelope. Avoid "Patch" pouring of concrete envelopes; however, where it is not feasible to pour the entire run between terminations in one operation provide 3/4 inch reinforcing rod dowels (number and locations as specified for reinforced concrete envelopes) extending 18 inches on both sides of the concrete joints.
9. Where conduits are buried in concrete: cross the building expansion joints with expansion fittings at right angles.
10. The relative locations of incoming services are indicated on the drawings; however, the exact relative location of conduits may be changed as required to avoid obstructions, etc.
11. Install conduits with even grading, without horizontal or vertical waves and mandrelled to insure a smooth interior surface free from burrs or obstructions that would damage cables. Where straight runs of conduits are not possible, slight bends with radii greater than 50 feet may be made by using slight angle at the couplings, provided water-tight seals are not broken. For radii less than 50 feet, utilize 5 degree angle coupling or 5 degree bend sections or factory formed bends with the required curvatures.

12. The work as specified and indicated on the drawings constitutes the best available information for use in planning the design and installation. However, do not construe this data to be necessarily complete or accurate and any existing or new underground or surface obstructions, interferences or impediments encountered in the installation of the conduits shall be avoided in the most practicable manner or the restriction removed or relocated as required without additional costs to the Owner. The Contractor: coordinate the installation with other new outside service installation of the various trades in order to maintain the grading herein specified and as indicated on the drawings. Identify the duct banks by installing a warning ribbon approximately 12 inches above all underground duct banks. The identifying ribbon shall be a PVC tape with metallic detection strip 6 inches wide, yellow in color, permanently imprinted with a legend identifying the service.
13. Sealing of Duct Openings:
    (a) After cables have been installed, seal all unused duct openings by caulking with approximately 1-1/2 inch thick oakum wick forced into the opening to a depth of 6 inches.
    (b) Non-hardening adhesive compound: Johns-Manville "Duxseal" or Barnard Duct Seal.
    (c) Swab out all ducts prior to pulling of cable. Ducts: capable of passing the appropriately sized mandrel.
    (d) Cables in raceways: sealed with O.Z. Type C terminators. All joints: watertight.
14. Paint all conduits in or below slabs with two coats of undiluted bituminous paint before installation and any scratches re-coated before covering.
15. All exterior/inter-building conduits and pull boxes for use with voice and data cabling, in additional to meeting size requirements and any other technical specifications noted in Division 17000, must be designed according to BICSI standards to accommodate the placement of fiber optic and voice grade cabling.

END OF SECTION

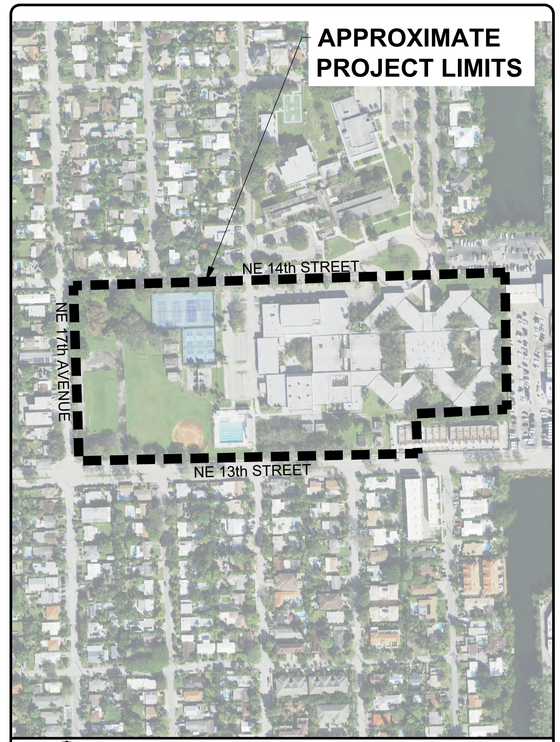
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55	**SHEET TOTAL**

CITY OF FORT LAUDERDALE

P12777
SUNRISE MIDDLE SCHOOL
PARK IMPROVEMENTS
1750 NE 14th STREET
FORT LAUDERDALE, FLORIDA

PHASE 2 BID DOCUMENTS



LOCATION SKETCH

P12777
SUNRISE MIDDLE SCHOOL
PARK IMPROVEMENTS
1750 NE 14th STREET
FORT LAUDERDALE, FLORIDA

CITY OF FORT LAUDERDALE
PARKS AND RECREATION DEPARTMENT
701 SOUTH ANDREWS AVENUE, FORT LAUDERDALE, FLORIDA

FORT LAUDERDALE CITY COMMISSION

DEAN J. TRANTALIS	MAYOR
JOHN C. HERBST	COMMISSIONER-DISTRICT I / VICE MAYOR
STEVEN GLASSMAN	COMMISSIONER-DISTRICT II
PAMELA BEASLEY-PITTMAN	COMMISSIONER-DISTRICT III
BEN SORENSEN	COMMISSIONER-DISTRICT IV

AECOM
AECOM TECHNICAL SERVICES, INC.
7650 W Courtney Campbell Causeway
Tampa, Florida 33607-1462
813.286.1711 tel 813.287.8591 fax
www.aecom.com

CIVIL
BCC ENGINEERING
305.670.2350 tel
www.bcceng.com

LANDSCAPE
CURTIS + ROGERS
305.442.1774 tel
www.curtisrogers.com

DATE: 09/16/2025

BID DOCUMENTS SUBMITTAL

PLOT

ANSI D 24" x 36"
Approved:____
Checked:____
Designer:____
Project Management Initials:
Last saved by: MOHANC 2025-09-11 Last Plotted: 2025-09-16
Filename: C:\USERS\MOHANC\DC\ACCDOCS\AECOM\BP-AMER (USA) 60641343-FTL PBP DESIGN SERVICES\PROJECT FILES\900 DESIGN COLLABORATION\915_TO 2901 - SUNRISE MIDDLE SCHOOL\L01-GP12777-G002-SGND-SHEET.DWG

PAUL KURTZ LICENSE No. 1716 STATE OF FLORIDA LANDSCAPE ARCHITECT

AECOM Technical Services, Inc
7650 West Courtney Campbell Causeway
Tampa, FL 33607–1462
PAUL KURTZ, RLA No. 1716

1. THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY PAUL KURTZ, L.A. USING A DIGITAL SIGNATURE AND DATE.
2. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED. THE SIGNATURE MUST BE VERIFIED ON THE ELECTRONIC DOCUMENTS.
3. THE ABOVE NAMED LANDSCAPE ARCHITECT SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G10-11.011, F.A.C.

SHEET NO.	SHEET TITLE
G002	SIGNATURE SHEET
G101	KEY PLAN
DL101 - DL104	LANDSCAPE DEMOLITION AND TREE PROTECTION PLANS
DL201	TREE PROTECTION NOTES AND DETAILS
L001	LANDSCAPE GENERAL NOTES
L101 - L104	LANDSCAPE SITE PLANS
L201 - L202	LANDSCAPE SITE DETAILS

ROBERTO LAMAZARES LICENSE No. 86416 STATE OF FLORIDA PROFESSIONAL ENGINEER

BCC Engineering LLC
6401 SW 87th Avenue, Suite 200
Miami, FL 33173
ROBERTO LAMAZARES, P.E. No. 86416

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SHEET NO.	SHEET TITLE
C001	CIVIL GENERAL NOTES
C002	PROJECT LAYOUT
C101 - C104	GRADING AND DRAINAGE PLANS
C105	GRADING AND DRAINAGE DETAILS
C201 - C204	EROSION CONTROL PLANS
C205	EROSION CONTROL NOTES AND DETAILS

AIDA M. CURTIS LICENSE LA1330 STATE OF FLORIDA LANDSCAPE ARCHITECT

Digitally signed by Aida M Curtis
Date: 2025.09.17 11:02:18 -04'00'

CURTIS + ROGERS DESIGN STUDIO
7520 S. Red Road, Suite M
South Miami, FL 33143
AIDA M. CURTIS, RLA No. 1330

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SHEET NO.	SHEET TITLE
L301 - L304	PLANTING PLANS
L401	PLANTING NOTES AND SCHEDULE
L402	PLANTING DETAILS
L501 - L504	IRRIGATION PLANS
L601	IRRIGATION NOTES AND DETAILS

SHAHZAD S. AHMED LICENSE No 68863 STATE OF FLORIDA PROFESSIONAL ENGINEER

AECOM Technical Services, Inc
7650 West Courtney Campbell Causeway
Tampa, FL 33607–1462
SHAHZAD S. AHMED, P.E. No. 68863

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SHEET NO.	SHEET TITLE
E001	ELECTRICAL LEGEND, NOTES AND ABBREVIATIONS
E002	ELECTRICAL ABBREVIATIONS AND NOTES
E100	OVERALL ELECTRICAL SITE PLAN
ED102	PARTIAL ELECTRICAL SITE PLAN - DEMOLITION
ES101 - ES102	PARTIAL ELECTRICAL SITE PLAN
E301	PAVILION LIGHTING AND POWER PLAN
E601	ELECTRICAL RISER DIAGRAM
E701	PANEL SCHEDULES
E901	PAVILION PHOTOMETRICS PLAN

COORDINATE WITH AECOM ON LATEST ISSUE OF DRAWINGS BEFORE COMMENCEMENT OF CONSTRUCTION.
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SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT

PARKS & RECREATION
City of Fort Lauderdale

PRIME CONSULTANT

AECOM

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	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT

PROJECT NUMBER

P12777

SHEET TITLE

SIGNATURE SHEET

SHEET NUMBER

G002



LIMIT OF WORK

PROPOSED ELEMENTS

- (A) TRACK (N.I.C.)
- (B) MULTIPURPOSE FIELD
- (C) PAVILION
- (D) POOL LIGHTING (N.I.C.)
- (E) PICKLEBALL COURT LIGHTING (N.I.C.)

PROJECT IMPROVEMENTS

1. RUNNING TRACK RESURFACING AND LONG JUMP RESTORATION. (N.I.C.)
2. DEMOLITION OF RACQUETBALL COURTS. (N.I.C.)
3. INSTALLATION OF PAVILION WITH LIGHTING.
4. INSTALLATION OF NEW SIDEWALKS AROUND PAVILION AREA. (N.I.C.)
5. INSTALLATION OF NEW SIDEWALKS WITHIN PAVILION AREA.
6. INSTALLATION OF LANDSCAPING AND IRRIGATION AT PAVILION AREA. (N.I.C.)
7. INSTALLATION OF ARTIFICIAL TURF MULTIPURPOSE FIELD.
8. INSTALLATION OF LIGHT POLES AND FIXTURES AT PICKLEBALL COURTS. (N.I.C.)
9. INSTALLATION OF LIGHT POLES AND FIXTURES AT SWIMMING POOL. (N.I.C.)
10. INSTALLATION OF SOD AT EXISTING BASEBALL FIELD. (N.I.C.)
11. INSTALLATION OF CHILLED WATER FOUNTAIN AT PAVILION AREA. (N.I.C.)

NOTES:

1. PROPOSED ELEMENTS INCLUDE NOT IN CONTRACT (N.I.C.) WORK BY OTHERS.
2. (NIC) WORK BY OTHERS IS SHOWN IN THE PLANS AND DETAILS FOR ILLUSTRATIVE AND COORDINATION PURPOSES. COORDINATION WITH OTHER CONTRACTORS DOING WORK ON SITE WILL BE REQUIRED.
3. COORDINATION WILL BE REQUIRED WITH OTHER CONTRACTORS, AS THERE WILL BE MUTLIPLE IMPROVEMENT PROJECTS BEING CONSTRUCTED SIMULTANEOUSLY. RESTORATION/ REPLACEMENT OF FACILITIES DAMAGED DURING CONSTRUCTION WILL BE REQUIRED.

N

0 20' 40' 80' 120'
SCALE: 1" = 40'-0"

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City of Fort Lauderdale

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SUITE 700
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PAUL KURTZ LICENSE No. 1716 STATE OF FLORIDA LANDSCAPE ARCHITECT

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	05/03/2024	DESIGN DEVELOPMENT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

P12777

SHEET TITLE

KEY PLAN

SHEET NUMBER

G101

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Designer:_____
Project Management Initials:
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Filename: C:\USERS\MOHANC\DOCUMENTS\ACCDOCS\AECOM\BP-AMER (USA) 60641343-FTL PBP DESIGN SERVICES\PROJECT FILES\900 DESIGN COLLABORATION\915_TO 29\01 - SUNRISE MIDDLE SCHOOL\01-GIP\12777-G101-OVRL.DWG

TOPOGRAPHIC SURVEY

SUNRISE MIDDLE SCHOOL PARK

CITY OF FORT LAUDERDALE PARKS BOND PROGRAM

CITY OF FORT LAUDERDALE, BROWARD COUNTY, FLORIDA 33315

LEGEND AND ABBREVIATIONS:

AT&T	AMERICAN TELEPHONE AND TELEGRAPH COMPANY
AVE.	AVENUE
BM	BENCH MARK
C	CALCULATED
CB	CATCH BASIN
CBWALL	CONCRETE BLOCK WALL
CLF	CHAIN LINK FENCE
CONC	CONCRETE
∅	DIAMETER
EASMNT	EASEMENT
ELECT	ELECTRIC
EOP	EDGE OF PAVEMENT
F.D.O.T.	FLORIDA DEPARTMENT OF TRANSPORTATION
FFE	FINISH FLOOR ELEVATION
FND.	FOUND
GRD	GROUND
ID	IDENTIFICATION
IFENCE	IRON FENCE
INV.	INVERT
IP	IRON PIPE
L/L	LOT LINE
LB	LAND BUSINES
LT	LEFT
MFENCE	METAL FENCE
M	MEASURED
MDCPR	MIAMI-DADE COUNTY PUBLIC RECORDS
NAD	NORTH AMERICAN DATUM
ND	NAIL & DISC
NGVD	NATIONAL GEODETIC VERTICAL DATUM
O.R.B.	OFFICIAL RECORD BOOK
O/S	OFF SET
PB	PLAT BOOK
P/L	PROPERTY LINE
PC	POINT OF COMMENCE
PDS TBM	PDS TEMPORARY BENCH MARK
PDS	PREMIERE DESIGN SOLUTIONS
PG	PAGE
PI	POINT OF INTERSECTION
PKN	PARKER-KALON COMPANY NAIL
PKND	PARKER-KALON COMPANY NAIL & DISC
PT	POINT OF TERMINANCE
R	RECORD
R/W	RIGHT OF WAY
RB	REBAR
RGE.	RANGE
RT	RIGHT
SEC.	SECTION
SSMH	SANITARY SEWERT MANHOLE
STA.	STATION
STMH	STORM MANHOLE
TBM	TEMPORARY BENCH MARK
TWP.	TOWNSHIP
UTIL.	UTILITY
U.S.	UNITED STATES

-BOXES:

ATT	AT&T BOX
TV	CABLE TELEVISION PANEL
CTV PANEL	CABLE TELEVISION PANEL
COM	COMMUNICATION UTILITY BOX
EPANEL	ELECTRIC PANEL
	ELECTRIC UTILITY BOX
FO	FIBER OPTIC UTILITY BOX
TB	TRAFFIC SIGNAL BOX
U	UNIDENTIFIED UTILITY BOX
WS	WATER SERVICE

-MANHOLES & DRAIN STRUCTURES:

ATT	AT&T MANHOLE
	CATCH BASIN
	DRAIN INLET
G	GREASE MANHOLE
S	SANITARY SEWER MANHOLE
ST	STORM SEWER MANHOLE

-VALVES:

NN	BACK FLOW PREVENTER
	BACK FLOW PREVENTER BIG
	CLEAN OUT
	FIRE HYDRANT
	IRRIGATION CONTROL VALVE
	PIPE
	WATER VALVE

-POLES:

	CONCRETE LIGHT POLE
C	CONCRETE POLE
CP	CONCRETE POWER POLE
	FLAG POLE
GP	GUARD POLE
	METAL LIGHT POLE
M	METAL POLE
WP	WOOD POWER POLE
W	WOOD POLE

-OTHER UTILITIES:

	AIR CONDITIONER UNIT
	BENCH
	BORING POINT
x 10.00	POINT ELEVATION
	GUY ANCHOR
	SPOT LIGHT
	TABLE
	TEMPORARY BENCH MARK (TBM)
	TRAFFIC SIGN
TRANSFORMER	TRANSFORMER
	TRASH CAN
	TREE
	PALM TREE
	UMBRELLA

-TYPES OF LINE:

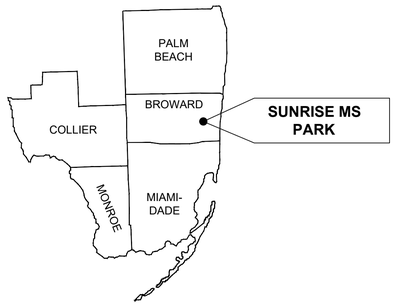
	CENTER LINE
	CHAIN LINK FENCE
	WOOD FENCE
	EOP (EDGE OF PAVEMENT LINE)
	IRON FENCE
	R/W (RIGHT OF WAY LINE)
	SECTIONAL LINE
	LOT LINE
	BUSH LINE

SURVEYOR'S NOTES:

SYMBOLS SHOWN IN SURVEY DRAWINGS ARE NOT TO SCALE AND SHALL NOT BE USED TO SIZE SUCH ELEMENTS.



LOCATION MAP
SCALE 1": 200'



VICINITY MAP
N.T.S.

LEGAL DESCRIPTION:

SCHOOL SITE 0250 145-48 B TRACT A TOGETHER WITH S1/2 OF PT OF VAC'D NE 14 ST LYING E OF NE 17 WAY & LYING N OF SAID TRACT A TOG WITH 35-49-42 BEG 172.26 N & 980 E OFNW COR BLK 2, PUBLIC RECORDS OF BROWARD COUNTY, STATE OF FLORIDA.

SURVEYOR'S NOTES:

1. NO UNDERGROUND PORTIONS OF FOOTINGS, FOUNDATIONS, UTILITIES OR OTHER IMPROVEMENTS WERE LOCATED.
2. ALL MEASUREMENTS AS SHOWN ARE IN ACCORDANCE WITH UNITED STATES STANDARD USING THE U.S. SURVEY FEET.
3. NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER. ADDITION OR DELETIONS OR ANY CHANGE ON THE INFORMATION CONTAINED IN THIS SURVEY IS NOT VALID WITHOUT THE CONSENT OF THE SIGNING PARTY.
4. TYPE OF SURVEY: TOPOGRAPHIC. NO TITLE SEARCH WAS MADE. EXAMINATION OF TITLE MUST BE MADE TO DETERMINE RECORDED INSTRUMENTS, IF ANY, AFFECTING THE PROPERTY BESIDES THOSE NOTED.
5. ALL DISTANCES AS SHOWN ARE BASED ON THE US SURVEY FOOT.
6. SHOWN ELEVATIONS ARE REFERRED TO NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988, AND MEETS THE STANDARDS OF PRACTICES AS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS AS CONTAINED IN CHAPTER 5J-17.0.51 THRU 5J-17.0.53. THE VERTICAL ACCURACY OBTAINED ON THIS TOPOGRAPHIC SURVEY EXCEED THE CALCULATED VALUE OF A CLOSURE IN FEET OF PLUS OR MINUS 0.05 TIMES THE SQUARE ROOT OF THE DISTANCE IN MILES A COMMONLY VALUE ACCEPTED IN THE CONSTRUCTION AND SURVEYING INDUSTRY.
   BENCH MARK BCED BM 1876, BROWARD COUNTY
   -ELEVATION: 5.90' (NGVD-29). CONVERSION FACTOR -1.58
7. THIS BOUNDARY- TOPOGRAPHIC SURVEY IS COVERED UNDER PROFESSIONAL LIABILITY INSURANCE.
8. DATE OF FIELD WORK: 03/18/2024.

SURVEYOR'S CERTIFICATE:

I HEREBY CERTIFY: THAT THE SKETCH OF THIS TOPOGRAPHIC SURVEY WAS PREPARED UNDER MY SUPERVISION AND THAT MEETS THE STANDARDS OF PRACTICE SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 5J-17 OF THE FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 475 OF THE FLORIDA STATUTES AND THAT THE SKETCH THEREON IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. SUBJECT TO NOTES AND NOTATIONS SHOWN HEREON.

AECOM

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SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT
PARKS & RECREATION
City of Fort Lauderdale

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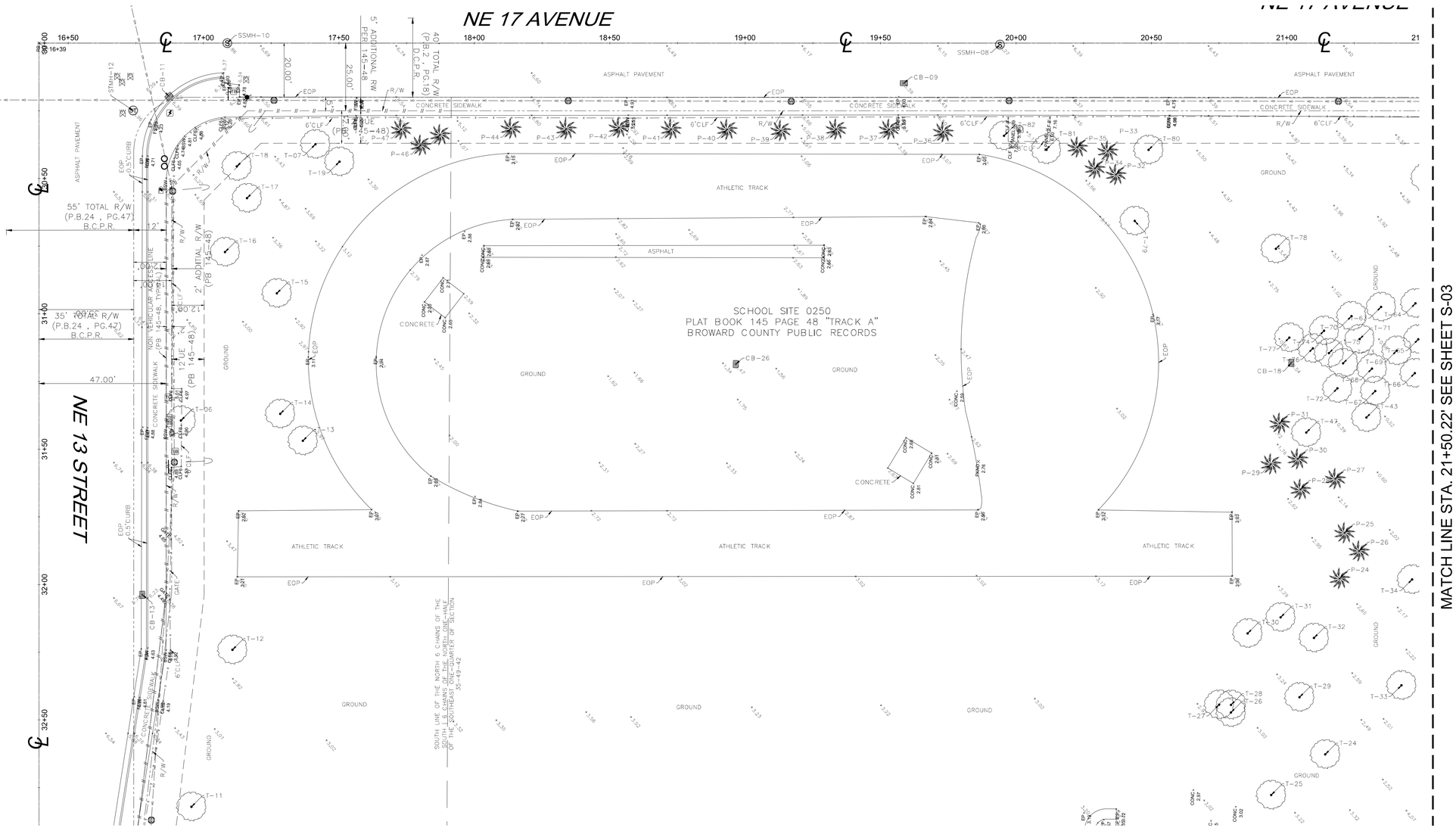
PROJECT NUMBER
P12777

SHEET TITLE
SURVEY GENERAL INFORMATION

SHEET NUMBER
V001

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Checked:
Designer:
Project Management Initials:
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DRAINAGE STRUCTURE						
STRUCTURE	RIM ELEVATION	INVERT		DIAMETER	MATERIAL	BOTTOM
SSMH-08	7.85'	N	3.70'	10"	CERAMIC	N/A
		S	3.75'	10"	CERAMIC	N/A
CB-09	6.97'	W	1.47'	15"	CONCRETE	1.47'
SSMH-10	8.44'	N	4.37'	10"	CERAMIC	N/A
CB-11	7.27'	S	3.47'	12"	CONCRETE	11.87'
STMH-12	7.54'	N	3.54'	12"	CONCRETE	3.54'
		W	3.54'	12"	CONCRETE	
CB-13	7.36'	E	4.36'	12"	CONCRETE	3.86'
CB-26	3.05'	N	0.05'	15"	CONCRETE	-2.35'

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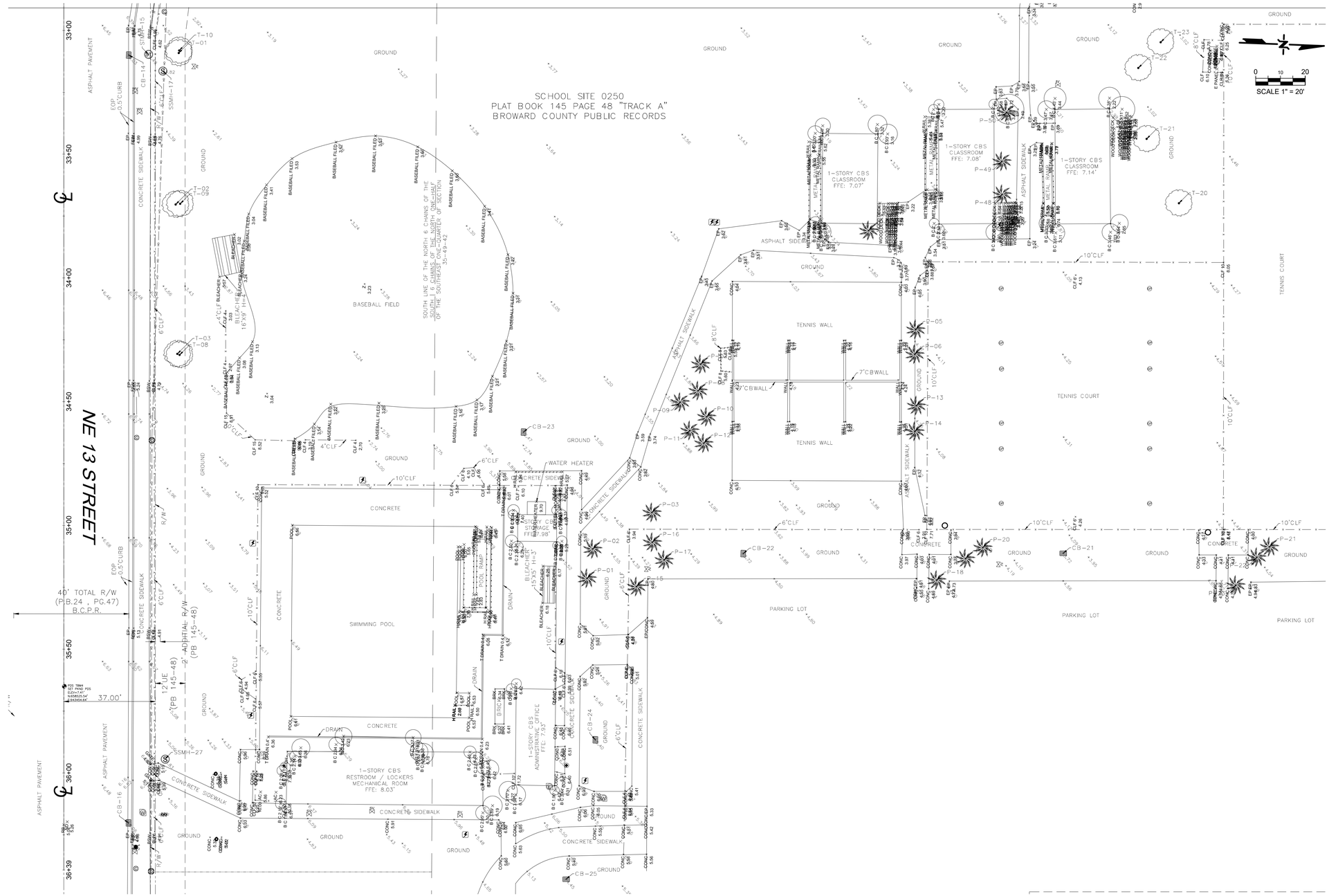
SHEET TITLE

SURVEY SITE PLAN

SHEET NUMBER

V101

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Project Management Initials: Designer: Checked: Approved:
ANSI D 24" x 36"



NOT CONTINUE

DRAINAGE STRUCTURE						
STRUCTURE	RIM ELEVATION	INVERT		DIAMETER	MATERIAL	BOTTOM
CB–14	7.61'	S	4.31'	12"	CONCRETE	3.11'
		N	4.31'	12"	CONCRETE	
STMH–15	8.07'	W	4.07'	12"	CONCRETE	2.92'
		S	4.07'	12"	CONCRETE	
CB–16	7.64'	S	3.14'	12"	CONCRETE	3.14'
SSMH–17	6.40'	N	2.70'	4"	PVC	N/A
		S	–4.00'	10"	PVC	
		E	–3.60'	10"	PVC	
CB–18	2.12'	S	–0.58'	15"	CONCRETE	–3.88'
CB–21	5.30'	S	0.80'	18"	CONCRETE	–1.00'
		N	0.80'	18"	CONCRETE	
CB–22	5.30'	N	1.00'	18"	CONCRETE	–1.20'
		S	1.30'	15"	CONCRETE	
CB–23	4.05'	E	1.55'	6"	PVC	0.55'
		N	1.05'	15"	CONCRETE	
CB–24	6.98'	S	1.98'	6"	PVC	1.98'
		E	1.98'	15"	CONCRETE	
CB–25	6.03'	S	2.03'	15"	CONCRETE	0.73'
		SW	–4.00'	10"	PVC	
		W	–4.00'	15"	CONCRETE	
SSMH–27	7.41'	W	2.71'	10"	PVC	N/A

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I/R	DATE	DESCRIPTION

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P12777

SHEET TITLE

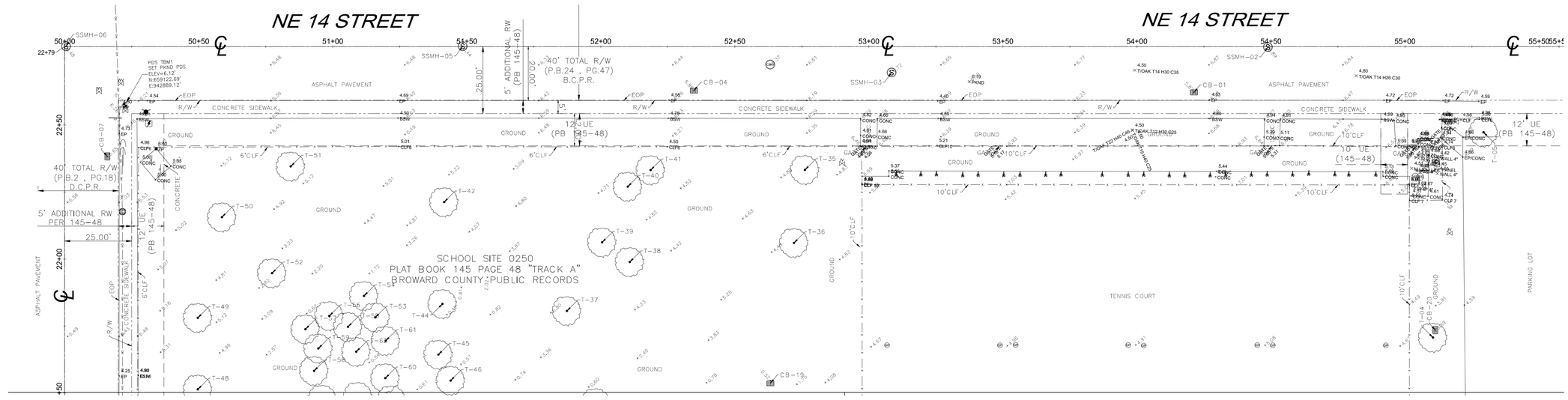
SURVEY SITE PLAN

SHEET NUMBER

V102

CAM #26-0329
Exhibit 1
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Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"



MATCH LINE STA. 21+50.22' SEE SHEET S-01

DRAINAGE STRUCTURE						
STRUCTURE	RIM ELEVATION	INVERT		DIAMETER	MATERIAL	BOTTOM
SSMH-08	7.85'	N	3.70'	10"	CERAMIC	N/A
		S	3.75'	10"	CERAMIC	N/A
CB-09	6.97'	W	1.47'	15"	CONCRETE	1.47'
SSMH-10	8.44'	N	4.37'	10"	CERAMIC	N/A
CB-11	7.27'	S	3.47'	12"	CONCRETE	11.87'
STMH-12	7.54'	N	3.54'	12"	CONCRETE	3.54'
		W	3.54'	12"	CONCRETE	
CB-13	7.36'	E	4.36'	12"	CONCRETE	3.86'
CB-26	3.05'	N	0.05'	15"	CONCRETE	-2.35'

NOT CONTINUE

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PROJECT

SUNRISE MIDDLE SCHOOL
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PROJECT NUMBER

P12777

SHEET TITLE

SURVEY SITE PLAN

SHEET NUMBER

V103

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Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"

TREE TABLE

PALM ID	COMMON NAME	TRUNK (INCHES)	CANOPY (FEET)	HEIGHT (FEET)
1	Tree	24	30	26
2	Tree	23	35	28
3	Tree	22	35	28
4	Tree	8	5	8
5	Tree	22	40	36
6	Tree	22	40	36
7	Tree	16	30	30
8	Tree	22	35	28
9	Tree	23	35	28
10	Tree	24	30	26
11	Tree	20	35	26
12	Tree	24	50	34
13	Tree	22	45	28
14	Tree	19	35	32
15	Tree	20	32	35
16	Tree	25	45	52
17	Tree	23	45	50
18	Tree	14	30	32
19	Tree	14	35	32
20	Tree	18	30	32
21	Tree	16	25	32
22	Tree	21	36	38
23	Tree	22	35	36
24	Tree	19	40	46
25	Tree	15	45	48
26	Tree	19	30	48
27	Tree	19	30	48
28	Tree	19	30	48
29	Tree	25	40	46
30	Tree	22	50	46
31	Tree	22	40	45
32	Tree	15	18	22
33	Tree	23	60	52
34	Tree	7	17	24
35	Tree	25	50	46
36	Tree	17	35	26
37	Tree	31	60	55
38	Tree	18	30	45
39	Tree	12	35	36
40	Tree	16	25	30
41	Tree	19	30	28
42	Tree	24	45	50
43	Pine Tree	15	12	40
44	Pine Tree	15	12	40
45	Pine Tree	15	12	40
46	Pine Tree	15	12	40
47	Tree	5	8	12
48	Tree	45	55	50
49	Tree	40	45	50
50	Tree	39	48	50
51	Tree	20	35	50
52	Pine Tree	15	12	40
53	Pine Tree	15	12	40
54	Pine Tree	15	12	40
55	Pine Tree	15	12	40
56	Pine Tree	15	12	40
57	Pine Tree	15	12	40
58	Pine Tree	15	12	40
59	Pine Tree	15	12	40
60	Pine Tree	15	12	40
61	Pine Tree	15	12	40
62	Pine Tree	15	12	40
63	Pine Tree	15	12	40
64	Pine Tree	15	12	40
65	Pine Tree	15	12	40
66	Pine Tree	15	12	40
67	Pine Tree	15	12	40
68	Pine Tree	15	12	40
69	Pine Tree	15	12	40
70	Pine Tree	15	12	40
71	Pine Tree	15	12	40
72	Pine Tree	15	12	40
73	Pine Tree	15	12	40
74	Pine Tree	15	12	40
75	Pine Tree	15	12	40
76	Pine Tree	15	12	40
77	Pine Tree	15	12	40
78	Tree	6	12	16
79	Tree	24	48	50
80	Tree	21	38	52
81	Tree	14	20	24
82	Tree	14	20	32

NOTE:

ALL DIMENSIONS AS SHOWN ARE SURVEY FOOT

PALM TABLE

PALM ID	COMMON NAME	TRUNK (INCHES)	CANOPY (FEET)	HEIGHT (FEET)
1	Sabalm palm	12	10	30
2	Sabalm palm	12	10	18.5
3	Sabalm palm	12	10	22
4	Royal palm	9	12	20
5	Sabalm palm	22	10	12
6	Sabalm palm	25	10	12
7	Sabalm palm	12	10	16
8	Sabalm palm	12	10	20
9	Sabalm palm	12	10	25
10	Sabalm palm	12	10	27
11	Sabalm palm	12	10	20
12	Sabalm palm	12	10	22
13	Sabalm palm	22	10	12
14	Sabalm palm	22	10	12
15	Sabalm palm	12	10	18.5
16	Sabalm palm	12	10	22
17	Sabalm palm	12	8	32
18	Sabalm palm	12	10	20
19	Sabalm palm	14	10	20
20	Sabalm palm	12	10	18
21	Sabalm palm	12	10	22
22	Sabalm palm	12	10	22
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25	Sabalm palm	12	8	22
26	Sabalm palm	12	8	22
27	Sabalm palm	12	8	16
28	Sabalm palm	12	8	8
29	Sabalm palm	12	8	22
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36	Sabalm palm	10	11	24
37	Sabalm palm	8	11	22
38	Sabalm palm	10	10	24
39	Sabalm palm	8	12	21
40	Sabalm palm	10	9	22
41	Sabalm palm	8	12	25
42	Sabalm palm	12	8	20
43	Sabalm palm	10	9	25
44	Sabalm palm	12	10	23
45	Sabalm palm	12	5	22
46	Sabalm palm	12	8	30
47	Sabalm palm	12	8	20
48	African palm	10	6	5
49	Royal palm	10	12	20
50	African palm	10	12	5

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SHEET TITLE

SURVEY TREE/PALM TABLE

SHEET NUMBER

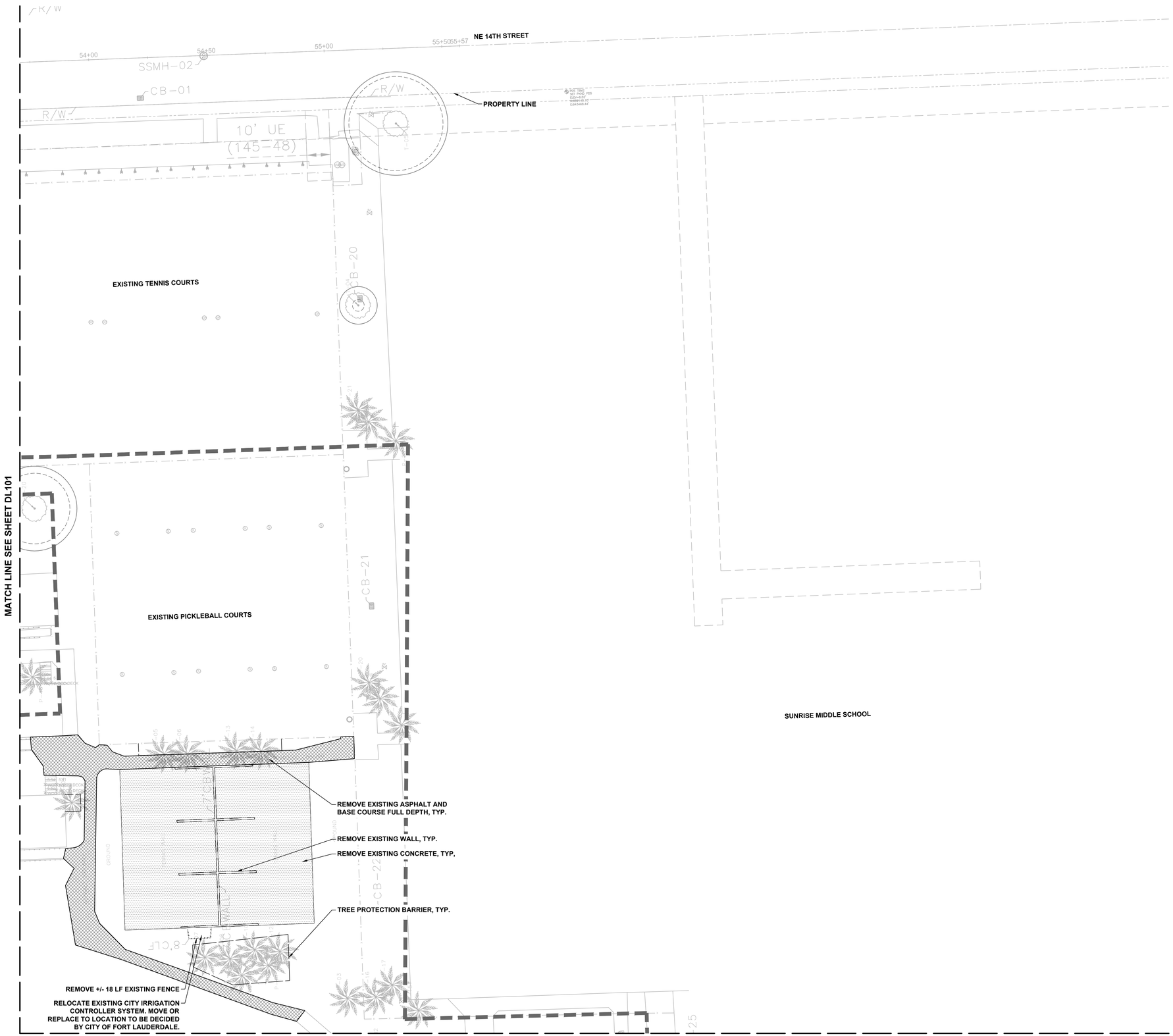
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LIMIT OF WORK

TREE PROTECTION LEGEND

- EXISTING TREE TO REMAIN
- CANOPY AREA
- CRITICAL ROOT ZONE
- EXISTING PALM TO REMAIN
- TREE PROTECTION BARRIER

DEMOLITION LEGEND

- REMOVE ASPHALT AND BASE COURSE FULL DEPTH
- REMOVE EXISTING CONCRETE PAVEMENT
- REMOVE EXISTING SAND/CLAY MIX
- REMOVE EXISTING FENCE

NOTES:

1. SEE NOTES AND DETAIL 1 ON SHEET DL201 FOR TREE PROTECTION BARRIER.
2. SEE NOTES AND DETAIL 2 ON SHEET DL201 FOR ROOT PRUNING.
3. TREE CANOPY AND CRITICAL ROOT ZONE LIMITS SHOWN ARE APPROXIMATE BASED ON SURVEY. FIELD VERIFY TREE CRITICAL ROOT ZONES WHERE AFFECTED BY PROPOSED IMPROVEMENTS.

N

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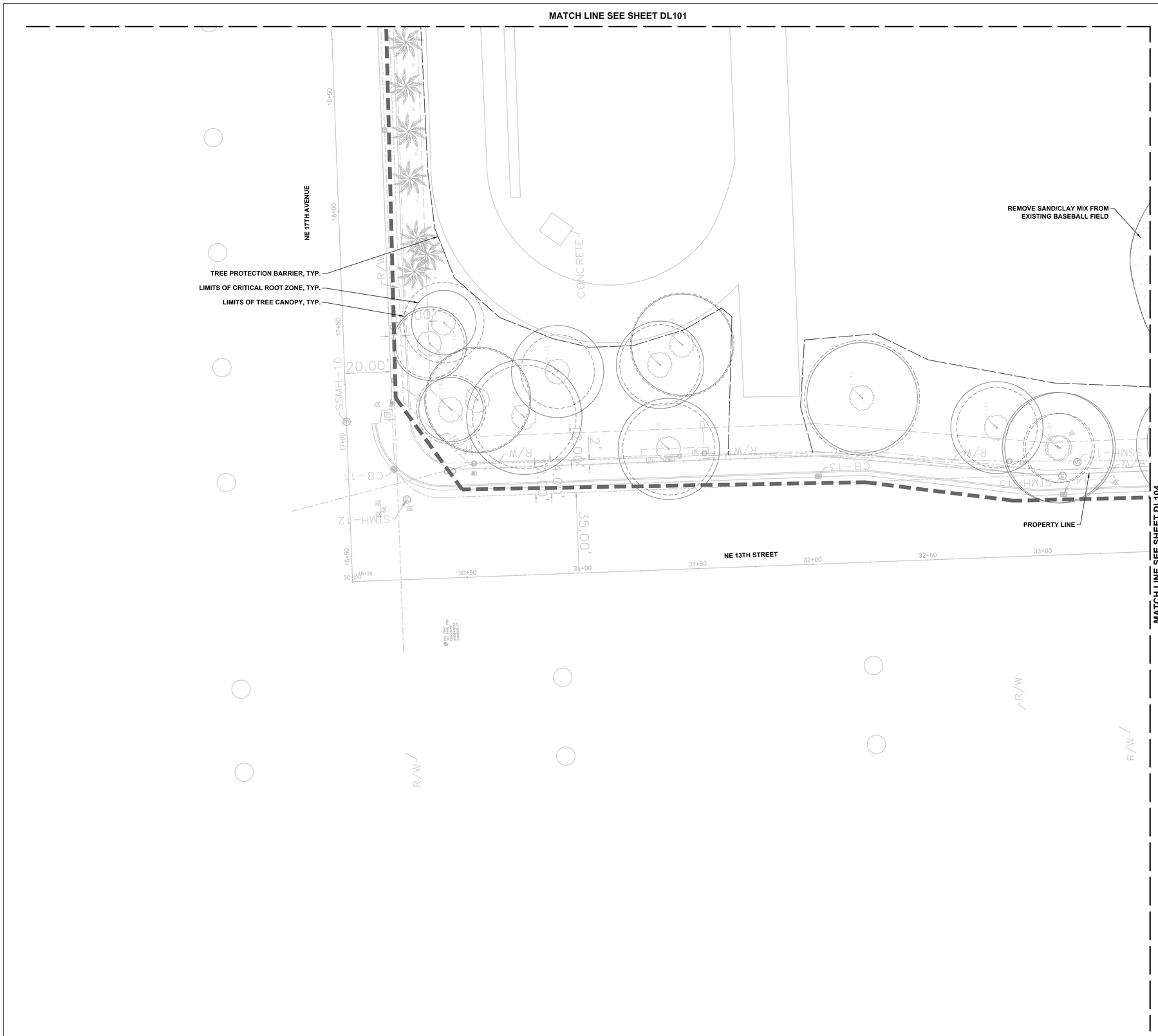
SHEET TITLE

LANDSCAPE DEMOLITION AND TREE PROTECTION PLAN

SHEET NUMBER

DL102

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Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"



LIMIT OF WORK

TREE PROTECTION LEGEND

- EXISTING TREE TO REMAIN
- CANOPY AREA
- CRITICAL ROOT ZONE
- EXISTING PALM TO REMAIN
- TREE PROTECTION BARRIER

DEMOLITION LEGEND

- REMOVE ASPHALT AND BASE COURSE FULL DEPTH
- REMOVE EXISTING CONCRETE PAVEMENT
- REMOVE EXISTING SAND/CLAY MIX
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NOTES:

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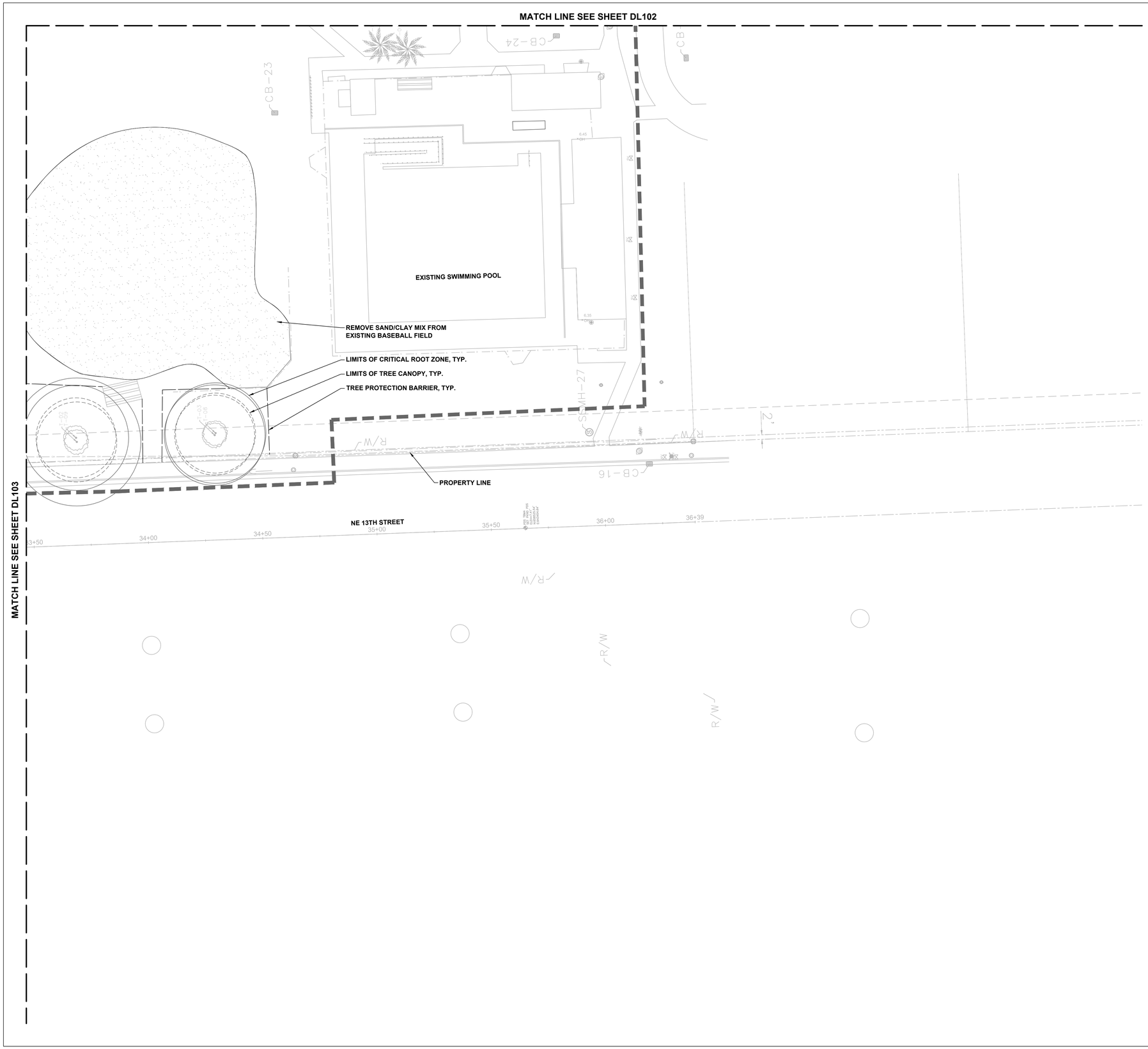
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LANDSCAPE DEMOLITION AND TREE PROTECTION PLAN

SHEET NUMBER

DL103

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LIMIT OF WORK

TREE PROTECTION LEGEND

- EXISTING TREE TO REMAIN
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- CRITICAL ROOT ZONE
- EXISTING PALM TO REMAIN
- TREE PROTECTION BARRIER

DEMOLITION LEGEND

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NOTES:
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SHEET TITLE

LANDSCAPE DEMOLITION AND TREE PROTECTION PLAN

SHEET NUMBER

DL104

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TREE PROTECTION NOTES:

1. CONTRACTOR SHALL PROTECT TREES TO BE PRESERVED FROM DAMAGE BY PROVIDING TREE BARRIERS ERECTED PRIOR TO SITE CLEARING OR OTHER CONSTRUCTION ACTIVITIES. TREE BARRIERS SHALL BE INSPECTED BY OWNER'S REPRESENTATIVE. CONTRACTOR SHALL PROVIDE 72 HOURS ADVANCE NOTICE TO OWNER'S REPRESENTATIVE AND PROJECT CERTIFIED ARBORIST TO SCHEDULE AN INSPECTION OF BARRIERS AND ROOT PRUNING. DO NOT ROOT PRUNE OR INSTALL TREE BARRIERS BEYOND THE PROJECT LIMITS.
2. THE CONTRACTOR WILL BE RESPONSIBLE FOR ADHERING TO ALL TREE PROTECTION MEASURES REQUIRED BY THE CITY OF FORT LAUDERDALE CODES, ORDINANCES AND STANDARD SPECIFICATIONS. THIS WILL INCLUDE ALL TREE BARRIERS, ROOT PRUNING, AND TREE TRIMMING/PRUNING ACTIVITIES. THESE REQUIREMENTS WILL APPLY WITHIN THE SPECIFIED "LIMITS OF WORK" AND WILL ALSO BE APPLICABLE IN ALL AREAS WHERE THE CONTRACTOR AND/OR HIS SUBCONTRACTORS STAGE, STORE OR PARK VEHICLES, EQUIPMENT, MATERIALS AND DEBRIS.
3. ALL TREE PRUNING AND/OR ROOT PRUNING ON EXISTING TREES TO BE PRESERVED WILL ONLY BE PERFORMED BY OR UNDER THE DIRECT SUPERVISION OF AN INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA) CERTIFIED ARBORIST. CERTIFIED ARBORIST SHALL HAVE A MINIMUM OF 5 YEARS EXPERIENCE ON SIMILAR PROJECTS. SUBMIT THE CERTIFIED ARBORIST'S CERTIFICATION AND PROJECT EXPERIENCE TO OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO PERFORMING THE WORK. FURTHERMORE, ALL TREE WORK SHALL CONFORM TO THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) 2001, AMERICAN NATIONAL STANDARD FOR TREE CARE OPERATIONS - TREE, SHRUB AND OTHER WOODY PLANT MAINTENANCE - STANDARD PRACTICES (PRUNING) ANSI A-300.
4. WHERE CALLED FOR ON THE PLANS, INSTALL TREE BARRIERS, EROSION CONTROL/SILT FENCING (ONLY IF REQUIRED TO PROTECT TREE FROM SILT, SILT FENCE IS NOT AN APPROVED TREE PROTECTION MEASURE) OR OTHER APPROVED PROTECTIVE BARRIERS AROUND ALL TREES TO BE PRESERVED, PER DETAIL (1) THIS SHEET. WHERE APPLICABLE, AND SPECIFICALLY APPROVED BY THE OWNER'S REPRESENTATIVE, PROTECTIVE BARRIERS MAY BE PLACED IN ROOT PRUNE TRENCHES.
5. PRIOR TO ANY FIELD CHANGES TAKING PLACE, IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE POTENTIAL IMPACTS TO EXISTING TREES WITH HIS CERTIFIED ARBORIST. INCLUDE RECOMMENDED MODIFICATIONS IN A PROPOSAL. THE OWNER'S REPRESENTATIVE MUST APPROVE, IN WRITING, ANY CHANGES TO THE APPROVED DESIGN PRIOR TO IMPLEMENTATION OF SAID CHANGE.
6. THE CONTRACTOR SHALL AVOID ANY OPEN EXCAVATIONS, FILL OR OTHER CONSTRUCTION ACTIVITIES WHENEVER POSSIBLE WITHIN THE DRIPLINE OF ANY EXISTING TREE UNLESS SPECIFIED IN THE PLANS.
7. CONTRACTOR SHALL PROTECT THE ROOT SYSTEMS OF TREES TO BE PRESERVED. DO NOT STORE ANY EQUIPMENT OR ANY MATERIALS WITHIN THE DRIPLINE OF ANY TREE. DO NOT RINSE ANY TOOLS OR EQUIPMENT WITHIN THE DRIPLINE OF ANY TREE. CONSTRUCTION MATERIALS, FILL, DEBRIS, EXCAVATED MATERIALS AND CHEMICALS SHALL NOT BE STORED WITHIN THE TREE BARRIER AREAS. VEHICLES OR EQUIPMENT SHALL NOT BE PARKED NOR OPERATED WITHIN BARRIERS.
8. TEMPORARY ACCESS WITHIN TREE BARRIERS SHALL BE PERMITTED FOR ROOT PRUNING, REMOVAL OF EXISTING PLANT MATERIAL, AND THE INSTALLATION OF PROPOSED PLANT MATERIAL WHERE INDICATED ON THE LANDSCAPE PLANS. HAND REMOVE EXISTING PLANT MATERIAL IN LOCATIONS BENEATH EXISTING, PROTECTED TREES. DO NOT USE MACHINERY OR HEAVY EQUIPMENT TO CLEAR AND GRUB BENEATH EXISTING TREES. IMMEDIATELY RESTORE TREE BARRIERS UPON COMPLETION OF WORK.
9. FOLLOWING COMPLETION OF ROOT PRUNING, CONTRACTOR SHALL BACKFILL THE TRENCH WITH NATIVE SOILS. BACKFILLING SHALL OCCUR AT THE END OF EACH DAY. DO NOT LEAVE ROOTS EXPOSED FOR MORE THAN 8 HOURS. A SOIL DRENCH FUNGICIDE SHALL BE APPLIED AT THE MANUFACTURER'S RECOMMENDED RATE TO THE TRENCH AREAS WITHIN FIVE DAYS FOLLOWING COMPLETION OF ROOT PRUNING OR AS DIRECTED BY ISA CERTIFIED ARBORIST.
10. WHERE CONSTRUCTION ACTIVITIES ARE ANTICIPATED TO LAST FOR AN EXTENDED PERIOD OF TIME NEAR EXISTING TREES, THE CONTRACTOR SHALL INSTALL AND MAINTAIN CITY APPROVED TREE BARRIERS AS SHOWN IN THE STANDARD DETAILS AND AS APPROVED BY THE OWNER'S REPRESENTATIVE.
11. WOODCHIPS, MULCH, OR ANOTHER CUSHIONING SURFACE MATERIAL APPROVED BY THE OWNER'S REPRESENTATIVE SHALL BE PLACED TO A MINIMUM DEPTH OF TEN (10) INCHES OVER AREAS WHERE ROOTS ARE PRESENT AND CONSTRUCTION TRAFFIC OCCURS. REMOVE THIS MATERIAL AFTER CONSTRUCTION IS COMPLETED.
12. CONTRACTOR SHALL MONITOR THE CONDITION OF THE BARRIERS DAILY AND REPAIR ANY BREACHES IMMEDIATELY.
13. ALL TREE PROTECTION MEASURES SHALL REMAIN IN PLACE AT ALL TIMES DURING CONSTRUCTION UNTIL THE OWNER'S REPRESENTATIVE AUTHORIZES REMOVAL.
14. PROTECT THE TRUNKS OF TREES EXPOSED TO CONSTRUCTION ACTIVITY WITHIN THE DRIPLINE WITH TREE ARMOR. PROTECT THE TRUNKS OF TREES WITHIN TWENTY-FIVE (25') OF ANY CONSTRUCTION ACTIVITY WITH TREE ARMOR IN ADDITION TO BARRIER IF THE BARRIER WILL BE TEMPORARILY MOVED OR REMOVED TO ALLOW FOR LIMITED APPROVED ACTIVITY INSIDE THE BARRIER. TREE ARMOR TRUNK PROTECTION SHALL BE PER FDOT 110-100 "TREE PROTECTION AND PRESERVATION" TRUNK PROTECTION DETAIL.
15. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER'S REPRESENTATIVE TO OBTAIN APPROVAL IN ADVANCE OF ANY AND ALL WORK WITHIN THE DRIPLINE OF ANY EXISTING TREE.

ROOT PRUNING NOTES:

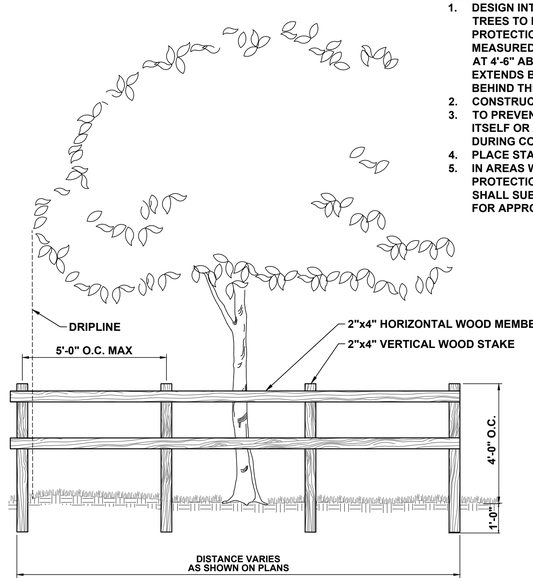
1. THE CONTRACTOR SHALL PROVIDE AN INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA) CERTIFIED ARBORIST TO PERFORM ROOT PRUNING. PROVIDE ARBORIST CONTACT INFORMATION TO OWNER'S REPRESENTATIVE.
2. THE CONTRACTOR'S ARBORIST SHALL MEET WITH THE CITY'S ARBORIST AT LEAST 1 DAY PRIOR TO SCHEDULED ROOT PRUNING ACTIVITY TO REVIEW AND AGREE ON PROPOSED ROOT PRUNING. THE ARBORISTS SHOULD RECORD THE AGREEMENT. THE CITY ARBORIST SHALL PROVIDE APPROVAL FOR CONTRACTOR'S ARBORIST TO PERFORM AGREED ROOT PRUNING.
3. ROOT PRUNING SHALL BE PERFORMED AS FAR IN ADVANCE OF OTHER CONSTRUCTION ACTIVITIES AS IS FEASIBLE, BUT AT A MINIMUM SHALL BE PERFORMED PRIOR TO ANY IMPACTS TO THE SOIL. ASSOCIATED TREE PROTECTION MEASURES SHALL BE IMPLEMENTED UPON COMPLETION OF SAID ROOT PRUNING.
4. ROOT PRUNING SHALL BE PERFORMED IN ACCORDANCE WITH ANSI A300 (PART 8) – 2020 ROOT MANAGEMENT, AND THE ISA BMP ROOT MANAGEMENT COMPANION PUBLICATION.
5. IF THERE IS A LIKELIHOOD OF EXCESSIVE WIND AND/OR RAIN, AN EXCEPTIONAL CARE SHALL BE TAKEN ON ANY ROOT PRUNING ACTIVITIES.
6. ROOTS SHALL BE CUT CLEANLY, AS FAR FROM THE TRUNK OF THE TREE AS POSSIBLE. ROOT PRUNING SHALL BE PERFORMED USING A ROOT CUTTING MACHINE DESIGNED SPECIFICALLY FOR THIS PURPOSE. ALTERNATE EQUIPMENT OR TECHNIQUES MUST BE APPROVED BY THE OWNER'S REPRESENTATIVE, PRIOR TO ANY WORK ADJACENT TO TREES TO BE PRESERVED.
7. UPON COMPLETION OF THE ROOT PRUNING, THE CONTRACTOR'S ARBORIST MUST NOTIFY CITY ARBORIST AND MEET ON SITE TO INSPECT THE ROOT PRUNING. ROOT PRUNING SHALL BE COMPLETED, INSPECTED, AND ACCEPTED PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION OR OTHER IMPACTS TO THE DRIPLINE OF TREES TO BE PROTECTED.
8. UPON COMPLETION OF INSPECTION, THE CITY'S ARBORIST SHALL RECORD THE RESULTS AND SHARE WITH CONTRACTOR.
9. EXCAVATIONS IN AN AREA WHERE ROOTS ARE PRESENT SHALL NOT CAUSE THE TEARING OR RIPPING OF TREE ROOTS. ROOTS MUST FIRST BE CLEANLY SEVERED PRIOR TO CONTINUING WITH THE EXCAVATION, OR TUNNELED AROUND TO PREVENT DAMAGE TO THE ROOT.
10. TREE ROOTS SHALL NOT BE EXPOSED TO OPEN AIR AND RISK OF DRYING OUT. ROOT ENDS SHALL BE COVERED WITH NATIVE SOIL OR BURLAP AND KEPT MOIST UNTIL FINAL BACKFILL OR FINAL GRADES HAVE BEEN ESTABLISHED.
11. WHEN DEEMED APPROPRIATE (E.G. DURING PERIODS OF DROUGHT) THE OWNER'S REPRESENTATIVE MAY REQUIRE A TEMPORARY IRRIGATION SYSTEM BE UTILIZED WITHIN THE REMAINING DRIPLINES OF ROOT PRUNED TREES.
12. SOIL MOISTURE
    A. VOLUMETRIC SOIL MOISTURE LEVEL, IN ALL SOILS WITHIN THE TREE BARRIER AREA SHALL BE MAINTAINED ABOVE PERMANENT WILT POINT TO A DEPTH OF AT LEAST 8 INCHES. NO SOIL WORK OR OTHER ACTIVITY SHALL BE PERMITTED WITHIN THE TREE AND PLANT PROTECTION AREA WHEN THE VOLUMETRIC SOIL MOISTURE IS ABOVE FIELD CAPACITY. THE PERMANENT WILT POINT AND FIELD CAPACITY FOR EACH TYPE OF SOIL TEXTURE SHALL BE DEFINED AS FOLLOWS (NUMBERS INDICATE PERCENTAGE VOLUMETRIC SOIL MOISTURE).

SOIL TYPE	PERMANENT WILT POINT	FIELD CAPACITY
SAND, LOAMY SAND, SANDY LOAM	5 - 8%	12 - 18%
LOAM, SANDY CLAY, SANDY CLAY LOAM	14 - 25%	27 - 36%
CLAY LOAM, SILT LOAM	11 - 22%	31 - 36%
SILTY CLAY, SILTY CLAY LOAM	22 - 27%	38 - 41%

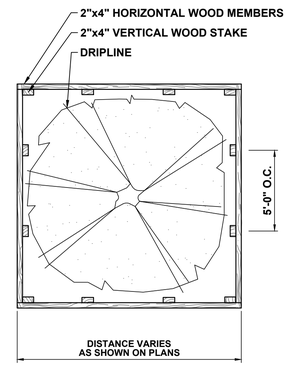
VOLUMETRIC SOIL MOISTURE SHALL BE MEASURED WITH A DIGITAL, ELECTRIC CONDUCTIVITY METER. THE METER SHALL BE THE DIGITAL SOIL MOISTURE METER, DSMM500 BY GENERAL SPECIALTY TOOLS AND INSTRUMENTS, OR APPROVED EQUIVALENT METER.

    B. THE CONTRACTOR SHALL CONFIRM THE SOIL MOISTURE LEVELS WITH A MOISTURE METER. IF THE MOISTURE IS TOO HIGH, SUSPEND OPERATIONS UNTIL THE SOIL MOISTURE DRAINS TO BELOW FIELD CAPACITY.

NOTE:
1. DESIGN INTENT IS TO PROTECT MAXIMUM AREA AROUND EXISTING TREES TO REMAIN. THE DRIPLINE IS CONSIDERED A MINIMUM PROTECTION ZONE. THE CRITICAL ROOT ZONE FOR A TREE IS MEASURED AS 1'-0" RADIUS PER ONE INCH (1") OF TRUNK DIAMETER AT 4'-6" ABOVE THE GROUND. THE CRITICAL ROOT ZONE OFTEN EXTENDS BEYOND THE DRIPLINE AND SHOULD BE PROTECTED BEHIND THE TREE PROTECTION BARRIER TO THE EXTENT POSSIBLE.
2. CONSTRUCT TREE PROTECTION BARRIERS AS INDICATED ON PLANS.
3. TO PREVENT ENTRY, TREE PROTECTION BARRIERS MUST CLOSE ON ITSELF OR ABUT EXISTING PHYSICAL FEATURES THAT WILL REMAIN DURING CONSTRUCTION ACTIVITIES.
4. PLACE STAKES TO AVOID ROOTS.
5. IN AREAS WHERE SPACE LIMITATIONS DO NOT PERMIT TREE PROTECTION BARRIER CONSTRUCTION PER DETAIL, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE OWNER'S REPRESENTATIVE FOR APPROVAL.



SECTION

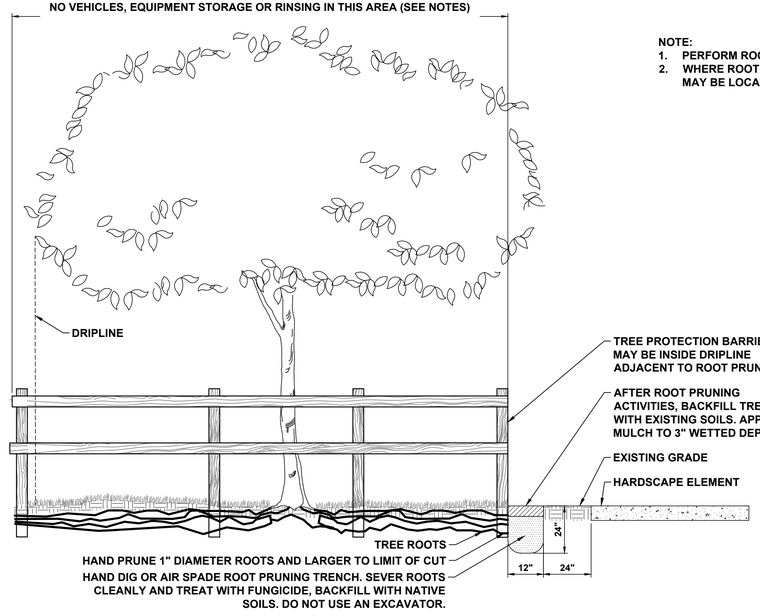


PLAN

1 TREE PROTECTION BARRIER
NTS

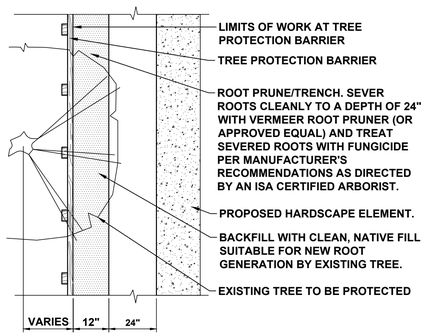
EXISTING TREE TO BE PROTECTED

NO VEHICLES, EQUIPMENT STORAGE OR RINSING IN THIS AREA (SEE NOTES)



SECTION

NOTE:
1. PERFORM ROOT PRUNING AS INDICATED ON PLANS.
2. WHERE ROOT PRUNING OCCURS, TREE PROTECTION BARRIER MAY BE LOCATED INSIDE THE DRIPLINE.



PLAN

2 ROOT PRUNING
NTS

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FORT LAUDERDALE
PARKS BOND PROGRAM

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City of Fort Lauderdale

PRIME CONSULTANT
AECOM
7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

SUB-CONSULTANT
CIVIL
BCC ENGINEERING
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www.bcceng.com

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www.hammondengineers.com

REGISTRATION
PAUL KURTZ LICENSE No. 1716 STATE OF FLORIDA LANDSCAPE ARCHITECT

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY PAUL KURTZ, L.A. USING A DIGITAL SIGNATURE AND DATE.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

AECOM Technical Services, INC
7650 West Courtney Campbell Causeway
Tampa, FL 33607-1462

ISSUE/REVISION

	09/16/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT
I/R	DATE	DESCRIPTION

PROJECT NUMBER
P12777

SHEET TITLE
TREE PROTECTION NOTES AND DETAILS

SHEET NUMBER
DL201

COORDINATE WITH AECOM ON LATEST ISSUE OF DRAWINGS BEFORE COMMENCEMENT OF CONSTRUCTION
NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G10-11.011, F.A.C.

ANSI D 24" x 36"
Approved:_____
Checked:_____
Designer:_____
Project Management Initials:

GENERAL NOTES:

1. CONTRACTOR SHALL MAINTAIN ACCESS TO PRIVATE PROPERTIES AT ALL TIMES.

3. SITE INFORMATION HAS BEEN PROVIDED BY SITE SURVEY PREPARED BY PREMIERE DESIGN SOLUTIONS INC. DATED AUGUST 2023.

4. HORIZONTAL CONTROL IS REFERENCED TO THE FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE, BASED ON THE NORTH AMERICAN DATUM OF 1983 (NAD 83). VERTICAL CONTROL IS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

5. CONTRACTOR SHALL VERIFY FIELD CONDITIONS BEFORE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL VERIFY EXISTING ELEVATIONS AND DIMENSIONS WHERE NEW WORK WILL MATCH EXISTING. DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION PRIOR TO THE COMMENCEMENT OF WORK.

6. CONTRACTOR SHALL OBTAIN ALL THE NECESSARY PERMITS FROM THE APPROPRIATE AUTHORITIES, DEPARTMENTS, AND/OR AGENCIES HAVING JURISDICTION PRIOR TO COMMENCING WORK.

7. ALL PRACTICAL AND NECESSARY EFFORTS SHALL BE TAKEN DURING CONSTRUCTION TO PREVENT UNNECESSARY TREE REMOVAL AND/OR DAMAGE.

8. THE LOCATION OF EXISTING UTILITIES HAS BEEN PREPARED FROM THE MOST RELIABLE INFORMATION AVAILABLE TO THE ENGINEER. THE INFORMATION IS NOT GUARANTEED. THEREFORE THE CONTRACTOR SHALL VERIFY THE LOCATION, ELEVATION AND MATERIAL OF ALL UTILITIES IN THE FIELD PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITIES.

9. UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEY INFORMATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THEIR EXACT LOCATION AND TO AVOID DAMAGE TO THEM. THE CONTRACTOR SHALL CONTACT SUNSHINE 811 AT PHONE NUMBER 811 OR 1-800-432-4770 TO REQUEST UNDERGROUND UTILITY LOCATION MARK-OUT AT LEAST TWO (2) WORKING DAYS BUT NO MORE THAN TEN (10) WORKING DAYS PRIOR TO BEGINNING EXCAVATION, INCLUDING SOIL DRILLING. THE CONTRACTOR SHALL ALSO CONTACT AND REQUEST UTILITY LOCATION MARK-OUT FROM BURIED UTILITY OWNERS WITH UTILITIES ON THE PROJECT SITE THAT ARE NOT PARTICIPANTS OF SUNSHINE 811.

10. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN WORKING IN OR AROUND EXISTING CITY-OWNED UTILITIES. THE CONTRACTOR SHALL NOTIFY THE CITY AT LEAST TWO BUSINESS DAYS IN ADVANCE OF ANY EXCAVATION WITHIN TEN FEET OF A CITY-OWNED UTILITY SO THAT A CITY REPRESENTATIVE MAY BE PRESENT.

11. CONTRACTOR SHALL TAKE CARE TO AVOID DAMAGE TO EXISTING PAVEMENT, STRUCTURES, LANDSCAPING, AND UTILITIES THAT ARE NOT INDICATED TO BE DEMOLISHED OR REMOVED. ANY DAMAGE TO EXISTING PAVEMENT, STRUCTURES, LANDSCAPING, AND UTILITIES NOT INDICATED TO BE DEMOLISHED OR REMOVED SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. IF CONTRACTOR MUST REPAIR DAMAGED IRRIGATION SYSTEMS INCLUDING CONTROL WIRES ANY PIPE REPAIRED OR REPLACED MUST BE SCHEDULE 40 PVC. ADDITIONALLY ANY DAMAGED COMPONENTS MUST BE REPLACED WITH THE ORIGINAL EQUIPMENT. IF ORIGINAL EQUIPMENT IS NOT AVAILABLE, A CITY APPROVED REPLACEMENT WILL SUFFICE.

12. WHERE PROPOSED WORK IS IN THE VICINITY OF UTILITY POLES, SUCH THAT SUPPORT OF THE POLE(S) WILL BE REQUIRED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE UTILITY OF THE WORK. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE UTILITY FOR SUPPORT OF THE POLE.

13. DURING EXCAVATION AND PLACEMENT OF UTILITIES THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY REGULATIONS AND SHALL SUBMIT TO THE ENGINEER FOR APPROVAL SHEET PILING, SHORING AND/OR BRACING DESIGNS AS MAY BE NECESSARY TO COMPLY WITH THESE REGULATIONS.

14. GROUNDWATER FROM ALL DEWATERING OPERATIONS SHALL BE DISCHARGED TO AN ENVIRONMENTALLY ACCEPTABLE LOCATION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, OR AS DIRECTED BY THE ENGINEER.

15. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL DEBRIS GENERATED DURING THE PROJECT OFF SITE AT A PROPERLY PERMITTED DISPOSAL FACILITY.

16. THE CONTRACTOR IS REQUIRED TO OBTAIN WRITTEN APPROVAL FROM THE ENGINEER FOR ANY DEVIATIONS FROM THE PLANS AND/OR SPECIFICATIONS.

17. THE UNDERGROUND CONTRACTOR SHALL MINIMIZE THE WORK AREA AND WIDTH OF TRENCHES TO AVOID DISTURBANCES OF NATURAL VEGETATION. SPOIL FROM TRENCHES SHALL BE PLACED ONLY ON PREVIOUSLY CLEARED AREAS, EXISTING RIGHT-OF-WAY OR APPROVED EASEMENT. THE CONTRACTOR SHALL NOT REMOVE OR DISTURB ANY TREES OR SHRUBS WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

18. ALL RESTORATION SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE AGENCIES HAVING JURISDICTION OVER THE RIGHT-OF-WAY WHERE THE PROJECT IS CONSTRUCTED.

19. CONTRACTOR SHALL REPAIR OR REPLACE ALL TRAFFIC SIGNAL LOOPS DETECTORS, COMMUNICATION CABLES AND CONDUITS, IF DAMAGED BY THE CONTRACTOR ACTIVITIES PER BCTED AND FDOT REQUIREMENTS. EXISTING TRAFFIC SIGNS SHALL BE RESET UPON COMPLETION PER BROWARD COUNTY TRAFFIC ENGINEERING STANDARDS. COST SHALL BE CONSIDERED INCIDENTAL.

20. PIPING, FITTINGS, AND APPURTENANCES FOR DUCTILE IRON PIPE SHALL BE RESTRAINED JOINT WHERE SHOWN ON THE PLANS.

21. RESILIENT SEATED GATE VALVES WITH BEVEL TYPE GEAR SHALL BE INSTALLED IN HORIZONTAL ORIENTATION WHEN LESS THAN 7-FEET OF COVER FROM TOP OF PIPE IS PRESENT.

22. NO CONNECTIONS FOR THE PURPOSE OF OBTAINING WATER SUPPLY DURING CONSTRUCTION SHALL BE MADE TO ANY FIRE HYDRANT OR BLOW-OFF STRUCTURE WITHOUT FIRST OBTAINING PERMISSION AND A CONSTRUCTION METER FROM THE CITY OF FORT LAUDERDALE.

23. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING, MOVING AND RELOCATING OR REPLACING ALL WATER SERVICES OR SEWER LATERALS WHICH ARE ENCOUNTERED DURING EXCAVATION. THE CONTRACTOR SHALL SUBMIT A WRITTEN PLAN FOR WATER SERVICE AND WASTEWATER SERVICE DISRUPTION FOR APPROVAL 7 (SEVEN) CALENDAR DAYS PRIOR TO THE ANTICIPATED DISRUPTION. THE CONTRACTOR SHALL NOTIFY THE PROPERTY OWNERS 48 HOURS IN ADVANCE OF ANY WORK ON THEIR SERVICES. THIS WORK SHALL BE CONSIDERED INCIDENTAL.

24. THE CONTRACTOR MUST INFORM THE CITY AT LEAST 48-HOURS IN ADVANCE OF CONSTRUCTION, IN WRITING IF ANY CONFLICT IS DISCOVERED DURING POT HOLE OPERATIONS FOR CLARIFICATION BY THE CITY.

25. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE UTILITIES DEPARTMENT OF THE CITY OF FORT LAUDERDALE AT LEAST TWO (2) BUSINESS DAYS IN ADVANCE TO COORDINATE ANY ACTIVITY TO BE PERFORMED BY THE CITY'S UTILITIES DEPARTMENT.

26. CONTRACTOR SHALL NOT DISTURB AREAS OUTSIDE EXISTING RIGHT-OF-WAY.

27. ALL WORK WITHIN STATE DEPARTMENT OF TRANSPORTATION (FDOT) RIGHT-OF-WAY SHALL BE IN CONFORMANCE WITH FDOT SPECIFICATIONS AND PERMIT REQUIREMENTS.

28. ALL WORK WITHIN BROWARD COUNTY RIGHT-OF-WAY SHALL BE IN CONFORMANCE WITH THE BROWARD COUNTY MINIMUM STANDARDS AND/OR REQUIREMENTS.

29. CONTRACTOR SHALL COMPLY WITH ALL LOCAL CITY, COUNTY AND STATE REGULATIONS PERTAINING TO THE CLOSING OF PUBLIC STREETS FOR USE OF TRAFFIC DURING CONSTRUCTION.

30. CONTRACTOR SHALL PREPARE AND SUBMIT MAINTENANCE OF TRAFFIC (MOT) PLANS FOR APPROVAL TO FDOT, CITY OF FORT LAUDERDALE, BROWARD COUNTY AS REQUIRED FOR WORK TO BE DONE WITHIN THEIR RIGHT-OF-WAY PRIOR TO COMMENCEMENT OF WORK. SPECIFIC AGENCY MOT REQUIREMENTS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

31. ALL OPEN TRENCHES AND HOLES ADJACENT TO ROADWAY OR WALKWAY SHALL BE PROPERLY MARKED AND BARRICADED TO ASSURE THE SAFETY OF BOTH VEHICULAR AND PEDESTRIAN TRAFFIC.

32. TRENCHES OR HOLES NEAR WALKWAYS, IN ROADWAYS OR THEIR SHOULDERS SHALL NOT BE LEFT OPEN DURING NON-WORKING HOURS WITHOUT ADEQUATE PROTECTION.

33. CONTRACTOR SHALL PROMPTLY REPAIR AND RESTORE EXISTING PAVEMENT, SIDEWALKS, CURBS, DRIVEWAYS, PIPES, RESIDENTIAL AND COMMERCIAL SPRINKLER LINES, CONDUIT, CABLES, ETC., PAVEMENT MARKINGS/SIGNATURE AND LANDSCAPE AREAS DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITIES TO ORIGINAL PRE-CONSTRUCTION CONDITION OR AS OTHERWISE SPECIFIED IN CONTRACT DOCUMENTS. THIS WORK SHALL BE CONSIDERED INCIDENTAL.

34. CONTRACTOR SHALL PROVIDE TEMPORARY FENCING AS REQUIRED BY AGENCIES HAVING JURISDICTION OVER THE PROJECT AND/OR WHEN REQUIRED FOR PUBLIC SAFETY.

35. THE CONTRACTOR SHALL BE RESPONSIBLE AT ALL TIMES THROUGHOUT THE DURATION OF CONSTRUCTION AND UNTIL ACCEPTANCE OF WORK, FOR THE PROTECTION OF EXISTING AND NEWLY INSTALLED UTILITIES FROM DAMAGE OR DISRUPTION OF SERVICE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING SUCH MEASURES AS NECESSARY TO PROTECT THE HEALTH, SAFETY AND WELFARE OF THOSE PERSONS HAVING ACCESS TO THE WORK SITE.

36. CONTRACTOR SHALL FIELD ADJUST LOCATION OF AIR RELEASE VALVES AS NECESSARY WHEN DIRECTED BY THE ENGINEER OR CITY OF FORT LAUDERDALE; COST SHALL BE INCIDENTAL.

37. CONTRACTOR SHALL FIELD ADJUST TO GRADE ALL EXISTING UTILITY CASTINGS INCLUDING VALVE BOXES, MANHOLES, HAND HOLES, PULL BOXES, INLETS AND SIMILAR STRUCTURES IN CONSTRUCTION AREA TO BE OVERLAYED WITH ASPHALT.

38. ALL CONSTRUCTION WITHIN FDOT RIGHT-OF-WAY MUST CONFORM WITH FDOT SPECIFICATIONS, STANDARDS, AND PERMIT REQUIREMENTS. NO WORK SHALL COMMENCE WITHIN FDOT RIGHT-OF-WAY WITHOUT AN FDOT PERMIT. FULL LANE WIDTH RESTORATION TO MATCH EXISTING PAVEMENT SECTION IS REQUIRED IN ACCORDANCE WITH FDOT STANDARDS FOR PROPOSED WORK WITHIN FDOT RIGHT-OF-WAY.

39. THE CONTRACTOR SHALL SUBMIT ALL REQUIRED SHOP DRAWINGS FOR CITY AND ENGINEER APPROVAL PRIOR TO ORDERING MATERIALS AND INSTALLATION.

GENERAL NOTES-BROWARD COUNTY TRAFFIC ENGINEERING DEPT.

1. THE AGENCY RESPONSIBLE FOR MAINTENANCE OF THE TRAFFIC SIGNALS AND RELATED EQUIPMENT IS BROWARD COUNTY TRAFFIC ENGINEERING DIVISION (BCTED). ALL SYSTEM COMMUNICATIONS EQUIPMENT, CABLING AND RELATED MATERIAL SHALL COMPLY WITH BROWARD COUNTY'S LATEST EDITION OF THE MINIMUM STANDARDS AS EXPRESSED IN THE "STANDARDS AND SPECIFICATIONS - COMMUNICATION INFRASTRUCTURE" DOCUMENT. PLEASE REFER TO (BCTED'S) COMMUNICATIONS POLICIES AND PROCEDURES FOR ADDITIONAL INFORMATION. BROWARD COUNTY TRAFFIC ENGINEERING DIVISION WILL NOT ACCEPT ANY PROJECTS THAT DO NOT MEET THESE STANDARDS AND SPECIFICATIONS. IF FIBER OPTIC PULL BOXES ALREADY EXIST AT AN INTERSECTION, NO ADDITIONAL FIBER OPTIC PULL BOXES WILL NEED TO BE INSTALLED. FOR A COPY OF THESE STANDARDS REFER TO THE BROWARD COUNTY WEB SITE AT WWW.BROWARD.ORG/TRAFFIC UNDER PUBLICATIONS.

2. IF THERE ARE COPPER INTERCONNECT CABLE/S WITHIN YOUR PROJECT LIMITS OR WITHIN 1,500 FEET OF YOUR PROJECT LIMITS, CONTACT THE COMMUNICATIONS MANAGER AT TECOMMUNICATIONS@BROWARD.ORG OR 954-847-2745.

3. IF THERE ARE FIBER OPTIC CABLE/S WITHIN YOUR PROJECT LIMITS OR WITHIN 1,500 FEET OF YOUR PROJECT LIMITS, CONTACT THE COMMUNICATIONS MANAGER AT TECOMMUNICATIONS@BROWARD.ORG OR 954-847-2745.

4. IF THERE ARE CELLULAR COMMUNICATIONS WITHIN YOUR PROJECT LIMITS, CONTACT THE COMMUNICATIONS MANAGER AT TECOMMUNICATIONS@BROWARD.ORG OR 954-847-2745.

5. ALL BCTED COMMUNICATIONS CABLES/CONDUIT SHALL BE LOCATED A MINIMUM OF 48 HOURS IN ADVANCE.

BROWARD COUNTY TRAFFIC ENGINEERING DIVISION PROCEDURE FOR NOTIFICATION OF COMMUNICATION DISRUPTION

COPPER INTERCONNECT CABLE NOTIFICATION CONTACT PERSON:

WHEN COMMUNICATIONS TO AN INTERSECTION MUST BE DISRUPTED BY A CONTRACTOR TO PERFORM WORK, THE CONTRACTOR SHALL PROVIDE TWO DAY ADVANCE NOTICE IN WRITING TO THE BROWARD COUNTY TRAFFIC ENGINEERING DIVISION. THIS NOTIFICATION SHALL BE CONVEYED VIA ELECTRONIC MAIL TO THE TRAFFIC SIGNAL TECHNICIAN III AT TECOMMUNICATIONS@BROWARD.ORG. NOTIFICATION SHALL INCLUDE CONTACT PERSON, TELEPHONE NUMBER, PURPOSE, LOCATION AND DURATION. THE DISRUPTION SHALL LAST FOR NO MORE THAN 3 CONSECUTIVE BUSINESS DAYS. WHERE POSSIBLE, THE DISRUPTION SHALL BE DURING OFF PEAK HOURS BEGINNING AT 9:00 AM AND ENDING AT 3:00 PM.

FIBER OPTIC CABLE NOTIFICATION CONTACT PERSON:

WHEN COMMUNICATIONS TO AN INTERSECTION MUST BE DISRUPTED BY A CONTRACTOR TO PERFORM WORK, THE CONTRACTOR SHALL PROVIDE TWO DAY ADVANCE NOTICE IN WRITING TO THE BROWARD COUNTY TRAFFIC ENGINEERING DIVISION. THIS NOTIFICATION SHALL BE CONVEYED VIA ELECTRONIC MAIL TO THE COMMUNICATIONS MANAGER AT TECOMMUNICATIONS@BROWARD.ORG. NOTIFICATION SHALL INCLUDE CONTACT PERSON, TELEPHONE NUMBER, PURPOSE, LOCATION AND DURATION. THE DISRUPTION SHALL LAST FOR NO MORE THAN 3 CONSECUTIVE BUSINESS DAYS. WHERE POSSIBLE, THE DISRUPTION SHALL BE DURING OFF PEAK HOURS BEGINNING AT 9:00 AM AND ENDING AT 3:00 PM.

UTILITY OWNER CONTACT PERSON:

INTERCONNECT COMMUNICATIONS CABLES - (ROBERT BLOUNT) BROWARD COUNTY TRAFFIC ENGINEERING DIVISION (BCTED) 954-847-2745

DRAINAGE NOTES:

1. DRAINAGE PIPE SHALL BE HIGH DENSITY POLYETHYLENE (HDPE) OR REINFORCED CONCRETE PIPE (RCP), THE USE OF RCP FOR PUBLIC ROADWAY CROSSINGS IS PREFERRED.

2. CATCH BASINS, INLETS AND JUNCTION BOXES SHALL NOT BE INSTALLED IN DRIVEWAYS.

3. PRIOR TO BACKFILLING EXFILTRATION TRENCHES, DRAINAGE INLETS OR MANHOLES, THE CONTRACTOR SHALL NOTIFY THE ENGINEERING INSPECTOR FOR AN INSPECTION.

4. DRAINAGE STRUCTURES SHALL BE CLEANED PRIOR TO ACCEPTANCE BY CITY.

5. ALL PIPES SHALL BE LAID IN DRY TRENCH. ALL MUCK OR UNSUITABLE MATERIALS IN TRENCHES, INLETS OR MANHOLES SHALL BE REMOVED AND BACKFILLED WITH SELECTED MATERIAL APPROVED BY THE ENGINEER.

6. MINIMUM COVER FOR HDPE PIPE UNDER ASPHALT SHALL BE 24-INCH COMPACTED LIMEROCK BASE. MINIMUM COVER FOR PIPE UNDER GRASS SHALL BE 18" COMPACTED SUBGRADE.

7. THE CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE PATTERNS AND PREVENT ADVERSE FLOODING OF THE TRAVEL LANES DURING CONSTRUCTION.

8. MAINTENANCE ACCESS SHALL BE PROVIDED ON BOTH SIDES OF EXFILTRATION TRENCHES IN THE FORM OF MANHOLES OR CATCH BASINS. THE MAXIMUM DISTANCE BETWEEN STORM STRUCTURES SHALL NOT EXCEED THREE HUNDRED (300) FEET).

9. ALL EXFILTRATION SYSTEMS SHALL BE DESIGNED IN ACCORDANCE WITH THE FLORIDA DEPARTMENT OF TRANSPORTATION DOCUMENT TITLED "DRAINAGE DESIGN GUIDE", LATEST EDITION.

10. GEOTEXTILE MATERIALS USED IN THE CONSTRUCTION OF EXFILTRATION TRENCHES SHALL BE IN ACCORDANCE WITH THE CRITERIA OF FLORIDA DEPARTMENT OF TRANSPORTATION'S DESIGN STANDARDS LATEST EDITION AND CITY OF FORT LAUDERDALE'S SPECIFICATIONS.

GENERAL DEMOLITION NOTES:

1. THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR, SUPERVISION, AND EQUIPMENT REQUIRED FOR THE ORDERLY DEMOLITION AND REMOVAL OF EXISTING STRUCTURES, PAVEMENT AND UTILITIES AS SHOWN ON THE DRAWINGS AND DESCRIBED HEREIN.

2. THE CONTRACTOR IS REQUIRED TO FAMILIARIZE ITSELF WITH THE STRUCTURES TO BE DEMOLISHED.

3. THE FOLLOWING LIST OF STRUCTURES REQUIRING DEMOLITION IS INCLUDED FOR THE CONTRACTOR'S CONVENIENCE ONLY. THE DRAWINGS INDICATE THE SCOPE OF DEMOLITION WHERE DEMOLITION IS REQUIRED.

   3.1. DEMOLITION AND REMOVAL OF A 5' MIN.± STRIP OF EXISTING ON-SITE ASPHALT, CONCRETE AND CURBING AROUND THE PERIMETER OF THE EXISTING STRUCTURES AND UTILITIES BEING DEMOLISHED.

   3.2. REMOVAL OF EXISTING ON-SITE ABOVEGROUND AND UNDERGROUND UTILITIES, INCLUDING REMOVAL OR PLUGGING OF EXISTING UTILITIES AS SHOWN ON PLANS.

4. PRIOR TO REMOVAL OF ANY UNDERGROUND TANK AND OTHER COMPONENT, CONTRACTOR MUST COMPLETELY DRAIN THE SYSTEMS TO AN APPROVED SANITATION TANK FOR DISPOSAL TO AN APPROVED LOCATION, AS REQUIRED BY DISPOSAL PERMIT.

5. PROTECT AND SAVE ALL UTILITIES, UNLESS OTHERWISE NOTED.

6. ALL THE CONCRETE AND PAVEMENT TO BE REMOVED MUST BE SAW CUT CLEAN PRIOR TO REMOVAL

7. WET DOWN MASONRY WALLS AND DEBRIS DURING DEMOLITION AND LOADING OPERATIONS TO PREVENT THE SPREAD OF DUST (AS APPLICABLE TO PROJECT).

8. WHERE DRAWINGS INDICATE EXISTING STRUCTURES ARE TO BE DEMOLISHED, WORK SHALL INCLUDED DEMOLITION AND REMOVAL OF ALL ASSOCIATED FEATURES OF THE STRUCTURE, INCLUDING BUT NOT LIMIT TO PAVEMENTS, SLABS, FOUNDATIONS AND STEPS.

9. ALL EXISTING SEWERS, PIPING AND UTILITIES SHOWN ARE NOT TO BE INTERPRETED AT THE EXACT LOCATION, OR AS THE ONLY OBSTACLES THAT MAY OCCUR ON THE SITE. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND PROCEED WITH CAUTION AROUND ANY ANTICIPATED FEATURES. GIVE NOTICE TO ALL UTILITY COMPANIES REGARDING DESTRUCTION AND REMOVAL OF ALL SERVICE LINES AND CAP ALL LINES BEFORE PROCEEDING WITH THE WORK.

10. THE CONTRACTOR SHALL COORDINATE WITH THE APPROPRIATE UTILITY COMPANY PRIOR TO REMOVAL OR RELOCATION OF ANY ELECTRICAL, TELEPHONE, CABLE AND/OR GAS LINES. SUFFICIENT TIME SHALL BE PROVIDED FOR RELOCATION AND CLOSE COORDINATION WITH THE UTILITY COMPANY TO PROVIDE A SMOOTH TRANSITION IN UTILITY SERVICE.

11. CONTRACTOR MUST STOP OPERATION AND NOTIFY THE OWNER/ENGINEER FOR PROPER DIRECTION IF ANY ENVIRONMENTAL OR HEALTH RELATED CONTAMINANT IS ENCOUNTERED DURING THE DEMOLITION/EXCAVATION PROCESS.

12. FILL FOR LOWER LEVELS OF DEMOLISHED STRUCTURES MAY INCLUDE CONCRETE OR MASONRY RUBBLE RESULTING FROM DEMOLITION, SUBJECT TO THE ENGINEER'S/ARCHITECT'S APPROVAL. RUBBLE SHALL NOT EXCEED SIX (6) INCHES IN LONGEST DIMENSION.

13. REMOVE AND LEGALLY DISPOSE OF ALL OTHER RUBBISH, RUBBLE, AND DEBRIS. COMPLY WITH ALL APPLICABLE LAWS AND REGULATIONS GOVERNING DISPOSAL OF WASTES AND DEBRIS.

14. ALL SIGNS OUTSIDE THE DEMOLITION AREA ARE TO REMAIN UNLESS OTHERWISE SPECIFIED.

15. ANY MUCK ENCOUNTERED UNDER PROPOSED STRUCTURES SHALL BE REMOVED TO 5 FT. BEYOND THE FOOTPRINT OF THAT STRUCTURE. BACKFILL WITH APPROVED FILL MATERIAL SATISFYING ALL COMPACTION REQUIREMENTS.

16. ALL EXISTING UTILITIES WITHIN THE DEMOLITION SITE AREA SHALL BE ADJUSTED, REMOVED OR RELOCATED AT THE CONTRACTOR'S EXPENSE. ACTUAL WORK SHALL BE COORDINATED BY THE CONTRACTOR DIRECTLY W/ THE APPROPRIATE UTILITY COMPANY. ALL EXPENSES SHALL BE INCLUDED IN THE CONTRACTOR'S BID.

17. ALL TRASH, DEBRIS AND OTHER MATERIAL REMOVED FROM THE SITE SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

PRE-DEMOLITION RESPONSIBILITIES

1. UPON RECEIPT OF NOTICE OF AWARD, THE CONTRACTOR SHALL ARRANGE A PRE-DEMOLITION CONFERENCE TO INCLUDE ALL INVOLVED GOVERNMENTAL AGENCIES, ALL AFFECTED UTILITY OWNERS, THE OWNER, THE ENGINEER AND THE CONTRACTOR.

2. PRIOR TO DEMOLITION, THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A DEMOLITION SCHEDULE DEPICTING EACH PHASE OF THE WORK.

3. PRIOR TO DEMOLITION, CONTRACTOR TO PROVIDE FOR THE OWNER A LISTING OF THE FACILITIES THE CONTRACTOR WILL UTILIZE FOR RECYCLING AND DISPOSAL OF SPECIFIC MATERIALS. CONTRACTOR TO SPECIFY THE MATERIALS INTENDED FOR RECYCLING AND THE MATERIALS INTENDED FOR DISPOSAL FOR OWNER'S APPROVAL.

4. PRIOR TO DEMOLITION CONTRACTOR TO PROVIDE THE OWNER SKETCHES SHOWING PROPOSED HAULING ROUTES TO RECYCLING AND DISPOSAL FACILITIES FOR APPROVAL.

DEMOLITION SAFETY

1. ALL DEMOLITION SHALL BE DONE IN A SAFE MANNER. SPECIFICALLY, THE RULES AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), THE FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) SHALL BE STRICTLY OBSERVED.

2. PROVIDE ADEQUATE PROTECTION FOR PERSONS AND PROPERTY AT ALL TIMES. EXECUTE THE WORK IN A MANNER TO AVOID HAZARDS TO PERSONS AND PROPERTY AND PREVENT INTERFERENCE WITH THE USE OF AND ACCESS TO ADJACENT BUILDINGS. STREETS AND SIDEWALKS SHALL NOT BE UNNECESSARILY BLOCKED BY DEBRIS AND EQUIPMENT.

3. IF PETROLEUM PRODUCTS ARE FOUND WHILE DEMOLISHING, PETROLEUM CONTAMINATED MATERIALS SHOULD BE DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.

TEMPORARY DEMOLITION FACILITIES

1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE OR SUPPLY TEMPORARY WATER SERVICE, SANITARY FACILITIES AND ELECTRICITY TO ITS EMPLOYEES AND SUBCONTRACTORS FOR THEIR USE DURING DEMOLITION.

2. MAINTENANCE OF TRAFFIC (MOT) IN THE PUBLIC RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE MUTCD AND FDOT.

3. ALL OPEN TRENCHES AND HOLES ADJACENT TO ROADWAYS OR WALKWAYS SHALL BE PROPERLY MARKED AND BARRICADED TO ASSURE THE SAFETY OF BOTH VEHICULAR AND PEDESTRIAN TRAFFIC.

WASTE MANAGEMENT PLAN

1. IMPLEMENT A WASTE MANAGEMENT PLAN FOR APPROVED BY THE OWNER. PROVIDE HANDLING, CONTAINERS, STORAGE, SIGNAGE, TRANSPORTATION AND OTHER ITEMS AS NEEDED TO IMPLEMENT THE WASTE MANAGEMENT PLAN DURING THE ENTIRE DURATION OF THE CONTRACT.

2. DESIGNATE A WASTE MANAGEMENT COORDINATOR TO BE RESPONSIBLE FOR IMPLEMENTING, MONITORING AND REPORTING STATUS OF WASTE MANAGEMENT WORK PLAN. COORDINATOR SHALL BE PRESENT AT PROJECT SITE FULL TIME FOR DURATION OF PROJECT.

3. TRAIN WORKERS, SUBCONTRACTORS AND SUPPLIERS ON PROPER WASTE MANAGEMENT PROCEDURES, AS APPROPRIATE FOR THE WORK OCCURING AT THE PROJECT SITE.

4. DISTRIBUTE A WASTE MANAGEMENT PLAN BEFORE WORK BEGINS. REVIEW PLAN PROCEDURES AND LOCATION ESTABLISHED FOR SALVAGE, RECYCLING AND DISPOSAL.

RECYCLING DEMOLITION WASTE

1. SEPARATE RECYCLABLE WASTE FROM OTHER WASTE MATERIALS, TRASH AND DEBRIS. SEPARATE RECYCLABLE WASTE BY TYPE AT THE PROJECT SITE TO THE MAXIMUM EXTENT PRACTICAL.

2. PROVIDE APPROPRIATELY MARKED CONTAINERS OR BINS FOR CONTROLLING RECYCLABLE WASTE UNTIL THEY ARE REMOVED FROM THE PROJECT SITE. INCLUDE A LIST OF ACCEPTABLE AND UNACCEPTABLE MATERIALS AT EACH CONTAINER AND BIN.

   2.1. INSPECT CONTAINERS AND BINS FOR CONTAMINATION AND REMOVE CONTAMINATED MATERIALS IF FOUND.

3. STOCKPILE PROCESSED MATERIALS ON-SITE WITHOUT INTERMIXING WITH OTHER MATERIALS. PLACE, GRADE AND SHAPE STOCKPILES TO DRAIN SURFACE WATER. COVER TO PREVENT WINDBLOWN DUST.

4. STOCKPILE MATERIALS AWAY FROM DEMOLITION AREA. DO NOT STORE WITHIN DRIP LINE OF REMAINING TREES.

5. STORE COMPONENTS OFF THE GROUND AND PROTECT FROM THE WEATHER.

6. REMOVE RECYCLABLE WASTE OFF THE OWNER'S PROPERTY AND TRANSPORT TO RECYCLING RECEIVER OR PROCESSOR.

7. ASPHALTIC CONCRETE PAVING: BREAK UP AND TRANSPORT PAVING TO ASPHALT RECYCLING FACILITY.

8. CONCRETE: REMOVE REINFORCEMENT AND OTHER METALS FROM CONCRETE AND SORT WITH OTHER METALS.

9. MASONRY: MASONRY WASTE SHALL INCLUDE WHOLE OR BROKEN BRICK AND CONCRETE MASONRY UNITS. WHOLE MASONRY UNITS SHALL BE CLEANED AND REUSED OR DONATED. BROKEN MASONRY SHALL BE CRUSHED AND USED AS FILL FOR OFFSITE AREAS. REMOVE METAL REINFORCEMENT, ANCHORS AND TIES FROM MASONRY AND SORT WITH OTHER METALS.

10. METALS: METALS FROM REINFORCED CONCRETE, REINFORCED MASONRY, STRUCTURAL STEEL MEMBERS, FLASHING AND SHEET METAL, CONDUIT PIPE, SIDING, PIPING AND WIRING SHALL BE SEPARATED BY TYPE.

    10.1. STRUCTURAL STEEL: STACK MEMBERS ACCORDING TO THEIR SIZE, TYPE AND LENGTH.

    10.2. REMOVE BOLTS, NUTS, WASHERS AND OTHER ROUGH HARDWARE.

11. SITE-CLEARING WASTE SHALL BE RECYCLED BY CHIPPING BRUSH, BRANCHES AND TREES, THEN HAUL TO NEAREST WOOD RECYCLING CENTER.

DISPOSAL OF WASTE

1. GENERAL: EXCEPT FOR ITEMS OR MATERIALS TO BE SALVAGED, RECYCLED OR OTHERWISE REUSED, REMOVE WASTE MATERIALS FROM PROJECT SITE AND LEGALLY DISPOSE OF THEM IN A LANDFILL OR OTHER PERMITTED DISPOSAL FACILITY.

   1.1. EXCEPT AS OTHERWISE SPECIFIED, DO NOT ALLOW WASTE MATERIALS THAT ARE TO BE DISPOSED OF TO ACCUMULATE ON-SITE.

   1.2. REMOVE AND TRANSPORT DEBRIS IN A MANNER THAT WILL PREVENT SPILLAGE ON ADJACENT SURFACES AND AREAS.

2. BURNING: DO NOT BURN WASTE MATERIALS.

3. DISPOSAL: TRANSPORT WASTE MATERIALS OFF THE OWNER'S PROPERTY AND LEGALLY DISPOSE OF THEM.

ABBREVIATIONS LEGEND

INV. = PIPE INVERT ELEVATION
E.O.P. = EDGE OF PAVEMENT
NGVD = NATIONAL GEODETIC VERTICAL DATUM
NAVD = NORTH AMERICAN VERTICAL DATUM

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FORT LAUDERDALE
PARKS BOND PROGRAM

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PARKS & RECREATION
City of Fort Lauderdale

PRIME CONSULTANT
AECOM
7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

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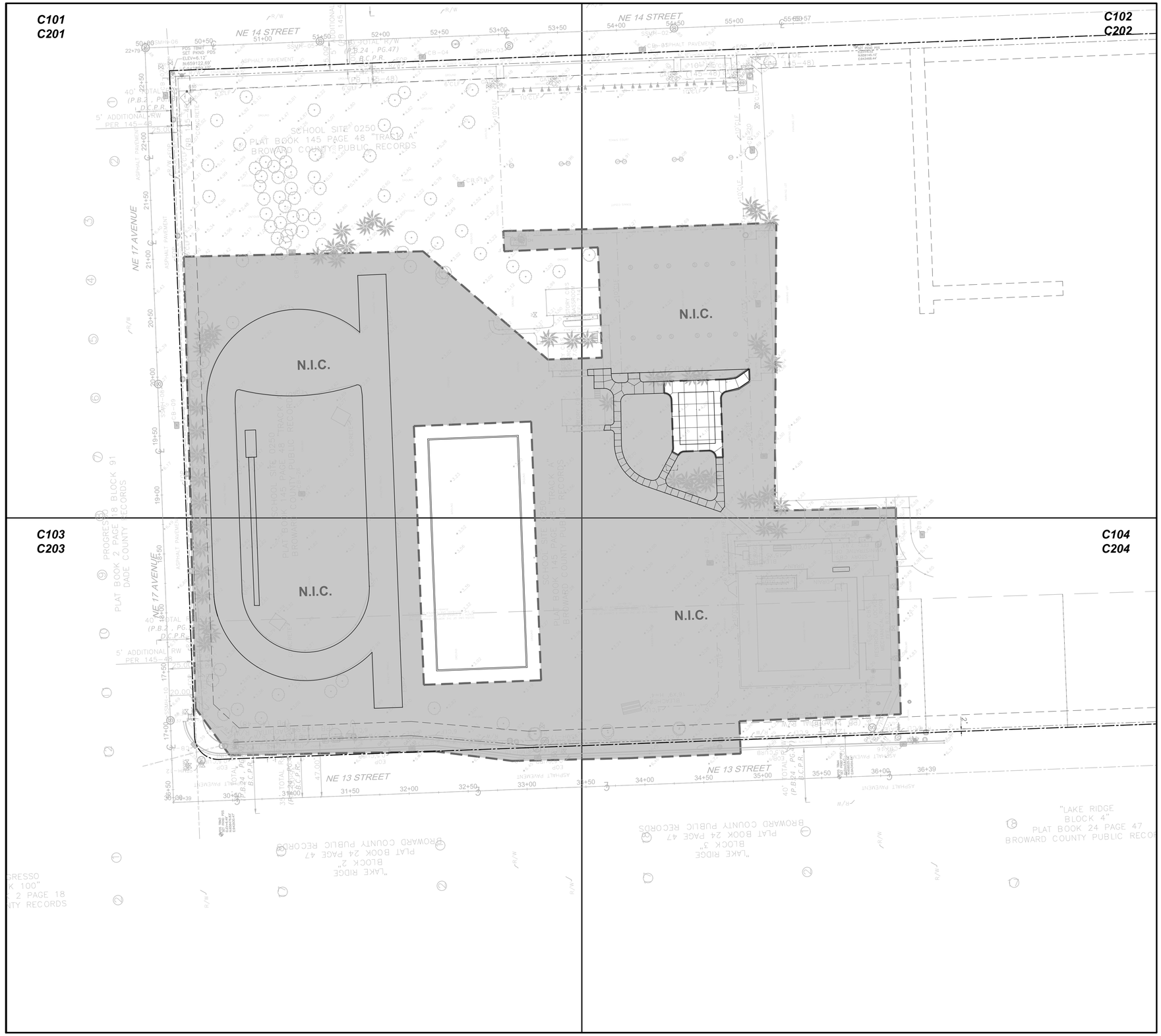
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REGISTRATION

ROBERTO LAMAZARES LICENSE No. 86416 STATE OF FLORIDA PROFESSIONA



LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE
- LIMIT OF WORK
- EXISTING ELECTRIC LINE TO REMAIN
- EXISTING POTABLE WATER LINE TO REMAIN
- EXISTING STORM LINE TO REMAIN
- EXISTING STORM STRUCTURE
- EXISTING SANITARY SEWER LINE TO REMAIN
- EXISTING BROWARD COUNTY TRAFFIC TO REMAIN
- EXISTING GAS LINE TO REMAIN
- EXISTING IRRIGATION LINE
- EXISTING BURIED ELECTRIC

NOTES:

1. **STORM WATER MUST BE CAPTURE ON SITE.**

N

0 20' 40' 80' 120'

SCALE: 1" = 40'-0"

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7650 W. COURTNEY CAMPBELL CAUSEWAY
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6401 SW 87th Avenue, Suite 200
Miami, FL 33173

ISSUE/REVISION

	09/16/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

P12777

SHEET TITLE

PROJECT LAYOUT

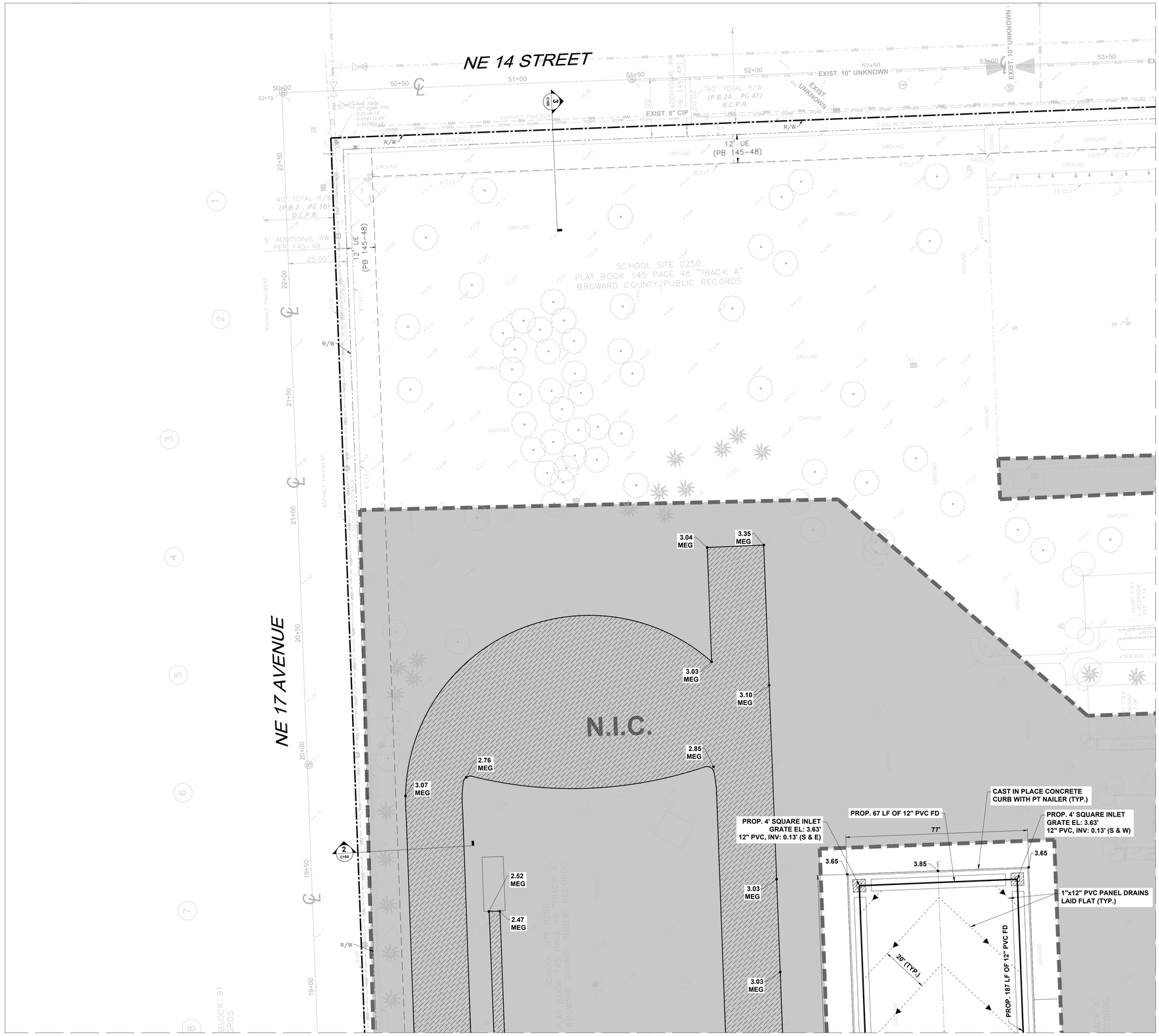
SHEET NUMBER

C002

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CAM #26-0329
Exhibit 1
Page 582 of 711

Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"
Last saved by: JMANTILLA(2025-09-11) Last Plotted: 2025-09-16
Filename: H:\PROJECTS\1021220.00 CITY OF FORT LAUDERDALE PARK BOND\1021220.09 TO 29 SUNRISE MIDDLE\8 - CAD\03 CAD\P12777-C-002-PROJ LAYOUT.DWG



LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE
- LIMIT OF WORK
- 1.5" X 12" PANEL DRAIN (REFER TO DETAILS 1 & 2 ON SHEET C105)
- 4.40 — PROPOSED ELEVATION
- 3.69 MEG — MATCH EXIST. GRADES
- -0.5% — DRAINAGE FLOW ARROW
- GB — GRADE BREAK
- PROP. FRENCH DRAIN
- TRACK RESURFACING
- PROP. CONCRETE SIDEWALK (REFER TO LANDSCAPE DETAILS)
- EXISTING ELECTRIC LINE TO REMAIN
- EXISTING POTABLE WATER LINE TO REMAIN
- EXISTING STORM LINE TO REMAIN
- EXISTING STORM STRUCTURE TO REMAIN
- EXISTING SANITARY SEWER TO REMAIN
- EXISTING BROWARD COUNTY TRAFFIC TO REMAIN
- EXISTING FORCE MAIN TO REMAIN
- EXISTING GAS MAIN TO REMAIN
- EXISTING COMMUNICATION TO REMAIN
- EXISTING COMCAST TO REMAIN

NOTES:

1. **PROPOSED SIDEWALK SHALL NOT EXCEED 2% CROSS-SLOPE AND 5% LONGITUDINAL SLOPE.**
2. **PROPOSED GRASS TO HARMONIZE SIDEWALK IMPROVEMENTS SHALL NOT EXCEED 25% SLOPE.**
3. **THE CONTRACTOR SHALL VERIFY EXISTING GRADES AND STRUCTURE INFORMATION FOR ACCURACY PRIOR TO THE START OF GRADING. NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY SHOULD CONFLICTS ARISE. REDIRECT WORK TO AVOID DELAY.**
4. **THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES, STRUCTURES AND SERVICES BEFORE COMMENCING THE WORK. THE LOCATIONS OF UTILITIES, STRUCTURES AND SERVICES SHOWN IN THE CONTRACT DOCUMENTS SHALL BE DEEMED TO BE APPROXIMATE ONLY. ALL DISCREPANCIES BETWEEN WHAT IS SHOWN AND THE ACTUAL FIELD CONDITIONS SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE. CONTRACTOR SHALL RECORD ALL UTILITY MARKINGS ON A SEPARATE SET OF DRAWINGS. THIS SET OF EXISTING UTILITY DRAWINGS SHALL BE KEPT ON-SITE FOR REFERENCE FOR THE DURATION OF THE PROJECT.**
5. **PROPOSED GRADES SHALL MEET EXISTING GRADES WITH A SMOOTH AND CONTINUOUS TRANSITION SO AS TO AVOID TRAPPING WATER. CONTRACTOR SHALL NOTIFY OWNER'S REPRESENTATIVE IF PUDDLING IS SUSPECTED AND REDIRECT WORK SO AS TO AVOID DELAY WHILE AWAITING RESPONSE.**
6. **REMOVE ALL VEGETATION, ORGANIC MATERIAL, BUILDING MATERIAL, DEMOLITION DEBRIS, AND ALL OTHER DELETERIOUS SUBSTANCES FROM THE AREA OF THE FILL. REMOVE ALL DEBRIS FROM THE SITE AND LEGALLY DISPOSE OFFSITE.**
7. **ARTIFICIAL TURF FIELD GRADING AND DRAINAGE ARE SHOWN FOR ILLUSTRATIVE AND COORDINATION PURPOSES BASED ON THE BASIS OF DESIGN PRODUCT. ARTIFICIAL TURF FIELD GRADING AND DRAINAGE TO BE PER MANUFACTURER'S INSTRUCTIONS. REFER MANUFACTURER'S CSI WRITTEN SPECIFICATIONS FOR GENERAL INFORMATION, PRODUCTS AND EXECUTION.**
8. **TRACK AND LONG JUMP ARE TO REMAIN IN THEIR EXACT POSITIONS. MILL AND RESURFACE TRACK AND LONG JUMP RUNWAY WITH 2" THICK (MIN.) SUPERPAVE ASPHALT PLACED IN TWO LIFTS. TRACK PAVEMENT MARKINGS ARE TO BE PLACED TO MATCH EXISTING LENGTHS, NUMBERS, RADII, ETC. AFTER RESURFACING HAS BEEN COMPLETED.**

N

0 10' 20' 40' 60'

SCALE: 1" = 20'-0"

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	05/03/2024	DESIGN DEVELOPMENT

PROJECT NUMBER

P12777

SHEET TITLE

GRADING AND DRAINAGE PLAN

SHEET NUMBER

C101

COORDINATE WITH AECOM ON LATEST ISSUE OF DRAWINGS BEFORE COMMENCEMENT OF CONSTRUCTION.
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LEGEND

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N

0 10' 20' 40' 60'

SCALE: 1" = 20'-0"

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AECOM

PROJECT

SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT

PARKS & RECREATION
City of Fort Lauderdale

PRIME CONSULTANT

AECOM

7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

SUB-CONSULTANT

CIVIL
BCC ENGINEERING
305.670.2350 tel
www.bcceng.com

LANDSCAPE
CURTIS + ROGERS DESIGN STUDIO
305.442.1774 tel
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GEOTECHNICAL SERVICES
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MECHANICAL, PLUMBING AND FIRE PROTECTION
HAMMOND AND ASSOCIATES CONSULTING
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REGISTRATION

ROBERTO LAMAZARES LICENSE No. 86416 STATE OF FLORIDA PROFESSIONAL ENGINEER

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BCC Engineering LLC
6401 SW 87th Avenue, Suite 200
Miami, FL 33173

ISSUE/REVISION

	09/16/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

P12777

SHEET TITLE

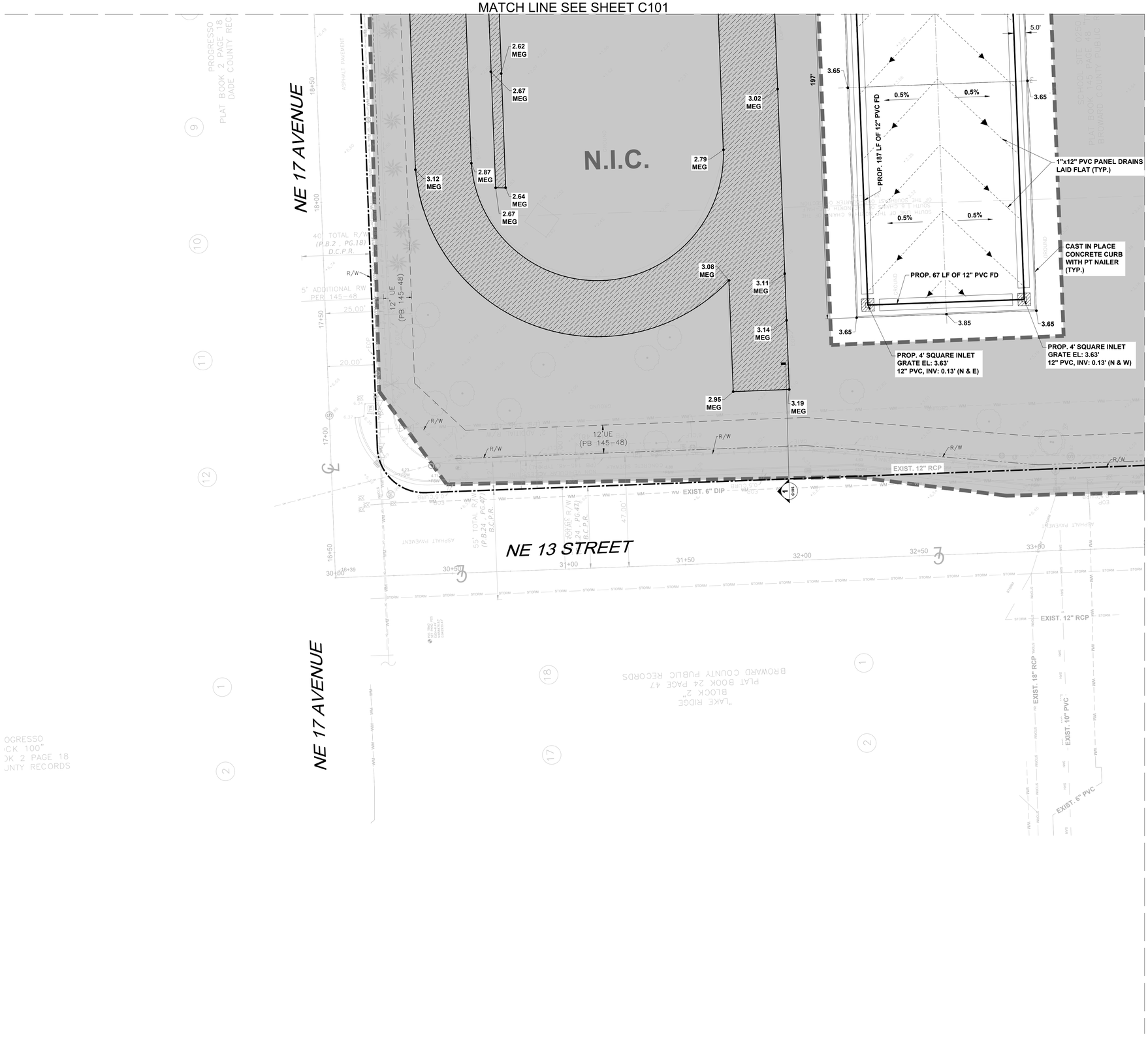
GRADING AND DRAINAGE PLAN

SHEET NUMBER

C102

COORDINATE WITH AECOM ON LATEST ISSUE OF DRAWINGS BEFORE COMMENCEMENT OF CONSTRUCTION.
NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

ANSI D 24" x 36"
Approved:
Checked:
Designer:
Project Management Initials:
Last saved by: JMANTILLA(2025-09-11) Last Plotted: 2025-09-16
Filename: H:\PROJECTS\102220.00 CITY OF FORT LAUDERDALE PARK BOND\102220.09 TO 29 SUNRISE MIDDLE\8 - CAD\03 CAD\P12777-C-101-GRDGPLN.DWG



LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE
- LIMIT OF WORK
- 1.5" X 12" PANEL DRAIN (REFER TO DETAILS 1 & 2 ON SHEET C105)
- 4.40 PROPOSED ELEVATION
- 3.69 MEG MATCH EXIST. GRADES
- -0.5% DRAINAGE FLOW ARROW
- GB GRADE BREAK
- PROP. FRENCH DRAIN
- TRACK RESURFACING
- PROP. CONCRETE SIDEWALK (REFER TO LANDSCAPE DETAILS)
- EXISTING ELECTRIC LINE TO REMAIN
- EXISTING POTABLE WATER LINE TO REMAIN
- EXISTING STORM LINE TO REMAIN
- EXISTING STORM STRUCTURE TO REMAIN
- EXISTING SANITARY SEWER TO REMAIN
- EXISTING BROWARD COUNTY TRAFFIC TO REMAIN
- EXISTING FORCE MAIN TO REMAIN
- EXISTING GAS MAIN TO REMAIN
- EXISTING COMMUNICATION TO REMAIN
- EXISTING COMCAST TO REMAIN

NOTES:

1. PROPOSED SIDEWALK SHALL NOT EXCEED 2% CROSS-SLOPE AND 5% LONGITUDINAL SLOPE.
2. PROPOSED GRASS TO HARMONIZE SIDEWALK IMPROVEMENTS SHALL NOT EXCEED 25% SLOPE.
3. THE CONTRACTOR SHALL VERIFY EXISTING GRADES AND STRUCTURE INFORMATION FOR ACCURACY PRIOR TO THE START OF GRADING. NOTIFY THE OWNER'S REPRESENTATIVE IMMEDIATELY SHOULD CONFLICTS ARISE. REDIRECT WORK TO AVOID DELAY.
4. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES, STRUCTURES AND SERVICES BEFORE COMMENCING THE WORK. THE LOCATIONS OF UTILITIES, STRUCTURES AND SERVICES SHOWN IN THE CONTRACT DOCUMENTS SHALL BE DEEMED TO BE APPROXIMATE ONLY. ALL DISCREPANCIES BETWEEN WHAT IS SHOWN AND THE ACTUAL FIELD CONDITIONS SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE. CONTRACTOR SHALL RECORD ALL UTILITY MARKINGS ON A SEPARATE SET OF DRAWINGS. THIS SET OF EXISTING UTILITY DRAWINGS SHALL BE KEPT ON-SITE FOR REFERENCE FOR THE DURATION OF THE PROJECT.
5. PROPOSED GRADES SHALL MEET EXISTING GRADES WITH A SMOOTH AND CONTINUOUS TRANSITION SO AS TO AVOID TRAPPING WATER. CONTRACTOR SHALL NOTIFY OWNER'S REPRESENTATIVE IF PUDDLING IS SUSPECTED AND REDIRECT WORK SO AS TO AVOID DELAY WHILE AWAITING RESPONSE.
6. REMOVE ALL VEGETATION, ORGANIC MATERIAL, BUILDING MATERIAL, DEMOLITION DEBRIS, AND ALL OTHER DELETERIOUS SUBSTANCES FROM THE AREA OF THE FILL. REMOVE ALL DEBRIS FROM THE SITE AND LEGALLY DISPOSE OFFSITE.
7. ARTIFICIAL TURF FIELD GRADING AND DRAINAGE ARE SHOWN FOR ILLUSTRATIVE AND COORDINATION PURPOSES BASED ON THE BASIS OF DESIGN PRODUCT. ARTIFICIAL TURF FIELD GRADING AND DRAINAGE TO BE PER MANUFACTURER'S INSTRUCTIONS. REFER MANUFACTURER'S CSI WRITTEN SPECIFICATIONS FOR GENERAL INFORMATION, PRODUCTS AND EXECUTION.
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SHEET TITLE

GRADING AND DRAINAGE PLAN

SHEET NUMBER

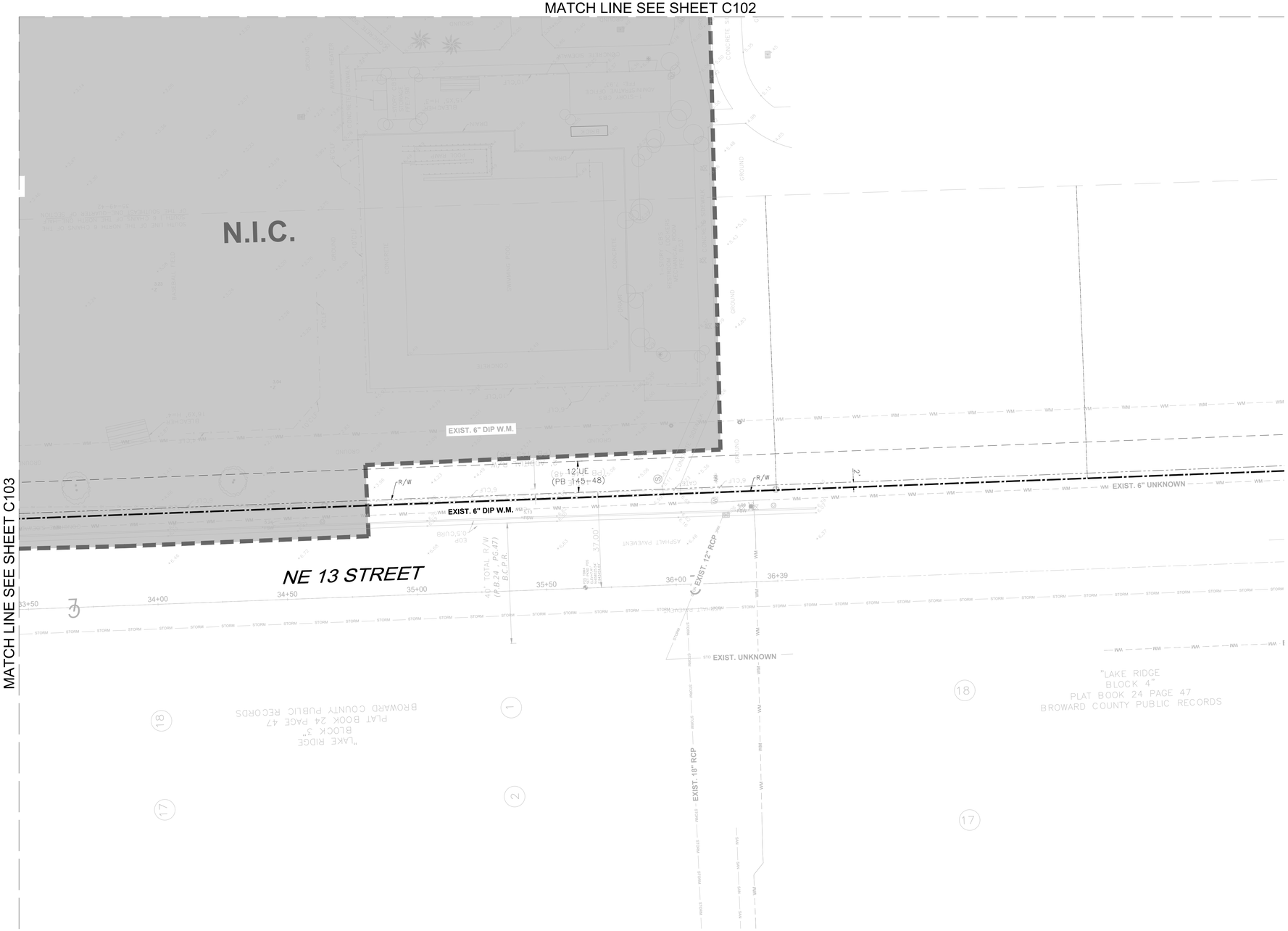
C103

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Project Management Initials: Designer:____ Checked:____ Approved:____ ANSI D 24" x 36"

Last saved by: JMANTILLA (2025-09-11) Last Plotted: 2025-09-16
Filename: H:\PROJECTS\1021220.00 CITY OF FORT LAUDERDALE PARK BOND\1021220.09 TO 29 SUNRISE MIDDLE\E9 - CAD\03 CAD\P12777-C-101-GRDGPLN.DWG

Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"



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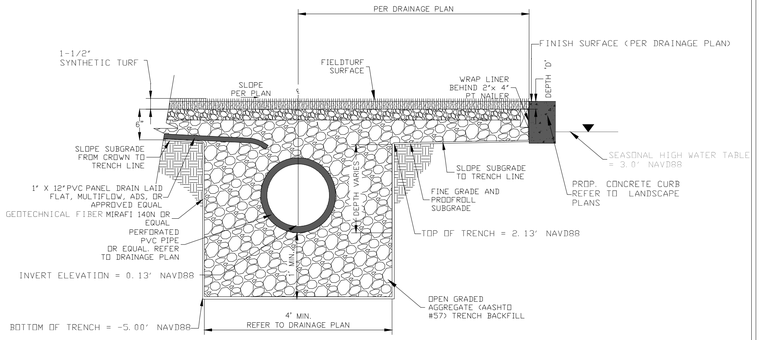
GRADING AND DRAINAGE PLAN

SHEET NUMBER

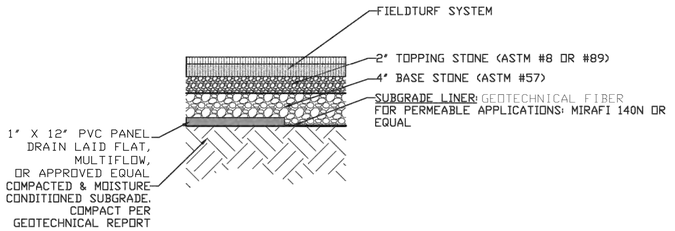
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Project Management Initials:____ Designer:____ Checked:____ Approved:____ ANSI D 24" x 36"
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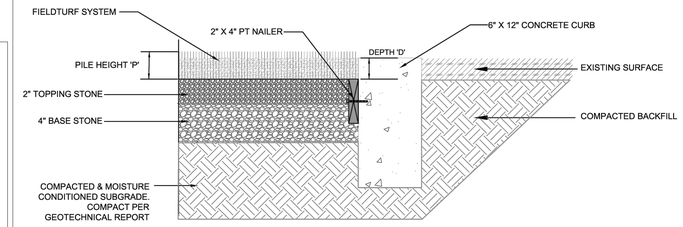
1 EXFILTRATION TRENCH
NTS



SELECT FILL:

1. SELECT FILL SHALL BE USCS CLASSIFICATION GW, GP, SW, OR SP. THE FINES CONTENT (% PASSING #200 SIEVE) SHALL NOT EXCEED 5%. ADDITIONALLY, THE SELECT FILL MATERIAL SHALL NOT CONTAIN ROCKS GREATER THAN 3" IN SIZE, ORGANIC MATERIAL, OR ANY DELETERIOUS SUBSTANCES.
2. AFTER REMOVAL OF THE EXISTING GRASS AND ORGANIC MATERIAL FROM THE SITE, AND PRIOR TO PLACEMENT OF THE SELECT FILL, THOROUGHLY SCARIFY THE EXISTING GROUND IN ORDER TO BREAK UP ANY OVER-COMPACTED AREAS.
3. SELECT FILL SHALL BE PLACED IN LIFTS NOT TO EXCEED 8", AND COMPACTED TO 90-92% STANDARD PROCTOR (ASTM D 698). WHERE COMPACTION EXCEEDS 92%, THOSE AREAS SHALL BE SCARIFIED TO A DEPTH OF 12" AND RECOMPACTED TO MEET THE SPECIFIED LIMITS.

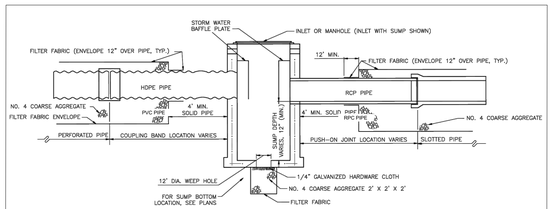
2 TYPICAL STONE BASE SECTION
NTS



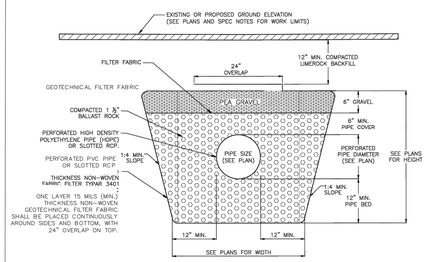
3 SYNTHETIC TURF EDGE DETAIL - 6" x 12" CURB
SCALE: NTS

FIELD DRAINAGE NOTES

1. AFTER EXCAVATION OF EXISTING SOIL TO THE PROPER ELEVATIONS REQUIRED THE NEW SUBGRADE WILL BE SHAPED AND COMPACTED TO DESIGNED DENSITY WITH A 0.5% SLOPE TO ALLOW FOR DRAINAGE.
2. A NEW CONCRETE CURB AND NAILER WILL BE INSTALLED AROUND THE PERIMETER TO PROVIDE A SECURE EDGE FOR FASTENING THE SYNTHETIC TURF.
3. A GEOTEXTILE FABRIC WILL BE PLACED OVER THE SUBGRADE, AND COMPOSITE DRAINS WILL BE INSTALLED AT 20 FEET ON CENTER AT A 45 DEGREE ANGLE TO THE FIELD. REFER TO THE FIELD DRAINAGE PLAN. (HERRINGBONE DESIGN)
4. THE COMPOSITE DRAINS WILL DRAIN TO A 12" (MIN) PERIMETER COLLECTOR WHICH WILL BE CONNECTED TO THE EXISTING DRAINAGE SYSTEM.
5. FREE DRAINING AGGREGATE SHALL BE PLACED OVER THE COMPOSITE DRAINS AND THE PERIMETER COLLECTORS AND FINE GRADED FOR A FIELD WITH A 0.5% SLOPE.



LONGITUDINAL CROSS SECTION

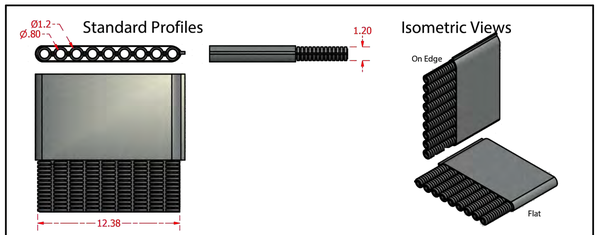


TRANSVERSE CROSS SECTION

NOTES:
1. CONTRACTOR MUST READ AND ABIDE THE CITY'S GENERAL CONSTRUCTION NOTES AND DRAINAGE DESIGN NOTES PRIOR TO STARTING CONSTRUCTION.
2. THE STANDARD CROSS SECTION SHALL BE CONSTRUCTED UNLESS OTHER SECTIONS ARE DESCRIBED OR DETAILED ON PLANS.
3. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PREVENT CONTAMINATION OF THE TRENCH WITH SAND, SILT AND FOREIGN MATERIALS.
4. THE 12" WEEP HOLE SHALL NOT BE USED IF THE BOTTOM OF THE INLET OR MANHOLE IS BELLOW THE NORMAL WATER TABLE, UNLESS OTHERWISE SHOWN ON PLANS.
5. FRENCH DRAINS MUST BE INSPECTED BY THE ENGINEERING INSPECTOR PRIOR TO CONTRACTOR BACKFILLING.

EXFILTRATION TRENCH SYSTEM D620

NOTE:
ALL DETAILS AND NOTES SHOWN ON THIS SHEET ARE RELATED TO THE CONSTRUCTION OF THE SYNTHETIC TURF FIELD, DETAILS ARE BASED ON THE BASIS-OF-DESIGN PRODUCT. THIS IS A DELEGATED DESIGN ITEM.
SYNTHETIC TURF SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. REFER TO MANUFACTURER'S WRITTEN CSI SPECIFICATIONS FOR GENERAL INFORMATION, PRODUCTS AND EXECUTION.



Multi-Flow Product Data Sheet - #12000 12" Multi-Flow Drain Pipe

Drainage Core

Property	Test Method	Value
Thickness, inches	ASTM D-1777	1.0
Flow Rate, gpm/ft *	ASTM D-4716	29
Compressive Strength, psf	ASTM D-1621 (sand method)	6000
Perforations / sq. ft.		>300
Standard Roll Length, ft.		150

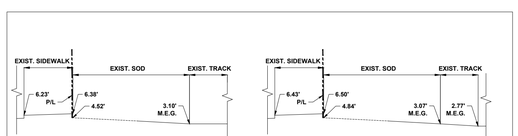
Geo-Textile Filter

Property	Test Method	Value
Weight (oz/sq2)	ASTM D-3776	4
Tensile Strength	ASTM D-4632	100
Elongation, %	ASTM D-4632	50
Puncture, lb	ASTM D-4833	50
Mullen Burst, psi	ASTM D-3786	200
Trapezoidal Tear, lb	ASTM D-4533	42
Coefficient of Perm, cm/s	ASTM D-4491	0.1
Flow Rate, gpm/ft2	ASTM D-4491	100
Permittivity, 1/sec	ASTM D-4491	1.8
A.O.S. Max US Std Sieve	ASTM D-4751	70
UV Stability,500 hrs, %	ASTM D-4355	70
Seam Strength, lb./ft.	ASTM D-4595	100
Fungus	ASTM G-21	No Growth

MULTIFLOW TITAN Proud Supplier
Manufactured by Varicore Technologies, Inc. - Prinsburg, MN 56281 - 800.978.8007
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US Patent Protect - 9483745856834

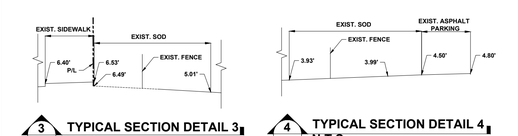
All values given represent minimum average roll values
** Horizontal Installation, gradient = 0.1, pressure = 10 psi for 100 hours*

4 MULTIFLOW DETAIL (AS SPECIFIED OR EQUAL)
NTS



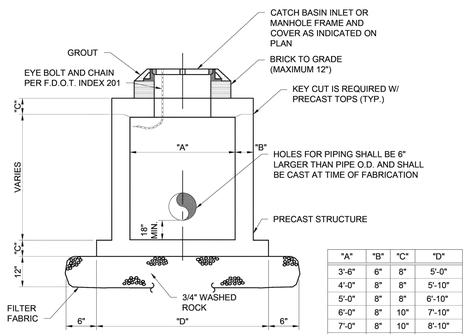
1 C103 TYPICAL SECTION DETAIL 1 N.T.S.

2 C101 TYPICAL SECTION DETAIL 2 N.T.S.



3 C101 TYPICAL SECTION DETAIL 3 N.T.S.

4 C102 TYPICAL SECTION DETAIL 4 N.T.S.

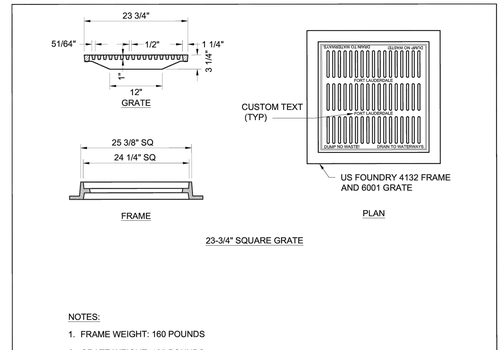


"A"	"B"	"C"	"D"
3'-6"	6"	8"	5'-0"
4'-0"	8"	8"	5'-10"
5'-0"	8"	8"	6'-10"
6'-0"	8"	10"	7'-10"
7'-0"	8"	10"	8'-10"
8'-0"	10"	10"	10'-2"

SECTION

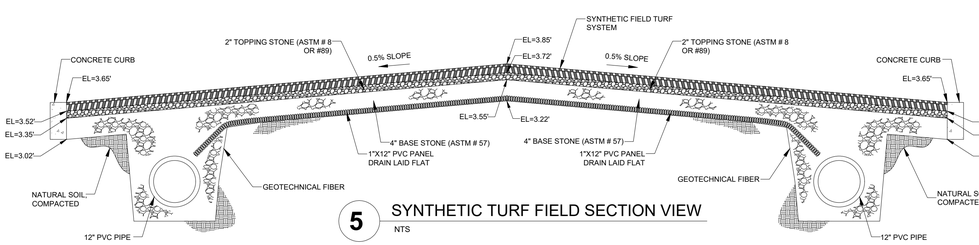
NOTES:
1. PRECAST STRUCTURE SHALL BE EITHER SQUARE OR ROUND AS INDICATED ON THE PLANS.
2. REINFORCING SHALL BE DESIGNED BY THE PRECAST MANUFACTURER TO COMPLY WITH FDOT INDEX 200.
3. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER'S REVIEW. SHOP DRAWINGS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF FLORIDA.
4. DESIGN STRUCTURE FOR H-20 TRUCK LOAD.
5. SHOP DRAWINGS SHALL INCLUDE CALCULATIONS DEMONSTRATING THAT STRUCTURE WILL RESIST FLOATION WHEN EMPTY AND SUBJECT TO GROUNDWATER TO TOP OF STRUCTURE.
6. CATCH BASINS SHALL HAVE USF 4155 FRAME AND 6209 GRATE.
7. MANHOLES SHALL HAVE USF 230 RING AND TYPE AA COVER WITH THE LETTERING "STORM SEWER" CAST IN THE COVER.

CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT ENGINEERING DETAILS 100 North Andrews Avenue, Fort Lauderdale, Florida 33301	PRECAST CIRCULAR & SQUARE DRAINAGE STRUCTURES	STRM. NO. STRM 009 REVISED 2017/07/14



NOTES:
1. FRAME WEIGHT: 160 POUNDS
2. GRATE WEIGHT: 125 POUNDS
3. LOAD RATING: AASHTO H-20
4. OPEN AREA: 153 SQUARE INCHES
5. INSTALL DRAIN MARKER

CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT ENGINEERING DETAILS 100 North Andrews Avenue, Fort Lauderdale, Florida 33301	ADA COMPLIANT CATCH BASIN FRAME AND GRATE 23" x 23"	STRM. NO. STRM 018 REVISED 2018/1/13



5 SYNTHETIC TURF FIELD SECTION VIEW
NTS

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REGISTRATION
ROBERTO LAMAZARES LICENSE No. 86416 STATE OF FLORIDA PROFESSIONAL ENGINEER

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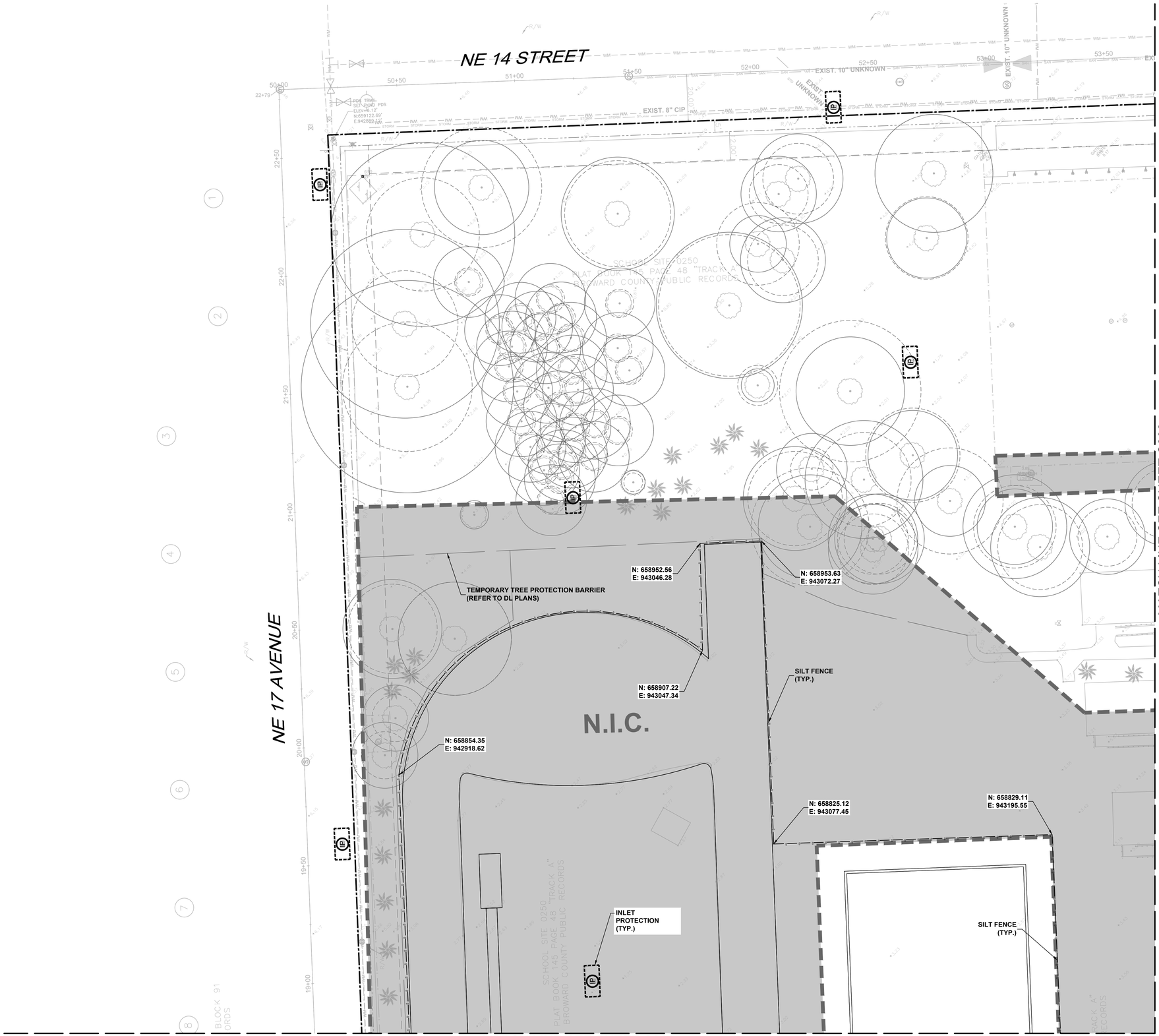
	09/16/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT
I/R	DATE	DESCRIPTION

PROJECT NUMBER
P12777

SHEET TITLE
GRADING AND DRAINAGE DETAILS

SHEET NUMBER
C105

Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"



LEGEND

- PROPERTY LINE
- RIGHT OF WAY LINE
- LIMIT OF WORK
- SILT FENCE
- IP — INLET PROTECTION
- TEMP. GRAVEL CONSTRUCTION ENTRANCE
- 6 FT HIGH WIND SCREEN
- TREE PROTECTION BARRIER (REFER TO LANDSCAPE PLANS)

NOTES:

1. **6 FT HIGH WIND SCREEN FENCE WITH SECTION LENGTHS OF 10 FT. FENCE TO BE MADE OF GALVANIZED STEEL CONSTRUCTION WITH BASE STANDS. SAND BAGS TO BE USED AS NEEDED.**

N

0 10' 20' 40' 60'
SCALE: 1" = 20'-0"

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P12777

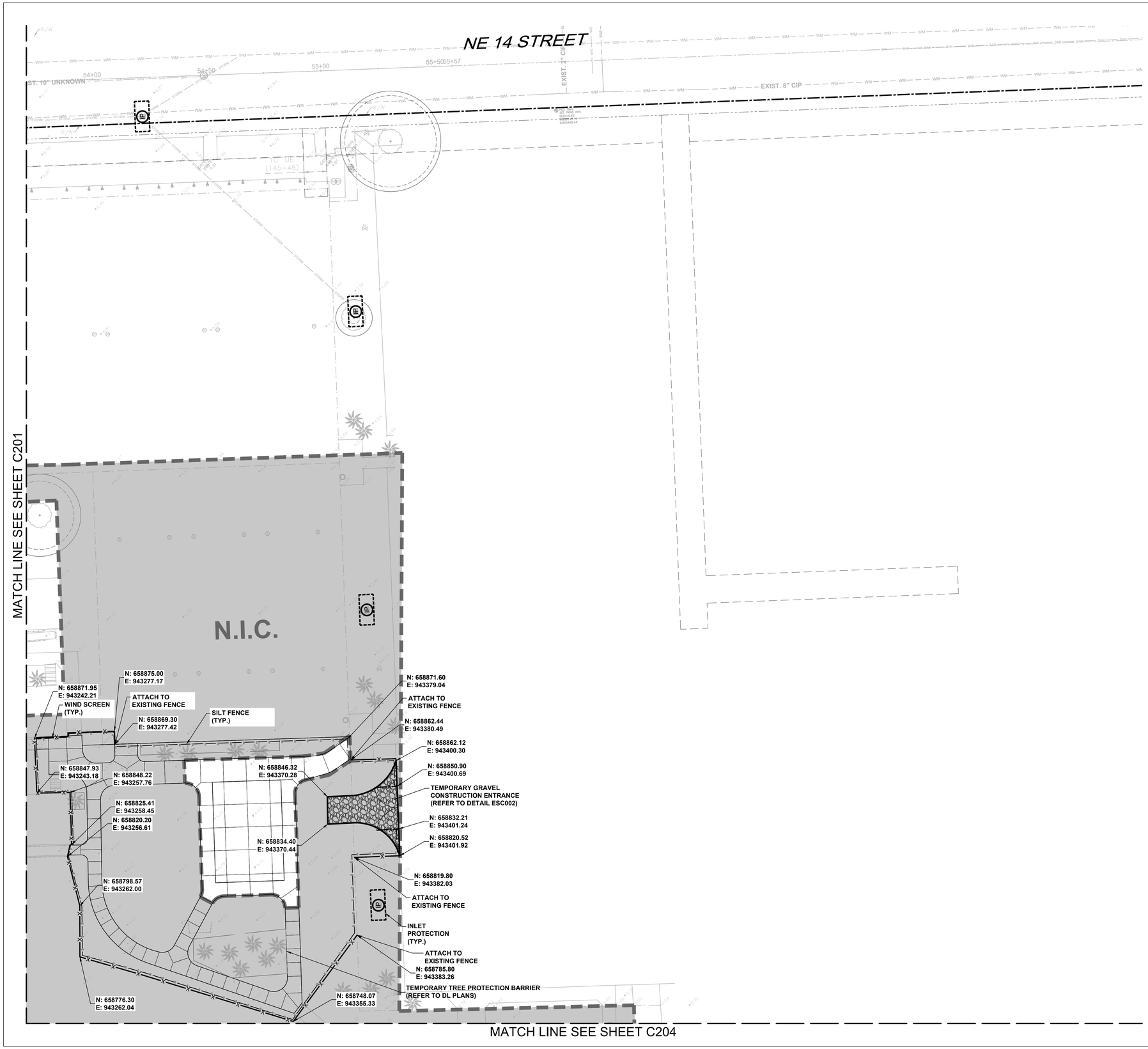
SHEET TITLE

EROSION CONTROL PLAN

SHEET NUMBER

C201

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LEGEND

- PROPERTY LINE
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- LIMIT OF WORK
- SILT FENCE
- IP — INLET PROTECTION
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- 6 FT HIGH WIND SCREEN
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SCALE: 1" = 20'-0"

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P12777

SHEET TITLE

EROSION CONTROL PLAN

SHEET NUMBER

C202

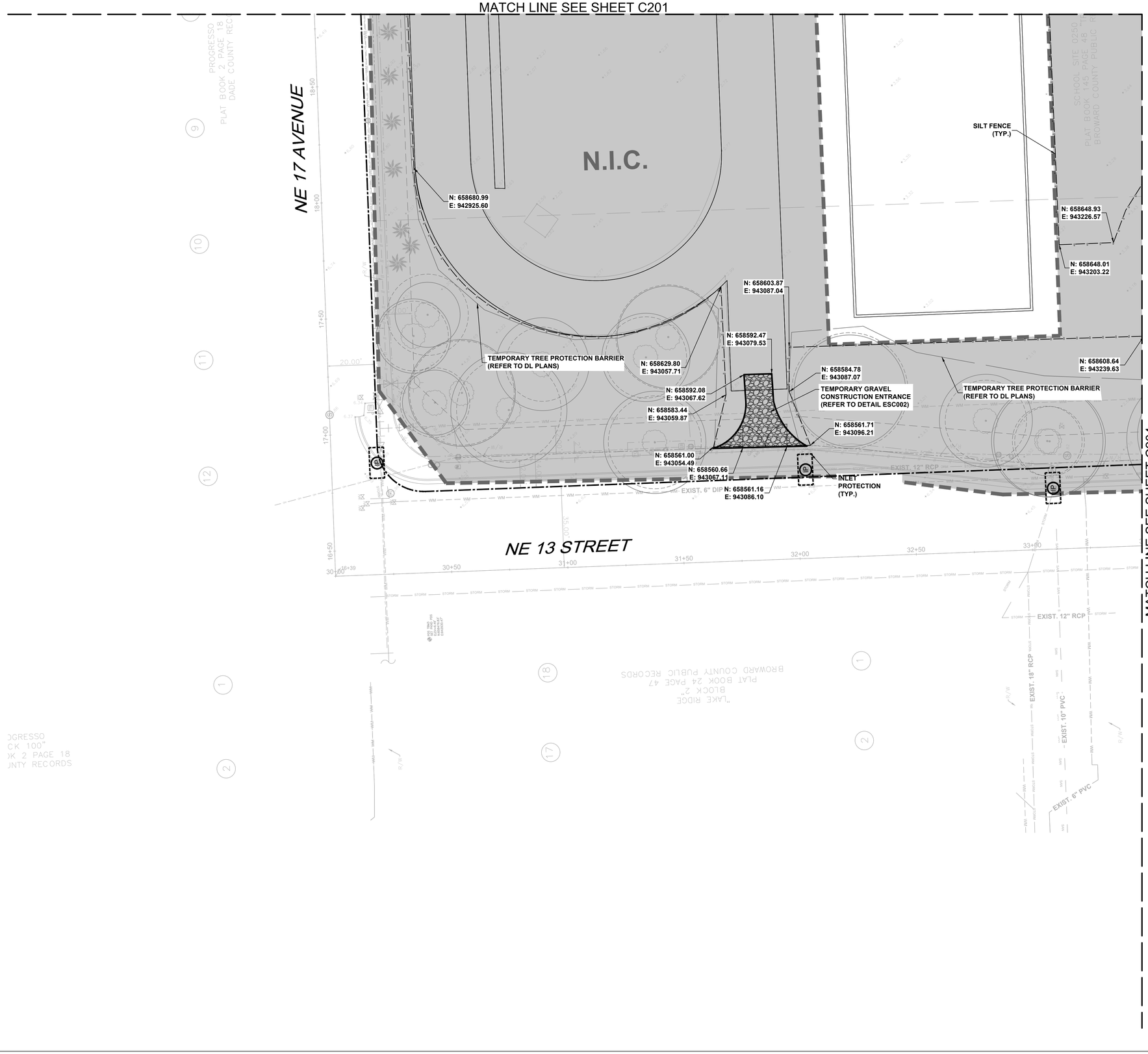
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FORT LAUDERDALE
PARKS BOND PROGRAM

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SUITE 700
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STATE OF FLORIDA
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PROJECT NUMBER

P12777

SHEET TITLE

EROSION CONTROL PLAN

SHEET NUMBER

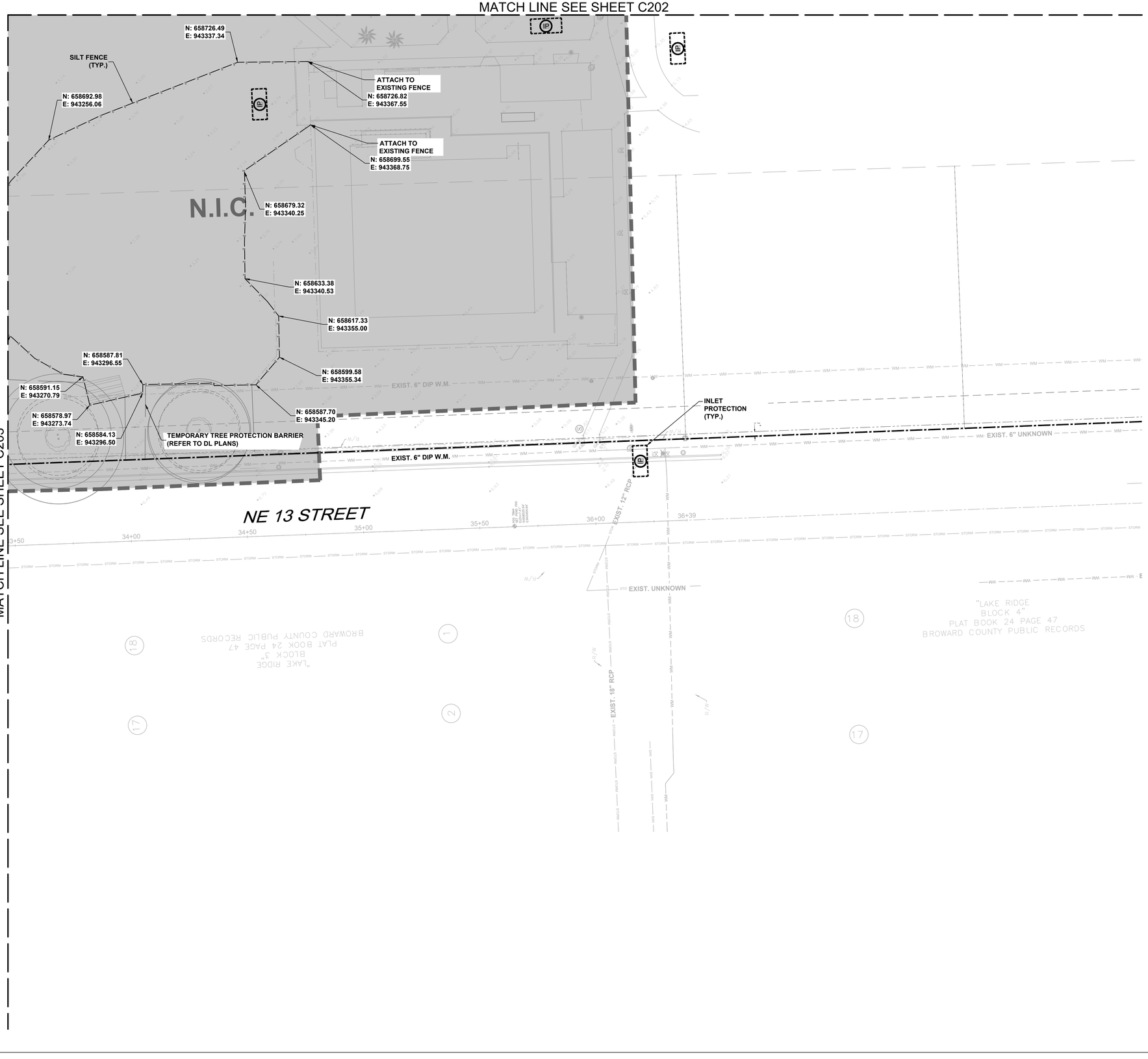
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Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"



LEGEND

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SHEET TITLE

EROSION CONTROL PLAN

SHEET NUMBER

C204

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Project Management Initials: Designer:_____ Checked:_____ Approved:_____ ANSI D 24" x 36"

ESC001 - EROSION AND SEDIMENT CONTROL NOTES Saturday, July 08, 2017

EROSION AND SEDIMENT CONTROL:

1. CONTRACTOR TO EMPLOY BEST MANAGEMENT PRACTICES THROUGHOUT CONSTRUCTION IN ORDER TO ENSURE POLLUTION PREVENTION. CONTRACTOR TO COMPLY WITH ALL LOCAL STATE AND OTHER GOVERNMENTAL ENVIRONMENTAL REGULATIONS THROUGHOUT CONSTRUCTION.
2. DURING CONSTRUCTION ALL CATCH BASIN INLETS SHALL BE PROTECTED TO PREVENT SEDIMENT AND DEBRIS FROM ENTERING THE CATCH BASIN.
3. SILT FENCES SHALL BE INSTALLED AS NECESSARY TO CONTROL OR PREVENT DISCHARGE OF SEDIMENT ONTO ADJACENT UNDISTURBED AREAS, OR OFF-SITE AREAS.
4. ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE STABILIZED WITHIN A REASONABLE PERIOD OF TIME TO ASSURE MINIMUM EROSION OF SOILS.
5. NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL ALL EROSION CONTROL MEASURES HAVE BEEN INSTALLED.
6. ALL EXPOSED AREAS SHALL BE SODDED AS SPECIFIED WITHIN 30 DAYS OF FINAL GRADING.
7. MAINTAIN EROSION CONTROL MEASURES AFTER EACH RAIN AND AT LEAST ONCE A WEEK.
8. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT SOIL SEDIMENT FROM LEAVING THE SITE.
9. CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL ORDINANCES THAT APPLY.
10. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSTALLED IF DEEMED NECESSARY BY CITY, COUNTY, AND STATE OF FLORIDA ON SITE INSPECTION, AT NO ADDITIONAL COST TO THE OWNER.
11. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY GOVERNING AUTHORITIES.
12. IF INSTALLATION OF STORM DRAINAGE SYSTEM SHOULD BE INTERRUPTED BY WEATHER OR NIGHTFALL, THE PIPE ENDS SHALL BE COVERED WITH FILTER FABRIC.
13. BURNING OF DEBRIS WILL NOT BE ALLOWED.
14. CONTRACTOR SHALL BE RESPONSIBLE TO TAKE WHATEVER MEANS NECESSARY TO ESTABLISH PERMANENT SOIL STABILIZATION.
15. CONTRACTOR IS TO PROVIDE EROSION CONTROL/SEDIMENTATION BARRIER (HAY BALES OR SILTATION CURTAIN) TO PREVENT SILTATION OF ADJACENT PROPERTY, STREETS, STORM SEWERS AND WATER WAYS. IN ADDITION CONTRACTOR SHALL PLACE STRAW, MULCH OR OTHER SUITABLE MATERIAL ON GROUND IN AREAS WHERE CONSTRUCTION RELATED TRAFFIC IS TO ENTER AND EXIT SITE IF IN THE OPINION OF THE ENGINEER AND/OR LOCAL AUTHORITIES IF EXCESSIVE QUANTITIES OF EARTH ARE TRANSPORTED OFF-SITE EITHER BY NATURAL DRAINAGE OR BY VEHICULAR TRAFFIC. THE CONTRACTOR IS TO REMOVE AND CLEAN SAID EARTH TO THE SATISFACTION OF THE ENGINEER AND/OR AUTHORITIES. EROSION CONTROL BARRIER SHALL BE ESTABLISHED AS THE FIRST ITEM OF WORK.

CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT ENGINEERING DETAILS — 100 North Andrews Avenue, Fort Lauderdale, Florida 33301

EROSION AND SEDIMENT CONTROL NOTES SHEET 1

DETAIL NO. ESC 001 — REVISED 2017/07/08

ESC001 - EROSION AND SEDIMENT CONTROL NOTES Saturday, July 08, 2017

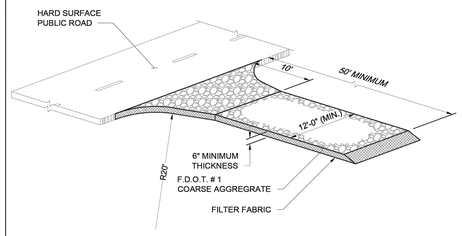
16. THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION'S STORMWATER PERMITTING PROGRAM APPLIES TO ALL CONSTRUCTION ACTIVITY THAT: 1) CONTRIBUTE STORMWATER DISCHARGES TO SURFACE WATER OF THE STATE OR INTO A MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4); 2) DISTURBS ONE OR MORE ACRES OF LAND; OR 3) LESS THAN ONE ACRE IS INCLUDED IF THE ACTIVITY IS PART OF A LARGER COMMON PLAN OF DEVELOPMENT THAT WILL MEET OR EXCEED THE ONCE ACRE THRESHOLD. DISTURB INCLUDES CLEARING, GRADING AND EXCAVATING.
17. FOR CONSTRUCTION ACTIVITY THAT IS SUBJECT TO THE NPDES FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION'S STORMWATER PERMITTING PROGRAM, THE CONTRACTOR SHALL:
    - 17.1. OBTAIN A GENERIC PERMIT FOR STORMWATER DISCHARGE FROM LARGE AND SMALL CONSTRUCTION ACTIVITIES FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION DOCUMENT 62-621.300(4)(A).
    - 17.2. COMPLY WITH ALL REQUIREMENTS OF THE GENERIC PERMIT.
    - 17.3. DEVELOP AND IMPLEMENT A STORMWATER POLLUTION PREVENTION PLAN (SWPPP).
    - 17.4. COMPLETE A NOTICE OF INTENT (NOI) FLORIDA DEPARTMENT OF ENVIORNMENTAL PROTECTION FORM 62-621.300(4)(B) IN ITS ENTIRETY USING THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION'S WEBSITE.
18. SUBMIT COPIES OF THE SWPPP AND THE NOI TO THE ENGINEER AS INFORMATIONAL RECORDS. THESE SUBMITTALS WILL NOT BE REVIEWED BY THE ENGINEER.
19. CONTRACTOR TO CLEAN AND REPAIR ALL EXISTING STORMWATER INFRASTRUCTURE THAT IS IMPACTED BY CONSTRUCTION ACTIVITIES, BEFORE LEAVING THE JOBSITE.
20. CONTRACTOR TO REMOVE ALL FILTER FABRIC AND POLLUTION PREVENTION ITEMS BEFORE THE FINAL WALK-THROUGH.

CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT ENGINEERING DETAILS — 100 North Andrews Avenue, Fort Lauderdale, Florida 33301

EROSION AND SEDIMENT CONTROL NOTES SHEET 2

DETAIL NO. ESC 002 — REVISED 2017/07/08

ESC002 - GRAVEL CONSTRUCTION ENTRANCE Tuesday, July 11, 2017



NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABLIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT ENGINEERING DETAILS — 100 North Andrews Avenue, Fort Lauderdale, Florida 33301

GRAVEL CONSTRUCTION ENTRANCE

DETAIL NO. ESC 003 — REVISED 2017/07/08

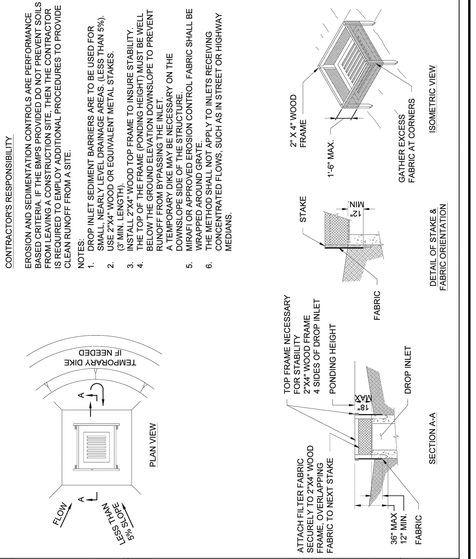
ESC004 - DROP INLET PROTECTION - SEDIMENT BARRIER Saturday, September 05, 2015

CONTRACTOR'S RESPONSIBILITY:

EROSION AND SEDIMENTATION CONTROLS ARE PERFORMANCE BASED CRITERIA. IF THE BMPS PROVIDED DO NOT PREVENT SOILS FROM LEAVING A CONSTRUCTION SITE, THEN THE CONTRACTOR IS RESPONSIBLE FOR ADDITIONAL PROCEDURES TO PROVIDE CLEAN RUNOFF FROM A SITE.

NOTES:

1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL DRAINAGE AREAS (DRAINAGE AREAS LESS THAN 5%).
2. USE 2"x4" WOOD OR EQUIVALENT METAL STAKES (3' MIN. LENGTH).
3. THE TOP OF THE WOOD TOP FRAME TO INSURE STABILITY.
4. THE TOP OF THE FRAME (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWNSLOPE TO PREVENT RUNOFF FROM BYPASSING THE INLET.
5. MIRAFI OR APPROVED EROSION CONTROL FABRIC SHALL BE PLACED ON THE DOWNSLOPE SIDE OF THE STRUCTURE.
6. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.

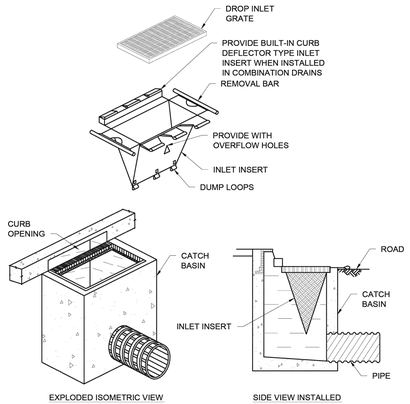


CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT ENGINEERING DETAILS — 100 North Andrews Avenue, Fort Lauderdale, Florida 33301

DROP INLET PROTECTION - SEDIMENT BARRIER

DETAIL NO. ESC 004 — REVISED 2016/09/21

ESC005 - DROP INLET PROTECTION - INLET INSERT Wednesday, July 12, 2017



NOTES:

1. THE INLET INSERT SHALL BE A SEDIMENT CONTROL DEVICE DESIGNED FOR DROP INLETS OR COMBINATION DRAINS WHERE A DROP INLET IS COUPLED WITH A CURB INLET.
2. THE INLET INSERT SHALL BE MADE OF A PERMEABLE GEOTEXTILE THAT ALLOWS WATER TO PASS BUT PREVENTS SILT AND SEDIMENT FROM CLOGGING THE DRAIN SYSTEM.
3. THE CONTRACTOR SHALL CLEAN AND INSPECT REGULARLY AND AFTER EVERY MAJOR RAIN EVENT.
4. INLET INSERTS SHALL BE "SILTSACK" BY ACF ENVIRONMENTAL, OR EQUAL. SUBMIT SHOP DRAWINGS IN ACCORDANCE WITH THE SPECIFICATIONS.

CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT ENGINEERING DETAILS — 100 North Andrews Avenue, Fort Lauderdale, Florida 33301

DROP INLET PROTECTION - INLET INSERT

DETAIL NO. ESC 005 — REVISED 2017/07/12

ESC009 - SILT FENCE - SHEET 1 Wednesday, July 12, 2017

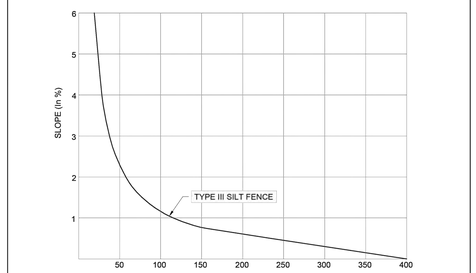
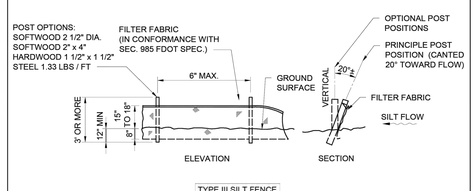


CHART 1: SILT FENCE SPACING



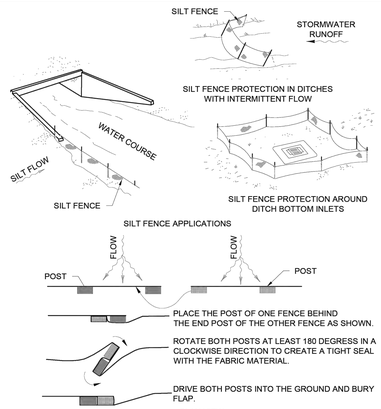
TYPE III SILT FENCE

CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT ENGINEERING DETAILS — 100 North Andrews Avenue, Fort Lauderdale, Florida 33301

SILT FENCE - SHEET 1

DETAIL NO. ESC 009 — REVISED 2017/07/12

ESC010 - SILT FENCE - SHEET 2 Tuesday, July 11, 2017



JOINING TWO SILT FENCES

NOTES:

1. WHERE USED IN DITCHES, THE SPACING FOR TYPE III SILT FENCE SHALL BE IN ACCORDANCE WITH CHART 1.
2. DO NOT CONSTRUCT SILT FENCES ACROSS PERMANENT FLOWING WATERCOURSES. SILT FENCES ARE TO BE AT UPLAND LOCATIONS AND TURBIDITY BARRIERS USED AT PERMANENT BODIES OF WATER.
3. WHERE USED AS SLOPE PROTECTION , SILT FENCE IS TO BE CONSTRUCTED ON 0% LONGITUDINAL GRADE TO AVOID CHANNELIZING RUNOFF ALONG THE LENGTH OF THE FENCE.

CITY OF FORT LAUDERDALE PUBLIC WORKS DEPARTMENT ENGINEERING DETAILS — 100 North Andrews Avenue, Fort Lauderdale, Florida 33301

SILT FENCE - SHEET 2

DETAIL NO. ESC 010 — REVISED 2017/07/11

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Filename: H:\PROJECTS\102\220.00 CITY OF FORT LAUDERDALE PARK BOND\102220.09 TO 29 SUNRISE MIDDLE\8 - CAD\03 CAD\P12777-C-307-EROSION DETAILS.DWG

AECOM

PROJECT

SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT

PARKS & RECREATION
City of Fort Lauderdale

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AECOM
7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
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ROBERT O LAMAZARES LICENSE No. 86416 STATE OF FLORIDA PROFESSIONAL ENGINEER

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ISSUE/REVISION

	09/16/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

P12777

SHEET TITLE

EROSION CONTROL DETAILS

SHEET NUMBER

C205

COORDINATE WITH AECOM ON LATEST ISSUE OF DRAWINGS BEFORE COMMENCEMENT OF CONSTRUCTION
NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

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Project Management Initials:_____ Designer:_____ Checked:_____ Approved:_____ ANSI D 24" x 36"

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SITE / LANDSCAPE GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN CONFORMANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL CODES AND ORDINANCES. ALL WORK SHALL BE IN CONFORMANCE WITH LOCAL ADMINISTRATIVE CODE, AND AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES.
2. CONTRACTOR TO NOTIFY THE OWNER OF ANY VIOLATION OF LOCAL, STATE OR FEDERAL CODES AND ORDINANCES.
3. EXISTING VEGETATION BEYOND THE LIMIT OF WORK LINE IS TO REMAIN AND MAY NOT BE REMOVED, DAMAGED OR DISTURBED. PRIOR TO THE START OF ALL CONSTRUCTION ACTIVITIES, INSTALL TREE PROTECTION AS INDICATED IN DRAWINGS TO PROTECT EXISTING TREES TO REMAIN.
4. NO CONSTRUCTION ACTIVITIES MAY OCCUR BEYOND THE LIMIT OF WORK LINE, TREE PROTECTION FENCING OR EROSION FENCING, INCLUDING THE PARKING OF EQUIPMENT, STORAGE OF MATERIALS, CLEAN-OUT, RINSING OF TOOLS OR EQUIPMENT, OR ANY OTHER CONSTRUCTION ACTIVITY. THIS PROHIBITION IS TO PREVENT THE COMPACTION OR CONTAMINATION OF SOIL AS WELL AS DAMAGE TO PLANTS. TREES TO BE REMOVED WITHIN THE LIMIT OF WORK MAY NOT BE DROPPED BEYOND THE LIMIT OF WORK INTO THE AREA OF EXISTING VEGETATION TO REMAIN. CARE SHOULD BE TAKEN TO PROTECT EXISTING TREES TO REMAIN AND ALL VEGETATION BEHIND THE LIMIT OF WORK LINE.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION, REPAIR, AND REPLACEMENT IN-KIND OF EXISTING LANDSCAPING, MATERIALS, UTILITIES OR STRUCTURES THAT ARE DAMAGED DURING CONSTRUCTION THAT WERE INDICATED TO REMAIN OR LOGICALLY EXPECTED TO REMAIN IN PLACE, AT NO ADDITIONAL COST TO THE OWNER.
6. PROTECT AND IMMEDIATELY REPAIR AT CONTRACTOR'S EXPENSE ANY CONSTRUCTION DAMAGE TO EXISTING IRRIGATION SYSTEMS INCLUDING CONTROL WIRES. REPLACE DAMAGED COMPONENTS WITH THE SAME MODEL AND MANUFACTURER AS ORIGINAL EQUIPMENT. IF REPLACEMENT EQUIPMENT IS NOT AVAILABLE, OBTAIN OWNER'S APPROVAL FOR REPLACEMENT EQUIPMENT BEFORE ORDERING OR INSTALLING. USE SCHEDULE 40 PVC TO REPAIR OR REPLACE DAMAGED PIPES.
7. VERIFY PROPERTY, EASEMENT, WETLANDS, AND LIMIT OF WORK LINES WITH OWNER'S REPRESENTATIVE PRIOR TO COMMENCING WORK.
8. NOT ALL SITE WORK IS SHOWN ON THE L-SERIES DRAWINGS. REVIEW ALL DRAWINGS THAT ILLUSTRATE THE SITE FOR OTHER WORK THAT MAY IMPACT THIS WORK BY LOCATION, DEPTH, OR TIMING OF INSTALLATION. THESE DRAWINGS SHOULD INCLUDE CIVIL, ARCHITECTURAL, ELECTRICAL AND LIGHTING, STRUCTURAL, PLUMBING, MECHANICAL, COMMUNICATION, AND WAYFINDING AT A MINIMUM.
9. NOTIFY LANDSCAPE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES FOUND IN PLANS AND ANY CONFLICTS ENCOUNTERED IN THE FIELD PRIOR TO PROCEEDING WITH CONSTRUCTION. CONTRACTOR SHALL NOT PROCEED WITH CONSTRUCTION AS DESIGNED WHEN IT IS OBVIOUS THAT UNKNOWN OBSTRUCTIONS, AREA DISCREPANCIES, AND/OR GRADE DIFFERENCES EXIST THAT MAY NOT HAVE BEEN KNOWN DURING DESIGN. SUCH CONDITIONS SHALL BE BROUGHT IMMEDIATELY IN WRITING TO THE ATTENTION OF THE LANDSCAPE ARCHITECT AND OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL NOT PROCEED UNTIL UNACCEPTABLE CONDITIONS HAVE BEEN CORRECTED TO THE SATISFACTION OF OWNER'S REPRESENTATIVE. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ANY COSTS, CONSTRUCTION DELAYS, OR REVISIONS DUE TO FAILURE TO GIVE SUCH NOTIFICATIONS.
10. MINOR CHANGES IN LAYOUT MAY BE REQUIRED TO ACCOMMODATE DESIGN INTENT OR FIELD CONDITIONS. NO ADDITIONAL PAYMENT WILL BE MADE TO THE CONTRACTOR FOR THIS WORK. CHANGES TO BE APPROVED BY LANDSCAPE ARCHITECT THROUGH A REQUEST FOR INFORMATION (RFI) PRIOR TO COMMENCING WORK. DOCUMENT CHANGES WITHIN AS-BUILTS.
11. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF AND WITH SUBCONTRACTORS AND OTHER TRADES AS REQUIRED TO ACCOMPLISH CONSTRUCTION OPERATIONS.
12. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES IN THE FIELD AND SHALL NOTIFY LANDSCAPE ARCHITECT OF ANY CONFLICTS BETWEEN UTILITIES AND INSTALLATION OF PROPOSED SITE OR LANDSCAPE FEATURES.
13. VERIFY ALL DIMENSIONS, GRADES AND CONDITIONS PRIOR TO COMMENCING WORK. NOTIFY LANDSCAPE ARCHITECT AND OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES OR IF THERE IS A CONFLICT WITH LAYOUT IN THE FIELD.
14. DO NOT SCALE THESE DRAWINGS OR MEASURE FROM THESE DRAWINGS. WRITTEN DIMENSIONS TAKE PRECEDENCE. CONTRACTOR SHALL IMMEDIATELY NOTIFY LANDSCAPE ARCHITECT OF DISCREPANCIES.
15. DIMENSIONS SHOWN ARE FROM BACK OF CURB, FACE OF WALL, OUTSIDE EDGE OF PAVING, NOTED CENTERLINES, AND THE LIKE UNLESS OTHERWISE NOTED ON PLANS.
16. ALL CURVES TO BE TRUE TANGENT RADII WITHOUT STRAIGHT SEGMENTS, SMOOTH, CONTINUOUS AND TANGENTIAL, WITH NO ABRUPT CHANGES IN DIRECTION.
17. QUANTITIES REFERENCED IN PLANS ARE SHOWN AS A COURTESY ONLY. QUANTITIES SHOWN GRAPHICALLY IN THE DRAWINGS TAKE PRECEDENCE OVER QUANTITIES LISTED IN TABLES. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES.
18. FOLLOW MANUFACTURER'S WRITTEN RECOMMENDATIONS FOR INSTALLATION FOR ALL ITEMS UNLESS SPECIFICALLY STATED OTHERWISE ON DRAWINGS.
19. ALL TESTING AND INSPECTIONS ASSOCIATED WITH INSTALLATION OF SITE IMPROVEMENTS ARE INCLUDED IN THE CONTRACTOR'S SCOPE OF WORK AT NO ADDITIONAL COST TO OWNER. SUCH TESTING AND INSPECTIONS INCLUDE BUT ARE NOT LIMITED TO CONCRETE, PLAYGROUND SURFACING, AND PLAY, FITNESS AND SPORTING EQUIPMENT AND STRUCTURES.
20. PROVIDE A ±6'X6' MOCK-UP OF EXPOSED AGGREGATE CONCRETE INCLUSIVE OF EXPANSION AND SAW CUT SCORE JOINTS WHEN SUCH PAVEMENT IS INDICATED. MOCKUPS CAN BE USED AS PART OF THE FINAL WORK UPON APPROVAL IF PROTECTED FOR THE DURATION OF THE CONSTRUCTION PERIOD.
21. COORDINATE ALL SHOP DRAWINGS REQUIRED AS PART OF SITE IMPROVEMENTS WITH ALL ASSOCIATED DISCIPLINES AND CONDITIONS. DRAWINGS SHALL SHOW ADJACENT INFORMATION THAT WILL GIVE CLEAR INDICATION OF THE INTERFACE TO STRUCTURES, UTILITIES, PROPERTY LINES AND EASEMENTS, AND ANY OTHER NECESSARY INFORMATION.
22. WRITTEN SPECIFICATIONS ARE PART OF THE CONSTRUCTION DOCUMENTATION PACKAGE. SPECIFICATIONS INCLUDE FDOT (FLORIDA DEPARTMENT OF TRANSPORTATION) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION CURRENT AT THE TIME CONTRACT IS AWARDED, AND MANUFACTURER'S WRITTEN CSI SPECIFICATIONS FOR BASIS-OF-DESIGN PRODUCTS INCLUDED IN DRAWINGS.

SODDING GENERAL NOTES

1. PROTECT ADJACENT TURF AND PLANTING AREAS FROM SOIL COMPACTION AND DAMAGE TO TURF AND PLANTS. PROMPTLY REPAIR DAMAGE TO ADJACENT TURF AND PLANTING AREAS.
2. RESTORE TO ORIGINAL CONDITION ANY AREAS DISTURBED BY CONSTRUCTION THAT ARE NOT DOCUMENTED TO RECEIVE PLANTINGS PER PLANTING PLANS. THIS IS INCLUSIVE OF IRRIGATION, FINAL GRADING, TOPSOIL AND VEGETATION UNLESS OTHERWISE NOTED.
3. SOD (GRASS) DAMAGED BY THE CONTRACTOR SHALL BE REPLACED BY CONTRACTOR AT THE CONTRACTOR'S EXPENSE. IN NON-IRRIGATED AREAS REPLACE DAMAGED SOD WITH BAHIA *(PASPALUM NOTATUM)* SOD. IN AREAS TO BE IRRIGATED REPLACE DAMAGED SOD WITH ST. AUGUSTINE (*STENOTAPHRUM SECUNDATUM*).
4. SOD TYPE SHALL BE BAHIA (*PASPALUM NOTATUM)* FOR NON-IRRIGATED AREAS, AND ST. AUGUSTINE (*STENOTAPHRUM SECUNDATUM*) FOR IRRIGATED AREAS, UNLESS OTHERWISE INDICATED IN DRAWINGS AND SHALL BE WELL MATTED WITH ROOTS. THE SOD SHALL BE TAKEN UP IN RECTANGLES, PREFERABLY 12" X 24" AND SHALL BE LIVE, FRESH AND UNINJURED AT THE TIME OF PLANTING. SOD SHALL BE REASONABLY FREE OF WEEDS AND OTHER GRASS AND SHALL HAVE A SOIL MAT OF SUFFICIENT THICKNESS ADHERING FIRMLY TO THE ROOTS TO WITHSTAND ALL NECESSARY HANDLING. KEEP THE SOD SHADED AND MOIST UNTIL IT IS PLANTED. DUMPING FROM VEHICLES WILL NOT BE PERMITTED. DAMAGED SOD WILL BE REJECTED. REPLANT WITHIN 48 HOURS AFTER TIME OF HARVESTING OR KEEP SOD DAMP UNTIL PLANTED.
5. SODDING SEQUENCE SCHEDULE:
   a. CORRECT SOFT SPOTS AND INEQUITIES IN GRADE BEFORE BEGINNING SOD WORK.
   b. GROUND SHALL BE SUFFICIENTLY MOIST PRIOR TO LAYING OF SOD. CONTRACTOR SHALL WATER AS NEEDED PRIOR TO LAYING SOD.
   c. PLACE SOD WITH STAGGERED JOINTS CLOSELY BUTTED. TAMP OR ROLL TO AN EVEN SURFACE TO THE REQUIRED FINISHED GRADE. AVOID CONTINUOUS SEAMS ALONG WATER FLOW LINE IN SWALES. PLACE SOD IN ROWS AT RIGHT ANGLES TO SLOPE.
   d. FERTILIZE WITH A SLOW-RELEASE FERTILIZER. SUBMIT FERTILIZER GUARANTEED ANALYSIS AND APPLICATION RATES TO THE LANDSCAPE ARCHITECT PRIOR TO APPLICATION. FERTILIZER SHALL NOT BE APPLIED BETWEEN JUNE 1 AND SEPTEMBER 30 IN COMPLIANCE WITH CITY OF FT. LAUDERDALE FERTILIZER ORDINANCE.
   e. SATURATE SOD WITH FINE WATER SPRAY WITHIN 2 HOURS OF PLANTING. WATER DAILY FOR FIRST WEEK AFTER PLANTING AS NECESSARY TO MAINTAIN MOIST SOIL 1.5 INCHES BELOW SOD.
   f. SOD ALL AREAS WITHIN 5 FEET OF ANY PROPOSED PAVEMENT, STRUCTURE, PATH, INLET OR SIMILAR HARDSCAPE. TRANSITION SOD TO BE LEVEL WITH ADJACENT TURF AND PLANTING AREAS.
   g. PLANT SOD DURING WEATHER CONDITIONS BENEFICIAL TO OPTIMUM ESTABLISHMENT RESULTS.
6. WATER, FERTILIZE, WEED, MOVE, TRIM, REPLANT AS REQUIRED TO MAINTAIN AND ESTABLISH WELL-ROOTED, EVENLY COLORED TURF FREE OF WEEDS AND PESTS. MOW TO A HEIGHT OF 2 TO 3 INCHES, CUTTING NO MORE THAN ONE THIRD OF GRASS HEIGHT. MAINTAIN FROM TIME OF INITIAL PLANTING UNTIL 90 DAYS AFTER FINAL ACCEPTANCE BY THE OWNER.

SITE FURNISHINGS GENERAL NOTES

1. QUALITY ASSURANCE:
   a. MANUFACTURER QUALIFICATIONS: MINIMUM OF 10 YEARS EXPERIENCE MANUFACTURING SITE FURNISHINGS. A FIRM EXPERIENCED IN MANUFACTURING SITE FURNISHINGS SIMILAR TO THOSE REQUIRED FOR THIS PROJECT AND WITH A RECORD OF SUCCESSFUL IN-SERVICE PERFORMANCE.
   b. INSTALLER QUALIFICATIONS: MINIMUM OF 5 YEARS EXPERIENCE ASSEMBLING AND INSTALLING SITE FURNISHINGS. AN EXPERIENCED INSTALLER WHO HAS COMPLETED INSTALLATION OF SITE FURNISHINGS SIMILAR IN MATERIAL, DESIGN, AND EXTENT TO THOSE INDICATED FOR THIS PROJECT AND WHOSE WORK HAS RESULTED IN CONSTRUCTION WITH A RECORD OF SUCCESSFUL IN-SERVICE PERFORMANCE.
   c. SOURCE LIMITATIONS: OBTAIN EACH COLOR, FINISH, SHAPE AND TYPE OF SITE FURNITURE FROM A SINGLE SOURCE WITH RESOURCES TO PROVIDE COMPONENTS OF CONSISTENT QUALITY IN APPEARANCE AND PHYSICAL PROPERTIES.
   d. WARRANTY: ALL SITE FURNISHINGS SHALL CARRY A MINIMUM ONE-YEAR MANUFACTURER'S LIMITED WARRANTY AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP. POWDER COATED SITE FURNISHINGS SHALL CARRY A FIVE-YEAR WARRANTY. THE WARRANTY PERIOD BEGINS ON THE DATE OF FINAL ACCEPTANCE BY THE OWNER.
2. BASIS-OF-DESIGN PRODUCT: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT INDICATED IN DRAWINGS OR COMPARABLE PRODUCT OF SIMILAR DESIGN AND EQUAL QUALITY.
3. SITE FURNISHINGS SHALL INCLUDE POST-CONSUMER, LONG-LASTING AND RECYCLABLE MATERIALS WHERE APPROPRIATE AND AS INDICATED IN DRAWINGS.
4. METAL FINISHES SHALL BE FROM MANUFACTURER'S STANDARD. PROVIDE FINISHES FOR HIGH-SALT ENVIRONMENTS IF AVAILABLE.
5. PRIOR TO ORDERING, THE CONTRACTOR SHALL SUBMIT MANUFACTURER'S PRODUCT DATA, CATALOG CUT SHEETS, REFERENCES, MATERIAL CERTIFICATES, SAMPLE WARRANTY FOR MANUFACTURER'S SPECIAL WARRANTIES, STORAGE REQUIREMENTS, INSTALLATION PROCEDURES, WRITTEN CSI SPECIFICATIONS, SHOP DRAWINGS AND SAMPLES FOR APPROVAL BY THE LANDSCAPE ARCHITECT AND OWNER'S REPRESENTATIVE.
6. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL STAKE THE LAYOUT OF SITE FURNISHINGS AND OTHER IMPROVEMENTS IN THE FIELD FOR APPROVAL OF THE LANDSCAPE ARCHITECT AND OWNER'S REPRESENTATIVE. DAMAGE TO UTILITIES OR EXISTING LANDSCAPING, EQUIPMENT, STRUCTURES OR OTHER FEATURES TO REMAIN SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
7. ALL SITE FURNISHINGS, MATERIALS, FINISHES, FASTENERS MUST MEET APPLICABLE ASTM, ADA, AND/OR CITY CODES AND ORDINANCES, WHICHEVER IS MOST STRINGENT.
8. INSTALL PER MANUFACTURER'S INSTRUCTIONS. UNLESS OTHERWISE INDICATED, INSTALL AFTER PAVING AND LANDSCAPING HAVE BEEN COMPLETED. INSTALL LEVEL, PLUMB, TRUE AND SECURELY ANCHORED AT LOCATIONS INDICATED ON DRAWINGS.
   a. SEPARATE DISSIMILAR METALS TO AVOID GALVANIC CORROSION. PROVIDE SPACERS AS NECESSARY. USE FASTENERS, BRACKETS AND HARDWARE OF MATERIAL COMPATIBLE WITH SITE FURNISHING AND CONCRETE.
   b. FOR SURFACE MOUNTINGS, USE MANUFACTURER'S STANDARD, CORROSION-RESISTANT-COATED OR NONCORRODIBLE FASTENERS, BRACKETS AND HARDWARE IF PROVIDED OR COMMERCIAL QUALITY, TAMPERPROOF, VANDAL AND THEFT RESISTANT, CONCEALED, RECESSED, AND CAPPED OR PLUGGED FASTENERS, BRACKETS AND HARDWARE AS RECOMMENDED BY MANUFACTURER.
   c. FOR IN-GROUND MOUNTINGS, SECURE AS RECOMMENDED BY MANUFACTURER. PROVIDE NON-STAINING, NONSHRINK NONMETALLIC GROUT OR EROSION-RESISTANT ANCHORING CEMENT WHERE SITE FURNISHINGS ARE SET IN PIPE SLEEVES OR VOIDS IN CONCRETE.
9. SUBMIT TO THE OWNER A MINIMUM OF TWO BOUND COPIES OF MANUFACTURER'S OPERATION AND MAINTENANCE RECOMMENDATIONS AND INSTRUCTIONS ALONG WITH SPARE PARTS PROVIDED BY THE MANUFACTURER.

COORDINATE WITH AECOM ON LATEST ISSUE OF DRAWINGS BEFORE COMMENCEMENT OF CONSTRUCTION.
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AECOM

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I/R	DATE	DESCRIPTION

PROJECT NUMBER

P12777

SHEET TITLE

LANDSCAPE GENERAL NOTES

SHEET NUMBER

L001



SITE PLAN LEGEND

- LIMIT OF WORK

PAVING TYPES

- A - 4" CONCRETE
- C - 6" CONCRETE
- EXISTING ELECTRIC LINE
- EXISTING ELECTRIC STRUCTURE
- EXISTING UTILITY STRUCTURE
- EXISTING TELEPHONE RISER
- EXISTING FIBER OPTIC CABLE
- EXISTING SIGN
- EXISTING POTABLE WATER LINE
- EXISTING STORM LINE
- EXISTING STORM STRUCTURE

NOTES:

1. FIELD LOCATE ALL UTILITIES.
2. STAKE PROPOSED LAYOUT IN FIELD FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION. NOTIFY LANDSCAPE ARCHITECT 48 HOURS PRIOR TO SITE VISIT.
3. PROVIDE TEMPORARY FENCING AS NECESSARY TO PREVENT ACCESS TO EXISTING POOL AREA THROUGHOUT DEMOLITION AND CONSTRUCTION.
4. TREE CANOPY AND CRITICAL ROOT ZONE LIMITS SHOWN ARE APPROXIMATE BASED ON SURVEY. FIELD VERIFY TREE CRITICAL ROOT ZONES WHERE AFFECTED BY PROPOSED IMPROVEMENTS.

N

0 10' 20' 40' 60'

SCALE: 1" = 20'-0"

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	05/03/2024	DESIGN DEVELOPMENT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

P12777

SHEET TITLE

LANDSCAPE SITE PLAN

SHEET NUMBER

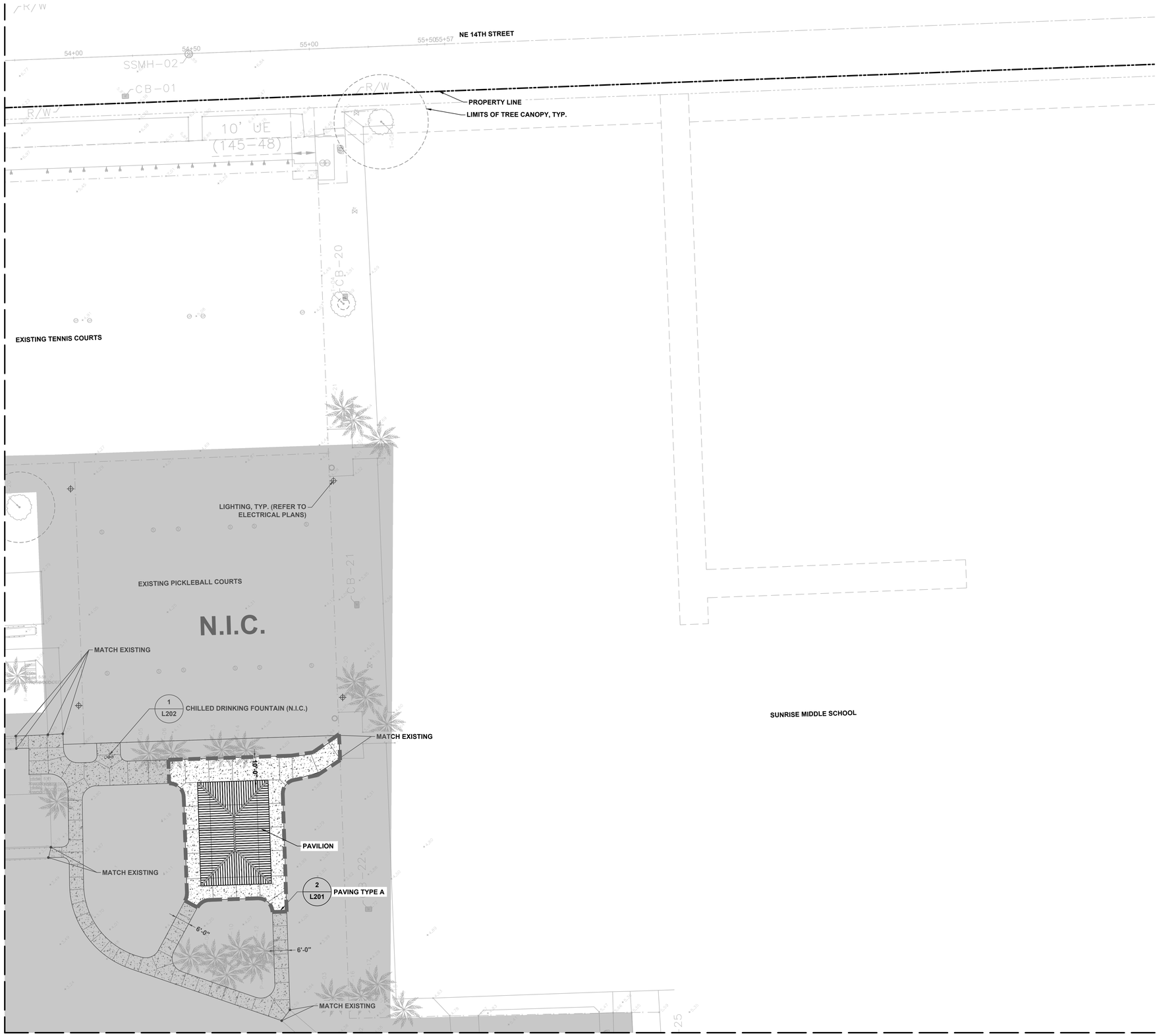
L101

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Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"



SITE PLAN LEGEND

- LIMIT OF WORK

PAVING TYPES

- A - 4" CONCRETE
- C - 6" CONCRETE
- EXISTING ELECTRIC LINE
- EXISTING ELECTRIC STRUCTURE
- EXISTING UTILITY STRUCTURE
- EXISTING TELEPHONE RISER
- EXISTING FIBER OPTIC CABLE
- EXISTING SIGN
- EXISTING POTABLE WATER LINE
- EXISTING STORM LINE
- EXISTING STORM STRUCTURE

NOTES:

1. FIELD LOCATE ALL UTILITIES.
2. STAKE PROPOSED LAYOUT IN FIELD FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION. NOTIFY LANDSCAPE ARCHITECT 48 HOURS PRIOR TO SITE VISIT.
3. PROVIDE TEMPORARY FENCING AS NECESSARY TO PREVENT ACCESS TO EXISTING POOL AREA THROUGHOUT DEMOLITION AND CONSTRUCTION.
4. TREE CANOPY AND CRITICAL ROOT ZONE LIMITS SHOWN ARE APPROXIMATE BASED ON SURVEY. FIELD VERIFY TREE CRITICAL ROOT ZONES WHERE AFFECTED BY PROPOSED IMPROVEMENTS.

N

0 10' 20' 40' 60'

SCALE: 1" = 20'-0"

AECOM

PROJECT

SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT

PARKS & RECREATION
City of Fort Lauderdale

PRIME CONSULTANT

AECOM

7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

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REGISTRATION

PAUL KURTZ LICENSE No. 1716 STATE OF FLORIDA LANDSCAPE ARCHITECT

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	09/18/2024	CONSTRUCTION DOCUMENTS
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P12777

SHEET TITLE

LANDSCAPE SITE PLAN

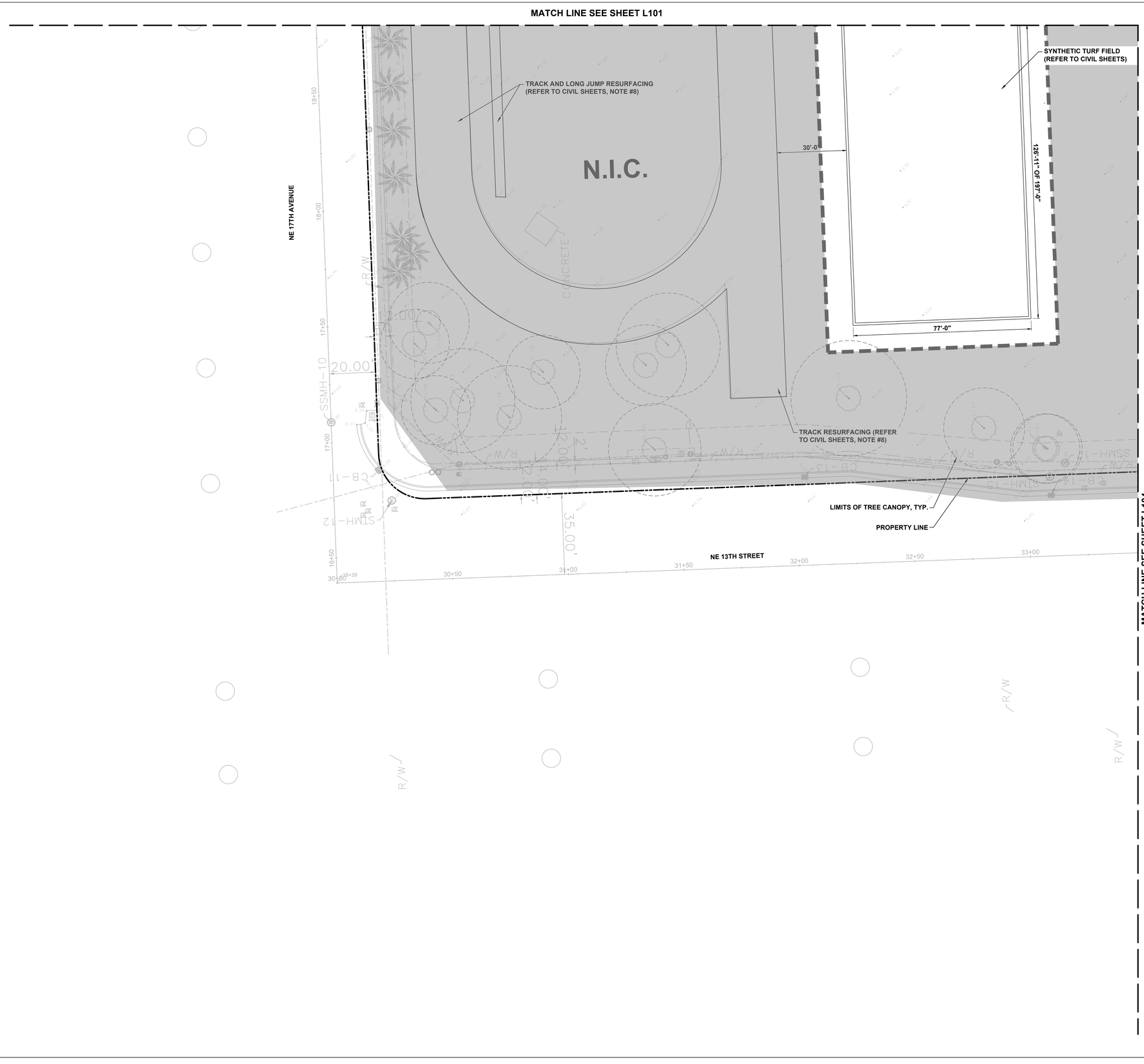
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L102

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Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"



SITE PLAN LEGEND

- LIMIT OF WORK

PAVING TYPES

- A - 4" CONCRETE
- C - 6" CONCRETE
- EXISTING ELECTRIC LINE
- EXISTING ELECTRIC STRUCTURE
- EXISTING UTILITY STRUCTURE
- EXISTING TELEPHONE RISER
- EXISTING FIBER OPTIC CABLE
- EXISTING SIGN
- EXISTING POTABLE WATER LINE
- EXISTING STORM LINE
- EXISTING STORM STRUCTURE

NOTES:

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SCALE: 1" = 20'-0"

AECOM

PROJECT

SUNRISE MIDDLE SCHOOL
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CLIENT

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SHEET TITLE

LANDSCAPE SITE PLAN

SHEET NUMBER

L103

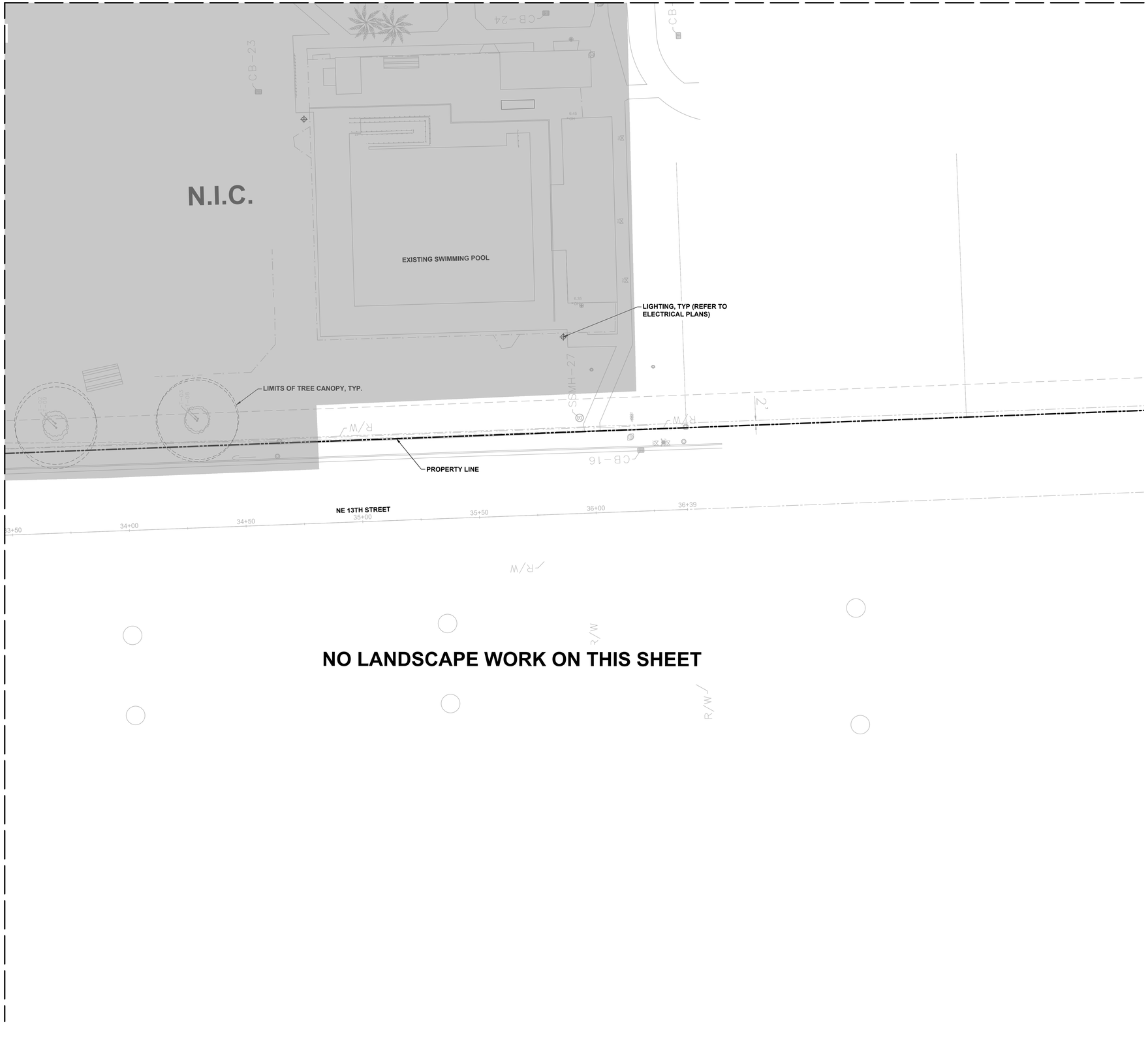
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Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"

MATCH LINE SEE SHEET L102



MATCH LINE SEE SHEET L103

NO LANDSCAPE WORK ON THIS SHEET

SITE PLAN LEGEND

- LIMIT OF WORK

PAVING TYPES

- A - 4" CONCRETE
- C - 6" CONCRETE
- EXISTING ELECTRIC LINE
- EXISTING ELECTRIC STRUCTURE
- EXISTING UTILITY STRUCTURE
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NOTES:

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AECOM

PROJECT

SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT

PARKS & RECREATION
City of Fort Lauderdale

PRIME CONSULTANT

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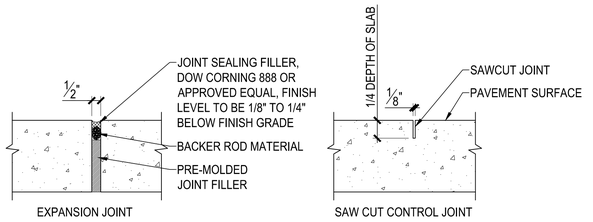
P12777

SHEET TITLE

LANDSCAPE SITE PLAN

SHEET NUMBER

L104

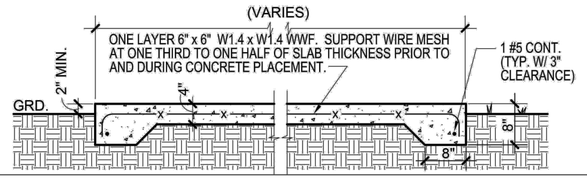


NOTES:
1. SAW CUT GREEN WITH EARLY ENTRY SAW BLADE AFTER FIRST CURE INITIAL SET. START SAWCUTTING AS SOON AS SAW WILL NOT RAVEL EDGES OR DISLODGE AGGREGATE, BUT IN NO CASE MORE THAN 12 HOURS AFTER THE SLAB IS PLACED.
2. PROVIDE EXPANSION JOINTS WHERE PAVING IS ADJACENT TO VERTICAL FACES, CURBS, STEPS, ANY FIXED OBJECT, OR OTHER RIGID PAVING MATERIAL.
3. REFER TO PLANS FOR JOINTING PATTERN.

1 CONCRETE JOINTS
3" = 1'-0"

NOTES:

- NEW 4" THICK CONCRETE WALKWAY WITH 8" THICKENED EDGE. PROVIDE 6" X 6" W 1.4 X W 1.4 ON WELL COMPACTED FILL FREE OF ORGANIC MATTER. SPLICE WIDE FABRIC ONE SQUARE PLUS 2". IN PLACE OF STEEL MESH REINFORCEMENT, PROVIDE FIBROUS CONCRETE REINFORCEMENT PER ASTM C-1116 TYPE III 4.1.3, AT 0.1% BY VOLUME.
- CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 P.S.I., #67 STONE, MAX W/C RATIO OF 0.6.
- PROVIDE CONTROL JOINTS TO SIDEWALK WIDTH AND 1/4 DEPTH OF SLAB SAW CUTS AT 5'-0" O.C. AND EXPANSION JOINTS EVERY 20' O.C.
- PROVIDE EXPANSION FILLER TO FULL DEPTH OF SLAB WITH JOINT SEALER AT EXPANSION JOINTS, (40'-0" O.C. MAXIMUM).
- NEW WALKWAY FINISH ELEVATION TO MATCH THAT OF EXISTING WALKWAY PER PLAN.
- MAX. # 5 BAR SPLICES SHALL BE 30" LONG MINIMUM.
- TOP SURFACE SHALL RECEIVE A LIGHT BROOM FINISH AS A MINIMUM OR MATCH EXISTING.
- NEW CONCRETE WALK SHALL BE 2" ABOVE GRADE.
- MAX CROSS SLOPE 1:50.
- MAX SLOPE LESS THAN 1:20.
- ALL SOIL UNDER PAVEMENT AND SIDEWALKS AREAS MUST BE MIN. 98% COMPACTION UNLESS REPLACING EXISTING PAVEMENT OR SIDEWALK AT THE SAME LOCATION



2 PAVING TYPE A - 4" CONCRETE
NTS

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AECOM

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PARKS BOND PROGRAM

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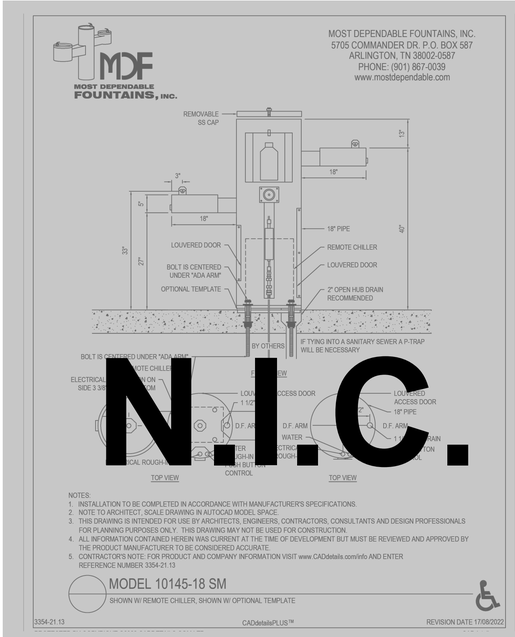
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PROJECT NUMBER
P12777

SHEET TITLE
LANDSCAPE SITE DETAILS

SHEET NUMBER
L201

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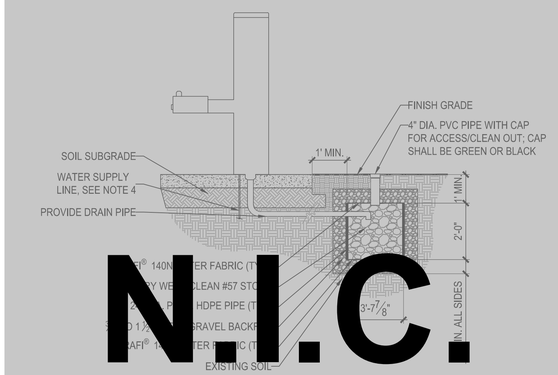
NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. NOTE TO ARCHITECT, SCALE DRAWING IN AUTOCAD MODEL SPACE
3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 3354-21.13

MODEL 10145-18 SM
SHOWN W/ REMOTE CHILLER, SHOWN W/ OPTIONAL TEMPLATE

3354-21.13 CADdetailsPLUS™ REVISION DATE:17/08/2022

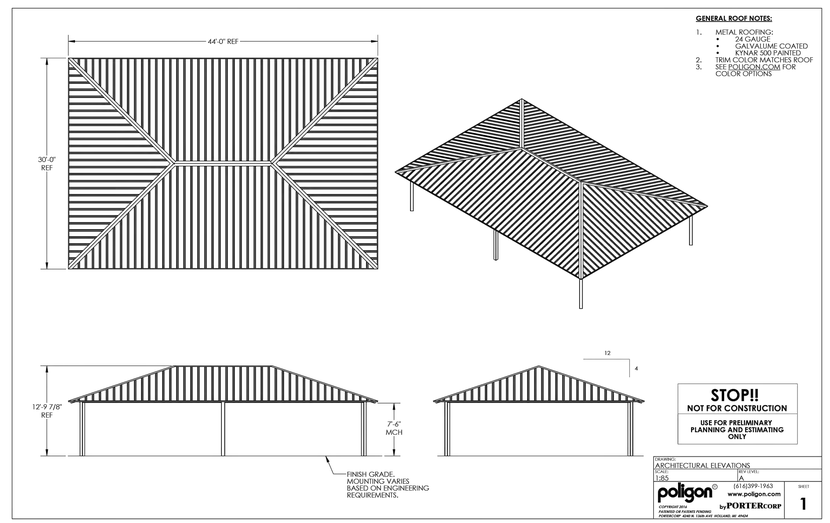
NOTES:
1. PROVIDE 3'-0" MINIMUM CLEARANCE ON ALL SIDES, AND 4'-0" MINIMUM ON FRONT AND SIDE APPROACH TO ADA ACCESSIBLE BOWL.
2. BASIS-OF-DESIGN: MOST DEPENDABLE FOUNTAINS INC.; MODEL 10145-18 SM, OR APPROVED EQUAL.
3. FINISH: POWDER COATED GREEN.
4. CHILL CAPABLE
5. MOUNTING PER MANUFACTURER'S INSTRUCTIONS.
6. REFER MANUFACTURER'S WRITTEN CSI SPECIFICATIONS FOR GENERAL INFORMATION, PRODUCTS AND EXECUTION.
7. SEE DETAIL 2/L202 FOR DRAIN DETAIL.

1 CHILLED DRINKING FOUNTAIN
NTS



NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND COMPLIANCE WITH ALL APPLICABLE STATE AND LOCAL CODES AND REGULATIONS.
2. THIS DRAWING IS INTENDED FOR PLANNING PURPOSES ONLY. CONTRACTOR TO SUBMIT SHOP DRAWING FOR REVIEW AND APPROVAL BY OWNER OR OWNER'S REPRESENTATIVE, AS APPLICABLE, PRIOR TO INSTALLATION.
3. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT, BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
4. CONTRACTOR TO PROVIDE A WATER SUPPLY LINE FROM THE DRINKING FOUNTAIN THAT CONNECTS TO THE EXISTING CITY WATER METER. REFER TO UTILITIES PLAN. CONTRACTOR TO ENSURE POSITIVE DRAINAGE TO DRY WELL.
5. DRY WELL MUST COMPLY WITH ALL APPLICABLE STATE AND LOCAL CODES AND REGULATIONS.
6. DRY WELL TO BE FIELD LOCATED IN TURF OR PLANTING AREA TO AVOID CONFLICTS WITH PLANTS AND UNDERGROUND UTILITIES.

2 CHILLED DRINKING FOUNTAIN DRAIN
NTS



NOTES:
1. BASIS-OF-DESIGN: POLIGON MODEL RAM 30'X44' OR APPROVED EQUAL.
2. GREEN POWDER COAT OVER GALVANIZED FINISH. MEET EXPOSURE CATEGORY D OF FLORIDA BUILDING CODE.
3. ENTRY HEIGHT OF PAVILION TO BE MINIMUM 8'-0".
4. REFER TO ELECTRICAL SHEETS FOR LIGHTING AND OUTLETS.
5. CONTRACTOR TO DESIGN FOUNDATION. PROVIDE FOUNDATION SHOP DRAWINGS SIGNED AND SEALED BY AN ENGINEER LICENSED IN THE STATE OF FLORIDA.
6. REFER MANUFACTURER'S WRITTEN CSI SPECIFICATIONS FOR GENERAL INFORMATION, PRODUCTS AND EXECUTION.
7. CONTRACTOR TO SUBMIT SHOP DRAWINGS SHOWING WIND LOAD CALCULATIONS AND FOUNDATION DESIGN RATED FOR 180 MPH PRIOR TO CONSTRUCTION.

3 PAVILION
NTS

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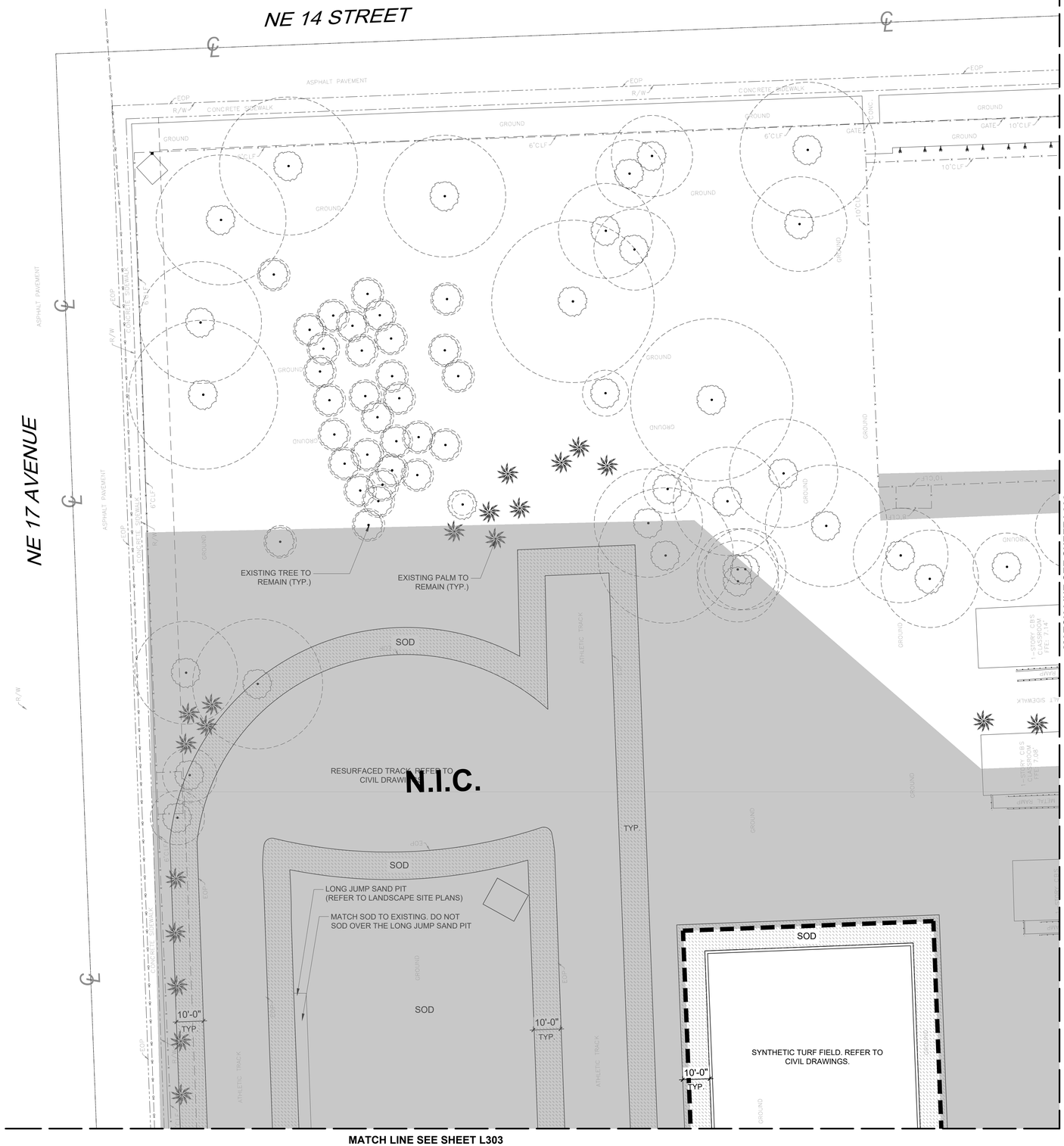
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P12777

SHEET TITLE
LANDSCAPE SITE DETAILS

SHEET NUMBER
L202

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PLANT SCHEDULE PLAN-01

SYMBOL	CODE	BOTANICAL NAME	COMMON NAME
GROUND COVERS			
	SOD	Paspalum notatum	Bahiagrass

NOTES:
REFER TO SHEET L401 FOR PLANT SCHEDULE QUANTITIES.

REFER TO SHEET L402 FOR PALM AND TREE PLANTING DETAILS.

N

0 10' 20' 40' 60'
SCALE: 1" = 20'-0"

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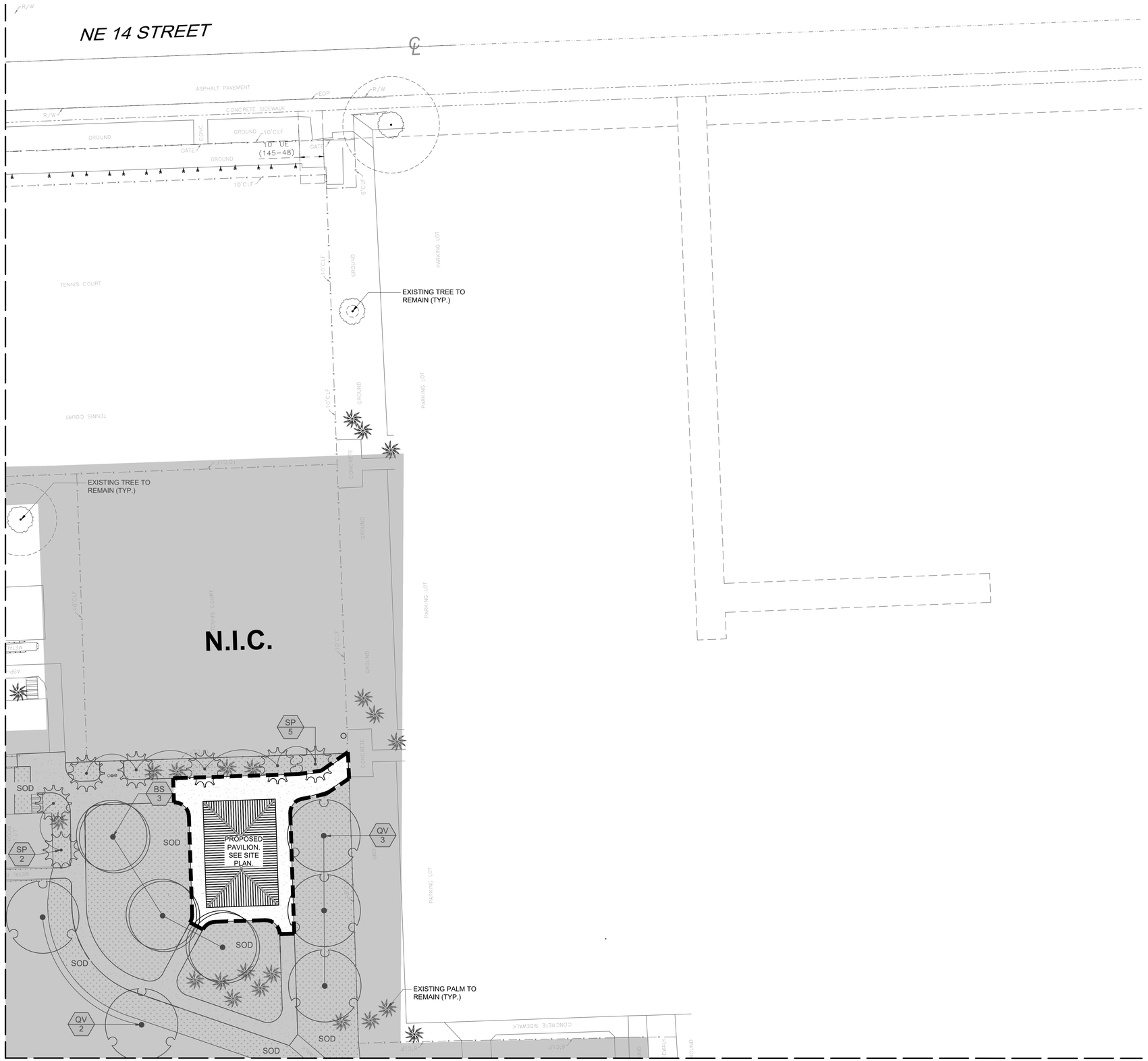
PLANTING PLAN-01

SHEET NUMBER

L301

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PLANT SCHEDULE PLAN-02

SYMBOL	CODE	BOTANICAL NAME	COMMON NAME
TREES			
	BS	Bursera simaruba	Gumbo Limbo
	QV	Quercus virginiana	Live Oak
PALM TREES			
	SP	Sabal palmetto	Cabbage Palmetto
GROUND COVERS			
	SOD2	Stenotaphrum secundatum	St. Augustine Grass

NOTES:
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REFER TO SHEET L402 FOR PALM AND TREE PLANTING DETAILS.

N

0 10' 20' 40' 60'
SCALE: 1" = 20'-0"

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SHEET TITLE
PLANTING PLAN-02

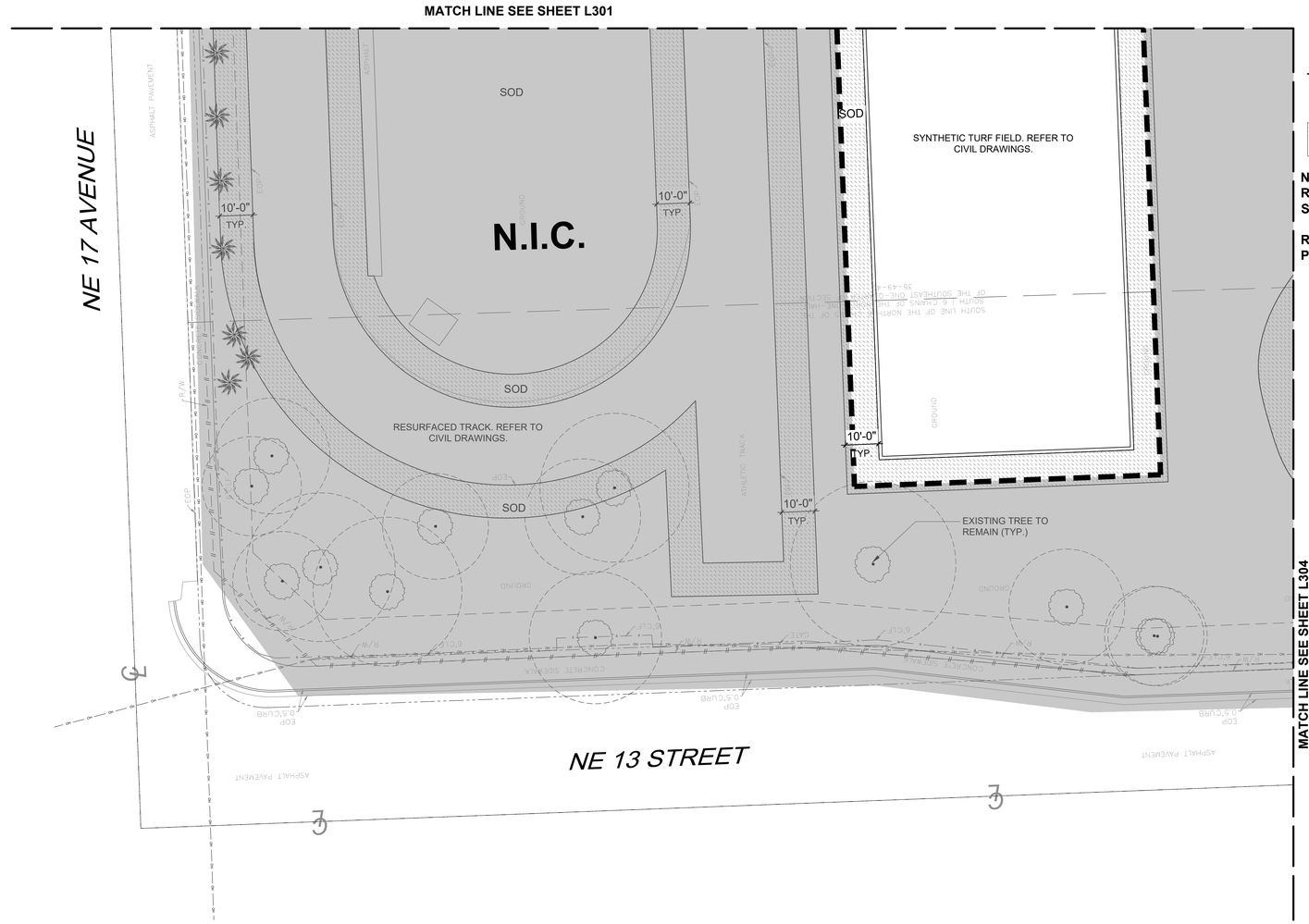
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PLANT SCHEDULE PLAN-03

SYMBOL	CODE	BOTANICAL NAME	COMMON NAME
GROUND COVERS			
	SOD	Paspalum notatum	Bahiagrass

NOTES:
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REFER TO SHEET L402 FOR PALM AND TREE PLANTING DETAILS.

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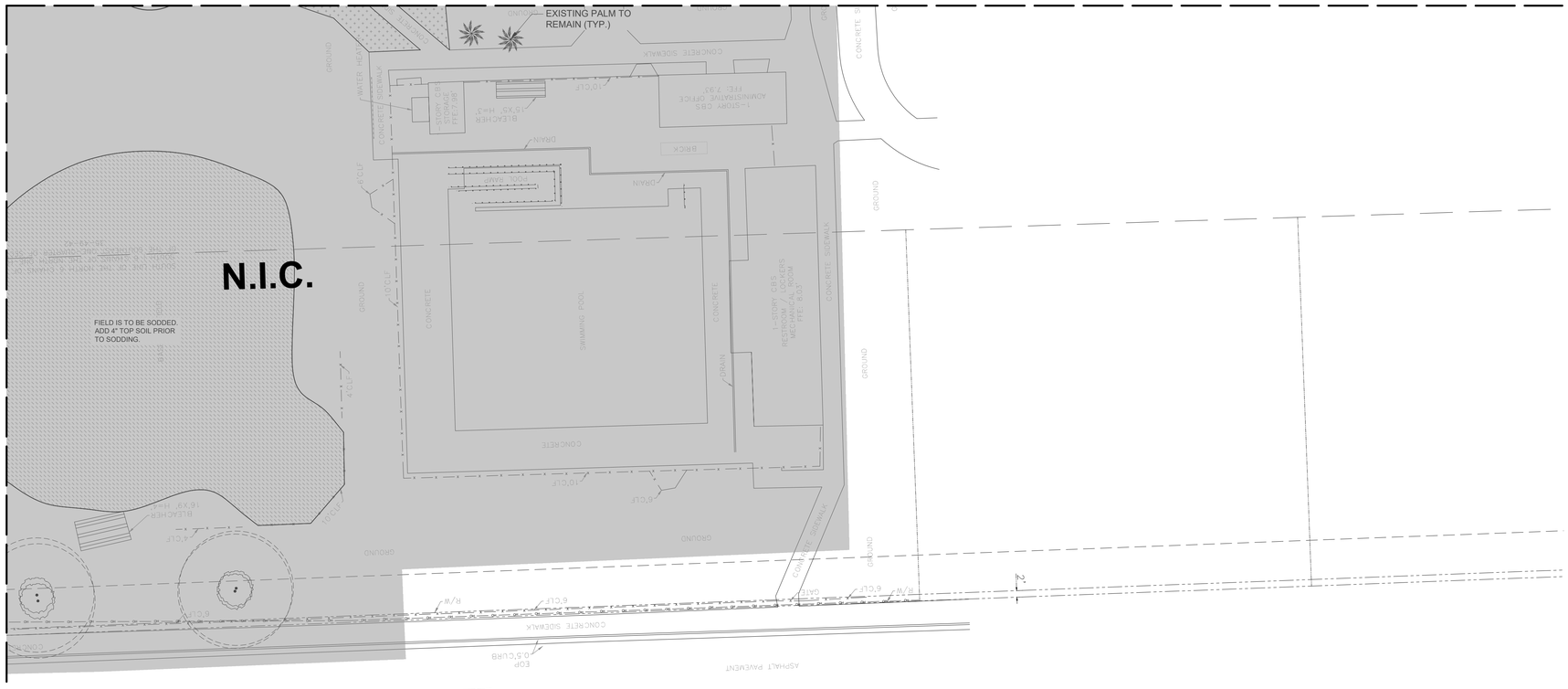
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PLANTING PLAN-03

SHEET NUMBER
L303

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Designer:____
Project Management Initials:

MATCH LINE SEE SHEET L302



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PLANT SCHEDULE PLAN-04

SYMBOL	CODE	BOTANICAL NAME	COMMON NAME
GROUND COVERS			
	SOD	Paspalum notatum	Bahiagrass
	SOD2	Stenotaphrum secundatum	St. Augustine Grass

NOTES:
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REFER TO SHEET L402 FOR PALM AND TREE PLANTING DETAILS.

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P12777

SHEET TITLE
PLANTING PLAN-04

SHEET NUMBER
L304

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PLANTING NOTES

1. THE WORK CONSISTS OF THE COMPLETE PLANT MATERIAL INSTALLATION AS SHOWN ON THE DRAWINGS AND AS HEREIN SPECIFIED. THIS WORK SHALL INCLUDE BUT IS NOT LIMITED TO THE RELOCATION/TRANSPLANTING OF EXISTING PALMS, THE SUPPLYING OF ALL PLANT MATERIAL SPECIFIED, THE FURNISHING OF LABOR, EQUIPMENT, AND MATERIALS CALLED FOR, AND PERFORMING ALL OPERATIONS IN CONNECTION WITH THE PLANTING INSTALLATION AS SHOWN ON THESE PLANS. FURTHER, THE WORK SHALL INCLUDE THE MAINTENANCE OF ALL NEW PLANTS, PLANTING AREAS, AND SOD UNTIL FINAL ACCEPTANCE BY THE OWNER AND THE FULFILLING OF GUARANTEE PROVISIONS SPECIFIED HEREIN.

2. THE CONTRACTOR SHALL BE FULLY ACQUAINTED WITH THE RELATED PAVING, LIGHTING, WATER SUPPLY, ELECTRICAL SUPPLY, AND OTHER UTILITIES TO PREVENT ANY MISUNDERSTANDING AND TO FACILITATE A TROUBLE FREE INSTALLATION. CALL THE SUNSHINE STATE ONE CALL OF FLORIDA 1-800-432-4770 PRIOR TO ANY CONSTRUCTION FOR UTILITY COORDINATION. IN ADDITION, NOTIFY THE UTILITY OWNER A MINIMUM OF 2-10 WORKING DAYS IN ADVANCE OF CONSTRUCTION TO IDENTIFY UTILITY LINE LOCATIONS.

3. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGES TO EXISTING FACILITIES THAT MAY RESULT FROM WORK PERFORMED BY THE CONTRACTOR. THE WORK PERFORMED UNDER THIS CONTRACT WILL INTERFACE WITH OTHER WORK BEING PERFORMED BY OTHER CONTRACTORS. IT WILL BE NECESSARY FOR THE CONTRACTOR TO COORDINATE AND SCHEDULE ACTIVITIES WITH OTHER CONTRACTORS AND THEIR SUBCONTRACTORS.

4. NO SUBSTITUTIONS SHALL BE MADE WITHOUT WRITTEN PERMISSION OF THE LANDSCAPE ARCHITECT OF RECORD AND CITY'S REPRESENTATIVE, PRIOR TO DELIVERY OR INSTALLATION OF SUCH MATERIALS.

5. IN THE EVENT DISCREPANCIES ARE NOTED BETWEEN THE PLANT LIST AND THE ACTUAL NUMBER OF PLANTS SHOWN ON THE PLANS, THE PLANS SHALL CONTROL. CONTRACTOR SHALL NOTIFY OWNER'S REPRESENTATIVE IMMEDIATELY IF DISCREPANCIES ARE FOUND.

6. PLANT MATERIALS WILL BE INSPECTED AT THE JOB SITE BY THE OWNER'S REPRESENTATIVE. AFTER INSPECTION, IF THE WORK DOES NOT COMPLY WITH PROJECT REQUIREMENTS, CONTRACTOR SHALL REPLACE REJECTED WORK AND CONTINUE SPECIFIED MAINTENANCE UNTIL WORK IS REINSPECTED AND FOUND TO BE ACCEPTABLE. REMOVE REJECTED PLANTS AND MATERIALS FROM THE SITE WITHIN 48 HOURS AND REPLACE WITH ACCEPTABLE MATERIALS.

7. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. THE OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO DIRECT THE REMOVAL AND REPLACEMENT OF ANY ITEMS WHICH DO NOT REPRESENT SUCH AN INSTALLATION.

8. ALL PLANT MATERIALS SHALL BE GRADE FLORIDA NO. 1, OR BETTER AS OUTLINED UNDER GRADES AND STANDARDS FOR NURSERY PLANTS, LATEST EDITION, FLORIDA DIVISION OF PLANT INDUSTRY, AND SHALL CONFORM TO ANSI STANDARDS FOR NURSERY STOCK (ANSI Z60.1-LATEST EDITION).

9. ALL PLANTING BEDS SHALL BE MULCHED IN ACCORDANCE WITH THE PLANTING DETAILS.

10. AFTER INITIAL PLANTINGS HAVE BEEN COMPLETED AND PRIOR TO MULCHING, APPLY "CHIPCO RONSTAR G" OR APPROVED EQUAL WITH A PROPERLY CALIBRATED GRANULAR APPLICATOR . APPLY AT A RATE AS DIRECTED BY MANUFACTURER'S RECOMMENDATIONS, FOR PLANTED AREAS SPECIFIED. DO NOT APPLY PRE-EMERGENT CHEMICAL DIRECTLY ON ANY PLANT MATERIALS. SUBMIT MSDS AND APPLICATION RATE INFORMATION TO THE LANDSCAPE ARCHITECT OF RECORD FOR APPROVAL PRIOR TO APPLICATION.

11. PLANTING SOIL SHALL BE PER FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 987 "SOIL LAYER MATERIALS".
    A. PROVIDE NEW LANDSCAPE SOIL WHERE NECESSARY WHICH IS FERTILE, BLACK IN COLOR, FRIABLE, NATURAL LOAM, SURFACE SOIL, REASONABLY FREE OF SUBSOIL, CLAY LUMPS, BRUSH, WEEDS, AND OTHER LITTER, AND FREE OF ROOTS, STUMPS, STONES LARGER THAN 1/2 INCH IN ANY DIMENSION, AND OTHER EXTRANEOUS OR TOXIC MATTER HARMFUL TO PLANT GROWTH, AND OTHERWISE CONFORMING TO FDOT SECTION 987.

    B. DO NOT OBTAIN SOIL FROM BOGS OR MARSHES.

    C. PLANTING BACKFILL FOR TREES, PALMS AND SHRUBS SHALL CONSIST OF 50% NATIVE SOIL AND 50% BLENDED SOIL (1/3 MUSHROOM COMPOST, 1/3 COMMERCIALLY PROCESSED AND COMPOSTED COW MANURE, AND 1/3 COMPOSTED BARK) EVENLY MIXED IN CONFORMANCE WITH SPECIFICATIONS FOR FDOT DISTRICT 4.

    D. CONTRACTOR SHALL TAKE RESPONSIBILITY FOR PERFORMING PERCOLATION TESTS PRIOR TO BACKFILLING WITH APPROVED PLANTING SOIL. NOTIFY LANDSCAPE ARCHITECT IMMEDIATELY IF PERCOLATION DOES NOT SUPPORT HEALTHY GROWTH OF PLANTINGS.

    E. SUBMIT SAMPLES OF LANDSCAPE SOIL AND PLANTING BACKFILL MIXTURE FOR TREES AND PALMS TO LANDSCAPE ARCHITECT FOR APPROVAL.

12. ALL PLANT MATERIALS AND SOD SHALL BE WATERED AND MAINTAINED BY THE CONTRACTOR FROM TIME OF INITIAL PLANTING UNTIL 90 DAYS AFTER FINAL ACCEPTANCE BY THE OWNER. ALL PLANT MATERIALS SHALL BE ADEQUATELY WATERED AND MAINTAINED TO REMAIN IN FLORIDA NO. 1 GRADE CONDITION THROUGHOUT THE MAINTENANCE PERIOD.

13. ALL SOD (GRASS) DAMAGED BY THE CONTRACTOR SHALL BE REPLACED WITH ST. AUGUSTINE SOD BY CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

14. SOD TYPE SHALL BE ST. AUGUSTINE (*STENOTAPHRUM SECUNDATUM*) UNLESS OTHERWISE INDICATED IN DRAWINGS AND SHALL BE WELL MATTED WITH ROOTS. THE SOD SHALL BE TAKEN UP IN RECTANGLES, PREFERABLY 12" X 24" AND SHALL BE LIVE, FRESH AND UNINJURED AT THE TIME OF PLANTING. SOD SHALL BE REASONABLY FREE OF WEEDS AND OTHER GRASS AND SHALL HAVE A SOIL MAT OF SUFFICIENT THICKNESS ADHERING FIRMLY TO THE ROOTS TO WITHSTAND ALL NECESSARY HANDLING. KEEP THE SOD SHADED AND MOIST UNTIL IT IS PLANTED. DUMPING FROM VEHICLES WILL NOT BE PERMITTED. DAMAGED SOD WILL BE REJECTED. REPLANT WITHIN 48 HOURS AFTER TIME OF HARVESTING OR KEEP SOD DAMP UNTIL PLANTED.

15. SODDING SEQUENCE SCHEDULE:
    a. CORRECT SOFT SPOTS AND INEQUITIES IN GRADE BEFORE BEGINNING SOD WORK.
    b. GROUND SHALL BE SUFFICIENTLY MOIST PRIOR TO LAYING OF SOD. CONTRACTOR SHALL WATER AS NEEDED PRIOR TO LAYING SOD.
    c. PLACE SOD WITH STAGGERED JOINTS CLOSELY BUTTED. TAMP OR ROLL TO AN EVEN SURFACE TO THE REQUIRED FINISHED GRADE. AVOID CONTINUOUS SEAMS ALONG WATER FLOW LINE IN SWALES. PLACE SOD IN ROWS AT RIGHT ANGLES TO SLOPE.
    d. FERTILIZE WITH A SLOW-RELEASE FERTILIZER. SUBMIT FERTILIZER GUARANTEED ANALYSIS AND APPLICATION RATES TO THE LANDSCAPE ARCHITECT PRIOR TO APPLICATION. FERTILIZER SHALL NOT BE APPLIED BETWEEN JUNE 1 AND SEPTEMBER 30 IN COMPLIANCE WITH CITY OF FT. LAUDERDALE FERTILIZER ORDINANCE.
    e. SATURATE SOD WITH FINE WATER SPRAY WITHIN 2 HOURS OF PLANTING. WATER DAILY FOR FIRST WEEK AFTER PLANTING AS NECESSARY TO MAINTAIN MOIST SOIL 1.5 INCHES BELOW SOD.
    f. SOD ALL AREAS WITHIN 5 FEET OF ANY PROPOSED PAVEMENT, STRUCTURE, PATH, INLET, SIMILAR HARDSCAPE, SLOPES 4:1 OR GREATER. TRANSITION SOD TO BE LEVEL WITH ADJACENT TURF AND PLANTING AREAS.
    g. PLANT SOD DURING WEATHER CONDITIONS BENEFICIAL TO OPTIMUM ESTABLISHMENT RESULTS.

16. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE OF ANY CONFLICT OR DISCREPANCY IN PLANS AND/OR ACTUAL FIELD CONDITIONS PRIOR TO PERFORMING ANY WORK IN THE AFFECTED AREA.

17. CONTRACTOR SHALL CLEAN UP AND REMOVE ALL SURPLUS AND DISCARDED MATERIALS AND RUBBISH FROM HIS CONSTRUCTION ON A DAILY BASIS.

18. FINAL INSPECTION WILL NOT TAKE PLACE UNTIL ALL MATERIALS ARE PLANTED/INSTALLED CORRECTLY. CONTRACTOR SHALL REQUEST A FINAL INSPECTION BY OWNER'S REPRESENTATIVE IN WRITING.

19. CONTRACTOR WILL BE NOTIFIED BY LETTER OF FINAL ACCEPTANCE WITHIN TEN DAYS AFTER FINAL INSPECTION OR TEN DAYS AFTER REINSPECTION, BY THE OWNER'S REPRESENTATIVE.

20. THE CONTRACTOR SHALL WARRANTY ALL PLANT MATERIAL FOR ONE (1) YEAR BEGINNING AT FINAL ACCEPTANCE.

21. PROPER SPACING OF PLANTS SHALL TAKE PRECEDENCE OVER PLANT QUANTITIES IN THE PLANT SCHEDULE OR ON PLANS. ANY EXTRA PLANTS THAT WILL NOT FIT ON SITE DUE TO UNFORESEEN CONDITIONS SHALL BECOME CITY OF FORT LAUDERDALE PROPERTY. THE CONTRACTOR SHALL PROVIDE 48 HOURS NOTICE TO THE CITY THAT UNUSED PLANTS ARE AVAILABLE FOR THE CITY TO PICK UP.

22. ALL LANDSCAPE MATERIAL SHALL BE STORED, INSTALLED AND MAINTAINED AT ALL TIMES IN A MANNER WHEREBY TRAFFIC CONTROL SIGNAGE AND DEVICES ARE VISIBLE TO MOTORISTS AND PEDESTRIANS.

23. APPLICATION OF HERBICIDES SHALL BE PERFORMED BY A PERSON POSSESSING A CURRENT FLORIDA RESTRICTED USE PESTICIDE LICENSE IN THE CORE CURRICULUM, RIGHT-OF-WAY AND AQUATIC CATEGORIES.

24. WATER IN PLANT MATERIAL AT TIME OF PLANTING AS INDICATED.

25. CONTRACTOR SHALL STAKE THE LOCATIONS OF ALL PROPOSED LANDSCAPING AND AMENITIES TO BE APPROVED BY LANDSCAPE ARCHITECT OR OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.

26. MULCH
    a. INORGANIC MULCH FOR PLANTING BEDS SHALL BE INSTALLED AS SHOWN ON PLANS. INORGANIC MULCH MATERIAL SHALL BE CRUSHED SHELL, THOROUGHLY WASHED, SCREENED, AND PROPERLY PREPARED TO CONTAIN NO ANIMAL MATTER. MINIMUM 3" DEPTH SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION AND ESTABLISHMENT PERIOD.
    b. ALL ORGANIC MULCH MATERIAL SHALL BE SHREDDED MELALEUCA AND SHALL BE APPLIED TO ALL TREE AND PALM PLANTING PITS AT A MINIMUM 4' DIAMETER OR THE COMPLETE WIDTH OF PLANTING PIT, WHICHEVER IS GREATER. MINIMUM 3" DEPTH SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION AND ESTABLISHMENT PERIOD.

PLANT SCHEDULE

SYMBOL	CODE	QTY	BOTANICAL NAME	COMMON NAME	SPECIFICATIONS	NATIVE
TREES						
	BS	3	Bursera simaruba	Gumbo Limbo	16` Ht. Min., 9` Spr. Min., 3" DBH Min.	Yes
	QV	5	Quercus virginiana	Live Oak	16` Ht. Min., 9` Spr. Min., 3" DBH Min.	Yes
PALM TREES						
	SP	7	Sabal palmetto	Cabbage Palmetto	16`-20` CT. Staggered Heights, Booted	Yes
GROUND COVERS						
	SOD	32,991 sf	Paspalum notatum	Bahiagrass	sod	No
	SOD2	9,718 sf	Stenotaphrum secundatum	St. Augustine Grass	sod	Yes

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AIDA M. CURTIS LICENSE No. 1330 STATE OF FLORIDA LANDSCAPE ARCHITECT

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I/R	DATE	DESCRIPTION
	09/16/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT

PROJECT NUMBER

P12777

SHEET TITLE

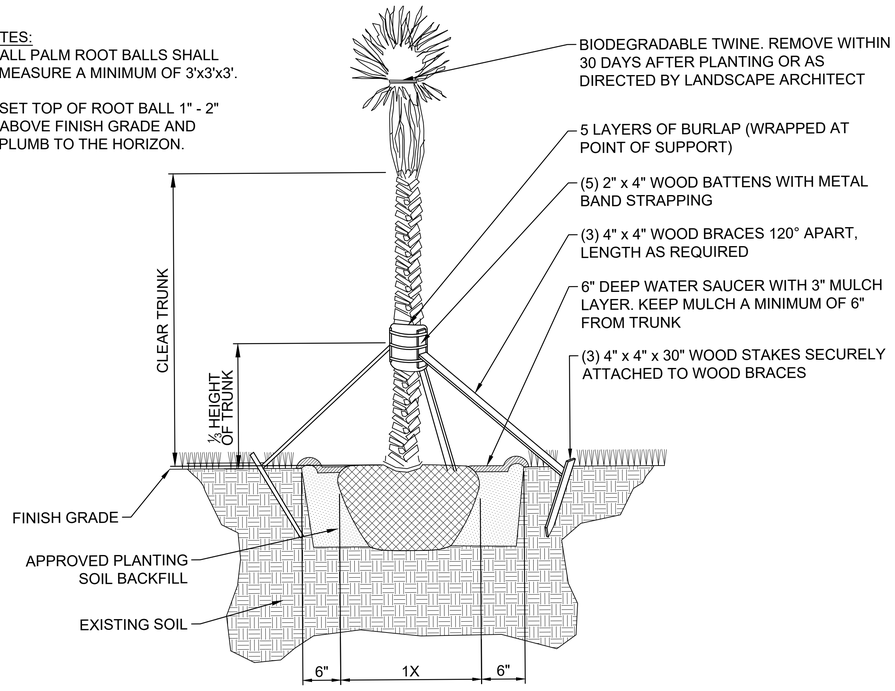
PLANTING NOTES & SCHEDULE

SHEET NUMBER

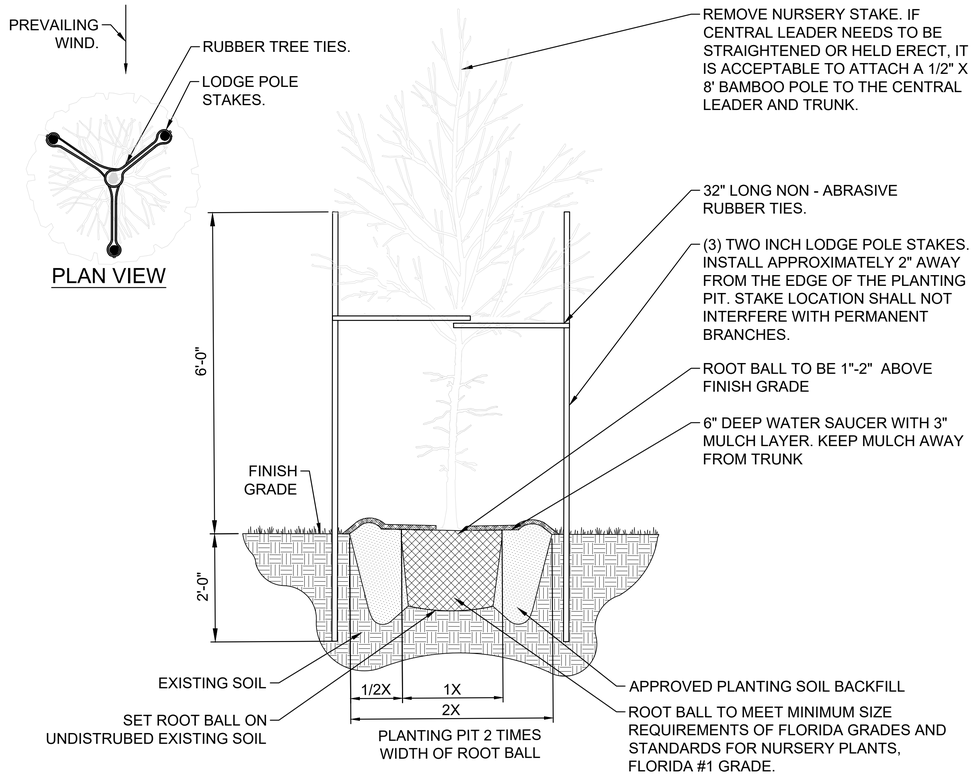
L401

Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"

NOTES:
1. ALL PALM ROOT BALLS SHALL MEASURE A MINIMUM OF 3'x3'x3'.
2. SET TOP OF ROOT BALL 1" - 2" ABOVE FINISH GRADE AND PLUMB TO THE HORIZON.



1 PALM PLANTING DETAIL
NTS



2 TREE PLANTING DETAIL
NTS

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PROJECT
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FORT LAUDERDALE
PARKS BOND PROGRAM

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PROJECT NUMBER
P12777

SHEET TITLE
PLANTING DETAILS

SHEET NUMBER
L402

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Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"

LEGEND

SYMBOL	MODEL NO.	DESCRIPTION
8Q	1806-HE-VAN-8Q	RAIN BIRD ADJ. POP-UP SPRAY (6")
8H	1806-HE-VAN-8H	RAIN BIRD ADJ. POP-UP SPRAY (6")
15T	1806-HE-VAN-15T	RAIN BIRD ADJ. POP-UP SPRAY (6")
15H	1806-HE-VAN-15H	RAIN BIRD ADJ. POP-UP SPRAY (6")
15CS	1806-HE-VAN-15LCS	RAIN BIRD ADJ. POP-UP SPRAY (6")
15RCS	1806-HE-VAN-15RCS	RAIN BIRD ADJ. POP-UP SPRAY (6")
15ST	1806-HE-VAN-15SST	RAIN BIRD ADJ. POP-UP SPRAY (6")
2.0	3506-PC-SAM-2.0	RAIN BIRD ADJ. POP-UP ROTOR (6")
4.0	5006-+-PC-SAM-R-SS-4.0	RAIN BIRD ADJ. POP-UP ROTOR (6")
16	8005-PC-SS-16	RAIN BIRD ADJ. POP-UP ROTOR (6")
16	8005-FC-SS-16	RAIN BIRD ADJ. POP-UP ROTOR (6")

NOTES:

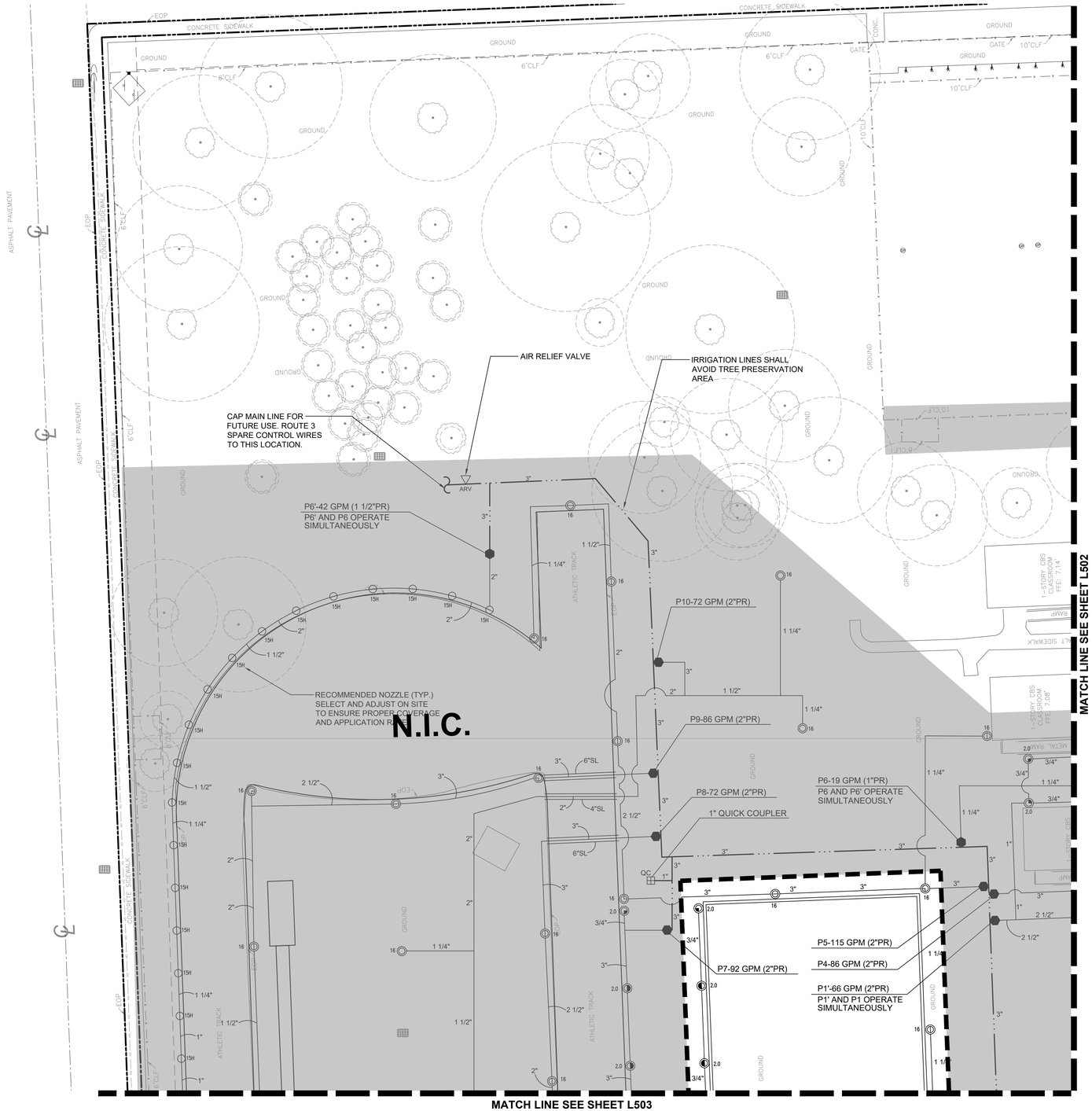
THIS PLAN SHALL BE USED AS A GUIDE TO LOCATE IRRIGATION ELEMENTS.

IRRIGATION SHALL BE INSTALLED TO MATCH SITE CONDITIONS.

ALL NEW IRRIGATION SHALL BE OPERABLE UPON COMPLETION.

CONTRACTOR RESPONSIBLE TO VERIFY LOCATION OF UTILITIES BEFORE INSTALLATION OF PIPES TO AVOID ANY CONFLICTS OR DAMAGE TO EXISTING LINES.

IRRIGATION SYSTEM HAS BEEN DESIGNED FOR ALL PROGRAM ELEMENTS. CONTRACTOR TO COORDINATE WITH OTHER VENDORS/CONTRACTORS TO ADJUST SYSTEM TO PROVIDE FULL COVERAGE ONLY TO ALL NEW SOD.



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AECOM

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I/R	DATE	DESCRIPTION

PROJECT NUMBER

P12777

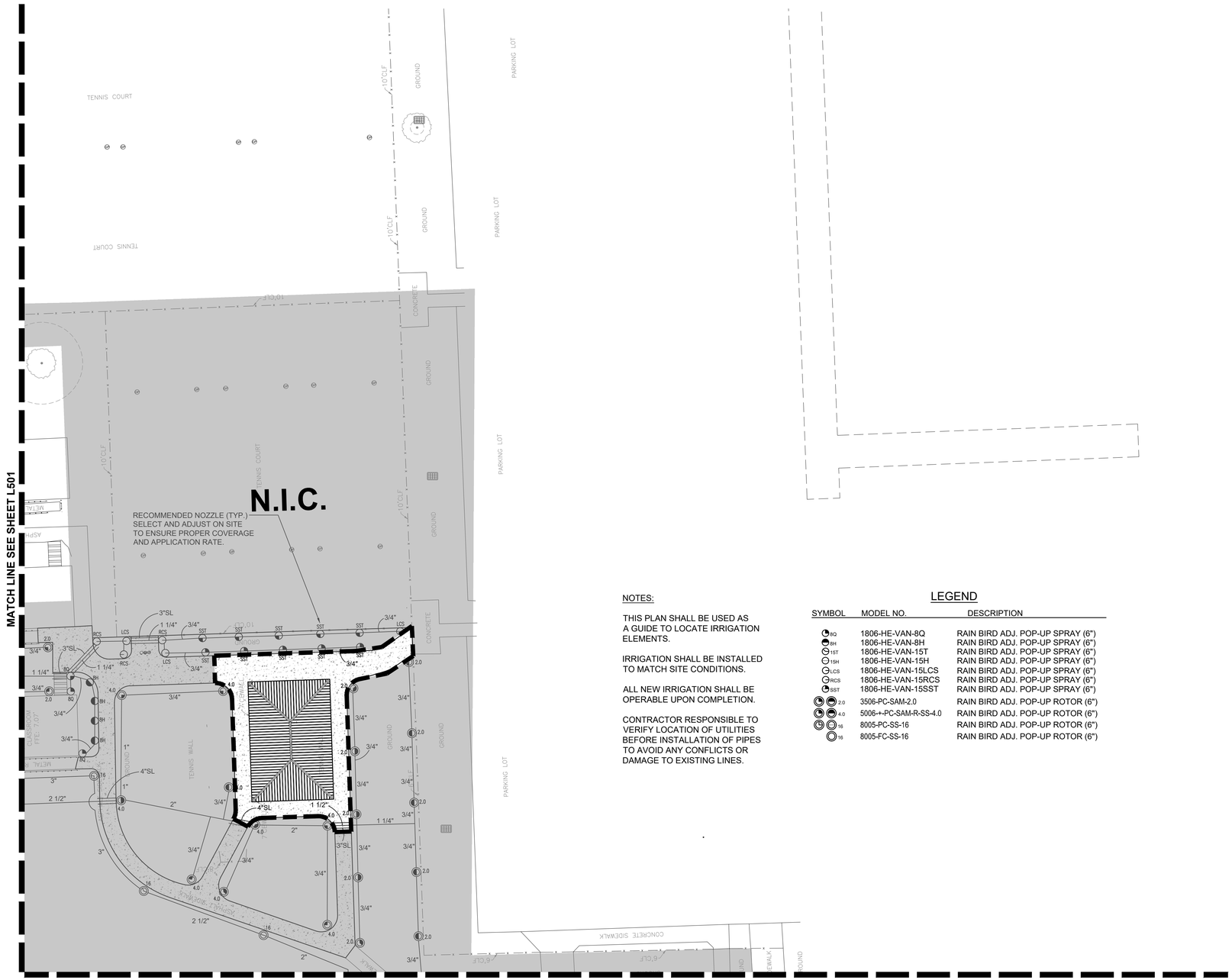
SHEET TITLE

IRRIGATION PLAN-01

SHEET NUMBER

L501

Project Management Initials: Designer:_____ Checked:_____ Approved:_____ ANSI D 24" x 36"



NOTES:

THIS PLAN SHALL BE USED AS A GUIDE TO LOCATE IRRIGATION ELEMENTS.

IRRIGATION SHALL BE INSTALLED TO MATCH SITE CONDITIONS.

ALL NEW IRRIGATION SHALL BE OPERABLE UPON COMPLETION.

CONTRACTOR RESPONSIBLE TO VERIFY LOCATION OF UTILITIES BEFORE INSTALLATION OF PIPES TO AVOID ANY CONFLICTS OR DAMAGE TO EXISTING LINES.

LEGEND

SYMBOL	MODEL NO.	DESCRIPTION
8Q	1806-HE-VAN-8Q	RAIN BIRD ADJ. POP-UP SPRAY (6")
8H	1806-HE-VAN-8H	RAIN BIRD ADJ. POP-UP SPRAY (6")
15T	1806-HE-VAN-15T	RAIN BIRD ADJ. POP-UP SPRAY (6")
15H	1806-HE-VAN-15H	RAIN BIRD ADJ. POP-UP SPRAY (6")
LCS	1806-HE-VAN-15LCS	RAIN BIRD ADJ. POP-UP SPRAY (6")
RCS	1806-HE-VAN-15RCS	RAIN BIRD ADJ. POP-UP SPRAY (6")
SST	1806-HE-VAN-15SST	RAIN BIRD ADJ. POP-UP SPRAY (6")
2.0	3506-PC-SAM-2.0	RAIN BIRD ADJ. POP-UP ROTOR (6")
4.0	5006-+-PC-SAM-R-SS-4.0	RAIN BIRD ADJ. POP-UP ROTOR (6")
16	8005-PC-SS-16	RAIN BIRD ADJ. POP-UP ROTOR (6")
16	8005-FC-SS-16	RAIN BIRD ADJ. POP-UP ROTOR (6")

N

0 10' 20' 40' 60'
SCALE: 1" = 20'-0"

COORDINATE WITH AECOM ON LATEST ISSUE OF DRAWINGS BEFORE COMMENCEMENT OF CONSTRUCTION
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REGISTRATION

AIDA M. CURTIS
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No. 1330
STATE OF
FLORIDA
LANDSCAPE ARCHITECT

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PROJECT NUMBER

P12777

SHEET TITLE

IRRIGATION PLAN-02

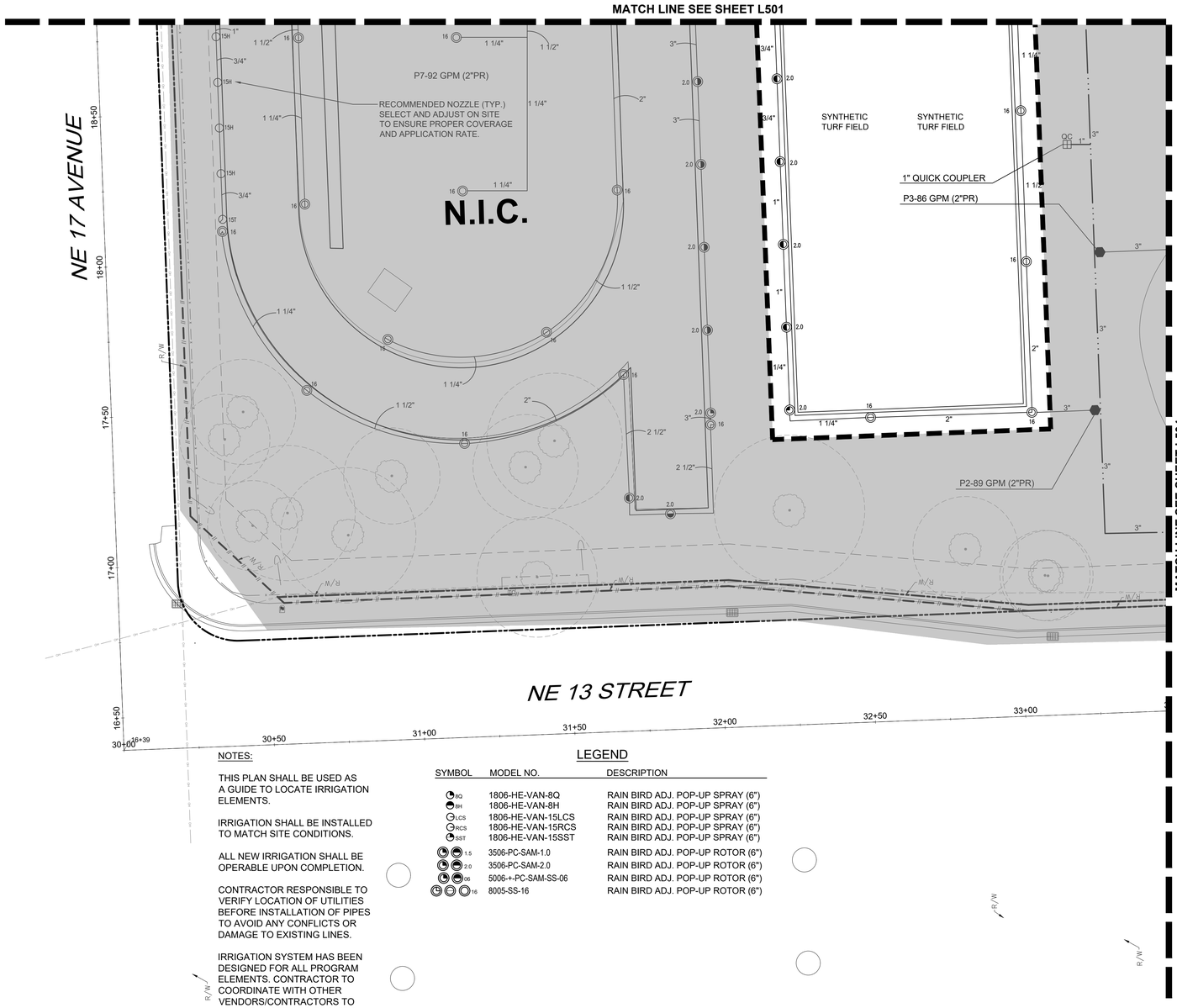
SHEET NUMBER

L502

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Project Management Initials: Designer:____ Checked:____ Approved:____ ANSI D 24" x 36"



NOTES:

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LEGEND

SYMBOL	MODEL NO.	DESCRIPTION
8Q	1806-HE-VAN-8Q	RAIN BIRD ADJ. POP-UP SPRAY (6")
8H	1806-HE-VAN-8H	RAIN BIRD ADJ. POP-UP SPRAY (6")
LCS	1806-HE-VAN-15LCS	RAIN BIRD ADJ. POP-UP SPRAY (6")
RCS	1806-HE-VAN-15RCS	RAIN BIRD ADJ. POP-UP SPRAY (6")
SST	1806-HE-VAN-15SST	RAIN BIRD ADJ. POP-UP SPRAY (6")
1.5	3506-PC-SAM-1.0	RAIN BIRD ADJ. POP-UP ROTOR (6")
2.0	3506-PC-SAM-2.0	RAIN BIRD ADJ. POP-UP ROTOR (6")
06	5006-+-PC-SAM-SS-06	RAIN BIRD ADJ. POP-UP ROTOR (6")
16	8005-SS-16	RAIN BIRD ADJ. POP-UP ROTOR (6")

N

0 10' 20' 40' 60'

SCALE: 1" = 20'-0"

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SHEET TITLE

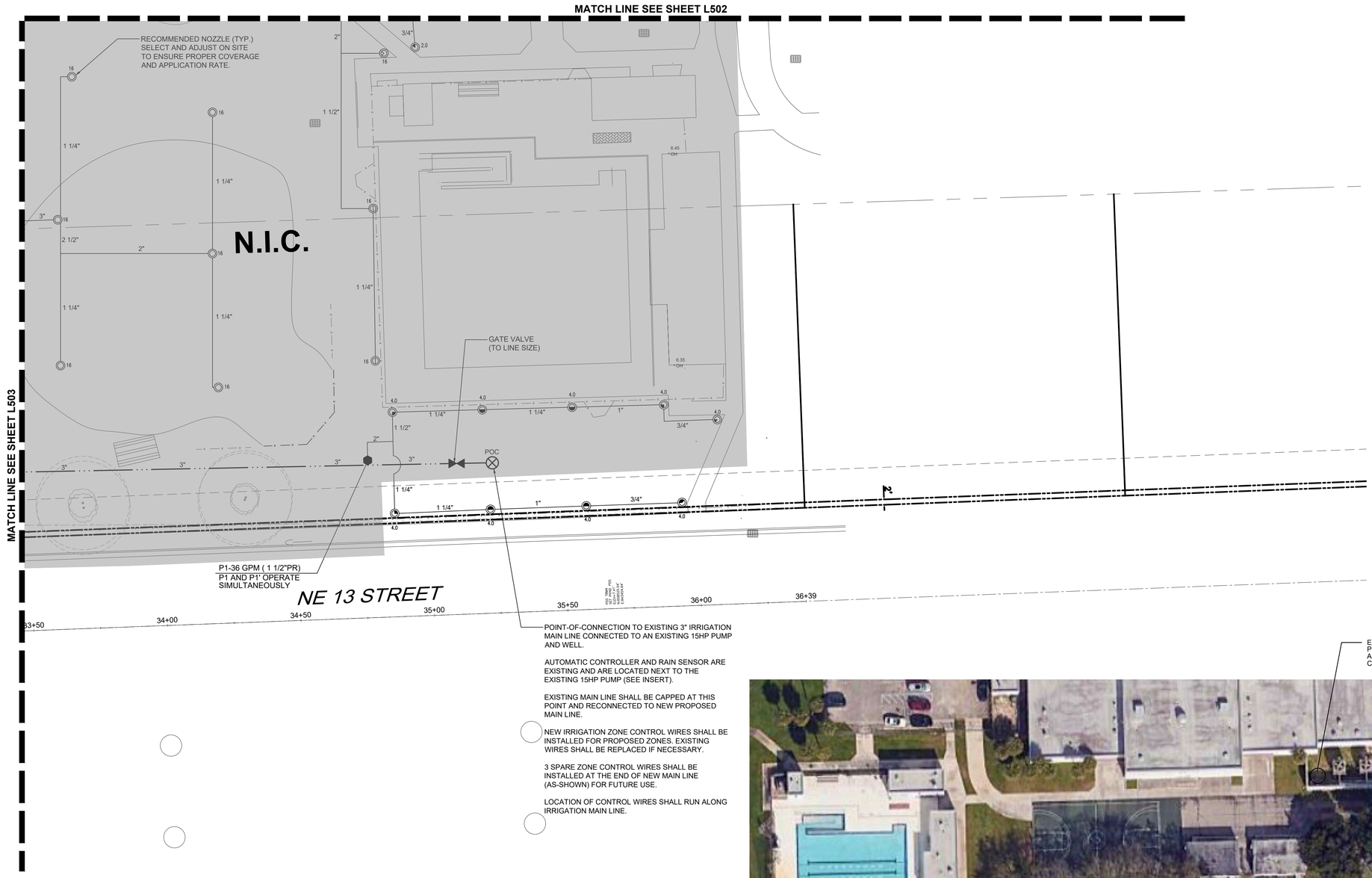
IRRIGATION PLAN-03

SHEET NUMBER

L503

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Project Management Initials: Designer:_____ Checked:_____ Approved:_____ ANSI D 24" x 36"



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LEGEND

SYMBOL	MODEL NO.	DESCRIPTION
RO	1806-HE-VAN-8Q	RAIN BIRD ADJ. POP-UP SPRAY (6")
RH	1806-HE-VAN-8H	RAIN BIRD ADJ. POP-UP SPRAY (6")
LCS	1806-HE-VAN-15LCS	RAIN BIRD ADJ. POP-UP SPRAY (6")
RCS	1806-HE-VAN-15RCS	RAIN BIRD ADJ. POP-UP SPRAY (6")
SST	1806-HE-VAN-15SST	RAIN BIRD ADJ. POP-UP SPRAY (6")
1.5	3506-PC-SAM-1.0	RAIN BIRD ADJ. POP-UP ROTOR (6")
2.0	3506-PC-SAM-2.0	RAIN BIRD ADJ. POP-UP ROTOR (6")
06	5006-+-PC-SAM-SS-06	RAIN BIRD ADJ. POP-UP ROTOR (6")
16	8005-SS-16	RAIN BIRD ADJ. POP-UP ROTOR (6")



N

0 10' 20' 40' 60'

SCALE: 1" = 20'-0"

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P12777

SHEET TITLE

IRRIGATION PLAN-04

SHEET NUMBER

L504

Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"

LEGEND

SYMBOL	MODEL NO.	DESCRIPTION	EST. QTY
8Q	1806-HE-VAN-8Q	RAIN BIRD ADJ. POP-UP SPRAY (6")	02
8H	1806-HE-VAN-8H	RAIN BIRD ADJ. POP-UP SPRAY (6")	02
15T	1806-HE-VAN-15T	RAIN BIRD ADJ. POP-UP SPRAY (6")	01
15H	1806-HE-VAN-15H	RAIN BIRD ADJ. POP-UP SPRAY (6")	22
LCS	1806-HE-VAN-15LCS	RAIN BIRD ADJ. POP-UP SPRAY (6")	03
RCS	1806-HE-VAN-15RCS	RAIN BIRD ADJ. POP-UP SPRAY (6")	03
SST	1806-HE-VAN-15SST	RAIN BIRD ADJ. POP-UP SPRAY (6")	10
2.0	3506-PC-SAM-2.0	RAIN BIRD ADJ. POP-UP ROTOR (6")	31
4.0	5006-+-PC-SAM-R-SS-4.0	RAIN BIRD ADJ. POP-UP ROTOR (6")	18
16	8005-PC-SS-16	RAIN BIRD ADJ. POP-UP ROTOR (6")	35
16	8005-FC-SS-16	RAIN BIRD ADJ. POP-UP ROTOR (6")	11
	PEBS SERIES	RAIN BIRD 24 VAC SOLENOID VALVE	
		1" PRS-D (PRESSURE REGULATED)	01
		1 1/2" PRS-D (PRESSURE REGULATED)	02
		2" PRS-D (PRESSURE REGULATED)	09
NOT SHOWN	ESP-LXME	RAIN BIRD MODULAR AUTO. CONTROLLER	EXISTING
NOT SHOWN	ESP-LXMSM	RAIN BIRD STATION MODULE (IF NECESSARY)	01
NOT SHOWN		RAIN BIRD RAIN SENSOR	EXISTING
NOT SHOWN		PAIGE DIRECT BURIAL UF WIRE	AS REQUIRED
		#14 AWG VALVE CONTROL	
		#12 AWG VALVE COMMON	
		SCH 40 PVC	AS REQUIRED
		MAIN LINE	
		SLEEVES	
		SHRUB RISERS	
NOT SHOWN		LATERAL PIPE FITTINGS	
		SDR 21, CLASS 200 PVC	AS REQUIRED
		LATERALS	
QC	44-LRC	QUICK COUPLER VALVE	02
NOT SHOWN	44-K	QUICK COUPLER KEY	02
		GATE VALVE (TO LINE SIZE)	01
ARV		AIR RELIEF VALVE	01
ARV, QC		VALVE BOXES	14
NOT SHOWN		PUMP STATION (15HP)	EXISTING
NOT SHOWN		WELL	EXISTING
NOT SHOWN		RUST CONTROL UNIT	01
POC		POINT-OF-CONNECTION (TO EX. PUMP SYSTEM)	01
NOT SHOWN		METALIC TAPE	AS REQUIRED

NOTES: ABOVE QUANTITIES ARE FOR COMPARISON ONLY.
CONTRACTOR SHALL VERIFY PRIOR TO SUBMITTING BID.

RUST CONTROL UNIT SHALL BE INSTALLED TO WORK WITH EXISTING PUMP.

ZONE SUMMARY CHART

STA NO.	VALVE	SPRINKLER TYPE	VALVE SIZE	WATER DEMAND	RUN *TIME	WEEKLY USAGE
1	P1	PC ROTOR	1 1/2"	36 GPM	90 MIN/WK	3240 GAL/WK
	P2	PC ROTOR	1 1/2"	66 GPM	90 MIN/WK	5940 GAL/WK
2	P2'	PC ROTOR	2"	89 GPM	90 MIN/WK	8010 GAL/WK
3	P3	FC ROTOR	2"	86 GPM	120 MIN/WK	10320 GAL/WK
4	P4	PC ROTOR	2"	86 GPM	90 MIN/WK	7740 GAL/WK
5	P5	PC ROTOR	2"	115 GPM	90 MIN/WK	10350 GAL/WK
6	P6	SPRAY	1"	19 GPM	60 MIN/WK	1140 GAL/WK
	P6'	SPRAY	2"	42 GPM	60 MIN/WK	2520 GAL/WK
7	P7	PC ROTOR	2"	92 GPM	90 MIN/WK	8280 GAL/WK
8	P8	PC ROTOR	2"	72 GPM	90 MIN/WK	6480 GAL/WK
9	P9	PC ROTOR	2"	86 GPM	90 MIN/WK	7740 GAL/WK
10	P10	FC ROTOR	2"	72 GPM	120 MIN/WK	8640 GAL/WK
				1080	MIN/WK	80,400 GAL/WK

* TO APPLY 1.5 IN/WK

IRRIGATION NOTES & SPECIFICATIONS

AUTOMATIC IRRIGATION SYSTEM	
WATER DEMAND / ZONE	REFER TO PLAN
WATER SOURCE	15HP PUMP (EXISTING)
PRESSURE REQUIRED	70 PSI

GENERAL

IRRIGATION SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODES, CONTRACT DRAWINGS, AND CONTRACT SPECIFICATIONS.

IRRIGATION DESIGN BASED ON "LANDSCAPE PLAN" DATED AUGUST 2024. CONTRACTOR SHALL REFER TO THIS PLAN TO COORDINATE SPRINKLER LOCATIONS AND PIPE ROUTING WITH NEW AND EXISTING PLANT LOCATIONS.

THIS IRRIGATION PLAN SHALL BE USED AS A GUIDE ONLY. CONTRACTOR SHALL INSTALL IRRIGATION TO MATCH LANDSCAPING, SIDEWALKS, BUILDINGS, ETC., AND TO OVERCOME THE INHERENT INACCURACIES THAT RESULT WHEN DESIGNING FROM BASE PLANS SCALED AT 1" = 20'-0".

THIS SYSTEM HAS BEEN DESIGNED AS A TYPICAL BLOCK VALVE TYPE USING RAINBIRD SPRAY SPRINKLERS, ROTORS, SOLENOID VALVES, AND AN EXISTING AUTOMATIC CONTROLLER. THE RAIN SENSOR IS EXISTING.

THE WATER SOURCE SHALL BE AN EXISTING 15HP PUMP AND WELL SYSTEM.

CONTRACTOR IS ADVISED TO STUDY THE PLANS FOR ADDITIONAL INFORMATION AND TO VISIT THE SITE TO BECOME FAMILIAR WITH EXISTING CONDITIONS.

TO ENSURE PROPER OPERATION, PUMPING CAPACITY, PROGRAMMING, VALVE SIZES, ZONE CAPACITIES, SPRINKLER SPACING, PIPE AND WIRE SIZES, INSTALLATION NOTES AND DETAILS, AND TECHNICAL SPECIFICATIONS SHALL BE FOLLOWED AS SHOWN.

PIPING

PIPE ROUTING IS SCHEMATIC ONLY AND SHALL BE ADJUSTED FOR ON SITE CONDITIONS.

PIPE SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODES AND PIPE MANUFACTURER'S INSTRUCTIONS.

PIPE ROUTED UNDER HARDSCAPED AREAS SHALL BE SLEEVED IN SCH 40 PVC. EACH SLEEVE SHALL: (1) BE BURIED TO A MINIMUM DEPTH OF 18", (2) BE TWO PIPE SIZES LARGER THAN THE CARRIER PIPE, AND (3) EXTEND 3' BEYOND HARDSCAPED AREA ON EACH END. CONTRACTOR SHALL VERIFY THE SIZE, DEPTH AND LOCATION OF ALL EXISTING SLEEVES.

MAIN LINES, SLEEVES, RISERS AND PIPE FITTINGS SHALL BE SCH 40 PVC, LATERAL LINES SHALL BE SDR 21, CLASS 200 PVC.

METAL TRACE TAPE SHALL BE INSTALLED TO ALLOW LOCATION OF WATER LINES AND TO PREVENT DAMAGED OF WATER LINES WHEN EXCAVATING.

PIPE SIZED TO LIMIT FLOW VELOCITIES TO 5 FEET/SECOND AND TO LIMIT FRICTION LOSS IN THE PIPING NETWORK.

SLEEVE PIPES SHALL BE INSTALLED SO BACKFILL DEPTHS ARE MAINTAINED AT 24" FOR MAIN LINE AND AT 18" FOR LATERALS ROUTED UNDER PAVEMENT, AND AT 18" FOR MAIN LINE AND AT 12" FOR ALL OTHER LATERALS ROUTED IN LANDSCAPED AREAS.

BACKFILL SHALL BE OF SUITABLE MATERIAL, FREE OF ROCKS, STONES, AND OTHER DEBRIS THAT WOULD DAMAGE IRRIGATION SYSTEM COMPONENTS.

A GATE VALVE SHALL BE INSTALLED AT STRATEGIC LOCATION FOR ISOLATION. THE GATE VALVE SHALL BE TO LINE SIZE AND INSTALLED IN A VALVE BOX. POROUS MATERIAL SHALL BE INSTALLED TO PROMOTE DRAINAGE.

ALL MAIN DIRECTIONAL FITTINGS SHALL BE THRUST BLOCKED IN ACCORDANCE WITH THE PIPE MANUFACTURER'S INSTRUCTIONS AND THE APPROPRIATE INSTALLATION DETAIL.

FLUSH IRRIGATION SYSTEM WITH WATER TO CLEAR LINES OF FOREIGN MATERIAL AFTER SYSTEM ASSEMBLY IS COMPLETE AND PRIOR TO INSTALATION OF SPRINKLER HEADS. CAP AND PLUG OUTLETS AND FILL LINES WITH WATER. PRESSURIZE ASSEMBLY TO 100 PSI AND SHUT OFF PUMP. SYSTEM SHALL HOLD AT 100 PSI FOR ONE HOUR AT NO LOSS OF PRESSURE. INSTALL SPRINKLER HEADS AFTER APPROVAL OF TEST RESULTS.

SPRINKLERS

SPRINKLER LOCATIONS ARE SCHEMATIC ONLY AND SHALL BE ADJUSTED FOR LANDSCAPING, SITE LIGHTING, PREVAILING WIND, MOUNDING, UTILITIES, ETC., TO ENSURE PROPER COVERAGE WITH MINIMAL UNDESIRABLE OVERTHROW.

SPRAY HEADS SHALL BE RAINBIRD 1800 SERIES. SIX INCH POP-UP TYPE SHALL BE INSTALLED IN AREAS LANDSCAPED WITH SOD AND MULCH, TWELVE INCH POP-UP TYPE SHALL BE INSTALLED IN AREAS LANDSCAPED WITH GROUNDCOVER AND LOW SHRUBS, SHRUB HEADS SHALL BE INSTALLED IN AREAS LANDSCAPED WITH TALL SHRUBS.

ALL SPRAY HEADS SHALL BE INSTALLED ON PVC SWING JOINTS CONSISTING OF SCH 40 FITTINGS AND SCH 80 NIPPLES. THE RISER FOR EACH BUBBLER, SHRUB HEAD AND 12" POP-UP SPRAY LOCATED IN A SHRUB MASS SHALL BE 1/2" SCH 40 PVC WHICH SHALL BE PAINTED FLAT BLACK TO BE LESS VISIBLE. RISERS FOR SHRUB HEADS SHALL BE INSTALLED A STANDARD HEIGHT OF 6" ABOVE PLANTS.

TWELVE INCH POP-UP SPRINKLERS LOCATED IN SHRUB MASSES SHALL BE INSTALLED TO THE HEIGHT REQUIRED SO EACH SPRINKLER IS CONCEALED FROM VIEW EXCEPT DURING OPERATION.

EACH SPRAY HEAD SHALL BE EQUIPPED WITH THE APPROPRIATE HE-VAN NOZZLE.

POP-UP ROTOR HEADS SHALL BE RAINBIRD 3500, 5000 AND 8005 SERIES WHICH SHALL BE INSTALLED ON PVC SWING JOINTS CONSISTING OF SCH 40 FITTINGS AND AND SCH 80 NIPPLES. ALL ROTORS SHALL BE OF STAINLESS STEEL CONSTRUCTION.

SPRINKLERS SHALL BE INSTALLED TO AND MAINTAINED AT THE PROPER HEIGHT TO ELIMINATE THE CHANCE OF INJURY TO THE PUBLIC.

QUICK COUPLER VALVES SHALL BE INSTALLED.

ADJUSTMENT FEATURES OF SPRINKLERS SPECIFIED SHALL BE UTILIZED TO ENSURE PROPER COVERAGE WITH MINIMAL UNDESIRABLE OVERTHROW. LOW ANGLE, FLAT SPRAY, AND ADJUSTABLE ARC NOZZLES SHALL BE USED TO MINIMIZE OVERTHROW.

SPRINKLERS LOCATED ADJACENT TO HARDSCAPED AREAS SHALL BE INSTALLED AWAY FROM HARDSCAPED AREAS TO MINIMIZE OVERTHROW AND THE CHANCE OF DAMAGE BY VEHICLES, PEDESTRIANS, AND LAWN MAINTENANCE PERSONNEL. AS A GENERAL RULE, 6" POP-UP SPRAY HEADS SHALL BE INSTALLED IN 4", SHRUB HEADS AND 12" POP-UP SPRAY HEADS SHALL BE INSTALLED IN 12", AND ROTOR HEADS SHALL BE INSTALLED IN 6".

CONTROL SYSTEM

AN EXISTING RAINBIRD ESP-LXME SERIES AUTOMATIC CONTROLLER SHALL BE USED.

CONTRACTOR SHALL PROVIDE ADDITIONAL ZONE MODULES IF NECESSARY.

WIRING FROM CONTROLLER TO VALVES SHALL BE COORDINATED WITH OWNERS REPRESENTATIVE.

CONTROL LINES FROM AUTOMATIC CONTROLLER TO IN-LINE AUTOMATIC VALVES SHALL BE #14 AWG UNDERGROUND FEED TYPE WHICH SHALL BE: (1) INSTALLED IN ACCORDANCE WITH LOCAL CODES, (2) INSTALLED IN SCH 40 PVC WIRE CONDUIT THROUGHOUT, (3) BURIED TO A MINIMUM DEPTH OF 15", (4) COLOR CODED TO FACILITATE TROUBLESHOOTING, AND (5) SPLICED MOSTLY AT VALVE LOCATIONS. SPLICES SHALL BE MADE WATERPROOF USING APPROVED METHODS. SPARE WIRES SHALL BE ROUTED FROM THE CONTROLLER IN ALL DIRECTIONS TO THE FARTHEST VALVES CONTROLLED.

AN INDIVIDUAL CONTROL WIRE SHALL BE ROUTED TO EACH VALVE AND VALVES WHICH OPERATE SIMULTANEOUSLY SHALL BE TEED TOGETHER AT THE APPROPRIATE CONTROLLER.

PULL BOXES SHALL BE INSTALLED IN THE WIRE CONDUIT AT INTERVALS SO ACCESS POINTS DO NOT EXCEED 200 FEET.

AUTOMATIC VALVE LOCATIONS ARE SCHEMATIC ONLY AND SHALL BE ADJUSTED FOR ON SITE CONDITIONS. EACH VALVE SHALL BE INSTALLED IN A VALVE BOX. A MINIMUM OF ONE CUBIC FOOT OF GRAVEL SHALL BE PROVIDED PER BOX TO PROMOTE DRAINAGE. THOSE VALVES WITH PRESSURE REGULATING FEATURE SHALL BE SET AT THE PRESSURE REQUIRED TO ENSURE PROPER OPERATION OF THE SPRINKLERS BEING CONTROLLED.

WATER CONSERVATION EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. A RAIN SENSOR SHALL BE INSTALLED.

PUMP STATION

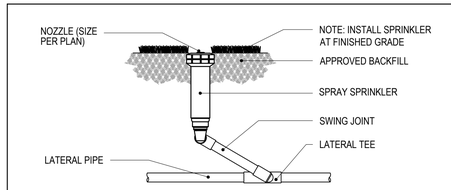
ONE EXISTING 15HP PUMP STATION AND WELL SHALL BE USED.

TIMING AND PRECIPITATION

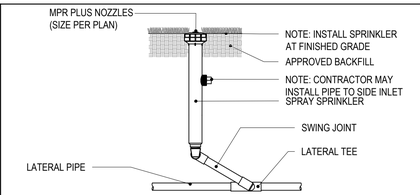
TIMING OF EACH STATION SHALL BE SET IN THE FIELD TO MATCH LOCAL REQUIREMENTS. REFER TO ZONE SUMMARY CHART FOR RECOMMENDED RUN TIMES TO APPLY 1.5 IN/WK.

PROGRAMMING

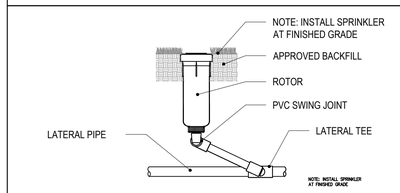
SYSTEM SHALL BE PROGRAMMED TO ENSURE THE CAPACITY OF THE PUMP STATION AND MAIN LINE PIPING NETWORK ARE NOT EXCEEDED.



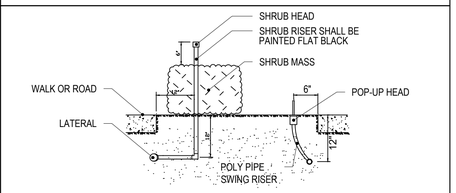
1 6" POP UP SPRINKLER ON PVC SWING JOINT
Scale: NTS



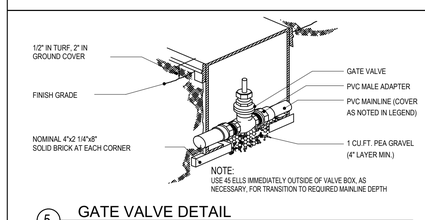
2 12" POP-UP SPRINKLER ON POLY PIPE SWING JOINT
Scale: NTS



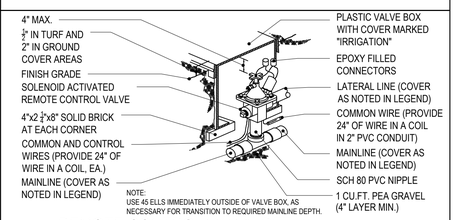
4 ROTOR ON POLY PVC SWING JOINT
Scale: NTS



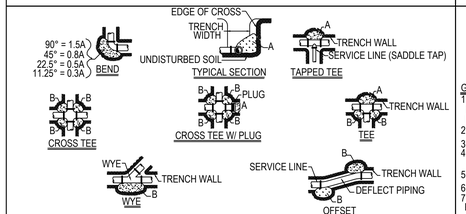
3 SPRINKLER LOCATION
Scale: NTS



5 GATE VALVE DETAIL
Scale: NTS



6 REMOTE CONTROL VALVE DETAIL
Scale: NTS



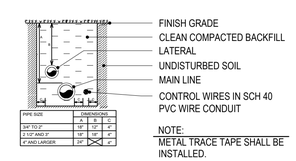
7 THRUST BLOCK DETAIL
Scale: NTS

THRUST BLOCK SCHEDULE						
PIPE SIZE	2"	4"	6"	8"	10"	12"	14"
A *	1	3	5.5	10	15	22	30
B *	1	2	4.5	7.5	12	17	23

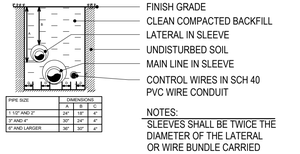
* DENOTES CHART NUMBERS ARE SQ. FT. BEARINGS ON UNDISTURBED SOIL.

GENERAL NOTES :
1. THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED MATERIAL. WHERE TRENCH WALL HAS BEEN DISTURBED EXCAVATE ALL LOOSE MATERIAL AND EXTEND THRUST BLOCK TO UNDISTURBED MATERIAL.
2. ON BENDS AND TEES EXTEND THRUST BLOCKS TO THE FULL LENGTH OF THE FITTING.
3. PLACE BOARD IN FRONT OF ALL PLUGS BEFORE POURING THRUST BLOCK.
4. BACKFILL SHALL CONSIST ENTIRELY OF CLEAN SAND AND SMALL ROCKFRAGMENTS. ANY MUCK FOUND AROUND THE EXCAVATION SHALL BE REPLACED WITH COMPACTED ACCEPTABLE MATERIAL.
5. DESIGN CRITERIA : SOIL BEARING = 1000 LBS./SQ. FT. PRESSURE = 150 PSI
6. CONCRETE SHALL BE 2500 PSI MINIMUM.
7. CONTRACTOR SHALL WRAP ALL FITTINGS IN POLYETHYLENE FILM (8 MILS) MINIMUM THICKNESS, PROVIDING MINIMUM OF ONE (1) FOOT OVERLAP, EACH SIDE OF FITTING.

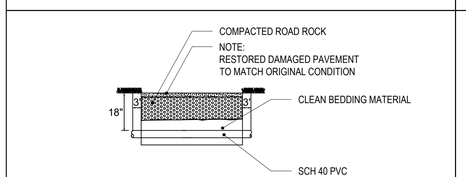
8 THRUST BLOCK SCHEDULE DETAIL
Scale: NTS



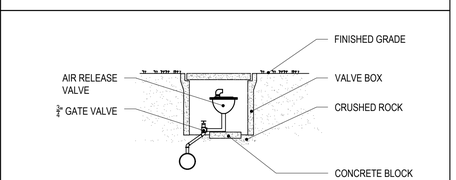
9 TRENCHING DETAIL-NON TRAFFIC AREAS
CONTROL WIRE IN WIRE CONDUIT
Scale: NTS



10 TRENCHING DETAIL-VEHICLE TRAFFIC AREAS
PIPE AND WIRE IN SLEEVE
Scale: NTS



11 PIPE SLEEVE DETAIL
Scale: NTS



12 AIR RELIEF VALVE

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AECOM

PROJECT

SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT

PRIME CONSULTANT

AECOM

7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

SUB-CONSULTANT

CIVIL
BCC ENGINEERING
305.670.2350 tel
www.bcceng.com

LANDSCAPE
CURTIS + ROGERS DESIGN STUDIO
305.442.1774 tel
www.curtisrogers.com

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GEOSOL, INC.
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www.geosol.net

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PDS, INC.
954.237.7850 tel
www.pds-eng.com

MECHANICAL, PLUMBING AND FIRE PROTECTION
HAMMOND AND ASSOCIATES CONSULTING
954.327.7111 tel
www.hammondengineers.com

REGISTRATION

AIDA M. CURTIS LICENSE No. 1330 STATE OF FLORIDA LANDSCAPE ARCHITECT

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Curtis + Rogers Design Studio, Inc
7520 S Red Rd., Ste M
South Miami, FL 33143

ISSUE/REVISION

I/R	DATE	DESCRIPTION
	09/16/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT

PROJECT NUMBER

P12777

SHEET TITLE

IRRIGATION NOTES AND DETAILS

SHEET NUMBER

L601

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Central Management Initials: Designer:____ Checked:____ Approved:____ ANSI D 24" x 36"

ELECTRICAL SYMBOLS LEGEND

	LED POLE MOUNTED SITE LIGHTING FIXTURE. LETTER INDICATES FIXTURE TYPE. SEE LIGHTING FIXTURE SCHEDULE.
	LED BOLLARD SITE LIGHTING FIXTURE. LETTER INDICATES FIXTURE TYPE. SEE LIGHTING FIXTURE SCHEDULE. PROVIDE QUANTITIES AS SHOWN ON DRAWINGS. (#) INDICATES POLE NUMBER.
	LIGHTING FIXTURES STRIP FIXTURE (SEE LIGHTING FIXTURE SCHEDULE) CEILING MOUNTED DOWNLIGHT (SEE LIGHTING FIXTURE SCHEDULE)
PC	PHOTOCELL
J J	OUTLET OR JUNCTION BOX, SIZE PER NEC.
	PANELBOARD; AS NOTED, REFER TO PANEL SCHEDULES.
	CONTROL PANEL.
SPD	SURGE PROTECTION DEVICE.

60/3/NP/3R	DISCONNECT SWITCH AS NOTED.
	(AMP RATING / # POLES / FUSE SIZE, NP OR NF / NEMA RATING)
	NP = FUSED PER NAMEPLATE RATING OF EQUIPMENT
	NF = NON-FUSED

PB	PULLBOX.
	DEVICE OR EQUIPMENT AS NOTED
	GROUND ROD UON.
#	REFERENCE NOTES
	CONDUIT RACEWAY EXPOSED. PAINT TO MATCH FINISH
	CONDUIT RACEWAY CONCEALED IN CEILING SPACE OR WALLS.
	CONDUIT RACEWAY IN CONCRETE SLAB OR UNDERGROUND.
	CONDUIT UP.
	CONDUIT DOWN.
G	UNDERGROUND GROUND CONDUCTOR.
LP	LIGHTNING PROTECTION UNDERGROUND COUNTERPOISE CONDUCTOR LIGHTNING PROTECTION ROOF CONDUCTOR.
C-1,3 (TIE)	HOMERUN TO PANEL - LETTER INDICATES PANEL, NUMBERS INDICATE BRANCH CIRCUITS. ALL RACEWAYS WITHOUT FURTHER DESIGNATION INDICATE A TWO-WIRE CIRCUIT. FOUR WIRES PLUS EG PLUS IG ARE INDICATED LONG MARKS INDICATE NEUTRAL CONDUCTOR, LONG MARKS WITH FLAG INDICATE ISOLATED GROUND (IG) CONDUCTOR. SHORT MARKS INDICATE PHASE OR SWITCHED CONDUCTORS. PROVIDE GREEN GROUND CONDUCTOR IN ALL CONDUITS. (TIE) INDICATES CIRCUIT IS SHARED WITH ADDITIONAL DEVICES/FIXTURES.
T	POWER TRANSFORMER (SIZED TO SCALE)

POWER PLAN SYMBOLS

NOTE: NOT ALL SYMBOLS MAY BE USED.

SYMBOL	DESCRIPTION
X Y Z	NORMAL POWER DUPLEX RECEPTACLE WITH COVERPLATE, NEMA 5-20R, STANDARD MOUNTING HEIGHT 18" A.F.F. UNLESS OTHERWISE NOTED: X INDICATES CIRCUIT NUMBER, Y INDICATES NON-STANDARD MOUNTING HEIGHT, AND Z INDICATES THE FOLLOWING: COPY = COPIER; MTD 42" A.F.F. REF = REFRIGERATOR; MTD 48" A.F.F. T = TAMPER RESISTANT TV = TELEVISION; MTD 72" A.F.F. U = USB UC = UNDER COUNTER V = VENDING, MTD 48" A.F.F. WP = WEATHER PROOF XX" = MTD AT XX" AFF
	GFCI RECEPTACLE INSTALLED IN READILY ACCESSIBLE LOCATION, SAME NOTATION AS ABOVE.
	DUPLEX RECEPTACLE , SAME NOTATION AS ABOVE.
	QUAD RECEPTACLE , SAME NOTATION AS ABOVE.
	SIMPLEX RECEPTACLE, SAME NOTATION AS ABOVE.
	SPECIAL RECEPTACLE, SAME NOTATION AS ABOVE.
	FLOOR BOX WITH FLUSH MOUNTED DEVICE
	CEILING MOUNTED DUPLEX RECEPTACLE
J	JUNCTION BOX / EQUIPMENT CONNECTION
M	1-PHASE MOTOR CONNECTION
M	3-PHASE MOTOR CONNECTION
$M	MOTOR RATED SWITCH
	MANUAL MOTOR STARTER, TOGGLE TYPE, WITH THERMAL OVERLOAD DEVICE
	MAGNETIC STARTER
	NON-FUSED DISCONNECT SWITCH
3 200/200	FUSED DISCONNECT SWITCH. # OF POLES, SWITCH, AND FUSE SIZE AS SHOWN
	COMBINATION MOTOR STARTER/DISCONNECT
	CONTROL STATION: SEE CONTROL DIAGRAMS OR PLAN SHEETS FOR TYPE AND QUANTITY OF DEVICES
	PANELBOARD (SIZED TO SCALE)
	POWER TRANSFORMER (SIZED TO SCALE)
	AIR TERMINAL
	GROUND BONDING POINT TO STEEL STRUCTURE, REBAR, PIPE, ETC.
	GROUNDING CONNECTION (TYPE AS SHOWN OR NOTED)
	GROUND BAR
MH X	MANHOLE: X INDICATES TYPE AS FOLLOWS P = POWER MANHOLE T = TELECOMMUNICATIONS MANHOLE

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SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT
PARKS & RECREATION
City of Fort Lauderdale

PRIME CONSULTANT
AECOM
7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

SUB-CONSULTANT
CIVIL
BCC ENGINEERING
305.670.2350 tel
www.bcceng.com

LANDSCAPE
CURTIS + ROGERS DESIGN STUDIO
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954.237.7850 tel
www.pds-eng.com

MECHANICAL, PLUMBING AND FIRE PROTECTION
HAMMOND AND ASSOCIATES CONSULTING
954.327.7111 tel
www.hammondengineers.com

REGISTRATION

AECOM Technical Services, INC
7650 West Courtney Campbell Causeway
Tampa, FL 33607-1462

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P12777

SHEET TITLE
ELECTRICAL LEGEND, NOTES, AND ABBREVIATIONS

SHEET NUMBER
E001

ABBREVIATIONS:

A	AMPS
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AC	AIR CONDITIONING [UNIT]
AFF	ABOVE FINISH FLOOR
A.I.C.	AMPERE INTERRUPTING CAPACITY
AFG	ABOVE FINISH GRADE
AL, ALUM.	ALUMINUM
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWG	AMERICAN WIRE GAUGE
BLDG.	BUILDING
C.	CONDUIT
CCTV	CLOSED CIRCUIT TELEVISION
CKT.	CIRCUIT
CU	COPPER
COMM.	COMMUNICATION
DIA.	DIAMETER
DN	DOWN
DWG.	DRAWING
EC	ELECTRICAL CONTRACTOR
ETC.	ET CETERA
EQUIP.	EQUIPMENT
EXT.	EXTERIOR
FOC	FIBER OPTIC CABLE
FT	FOOT; FEET
FTL	FEED THROUGH LUGS
FUT	FUTURE
GA	GAUGE
GEC	GROUNDING ELECTRODE CONDUCTOR
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
HP	HORSEPOWER
HZ	HORIZONTAL, HERTZ
I.D.	IDENTIFICATION
IN.	INCHES
JB	JUNCTION BOX
KVA	KILOVOLT AMPERES
KW	KILOWATT
LED	LIGHT EMITTING DIODE
LFMC	LIQUID-TIGHT, FLEXIBLE, METAL CONDUIT
LOC.	LOCATION
LTG	LIGHTING
MAX.	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MIN.	MINIMUM
MLCC	MUSCO LIGHTING CONTROL CABINET
M.L.O.	MAIN LUGS ONLY
MTD	MOUNTED
N	NEUTRAL
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
Ø	PHASE
P	POLE
PNL	PANEL
PVC	POLYVINYL CHLORIDE
RECEPT.	RECEPTACLE
RGS	RIGID GALVANIZED STEEL
SCH.	SCHEDULE
SER	SERVICE ENTRANCE RATED
SPD	SURGE PROTECTIVE DEVICE
S.S.	STAINLESS STEEL
SQ.	SQUARE
SYMM.	SYMMETRICAL
TSP	TECHNICAL SPECIAL PROVISIONS
TYP.	TYPICAL
UL	UNDERWRITERS LABORATORIES
UON	UNLESS OTHERWISE NOTED
V	VOLTS
VA	VOLT-AMPS
VAC	VOLTS ALTERNATING CURRENT
W	WIRE; WATT
W/	WITH
WAP	WIRELESS ACCESS POINT
WIFI	WIRELESS FIDELITY
WP	WEATHERPROOF (NEMA 3R)
XFMR	TRANSFORMER

ELECTRICAL GENERAL NOTES:

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE CURRENTLY ADOPTED EDITION OF NATIONAL ELECTRICAL CODE AND SHALL ALSO COMPLY WITH ALL APPLICABLE RULES AND REGULATIONS OF LOCAL AND STATE LAWS AND ORDINANCES.
2. CONTRACTOR SHALL MAKE A THOROUGH EXAMINATION OF THE SITE AND THE CONTRACT DOCUMENTS. NO CLAIM FOR EXTRA COMPENSATION WILL BE RECOGNIZED IF DIFFICULTIES ARE ENCOUNTERED WHICH AN EXAMINATION OF SITE CONDITIONS AND CONTRACT DOCUMENTS PRIOR TO EXECUTING CONTRACT WOULD HAVE REVEALED.
3. ELECTRICAL CONTRACTOR SHALL ARRANGE FOR ALL NECESSARY PERMITS, LICENSES, UTILITY COORDINATION, AND INSPECTIONS AS REQUIRED BY THE CITY OR UTILITY COMPANY. CONTRACTOR IS RESPONSIBLE FOR ALL EQUIPMENT REQUIRED BY UTILITY COMPANY AND SHOULD INCLUDE NECESSARY COSTS IN BID.
4. CONTRACTOR SHALL MAINTAIN AN UP TO DATE AND LEGIBLE SET OF AS-BUILT DRAWINGS ON SITE AT ALL TIMES TO REFLECT AS-BUILT CONDITIONS.
5. FEED ALL RECEPTACLES AND DEVICES WITH (2) #12, (1) #12 GND IN 3/4" C, UON.
6. PROVIDE (2) #12, (1) #12 GND AND #12 SWITCH LEGS AS REQUIRED IN 3/4" C FOR ALL NEW BUILDING LIGHTING, UON.
7. PROVIDE AN EQUIPMENT GROUNDING CONDUCTOR IN ALL FEEDER AND BRANCH CIRCUIT RACEWAYS.
8. ALL 120V, 20A CIRCUIT HOMERUNS OVER 50FT. SHALL BE #10 CU MINIMUM, UON.
9. ALL 120V, 20A CIRCUIT HOMERUNS OVER 150FT. SHALL BE #8 CU MINIMUM, UON.
10. ALL 208V OR 240V, 20A CIRCUIT HOMERUNS OVER 150FT. SHALL BE #10 CU. MINIMUM, UON.
11. ALL 208V OR 240V, 20A CIRCUIT HOMERUNS OVER 300FT. SHALL BE #8 CU MINIMUM, UON.
12. PROVIDE PULLSTRINGS IN ALL EMPTY CONDUIT AND RACEWAYS WITH LABELING AND CAPS AT EACH END.
13. LOCATE EXISTING UTILITIES AND PROTECT THEM FROM DAMAGE.
14. UNDERGROUND CONDUIT SHALL BE PVC SCH. 40, UON. UNDERGROUND CONDUIT SHALL TRANSITION TO RGS CONDUIT WITH PVC TO RGS CONDUIT FITTINGS. EXTERIOR CONDUIT SHALL BE RGS ABOVE GRADE THROUGH AND INCLUDING THE FIRST 90 DEGREE FITTING UNDERGROUND UON.
15. INTERIOR CONDUIT WITH A TRADE SIZE OF LESS THAN 2" SHALL BE EMT. CONDUIT WITH A TRADE SIZE OF 2" AND GREATER SHALL BE RGS.
16. UNDERGROUND CONDUITS SHALL BE INSTALLED A MINIMUM OF 36" BELOW GRADE.
17. EXPOSED EXTERIOR CONDUIT SHALL BE RGS THROUGH AND INCLUDING THE FIRST 90° BEND INSTALLED UNDERGROUND. TRANSITIONS BETWEEN RGS AND PVC CONDUIT SHALL BE MADE WITH A RGS TO PVC CONDUIT FITTING.
18. PLASTIC END CAPS SHALL BE INSTALLED ON ENDS OF UNISTRUT.
19. ADJUST THE LOCATIONS OF THE SPD'S SUCH THAT THE MAXIMUM SPD BRAIDED/TWISTED LEADS LENGTH DO NOT EXCEED 24 INCHES AND HAVE NO SHARP TURNS.
20. THE CONTRACTOR SHALL FURNISH AND INSTALL COMPLETE IN ALL RESPECTS ALL LIGHTING FIXTURES LISTED IN THE LIGHTING FIXTURE SCHEDULE.
21. THE CONTRACTOR SHALL SUBMIT CATALOG CUTS OF ALL THE LIGHTING FIXTURES TO THE ENGINEER. THESE CUTS SHALL BE SUBMITTED IMMEDIATELY AFTER THE CONTRACTOR HAS RECEIVED AN APPROVED MATERIAL LIST FROM THE ENGINEER.
22. IF ALTERNATE LIGHTING FIXTURES ARE SUBMITTED, EC SHALL PROVIDE AT A MINIMUM:
    - 22.1. PHOTOMETRIC CALCULATIONS FOR ALL SITE LIGHTING AREAS INDICATING POINT-BY-POINT LIGHT LEVELS, MAX:MIN RATIOS, AVG:MIN RATIOS, LIGHT LOSS FACTORS, ETC.
    - 22.2. DATA SHEETS AND SHOP DRAWINGS SHALL INDICATE LUMEN OUTPUT, INPUT WATTAGE, VOLTAGE, HOUSING MATERIAL AND FINISH, DIMENSIONS, COLOR RENDERING INDEX, COLOR CORRECTION TEMPERATURE, EFFECTIVE PROJECTED AREA, ETC.
23. COORDINATE ALL LOCATIONS OF LIGHTING FIXTURES WITH EXISTING CONDITIONS. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS, WITH PARTICULAR ATTENTION TO UNDERGROUND UTILITIES, CONDUITS, PIPES, ETC.
24. THE CONTRACTOR SHALL REPAIR AND REPLACE THE DISTURBED CONCRETE. COORDINATE THE REMOVAL AND PATCHING OF THE EXISTING CONCRETE WALKWAYS, PADS, ETC. FOR THE UNDERGROUND CONDUITS AND PULLBOXES.

COORDINATE WITH AECOM ON LATEST ISSUE OF DRAWINGS BEFORE COMMENCEMENT OF CONSTRUCTION.
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SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT
PARKS & RECREATION
City of Fort Lauderdale

PRIME CONSULTANT
AECOM

7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

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BCC ENGINEERING
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www.bcceng.com

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7650 West Courtney Campbell Causeway
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	09/16/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT

PROJECT NUMBER
P12777

SHEET TITLE
ELECTRICAL ABBREVIATIONS AND NOTES

SHEET NUMBER
E002

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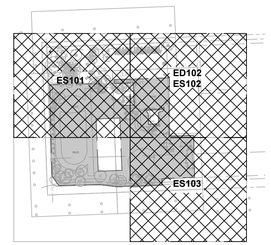
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Central File Management Initials: Designer:_____ Checked:_____ Approved:_____ ANSI D 24" x 36"



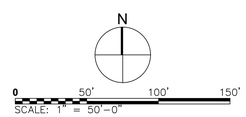
1 OVERALL ELECTRICAL SITE PLAN
SCALE : 1" = 50'-0"

GENERAL NOTES:

1. REFER TO SHEET E002 FOR ADDITIONAL GENERAL NOTES.



KEY PLAN



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AECOM

7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

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Shahzad S. Ahmed
P.E. No. 68863

AECOM Technical Services, INC
7650 West Courtney Campbell Causeway
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SHEET TITLE

OVERALL ELECTRICAL SITE PLAN

SHEET NUMBER

E100

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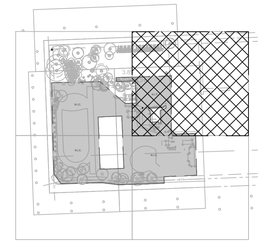
1 PARTIAL ELECTRICAL SITE PLAN - DEMOLITION
SCALE : 1" = 20'-0"

GENERAL NOTES:

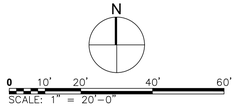
1. REFER TO SHEET E002 FOR ADDITIONAL GENERAL NOTES.

KEYED NOTES:

1. DISCONNECT AND REMOVE EXISTING CITY IRRIGATION CONTROLLER SYSTEM. MOVE OR REPLACE TO LOCATION TO BE DECIDED BY CITY OF FORT LAUDERDALE.
2. DISCONNECT AND REMOVE EXISTING RECEPTACLE OUTLETS IN PREPARATION FOR THE NEW PAVILION.



KEY PLAN



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SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT

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City of Fort Lauderdale

PRIME CONSULTANT

AECOM

7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

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7650 West Courtney Campbell Causeway
Tampa, FL 33607-1462

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PROJECT NUMBER

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SHEET TITLE

PARTIAL ELECTRICAL SITE PLAN - DEMOLITION

SHEET NUMBER

ED102

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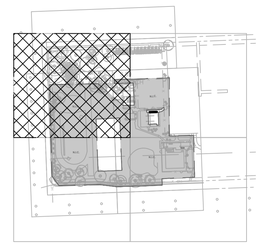
Project Management Initials: Designer:_____ Checked:_____ Approved:_____ ANSI D 24" x 36"



1 PARTIAL ELECTRICAL SITE PLAN
SCALE : 1" = 20'-0"

GENERAL NOTES:

1. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS, AND SHEET E002 FOR GENERAL NOTES.
2. DO NOT ROUTE CONDUIT UNDER COURTS.
3. BURY CONDUITS AT 36" BFG.
4. ROUTE PICKLEBALL COURT LIGHTING CIRCUITS THROUGH THE LIGHTING CONTACTOR. REFER TO SHEET E601.
5. PICKLEBALL COURT AND POOL AREA LIGHTING AND POLES ARE PROVIDED BY MUSCO. SEE SPECIFICATION EXTERIOR LIGHTING SECTION 265619 FOR ADDITIONAL INFORMATION. CONTRACTOR TO SUBMIT SHOP DRAWINGS SHOWING WIND LOAD CALCULATIONS AND FOUNDATION DESIGN RATED FOR 180 MPH PRIOR TO CONSTRUCTION.
6. COIL 30' CONDUCTORS FOR EXTENSION UP THE POLE FOR CONNECTION TO MUSCO DRIVER BOX.
7. SIZE ALL BOXES PER NEC.



KEY PLAN

N

0 10' 20' 40' 60'
SCALE: 1" = 20'-0"

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AECOM

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SUITE 700
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813.286.1711 tel 813.287.8591 fax
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SHAHZAD S. AHMED
LICENSE
NO. 68863
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

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AECOM Technical Services, INC
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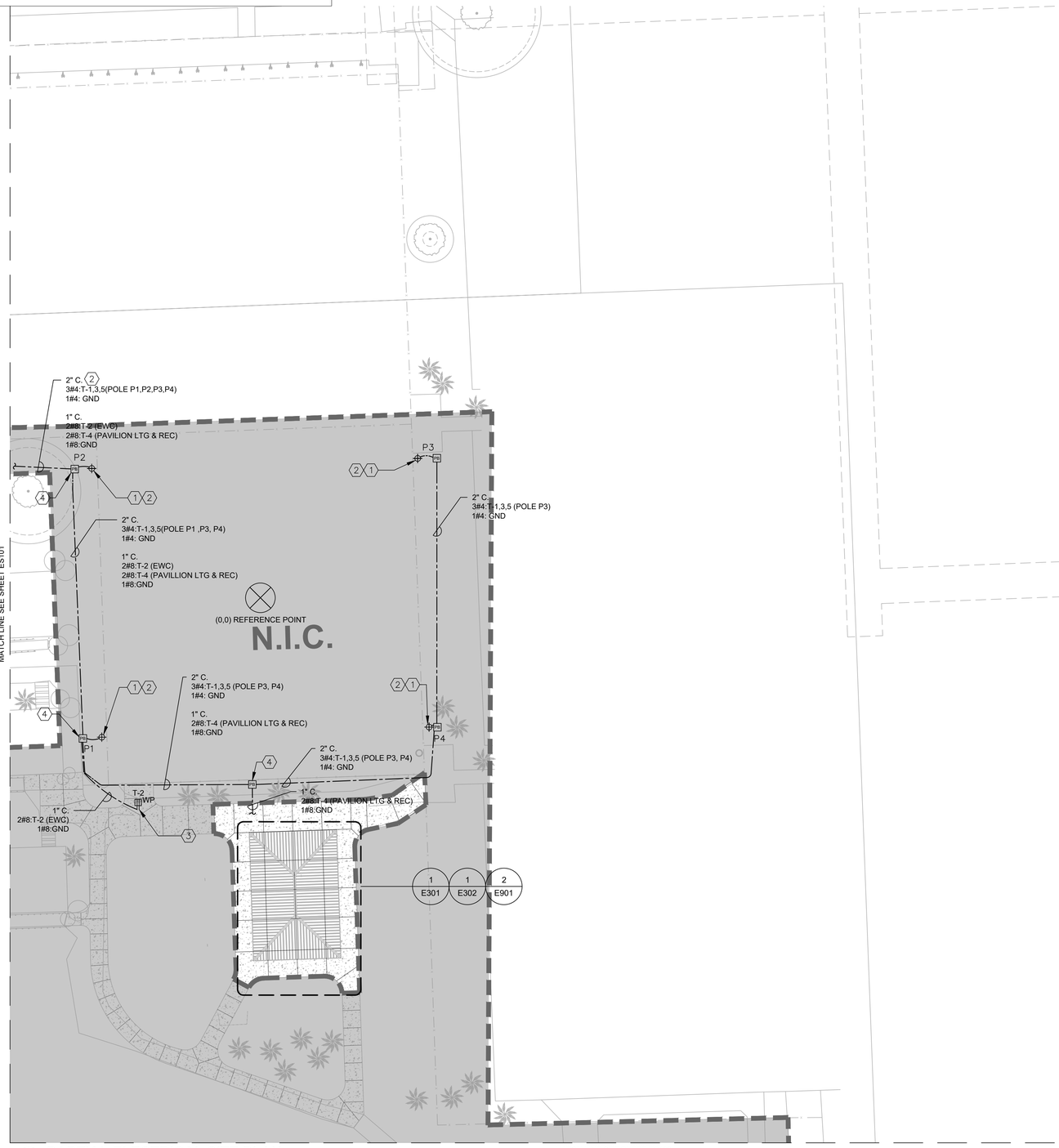
P12777

SHEET TITLE

PARTIAL ELECTRICAL SITE PLAN

SHEET NUMBER

ES101



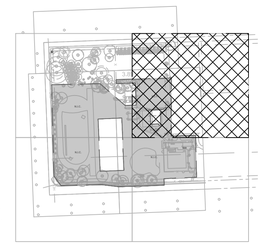
1 PARTIAL ELECTRICAL SITE PLAN
SCALE : 1" = 20'-0"

GENERAL NOTES:

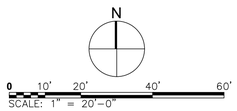
1. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS, AND SHEET E002 FOR GENERAL NOTES.
2. DO NOT ROUTE CONDUIT UNDER COURTS.
3. BURY CONDUITS AT 36" BFG.
4. ROUTE TENNIS PICKLEBALL LIGHTING CIRCUITS THROUGH THE LIGHTING CONTACTOR. REFER TO SHEET E601.
5. PICKLEBALL COURT LIGHTING AND POLES ARE PROVIDED BY MUSCO. SEE SPECIFICATION EXTERIOR LIGHTING SECTION 265619 FOR ADDITIONAL INFORMATION. CONTRACTOR TO SUBMIT SHOP DRAWINGS SHOWING WIND LOAD CALCULATIONS AND FOUNDATION DESIGN RATED FOR 180 MPH PRIOR TO CONSTRUCTION.
6. COIL 30' CONDUCTORS FOR EXTENSION UP THE POLE FOR CONNECTION TO MUSCO DRIVER BOX.
7. SIZE ALL BOXES PER NEC.

KEYED NOTES:

1. NEW LIGHT POLES AND FIXTURES DESIGNED BY MUSCO LIGHTING.
2. LIGHTING POLE CONDUIT AND CONDUCTORS TO BE ROUTED VIA MUSCO LIGHTING CONTACTOR IN MUSCO FURNISHED CONTRACTOR INSTALLED MUSCO LIGHTING CONTROL CABINET 'MLCC'.
3. PROVIDE 120V SINGLE PHASE, 20A, RECEPTACLE WITH WEATHERPROOF METALLIC 'IN-USE' COVER FOR ELECTRIC WATER COOLER. PROVIDE 20A/1P GFCI TYPE BREAKER FOR RECEPTACLE GFCI PROTECTION. COORDINATE EXACT LOCATION OF ELECTRIC WATER COOLER PRIOR ROUGH-IN.
4. PROVIDE 12"x24"x18" PRECAST CONCRETE PULL BOX W/POLYMER HEAVY DUTY COVER. BROOKS 38 SERIES OR EQUAL. REFER TO SHEET E302 FOR PULLBOX DETAIL.



KEY PLAN



COORDINATE WITH AECOM ON LATEST ISSUE OF DRAWINGS BEFORE COMMENCEMENT OF CONSTRUCTION.
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I/R	DATE	DESCRIPTION

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SHEET TITLE

PARTIAL ELECTRICAL SITE PLAN

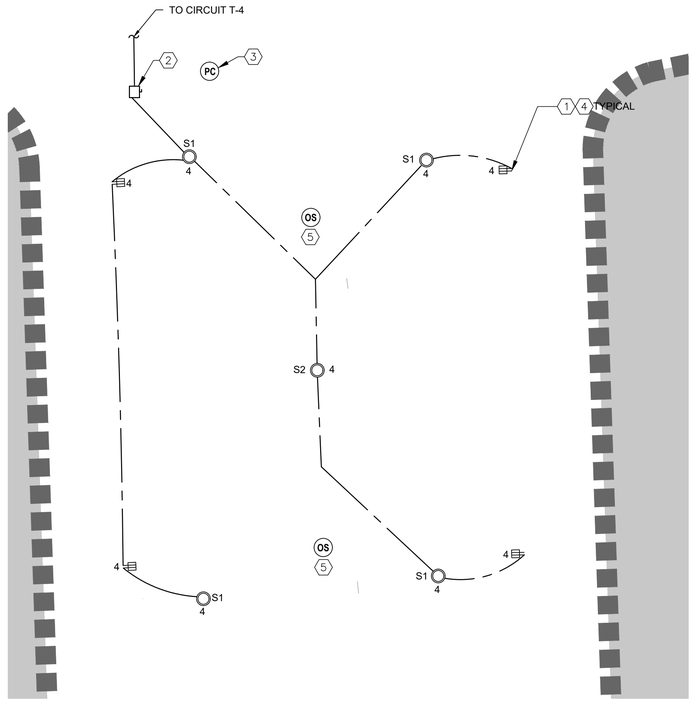
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ES102

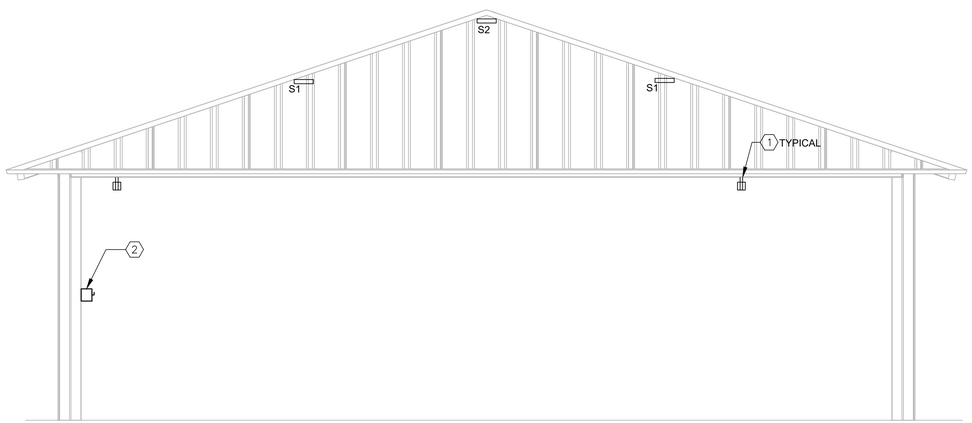
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Exhibit 1
Page 616 of 711

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Plot Management Initials: Designer:____ Checked:____ Approved:____ ANSI D 24" x 36"

LIGHTING FIXTURE SCHEDULE										
TYPE	QTY	MANUFACTUER	DESCRIPTION	MODEL	ARANGEMENT	MOUNTING HEIGHT	LLF	LUMINAIRE LUMENS	LUMINAIRE WATTS	TOTAL WATTS
S1	4	COOPER LIGHTING OR APPROVED EQUAL	EXTERIOR PENDANT LOW PROFILE ROUND LUMINAIRE, 4000 CCT, 70 MIN. CRI, DIE CAST ALUMINUM HOUSING WITH POWDER COAT FINISH; UL, ETL, OR APPROVED NRTL LISTED AND LABLED, DLC QUALIFIED.	TT-D2-740-U-WQ	SINGLE	10' 0"	0.9	4215	47.2	188.8
S2	1	COOPER LIGHTING OR APPROVED EQUAL	SAME AS TYPE S1 ABOVE, EXCEPT MOUNTING HEIGHT.	TT-D2-740-U-WQ	SINGLE	12' 0"	0.9	4215	47.2	47.2



1 PAVILION CEILING PLAN
SCALE : 3/16" = 1'



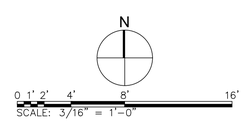
2 PAVILION DETAIL
SCALE : NTS

GENERAL NOTES:

1. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS, AND SHEET E002 FOR GENERAL NOTES.
2. REFER TO SITE PLANS FOR CONDUIT AND WIRE SIZES.

KEYED NOTES:

1. PROVIDE WEATHERPROOF GFI RECEPTACLES WITH METAL LOCKABLE, IN-USE, COVERS IN CEILING SOFFIT OF NEW PAVILION.
2. PROVIDE 30 AMP NEMA 3R FUSED AT 20 AMPS SINGLE POLE HEAVY DUTY DISCONNECT SWITCH. EXTEND A #4 BARE COPPER CONDUCTOR FROM GROUND BAR IN DISCONNECT AND EXTEND TO (2) GROUND RODS, REBAR IN FOOTER AND STRUCTURAL STEEL.
3. PROVIDE PHOTOCELL (PC) ON PAVILION MOUNTED ON 3/4" RGS CONDUIT 6" ABOVE ROOF TO CONTROL PAVILION LIGHTING CIRCUIT T-4. AIM NORTH.
4. PAVILION RECEPTACLES SHALL BE CONNECTED AHEAD OF THE PHOTOCELL CONTROLLING THE LIGHTNING.
5. PROVIDE OCCUPANCY SENSOR TO CONTROL LIGHTING.



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SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT

PARKS & RECREATION
City of Fort Lauderdale

PRIME CONSULTANT

AECOM

7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

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Shahzad S. Ahmed
P.E. No. 68863

AECOM Technical Services, INC
7650 West Courtney Campbell Causeway
Tampa, FL 33607-1462

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	09/16/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT

PROJECT NUMBER

P12777

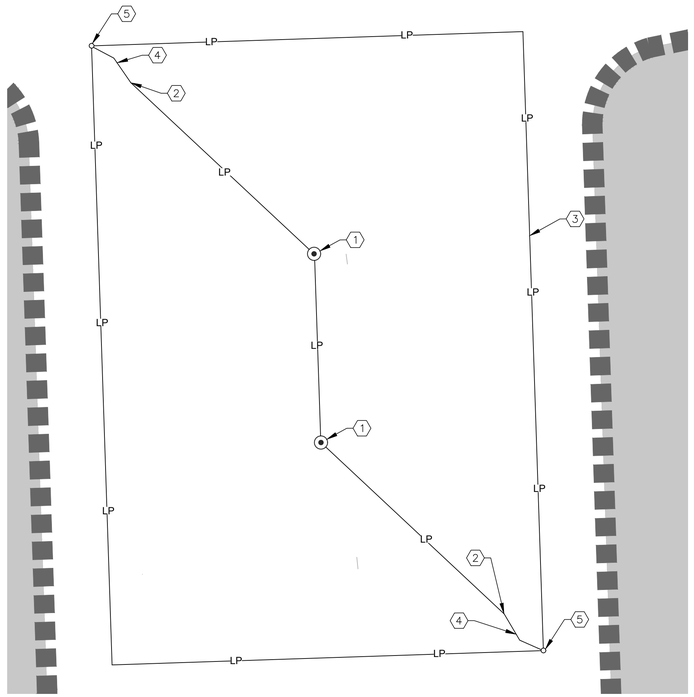
SHEET TITLE

PAVILION LIGHTING AND POWER PLAN

SHEET NUMBER

E301

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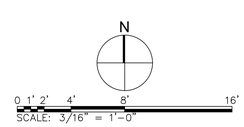
1 PAVILION LIGHTNING PROTECTION PLAN
SCALE : 3/16" = 1'

GENERAL NOTES:

1. REFER TO SHEET E001 FOR ELECTRICAL SYMBOLS, AND SHEET E002 FOR GENERAL NOTES.
2. ALL LIGHTNING PROTECTION CABLES AND DOWN LEADS SHALL BE CONCEALED.
3. REFER TO SHEET E302 AND E303 FOR DETAILS ON GROUNDING AND LIGHTNING PROTECTION COMPONENTS.
4. ALL LIGHTNING PROTECTION CABLES AND DOWN LEADS SHALL BE CONCEALED.
5. ALL LIGHTNING PROTECTION CABLES AND DOWN LEADS SHALL BE CONCEALED.
6. METAL BODIES WITHIN 6' OF THE LIGHTNING PROTECTION SYSTEM SHALL BE BONDED TO THE LIGHTNING PROTECTION SYSTEM.
7. ALL LIGHTNING PROTECTION CONDUCTORS SHALL BE CLASS I COPPER
8. CONDUCTORS SHALL BE SIZED IN ACCCORDANCE WITH NFPA 780 CLASS I MATERIAL REQUIREMENTS.
9. PROVIDE LIGHTNING PROTECTION SYSTEM WITH UL MASTER LABEL.

⬡ KEYED NOTES:

1. PROVIDE 18" AIR TERMINAL MOUNTED ON STANDING SEAM ROOF. REFER TO DETAIL 3 TO SHEET E-303.
2. ROUTE LIGHTNING CONDUCTOR TO GROUND ROD TEST WELL.
3. GROUND RING ELECTRODE 4/0 COPPER SHALL BE INSTALL 24" (MIN.) BELOW GRADE.
4. BOND LIGHTNING PROTECTION COUNTERPOISE TO MAIN GROUNDING SYSTEM.
5. REFER TO GROUND TEST WELL DETAIL ON SHEET E-303.



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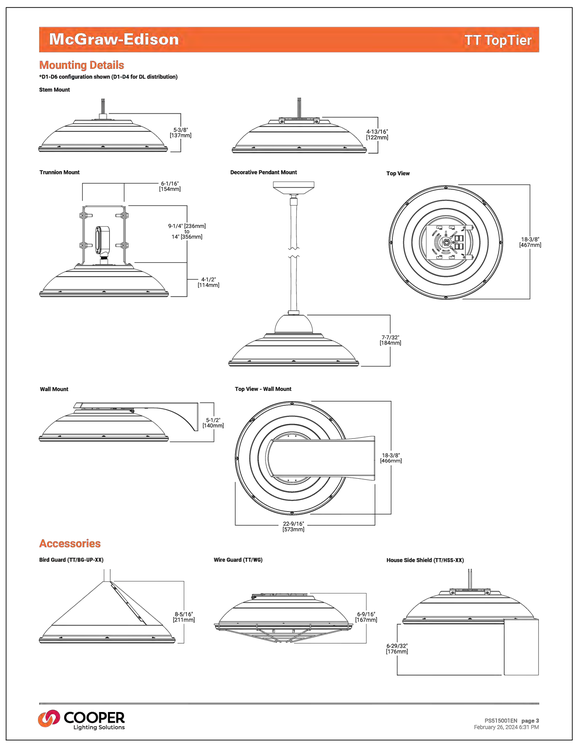
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PAVILION LIGHTNING PROTECTION PLAN

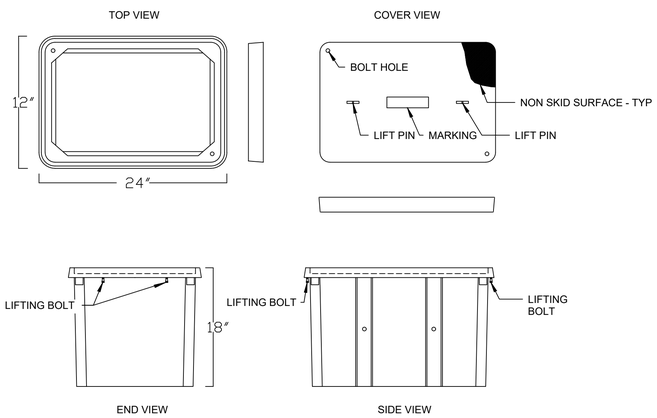
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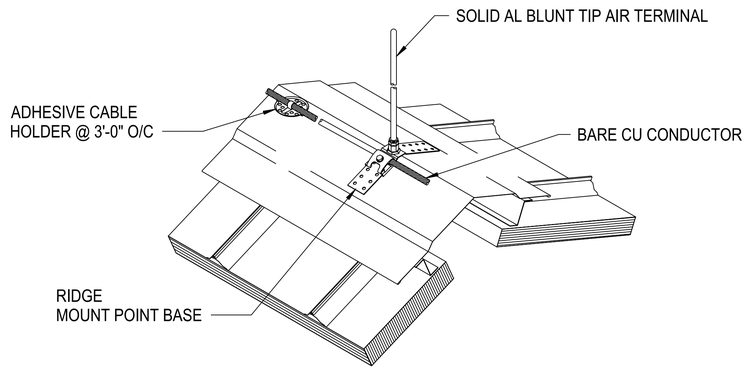
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1 LIGHT FIXTURE 'S1' AND 'S2' MOUNTING DETAIL
SCALE : NTS



2 ELECTRICAL PULL BOX DETAIL
SCALE : NTS



3 AIR TERMINAL DETAIL
SCALE : NTS

4 THRU ROOF DETAIL
SCALE : NTS

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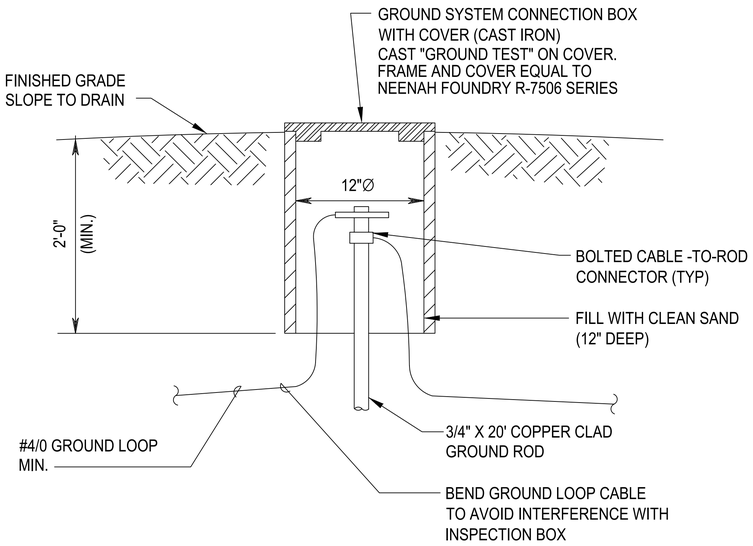
PROJECT NUMBER
P12777

SHEET TITLE
ELECTRICAL DETAILS

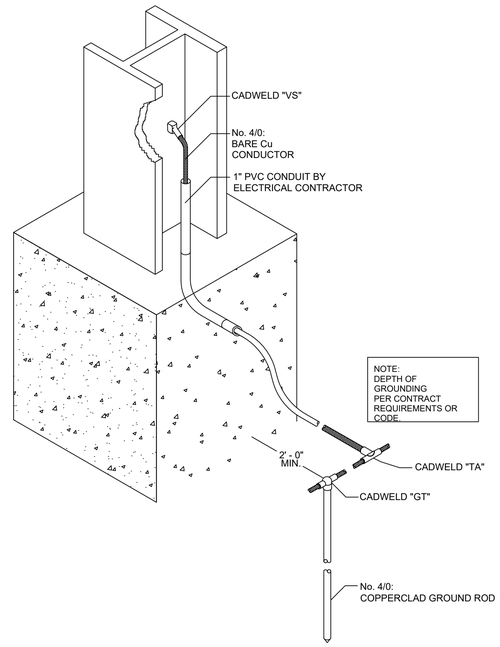
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Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"



1 GROUND ROD TEST WELL
SCALE : NTS



2 GROUND ROD DETAIL
SCALE : NTS

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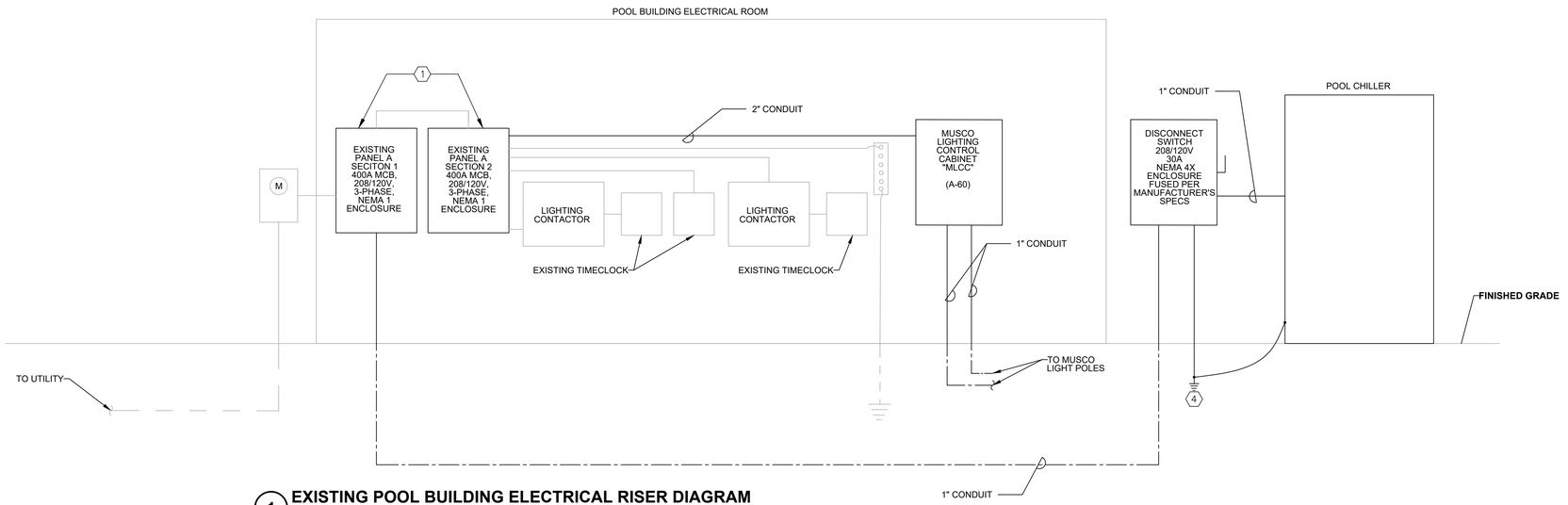
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SHEET TITLE
ELECTRICAL DETAILS

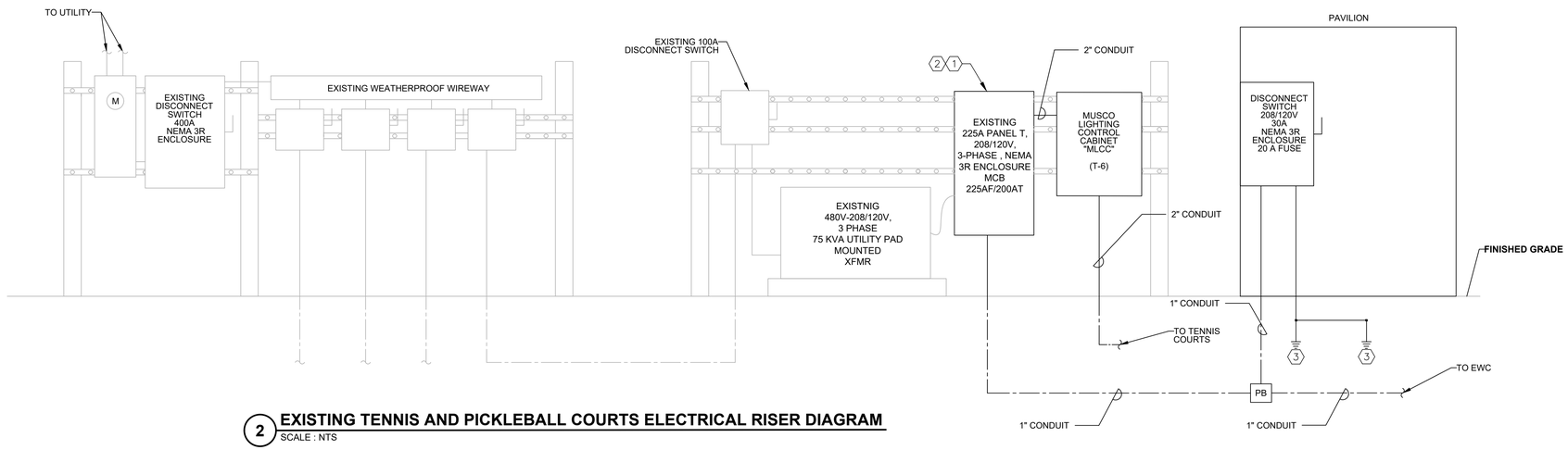
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Central Management Initials: Designer:____ Checked:____ Approved:____ ANSI D 24" x 36"



1 EXISTING POOL BUILDING ELECTRICAL RISER DIAGRAM
SCALE : NTS



2 EXISTING TENNIS AND PICKLEBALL COURTS ELECTRICAL RISER DIAGRAM
SCALE : NTS

GENERAL NOTES:

1. DRAWINGS HAVE BEEN DEVELOPED FROM AS-BUILT DRAWINGS AND VISUAL FIELD INSPECTION.
2. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS PRIOR TO BID. IF THERE ARE ANY DISCREPANCIES BETWEEN DRAWINGS AND FIELD FINDING CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER OF RECORD (10) DAYS PRIOR TO BID.
3. REFER TO SHEET E701 FOR PANEL SCHEDULES.

KEYED NOTES:

1. EXISTING PANEL AFFECTED BY SCOPE OF WORK.
2. ADD LABEL 'T' TO EXISTING TENNIS COURT PANEL.
3. PROVIDE 3/4" X 10' - 0" COPPER CLAD GROUND RODS SPACED AT MINIMUM 10'-0" APART. BOND WITH #4 CU GEC.
4. PROVIDE 3/4" X 10' - 0" COPPER CLAD GROUND ROD AND BOND WITH #4 CU GEC.

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SHEET TITLE

ELECTRICAL RISER DIAGRAM

SHEET NUMBER

E601

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PANELBOARD: A (EXISTING)

BUS AMPS: 400A
MAIN SIZE/TYPE: 400A MCB
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

FAULT CURRENT: EXISTING
AIC RATING: EXISTING
SERVES:
MOUNTING: SURFACE ENCLOSURE: NEMA 1
LOCATION: ELECTRICAL ROOM

CKT NO	DESCRIPTION	CONDUCTOR & CONDUIT PH	NEUT	GND	IG	COND	BREAKER TYP	AMP	POLE	VOLTAMPS/PHASE A	B	C	VOLTAMPS/PHASE A	B	C	BREAKER POLE	AMP	TYP	CONDUCTOR & CONDUIT COND	IG	GND	NEUT	PH	DESCRIPTION	CKT NO.
1		ex								3,696			1,144			2	20	ex	ex	--	ex	ex	ex	VAC PUMP	2
3	REC. PUMP	ex	ex	ex	--	ex	ex	50	3		3,696			1,144											4
5		ex										3,696			1,000	1	20	ex	ex	--	ex	ex	ex	CHEM FEED PUMP	6
7	OZONE GEN'S	ex	ex	ex	--	ex	ex	20	1	184			930			1	20	ex	ex	--	ex	ex	ex	EF-5,EF-6,EF-7,	8
9	EF-3,EF-4	ex	ex	ex	--	ex	ex	20	1		680			498									ex		10
11		ex										4,667			498	3	15	ex	ex	--	ex	ex	ex	A/C-2	12
13	EDH-2	ex	ex	ex	--	ex	ex	50	3	4,667			498										ex		14
15		ex									4,667			1,350		1	20	ex	ex	--	ex	ex	ex	GWH	16
17	CU-2	ex	ex	ex	--	ex	ex	30	2			2,900			2,900								ex	CU-2	18
19		ex								2,900			2,900			2	30	ex	ex	--	ex	ex	ex		20
21	LIGHTING SECUIRTY	ex	ex	ex	--	ex	ex	20	1		1,000			2,175		2	20	ex	ex	--	ex	ex	ex	A/C-1	22
23	EWC	ex	ex	ex	--	ex	ex	20	1			1,000			2,175								ex		24
25	SPARE	ex	ex	ex	--	ex	ex	20	1				800			1		ex	ex	--	ex	ex	ex	EF-1, RECS	26
27	SPACE								1					900		1	20	ex	ex	--	ex	ex	ex	RECEPT'S	28
29	SPACE								1						920	1	20	ex	ex	--	ex	ex	ex	RECEPTS, PUMP P-9	30
31	LIGHTING	ex	ex	ex	--	ex	ex	20	1	824			900			1	20	ex	ex	--	ex	ex	ex	RECEPT'S	32
33	LIGHTING	ex	ex	ex	--	ex	ex	20	1		870			1,808		1	20	ex	ex	--	ex	ex	ex	LIGHTING, EF-2	34
35	POOL LT'S	ex	ex	ex	--	ex	ex	20	1			900			900	1	20	ex	ex	--	ex	ex	ex	POOL LT'S	36
37	POOL LT'S	ex	ex	ex	--	ex	ex	20	1	900			1,000			1	20	ex	ex	--	ex	ex	ex	FIRE AL & TELE	38
39	POOL FIB. OPT.	ex	ex	ex	--	ex	ex	20	1		1,000			2,500		2	30	ex	ex	--	ex	ex	ex	PAINT TRAILER	40
41	SPARE	ex	ex	ex	--	ex	ex	20	1						2,500								ex		42
SECTION: 2																									
43	POOL DECK LTG.	ex	ex	ex	--	ex	ex	20	2	1,125			900			2	20	ex	ex	--	ex	ex	ex	POOL DECK LTG	44
45		ex									1,125			900									ex		46
47	SPACE								1						900	2	20	ex	ex	--	ex	ex	ex	POOL DECK LTG	48
49	INSTA-HOT WH	ex	ex	ex	--	ex	ex	20	2	1,500			900										ex		50
51		ex									1,500			21		1	20	ex	ex	--	ex	ex	ex	TS-1,2,3,4,5,6,7	52
53	EXIT LIGHTS	ex	ex	ex	--	ex	ex	20	1			11											ex		54
55	HAND DRYER	ex	ex	ex	--	ex	ex	20	2	1,144						3	30	ex	ex	--	ex	ex	ex	TVSS	56
57		ex									1,144												ex		58
59	HAND DRYER	ex	ex	ex	--	ex	ex	20	2			1,144			300	1	20		3/4"		10	10	10	LIGHTING CONTROL CABINET	60
61		ex								1,144						1								SPACE	62
63		10									540					1								SPACE	64
65	POOL LTG P5	10		10		1"		20	3			540				1								SPACE	66
67		10								540						1								SPACE	68
69		10									540					1								SPACE	70
71	POOL LTG P6	10		10		1"		20	3			540				1								SPACE	72
73		10								540						1								SPACE	74
75	SPACE								1							1								SPACE	76
77	SPACE								1							1								SPACE	78
79	SPACE								1							1								SPACE	80
81	SPACE								1							1								SPACE	82
83	SPACE								1							1								SPACE	84
								SUBTOTAL		19,164	16,762	15,398	9,972	11,296	12,093	SUBTOTAL									

LOAD	CONN. VA	DF
COOLING		1.00
HEATING		0
LIGHTING	3,240	1.25
RECEPTACLES		1.0/.5
MOTORS		1.00
WATER HEATER		1.00
MISC EQUIP	300	1.00

LOAD	CONN. VA	DF
REFRIGERATION		1.00
SIGN/DISPLAY		1.25
KITCHEN		1.00
EXISTING	81,145	1.00
LARGEST MOTOR		1.25
SHOW WINDOW		1.25
LTG TRACK		1.00

TOTAL PHASE A - VA	29,136	
CONN.AMPS	243	
TOTAL PHASE B - VA	28,058	
CONN. AMPS	234	
TOTAL PHASE C - VA	27,491	
CONN. AMPS	229	**TOTAL DEMAND**
TOTAL PNLBD - VA	84,685	85,495 VA
AMPS	235	237 A

PANELBOARD: T (EXISTING)

BUS AMPS: 225A
MAIN SIZE/TYPE: 200A MCB
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

FAULT CURRENT: EXISTING
AIC RATING: EXISTING
SERVES:
MOUNTING: SURFACE ENCLOSURE: NEMA 3R
LOCATION: TENNIS COURTS

CKT NO.	DESCRIPTION	CONDUCTOR & CONDUIT PH	NEUT	GND	IG	COND	BREAKER TYP	AMP	POLE	VOLTAMPS/PHASE A	B	C	VOLTAMPS/PHASE A	B	C	BREAKER POLE	AMP	TYP	CONDUCTOR & CONDUIT COND	IG	GND	NEUT	PH	DESCRIPTION	CKT NO.
1		4								1,999						1	20							FUTURE ELEC WTR CHILLER	2
3	TENNIS COURT LTG	4		4		2"		30	3		1,999			956		1	20		1"		8	8	8	PAVILION LTG & RECP	4
5		4										1,999			300	1	20		3/4"		10	10	10	LIGHTING CONTROL CABINET	6
7	SPACE								1							1								SPACE	8
9	SPACE								1							1								SPACE	10
11	SPACE								1							1								SPACE	12
13	SPACE								1							1								SPACE	14
15	SPACE								1							1								SPACE	16
17	SPACE								1							1								SPACE	18
19	SPACE								1							1								SPACE	20
21	SPACE								1							1								SPACE	22
23	SPACE								1							1								SPACE	24
25	SPACE								1							1								SPACE	26
27	SPACE								1							1								SPACE	28
29	SPACE								1							1								SPACE	30
31	SPACE								1				5,188			2	30						ex	EXISTING	32
33	SPACE								1					5,188									ex		34
35	EXISTING	ex	ex	ex	--	ex	ex	50	2			5,188			5,188	2	60						ex	EXISTING	36
37		ex								5,188			5,188										ex		38
39	EXISTING	ex	ex	ex	--	ex	ex	60	2		5,188			5,188		2	60						ex	EXISTING	40
41		ex										5,188			5,188								ex		42
								SUBTOTAL		7,187	7,187	12,374	10,375	11,331	10,675	SUBTOTAL									

LOAD	CONN. VA	DF
COOLING		1.00
HEATING		0
LIGHTING	6,533	1.25
RECEPTACLES	720	1.0/.5
MOTORS		1.00
WATER HEATER		1.00
MISC EQUIP		0.75

LOAD	CONN. VA	DF
REFRIGERATION		1.00
SIGN/DISPLAY		1.25
KITCHEN		1.00
EXISTING	51,876	1.00
LARGEST MOTOR		1.25
SHOW WINDOW		1.25
LTG TRACK		1.00

TOTAL PHASE A - VA	17,562	
CONN.AMPS	146	
TOTAL PHASE B - VA	18,518	
CONN. AMPS	154	
TOTAL PHASE C - VA	23,049	
CONN. AMPS	192	**TOTAL DEMAND**
TOTAL PNLBD - VA	59,129	60,762 VA
AMPS	164	169 A

GENERAL NOTES:

1. DRAWINGS HAVE BEEN DEVELOPED FROM AS-BUILT DRAWINGS AND VISUAL FIELD INSPECTION.
2. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS PRIOR TO BID. IF THERE ARE ANY DISCREPANCIES BETWEEN DRAWINGS AND FIELD FINDING CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER OF RECORD (10) DAYS PRIOR TO BID.
3. NEW CIRCUIT BREAKER PANEL SHALL MEET OR EXCEED EXISTING PANELBOARD BREAKERS AIC RATING.

KEYED NOTES:

1. ADD LABEL 'T' TO EXISTING TENNIS COURT PANEL.
2. PROVIDE GFI CIRCUIT BREAKER.
3. PROVIDE NEW BREAKER IN EXISTING SPACE. BREAKER SHALL BE BY SAME MANUFACTURER OF EXISTING PANEL AND SHALL MEET OR EXCEED EXISTING BREAKERS FAULT CURRENT RATINGS.

AECOM

PROJECT

SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT

PARKS & RECREATION
City of Fort Lauderdale

PRIME CONSULTANT

AECOM

7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

SUB-CONSULTANT

CIVIL
BCC ENGINEERING
305.670.2350 tel
www.bcceng.com

LANDSCAPE
CURTIS + ROGERS DESIGN STUDIO
305.442.1774 tel
www.curtisrogers.com

GEOTECHNICAL SERVICES
GEOSOL, INC.
305.828.4367 tel
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SURVEYOR
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954.237.7850 tel
www.pds-eng.com

MECHANICAL, PLUMBING AND FIRE PROTECTION
HAMMOND AND ASSOCIATES CONSULTING
954.327.7111 tel
www.hammondengineers.com

REGISTRATION

SHAHZAD S. AHMED LICENSE NO. 68863 STATE OF FLORIDA PROFESSIONAL ENGINEER

Shahzad S. Ahmed
P.E. No. 68863

AECOM Technical Services, INC
7650 West Courtney Campbell Causeway
Tampa, FL 33607-1462

ISSUE/REVISION

	09/16/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT
I/R	DATE	DESCRIPTION

PROJECT NUMBER

P12777

SHEET TITLE

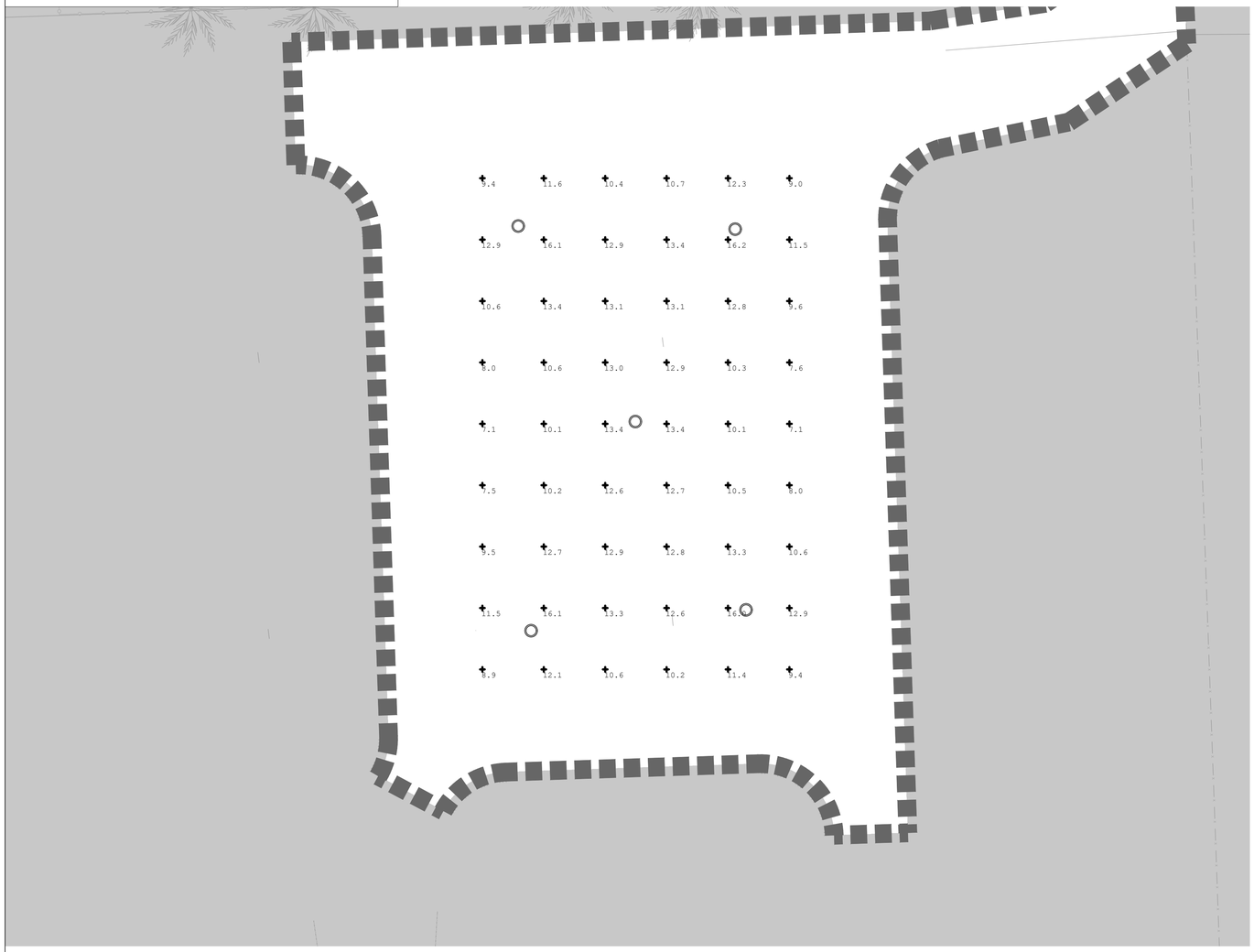
PANEL SCHEDULES

SHEET NUMBER

E701

COORDINATE WITH AECOM ON LATEST ISSUE OF DRAWINGS BEFORE COMMENCEMENT OF CONSTRUCTION
NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

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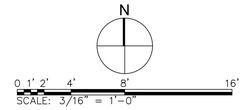
1 PAVILION PHOTOMETRICS CALCULATIONS

SCALE : 3/16" = 1'

CALCULATION SUMMARY							
LABEL	CALCTYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
PAVILION	ILLUMINANCE	Fc	11.50	16.2	7.1	1.62	2.28

GENERAL NOTES:

1. PHOTOMETRIC VALUES ARE IN FOOTCANDLES AND MEASURED AT GRADE.
2. PHOTOMETRIC VALUES WERE CALCULATED USING LIGHTING ANALYSIS SOFTWARE AGI32 VERSION 20.11 WITH MANUFACTURERS PUBLISHED IES FILES.



COORDINATE WITH AECOM ON LATEST ISSUE OF DRAWINGS BEFORE COMMENCEMENT OF CONSTRUCTION
NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

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AECOM

PROJECT

SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

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ISSUE/REVISION

I/R	DATE	DESCRIPTION
	09/16/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT

PROJECT NUMBER

P12777

SHEET TITLE

PAVILION PHOTOMETRICS PLAN

SHEET NUMBER

E901

ANSI D 24" x 36" Approved:_____ Checked:_____ Designer:_____ Document Management Initials:
Last saved by: JOSE.ALVAREZ (2025-09-11) Last Plotted: 2025-09-16
Filename: C:\USERS\JOSE.ALVAREZ\DOCUMENTS\ACCDOCS\AECOM\BP-AMER (USA) 60641343-FTL PBP DESIGN SERVICES\PROJECT FILES\900 DESIGN COLLABORATION\915_TO 2901 - SUNRISE MIDDLE SCHOOL\06-A-S-E-WIP126XX-SUNRISE E301.rvt

AFFIDAVIT OF COMPLIANCE WITH FOREIGN ENTITY LAWS
(Florida Statute- §287.138, 692.201, 692.202, 692.203, and 692.204)

The undersigned, on behalf of the entity listed below ("Entity"), hereby attests under penalty of perjury as follows:

1. Entity is not owned by the government of a foreign country of concern as defined in Section 287.138, Florida Statutes. (Source:§ 287.138(2)(a), Florida Statutes)
2. The government of a foreign country of concern does not have a controlling interest in Entity. (Source:§ 287.138(2)(b), Florida Statutes)
3. Entity is not organized under the laws of, and does not have a principal place of business in, a foreign country of concern. (Source: § 287.138(2)(c), Florida Statutes)
4. Entity is not owned or controlled by the government of a foreign country of concern, as defined in Section 692.201, Florida Statutes. (Source:§ 288.007(2), Florida Statutes)
5. Entity is not a partnership, association, corporation, organization, or other combination of persons organized under the laws of or having its principal place of business in a foreign country of concern, as defined in Section 692.201, Florida Statutes, or a subsidiary of such entity. (Source: § 288.007(2), Florida Statutes)
6. Entity is not a foreign principal, as defined in Section 692.201, Florida Statutes. (Source: § 692.202(5)(a)(I), Florida Statutes)
7. Entity is in compliance with all applicable requirements of Sections 692.202, 692.203, and 692.204, Florida Statutes.
8. ***(Only applicable if purchasing real property)*** Entity is not a foreign principal prohibited from purchasing the subject real property. Entity is either (a) not a person or entity described in Section 692.204(1)(a), Florida Statutes, or (b) authorized under Section 692.204(2), Florida Statutes, to purchase the subject property. Entity is in compliance with the requirements of Section 692.204, Florida Statutes. (Source:§§ 692.203(6)(a), 692.204(6)(a), Florida Statutes)

The undersigned is authorized to execute this affidavit on behalf of Entity.

Name: _____ Title:_____ Entity: _____

Signature: _____ Date: _____

NOTARY PUBLIC ACKNOWEDGEMENT SECTION

STATE OF _____

COUTY OF _____

The foregoing instrument was acknowledged before me, by means of □ physical presence or □ online notarization, this ____ day of _____20 __, by _____, as

_____ for _____, who is

personally known to me or who has produced _____as identification.

Notary Public Signature: _____ (Notary Seal)

Print Name:_____ My commission expires:_____

QUESTIONNAIRE SHEET

PLEASE PRINT OR TYPE:

Firm Name:

President

Business Address:

Telephone:

Fax:

E-Mail Address:

What was the last project of this nature which you completed? Include the year, description, and contract value.

The following are named as three corporations and representatives of those corporations for which you have performed work similar to that required by this contract, and which the City may contact as your references (include addresses, telephone numbers and e-mail addresses). Include the project name, year, description, and contract value.

How many years has your organization been in business?

Have you ever failed to complete work awarded to you; if so, where and why?

The name of the qualifying agent for the firm and his position is:

Certificate of Competency Number of Qualifying Agent:

Effective Date: Expiration Date:

Licensed in:

Engineering Contractor's License #
(County/State)

Expiration Date:

NOTE: To be considered for award of this contract, the bidder must submit a financial statement upon request.

NOTE: Contractor must have proper licensing and shall provide copy of same with his proposal.

QUESTIONNAIRE SHEET

1. Have you personally inspected the proposed work and have you a complete plan for its performance?

2. Will you sublet any part of this work? If so, list the portions or specialties of the work that you will.

a)

b)

c)

d)

e)

f)

g)

3. What equipment do you own that is available for the work?

4. What equipment will you purchase for the proposed work?

5. What equipment will you rent for the proposed work?

CITY OF FORT LAUDERDALE BID/PROPOSAL CERTIFICATION

Please Note: It is the sole responsibility of the bidder/proposer to ensure that their response is submitted electronically through the City's on-line strategic sourcing platform prior to the bid opening date and time listed. Paper bid submittals will not be accepted. 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) _____ EIN (Optional): _____

Address: _____

City: _____State: _____ Zip: _____

Telephone No.: _____ FAX No.: _____ Email: _____

Delivery: Calendar days after receipt of Purchase Order **(section 1.02 of General Conditions)**: _____

Total Bid Discount **(section 1.05 of General Conditions)**: _____

Check box if your firm qualifies for DBE **(section 1.09 of General Conditions)**: ❑

ADDENDUM ACKNOWLEDGEMENT - Proposer acknowledges that the following addenda have been received and are included in the proposal:

Addendum No.	Date Issued	Addendum No.	Date Issued	Addendum No.	Date Issued	Addendum No.	Date Issued

VARIANCES: If you take exception or have variances to any term, condition, specification, scope of service, or requirement in this competitive solicitation you must specify such exception or variance in the space provided below or reference in the space provided below all variances contained on other pages within your response. Additional pages may be attached if necessary. No exceptions or variances will be deemed to be part of the response submitted unless such is listed and contained in the space provided below. The City does not, by virtue of submitting a variance, necessarily accept any variances. If no statement is contained in the below space, it is hereby implied that your response is in full compliance with this competitive solicitation. If you do not have variances, simply mark N/A.

_____

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

CONTRACT PAYMENT METHOD

The City of Fort Lauderdale has implemented a Procurement Card (P-Card) program which changes how payments are remitted to its vendors. The City has transitioned from traditional paper checks to credit card payments via MasterCard or Visa as part of this program.

This allows you as a vendor of the City of Fort Lauderdale to receive your payments fast and safely. No more waiting for checks to be printed and mailed.

In accordance with the contract, payments on this contract will be made utilizing the City's P-Card (MasterCard or Visa). Accordingly, bidders must presently have the ability to accept the credit card or take whatever steps necessary to implement acceptance of a card before the start of the contract term, or contract award by the City.

All costs associated with the Contractor's participation in this purchasing program shall be borne by the Contractor. The City reserves the right to revise this program as necessary.

By signing below, you agree with these terms.

Please indicate which credit card payment you prefer:

☐ MasterCard

☐ Visa

_____

Company Name

_____ _____

Name (Printed) Signature

_____ _____

Title Date

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PREFERENCE

Section 2-185, Code of Ordinances of the City of Fort Lauderdale, provides for a disadvantaged business preference.

In order to be considered for a DBE Preference, a bidder must include a certification from a government agency, as applicable to the DBE Preference class claimed **at the time of bid submittal**.

Upon formal request of the City, based on the application of a DBE Preference the Bidder shall, within ten (10) calendar days, submit the following documentation to the DBE Class claimed:

A) Copy of City of Fort Lauderdale current year business tax receipt, **or** Broward County current year business tax receipt, **or** State of Florida active registration **and/or**

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 disadvantaged business preference.

THE COMPLETE DBE PREFERENCE ORDINANCE MAY BE FOUND ON THE CITY'S WEB SITE AT THE FOLLOWING LINK: https://www.fortlauderdale.gov/home/showpublisheddocument?id=56883

Definitions

a. The term "disadvantaged class 1 enterprise" shall mean any disadvantaged business enterprise that has established and agrees to maintain a permanent place of business located in a non-residential zone, staffed with full-time employees within the limits of the city, and provides supporting documentation of its City of Fort Lauderdale business tax and disadvantaged certification as established in the City's Procurement Manual.

b. The term "disadvantaged class 2 enterprise" shall mean any disadvantaged business enterprise that has established and agrees to maintain a permanent place of business within the limits of the city with a full-time employees and provides supporting documentation of its City of Fort Lauderdale business tax and disadvantaged certification as established in the City's Procurement Manual.

c. The term "disadvantaged class 3 enterprise" shall mean any disadvantaged business enterprise that has established and agrees to maintain a permanent place of business located in a non-residential zone, staffed with full-time employees within the limits of the Tri-County area and provides supporting documentation of its City of Fort Lauderdale business tax and disadvantaged certification as established in the City's Procurement Manual.

d. The term "disadvantaged class 4 enterprise" shall mean any disadvantaged business enterprise that does not qualify as a Class A, Class B, or Class C business, but is located in the State of Florida and provides supporting documentation of its disadvantaged certification as established in the City's Procurement Manual.

DISADVANTAGED BUSINESS ENTERPRISE CERTIFICATION STATEMENT

The Business identified below certifies that it qualifies for the disadvantaged business enterprise price preference classification as indicated herein, and further certifies and agrees that it will re-affirm its preference classification annually no later than thirty (30) calendar days prior to the anniversary of the date of a contract awarded pursuant to this solicitation. Violation of the foregoing provision may result in contract termination.

(1) _____ is a disadvantaged class 1 enterprise as defined in the City of Fort Lauderdale Ordinance Section 2-185 disadvantaged business enterprise that has established and agrees to maintain a permanent place of business located in a non-residential zone, staffed with full-time employees within the limits of the city, and provides supporting documentation of its City of Fort Lauderdale business tax and disadvantaged certification as established in the City's Procurement Manual.

Business Name

(2) _____ is a disadvantaged class 2 enterprise as defined in the City of Fort Lauderdale Ordinance Section 2-185 disadvantaged business enterprise that has established and agrees to maintain a permanent place of business within the limits of the city with a full-time employee(s) and provides supporting documentation of its City of Fort Lauderdale business tax and disadvantaged certification as established in the City's Procurement Manual.

Business Name

(3) _____ is a disadvantaged class 3 enterprise as defined in the City of Fort Lauderdale Ordinance Section 2-185 disadvantaged business enterprise that has established and agrees to maintain a permanent place of business located in a non-residential zone, staffed with full-time employees within the limits of the Tri-County area and provides supporting documentation of its City of Fort Lauderdale business tax and disadvantaged certification as established in the City's Procurement Manual.

Business Name

(4) _____ is a disadvantaged class 4 enterprise as defined in the City of Fort Lauderdale Ordinance Section 2-185 disadvantaged business enterprise that does not qualify as a Class A, Class B, or Class C business, but is located in the State of Florida and provides supporting documentation of its disadvantaged certification as established in the City's Procurement Manual.

Business Name

(5) _____ is not considered a Disadvantaged Enterprise Business as defined in the City of Fort Lauderdale Ordinance Sec.2-185 and does not qualify for DBE Preference consideration.

Business Name

BIDDER'S COMPANY: _____

AUTHORIZED COMPANY PERSON: _____

PRINT NAME SIGNATURE DATE

E-VERIFY AFFIRMATION STATEMENT

Solicitation/Bid /Contract No: _____

Project Description:

Contractor/Proposer/Bidder acknowledges and agrees to utilize the U.S. Department of Homeland Security's E-Verify System to verify the employment eligibility of,

A. all persons employed by Contractor/Proposer/Bidder to perform employment duties within Florida during the term of the Contract, and,

B. all persons (including subcontractors/vendors) assigned by Contractor/Proposer/Bidder to perform work pursuant to the Contract.

The Contractor/Proposer/Bidder acknowledges and agrees that use of the U.S. Department of Homeland Security's E-Verify System during the term of the Contract is a condition of the Contract.

Contractor/Proposer/ Bidder Company Name: _____

Authorized Company Person's Signature: _____

Authorized Company Person's Title: _____

Date: _____

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:
https://library.municode.com/fl/fort_lauderdale/codes/code_of_ordinances?nodeId=COOR_CH2AD_ARTVFI_DIV2PR_S2-186LOBUPR

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:

1. 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 price preference classification as indicated herein, and further certifies and agrees that it will re-affirm its local preference classification annually no later than thirty (30) calendar days prior to the anniversary of the date of a contract awarded pursuant to this ITB. Violation of the foregoing provision may result in contract termination.

(1) _____ Business Name is a **Class A** Business as defined in City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the City of Fort Lauderdale current year Business Tax Receipt **and** a complete list of full-time employees and evidence of their addresses shall be provided within 10 calendar days of a formal request by the City.

(2) _____ Business Name is a **Class B** Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the Business Tax Receipt **or** a complete list of full-time employees and evidence of their addresses shall be provided within 10 calendar days of a formal request by the City.

(3) _____ Business Name is a **Class C** Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. A copy of the Broward County Business Tax Receipt shall be provided within 10 calendar days of a formal request by the City.

(4) _____ Business Name requests a **Conditional Class A** classification as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. Written certification of intent shall be provided within 10 calendar days of a formal request by the City.

(5) _____ Business Name requests a **Conditional Class B** classification as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186. Written certification of intent shall be provided within 10 calendar days of a formal request by the City.

(6) _____ Business Name is considered a **Class D** Business as defined in the City of Fort Lauderdale Ordinance No. C-17-26, Sec.2-186 and does not qualify for Local Preference consideration.

BIDDER'S COMPANY: _____

AUTHORIZED COMPANY PERSON: _____
PRINT NAME SIGNATURE DATE

NON-COLLUSION STATEMENT

By signing this offer, the vendor/contractor certifies that this offer is made independently and *free* from collusion. Vendor shall disclose below any City of Fort Lauderdale, FL officer or employee, or any relative of any such officer or employee who is an officer or director of, or has a material interest in, the vendor's business, who is in a position to influence this procurement.

Any City of Fort Lauderdale, FL officer or employee who has any input into the writing of specifications or requirements, solicitation of offers, decision to award, evaluation of offers, or any other activity pertinent to this procurement is presumed, for purposes hereof, to be in a position to influence this procurement.

For purposes hereof, a person has a material interest if they directly or indirectly own more than 5 percent of the total assets or capital stock of any business entity, or if they otherwise stand to personally gain if the contract is awarded to this vendor.

In accordance with City of Fort Lauderdale, FL Policy and Standards Manual, 6.10.8.3,

> 3.3. City employees may not contract with the City through any corporation or business entity in which they or their immediate family members hold a controlling financial interest (e.g., ownership of five (5) percent or more).
>
> 3.4. Immediate family members (spouse, parents, and children) are also prohibited from contracting with the City subject to the same general rules.

Failure of a vendor to disclose any relationship described herein shall be reason for debarment in accordance with the provisions of the City Procurement Code.

NAME	RELATIONSHIPS
_____	_____
_____	_____
	_____
	_____

In the event the vendor does not indicate any names, the City shall interpret this to mean that the vendor has indicated that no such relationships exist.

_____ _____

Authorized Signature Title

_____ _____

Name (Printed) Date

CONTRACTOR'S CERTIFICATE OF COMPLIANCE WITH NON-DISCRIMINATION PROVISIONS OF THE CONTRACT

The completed and signed form should be returned with the Contractor's submittal. If not provided with submittal, the Contractor must submit within three business days of City's request. Contractor may be deemed non-responsive for failure to fully comply within stated timeframes.

Pursuant to City Ordinance Sec. 2-17(a)(i)(ii), bidders must certify compliance with the Non-Discrimination provision of the ordinance.

A. Contractors doing business with the City shall not discriminate against their employees based on the employee's race, color, religion, gender (including identity or expression), marital status, sexual orientation, national origin, age, disability, or any other protected classification as defined by applicable law.

   Contracts. Every Contract exceeding $100,000, or otherwise exempt from this section shall contain language that obligates the Contractor to comply with the applicable provisions of this section.

   The Contract shall include provisions for the following:

   (i) The Contractor certifies and represents that it will comply with this section during the entire term of the contract.

   (ii) The failure of the Contractor to comply with this section shall be deemed to be a material breach of the contract, entitling the City to pursue any remedy stated below or any remedy provided under applicable law.

_____ _____

Authorized Signature Print Name and Title

_____

Date

CITY OF FORT LAUDERDALE

SWORN STATEMENT PURSUANT TO SECTION 287.087, FLORIDA STATUTES, ON PREFERENCE TO BUSINESS WITH DRUG-FREE WORK PLACE PROGRAMS

I certify that I have established a Drug Free Work Place program and have complied with the following

a. Published and distributed to each employee a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibitions.

b. Required all new employees to undergo laboratory testing as a condition of employment and will require all employees, as a condition of their continued employment, to undergo laboratory testing to detect illegal drug or alcohol use according to Florida Statutes 440.101 and 440.102.

c. Ensured that applicants with a confirmed positive drug or alcohol screening test result are not considered for employment.

d. Have tested employees when reasonably suspected of illegal drug or alcohol use.

e. Ensured that any employee refusing to take a drug or alcohol screening test in violation of the Drug Free Work Place Policy is subject to dismissal for failure to abide by the provisions of the Policy.

f. Informed employees about the dangers of drug abuse in the workplace, the business' policy of maintain a drug-free workplace, any available drug counseling, rehabilitation and employee assistance programs and the penalties that may be imposed upon employees for drug abuse violations.

g. In the statement specified in subparagraph a, notified the employees that, as a condition of their employment, the employee will abide by the terms of the statement and will notify their employer of any conviction of, or plea of guilty or nolo contendere to, any violation of Chapter 893 or of any controlled substance law of the United States of any state, for a violation occurring in the workplace no later than 5 days after such conviction.

h. Have required all employees to sign a copy of this statement of compliance acknowledging their understanding and agreeing to abide with the requirements of the Drug Work Place Policy.

i. Will impose a sanction on or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community by, any employee who is so convicted.

j. Am making a good faith effort to continue to maintain a Drug Free Work Place through implementation of this document.

BY: _____ DATE: _____

NAME (Printed) _____ TITLE: _____

COMPANY NAME:_____

Affix Company Seal

TRENCH SAFETY

Bidder acknowledges that included in the appropriate bid items of his bid and in the Total Bid Price are costs for complying with the Florida Trench Safety Act, Florida Statutes 553.60 – 553.64. The bidder further identifies the costs of such compliance to be summarized below:

Trench Safety Measure (Description)	Units of Measure (LF/SF)	Unit (Quantity)	Unit Cost	Extended Cost
A.				
B.				
C.				
D.				
			Total:	

The bidder certifies that all trench excavation done within his control in excess of five feet (5') in depth shall be in accordance with the Occupational Safety and Health Administration's excavation safety standards, C.F.R. s. 1926.650 Subpart P., and the Florida Trench Safety Act, Florida Statutes 553.60-553.64.

Failure to complete the above may result in the bid being declared non-responsive.

DATE:

(SIGNATURE)

STATE OF: COUNTY OF:

PERSONALLY APPEARED BEFORE ME, the undersigned authority,

(Name of Individual Signing)

who, after first being duly sworn by me, affixed his/her signature in the space provided above on this day of , 20 .

NOTARY PUBLIC

My Commission Expires:

City of Fort Lauderdale

REFERENCES FORM

A minimum of three (3) references shall be provided

NOTE: - items with asterisk (*) are mandatory

Bidder Company Name*			
Key Contact Name*		**Title**	
Email*		**Phone***	

References

Note: References will be contacted via emails with Key Contact Copied

1. Ref. Company Name			
Address			
Contact Name		Title	
Email*		Phone	
Contract/Project Value ($)		Year	
Project Title*			
Project Description			

2. Ref. Company Name			
Address			
Contact Name		Title	
Email*		Phone	
Contract/Project Value ($)		Year	
Project Title*			
Project Description			

3. Ref. Company Name			
Address			
Contact Name		Title	
Email*		Phone	

City of Fort Lauderdale

REFERENCES FORM

A minimum of three (3) references shall be provided

Contract/Project Value ($)		Year	
Project Title			
Project Description			

4. Ref. Company Name			
Address			
Contact Name		Title	
Email*		Phone	
Contract/Project Value ($)		Year	
Project Title*			
Project Description			

5. Ref. Company Name			
Address			
Contact Name		Title	
Email*		Phone	
Contract/Project Value ($)		Year	
Project Title*			
Project Description			

CITY OF FORT LAUDERDALE

ANTI-HUMAN TRAFFICKING AFFIDAVIT

Rev Date: 02/04/2025

The undersigned, on behalf of _____,
(Print entity's complete legal name as registered with suffix: INC, LLC, LTD, LP, PA, etc.)

a _____ nongovernmental entity ("Nongovernmental Entity"), under penalty of perjury,
(State entity is registered)
hereby deposes and says:

1. My name is _____.
(Print complete name of corporate officer/authorized representative)

2. I am an ____ officer or ____ authorized representative (Select one) of the Nongovernmental Entity. My title is: _____.
(Print title of corporate officer/authorized representative)

3. I attest that the Nongovernmental Entity does not use coercion for labor or services as defined in Section 787.06, Florida Statutes (2024), as may be amended or revised.

Under penalties of perjury, I declare that I have read the foregoing Anti-Human Trafficking Affidavit and that the facts stated in it are true.

Signature of Officer or Representative: _____

Office Address: _____

Email Address: _____

Main Phone Number: _____ FEIN No.: _____

STATE OF _____
COUNTY OF _____

Sworn to and subscribed before me by means of ☐ physical presence or ☐ online notarization, this ____ day of _____, 2025, by _____.
(Print name of corporate officer/representative)

_____
(Signature of Notary Public – State of _____)

(NOTARY SEAL)

_____
Print, Type or Stamp Commissioned Name of Notary Public)

Personally Known ☐ OR Produced Identification ☐

Type of Identification Produced_____

SAMPLE

City of Fort Lauderdale • Procurement Services Division
101 NE 3rd Ave., Suite 1650 • Fort Lauderdale, Florida 33301
954-828-5933 Fax 954-828-5576
purchase@fortlauderdale.gov

ADDENDUM NO. 1

ITB No. 568

TITLE: Sunrise Middle School – Park Improvements Phase II

ISSUED: February 4th, 2026

This addendum is being issued to replace the following plan and drawing sheets:

1. Updated drawing sheets:

    - DL103
    - DL104
    - L102
    - L201

All other terms, conditions, and specifications remain unchanged.

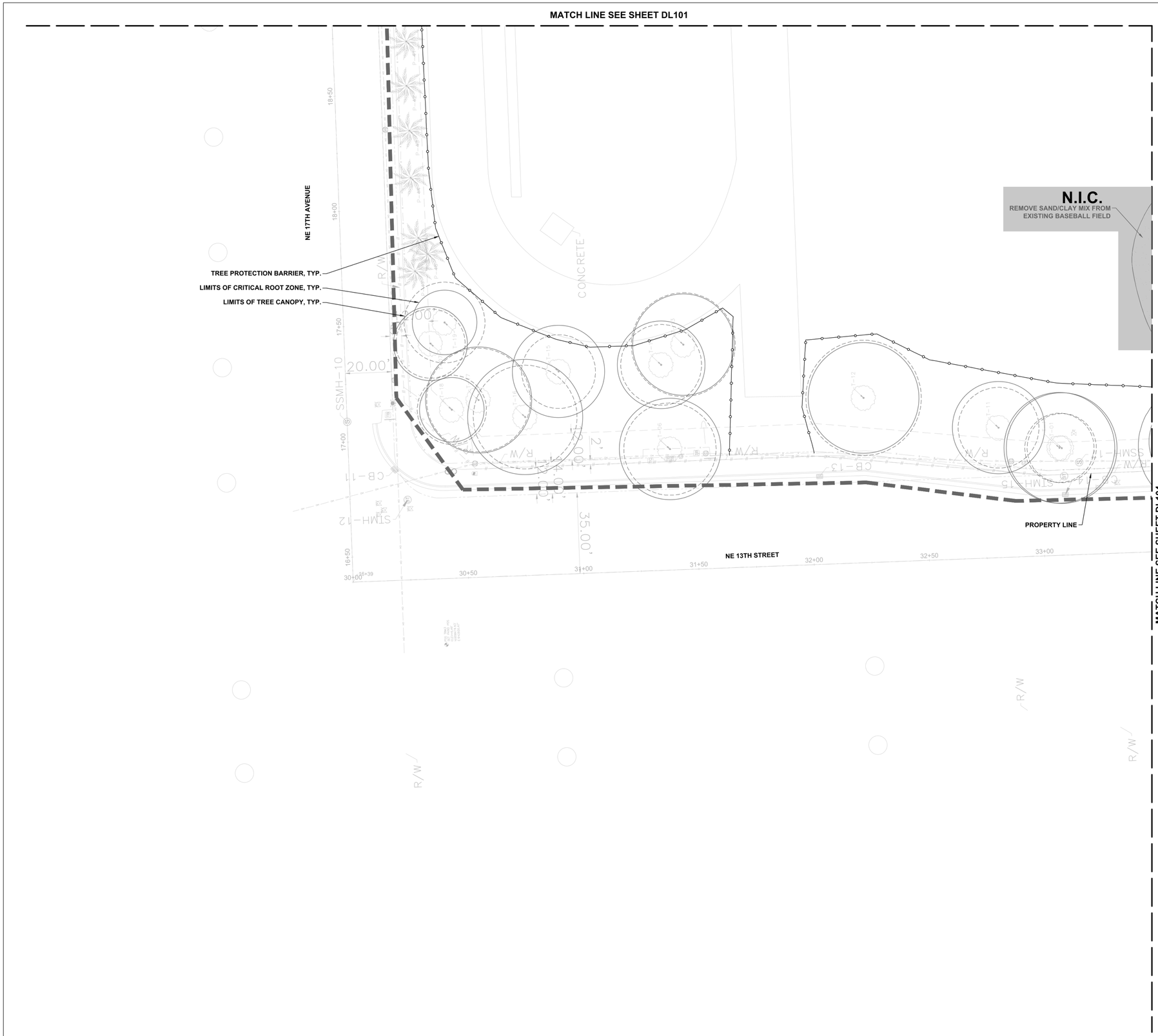
Yesenia Pascual
Yesenia Pascual
Sr. Procurement Specialist

Company Name: _____
(please print)

Bidder's Signature: _____

Date: _____

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Filename: C:\USERS\JESSICA.SOLEYN\DOCUMENTS\ACCDOCS\AECOM\BP-AMER (USA) 60641343-FTL PBP DESIGN SERVICES\PROJECT FILES\900 DESIGN COLLABORATION\915_TO 29\01 - SUNRISE MIDDLE SCHOOL\04-LAS\P12777-DL101-DEMO.DWG Project Management Initials: Designer: Checked: Approved: ANSI D 24" x 36"



LIMIT OF WORK

TREE PROTECTION LEGEND

- EXISTING TREE TO REMAIN
- CANOPY AREA
- CRITICAL ROOT ZONE
- EXISTING PALM TO REMAIN
- TREE PROTECTION BARRIER

DEMOLITION LEGEND

- REMOVE ASPHALT AND BASE COURSE FULL DEPTH
- REMOVE EXISTING CONCRETE PAVEMENT
- N.I.C. — REMOVE EXISTING SAND/CLAY MIX
- REMOVE EXISTING FENCE

NOTES:

1. SEE NOTES AND DETAIL 1 ON SHEET DL201 FOR TREE PROTECTION BARRIER.
2. SEE NOTES AND DETAIL 2 ON SHEET DL201 FOR ROOT PRUNING.
3. TREE CANOPY AND CRITICAL ROOT ZONE LIMITS SHOWN ARE APPROXIMATE BASED ON SURVEY. FIELD VERIFY TREE CRITICAL ROOT ZONES WHERE AFFECTED BY PROPOSED IMPROVEMENTS.

N

0 10' 20' 40' 60'
SCALE: 1" = 20'-0"

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COORDINATE WITH AECOM ON LATEST ISSUE OF DRAWINGS BEFORE COMMENCEMENT OF CONSTRUCTION.
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PROJECT

SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT

PARKS & RECREATION
City of Fort Lauderdale

PRIME CONSULTANT

AECOM

7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

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305.670.2350 tel
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MECHANICAL, PLUMBING AND FIRE PROTECTION
HAMMOND AND ASSOCIATES CONSULTING
954.327.7111 tel
www.hammondengineers.com

REGISTRATION

PAUL KURTZ LICENSE No. 1716 STATE OF FLORIDA LANDSCAPE ARCHITECT

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AECOM Technical Services, INC
7650 West Courtney Campbell Causeway
Tampa, FL 33607-1462

ISSUE/REVISION

I/R	DATE	DESCRIPTION
	01/27/2026	ADDENDUM 1
	09/11/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT

PROJECT NUMBER

P12777

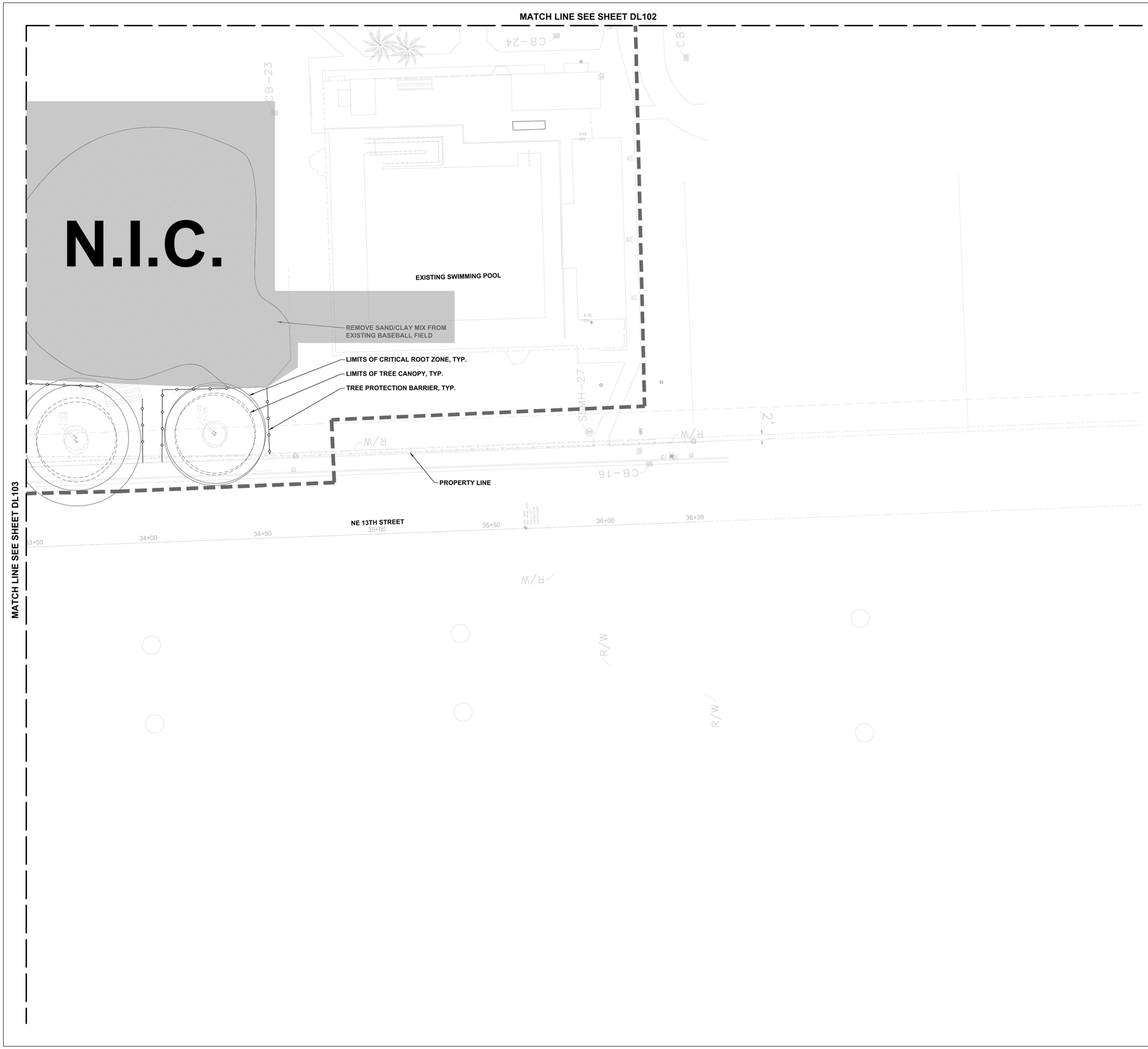
SHEET TITLE

LANDSCAPE DEMOLITION AND TREE PROTECTION PLAN

SHEET NUMBER

DL103

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LIMIT OF WORK

TREE PROTECTION LEGEND

- EXISTING TREE TO REMAIN
- CANOPY AREA
- CRITICAL ROOT ZONE
- EXISTING PALM TO REMAIN
- TREE PROTECTION BARRIER

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- REMOVE ASPHALT AND BASE COURSE FULL DEPTH
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NOTES:

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N

0 10' 20' 40' 60'
SCALE: 1" = 20'-0"

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PROJECT

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FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT

PARKS & RECREATION
City of Fort Lauderdale

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AECOM

7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
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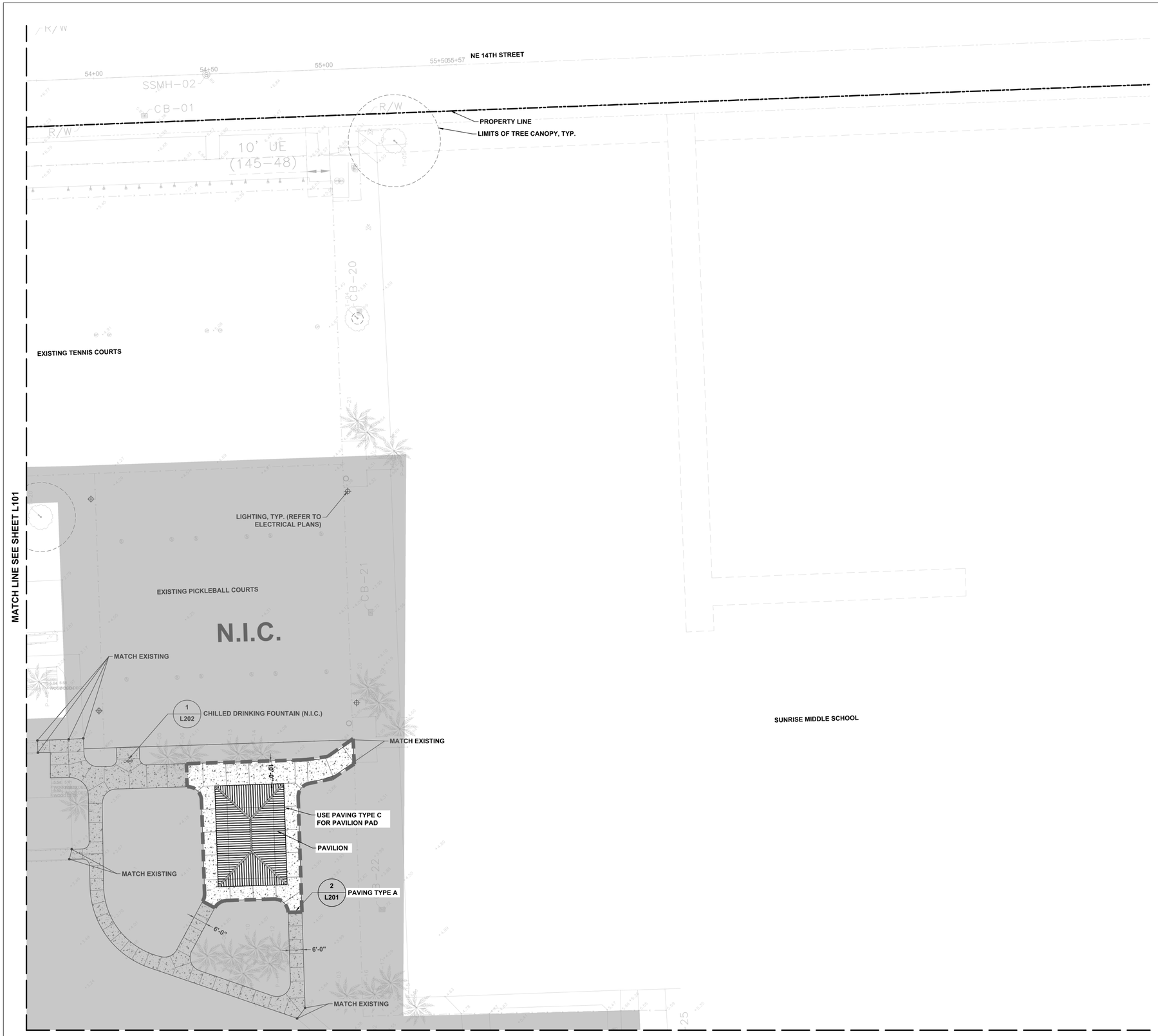
P12777

SHEET TITLE

LANDSCAPE DEMOLITION AND TREE PROTECTION PLAN

SHEET NUMBER

DL104



SITE PLAN LEGEND

LIMIT OF WORK

PAVING TYPES

A - 4" CONCRETE

C - 6" CONCRETE

EXISTING ELECTRIC LINE

EXISTING ELECTRIC STRUCTURE

EXISTING UTILITY STRUCTURE

EXISTING TELEPHONE RISER

EXISTING FIBER OPTIC CABLE

EXISTING SIGN

EXISTING POTABLE WATER LINE

EXISTING STORM LINE

EXISTING STORM STRUCTURE

NOTES:

1. FIELD LOCATE ALL UTILITIES.
2. STAKE PROPOSED LAYOUT IN FIELD FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION. NOTIFY LANDSCAPE ARCHITECT 48 HOURS PRIOR TO SITE VISIT.
3. PROVIDE TEMPORARY FENCING AS NECESSARY TO PREVENT ACCESS TO EXISTING POOL AREA THROUGHOUT DEMOLITION AND CONSTRUCTION.
4. TREE CANOPY AND CRITICAL ROOT ZONE LIMITS SHOWN ARE APPROXIMATE BASED ON SURVEY. FIELD VERIFY TREE CRITICAL ROOT ZONES WHERE AFFECTED BY PROPOSED IMPROVEMENTS.

N

0 10' 20' 40' 60'

SCALE: 1" = 20'-0"

AECOM

PROJECT

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I/R	DATE	DESCRIPTION

PROJECT NUMBER

P12777

SHEET TITLE

LANDSCAPE SITE PLAN

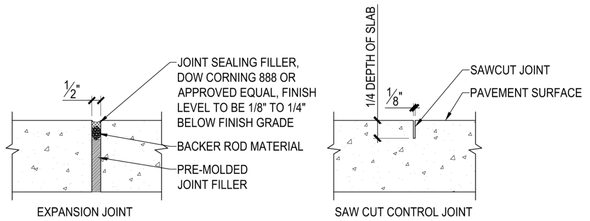
SHEET NUMBER

L102

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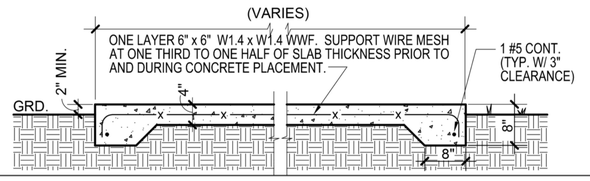


NOTES:
1. SAW CUT GREEN WITH EARLY ENTRY SAW BLADE AFTER FIRST CURE INITIAL SET. START SAWCUTTING AS SOON AS SAW WILL NOT RAVEL EDGES OR DISLODGE AGGREGATE, BUT IN NO CASE MORE THAN 12 HOURS AFTER THE SLAB IS PLACED.
2. PROVIDE EXPANSION JOINTS WHERE PAVING IS ADJACENT TO VERTICAL FACES, CURBS, STEPS, ANY FIXED OBJECT, OR OTHER RIGID PAVING MATERIAL.
3. REFER TO PLANS FOR JOINTING PATTERN.

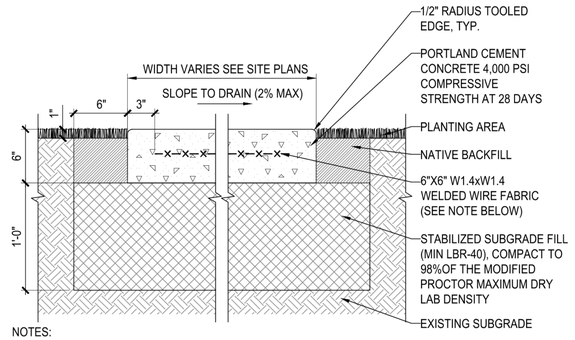
1 CONCRETE JOINTS
3" = 1'-0"

NOTES:

- NEW 4" THICK CONCRETE WALKWAY WITH 8" THICKENED EDGE. PROVIDE 6" X 6" W 1.4 X W 1.4 ON WELL COMPACTED FILL FREE OF ORGANIC MATTER. SPLICE WIDE FABRIC ONE SQUARE PLUS 2". IN PLACE OF STEEL MESH REINFORCEMENT, PROVIDE FIBROUS CONCRETE REINFORCEMENT PER ASTM C-1116 TYPE III 4.1.3, AT 0.1% BY VOLUME.
- CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 P.S.I., #67 STONE, MAX W/C RATIO OF 0.6.
- PROVIDE CONTROL JOINTS TO SIDEWALK WIDTH AND 1/4 DEPTH OF SLAB SAW CUTS AT 5'-0" O.C. AND EXPANSION JOINTS EVERY 20' O.C.
- PROVIDE EXPANSION FILLER TO FULL DEPTH OF SLAB WITH JOINT SEALER AT EXPANSION JOINTS, (40'-0" O.C. MAXIMUM).
- NEW WALKWAY FINISH ELEVATION TO MATCH THAT OF EXISTING WALKWAY PER PLAN.
- MAX. # 5 BAR SPLICES SHALL BE 30" LONG MINIMUM.
- TOP SURFACE SHALL RECEIVE A LIGHT BROOM FINISH AS A MINIMUM OR MATCH EXISTING.
- NEW CONCRETE WALK SHALL BE 2" ABOVE GRADE.
- MAX CROSS SLOPE 1:50.
- MAX SLOPE LESS THAN 1:20.
- ALL SOIL UNDER PAVEMENT AND SIDEWALKS AREAS MUST BE MIN. 98% COMPACTION UNLESS REPLACING EXISTING PAVEMENT OR SIDEWALK AT THE SAME LOCATION



2 PAVING TYPE A - 4" CONCRETE
NTS



NOTES:
1. SEE DETAIL 1 THIS SHEET FOR CONCRETE JOINTS.
2. PROCURE WELDED WIRE FABRIC REINFORCEMENT IN SHEETS, REINFORCEMENT PROCURED IN ROLLS WILL NOT BE ALLOWED. SET CHAIRS IN PLACE UNDER THE REINFORCEMENT PRIOR TO POURING CONCRETE, WELDED WIRE FABRIC REINFORCEMENT SHALL CONFORM WITH AASHTO M 55 (ASTM A185).
3. TYPE 1 FINISH - LIGHT BROOM FINISH. PERPENDICULAR TO DIRECTION OF TRAVEL.
4. FOR CONCRETE IN PLAYGROUND PROVIDE SLIP-RESISTANT FINISH. SEE LF DRAWINGS.

1 PAVING TYPE C - 6" CONCRETE
3" = 1'-0"

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PROJECT

SUNRISE MIDDLE SCHOOL
FORT LAUDERDALE
PARKS BOND PROGRAM

CLIENT

PARKS & RECREATION
City of Fort Lauderdale

PRIME CONSULTANT

AECOM

7650 W. COURTNEY CAMPBELL CAUSEWAY
SUITE 700
TAMPA, FL 33607
813.286.1711 tel 813.287.8591 fax
www.aecom.com

SUB-CONSULTANT

CIVIL
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954.327.7111 tel
www.hammondengineers.com

REGISTRATION

PAUL KURTZ LICENSE No. 1716 STATE OF FLORIDA LANDSCAPE ARCHITECT

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	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT

PROJECT NUMBER

P12777

SHEET TITLE

LANDSCAPE SITE DETAILS

SHEET NUMBER

L201

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Project Management Initials: Designer:_____ Checked:_____ Approved:_____ ANSI D 24" x 36"

City of Fort Lauderdale • Procurement Services Division
101 NE 3rd Ave., Suite 1650 • Fort Lauderdale, Florida 33301
954-828-5933 Fax 954-828-5576
purchase@fortlauderdale.gov

ADDENDUM NO. 2

ITB No. 568

TITLE: Sunrise Middle School – Park Improvements Phase II

ISSUED: February 10th, 2026

This addendum is issued to update the following:

1. Plan and Drawing Sheets

    - Replacement of the cover sheet to include Sheet L-202 in the index
    - Inclusion of drawing sheet DL-101

2. Geotechnical Report

    - The Geotechnical Report is hereby included as part of the solicitation documents.

All other terms, conditions, and specifications remain unchanged.

Yesenia Pascual
Yesenia Pascual
Sr. Procurement Specialist

Company Name: _____
(please print)

Bidder's Signature: _____

Date: _____

DRAWING INDEX

	COVER SHEET
G002	SIGNATURE SHEET
G101	**KEY PLAN**
	SURVEY
V001	SURVEY GENERAL INFORMATION
V101 - V103	SURVEY SITE PLANS
V104	SURVEY TREE/PALM TABLE
	DEMOLITION
DL101 - DL104	LANDSCAPE DEMOLITION AND TREE PROTECTION PLANS
DL201	TREE PROTECTION NOTES AND DETAILS
	CIVIL
C001	CIVIL GENERAL NOTES
C002	PROJECT LAYOUT
C101 - C104	GRADING AND DRAINAGE PLANS
C105	GRADING AND DRAINAGE DETAILS
C201 - C204	EROSION CONTROL PLANS
C205	EROSION CONTROL DETAILS
	SITE / LANDSCAPE
L001	LANDSCAPE GENERAL NOTES
L101 - L104	LANDSCAPE SITE PLANS
L201 - L202	LANDSCAPE SITE DETAILS
L301 - L304	PLANTING PLANS
L401	PLANTING NOTES AND SCHEDULE
L402	PLANTING DETAILS
L501 - L504	IRRIGATION PLANS
L601	IRRIGATION NOTES AND DETAILS
	ELECTRICAL
E001	ELECTRICAL LEGEND, NOTES, AND ABBREVIATIONS
E002	ELECTRICAL ABBREVIATIONS AND NOTES
E100	OVERALL ELECTRICAL SITE PLAN
ED102	PARTIAL ELECTRICAL SITE PLAN - DEMOLITION
ES101 - ES102	PARTIAL ELECTRICAL SITE PLAN
E301	PAVILION LIGHTING AND POWER PLAN
E302	PAVILION LIGHTING AND PROTECTION PLAN
E303 - E304	ELECTRICAL DETAILS
E601	ELECTRICAL RISER DIAGRAM
E701	PANEL SCHEDULES
E901	PAVILION PHOTOMETRICS PLAN
55	**SHEET TOTAL**

CITY OF FORT LAUDERDALE

P12777
SUNRISE MIDDLE SCHOOL
PARK IMPROVEMENTS
1750 NE 14th STREET
FORT LAUDERDALE, FLORIDA

PHASE 2 BID DOCUMENTS



LOCATION SKETCH

P12777
SUNRISE MIDDLE SCHOOL
PARK IMPROVEMENTS
1750 NE 14th STREET
FORT LAUDERDALE, FLORIDA

CITY OF FORT LAUDERDALE
PARKS AND RECREATION DEPARTMENT
701 SOUTH ANDREWS AVENUE, FORT LAUDERDALE, FLORIDA

FORT LAUDERDALE CITY COMMISSION

DEAN J. TRANTALIS	MAYOR
JOHN C. HERBST	COMMISSIONER-DISTRICT I / VICE MAYOR
STEVEN GLASSMAN	COMMISSIONER-DISTRICT II
PAMELA BEASLEY-PITTMAN	COMMISSIONER-DISTRICT III
BEN SORENSEN	COMMISSIONER-DISTRICT IV

AECOM
AECOM TECHNICAL SERVICES, INC.
7650 W Courtney Campbell Causeway
Tampa, Florida 33607-1462
813.286.1711 tel 813.287.8591 fax
www.aecom.com

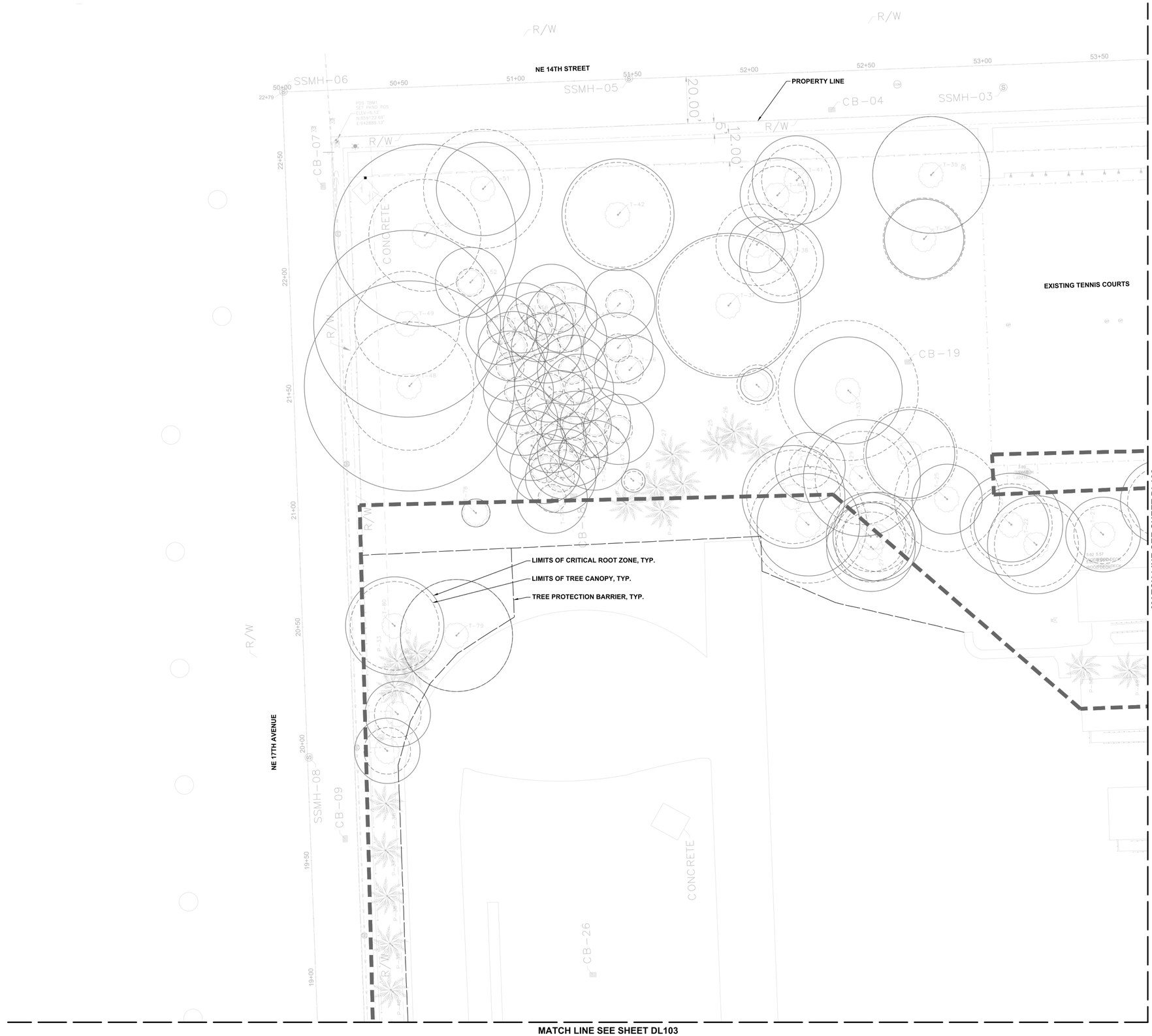
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DATE: 02/05/2026

ADDENDUM 2

PLOT



LIMIT OF WORK

TREE PROTECTION LEGEND

- EXISTING TREE TO REMAIN
- CANOPY AREA
- CRITICAL ROOT ZONE
- EXISTING PALM TO REMAIN
- TREE PROTECTION BARRIER

DEMOLITION LEGEND

- REMOVE ASPHALT AND BASE COURSE FULL DEPTH
- REMOVE EXISTING CONCRETE PAVEMENT
- REMOVE EXISTING SAND/CLAY MIX
- REMOVE EXISTING FENCE

NOTES:

1. SEE NOTES AND DETAIL 1 ON SHEET DL201 FOR TREE PROTECTION BARRIER.
2. SEE NOTES AND DETAIL 2 ON SHEET DL201 FOR ROOT PRUNING.
3. TREE CANOPY AND CRITICAL ROOT ZONE LIMITS SHOWN ARE APPROXIMATE BASED ON SURVEY. FIELD VERIFY TREE CRITICAL ROOT ZONES WHERE AFFECTED BY PROPOSED IMPROVEMENTS.

N

0 10' 20' 40' 60'

SCALE: 1" = 20'-0"

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	09/11/2025	BID DOCUMENTS
	09/18/2024	CONSTRUCTION DOCUMENTS
	05/03/2024	DESIGN DEVELOPMENT

PROJECT NUMBER

P12777

SHEET TITLE

LANDSCAPE DEMOLITION AND TREE PROTECTION PLAN

SHEET NUMBER

DL101

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CITY OF FORT LAUDERDALE PARKS BOND PROGRAM IMPLEMENTATION PROJECT - PHASE II SUNRISE MIDDLE SCHOOL PARK IMPROVEMENTS LOCATED AT 1750 NE 14TH STREET CITY OF FORT LAUDERDALE, FLORIDA

REPORT OF SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATIONS

PREPARED FOR: AECOM

PREPARED BY: GEOSOL, INC.

OCTOBER 4, 2024

GEOSOL, Inc.

AECOM
5438 Wade Park Boulevard, Suite 200
Raleigh, North Carolina 27607

October 4, 2024

Attention: Ms. Chayanika Mohan – Urban Planner III

Re: **Report of Subsurface Exploration and Geotechnical Engineering Evaluations**
City of Fort Lauderdale Parks Bond Program Implementation Project – Phase II
Sunrise Middle School Park Improvements
Located at 1750 NE 14th Street
City of Fort Lauderdale, Florida
GEOSOL Project No. 224120

Dear Ms. Mohan:

Geosol, Inc. (GEOSOL) is pleased to submit this report presenting the results of our geotechnical services for the above-referenced project. The services were provided in accordance with our proposal No. P-223200-R1 dated December 8, 2023. Notice to proceed to perform our services was provided by your office on February 29, 2024 by means of a Task Order.

The results of our field exploration and laboratory testing programs for the proposed Sunrise Middle School Park improvements project as well as our geotechnical engineering evaluations are presented in the accompanying report.

GEOSOL appreciates the opportunity to work on this interesting project. If you have any question or need additional information, please do not hesitate to call our office.

Sincerely,

GEOSOL, INC.

2/28/25

Oracio Riccobono, P.E.
Chief Geotechnical Engineer
Florida License No. 49324
Texas License No. 143780

Oracio Riccobono
2025.02.28 12:29:48 -05'00'

Adnan Ismail, P.E.
Senior Geotechnical Engineer
Florida License No. 76014
Texas License No. 143698

Juan Gonzalez, P.E.
Project Geotechnical Engineer
Project Geotechnical Engineer

"This item has been electronically signed and sealed by Oracio Riccobono, PE. on the date indicated here using a SHA authentication code. Printed copies of this document are not considered signed and sealed and the SHA authentication code must be verified on any electronic copies."

cc: Addressee
File

GEOSOL, Inc.

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GEOSOL, Inc.

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	Sheet 2: USDA Soil Survey Map
	Table 1 – Summary of Test Boring Location
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	Organic Content Test Results
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Appendix "C"	Table 4 – Summary of Borehole Percolation Test Results
	Schematics of SFWMD's Usual Open-Hole Percolation Test

1.0 INTRODUCTION

1.1 Project Information

As we understand it, the City of Fort Lauderdale plans to provide park improvements at the Sunrise Middle School Park located at 1750 NE 14th Street in the City of Fort Lauderdale, Florida. As we understand it, the proposed improvements will generally include a security fence, a pool chiller, a synthetic turf field, resurfacing of the track, a lit pavilion, lighting upgrades at the pickleball/tennis court and the pool, a chilled water fountain, and drainage improvements. As requested, our scope of service did not include any geotechnical services for the proposed security fence that will be done by the City of Fort Lauderdale.

Based on our discussions, geotechnical services were required to explore the subsurface conditions to obtain geotechnical data for use in the design and construction of the above-referenced proposed park improvements. Specifically, the geotechnical services were limited to the performance of Standard Penetration Test (SPT) borings to characterize the subsurface conditions, as well as borehole percolation testing for use in drainage analyses and design. The results of the field exploration and laboratory testing programs were used to investigate the subsurface and groundwater conditions and to provide geotechnical engineering recommendations for the proposed park improvements.

1.2 Purpose

The purpose of the geotechnical study was to evaluate the subsurface and groundwater conditions at the site of the proposed park improvements, to provide evaluations and the foundation recommendations for the proposed structures. This report presents the results of our field exploration, laboratory testing, and geotechnical engineering evaluations for the proposed construction.

2.0 SCOPE OF SERVICES

The scope of services consisted of providing the following services:

1. Performing site reconnaissance, locating and coordinating for existing utilities.

2. Drilling one (1) SPT boring to a depth of 25 feet below existing grades for the proposed pool chiller,

3. Drilling two (2) SPT borings to depths of 10 feet below existing grades for the proposed synthetic turf field,

4. Drilling two (2) SPT borings to depths of 10 feet below existing grades for the proposed resurfacing of the track,

5. Drilling two (2) SPT borings to depths of 30 feet below existing grades for the proposed lit pavilion,

6. Drilling two (2) SPT borings to depths of 20 feet below existing grades for the proposed lighting at the pickleball/tennis court,

7. Drilling two (2) SPT borings to depths of 20 feet below existing grades for the proposed lighting at the pool,

8. Drilling one (1) SPT boring to a depth of 15 feet below existing grades for the proposed chilled water fountain, and

9. Performing two (2) borehole percolation tests at depths of 10 feet for the proposed park drainage improvements

10. Measuring groundwater levels at the boring locations.

11. Backfilling the boreholes using grout and restoring the site to their original conditions.

12. Visually examining and classifying all recovered soil samples from in the laboratory using the Unified Soil Classification System (USCS). The laboratory testing program includes grain-size analyses, percent passing the No. 200 sieve, and moisture content determination.

13. Evaluating the results of the SPT boring information.

14. Deriving soil/rock parameters for use in the foundation analysis of the proposed park improvements.

15. Providing discussions of critical design or construction considerations based on the subsurface and groundwater conditions developed from the results of the geotechnical investigations.

16. Preparing a geotechnical engineering report summarizing the field-testing data, subsurface and groundwater conditions, geotechnical evaluations and recommendations.

3.0 SITE CONDITIONS

Our understanding of the site conditions is based on our site visit, and field review and observations during the performance of the field exploration program. The site of the proposed park improvements is located at 1750 NE 14th Street in the City of Fort Lauderdale, Florida. The existing site consist of a park with trees, basketball courts, baseball fields, pickleball/tennis courts, running track and a pool. Residential and commercial buildings are located in the immediate vicinity of the proposed park improvements. We have appended a Site Vicinity Map that identifies the location of the study area, which is presented in Sheet 1 of Appendix “A”.

4.0 FIELD EXPLORATION

4.1 General

The field exploration program for this study included the following:

- One (1) SPT boring (PC-1) was performed to a depth of 25 feet below existing grades for the proposed pool chiller,
- Two (2) SPT borings (ST-1 and ST-2) were performed to depths of 10 feet below existing grades for the proposed synthetic turf field,
- Two (2) SPT borings (RT-1 and RT-2) were performed to depths of 10 feet below existing grades for the proposed resurfacing of the track,
- Two (2) SPT borings (LP-1 and LP-2) were performed to depths of 30 feet below existing grades for the proposed lit pavilion,
- Two (2) SPT borings (LPT-1 and LPT-2) were performed to depths of 20 feet below existing grades for the proposed lighting at the pickleball/tennis court,
- Two (2) SPT borings (LPL-1 and LPL-2) were performed to depths of 20 feet below existing grades for the proposed lighting at the pool,
- One (1) SPT boring (WF-1) was performed to a depth of 15 feet below existing grades for the proposed chilled water fountain, and
- Two (2) Borehole Percolation tests were (P-1 and P-2) performed to a depth of 10 feet for the proposed park drainage improvements

The test locations were marked in the field by a representative of GEOSOL using the plans provided to us by AECOM showing the proposed park improvements, existing landmarks and standard taping procedures. The tests were performed as close as possible to the proposed park improvements considering existing utilities and equipment accessibility constraints. Latitude and longitude coordinates were obtained by means of a hand-held Global Positioning System (GPS) device (Garmin eTrex 20x). The coordinates were converted to northing and easting coordinates using computer software (Corpscon). A summary of the approximate test locations is presented on Table 1 and in the Test Location Plan in Appendix "A".

4.2 Standard Penetration Test (SPT) Borings

The SPT boring procedures were conducted in general conformance with ASTM D-1586. All SPT borings were performed utilizing a truck-mounted drill rig (Foremost Mobile B-53) using an automatic hammer. After seating the sampler 6 inches, the number of successive blows required to drive the sampler 12 inches into the soil constitutes the test result commonly referred to as the "N"-value. The "N"-value has been empirically correlated with various soil properties and is considered to be indicative of the relative density of cohesionless soils and the consistency of cohesive soils. The N-value information for each SPT boring is presented in the Report of Core Borings sheet that is included in Appendix "A".

4.3 Borehole Percolation Testing

The percolation testing was performed in general accordance with the South Florida Water Management District (SFWMD) "Usual Open-Hole" constant head method. The test was performed to determine the hydraulic conductivity value (k) of the subsurface materials at a depth of 10 feet below the existing ground surface. The borehole was drilled by means of a 6 ¾ -inch diameter tri-cone bit and water. Upon drilling the borehole, a 6-inch diameter perforated PVC pipe was inserted in the ground and used a pump for purging the well prior the start of the test. After completion of the percolation test, the borehole was backfilled with grout and the site was restored as required. The hydraulic conductivity value (k) was determined from the results obtained during the field testing. The hydraulic conductivity value is reported in units of cubic feet per second per square foot of seepage area per foot of head (cfs/ft^2-ft.). The test results are presented in Table 4 in Appendix "C" of this report.

4.4 Water Level Measurements

Water level depths were obtained during the performance of the test boring operations. They are noted in the Report of Core Borings sheet in Appendix "A". In relatively pervious soils/rocks, such as sandy (granular) soils and porous limestone, the indicated depths are usually reliable groundwater levels. Seasonal variations, tidal conditions, temperature variations, land uses, and recent rainfall conditions may influence the depth of groundwater levels.

5.0 LABORATORY TESTING PROGRAM

5.1 General

Representative samples collected from the test borings were visually reviewed in the laboratory by a Geotechnical Engineer to confirm the field classifications. The soil samples were then classified using the Unified Soil Classification System (USCS) in general accordance with the American Society of Testing and Materials (ASTM) test designation D-2488 and ASTM D-2487. Additionally, soil samples were classified using the American Association of State Highway and Transportation Officials (AASHTO) Soil Classification System in general accordance with the ASTM test designation D-3282. The classification was based on visual observations with the aids of limited laboratory testing, which consisted of moisture content, grain-size analysis, percent passing the No. 200 sieve, and organic content. The tests were performed on selected samples believed to be representative of the materials encountered. A summary of the laboratory test results is provided in Table No. 2 in Appendix "B" of this report. FDOT Environmental Classification Testing was also performed on a select water sample. A summary of these laboratory test results is presented in Table No. 3 of Appendix "B".

5.2 Moisture Content

The laboratory moisture content test consists of the determination of the percentage of moisture contents in selected samples in general accordance with FDOT Test Designation FM1-T265 (ASTM Test Designation D-2216, titled "Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregate Mixtures"). Briefly, the moisture content is determined by weighing a sample of the selected material and then drying it in a warm oven. Care is taken to use a gentle heat so as not to destroy any organics. The sample is removed from the oven and re-weighed. The difference of the two weights is the amount of moisture removed from the sample. The weight of the moisture divided by the weight of the dry soil sample is the percentage by weight of moisture in the sample. The test results are summarized in Table No. 2 of Appendix “B”.

5.3 Grain-Size Analysis

The grain-size analyses were conducted in general accordance with the ASTM Test Designation D-6913, titled “Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis”. The grain-size analysis test measures the percentage passing a set of standard size sieves. In this manner, the grain-size distribution of a soil is measured. A summary of these test results are presented on Table 2 in Appendix “B”. The grain-size analysis curves are presented in Appendix “B”.

5.4 Organic Content

Organic content test consists of the determination of the percentage of organic content in selected samples in general accordance with FDOT Test Designation FM1-T267 (ASTM Test Designation D-2974, titled "Moisture, Ash, and Organic Matter of Peat and Other Organic Soils"). Briefly, the organic content is determined by weighing a sample of the selected material and then burning off the organic material in a hot oven. The sample is removed from the oven and re-weighed. The difference of the two weights is the amount of organic material removed from the sample. The weight of the organic material divided by the weight of the dry soil sample is the percentage by weight of organic material in the sample. The organic content test results are given in Table No. 2 of Appendix “B”.

5.5 Environmental Classification

As part of the laboratory testing, environmental corrosion tests on a water sample recovered from the SPT boring locations along the project were performed. Environmental corrosion tests include parameters such as pH, resistivity, sulfates content and chlorides content. The environmental corrosion tests were conducted in general accordance with the FDOT Test Designations FM5-550, 5-551, 5-552, and 5-553.

Based on the laboratory test results and the FDOT's "Structures Design Guidelines, Section 1.3", the environment along the proposed improvements has been classified as moderately aggressive for the steel and concrete substructures, and slightly aggressive for the superstructures. The test results obtained are tabulated in Table 3 in Appendix "B" of this report.

6.0 GENERALIZED SUBSURFACE CONDITIONS

6.1 Regional Geology

The project is located on the Southern flank of the Florida Plateau, a stable, carbonate platform on which thick deposits of Jurassic, Cretaceous, Tertiary limestones, dolomites and evaporites have accumulated. In the project area, the upper 200 feet of this platform is composed predominantly of limestone and quartz sand. These sediments were deposited during several glacial and interglacial stages during the Pleistocene Epoch. Three major geological formations are encountered along the project alignment in the upper 200 feet. These formations are in descending order: (1) the Fort Thompson Formation, (2) the Tamiami Formation and (3) the Hawthorn Formation.

The rock formations encountered in the Broward County area are typically much softer than the "bedrock" formations encountered in other areas of the country. The strength of the limestone as well as its deformation characteristics depends upon the degree of cementation of the formation and its alteration by solutioning and weathering subsequent to deposition. One of the most important characteristics of the limestone encountered in the project area is the degree of erosion. Past surface solutioning of the limestone has resulted in formation called "pinnacle rock". In some cases, nearly vertical cylindrical-shaped solution cavities are filled with surficial fine sands extending below the groundwater level.

6.2 Broward County Soil Survey

The *Soil Survey of Broward County Area, Florida*, published by the United States Department of Agriculture (USDA), was reviewed for general near-surface soil information within the general project vicinity. This information indicates that there is one (1) primary mapping unit within the project vicinity, as follows:

- Arents-Urban land complex (11)

A reproduction of the USDA Soils Survey map for the project area is illustrated in Sheet 2 of Appendix "A" of this report.

7.0 SITE SUBSURFACE CONDITIONS

7.1 General

The subsurface conditions disclosed by the test borings performed for this study are generally consistent with the regional geology described above. Detailed information is presented in the Report of Core Boring Sheet in Appendix “A”. The stratification shown is based on visual examination of recovered samples and interpretation of the field boring logs. Specifically, we have identified five (5) strata, besides the asphalt pavement, along the project alignment and they are described in Table “A” on the following page.

TABLE "A" – SUMMARY OF GENERALIZED SUBSURFACE STRATIGRAPHY

Stratum No.	Approximate Depth Interval (feet)	Material Description	AASHTO Soil Group	USCS Soil Symbol
1	0 to 0.5	Dark Brown Organic Silty Fine SAND with Grass (TOPSOIL)	A-8	OL
2	0.5 to 4.5	Brown Clean to Slightly Silty Fine to Medium SAND with Trace to Little Limerock Fragments (FILL)	A-3	SP/SP-SM
3	1.5 to 9.5	Brown Sandy LIMESTONE	N/A	N/A
4	7.5 to 30.0	Brown Clean to Slightly Silty Fine to Medium SAND with Trace to Few Limestone Fragments	A-3	SP/SP-SM
5	7.5 to 18.0	Brown Silty Fine to Medium SAND with Few to Some Limestone Fragments	A-2-4	SM

Note: 1) Specific subsurface conditions are presented on the Report of Core Boring sheet shown in Appendix "A".

7.2 Groundwater Conditions

Groundwater levels were measured in the completed boreholes during the drilling operations. Measurements made in the test locations disclosed the water table to be at depths ranging from 3.1 to 4.6 feet below the ground surface, with an average of about 3.8 feet. Given the granular nature of the soils and type of limestone formation, we consider the recorded levels to stabilize in a short time and to be reasonably reliable. The Report of Core Boring sheet presented in Appendix "A" show the groundwater table information at each boring location.

It is to be noted that borings were performed during the rainy season. Therefore, during the dry season the groundwater may be 6 to 12 inches lower than the levels measured at the test boring locations.

8.0 GEOTECHNICAL SOIL/ROCK DESIGN PARAMETERS

The geotechnical design parameters for this study were obtained on the basis of empirical relationships between the SPT "N"-values and the shear strength of the soil/rock strata, statistical evaluation of the field data, our local experience and literature review. Table "B" on the following page presents the recommended soil/rock parameters for use in foundation analyses and design.

TABLE "B"- SUMMARY OF GEOTECHNICAL DESIGN PARAMETERS

General Material Description	Approximate Depth Interval (Feet)	Unit Weight, γ (PCF)		Average SPT N_{safety}-value (BPF)	Friction Angle, ϕ (Degrees)	Cohesion, C (TSF)	Coulomb Earth Pressure Coefficients		
		Total	Effective				Active (Ka)	Passive (Kp)	At-Rest (Ko)
Granular Fill (Stratum 2)	0.5 to 4.5	105	43	10	30	-	0.30	4.08	0.50
Natural Limestone (Stratum 3)	1.5 to 9.5	120	58	18	36	-	0.24	5.95	0.41
Granular Soils (Strata 4 and 5)	7.5 to 30.0	115	53	15	32	-	0.28	4.60	0.47

Note:
1) SPT "N"-values were obtained with the use of an automatic hammer.
2) SPT $N_{Safety} = 1.24 * N_{Automatic}$ per FDOT SFH.
3) Submerged soil unit weight (γ_{eff}) shall be used for foundation analyses.
4) Stratum 1 is the topsoil.
5) Limestone modeled as sandy gravel since Nsafety range between 10 and 25 blows per foot (BPF) per FDOT SFH

9.0 FOUNDATION ANALYSES FOR PROPOSED PARK IMPROVEMENTS

9.1 General

As we understand it, the proposed improvements will generally include a security fence, a pool chiller, a synthetic turf field, resurfacing of the track, a lit pavilion, lighting upgrades at the pickleball/tennis court and the pool, a chilled water fountain, and drainage improvements. As requested, our scope of service did not include any geotechnical services for the proposed security fence that will be done by the City of Fort Lauderdale.

Based on the results of our subsurface exploration and foundation evaluations, conventional shallow foundations are suitable for the support of the proposed park improvements after proper site preparation. Geotechnical analyses and evaluations for foundation design and related construction are presented in subsequent sections of this report. Specifically, we have provided design and construction criteria for supporting the proposed park improvements on conventional shallow foundations. The conventional shallow foundations may bear on acceptable compacted structural fill materials or compacted existing soils.

For footings resting on acceptable compacted structural fill materials or compacted existing soils, the site preparation recommendation presented in this report must be properly implemented. Additional criteria regarding footing design and construction is presented in the following sections of the report.

9.2 Footings Bearing Capacity Evaluations

The shallow foundations may bear on the surface of acceptable compacted structural fill or compacted existing soils, or natural limestone. Preparation of the site to receive the new construction should include removal of any existing topsoil, substructures, grass, roots and/or vegetation system. We recommend that the footings bearing on acceptable compacted structural fill, compacted existing soils, or natural limestone be designed using a maximum gross allowable bearing capacity of 2,500 psf with a minimum footing width of 3-feet, and a minimum footing embedment of 2 feet. The shallow foundation analyses assume that the footings will be on horizontal ground and that there are no eccentric loading conditions acting on the footings.

We recommend that the footings supporting foundations have a minimum width of 3-feet, even if that dimension produces a bearing pressure less than the allowable. The purpose of limiting the minimum footing size is to prevent a "punching" shear failure and to reduce the possibility of bearing on an isolated weak zone. The minimum footing cover required is 2-feet.

Foundations subject to transient lateral loads will resist these forces through a combination of base shearing resistance mobilized at the footing-subgrade interface and earth pressure acting on the vertical faces of the footings at right angles to the direction of applied load. Base shearing resistance should be determined using a friction factor of 0.58. Earth pressure resistance should be computed using an equivalent fluid pressure of 35 pounds per square foot per foot of depth, for granular backfill material. Resistance to sliding determined in accordance with the above should be considered available/ultimate resistance. Accordingly, the design for the sliding should include a factor of safety. We recommend that factor of safety of at least 1.5 be used.

To calculate the resistance of shallow foundations to uplift forces, a prismatic failure block with vertical faces should be assumed above the footing base. The resisting forces will be provided by the combination of footing weight, overburden soil weight in the failure block, and shearing resistance along the faces of the soil block. The weight of the soil above the water table should be taken as 105 pounds per cubic foot (pcf). For submerged soil, a buoyant weight of 43 pcf should be used. The factor of safety against uplift should not be less than 1.5.

A modulus of subgrade reaction (k) value of 100 pounds per cubic inch (pci) may be used for slab-on-grade design when lying on structural fill or existing soils that have been compacted to at least 95% of the modified Proctor maximum dry density determined by ASTM D-1557.

9.3 Settlement Potential

The amount of settlement that shallow foundations founded on top of acceptable compacted structural fill, compacted existing soils, or natural limestone will experience is primarily governed by the compressibility of the acceptable compacted structural fill, compacted existing soils, or natural limestone, the sizes and depths of the foundations, and the pressure imposed on the supporting materials. We have compared the data obtained from the SPT borings performed with our foundation design experience with similar structures founded on top of acceptable compacted structural fill, compacted existing soils, or natural limestone. Footings designed with the criteria in Section 9.2 and constructed in the manner recommended in Section 11.0 are estimated to sustain maximum total settlements in the range of one (1) inch, which corresponds to the maximum allowable bearing pressures of about 2,500. Differential settlements between adjacent footings are expected to be one-half of the total settlement, i.e. ½-inch.

The acceptable compacted structural fill. compacted existing soils, or natural limestone which will provide support to the foundations, have low compressibility and any settlement due to pressure applied by the foundations is likely to occur almost immediately upon application of the loads. In this case, nearly all of the settlement of the foundations due to dead loads is expected to take place during construction. The portion of the settlement due to the live loadings of the structure will generally take place soon after the first application of this load.

10.0 GEOTECHNICAL ENGINEERING ANALYSES AND EVALUATIONS FOR THE PROPOSED PARK IMPROVEMENTS

10.1 General

The results of this study indicate that the site is generally suitable for the construction of the proposed park improvements when viewed from a geotechnical engineering perspective.

10.2 Site Preparation

Site preparation for the proposed park improvements will most likely include striping of vegetation, removal of unsuitable soils, backfilling operations, and asphalt pavement construction. The following are our discussions regarding the utilization and the site preparation requirements of the subsurface soils.

- The material from Stratum 1 is the topsoil (A-8) and considered to be unsuitable (muck). It shall be removed during clearing and grubbing.

- The material from Strata Number 2 and 4 (A-3 Soils) is considered to be select and should be utilized in accordance with FDOT Standard Plan Index 120-001.

- The material from Stratum Number 5 (A-2-4 soils) is considered to be select and should be utilized in accordance with FDOT Standard Plans for Road and Bridge Construction Index 120-001. Certain types of A-2-4 material are likely to retain excess moisture and may be difficult to dry and compact. It should be used in the embankment above the water level existing at time of construction.

- The material from Stratum Number 3 is the natural Limestone Formation. This material may be difficult to dewater, excavate and/or penetrate and may require special equipment to do so.

10.3 Fill Material

The fill should consist of select material, meeting the requirements of Standard Plan Index 120-001 and shall be constructed in general accordance of Section 120.8 of the FDOT *Standard Specifications for Road and Bridge Construction*.

10.4 Asphalt Pavement Design Suggestions

Flexible pavement sections in this geographic area typically consist of an asphaltic concrete wearing course, limerock base course and a layer of stabilized subgrade. Based on our analysis and experience in the area, we suggest the following pavement section thicknesses. The final pavement design shall be performed by The Designer on the basis of loading application and design life of the proposed pavement.

TABLE "C" – FLEXIBLE PAVEMENT DESIGN SUGGESTIONS

TYPE OF PAVEMENT	LAYER	MATERIAL DESCRIPTION	LAYER THICKNESSES (Inches)	
			LIGHT DUTY	HEAVY DUTY
Flexible	(A)	Florida DOT Asphalt Type S	1.5	2.5
	(B)	Crushed limerock with minimum LBR of 100 compacted to 98% of the Modified Proctor maximum dry density	6.0	8.0
	(SB)	Stabilized sub-base fill with a minimum LBR of 40 compacted to 95% of the Modified Proctor maximum dry density	12.0	12.0
(A) = Asphaltic Concrete (B) = Base Course (SB) = Stabilized Subbase				

Site earthwork preparation procedures as discussed in Section 11.0 is appropriate for proposed pavement areas.

We recommend that after the removal of all topsoil /existing surface features and after final subgrade elevations have been achieved, that Limerock Bearing Ratio (LBR) tests be performed per every 10,000 square feet of subgrade. If the LBR values are less than 40, we recommend that the subgrade be stabilized to depths of 12 inches to achieve minimum Limerock Bearing Ratio (LBR) values of 40. The subgrade should be compacted to at least 95 percent of maximum dry density (ASTM D-1557 or AASHTO T-180).

The base course materials in the pavements should consist of crushed limestone having a minimum Limerock Bearing Ratio (LBR) of 100. Base materials should meet the requirements presented in the latest version of the Florida Department of Transportation "Specifications for Road and Bridge Construction", Section 911. The base course should be compacted to at least 98 percent of maximum dry density (ASTM D-1557 or AASHTO T-180).

10.5 Rigid Pavement Design Suggestions

The existing subsurface conditions along the project alignment generally consists of slightly silty to silty fine to medium sand with limerock fragments, having an AASHTO classification of A-3 and/or A-2-4, with percent passing the number 200 sieve in the range of 4 to 19 percent.

Two (2) base options were considered for the rigid pavement design, the asphalt base option and the special select soil (SSS) option. However, due to the unknown history of successful construction and performance of rigid pavement with SSS in the project's area at a reasonable cost, the composition of the existing embankment soils, as well as common construction practices, the asphalt base option appears to be more appropriate.

Based on our analysis and experience in the area, we suggest the following pavement section thicknesses. The final pavement design shall be performed by The Designer on the basis of loading application and design life of the proposed pavement.

TABLE "D" – RIGID PAVEMENT DESIGN SUGGESTIONS

Type Of Pavement	Material Description	Layer Thickness (inches)
Rigid Pavement	Jointed Plain Concrete Pavement Slab	8
	Asphalt Base Course (Type B-12.5)	4
	Stabilized sub-base fill with a minimum LBR of 40 compacted to 95% of the Modified Proctor maximum dry density	12

We recommend that after the removal of all topsoil /existing surface features and after final subgrade elevations have been achieved, that Limerock Bearing Ratio (LBR) tests be performed per every 10,000 square feet of subgrade. If the LBR values are less than 40, we recommend that the subgrade be stabilized to depths of 12 inches to achieve minimum Limerock Bearing Ratio (LBR) values of 40. The subgrade should be compacted to at least 95 percent of maximum dry density (ASTM D-1557 or AASHTO T-180).

11.0 CONSTRUCTION CONSIDERATIONS

11.1 Site Preparation

The shallow foundations may bear on the surface on acceptable compacted structural fill or compacted existing soils, or natural limestone. We recommend that any existing unsuitable materials such as asphalt/concrete pavement, substructures, topsoil, grass and vegetation system be stripped from the proposed construction areas. In addition, any underground utilities that might exist within the structure footprints should be entirely removed and replaced with structural fill. After stripping is completed, the surface soils at the proposed structure areas should be leveled and densified prior to the placement of the subfloor fill. Where the above site preparation procedures created excavations below the final proposed grade, the excavations should be brought to final grade with structural fill as specified in Section 11.3 of this report.

It is recommended that the structural fill or existing soils at the bottoms of the foundation excavations be compacted in-place. These materials should be compacted to achieve no less than 95% of the modified Proctor maximum dry density determined by the ASTM designation D-1557. If the foundation bearing materials become disturbed due to surface water resulting from precipitation and runoff, the disturbed soils should be overexcavated and replaced with structural fill as specified in Section 11.3 of this report.

11.2 In-Situ Densification of Soils

Compaction of the in-place soils should be performed in the proposed construction footprint plus a 5-foot wide perimeter extending beyond the outer lines of the structure areas, where practical. Any compaction taking place within a distance of 25 feet from any existing structure or utility should be compacted with a vibratory plate or small walk behind vibratory roller to avoid damage to any existing utility of structure.

Compaction of the bearing surface soils should continue until no further vertical settlement of the surface is visually discernible. Density control should be exercised in the upper 12 inches of the subgrade (if feasible). Soils in this interval should be compacted to 95% of the modified Proctor maximum dry density determined per ASTM D-1557. Addition of moisture by frequent wetting of the subgrade may be necessary during the rolling operations to prevent drying and loosening of the upper 6 to 12 inches of soil.

11.3 Structural Fill and Backfill

Proper control of the placement and compaction of new fills for the project should be exercised by a representative of the Geotechnical Engineer. The fill materials should be placed in lifts not exceeding 12 inches in loose thickness. Each lift should be compacted to a minimum of 95% of the modified Proctor maximum dry density near the optimum moisture content as determined by ASTM D-1557. Fill to be compacted with a vibratory plate or a small walk behind vibratory roller should be placed in lifts not exceeding six (6) inches in loose thickness.

It is imperative that any fill supporting floor slabs be placed, compacted and tested in accordance with the specifications of this report. The tests should be performed by a qualified soils technician working under the supervision of a Geotechnical Engineer in accordance with appropriate ASTM procedures. Any fill indicating less than the recommended relative compaction should be re-compacted until the required density is obtained prior to the placement of subsequent lifts or concrete for the substructure.

The structural fill should be free of organic matter and consist of granular material containing less than 10 percent material passing the No. 200 mesh sieve. The fill material may be composed of either clean sand and/or crushed limerock. The structural fill should have a Unified Soil Classification System (USCS) designation of SP, SW, SP-SM or SW-SM. If crushed limerock fill is used, it should have no particle size in excess of three (3) inches. If structural fill is to be placed below the groundwater, it should consist of crushed limerock and should have a USCS designation of GP or GW.

11.4 Excavation Recommendations

The proposed improvements will likely require excavation of the existing subsurface materials. Temporary excavation side slopes of 1V: 2H in the granular subsurface materials (Strata 2, 4 and 5), and 1V: 1H in the natural limestone formation (Stratum 3) are stable and have a minimum factor of safety of 1.3. If steeper sides are used, the excavations will require the need of temporary ground support systems in order to maintain the stability of the excavations and for safety reasons. Based on the results of the soil boring, an unsupported vertical cut is not considered stable or safe during construction. An unsupported vertical cut will cause cracks at the grade surface and on the surface of the asphalt-paved roadway because the angle of repose of the granular soils will be exceeded and a failure surface will develop behind the vertical face of the excavation. The existing subsurface materials may be excavated using conventional excavation equipment. It is to be noted that the natural limestone formation may require special equipment to excavate and/or penetrate. The temporary ground support system should be in conformance with the Occupational Safety and Health Administration (OSHA) Standards. The soil/rock parameters presented in Table "B" may be used for design of the temporary ground support system. Materials removed from the excavation should not be stockpiled immediately adjacent to the cut, inasmuch as this load may cause a sudden collapse of the temporary ground support system.

11.5 Ground Water Control

Dewatering may be required during excavation depending on the construction technique used and the time of the year when the construction occurs. Successful removal of the existing subsurface materials may necessitate that the work be performed in-the-dry, thereby requiring temporary lowering of the groundwater table in the proposed excavation areas. De-watering involves lowering the ambient groundwater table below the existing groundwater levels. This may be accomplished through use of a wellpoint system or submersible pump. The water from the on-site dewatering operations should be directed to a suitable discharge point and must be adequate to satisfy any local, state or federal regulatory agency. Any dewatering system shall be designed by a professional engineer registered in the State of Florida. During foundation construction and initial concrete curing area, water levels should be maintained at least 1 foot below the foundation bearing elevation. It is to be noted that the natural limestone formation maybe difficult to dewater, and that a well point system may be required.

12.0 ON SITE SOIL SUITABILITY

All materials to be used for backfill or compacted fill construction should be evaluated and, if necessary, tested by The Contractor prior to placement to determine if they are suitable for the intended use. In general, based on the boring results, the majority of the on-site granular fill materials can be used as general subgrade fill and backfill in the proposed structures areas, provided that it is free of rubble, clay, rock, roots and organic matter. Suitable structural fill materials should consist of limerock and fine to medium sand with less than ten (10) percent passing the No. 200 sieve, free of rubble, organics, clay, debris and other unsuitable material. Any off-site materials used as fill should be approved by The Contractor prior to acquisition.

13.0 REPORT LIMITATIONS

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This company is not responsible for the conclusions, opinions or recommendations made by others based on these data. No other warranties are expressed or implied.

The scope of the investigation was intended to specifically evaluate subsurface conditions within the influence of the proposed project. The analyses and recommendations submitted in this report are based upon the data obtained from the test borings performed at the locations indicated. If any subsoil variations become evident during the course of this project, a re-evaluation of the recommendations contained in this report will be necessary after we have had an opportunity to observe the characteristics of the conditions encountered. The applicability of the report should also be reviewed in the event significant changes occur in the design.

The scope of our services does not include any environmental assessment or investigation for the presence or absence of hazardous or toxic materials in the soil, groundwater, or surface water within or beyond the site studied. Any statements in this report regarding odors, staining of soils, or other unusual conditions observed are strictly for the information of our client.

APPENDIX "A"

Sheet 1: Site Vicinity Map
Sheet 2: USDA Soil Survey Map
Table 1 – Summary of Test Boring Location
Sheet 3: Test Location Plan
Sheets 4 through 9: Report of Core Borings

GEOSOL, Inc.



APPROXIMATE SITE LOCATION

SITE VICINITY MAP

COUNTY: BROWARD COUNTY, FLORIDA

REFERENCE: GOOGLE EARTH, 2024

DATE: SEPTEMBER, 2024

SITE VICINITY MAP

CITY OF FORT LAUDERDALE PARKS BOND PROGRAM
IMPLEMENTATION PROJECT - PHASE II
SUNRISE MIDDLE SCHOOL PARK IMPROVEMENTS
LOCATED AT 1750 NE 14TH STREET
CITY OF FORT LAUDERDALE, FLORIDA

DRAWN	SCALE	PROJ. No.
AN	N.T.S.	224120
CHECKED	DATE	SHEET 1
OR	SEP., 2024	

APPROXIMATE SITE LOCATION



USDA SOILS SURVEY MAP

MAP UNIT	SOIL NAME
11	Dade-Urban land complex

COUNTY: BROWARD COUNTY, FLORIDA

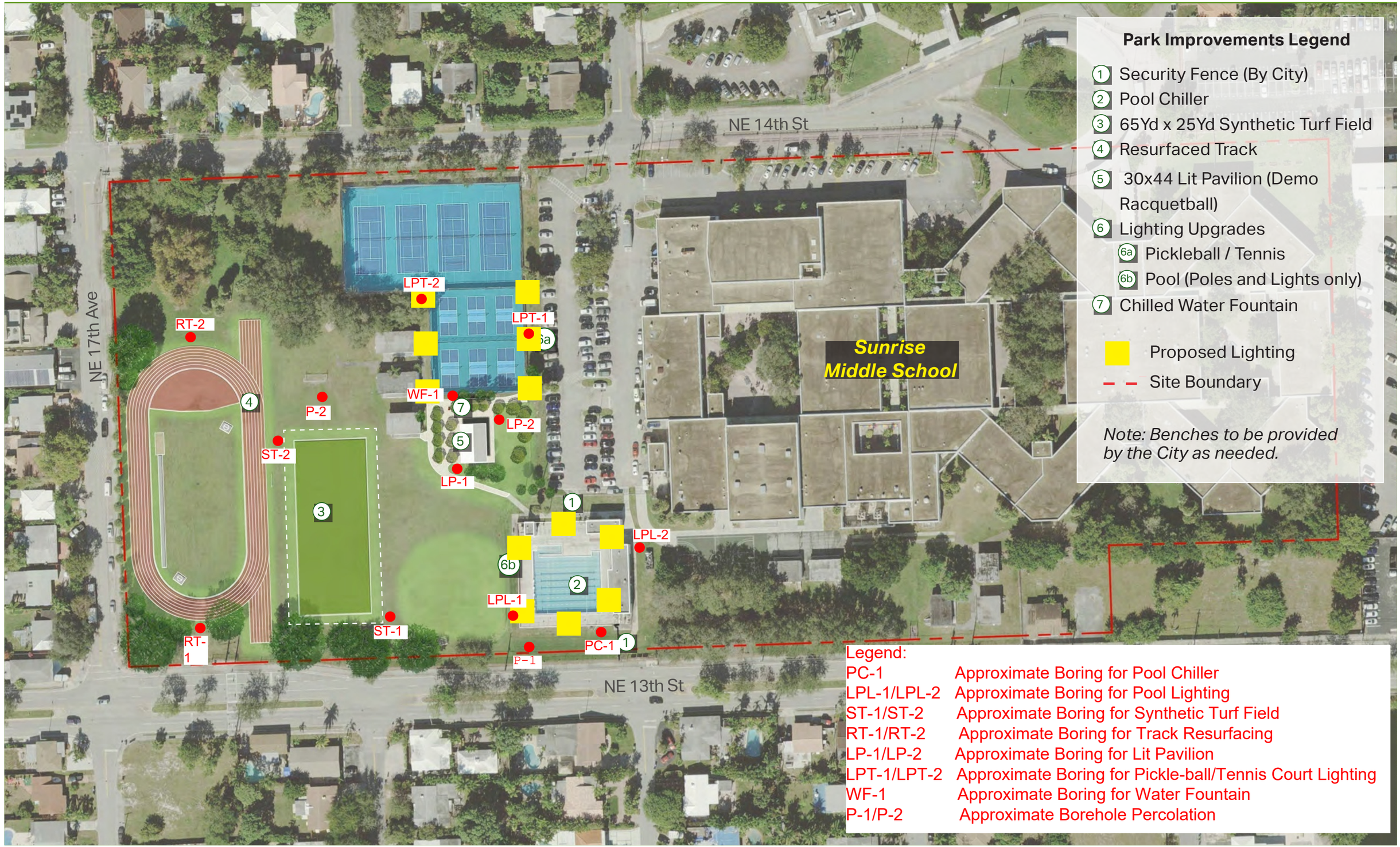
REFERENCE: NRCS WEB SOILS SURVEY, 2024

DATE: SEPTEMBER, 2024

USDA SOILS SURVEY MAP

CITY OF FORT LAUDERDALE PARKS BOND PROGRAM
IMPLEMENTATION PROJECT - PHASE II
SUNRISE MIDDLE SCHOOL PARK IMPROVEMENTS
LOCATED AT 1750 NE 14TH STREET
CITY OF FORT LAUDERDALE, FLORIDA

DRAWN	SCALE	PROJ. No.
AN	N.T.S.	224120
CHECKED	DATE	SHEET 2
OR	SEP., 2024	



Park Improvements Legend

1. Security Fence (By City)
2. Pool Chiller
3. 65Yd x 25Yd Synthetic Turf Field
4. Resurfaced Track
5. 30x44 Lit Pavilion (Demo Racquetball)
6. Lighting Upgrades
   - 6a Pickleball / Tennis
   - 6b Pool (Poles and Lights only)
7. Chilled Water Fountain

Proposed Lighting

Site Boundary

Note: Benches to be provided by the City as needed.

Legend:

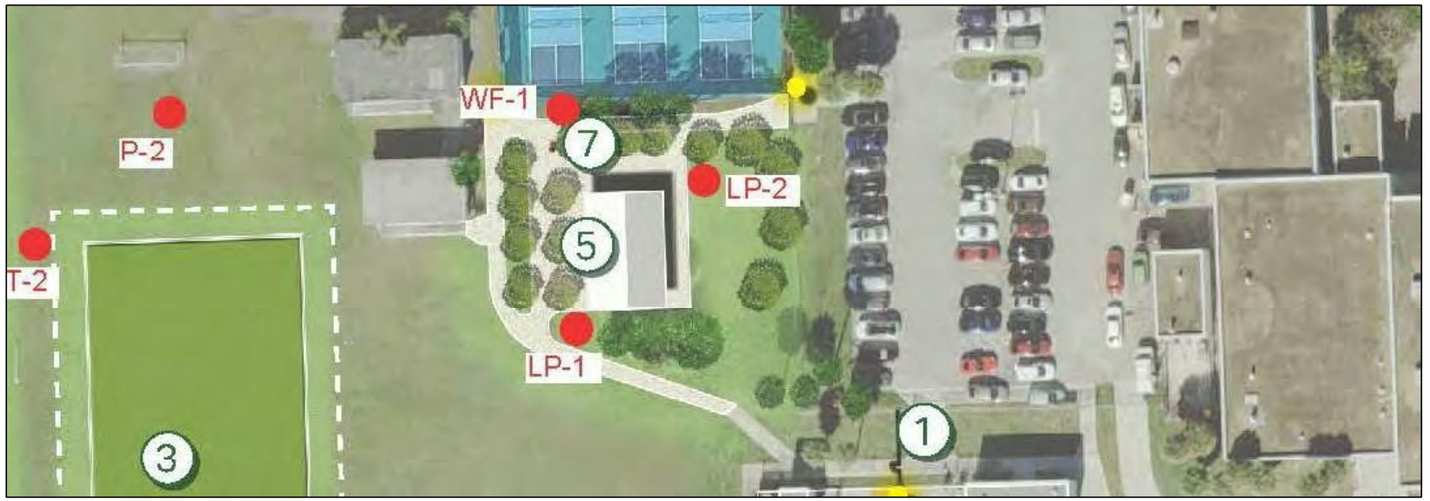
PC-1	Approximate Boring for Pool Chiller
LPL-1/LPL-2	Approximate Boring for Pool Lighting
ST-1/ST-2	Approximate Boring for Synthetic Turf Field
RT-1/RT-2	Approximate Boring for Track Resurfacing
LP-1/LP-2	Approximate Boring for Lit Pavilion
LPT-1/LPT-2	Approximate Boring for Pickle-ball/Tennis Court Lighting
WF-1	Approximate Boring for Water Fountain
P-1/P-2	Approximate Borehole Percolation

Sunrise Middle School - *Concept Plan*

City of Fort Lauderdale Parks Bond Program Implementation Project – Phase II
Sunrise Middle School Park Improvements
Located at 1750 NE 14th Street
City of Fort Lauderdale, Florida
GEOSOL Project No. 224120

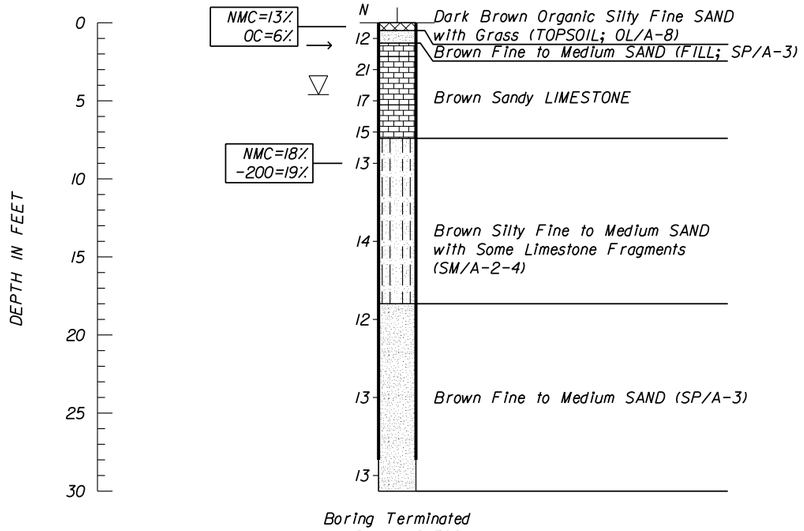
TABLE 1 - SUMMARY OF TEST LOCATIONS

BORING / TEST No.	APPROXIMATE TEST LOCATION (FEET)				GROUND SURFACE ELEVATION (FEET)
	NORTHING	EASTING	LATITUDE	LONGITUDE	
PC-1	658598	943467	26.142905	-80.124245	N/A
LPL-1	658607	943362	26.142930	-80.124565	N/A
LPL-2	658695	943507	26.143171	-80.124119	N/A
ST-1	658624	943214	26.142980	-80.125015	N/A
ST-2	658892	943078	26.143721	-80.125423	N/A
RT-1	658603	943004	26.142928	-80.125654	N/A
RT-2	658933	942991	26.143834	-80.125689	N/A
LP-1	658785	943294	26.143423	-80.124767	N/A
LP-2	658849	943368	26.143597	-80.124541	N/A
LPT-1	658936	943389	26.143836	-80.124474	N/A
LPT-2	658966	943250	26.143921	-80.124897	N/A
WF-1	658848	943271	26.143597	-80.124835	N/A
P-1	658571	943385	26.142833	-80.124495	N/A
P-2	658913	943133	26.143776	-80.125254	N/A



BORING LOCATION PLAN

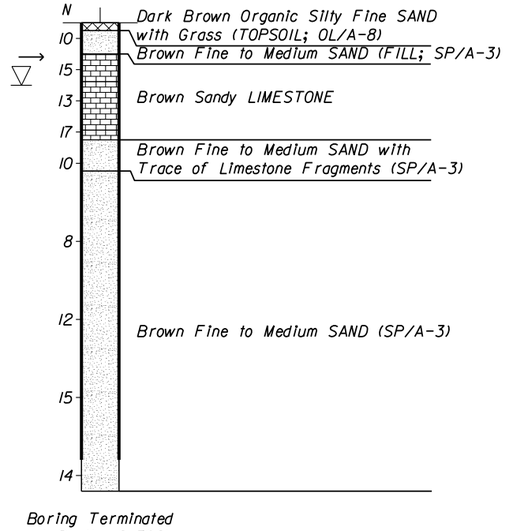
BOR # LP-1
ELEV. N/A
DATE 9/11/2024
DRILLER R.Morales - GEOSOL, Inc.
HAMMER Auto
RIG B-53
LATITUDE 26.143423
LONGITUDE -80.124767
NORTHING 658785
EASTING 943294



Boring Terminated
at Depth of 30ft

Casing Length 28ft

BOR # LP-2
ELEV. N/A
DATE 9/13/2024
DRILLER R.Morales - GEOSOL, Inc.
HAMMER Auto
RIG B-53
LATITUDE 26.143597
LONGITUDE -80.124541
NORTHING 658849
EASTING 943368



Boring Terminated
at Depth of 30ft

Casing Length 28ft

0 2 10
Feet
Vertifcal Scale
Horizontal N.T.S.

LEGEND

- TOPSOIL (OL/A-8)
- SAND (FILL; SP/SP-SM/A-3)
- SILTY SAND (SM/A-2-4)
- SAND (SP/SP-SM/A-3)
- LIMESTONE

NOTES:

1) SPT BORINGS PERFORMED PER ASTM D-1586 WITH A HAMMER WEIGHT OF 140 LBS FALLING 30 INCHES.

▽ WATER TABLE AT TIME OF DRILLING

| | CASING USED

● APPROXIMATE SPT BORING LOCATION

N NUMBERS TO THE LEFT OF BORING INDICATE SPT VALUE FOR 12" PENETRATION (UNLESS OTHERWISE NOTED)

NMC NATURAL MOISTURE CONTENT (%)

-200 PERCENT PASSING #200 SIEVE (%)

OC ORGANIC CONTENT (%)

⟶ PERIODIC TOTAL LOSS OF DRILLING FLUID CIRCULATION (100%)

NOTE FOR EXCAVATION CONSTRUCTION:

1) THE CONTRACTOR IS ADVISED THAT CAVING SOILS AND/OR DENSE TO VERY DENSE SOILS MAY BE ENCOUNTERED DURING THE EXCAVATION.

2) THE CONTRACTOR IS ADVISED THAT A STRONG NATURAL LIMESTONE LAYER MAY BE ENCOUNTERED DURING THE EXCAVATION WHICH MAY REQUIRE SPECIAL EQUIPMENT TO DO SO.

3) THE CONTRACTOR IS ADVISED THAT PERIODIC TOTAL LOSS OF CIRCULATION WAS EXPERIENCED DURING THE PERFORMANCE OF THE BORINGS WHICH MAY MAKE IT DIFFICULT TO MAINTAIN THE FLUID LEVEL IN THE EXCAVATION.

ENVIRONMENTAL CLASSIFICATION:

SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE: MODERATELY AGGRESSIVE

WATER:

pH: 7.5-7.9
CHLORIDE: 100-140 PPM
SULFATE: 0 PPM
RESISTIVITY: 2,300-3,000 OHM-CM

GRANULAR MATERIALS- RELATIVE DENSITY	AUTOMATIC SPT HAMMER (BLOWS PER FOOT)
VERY LOOSE	LESS THAN 3
LOOSE	3-8
MEDIUM DENSE	8-24
DENSE	24-40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTANCY	**AUTOMATIC SPT HAMMER (BLOWS PER FOOT)**
VERY SOFT	LESS THAN 1
SOFT	1-3
FIRM	3-6
STIFF	6-12
VERY STIFF	12-24
HARD	GREATER THAN 24

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

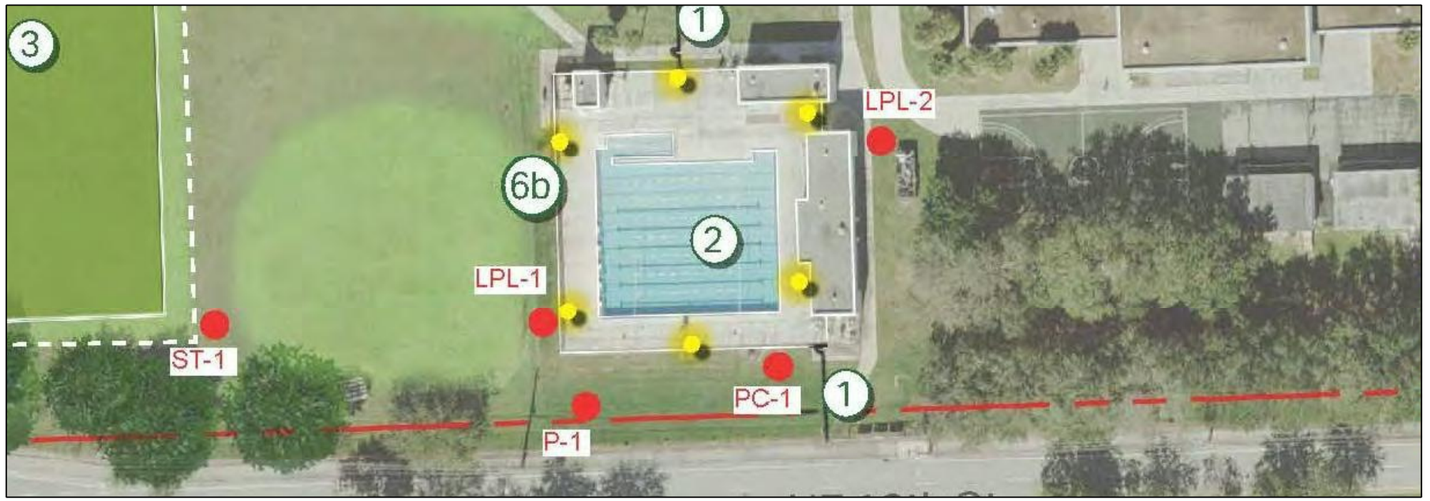
ENGINEER OF RECORD:
GEOSOL, INC.
ORACIO RICCOBONO, P.E.
PE LICENSE No. 49324
5795-A NW 151ST STREET
MIAMI LAKES, FL 33014

CITY OF FORT LAUDERDALE PARKS BOND PROGRAM
IMPLEMENTATION PROJECT - PHASE II
SUNRISE MIDDLE SCHOOL PARK IMPROVEMENTS
LOCATED AT 1750 NE 14TH STREET
CITY OF FORT LAUDERDALE, FLORIDA

REPORT OF CORE BORINGS

SHEET NO. 4

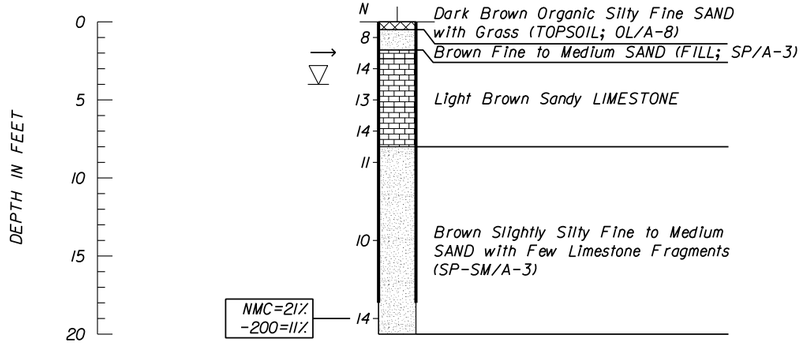
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BORING LOCATION PLAN

N

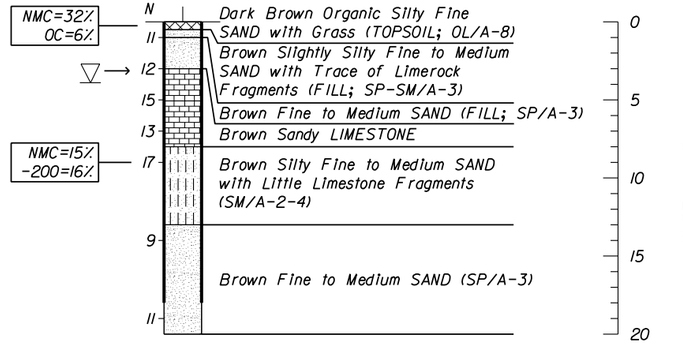
BOR # LPL-1
ELEV. N/A
DATE 9/12/2024
DRILLER R.Morales - GEOSOL, Inc.
HAMMER Auto
RIG B-53
LATITUDE 26.14293
LONGITUDE -80.124565
NORTHING 658607
EASTING 943362



Boring Terminated at Depth of 20ft

Casing Length 18ft

BOR # LPL-2
ELEV. N/A
DATE 9/13/2024
DRILLER R.Morales - GEOSOL, Inc.
HAMMER Auto
RIG B-53
LATITUDE 26.143171
LONGITUDE -80.124119
NORTHING 658695
EASTING 943507



Boring Terminated at Depth of 20ft

Casing Length 18ft

0 2 10
Feet
Vertifcal Scale
Horizontal N.T.S.

LEGEND

- TOPSOIL (OL/A-8)
- SAND (FILL; SP/SP-SM/A-3)
- SILTY SAND (SM/A-2-4)
- SAND (SP/SP-SM/A-3)
- LIMESTONE

NOTES:

1) SPT BORINGS PERFORMED PER ASTM D-1586 WITH A HAMMER WEIGHT OF 140 LBS FALLING 30 INCHES.

▽ WATER TABLE AT TIME OF DRILLING

CASING USED

● APPROXIMATE SPT BORING LOCATION

N NUMBERS TO THE LEFT OF BORING INDICATE SPT VALUE FOR 12" PENETRATION (UNLESS OTHERWISE NOTED)

NMC NATURAL MOISTURE CONTENT (%)

-200 PERCENT PASSING #200 SIEVE (%)

OC ORGANIC CONTENT (%)

⟶ PERIODIC TOTAL LOSS OF DRILLING FLUID CIRCULATION (100%)

NOTE FOR EXCAVATION CONSTRUCTION:

1) THE CONTRACTOR IS ADVISED THAT CAVING SOILS AND/OR DENSE TO VERY DENSE SOILS MAY BE ENCOUNTERED DURING THE EXCAVATION.

2) THE CONTRACTOR IS ADVISED THAT A STRONG NATURAL LIMESTONE LAYER MAY BE ENCOUNTERED DURING THE EXCAVATION WHICH MAY REQUIRE SPECIAL EQUIPMENT TO DO SO.

3) THE CONTRACTOR IS ADVISED THAT PERIODIC TOTAL LOSS OF CIRCULATION WAS EXPERIENCED DURING THE PERFORMANCE OF THE BORINGS WHICH MAY MAKE IT DIFFICULT TO MAINTAIN THE FLUID LEVEL IN THE EXCAVATION.

ENVIRONMENTAL CLASSIFICATION:

SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE: MODERATELY AGGRESSIVE

WATER:

pH: 7.5-7.9
CHLORIDE: 100-140 PPM
SULFATE: 0 PPM
RESISTIVITY: 2,300-3,000 OHM-CM

GRANULAR MATERIALS- RELATIVE DENSITY	AUTOMATIC SPT HAMMER (BLOWS PER FOOT)
VERY LOOSE	LESS THAN 3
LOOSE	3-8
MEDIUM DENSE	8-24
DENSE	24-40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTANCY	**AUTOMATIC SPT HAMMER (BLOWS PER FOOT)**
VERY SOFT	LESS THAN 1
SOFT	1-3
FIRM	3-6
STIFF	6-12
VERY STIFF	12-24
HARD	GREATER THAN 24

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD:
GEOSOL, INC.
ORACIO RICCOBONO, P.E.
PE LICENSE No. 49324
5795-A NW 151ST STREET
MIAMI LAKES, FL 33014

CITY OF FORT LAUDERDALE PARKS BOND PROGRAM
IMPLEMENTATION PROJECT - PHASE II
SUNRISE MIDDLE SCHOOL PARK IMPROVEMENTS
LOCATED AT 1750 NE 14TH STREET
CITY OF FORT LAUDERDALE, FLORIDA

REPORT OF CORE BORINGS

SHEET NO. 5

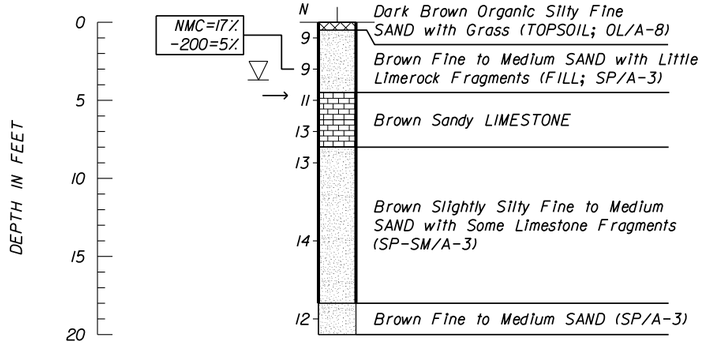
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BORING LOCATION PLAN

N

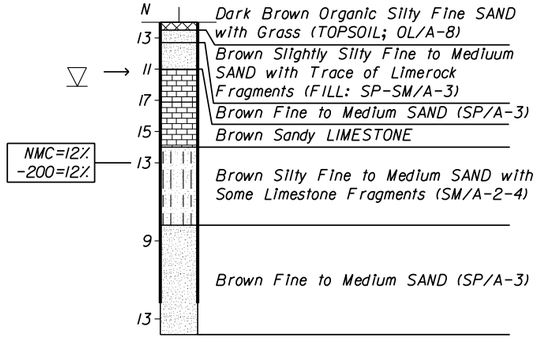
BOR # LPT-1
ELEV. N/A
DATE 9/10/2024
DRILLER R.Morales - GEOSOL, Inc.
HAMMER Auto
RIG B-53
LATITUDE 26.143836
LONGITUDE -80.124474
NORTHING 658936
EASTING 943389



Boring Terminated at Depth of 20ft

Casing Length 18ft

BOR # LPT-2
ELEV. N/A
DATE 9/13/2024
DRILLER R.Morales - GEOSOL, Inc.
HAMMER Auto
RIG B-53
LATITUDE 26.143921
LONGITUDE -80.124897
NORTHING 658966
EASTING 943250



Boring Terminated at Depth of 20ft

Casing Length 18ft

LEGEND

- TOPSOIL (OL/A-8)
- SAND (FILL; SP/SP-SM/A-3)
- SILTY SAND (SM/A-2-4)
- SAND (SP/SP-SM/A-3)
- LIMESTONE

NOTES:

1) SPT BORINGS PERFORMED PER ASTM D-1586 WITH A HAMMER WEIGHT OF 140 LBS FALLING 30 INCHES.

- WATER TABLE AT TIME OF DRILLING
- CASING USED
- APPROXIMATE SPT BORING LOCATION
- N — NUMBERS TO THE LEFT OF BORING INDICATE SPT VALUE FOR 12" PENETRATION (UNLESS OTHERWISE NOTED)
- NMC — NATURAL MOISTURE CONTENT (%)
- -200 — PERCENT PASSING #200 SIEVE (%)
- OC — ORGANIC CONTENT (%)
- ⟶ — PERIODIC TOTAL LOSS OF DRILLING FLUID CIRCULATION (100%)

NOTE FOR EXCAVATION CONSTRUCTION:

1) THE CONTRACTOR IS ADVISED THAT CAVING SOILS AND/OR DENSE TO VERY DENSE SOILS MAY BE ENCOUNTERED DURING THE EXCAVATION.

2) THE CONTRACTOR IS ADVISED THAT A STRONG NATURAL LIMESTONE LAYER MAY BE ENCOUNTERED DURING THE EXCAVATION WHICH MAY REQUIRE SPECIAL EQUIPMENT TO DO SO.

3) THE CONTRACTOR IS ADVISED THAT PERIODIC TOTAL LOSS OF CIRCULATION WAS EXPERIENCED DURING THE PERFORMANCE OF THE BORINGS WHICH MAY MAKE IT DIFFICULT TO MAINTAIN THE FLUID LEVEL IN THE EXCAVATION.

ENVIRONMENTAL CLASSIFICATION:

SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE: MODERATELY AGGRESSIVE

WATER:

pH: 7.5-7.9
CHLORIDE: 100-140 PPM
SULFATE: 0 PPM
RESISTIVITY: 2,300-3,000 OHM-CM

GRANULAR MATERIALS- RELATIVE DENSITY	AUTOMATIC SPT HAMMER (BLOWS PER FOOT)
VERY LOOSE	LESS THAN 3
LOOSE	3-8
MEDIUM DENSE	8-24
DENSE	24-40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTANCY	AUTOMATIC SPT HAMMER (BLOWS PER FOOT)
VERY SOFT	LESS THAN 1
SOFT	1-3
FIRM	3-6
STIFF	6-12
VERY STIFF	12-24
HARD	GREATER THAN 24

0 2 10
Feet
Vertifcal Scale
Horizontal N.T.S.

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD:
GEOSOL, INC.
ORACIO RICCOBONO, P.E.
PE LICENSE No. 49324
5795-A NW 151ST STREET
MIAMI LAKES, FL 33014

CITY OF FORT LAUDERDALE PARKS BOND PROGRAM
IMPLEMENTATION PROJECT - PHASE II
SUNRISE MIDDLE SCHOOL PARK IMPROVEMENTS
LOCATED AT 1750 NE 14TH STREET
CITY OF FORT LAUDERDALE, FLORIDA

REPORT OF CORE BORINGS

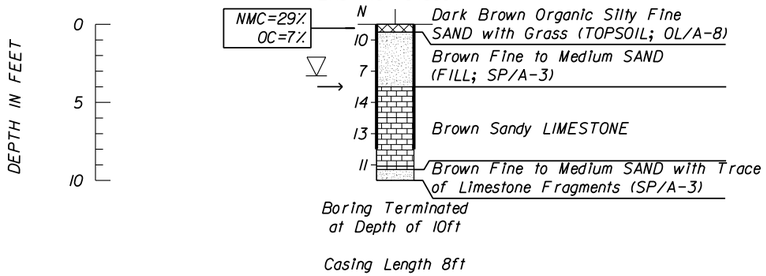
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BORING LOCATION PLAN

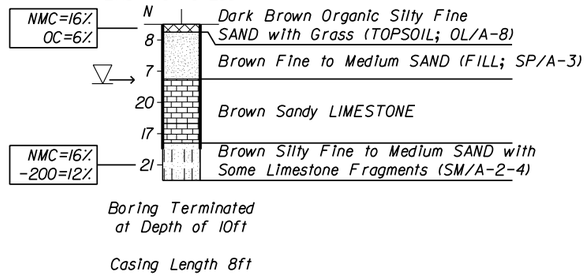
BOR # RT-1
ELEV. N/A
DATE 9/16/2024
DRILLER R.Morales - GEOSOL, Inc.
HAMMER Auto
RIG B-53
LATITUDE 26.142928
LONGITUDE -80.125654
NORTHING 658603
EASTING 943004



Boring Terminated at Depth of 10ft

Casing Length 8ft

BOR # RT-2
ELEV. N/A
DATE 9/16/2024
DRILLER R.Morales - GEOSOL, Inc.
HAMMER Auto
RIG B-53
LATITUDE 26.143834
LONGITUDE -80.125689
NORTHING 658933
EASTING 942991



Boring Terminated at Depth of 10ft

Casing Length 8ft

LEGEND

- TOPSOIL (OL/A-8)
- SAND (FILL; SP/SP-SM/A-3)
- SILTY SAND (SM/A-2-4)
- SAND (SP/SP-SM/A-3)
- LIMESTONE

NOTES:

1) SPT BORINGS PERFORMED PER ASTM D-1586 WITH A HAMMER WEIGHT OF 140 LBS FALLING 30 INCHES.

▽ WATER TABLE AT TIME OF DRILLING

CASING USED

● APPROXIMATE SPT BORING LOCATION

N NUMBERS TO THE LEFT OF BORING INDICATE SPT VALUE FOR 12" PENETRATION (UNLESS OTHERWISE NOTED)

NMC NATURAL MOISTURE CONTENT (%)

-200 PERCENT PASSING #200 SIEVE (%)

OC ORGANIC CONTENT (%)

⟶ PERIODIC TOTAL LOSS OF DRILLING FLUID CIRCULATION (100%)

NOTE FOR EXCAVATION CONSTRUCTION:

1) THE CONTRACTOR IS ADVISED THAT CAVING SOILS AND/OR DENSE TO VERY DENSE SOILS MAY BE ENCOUNTERED DURING THE EXCAVATION.

2) THE CONTRACTOR IS ADVISED THAT A STRONG NATURAL LIMESTONE LAYER MAY BE ENCOUNTERED DURING THE EXCAVATION WHICH MAY REQUIRE SPECIAL EQUIPMENT TO DO SO.

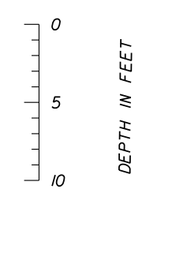
3) THE CONTRACTOR IS ADVISED THAT PERIODIC TOTAL LOSS OF CIRCULATION WAS EXPERIENCED DURING THE PERFORMANCE OF THE BORINGS WHICH MAY MAKE IT DIFFICULT TO MAINTAIN THE FLUID LEVEL IN THE EXCAVATION.

ENVIRONMENTAL CLASSIFICATION:

SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE: MODERATELY AGGRESSIVE

WATER:

pH: 7.5-7.9
CHLORIDE: 100-140 PPM
SULFATE: 0 PPM
RESISTIVITY: 2,300-3,000 OHM-CM





GRANULAR MATERIALS- RELATIVE DENSITY	AUTOMATIC SPT HAMMER (BLOWS PER FOOT)
VERY LOOSE	LESS THAN 3
LOOSE	3-8
MEDIUM DENSE	8-24
DENSE	24-40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTANCY	**AUTOMATIC SPT HAMMER (BLOWS PER FOOT)**
VERY SOFT	LESS THAN 1
SOFT	1-3
FIRM	3-6
STIFF	6-12
VERY STIFF	12-24
HARD	GREATER THAN 24

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD:
GEOSOL, INC.
ORACIO RICCOBONO, P.E.
PE LICENSE No. 49324
5795-A NW 151ST STREET
MIAMI LAKES, FL 33014

CITY OF FORT LAUDERDALE PARKS BOND PROGRAM
IMPLEMENTATION PROJECT - PHASE II
SUNRISE MIDDLE SCHOOL PARK IMPROVEMENTS
LOCATED AT 1750 NE 14TH STREET
CITY OF FORT LAUDERDALE, FLORIDA

REPORT OF CORE BORINGS

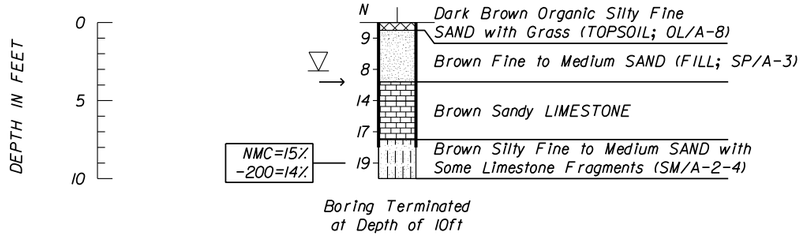
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BORING LOCATION PLAN

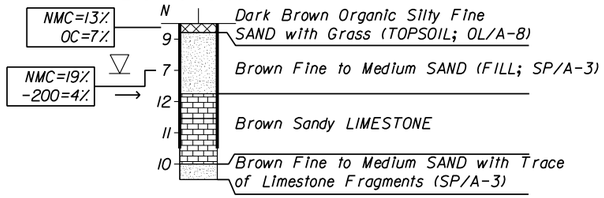
BOR # ST-1
ELEV. N/A
DATE 9/16/2024
DRILLER R.Morales - GEOSOL, Inc.
HAMMER Auto
RIG B-53
LATITUDE 26.14298
LONGITUDE -80.125015
NORTHING 658624
EASTING 943214



Boring Terminated at Depth of 10ft

Casing Length 8ft

BOR # ST-2
ELEV. N/A
DATE 9/16/2024
DRILLER R.Morales - GEOSOL, Inc.
HAMMER Auto
RIG B-53
LATITUDE 26.143721
LONGITUDE -80.125423
NORTHING 658892
EASTING 943078



Boring Terminated at Depth of 10ft

Casing Length 8ft



0 2 10
Feet
Vertifcal Scale
Horizontal N.T.S.

LEGEND

- TOPSOIL (OL/A-8)
- SAND (FILL; SP/SP-SM/A-3)
- SILTY SAND (SM/A-2-4)
- SAND (SP/SP-SM/A-3)
- LIMESTONE

NOTES:

1) SPT BORINGS PERFORMED PER ASTM D-1586 WITH A HAMMER WEIGHT OF 140 LBS FALLING 30 INCHES.

▽ WATER TABLE AT TIME OF DRILLING

CASING USED

● APPROXIMATE SPT BORING LOCATION

N NUMBERS TO THE LEFT OF BORING INDICATE SPT VALUE FOR 12" PENETRATION (UNLESS OTHERWISE NOTED)

NMC NATURAL MOISTURE CONTENT (%)

-200 PERCENT PASSING #200 SIEVE (%)

OC ORGANIC CONTENT (%)

⟶ PERIODIC TOTAL LOSS OF DRILLING FLUID CIRCULATION (100%)

NOTE FOR EXCAVATION CONSTRUCTION:

1) THE CONTRACTOR IS ADVISED THAT CAVING SOILS AND/OR DENSE TO VERY DENSE SOILS MAY BE ENCOUNTERED DURING THE EXCAVATION.

2) THE CONTRACTOR IS ADVISED THAT A STRONG NATURAL LIMESTONE LAYER MAY BE ENCOUNTERED DURING THE EXCAVATION WHICH MAY REQUIRE SPECIAL EQUIPMENT TO DO SO.

3) THE CONTRACTOR IS ADVISED THAT PERIODIC TOTAL LOSS OF CIRCULATION WAS EXPERIENCED DURING THE PERFORMANCE OF THE BORINGS WHICH MAY MAKE IT DIFFICULT TO MAINTAIN THE FLUID LEVEL IN THE EXCAVATION.

ENVIRONMENTAL CLASSIFICATION:

SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE: MODERATELY AGGRESSIVE

WATER:

pH:	7.5-7.9
CHLORIDE:	100-140 PPM
SULFATE:	0 PPM
RESISTIVITY:	2,300-3,000 OHM-CM

GRANULAR MATERIALS- RELATIVE DENSITY	AUTOMATIC SPT HAMMER (BLOWS PER FOOT)
VERY LOOSE	LESS THAN 3
LOOSE	3-8
MEDIUM DENSE	8-24
DENSE	24-40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTANCY	**AUTOMATIC SPT HAMMER (BLOWS PER FOOT)**
VERY SOFT	LESS THAN 1
SOFT	1-3
FIRM	3-6
STIFF	6-12
VERY STIFF	12-24
HARD	GREATER THAN 24

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD:
GEOSOL, INC.
ORACIO RICCOBONO, P.E.
PE LICENSE No. 49324
5795-A NW 151ST STREET
MIAMI LAKES, FL 33014

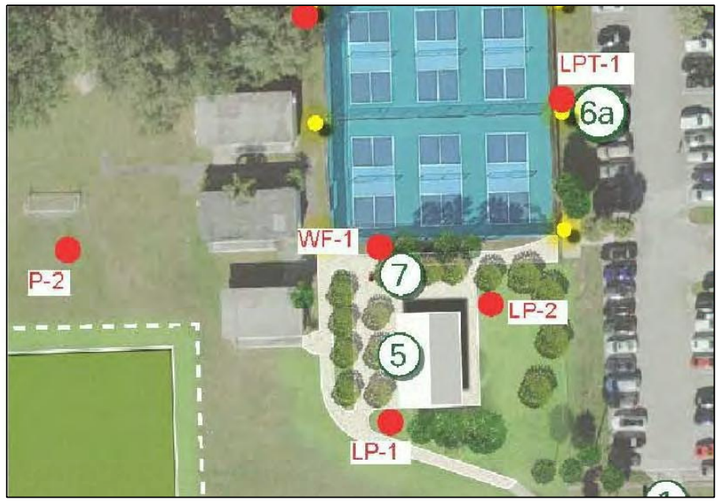
CITY OF FORT LAUDERDALE PARKS BOND PROGRAM
IMPLEMENTATION PROJECT - PHASE II
SUNRISE MIDDLE SCHOOL PARK IMPROVEMENTS
LOCATED AT 1750 NE 14TH STREET
CITY OF FORT LAUDERDALE, FLORIDA

REPORT OF CORE BORINGS

SHEET NO. 8

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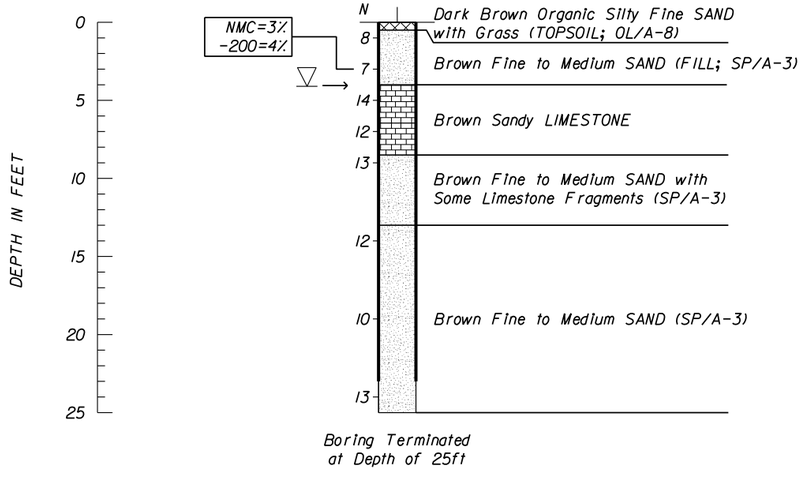




BORING LOCATION PLAN

N

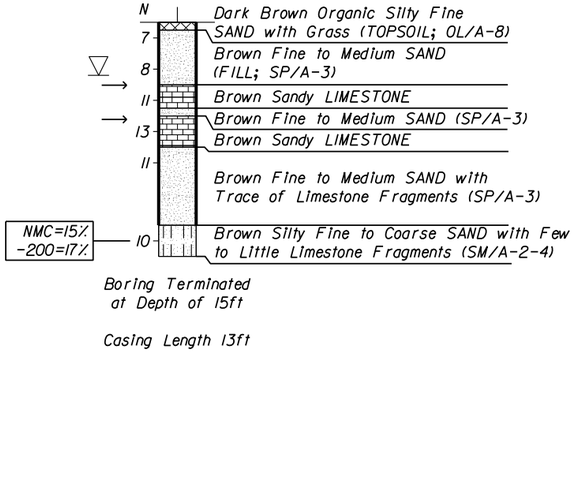
BOR # PC-1
ELEV. N/A
DATE 9/16/2024
DRILLER R.Morales
HAMMER B-53
RIG Auto
LATITUDE 26.142905
LONGITUDE -80.124245
NORTHING 658598
EASTING 943467



Boring Terminated at Depth of 25ft

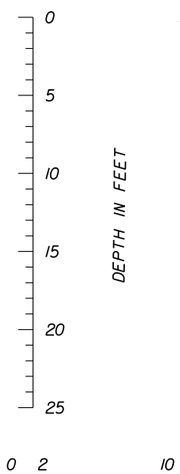
Casing Length 23ft

BOR # WF-1
ELEV. N/A
DATE 9/16/2024
DRILLER R.Morales
HAMMER B-53
RIG Auto
LATITUDE 26.143597
LONGITUDE -80.124835
NORTHING 658848
EASTING 943271



Boring Terminated at Depth of 15ft

Casing Length 13ft



0 2 10
Feet
Vertifcal Scale
Horizontal N.T.S.

LEGEND

- TOPSOIL (OL/A-8)
- SAND (FILL; SP/SP-SM/A-3)
- SILTY SAND (SM/A-2-4)
- SAND (SP/SP-SM/A-3)
- LIMESTONE

NOTES:

1) SPT BORINGS PERFORMED PER ASTM D-1586 WITH A HAMMER WEIGHT OF 140 LBS FALLING 30 INCHES.

▽ WATER TABLE AT TIME OF DRILLING

CASING USED

● APPROXIMATE SPT BORING LOCATION

N NUMBERS TO THE LEFT OF BORING INDICATE SPT VALUE FOR 12" PENETRATION (UNLESS OTHERWISE NOTED)

NMC NATURAL MOISTURE CONTENT (%)

-200 PERCENT PASSING #200 SIEVE (%)

OC ORGANIC CONTENT (%)

⟶ PERIODIC TOTAL LOSS OF DRILLING FLUID CIRCULATION (100%)

NOTE FOR EXCAVATION CONSTRUCTION:

1) THE CONTRACTOR IS ADVISED THAT CAVING SOILS AND/OR DENSE TO VERY DENSE SOILS MAY BE ENCOUNTERED DURING THE EXCAVATION.

2) THE CONTRACTOR IS ADVISED THAT A STRONG NATURAL LIMESTONE LAYER MAY BE ENCOUNTERED DURING THE EXCAVATION WHICH MAY REQUIRE SPECIAL EQUIPMENT TO DO SO.

3) THE CONTRACTOR IS ADVISED THAT PERIODIC TOTAL LOSS OF CIRCULATION WAS EXPERIENCED DURING THE PERFORMANCE OF THE BORINGS WHICH MAY MAKE IT DIFFICULT TO MAINTAIN THE FLUID LEVEL IN THE EXCAVATION.

ENVIRONMENTAL CLASSIFICATION:

SUPERSTRUCTURE: SLIGHTLY AGGRESSIVE
SUBSTRUCTURE: MODERATELY AGGRESSIVE

WATER:

pH: 7.5-7.9
CHLORIDE: 100-140 PPM
SULFATE: 0 PPM
RESISTIVITY: 2,300-3,000 OHM-CM

GRANULAR MATERIALS- RELATIVE DENSITY	AUTOMATIC SPT HAMMER (BLOWS PER FOOT)
VERY LOOSE	LESS THAN 3
LOOSE	3-8
MEDIUM DENSE	8-24
DENSE	24-40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTANCY	**AUTOMATIC SPT HAMMER (BLOWS PER FOOT)**
VERY SOFT	LESS THAN 1
SOFT	1-3
FIRM	3-6
STIFF	6-12
VERY STIFF	12-24
HARD	GREATER THAN 24

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD:
GEOSOL, INC.
ORACIO RICCOBONO, P.E.
PE LICENSE No. 49324
5795-A NW 151ST STREET
MIAMI LAKES, FL 33014

CITY OF FORT LAUDERDALE PARKS BOND PROGRAM
IMPLEMENTATION PROJECT - PHASE II
SUNRISE MIDDLE SCHOOL PARK IMPROVEMENTS
LOCATED AT 1750 NE 14TH STREET
CITY OF FORT LAUDERDALE, FLORIDA

REPORT OF CORE BORINGS

SHEET NO. 9

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APPENDIX "B"

Table 2 – Summary of Laboratory Test Results
Table 3 – Summary of Environmental Classification Test Results
Moisture Content Test Results
Percent Passing the No. 200 Sieve Test Results
Grain-Size Analysis Results and Curves
Organic Content Test Results
Environmental Classification Test Results

TABLE 2 - SUMMARY OF LABORATORY TEST RESULTS
Sunrise Middle School Park Improvements - AECOM
Broward County, Florida
GEOSOL Project No.: 224120

BORING NUMBER	SAMPLE NUMBER	AASHTO Group	USCS SYMBOL	Sample Depth (FEET)	Sieve Analysis (Percent Passing)									Organic Content (%)	Natural Moisture Content (%)
					1"	3/4"	3/8"	#4	#10	#40	#60	#100	#200		
LPT-1	2	A-3	SP	2.0 - 4.0	100	95	88	84	82	70	45	11	5	-	17
LP-1	1	A-8	OL	0.0 - 0.5	-	-	-	-	-	-	-	-	-	6	13
LP-1	5	A-2-4	SM	8.0 - 10.0	92	88	72	60	53	45	31	21	19	-	18
LPL-1	7	A-3	SP-SM	18.0 - 20.0	100	100	98	94	89	75	50	22	11	-	21
RT-2	1	A-8	OL	0.0 - 0.5	-	-	-	-	-	-	-	-	-	6	16
LPL-2	1	A-8	OL	0.0 - 0.5	-	-	-	-	-	-	-	-	-	6	32
ST-2	1	A-8	OL	0.0 - 0.5	-	-	-	-	-	-	-	-	-	7	13
RT-1	1	A-8	OL	0.0 - 0.5	-	-	-	-	-	-	-	-	-	7	29
LPL-2	5	A-2-4	SM	8.0 - 10.0	100	89	86	77	67	55	46	28	16	-	15
RT-2	5	A-2-4	SM	8.0 - 10.0	98	91	81	68	62	52	35	17	12	-	16
ST-2	2	A-3	SP	2.0 - 4.0	100	100	100	100	100	84	49	10	4	-	19
LPT-2	5	A-2-4	SM	8.0 - 10.0	96	95	78	65	55	46	33	17	12	-	12
WF-1	6	A-2-4	SM	13.0 - 15.0	100	100	99	88	78	66	57	31	17	-	15
PC-1	2	A-3	SP	2.0 - 4.0	100	100	100	100	100	85	48	8	4	-	3
ST-1	5	A-2-4	SM	8.0 - 10.0	100	95	78	64	54	45	31	19	14	-	15

TABLE 3 - SUMMARY OF ENVIRONMENTAL CLASSIFICATION TEST RESULTS
Sunrise Middle School Park Improvements - AECOM
Broward County, Florida
GEOSOL Project No.: 224120

Sample Location	Sample Type	Depth (ft)	pH	Resistivity (ohm-cm)	Chloride (ppm)	Sulfate (ppm)	FDOT ENVIRONMENTAL CLASSIFICATION	
							Steel	Concrete
LP-1	Water	4.6	7.9	3,000	100	0	MA	MA
PC-1	Water	4.1	7.5	2,300	140	0	MA	MA

NOTES: (1) The following FDOT laboratory test methods were utilized.
4500H+ (pH)
EPA 120.1 (Equivalent to FM5-551: Resistivity)
EPA-300 (Equivalent to FM5-552: Chlorides)
EPA-300 (Equivalent to FM5-553: Sulfates)
(2) SA: SLIGHTLY AGGRESSIVE
(3) MA: MODERATELY AGGRESSIVE
(4) EA: EXTREMELY AGGRESSIVE

FDOT Criteria for Substructure Environmental Classification (FDOT *Structures Design Guidelines*)

Classification	Environmental Condition	Units	Steel		Concrete	
			Water	Soil	Water	Soil
Extremely Aggressive (If any of these conditions exist)	pH		< 6.0		< 5.0	
	Cl	ppm	> 2000		> 2000	
	SO_4	ppm	N.A.		> 1500	> 2000
	Resistivity	Ohm-cm	< 1000		< 500	
Slightly Aggressive (If all of these conditions exist)	pH		> 7.0		> 6.0	
	Cl	ppm	< 500		< 500	
	SO_4	ppm	N.A.		< 150	< 1000
	Resistivity	Ohm-cm	> 5000		> 3000	
Moderately Aggressive	This classification must be used at all sites not meeting requirements for either slightly aggressive or extremely aggressive environments.					
pH = acidity ($-\log_{10}H^+$; potential of Hydrogen), Cl = chloride content, SO_4 = Sulfate content.						

MOISTURE CONTENT TEST RESULTS (ASTM D-2216)

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
LOCATION: Broward County, Florida
PROJECT No.: 224120

Boring No.	LPT-1	LP-1	LP-1	LPL-1	RT-2
Sample No.	2	1	5	7	1
Sample Depth (Feet)	2-4	0-0.5	8-10	18-20	0-0.5
Tare No.	19	N-2	11	232	4I
Tare plus wet soil (grams)	458.0	75.3	475.4	293.5	84.1
Tare plus dry soil (grams)	394.3	67.5	405.8	243.4	73.9
Water Ww (grams)	63.7	7.8	69.6	50.1	10.2
Tare (grams)	8.8	8.6	8.6	8.9	8.6
Dry soil Ws (grams)	385.5	58.9	397.2	234.5	65.3
Water Content w (%)	16.5	13.2	17.5	21.4	15.6

Boring No.	LPL-2	ST-2	RT-1	LPL-2	RT-2
Sample No.	1	1	1	5	5
Sample Depth (Feet)	0-0.5	0-0.5	0-0.5	8-10	8-10
Tare No.	B-3	4N	B-5	N-2	C-1
Tare plus wet soil (grams)	52.1	54.6	59.1	344.7	495.3
Tare plus dry soil (grams)	41.5	49.5	47.8	300.5	428.6
Water Ww (grams)	10.6	5.1	11.3	44.2	66.7
Tare (grams)	8.6	8.7	8.7	8.7	8.8
Dry soil Ws (grams)	32.9	40.8	39.1	291.8	419.8
Water Content w (%)	32.2	12.5	28.9	15.1	15.9

Boring No.	ST-2	LPT-2	WF-1	PC-1	ST-1
Sample No.	2	5	6	2	5
Sample Depth (Feet)	2-4	8-10	13-15	2-4	8-10
Tare No.	18	54	4B	103	19
Tare plus wet soil (grams)	299.3	374.3	188.1	418.7	518.9
Tare plus dry soil (grams)	252.2	335.8	164.2	405.6	452.0
Water Ww (grams)	47.1	38.5	23.9	13.1	66.9
Tare (grams)	8.7	8.8	8.7	8.9	8.7
Dry soil Ws (grams)	243.5	327.0	155.5	396.7	443.3
Water Content w (%)	19.3	11.8	15.4	3.3	15.1

MATERIAL PASSING THE # 200 SIEVE TEST RESULTS (AASHTO T-11)

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
LOCATION: Broward County, Florida
PROJECT No.: 224120

Boring No.	LPT-1	LP-1	LPL-1	LPL-2	RT-2
Sample No.	2	5	7	5	5
Sample Depth (Feet)	2-4	8-10	18-20	8-10	8-10
Original Dry Weight of Soil (grams)	385.5	397.2	234.5	291.8	419.8
Weight of Soil After Washing (grams)	367.3	323.3	207.6	243.8	368.2
Weight of Soil Passing 200 Sieve (grams)	18.2	73.9	26.9	48.0	51.6
Percent of Soil Passing 200 Sieve (%)	4.7	18.6	11.5	16.4	12.3

Boring No.	ST-2	LPT-2	WF-1	PC-1	ST-1
Sample No.	2	5	6	2	5
Sample Depth (Feet)	2-4	8-10	13-15	2-4	8-10
Original Dry Weight of Soil (grams)	243.5	327.0	155.5	396.7	443.3
Weight of Soil After Washing (grams)	233.5	286.5	129.1	382.5	379.5
Weight of Soil Passing 200 Sieve (grams)	10.0	40.5	26.4	14.2	63.8
Percent of Soil Passing 200 Sieve (%)	4.1	12.4	17.0	3.6	14.4

GRAIN SIZE DATA SHEET

DATE: 9/11/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida

Boring No. LPT-1
Sample No. 2
Depth (feet) 2-4

SOIL DESCRIPTION: Brown Fine to Medium SAND with Little of Limerock Fragments (FILL; SP)

Tare #	Dry Soil Wt.
19	385.5

Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	0.0	0.0	100.0	100.0	0.0
19	19mm 3/4"	19.5	5.1	94.9	94.9	19.5
9.5	9.5mm 3/8"	46.7	12.1	87.9	87.9	27.2
4.75	4.75mm #4	63.0	16.3	83.7	83.7	16.3
2.36	2 mm #10	70.6	18.3	81.7	81.7	7.6
0.6	425um #40	115.9	30.1	69.9	69.9	45.3
0.3	250um #60	213.7	55.4	44.6	44.6	97.8
0.15	150um #100	343.9	89.2	10.8	10.8	130.2
0.075	75um #200	367.3	95.3	4.7	4.7	23.4
PAN	-	385.5	100.0	0.0	0.0	18.2

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

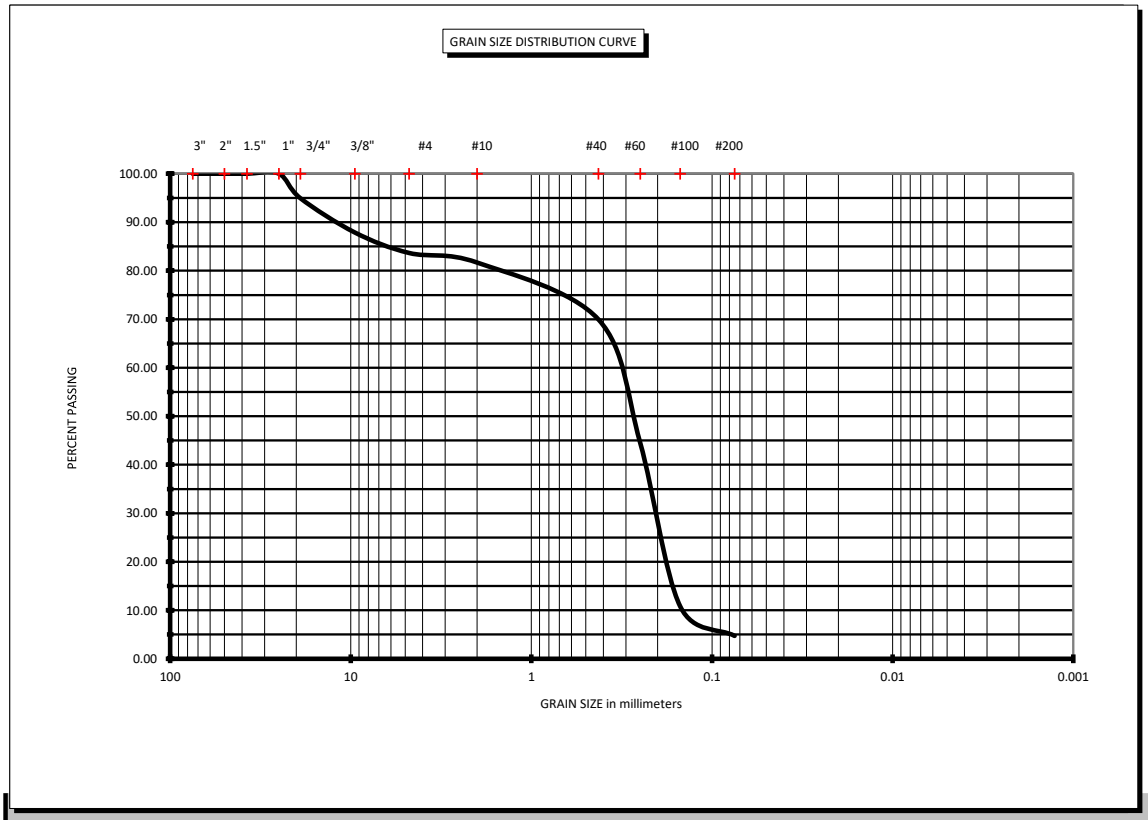
Cu = D60 / D10
Cc = (D30)^2 / (D10 x D60)
1000 um = 1 mm

tested by: SAVERIO R. computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 9/11/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # LPT-1 **SAMPLE #** 2 **Depth (feet)** 2-4

SOIL DESCRIPTION: Brown Fine to Medium SAND with Little of Limerock Fragments (FILL; SP)

Natural Moisture Content: 16.5%

GRAIN SIZE DATA SHEET

DATE: 9/12/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida

Boring No. LP-1
Sample No. 5
Depth (feet) 8-10

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Some Limestone Fragments (SM)

Tare #	Dry Soil Wt.
11	397.2

Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	33.3	8.4	91.6	91.6	33.3
19	19mm 3/4"	48.4	12.2	87.8	87.8	15.1
9.5	9.5mm 3/8"	112.2	28.2	71.8	71.8	63.8
4.75	4.75mm #4	159.8	40.2	59.8	59.8	47.6
2.36	2 mm #10	186.2	46.9	53.1	53.1	26.4
0.6	425um #40	218.3	55.0	45.0	45.0	32.1
0.3	250um #60	273.6	68.9	31.1	31.1	55.3
0.15	150um #100	312.2	78.6	21.4	21.4	38.6
0.075	75um #200	323.3	81.4	18.6	18.6	11.1
PAN	-	397.2	100.0	0.0	0.0	73.9

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

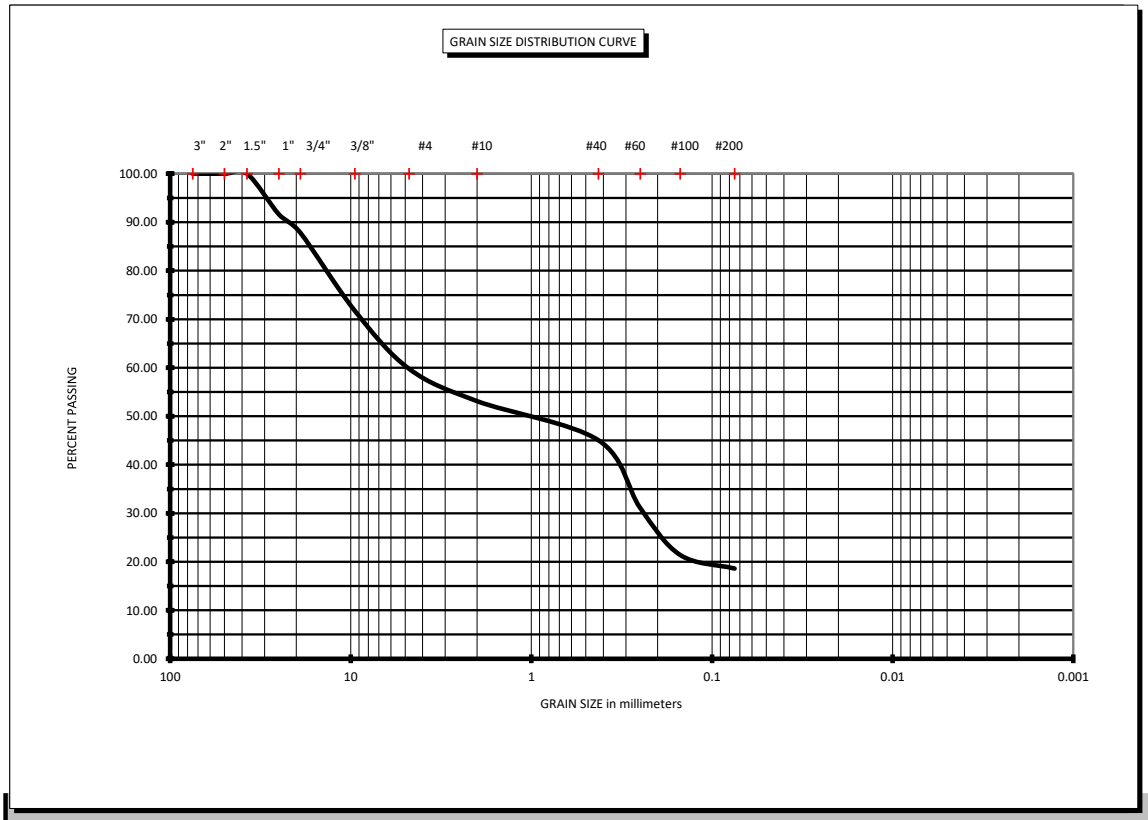
Cu = D60 / D10
Cc = (D30)^2 / (D10 x D60)
1000 um = 1 mm

tested by: SAVERIO R. computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 9/12/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # LP-1 **SAMPLE #** 5 **Depth (feet)** 8-10

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Some Limestone Fragments (SM)

Natural Moisture Content: 17.5%

GRAIN SIZE DATA SHEET

DATE: 9/13/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida

Boring No. LPL-1
Sample No. 7
Depth (feet) 18-20

SOIL DESCRIPTION: Brown Slightly Silty Fine to Medium SAND with Few Limestone Fragments (SP-SM)

Tare #	Dry Soil Wt.
232	234.5

Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	0.0	0.0	100.0	100.0	0.0
19	19mm 3/4"	0.0	0.0	100.0	100.0	0.0
9.5	9.5mm 3/8"	5.4	2.3	97.7	97.7	5.4
4.75	4.75mm #4	15.2	6.5	93.5	93.5	9.8
2.36	2 mm #10	26.3	11.2	88.8	88.8	11.1
0.6	425um #40	57.5	24.5	75.5	75.5	31.2
0.3	250um #60	116.2	49.6	50.4	50.4	58.7
0.15	150um #100	182.8	78.0	22.0	22.0	66.6
0.075	75um #200	207.6	88.5	11.5	11.5	24.8
PAN	-	234.5	100.0	0.0	0.0	26.9

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

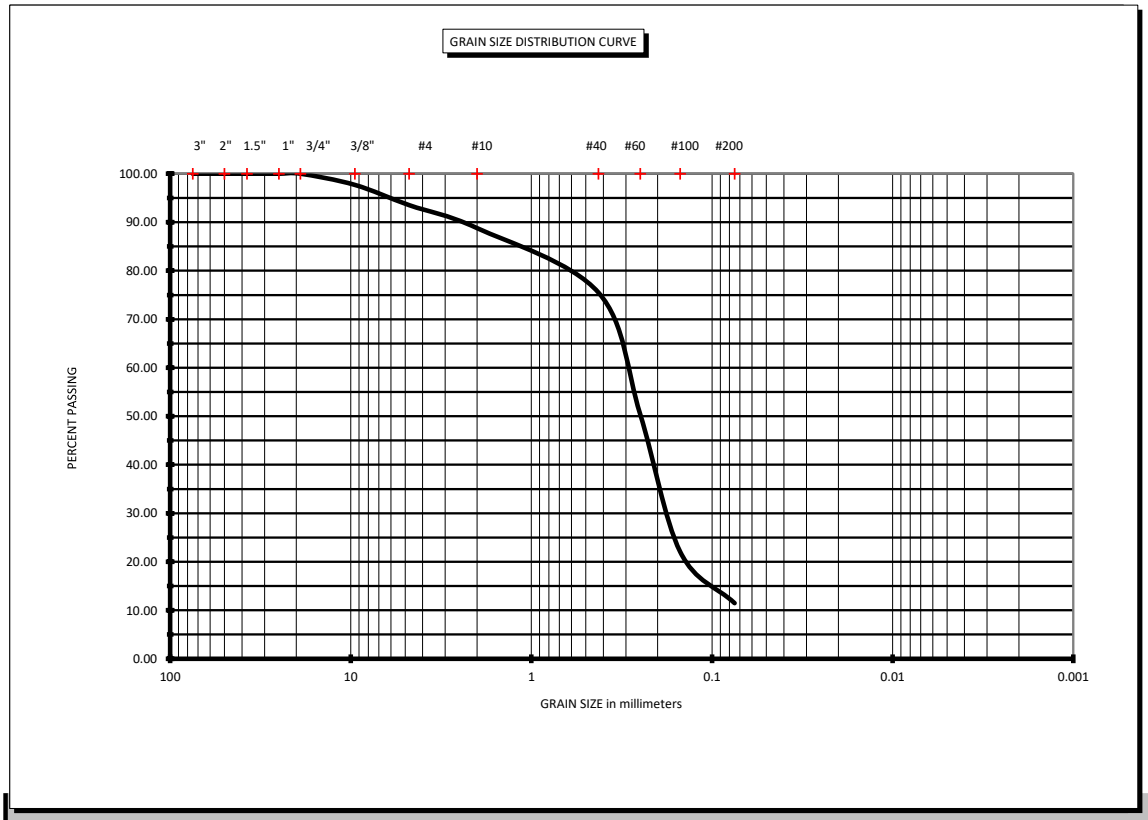
Cu = D60 / D10
Cc = (D30)^2 / (D10 x D60)
1000 um = 1 mm

tested by: SAVERIO R. computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 9/13/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # LPL-1 **SAMPLE #** 7 **Depth (feet)** 18-20

SOIL DESCRIPTION: Brown Slightly Silty Fine to Medium SAND with Few Limestone Fragments (SP-SM)

Natural Moisture Content: 21.4%

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida

Boring No. LPL-2
Sample No. 5
Depth (feet) 8-10

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Little of Limestone Fragments (SM)

Tare #	Dry Soil Wt.
N-2	291.8

Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	0.0	0.0	100.0	100.0	0.0
19	19mm 3/4"	31.2	10.7	89.3	89.3	31.2
9.5	9.5mm 3/8"	41.0	14.1	85.9	85.9	9.8
4.75	4.75mm #4	67.1	23.0	77.0	77.0	26.1
2.36	2 mm #10	95.4	32.7	67.3	67.3	28.3
0.6	425um #40	130.8	44.8	55.2	55.2	35.4
0.3	250um #60	158.1	54.2	45.8	45.8	27.3
0.15	150um #100	211.5	72.5	27.5	27.5	53.4
0.075	75um #200	243.8	83.6	16.4	16.4	32.3
PAN	-	291.8	100.0	0.0	0.0	48.0

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

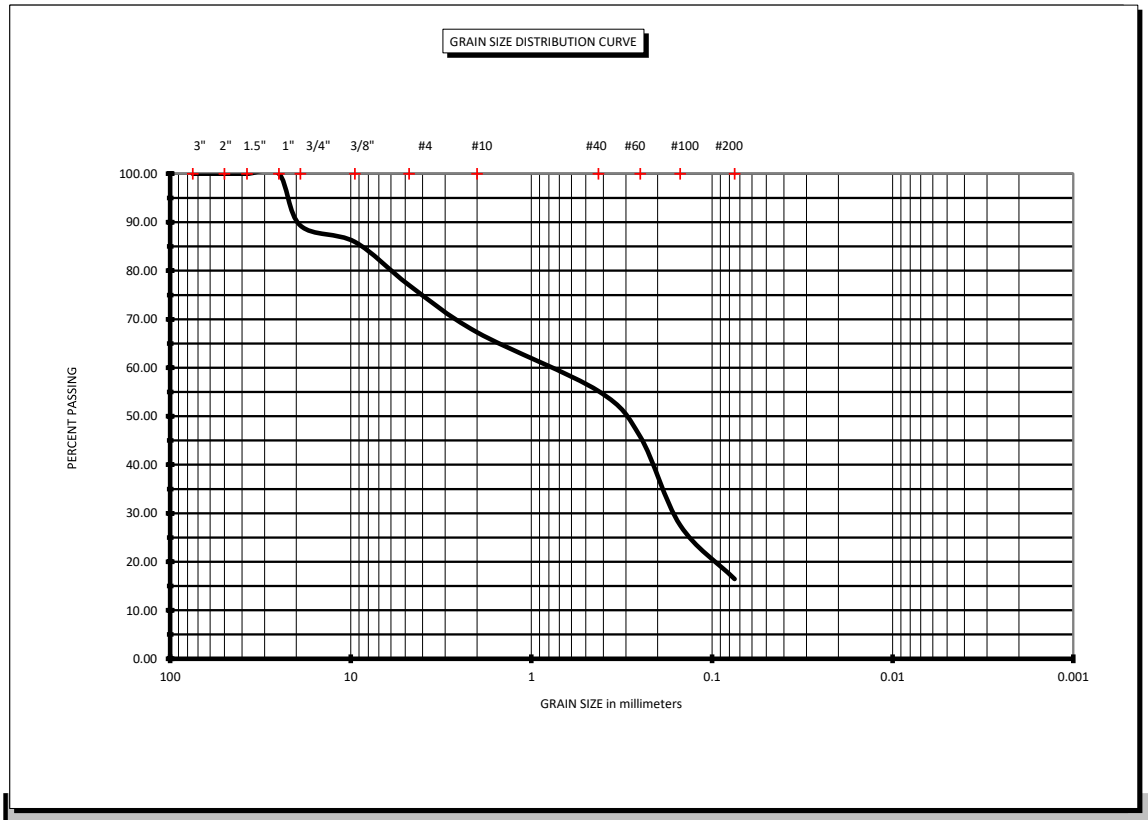
Cu = D60 / D10
Cc = (D30)^2 / (D10 x D60)
1000 um = 1 mm

tested by: SAVERIO R. computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # LPL-2 **SAMPLE #** 5 **Depth (feet)** 8-10

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Little of Limestone Fragments (SM)

Natural Moisture Content: 15.1%

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida

Boring No. RT-2
Sample No. 5
Depth (feet) 8-10

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Some Limestone Fragments (SM)

Tare #	Dry Soil Wt.
C-1	419.8

Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	10.2	2.4	97.6	97.6	10.2
19	19mm 3/4"	37.6	9.0	91.0	91.0	27.4
9.5	9.5mm 3/8"	79.1	18.8	81.2	81.2	41.5
4.75	4.75mm #4	132.5	31.6	68.4	68.4	53.4
2.36	2 mm #10	158.1	37.7	62.3	62.3	25.6
0.6	425um #40	199.5	47.5	52.5	52.5	41.4
0.3	250um #60	274.7	65.4	34.6	34.6	75.2
0.15	150um #100	348.1	82.9	17.1	17.1	73.4
0.075	75um #200	368.2	87.7	12.3	12.3	20.1
PAN	-	419.8	100.0	0.0	0.0	51.6

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

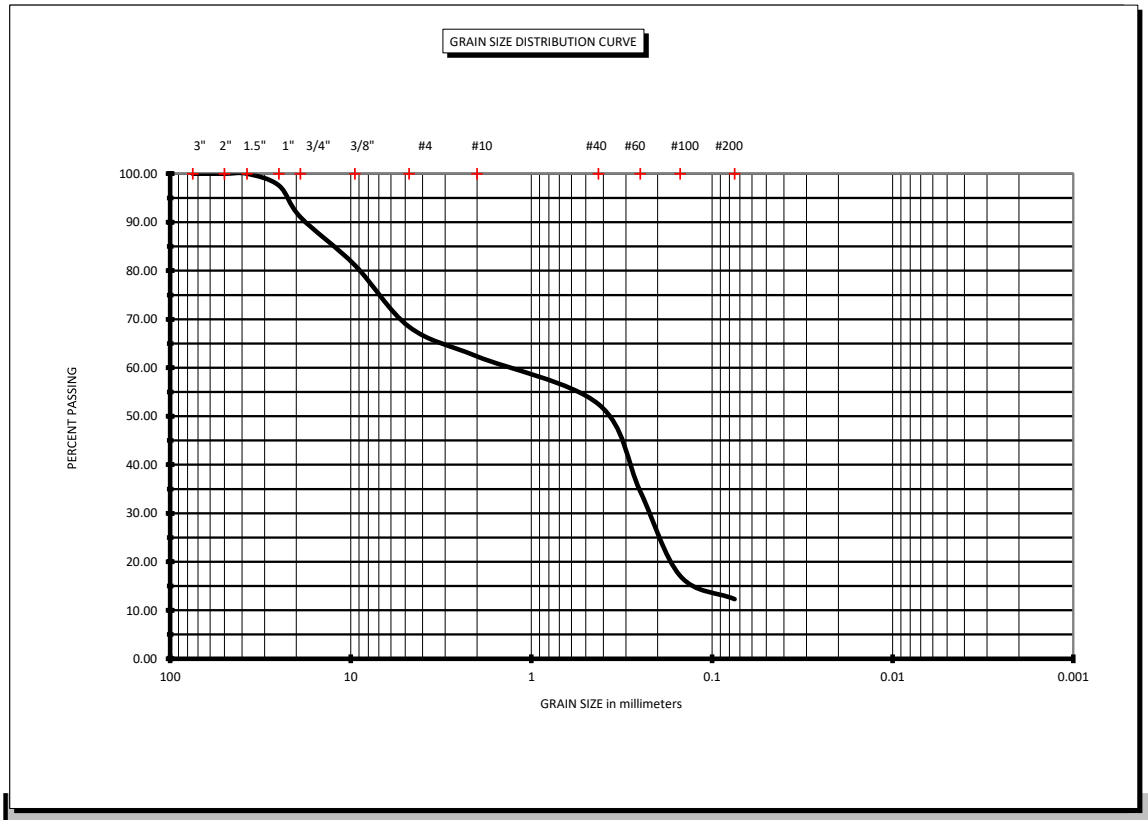
Cu = D60 / D10
Cc = (D30)^2 / (D10 x D60)
1000 um = 1 mm

tested by: SAVERIO R. computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # RT-2 **SAMPLE #** 5 **Depth (feet)** 8-10

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Some Limestone Fragments (SM)

Natural Moisture Content: 15.9%

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida

Boring No. ST-2
Sample No. 2
Depth (feet) 2-4

SOIL DESCRIPTION: Brown Fine to Medium SAND (FILL; SP)

Tare #	Dry Soil Wt.
18	243.5

Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	0.0	0.0	100.0	100.0	0.0
19	19mm 3/4"	0.0	0.0	100.0	100.0	0.0
9.5	9.5mm 3/8"	0.0	0.0	100.0	100.0	0.0
4.75	4.75mm #4	0.0	0.0	100.0	100.0	0.0
2.36	2 mm #10	0.0	0.0	100.0	100.0	0.0
0.6	425um #40	38.2	15.7	84.3	84.3	38.2
0.3	250um #60	123.3	50.6	49.4	49.4	85.1
0.15	150um #100	219.6	90.2	9.8	9.8	96.3
0.075	75um #200	233.5	95.9	4.1	4.1	13.9
PAN	-	243.5	100.0	0.0	0.0	10.0

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

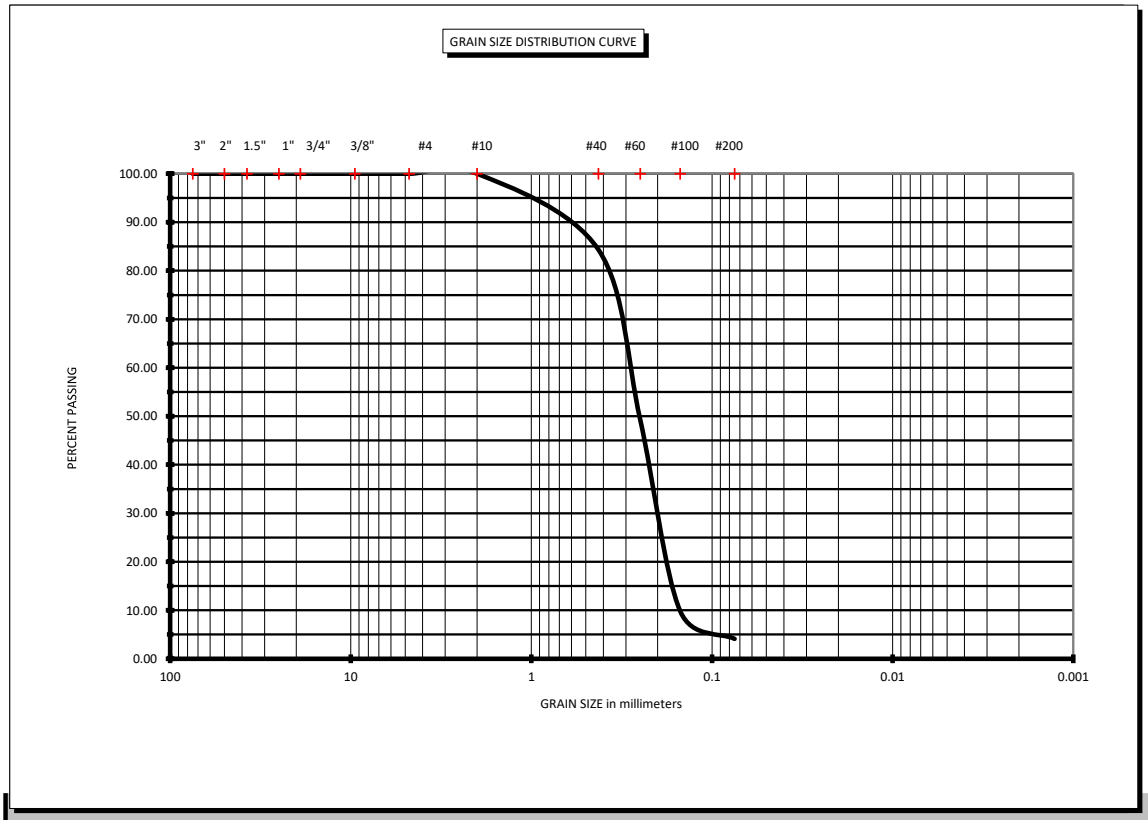
Cu = D60 / D10
Cc = (D30)^2 / (D10 x D60)
1000 um = 1 mm

tested by: SAVERIO R. computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # ST-2 **SAMPLE #** 2 **Depth (feet)** 2-4

SOIL DESCRIPTION: Brown Fine to Medium SAND (FILL; SP)

Natural Moisture Content: 19.3%

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida

Boring No. LPT-2
Sample No. 5
Depth (feet) 8-10

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Some Limestone Fragments (SM)

Tare #	Dry Soil Wt.
54	327.0

Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	12.3	3.8	96.2	96.2	12.3
19	19mm 3/4"	16.8	5.1	94.9	94.9	4.5
9.5	9.5mm 3/8"	73.5	22.5	77.5	77.5	56.7
4.75	4.75mm #4	114.6	35.0	65.0	65.0	41.1
2.36	2 mm #10	145.8	44.6	55.4	55.4	31.2
0.6	425um #40	175.4	53.6	46.4	46.4	29.6
0.3	250um #60	218.9	66.9	33.1	33.1	43.5
0.15	150um #100	272.3	83.3	16.7	16.7	53.4
0.075	75um #200	286.5	87.6	12.4	12.4	14.2
PAN	-	327.0	100.0	0.0	0.0	40.5

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

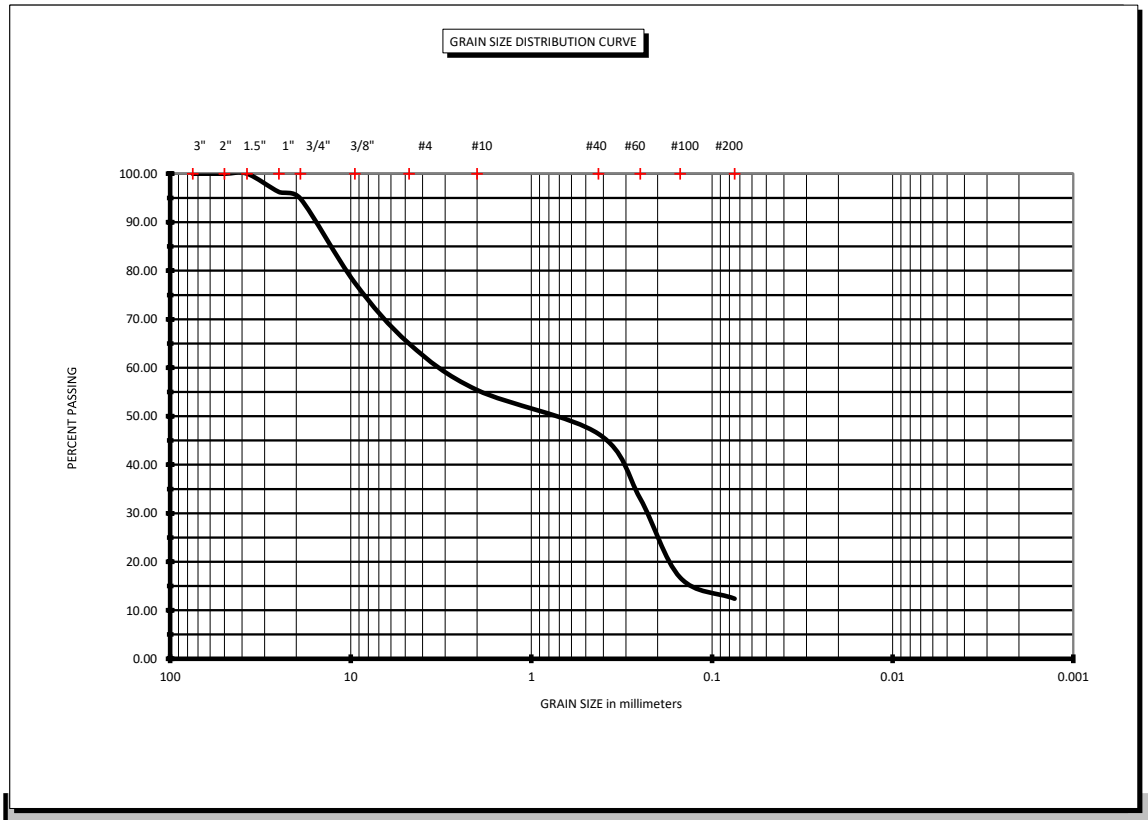
Cu = D60 / D10
Cc = (D30)^2 / (D10 x D60)
1000 um = 1 mm

tested by: SAVERIO R. computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # LPT-2 **SAMPLE #** 5 **Depth (feet)** 8-10

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Some Limestone Fragments (SM)

Natural Moisture Content: 11.8%

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida

Boring No. WF-1
Sample No. 6
Depth (feet) 13-15

SOIL DESCRIPTION: Brown Silty Fine to Coarse SAND with Few to Little of Limestone Fragments (SM)

Tare #	Dry Soil Wt.
4B	155.5

Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	0.0	0.0	100.0	100.0	0.0
19	19mm 3/4"	0.0	0.0	100.0	100.0	0.0
9.5	9.5mm 3/8"	2.1	1.4	98.6	98.6	2.1
4.75	4.75mm #4	17.9	11.5	88.5	88.5	15.8
2.36	2 mm #10	34.8	22.4	77.6	77.6	16.9
0.6	425um #40	53.5	34.4	65.6	65.6	18.7
0.3	250um #60	66.3	42.6	57.4	57.4	12.8
0.15	150um #100	107.5	69.1	30.9	30.9	41.2
0.075	75um #200	129.1	83.0	17.0	17.0	21.6
PAN	-	155.5	100.0	0.0	0.0	26.4

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

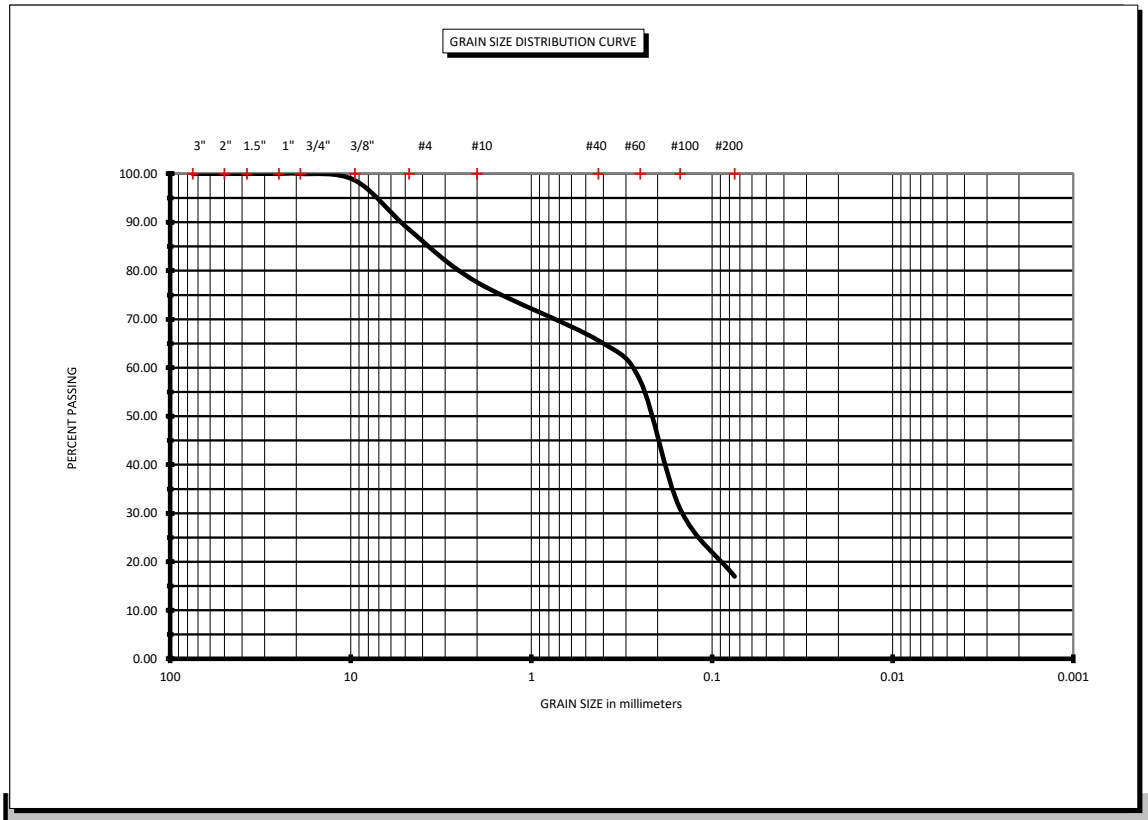
Cu = D60 / D10
Cc = (D30)^2 / (D10 x D60)
1000 um = 1 mm

tested by: SAVERIO R. computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # WF-1 **SAMPLE #** 6 **Depth (feet)** 13-15

SOIL DESCRIPTION: Brown Silty Fine to Coarse SAND with Few to Little of Limestone Fragments (SM)

Natural Moisture Content: 15.4%

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida

Boring No. PC-1
Sample No. 2
Depth (feet) 2-4

SOIL DESCRIPTION: Brown Fine to Medium SAND (FILL; SP)

Tare #	Dry Soil Wt.
103	396.7

Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	0.0	0.0	100.0	100.0	0.0
19	19mm 3/4"	0.0	0.0	100.0	100.0	0.0
9.5	9.5mm 3/8"	0.0	0.0	100.0	100.0	0.0
4.75	4.75mm #4	0.0	0.0	100.0	100.0	0.0
2.36	2 mm #10	1.0	0.3	99.7	99.7	1.0
0.6	425um #40	59.2	14.9	85.1	85.1	58.2
0.3	250um #60	205.0	51.7	48.3	48.3	145.8
0.15	150um #100	365.3	92.1	7.9	7.9	160.3
0.075	75um #200	382.5	96.4	3.6	3.6	17.2
PAN	-	396.7	100.0	0.0	0.0	14.2

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

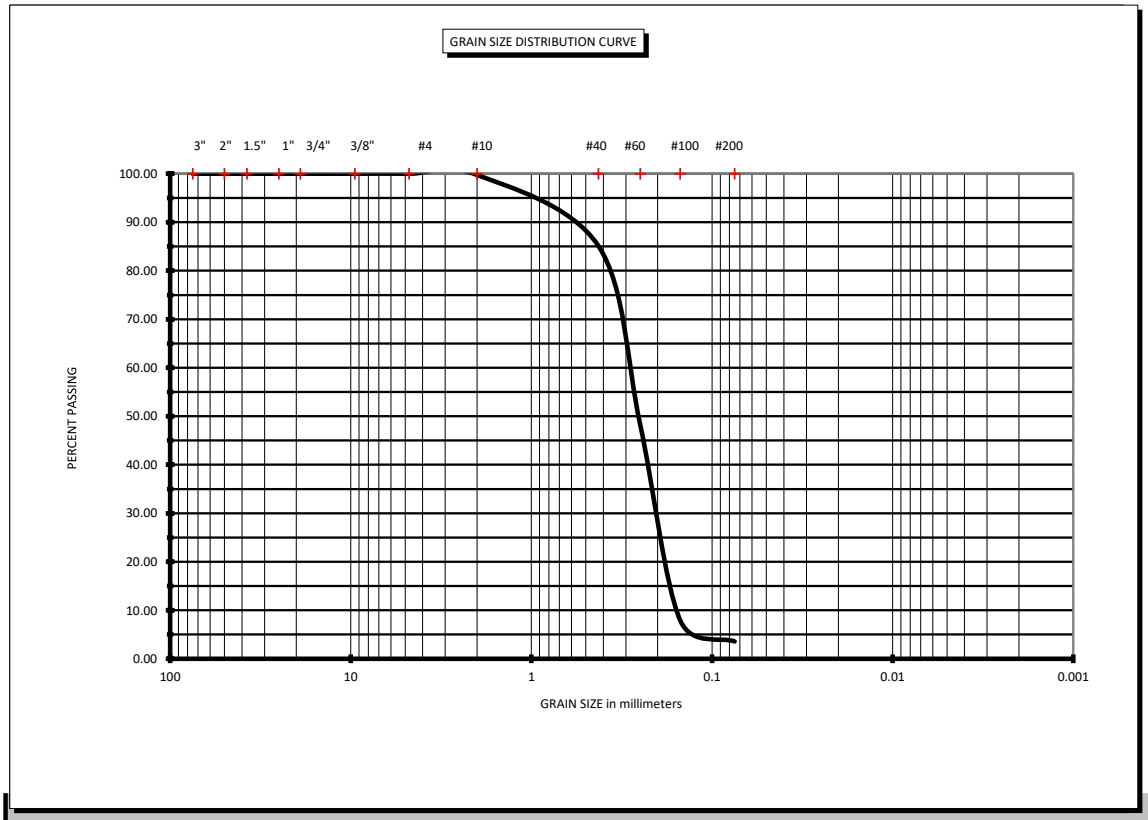
Cu = D60 / D10
Cc = (D30)^2 / (D10 x D60)
1000 um = 1 mm

tested by: SAVERIO R. computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # PC-1 **SAMPLE #** 2 **Depth (feet)** 2-4

SOIL DESCRIPTION: Brown Fine to Medium SAND (FILL; SP)

Natural Moisture Content: 3.3%

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida

Boring No. ST-1
Sample No. 5
Depth (feet) 8-10

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Some Limestone Fragments (SM)

Tare #	Dry Soil Wt.
19	443.3

Sieve Size	Sieve Sizes	Cumulative Wt. Retained	% RETAINED	% PASSING	% PASSING TOTAL SAMPLE	WEIGHT RETAINED (Grams)
75	75mm 3"	0.0	0.0	100	100	0.0
50	50mm 2"	0.0	0.0	100	100	0.0
37.5	37.5mm 1.5"	0.0	0.0	100.0	100.0	0.0
25	25mm 1"	0.0	0.0	100.0	100.0	0.0
19	19mm 3/4"	24.3	5.5	94.5	94.5	24.3
9.5	9.5mm 3/8"	99.4	22.4	77.6	77.6	75.1
4.75	4.75mm #4	161.8	36.5	63.5	63.5	62.4
2.36	2 mm #10	201.9	45.5	54.5	54.5	40.1
0.6	425um #40	245.4	55.4	44.6	44.6	43.5
0.3	250um #60	305.5	68.9	31.1	31.1	60.1
0.15	150um #100	358.2	80.8	19.2	19.2	52.7
0.075	75um #200	379.5	85.6	14.4	14.4	21.3
PAN	-	443.3	100.0	0.0	0.0	63.8

NOTES: Percent passing the #200 sieve was determined by the wash method.

ASTM D 2487 Classification of Soil for Engineering Purposes

Coarse Gravel	< 3" and > 3/4"
Fine Gravel	< 3/4" and > #4

Coarse Sand	< #4 and > #10
Medium Sand	< #10 and > #40
Fine Sand	< #40 and > #200

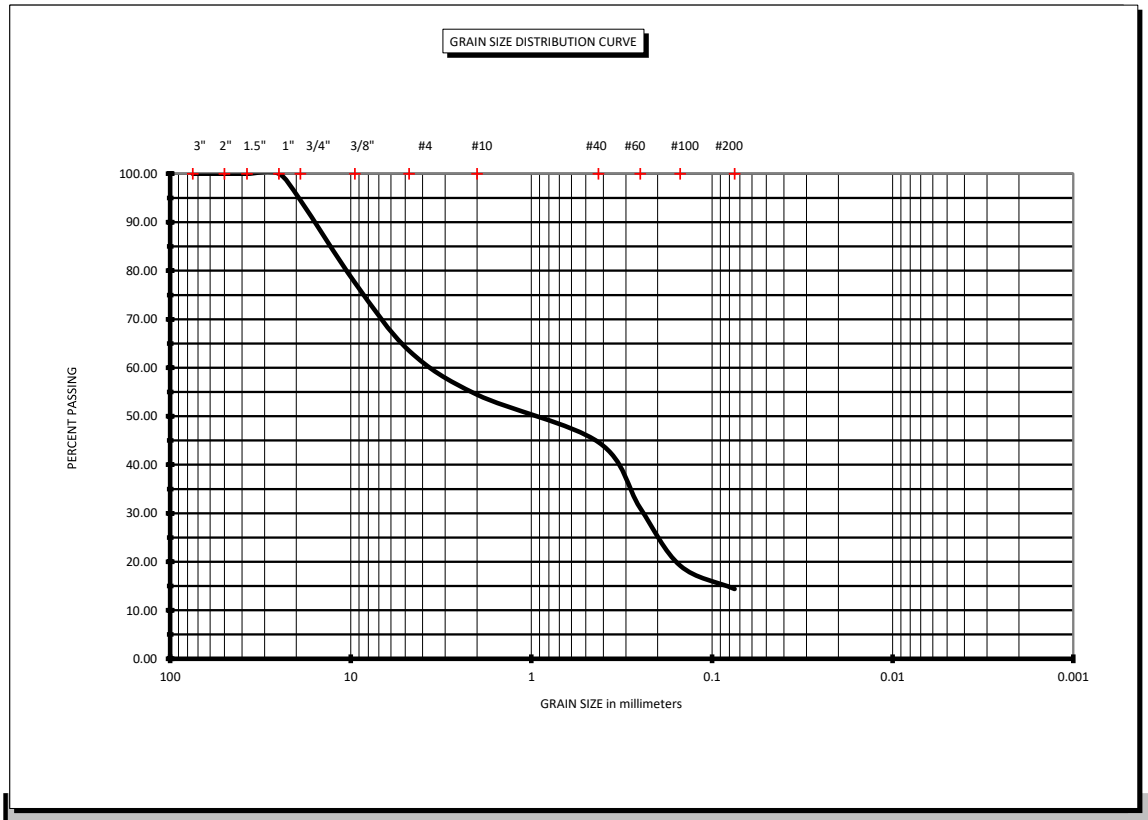
Cu = D60 / D10
Cc = (D30)^2 / (D10 x D60)
1000 um = 1 mm

tested by: SAVERIO R. computed by: S. Zhang checked by: O. Riccobono

GRAIN SIZE DATA SHEET

DATE: 9/17/2024

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
GEOSOL PROJECT No. 224120
GENERAL LOCATION: Broward County, Florida



ASTM D 2487 Classification of Soil for Engineering Purposes			Coarse Sand	< #4 and > #10	Cu = D60 / D10
Coarse Gravel	< 3" and > 3/4"		Medium Sand	< #10 and > #40	Cc = (D30)^2 / (D10 x D60)
Fine Gravel	< 3/4" and > #4		Fine Sand	< #40 and > #200	

BORING # ST-1 **SAMPLE #** 5 **Depth (feet)** 8-10

SOIL DESCRIPTION: Brown Silty Fine to Medium SAND with Some Limestone Fragments (SM)

Natural Moisture Content: 15.1%

ORGANIC CONTENT TEST RESULTS (ASTM D-2974)

PROJECT NAME: Sunrise Middle School Park Improvements - AECOM
LOCATION: Broward County, Florida
PROJECT No.: 224120

Boring No.	LP-1	RT-2	LPL-2	ST-2
Sample No.	1	1	1	1
Sample Depth (Feet)	0-0.5	0-0.5	0-0.5	0-0.5
Crucible No.	0	M5	A5	B5
Weight of Crucible and Oven-Dried Sample (grams)	117.6	132.6	61.6	78.4
Weight of Crucible and Sample after Ignition (grams)	113.9	128.6	59.7	75.5
Weight of Crucible (grams)	58.7	67.4	29.1	37.7
Weight of Oven-Dried Soil (grams)	58.9	65.2	32.5	40.7
Weight Loss due to Ignition (grams)	3.7	4.0	1.9	2.9
Percent Organics (%)	6.3	6.1	5.8	7.1

Boring No.	RT-1
Sample No.	1
Sample Depth (Feet)	0-0.5
Crucible No.	J1
Weight of Crucible and Oven-Dried Sample (grams)	77.9
Weight of Crucible and Sample after Ignition (grams)	75.3
Weight of Crucible (grams)	39.5
Weight of Oven-Dried Soil (grams)	38.4
Weight Loss due to Ignition (grams)	2.6
Percent Organics (%)	6.8

Geosol, Inc.
5795-A NW 151st Street
Miami Lakes, Florida 33014
(305) 828-4367

ANALYTICAL RESULTS

Project: Sunrise Middle School Park Improvements - AECOM
Project No.: 224120

Sample: P - 1 Lab ID: 224120-1 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B				
pH at 25 Degrees C	7.9	Std. Units	0.10	0.10	1
Resistivity	Analytical Method: EPA 120.1 Resistivity				
Resistivity	3,000	ohms-cm	0.01	0.01	1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0				
Chloride	100	mg/L	400	20	1
Sulfate	0	mg/L	100	1	1

REPORT OF LABORATORY ANALYSIS

Geosol, Inc.
5795-A NW 151st Street
Miami Lakes, Florida 33014
(305) 828-4367

ANALYTICAL RESULTS

Project: Sunrise Middle School Park Improvements - AECOM
Project No.: 224120

Sample: P - 2 Lab ID: 224120-2 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B				
pH at 25 Degrees C	7.5	Std. Units	0.10	0.10	1
Resistivity	Analytical Method: EPA 120.1 Resistivity				
Resistivity	2,300	ohms-cm	0.01	0.01	1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0				
Chloride	140	mg/L	400	20	1
Sulfate	0	mg/L	100	1	1

REPORT OF LABORATORY ANALYSIS

APPENDIX "C"

Table 4 – Summary of Borehole Percolation Test Results
Schematics of SFWMD's Usual Open-Hole Percolation Test

TABLE 4 - SUMMARY OF CONSTANT HEAD BOREHOLE PERCOLATION TEST RESULTS

City of Fort Lauderdale Parks Bond Program Implementation Project – Phase II
Proposed Improvements at Sunrise Middle School Park
Located at 1750 NE 14th Street
City of Fort Lauderdale, Florida
GEOSOL Project No. 224120

Test No.	Date Performed	Diameter		Depth of Hole	Depth to Groundwater Level Below Ground Surface (Feet)		SATURATED HOLE DEPTH	Corrected Depth of	Average Flow Rate	K, Hydraulic Conductivity
		Casing (Inches)	Hole (Inches)	(Feet)	Prior to Test	During Test	Ds (Feet)	Hole (Feet)	(gpm)	(cfs/ft^2-Ft Head)
P-1	09/12/24	6	6.75	10	3.8	0.00	6.20	10.00	10.0	4.54E-04
P-2	09/12/24	6	6.75	10	4.4	0.00	5.60	10.00	11.0	4.47E-04

NOTES:

(1) The above hydraulic conductivity values are for a French drains installed to the same depth as the borehole test. The values represent an ultimate value. The designer should decide on the required factor of safety.

(2) The hydraulic conductivity values were calculated based on the South Florida Water Management Districts's USUAL OPEN HOLE CONSTANT HEAD exfiltration test procedure as shown on the following page.

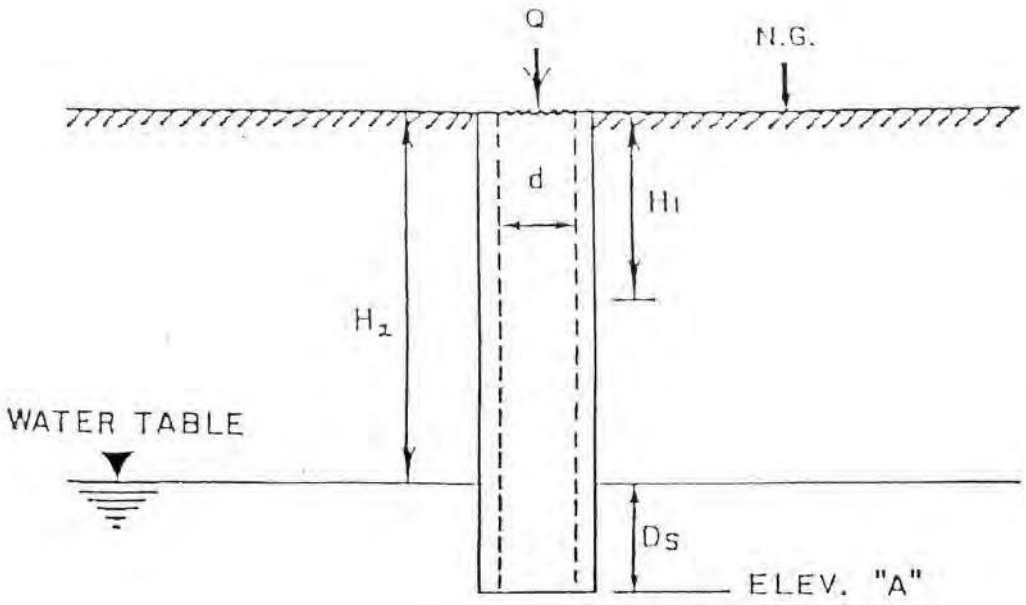
(3) The diameter of the CASING was used in the computation of the hydraulic conductivity values presented in the above table.

(4) Loss of circulation was NOT encountered during the performance of the borehole percolation tests.

SUBSURFACE STRATIFICATION

TEST No.	TEST LOCATION (FEET)		DEPTH (FEET)		GENERAL MATERIAL DESCRIPTION
	NORTHING	EASTING	FROM	TO	
P-1	658571	943385	0.00	0.50	Dark Brown Organic Silty Fine SAND with Grass (TOPSOIL)
			0.50	1.10	Brown Fine to Medium SAND
			1.10	7.30	Brown to Light Brown Sandy LIMESTONE
			7.30	10.00	Brown Fine to Medium SAND
P-2	658913	943133	0.00	0.50	Dark Brown Organic Silty Fine SAND with Grass (TOPSOIL)
			0.50	1.80	Brown Fine to Medium SAND
			1.80	7.30	Light Brown Sandy LIMESTONE
			7.30	9.30	Brown Fine to Medium SAND with Some Limestone Fragments
			9.30	10.00	Brown Fine to Medium SAND

USUAL OPEN - HOLE TEST



$$K = \frac{4Q}{\pi d(2H_2^2 + 4H_2 D_S + H_2 d)}$$

K = HYDRAULIC CONDUCTIVITY (CFS/FT.^{2} - FT. HEAD)

Q = "STABILIZED" FLOW RATE (CFS)

d = DIAMETER OF TEST HOLE (FEET)

H_2 = DEPTH TO WATER TABLE (FEET)

D_S = SATURATED HOLE DEPTH (FEET)

ELEV. "A" = PROPOSED TRENCH BOTTOM ELEV.

H_1 = AVERAGE HEAD ON UNSATURATED HOLE SURFACE (FT. HEAD)

Reference: SFWMD Management and Storage of Surface Waters
Permit Information Manual Vol. IV, Figure 3, Page 12.