

CITY OF SANIBEL

PROJECT MANUAL FOR POST HURRICANE IAN LIFT STATION CONTROL PANEL AND PLATFORM IMPROVEMENTS - PHASE 1

ITB-UT-2-2026/BS

MARCH 2, 2026



*City of Sanibel
Office of the Procurement Manager
800 Dunlop Road, Sanibel, FL 33957
(239)472-6397*

BIDS DUE BY: 2:30 PM, (ET) April 2, 2026

MANDATORY PRE-BID CONFERENCE: 10:00 AM (ET) March 17, 2026

NO QUESTIONS WILL BE ACCEPTED AFTER: 5:00 PM, (ET) March 23, 2026, all questions must be submitted in writing to jason.goodrich@mysanibel.com and received by stated time.

SEALED ENVELOPES MUST BE MARKED WITH THE TITLE OF THE BID, BID NUMBER, NAME AND ADDRESS OF THE BIDDER.

Courier Packages (FedEx, UPS) shall clearly state on the outer packaging, the Invitation to Bid Title and the Invitation to Bid Number. If the proper information is not on the courier's outer packaging the Bid/RFP may be sent back to the Vendor without being opened and/or given consideration for that project.

POST HURRICANE IAN LIFT STATION CONTROL PANEL
AND PLATFORM IMPROVEMENTS - PHASE 1

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CITY OF SANIBEL, FLORIDA

ADVERTISEMENT FOR BIDS

Legal Notice is hereby given that sealed proposals will be received at the Office of the Procurement Manager, City of Sanibel, Florida, at City Hall, 800 Dunlop Road, Sanibel, until 2:30 P.M., on Thursday April 2, 2026 and shortly thereafter will be publicly opened and read aloud. Any proposal offered later than the above time will be returned unopened.

The work for which proposals are to be received consists of the following:

POST HURRICANE IAN LIFT STATION CONTROL PANEL AND PLATFORM IMPROVEMENTS - PHASE 1

Proposals shall be properly and completely executed on a standard proposal form. Each proposal shall be accompanied by an acceptable certified check or cashier's check made payable to the City of Sanibel, or an acceptable Bidders Bond, in an amount not less than five percent (5%) of the total bid price.

The Contractor to whom the work is awarded will be required to furnish an acceptable Surety Bond in an amount of one hundred percent (100%) of the contract price.

No bidder may withdraw his proposal within a period of sixty (60) days following the date set for receiving proposals. The City of Sanibel reserves the right to hold any and all bids for a period of not more than sixty (60) days and said bids shall be and remain valid and in full force and effect during said period. The City of Sanibel reserves the right to reject any and all proposals and to waive informalities.

Plans and Specifications for the work may be obtained online at:

<https://www.mysanibel.com/297/City-Bids>

Brett Schira
Procurement Manager
AFFIDAVIT REQUESTED
PUBLISH ONE TIME
Fort Myers News-Press
March 2, 2026

INFORMATION FOR BIDDERS

1.01 SCOPE

- A. The contract work provides for the **Post Hurricane Ian Lift Station Control Panel and Platform Improvements - Phase 1** and other related items pertinent and incidental thereto including the furnishing of all labor, materials, supplies, equipment, work and services, ready for satisfactory and continuous operation, in accordance with the drawings and specifications.
- B. The work described by these specifications is located at wastewater lift station facilities, owned, operated, and maintained by the City of Sanibel.
- C. The Work consists of furnishing all labor, equipment, materials, and services required to install the lift station platforms, concrete foundations, control panels, and associated electrical improvements, including demolition of existing electrical panels, bypass pumping of the lift stations, and all other work necessary for a complete installation. The City has already procured the control panels, generator receptacle and back box, power panels, terminal boxes, junction boxes with air vents, platforms, and ladders, which will be stored at Sanibel's Public Works facility, and the Contractor is responsible solely for transporting all Owner-furnished equipment to the site and performing all required installation. All other equipment and materials shown on the plans or required for a complete and functional installation shall be provided and installed by the Contractor.
- D. A purchase order for the project is anticipated in May 2026.

1.02 CONTRACT DOCUMENTS AND SPECIFICATIONS

- A. Work to be performed shall be in accordance with drawings and specifications prepared by Tetra Tech, Inc., Weston & Sampson, Inc., and the City of Sanibel.

1.03 BIDDER TO EXAMINE SITE

- A. All bidders are to inform themselves of the conditions under which the work is to be performed, the site of the work, the obstacles which may be encountered, and all other relevant matters concerning the work to be performed. The successful bidder will not be allowed any extra compensation by reason of any matter or thing concerning which said bidder might have fully informed themselves because of their failure to have so informed themselves prior to the bidding.

1.04 INFORMATION NOT GUARANTEED

- A. All information given relating to borings, material encountered, and groundwater is from the reports of the boring CONTRACTOR. Such information is furnished only for the information and convenience of the bidders. It is understood and agreed that the OWNER does not warrant or guarantee as to the accuracy or completeness of such information. Each bidder must satisfy themselves regarding the character, quantities, and conditions of the various materials and work to be done.
- B. It is further understood and agreed that the bidder or the CONTRACTOR will not use any information made available to themselves or obtained by any examination made by them in any manner as a basis or ground of claim or demand of any nature against the OWNER arising from or by reason of any variance which may exist between the information offered and the actual materials and structures encountered during the construction work.

1.05 QUESTIONS REGARDING CONTRACT DOCUMENTS

- A. In general, no answer will be given in reply to an oral question if the question involves an interpretation of the intent or meaning of the drawings or contract documents, or the equality or use of products or methods other than those definitely designated or described on the drawings or in the specifications. Any information given to bidders other than by means of the drawings and contract documents or by addenda as described below is given informally and shall not be used as the basis of a claim against the OWNER or the Engineer.
- B. To receive consideration, such questions shall be submitted in writing to the OWNER at least **TEN (10)** days before the advertised date for receipt of bids. If the question involves equality or use of products or methods, it must be accompanied by drawings, specifications, or other data, in sufficient detail to enable the OWNER to determine the equality or suitability of the product or method. In general, the OWNER will neither approve nor disapprove particular products prior to the opening of the bids; such products will be considered when offered by the CONTRACTOR for incorporation into the work.
- C. The OWNER will arrange as addenda, which shall become a part of the Contract, all questions received as above provided, with his decision regarding each. Addenda will be posted at least **FIVE (5)** days prior to the receipt of bids. It shall be the responsibility of the CONTRACTOR, prior to submitting a proposal, to check the DemandStar online marketplace to download any and all addenda associated with the project. CONTRACTOR shall acknowledge issued addenda on Proposal document page (P-2).
- D. Unless such action shall have been taken by the CONTRACTOR and approval obtained, he agrees to use the product or method designated or described in the specifications or as amended by these addenda.

1.06 PROPOSAL FORM

- A. All bids must be submitted upon the Proposal Form which will be furnished by the OWNER. The Proposal Form shall be completely executed and shall give the price bid for each item of work proposed, both in words and figures, and shall be signed by the bidder.
- B. In the event of a discrepancy between the prices written in words and prices written in figures, the prices written in words shall govern.
- C. The successful bidder shall be prepared to complete the work within **TWO HUNDRED SEVENTY (270)** calendar days of the Notice to Proceed.

1.07 LETTER FROM SURETY

- A. The CONTRACTOR shall submit with their executed bid proposal a letter or statement from their surety company that it will execute and deliver a one hundred percent (100%) Performance and Payment Bond.

1.08 AWARD OF CONTRACT

- A. Lump Sum Proposals - The award of Contract shall be made to the low, responsive and responsible bidder on the lump sum proposals submitted for the work. The Contract shall be deemed as having been awarded when formal notice shall have been served upon the successful bidder by an officer or agent of the OWNER duly authorized to give such notice.
- B. Unit Price Proposals
 - (1) The award of the Contract will be made to the lowest responsible bidder on the total bid price given on the Proposal Form, page P-1. The Contract shall be deemed as having been awarded when formal notice shall have been served upon the successful bidder by an officer or agent of the OWNER duly authorized to give such notice.
 - (2) The quantities listed in the unit price proposal form are to be considered as approximate and are to be used for the comparison of bids only. The unit prices to be tendered by the bidders are to be tendered expressly for the scheduled quantities, as they may be increased or decreased as hereinafter provided. Payments, except for lump sum items in the unit price Contract, will be made to the CONTRACTOR for the actual quantities of work performed or materials furnished in accordance with the plans and specifications; and it is understood that the scheduled quantities of work to be done and materials to be furnished may each be increased or diminished as hereinbefore provided without in any way invalidating the unit price bid. Where there is a conflict between the unit price and

the extension thereof made by the bidder, the unit price shall govern, and the Engineer shall be authorized to make a correct extension of such unit bid price and to use such corrected extension in comparing bids.

- (3) When bids are requested on "Alternate" items, the City reserves the right to select the lowest responsible bidder based upon either the base bid or the base bid with any or all of the alternate bid prices.
- (4) The City reserves the right to accept or reject any or all bids and to waive any formal irregularities in the bids, when deemed to be in the best interest of the City.

1.09 BID SECURITY

- A. Each bid shall be accompanied by a cashier's check made payable to the OWNER or an acceptable bidder's bond in an amount of not less than five percent (5%) of the total bid price. The checks will be returned to all except the three lowest formal bidders within three days after the date of opening the bids. Any checks remaining with the OWNER shall be returned upon execution of a contract.

1.10 EXPERIENCE AND ABILITY OF CONTRACTOR

- A. It is the intent of the OWNER not to award the Contract to any bidder who does not furnish satisfactory evidence they have the ability and experience in this class of work, and that they have sufficient capital and plant to enable them to prosecute the same successfully and to complete it in the time named in the proposal. CONTRACTOR shall have a minimum of **FIVE (5)** years' experience with similar projects.

1.11 EXECUTION OF CONTRACT

- A. The successful bidder to whom the Contract is awarded shall be required to execute **three (3)** copies of the Construction Contract and **three (3)** copies of the Performance and Payment Bond.

1.12 FORFEITURE OF BID SECURITY

- A. In the event that the party to whom the Contract is awarded shall fail or neglect to execute the Contract and furnish satisfactory bonds within TEN (10) days after the OWNER has notified him that the Contract is ready for execution, the OWNER may determine that the bidder abandoned the Contract, and thereupon the proposal and acceptance shall be null and void; and the security accompanying the proposal shall be forfeited to and retained by the OWNER as liquidated damages for such failure and neglect, and to indemnify the OWNER for any loss which may be sustained by failure of the bidder to execute the Contract. After the execution of the Contract and the acceptance of the bonds by the OWNER, the bid securities which have been retained by the OWNER shall be returned to the respective bidders.

1.13 UNAVAILABILITY OF MATERIALS

- A. Bids must be based on use of the materials specified, subject to the provisions of any addenda issued. If the CONTRACTOR is unable to furnish or use any of the materials or equipment specified because of any order by a governmental agency limiting the manufacture or use, or because of the supply situation in the general market for such material or equipment, the CONTRACTOR shall offer substitutes therefor. The substitutes shall be suitable for the purpose, considering the factors of quality, serviceability, appearance, and maintenance. No substitute shall be used until it has been approved by the Engineer.
- B. No consideration will be given to the use of substitutes on account of market conditions unless the CONTRACTOR demonstrates that for the item in question, CONTRACTOR placed their order and submitted shop drawings without delay, that CONTRACTOR has shown due diligence in attempting to locate the item as specified, and that the unavailability is due to market conditions in general throughout the particular industry.
- C. If substitutes are used in the work, the compensation to be paid to the CONTRACTOR shall be subject to review and adjustment. As a general principle, if the Engineer shall determine that the substitute will be less satisfactory, the CONTRACTOR shall allow a credit to the OWNER; only "under unusual circumstances shall there be an increase in" compensation to the CONTRACTOR on account of substitution. The basis upon which the amount of price adjustments will be founded shall be the cost of the appropriate items at the time the bids were opened.

1.14 LOCAL LABOR AND MATERIALS

- A. Whenever possible, the CONTRACTOR, their sub-contractors, material personnel, or others who employ labor, shall employ such labor locally.

1.15 NONDISCRIMINATION IN EMPLOYMENT

- A. Contracts for work under this proposal may obligate the CONTRACTOR and sub-contractors not to discriminate in employment practices.
- B. Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the Contract.

1.16 RIGHT-OF-ACCESS

- A. The CONTRACTOR agrees that a representative of the OWNER or Engineer will have access to the work wherever it is in preparation of progress and that the CONTRACTOR will provide facilities for such access and inspection.

1.17 SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

- A. The successful bidder shall be responsible for all obligations prescribed as employer obligations under Chapter XVII of Title 29, Code of Federal Regulations, Part 1926, otherwise known as "Safety and Health Regulations for Construction."

1.18 UTILITIES

- A. All existing utility systems which conflict with the construction of the work herein shall be relocated or temporarily removed and replaced as required. Such relocating or temporary removal and replacement shall be accomplished at the expense of the CONTRACTOR, and the work shall be done by the Utility unless the Utility approves in writing that the work may be done by the CONTRACTOR.
- B. The CONTRACTOR shall make all necessary applications and arrangements and pay all fees and charges for electrical energy for power and light required for the construction of this Contract during its entire progress. CONTRACTOR shall provide and pay for all temporary wiring, switches, connections and meters.

1.19 EASEMENTS

- A. The OWNER will obtain right-of-way easements over and through certain private lands for the construction and rehabilitation. The width or limits of such rights-of-way will be defined by the OWNER before the work or construction shall begin. If the methods of construction employed by the CONTRACTOR are such as to require the use of land beyond the limits obtained, CONTRACTOR shall make their own agreements with the property owners affected for the use of such additional land and submit a copy of the agreement to the "owner".
- B. In all such easement rights-of-way, the CONTRACTOR shall be required to carefully remove the Owner's fences, or other obstacles to the construction procedure, and replace the same after the work is installed. The backfilling shall be to the grade of the existing ground level or to the grade as established by the Owner in the event the Owner permits the deposit of excess material upon such land.
- C. The cost of all such restoration of property shall be included and no additional payment will be allowed for this work.

1.20 OPERATIONS WITHIN RIGHT-OF-WAY

- A. In public thoroughfares, all operations of the CONTRACTOR, including those of temporary nature, must be confined within the applicable right-of-way limits. If the methods of the construction employed by the CONTRACTOR are such as to require the use of land beyond the public thoroughfares, CONTRACTOR shall make their own agreements with the property owners affected for the use of such additional land and submit a copy of the agreement to the "owner".

1.21 PUBLIC RECORDS

A. OWNER is a public agency subject to Chapter 119, Florida Statutes, the Public Records Law. As a CONTRACTOR or service provider to OWNER, CONTRACTOR is also subject to the Public Records Law pursuant to Section 119.0701, Florida Statutes, and shall comply with Florida's Public Records Law. Unless specifically exempted by Florida law, in whole or part, the CONTRACTOR shall:

- (1) Keep and maintain public records required by the OWNER in order to perform the service. This shall include all records relating to CONTRACTOR'S services provided to the OWNER and includes "all documents, papers, letters, maps, books, tapes, photographs, films, sound recordings, data processing software, or other material, regardless of the physical form, characteristics or means of transmission."
- (2) Upon request from the OWNER'S custodian of public records, provide the OWNER 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, 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 the contract if the CONTRACTOR does not transfer the records to the OWNER.
- (4) Upon completion of the contract, transfer, at no cost to the OWNER, all public records in possession of the CONTRACTOR, or keep and maintain public records required by the OWNER to perform the service. If the CONTRACTOR transfers all public records to the OWNER upon completion of the contract, the CONTRACTOR shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the CONTRACTOR keeps and maintains public records upon completion of the contract, the CONTRACTOR shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the OWNER, upon request from the OWNER'S custodian of public records, in a format that is compatible with the information technology systems of the OWNER.

B. As required by Section 119.0701(2)(a), the following contact information is provided to the CONTRACTOR in the format required by statute:

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

SANIBEL CITY CLERK
800 DUNLOP ROAD
SANIBEL, FLORIDA 33957
(239) 472-3700
scotty.kelly@mysanibel.com

1.22 E-Verify

- A. In compliance with Section 448.095, Fla. Stat., CONTRACTOR and its sub-contractor must be registered with and use the E-Verify system to verify work authorization status of all employees hired after January 1, 2021.
- (1) CONTRACTOR shall require each of its sub-contractors to provide CONTRACTOR with an affidavit stating that the sub-contractor does not employ, contract with, or sub-contract with an unauthorized alien. CONTRACTOR shall maintain a copy of the sub-contractor's affidavit as part of and pursuant to the records retention requirements of this Agreement.
 - (2) The OWNER, CONTRACTOR, or any sub-contractor who has a good faith belief that a person or entity with which it is contracting has knowingly violated Section 448.09(1), Fla. Stat. or the provisions of this section shall terminate the contract with the person or entity.
 - (3) The OWNER, upon good faith belief that a sub-contractor knowingly violated the provisions of this section, but CONTRACTOR otherwise complied, shall promptly notify CONTRACTOR, and CONTRACTOR shall immediately terminate the contract with the sub-contractor.
 - (4) A contract terminated under the provisions of this section is not a breach of contract and may not be considered such. Any contract termination under the provisions of this section may be challenged pursuant to Section 448.095(2)(d), Fla. Stat. CONTRACTOR acknowledges that upon termination of this Agreement by the OWNER for a violation of this section by CONTRACTOR, CONTRACTOR may not be awarded a public contract for at least one (1) year. CONTRACTOR further acknowledges that CONTRACTOR is liable for any additional costs incurred by the OWNER as a result of termination of any contract for a violation of this section.
 - (5) Subcontracts. CONTRACTOR or sub-contractor shall insert in any subcontracts the clauses set forth in this section, including this subsection, requiring the sub-contractor to include these clauses in any lower tier subcontracts. CONTRACTOR shall be responsible for compliance by any sub-contractor or lower tier sub-contractor with the clauses set forth in this section.

PROPOSAL

CITY OF SANIBEL, FLORIDA

**POST HURRICANE IAN LIFT STATION CONTROL PANEL AND PLATFORM
IMPROVEMENTS - PHASE 1**

DUE APRIL 2, 2026 @ 2:30 PM

TO: CITY OF SANIBEL
Office of the Procurement Manager
800 Dunlop Rd.
SANIBEL, FLORIDA 33957

Pursuant to the advertisement for bids, the undersigned having read the Specifications and examined the Drawings prepared by Tetra Tech, Inc. and the City of Sanibel for the **POST HURRICANE IAN LIFT STATION CONTROL PANEL AND PLATFORM IMPROVEMENTS - PHASE 1** in the City of Sanibel, Florida hereby proposes to provide all materials, and all equipment, tools, etc., and to perform all labor necessary for furnishing the equipment as specified and described in said Specifications.

The Total Bid Price for the work based on the summation of the extensions of the unit prices on the attached itemized proposal is:

Item	Quantity	Total Price
Post Hurricane Ian Lift Station Control Panel and Platform Improvements - Phase 1	1	\$
TOTAL BID IN WORDS _____ _____ \$ _____ (In words)(In figures)		
NAME OF SUBMITTING CONTRACTOR _____		

TIME OF COMPLETION

The undersigned further agrees to complete the fabrication and delivery of such work, ready for continuous and satisfactory operation in all respects, within **TWO HUNDRED SEVENTY (270)** calendar days of the Notice to Proceed.

TIME OF VALIDITY

It is hereby agreed that this proposal shall remain in full force and effect and may not be withdrawn for a period of sixty (60) days from the date of receiving proposals by the City of Sanibel.

BID SECURITY

The undersigned encloses herewith a certified check or cashier's check payable to the City of Sanibel, Florida or a bidder's bond bonding the undersigned and surety to the City of Sanibel, Florida in an amount not less than five percent (5%) of the total bid price as set out above, guaranteeing that the undersigned will enter into contract for the performance of the work if this proposal is accepted.

ADDENDA

Receipt of Addenda Nos. _____ is hereby acknowledged.

REQUIRED BID ITEMS

No.	Name	Page Reference
1	Bid Package in sealed envelope marked with Title of Bid, Bid Number, Name & Address of Bidder	Cover page Invitation to Bid
2	Complete Proposal on form provided	Pages A-1 and P-1 through P-9
3	Complete Unit Price Proposal	Pages P-1 through P-9
4	Complete Similar Project Experience	Pages SPE-1 through SPE-6
5	Include Certified Check or Bid Bond 5% or more of total bid price	Pages A-1 and IB-4
6	Acknowledge issued addenda on page 2 of Proposal Form	Pages IB-2, P-2, GC-1
7	Letter or statement from Bidder's surety company it will execute and deliver a 100% Performance and Payment Bond	Page IB-3
8	Furnish evidence they have ability & experience, have sufficient capital and plant, and minimum 5-years of experience	Page IB-4, Pages SPE-1 through SPE-6

UNIT PRICE PROPOSAL

ITEM NO.	DESCRIPTION	EST. QUANT.	UNIT	UNIT PRICE	EXTENDED PRICE
1	General Requirements	1	LS		
2	Mobilizations/Demobilization	1	LS		
3	Maintenance of Traffic	1	LS		
4	LS 5 Installation				
4a	Demolition	1	LS		
4b	Bypass	1	LS		
4c	Cast in Place Concrete	1	LS		
4d	Auger Cast Piles	1	LS		
4e	Additional Auger Cast Pile Depth	5	LF		
4f	Platform Installation	1	LS		
4g	Electrical Improvements	1	LS		
4h	Submersible Pumps	2	EA		
4i	Site Restoration	1	LS		

UNIT PRICE PROPOSAL (continued)

ITEM NO.	DESCRIPTION	EST. QUANT.	UNIT	UNIT PRICE	EXTENDED PRICE
5	LS 14 Installation				
5a	Demolition	1	LS		
5b	Bypass	1	LS		
5c	Cast in Place Concrete	1	LS		
5d	Auger Cast Piles	1	LS		
5e	Additional Auger Cast Pile Depth	5	LF		
5f	Platform Installation	1	LS		
5g	Electrical Improvements	1	LS		
5h	Submersible Pumps	2	EA		
5i	Site Restoration	1	LS		
6	LS 17 Installation				
6a	Demolition	1	LS		
6b	Bypass	1	LS		
6c	Cast in Place Concrete	1	LS		
6d	Auger Cast Piles	1	LS		
6e	Additional Auger Cast Pile Depth	5	LF		
6f	Platform Installation	1	LS		
6g	Electrical Improvements	1	LS		
6h	Submersible Pumps	2	EA		
6i	Site Restoration	1	LS		

UNIT PRICE PROPOSAL (continued)

ITEM NO.	DESCRIPTION	EST. QUANT.	UNIT	UNIT PRICE	EXTENDED PRICE
7	LS 20 Installation				
7a	Demolition	1	LS		
7b	Bypass	1	LS		
7c	Cast in Place Concrete	1	LS		
7d	Auger Cast Piles	1	LS		
7e	Additional Auger Cast Pile Depth	5	LF		
7f	Platform Installation	1	LS		
7g	Electrical Improvements	1	LS		
7h	Submersible Pumps	2	EA		
7i	Site Restoration	1	LS		
8	LS 32 Installation				
8a	Demolition	1	LS		
8b	Bypass	1	LS		
8c	Cast in Place Concrete	1	LS		
8d	Auger Cast Piles	1	LS		
8e	Additional Auger Cast Pile Depth	5	LF		
8f	Platform Installation	1	LS		
8g	Electrical Improvements	1	LS		
8h	Submersible Pumps	2	EA		
8i	Site Restoration	1	LS		

UNIT PRICE PROPOSAL (continued)

ITEM NO.	DESCRIPTION	EST. QUANT.	UNIT	UNIT PRICE	EXTENDED PRICE
9	LS 46 Installation				
9a	Demolition	1	LS		
9b	Bypass	1	LS		
9c	Cast in Place Concrete	1	LS		
9d	Auger Cast Piles	1	LS		
9e	Additional Auger Cast Pile Depth	5	LF		
9f	Platform Installation	1	LS		
9g	Electrical Improvements	1	LS		
9h	Submersible Pumps	2	EA		
9i	Site Restoration	1	LS		
10	LS 54 Installation				
10a	Demolition	1	LS		
10b	Bypass	1	LS		
10c	Cast in Place Concrete	1	LS		
10d	Auger Cast Piles	1	LS		
10e	Additional Auger Cast Pile Depth	5	LF		
10f	Platform Installation	1	LS		
10g	Electrical Improvements	1	LS		
10h	Submersible Pumps	2	EA		
10i	Site Restoration	1	LS		

UNIT PRICE PROPOSAL (continued)

ITEM NO.	DESCRIPTION	EST. QUANT.	UNIT	UNIT PRICE	EXTENDED PRICE
11	LS 55 Installation				
11a	Demolition	1	LS		
11b	Bypass	1	LS		
11c	Cast in Place Concrete	1	LS		
11d	Auger Cast Piles	1	LS		
11e	Additional Auger Cast Pile Depth	5	LF		
11f	Platform Installation	1	LS		
11g	Electrical Improvements	1	LS		
11h	Submersible Pumps	2	EA		
11i	Site Restoration	1	LS		
12	LS 88 Installation				
12a	Demolition	1	LS		
12b	Bypass	1	LS		
12c	Cast in Place Concrete	1	LS		
12d	Auger Cast Piles	1	LS		
12e	Additional Auger Cast Pile Depth	5	LF		
12f	Platform Installation	1	LS		
12g	Electrical Improvements	1	LS		
12h	Submersible Pumps	2	EA		
12i	Site Restoration	1	LS		

UNIT PRICE PROPOSAL (continued)

ITEM NO.	DESCRIPTION	EST. QUANT.	UNIT	UNIT PRICE	EXTENDED PRICE
13	LS 97 Installation				
13a	Demolition	1	LS		
13b	Bypass	1	LS		
13c	Cast in Place Concrete	1	LS		
13d	Auger Cast Piles	1	LS		
13e	Additional Auger Cast Pile Depth	5	LF		
13f	Platform Installation	1	LS		
13g	Electrical Improvements	1	LS		
13h	Submersible Pumps	2	EA		
13i	Site Restoration	1	LS		
14	Owner's Contingency	1	LS	\$200,000.00	\$200,000.00
TOTAL:					

Respectfully submitted,

Contractor
(Individual____) (Partnership____) or (Corporation____)

(SEAL)

Signed _____

Name (print) _____

Title _____

Address _____

City/State _____

Telephone _____

Fax _____

Email _____

DATE:

NOTE: The legal status of the bidder, whether as an individual, partnership or corporation, must be indicated above, and all pertinent information as required of the Specifications must be furnished.

SIMILAR PROJECT EXPERIENCE

DATE: _____

PROJECT IDENTIFICATION:

CITY OF SANIBEL

POST HURRICANE IAN LIFT STATION CONTROL PANEL AND PLATFORM IMPROVEMENTS - PHASE 1

List at least five (5) similar projects completed in the last ten (10) years that indicate the experience and qualifications of Bidder relevant to this project. Similar projects include:

- Wastewater lift station rehabilitation including pump and control panel removal and replacement
- Installation of auger cast piles and cast in place concrete
- Installation of aluminum platforms

At least one (1) project should include temporary bypass pumping and preparation of an approved maintenance of operations plan.

Bidder must include references from the respective clients in the fields below. Information should include Owner's name with contact person; description of work including Bidder's responsibilities; original contract price; final contract price; original contract time; actual time to complete the project; and any relevant circumstances or conditions about the project.

PROJECT NAME: _____

OWNER'S NAME: _____

CONTACT: _____ PHONE: _____

PROJECT DESCRIPTION: _____

ORIGINAL CONTRACT AMOUNT: \$ _____

FINAL CONTRACT AMOUNT: \$ _____

NUMBER AND DOLLAR AMOUNT OF CHANGE ORDERS: _____

ORIGINAL CONTRACT TIME (Substantial Completion): _____

ACTUAL TIME TO COMPLETE (Substantial Completion): _____

OTHER RELEVANT INFORMATION: _____

PROJECT NAME: _____

OWNER'S NAME: _____

CONTACT: _____ PHONE: _____

PROJECT DESCRIPTION: _____

ORIGINAL CONTRACT AMOUNT: \$ _____

FINAL CONTRACT AMOUNT: \$ _____

NUMBER AND DOLLAR AMOUNT OF CHANGE ORDERS: _____

ORIGINAL CONTRACT TIME (Substantial Completion): _____

ACTUAL TIME TO COMPLETE (Substantial Completion): _____

OTHER RELEVANT INFORMATION: _____

PROJECT NAME: _____

OWNER'S NAME: _____

CONTACT: _____ PHONE: _____

PROJECT DESCRIPTION: _____

ORIGINAL CONTRACT AMOUNT: \$ _____

FINAL CONTRACT AMOUNT: \$ _____

NUMBER AND DOLLAR AMOUNT OF CHANGE ORDERS: _____

ORIGINAL CONTRACT TIME (Substantial Completion): _____

ACTUAL TIME TO COMPLETE (Substantial Completion): _____

OTHER RELEVANT INFORMATION: _____

PROJECT NAME: _____

OWNER'S NAME: _____

CONTACT: _____ PHONE: _____

PROJECT DESCRIPTION: _____

ORIGINAL CONTRACT AMOUNT: \$ _____

FINAL CONTRACT AMOUNT: \$ _____

NUMBER AND DOLLAR AMOUNT OF CHANGE ORDERS: _____

ORIGINAL CONTRACT TIME (Substantial Completion): _____

ACTUAL TIME TO COMPLETE (Substantial Completion): _____

OTHER RELEVANT INFORMATION: _____

PROJECT NAME: _____

OWNER'S NAME: _____

CONTACT: _____ PHONE: _____

PROJECT DESCRIPTION: _____

ORIGINAL CONTRACT AMOUNT: \$ _____

FINAL CONTRACT AMOUNT: \$ _____

NUMBER AND DOLLAR AMOUNT OF CHANGE ORDERS: _____

ORIGINAL CONTRACT TIME (Substantial Completion): _____

ACTUAL TIME TO COMPLETE (Substantial Completion): _____

OTHER RELEVANT INFORMATION: _____

SPECIMEN FORM OF CONTRACT

THIS CONTRACT, made this _____ day of _____, 2026, by and between THE CITY OF SANIBEL, FLORIDA, hereinafter called "OWNER", and _____ a Florida profit corporation, hereinafter called "CONTRACTOR".

WITNESSETH: That for and in consideration of the covenants set forth below and other good and valuable consideration, the sufficiency and receipt of which is acknowledged, OWNER and CONTRACTOR hereby agree as follows:

1. The term "CONTRACT DOCUMENTS" means and includes the following, all of which are incorporated herein and made part of the CONTRACT:
 - A. Project Manual for **"Post Hurricane Ian Lift Station Control Panel and Platform Improvements – Phase 1"** dated March 2, 2026, including, without limitation, all General Specifications, General Conditions, Special Provisions, Required Contract Provisions, Technical Specifications, and Appendices
 - B. Bidding Documents, including Advertisement, Information to Bidders, and Addenda
 - C. Bid Drawings for **"Post Hurricane Ian Lift Station Control Panel and Platform Improvements – Phase 1"** dated March 2, 2026.
 - D. CONTRACTOR'S Proposal in response to ITB-UT-2-2026/BS
 - E. This CONTRACT
 - F. Performance and Payment Bond
 - G. Notice of Award
 - H. Notice to Proceed
 - I. Change Order(s)
2. The CONTRACTOR will commence and complete the construction which includes:

"Post Hurricane Ian Lift Station Control Panel and Platform Improvements – Phase 1" as described in the CONTRACT DOCUMENTS (the "WORK")
3. The CONTRACTOR will furnish all of the material, supplies, tools, equipment, labor and other services necessary for the completion of the WORK.
4. The CONTRACTOR will commence the WORK within six calendar days after date of the NOTICE TO PROCEED and will complete the same with within **TWO HUNDRED SEVENTY (270)** calendar days after notice to proceed, unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.
5. The CONTRACTOR agrees to perform all of the WORK in accordance with the CONTRACT DOCUMENTS for the sum of \$_____ said amount being the total "unit price sum" as listed on the Contractor's proposal form as submitted for this project.
6. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.
7. The CONTRACT DOCUMENTS embody the entire agreement of CONTRACTOR and OWNER regarding the Work. No deviation from the CONTRACT DOCUMENTS will be allowed, honored or compensated unless accompanied by a fully executed change order.

8. This CONTRACT shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns; however, CONTRACTOR shall not assign or otherwise transfer its rights, duties or obligations under this CONTRACT without prior written consent of OWNER.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in counterparts each of which shall be deemed an original on the date first above written.

(SEAL)

OWNER City of Sanibel

ATTEST _____

By _____

Name _____

Name _____

Title _____

Title _____

(SEAL)

CONTRACTOR: _____

ATTEST _____

By _____

Name _____

Name _____

Title _____

Title _____

Email _____

Approved as to form

City Attorney

SPECIMEN FORM OF CONTRACT
PERFORMANCE AND PAYMENT BOND

BY THIS BOND, WE

(Name of Contractor)

(Address of Contractor)

A _____, as principal, and
(Corporation, Partnership, or Individual)

(Name of Surety)

(Address of Surety)

a Corporation, as Surety, are bound to

(Name of Owner)

(Address of Owner)

herein called Owner, in the sum of _____
_____ Dollars, (\$_____)

for payment of which we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs the Contract dated _____, **"Year"** between Principal and Owner for construction of:

the contract being made a part of this bond by reference, at the times and in the manner prescribed in the contract and;

2. Promptly makes payments to call claimants, as defined in Section 255.05 (1), Florida Statutes, supplying Principal with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the work provided for in the Contract and;
3. Pays Owner all losses, damages, expenses, costs, and attorney's fees, including appellate proceedings, that Owner sustains because of a default by Principal under the Contract and;
4. Performs the guarantee of all work and materials furnished under the Contract for the time specified in the Contract; then this bond is void; otherwise it remains in full force.

Any changes in or under the Contract Documents and compliance or non-compliance with any formalities connected with the Contract or the changes does not affect Surety's obligation under this bond.

DATED ON _____, **"Year"**.

ATTEST:

Principal

By _____

(Principal) Secretary

(SEAL)

(Witness as to Principal)

(Address)

ATTEST:

(Surety) Secretary

Surety

By _____
Attorney-in-Fact

(SEAL)

(Witness as to Surety)

(Address)

(Address)

NOTE: Date of bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute Bond.

IMPORTANT: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

PERIODIC ESTIMATE FOR PARTIAL PAYMENT

PROJECT: _____ OWNER: _____

ENGINEER: _____ CONTRACTOR: _____

PERIODIC ESTIMATE NO. _____ FOR PERIOD _____ TO _____

ANALYSIS OF ADJUSTED CONTRACT AMOUNT TO DATE

- A. Original contract amount (Col.6) _____
- B. Plus: Change Order Additions (Col.13) _____
- C. Less: Change Order Deductions (Col.16) _____
- D. Adjust contract amount to date _____

ANALYSIS OF WORK PERFORMED

- 1. Amount of original contract work performed to date (Col.8) _____
- 2. Change Order work performed to date _____
- 3. Total amount of work performed to date _____
- 4. Add: Materials stored at close of this period
(Attach detailed schedule _____)
- 5. Less: Amount retained _____ percent _____
- 6. Net amount earned on contract work to date _____
- 7. Less: Amount of previous payments _____
- 8. Balance due this payment _____

CERTIFICATION OF CONTRACTOR

According to the best of my knowledge and belief, I certify that all items and amounts shown on the face of this periodic estimate are correct; that all work has been performed and/or material supplied in full accordance with the Terms and Conditions of the Contract, and/or duly authorized deviations, substitutions, alterations, and/or additions; that this estimate is as true and correct statement of the contract account up to and including the last day of the period covered by this Periodic Estimate, and that no part of the "Balance Due This Payment" has been received:

(Contractor)

By _____
(Authorized Representative)

Title _____

RECOMMENDATION OF ENGINEER

In accordance with the contract and this Periodic Estimate for Partial Payment, the Contractor is entitled to payment in the amount shown above.

DATE: _____

By _____

PERIODIC ESTIMATE FOR PARTIAL PAYMENT

PROJECT:

OWNER:

ENGINEER:

CONTRACTOR:

PERIODIC ESTIMATE NO. _____ FOR PERIOD _____ TO _____

CONTRACT AMOUNT						COMPLETED TO DATE		
ITEM NO.	DESCRIPTION OF ITEM	QUANTITY	UNIT OF MEAS.	COST PER UNIT	TOTAL AMOUNT	QUANTITY	AMOUNT	% COM- PLETE
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

TOTAL

PERIODIC ESTIMATE FOR PARTIAL PAYMENT

PROJECT:

OWNER:

ENGINEER:

CONTRACTOR:

PERIODIC ESTIMATE NO. _____ FOR PERIOD _____ TO _____

SCHEDULE OF CHANGE ORDERS

CHANGE ORDER					ADDITIONS	
					AMOUNT COMPLETED TO DATE	DEDUCTIONS
NO. (10)	DATE (11)	DESCRIPTION (12)	AMOUNT (13)	PERCENT COMPLETE (14)	(15)	(16)

TOTAL

CONTRACTOR'S LETTERHEAD

CONTRACTOR'S CERTIFICATE

I, _____, the duly qualified, acting and authorized agent of the Contractor, _____ on the project, do hereby certify that we have performed all of the work set forth in strict accordance with the plans, specifications, laws and ordinances applicable thereto and do further certify that all materials and equipment listed herein have been paid for in full as allowed on all prior Estimates and, if requested to do so, will show evidence of payment for same in writing before the final payment of this Estimate No. _____.

I further certify (if this is a Final Estimate) that the amount received hereunder is considered compensation and final payment in full for all work performed under the Contract, including any amendments thereto, and upon payment of said sum, hereby release the Owner, its employees, agents, and representatives in accordance with said Contract. We further certify that we fully guarantee all work performed hereunder for a period of twelve months from the date of payment for the Final Estimate, (in accordance with the terms of our original Contract and all Amendments thereto), during which time all terms and conditions of the original Contract Documents shall remain in full force and effect, including the insurance requirements, Hold Harmless Agreement and Indemnifying Agreements as contained in said Contract Documents.

CERTIFIED TO FOR PAYMENT ON THIS _____ DAY OF _____, "Year".

CONTRACTOR'S SEAL

Contractor

BY: _____

TITLE: _____

Sworn to before me this _____ day of _____, "Year".

NOTARY

My commission expires: _____:

(NOTARY SEAL)

PROJECT: _____

OWNER: City of Sanibel

CHANGE ORDER NO. _____

TO: _____

You are hereby authorized to make the following additions and/or deductions to your contract amount.

	PREVIOUS CONTRACT AMOUNT	NET CHANGE		REVISED		CONTRACT AMOUNT
		INCREASE	DECREASE	(DEDUCT)	(ADD)	
TOTAL:	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____	\$ _____

Description of Change: Add Deduct

RECOMMENDED:

APPROVED:

OWNER _____

By _____ By _____

Title _____ Date _____ Title _____ Date _____

ACCEPTED:

CONTRACTOR _____

BY _____

Title _____ Date _____

GENERAL CONDITIONS OF THE CONTRACT

SECTION 2.1 - CONTRACT DOCUMENTS

2.1.01 GENERAL:

The Contract Documents comprise the following general classifications of documents, including all additions, deletions, modifications, or other documents incorporated therein:

1. Bidding Documents
2. Contract
3. General Conditions of the Contract
4. Special Conditions
5. Specifications

2.1.02 BIDDING DOCUMENTS:

The Bidding Documents are issued by the OWNER to assist bidders in preparing their proposal include:

1. Advertisement
2. Information for Bidders
3. Proposal: The offer of a Bidder to perform the work described by the Contract Documents made out and submitted on the prescribed Proposal Form, properly signed and guaranteed.
4. Addenda to Contract Documents: Any addenda issued during the time of bidding, or forming a part of the Contract Documents loaned to the Bidder for the preparation of his Proposal, shall be covered in the Proposal, and shall be made a part of the Contract. Receipt of each Addendum shall be acknowledged in the Proposal.

2.1.03 CONTRACT:

The Contract defines the "Contract Documents" and covers the performance of the work described in the Contract Documents including all supplemental addenda thereto and all general and special provisions pertaining to the work or materials.

2.1.04 GENERAL CONDITIONS OF THE CONTRACT:

The General Conditions of the Contract outline certain general responsibilities of the OWNER and the CONTRACTOR (who are the parties to the Contract) and those responsibilities delegated by the OWNER to the Engineer who acts as the agent of the OWNER.

1. Definitions: Wherever the words hereinafter defined, or pronouns used in their stead, occur in these specifications and contract documents, they shall have the meanings herein given:
 - A. The word "OWNER" shall mean the municipality, person, firm, or corporation as specified in the Advertisement for Bids, for whom the work is to be done.

- B. The word "CONTRACTOR" shall mean the person, firm, or corporation entering into a contract with the OWNER to construct and complete the work as herein specified, set out and shown.
- C. The word "sub-contractor" shall mean a person, firm, or corporation, other than a CONTRACTOR, supplying labor and materials or labor for work at the site of the project.
- D. The word "Engineer" shall mean the project engineer as designated by the OWNER.

2.1.05 SPECIAL CONDITIONS:

Special Conditions are special provisions not included in the General Conditions of the Contract, which apply to this specific project.

2.1.06 DRAWINGS AND SPECIFICATIONS:

The intent of the Drawings and Specifications is that the CONTRACTOR shall furnish all labor, materials, equipment, and transportation necessary for the proper execution of the work, unless specifically noted otherwise. The CONTRACTOR shall do all the work outlined in the Contract Documents and all incidental work necessary to complete the project in a substantial and acceptable manner, and fully complete the work or improvement, operational and ready for occupancy by the OWNER.

1. Discrepancies: Any discrepancies found between the Drawings and Specifications and site conditions or any inconsistencies or ambiguities in the Drawings and Specifications shall be immediately reported to the Engineer, who shall promptly correct such inconsistencies or ambiguities in writing. Any work done by the CONTRACTOR after his discovery of such discrepancies, inconsistencies, or ambiguities shall be done at the CONTRACTOR'S risk.
2. Adequacy: Responsibility for adequacy of the design and for sufficiency of the Drawings and Specifications shall be borne by the OWNER. The complete requirements of the work to be performed under the Contract shall be set forth in Drawings and Specifications to be supplied by the OWNER through the Engineer or by the Engineer as representative of the OWNER. The Drawings and Specifications shall be considered inseparable documents; and in considering them, the CONTRACTOR shall rely upon both instruments in order to perform the work in accordance with their combined intent.
3. Additional Instructions: Further instructions may be issued by the Engineer during the progress of the work by means of Drawings, or otherwise to make more clear or specific the Drawings and Specifications or as may be necessary to explain or illustrate changes in the work to be done. Where said correction of errors or omissions, except as provided in the next two paragraphs below, adds to the amount of work to be done by the CONTRACTOR, compensation for said additional work shall be made under the item for Extra Work except where the additional work may be classed under some item of work for which a unit price is included in the proposal.
4. The fact that specific mention of the fixture, or of any part of work, is omitted in the specifications, whether intentionally or otherwise, when the same is clearly shown or indicated on the drawings, or is usually and customarily required to fully complete such work as is specified herein, will not entitle the CONTRACTOR to consideration in the matter

of any claim for extra compensation, but the said fixtures or work or both must be installed or done the same as if called for by both drawings and specifications.

5. All work indicated on the drawings and not mentioned in the specifications or vice versa, and all work and material usual and necessary to make work complete in all its parts, whether or not they are indicated on the drawings or mentioned in the specifications, shall be furnished and executed the same as if they were called for by both the drawings and specifications.
6. Plans and Specifications: The Engineer may furnish the CONTRACTOR up to 5 sets of plans and specifications covering this project at no cost to the CONTRACTOR. For each set of plans and specifications furnished to the CONTRACTOR, or any of his sub-contractor's, in excess of this number, the CONTRACTOR shall be billed at actual cost of printing and delivery.
7. Dimensions: Only figured dimensions on the Drawings will be used by the CONTRACTOR. Where the work of the CONTRACTOR is affected by finish dimensions, these shall be determined by the CONTRACTOR at the site, and he shall assume the responsibility, therefore.

2.1.07 CONTRACT DOCUMENTS FOR THE USE OF THE ENGINEER:

The CONTRACTOR shall maintain one complete set of the Contract Documents at the job site which shall always be available to the Engineer and upon which the CONTRACTOR shall record all changes and field adjustments. The CONTRACTOR shall keep one copy of plans, shop drawings, and supplemental drawings at the site in good order and annotated to show all changes made during construction. An as-built survey of the project shall be performed and submitted to OWNER prior to final acceptance. The survey shall be conducted in accordance with the standards set forth in Chapter 472 of the Florida Statutes and the Minimum Technical Standards for such survey as specified in Chapter 61G17 of the Florida Administrative Code. The cost of the survey shall be borne by the CONTRACTOR.

SECTION 2.2 - OWNER-CONTRACTOR-ENGINEER RELATIONS

2.2.01 OWNER'S RIGHTS AND RESPONSIBILITIES:

1. Lands by OWNER: The OWNER will provide the lands shown on the Drawings or described in the Specifications upon which the work under the Contract is to be performed and to be used for right-of-way for access. Any delay in furnishing these lands by the OWNER will be deemed proper for adjustment in the Contract Amount and in the time of completion.
2. Base Lines and Bench Marks: Unless otherwise specified, the OWNER will establish base lines, and bench marks.
3. OWNER'S Right to Correct Deficiencies: Upon failure to perform the work in accordance with the Contract Documents, including any requirements with respect to the Schedule of Completion, and after five days' written notice to the CONTRACTOR, the OWNER may, without prejudice to any other remedy he may have, correct such deficiencies in work intended to become a permanent part of the project. The cost to correct such deficiencies may be deducted from the payment due the CONTRACTOR.

4. Suspension of Work by OWNER: The OWNER shall have the authority to suspend the work, wholly or in part, for such period or periods as he may deem necessary due to unsuitable weather or such other conditions as are considered unfavorable to carry out the provisions of the Contract, or to supply materials meeting the requirements of the Contract Documents.
 - A. Notice: The work or any portion thereof may be suspended at any time by the OWNER provided that he gives the CONTRACTOR five days' notice of suspension which shall set forth the date on which work is to be resumed. The CONTRACTOR shall resume the work upon written notice from the OWNER and within ten days after the date set forth in the notice of suspension. If the OWNER does not give written notice to resume work within ten days of the date fixed in the notice of suspension, the CONTRACTOR may abandon that portion of the work so suspended and shall be entitled to payment in accordance with Paragraph 2.6.09, Payment for Work Suspended by the OWNER.
 - B. In case of any suspensions, the time in which the CONTRACTOR is required to complete the work shall be extended as many working days as the same is suspended; provided, however, that if the work is suspended on account of failure on the part of the CONTRACTOR to comply with specifications, such extensions of time will not be allowed.
5. OWNER'S Right to Terminate Agreement and Complete the Work: The OWNER shall have the right to terminate his agreement with the CONTRACTOR after giving ten days' written notice of termination to the CONTRACTOR in the event of any default by the CONTRACTOR.
 - A. Default by CONTRACTOR: It shall be considered a default by the CONTRACTOR whenever he shall:
 - (i) Declare bankruptcy, become insolvent, or assign his assets for the benefit of his creditors.
 - (ii) Disregard or violate provisions of the Contract Documents or fail to prosecute the work according to the agreed Schedule of Completion, including extensions thereof.
 - (iii) Fail to provide a qualified superintendent, competent workmen or sub-contractor's, or proper materials, or fail to make prompt payment, therefore.
 - B. Completion by the OWNER: In the event of termination of the Agreement by the OWNER because of default by the CONTRACTOR, the OWNER may take possession of the work and of all materials and equipment thereon and may finish the work by whatever method and means he may select.

2.2.02 CONTRACTOR'S RIGHTS AND RESPONSIBILITIES:

All work shall be done in strict accordance with the Contract Documents. Observations, construction reviews, tests, recommendations or approvals by the Engineer or persons other than the CONTRACTOR, shall in no way relieve the CONTRACTOR of his obligation to complete all work in accordance with the Contract Documents. All work shall be done under the direct supervision of the

CONTRACTOR. The CONTRACTOR shall be responsible for construction means, methods, techniques and procedures, and for providing a safe place for the performance of the work by the CONTRACTOR, Sub-contractor's, suppliers and their employees, and for access use, work or occupancy by all authorized persons. The CONTRACTOR shall be responsible for all obligations prescribed as employer obligations under Chapter XVII of Title 29, Code of Federal Regulations, Part 1926, otherwise known as "Safety and Health Regulations for Construction".

1. Lands by CONTRACTOR: Any land and access thereto not specifically shown to be furnished by the OWNER that may be required for temporary construction facilities or for storage of materials shall be provided by the CONTRACTOR with no liability to the OWNER. The CONTRACTOR shall confine his apparatus and storage to such additional areas as he may provide at his expense.
 - A. Private and Public Property: The CONTRACTOR shall not enter upon private property for any purpose without obtaining permission; and he shall be responsible for the preservation of all public property, trees, monuments, structures, and improvements, along and adjacent to the street and/or right-of-way and shall use every precaution necessary to prevent damage or injury thereto. He shall use suitable precautions to prevent damage to pipes, conduits, and other underground structures, and shall protect carefully from disturbance or damage all monuments and property marks until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until directed.
2. Surveys: Based upon the information provided by the OWNER, the CONTRACTOR shall develop and make all detailed surveys necessary for construction, including slope stakes, batter boards, stakes for pile locations and other working point lines, and elevations. The CONTRACTOR shall carefully preserve bench marks, reference points and stakes; and, in the case of destruction thereof by the CONTRACTOR or resulting from his negligence, the CONTRACTOR shall be charged with the expense and damage resulting there from and shall be responsible for any mistakes that may be caused by the loss or disturbance of such bench marks, reference points, and stakes.
3. Public Utilities: The elevation and location of all public utilities shown on the Drawings were taken from existing public records. It shall be the duty of the CONTRACTOR to make final and exact determination of the location and extent of all utilities, and he will be liable for any expense resulting from damage to them.
4. Superintendent: A qualified superintendent, who is acceptable to the OWNER, shall be maintained on the work and give efficient supervision to the work until its completion. The superintendent shall have full authority to act in behalf of the CONTRACTOR, and all instruction given to the superintendent shall be considered as given to the CONTRACTOR. It shall be the responsibility of this CONTRACTOR's superintendent to coordinate the work of all the sub-contractor's. The superintendent shall be present on the site at all times required to perform adequate supervision and coordination.
5. Subcontracts: At the time set forth in the Contract Documents or when requested by the OWNER, the CONTRACTOR shall submit in writing for review of the OWNER the names of the sub-contractor's proposed for the work. Sub-contractor's may not be changed, except at the request or with the approval of the OWNER. The CONTRACTOR is responsible to the OWNER for the acts and deficiencies of his sub-contractor's, and of their direct and indirect employees, to the same extent as he is responsible for the acts and deficiencies of his employees. The Contract Documents shall not be construed as creating

any contractual relation between any sub-contractor and the OWNER. The CONTRACTOR shall bind every sub-contractor by the terms of the Contract Documents.

A. For convenience of reference and to facilitate the letting of Contracts and Subcontracts, the Specifications are separated into titled sections. Such separation shall not, however, operate to make the OWNER or the Engineer an arbiter to establish limits to the contracts between CONTRACTOR and sub-contractor.

6. CONTRACTOR'S Right to Suspend Work or Terminate Agreement: CONTRACTOR may suspend work or terminate his Agreement with the OWNER upon ten days' written notice to the OWNER for any of the following reasons:

A. If an order of any court or other public authority caused the work to be stopped or suspended for a period of 90 days through no act or fault of the CONTRACTOR or his employees.

B. If the OWNER should fail to pay the CONTRACTOR any sum within 45 days after its award by arbitrators.

7. Work During an Emergency: The CONTRACTOR shall perform any work and shall furnish and install any materials and equipment necessary during an emergency endangering life or property. In all cases, he shall notify the OWNER of the emergency as soon as practicable, but he shall not wait for instruction before proceeding to properly protect both life and property.

2.2.03 RESPONSIBILITY OF THE ENGINEER:

The Engineer shall decide questions which may arise as to the quality and acceptability of materials furnished, work performed, rate of progress of work, interpretation of Drawings and Specifications, and all questions as to the acceptable fulfillment of the Agreement on the part of the CONTRACTOR. The duties and responsibilities of the Engineer as set forth herein shall not be extended, except through written consent of the Engineer and the OWNER.

1. Observation of the Work: All materials and each part or detail of the work shall always be subject to observation by the Engineer and the OWNER; and the CONTRACTOR will be held strictly to the intent of the Contract Documents in regard to quality of materials, workmanship, and the diligent execution of the Contract. Observations may be made at the site or at the source of material supply, whether mill, plant, or shop. The Engineer shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the CONTRACTOR as is required to make his observations and construction review.

2. Acceptability of Work: The Engineer's decision as to the acceptability or adequacy of the work shall be final and binding upon the CONTRACTOR. The CONTRACTOR agrees to abide by the Engineer's decision relative to the performance of the work.

3. Engineer's Decisions: All claims of the OWNER or the CONTRACTOR shall be presented to the Engineer for decision which shall be final, except in cases where time and/or financial considerations are involved, which shall be subject to arbitration.

2.2.04 ORAL AGREEMENTS:

No oral order, objection, claim, or notice by any party to the others shall affect or modify any of the terms or obligations contained in any of the Contract Documents; and none of the provisions of the Contract Documents shall be held to be waived or modified by reason of any act whatsoever, other than a definitely agreed waiver or modification thereof in writing; and no evidence shall be introduced in any proceeding of any other waiver or modification.

2.2.05 OBSERVATION OF COMPLETED WORK

The CONTRACTOR shall remove or uncover such portions of the completed work as may be directed by the OWNER at any time before acceptance of the work. After examination, the CONTRACTOR shall restore the work to the standard required by the Contract Documents. Should the work thus exposed or examined prove acceptable, the uncovering or removing and the restoring of the work shall be paid for as Extra Work; but should the work exposed or examined prove unacceptable, the uncovering, removing, and restoring of the work shall be at the CONTRACTOR'S expense.

2.2.06 WORK BY OWNER OR OTHER CONTRACTOR'S:

1. Separate Contracts: The OWNER may let other contracts in connection with the work of the CONTRACTOR. The CONTRACTOR shall cooperate with other CONTRACTOR'S regarding storage of materials and execution of their work. It shall be the CONTRACTOR'S responsibility to inspect all work by other CONTRACTOR'S affecting his work and to report to the OWNER any irregularities which will not permit him to complete his work in a satisfactory manner. His failure to notify the OWNER of such irregularities shall indicate the work of other CONTRACTOR'S has been satisfactorily completed to receive his work. The CONTRACTOR shall not be responsible for defects of which he could not have known, which develop in the work of others after the work is completed. It shall be the responsibility of the CONTRACTOR to measure the completed work in place and report to the OWNER immediately any difference between completed work by others and the provisions of the Contract Documents.
2. Written Agreement: Whenever work being done by the OWNER through his own employees or through other CONTRACTOR'S is contiguous to work covered by the Contract Documents, the respective rights of the various interests involved shall be established by written agreement to secure the completion of the various portions of the work in general harmony.

2.2.07 SECTION DELETED

2.2.08 NIGHT AND SUNDAY WORK:

No night or Sunday work requiring the presence of an Engineer or Inspector will be permitted, except in case of emergency and then only to such an extent as it is absolutely necessary and with written approval of the Engineer, provided that the clause shall not operate in case of a gang organized for regular and continuous night work, and on work which, in the opinion of the Engineer, can be performed satisfactorily at night or on Sunday.

SECTION 2.3 - MATERIALS, EQUIPMENT, AND WORKMANSHIP

2.3.01 MATERIALS AND EQUIPMENT:

The materials and equipment installed in the work shall meet the requirements of the Contract Documents, and no materials or equipment shall be ordered until reviewed by the Engineer. All materials and equipment not otherwise specifically indicated shall be furnished by the CONTRACTOR. The CONTRACTOR shall guarantee all materials and equipment he provides in accordance with Paragraph 2.3.08.

1. Substitutions: In order to establish standards of quality, the Engineer has, in the detailed Specifications, referred to certain products by name and catalog number. This procedure is not to be construed as eliminating from competition other products of equal or better quality by other manufacturers where fully suitable in design.
 - A. The CONTRACTOR shall furnish the complete list of proposed desired substitutions prior to signing of the Contract, together with such engineering and catalog data as the Engineer may require.
 - B. The CONTRACTOR shall abide by the Engineer's recommendation when proposed substitute materials or items of equipment are not recommended for installation and shall furnish the specified material or item of equipment in such case. All proposals for substitutions shall be submitted in writing by the General CONTRACTOR and not by individual trades or material suppliers. The Engineer will review proposed substitutions and make his recommendations in writing within a reasonable time.
2. Space Requirements: It shall be the responsibility of the CONTRACTOR to ensure that materials and equipment to be furnished fit the space available. He shall make necessary field measurements to ascertain space requirements, including those for connections and shall order such sizes and shapes of equipment that the final installation shall suit the true intent and meaning of the Contract Documents.
3. Arrangement: Where equipment requiring different arrangement of connections from those shown is approved, it shall be the responsibility of the CONTRACTOR to install the equipment to operate properly, and in harmony with the intent of the Contract Documents, and to make all changes in the work required by such arrangement.
4. Unacceptable Materials and Equipment: Materials and equipment which do not conform to the requirements of the Contract Documents, are not equal to samples reviewed by the Engineer, or are in any way unsatisfactory or unsuited to the purpose for which they are intended, shall not be furnished nor installed.
5. Storage: Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the work. When considered necessary, they shall be placed on wooden platforms or other hard, clean surfaces, and not on the ground, and/or they shall be placed under cover. Stored materials and equipment shall be located to facilitate prompt inspection. Private property shall not be used for storage purposes without the written permission of the OWNER or lessee.

6. Manufacturer's Directions: Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer.

2.3.02 SAMPLES:

All samples called for in the Specifications or required by the Engineer shall be furnished by the CONTRACTOR and shall be submitted to the Engineer for his review. Samples shall be furnished so as not to delay fabrication, allowing the Engineer reasonable time for the consideration of the samples submitted.

1. Samples for Tests: CONTRACTOR shall furnish such samples of material as may be required for examination and test. All samples of materials for tests shall be taken according to standard methods or as provided in the Contract Documents.
2. CONTRACTOR'S Guaranty: All samples shall be submitted by the CONTRACTOR with a covering letter indicating that such samples are recommended by the CONTRACTOR for the service intended and that the CONTRACTOR'S Guaranty will fully apply.
3. All materials, equipment, and workmanship shall be in accordance with samples guaranteed by the CONTRACTOR and reviewed by the Engineer.

2.3.03 SHOP DRAWINGS:

The CONTRACTOR shall provide shop drawings, setting schedules and such other drawings as may be necessary for the prosecution of the work in the shop and in the field as required by the Drawings, Specifications, or the Engineer's instructions. Deviations from the Drawings and Specifications shall be called to the attention of the Engineer at the time of the first submission of shop drawings and other drawings for consideration. The Engineer's review of any drawings shall not release the CONTRACTOR from responsibility for such deviations. Shop drawings shall be submitted according to a schedule prepared jointly by the CONTRACTOR and the Engineer.

1. CONTRACTOR'S Certification: When submitted for the Engineer's review, shop drawings shall bear the CONTRACTOR'S certification that he has reviewed, checked, and approved the shop drawings; that they are in harmony with the requirements of the Project and with the provisions of the Contract Documents; and that he has verified all field measurements and construction criteria, materials, catalog numbers, and similar data. CONTRACTOR shall also certify that the work represented by the shop drawings is recommended by the CONTRACTOR and the CONTRACTOR'S Guaranty will fully apply.

2.3.04 EQUIPMENT DATA:

The CONTRACTOR shall submit for the Engineer's review complete catalog data for every manufactured item of equipment and all components to be used in the work, including specific performance data, material description, rating, capacity, working pressure, material gage or thickness, brand name, catalog number, and general type. This submission shall be compiled by the CONTRACTOR and reviewed by the Engineer before any of the equipment is ordered.

1. Index: Each data sheet or catalog in the submission shall be indexed according to specification section and paragraph for each reference.

2. Relation to Contract Documents: Catalog data for equipment reviewed by the Engineer shall not supersede the Engineer's Contract Documents. The review of the Engineer shall not relieve the CONTRACTOR from responsibility for deviations from Drawings or Specifications, unless he has in writing called the Engineer's attention to such deviations at the time of submission, nor shall it relieve him from responsibility for error of any sort in the items submitted. The CONTRACTOR shall check the work described by the catalog data with the Engineer's Contract Documents for deviations and errors.
3. CONTRACTOR'S Certification: Equipment data shall be submitted by the CONTRACTOR with a covering letter indicating that he has reviewed, checked and approved the data submitted; that they are in harmony with the requirements of the project and with the provisions of the Contract Documents; and that he has verified all field measurements and construction criteria, materials, catalog numbers, and similar data. CONTRACTOR shall also certify that the work represented by the shop drawings is recommended by the CONTRACTOR and that his Guaranty will fully apply.

2.3.05 REJECTED WORK AND MATERIALS:

Any defective work whether the result of poor workmanship, use of defective materials, damage through carelessness or any other cause shall be removed within ten days after written notice is given by the OWNER, and the work shall be re-executed by the CONTRACTOR. The fact that the Engineer may have previously overlooked such defective work shall not constitute an acceptance of any part of it.

1. Should the CONTRACTOR fail to remove rejected work or materials within ten days after written notice to do so, the OWNER may remove them and may store the materials.
2. Correction of faulty work after final payment shall be in accordance with Paragraph 2.5.12.

2.3.06 CUTTING AND PATCHING:

The CONTRACTOR shall do all necessary cutting and patching of the work that may be required to properly receive the work of the various trades or as required by the Drawings and Specifications to complete the structure. He shall restore all such cut or patched work as approved by the Engineer. Cutting of existing structure that may endanger the work, adjacent property, workmen, or the public shall not be done.

2.3.07 CHARACTER OF WORKMEN:

The CONTRACTOR shall always be responsible for the conduct and discipline of his employees and/or any sub-contractor or persons employed by sub-contractor's. All workmen must have sufficient knowledge, skill, and experience to perform properly the work assigned to them. Any foreman or workman employed by the CONTRACTOR or sub-contractor who does not perform his work in a skillful manner or appears to be incompetent or to act in a disorderly or intemperate manner shall, at the written request of the OWNER, be discharged immediately and shall not be employed again in any portion of the work without the approval of the OWNER.

2.3.08 GUARANTY:

The CONTRACTOR shall guarantee all materials and equipment furnished and work performed for a period of one year from the date of written acceptance of the work.

1. Correction of faulty work after final payment shall be as provided in Paragraph 2.5.12.

2.3.09 A.S.T.M. DESIGNATION:

Wherever the letters "A.S.T.M." are used in these specifications, it shall be understood as referring to the American Society for Testing Materials. When reference is made to a certain Designation Number of a specification or test as set out or given by the American Society of Testing Materials, it shall be understood to mean the current, up-to-date standard specification or tentative specification for that particular process, material, or test as currently published by that group.

SECTION 2.4 – INSURANCE, LEGAL RESPONSIBILITY, AND SAFETY

2.4.01 INSURANCE:

CONTRACTOR shall purchase and maintain such comprehensive general liability and other insurance as well as provide protection from claims set forth below which may arise out of or result from CONTRACTOR'S performance of the Work and CONTRACTOR'S other obligations under the Contract Documents, whether such performance is by CONTRACTOR, by any sub-contractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. All insurance policies shall be with insurers qualified to do business in the state of the Project location.

1. Types: The types of insurance the CONTRACTOR is required to obtain and maintain for the full period of the Contract will be: Workmen's Compensation and Employer's Liability, Comprehensive General Liability and Automobile Liability, U.S.L. & H. coverage (if applicable), Jones Act (if applicable) and an Excess Liability Umbrella Insurance as detailed in the following specifications.
2. Evidence: As evidence of specified insurance coverage, the OWNER may, in lieu of actual policies, accept a Certificate of Insurance on Accord Form 25 issued by the insurance carrier showing such policies in force for the specified period. Each policy or certificate will bear an endorsement or statement waiving right of cancellation or reduction in coverage without ten days notice in writing to be delivered by registered mail to the OWNER. Should any policy be canceled before final payment by the OWNER to the CONTRACTOR and the CONTRACTOR fails immediately to procure other insurance as specified, the OWNER reserves the right to procure such insurance and to deduct the cost thereof from any sum due the CONTRACTOR under this Contract.
3. Adequacy of Performance: Any insurance bearing on adequacy of performance shall be maintained after completion of the project for the full guaranty period. Should such insurance be canceled before the end of the guaranty period and the CONTRACTOR fails immediately to procure other insurance as specified, the OWNER reserves the right to procure such insurance and to charge the cost thereof to the CONTRACTOR.
4. Payment of Damages: Nothing contained in these insurance requirements is to be construed as limiting the extent of the CONTRACTOR'S responsibility for payment of damages resulting from his operations under this Contract.

2.4.02 COMPREHENSIVE GENERAL LIABILITY INSURANCE:

1. General liability insurance shall provide full comprehensive form coverage for both bodily injury and property damage. Such coverage shall include premises-operations, underground hazard, products/completed operations hazard, contractual insurance, broad

form property damage, independent CONTRACTOR'S, and personal injury. The limits for bodily injury shall be \$500,000 each occurrence and \$500,000 aggregate. The limits for property damage shall be \$100,000 each occurrence and \$100,000 aggregate.

2. Automobile liability insurance shall provide full comprehensive form coverage for both bodily injury and property damage. Such coverage shall include owned, hired, and non-owned vehicles. The limits for bodily injury shall be \$500,000 each person and \$500,000 each accident. The limits for property damage shall be \$100,000.
3. Excess liability insurance shall provide an umbrella form coverage for both bodily injury and property damage combined with a minimum limit of \$2,000,000.
4. Indemnity: Included in such insurance will be contractual coverage sufficiently broad to insure the OWNER, the Engineer, their consultants and each of their officers, agents, and employees as additional insured under the General Liability Policy. See Paragraph 2.4.05 below for provisions of Indemnity.

2.4.03 WORKMEN'S COMPENSATION INSURANCE:

CONTRACTOR'S shall provide the statutory Workmen's Compensation and Employer's Liability Insurance requirements of the most current and applicable state Workmen's Compensation Insurance Laws.

2.4.04 DELETED

2.4.05 INDEMNITY:

The CONTRACTOR (sub-contractor) hereinafter "Indemnitor", hereby agrees to indemnify, save and hold harmless, and defend at its own expense the Engineer, OWNER, their respective partners, agents, employees, and anyone else acting for or on behalf of any of them, and any other person or entity for whom any of them may be legally responsible (herein collectively called "Indemnities") from all claims, losses, damages, suits, costs and expenses, including attorneys' fees, or actions of any nature whatsoever which arise out of or are connected with, or are alleged to arise out of or be connected with, the Work to be performed herein; including without limiting the generality of the foregoing, all liability for damages, loss, claims, demands, and actions arising or alleged to arise from injury including death, damage to property including the loss of use thereof and consequential damages therefrom, or damages arising out of economic loss, to any person or entity including any Indemnatee or Indemnitor or its employees, servants and agents whether based upon, or claimed to be based upon, statutory (including without limiting the generality of the foregoing, workmen's compensation), contractual, tort or other liability of any Indemnatee whether or not caused, or alleged to be caused, in whole or in part, by the joint, several or sole negligence, breach of contract, breach of warranty, strict liability, or other breach of duty by any Indemnatee, its partners, employees, agents, and anyone else for or on behalf of any of them, or any other person for whom any Indemnatee may be responsible.

In the event more than one Indemnitor is responsible or alleged to be responsible in respect to an accident or occurrence covered by this indemnification, then all of such Indemnitor shall be jointly and severally responsible to the Indemnities for indemnification shall be settled by separate proceedings and without jeopardy to any Indemnatee.

The indemnity provided hereunder shall not include indemnification of the Engineer in respect to claims arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs, or specifications, or (2) the giving of or the failure to give directions or instructions by

the Engineer, his agents or employees; provided that such giving or failure to give is a primary cause of the injuries and damages.

If any part of these indemnity provisions is adjudged to be contrary to law, the remaining parts of these provisions shall in all other respects be and remain legally effective and binding. Moreover, these indemnity provisions shall not be construed to eliminate or in any way reduce any other indemnification or right which the Engineer and OWNER has by law.

2.4.06 WAIVER OF SUBROGATION:

The OWNER and the CONTRACTOR waive all rights against (1) each other and other sub-contractor's, agents, and employees of each other, and (2) the Engineer and separate CONTRACTOR'S, if any, and their sub-contractor's, agents, and employees, for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to this Section 2.4 or any other property insurance applicable to the work, except such rights as they may have to the proceeds of such insurance held by the OWNER as trustees. The OWNER or the CONTRACTOR, as appropriate, shall require of the Engineer, separate CONTRACTOR'S and sub-contractor's by appropriate agreements, written where legally required for validity, similar waivers each in favor of all other parties enumerated in this subparagraph 2.4.06.

2.4.07 PATENTS AND ROYALTIES:

If any design, device, material, or process covered by letters, patent or copyright is used by the CONTRACTOR, he shall provide for such use by legal agreement with the OWNER of the patent or a duly authorized licensee of such OWNER, and shall save harmless the OWNER and the Engineer from any and all loss or expense on account thereof, including its use by the OWNER.

2.4.08 PERMITS:

All permits and licenses (except as listed hereafter) necessary for the prosecution of the work shall be secured and paid for by the CONTRACTOR. The permits for construction within or across the property, rights-of-way, or easements of highways, railroads, gas lines, electric power transmission lines, water lines, telephone lines, telegraph lines, levees, or other utilities shall be secured and paid for by the OWNER. City of Sanibel Building Dept. permit fees shall be paid for by the OWNER.

2.4.09 LAWS TO BE OBSERVED:

The CONTRACTOR shall give all notices and comply with all Federal, State, and local laws, ordinances, and regulations in any manner affecting the conduct of the work, and all such orders and decrees as exist, or may be enacted by bodies or tribunals having any jurisdiction or authority over the work, and shall indemnify and save harmless the OWNER and the Engineer against any claim or liability arising from, or based on, the violation of any such law, ordinance, regulation, order or decree, whether by himself or his employees. If any discrepancy or inconsistency is discovered in the plans, drawings, specifications, or contract for this work in relation to any such law, ordinance, regulations, order or decree, the CONTRACTOR shall forthwith report the same to the Engineer in writing.

1. Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein; and the contract shall be read and enforced as though it were included herein and, if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the contract shall forthwith be physically amended to make such insertion. This shall include but not be limited to the Occupational Safety and Health Act of 1970.

2.4.10 WRITTEN NOTICE:

Written notice shall be considered as served when delivered in person or sent by registered mail to the individual, firm, or corporation, or to the last business address of such known to him who serves the notice.

1. Change of Address: It shall be the duty of each party to advise the other parties to the Contract as to any change in his business address until completion of the Contract.

2.4.11 ASSIGNMENT OF CONTRACT:

Neither the CONTRACTOR nor the OWNER shall sublet, sell, transfer, assign, or otherwise dispose of the Contract or any portion thereof, or of his right, title, or interest therein, or his obligations thereunder, without written consent of the other party.

2.4.12 ORAL AGREEMENTS:

No oral order, objection, claim, or notice by any party to the others shall affect or modify any of the terms or obligations contained in any of the Contract Documents; and none of the provisions of the Contract Documents shall be held to be waived or modified by reason of any act whatsoever, other than by a definitely agreed waiver or modification thereof in writing, and no evidence shall be introduced in any proceeding of any other waiver or modification.

2.4.13 WORK DURING AN EMERGENCY:

The CONTRACTOR shall perform any work and shall furnish and install any materials and equipment necessary during an emergency endangering life or property. In all cases he shall not wait for instructions before proceeding to properly protect both life and property.

2.4.14 WARNING SIGNS AND BARRICADES:

The CONTRACTOR shall provide adequate signs, barricades, warning lights, and watchmen and take all necessary precautions for the protection of the work and the safety of the public. All barricades and obstructions shall be protected at night by suitable signal lights which shall be kept burning from sunset to sunrise. Barricades shall be of substantial construction and shall be painted such as to increase their visibility at night. Suitable warning signs shall be so placed and illuminated at night as to show in advance where construction, barricades, or detours exist.

2.4.15 PUBLIC CONVENIENCE:

The CONTRACTOR shall at all times so conduct his work as to insure the least possible obstruction to traffic and inconvenience to the general public and the residents in the vicinity of the work, and to insure the protection of persons and property. No road or street shall be closed to the public, except with the permission of the proper authorities. Fire hydrants on or adjacent to the work shall always be kept accessible to fire-fighting equipment. Temporary provisions shall be made by the CONTRACTOR to ensure the use of sidewalks and the proper functioning of all gutters, sewer inlets, drainage ditches, and irrigation ditches, which shall not be obstructed.

2.4.16 SAFETY:

In accordance with general accepted construction practices, the CONTRACTOR shall be solely and completely responsible for conditions of the job site, including safety of all persons and property affected

directly or indirectly by his operations during the performance of the work. This requirement will apply continuously 24 hours per day until acceptance of the work by the OWNER and shall not be limited to normal working hours.

1. The duty of the Engineer to conduct construction review of the CONTRACTOR'S performance is not intended to include review of the adequacy of the CONTRACTOR'S safety measures in, on, or near the construction site.

2.4.17 EXISTING CONSTRUCTION:

When new construction is adjacent to or crosses highways, railroads, streets, or utilities under the jurisdiction of State, County, City, or other public agency, public utility, or private entity, the OWNER shall secure written permission from the proper authority before executing such new construction. The CONTRACTOR shall satisfy himself that the OWNER has secured written permission before any work is done. The CONTRACTOR shall acquaint himself with and shall execute the work in accordance with any and all requirements of the written permit. The CONTRACTOR shall replace or repair all existing construction damaged in the execution of this Contract. The CONTRACTOR will be required to furnish a release from the proper authority before final acceptance of the work.

2.4.18 SANITARY PROVISIONS:

The CONTRACTOR shall provide and maintain such sanitary accommodations for the use of his employees and those of his sub-contractor's as may be necessary to comply with the requirements and regulations of the local and state departments of health.

2.4.19 NONDISCRIMINATION IN EMPLOYMENT:

The CONTRACTOR agrees:

1. That in the hiring of employees for the performance of work under this contract or any subcontract hereunder, no CONTRACTOR, or sub-contractor, shall, by reason of race, religion, color, sex, national origin or ancestry, discriminate against any citizen who is qualified and available to perform the work to which the employment relates;
2. That no CONTRACTOR, sub-contractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this contract on account of race, religion, color, sex, national origin or ancestry;
3. The CONTRACTOR agrees to comply with any Federal, State, or local law with respect to nondiscrimination in employment.

SECTION 2.5 - PROGRESS AND COMPLETION OF WORK

2.5.01 NOTICE TO PROCEED:

Following the execution of the Contract by the OWNER and the CONTRACTOR, written Notice to Proceed with work shall be given by the OWNER to the CONTRACTOR. The CONTRACTOR shall begin and shall prosecute the work regularly and uninterruptedly thereafter and not before (except as provided for herein) with such force as to secure the completion of the work within the Contract Time.

2.5.02 CONTRACT TIME:

The CONTRACTOR shall complete, in an acceptable manner, all of the work contracted for in the time stated herein. Computation of Contract Time shall commence on the day specified in the Notice to Proceed and every calendar day following, except as herein provided, shall be counted as Contract Time.

2.5.03 SCHEDULE OF COMPLETION:

The CONTRACTOR shall submit, at such times as may reasonably be requested by the Engineer, schedules showing the order in which the CONTRACTOR proposes to carry on the work, with dates at which the CONTRACTOR will start the various parts of the work, and estimated date of completion of each part.

2.5.04 CHANGES IN THE WORK:

The OWNER may, as the need arises, order changes in the work through additions, deletions, or modifications to the extent of 25% of the original Contract Amount, without invalidating the Contract. Compensation and time of completion affected by the change shall be adjusted at the time of ordering such change.

2.5.05 EXTRA WORK:

New and unforeseen items of work found to be necessary and which cannot be covered by any item or combination of items for which there is a Contract price, shall be classed as Extra Work. The CONTRACTOR shall do such Extra Work and furnish such materials as may be required for the proper completion or construction of the whole work contemplated, upon written order from the OWNER as approved by the Engineer. In the absence of such written order, no claim for Extra Work shall be considered. Extra Work shall be performed in accordance with these Contract Documents where applicable and work not covered by such shall be done in accordance with the best construction practice and in a workmanlike manner. Extra Work required in an emergency to protect life and property shall be performed by the CONTRACTOR as required.

2.5.06 EXTENSION OF CONTRACT TIME:

A delay beyond the CONTRACTOR'S control occasioned by an Act of God, by act or omission on the part of the OWNER, or by strikes, lockouts, fire, etc., may entitle the CONTRACTOR to an extension of time in which to complete the work as agreed by the OWNER, provided, however, that the CONTRACTOR shall immediately give written notice to the OWNER of the cause of such delay.

1. Act of God shall mean an earthquake, flood, cyclone, or other cataclysmic phenomenon of nature. Rain, wind, flood, or other natural phenomenon of normal intensity for the locality shall not be construed as an Act of God, and no reparation shall be made to the CONTRACTOR for damages to the work resulting therefrom.

2.5.07 USE OF COMPLETED PORTIONS:

The OWNER shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding that the time for completing the entire work or such portions may not have expired; but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents. If such prior use increases the cost of or delays the completion of uncompleted work or causes refinishing of completed work, the

CONTRACTOR shall be entitled to such extra compensation or extension of time or both, as agreed by the OWNER.

2.5.08 REMOVAL OF CONSTRUCTION EQUIPMENT, TOOLS, AND SUPPLIES:

At the termination of this Contract, before acceptance of the work by the OWNER, the CONTRACTOR shall remove all of his equipment, tools, and supplies from the property of the OWNER. Should the CONTRACTOR fail to remove such equipment, tools, and supplies, the OWNER shall have the right to remove them at the expense of the CONTRACTOR.

2.5.09 CLEANING UP:

The CONTRACTOR shall remove from the OWNER'S property, and from all public and private property, all temporary structures, rubbish, and waste materials resulting from his operation or caused by his employees, and shall remove all surplus materials leaving the site smooth, clean, and true to line and grade.

2.5.10 ENGINEER'S CERTIFICATE OF SUBSTANTIAL COMPLETION:

When the work to be performed under this Contract is substantially completed in accordance with the Contract Documents, the Engineer shall prepare an Engineer's Certificate of Substantial Completion to be acknowledged and accepted by the OWNER and the CONTRACTOR. The Certificate may list items to be completed or corrected, but such Certificate shall not relieve the CONTRACTOR of his obligation to complete all work, whether listed or not, in accordance with the Contract Documents nor will it preclude any right the OWNER may have for recourse in accordance with the Contract Documents.

2.5.11 TERMINATION OF CONTRACTOR'S RESPONSIBILITY:

The Contract will be considered complete when all work has been finished, the final review made up by the Engineer, and the project accepted in writing by the OWNER. The CONTRACTOR'S responsibility shall then cease, except as set forth in his Performance and Payment Bond, as provided in Paragraph 2.3.08 Guaranty, and as provided in Paragraph 2.5.12 Correction of Faulty Work After Final Payment.

2.5.12 CORRECTION OF FAULTY WORK AFTER FINAL PAYMENT:

The making of the final payment by the OWNER to the CONTRACTOR shall not relieve the CONTRACTOR of responsibility for faulty materials or workmanship. The CONTRACTOR shall promptly replace any such defects discovered within one year from the date of written acceptance of the work.

2.5.13 LIQUIDATED DAMAGES:

In the event the CONTRACTOR fails to complete satisfactorily the entire work contemplated and provided for under this contract on or before the date of completion determined as described elsewhere herein, the OWNER shall deduct from the monies due to CONTRACTOR the sum of One Thousand Five Hundred Dollars (\$1,500.00) for each calendar day of delay, which sum is agreed upon not as a penalty but as a fixed and liquidated damage for each day of such delay, to be paid in full and subject to no deduction, it being understood and agreed that the time of completion is of the essence. If the monies due the CONTRACTOR are less than the amount of such liquidated damages, then the CONTRACTOR shall pay the balance to the OWNER.

2.5.14 INCENTIVE CLAUSE:

The City of Sanibel will pay the CONTRACTOR an "Incentive Bonus" in the sum of One Hundred Dollars (\$100.00) for each calendar day if the work in the Contract is completed in accordance with the Contract Documents, as determined by the Engineer, before the documented project completion date.

The parties anticipate that delays may be caused by or arise from any number of events during the course of the Contract, including, but not limited to, work performed, work deleted, change orders, supplemental agreements, delays, disruptions, differing site conditions, utility conflicts, design changes or defects, time extensions, extra work, right-of-way issues, permitting issues, actions of Suppliers, sub-contractor's or other CONTRACTOR'S, actions by third parties, shop drawing approval process delays, expansion of the physical limits of the project to make it functional, weather, weekends, holidays, suspension of CONTRACTOR'S operations, or other such events, forces or factors sometimes experienced in construction work. Such delays or events and their potential impacts on performance by the CONTRACTOR are specifically contemplated and acknowledged by the parties in entering into this Contract and shall not extend the "Incentive Bonus" Completion Date set forth above.

SECTION 2.6 – PAYMENTS TO CONTRACTOR

2.6.01 DETAILED BREAKDOWN OF CONTRACT AMOUNT:

Except in cases where unit prices form the basis for payment under the Contract, the CONTRACTOR shall, within ten days of receipt of Notice to Proceed, submit a complete breakdown of the Contract Amount showing the value assigned to each part of the work, including an allowance for profit and overhead. Upon approval of the breakdown of the Contract Amount by the Engineer, it shall be used as the basis for all Requests for Payment.

2.6.02 REQUESTS FOR PAYMENT:

Progress Payments. OWNER may make progress payments on the project based on the CONTRACTOR'S Applications for Payment as recommended by the Engineer during construction as provided below.

1. Prior to Substantial Completion progress payments will be in an amount equal to 90% of the Work completed, and 90% of materials and equipment not incorporated in the Work but delivered and suitably stored, less in each case the aggregate of payments previously made.
2. Upon Substantial Completion, OWNER shall pay an amount sufficient to increase total payments to CONTRACTOR to 95% of the Contract Price, less such amounts as Engineer shall determine in accordance with paragraph 2.6.05 of the General Conditions.

2.6.03 DELETED

2.6.04 OWNER'S ACTION ON REQUEST FOR PAYMENT:

Within 30 days after receipt of a Request for Payment from the CONTRACTOR, the OWNER shall:

1. Process the Request for Payment as recommended by the Engineer.

2. Pay such other amount, in accordance with Paragraph 2.6.05, as he shall decide is due the CONTRACTOR, informing the CONTRACTOR and the Engineer in writing of his reasons for paying the amended amount.
3. Withhold payment in accordance with Paragraph 2.6.05, informing the CONTRACTOR and the Engineer of his reasons for withholding payment.

2.6.05 OWNER'S RIGHT TO WITHHOLD PAYMENT OF A REQUEST FOR PAYMENT:

The OWNER may withhold payment, in whole or in part, of a Request for Payment to the extent necessary to protect himself from loss on account of any of the following:

1. Defective work.
2. Evidence indicating the probable filing of claims by other parties against the CONTRACTOR which may adversely affect the OWNER.
3. Failure of the CONTRACTOR to make payments due to sub-contractor's, material suppliers, or employees.
4. Damage to another CONTRACTOR.

2.6.06 PAYMENT FOR UNCORRECTED WORK:

Should the OWNER direct the CONTRACTOR not to correct work that has been damaged or that was not performed in accordance with the Contract Documents, an equitable deduction from the Contract Amount shall be made to compensate the OWNER for the Uncorrected work.

2.6.07 PAYMENT FOR REMOVAL OF REJECTED WORK AND MATERIALS:

The removal of work and materials rejected in accordance with Paragraph 2.3.05 and the re-execution of acceptable work by the CONTRACTOR shall be at the expense of the CONTRACTOR, and he shall pay the cost of replacing the work of other CONTRACTOR'S destroyed or damaged by the removal of the rejected work or materials and the subsequent replacement of acceptable work.

1. Removal by OWNER: Removal of rejected work or materials and storage of materials by the OWNER, in accordance with Paragraph 2.3.05, shall be paid by the CONTRACTOR within 30 days after written notice to pay is given by the OWNER. If the CONTRACTOR does not pay the expenses of such removal and after ten days written notice being given by the OWNER of his intent to sell the materials, the OWNER may sell the materials at auction or at private sale and will pay the CONTRACTOR the net proceeds therefrom after deducting all the costs and expenses that should have been borne by the CONTRACTOR.

2.6.08 PAYMENT FOR EXTRA WORK:

Written notice of claims for payment for Extra Work shall be given by the CONTRACTOR within ten days after receipt of instructions from the OWNER to proceed with the Extra Work and before any work is commenced, except in an emergency endangering life or property. No claim shall be valid unless so made. In all cases, the CONTRACTOR'S itemized estimate sheets showing all labor and material shall be submitted to the OWNER. The OWNER'S order for Extra Work shall specify any extension of the Contract Time and one of the following methods of payment.

1. Unit prices or combinations of unit prices which formed the basis of the original Contract.
2. A lump sum based on the CONTRACTOR'S estimate and accepted by the OWNER.
3. Actual cost plus 15% for overhead and profit. Actual costs are defined as follows:
 - A. Labor costs, including all allowances for holidays, vacation, sick leave, apprentice programs, hospitalization, or other "fringe benefits" and including time of foreman while engaged directly upon extra work.
 - B. Labor insurance and taxes.
 - C. Materials and supplies used on the work.
 - D. Associated General CONTRACTOR'S of America standard rental rates on each piece of equipment having a value in excess of \$50.00. Equipment and tools of lesser value are considered "small tools" and, as such, are considered to be part of overhead.

2.6.09 PAYMENT FOR WORK SUSPENDED BY THE OWNER:

If the work or any part thereof shall be suspended by the OWNER and abandoned by the CONTRACTOR as provided in Paragraph 2.2.01 d., Suspension of Work by OWNER, the CONTRACTOR will then be entitled to payment for all work done on the portions so abandoned, plus 15% of the value of the abandoned work to compensate for overhead, plant expense, and anticipated profit.

2.6.10 PAYMENT FOR WORK BY THE OWNER:

The cost of the work performed by the OWNER, in removing construction equipment, tools, and supplies in accordance with Paragraph 2.5.08, Removal of Construction Equipment, Tools, and Supplies, and in correcting deficiencies in accordance with Paragraph 2.2.01 e., OWNER'S Right to Terminate the Agreement and Complete the Work shall be paid by the CONTRACTOR.

2.6.11 PAYMENT FOR WORK BY THE OWNER FOLLOWING HIS TERMINATION OF THE CONTRACT:

Upon termination of the Contract by the OWNER in accordance with Paragraph 2.2.01 e., OWNER'S Right to Terminate Agreement and Complete the Work, no further payments shall be due the CONTRACTOR until the work is completed. If the unpaid balance of the Contract Amount shall exceed the cost of completing the work including all overhead costs, the excess shall be paid to the CONTRACTOR. If the cost of completing the work shall exceed the unpaid balance, the CONTRACTOR shall pay the difference to the OWNER. The cost incurred by the OWNER, as herein provided, and the damage incurred through the CONTRACTOR'S default, shall be certified by the OWNER.

1. Unpaid Balance: If the unpaid balance of the Contract Sum exceeds the cost of finishing the work, including compensation for the Engineer's additional services, such shall be paid to the CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR shall pay the difference to the OWNER. The cost incurred by the OWNER as herein provided shall be certified by the Engineer.

2.6.12 PAYMENT FOR WORK TERMINATED BY THE CONTRACTOR:

Upon suspension of the work or termination of the Contract by the CONTRACTOR in accordance with Paragraph 2.2.02f, CONTRACTOR'S Right to Suspend Work or Terminate Agreement, the CONTRACTOR shall recover payment from the OWNER for the work performed, plus loss on plant and materials, plus established profit and damages.

2.6.13 PAYMENT FOR SAMPLES AND TESTING OF MATERIALS:

Samples furnished in accordance with Paragraph 2.3.02, Samples, shall be furnished by the CONTRACTOR at his expense and may be used in the work, after acceptance.

1. Testing of samples and materials furnished in accordance with Paragraph 2.3.02, Samples, shall be arranged and paid for by the OWNER.

2.6.14 ACCEPTANCE AND FINAL PAYMENT:

When the CONTRACTOR shall have completed the work in accordance with the terms of the Contract Documents, he shall certify completion of the work to the OWNER and submit a final Request for Payment, which shall be the Contract Amount plus all approved additions, less all approved deductions and less previous payments made. The CONTRACTOR shall furnish evidence that he has fully paid all debts for labor, materials, and equipment incurred in connection with the work, and, upon acceptance by the OWNER, the OWNER will release the CONTRACTOR, except as to the conditions of the Performance and Payment Bond, any legal rights of the OWNER, required guaranties, and Correction of Faulty Work after Final Payment, and will pay the CONTRACTOR'S final Request for Payment. The CONTRACTOR shall allow sufficient time between the time of completion of the work and approval of the final Request for Payment for the Engineer to assemble and check the necessary data.

1. Release of Liens: The CONTRACTOR shall deliver to the OWNER a complete release of all liens arising out of this Contract before the final Request for Payment is paid. If any lien remains unsatisfied after all payments are made, the CONTRACTOR shall refund to the OWNER such amounts as the OWNER may have been compelled to pay in discharging such liens including all costs and a reasonable attorney's fee.
2. Final Payment: The CONTRACTOR shall be paid in full within 61 days after the date of substantial completion. If within 61 days after substantial completion there remains uncompleted minor items, an amount equal to 200% of the value of each item as determined by the Engineer shall be withheld and paid 61 days following completion of all such items. This payment shall constitute final settlement.

SECTION 2.7 - CONTROL OF THE WORK

2.7.01 GENERAL:

The following general provisions have been taken verbatim from the Florida Department of Transportation Standard Specifications for Road and Bridge Construction with certain modifications to meet specific requirements of the City of Sanibel. The CONTRACTOR is advised to read these provisions very carefully and ensure that he fully understands all of the requirements.

2.7.02 PLANS AND WORKING DRAWINGS:

1. Plans and Contract Documents:

The CONTRACTOR will be furnished an appropriate number of copies of the plans and special provisions as required for the particular project. Copies of the Standard Specifications may be purchased from the Florida Department of Transportation. The CONTRACTOR shall have available on the work, at all times, one copy each of the plans, specifications and special provisions.

2. Plans:

The plans furnished by the Engineer consist of general drawings showing such details as are necessary to give a comprehensive idea of the construction contemplated. Roadway plans will show in general, alignment, profile grades, typical cross sections and general cross sections. Structure plans, in general, will show in detail all dimensions of the work contemplated. When the structure plans do not show the dimensions in detail, they will show general features and such details as are necessary to give a comprehensive idea of the structure.

3. Alterations in Plans:

All authorized alterations affecting the requirements and information given on the approved plans shall be in writing. No changes shall be made on any plan or drawing after its approval by the Engineer, except by direction of the Engineer.

4. Working Drawings (for Structures):

A. General:

The CONTRACTOR shall furnish, on sheets not larger than 24 inches by 36 inches, such working and detail drawings as may be required for any part of the structure and which are not included in plans furnished by the Engineer.

B. For Steel Structures:

Working Drawings for steel structures shall consist of shop detail, erection details and other working plans, showing details, dimensions, sizes of material, and other information necessary for the complete fabrication and erection of the metal work.

C. For Concrete Structures:

Working drawings for concrete structures shall consist of such detailed plans as may reasonably be required for the effective prosecution of the work and which are not included in plans furnished by the Engineer. These may include details of falsework, bracing centering and formwork, masonry layout diagrams, and diagrams for bending reinforcing steel.

D. Submission of Working Drawings:

The CONTRACTOR shall submit to the Engineer for approval three (3) sets of any required detailed shop or working drawings. These drawings shall be submitted in

sufficient time to allow adequate study and discussion and any necessary correction prior to beginning the work they cover. Prior to the approval of these drawings any work done, or materials ordered for the structures involved shall be at the CONTRACTOR'S risk. One set of these drawings will be returned to the CONTRACTOR, either approved or marked with corrections required. The other sets will be retained by the Engineer.

E. Responsibility of Accuracy of Working Drawings:

It is understood, however, that approval by the Engineer of the CONTRACTOR'S working drawings does not relieve the CONTRACTOR of any responsibility for accuracy of dimensions and details, or for conformity of dimensions and details. The CONTRACTOR shall be responsible for agreement and conformity of his working drawings with the approved plans and specifications.

F. Cost of Working Drawings:

The contract prices shall include the cost of furnishing all working drawings, and the CONTRACTOR will be allowed no extra compensation for such drawings.

2.7.03 COORDINATION OF PLANS, SPECIFICATIONS AND SPECIAL PROVISIONS:

These Specifications, the plans, special provisions, and all supplementary documents are integral parts of the contract, and a requirement occurring in one is as binding as though occurring in all.

They are intended to be complementary and to describe and provide for a complete work. In addition to the work and materials specifically called for in the Specifications as being included in any specific pay item, additional incidental work, not specifically mentioned, will be included in such pay item when so shown in the plans, or if indicated, or obvious and apparent, as being necessary for the proper completion of the work under such pay item and not stipulated as being covered under other pay items. In case of discrepancy, computed dimensions shall govern over scaled dimensions, plans shall govern over Standard Specifications, and special provisions shall govern over both Standard Specifications and Plans.

2.7.04 CONFORMITY OF WORK WITH PLANS:

All Work performed, and all materials furnished shall be in reasonably close conformity with the lines, grades, cross sections, dimensions, and material requirements, including tolerances, shown on the plans or indicated in the specifications.

In the event the Engineer finds the materials or the finished product in which the materials are used not within reasonable close conformity with the plans and specifications, but that reasonably acceptable work has been produced, he shall then make a determination if the work shall be accepted and remain in place. In this event, the Engineer will document the basis of acceptance by contract modification which will provide for an appropriate adjustment in the contract price for such work or materials as he deems necessary to conform to his determination based on engineering judgment.

In the event the Engineer finds the materials, or the finished product in which the materials are used, or the work performed are not in reasonably close conformity with the plans and specifications and have resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced or otherwise corrected by and at the expense of the CONTRACTOR.

In the event the OWNER accepts the work that is not within these tolerances, appropriate deductions will be made from the actual amount used to cover the cost of the extra material. The amount will be computed based on the job mix formula and the unit price stated in the Contract.

2.7.05 ERRORS OR OMISSIONS IN PLANS OR SPECIFICATIONS:

The CONTRACTOR shall take no advantage of any apparent error or omission which he might discover in the plans or specifications but shall forthwith notify the Engineer of such discovery, who will then make such corrections and interpretations as he deems necessary for reflecting the actual spirit and intent of the plans and specifications.

2.7.06 AUTHORITY OF THE ENGINEER:

All work shall be available for inspection by the Engineer and performed to his satisfaction.

It is agreed by the parties hereto that the Engineer shall decide all questions, difficulties and disputes, of whatever nature, which may arise relative to the interpretation of the plans, construction, prosecution and fulfillment of the contract, and as to the character, quality, amount and value of any work done, and materials furnished, under or by reason of the contract.

2.7.07 AUTHORITY AND DUTIES OF ENGINEER'S ASSISTANTS:

The Engineer may appoint such assistants and representatives as he desires. They shall be authorized to inspect all work done and all materials furnished. Such inspection may extend to all or any part of the work and to the manufacture, preparation or fabrication of the materials to be used. Such assistants shall not be authorized to revoke, alter or waive any requirement of the specifications. They shall be authorized to call to the attention of the CONTRACTOR any failure of the work or materials to conform to the specifications and contract and shall have the authority to reject materials or suspend the work until any questions at issue can be referred to and decided by the Engineer. The CONTRACTOR shall be immediately notified in writing of any such suspension of the work and such notice shall state in detail the reasons for the suspension. The presence of the inspector or other assistant shall in no way lessen the responsibility of the CONTRACTOR.

2.7.08 CONSTRUCTION STAKES AND MARKERS:

1. Stakes Furnished:

The CONTRACTOR shall furnish and set, free of charge, slope stakes, grade stakes and all other stakes necessary for construction of the project. The CONTRACTOR shall furnish all templates and other materials necessary for making and maintaining points and lines given and shall furnish the Engineer such incidental labor as he may require in reestablishing points and lines necessary to the prosecution of the work.

2. Special Requirements for Landscape Work:

For landscape work, the OWNER will furnish all stakes in the size and quantity required and the CONTRACTOR shall set all such stakes with his own forces. The CONTRACTOR shall maintain such stakes in place until the layout is approved and the digging of the holes for the plantings has begun; replacing any which may become destroyed or disturbed during such period.

2.7.09 CONTRACTOR'S SUPERVISION:

1. Prosecution of work:

The CONTRACTOR shall give the work the constant attention necessary to assure the scheduled progress and he shall cooperate fully with the Engineer and with other CONTRACTOR'S at work in the vicinity.

2. CONTRACTOR'S Superintendent:

The CONTRACTOR shall at all times have on the work as his agent, a competent superintendent capable of thoroughly interpreting the plans and specifications and thoroughly experienced in the type of work being performed, who shall receive the instructions from the Engineer or his authorized representatives. The superintendent shall have full authority to execute the orders or directions of the Engineer and to supply promptly any materials, tools, equipment, labor and incidentals which may be required. Such superintendence shall be furnished regardless of the amount of work sublet.

3. Supervision for Emergencies:

The CONTRACTOR shall have a responsible person available at or reasonably near the work site on a 24-hour basis, seven days a week, in order that he may be contacted in emergencies and in cases where immediate action must be taken to maintain traffic or to handle any other problem that might arise. For compliance with this requirement outside of working hours, the furnishing of the telephone number where such person can be reached will suffice.

2.7.10 GENERAL INSPECTION REQUIREMENTS:

1. Cooperation by CONTRACTOR:

No work shall be done, nor materials used, without suitable inspection by the Engineer or his representative, and the CONTRACTOR shall furnish the Engineer with every reasonable facility for ascertaining whether the work performed, and materials used are in accordance with the requirements and intent of the plans and specifications. If the Engineer so requests, the CONTRACTOR shall, at any time before final acceptance of the work, remove or uncover such portions of the finished work as may be directed. After examination, the CONTRACTOR shall restore the uncovered portions of the work to the standard required by the specifications. Should the work so exposed or examined prove unacceptable, the uncovering or removal, and the replacing of the covering or making good of the parts removed, shall be at the CONTRACTOR'S expense. However, should the work thus exposed or examined prove acceptable, the uncovering or removing, and the replacing of the covering or making good of the parts removed, shall be paid for as extra work.

2. Failure of Engineer to Reject Work During Construction:

If, during or prior to construction operations, the Engineer should fail to reject defective work or materials, whether from lack of discovery of such defect or for any other reason, such initial failure to reject shall in no way prevent his later rejection when such defect is discovered, or obligate the Engineer to final acceptance, and the CONTRACTOR shall make no claim for losses suffered due to any necessary removals or repairs of such defects.

3. Failure to Remove and Renew Defective Materials and Work:

Should the CONTRACTOR fail or refuse to remove and renew any defective materials used or work performed, or to make any necessary repairs in an acceptable manner and in accordance with the requirements of the specifications, within the time indicated in writing, the Engineer shall have the authority to cause the unacceptable or defective materials or work to be repaired, removed and renewed, as may be necessary; all at the CONTRACTOR'S expense. Any expense incurred by the City in making these repairs, removals or renewals, which the CONTRACTOR has failed or refused to make, shall be paid for out of any moneys due or which may become due the CONTRACTOR, or may be charged against the contract bond. Continued failure or refusal on the part of the CONTRACTOR to make any or all necessary repairs promptly, fully and in an acceptable manner shall be sufficient cause for the City, at its option, to perform the work with its own organization, or to contract with any other individual, firm or corporation to perform the work. All costs and expenses incurred thereby shall be charged against the defaulting CONTRACTOR and the amount thereof deducted from any moneys due or which may become due to him or shall be charged against the contract bond. Any work performed, subsequent to forfeiture of the Contract, as described in this Article, shall not relieve the CONTRACTOR in any way of his responsibility for the work performed by him.

2.7.11 FINAL CONSTRUCTION INSPECTION:

1. Maintenance Until Final Acceptance:

The CONTRACTOR shall maintain all work in first-class condition until it has been completed as a whole and has been accepted by the Engineer under the provisions of 2.7.12.

2. Semifinal Inspections:

The Engineer will make a semifinal inspection within seven (7) days after notice from the CONTRACTOR of presumptive completion of the entire project. If, at the semifinal inspection, all construction provided for and contemplated by the contract is found completed to the Engineer's satisfaction, such inspection shall constitute the final inspection, as prescribed below. If, however, at any semifinal inspection any work is found unsatisfactory, in whole or in part, the Engineer shall give the CONTRACTOR the necessary instructions as to replacement of material and performance or re-performance of work necessary and prerequisite to final completion and acceptance, and the CONTRACTOR forthwith shall comply with and execute such instructions. Upon satisfactory replacement of material and performance or reperformance of such work, another inspection shall be made, which shall constitute the final inspection if the required material is found to have been replaced and the work completed satisfactorily.

3. Final Inspection:

Whenever all materials have been furnished, all work has been performed, and the construction contemplated by the contract has been satisfactorily completed, the Engineer will make the final inspection.

2.7.12 FINAL ACCEPTANCE:

When, upon completion of the final construction inspection, the work is found to be completed satisfactorily, the Engineer shall give the OWNER a written recommendation for acceptance of the work. The OWNER shall then satisfy himself as to the Engineer's recommendation and within five days of said recommendation notify the CONTRACTOR, in writing, of his acceptance of the work.

2.7.13 CLAIMS BY CONTRACTOR:

Where the CONTRACTOR deems that extra compensation is due him for work or materials not clearly covered in the contract or not ordered by the Engineer as extra work, as defined herein, the CONTRACTOR shall notify the Engineer in writing of his intentions to make claim for extra compensation, before he begins the work on which he bases the claim. If such notification is not given, and the Engineer is not afforded proper opportunity for keeping strict account of actual cost, as defined for force account, then the CONTRACTOR thereby agrees to waive the claim for such extra compensation. Such notice by the CONTRACTOR, and the fact that the Engineer has kept account of the cost as aforesaid, shall not in any way be construed as establishing the validity of the claim. In such case the claim after consideration by the Engineer, is found to be valid, it shall be allowed and paid for as extra as provided herein.

**STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
STANDARD TERMS AND CONDITIONS
APPLICABLE TO GRANT AGREEMENTS**

ATTACHMENT 1

1. Entire Agreement.

This Grant Agreement, including any Attachments and Exhibits referred to herein and/or attached hereto (Agreement), constitutes the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior agreements, whether written or oral, with respect to such subject matter. Any terms and conditions included on Grantee's forms or invoices shall be null and void.

2. Grant Administration.

- a. Order of Precedence. If there are conflicting provisions among the documents that make up the Agreement, the order of precedence for interpretation of the Agreement is as follows:
 - i. Standard Grant Agreement
 - ii. Attachments other than Attachment 1, in numerical order as designated in the Standard Grant Agreement
 - iii. Attachment 1, Standard Terms and Conditions
 - iv. The Exhibits in the order designated in the Standard Grant Agreement
- b. All approvals, written or verbal, and other written communication among the parties, including all notices, shall be obtained by or sent to the parties' Grant Managers. All written communication shall be by electronic mail, U.S. Mail, a courier delivery service, or delivered in person. Notices shall be considered delivered when reflected by an electronic mail read receipt, a courier service delivery receipt, other mail service delivery receipt, or when receipt is acknowledged by recipient. If the notice is delivered in multiple ways, the notice will be considered delivered at the earliest delivery time.
- c. If a different Grant Manager is designated by either party after execution of this Agreement, notice of the name and contact information of the new Grant Manager will be submitted in writing to the other party and maintained in the respective parties' records. A change of Grant Manager does not require a formal amendment or change order to the Agreement.
- d. This Agreement may be amended, through a formal amendment or a change order, only by a written agreement between both parties. A formal amendment to this Agreement is required for changes which cause any of the following:
 - (1) an increase or decrease in the Agreement funding amount;
 - (2) a change in Grantee's match requirements;
 - (3) a change in the expiration date of the Agreement;
 - (4) changes to the cumulative amount of funding transfers between approved budget categories, as defined in Attachment 3, Grant Work Plan, that exceeds or is expected to exceed twenty percent (20%) of the total budget as last approved by Department; and/or
 - (5) any changes to the terms and conditions of the Agreement other than the specific instances enumerated below when a change order may be used.A change order to this Agreement may be used when:
 - (1) task timelines within the current authorized Agreement period change;
 - (2) the cumulative transfer of funds between approved budget categories, as defined in Attachment 3, Grant Work Plan, are less than twenty percent (20%) of the total budget as last approved by Department;
 - (3) changing the current funding source as stated in the Standard Grant Agreement; and/or
 - (4) fund transfers between budget categories for the purposes of meeting match requirements.This Agreement may be amended to provide for additional services if additional funding is made available by the Legislature.
- e. All days in this Agreement are calendar days unless otherwise specified.

3. Agreement Duration.

The term of the Agreement shall begin and end on the dates indicated in the Standard Grant Agreement, unless extended or terminated earlier in accordance with the applicable terms and conditions. The Grantee shall be eligible for reimbursement for work performed on or after the date of execution through the expiration date of this Agreement, unless otherwise specified in Attachment 2, Special Terms and Conditions. However, work performed prior to the

execution of this Agreement may be reimbursable or used for match purposes if permitted by the Special Terms and Conditions.

4. Deliverables.

The Grantee agrees to render the services or other units of deliverables as set forth in Attachment 3, Grant Work Plan. The services or other units of deliverables shall be delivered in accordance with the schedule and at the pricing outlined in the Grant Work Plan. Deliverables may be comprised of activities that must be completed prior to Department making payment on that deliverable. The Grantee agrees to perform in accordance with the terms and conditions set forth in this Agreement and all attachments and exhibits incorporated by the Standard Grant Agreement.

5. Performance Measures.

The Grantee warrants that: (1) the services will be performed by qualified personnel; (2) the services will be of the kind and quality described in the Grant Work Plan; (3) the services will be performed in a professional and workmanlike manner in accordance with industry standards and practices; (4) the services shall not and do not knowingly infringe upon the intellectual property rights, or any other proprietary rights, of any third party; and (5) its employees, subcontractors, and/or subrecipients shall comply with any security and safety requirements and processes, if provided by Department, for work done at the Project Location(s). The Department reserves the right to investigate or inspect at any time to determine whether the services or qualifications offered by Grantee meet the Agreement requirements. Notwithstanding any provisions herein to the contrary, written acceptance of a particular deliverable does not foreclose Department's remedies in the event deficiencies in the deliverable cannot be readily measured at the time of delivery.

6. Acceptance of Deliverables.

- a. Acceptance Process. All deliverables must be received and accepted in writing by Department's Grant Manager before payment. The Grantee shall work diligently to correct all deficiencies in the deliverable that remain outstanding, within a reasonable time at Grantee's expense. If Department's Grant Manager does not accept the deliverables within 30 days of receipt, they will be deemed rejected.
- b. Rejection of Deliverables. The Department reserves the right to reject deliverables, as outlined in the Grant Work Plan, as incomplete, inadequate, or unacceptable due, in whole or in part, to Grantee's lack of satisfactory performance under the terms of this Agreement. The Grantee's efforts to correct the rejected deliverables will be at Grantee's sole expense. Failure to fulfill the applicable technical requirements or complete all tasks or activities in accordance with the Grant Work Plan will result in rejection of the deliverable and the associated invoice. Payment for the rejected deliverable will not be issued unless the rejected deliverable is made acceptable to Department in accordance with the Agreement requirements. The Department, at its option, may allow additional time within which Grantee may remedy the objections noted by Department. The Grantee's failure to make adequate or acceptable deliverables after a reasonable opportunity to do so shall constitute an event of default.

7. Financial Consequences for Nonperformance.

- a. Withholding Payment. In addition to the specific consequences explained in the Grant Work Plan and/or Special Terms and Conditions, the State of Florida (State) reserves the right to withhold payment when the Grantee has failed to perform/comply with provisions of this Agreement. None of the financial consequences for nonperformance in this Agreement as more fully described in the Grant Work Plan shall be considered penalties.
- b. Invoice reduction
If Grantee does not meet a deadline for any deliverable, the Department will reduce the invoice by 1% for each day the deadline is missed, unless an extension is approved in writing by the Department.
- c. Corrective Action Plan. If Grantee fails to correct all the deficiencies in a rejected deliverable within the specified timeframe, Department may, in its sole discretion, request that a proposed Corrective Action Plan (CAP) be submitted by Grantee to Department. The Department requests that Grantee specify the outstanding deficiencies in the CAP. All CAPs must be able to be implemented and performed in no more than sixty (60) calendar days.
 - i. The Grantee shall submit a CAP within ten (10) days of the date of the written request from Department. The CAP shall be sent to the Department's Grant Manager for review and approval. Within ten (10) days of receipt of a CAP, Department shall notify Grantee in writing whether the CAP proposed has been accepted. If the CAP is not accepted, Grantee shall have ten (10) days from receipt of Department letter rejecting the proposal to submit a revised proposed CAP. Failure to obtain Department approval of a CAP as specified above may result in Department's termination of this Agreement for cause as authorized in this Agreement.

- ii. Upon Department's notice of acceptance of a proposed CAP, Grantee shall have ten (10) days to commence implementation of the accepted plan. Acceptance of the proposed CAP by Department does not relieve Grantee of any of its obligations under the Agreement. In the event the CAP fails to correct or eliminate performance deficiencies by Grantee, Department shall retain the right to require additional or further remedial steps, or to terminate this Agreement for failure to perform. No actions approved by Department or steps taken by Grantee shall preclude Department from subsequently asserting any deficiencies in performance. The Grantee shall continue to implement the CAP until all deficiencies are corrected. Reports on the progress of the CAP will be made to Department as requested by Department's Grant Manager.
- iii. Failure to respond to a Department request for a CAP or failure to correct a deficiency in the performance of the Agreement as specified by Department may result in termination of the Agreement.

8. Payment.

- a. Payment Process. Subject to the terms and conditions established by the Agreement, the pricing per deliverable established by the Grant Work Plan, and the billing procedures established by Department, Department agrees to pay Grantee for services rendered in accordance with section 215.422, Florida Statutes (F.S.).
- b. Taxes. The Department is exempted from payment of State sales, use taxes and Federal excise taxes. The Grantee, however, shall not be exempted from paying any taxes that it is subject to, including State sales and use taxes, or for payment by Grantee to suppliers for taxes on materials used to fulfill its contractual obligations with Department. The Grantee shall not use Department's exemption number in securing such materials. The Grantee shall be responsible and liable for the payment of all its FICA/Social Security and other taxes resulting from this Agreement.
- c. Maximum Amount of Agreement. The maximum amount of compensation under this Agreement, without an amendment, is described in the Standard Grant Agreement. Any additional funds necessary for the completion of this Project are the responsibility of Grantee.
- d. Reimbursement for Costs. The Grantee shall be paid on a cost reimbursement basis for all eligible Project costs upon the completion, submittal, and approval of each deliverable identified in the Grant Work Plan. Reimbursement shall be requested on Exhibit C, Payment Request Summary Form. To be eligible for reimbursement, costs must be in compliance with laws, rules, and regulations applicable to expenditures of State funds, including, but not limited to, the Reference Guide for State Expenditures, which can be accessed at the following web address: <https://www.myfloridacfo.com/docs-sf/accounting-and-auditing-libraries/state-agencies/reference-guide-for-state-expenditures.pdf>.
- e. Rural Communities and Rural Areas of Opportunity. If Grantee is a county or municipality that qualifies as a "rural community" or "rural area of opportunity" (RAO) as defined in subsection 288.0656(2), F.S., such Grantee may request from the Department that all invoice payments under this Agreement be directed to the relevant county or municipality or to the RAO itself. The Department will agree to Grantee's request if:
 - i. Grantee demonstrates that it is a county or municipality that qualifies as a "rural community" or "rural area of opportunity" under subsection 288.0656(2), F.S.;
 - ii. Grantee demonstrates current financial hardship using one (1) or more of the "economic distress" factors defined in subsection 288.0656(2)(c), F.S.;
 - iii. Grantee's performance has been verified by the Department, which has determined that Grantee is eligible for invoice payments and that Grantee's performance has been completed in accordance with this Agreement's terms and conditions; and
 - iv. Applicable federal and state law(s), rule(s) and regulation(s) allow for such payments.

This subsection may not be construed to alter or limit any other applicable provisions of federal or state law, rule, or regulation. A current list of Florida's designated RAOs can be accessed at the following web address: <https://floridajobs.org/community-planning-and-development/rural-community-programs/rural-areas-of-opportunity>.
- f. Invoice Detail. All charges for services rendered or for reimbursement of expenses authorized by Department pursuant to the Grant Work Plan shall be submitted to Department in sufficient detail for a proper pre-audit and post-audit to be performed. The Grantee shall only invoice Department for deliverables that are completed in accordance with the Grant Work Plan.
- g. State Funds Documentation. Pursuant to section 216.1366, F.S., if Grantee meets the definition of a non-profit organization under section 215.97(2)(m), F.S., Grantee must provide the Department with documentation that indicates the amount of state funds:

- i. Allocated to be used during the full term of the contract or agreement for remuneration to any member of the board of directors or an officer.
- ii. Allocated under each payment by the public agency to be used for remuneration of any member of the board of directors or an officer.

The documentation must indicate the amounts and recipients of the remuneration. Such information must be posted on the State's the contract tracking system and maintained pursuant to section 215.985, F.S., and must be posted on the Grantee's website, if Grantee maintains a website.

- h. Interim Payments. Interim payments may be made by Department, at its discretion, if the completion of deliverables to date have first been accepted in writing by Department's Grant Manager.
- i. Final Payment Request. A final payment request should be submitted to Department no later than sixty (60) days following the expiration date of the Agreement to ensure the availability of funds for payment. However, all work performed pursuant to the Grant Work Plan must be performed on or before the expiration date of the Agreement.
- j. Annual Appropriation Contingency. The State's performance and obligation to pay under this Agreement is contingent upon an annual appropriation by the Legislature. This Agreement is not a commitment of future appropriations. Authorization for continuation and completion of work and any associated payments may be rescinded, with proper notice, at the discretion of Department if the Legislature reduces or eliminates appropriations.
- k. Interest Rates. All interest rates charged under the Agreement shall be calculated on the prevailing rate used by the State Board of Administration. To obtain the applicable interest rate, please refer to: <https://www.myfloridacfo.com/division/aa/local-governments/judgement-interest-rates>.
- l. Refund of Payments to the Department. Any balance of unobligated funds that have been advanced or paid must be refunded to Department. Any funds paid in excess of the amount to which Grantee or subgrantee is entitled under the terms of the Agreement must be refunded to Department. If this Agreement is funded with federal funds and the Department is required to refund the federal government, the Grantee shall refund the Department its share of those funds.

9. Documentation Required for Cost Reimbursement Grant Agreements and Match.

If Cost Reimbursement or Match is authorized in Attachment 2, Special Terms and Conditions, the following conditions apply. Supporting documentation must be provided to substantiate cost reimbursement or match requirements for the following budget categories:

- a. Salary/Wages. Grantee shall list personnel involved, position classification, direct salary rates, and hours spent on the Project in accordance with Attachment 3, Grant Work Plan in their documentation for reimbursement or match requirements.
- b. Overhead/Indirect/General and Administrative Costs. If Grantee is being reimbursed for or claiming match for multipliers, all multipliers used (i.e., fringe benefits, overhead, indirect, and/or general and administrative rates) shall be supported by audit. If Department determines that multipliers charged by Grantee exceeded the rates supported by audit, Grantee shall be required to reimburse such funds to Department within thirty (30) days of written notification. Interest shall be charged on the excessive rate.
- c. Contractual/Subaward Costs (Subcontractors/Subrecipients). Match or reimbursement requests for payments to subcontractors/subrecipients must be substantiated by copies of invoices with backup documentation identical to that required from Grantee. Subcontracts/subawards which involve payments for direct salaries shall clearly identify the personnel involved, salary rate per hour, and hours spent on the Project. All eligible multipliers used (i.e., fringe benefits, overhead, indirect, and/or general and administrative rates) shall be supported by audit. If Department determines that multipliers charged by any subcontractor/subrecipient exceeded the rates supported by audit, Grantee shall be required to reimburse such funds to Department within thirty (30) days of written notification. Interest shall be charged on the excessive rate. Nonconsumable and/or nonexpendable personal property or equipment costing \$5,000 or more purchased for the Project under a subcontract/subaward is subject to the requirements set forth in chapters 273 and/or 274, F.S., and Chapter 69I-72, Florida Administrative Code (F.A.C.) and/or Chapter 69I-73, F.A.C., as applicable. For grants funded with federal funds, nonconsumable and/or nonexpendable personal property or equipment costing \$10,000 or more purchased for the Project under a subcontract/subaward is subject to the requirements set forth in 2 CFR 200. The Grantee shall be responsible for maintaining appropriate property records for any subcontracts/subawards that include the purchase of equipment as part of the delivery of services. The Grantee shall comply with this requirement and ensure its subcontracts/subaward issued under this Agreement, if any, impose this requirement, in writing, on its subcontractors/subrecipients.

Attachment 1

- i. For fixed-price (vendor) subcontracts/subawards, the following provisions shall apply: The Grantee may award, on a competitive basis, fixed-price subcontracts/subawards to consultants/contractors in performing the work described in Attachment 3, Grant Work Plan. Invoices submitted to Department for fixed-price subcontracted/subawarded activities shall be supported with a copy of the subcontractor/subrecipient's invoice and a copy of the tabulation form for the competitive procurement process (e.g., Invitation to Bid, Request for Proposals, or other similar competitive procurement document) resulting in the fixed-price subcontract/subaward. The Grantee may request approval from Department to award a fixed-price subcontract/subaward resulting from procurement methods other than those identified above. In this instance, Grantee shall request the advance written approval from Department's Grant Manager of the fixed price negotiated by Grantee. The letter of request shall be supported by a detailed budget and Scope of Services to be performed by the subcontractor/subrecipient. Upon receipt of Department Grant Manager's approval of the fixed-price amount, Grantee may proceed in finalizing the fixed-price subcontract/subaward.
 - ii. If the procurement is subject to the Consultant's Competitive Negotiation Act under section 287.055, F.S., or the Brooks Act, Grantee must provide documentation clearly evidencing it has complied with the statutory or federal requirements.
- d. Travel. All requests for match or reimbursement of travel expenses shall be in accordance with section 112.061, F.S.
- e. Direct Purchase Equipment. For grants funded fully or in part with state funds, equipment is defined as capital outlay costing \$5,000 or more. For grants funded fully with federal funds, equipment is defined as capital outlay costing \$10,000 or more. Match or reimbursement for Grantee's direct purchase of equipment is subject to specific approval of Department and does not include any equipment purchased under the delivery of services to be completed by a subcontractor/subrecipient. Include copies of invoices or receipts to document purchases, and a properly completed Exhibit B, Property Reporting Form.
- f. Rental/Lease of Equipment. Match or reimbursement requests for rental/lease of equipment must include copies of invoices or receipts to document charges.
- g. Miscellaneous/Other Expenses. If miscellaneous or other expenses, such as materials, supplies, non-excluded phone expenses, reproduction, or mailing, are reimbursable or available for match or reimbursement under the terms of this Agreement, the documentation supporting these expenses must be itemized and include copies of receipts or invoices. Additionally, independent of Grantee's contract obligations to its subcontractor/subrecipient, Department shall not reimburse any of the following types of charges: cell phone usage; attorney's fees or court costs; civil or administrative penalties; or handling fees, such as set percent overages associated with purchasing supplies or equipment.
- h. Land Acquisition. Reimbursement for the costs associated with acquiring interest and/or rights to real property (including access rights through ingress/egress easements, leases, license agreements, or other site access agreements; and/or obtaining record title ownership of real property through purchase) must be supported by the following, as applicable: Copies of Property Appraisals, Environmental Site Assessments, Surveys and Legal Descriptions, Boundary Maps, Acreage Certification, Title Search Reports, Title Insurance, Closing Statements/Documents, Deeds, Leases, Easements, License Agreements, or other legal instrument documenting acquired property interest and/or rights. If land acquisition costs are used to meet match requirements, Grantee agrees that those funds shall not be used as match for any other Agreement supported by State or Federal funds.

10. Status Reports.

The Grantee shall submit status reports quarterly, unless otherwise specified in the Attachments, on Exhibit A, Progress Report Form, to Department's Grant Manager describing the work performed during the reporting period, problems encountered, problem resolutions, scheduled updates, and proposed work for the next reporting period. Quarterly status reports are due no later than twenty (20) days following the completion of the quarterly reporting period. For the purposes of this reporting requirement, the quarterly reporting periods end on March 31, June 30, September 30 and December 31. The Department will review the required reports submitted by Grantee within thirty (30) days.

11. Retainage.

The following provisions apply if Department withholds retainage under this Agreement:

- a. The Department reserves the right to establish the amount and application of retainage on the work performed under this Agreement up to the maximum percentage described in Attachment 2, Special Terms and Conditions. Retainage may be withheld from each payment to Grantee pending satisfactory completion of work and approval of all deliverables.

Attachment 1

- b. If Grantee fails to perform the requested work or fails to perform the work in a satisfactory manner, Grantee shall forfeit its right to payment of the retainage associated with the work. Failure to perform includes, but is not limited to, failure to submit the required deliverables or failure to provide adequate documentation that the work was actually performed. The Department shall provide written notification to Grantee of the failure to perform that shall result in retainage forfeiture. If the Grantee does not correct the failure to perform within the timeframe stated in Department's notice, the retainage will be forfeited to Department.
- c. No retainage shall be released or paid for incomplete work while this Agreement is suspended.
- d. Except as otherwise provided above, Grantee shall be paid the retainage associated with the work, provided Grantee has completed the work and submits an invoice for retainage held in accordance with the invoicing procedures under this Agreement.

12. Insurance.

- a. Insurance Requirements for Subrecipients and/or Subcontractors. The Grantee shall require its subrecipients and/or subcontractors, if any, to maintain insurance coverage of such types and with such terms and limits as described in this Agreement. The Grantee shall require all its subrecipients and/or subcontractors, if any, to make compliance with the insurance requirements of this Agreement a condition of all contracts that are related to this Agreement. Subrecipients and/or subcontractors must provide proof of insurance upon request.
- b. Deductibles. The Department shall be exempt from, and in no way liable for, any sums of money representing a deductible in any insurance policy. The payment of such deductible shall be the sole responsibility of the Grantee providing such insurance.
- c. Proof of Insurance. Upon execution of this Agreement, Grantee shall provide Department documentation demonstrating the existence and amount for each type of applicable insurance coverage *prior to* performance of any work under this Agreement. Upon receipt of written request from Department, Grantee shall furnish Department with proof of applicable insurance coverage by standard form certificates of insurance, a self-insured authorization, or other certification of self-insurance.
- d. Duty to Maintain Coverage. In the event that any applicable coverage is cancelled by the insurer for any reason, or if Grantee cannot get adequate coverage, Grantee shall immediately notify Department of such cancellation and shall obtain adequate replacement coverage conforming to the requirements herein and provide proof of such replacement coverage within ten (10) days after the cancellation of coverage.
- e. Insurance Trust. If the Grantee's insurance is provided through an insurance trust, the Grantee shall instead add the Department of Environmental Protection, its employees, and officers as an additional covered party everywhere the Agreement requires them to be added as an additional insured.

13. Termination.

- a. Termination for Convenience. When it is in the State's best interest, Department may, at its sole discretion, terminate the Agreement in whole or in part by giving 30 days' written notice to Grantee. The Department shall notify Grantee of the termination for convenience with instructions as to the effective date of termination or the specific stage of work at which the Agreement is to be terminated. The Grantee must submit all invoices for work to be paid under this Agreement within thirty (30) days of the effective date of termination. The Department shall not pay any invoices received after thirty (30) days of the effective date of termination.
- b. Termination for Cause. The Department may terminate this Agreement if any of the events of default described in the Events of Default provisions below occur or in the event that Grantee fails to fulfill any of its other obligations under this Agreement. If, after termination, it is determined that Grantee was not in default, or that the default was excusable, the rights and obligations of the parties shall be the same as if the termination had been issued for the convenience of Department. The rights and remedies of Department in this clause are in addition to any other rights and remedies provided by law or under this Agreement.
- c. Grantee Obligations upon Notice of Termination. After receipt of a notice of termination or partial termination unless as otherwise directed by Department, Grantee shall not furnish any service or deliverable on the date, and to the extent specified, in the notice. However, Grantee shall continue work on any portion of the Agreement not terminated. If the Agreement is terminated before performance is completed, Grantee shall be paid only for that work satisfactorily performed for which costs can be substantiated. The Grantee shall not be entitled to recover any cancellation charges or lost profits.
- d. Continuation of Prepaid Services. If Department has paid for any services prior to the expiration, cancellation, or termination of the Agreement, Grantee shall continue to provide Department with those services for which it has already been paid or, at Department's discretion, Grantee shall provide a refund for services that have been paid for but not rendered.

- e. Transition of Services Upon Termination, Expiration, or Cancellation of the Agreement. If services provided under the Agreement are being transitioned to another provider(s), Grantee shall assist in the smooth transition of Agreement services to the subsequent provider(s). This requirement is at a minimum an affirmative obligation to cooperate with the new provider(s), however additional requirements may be outlined in the Grant Work Plan. The Grantee shall not perform any services after Agreement expiration or termination, except as necessary to complete the transition or continued portion of the Agreement, if any.

14. Notice of Default.

If Grantee defaults in the performance of any covenant or obligation contained in the Agreement, including, any of the events of default, Department shall provide notice to Grantee and an opportunity to cure that is reasonable under the circumstances. This notice shall state the nature of the failure to perform and provide a time certain for correcting the failure. The notice will also provide that, should the Grantee fail to perform within the time provided, Grantee will be found in default, and Department may terminate the Agreement effective as of the date of receipt of the default notice.

15. Events of Default.

Provided such failure is not the fault of Department or outside the reasonable control of Grantee, the following non-exclusive list of events, acts, or omissions, shall constitute events of default:

- a. The commitment of any material breach of this Agreement by Grantee, including failure to timely deliver a material deliverable, failure to perform the minimal level of services required for a deliverable, discontinuance of the performance of the work, failure to resume work that has been discontinued within a reasonable time after notice to do so, or abandonment of the Agreement;
- b. The commitment of any material misrepresentation or omission in any materials, or discovery by the Department of such, made by the Grantee in this Agreement or in its application for funding;
- c. Failure to submit any of the reports required by this Agreement or having submitted any report with incorrect, incomplete, or insufficient information;
- d. Failure to honor any term of the Agreement;
- e. Failure to abide by any statutory, regulatory, or licensing requirement, including an entry of an order revoking the certificate of authority granted to the Grantee by a state or other licensing authority;
- f. Failure to pay any and all entities, individuals, and furnishing labor or materials, or failure to make payment to any other entities as required by this Agreement;
- g. Employment of an unauthorized alien in the performance of the work, in violation of Section 274 (A) of the Immigration and Nationality Act;
- h. Failure to maintain the insurance required by this Agreement;
- i. One or more of the following circumstances, uncorrected for more than thirty (30) days unless, within the specified 30-day period, Grantee (including its receiver or trustee in bankruptcy) provides to Department adequate assurances, reasonably acceptable to Department, of its continuing ability and willingness to fulfill its obligations under the Agreement:
 - i. Entry of an order for relief under Title 11 of the United States Code;
 - ii. The making by Grantee of a general assignment for the benefit of creditors;
 - iii. The appointment of a general receiver or trustee in bankruptcy of Grantee's business or property; and/or
 - iv. An action by Grantee under any state insolvency or similar law for the purpose of its bankruptcy, reorganization, or liquidation.

16. Suspension of Work.

The Department may, in its sole discretion, suspend any or all activities under the Agreement, at any time, when it is in the best interest of the State to do so. The Department shall provide Grantee written notice outlining the particulars of suspension. Examples of reasons for suspension include, but are not limited to, budgetary constraints, declaration of emergency, or other such circumstances. After receiving a suspension notice, Grantee shall comply with the notice. Within 90 days, or any longer period agreed to by the parties, Department shall either: (1) issue a notice authorizing resumption of work, at which time activity shall resume; or (2) terminate the Agreement. If the Agreement is terminated after 30 days of suspension, the notice of suspension shall be deemed to satisfy the thirty (30) days' notice required for a notice of termination for convenience. Suspension of work shall not entitle Grantee to any additional compensation.

17. Force Majeure.

The Grantee shall not be responsible for delay resulting from its failure to perform if neither the fault nor the negligence of Grantee or its employees or agents contributed to the delay and the delay is due directly to acts of God, wars, acts

of public enemies, strikes, fires, floods, or other similar cause wholly beyond Grantee's control, or for any of the foregoing that affect subcontractors/subrecipients or suppliers if no alternate source of supply is available to Grantee. In case of any delay Grantee believes is excusable, Grantee shall notify Department in writing of the delay or potential delay and describe the cause of the delay either (1) within ten days after the cause that creates or will create the delay first arose, if Grantee could reasonably foresee that a delay could occur as a result; or (2) if delay is not reasonably foreseeable, within five days after the date Grantee first had reason to believe that a delay could result. **THE FOREGOING SHALL CONSTITUTE THE GRANTEE'S SOLE REMEDY OR EXCUSE WITH RESPECT TO DELAY.** Providing notice in strict accordance with this paragraph is a condition precedent to such remedy. No claim for damages, other than for an extension of time, shall be asserted against Department. The Grantee shall not be entitled to an increase in the Agreement price or payment of any kind from Department for direct, indirect, consequential, impact or other costs, expenses or damages, including but not limited to costs of acceleration or inefficiency, arising because of delay, disruption, interference, or hindrance from any cause whatsoever. If performance is suspended or delayed, in whole or in part, due to any of the causes described in this paragraph, after the causes have ceased to exist Grantee shall perform at no increased cost, unless Department determines, in its sole discretion, that the delay will significantly impair the value of the Agreement to Department, in which case Department may: (1) accept allocated performance or deliveries from Grantee, provided that Grantee grants preferential treatment to Department with respect to products subjected to allocation; (2) contract with other sources (without recourse to and by Grantee for the related costs and expenses) to replace all or part of the products or services that are the subject of the delay, which purchase may be deducted from the Agreement quantity; or (3) terminate Agreement in whole or in part.

18. Indemnification.

- a. The Grantee shall be fully liable for the actions of its agents, employees, partners, and subcontractors/subrecipients and shall fully indemnify, defend, and hold harmless Department and its officers, agents, and employees, from suits, actions, damages, and costs of every name and description arising from or relating to:
 - i. personal injury and damage to real or personal tangible property alleged to be caused in whole or in part by Grantee, its agents, employees, partners, and subcontractors/subrecipients; provided, however, that Grantee shall not indemnify for that portion of any loss or damages proximately caused by the negligent act or omission of Department;
 - ii. the Grantee's breach of this Agreement or the negligent acts or omissions of Grantee.
- b. The Grantee's obligations under the preceding paragraph with respect to any legal action are contingent upon Department giving Grantee: (1) written notice of any action or threatened action; (2) the opportunity to take over and settle or defend any such action at Grantee's sole expense; and (3) assistance in defending the action at Grantee's sole expense. The Grantee shall not be liable for any cost, expense, or compromise incurred or made by Department in any legal action without Grantee's prior written consent, which shall not be unreasonably withheld.
- c. Notwithstanding sections a. and b. above, the following is the sole indemnification provision that applies to Grantees that are governmental entities: Each party hereto agrees that it shall be solely responsible for the negligent or wrongful acts of its employees and agents. However, nothing contained herein shall constitute a waiver by either party of its sovereign immunity or the provisions of section 768.28, F.S. Further, nothing herein shall be construed as consent by a state agency or subdivision of the State to be sued by third parties in any matter arising out of any contract or this Agreement.
- d. No provision in this Agreement shall require Department to hold harmless or indemnify Grantee, insure or assume liability for Grantee's negligence, waive Department's sovereign immunity under the laws of Florida, or otherwise impose liability on Department for which it would not otherwise be responsible. Any provision, implication or suggestion to the contrary is null and void.

19. Limitation of Liability.

The Department's liability for any claim arising from this Agreement is limited to compensatory damages in an amount no greater than the sum of the unpaid balance of compensation due for goods or services rendered pursuant to and in compliance with the terms of the Agreement. Such liability is further limited to a cap of \$100,000.

20. Remedies.

Nothing in this Agreement shall be construed to make Grantee liable for force majeure events. Nothing in this Agreement, including financial consequences for nonperformance, shall limit Department's right to pursue its remedies for other types of damages under the Agreement, at law or in equity. The Department may, in addition to

other remedies available to it, at law or in equity and upon notice to Grantee, retain such monies from amounts due Grantee as may be necessary to satisfy any claim for damages, penalties, costs and the like asserted by or against it.

21. Waiver.

The delay or failure by Department to exercise or enforce any of its rights under this Agreement shall not constitute or be deemed a waiver of Department's right thereafter to enforce those rights, nor shall any single or partial exercise of any such right preclude any other or further exercise thereof or the exercise of any other right.

22. Statutory Notices Relating to Unauthorized Employment and Subcontracts/Subawards.

- a. The Department shall consider the employment by any Grantee of unauthorized aliens a violation of Section 274A(e) of the Immigration and Nationality Act. If Grantee/subcontractor/subrecipient knowingly employs unauthorized aliens, such violation shall be cause for unilateral cancellation of this Agreement. The Grantee shall be responsible for including this provision in all subcontracts/subawards with private organizations issued as a result of this Agreement.
- b. Pursuant to sections 287.133, 287.134, and 287.137 F.S., the following restrictions apply to persons placed on the convicted vendor list, discriminatory vendor list, or the antitrust violator vendor list:
 - i. Public Entity Crime. 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, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies on leases of real property to a public entity; may not be awarded or perform work as a Grantee, 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, F.S., for CATEGORY TWO for a period of 36 months following the date of being placed on the convicted vendor list.
 - ii. Discriminatory Vendors. An entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid, proposal, or reply on a contract to provide any goods or services to a public entity; may not submit a bid, proposal, or reply on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids, proposals, or replies 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.
 - iii. Antitrust Violator Vendors. A person or an affiliate who has been placed on the antitrust violator vendor list following a conviction or being held civilly liable for an antitrust violation may not submit a bid, proposal, or reply on any contract to provide any good or services to a public entity; may not submit a bid, proposal, or reply on any contract with a public entity for the construction or repair of a public building or public work; may not submit a bid, proposal, or reply on leases of real property to a public entity; may not be awarded or perform work as a Grantee, supplier, subcontractor, or consultant under a contract with a public entity; and may not transact new business with a public entity.
 - iv. Notification. The Grantee shall notify Department if it or any of its suppliers, subcontractors, or consultants have been placed on the convicted vendor list, the discriminatory vendor list, or antitrust violator vendor list during the life of the Agreement. The Florida Department of Management Services is responsible for maintaining the discriminatory vendor list and the antitrust violator vendor list and posts the list on its website. Questions regarding the discriminatory vendor list or antitrust violator vendor list may be directed to the Florida Department of Management Services, Office of Supplier Development, at (850) 487-0915.

23. Compliance with Federal, State and Local Laws.

- a. The Grantee and all its agents shall comply with all federal, state and local regulations, including, but not limited to, nondiscrimination, wages, social security, workers' compensation, licenses, and registration requirements. The Grantee shall include this provision in all subcontracts/subawards issued as a result of this Agreement.
- b. The Grantee, its subrecipients, subcontractors and agents must also comply with the following civil rights laws and regulations:
 - i. Title VI of the Civil Rights Act of 1964 as amended (prohibiting discrimination in federally assisted programs on the basis of race, color, or national origin in the delivery of services or benefits);

- ii. Section 13 of the 1972 Amendment to the Federal Water Pollution Control Act (prohibiting discrimination on the basis of sex in the delivery of services or benefits under the Federal Water Pollution Control Act as amended);
 - iii. Section 504 of the Rehabilitation Act of 1973 (prohibiting discrimination in federally assisted programs on the basis of disability, both in employment and in the delivery of services and benefits);
 - iv. Age Discrimination Act of 1975 (prohibiting discrimination in federally assisted programs on the basis of age in the delivery of services or benefits);
 - v. 40 C.F.R. Part 7, (implementing Title VI of the Civil Rights Act of 1964, Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act, and Section 504 of the Rehabilitation Act of 1973);
 - vi. Florida Civil Rights Act of 1992 (Title XLIV Chapter 760, Sections 760.01, 760.11 and 509.092, F.S.), including Part I, chapter 760, F.S. (prohibiting discrimination on the basis of race, color, religion, sex, pregnancy, national origin, age, handicap, or marital status).
- c. This Agreement shall be governed by and construed in accordance with the laws of the State of Florida.
 - d. Any dispute concerning performance of the Agreement shall be processed as described herein. Jurisdiction for any damages arising under the terms of the Agreement will be in the courts of the State, and venue will be in the Second Judicial Circuit, in and for Leon County. Except as otherwise provided by law, the parties agree to be responsible for their own attorney fees incurred in connection with disputes arising under the terms of this Agreement.

24. Build America, Buy America Act (BABA) - Infrastructure Projects with Federal Funding.

This provision does not apply to Agreements that are wholly funded by Coronavirus State and Local Fiscal Recovery Funds under the American Rescue Plan Act. Also, this provision does not apply where there is a valid waiver in place. However, the provision may apply to funds expended before the waiver or after expiration of the waiver.

If applicable, Recipients or Subrecipients of an award of Federal financial assistance from a program for infrastructure are required to comply with the Build America, Buy America Act (BABA), including the following provisions:

- a. All iron and steel used in the project are produced in the United States--this means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States;
- b. All manufactured products used in the project are produced in the United States--this means the manufactured product was manufactured in the United States; and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation; and
- c. All construction materials are manufactured in the United States--this means that all manufacturing processes for the construction material occurred in the United States.

The Buy America preference only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to an infrastructure project. As such, it does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the infrastructure project. Nor does a Buy America preference apply to equipment and furnishings, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished infrastructure project but are not an integral part of the structure or permanently affixed to the infrastructure project.

25. Investing in America

Grantees of an award for construction projects in whole or in part by the Bipartisan Infrastructure Law or the Inflation Reduction Act, including the following provision:

- a. Signage Requirements
 - a. Investing in America Emblem: The recipient will ensure that a sign is placed at construction sites supported in whole or in part by this award displaying the official Investing in America emblem and must identify the project as a “project funded by President Biden’s Bipartisan Infrastructure Law” or “project funded by President Biden’s Inflation Reduction Act” as applicable. The sign must be placed at construction sites in an easily visible location that can be directly linked to the work taking place and must be maintained in good condition throughout the construction period.

The recipient will ensure compliance with the guidelines and design specifications provided by EPA for using the official Investing in America emblem available at:
<https://www.epa.gov/invest/investing-america-signage>.

b. Procuring Signs: Consistent with section 6002 of RCRA, 42 U.S.C. 6962, and 2 CFR 200.323, recipients are encouraged to use recycled or recovered materials when procuring signs. Signage costs are considered an allowable cost under this assistance agreement provided that the costs associated with signage are reasonable. Additionally, to increase public awareness of projects serving communities where English is not the predominant language, recipients are encouraged to translate the language on signs (excluding the official Investing in America emblem or EPA logo or seal) into the appropriate non-English language(s). The costs of such translation are allowable, provided the costs are reasonable.

26. Scrutinized Companies.

- a. Grantee certifies that it is not on the Scrutinized Companies that Boycott Israel List or engaged in a boycott of Israel. Pursuant to section 287.135, F.S., the Department may immediately terminate this Agreement at its sole option if the Grantee is found to have submitted a false certification; or if the Grantee is placed on the Scrutinized Companies that Boycott Israel List or is engaged in the boycott of Israel during the term of the Agreement.
- b. If this Agreement is for more than one million dollars, the Grantee certifies that it is also not on the Scrutinized Companies with Activities in Sudan, Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or engaged with business operations in Cuba or Syria as identified in section 287.135, F.S. Pursuant to section 287.135, F.S., the Department may immediately terminate this Agreement at its sole option if the Grantee is found to have submitted a false certification; or if the Grantee is placed on the Scrutinized Companies with Activities in Sudan List, or Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or engaged with business operations in Cuba or Syria during the term of the Agreement.
- c. As provided in subsection 287.135(8), F.S., if federal law ceases to authorize these contracting prohibitions, then they shall become inoperative.

27. Lobbying and Integrity.

The Grantee agrees that no funds received by it under this Agreement will be expended for the purpose of lobbying the Legislature or a State agency pursuant to section 216.347, F.S., except that pursuant to the requirements of section 287.058(6), F.S., during the term of any executed agreement between Grantee and the State, Grantee may lobby the executive or legislative branch concerning the scope of services, performance, term, or compensation regarding that agreement. The Grantee shall comply with sections 11.062 and 216.347, F.S.

28. Record Keeping.

The Grantee shall maintain books, records and documents directly pertinent to performance under this Agreement in accordance with United States generally accepted accounting principles (US GAAP) consistently applied. The Department, the State, or their authorized representatives shall have access to such records for audit purposes during the term of this Agreement and for five (5) years following the completion date or termination of the Agreement. In the event that any work is subcontracted or subawarded, Grantee shall similarly require each subcontractor/subrecipient to maintain and allow access to such records for audit purposes. Upon request of Department's Inspector General, or other authorized State official, Grantee shall provide any type of information the Inspector General deems relevant to Grantee's integrity or responsibility. Such information may include, but shall not be limited to, Grantee's business or financial records, documents, or files of any type or form that refer to or relate to Agreement. The Grantee shall retain such records for the longer of: (1) three years after the expiration of the Agreement; or (2) the period required by the General Records Schedules maintained by the Florida Department of State (available at: <http://dos.myflorida.com/library-archives/records-management/general-records-schedules/>).

29. Audits.

- a. Inspector General. The Grantee understands its duty, pursuant to section 20.055(5), F.S., to cooperate with the inspector general in any investigation, audit, inspection, review, or hearing. The Grantee will comply with this duty and ensure that its subrecipients and/or subcontractors issued under this Agreement, if any, impose this requirement, in writing, on its subrecipients and/or subcontractors, respectively.
- b. Physical Access and Inspection. Department personnel shall be given access to and may observe and inspect work being performed under this Agreement, with reasonable notice and during normal business hours, including by any of the following methods:

- i. Grantee shall provide access to any location or facility on which Grantee is performing work, or storing or staging equipment, materials or documents;
 - ii. Grantee shall permit inspection of any facility, equipment, practices, or operations required in performance of any work pursuant to this Agreement; and,
 - iii. Grantee shall allow and facilitate sampling and monitoring of any substances, soils, materials or parameters at any location reasonable or necessary to assure compliance with any work or legal requirements pursuant to this Agreement.
- c. Special Audit Requirements. The Grantee shall comply with the applicable provisions contained in Attachment 5, Special Audit Requirements. Each amendment that authorizes a funding increase or decrease shall include an updated copy of Exhibit 1, to Attachment 5. If Department fails to provide an updated copy of Exhibit 1 to include in each amendment that authorizes a funding increase or decrease, Grantee shall request one from the Department's Grants Manager. The Grantee shall consider the type of financial assistance (federal and/or state) identified in Attachment 5, Exhibit 1 and determine whether the terms of Federal and/or Florida Single Audit Act Requirements may further apply to lower tier transactions that may be a result of this Agreement. For federal financial assistance, Grantee shall utilize the guidance provided under 2 CFR §200.331 for determining whether the relationship represents that of a subrecipient or vendor. For State financial assistance, Grantee shall utilize the form entitled "Checklist for Nonstate Organizations Recipient/Subrecipient vs Vendor Determination" (form number DFS-A2-NS) that can be found under the "Links/Forms" section appearing at the following website: <https://apps.fldfs.com/fsaa>.
- d. Proof of Transactions. In addition to documentation provided to support cost reimbursement as described herein, Department may periodically request additional proof of a transaction to evaluate the appropriateness of costs to the Agreement pursuant to State guidelines (including cost allocation guidelines) and federal, if applicable. Allowable costs and uniform administrative requirements for federal programs can be found under 2 CFR 200. The Department may also request a cost allocation plan in support of its multipliers (overhead, indirect, general administrative costs, and fringe benefits). The Grantee must provide the additional proof within thirty (30) days of such request.
- e. No Commingling of Funds. The accounting systems for all Grantees must ensure that these funds are not commingled with funds from other agencies. Funds from each agency must be accounted for separately. Grantees are prohibited from commingling funds on either a program-by-program or a project-by-project basis. Funds specifically budgeted and/or received for one project may not be used to support another project. Where a Grantee's, or subrecipient's, accounting system cannot comply with this requirement, Grantee, or subrecipient, shall establish a system to provide adequate fund accountability for each project it has been awarded.
 - i. If Department finds that these funds have been commingled, Department shall have the right to demand a refund, either in whole or in part, of the funds provided to Grantee under this Agreement for non-compliance with the material terms of this Agreement. The Grantee, upon such written notification from Department shall refund, and shall forthwith pay to Department, the amount of money demanded by Department. Interest on any refund shall be calculated based on the prevailing rate used by the State Board of Administration. Interest shall be calculated from the date(s) the original payment(s) are received from Department by Grantee to the date repayment is made by Grantee to Department.
 - ii. In the event that the Grantee recovers costs, incurred under this Agreement and reimbursed by Department, from another source(s), Grantee shall reimburse Department for all recovered funds originally provided under this Agreement and interest shall be charged for those recovered costs as calculated on from the date(s) the payment(s) are recovered by Grantee to the date repayment is made to Department.
 - iii. Notwithstanding the requirements of this section, the above restrictions on commingling funds do not apply to agreements where payments are made purely on a cost reimbursement basis.

30. Conflict of Interest.

The Grantee covenants that it presently has no interest and shall not acquire any interest which would conflict in any manner or degree with the performance of services required.

31. Independent Contractor.

The Grantee is an independent contractor and is not an employee or agent of Department.

32. Subcontracting/Subawards.

- a. Unless otherwise specified in the Special Terms and Conditions, all services contracted for are to be performed solely by Grantee.

- b. The Department may, for cause, require the replacement of any Grantee employee, subcontractor/subrecipient, or agent. For cause, includes, but is not limited to, technical or training qualifications, quality of work, change in security status, or non-compliance with an applicable Department policy or other requirement.
- c. The Department may, for cause, deny access to Department's secure information or any facility by any Grantee employee, subcontractor/subrecipient, or agent.
- d. The Department's actions under paragraphs b. or c. shall not relieve Grantee of its obligation to perform all work in compliance with the Agreement. The Grantee shall be responsible for the payment of all monies due under any subcontract/subaward. The Department shall not be liable to any subcontractor/subrecipient for any expenses or liabilities incurred under any subcontract/subaward, and Grantee shall be solely liable to the subcontractor for all expenses and liabilities incurred under any subcontract/subaward.
- e. The Department will not deny Grantee's employees, subcontractors/subrecipients, or agents access to meetings within the Department's facilities, unless the basis of Department's denial is safety or security considerations.
- f. A list of minority-owned firms that could be offered subcontracting opportunities may be obtained by contacting the Office of Supplier Development at (850) 487-0915.
- g. The Grantee shall not be liable for any excess costs for a failure to perform, if the failure to perform is caused by the default of a subcontractor/subrecipient at any tier, and if the cause of the default is completely beyond the control of both Grantee and the subcontractor(s)/subrecipient(s), and without the fault or negligence of either, unless the subcontracted/subawarded products or services were obtainable from other sources in sufficient time for Grantee to meet the required delivery schedule.

33. Guarantee of Parent Company.

If Grantee is a subsidiary of another corporation or other business entity, Grantee asserts that its parent company will guarantee all of the obligations of Grantee for purposes of fulfilling the obligations of Agreement. In the event Grantee is sold during the period the Agreement is in effect, Grantee agrees that it will be a requirement of sale that the new parent company guarantee all of the obligations of Grantee.

34. Survival.

The respective obligations of the parties, which by their nature would continue beyond the termination or expiration of this Agreement, including without limitation, the obligations regarding confidentiality, proprietary interests, and public records, shall survive termination, cancellation, or expiration of this Agreement.

35. Third Parties.

The Department shall not be deemed to assume any liability for the acts, failures to act or negligence of Grantee, its agents, servants, and employees, nor shall Grantee disclaim its own negligence to Department or any third party. This Agreement does not and is not intended to confer any rights or remedies upon any person other than the parties. If Department consents to a subcontract/subaward, Grantee will specifically disclose that this Agreement does not create any third-party rights. Further, no third parties shall rely upon any of the rights and obligations created under this Agreement.

36. Severability.

If a court of competent jurisdiction deems any term or condition herein void or unenforceable, the other provisions are severable to that void provision, and shall remain in full force and effect.

37. Grantee's Employees, Subcontractors/Subrecipients and Agents.

All Grantee employees, subcontractors/subrecipients, or agents performing work under the Agreement shall be properly trained technicians who meet or exceed any specified training qualifications. Upon request, Grantee shall furnish a copy of technical certification or other proof of qualification. All employees, subcontractors/subrecipients, or agents performing work under Agreement must comply with all security and administrative requirements of Department and shall comply with all controlling laws and regulations relevant to the services they are providing under the Agreement.

38. Assignment.

The Grantee shall not sell, assign, or transfer any of its rights, duties, or obligations under the Agreement, or under any purchase order issued pursuant to the Agreement, without the prior written consent of Department. In the event of any assignment, Grantee remains secondarily liable for performance of the Agreement, unless Department expressly waives such secondary liability. The Department may assign the Agreement with prior written notice to Grantee of its intent to do so.

39. Compensation Report.

If this Agreement is a sole-source, public-private agreement or if the Grantee, through this agreement with the State, annually receive 50% or more of their budget from the State or from a combination of State and Federal funds, the Grantee shall provide an annual report, including the most recent IRS Form 990, detailing the total compensation for

the entities' executive leadership teams. Total compensation shall include salary, bonuses, cashed-in leave, cash equivalents, severance pay, retirement benefits, deferred compensation, real-property gifts, and any other payout. The Grantee must also inform the Department of any changes in total executive compensation between the annual reports. All compensation reports must indicate what percent of compensation comes directly from the State or Federal allocations to the Grantee.

40. Disclosure of Gifts from Foreign Sources.

If the value of the grant under this Agreement is \$100,000 or more, Grantee shall disclose to Department any current or prior interest of, any contract with, or any grant or gift received from a foreign country of concern, as defined in section 286.101, F.S., if such interest, contract, or grant or gift has a value of \$50,000 or more and such interest existed at any time or such contract or grant or gift was received or in force at any time during the previous 5 years. Such disclosure shall include the name and mailing address of the disclosing entity, the amount of the contract or grant or gift or the value of the interest disclosed, the applicable foreign country of concern and, if applicable, the date of termination of the contract or interest, the date of receipt of the grant or gift, and the name of the agent or controlled entity that is the source or interest holder. If the disclosure requirement is applicable as described above, then within 1 year before applying for any grant, Grantee must also provide a copy of such disclosure to the Department of Financial Services.

41. Food Commodities.

To the extent authorized by federal law, the Department, its grantees, contractors and subcontractors/subrecipients shall give preference to food commodities grown or produced in this state when purchasing food commodities, including farm products as defined in section 823.14, F.S., of any class, variety, or use thereof in their natural state or as processed by a farm operation or processor for the purpose of marketing such product.

42. Anti-human Trafficking.

If the Grantee is a nongovernmental entity, the Grantee must provide the Department with an affidavit signed by an officer or a representative of the Grantee under penalty of perjury attesting that the Grantee does not use coercion for labor or services as defined in section 787.06, F.S.

43. Iron and Steel for Public Works Projects.

If this Agreement funds a "public works project" as defined in section 255.0993, F.S., or the purchase of materials to be used in a public works project, any iron or steel permanently incorporated in the Project must be "produced in the United States," as defined in section 255.0993, F.S. This requirement does not apply if the Department determines that any of the following circumstances apply to the Project:

- (1) iron or steel products produced in the United States are not produced in sufficient quantities, reasonably available, or of satisfactory quality;
- (2) the use of iron or steel products produced in the United States will increase the total cost of the project by more than twenty percent (20%); or
- (3) complying with this requirement is inconsistent with the public interest.

Further, this requirement does not prevent the Contractor's minimal use of foreign steel and iron materials if:

- (1) such materials are incidental or ancillary to the primary product and are not separately identified in the project specifications; and
- (2) the "cost" of such materials, as defined in section 255.0993, F.S., does not exceed one-tenth of one percent (1%) of the total Project Cost under this Agreement or \$2,500, whichever is greater.

Electrical components, equipment, systems, and appurtenances, including supports, covers, shielding, and other appurtenances related to an electrical system that are necessary for operation or concealment (excepting transmission and distribution poles) are not considered to be iron or steel products and are, therefore, exempt from the requirements of this paragraph.

This provision shall be applied in a manner consistent with and may not be construed to impair the state's obligations under any international agreement.

44. Complete and Accurate information.

Grantee represents and warrants that all statements and information provided to DEP are current, complete, and accurate. This includes all statements and information in this Grant, as well as its Attachments and Exhibits.

45. Execution in Counterparts and Authority to Sign.

This Agreement, any amendments, and/or change orders related to the Agreement, may be executed in counterparts, each of which shall be an original and all of which shall constitute the same instrument. In accordance with the Electronic Signature Act of 1996, electronic signatures, including facsimile transmissions, may be used and shall have the same force and effect as a written signature. Each person signing this Agreement warrants that he or she is duly authorized to do so and to bind the respective party to the Agreement.

Attachment 1

SPECIAL PROVISIONS

1. REFERENCE SPECIFICATIONS – Florida Building Code (FBC) 2023 - 8th Edition with all current revisions and supplements; Florida Fire Prevention Code (FFPC) 2020 - 7th edition with all current revisions and supplements, (includes Florida versions of NFPA 1 & NFPA 101, 2021 edition); All other Federal, State and Local Codes and Ordinances which may be in effect for this construction location.
2. The Contractor shall be responsible for applying for a City of Sanibel Building Department construction permit for the project (if necessary). The City shall be responsible for payment of fees for the Sanibel Building Department permits. Required licensing costs and any other miscellaneous fees associated with the project shall be paid for by the Contractor. All required environmental permits shall be secured by the City. Contractor must possess or be able to obtain a City of Sanibel business tax receipt or any other required licensing prior to the start of any work.
3. The contractor shall be responsible for all survey construction layout.
4. The Contractor shall dispose of all debris such as trees, brush, stumps and other deleterious material at location off the Island of Sanibel. No extra compensation will be allowed for hauling and providing the off-island disposal areas.
5. The Contractor is advised that he may not enter upon private property adjacent to the project without written consent of the affected property owner. A copy of the permission document shall be given to the Engineer.
6. The Contractor is hereby advised that he may not engage in any work on private property in the City of Sanibel during the contract performance period without written permission from the City of Sanibel. Failure to comply with this provision may result in suspension of all work activities until the matter is resolved.

An example of such work would be the paving of a private driveway. If the Contractor paves the driveway and the property owners does not possess the proper City permits, the entire project might be stopped until the necessary permits are obtained. The delay could be months and the Contractor could be assessed for liquidated damages.

7. No allowance for time extension of the project will be made for weather conditions common to Southwest Florida during the contract time period. The Contractor is reminded that time is of the essence and the work should proceed as quickly and efficiently as possible.
8. The Contractor shall remove and relocate as necessary all mailboxes, street signs, post fences structures such as headwalls, pipes, etc., and any other item necessary for progress and completion of the work. Payment shall be incidental to other items of work.
9. The Contractor shall include the adjustment of those structures (manholes, valves, etc.) that are required to be adjusted for the satisfactory completion of the work. These structures shall be of reinforced concrete or may be brick masonry if circular and constructed in place and shall include the necessary metal frames and gratings. No payment will be made for these items.
10. The contractor will ensure that the roadway and bridges over which he hauls materials will be kept clear. If spoil material and water fall from the truck onto the roadway, the

contractor will keep the road clear at all times, either by power broom or by whatever means is necessary, if excessive material continues to be deposited, the Engineer will require hauling to be discontinued until the situation is resolved.

11. Contractor responsible for any temporary markings (i.e. signs, barricades, Striping, caution tape) to assure traffic safety (Vehicular, Pedestrian and Bicycle traffic).
12. All subcontractors must be approved in writing by the City.
13. All soil and concrete tests will be made by a laboratory approved of by the Engineer. Cost of testing will be paid for by the Owner except all subsequent tests deemed necessary because the original test indicated that the work did not conform to specifications. These tests shall be paid for by the contractor. The location of these tests shall be determined by the Owner.
14. An As-Built survey of the project shall be performed and submitted to Owner prior to final acceptance. The survey shall be conducted in accordance with the standards set forth in Chapter 472 of the Florida Statutes and the Minimum Technical Standards for such surveys as specified in Chapter 61G17 of the Florida Administrative Code. The cost of the survey shall be borne by the Contractor.
15. The Contractor shall prevent erosion of soil on the site and adjacent property resulting from his construction activities. Effective measures shall be initiated prior to the commencement of clearing, grading, excavation, or other operation that will disturb the natural protection. Install silt barriers or screens for capturing sediments/solids from erosion and dewatering / jetting activities.
16. The Contractor must be in possession of or obtain from the City of Sanibel an Occupational Registration and if applicable a Vegetation Competency Card prior to the start of the contract work to be done.
17. The Contractor is responsible to pay all toll fees required by Lee County to use the Sanibel Causeway.
18. Contractor is responsible for preventing any workers on this project, including all subcontractors, from feeding alligators anywhere on Sanibel Island. Contractor is required to instruct all workers and subcontractors not to eat lunch on the edge of any waterbody on Sanibel Island and not to feed, tease or interact in any way with any alligators, which is illegal under state law. Signage provided by the City regarding alligator feeding shall be posted on all job sites in a clearly visible location. Project sites adjacent to open water of any kind shall have a minimum of two additional alligator signs posted in clearly visible locations near the water's edge. All job sites shall be maintained free of any open containers of food or any food-related garbage. All workers on this project are to be informed that the City takes this issue very seriously and will prosecute any violators to the full extent of this law. State penalties for violating this law include a fine of up to \$500 per incidence and up to 60 days in jail. Failure to inform workers of the prohibition against feeding alligators as required above or evidence of alligators being fed by workers on this project, either at the project site or elsewhere on Sanibel Island, will result in immediate revocation of this contract.
19. Payment for work items in this contract is based on actual quantities with unit cost as per the bid schedule. The owner reserves the right to adjust quantities up to twenty-five

percent (25%) over or underestimated quantities at contract unit prices. Any increase of work items shall be based on unit prices of similar work items in the vicinity. Any such adjustment resulting in the increase of the total contract price must be approved by the City Council.

20. It is up to the contractor to verify the correct scaling for printed plan documents of electronic documents provided by the City.
21. Contractor to provide Certificate of Workman's Compensation Insurance; U.S.L.& H. coverage, Jones Act (if applicable) and Public Liability in an amount not less than \$1,000,000.00

SPECIAL PROVISIONS

FLORIDA DEP STANDARD TERMS AND CONDITIONS APPLICABLE TO GRANT AGREEMENTS

Sections Applicable to this Contract:

Paragraph 22. Statutory Notices Relating to Unauthorized Employment and Subcontracts/Subawards

Paragraph 23. Compliance with Federal, State and Local Laws

REQUIRED CONTRACT PROVISIONS

TERMINATION FOR CAUSE OR CONVENIENCE; REMEDIES

This contract is for more than the simplified acquisition threshold, currently set at \$250,000, so it must address administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms and provide for such sanctions and penalties as appropriate. See 2 C.F.R. Part 200, Appendix II(A). This requirement applies to all FEMA grant and cooperative agreement programs.

The City of Sanibel may terminate the contract at any time for breach of contractual obligations or for convenience, by providing the provider with a written notice of such cancellation. In the event of a termination for cause, the termination shall become effective on the date specified in the notice of cancellation, and the City of Sanibel shall have no continuing financial or other obligations to the Contractor from the effective date of the termination through what otherwise would have remained of the contract term. In the event of a termination for convenience, such termination shall not be earlier than 30 days from the date of such written notice, and the City shall be obligated to pay reasonable, substantiated demobilization costs but shall otherwise have no continuing financial or other obligations to the Contractor from the effective date of the termination through what otherwise would have remained for the contract term.

ACCESS TO RECORDS

The following access to records requirements apply to this contract: (1) The contractor agrees to provide the State of Florida (or any of its agencies), the City of Sanibel, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions. (2) The Contractor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed. (3) The contractor agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract."

COMPLIANCE WITH FEDERAL LAW, REGULATIONS AND EXECUTIVE ORDERS

This is an acknowledgement that FEMA financial assistance will be used to fund the contract only. The contractor will comply with all applicable federal law, regulations, executive orders, FEMA policies, procedures, and directives.

NO OBLIGATION BY FEDERAL GOVERNMENT

The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, contractor, or any other party pertaining to any matter resulting from the contract.

PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR RELATED ACTS

The contractor acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the contractor's actions pertaining to this contract.

COPELAND ANTI-KICKBACK ACT

Compliance with the Copeland "Anti-Kickback" Act.

The contractor shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this contract. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clause above and such other clauses as FEMA may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all these contract clauses.

Breach. A breach of the contract clauses above may be grounds for termination of the contract, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. § 5.12.

CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Compliance with the Contract Work Hours and Safety Standards Act.

The following clauses set forth in 29 C.F.R. § 5.5(b) are required, in accordance with the Contract Work Hours and Safety Standards Act:

- (1) *Overtime requirements.* No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- (2) *Violation; liability for unpaid wages; liquidated damages.* In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of \$27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.
- (3) *Withholding for unpaid wages and liquidated damages.* The City of Sanibel shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which

is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

- (4) *Subcontracts.* The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

CLEAN AIR ACT AND THE FEDERAL WATER POLLUTION CONTROL ACT

Federal Water Pollution Control Act

The contractor agrees to comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.

The contractor agrees to report each violation to the City of Sanibel and understands and agrees that the City of Sanibel will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

The contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by FEMA.

EQUAL EMPLOYMENT OPPORTUNITY

During the performance of this contract, the contractor agrees as follows:

- (1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants' employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- (2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration

for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

- (3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
- (4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- (8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: provided, however, that in the event a contractor

becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

The City of Sanibel further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: *provided, however*, that if the applicant so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The City of Sanibel agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The City of Sanibel further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

DEBARMENT AND SUSPENSION

This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the contractor is required to verify that none of the contractor's principals (defined at 2 C.F.R. § 180.995) or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

The contractor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

This certification is a material representation of fact relied upon by The City of Sanibel. If it is later determined that the contractor did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R.

pt. 3000, subpart C, in addition to remedies available to the City of Sanibel, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

BYRD ANTI-LOBBYING AMENDMENT

Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352 (as amended)

Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, officer or employee of Congress, or an employee of a Member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient who in turn will forward the certification(s) to the awarding agency.

Required Certification. If applicable, contractors must sign and submit to the non-federal entity the following certification.

APPENDIX A, 44 C.F.R. PART 18 – CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned

shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The Contractor _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. Chap. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

Signature of Contractor's Authorized Official

Name and Title of Contractor's Authorized Official

Date

PROCUREMENT OF RECOVERED MATERIAL

This required contract provision applies to all procurements over \$10,000 made by a state agency or an agency of a political subdivision of a state and its contractors.

The requirements include: Procuring only items designated in EPA guidelines that contain the highest practical percentage of recovered materials consistent with maintaining competition, where the purchase price of the item is greater than \$10,000, or the value of the amount of items purchased in the preceding fiscal year was greater than \$10,000; Procuring solid waste management services in a way that maximizes energy and resource recovery; and Establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired Competitively within a timeframe providing for compliance with the contract performance schedule; Meeting contract performance requirements; or At a reasonable price. Information about this requirement, along with the list of EPA-designated items, is available at EPA's Comprehensive Procurement Guidelines webpage: <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>. The Contractor also agrees to comply with all other applicable requirements of Section 6002 of the Solid Waste Disposal Act."

PROHIBITION ON CONTRACTING FOR COVERED TELECOMMUNICATIONS EQUIPMENT OR SERVICES

Section 889(b)(1) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (FY2019 NDAA) and 2 C.F.R. § 200.216, as implemented by FEMA Policy 405-143-1, Prohibitions on Expending FEMA Award Funds for Covered Telecommunications Equipment or Services (Interim), prohibit the obligation or expending of federal award funds on certain telecommunication products or from certain entities for national security reasons. Effective August 13, 2020, FEMA recipients and subrecipients, as well as their contractors and subcontractors, may not obligate or expend any FEMA award funds to:

- a. Procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system;
- b. Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system; or
- c. Enter into, extend, or renew contracts with entities that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system.

"Prohibition on Contracting for Covered Telecommunications Equipment or Services (a) Definitions. As used in this clause, the terms backhaul; covered foreign country; covered telecommunications equipment or services; interconnection arrangements; roaming; substantial or essential component; and telecommunications equipment or services have the meaning as defined in FEMA Policy 405-143-1, Prohibitions on Expending FEMA Award Funds for Covered Telecommunications Equipment or Services (Interim), as used in this clause— (b) Prohibitions. (1) Section 889(b) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019, Pub. L. No. 115-232, and 2 C.F.R. § 200.216 prohibit the head of an executive agency on or after Aug.13, 2020, from obligating or expending grant, cooperative agreement, loan, or loan guarantee funds on certain telecommunications products or from certain entities for national security reasons. (2) Unless an exception in paragraph (c) of this clause applies, the contractor and its

subcontractors may not use grant, cooperative agreement, loan, or loan guarantee funds from the Federal Emergency Management Agency to: (i) Procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system; (ii) Enter into, extend, or renew a contract to procure or obtain any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology of any system; (iii) Enter into, extend, or renew contracts with entities that use covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system; or (iv) Provide, as part of its performance of this contract, subcontract, or other contractual instrument, any equipment, system, or service that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. (c) Exceptions. (1) This clause does not prohibit contractors from providing— (i) A service that connects to the facilities of a third-party, such as backhaul, roaming, or interconnection arrangements; or Contract Provisions Guide 28 (ii) Telecommunications equipment that cannot route or redirect user data traffic or permit visibility into any user data or packets that such equipment transmits or otherwise handles. (2) By necessary implication and regulation, the prohibitions also do not apply to: (i) Covered telecommunications equipment or services that: i. Are not used as a substantial or essential component of any system; and ii. Are not used as critical technology of any system. (ii) Other telecommunications equipment or services that are not considered covered telecommunications equipment or services. (d) Reporting requirement. (1) In the event the contractor identifies covered telecommunications equipment or services used as a substantial or essential component of any system, or as critical technology as part of any system, during contract performance, or the contractor is notified of such by a subcontractor at any tier or by any other source, the contractor shall report the information in paragraph (d)(2) of this clause to the recipient or subrecipient, unless elsewhere in this contract are established procedures for reporting the information. (2) The Contractor shall report the following information pursuant to paragraph (d)(1) of this clause: (i) Within one business day from the date of such identification or notification: The contract number; the order number(s), if applicable; supplier name; supplier unique entity identifier (if known); supplier Commercial and Government Entity (CAGE) code (if known); brand; model number (original equipment manufacturer number, manufacturer part number, or wholesaler number); item description; and any readily available information about mitigation actions undertaken or recommended. (ii) Within 10 business days of submitting the information in paragraph (d)(2)(i) of this clause: Any further available information about mitigation actions undertaken or recommended. In addition, the contractor shall describe the efforts it undertook to prevent use or submission of covered telecommunications equipment or services, and any additional efforts that will be incorporated to prevent future use or submission of covered telecommunications equipment or services. (e) Subcontracts. The Contractor shall insert the substance of this clause, including this paragraph (e), in all subcontracts and other contractual instruments.”

DOMESTIC PREFERENCES FOR PROCUREMENT

As appropriate, and to the extent consistent with law, NFEs should, to the greatest extent practicable under a federal award, provide a preference for the purchase, acquisition, or use of goods, products or materials produced in the United States. This includes, but is not limited to, iron, aluminum, steel, cement, and other manufactured products.

As appropriate, and to the extent consistent with law, the contractor should, to the greatest extent practicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States. This includes, but is not limited to iron, aluminum, steel, cement, and other manufactured products. For purposes of this clause: Produced in the United States means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States. Manufactured products mean items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.”

CONTRACT CHANGES OR MODIFICATIONS

To be allowable under a FEMA grant or cooperative agreement award, the cost of any contract change, modification, amendment, addendum, change order, or constructive change must be necessary, allocable, within the scope of the grant or cooperative agreement, reasonable for the scope of work, and otherwise allowable.

AFFIRMATIVE SOCIOECONOMIC STEPS

For procurements under FEMA declarations and awards issued on or after November 12, 2020, all NFEs are required to take the six affirmative steps to ensure use of small and minority businesses, women’s business enterprises, and labor surplus area firms when possible. One of the six steps is to require the prime contractor, if subcontracts are to be let, to take the five other affirmative steps, For procurements under FEMA declarations and awards issued between December 26, 2014, and November 12, 2020, this requirement only applies to non-state entities.

If subcontracts are to be let, the prime contractor is required to take all necessary steps identified in 2 C.F.R. § 200.321(b)(1)-(5) to ensure that small and minority businesses, women’s business enterprises, and labor surplus area firms are used when possible.

COPYRIGHT AND DATA RIGHTS

An NFE is required by 2 C.F.R. § 200.315 to provide certain licenses with respect to copyright and data to the federal awarding agency. 2 C.F.R. § 200.315(b) provides to the federal awarding agency “a royalty-free, nonexclusive and irrevocable right to reproduce, publish, or otherwise use [any work that is subject to copyright] for federal purposes, and to authorize others to do so.” 2 C.F.R. § 200.315(d) provides to the federal government the rights to “obtain, reproduce, publish, or otherwise use” data produced under a federal award and to authorize others to do the same.

The Contractor grants to the City of Sanibel a paid-up, royalty-free, nonexclusive, irrevocable, worldwide license in data first produced in the performance of this contract to reproduce, publish, or otherwise use, including prepare derivative works, distribute copies to the public, and perform publicly and display publicly such data. For data required by the contract but not first produced in the performance of this contract, the Contractor will identify such data and grant to the City of Sanibel or acquires on its behalf a license of the same scope as for data first produced in the performance of this contract. Data, as used herein, shall include any work subject to copyright under 17 U.S.C. § 102, for example, any written reports or literary works, software and/or source code, music, choreography, pictures or images, graphics, sculptures, videos, motion pictures or other audiovisual works, sound and/or video recordings, and architectural works. Upon or before the completion of this contract, the Contractor will deliver to the City of Sanibel data first produced in the performance of this contract and data required by the contract but not first produced in the performance of this contract in formats acceptable by the City of Sanibel.”

CONTRACT DOCUMENTS

CITY OF SANIBEL POST HURRICANE IAN LIFT STATION CONTROL PANEL AND PLATFORM IMPROVEMENTS – PHASE 1

TECHNICAL SPECIFICATIONS

MARCH 2026

Prepared For:



Prepared By:



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Tetra Tech #200-08498-24002

CITY OF SANIBEL
POST HURRICANE IAN LIFT STATION CONTROL PANEL AND PLATFORM IMPROVEMENTS – PHASE 1

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CITY OF SANIBEL

POST HURRICANE IAN LIFT STATION CONTROL PANEL AND PLATFORM IMPROVEMENTS – PHASE 1

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SECTION 011000

SUMMARY OF WORK

PART 1 – GENERAL

1.01 DESCRIPTION

- A. The Work consists of furnishing all labor, equipment, materials, and services required to install the lift station platforms, concrete foundations, control panels, and associated electrical improvements, including demolition of existing electrical panels, bypass pumping of the lift stations, and all other work necessary for a complete installation. The City has already procured the control panels, generator receptacle and back box, power panels, terminal boxes, junction boxes with air vents, platforms, and ladders, which will be stored at Sanibel's Public Works facility, and the Contractor is responsible solely for transporting all Owner-furnished equipment to the site and performing all required installation. All other equipment and materials shown on the plans or required for a complete and functional installation shall be provided and installed by the Contractor.
- B. Contractor's Duties:
1. Cooperate with the Owner or Owner's Representatives.
 2. Adequately phase and coordinate the project and all associated work efforts to avoid delays or project issues.
 3. Except as specifically noted, provide and pay for:
 - a. Labor, materials, and equipment.
 - b. Tools, construction equipment, and machinery.
 - c. Other facilities and services necessary for the proper execution and completion of the Work.
 4. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities that bear on performance of Work.
 5. Promptly submit written notice to Engineer of observed variance of Contract Documents from legal requirements.
 6. Enforce strict discipline and good order among employees. Do not employ on Work persons not skilled in their assigned task.
 7. The Contractor shall furnish personnel and equipment that will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress that will ensure the completion of the work within the time stipulated in the Proposal. This project is a critical/priority project, and the work should be completed in a timely fashion accordingly. If, at any time, such personnel appear to the Engineer to be inefficient, inappropriate or insufficient for securing the

quality of work aforesaid, he may order the Contractor to increase efficiency, change the character or increase the personnel and equipment, and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress.

END OF SECTION

SECTION 012200

MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.01 GENERAL INFORMATION

- A. Refer to Section 011000 for a description of the work required for completion of the Work.
- B. Subject to the provisions in the Contract General Conditions, all work and payment for the work is represented by the Total Base Bid amount shown on the Bid Form.

1.02 PAYMENT

- A. Work under this contract will be paid for on a unit price and/or lump sum price basis as outlined on the Bid Form. The amount of payment will be as defined in the Standard Form of Agreement between Owner and Contractor.
- B. The prices shown on the Bid Form establish a total price cost for completing the Work in its entirety. Furnish all materials, equipment, transportation, tools, labor, services and supplies, plus any miscellaneous items and services that may not be specifically identified in the Contract Drawings and Specifications but that can be inferred from the Contract Drawings and Specifications and are necessary to produce a completed Work that is usable in a manner for which it was intended. If any items for a complete work are omitted or not shown, the Contractor shall furnish and install them without additional cost to the Owner. No separate payment will be made for another Payment Item required to complete the work of a lump sum item.
- C. The Contractor shall prepare and submit an Application for Payment no more often than each month.
- D. Retainage shall apply to all Contractor payments prior to final acceptance as provided for in the Contract General Conditions.

1.03 MEASUREMENT FOR PAYMENT

- A. Measurement for Lump Sum bid items shall be based on the percent of actual completion as determined by the Contractor and agreed upon by the Engineer.
- B. Measurement for Unit Price bid items shall be based on the actual quantity provided and accepted by the Engineer.
- C. Measurement of volumes shall be the actual "as-built" volume pertinent to payment items. Quantities on the Bid Form are estimated and may be increased or decreased without limit.

1.04 PAYMENT ITEMS

- A. Separate payment will be made for the Unit Price and Lump Sum Items listed on the Bid Form. Related work not specifically listed or identified, but evidently necessary for satisfactory completion of the Item, shall be considered to be included.
- B. No separate payment will be made for the following Work, and its cost shall be included in appropriate Payment Items:
 - 1. Record drawings.
 - 2. Clean up.
 - 3. Testing materials and apparatus.
 - 4. Appurtenant work.
 - 5. Contractor fees associated with the performance of the Work.
 - 6. Project phasing and coordination.
 - 7. Work required outside of normal work hours (nights, weekends or holidays, etc.)
 - 8. Submitting and obtaining all necessary permit approvals, including fees.
 - 9. Storm preparation and associated demobilization and remobilization.
- C. The following will clarify the work included for bid items in the Pay Item Sheet:

General Requirements (Bid Item No. 1)

- a. Measurement of various items for General Requirements will not be made for payment, and all items shall be included in the appropriate lump sum prices throughout the bid schedule.
- b. Payment will be made at the Contract lump sum price for the item, which shall be full compensation for all administrative, supervisory, and support services necessary to complete the project. This includes project coordination, permitting, scheduling, quality control, bonds, safety compliance, and all other general obligations not specifically covered under other bid items.

Mobilization and Demobilization (Bid Item No. 2)

- a. Measurement of various items for Mobilization and Demobilization will not be made for payment, and all items shall be included in the lump sum price.
- b. Payment for Mobilization and Demobilization will be made at the Contract lump sum price for the item, which price and payment shall be full compensation for the preparatory work and operations in mobilizing for beginning work on the Project and demobilizing for ending work on the Project, as well as any storm preparation and required demobilization during work on the Project. The establishment and maintenance/use of field offices, buildings, safety equipment, first aid supplies, sanitary and other facilities, as required by these Specifications, State and local laws and any other pre-construction expense necessary for the state of the Work; the cost of field engineering, including proper disposal of all debris, permits and all permit fees, construction schedules, project phasing and coordination, pre-construction

photographs/videos, silt fences, inlet protection, cleaning or maintaining the work areas, temporary facilities, record documents, operating and maintenance data. The cost for furnishing, installing, maintaining, and removing a 6-foot temporary chain-link construction fence at each lift station site shall also be included under this lump sum Bid Item. No separate measurement or payment will be made for temporary fencing.

The Contractor shall submit invoices substantiating the cost of mobilization with each pay request. Up to 75% will be paid for mobilization with the remaining 25% being paid after demobilization and as-built surveys and redlines have been received. The contractor should not assume that all items listed in the above paragraph are mandated for work performed under this specification, although if included, they do fall under this lump sum item.

Maintenance of Traffic (Bid Item No. 3)

- a. No separate measurement will be made for Maintenance of Traffic. All work needed to provide and maintain required traffic-control devices and safe access—such as signs, cones, barricades, message boards, detours, and flagging—shall be included in the lump sum price for this item.
- b. Payment will be made at the lump sum price for Maintenance of Traffic, which covers all labor, equipment, materials, and services needed to set up, maintain, adjust, and remove traffic-control measures. This includes preparing MOT plans as needed, coordinating with agencies, keeping access open to the public and emergency services, and restoring traffic patterns once work is complete. No additional payment will be made for extra devices or measures needed to meet field conditions.

Demolition (Bid Items No. 4a-13a)

- a. Measurement of demolition work will not be made for payment. All demolition activities shall be included in the lump sum price for this item.
- b. Payment will be made at the Contract lump sum price for demolition, which shall be full compensation for removal and proper disposal of existing structures, equipment, piping, concrete, and any other materials as indicated in the Drawings and Specifications. Demolition is to include necessary tree removal, any other vegetation removal, and asphalt demolition at Lift Station 17. This includes all labor, tools, equipment, permits, and coordination necessary to complete demolition in compliance with safety and environmental regulations.

Bypass (Bid Items No. 4b-13b)

- a. Measurement of bypass pumping and related work will not be made for payment. All bypass operations shall be included in the lump sum price for this item.
- b. Payment will be made at the Contract lump sum price for bypass, which shall be full compensation for furnishing, installing, operating, and maintaining temporary bypass

systems to ensure uninterrupted service during construction. This includes all piping, fittings, pumps, power supply, fuel, monitoring, and restoration of bypass areas, as well as compliance with all regulatory requirements.

Cast in Place Concrete (Bid Items No. 4c-13c)

- a. Measurement for Cast-in-Place Concrete will not be made for payment. All work associated with cast-in-place concrete—including construction of ladder landings, above-grade concrete columns, and pile caps—shall be included in the lump sum price for this item
- b. Payment will be made at the Contract lump sum price for Cast-in-Place Concrete, which shall be full compensation for all labor, materials, equipment, forming, reinforcement, placement, finishing, curing, concrete testing and related work necessary to construct the above-grade concrete components of the lift station platform system. This includes, but is not limited to all ladder landings, concrete columns above grade, the pile cap supporting the column and encasing conduits, anchorage, coatings (if required), layout, safety, quality control, and compliance with all applicable codes and specifications.

Auger Cast Piles (Bid Items No. 4d-13d)

- a. Measurement for Auger Cast Piles will not be made for payment. All auger cast pile work—including drilling of shafts up to the vertical linear-foot depth specified in the Drawings for each lift station and the placement of all required below-grade concrete—shall be included in the lump sum price for this item.
- b. Payment will be made at the Contract lump sum price for Auger Cast Piles, which shall be full compensation for all drilling, excavation, reinforcement, concrete placement, tremie operations, spoil management, casing or slurry, and all other activities necessary to install the auger cast piles to the depths specified in the Drawings. This payment includes all labor, materials, equipment, layout, safety, testing, documentation, and coordination required to complete the pile foundations through the specified vertical depth.

Additional Auger Cast Pile Depth (Bid Items No. 4e-13e)

- a. Measurement for Additional Auger Cast Pile Depth will be made per linear foot (LF) of auger cast pile installed beyond the vertical linear-foot depth specified in the Drawings. Measurement will be taken along the actual additional drilled and concreted depth.
- b. Payment for Additional Auger Cast Pile Depth will be made at the Contract unit price per LF for this item. This payment shall be full compensation for all additional drilling, reinforcement, concrete, spoil removal, and any casing/slurry or specialty operations needed to achieve the extra depth required due to field conditions, obstructions, unsuitable soils, or other circumstances necessitating pile extension beyond the design depth.

Platform Installation (Bid Items No. 4f-13f)

- a. Measurement of platform installation will not be made for payment. All installation work shall be included in the lump sum price for this item.
- b. Payment will be made at the Contract lump sum price for installation of aluminum platforms, which shall be full compensation for installing City provided platforms, anchoring to foundations, assembling and erecting the platforms, grating, ladders, railings, all necessary fasteners and all other work required to install the platforms as shown on the drawings and described in the specifications. The City has purchased the platforms, railing, grating and ladders which are being stored by the City. The contractor is responsible for moving the stored platforms and components from the storage location on Sanibel to the individual lift station locations and installing them.

Electrical Improvements (Bid Items No. 4g-13g)

- a. Measurement of electrical improvements will not be made for payment. All electrical work shall be included in the lump sum price for this item.
- b. Payment will be made at the Contract lump sum price for electrical improvements, which shall be full compensation for furnishing and installing all electrical components required to power and operate the lift station. This includes service connections, grounding, lighting, conduit, wiring, and all other Contractor-provided electrical materials necessary for a complete and functional system. The City has furnished the control panels, generator receptacle and back box, power panels, terminal boxes, junction boxes with air vents, platforms, ladders, and stairs. These Owner-furnished items will be stored at Sanibel's Public Works facility. The Contractor is responsible for transporting all Owner-furnished equipment from the storage location to the individual lift station sites and installing them. All other electrical equipment, components, and materials not specifically furnished by the City shall be provided and installed by the Contractor under this lump sum bid item.

Submersible Pumps (Bid Items No. 4h-13h)

- a. Measurement of submersible pumps will be based on the actual quantity of pumps furnished, installed, and accepted by the City.
- b. Payment will be made at the Contract unit price for Submersible Pumps, which shall be full compensation for furnishing and installing two submersible pumps at each of the ten lift stations. This includes furnishing the pumps, installing them, connecting them to the panels, and lift station start up testing. Testing will include a drawdown test performed by the pump manufacturer's representative to demonstrate the pumps are operating as intended and the lift station functions properly. Provide 100' of cables for power connection, moisture detection, and overload protection for each pump supplied.

Site Restoration (Bid Items No. 4i-13i)

- a. Measurement of site restoration will not be made for payment. All restoration work shall be included in the lump sum price for this item.
- b. Payment will be made at the Contract lump sum price for site restoration, which shall be full compensation for restoring the lift station site and adjacent areas to pre-construction or better condition. This includes sod installation, turf restoration, replacement of asphalt driveways and sidewalks, asphalt driveway relocation at Lift Station 17, installation of bollards at LS 46, and any additional repairs necessary due to construction activities. Restoration of all disturbed areas located around and beneath the lift station platforms shall be performed using Bahia sod. Proper grading, soil preparation, and full turf establishment are required, and no separate measurement or payment will be made for this work.

Owner's Contingency (Bid Item No. 14)

- a. Measurement for Contingency will not be based on physical quantities or percentage of work completed. This item is included to cover unforeseen conditions or additional work authorized by the Owner that is not specifically identified in other bid items.
- b. Payment for Contingency will be made only upon written authorization from the Owner or Engineer. The Contract lump sum or unit price for this item shall serve as a budgetary allowance and does not guarantee payment. All work performed under this item must be documented and approved through a formal change order process. Compensation shall include all labor, materials, equipment, and incidentals necessary to complete the authorized work.

END OF SECTION

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. The Contractor shall submit to the Engineer for review and approval, such Shop Drawings, Test Reports, and Product Data on materials and equipment (hereinafter in this Section called Data), and material samples (hereinafter in this Section called Samples) as are required for the proper control of work, including but not limited to those Shop Drawings, Data, and Samples for materials and equipment specified elsewhere in the Specifications and in the Drawings.
2. Within fourteen (14) calendar days after the Effective Date of the Agreement, the Contractor shall submit to the Engineer a complete list of preliminary data on items for which Shop Drawings are to be submitted. Included in this list shall be the names of all proposed manufacturers furnishing specified items. Review of this list by the Engineer shall in no way expressed or implied relieve the Contractor from submitting complete Shop Drawings and providing materials, equipment, etc., fully in accordance with the Contract Documents. This procedure is required in order to expedite final review of Shop Drawings.
3. The Contractor is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the Owner and the Engineer. This log should include the following items:
 - a. Submittal description and number assigned.
 - b. Date to Engineer.
 - c. Date returned to Contractor (from Engineer).
 - d. Status of submittal (Approved, Approved as Noted, Amend and Resubmit, and Rejected).
 - e. Date of resubmittal and return (as applicable).
 - f. Date material release (for fabrication).
 - g. Projected date of fabrication.
 - h. Projected date of delivery to site.

- i. Status of O&M manuals submittal.
- j. Specification Section.
- k. Drawings sheet number.

1.02 CONTRACTOR'S RESPONSIBILITY

- A. It is the responsibility of the Contractor to check all drawings, data and samples prepared before submitting them to the Engineer for review. Each and every copy of the Drawings and data shall bear the Contractor's stamp showing that they have been so checked. Shop drawings submitted to the Engineer without the Contractor's stamp will be returned to the Contractor for conformance with this requirement. Shop drawings shall indicate any deviations in the submittal from requirements of the Contract Documents. If the Contractor takes exception to the specifications, the Contractor shall note the exception in the letter of transmittal to the Engineer.
- B. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Catalog numbers and similar data.
 - 4. Conformance with Specifications.
- C. The Contractor shall furnish the Engineer a schedule of Shop Drawing submittals fixing the respective dates for the submission of shop and working drawings, the beginning and ending of manufacture, testing, and installation of materials, supplies, and equipment. This schedule shall indicate those that are critical to the progress schedule.
- D. The Contractor shall not begin any of the work covered by a Shop Drawing, Data, or a Sample returned for correction until a revision or correction thereof has been reviewed and returned to him, by the Engineer, with approval.
- E. The Contractor shall submit to the Engineer all drawings and schedules sufficiently in advance of construction requirements to provide no less than thirty (30) calendar days for checking and appropriate action from the time the Engineer receives them.
- F. All submittals shall be accompanied with a transmittal letter prepared in duplicate containing the following information:
 - 1. Date.
 - 2. Project Title and Number.
 - 3. Contractor's name and address.

4. The number of each Shop Drawings, Project Data, and Sample submitted.
 5. Notification of Deviations from Contract Documents.
 - a. The Contractor shall indicate in **bold type** at the top of the cover sheet of submittal of shop drawing if there is a deviation from the Drawings, Specifications, or referenced specifications or codes.
 - b. The Contractor shall also list any deviations from the Drawings, Specifications, or referenced specifications or codes and identify in green ink prominently on the applicable Shop Drawings.
 6. Submittal Log Number conforming to Specification Section Number.
- G. The Contractor shall submit all descriptive or product data information and Shop Drawings to the Owner and Engineer in electronic PDF format via e-mail. The Engineer will review the submittal with the Owner and return to Contractor with appropriate review comments.
 - H. The Contractor shall be responsible for and bear all costs of damages which may result from the ordering of any material or from proceeding with any part of Work prior to the completion of the review by the Engineer of the necessary Shop Drawings.
 - I. The Contractor shall be fully responsible for observing the need for and making any changes in the arrangement of piping, connections, wiring, manner of installation, etc., which may be required by the materials/equipment he proposes to supply both as pertains to his own work and any work affected under other parts, headings, or divisions of the Drawings and Specifications.
 - J. The Contractor shall not use Shop Drawings as a means of proposing alternate items to demonstrate compliance with the Drawings and Specifications.
 - K. Drawings and schedules shall be checked and coordinated with the work of all trades and sub-contractors involved, before they are submitted for review by the Engineer and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.
 - L. Each submittal will bear a stamp indicating that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal. The Contractor stamp shall be similar to the sample given below.

(OWNER'S NAME)	
(PROJECT NAME)	
(PROJECT NUMBER)	
SHOP DRAWING NO.: _____	
SPECIFICATION SECTION: _____	DRAWING NO. _____
WITH RESPECT TO THIS SHOP DRAWING OR SAMPLE, I HAVE DETERMINED AND VERIFIED ALL QUANTITIES, DIMENSIONS, SPECIFIED PERFORMANCE CRITERIA, INSTALLATION REQUIREMENTS, MATERIALS, CATALOG NUMBERS, AND SIMILAR DATA WITH RESPECT THERETO AND REVIEWED OR COORDINATED THIS SHOP DRAWING OR SAMPLE WITH OTHER SHOP DRAWINGS AND SAMPLES AND WITH THE REQUIREMENTS OF THE WORK AND THE CONTRACT DOCUMENTS.	
_____ NO VARIATION FROM CONTRACT DOCUMENTS _____ VARIATION FROM CONTRACT DOCUMENTS AS SHOWN	
(CONTRACTOR'S NAME)	
(CONTRACTOR'S ADDRESS)	
BY: _____	DATE: _____
AUTHORIZED SIGNATURE	

1.03 ENGINEER'S REVIEW OF SHOP DRAWINGS

- A. The Engineer's review of Shop Drawings, Data, and Samples as submitted by the Contractor will be to determine if the items(s) generally conforms to the information in the Contract Documents and is compatible with the design concept. The Engineer's review and exceptions, if any, will not constitute an approval of dimensions, connections, quantities, and details of the material, equipment, device, or item shown.
- B. The review of drawings and schedules will be general, and shall not be construed:
 1. As permitting any departure from the Contract Documents.
 2. As relieving the Contractor of responsibility for any errors, including details, dimensions, and materials.
 3. As approving departures from details furnished by the Engineer, except as otherwise provided herein.
- C. If the drawings or schedules as submitted describe variations and show a departure from the Contract Documents which the Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or contract time, the Engineer may return the reviewed drawings without noting an exception.
- D. "Approved As Noted" - Contractor shall incorporate Engineer's comments into the submittal before release to manufacturer. The Contractor shall send a letter to the Engineer acknowledging the comments and their incorporation into the Shop Drawing.

- E. "Amend And Resubmit" - Contractor shall resubmit the Shop Drawing to the Engineer. The resubmittal shall incorporate the Engineer's comments highlighted on the Shop Drawing.
- F. "Rejected" - Contractor shall correct, revise and resubmit Shop Drawing for review by Engineer.
- G. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than the corrections requested by the Engineer on previous submissions. The Contractor shall make any corrections required by the Engineer.
- H. If the Contractor considers any correction indicated on the drawings to constitute a change to the Drawings or Specifications, the Contractor shall give written notice thereof to the Engineer.
- I. When the Shop Drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.
- J. No partial submittals will be reviewed. Submittals not deemed complete will be stamped "Rejected" and returned to the Contractor for resubmittal. Unless otherwise specifically permitted by the Engineer, make all submittals in groups containing all associated items for:
 - 1. Systems.
 - 2. Processes.
 - 3. As indicated in specific Specifications Sections.All drawings, schematics, manufacturer's product data, certifications, and other Shop Drawing submittals required by a system specification shall be submitted at one time as a package to facilitate interface checking.
- K. Only the Engineer shall utilize the color "red" in marking Shop Drawing submittals.
- L. Shop drawing and submittal data shall be reviewed by the Engineer for each original submittal and first resubmittal; thereafter review time for subsequent resubmittals shall be charged to the Contractor and the Contractor shall reimburse the Owner for services rendered by the Engineer as specified in the Supplementary Conditions.

1.04 SHOP DRAWINGS

- A. When used in the Contract Documents, the term "Shop Drawing" shall be considered to mean Contractor's plans for materials and equipment which become an integral part of the Project. Shop Drawings shall be complete and detailed and shall consist of

fabrication, erection, setting and schedule drawings, manufacturer's scale drawings, and wiring and control diagrams. Catalogs cuts, catalogs, pamphlets, descriptive literature, and performance and test data shall be considered only as supportive information to required Shop Drawings as defined above. As used herein, the term "manufactured" applies to standard units usually mass-produced; and "fabricated" means items specifically assembled or made out of selected materials to meet individual design requirements.

- B. Manufacturer's catalog sheets, brochures, diagrams, illustrations, and other standard descriptive data shall be clearly marked to identify pertinent materials, products, or models. Delete information which is not applicable to the Work by striking or cross-hatching.
- C. Each Shop Drawing shall be submitted with a cover sheet which shall include a title block for the submittal, refer to Section 00847 – Shop Drawing Submittal Form. The title block/cover sheet shall display the following:
 - 1. Project Title and Number.
 - 2. Name of project building or structure.
 - 3. Number and title of the Shop Drawing.
 - 4. Date of Shop Drawing or revision.
 - 5. Name of Contractor and subcontractor submitting drawing.
 - 6. Supplier/manufacturer.
 - 7. Separate detailer when pertinent.
 - 8. Specification title and Section number.
 - 9. Applicable Drawing number.
- D. Data on materials and equipment shall include, without limitation, materials and equipment lists, catalog data sheets, catalog cuts, performance curves, diagrams, verification of conformance with applicable standards or codes, materials of construction, and similar descriptive material. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, size, finish, and all other pertinent Data.
- E. For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name, and address, and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.

- F. If drawings show variations from Contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in his letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the Contractor fails to describe such variations, he shall not be relieved of the responsibility for executing the Work in accordance with the Contract, even though such drawings have been reviewed.
- G. All manufacturers or equipment suppliers who propose to furnish equipment or products shall submit an installation list to the Engineer along with the required shop drawings. The installation list shall include at least five (5) installations where identical equipment has been installed and has been in operation for a period of at least two (2) years unless specified otherwise in the Specification Section applicable.

1.05 WORKING DRAWINGS

- A. When used in the Contract Documents, the term "Working Drawings" shall be considered to mean the Contractor's plan for temporary structures such as temporary bulkheads, support of open cut excavation, support of utilities, ground water control systems, forming and falsework for underpinning, and for such other work as may be required for construction but does not become an integral part of the Project.
- B. Copies of working drawings as noted in paragraph 1.05 A. above, shall be submitted to the Engineer where required by the Contract Documents or requested by the Engineer, and shall be submitted at least thirty (30) calendar days (unless otherwise specified elsewhere) in advance of their being required for the Work.
- C. Working Drawings shall be signed by a registered Professional Engineer, currently licensed to practice in the State of Florida, and shall convey, or be accompanied by, calculations or other sufficient information to completely explain the structure, machine, or system described and its intended manner of use. Prior to commencing such work, working drawings must have been reviewed without specific exceptions by the Engineer, which review will be for general conformance and will not relieve the Contractor in any way from his responsibility with regard to the fulfillment of the terms of the Contract. All risks to new or existing work are assumed by the Contractor; the Owner and Engineer shall have no responsibility therefor.

1.06 SAMPLES

- A. The Contractor shall furnish, for the approval of the Engineer, samples required by the Contract Documents or requested by the Engineer. Samples shall be delivered to the Engineer as specified or directed. The Contractor shall prepay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in the Work until approved by the Engineer.
- B. Samples shall be of sufficient size and quantity to clearly illustrate:
 - 1. Functional characteristics of the product, with integrally related parts and attachment devices.

2. Full range of color, texture, and pattern.
 3. A minimum of three (3) samples of each item shall be submitted.
- C. Each sample shall have a label indicating:
1. Name of Project.
 2. Name of Contractor and subcontractor.
 3. Material or equipment represented.
 4. Place of origin.
 5. Name of producer/supplier and brand (if any).
 6. Location in Project.
 7. Submittal and specification numbers.
- (Samples of finished materials shall have additional marking that will identify them under the finished schedules.)
- D. The Contractor shall prepare a transmittal letter and a description sheet for each shipment of samples. The description sheet shall contain the information required in Paragraphs 1.06B and C above. He shall enclose a copy of the letter and description sheet with the shipment and send a copy of the letter and description sheet to the Engineer. Approval of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.
- E. Approved samples not destroyed in testing shall be sent to the Engineer or stored at the site of the Work. Approved Samples of the hardware in good condition will be marked for identification and may be used in the Work. Materials and equipment incorporated in the Work shall match the approved Samples. Samples which failed testing or were not approved will be returned to the Contractor at his expense, if so requested at time of submission.

END OF SECTION

SECTION 014100

REGULATORY REQUIREMENTS

PART 1 -- GENERAL

1.01 PERMITS

- A. The Contractor shall apply for and obtain the following permits and approvals:
 - 1. City of Sanibel Utility Permits for Right-of-Way Construction.
 - 2. City of Sanibel Building Permit
- C. Miscellaneous permit activities:
 - 1. Each bidder shall submit copies of occupational and/or competency licenses with their bid. Failure to provide evidence of any required licenses may be cause for rejection.
 - 2. A complete list of permit fees can be obtained from the City of Sanibel Building Department or its official website.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 015526

TRAFFIC CONTROL

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall be responsible for the maintenance of traffic within the limits of the project for the duration of the construction and temporary suspensions of the Work in accordance with the requirements of the Contract Documents. The term "Maintenance of Traffic" (MOT) includes all of such facilities, devices, and operations required for the safety and convenience of the public as well as for minimizing public nuisance.
- B. Prior to performing any work within the right-of-way, the Contractor shall obtain right-of-way permits from the City.

1.02 CONTRACTOR SUBMITTALS

- A. General: Submittals shall be furnished in accordance with Section 013300 – Submittal Procedures.
- B. Traffic Control Plans for 2-lane roads shall be submitted to the City and Engineer a minimum of two weeks prior to the scheduled commencement of the work. Traffic Control Plans for 2-lane roads shall be typical plan submittals. Traffic Control Plans for 4-lane roads shall be submitted to the City and Engineer a minimum of 4 weeks prior to the scheduled commencement of the Work. Traffic Control Plans for 4-lane roads shall be dimensioned pictorial plans of the positioning of the proposed signage, pavement markings, and delineators, etc. All Traffic Control Plans shall be prepared in accordance with FDOT and FHWA's Manual on Uniform Traffic Control Devices (MUTCD).
- C. MOT message boards will be required on Maintenance of Traffic plans pertaining to 4-lane roads. The message board wording is to be submitted by the Contractor for approval by the City and is required to be in place at each end of the MOT section two weeks prior to the start of construction on the 4-lane road. The Contractor shall maintain the message boards for a period not less than 4 weeks after construction commencement on the 4-lane road. The City reserves the right to modify the locations of the message boards to suit the overall MOT phasing works with adjoining contract areas.

PART 2 – PRODUCTS

- A. Barricades, flashers, lights, and "Danger", "Caution", "Road Closed – Local Traffic Only", etc. signs shall meet the requirements of the Florida Department of Transportation and the MUTCD and shall be inspected and maintained in working condition, weighed down with sandbags or by other suitable means.

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor shall implement the Traffic Control Plan. At the end of the Contract, the Contractor shall remove temporary equipment and facilities when no longer required and restore grounds to original or improved conditions.
- B. All existing drainage must be maintained to prevent flooding of roadways and adjoining property. Where temporary construction causes flooding of the right-of-way, the Contractor shall provide temporary facilities to connect to the permanent drainage system.
- C. Curb inlets shall have temporary traffic-bearing traversable grates placed on top where applicable until the curb and gutter is constructed.
- D. Temporary pipe shall be used under driveways to convey drainage where necessary.
- E. Access to private residences and commercial businesses shall be maintained at all times during construction. The Contractor shall coordinate with the City on any temporary access closings prior to beginning Work in the area.
- F. The Contractor shall supply signage to identify entrances for affected businesses.

3.02 TRAFFIC CONTROL PLAN

- A. Generic traffic control plans are acceptable for all construction work affecting 2-lane local roads for the Contract. These generic plans shall be submitted for the approval by the City. Traffic Control Plans affecting 4-lane roads shall be site specific and shall include the detailed requirements. 4-lane traffic control plans requiring reduction to 2-lane opposing traffic or that will remain in place for more than 10 hours in one 24-hour period will be prepared by the Contractor's Traffic Engineer. A pre-design meeting will be held to review the Contractor's preliminary submittal.
- B. The Traffic Control Plan shall be reproducible, dimensioned, pictorial plans of the area of the proposed MOT showing all signs, devices, tapers, and buffer zones listing the proper distances and lengths per the MUTCD and FDOT Standard Plans.
- C. The Traffic Control Plan must include a brief description of the Work being done, along with the start and completion dates, Work hours, night activity, etc. It also must include a 24-hour emergency telephone number of the supervisor responsible for the maintenance of the Traffic Control Plan.
- D. The Traffic Control Plan shall cover the major construction operations for this project. The Contractor shall be responsible for the proper execution of the traffic control during related minor construction operations.

- E. Locations for advance warning and other construction signs as depicted on the Traffic Control Plans shall be approximate considering the existing field conditions.
- F. 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, flag persons and other safety devices in accordance with the requirements of 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) and the appropriate FDOT Standard Plans indexes.
 - 1. The City shall be allowed access to observe these traffic control plans in use. The City may make changes to the MOT as field conditions warrant.
 - 2. 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.
- G. The traffic control plan shall include any pedestrian crossing or walkway issues.
- H. Arrows on the Traffic control Plans denote direction of traffic only and do not reflect pavement markings unless otherwise noted.

3.03 MAINTENANCE OF TRAFFIC

- A. The Contractor shall take all necessary precautions to prevent injury to public.
- B. All platforms and foundations shall each be adequately barricaded and lighted if they pose a danger to the public or are within 6 feet of the edge of pavement. Cones shall not be used.
- C. Excavated material and construction materials shall not be stockpiled in such manner as to unnecessarily hinder or confuse traffic adjacent to work. Materials shall be stored at least 6 feet beyond the edge of pavement and at least 10 feet from the radius of any intersection or as necessary to maintain proper site distances.
- D. Toe boards shall be provided to retain excavated material if required by the City or by the agency having jurisdiction over the street or highway.
- E. Maintain all lanes that are being used for the maintenance of traffic, including those on temporary facilities, under all weather conditions. Keep the lanes reasonably free of dust, and, when necessary to accomplish this, sprinkle them with water, or apply some other dust palliative. Grade roads as necessary to provide a smooth, pothole-free driving surface.
- F. The alteration of existing traffic patterns to create a Work zone shall not commence until all labor and materials are available for the construction in that area.

- G. The Contractor shall repair all potholes in new and existing asphalt created from the construction process as soon as practical and shall maintain a supply of asphalt cold mix on the project site to expedite those repairs.
- H. Contractor shall restore roadways to a minimum of 20' wide clear travel lanes within 24 hours of backfilling at the end of a workday.
- I. Throughout the project limits where sidewalks currently exist, pedestrian and wheelchair travel-ways shall be maintained on the project at all times. The travel-way shall be a minimum of 4 feet in width, smooth, but not slick with waterproof surface, and shall be ramped as necessary for continuity.
- J. The Contractor shall maintain safe vehicular access to all adjacent property at all times.
- K. Traffic disruptions which are not shown by the Traffic Control Plan, but which are necessary to construct the project, shall be submitted in writing to the City for approval two weeks prior to commencement of Work. Submitted material shall include sketches, calculations and other data required by the City.
- L. During and after completion of construction, the Contractor shall provide all necessary temporary pavement markings (i.e. lane lines, arrows, crosswalks, stop bars, etc.) until permanent markings are installed.
- M. Contractor shall remove or cover any existing or proposed signs that conflict with the Traffic Control Plans. When the conflict no longer exists, the Contractor shall restore the signs to their original condition. Unnecessary construction signs and markers that are no longer applicable are to be covered or removed at the end of each workday.
- N. The Contractor shall repair and maintain roads and shoulders, including four-lane roads used for two-way traffic during the installation of the Work, throughout the duration of the Contract. Repairs shall be made to any low or rutted-out shoulders and restored to the condition at which it was at the beginning of the Work. Road shoulders shall be maintained within 2" from the top of pavement, throughout the duration of the Contract and shall provide adequate drivability.

3.04 MAINTENANCE, REMOVAL, AND REINSTALLATION OF EXISTING TRAFFIC SIGNS

- A. The City will be given a 48-hour advance notice for any removal or relocation of any stop sign. The removal or relocation of stop signs will be the responsibility of the Contractor. A portable stop sign may only be used in case of an emergency and shall be mounted at a height of 7 feet to the bottom of the sign.
- B. The maintenance and/or removal and reinstallation of any existing traffic control sign, or street name sign, (hereinafter termed traffic control devices) within the area of the project will be the responsibility of the Contractor.

- C. The Contractor shall conduct all operations such that they will in no way obstruct or interfere with the operation of any existing traffic control device.
- D. The Contractor will be held responsible for any existing traffic control devices which are damaged or removed without approval of the City and will be charged for their replacement. This includes, but is not limited to, traffic signal loop, detector loops embedded in the street, signal conduits, cable, synchronization cables, and pull boxes at signalized intersections.
- E. The Contractor will be held liable for any damage from any accident resulting from the removal, relocation or failure of any existing traffic control devices by construction operations.
- F. The Contractor shall coordinate with the appropriate jurisdictions.
- G. The Contractor shall be responsible to construct, relocate, and maintain all traffic control signs, pavement markings, barriers, barricades and other devices to cover and or remove signs as needed, and to do all Work necessary to maintain a safe Work zone. The Contractor shall respond within 2 hours of notification by the City or his representative to correct any missing or deficient traffic control devices.
- H. Existing permanent pavement markings shall be maintained by the Contractor. Any temporary pavement markings required to reroute traffic during construction operations will be the responsibility of the Contractor.

END OF SECTION

SECTION 015723

TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Contractor shall design, provide, maintain and remove temporary erosion and sedimentation controls as necessary to ensure compliance to limits established by City. Contractor is responsible for erosion and sedimentation control during construction or until final controls become effective.
- B. Temporary controls will be implemented to prevent soil erosion from the site surface. This includes erosion caused by rainfall or storm runoff. These control measures include, but are not limited to:
 - 1. Mulching, seeding, chemical binders, rip-rap or tack coats on site surfaces.
 - 2. Providing drainage and runoff controls at those locations which will prevent or maintain within acceptable limits, scour or gully erosion.
 - 3. Scheduling work in areas of the site that will be susceptible to erosion so that they are not left unprotected during times of heavy rainfall.
- C. Temporary sedimentation controls will be implemented to limit soil transport and prevent sediment pollution outside the limits of work. These controls include, but are not limited to; terracing, contouring, dams, screens, traps, basins, barriers, or other appurtenances located on, or at the foot of, sloped surfaces or within water ways.

PART 2 - PRODUCTS

2.01 EROSION CONTROL

- A. Solid sodding shall meet requirements as specified in Section 02822.
- B. Covering fabric shall be fabricated of material acceptable to Engineer.
- C. Silt Screens shall be fabricated of material which conforms to FDOT Index 102.

2.02 SEDIMENTATION CONTROL

- A. Bales shall be clean, seed free, cereal hay type.
- B. Netting shall be fabricated of material acceptable to ENGINEER.

- C. Filter stone shall be crushed stone conforming to Florida Department of Transportation Specifications.
- D. Concrete block shall be hollow, non-load bearing type.
- E. Concrete shall be exterior grade not less than one inch thick.
- F. Silt Screens shall be fabricated of material acceptable to ENGINEER.

PART 3 - EXECUTION

3.01 EROSION CONTROL

- A. Minimum procedures for seeding are:
 - 1. Scarify slopes to a depth of not less than six inches and remove large clods, rocks, stumps, roots larger than ½ inch in diameter and debris.
 - 2. Sow seed by hydro or mechanical methods within twenty-four (24) hours after ground is scarified.
 - 3. Apply mulch loosely and to a thickness of between ¾ inch and 1½ inches.
 - 4. Roll and water seeded areas in a manner which will encourage sprouting of seeds and growing of grass. Reseed areas which exhibit unsatisfactory growth. Backfill and seed eroded areas.

3.02 SEDIMENT CONTROL

- A. Install and maintain effective sediment controls. Straw or hay bale dikes, sediment traps or basins shall be constructed in accordance with the Florida Department of Transportation drainage manual.

3.03 PERFORMANCE

- A. Should any of the temporary erosion or sediment control measures employed by Contractor fail to produce results which comply with the requirements of the State of Florida, Owner, Engineer, City or other regulatory agencies with jurisdiction, Contractor shall immediately take whatever steps are necessary to correct the deficiency at no cost to the Owner.

3.04 REMOVAL

- A. When final permanent controls become effective or when directed by Engineer, Contractor shall remove temporary erosion and sedimentation controls and restore surfaces to preconstruction conditions or as required by the Contract Documents.

END OF SECTION

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SECTION 017823

OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work:

1. Compile product data and related information appropriate for Owner's maintenance and operation of products furnished under Contract.
 - a. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent sections of Specifications.
2. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems.

1.02 QUALITY ASSURANCE

A. Preparation of data shall be done by personnel:

1. Trained and experienced in maintenance and operation of described products.
2. Familiar with requirements of this Section.
3. Skilled as technical writer to the extent required to communicate essential data.
4. Skilled as draftsman competent to prepare required drawings.

1.03 FORM OF SUBMITTALS

A. Prepare data in form of an instructional manual for use by Owner's personnel.

B. Format:

1. Size: 8-1/2 inches x 11 inches.
2. Paper: 20 pound minimum, white, for typed pages.
3. Text: Manufacturer's printed data, or neatly typewritten.
4. Drawings:
 - a. Provide reinforced punched binder tab, bind in with text.

- b. Reduce larger drawings and fold to size of text pages but not larger than 14 inches x 17 inches.
- 5. Provide fly-leaf for each separate product, or each piece of operating equipment.
 - a. Provide typed description of projects and major component parts of equipment.
 - b. Provide identified tabs.
- 6. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:
 - a. Title of Project.
 - b. Identity of separate structure as applicable.
 - c. Identity of general subject matter covered in the manual.

C. Binders:

- 1. Commercial quality , three D-ring type binders with durable and cleanable white plastic covers. Binders shall be presentation type with clear vinyl covers on front, back and spine. Binders shall include two sheet lifters and two, horizontal inside pockets.
- 2. Maximum D-ring width: 2 inches.
- 3. When multiple binders are used, correlate the data into related consistent groupings.

1.04 CONTENT OF MANUAL

- A. Neatly typewritten table of contents for each volume, arranged in systematic order.
 - 1. Contractor, name of responsible principal, address and telephone number.
 - 2. A list of each product required to be included, indexed to content of the volume.
 - 3. List, with each product, name, address and telephone number of:
 - a. Subcontractor, manufacturer and installer name, addresses and telephone numbers.
 - b. A list of each product required to be included, indexed to content of the volume.

- c. Identify area of responsibility of each.
 - d. Local source of supply for parts and replacement equipment including name, address and telephone number.
 - 4. Identify each product by product name and other identifying symbols as set forth in Contract Documents.
- B. Product Data:
 - 1. Include only those sheets which are pertinent to the specific product.
 - 2. Annotate each sheet to:
 - a. Clearly identify specific product or part installed.
 - b. Clearly identify data applicable to installation.
 - c. Delete references to inapplicable information.
 - 3. Operation and maintenance information as herein specified.
 - 4. Record shop drawings as submitted and approved with all corrections made for each product.
- C. Drawings:
 - 1. Supplement product data with drawings as necessary to clearly illustrate:
 - a. Relations of component parts of equipment and systems.
 - b. Control and flow diagrams.
 - 2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
 - 3. Do not use Project Record Documents as maintenance drawings.
- D. Written test, as required to supplement product data for the particular installation:
 - 1. Organize in consistent format under separate headings for different procedures.
 - 2. Provide logical sequence of instruction of each procedure.
- E. Copy of each warranty, bond and service contract issued.
 - 1. Provide information sheet for Owner's personnel, give:

- a. Proper procedures in event of failure.
- b. Instances which might affect validity of warranties or bonds.

1.05 MANUAL FOR MATERIALS AND FINISHES

- A. Submit six (6) copies of complete manual in final form.
- B. Content: for architectural products, applied materials and finishes:
 - 1. Manufacturer's data, giving full information on products.
 - a. Catalog number, size, composition.
 - b. Color and texture designations.
 - c. Information required for reordering special manufacturing products.
 - 2. Instructions for care and maintenance.
 - a. Manufacturer's recommendation for types of cleaning agents and methods.
 - b. Cautions against cleaning agents and methods which are detrimental to product.
 - c. Recommended schedule for cleaning and maintenance.
- C. Content, for moisture protection and weather-exposed products:
 - 1. Manufacturer's data, giving full information on products.
 - a. Applicable standards.
 - b. Chemical composition.
 - c. Details of installation.
 - 2. Instructions for inspection, maintenance and repair.
- D. Additional requirements for maintenance data: Respective sections of Specifications.

1.06 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit six (6) copies of complete manual in final form.
- B. Content, for each unit of equipment and system, as appropriate:
 - 1. Description of unit and component parts.
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 - d. Summary of information listed on equipment and motor data plates.
 - 2. Operating procedures:
 - a. Start-up, break-in, routine and normal operating instructions.
 - b. Regulation, control, stopping, shut-down and emergency instructions.
 - c. Summer and winter operating instructions.
 - d. Special operating instructions.
 - 3. Maintenance procedures:
 - a. Routine operations.
 - b. Guide to "trouble-shooting".
 - c. Disassembly, repair and reassembly.
 - d. Alignment, adjusting and checking.
 - 4. Servicing and lubrication required.
 - 5. Manufacturer's printed operating and maintenance instructions.
 - 6. Description of sequence of operation by control manufacturer.
 - 7. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.
 - a. Predicted life of parts subject to wear.
 - b. Items recommended to be stocked as spare parts.

8. As-installed control diagrams by controls manufacturer.
 9. Each Contractor's coordination drawings.
 - a. As-installed color coded piping diagrams.
 10. Charts of valve tag numbers, with location and function of each valve.
 11. List of original manufacturer's spare parts, manufacturer's current prices and recommended quantities to be maintained in storage.
 12. Other data as required under pertinent sections of specifications.
 13. Approved record shop drawings with all corrections made, and a copy of the warranty statement, checkout memo, demonstration test procedures and demonstration test certification.
- C. Content, for each electric and electronic systems, as appropriate:
1. Description of system and component parts.
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 2. Circuit directories and panelboards.
 - a. Electrical service.
 - b. Controls.
 - c. Communications.
 3. As installed color coded wiring diagrams.
 4. Operating procedures:
 - a. Routine and normal operating instructions.
 - b. Sequences required.
 - c. Special operating instructions.
 5. Maintenance procedures:
 - a. Routine operations.

- b. Guide to "trouble-shooting".
 - c. Disassembly, repair and reassembly.
 - d. Adjustment and checking.
- 6. Manufacturer's printed operating and maintenance instructions.
- 7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
- 8. Other data as required under pertinent sections of specifications.
- D. Prepare and include additional data when the need for such data becomes apparent during instruction of Owner's personnel.
- E. Additional requirements for operating and maintenance data: Respective sections of Specifications.

1.07 SUBMITTAL SCHEDULE

- A. Submit two (2) copies of preliminary draft of proposed formats and outlines of contents of Operation and Maintenance Manuals within 90 days after Notice to Proceed.
- B. Submit two (2) copies of completed data in preliminary form no later than 20 days following Engineer's review of the last shop drawing of a product and/or other submittal, but no later than delivery of equipment. One (1) copy will be returned with comments to be incorporated into the final copies and the other copy will be retained on-site for use in any early training.
- C. Submit six (6) copies of approved manual in final form directly to the offices of the Engineer, Tetra Tech, within 10 days after the reviewed copy or last item of the reviewed copy is returned.
- D. Provide six (6) copies of addenda to the operation and maintenance manuals as applicable and certificates as specified within 30 days after final inspection.

1.08 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to demonstration test, fully instruct Owner's designated operating and maintenance personnel in operation, adjustment and maintenance of products, equipment and systems.
- B. Operating and maintenance manual shall constitute the basis of instruction. Review contents of manual with Owner's operating and maintenance personnel in full detail to explain all aspects of operations and maintenance.

- C. Instructors shall be fully qualified personnel as outlined within the individual equipment specifications. If no specific training specifications are listed with the equipment, the Contractor shall provide the instruction with qualified Contractor personnel.
- D. The Contractor shall provide a list to the Owner indicating the date, time and instructors that will be present for all training sessions.
- E. The instructors shall provide for and prepare lesson scopes and handouts for up to five individuals designated by the Owner that outline the items to be covered. Separate sessions for operation and maintenance instruction shall be provided consecutively. Handouts shall be submitted to the Owner with at least one week's notice prior to the training sessions.
- F. All instruction sessions shall be video recorded with portable video recording cameras supplied by the Contractor. Video recording shall be made by the Contractor under the direction of the Owner using DHS compatible video recording equipment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 017836

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope of Work:
 - 1. Compile specified warranties and bonds.
- B. Related Work Described Elsewhere:
 - 1. General Conditions: Division 1.

1.02 SUBMITTAL REQUIREMENTS

- A. Assemble warranties, bonds and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors.
- B. Number of original signed copies required: Two (2) each.
- C. Table of Contents: Neatly typed, in orderly sequence. Provide complete information for each item.
 - 1. Product of work item.
 - 2. Firm, with name of principal, address and telephone number.
 - 3. Scope.
 - 4. Date of beginning of warranty, bond or service and maintenance contract.
 - 5. Duration of warranty, bond or service maintenance contract.
 - 6. Provide information for Owner's personnel:
 - a. Proper procedure in case of failure.
 - b. Instances which might affect the validity or warranty or bond.
 - 7. Contractor, name of responsible principal, address and telephone number.

1.03 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.
- B. Format:
 - 1. Size 8-1/2 inches by 11 inches, punch sheets for standard three (3) ring binder.
 - a. Fold larger sheets to fit into binders.
 - 2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS". List:
 - a. Title of Project.
 - b. Name of Contractor.
- C. Binders: Commercial quality, three (3) D-ring type binders with durable and cleanable white plastic covers and maximum D-ring width of two (2) inches. Binders shall be presentation type with clear vinyl covers on front, back, and spine. Binders shall include two sheet lifters and two horizontal inside pockets.

1.04 WARRANTY SUBMITTALS REQUIREMENTS

- A. For all major pieces of equipment, submit a warranty from the equipment manufacturer. The manufacturer's warranty period shall be concurrent with the Contractor's for one (1) year, unless otherwise specified, commencing at the time of final acceptance by the Owner.
- B. The Contractor shall be responsible for obtaining certificates for equipment warranty for all major equipment. The Engineer reserves the right to request warranties for equipment not classified as major. The Contractor shall still warrant equipment not considered to be "major" in the Contractor's one-year warranty period even though certificates of warranty may not be required.
- C. In the event that the equipment manufacturer or supplier is unwilling to provide a one (1) year warranty commencing at the start of the Correction Period, the Contractor shall obtain from the manufacturer a two (2) year warranty commencing at the time of equipment delivery to the job site. This two (2) year warranty from the manufacturer shall not relieve the Contractor of the one (1) year warranty, starting at the time of Owner's acceptance of the equipment.
- D. The Owner shall incur no labor or equipment cost during the guarantee period.
- E. Guarantee shall cover all necessary labor, equipment, materials, and replacement parts resulting from faulty or inadequate equipment design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by the manufacturer or the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 017839

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall maintain at the site for the Owner one record copy of:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change orders and other modifications to the Contract.
5. Engineer field orders or written instructions.
6. Approved shop drawings, product data and samples.
7. Field test records.
8. As Built Drawings.

B. Related Requirements:

1. General Conditions
2. Section 013300: Submittal Procedures
3. Section 014100: Regulatory Requirements

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. The Contractor shall store record documents, As-Builts, and samples apart from documents used for construction.

1. Provide files and racks for storage of documents.
2. Provide locked cabinet or secure storage space for storage of samples.

B. Documents shall be maintained in a clean, dry, legible condition and in good order. Do not use As-Built Documents for construction purposes.

C. Documents and samples shall be available at all times for inspection by the Engineer.

1.03 MARKING DEVICES

- A. The Contractor shall provide suitable permanent marking pens for recording information in the color code designated by the Engineer.

1.04 RECORDING

- A. Each document shall be labeled "AS BUILT" in large printed letters, and shall include the Contractor's name and the name of the person responsible for the As Built Drawings.
- B. As-Built information shall be kept current with construction progress.

1.05 SUBMITTAL

- A. Sketches showing the As-Built information shall be made available to the Engineer for review monthly with the Application For Progress Payment. As Built Drawings shall be reviewed with the Engineer monthly as part of the Application for Progress Payment review process.
- B. At Contract close-out, deliver a complete set of As Built Documents to the Engineer for the Owner. As Built Drawings must be signed and sealed by a licensed land surveyor in the state of Florida.
- C. Accompany submittal with transmittal letter in duplicate, containing:
 - 1. Date.
 - 2. Project title and number.
 - 3. Contractor's name and address.
 - 4. Title and number of each As Built Document.
 - 5. Certification that each document as submitted is complete and accurate.
 - 6. Signature of the Contractor or his authorized representative.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 03 11 00

CONCRETE FORMWORK

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section of the specifications covers the furnishing and installation of forms for cast-in-place concrete.

1.02 RELATED WORK:

- A. Section 01 45 23, STRUCTURAL TESTS AND INSPECTIONS
- B. Section 03 15 13, WATERSTOPS
- C. Section 03 21 00, CONCRETE REINFORCEMENT
- D. Section 03 30 00, CAST-IN-PLACE CONCRETE

1.03 REFERENCES:

The following standards form a part of this specification:

American Concrete Institute (ACI)

ACI 301 Specifications for Concrete Construction

ACI 347 Guide to Formwork for Concrete

Unified Facilities Guide Specifications (UFGS)

UFGS 03 30 00 Cast-in-Place Concrete

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Forms for exterior and interior surfaces which will be exposed to view after the work is completed, whether such surfaces are painted or unpainted, shall be new plywood stock, steel, tempered masonite, or other materials which will provide smooth concrete surfaces without subsequent surface plastering. Plastic or plastic-faced forms shall not be used, except with the prior approval of the Engineer.
- B. Form ties shall be cone type or equal, with waterstop, which leaves no metal closer than 2-inches to finished face of concrete.
- C. Form release agent shall be a non-staining, non-yellowing, non-toxic liquid free from

kerosene and resins of the type recommended by the manufacturer of the forming system being used such as L&M EZ Strip by LATICRETE, Bethany, CT and "Magic Kote" by Dayton Superior Corp., Miamisburg, OH or approved equal.

- D. Where steel adjacent to vertical faces of forms cannot be otherwise secured, mortar doughnuts shall be used to prevent steel from lying too close to the finish vertical faces of the concrete.

PART 3 - EXECUTION

3.01 PREPARATION:

Surfaces of forms to be in contact with concrete shall be greased with nonstaining form release compound. Wetting will not be accepted as a substitute. Approval of the Engineer shall be obtained before use of coated materials or liners in lieu of form release compound, except as modified herein.

3.02 CONSTRUCTION:

- A. For concrete surfaces which will be visible after completion of the structure, painted or unpainted, the type and the precise location of form ties, nails joints between form members, and any other features which will leave a visible trace in the finished concrete, will be subject to the approval of the Engineer.
- B. Formwork shall be so constructed, braced, or tied that the formed surfaces of the concrete will be perfectly true, smooth, and to the dimensions shown on the drawings. All forms used for circular sections shall be true arcs as indicated on the drawings. Short chords will not be acceptable. Form line shall present an uninterrupted surface conforming to radii indicated on the drawings.
- C. Forms shall be sufficiently tight to prevent leakage of mortar, and when necessary shall have temporary openings as required for thorough cleaning, and as required for introduction of concrete to avoid excessive free fall. Panels damaged in stripping or otherwise shall not be reused.
- D. Unless otherwise noted on the design drawings, forms shall be filleted and chamfered at all sharp corners and exposed edges with a 3/4-inch chamfer. Chamfer shall not be used where masonry or other material will subsequently be installed flush with one of the adjacent surfaces of the concrete. Where a wash or slope is indicated on the drawings no additional chamfer is required.

3.03 REMOVAL OF FORMS

- A. Except as otherwise specifically authorized by the Engineer, forms shall not be removed before the concrete has attained a strength of at least 30 percent of the ultimate strength prescribed by the design and not before reaching the following number of day-degrees [whichever is the longer]:

<u>Forms for</u>	<u>Day-Degree*</u>
Beams and Slabs	500
Walls and vertical surfaces	200

* Day-Degree: Total number of days times average daily air temperature at surface of concrete. For example, 5 days at a daily weighted average temperature of 60 deg F equals 300 day-degrees. Temperatures below 50 deg F are not to be considered in determining Day-Degree.

- B. Where beams, girder, columns, walls and similar vertical forms are adequately supported on shores, the side forms may be removed after 24 hours of cumulative curing time provided the side forms support no loads other than the lateral pressure of the plastic concrete. Cumulative curing time represents the sum of time intervals, not necessarily consecutive, during which the temperature of the air surrounding the concrete is above 50 deg. F in accordance with American Concrete Institute standards.
- C. Shoring shall not be removed until the concrete has attained at least 70 percent of the specified strength and sufficient strength to support safely its own weight and the construction live loads upon it.
- D. Forms shall be removed in such a manner as not to impair safety and serviceability of the structure. Concrete exposed by form removal shall have sufficient strength not to be damaged by the removal operation.

END OF SECTION

SECTION 03 21 00

CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section of the specification covers the furnishing and installation of reinforcement for cast-in-place concrete.

1.02 RELATED WORK:

- A. Section 01 45 23, STRUCTURAL TESTS AND INSPECTIONS
- B. Section 03 11 00, CONCRETE FORMWORK
- C. Section 03 15 13, WATERSTOPS
- D. Section 03 30 00, CAST-IN-PLACE CONCRETE

1.03 SYSTEM DESCRIPTION:

Materials and construction shall conform to ACI 318 and ACI 350 unless otherwise noted on the design drawings or modified herein.

1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. The Contractor shall furnish the Engineer with complete checked, reinforcing steel shop drawings and bar lists. Shop drawing shall include the grade of steel used as well as splice lengths.
- B. Mill test reports shall accompany drawings. Fabrication shall not commence until the drawings and mill test reports have been released by the Engineer.
- C. When fiber reinforcement is used, the Contractor shall submit manufacturer's data confirming that material meets the specification.

1.05 REFERENCES:

- A. The following standards form a part of these specifications:

American Concrete Institute (ACI)

ACI 318

Building Code Requirements for Structural
Concrete and Commentary

ACI	PRC-347	Guide to Formwork for Concrete
ACI	350	Code Requirements for Environmental Engineering Concrete Structures
ACI	MNL-66	ACI Detailing Manual

ASTM International (ASTM)

ASTM	A185	Standard Specification for Welded Steel Wire Reinforcement, Plain, for Concrete
ASTM	A1064/A1064M	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM	A615/A615M	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM	A775/A775M	Standard Specification for Epoxy-coated Steel Reinforcing Bars
ASTM	A884/A884M	Standard Specification for Epoxy-coated Steel Wire and Welded Wire Reinforcement

American Welding Society (AWS)

AWS	D1.4/D1.4M	Structural Welding Code - Steel, Reinforcing Bars

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Steel reinforcing bars shall conform to ASTM A615/A615M, Grade 60, and A775/A775M if epoxy-coated bars are specified.
- B. Welded steel wire fabric shall conform to ASTM A185 or ASTM A1064/A1064M and ASTM A884/A884M if epoxy-coated fabric is specified. Gauge and spacing of wires shall be as indicated on the drawings.
- C. Reinforcing steel shall be detailed in accordance with ACI MNL-66 modified as applicable to conform to ACI 350.

- D. Reinforcement shall be accurately formed to the dimensions indicated on the drawings. Bars shall be shipped to the site with bars of the same size and shape, fastened in bundles with securely wired-on metal identification tags listing both size and mark.
- E. Any bar showing cracks after bending shall be discarded.
- F. Steel failing to meet the requirements of this specification or the drawings will be rejected and shall be removed from the site immediately.

2.02 FIBER REINFORCEMENT

When called for on the drawings, concrete engineered reinforcing fibers shall be polypropylene, collated, fibrillated fibers from Fibermesh Co., Chattanooga, TN; Forta Corporation, Grove City, PA; or approved equal. Only fibers designed and manufactured specifically for use in concrete from virgin polypropylene and so certified by the manufacturer shall be acceptable.

PART 3 - EXECUTION

3.01 STEEL INSTALLATION:

- A. Before being placed in position, reinforcement shall be thoroughly cleaned of loose mill and rust scale, dirt, and other coatings (including ice), that reduce or destroy bond. When there is a delay in depositing concrete after reinforcement is in place, bars shall be reinspected and cleaned, as necessary.
- B. After forms have been oiled, but before concrete is placed, all steel shall be securely wired in the exact position called for and shall be maintained in that position until all concrete is placed and compacted. Chair bars and supports shall be provided in a number and arrangement satisfactory to the Engineer.
- C. Concrete blocks having a minimum bearing area of 2-inches by 2-inches and equal in quality to that specified for the slab, shall be used for supporting reinforcing bars for slabs on grade. Wood blocks, stones, brick chips, etc., shall not be used to support reinforcement.
- D. Metal supports shall be of types that will not penetrate the surface of formwork or slab, and which will not show through or stain surfaces that are to be exposed to view, painted or unpainted.
- E. Welding of reinforcing bars will be permitted only where permission of the Engineer has been obtained in advance. Such welding shall be performed only under conditions established by the Engineer, and in accordance with AWS D1.4/D1.4M.

- F. Reinforcement, which is to be exposed for a considerable length of time after having been placed, shall be painted with a heavy coat of cement grout, if required by the Engineer.

3.02 FIBER INSTALLATION:

- A. Fibermesh fibers shall be used in concrete as indicated on the drawings or as specified and in strict accordance with the manufacturer's recommendations as to type and amount. The fiber manufacturer or approved distributor shall provide the services of a qualified employee for pre-job meeting and initial job start up.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 -GENERAL

1.01 GENERAL PROVISIONS:

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 – GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.

1.02 DESCRIPTION OF WORK:

- A. Work Included: This Section specifies cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes for the following:
 - 1. Footings
 - 2. Foundation walls
 - 3. Slab-on-grade
 - 4. Suspended slabs
 - 5. Concrete toppings
 - 6. Grout
- B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
 - 1. Section 01 45 23, SPECIAL TESTS AND INSPECTIONS
 - 2. Section 04 01 00, MASONRY
 - 3. Section 05 31 23, STEEL DECK; Steel composite and form deck.
 - 4. Section 06 10 00, ROUGH CARPENTRY
 - 5. Section 31 00 00, EARTHWORK; Excavation and establishment of subgrade elevations.

1.03 SUBMITTALS:

- A. Refer to Section 01 33 23, SUBMITTALS for submittal provisions and procedures.
- B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, water-stops, joint systems,

curing compounds, dry-shake finish materials, and others if requested by the Engineer.

- C. Shop drawings for reinforcement detailing, fabricating, bending, and placing concrete reinforcement. Comply with ACI PRC-315 "Guide to Presenting Reinforcing Steel Design Details". Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing and supports for concrete.
- D. Submit shop drawings for all formwork for Architecturally Exposed Concrete (Concrete Exposed to View) showing cone tie patterns.
- E. Concrete mix design for each mix specified. Supporting test data shall be submitted if requested.
 - 1. Submit alternate mix designs when the characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
 - 2. Indicate the amounts of mixing water to be withheld for later addition at the Project site.
- F. Proposed method of curing and associated products.
- G. Proposed precautions for hot weather and cold weather concreting.
- H. Samples: For waterstops and vapor retarder.
 - 1. Submit samples of materials as requested by the Engineer or SER, including names, sources, and descriptions.
- I. Laboratory test reports for concrete materials and mix design test.
- J. Material test reports for the following, from a qualified testing agency, indicating compliance with specification requirements:
 - 1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- K. Material certificates for each of the following, signed by the manufacturers:
 - 1. Cementitious material.
 - 2. Admixtures
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.
 - 5. Non-metallic shrinkage resistant grout.
 - 6. Waterstops.
 - 7. Curing compounds.

8. Floor and slab treatments.
 9. Bonding agents.
 10. Adhesives.
 11. Vapor retarders.
 12. Semi-rigid joint filler.
 13. Joint-filler strips.
 14. Repair materials.
- L. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.
- M. Qualification Data: For Installer and Manufacturer.
- N. LEED Certification Documentation: Submit documentation from the manufacturer highlighting LEED requirements for materials and products of this Section. Comply with the requirements of **Section 01 35 60, Sustainable Design Requirements**.

1.04 QUALITY ASSURANCE:

- A. Installer Qualifications: A qualified installer who employs on the Project personnel qualified as ACI certified Flatwork Associate and Finisher and a supervisor who is an ACI certified Concrete Flatwork Associate.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mix concrete products that complies with ASTM C94/C94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Plants."
- C. Testing Agency for Mix Design Qualifications: An independent agency, registered in the State of Florida as an approved testing agency, qualified according to ASTM C1077 and ASTM E329 for testing indicated.
1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 2. Personnel performing laboratory tests shall be ACI certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician – Level 1. The Testing Agency Laboratory supervisor shall be an ACI certified Concrete Laboratory Testing Technician – Level 2.

- D. Source Limitations: Obtain each type of class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- E. Pre-installation Conference: Conduct a conference at the Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
 - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete subcontractor.
 - e. Structural Engineer.
 - f. Independent testing agency responsible for field testing.
 - g. Owner's Authorized Representative.
 - h. Engineer.
 - 2. Review inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint filler strips, semi-rigid joint fillers, forms and form removal limitations, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor slab and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.05 REFERENCES:

Comply with the following unless modified by requirements in the Contract Documents.

Where the language in any of the documents referred to herein is in the form of a recommendation or suggestion, such recommendations or suggestions shall be deemed to be mandatory under this Contract.

American Concrete Institute (ACI)

ACI 117	Specification for Tolerances for Concrete Construction and Materials and Commentary

ACI PRC-211.1	Selecting Proportions for Normal-Density and High Density Concrete
ACI PRC-214	Guide to Evaluation of Strength Test Results of Concrete
ACI 301	Specification for Concrete Construction
ACI 302.1R	Guide to Concrete Floor and slab Construction
ACI PRC-304	Guide for Measuring, Mixing, Transporting and Placing Concrete
ACI 305	Specification for Hot Weather Concreting
ACI 306	Standard Specification for Cold Weather Concreting
ACI PRC-308	Guide to External Curing of Concrete
ACI PRC-309	Guide for Consolidation of Concrete
ACI 311.7	Specification for Inspection of Concrete Construction
ACI PRC-315	Guide to Presenting Reinforcing Steel Design Details
ACI 318	Building Code Requirements for Structural Concrete and Commentary
ACI PRC-347	Guide to Formwork for Concrete

ASTM International (ASTM)

ASTM A82/A82M	Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
ASTM A185	Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
ASTM A615/A615M	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM C31/C31M	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33/C33M	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94/C94M	Standard Specification for Ready-Mixed Concrete
ASTM C109/C109M	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. Cube Specimens)
ASTM C143/C143M	Standard Test Method for Slump of Hydraulic-Cement Concrete

ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172/C172M	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C219	Standard Terminology Relating to Hydraulic and Other Inorganic Cements
ASTM C231/C231M	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260/C260M	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C494/C494M	Standard Specification for Chemical Admixtures for Concrete
ASTM C618	Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C881/C881M	Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C979/C979M	Standard Specification for Pigments for Integrally Colored Concrete
ASTM C989/C989M	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1059/C1059M	Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete
ASTM C1064/C1064M	Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
ASTM C1077	Standard Practice for Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1107/C1107M	Standard Specification for Packaged, Dry, Hydraulic-Cement Grout (Non-Shrink)

ASTM C1315	Standard Specification for Liquid Membrane Forming Compounds Having Special Properties for Curing and Sealing Concrete
ASTM D1752	Standard Specification for Preformed Sponge Rubber and Cork and Recycled Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D2240	Standard Test Method for Rubber Property – Durometer Hardness
ASTM E329	Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
ASTM E1155	Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers
ASTM E1643	Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact With Earth or Granular Fill Under Concrete Slabs
ASTM E1745	Standard Specification for Plastic Water Vapor Retarders Used in Contact With Soil or Granular Fill Under Concrete Slabs

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M182	Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats
AASHTO M194	Standard Specification for Chemical Admixtures for Concrete

1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.01 FORM-FACING MATERIALS:

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
- B. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, $\frac{3}{4}$ -inch by $\frac{3}{4}$ -inch, minimum.
- D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral earth pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
- G. Furnish units that will leave no corrodible metal closer than 1-inch to the plane of exposed concrete surface.
- H. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.02 STEEL REINFORCEMENT:

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.
- B. Plain Steel Wire: ASTM A82/A82M, as drawn.
- C. Plain-Steel Welded Wire Reinforcement: ASTM A185, plain, fabricated from as-drawn steel wire into flat sheets.

2.03 NON-METALLIC SHRINKAGE RESISTANT GROUT:

- A. Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive, non-staining, mixed with water to consistency suitable for

application and a 30-minute working time. The minimum ultimate compressive strength of the grout shall be 5000 psi at 7 days and 7500 psi at 28 days.

2.04 REINFORCEMENT ACCESSORIES:

- A. Joint Dowel Bars: ASTM A615/A615M, Grade 60, plain-steel bars, cut bars true to length with ends square and free of burrs.
- B. Bar Supports: Bolster, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice", of greater of compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless steel bar supports.
 - 2. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs. Concrete bricks may be used to support reinforcing steel where application allows.

2.05 CONCRETE MATERIALS:

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout the Project:
 - 1. Portland Cement: ASTM C150, Type I/II. Supplement with the following:
- B. Fly Ash: ASTM C618, Class F.
- C. Ground Granulated Blast Furnace Slag: ASTM C989/C989M, Grade 100 or 120.
- D. Cementitious Materials: Percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:
 - 1. Fly Ash or Ground Granulated Blast Furnace Slag: 25 percent, minimum.
 - 2. Combined Fly Ash and Pozzolan: 35 percent, maximum.
 - 3. Ground Granulated Blast Furnace Slag: 50 percent, maximum.
 - 4. Combined Fly Ash or Pozzolan and Ground Granulated Blast Furnace Slag: 50 percent Portland cement minimum, with fly ash or pozzolan not exceeding 35 percent.
- E. Normal-Weight Aggregates: ASTM C33/C33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.
 - 1. Maximum Coarse Aggregate Size: $\frac{3}{4}$ -inch nominal.

2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

F. Water: ASTM C94/C94M and potable.

2.06 ADMIXTURES:

A. Air-Entraining Admixture: ASTM C260/C260M.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C494/C494M.

C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor,; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C494/C494M, Type C.

1. Products:
Euclid Chemical Company; Eucon CIA.
GCP Applied Technologies, Inc.; DCI.
BASF Admixtures, Inc.; Rheocrete CNI.
Sika Corporation; Sika CNI.

D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

1. Products:
GCP Applied Technologies, Inc.; DCIS.

2.07 WATERSTOPS:

- A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, $\frac{3}{4}$ -inch by 1-inch.
 - 1. CETCO; Volclay Waterstop-RX.
 - 2. Concrete Sealants, Inc.; Conseal CS-231.
 - 3. Sika Corporation; Swellstop.
 - 4. Henry, a Carlisle Company; Synko-Flex.
 - 5. Henry, a Carlisle Company ; Mirastop BW.
- B. Self-Expanding Rubber Strip Waterstops: Manufactured rectangular or trapezoidal strip, bentonite-free hydrophilic polymer modified chloroprene rubber, for adhesive bonding to concrete, $\frac{3}{8}$ -inch by $\frac{3}{4}$ -inch.
 - 1. GCP Applied Technologies, Inc.; DeNeef Swellseal.
 - 2. Sika Corporation; Hydrotite.
 - 3. OCM, Inc.; Adeka Ultra Seal.
- C. Waterstops: Provide ribbed, dumbbell type or center bulb type waterstops at construction joints and other joints as indicated.
 - 1. Polyvinyl Chloride Waterstops: Corps of Engineers CRD-C 572.

2.08 VAPOR RETARDERS:

- A. Plastic Vapor Retarder: ASTM E1745, Class B. Include manufacturer's recommended adhesive or pressure-sensitive tape.
 - 1. Products:
 - a. Fortifiber Corporation; Moistop Ultra.
 - b. Raven Industries, Inc.; Vapor Block 10.
 - c. Stego Industries, LLC; Stego Wrap, 15 mils.

2.09 FLOOR AND SLAB TREATMENTS:

- A. Unpigmented Mineral Dry-Shake Floor Hardener: Factory-packaged dry combination of Portland cement, graded quartz aggregate, and plasticizing admixture.
 - 1. Products:
 - a. Dayton Superior Corporation; Quartz Tuff.
 - b. Euclid Chemical Company; Surflex.
 - c. Laticrete International, Inc.; L&M Quatzpalte FF.

- d. Sika Corporation; SikaColor Color Hardener.
- B. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; colorless; that penetrates, hardens, and densifies concrete surfaces.
 - 1. Products:
 - a. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Intraseal.
 - b. Curecrete Distribution Inc.; Ashford Formula.
 - c. Dayton Superior Corporation; Day-Chem Sure Hard.
 - d. Euclid Chemical Company; Euco Diamond Hard.
 - e. Kaufman Products, Inc.; SureHard.
 - f. Laticrete International, Inc.; L&M Seal Hard.
 - g. Meadows, W.R., Inc.; Liqui-Hard.

2.10 CURING MATERIALS:

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz. /sq. yd. when dry.
- B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B, 18 to 25 percent solids, non-dissipating, certified by curing compound manufacturer to not interfere with bonding of floor coverings.
 - 1. Products:
 - a. Euclid Chemical Company; Diamond Clear VOX
 - b. Laticrete International, Inc.; L&M Dress & Seal WB
 - c. Meadows, W.R., Inc.; Vocomp-20
 - d. Nox-Crete Products Group, Kinsman Corporation; Cure & Seal 250E
 - e. Dayton Superior Company; Cure & Seal 309 J18
- E. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
 - 1. Products:
 - a. ProSpec Cure & Seal WB 1315

- b. Euclid Chemical Company; Super Diamond Clear VOX
- c. Meadows, W.R., Inc.; Vocomp-30
- d. Dayton Superior Company; Cure & Seal 30%

2.11 RELATED MATERIALS:

- A. Expansion and Isolation Joint Filler Strips: ASTM D1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D2240.
- C. Bonding Agent: ASTM C1059/C1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C881/C881M, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- E. Reglets: Fabricate reglets of not less than 0.0217-inch thick, galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- B. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336-inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.12 REPAIR MATERIALS:

- A. Repair Underlayment: Cement based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8-inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C150, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8-inch to 1/4-inch or coarse sand as recommended by the underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4100 psi at 28 days when tested in accordance with ASTM C109/C109M.

- B. Repair Overlayment: Cement based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8-inch and that can be feathered at edges to match adjacent floor elevations.
1. Cement Binder: ASTM C150, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C219.
 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8-inch to 1/4-inch or coarse sand as recommended by the topping manufacturer.
 4. Compressive Strength: Not less than 5000 psi at 28 days when tested in accordance with ASTM C109/C109M.

2.13 CONCRETE MIXTURES, GENERAL:

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:
1. Fly Ash: 25 percent.
 2. Combined Fly Ash and Pozzolan: 25 percent.
 3. Ground Granulated Blast-Furnace Slag: 50 percent.
 4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing, high-range water reducing or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water cementitious materials ratio below 0.50.

4. Use retarding admixture in combination with Set accelerating Corrosion Inhibitor. Retarder is not required for non-set accelerating corrosion inhibitor.
5. Use corrosion inhibiting admixture in concrete mixtures where indicated.

2.14 CONCRETE MIXTURES FOR BUILDING ELEMENTS:

A. Columns: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 5000 psi at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 4-inches for concrete with verified slump of 2-inch to 4-inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1-inch.
4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.
2. Minimum Cementitious Materials Content: 540 lb. /cu. yd.
3. Slump Limit: 4-inches, plus or minus 1-inch.
4. Air Content: Do not allow air content of troweled finished floors to exceed 3 percent.
5. Corrosion Inhibiting Admixture: Apply to all slabs at a rate of 4 gallons per cubic yard of concrete.

2.15 FABRICATING REINFORCEMENT:

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

2.16 CONCRETE MIXING:

- ##### A. Ready-Mix Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94, and furnish batch ticket information.
- ##### B. When air temperature is between 85 and 90 degrees F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Coordinate the installation of joint materials, vapor retarder/barrier, and other related materials with placement of forms and reinforcing.

3.02 FORMWORK:

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI PRC-347 as abrupt or gradual, as follows:
 - 1. Class A, 1/8-inch for smooth-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, reglets, recesses, and the like for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspections ports where interior area formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.03 EMBEDDED ITEMS:

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges".
 - 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
- B. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting type screeds.

3.04 REMOVING AND REUSING FORMS:

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 degrees F for 24 hours after placing concrete if concrete is hard enough to not be damaged by form removal operations and curing and protection operations are maintained.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by the Engineer.

3.05 VAPOR RETARDERS:

- A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E1643 and manufacturer's written instructions.

- B. Lap joints 6-inches and seal with manufacturer's recommended tape.

3.06 STEEL REINFORCEMENT:

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire ties.

3.07 JOINTS:

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or approved by the Engineer.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2-inches into concrete.
 - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 4. Locate horizontal joints in walls and columns at the underside of floors, slabs, beams, and girders and at the top of footings and floor slabs.
 - 5. Space vertical joints in walls at 60-feet on center maximum. Locate joints besides piers integral with walls, near corners, and in concealed locations where possible.

6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge joint to a radius of 1/8-inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Terminate full-width joint filler strips not less than 1/2-inch or more than 1-inch below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants", are indicated.
 2. Install joint filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.08 CONCRETE PLACEMENT:

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 3. Do not use vibrators to transport concrete. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6-inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in continuous operation, within limits of construction joints, until placement of panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces uniformly to drains where required.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 degrees F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 degrees F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, providing water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing of concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.09 FINISHING FORMED SURFACES:

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with minimum number of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces exposed to public view.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth finish with texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.10 FINISHING FLOORS AND SLABS:

- A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Re-straighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.
1. Apply float finish to surfaces to receive trowel finish.
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and re-straightening until surface is free of trowel marks and uniform in texture and

appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film finish coating system.
 2. Finish surfaces to the following tolerances, according to ASTM E1155 for a randomly trafficked floor surface:
 3. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
- D. Broom Finish: Apply a broom finish to exterior platforms, steps, and ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.
- E. Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to all surfaces with truck traffic according to manufacturer's written instructions and as follows:
1. Uniformly apply dry-shake floor hardener at a rate of 100 lb. /100 sq. ft. unless greater amount is recommended by manufacturer.
 2. Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader and embed by power floating. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.
 3. After final floating, apply a trowel finish. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.

3.11 MISCELLANEOUS CONCRETE ITEMS:

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.12 CONCRETE PROTECTING AND CURING:

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Curing all slabs in the project with moisture curing. Keep surfaces continually moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in the widest practicable width, with sides and ends lapped at least 12-inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas

subject to heavy rainfall within three hours after initial applications. Maintain continuity of coating and repair damage during curing period.

- a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.
4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subject to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply second coat. Maintain continuity of coating and repair damage during curing period.
- D. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

3.13 LIQUID FLOOR TREATMENTS:

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment to concrete floors exposed to view according to manufacturer's written instructions.
 1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 2. Comply with Manufacturer's written instructions for application.
- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

3.14 JOINT FILLING:

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

3.15 CONCRETE SURFACE REPAIRS:

- A. Defective Concrete: repair and patch defective areas when approved by the Engineer. Remove and replace concrete that cannot be repaired and patched to the Engineer's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part Portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2-inch in any dimension in solid concrete, but not less than 1-inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush coat holes and voids with bonding agent. Fill and compact patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by the Engineer.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 - 1. Repair finished surfaces containing defects. Surface defects include spalls, pop outs, honeycombs, rock pockets, crazing and cracks in excess of 0.01-inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 - 2. After concrete has cured at least 14-days, correct high areas by grinding.
 - 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Repair defective areas, except random cracks and single holes 1-inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least $\frac{3}{4}$ -inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 6. Repair random cracks and single holes 1-inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72-hours.
- E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to the Engineer's approval.

3.16 FIELD QUALITY CONTROL:

- A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
1. Steel reinforcement placement.
 2. Steel reinforcement welding.
 3. Headed bolts and studs.
 4. Verification of use of required design mixture.
 5. Concrete placement, including conveying and depositing.
 6. Curing procedures and maintenance of curing temperature.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C172/C172M shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample of each day's pour of each concrete mixture exceeding 5 cubic yards, but less than 25 cubic yards, plus one set for each additional 50 cubic yards or fraction thereof.
 2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C231/C231M, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 degrees F and below and when 80 degrees F and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C31/C31M.
 6. Cast and laboratory cure five standard cylinder specimens for each composite sample.
 7. Compressive Strength Tests: ASTM C39/C39M; test one set of two-laboratory-cured specimens at 7 days and one set of two specimens at 28 days. Test remaining specimen at 28 days if previous results are satisfactory or retain this specimen for 56 day testing if results are not satisfactory.
 8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive strength tests equals or exceeds specified compressive strength and no compressive strength test value falls below specified compressive strength by more than 500 psi.
- D. Test results shall be reported in writing to the Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7 and 28 day tests.
1. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as the sole basis for approval or rejection of concrete.
 2. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as required by the Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as required by the Engineer.

3. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 4. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.
- E. Measure floor and slab flatness and levelness according to ASTM E1155 within 24 hours of finishing.

3.17 GROUTING:

- A. Mix grout in accordance with the approved manufacturer's instructions to a consistency which will permit placement. Place grout so as to ensure complete bearing and elimination of air pockets.

3.18 TEST FOR WATERTIGHTNESS:

- A. All concrete shall be watertight against leakage or groundwater infiltration. Special care shall be taken in the construction joints and any noticeable leakage or seepage causing wet spots on the concrete walls or slabs shall be repaired by and at the expense of the Contractor and by methods approved by the Engineer. See Section 03150, WATERSTOPS.
- B. All liquid holding concrete structures shall be tested for leakage before backfilling and after the concrete has attained the specified minimum 28-day design strength, as indicated by test cylinders.
- C. The structure shall be filled with water to the overflow level, allowed to stand for at least 24-hours, and refilled to overflow to begin the test. After 72 hours, the liquid loss per 24 hour period shall be determined, either by measuring the amount required to refill the tank to overflow, by measuring the drop in water level, or by an equivalent procedure approved by the Engineer. Evaporative losses shall be calculated and deducted from the measured loss to determine net liquid loss (leakage). If the leakage per 24-hour period exceeds the allowable, the structure shall be repaired and retested until the leakage falls within the allowable limit.
- D. For structures designed to hold water, one twentieth of one percent leakage will be allowed during a 24-hour period. No leakage (zero leakage) will be permitted for structures designed to hold liquid chemicals or fuels.
- E. The Contractor shall pay all costs (including water) incurred in the testing for watertightness.
- F. The Engineer shall be given a minimum notice of 48 hours prior to commencement of the leakage test.

END OF SECTION

SECTION 050523

BOLTS, WASHERS, ANCHORS, AND EYEBOLTS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section covers field installation requirements for anchor bolts, connecting bolts, washers, drilled anchors, epoxy anchors, screw anchors, eyebolts, and stainless-steel fasteners for platforms and control panel assemblies at lift stations.

1.02 DESIGN CRITERIA

- A. Installation shall comply with:
 - 1. AISC Specification for Structural Steel Buildings.
 - 2. Manufacturer's installation instructions for anchors and fasteners.
 - 3. Project drawings and approved shop drawings.

1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the General Conditions and Section 013300: Submittal Requirements.

PART 2 - PRODUCTS

2.01 INSTALLATION MATERIALS

- A. Use only products approved by the City and produced during platform fabrication.

PART 3 - EXECUTION

3.01 STORAGE AND HANDLING

- A. Store bolts and anchors above ground on clean platforms or skids.
- B. Protect from dirt, grease, and corrosion prior to installation.

3.02 INSTALLATION REQUIREMENTS

- A. Anchor Bolts
 - 1. Verify alignment and elevation using templates before concrete placement.

2. For drilled or epoxy anchors, prepare holes per manufacturer's recommendations.
3. Minimum embedment depth shall meet manufacturer's requirements and project drawings.
4. Protect exposed threads with grease and nuts until equipment installation.

B. Connection Bolts

1. Install per AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
2. Ensure washers and nuts bear squarely; use beveled washers on sloped surfaces.
3. Tighten bolts to specified torque; verify with calibrated wrench.

C. Epoxy Anchors

1. Clean holes thoroughly; apply adhesive per ASTM C881 requirements.
2. Allow curing time before applying load.

D. Screw Anchors

1. Install per manufacturer's torque and embedment specifications.

E. Eyebolts and Lifting Eyes

1. Install welded or forged eyebolts in designated locations; verify thread engagement.

3.03 FIELD QUALITY CONTROL

- A. Inspect all installed anchors and bolts for alignment, embedment, and torque.
- B. Document installation and testing results in daily reports.

END OF SECTION

SECTION 051200

MISCELLANEOUS STRUCTURAL STEEL AND ALUMINUM

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section covers field installation of ten (10) prefabricated aluminum lift station platforms.

1.02 SUBMITTALS

- A. Submit shop drawings in accordance with the General Conditions and Section 013300: Submittal Requirements.
- B. Submit erection drawings showing platform layout, anchor locations, and connections.
- C. Submit Shop Drawings prepared under supervision of a registered Professional Engineer, including complete details and schedules for fabrication and assembly of structural members, procedures, and diagrams. Include details of cuts, connections, camber, holes, welds, and other pertinent data.

PART 2 - PRODUCTS

2.01 INSTALLATION MATERIALS

- A. Use only the provided prefabricated components of the platforms.
- B. Provide shims, leveling plates, and protective coatings for field-installed items.

PART 3 - EXECUTION

3.01 STORAGE AND HANDLING

- A. Store structural members above ground on clean supports.
- B. Protect from corrosion and damage prior to installation.

3.02 INSTALLATION OF PLATFORMS AND STRUCTURAL MEMBERS

- A. Install platforms and framing per structural plans and approved shop drawings.
- B. Align and level all members; verify elevations before final connections.
- C. Secure platforms to foundations using preset anchor bolts or approved drilled/epoxy anchors.

- D. Ensure all connections are tight and meet torque requirements.

3.03 FIELD WELDING

- A. Perform welding per AWS D1.1 (steel), AWS D1.2 (aluminum), and AWS D1.6 (stainless steel).
- B. Provide inert gas backing for stainless steel pipe welds.
- C. Grind exposed welds smooth; ensure full penetration where required.

3.04 GALVANIZED SURFACE REPAIR

- A. Touch up damaged galvanizing with zinc-rich coating per ASTM A780.

3.05 CORROSION PROTECTION

- A. Isolate aluminum from dissimilar metals using neoprene gaskets or washers.

3.06 FIELD QUALITY CONTROL

- A. Inspect alignment, bolt torque, weld quality, and corrosion protection.
- B. Document installation and testing results in daily reports.

END OF SECTION

SECTION 055100

LADDERS, STAIRS, AND STAIR NOSINGS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section covers field installation of vertical ladders, inclined aluminum ladders with handrails, prefabricated stairs, stair nosings, stair treads, and fall protection devices for access to elevated platforms at lift stations.

1.02 DESIGN CRITERIA

- A. Handrails, Walkways, Ladders, and Personnel Platforms: OSHA, FBC.
- B. Project structural drawings and approved shop drawings.

1.03 SUBMITTALS

- A. Submit shop drawings and signed and sealed calculations in accordance with the General Conditions and Section 013300: Submittal Requirements.
- B. Submit erection drawings showing ladder and stair locations, anchorage details, and connections to platforms.
- C. Provide installation procedures for fall protection systems.
- D. Submit field verification reports for alignment and anchorage.

PART 2 - PRODUCTS

2.01 INSTALLATION MATERIALS

- A. Use only approved ladders, stairs, and safety devices per fabrication specifications.
- B. Provide all necessary hardware, anchors, and fall protection components for field installation.

PART 3 - EXECUTION

3.01 STORAGE AND HANDLING

- A. Store ladders and stair components above ground on clean supports.
- B. Protect from corrosion and damage prior to installation.

3.02 INSTALLATION OF LADDERS AND STAIRS

- A. Install ladders and stairs per structural plans and approved shop drawings.
- B. Ensure proper clearance behind ladders (minimum 7 inches from rung centerline to nearest obstruction).
- C. Align and level stairs; verify tread spacing and handrail height per OSHA and FBC requirements.
- D. Secure ladders and stairs to platforms using preset anchor bolts or approved drilled/epoxy anchors (see section 050523).
- E. Install fall prevention devices (Saf-T-climb or equivalent) on all ladders per manufacturer's instructions.

3.03 FIELD WELDING AND BOLTING

- A. Perform welding per AWS standards for aluminum and stainless steel where required.
- B. Tighten all bolts to specified torque; verify with calibrated wrench.

3.04 CORROSION PROTECTION

- A. Touch up damaged galvanized surfaces per ASTM A780.
- B. Coat aluminum surfaces in contact with concrete or dissimilar metals; use neoprene gaskets or washers to prevent galvanic corrosion.

3.05 FIELD QUALITY CONTROL

- A. Inspect alignment, anchorage, and fall protection installation.
- B. Document installation and testing results in daily reports.

END OF SECTION

SECTION 055300

GRATING, COVER PLATES, AND ACCESS HATCHES

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section covers field installation of steel and aluminum grating, cover plates, floor plates, and access hatches for platforms and openings at lift stations.

1.02 DESIGN CRITERIA

- A. Installation shall comply with:

1. Grating and floor plates: Design live load of 100 psf, maximum deflection of 1/240 of span or ¼ inch.
2. Access hatches: Design live load of 300 psf.
3. Project structural drawings and approved shop drawings.

1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the General Conditions and Section 013300: Submittal Requirements.
- B. Provide installation procedures for fastening and alignment.
- C. Submit field verification reports for flushness and anchorage.

PART 2 - PRODUCTS

2.01 INSTALLATION MATERIALS

- A. Use only approved grating, plates, frames, and hatches per fabrication specifications.
- B. Provide saddle clips, anchors, and corrosion protection materials for field installation.

PART 3 - EXECUTION

3.01 STORAGE AND HANDLING

- A. Store grating and hatch components above ground on clean supports.
- B. Protect from corrosion and damage prior to installation.

3.02 INSTALLATION OF GRATINGS AND PLATES

- A. Install grating and cover plates per structural plans and approved shop drawings.
- B. Set frames and supports accurately to maintain flush alignment with finished floor.
- C. Secure grating panels with no fewer than four saddle clips per section; clips shall match grating material.
- D. Ensure removable plates have recessed lifting handles to minimize tripping hazards.

3.03 INSTALLATION OF ACCESS HATCHES

- A. Install hatches level and square; verify alignment with platform openings.
- B. Attach fall protection grating panels and hold-open arms per manufacturer's instructions.
- C. Confirm torsion rod lift assistance and locking mechanisms function properly.

3.04 FIELD WELDING AND BOLTING

- A. Perform welding per AWS standards for aluminum and stainless steel where required.
- B. Tighten all bolts to specified torque; verify with calibrated wrench.

3.05 CORROSION PROTECTION

- A. Touch up damaged galvanized surfaces per ASTM A780.
- B. Coat aluminum surfaces in contact with concrete or dissimilar metals; use neoprene gaskets or washers to prevent galvanic corrosion.

3.06 FIELD QUALITY CONTROL

- A. Inspect alignment, anchorage, and flushness of grating and hatches.
- B. Document installation and testing results in daily reports.

END OF SECTION

SECTION 260500

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 – GENERAL

1.01 SUMMARY

A. Applicability

1. Electrical requirements of this section, and those sections included in Division 26, applies to all electrical work described or otherwise required in other sections and divisions of this specification, including but not limited to:
 - a. Division 33
2. Manufactured equipment assemblies shall be listed and labeled by a Nationally Recognized Testing Laboratory acceptable to the Authorities having Jurisdiction.
3. This section specifies general requirements for electrical work. Detailed requirements for specific electrical items are specified in other sections, but are subject to the general requirements of this section. The electrical drawings and schedules included are functional in nature and do not specify exact locations of equipment or equipment terminations.

B. Bid and Construction Documents (Contract Documents)

1. Examine all drawings and Specifications to determine actual locations, sizes, materials, and ratings of equipment provided by others. Coordinate rough-in requirements and locations with Manufacturer instructions prior to installing conduit to equipment and devices.
2. The Drawings and Specifications contemplate a finished piece of Work of such character and quality as described in and reasonably inferred from them, and fitting with the Work of other Contractors and the Owner. By submitting a Bid the Contractor agrees that failure to show details or repeat on any drawings the figures or notes given on another shall not be cause for additional charges or claims.
3. Contract documents and divisions of work described therein, does not direct or otherwise restrict qualified trades from performing work within their specific areas of training and expertise provided that their qualifications meet minimum standards specified.
4. Record drawings provided with the contract drawing set, where applicable, constitutes the best available information for relevant systems at the time of design. Record drawing accuracy is explicitly not guaranteed, and are provided exclusively for the Contractor's

convenience. The Contractor is responsible for field-verifying the accuracy of record drawings prior to use for planning and execution of work. Actual field conditions are specifically and entirely the responsibility of the Contractor. Deviation of the record drawings from actual field conditions shall not constitute a basis for any increase in time allowed for completion or compensation to the Contractor.

5. Duty to Notify

- a. Notify the Engineer in writing of any perceived discrepancies, errors, or omissions in the Contract Documents prior to bid. The Engineer will provide clarification to resolve these issues prior to bid.
- b. The Contractor shall resolve their questions regarding the perceived inconsistency, errors, or omissions contained within the Contract Documents prior to bid. Failure of the Contractor to identify and resolve such issues prior to bid, shall result in no basis of claim for increased compensation for the Work, or the time allowed for the completion of the contract.
- c. The Construction Manager interpretation shall govern.

C. Definitions

1. Provide: Furnish and install complete and ready for intended purpose.
2. Contractor: The party who furnishes and installs all tools, materials, and equipment to complete the work shown and implied in the drawings and these Specifications. This includes the Prime Contractor, the Electrical Contractor, Control System Integrator, and all other Contractors and Subcontractors.
3. Control System Integrator / System Integrator/ Integrator: The party that furnishes all control components and designs, the detailed control wiring diagrams, and layout and assembly of the custom control panels. See Division 40.
4. Control System: All equipment, instruments, and wiring for control and monitoring of all operating equipment. This shall also include custom control panels, packaged control panels, and control equipment furnished with other systems and mechanical equipment. All sensing, transmitting, indicating, control and recording of all functions as specified and shown shall also be included in the control system.
5. Elementary or Schematic or Control Diagram: Shows, by means of graphic symbols, the electrical connections and functions of a specific circuit arrangement. The schematic diagram shows all circuit functions without regard to the actual physical size, shape, or location of the component devices or parts.

6. Single-Line Diagram/ One-Line Diagram: Shows, by means of lines and graphical symbols, the course of the electrical distribution system and the components, devices, or parts used therein.
7. Wiring Diagram or Connection Schematic: Includes all of the devices in a system and shows their physical relationship to each other, including terminals and interconnecting wiring in assembly. This diagram shall be (a) in a form showing interconnecting wiring only by terminal designation (wireless diagram), or (b) a panel layout diagram showing the physical location of devices plus the elementary diagram.
8. Interconnection Diagram: Shows all external connections between terminals of equipment and outside points, such as motors and auxiliary devices. References shall be shown to all connection diagrams that interface to the interconnection diagrams. Interconnection diagrams shall be of the continuous line type. Bundled wires shall be shown as a single line with the direction of entry / exit of the individual wires clearly shown. Each wire identification as actually installed shall be shown. The wire identification for each end of the same wire shall be identical. All devices and equipment shall be identified. Terminal blocks shall be shown as actually installed and identified in the equipment complete with individual terminal identification. All jumpers, shielding and grounding termination details not shown on the equipment connection diagrams shall be shown on the interconnection diagrams. Wires or jumpers shown on the equipment connection diagrams shall not be shown again on the interconnection diagram. Signal and DC circuit polarities and wire pairs shall be shown. Spare wires and cables shall be shown.
9. Arrangement, Layout, or Outline Drawings: Shows the physical space and mounting requirements of a piece of equipment. Diagrams may also indicate ventilation requirements and space provided for connections or the location to which connections are to be made.

1.02 GENERAL DESCRIPTION OF WORK

- A. The Contractor shall provide all labor, material, tools, equipment and services required to complete the furnishing, installation, wiring, connection, calibration, adjustment, testing and operation of electrical equipment, devices and components as indicated and implied by the plans and these Specifications.
 1. Complete the procurement, installation, wiring, connection, calibration, adjustment, testing and operation of all electrical devices, components, accessories and equipment that is not shown or specified, but which is nonetheless required to make the systems shown and specified function properly.
 2. Complete the wiring to, connection to, adjustment and calibration of, and testing of furnished electrical components.

3. Install equipment so it is readily accessible for maintenance. Installations shall have electrical clearances in accordance with NEC and shall be installed in locations that will provide adequate cooling.
4. Check electrical equipment prior to installation so that defective equipment is not installed.
5. Provide field services of qualified technicians to supervise and check out the installation of the equipment, to supervise and check out interconnecting wiring, to conduct start-up of operation of the equipment, and to correct any problems that occur during start-up.
6. Provide circuit breakers, conduit, wire and installation for all items that require electrical power.
7. The Contractor shall provide all permits, licenses, approvals and other arrangements for work on this project and all fees shall be paid for by the Contractor. The Contractor shall include these fees in the bid price.

1.03 PROJECT DESCRIPTION

A. General

1. In general, the project shall consist of all electrical, control, and telemetry construction required to make a complete and operating system. The following is a description of the work anticipated by the Electrical Contractor. The Electrical Contractor shall coordinate with the Control System Integrator during bid to establish exact division of responsibility.
2. Install owner provided Pump Control Panel (power), Pump Control Panel (controls), Termination cabinet for lift stations (LS-5, LS-14, LS-17, LS-20, LS-32, LS-46, LS-54, LS-55, LS-88, LS-97).
3. Provide and install Utility disconnect switches, Utility Meters, Main Breaker disconnect switches and all associated appurtenances shown on electrical plans and specs to have a complete and functioning system.
4. Maintain existing lift station systems until new systems are in place to switch over. Contractor shall work with OWNER to bypass lift station or provide portable generators for existing lift stations to maintain operation of the lift stations until the new systems can be utilized.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIALS

A. General

1. Equipment and materials shall be new and free from defects. All material and equipment of the same or a similar type shall be of the same manufacturer throughout the work. Standard production materials shall be used wherever possible.

B. Equipment Finish

1. Unless otherwise specified, electrical equipment and materials shall be painted by the manufacturer.

2.02 OPERATION AND MAINTENANCE MANUALS

- A. The Contractor shall prepare and assemble detailed operation and maintenance (O&M) manuals in accordance with the project general requirements and other requirements in other specification sections. The manuals shall be bound in a 3 ring binder and tabbed with an index. The O&M manual format shall follow the submittal data specified in Section 260500. The manuals shall include, but not be limited to, the following:

1. Catalog data and complete parts list for all equipment and devices
2. All cut sheets of equipment and components
3. Preventative maintenance procedures
4. Trouble-shooting
5. Calibration
6. Testing
7. Replacement of components
8. Automatic mode operation
9. Manual mode operation
10. System schematics / shop drawings and record drawing.
11. As-built wiring diagrams of cabinet and enclosure contained assemblies
12. As-built wiring diagrams of overall system
13. Listing of recommended spare parts
14. Listing of recommended maintenance tools and equipment

PART 3 EXECUTION

3.01 GENERAL

A. Storage and Installation Environment

1. The Contractor shall store all electrical equipment in a dry environment free from dust, moisture, sprays or vapors which may be detrimental to their new condition. After installation of equipment, the Contractor shall take care to protect all equipment from all dust, moisture, paint and other spray, harmful vapors.
2. Equipment shall not be installed in indoor areas until the area is covered, dry and finished to the point that other work will not create dust, vapors, or moisture. Equipment with integral heaters and fans shall not be installed until power is available at the location, and the heater and fan shall be energized within 6 hours of the equipment being installed.

B. Housekeeping

1. The premises shall be kept free of accumulated materials, rubbish and debris at all times. Surplus material, tools and equipment must not be stored at the job site. Upon completion of the project, all equipment and fixtures shall be cleaned and in proper condition for their intended use.

3.02 TESTS

- A. Prior to functional testing, all protective devices shall be adjusted and made operative. Prior to energization of equipment, the Contractor shall perform a functional checkout of the control circuit. Checkout shall consist of energizing each control circuit and operating each control, alarm or malfunction device and each interlock in turn to verify that the specified action occurs. The Contractor shall submit a description of the proposed functional test procedures prior to the performance of the functional checkout.
- B. The Contractor shall verify motors are connected to rotate in the correct direction. Verification may be accomplished by momentarily energizing the motor, provided the Contractor confirms that neither the motor nor the driven equipment will be damaged by reverse operation.

3.03 FINAL ACCEPTANCE

- A. Prior to final acceptance, the Engineer will perform one or more site observation trips to develop a "punch list" of items deemed incomplete. The Electrical Contractor and Control System Integrator shall be present while these inspections are taking place and shall be available for opening cabinets and operating and adjusting the system as is necessary for the Engineer to verify all equipment is installed and operates to the requirements of the contract documents.

- B. The Contractor shall complete all items of work, including wire markers, nameplates, final tests and final test reports prior to requesting final acceptance inspections. All equipment shall be checked for proper operation and all signals verified for correct calibration and wiring. Fixtures shall have been cleaned, and burned out or defective lamps shall have been replaced.

3.04 TRAINING

- A. The Contractor shall provide training in accordance with the specific requirements in other sections of these Specifications. In addition to training required in other Sections of the Specifications, the Contractor shall conduct specifically organized training sessions in the overall operation and maintenance of the electrical system for personnel employed by the Owner. The training sessions shall be conducted to educate and train the personnel in operation and maintenance of all components of the electrical system outside the training requirements in the other sections of these Specifications. Training shall include, but not be limited to, the following:
 - 1. Preventative maintenance procedures
 - 2. Trouble-shooting
 - 3. Calibration
 - 4. Testing
 - 5. Replacement of components
 - 6. Equipment operation
- B. At least two training sessions, each at least four (4) hours in duration, shall be conducted at the facility after start-up of the system. The Contractor shall prepare and assemble specific instruction materials for each training session and shall supply such materials to the Owner at least one (1) week prior to the time of the training.

END OF SECTION 260500

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SECTION 260505

SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Electrical demolition.

PART 2 – PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work: As specified in individual sections.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify field measurements and circuiting arrangements are as indicated.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition drawings are based on casual field observation and existing record documents.
- D. Report discrepancies to OI before disturbing existing installation.
- E. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Disconnect electrical systems to be removed.
- B. Coordinate utility service outages with utility company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
 - 1. Obtain permission from Owner at least _____ hours before partially or completely disabling system.

2. Make temporary connections to maintain service in areas adjacent to work area.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Remove, relocate, and extend existing installations to accommodate new construction.
- B. Remove abandoned wiring to source of supply.
- C. Remove exposed abandoned conduit. . Cut conduit flush with grade, and patch surfaces.
- D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
- E. Disconnect and remove abandoned panelboards and distribution equipment.
- F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- G. Repair adjacent construction and finishes damaged during demolition and extension work.
- H. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
- I. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.04 CLEANING AND REPAIR

- A. See Section 017419 - Construction Waste Management and Disposal for additional requirements.
- B. Clean and repair existing materials and equipment that remain or that are to be reused.

END OF SECTION 260505

SECTION 260519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Single conductor building wire.
- B. Wiring connectors.
- C. Electrical tape.
- D. Heat shrink tubing.
- E. Wire pulling lubricant.
- F. Cable ties.

1.02 RELATED REQUIREMENTS

- A. Section 078400 - Firestopping.
- B. Section 260526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
- C. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2024).
- B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2023.
- C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010, with Editorial Revision (2020).
- D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).
- E. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2024.
- F. ASTM D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes; 2020.

- G. FS A-A-59544 - Cable and Wire, Electrical (Power, Fixed Installation); 2008a (Validated 2019).
- H. IEEE 1210 - IEEE Standard Tests for Determining Compatibility of Cable-Pulling Lubricants with Wire and Cable; 2004 (Corrigendum 2014).
- I. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- J. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2021.
- K. NETA ATS - Standard for Acceptance Testing Specifications for Electrical Power Equipment And Systems; 2025.
- L. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- M. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.
- N. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.
- O. UL 267 - Outline of Investigation for Wire-Pulling Compounds; Current Edition, Including All Revisions.
- P. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.
- Q. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.
- R. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.
- S. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.
- T. UL 1277 - Electrical Power and Control Tray Cables with Optional Optical-Fiber Members; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
 - 2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
 - 3. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

PART 2 – PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
- C. Nonmetallic-sheathed cable is not permitted.
- D. Underground feeder and branch-circuit cable is not permitted.
- E. Service entrance cable is not permitted.
- F. Armored cable is not permitted.
- G. Metal-clad cable is not permitted.
- H. Manufactured wiring systems are not permitted.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products that comply with requirements of NFPA 70.

- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.
- E. Comply with FS A-A-59544 where applicable.
- F. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- G. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- H. Conductors for Grounding and Bonding: Also comply with Section 260526.
- I. Conductors and Cables Installed Where Exposed to Direct Rays of Sun: Listed and labeled as sunlight resistant.
- J. Conductor Material:
 - 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
 - 2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
 - 3. Tinned Copper Conductors: Comply with ASTM B33.
- K. Minimum Conductor Size:
 - 1. Branch Circuits: 12 AWG.
 - a. Exceptions:
 - 1) 20 A, 120 V circuits longer than 75 feet: 10 AWG, for voltage drop.
 - 2) 20 A, 120 V circuits longer than 150 feet: 8 AWG, for voltage drop.
 - 2. Control Circuits: 14 AWG.
- L. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- M. Conductor Color Coding:
 - 1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.

2. Color Coding Method: Integrally colored insulation.
 - a. Conductors size 4 AWG and larger may have black insulation color coded using vinyl color coding electrical tape.
3. Color Code:
 - a. 480Y/277 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Brown.
 - 2) Phase B: Orange.
 - 3) Phase C: Yellow.
 - 4) Neutral/Grounded: Gray.
 - b. 208Y/120 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral/Grounded: White.
 - c. 240/120 V High-Leg Delta, 3 Phase, 4 Wire System:
 - 1) Phase A: Black.
 - 2) Phase B (High-Leg): Orange.
 - 3) Phase C: Blue.
 - 4) Neutral/Grounded: White.
 - d. 240/120 V, 1 Phase, 3 Wire System:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Neutral/Grounded: White.
 - e. Equipment Ground, All Systems: Green.
 - f. For modifications or additions to existing wiring systems, comply with existing color code when existing code complies with NFPA 70 and is approved by the authority having jurisdiction.
 - g. For control circuits, comply with manufacturer's recommended color code.

2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Manufacturers:

1. Copper Building Wire:

- B. Description: Single conductor insulated wire.
- C. Conductor Stranding:
 - 1. Feeders and Branch Circuits:
 - a. Size 10 AWG and Smaller: Solid.
 - b. Size 8 AWG and Larger: Stranded.
 - 2. Control Circuits: Stranded.
- D. Insulation Voltage Rating: 600 V.
- E. Insulation:
 - 1. Copper Building Wire: Type THHN/THWN, THHN/THWN-2, or XHHW-2, except as indicated below.
 - a. Size 4 AWG and Larger: Type XHHW-2.
 - b. Installed Underground: Type XHHW-2.

2.04 WIRING CONNECTORS

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
- B. Connectors for Grounding and Bonding: Comply with Section 260526.
- C. Wiring Connectors for Splices and Taps:
 - 1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
 - 2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.
- D. Wiring Connectors for Terminations:
 - 1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
 - 2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
 - 3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.

4. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
 5. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
 6. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections to terminal screws.
 7. Conductors for Control Circuits: Use crimped terminals for all connections.
- E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.
- F. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.
- G. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
- H. Mechanical Connectors: Provide bolted type or set-screw type.
- I. Compression Connectors: Provide circumferential type or hex type crimp configuration.
- J. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.

2.05 ACCESSORIES

- A. Electrical Tape:
1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.
 2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
 3. Rubber Splicing Electrical Tape: Ethylene Propylene Rubber (EPR) tape, complying with ASTM D4388; minimum thickness of 30 mil; suitable for continuous temperature environment up to 194 degrees F and short-term 266 degrees F overload service.
 4. Electrical Filler Tape: Rubber-based insulating moldable putty, minimum thickness of 125 mil; suitable for continuous temperature environment up to 176 degrees F.

5. Varnished Cambric Electrical Tape: Cotton cambric fabric tape, with or without adhesive, oil-primed and coated with high-grade insulating varnish; minimum thickness of 7 mil; suitable for continuous temperature environment up to 221 degrees F.
 6. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.
- B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.
- C. Wire Pulling Lubricant:
1. Listed and labeled as complying with UL 267.
 2. Suitable for use with conductors/cables and associated insulation/jackets to be installed, when tested in accordance with IEEE 1210; approved by conductor/cable manufacturer.
 3. Suitable for use at installation temperature.
- D. Cable Ties: Material and tensile strength rating suitable for application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that work likely to damage wire and cable has been completed.
- C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- D. Verify that field measurements are as indicated.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.03 INSTALLATION

- A. Circuiting Requirements:
1. Unless dimensioned, circuit routing indicated is diagrammatic.
 2. When circuit destination is indicated without specific routing, determine exact routing required.

3. Arrange circuiting to minimize splices.
 4. Include circuit lengths required to install connected devices within 10 ft of location indicated.
 5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.
 6. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is permitted, under the following conditions:
 - a. Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.
 - b. Increase size of conductors as required to account for ampacity derating.
 - c. Size raceways, boxes, etc. to accommodate conductors.
 7. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.
 8. Provide oversized neutral/grounded conductors where indicated.
- B. Install products in accordance with manufacturer's instructions.
- C. Perform work in accordance with NECA 1 (general workmanship).
- D. Installation in Raceway:
1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
 2. Pull all conductors and cables together into raceway at same time.
 3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
 4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.
- E. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

- F. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
- G. Install conductors with a minimum of 12 inches of slack at each outlet.
- H. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet of slack.
- I. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.
- J. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
- K. Make wiring connections using specified wiring connectors.
 - 1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
 - 2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
 - 3. Do not remove conductor strands to facilitate insertion into connector.
 - 4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminants. Do not use wire brush on plated connector surfaces.
 - 5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 - 6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- L. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
 - 1. Dry Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
 - a. For taped connections, first apply adequate amount of rubber splicing electrical tape or electrical filler tape, followed by outer covering of vinyl insulating electrical tape.
 - b. For taped connections likely to require re-entering, including motor leads, first apply varnished cambric electrical tape, followed by adequate amount of rubber splicing electrical tape, followed by outer covering of vinyl insulating electrical tape.

2. Damp Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
 - a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
 - b. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.
 3. Wet Locations: Use heat shrink tubing.
- M. Insulate ends of spare conductors using vinyl insulating electrical tape.
- N. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.
- O. Identify conductors and cables in accordance with Section 260553.
- P. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.
- Q. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is only required for services and feeders. The resistance test for parallel conductors listed as optional is not required.
- D. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION 260519

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SECTION 260526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Grounding and bonding requirements.
- B. Conductors for grounding and bonding.
- C. Connectors for grounding and bonding.
- D. Ground rod electrodes.
- E. Ground access wells.

1.02 RELATED REQUIREMENTS

- A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
- B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. IEEE 81 - IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System; 2012.
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- C. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; 2022.
- D. NETA ATS - Standard for Acceptance Testing Specifications for Electrical Power Equipment And Systems; 2025.
- E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding

and bonding system components.

- C. Field quality control test reports.

1.05 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 – PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

- A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.
- B. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
- E. Grounding System Resistance:
 - 1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Engineer. Precipitation within the previous 48 hours does not constitute normally dry conditions.
 - 2. Grounding Electrode System: Not greater than 5 ohms to ground, when tested according to IEEE 81 using "fall-of-potential" method.
 - 3. Between Grounding Electrode System and Major Electrical Equipment Frames, System Neutral, and Derived Neutral Points: Not greater than 0.5 ohms, when tested using "point-to-point" methods.
- F. Grounding Electrode System:
 - 1. Provide connection to required and supplemental grounding electrodes indicated to form

grounding electrode system.

- a. Provide continuous grounding electrode conductors without splice or joint.
- b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.

2. Metal In-Ground Support Structure:

- a. Provide connection to metal in-ground support structure that is in direct contact with earth in accordance with NFPA 70.

3. Ground Ring:

- a. Provide a ground ring encircling the building or structure consisting of bare copper conductor not less than 2 AWG in direct contact with earth, installed at a depth of not less than 30 inches.
- b. Where location is not indicated, locate ground ring conductor at least 24 inches outside platform perimeter foundation.
- c. Provide connection from ground ring conductor to:
 - 1) Perimeter columns of metal frame.
 - 2) Ground rod electrodes located at each corner of the platform.

4. Ground Rod Electrode(s):

- a. Provide single electrode unless otherwise indicated or required.
- b. Space electrodes not less than 10 feet from each other and any other ground electrode.
- c. Where location is not indicated, locate electrode(s) at least 5 feet outside building perimeter foundation as near as possible to electrical service entrance; where possible, locate in softscape (uncovered) area.
- d. Provide ground access well for first connected electrode.

5. Provide additional ground electrode(s) as required to achieve specified grounding electrode system resistance.

G. Service-Supplied System Grounding:

1. For each service disconnect, provide grounding electrode conductor to connect neutral (grounded) service conductor to grounding electrode system. Unless otherwise indicated,

make connection at neutral (grounded) bus in service disconnect enclosure.

2. For each service disconnect, provide main bonding jumper to connect neutral (grounded) bus to equipment ground bus where not factory-installed. Do not make any other connections between neutral (grounded) conductors and ground on load side of service disconnect.

H. Bonding and Equipment Grounding:

1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
7. Provide bonding for metal platform frame.

2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:

1. Provide products listed, classified, and labeled as suitable for the purpose intended.
2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 260526:

1. Use insulated copper conductors unless otherwise indicated.
 - a. Exceptions:
 - 1) Use bare tinned copper conductors where installed underground in direct contact with earth.

- 2) Use bare tinned copper conductors where directly encased in concrete (not in raceway).
2. Factory Pre-fabricated Bonding Jumpers: Furnished with factory-installed ferrules; size braided cables to provide equivalent gauge of specified conductors.
- C. Connectors for Grounding and Bonding:
1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
 2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
 3. Unless otherwise indicated, use mechanical connectors or compression connectors for accessible connections.
- D. Ground Rod Electrodes:
1. Comply with NEMA GR 1.
 2. Material: Copper-bonded (copper-clad) steel.
 3. Size: 3/4 inch diameter by 10 feet length, unless otherwise indicated.
 4. Where rod lengths of greater than 10 feet are indicated or otherwise required, sectionalized ground rods may be used.
- E. Ground Access Wells:
1. Description: Open bottom round or rectangular well with access cover for testing and inspection; suitable for the expected load at the installed location.
 2. Size: As required to provide adequate access for testing and inspection, but not less than minimum size requirements specified.
 - a. Round Wells: Not less than 8 inches in diameter.
 - b. Rectangular Wells: Not less than 12 by 12 inches.
 3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 10 inches.
 4. Cover: Factory-identified by permanent means with word "GROUND".

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that work likely to damage grounding and bonding system components has been completed.
- B. Verify that field measurements are as indicated.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70.
 - 1. Outdoor Installations: Unless otherwise indicated, install with top of rod 6 inches below finished grade.
- D. Make grounding and bonding connections using specified connectors.
 - 1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
 - 2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
 - 3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
 - 4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
 - 5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
- E. Identify grounding and bonding system components in accordance with Section 260553.

3.03 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, for additional requirements.

- B. Inspect and test in accordance with NETA ATS except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.13.
- D. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.
- E. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.
- F. Submit detailed reports indicating inspection and testing results and corrective actions taken.

END OF SECTION 260526

SECTION 260529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Concrete equipment pads.
- B. Section 055000 - Metal Fabrications: Materials and requirements for fabricated metal supports.
- C. Section 260533.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.
- D. Section 260533.16 - Boxes for Electrical Systems: Additional support and attachment requirements for boxes.
- E. Section 262513 - Low-Voltage Busways: Additional support and attachment requirements for busway.
- F. Section 265600 - Exterior Lighting: Additional support and attachment requirements for exterior luminaires.

1.03 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.
- D. MFMA-4 - Metal Framing Standards Publication; 2004.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction,

Including All Applicable Amendments and Supplements.

H. UL 5B - Strut-Type Channel Raceways and Fittings; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate sizes and arrangement of supports and bases with actual equipment and components to be installed.
2. Coordinate work to provide additional framing and materials required for installation.
3. Coordinate compatibility of support and attachment components with mounting surfaces at installed locations.
4. Coordinate arrangement of supports with ductwork, piping, equipment and other potential conflicts.
5. Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

1. Do not install products on or provide attachment to concrete surfaces until concrete has cured; see Section 033000.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel/strut framing systems, nonpenetrating rooftop supports, and post-installed concrete/masonry anchors.
- C. Installer's qualification statement.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications for Field Welding.
- B. Product Listing Organization Qualifications: Organization recognized by OSHA as Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 – PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

B. General Requirements

1. Comply with the following. Where requirements differ, comply with most stringent.
 - a. NFPA 70.
 - b. Florida Building Code.
 - c. Requirements of authorities having jurisdiction.
2. Provide required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for complete installation of electrical work.
3. Provide products listed, classified, and labeled as suitable for purpose intended, where applicable.
4. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
5. Do not use products for applications other than as permitted by NFPA 70 and product listing.
6. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
7. Steel Components: Use corrosion-resistant materials suitable for environment where installed.
 - a. Outdoor and Damp or Wet Indoor Locations: Use stainless steel or aluminum unless otherwise indicated.
 - b. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - c. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

C. Materials for Metal Fabricated Supports: 316 stainless steel or aluminum.

D. Conduit and Cable Supports: Straps and clamps suitable for conduit or cable to be supported.

1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.

2. Conduit Clamps: Bolted type unless otherwise indicated.
- E. Outlet Box Supports: Hangers and brackets suitable for boxes to be supported.
- F. Metal Channel/Strut Framing Systems:
1. Description: Factory-fabricated, continuous-slot, metal channel/strut and associated fittings, accessories, and hardware required for field assembly of supports.
 2. Comply with MFMA-4.
 3. Channel Material:
 - a. Outdoor and Damp or Wet Indoor Locations: Use stainless steel.
 4. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch.
 5. Minimum Channel Dimensions: 1-5/8 inch wide by 13/16 inch high.
- G. Hanger Rods: Threaded, zinc-plated steel unless otherwise indicated.
- H. Anchors and Fasteners:
1. Unless otherwise indicated and where not otherwise restricted, use anchor and fastener types indicated for specified applications.
 2. Steel: Use beam clamps, machine bolts, or welded threaded studs.
 3. Sheet Metal: Use sheet metal screws.
 4. Plastic and lead anchors are not permitted.
 5. Powder-actuated fasteners are not permitted.
 6. Preset Concrete Inserts: Continuous metal channel/strut and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
 - a. Manufacturer: Same as manufacturer of metal channel/strut framing system.
 - b. Comply with MFMA-4.
 - c. Channel Material: Use galvanized steel.
 - d. Minimum Channel Thickness: Steel sheet, 12 gauge, 0.1046 inch minimum base metal thickness.
 7. Post-Installed Concrete and Masonry Anchors: Evaluated and recognized by ICC Evaluation Service, LLC (ICC-ES) for compliance with applicable building code.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install hangers and supports in accordance with NECA 1.
- C. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.
- D. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
- E. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
- F. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
- G. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
 - 1) Field Welding, Where Approved by Engineer
- H. Equipment Support and Attachment:
 - 1) Use metal, fabricated supports or supports assembled from metal channel/strut to support equipment as required.
 - 2) Use metal channel/strut secured to studs to support equipment surface mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
 - 3) Use metal channel/strut to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
 - 4) Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.

- I. Conduit Support and Attachment: See Section 260533.13 for additional requirements.
- J. Box Support and Attachment: See Section 260533.16 for additional requirements.
- K. Busway Support and Attachment: See Section 262513 for additional requirements.
- 1. Exterior Luminaire Support and Attachment: See Section 265600 for additional requirements.
- L. Preset Concrete Inserts: Use manufacturer provided closure strips to inhibit concrete seepage during concrete pour.
- M. Secure fasteners in accordance with manufacturer's recommended torque settings.
- N. Remove temporary supports.

3.03 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Inspect support and attachment components for damage and defects.
- C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION 260529

SECTION 260533.13

CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Galvanized steel rigid metal conduit (RMC).
- B. Stainless steel rigid metal conduit (RMC).
- C. Aluminum rigid metal conduit (RMC).
- D. PVC-coated galvanized steel rigid metal conduit (RMC).
- E. Liquidtight flexible metal conduit (LFMC).
- F. Galvanized steel electrical metallic tubing (EMT).
- G. Rigid polyvinyl chloride (PVC) conduit.
- H. Reinforced thermosetting resin conduit (RTRC).

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Concrete encasement of conduits.
- B. Section 078400 - Firestopping.
- C. Section 260526 - Grounding and Bonding for Electrical Systems.
 - 1. Includes additional requirements for fittings for grounding and bonding.
- D. Section 260529 - Hangers and Supports for Electrical Systems.
- E. Section 260533.16 - Boxes for Electrical Systems.
- F. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
- G. Section 262100 - Low-Voltage Electrical Service Entrance: Additional requirements for electrical service conduits.
- H. Section 312316 - Excavation.
- I. Section 312316.13 - Trenching: Excavating, bedding, and backfilling.

- J. Section 312323 - Fill: Bedding and backfilling.
- K. Section 337119 - Electrical Underground Ducts, Ductbanks, and Manholes.

1.03 REFERENCE STANDARDS

- A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2020.
- B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2020.
- C. ANSI C80.5 - American National Standard for Electrical Rigid Metal Conduit - Aluminum (ERMC-A); 2025.
- D. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit; 2018.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- F. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2020.
- G. NECA 102 - Standard for Installing Aluminum Rigid Metal Conduit; 2004.
- H. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2025.
- I. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
- J. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Metal Conduit and Intermediate Metal Conduit; 2018.
- K. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2020.
- L. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2021.
- M. NEMA TC 14 (SERIES) - Reinforced Thermosetting Resin Conduit and Fittings Series; 2015.
- N. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- O. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.
- P. UL 6A - Electrical Rigid Metal Conduit-Aluminum, Red Brass, and Stainless Steel; Current Edition, Including All Revisions.
- Q. UL 360 - Liquid-Tight Flexible Metal Conduit; Current Edition, Including All Revisions.
- R. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.
- S. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

- T. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.
- U. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.
- V. UL 1203 - Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations; Current Edition, Including All Revisions.
- W. UL 1242 - Electrical Intermediate Metal Conduit-Steel; Current Edition, Including All Revisions.
- X. UL 2419 - Outline of Investigation for Electrically Conductive Corrosion Resistant Compounds; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate minimum sizes of conduits with actual type and quantity of conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
2. Coordinate arrangement of conduits with structural members, ductwork, piping, equipment, and other potential conflicts.
3. Verify exact conduit termination locations required for boxes, enclosures, and equipment.
4. Coordinate work to provide roof penetrations that preserve integrity of roofing system and do not void roof warranty.
5. Notify Architect of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:

1. Do not begin installation of conductors and cables until installation of conduit between termination points is complete.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.

1.06 QUALITY ASSURANCE

- A. Product Listing Organization Qualifications: Organization recognized by OSHA as Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

PART 2 – PRODUCTS

2.01 CONDUIT APPLICATIONS

- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70, manufacturer's instructions, and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, use rigid aluminum metal conduit.
- C. Underground:
 - 1. Under Slab on Grade: Use aluminum rigid metal conduit (RMC), rigid PVC conduit, or reinforced thermosetting resin conduit (RTRC).
 - 2. Exterior, Direct-Buried: Use aluminum rigid metal conduit (RMC) or rigid PVC conduit.
 - 3. Exterior, Embedded Within Concrete: Use galvanized steel rigid metal conduit (RMC) or rigid PVC conduit.
 - 4. Where rigid polyvinyl chloride (PVC) conduit is provided, transition to aluminum rigid metal conduit (RMC) where emerging from underground.
 - 5. Where rigid polyvinyl (PVC) conduit larger than 2-inch (53 mm) trade size is provided, use aluminum rigid metal conduit (RMC) elbows or PVC-coated galvanized steel rigid metal conduit (RMC) elbows for bends.
- D. Embedded Within Concrete:
 - 1. Within Slab on Grade: Use galvanized steel rigid metal conduit (RMC) or rigid PVC conduit.
 - 2. Within Slab Above Ground: Use galvanized steel rigid metal conduit (RMC) or rigid PVC conduit.
 - 3. Where rigid polyvinyl (PVC) conduit is provided, transition to aluminum rigid metal conduit (RMC) where emerging from concrete.
 - 4. Where aluminum rigid metal conduit (RMC) is installed in concrete, use corrosion protection tape, factory-applied corrosion protection coating, or field-applied corrosion protection compound acceptable to authorities having jurisdiction to provide supplementary corrosion protection.

- E. Exposed, Not Subject to Physical Damage: Use aluminum rigid metal conduit (RMC) or rigid PVC conduit.
- F. Exposed, Subject to Physical Damage: Use aluminum rigid metal conduit (RMC) or schedule 80 rigid PVC conduit.
 - 1. Locations subject to physical damage include, but are not limited to:
 - a. Where exposed below 8 feet.
- G. Flexible Connections to Vibrating Equipment:
 - 1. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit (LFMC).
 - 2. Maximum Length: 3 feet unless otherwise indicated.

2.02 CONDUIT - GENERAL REQUIREMENTS

- A. Comply with NFPA 70.
- B. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling mandrel through them.
- C. Electrical Service Conduits: See Section 262100 for additional requirements.
- D. Fittings for Grounding and Bonding: See Section 260526 for additional requirements.
- E. Provide conduit, fittings, supports, and accessories required for complete raceway system.
- F. Provide products listed, classified, and labeled as suitable for purpose intended.
- G. Minimum Conduit Size, Unless Otherwise Indicated:
 - 1. Branch Circuits: 1-inch trade size.
 - 2. Branch Circuit Homeruns: 1-inch trade size.
 - 3. Control Circuits: 1-inch trade size.
 - 4. Underground, Exterior: 1-inch trade size.
- H. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

- A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
- B. Fittings:
 - 1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6.
 - 2. Hazardous/Classified Locations: Use fittings listed and labeled as complying with UL 1203 for classification of installed location.
 - 3. Material: Use steel or malleable iron.
 - a. Where not subject to severe corrosive influence, stainless steel or aluminum fittings may be used.
 - b. Do not use die cast zinc fittings.
 - 4. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.04 STAINLESS STEEL RIGID METAL CONDUIT (RMC)

- A. Description: NFPA 70, Type RMC stainless steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6A.
- 1. Material: Type 304 or 316 stainless steel.
- B. Fittings:
 - 1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6A.
 - 2. Hazardous/Classified Locations: Use fittings listed and labeled as complying with UL 1203 for classification of installed location.
 - 3. Material: Use stainless steel with corrosion resistance equivalent to conduit.
 - 4. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.05 ALUMINUM RIGID METAL CONDUIT (RMC)

- A. Description: NFPA 70, Type RMC aluminum rigid metal conduit complying with ANSI C80.5 and listed and labeled as complying with UL 6A.

B. Fittings:

1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B or UL 6A.
2. Hazardous/Classified Locations: Use fittings listed and labeled as complying with UL 1203 for classification of installed location.
3. Material: Use aluminum.
4. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and compression/gland types, are not permitted.

2.06 PVC-COATED GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

- A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6.
- B. Exterior Coating: Polyvinyl chloride (PVC), nominal thickness of 40 mil, 0.040 inch.
- C. PVC-Coated Boxes and Fittings:
1. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.
 2. Nonhazardous Locations: Use boxes and fittings listed and labeled as complying with UL 514A, UL 514B, or UL 6.
 3. Hazardous/Classified Locations: Use fittings listed and labeled as complying with UL 1203 for classification of installed location.
 4. Material: Use steel or malleable iron.
 5. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil, 0.040 inch.
- D. PVC-Coated Supports: Furnish with exterior coating of polyvinyl chloride (PVC), minimum thickness of 15 mil, 0.015 inch.

2.07 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

- A. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.
- B. Fittings:
1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2. Material: Use steel or malleable iron.

a. Do not use die cast zinc fittings.

2.08 GALVANIZED STEEL ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT galvanized steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

B. Fittings:

1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

2. Material: Use steel or malleable iron.

3. Connectors and Couplings: Use compression/gland type.

a. Do not use indenter type connectors and couplings.

2.09 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.

B. Fittings:

1. Manufacturer: Same as manufacturer of conduit to be connected.

2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.10 REINFORCED THERMOSETTING RESIN CONDUIT (RTRC)

A. Description: NFPA 70, Type RTRC reinforced thermosetting resin conduit complying with NEMA TC 14 (SERIES).

B. Supports: As recommended by manufacturer.

C. Fittings: Same type and manufacturer as conduit to be connected.

2.11 ACCESSORIES

A. Conduit Joint Compound: Corrosion-resistant, electrically conductive compound listed as complying with UL 2419; suitable for use with conduit to be installed.

- B. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
- C. Epoxy Adhesive for RTRC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
- D. Pull Strings: Use nylon or polyester tape with average breaking strength of not less than 1,250 lbf.
- E. Foam Conduit Sealant:
 - 1. Removable, two-part, closed-cell foam, specifically designed for sealing conduit openings against water, moisture, gases, and dust.
 - 2. Suitable for use with conductors/cables and associated insulation/jackets to be installed.
 - 3. Rated to hold minimum of 10 ft water head pressure.
 - 4. Products:
 - a. American Polywater Corporation; Polywater AFT Foam Duct Sealant: www.polywater.com/#sle.
 - b. American Polywater Corporation; Polywater FST Foam Duct Sealant: www.polywater.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.
- F. Sealing Compound for Hazardous/Classified Location Sealing Fittings: Listed for use with particular fittings to be installed.
- G. Sealing Systems for Concrete Penetrations:
 - 1. Sleeves: Provide water stop ring or cement coating that bonds to concrete to prevent water infiltration.
 - 2. Rate for minimum of 40 psig; suitable for sealing around conduits to be installed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive conduits.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install conduit in accordance with NECA 1.
- C. Galvanized Steel Rigid Metal Conduit (RMC): Install in accordance with NECA 101.
- D. Aluminum Rigid Metal Conduit (RMC): Install in accordance with NECA 102.
- E. Intermediate Metal Conduit (IMC): Install in accordance with NECA 101.
- F. PVC-Coated Galvanized Steel Rigid Metal Conduit (RMC): Install using only tools approved by manufacturer.
- G. Rigid Polyvinyl Chloride (PVC) Conduit: Install in accordance with NECA 111.
- H. Conduit Routing:
 - 1. Unless dimensioned, conduit routing indicated is diagrammatic.
 - 2. When conduit destination is indicated without specific routing, determine exact routing required.
 - 3. Conceal conduits unless specifically indicated to be exposed.
 - 4. Conduits in the following areas may be exposed, unless otherwise indicated:
 - 5. Conduits installed underground or embedded in concrete may be routed in shortest possible manner unless otherwise indicated. Route other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
 - 6. Arrange conduit to maintain adequate headroom, clearances, and access.
 - 7. Arrange conduit to provide no more than equivalent of four 90-degree bends between pull points.
 - 8. Arrange conduit to provide no more than 150 feet between pull points.
 - 9. Route conduits above water and drain piping where possible.
 - 10. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
 - 11. Maintain minimum clearance of 6 inches between conduits and piping for other systems.
 - 12. Group parallel conduits in same area on common rack.

I. Conduit Support:

1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by authorities having jurisdiction; see Section 260529.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Use conduit strap to support single surface-mounted conduit.
 - a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
4. Use metal channel/strut with accessory conduit clamps to support multiple parallel surface-mounted conduits.
5. Use conduit clamp to support single conduit from beam clamp or threaded rod.
6. Use of spring steel conduit clips for support of conduits is not permitted.
7. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with most stringent requirements.

J. Connections and Terminations:

1. Use approved conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.
4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
5. Terminate threaded conduits in boxes and enclosures using threaded hubs for dry locations and raintight hubs for wet locations.
6. Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit terminations to protect conductors.
7. Secure joints and connections to provide mechanical strength and electrical continuity.

K. Penetrations:

1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Provide suitable sealing system where conduits penetrate exterior wall below grade.
6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty.
8. Install firestopping to preserve fire resistance rating of partitions and other elements; see Section 078400.

L. Underground Installation:

1. Provide trenching and backfilling; see Section 312316 and Section 312323.
2. Minimum Cover, Unless Otherwise Indicated or Required:
 - a. Underground, Exterior: 24 inches.
 - b. Under Slab on Grade: 12 inches to bottom of slab.
 - c. Utility: 36 inches or utility requirements.
3. Provide underground warning tape along entire conduit length for service entrance where not concrete-encased; see Section 260553.

M. Embedment Within Structural Concrete Slabs (only where approved by Structural Engineer):

1. Maximum Conduit Size: 1-inch trade size unless otherwise approved.
2. Install conduits within middle one third of slab thickness.
3. Secure conduits to prevent floating or movement during pouring of concrete.

N. Concrete Encasement: Where conduits not otherwise embedded within concrete are indicated to be concrete-encased, provide minimum concrete cover of 3 inches on all sides unless otherwise indicated.

- O. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
 2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
 3. Where calculated in accordance with NFPA 70 for reinforced thermosetting resin conduit (RTRC) conduit installed above ground to compensate for thermal expansion and contraction.
 4. Where conduits are subject to earth movement by settlement.
- P. Conduit Sealing:
1. Use foam conduit sealant to prevent entry of moisture and gases. This includes, but is not limited to:
 - a. Where conduits enter building from outside.
 - b. Where service conduits enter panels underground distribution system.
 - c. Where conduits enter building from underground.
 - d. Where conduits may transport moisture to contact live parts.
 2. Where conduits cross barriers between areas of potential substantial temperature differential, use foam conduit sealant at accessible point near penetration to prevent condensation. This includes, but is not limited to:
 - a. Where conduits pass from underground into equipment.
 - b. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
 3. Where conduits cross boundaries of hazardous/classified locations, provide identified/listed sealing fittings as approved by authorities having jurisdiction; locate as indicated or in accordance with NFPA 70.
- Q. Provide pull string in each empty conduit and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.
- R. Provide grounding and bonding; see Section 260526.
- S. Identify conduits; see Section 260553.

3.03 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
- C. Where coating of PVC-coated galvanized steel rigid metal conduit (RMC) contains cuts or abrasions, repair in accordance with manufacturer's instructions.
- D. Correct deficiencies and replace damaged or defective conduits.

3.04 CLEANING

- A. Clean interior of conduits to remove moisture and foreign matter.

3.05 PROTECTION

- A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION 260533.13

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SECTION 260533.16

BOXES FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.
- B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.
- C. Boxes for hazardous (classified) locations.
- D. Underground boxes/enclosures.

1.02 RELATED REQUIREMENTS

- A. Section 083100 - Access Doors and Panels: Panels for maintaining access to concealed boxes.
- B. Section 260529 - Hangers and Supports for Electrical Systems.
- C. Section 260533.13 - Conduit for Electrical Systems:
 - 1. Conduit bodies and other fittings.
 - 2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.
- D. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
- E. Section 262726 - Wiring Devices:
 - 1. Wall plates.
 - 2. Additional requirements for locating boxes for wiring devices.
- F. Section 337119 - Electrical Underground Ducts, Ductbanks, and Manholes: Concrete manholes for electrical systems.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.
- C. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.

- D. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
- E. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013 (Reaffirmed 2020).
- F. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports; 2013 (Reaffirmed 2020).
- G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. SCTE 77 - Specifications for Underground Enclosure Integrity; 2023.
- I. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
- J. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
- K. UL 508A - Industrial Control Panels; Current Edition, Including All Revisions.
- L. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.
- M. UL 514C - Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers; Current Edition, Including All Revisions.
- N. UL 1203 - Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
 - 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
 - 4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
 - 5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc.

installed under other sections or by others.

6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures, boxes for hazardous (classified) locations, floor boxes, and underground boxes/enclosures.
 1. Underground Boxes/Enclosures: Include reports for load testing in accordance with SCTE 77 certified by a professional engineer or an independent testing agency upon request.
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 1. See Section 016000 - Product Requirements, for additional provisions.
 2. Keys for Lockable Enclosures: Two of each different key.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 BOXES

- A. General Requirements:
 1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
 2. Provide all boxes, fittings, supports, and accessories required for a complete raceway

system and to accommodate devices and equipment to be installed.

3. Provide products listed, classified, and labeled as suitable for the purpose intended.
4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:

1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
2. Use cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
3. Use cast aluminum boxes where aluminum rigid metal conduit is used.
4. Use nonmetallic boxes where exposed rigid PVC conduit is used.
5. Use suitable concrete type boxes where flush-mounted in concrete.
6. Use suitable masonry type boxes where flush-mounted in masonry walls.
7. Use raised covers suitable for the type of wall construction and device configuration where required.
8. Use shallow boxes where required by the type of wall construction.
9. Do not use "through-wall" boxes designed for access from both sides of wall.
10. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
11. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
12. Nonmetallic Boxes: Comply with NEMA OS 2, and list and label as complying with UL 514C.
13. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
14. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
15. Wall Plates: Comply with Section 262726.

- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
 - 1. Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
 - 2. NEMA EN 10250 Environment Type, Unless Otherwise Indicated:
 - a. Outdoor Locations: Type 4X, stainless steel.
 - 3. Junction and Pull Boxes Larger Than 100 cubic inches:
 - a. Provide hinged-cover enclosures unless otherwise indicated.
 - b. Boxes 6 square feet and Larger: Provide hinged-cover enclosures.
- D. Boxes for Hazardous (Classified) Locations: Listed and labeled as complying with UL 1203 for the classification of the installed location.
- E. Underground Boxes/Enclosures:
 - 1. Description: In-ground, open bottom boxes furnished with flush, non-skid covers with legend indicating type of service and stainless steel cover bolts.
 - 2. Size: 11 by 17 unless otherwise indicated.
 - 3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 12 inches.
 - 4. Provide logo on cover to indicate type of service.
 - 5. Applications:
 - a. Sidewalks and Landscaped Areas Subject Only to Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77 Tier 8 load rating.
 - b. Parking Lots, in Areas Subject Only To Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77 Tier 22 load rating.
 - c. Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.
 - 6. Polymer Concrete Underground Boxes/Enclosures: Comply with SCTE 77.
 - a. Combination fiberglass/polymer concrete boxes/enclosures are acceptable.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive boxes.
- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130 , _____.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.
- E. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
- F. Box Locations:
 - 1. Locate boxes to be accessible. Provide access panels in accordance with Section 083100 as required where approved by the Architect.
 - 2. Unless dimensioned, box locations indicated are approximate.
 - 3. Locate boxes as required for devices installed under other sections or by others.
- G. Box Supports:
 - 1. Secure and support boxes in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction.
 - 2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
 - 3. Use far-side support to secure flush-mounted boxes supported from single stud in hollow stud walls. Repair or replace supports for boxes that permit excessive movement.
- H. Install boxes plumb and level.

I. Flush-Mounted Boxes:

1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.

J. Install boxes as required to preserve insulation integrity.

K. Underground Boxes/Enclosures:

1. Install enclosure on gravel base, minimum 6 inches deep.
2. Flush-mount enclosures located in concrete or paved areas.
3. Mount enclosures located in landscaped areas with top at 1 inch above finished grade.
4. Provide cast-in-place concrete collar minimum 10 inches wide by 12 inches deep, around enclosures that are not located in concrete areas.
5. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.

L. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

M. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

N. Close unused box openings.

O. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

P. Provide grounding and bonding in accordance with Section 260526.

Q. Identify boxes in accordance with Section 260553.

3.03 CLEANING

A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.04 PROTECTION

- A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION 260533.16

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SECTION 260553

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Electrical identification requirements.
- B. Identification nameplates and labels.
- C. Wire and cable markers.
- D. Underground warning tape.
- E. Warning signs and labels.

1.02 RELATED REQUIREMENTS

- A. Section 099113 - Exterior Painting.
- B. Section 099123 - Interior Painting.
- C. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.

1.03 REFERENCE STANDARDS

- A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. NFPA 70E - Standard for Electrical Safety in the Workplace; 2024.
- C. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
- B. Sequencing:
 - 1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.

2. Do not install identification products until final surface finishes and painting are complete.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.
- C. Shop Drawings: Provide schedule of items to be identified indicating proposed designations, materials, legends, and formats.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.

1.07 FIELD CONDITIONS

- A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

PART 2 – PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

- A. Existing Work: Unless specifically excluded, identify existing elements to remain that are not already identified in accordance with specified requirements.
- B. Identification for Equipment:
 1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
 - a. Enclosed switches and circuit breakers:
 - 1) Identify voltage and phase.
 - 2) Identify power source and circuit number. Include location when not within sight of equipment.
 - 3) Identify load(s) served. Include location when not within sight of equipment.
 2. Service Equipment:
 - a. Use identification nameplate to identify each service disconnecting means.
 3. Use identification nameplate to identify equipment utilizing series ratings, where permitted, in accordance with NFPA 70.

4. Use identification nameplate to identify EQUIPMENT utilizing a high leg delta system in accordance with NFPA 70.
 5. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70 including but not limited to the following.
 - a. Service equipment.
 - b. Industrial control panels.
 - c. Motor control centers.
 - d. Elevator control panels.
 - e. Industrial machinery.
 6. Arc Flash Hazard Warning Labels: Use warning labels to identify arc flash hazards for electrical equipment, such as switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized.
 - a. Minimum Size: 3.5 by 5 inches.
 - b. Legend: Include orange header that reads "WARNING", followed by the word message "Arc Flash and Shock Hazard; Appropriate PPE Required; Do not operate controls or open covers without appropriate personal protection equipment; Failure to comply may result in injury or death; Refer to NFPA 70E for minimum PPE requirements".
 - c. Service Equipment: Include the following information in accordance with NFPA 70.
 - 1) Nominal system voltage.
- C. Identification for Conductors and Cables:
1. Color Coding for Power Conductors 600 V and Less: Comply with Section 260519.
 2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment.
 3. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
 - a. At each source and load connection.
 - b. Within boxes when more than one circuit is present.

- c. Within equipment enclosures when conductors and cables enter or leave the enclosure.
- 4. Use wire and cable markers to identify connected grounding electrode system components for grounding electrode conductors.
- 5. Use underground warning tape to identify direct buried cables.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:

- 1. Materials:
 - a. Outdoor Locations: Use stainless steel nameplates suitable for exterior use.
- 2. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser-etched text.

B. Identification Labels:

- 1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
- 2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

C. Format for Equipment Identification:

- 1. Minimum Size: 1 inch by 2.5 inches.
- 2. Legend:
 - a. Equipment designation or other approved description.
- 3. Text: All capitalized unless otherwise indicated.
- 4. Minimum Text Height:
 - a. System Designation: 1 inch.
 - b. Equipment Designation: 1/2 inch.
 - c. Other Information: 1/4 inch.
- 5. Color:
 - a. Normal Power System: White text on black background.

D. Format for Caution and Warning Messages:

1. Minimum Size: 2 inches by 4 inches.
2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 1/2 inch.
5. Color: Black text on yellow background unless otherwise indicated.

E. Format for Receptacle Identification:

1. Minimum Size: 3/8 inch by 1.5 inches.
2. Legend: Power source and circuit number or other designation indicated.
 - a. Include voltage and phase for other than 120 V, single phase circuits.
3. Text: All capitalized unless otherwise indicated.
4. Minimum Text Height: 3/16 inch.
5. Color: Black text on clear background.

2.03 WIRE AND CABLE MARKERS

- A. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.
- B. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.
- C. Legend: Power source and circuit number or other designation indicated.
- D. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
 1. Do not use handwritten text.
- E. Minimum Text Height: 1/8 inch.
- F. Color: Black text on white background unless otherwise indicated.

2.04 UNDERGROUND WARNING TAPE

- A. Materials: Use foil-backed detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.
- B. Foil-backed Detectable Type Tape: 3 inches wide, with minimum thickness of 5 mil, unless otherwise required for proper detection.
- C. Legend: Type of service, continuously repeated over full length of tape.
- D. Color:
 - 1. Tape for Buried Power Lines: Black text on red background.

2.05 WARNING SIGNS AND LABELS

- A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.
- B. Warning Signs:
 - 1. Materials:
 - a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
 - b. Outdoor Locations: Use factory pre-printed rigid aluminum signs.
 - 2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
 - 3. Minimum Size: 7 by 10 inches unless otherwise indicated.
- C. Warning Labels:
 - 1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
 - a. Do not use labels designed to be completed using handwritten text.
 - 2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
 - 3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 EXECUTION

3.01 PREPARATION

- A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
 - 1. Surface-Mounted Equipment: Enclosure front.
 - 2. Flush-Mounted Equipment: Inside of equipment door.
 - 3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
 - 4. Elevated Equipment: Legible from the floor or working platform.
 - 5. Branch Devices: Adjacent to device.
 - 6. Interior Components: Legible from the point of access.
 - 7. Conductors and Cables: Legible from the point of access.
 - 8. Devices: Outside face of cover.
- C. Install identification products centered, level, and parallel with lines of item being identified.
- D. Secure nameplates to exterior surfaces of enclosures using self-adhesive backing and to interior surfaces using self-adhesive backing.
- E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.
- F. Install underground warning tape above buried lines with one tape per trench at 3 inches below finished grade.
- G. Secure rigid signs using stainless steel screws.
- H. Mark all handwritten text, where permitted, to be neat and legible.

3.03 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, for additional requirements.

- B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION 260553

SECTION 262100

LOW-VOLTAGE ELECTRICAL SERVICE ENTRANCE

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Electrical service requirements.

1.02 RELATED REQUIREMENTS

- A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables.
- B. Section 260526 - Grounding and Bonding for Electrical Systems.
- C. Section 260529 - Hangers and Supports for Electrical Systems.
- D. Section 260533.13 - Conduit for Electrical Systems.
- E. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
- F. Section 312316 - Excavation.
- G. Section 312316.13 - Trenching: Excavating, bedding, and backfilling.
- H. Section 312323 - Fill: Bedding and backfilling.

1.03 DEFINITIONS

- A. Service Point: The point of connection between the facilities of the serving utility and the premises wiring as defined in NFPA 70, and as designated by the Utility Company.

1.04 REFERENCE STANDARDS

- A. IEEE C2 - National Electrical Safety Code(R) (NESC(R)); 2023.
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. No later than two weeks following date established in Notice to Proceed, notify Utility Company of anticipated date of service.

B. Coordination:

1. Verify the following with Utility Company representative:
 - a. Utility Company requirements, including division of responsibility.
 - b. Exact location and details of utility point of connection.
 - c. Utility easement requirements.
 - d. Utility Company charges associated with providing service.
2. Coordinate the work with other trades to avoid placement of other utilities or obstructions within the spaces dedicated for electrical service and associated equipment.
3. Coordinate arrangement of service entrance equipment with the dimensions and clearance requirements of the actual equipment to be installed.
4. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

C. Arrange for Utility Company to provide permanent electrical service. Prepare and submit documentation required by Utility Company.

D. Utility Company charges associated with providing permanent service to be paid by Contractor and reimbursed by Owner.

E. Preinstallation Meeting: Convene one week prior to commencing work of this section to review service requirements and details with Utility Company representative.

F. Scheduling:

1. Arrange for inspections necessary to obtain Utility Company approval of installation.

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product. Include ratings, configurations, standard wiring diagrams, outline and support point dimensions, finishes, weights, service condition requirements, and installed features.

1.07 QUALITY ASSURANCE

A. Comply with the following:

1. IEEE C2 (National Electrical Safety Code).

2. NFPA 70 (National Electrical Code).
 3. The requirements of the Utility Company.
 4. The requirements of the local authorities having jurisdiction.
- B. Products: Listed, classified, and labeled as suitable for the purpose intended.
 - C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.
- B. Store products indoors in a clean, dry space having a uniform temperature to prevent condensation (including outdoor rated products which are not weatherproof until completely and properly installed). Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle products carefully to avoid damage to internal components, enclosure, and finish.

PART 2 – PRODUCTS

2.01 ELECTRICAL SERVICE REQUIREMENTS

- A. Provide replacement of existing electrical service consisting of all required conduits, conductors, equipment, metering provisions, supports, accessories, etc. as necessary for connection between Utility Company point of supply and service entrance equipment.
- B. Electrical Service Characteristics: As indicated on drawings.
- C. Utility Company: LCEC - Lee County Electric Cooperative.
- D. Division of Responsibility:
 1. Pad-Mounted Utility Transformers:
 - a. Transformer Pads: Furnished and installed by Contractor per Utility Company requirements.
 - b. Transformers: Furnished and installed by Utility Company.
 - c. Transformer Grounding Provisions: Furnished and installed by Contractor per Utility Company requirements.
 - d. Primary:

- 1) Trenching and Backfilling: Provided by Contractor.
 - 2) Conduits: Furnished by Utility Company and installed by Contractor.
 - 3) Conductors: Furnished and installed by Utility Company.
- e. Secondary:
 - 1) Trenching and Backfilling: Provided by Contractor.
 - 2) Conduits: Furnished and installed by Contractor.
 - 3) Conductors: Furnished and installed by Contractor (Service Point at transformer).
2. Pole-Mounted Utility Transformers:
 - a. Utility Poles: Furnished and installed by Utility Company.
 - b. Transformers: Furnished and installed by Utility Company.
 - c. Transformer Grounding Provisions: Furnished and installed by Utility Company.
 - d. Primary: Furnished and installed by Utility Company.
 - e. Secondary - Underground Service:
 - 1) Conduits: Furnished and installed by Contractor.
 - 2) Conductors: Furnished and installed by Contractor (Service Point at utility pole).
3. Terminations at Service Point: Provided by Utility Company.
4. Metering Provisions:
 - a. Meter Bases: Furnished and installed by Contractor per Utility Company requirements.

E. Products Furnished by Contractor: Comply with Utility Company requirements.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that ratings and configurations of service entrance equipment are consistent with the indicated requirements.

- C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Verify and mark locations of existing underground utilities.

3.03 INSTALLATION

- A. Install products in accordance with manufacturer's instructions and Utility Company requirements.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Arrange equipment to provide minimum clearances and required maintenance access.
- D. Provide required trenching and backfilling in accordance with Section 312316.13.
- E. Provide required support and attachment components in accordance with Section 260529.
- F. Provide grounding and bonding for service entrance equipment in accordance with Section 260526.
- G. Identify service entrance equipment, including main service disconnect(s) in accordance with Section 260553.

3.04 PROTECTION

- A. Protect installed equipment from subsequent construction operations.

END OF SECTION 262100

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SECTION 262726

WIRING DEVICES

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Wall switches.
- B. Receptacles.
- C. Wall plates and covers.

1.02 RELATED REQUIREMENTS

- A. Section 260526 - Grounding and Bonding for Electrical Systems.
- B. Section 260533.16 - Boxes for Electrical Systems.
- C. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
- D. Section 262913 - Enclosed Controllers: Manual motor starters and horsepower rated motor-starting switches without overload protection.

1.03 REFERENCE STANDARDS

- A. FS W-C-596 - Connector, Electrical, Power, General Specification for; 2014h (Validated 2022).
- B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush Mounted (General Specification); 2017g (Validated 2023).
- C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.
- E. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2020).
- F. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2021.
- G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.
- I. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

- J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.
- K. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
3. Coordinate the placement of outlet boxes for wall switches with actual installed door swings.
4. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
5. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

B. Sequencing:

1. Do not install wiring devices until final surface finishes and painting are complete.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Products: Listed, classified, and labeled as suitable for the purpose intended.
- D. Product Evaluation and Listing Organization Qualifications: Organization engaged in evaluation of products and services, including those recognized by OSHA as Nationally Recognized Testing Laboratories (NRTL), and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND PROTECTION

- A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.

PART 2 – PRODUCTS

2.01 WIRING DEVICES - GENERAL REQUIREMENTS

- A. Provide wiring devices suitable for intended use with ratings adequate for load served.
- B. Wiring Device Applications:
 - 1. Receptacles Installed Outdoors or in Damp or Wet Locations: Use weather-resistant GFCI receptacles with weatherproof covers.
- C. Wiring Device Finishes:
 - 1. Provide wiring device finishes as described below, unless otherwise indicated.
 - 2. Wiring Devices Installed in Wet or Damp Locations: White with weatherproof cover.

2.02 WALL SWITCHES

- A. Manufacturers:
 - 1. Hubbell Incorporated; _____: www.hubbell.com/#sle.
 - 2. Leviton Manufacturing Company, Inc; _____: www.leviton.com/#sle.
 - 3. Pass & Seymour, a brand of Legrand North America, Inc; _____: www.legrand.us/#sle.
- B. General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.
 - 1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.
- C. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw as indicated on the drawings.

2.03 RECEPTACLES

- A. Manufacturers:
 - 1. Hubbell Incorporated; _____: www.hubbell.com/#sle.
 - 2. Leviton Manufacturing Company, Inc; _____: www.leviton.com/#sle.

3. Lutron Electronics Company, Inc; Designer Style: www.lutron.com/#sle.
 4. Pass & Seymour, a brand of Legrand North America, Inc; _____: www.legrand.us/#sle.
- B. General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
 2. NEMA configurations specified are according to NEMA WD 6.
- C. GFCI Receptacles:
1. General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
 - a. Provide test and reset buttons of same color as device.
 2. Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SD suitable for installation in damp or wet locations.

2.04 WALL PLATES AND COVERS

- A. Wall Plates: Comply with UL 514D.
1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
 2. Size: Standard.
 3. Screws: Metal with slotted heads finished to match wall plate finish.
- B. Weatherproof Receptacle Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.
- C. Weatherproof Switch Covers for Wet or Damp Locations: Gasketed, metallic, with externally operable actuating means and corrosion-resistant screws; listed as suitable for use in wet locations.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
- C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- F. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

- A. Provide extension rings to bring outlet boxes flush with finished surface.
- B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
- B. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of wiring devices provided under this section.
 - 1. Mounting Heights: ABOVE FLOOD ELEVATION.
 - 2. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
- C. Install wiring devices in accordance with manufacturer's instructions.
- D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
- E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.
- F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
- G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

- H. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.
- I. Install wiring devices plumb and level with mounting yoke held rigidly in place.
- J. Install wall switches with OFF position down.
- K. Do not share neutral conductor on branch circuits utilizing wall dimmers.
- L. Install vertically mounted receptacles with grounding pole on bottom and horizontally mounted receptacles with grounding pole on right.
- M. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
- N. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.
- O. Identify wiring devices in accordance with Section 260553.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, for additional requirements.
- B. Inspect each wiring device for damage and defects.
- C. Operate each wall switch with circuit energized to verify proper operation.
- D. Test each receptacle to verify operation and proper polarity.
- E. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.
- F. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.05 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION 262726

SECTION 262816.13

ENCLOSED CIRCUIT BREAKERS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Enclosed circuit breakers.

1.02 RELATED REQUIREMENTS

- A. Section 260526 - Grounding and Bonding for Electrical Systems.
- B. Section 260529 - Hangers and Supports for Electrical Systems.
- C. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; 2013e, with Amendments (2022).
- B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- C. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
- D. NETA ATS - Standard for Acceptance Testing Specifications for Electrical Power Equipment And Systems; 2025.
- E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
- G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
- H. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.
- I. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:

1. Coordinate work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
4. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for circuit breakers, enclosures, and other installed components and accessories.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed circuit breaker internal components, enclosure, and finish.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Eaton Corporation: www.eaton.com/#sle.
- B. Schneider Electric: www.se.com/#sle.

2.02 ENCLOSED CIRCUIT BREAKERS

- A. Description: Units consisting of molded case circuit breakers individually mounted in enclosures.

- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
 - 1. Altitude: Less than 6,600 feet.
 - 2. Ambient Temperature: Between 23 degrees F and 104 degrees F.
- D. Short Circuit Current Rating:
- E. Enclosed Circuit Breakers Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.
- F. Conductor Terminations: Suitable for use with the conductors to be installed.
- G. Provide thermal magnetic circuit breakers unless otherwise indicated.
- H. Provide insulated, groundable fully rated solid neutral assembly where a neutral connection is required, with a suitable lug for terminating each neutral conductor.
- I. Provide solidly bonded equipment ground bus in each enclosed circuit breaker, with a suitable lug for terminating each equipment grounding conductor.
- J. Enclosures: Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E.
 - 1. Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Outdoor Locations: Type 4X, stainless steel.
 - 2. Provide surface-mounted enclosures.
- K. Provide externally operable handle with means for locking in the OFF position.

2.03 MOLDED CASE CIRCUIT BREAKERS

- A. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated.
- B. Interrupting Capacity:
 - 1. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
 - a. 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.

- b. 18,000 rms symmetrical amperes at 480 VAC.
- 2. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
- C. Conductor Terminations:
 - 1. Provide mechanical lugs unless otherwise indicated.
 - 2. Lug Material: Copper, suitable for terminating copper conductors only.
- D. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
- E. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that the ratings of the enclosed circuit breakers are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive enclosed circuit breakers.
- D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Provide required support and attachment in accordance with Section 260529.
- E. Install enclosed circuit breakers plumb.
- F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed circuit breakers such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.
- G. Provide grounding and bonding in accordance with Section 260526.

- H. Identify enclosed circuit breakers in accordance with Section 260553.

3.03 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, for additional requirements.
- B. Inspect and test in accordance with manufacturer's instructions and NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.6.1.1 for circuit breakers used for service entrance and for circuit breakers larger than 400 amperes. Tests listed as optional are not required.
- D. Correct deficiencies and replace damaged or defective enclosed circuit breakers.

3.04 ADJUSTING

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING

- A. Clean dirt and debris from circuit breaker enclosures and components according to manufacturer's instructions.
- B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 262816.13

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SECTION 262816.16

ENCLOSED SWITCHES

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Enclosed safety switches.

1.02 RELATED REQUIREMENTS

- A. Section 260526 - Grounding and Bonding for Electrical Systems.
- B. Section 260529 - Hangers and Supports for Electrical Systems.
- C. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- B. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
- C. NEMA BS 31047 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum); 2013 (Reaffirmed 2023).
- D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
- F. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
- G. UL 98 - Enclosed and Dead-Front Switches; Current Edition, Including All Revisions.
- H. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.

2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
4. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for enclosed switches and other installed components and accessories.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed switch internal components, enclosure, and finish.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Eaton Corporation: www.eaton.com/#sle.
- B. Schneider Electric: www.se.com/#sle.

2.02 ENCLOSED SAFETY SWITCHES

- A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:

1. Altitude: Less than 6,600 feet.
 2. Ambient Temperature: Between -22 degrees F and 104 degrees F.
- D. Horsepower Rating: Suitable for connected load.
- E. Voltage Rating: Suitable for circuit voltage.
- F. Short Circuit Current Rating:
- G. Enclosed Safety Switches Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.
- H. Provide with switch blade contact position that is visible when the cover is open.
- I. Conductor Terminations: Suitable for use with the conductors to be installed.
- J. Provide insulated, groundable fully rated solid neutral assembly where a neutral connection is required, with a suitable lug for terminating each neutral conductor.
- K. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.
- L. Enclosures: Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E.
1. Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
 - a. Outdoor Locations: Type 4X, stainless steel.
- M. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.
- N. Heavy Duty Switches:
1. Comply with NEMA BS 31047.
 2. Conductor Terminations:
 - a. Provide mechanical lugs unless otherwise indicated.
 - b. Lug Material: Copper, suitable for terminating copper conductors only.
 3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.

- O. Provide the following features and accessories where indicated or where required to complete installation:
 - 1. Hubs: As required for environment type; sized to accept conduits to be installed.
 - 2. Viewing Window: Positioned over switch blades for visual confirmation of contact position with door closed.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that the ratings of the enclosed switches are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive enclosed safety switches.
- D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Provide required support and attachment in accordance with Section 260529.
- E. Install enclosed switches plumb.
- F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.
- G. Provide grounding and bonding in accordance with Section 260526.
- H. Identify enclosed switches in accordance with Section 260553.

3.03 ADJUSTING

- A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.04 CLEANING

- A. Clean dirt and debris from switch enclosures and components according to manufacturer's instructions.
- B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 262816.16

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SECTION 264300

SURGE PROTECTIVE DEVICES

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Surge protective devices for service entrance locations.

1.02 RELATED REQUIREMENTS

- A. Section 260526 - Grounding and Bonding for Electrical Systems.

1.03 ABBREVIATIONS AND ACRONYMS

- A. SPD: Surge Protective Device.

1.04 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- B. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. UL 1449 - Standard for Surge Protective Devices; Current Edition, Including All Revisions.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Include detailed component information, voltage, surge current ratings, repetitive surge current capacity, voltage protection rating (VPR) for all protection modes, maximum continuous operating voltage (MCOV), nominal discharge current (I-n), short circuit current rating (SCCR), connection means including any required external overcurrent protection, enclosure ratings, outline and support point dimensions, weight, service condition requirements, and installed features.
- C. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.

- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND PROTECTION

- A. Store in a clean, dry space in accordance with manufacturer's written instructions.

1.08 FIELD CONDITIONS

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.09 WARRANTY

- A. See Section 017836 - Warranties, for additional warranty requirements.
- B. Manufacturer's Warranty: Provide minimum five year warranty covering repair or replacement of surge protective devices showing evidence of failure due to defective materials or workmanship.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Field-Installed, Externally Mounted Surge Protective Devices:
 - 1. Schneider Electric: www.se.com/#sle.
 - 2. Surge Suppression, LLC (SSI): www.surgesuppression.com/#sle.

2.02 SURGE PROTECTIVE DEVICES - GENERAL REQUIREMENTS

- A. Description: Factory-assembled surge protective devices (SPDs) for 60 Hz service; listed, classified, and labeled as suitable for the purpose intended; system voltage as indicated on the drawings.
- B. Unless otherwise indicated, provide field-installed, externally-mounted SPDs.
- C. List and label as complying with UL 1449, Type 1 when connected on line side of service disconnect overcurrent device and Type 1 or 2 when connected on load side of service disconnect overcurrent device.
- D. Protected Modes:
 - 1. Wye Systems: L-N, L-G, N-G, L-L.

2. Delta Systems: L-G, L-L.
 3. Single Split Phase Systems: L-N, L-G, N-G, L-L.
 4. High Leg Delta Systems: L-N, L-G, N-G, L-L.
- E. UL 1449 Voltage Protection Ratings (VPRs):
1. 208Y/120V System Voltage: Not more than 1,000 V for L-N, L-G, and N-G modes and 1,200 V for L-L mode.
 2. 240/120V System Voltage: Not more than 1,000 V for L-N, L-G, and N-G modes and 1,200 V for L-L mode.
 3. 480V Delta System Voltage: Not more than 1,800 V for L-G mode and 3,000 V for L-L mode.
- F. UL 1449 Maximum Continuous Operating Voltage (MCOV): Not less than 115% of nominal system voltage.
- G. Enclosure Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
1. Outdoor locations: Type 4X.
- H. Mounting for Field-installed, Externally Mounted SPDs: Attached to the disconnect switch.

2.03 SURGE PROTECTIVE DEVICES FOR SERVICE ENTRANCE LOCATIONS

- A. Surge Protective Device:
1. Protection Circuits: Field-replaceable modular or non-modular.
 2. Surge Current Rating: Not less than 160 kA per mode/320 kA per phase.
 3. UL 1449 Nominal Discharge Current (I-n): 20 kA.
 4. UL 1449 Short Circuit Current Rating (SCCR): Not less than the available fault current at the installed location as indicated on the drawings.
 5. Diagnostics:
 - a. Protection Status Monitoring: Provide indicator lights to report the protection for each phase.
 - b. Alarm Notification: Provide indicator light and audible alarm to report alarm condition. Provide button to manually silence audible alarm.

6. Provide surge rated integral disconnect switch for SPDs not connected to a dedicated circuit breaker or fused switch or not direct bus connected.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that the service voltage and configuration marked on the SPD are consistent with the service voltage and configuration at the location to be installed.
- C. Verify that electrical equipment is ready to accept connection of the SPD and that installed overcurrent device is consistent with requirements of drawings and manufacturer's instructions.
- D. Verify system grounding and bonding is in accordance with Section 260526, including bonding of neutral and ground for service entrance and separately derived systems where applicable. Do not energize SPD until deficiencies have been corrected.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Perform work in accordance with NECA 1 (general workmanship).
- B. Install products in accordance with manufacturer's instructions.
- C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
- D. Unless indicated otherwise, connect service entrance surge protective device on load side of service disconnect main overcurrent device.
- E. Provide conductors with minimum ampacity as required by NFPA 70 and not less than manufacturer's recommended minimum conductor size.
- F. Install conductors between SPD and equipment terminations as short and straight as possible, not exceeding manufacturer's recommended maximum conductor length. Twist conductors together to reduce inductance.
- G. Do not energize SPD until bonding of neutral and ground for service entrance and separately derived systems is complete in accordance with Section 260526 where applicable. Replace SPDs damaged by improper or missing neutral-ground bond.

3.03 CLEANING

- A. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 264300

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SECTION 265600

EXTERIOR LIGHTING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Exterior luminaires.
- B. Poles and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 260529 - Hangers and Supports for Electrical Systems.
- B. Section 260533.16 - Boxes for Electrical Systems.

1.03 REFERENCE STANDARDS

- A. ANSI O5.1 - American National Standard for Wood Poles: Specifications and Dimensions; 2022.
- B. IEEE C2 - National Electrical Safety Code(R) (NESC(R)); 2023.
- C. IES LM-79 - Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products; 2024.
- D. IES LM-80 - Approved Method: Measuring Maintenance of Light Output Characteristics of Solid-State Light Sources; 2021.
- E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
- F. NECA/IESNA 501 - Standard for Installing Exterior Lighting Systems; 2000 (Reaffirmed 2006).
- G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. UL 844 - Luminaires for Use in Hazardous (Classified) Locations; Current Edition, Including All Revisions.
- I. UL 1598 - Luminaires; Current Edition, Including All Revisions.
- J. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:

1. Coordinate placement of light fixture with owner to illuminate platform and control panels.
2. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.
 1. LED Luminaires:
 - a. Include estimated useful life, calculated based on IES LM-80 test data.
 2. Poles: Include information on maximum supported effective projected area (EPA) and weight for the design wind speed.

1.06 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Receive, handle, and store products according to NECA/IESNA 501 and manufacturer's written instructions.
- B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.
- C. Receive, handle, and store wood poles in accordance with ANSI O5.1.

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Provide 2-year manufacturer warranty for all LED luminaires, including drivers.

PART 2 – PRODUCTS

2.01 LUMINAIRES

A. Manufacturers:

1. Acuity Brands, Inc; D-Series Flood Size 1: www.acuitybrands.com/#sle.

B. Provide products that comply with requirements of NFPA 70.

C. Provide products that are listed and labeled as complying with UL 1598, where applicable.

D. Provide products listed, classified, and labeled as suitable for the purpose intended.

E. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

F. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.

G. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

H. Provide luminaires listed and labeled as suitable for wet locations unless otherwise indicated.

I. Hazardous (Classified) Location Luminaires: Listed and labeled as complying with UL 844 for the classification of the installed location.

J. LED Luminaires:

1. Components: UL 8750 recognized or listed as applicable.
2. Tested in accordance with IES LM-79 and IES LM-80.
3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

2.02 POLES

A. Manufacturers:

1. Hubbell Lighting, Inc; _____: www.hubbelllighting.com/#sle.

B. All Poles:

1. Provide poles and associated support components suitable for the luminaire(s) and associated supports and accessories to be installed.
2. Structural Design Criteria:
3. Material: Aluminum, unless otherwise indicated.
4. Shape: Round straight, unless otherwise indicated.
5. Finish: Match luminaire finish, unless otherwise indicated.
6. Mounting Height: 12, unless otherwise indicated.
7. Mounting: MOUNT LIGHT FIXTURE TO PLATFORM SUPPORTS, unless otherwise indicated.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- C. Verify that suitable support frames are installed where required.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of luminaires provided under this section.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install products in accordance with manufacturer's instructions.
- D. Install luminaires in accordance with NECA/IESNA 501.
- E. Provide required support and attachment in accordance with Section 260529.
- F. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- G. Pole-Mounted Luminaires:

1. Maintain the following minimum clearances:

- a. Comply with IEEE C2.
- b. Comply with utility company requirements.

2. Grounding:

- a. Bond luminaires, metal accessories, metal poles, and foundation reinforcement to branch circuit equipment grounding conductor.

3. Install separate service conductors, 12 AWG copper, from each luminaire down to handhole for connection to branch circuit conductors.

H. Install accessories furnished with each luminaire.

I. Bond products and metal accessories to branch circuit equipment grounding conductor.

J. Install lamps in each luminaire.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Inspect each product for damage and defects.

C. Operate each luminaire after installation and connection to verify proper operation.

D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

3.04 ADJUSTING

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Engineer. Secure locking fittings in place.

3.05 CLEANING

A. Clean surfaces according to NECA/IESNA 501 and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.06 CLOSEOUT ACTIVITIES

3.07 PROTECTION

A. Protect installed luminaires from subsequent construction operations.

END OF SECTION 265600

SECTION 312316.13

TRENCHING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Trench excavation.
- B. Backfill and compaction.

1.02 RELATED REQUIREMENTS

- A. Section 260553 - Identification for Electrical Systems.
- B. Section 312200 - Grading.

1.03 DEFINITIONS

1.04 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate trenching with utility installation.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 3 years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified, with minimum 3 years of documented experience.

PART 2 – PRODUCTS

2.01 FILL MATERIALS

- A. General Fill: Comprised of sand and gravel; free of shale, clay, friable materials, and debris.

2.02 ACCESSORIES

- A. Underground Warning Tape: Suitable for direct burial.
 - 1. See Section 260553 for underground warning tapes at underground electrical lines.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Identify required lines, levels, contours, and datum locations.
- B. Protect plants, lawns, rock outcroppings, and other features to remain.
- C. Locate and identify existing utilities to remain as indicated on drawings and protect from damage.
- D. Notify utility company to remove and relocate utilities as indicated on drawings.

3.02 SUPPORT AND PROTECTION

- A. Excavation Safety: Comply with OSHA's Excavation Standard, 29 CFR 1926, Subpart P.

3.03 TRENCH EXCAVATION

- A. Grade top perimeter of excavation to prevent surface water collection.
- B. General: Cut trenches neat and clean.
 - 1. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.
- C. Utility Preparation: Rake trench bottom to uniform grade.
 - 1. Remove unsuitable subgrade and backfill.
 - 2. Compact subgrade to density equal to or greater than subsequent fill material requirements.
- D. Maintain trenches and prevent loose soil or rocks from entering.
- E. Remove excavated material that is unsuitable for re-use from site.
- F. Remove excess excavated material from site.

3.04 BACKFILL AND COMPACTION

- A. Backfill to contours and elevations indicated on drawings using unfrozen materials.
- B. Employ placement method that does not disturb or damage other work.
- C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen, or spongy subgrade surfaces.
- D. General Fill: Place and compact materials in equal continuous layers not exceeding 8 inches

compacted depth.

E. Underground Warning Tape:

1. Install 6 to 8 inches below finished grade, directly above buried pipe.
2. See Section 260553 for installation.

3.05 CLEANING

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
- B. Stockpile excavated material re-used in area designated on-site; see Section 312200.
- C. Remove excavated material that is not required or unsuitable for re-use from site.

3.06 PROTECTION

- A. Divert surface water away from excavations.
- B. Keep excavations free of standing water.
- C. Maintain stability of banks and loose soils; prevent from falling into excavations.
- D. Maintain excavations in neat and square, undisturbed condition.

END OF SECTION 312316.13

SECTION 31 63 16

AUGER CAST GROUT PILES

PART 1-GENERAL

1.01 SUMMARY:

- A. Work under this section consists of furnishing all necessary supervision, labor, materials, and equipment required for the installation of augered cast-in-place grout piles (ACPs), also known as Continuous Flight Auger (CFA) Piles as shown on the Contract Drawings and as specified herein.
- B. The ACP specialty Contractor (referred to hereafter as “Contractor”) shall visit the site prior to mobilization of equipment to the site to observe and review specific site conditions, access conditions, requirements for equipment, and to evaluate methods and costs to install ACPs.
- C. The Contractor is responsible for furnishing all materials, products, accessories, tools, equipment, services, transportation, labor and supervision, and manufacturing techniques required for installation of ACPs and pile top attachments for this project.
- D. The Contractor is responsible for constructing minimum 24-inch diameter ACPs, designed by the Engineer and installed with full length reinforcing steel and grout.
- E. The Contractor shall install ACPs that will develop the loads capacities indicated on the project plans.
- F. Protect existing structures in accordance with the requirements of authorities having jurisdiction over the adjacent structures and utilities.

1.02 RELATED WORK:

- A. Related Documents and Sections: Examine Contract Documents for requirements that directly affect or are affected by the Work of this Section. A list of those Documents and Sections includes, but is not limited to, the following:
 - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 01 General Requirements Specification Sections, apply to this Section.
 - 2. Section 01 33 23 – SUBMITTALS
 - 3. Section 03 11 00 – CONCRETE FORMWORK
 - 4. Section 03 21 00 – CONCRETE REINFORCEMENT
 - 5. Section 03 30 00 – CAST-IN-PLACE CONCRETE

1.03 REFERENCES:

A. The following standards are applicable to the work of this section to the extent referenced herein:

1. American Association of State Highway Transportation Officials (AASHTO)

AASHTO LRFD Bridge Design Specifications, Current Edition
2. ASTM International (ASTM)
ASTM A36 – Structural Steel
ASTM A615 – Deformed and Plain Billet Steel Bars for Concrete Reinforcement
ASTM A722 Uncoated High-Strength Steel Bar for Prestressing Concrete
ASTM A775 – Epoxy-Coated Reinforcing Steel Bars
ASTM C109 – Test Method for Compressive Strength of Hydraulic Cement Mortars Using 2-inch Cube Specimens
ASTM C150 – Standard Specification for Portland Cement, Type II
ASTM C404 – Aggregates for Masonry Grout
ASTM C494 – Chemical Admixtures for Concrete
ASTM D1143 – Method of Testing Piles Under Static Axial Compressive Load
3. Federal Highway Administration (FHWA)

FHWA HIF-07-03, Geotechnical Engineering Circular No. 8, Design and Construction of Continuous Flight (CFA) Piles, 2007

1.04 PAYMENT

A. Contract Lump Sum: Base Contract Lump Sum on number and dimensions of piles from tip to pile top.

B. Work of this Section is affected as follows:

1. Pile Length: Additional payment for piles lengths in excess of that indicated, and credit for pile lengths less than that indicated, is calculated at unit prices stated in the Contract , based on net addition or deduction to total pile length as determined by Engineer and measured to nearest 12 inches.
2. Unit prices include labor, materials, tools, equipment, and incidentals for excavation, grout fill, reinforcement, testing and inspection, and other items for complete pile installation.
3. Test piles that become part of permanent foundation system are considered as an integral part of the Work.

4. No payment is made for rejected piles, including piles out of specified tolerance or defective piles.

1.05 PROJECT SITE AND SUBSURFACE CONDITIONS:

- C. The Contractor shall be responsible for their own interpretations of and/or conclusions regarding subsurface conditions. The Contractor may conduct borings, probes, or test pits to evaluate strata or further evaluate the potential for obstructions at no additional cost to the Owner.
- D. ACPs will be installed for support of The City of Sanibel, Lift Station Platforms.
 1. ACP and pile top to column connection shall be designed using the procedures in FHWA HIF-07-03, Geotechnical Engineering Circular No. 8, Design and Construction of Continuous Flight (CFA) Piles
 2. ACPs shall have a minimum length as shown in the Drilled Shaft Data Table presented in Drawing S012.
 3. Contractor shall protect adjacent structures, underground utilities and other construction from damage caused by ACP construction.
- E. The Contractor shall be aware that fill materials or naturally deposited cobbles and boulders may exist within the work area and may be encountered. The Contractor is responsible for removal or penetration of obstructions.

1.06 SUBMITTALS – IN ACCORDANCE WITH SECTION 01 33 23 SUBMITTALS, SUBMIT THE FOLLOWING

- A. Submittals shall be delivered to the Owner's Representative/Engineer a minimum of 21 calendar days prior to ACP installation. Work shall not begin until the appropriate submittals have been received, reviewed, and approved in writing by Owner's Representative/Engineer. The Contractor shall allow Owner's Representative/Engineer up to 2 weeks to review, comment, and return the submittal package after a complete set has been received. Note that any additional time required due to incomplete or unacceptable submittals shall not be cause for delay or impact claims. All costs associated with incomplete or unacceptable submittals shall be the responsibility of the Contractor.
- B. Review of the submittals by the Owner's Representative/Engineer will not relieve the Contractor of the responsibility to provide and safely install ACP's capable of supporting the design loads specified herein.
- C. Contractor's Qualifications: The Contractor performing the work in this Specification shall have installed ACPs for a minimum of five years on similar projects. At the time of the bid, the Contractor shall submit a list containing at least five comparable installations on which the Contractor and the Superintendent have installed ACPs. A brief description of key project drilled pile features; time period (dates) when bored pile work was performed and ultimate client's name; direct client contact name, address, telephone number, and email address shall be included for each project. The Contractor may not use consultants or manufacturer's representatives to meet the requirements of this

section.

1. Resume of Project Superintendent including pertinent project experience.
2. Prior to the start of work, the Contractor shall submit a list identifying the drill operators and on-site supervisors who will be assigned to the project. Drill operators and on-site supervisors shall have a minimum of one year experience installing ACPs with the Contractor's organization.

D. Shop Drawings:

1. The Contractor's Engineer shall submit for approval, ACP shop drawings indicating how the Contractor will meet the requirements of the design details in support the structural loads indicated on the Drawings. As a minimum the ACP show drawings shall include:
 - a. Detailed summary of design assumptions.
 - b. A figure with ACP identification numbers, reference baseline, and elevation datum, and proposed subsurface exploration locations.
 - c. Details of proposed ACP type and diameter.
 - d. Type and size of reinforcing steel.
 - e. Total ACP length, and minimum embedment lengths
 - f. Steel Reinforcement Shop Drawings: Comply with ACI 315. Furnish shop drawings prepared by a Professional Engineer licensed in the state of installation that include placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement
 - a. Prior to fabrication: Indicate steel grades, sizes, bending details, protective coatings, spacing, placement and supports.
 - b. Supplementary Product Literature: Furnish manufacturer's literature describing general properties of each product to be used in the Work.
 - c. Certifications: Furnish manufacturer's certified reports of mill tests for reinforcing steel and anchorage devices, including physical and chemical analysis.
 - g. Top of ACP connection details.

E. The Contractor or Contractor's grout supplier shall submit detailed information about the proposed grout mix to Owner's Representative/Engineer. The information shall include:

1. Mix proportions and evidence of the proposed mix provides adequate strength and uniform consistency of grout.
2. Type, manufacturer, and chemical composition of grout.
3. Type, manufacturer or source, and purposes of admixtures.
4. Gradation, fineness modulus, and source of fine aggregates.
5. Certification of grout mix materials to be in compliance with "Applicable Standards," including cement, aggregate, and all admixtures.

- F. Certified mill test reports, properly marked, for the reinforcing steel, as the materials are delivered, to Owner's Representative/Engineer for record purposes. The ultimate strength, yield strength, elongation, and composition shall be included.
- G. Proposed Work Plan providing step-by-step procedures for ACP installation, including:
1. Details on spoils management.
 2. Proposed equipment and techniques for ACP installation, including rig name, model number, proposed drill attachments, pumps for grout or concrete, mixing equipment, automated monitoring equipment, and similar equipment to be used in construction, including details of procedures for calibrating equipment as required.
 3. Detailed sequence of excavation/drilling technique, water, or air flushing, reinforcing steel placement, and grout placement.
 4. Target drilling and grouting parameters (along with acceptable ranges) for pile installation, including auger rotation speed, drilling penetration rates, torque, applied crowd pressures and grout volume factors.
 5. Method of advancing the hole through soil, including cobbles and boulders, fill materials, including construction debris or other obstructions.
 6. Procedures for supporting and centering reinforcing steel.
 7. Plan describing how surface water, drill flush and excess grout will be controlled and disposed. The Contractor shall not allow discharge of any materials from the installation of ACPs to enter surrounding water bodies.
 8. Cement grout or concrete design mix including admixtures to be used in the mix. Identify planned grout cube or concrete cylinder samples as required herein and relate samples to the construction sequence.
 9. Procedures for monitoring and recording grout or concrete pressures and volumes placed during installation.
 10. Contingency plans for equipment failures during drilling or grouting operations (grout pump, monitoring equipment, etc.).
 11. Methods to ensure quality control.
- H. As-Built Records:
1. The Contractor shall submit ACP installation logs within 24 hours of installations, which shall include:
 - a. pile identification number, dimensions (diameter, wall thickness, and length of steel casing; center bar type, size, and length; top and bottom elevations), cutoff and tip elevation, verticality information,
 - b. any deviation from specified location,
 - c. description of soil/ water/ obstructions encountered, length and descriptions of frictional zone,
 - d. grouting records including time and amount of grout used including maximum and average pump pressures, grout samples taken, finished grout head, re-drill and re-grout records.
 - e. Installation logs shall also include remarks concerning unusual installation behavior or conditions of the ACP.
 - f. Elevations and distances shall be provided to the nearest 0.1 ft.

2. The Contractor shall submit within 30 calendar days after completion of the ACP work a report containing:
 - a. "As-constructed" drawings showing the location and designation number of the ACP's sealed by a surveyor as specified herein,
 - b. Steel manufacturer's mill test reports for the steel reinforcement incorporated in the installation.

1.07 INSTALLATION TOLERANCES:

- A. Install the ACP's as close as practicable to the plan location.
- B. ACP's shall be plumb or battered within 2 percent of total-length plan alignment.
- C. The center of the ACP head shall not vary from plan location at cutoff by more than 2-inches.
- D. Acceptable tolerance of top of ACP from indicated cutoff elevation shall not be more than ½-inch. The Contractor may elect to trim ACPs to cutoff elevation after the pile cap is excavated.
- E. Centerline of core reinforcement shall not be more than ¾-inch from centerline of piling.

1.08 QUALITY CONTROL:

- A. The Contractor's Engineer shall have at least five years of experience in drilled ACP installation.
- B. Work shall always be directly supervised by an approved, experienced Project Superintendent with at least three years of recent supervision experience on similar projects, constructed with similar methods and in similar ground conditions.
- C. Employ a surveyor licensed in the State of Florida to survey as installed ACP locations. The Contractor shall be responsible for establishing the correct plan location of each pile in the field and shall determine and certify the actual location of each pile as installed, including a determination of the deviation(s) of the center of each pile from the plan location. Establish and be responsible for the protection and maintenance of project benchmarks.
- D. The Owner's Representative/Engineer will observe the Contractor's ACP installation. The Contractor shall cooperate with the Owner's Representative/Engineer in all respects to facilitate any testing or observations.
 1. The presence of the Owner's Representative/Engineer shall not relieve the Contractor of its responsibility to perform the Work in accordance with the approved submittals and contract documents, nor shall it be construed to relieve the Contractor from full responsibility for the means and methods of construction, protection of site improvements against damage, and for safety on the construction site.
- E. The Contractor shall adhere to the applicable requirements of the Standard

Specifications, OSHA Standards and to all other applicable ordinances, codes, statutory rules, and regulations of federal, state, and local authorities having jurisdiction over the Work of this Section.

- F. Work not in conformance with the specified requirements shall be improved, or removed and replaced, at no additional cost to the Owner. All costs related to testing of nonconforming Work or materials shall be paid for by the Contractor, at no additional cost to the Owner.
- G. The Contractor shall employ an experienced, independent testing agency to obtain grout cube samples and perform grout testing.
 - 1. Failure to detect any defective work or material shall not in any way prevent later rejection when such defect is discovered, nor shall it obligate the Owner's Representative/Engineer for final acceptance.
 - 2. If, as a result of these tests, it is determined that the specified grout properties are not being obtained, the Owner's Representative/Engineer may require such changes in proportions or materials, or both, as may be necessary to secure the specified properties, at no additional expense to the Owner.
 - 3. Provide at no additional expense all materials, labor, and services for sampling and testing required by the Owner's Representative/Engineer, including but not limited to:
 - a. Preparation, handling, storage, and transportation of concrete test specimens as required by the Owner's Representative/Engineer.
 - b. Suitable containers for the storage, curing and transportation of concrete test specimens in accordance with ASTM C 31.
 - c. Suitable storage for a supply of grout cube molds, test equipment and other items required for sampling and testing.
- H. The Contractor shall employ an experienced, independent testing agency to perform Pile Integrity Testing (PIT).
 - 1. Low-strain impact integrity testing shall be performed on completed ACPs in accordance with ASTM D5882, Standard Test Method for Low-Strain Impact Integrity Testing of Deep Foundations. This method evaluates the pile's physical continuity, cross-sectional uniformity, material consistency, and approximate length by measuring and analyzing the pile head's velocity response (and optional force response) induced by a light, axial impact applied at the pile head.
 - 2. The testing agency shall utilize calibrated equipment and sensors meeting ASTM D5882 requirements, ensure that pile heads are properly prepared to receive the impact, and record all wave-reflection data for engineering interpretation. Test results shall clearly identify any potential reductions or increases in pile impedance indicative of necking, bulging, soil inclusions, voids, or other integrity anomalies.
 - 3. Only qualified personnel experienced in ASTM D5882 testing and interpretation shall perform and report PIT results.
 - 4. ACPs shall be considered acceptable when low-strain integrity testing performed in accordance with ASTM D5882 indicates:
 - a. a continuous, uniform pile section with no significant reductions in impedance suggestive of necking, cracking, soil inclusions, or major voids.

- b. no reflections indicating an unexpected decrease in pile cross-section exceeding 10% of the nominal area
 - c. no impedance increases indicating significant bulging or material contamination and
 - d. a clear end-of-pile toe reflection occurring at a time consistent with the design pile length $\pm 10\%$.
- 5. Piles exhibiting anomalous signals that cannot be attributed to site conditions, construction records, or soil layering shall be designated suspect piles and shall be subject to additional evaluation, which may include re-testing, coring, load testing, or installation of replacement piles at no additional cost to the Owner. Piles failing to demonstrate adequate structural integrity shall be rejected and remedied or replaced in accordance with the Engineer's direction.
- 6. The Contractor shall complete PIT on a minimum of two piles per pile group and at least one pile per day of pile installation and all piles exhibiting irregularities in automated installation logs (e.g., deviations in grout pressure, extraction rate, or grout volume). Additional testing shall be performed on any pile designated by the Engineer based on proximity to underground obstructions, installation interruptions, or evidence of loss of grout head.

PART 2 – PRODUCTS

2.01 DRILLING EQUIPMENT:

- A. Drilling equipment shall be a type and capacity suitable for installing piles as indicated.
- B. Equipment shall consist of a continuous-flight, hollow-shaft auger which shall be rotated into the ground to the required pile depth as established by the pile load tests. Advance the auger at a continuous rate that prevents removal of excess soil. Stop advancement after reaching the required depth. The hole in the bottom of the auger shall be closed with a suitable plug while being advanced into the ground. The plug shall be removed by grout or with a reinforcing bar. At the start of pumping grout, raise the auger from 150 to 300 mm (6 to 12 inches) and after the grout pressure builds sufficiently, redrill the auger to the previously established tip elevation. Cement grout shall then be injected through the auger shaft as the auger is being withdrawn, in such a way as to exert removing pressure on the withdrawing earth filled auger flights as well as lateral pressure on the soil surrounding the grout-filled pile hole. Grout pumping pressures shall be measured and shall be maintained high enough at all times to offset hydrostatic and lateral earth pressures. The auger shall rotate in a positive direction and shall be withdrawn in a steady continuous motion.
- C. The auger flighting shall be continuous from the auger head to the top of auger without gaps or other breaks. The auger flighting shall be uniform in diameter throughout its length and shall be the diameter specified for the piles less a maximum of 3 percent.
- D. The hole through which the high-strength grout is pumped during the placement of the pile shall be located at the bottom of the auger head below the bar containing the cutting teeth.
- E. Augers over 12000 mm (40 feet) in length shall contain a middle guide.

- F. The piling leads should be prevented from rotating by a stabilizing arm or by firmly placing the bottom of the leads into the ground or by some other acceptable means. Leads shall be marked at 300 mm (1 foot) intervals to facilitate measurement of auger penetration.

Equivalent backup drill rig and equipment shall be available and on site within 7 calendar days if ACP rig or its equipment is not operational.]

2.02 MIXING AND PUMP EQUIPMENT:

- A. Only approved pumping and mixing equipment shall be used in the preparation and handling of the grout. A screen to remove over-size particles shall be placed at the pump inlet. All oil or other rust inhibitor shall be removed from mixing drums and grout pumps. All materials shall be such as to produce a homogeneous grout of the desired consistency.
- B. The grout pump shall be a positive displacement piston type pump capable of developing displacing pressures at the pump not less than 2.5 Mpa (350 psi). The grout pump shall be provided with a pressure gauge in clear view of the equipment operator. The grout pump shall be calibrated at the beginning of the work to determine the volume of grout pumped per stroke. A positive method of counting grout pump strokes shall be provided by the Pile Contractor. Such methods may include digital or mechanical stroke counters or other acceptable methods.
- C. The Contractor shall provide a Pile Installation Recorded (PIR) for ACPs for use by the Agency and the Consultant during pile installation. The PIR shall be used for each piling rig. The PIR shall record appropriate information during both the augering phase and during the grouting phase of the installation to assure minimum grout volume pumped per unit depth increment, and shall print results immediately upon completion of each pile.

2.03 MATERIALS:

A. Cement Grout

1. Strength – Cement-based grout shall consist of a mixture so proportioned to produce a hardened mortar with a minimum compressive strength in 28 days of 5,000 psi or greater as determined by the Contractor's mix design, and as referenced to ASTM C125.
2. Cement shall meet the requirements provided in Section 03 30 00, Cast-in-Place Concrete.
3. Water shall meet the requirements provided in Section 03 30 00, Cast-in-Place Concrete.
4. Admixtures shall meet the requirements provided in Section 03 30 00, Cast-in-Place Concrete. Admixtures which control bleed, improve flowability, reduce water content, and retard set may be used in the grout subject to the review and acceptance by the Owner's Representative/Engineer. Admixtures shall only be added to the grout used for filling sealed encapsulations. Admixtures shall be compatible with the grout and mixed in accordance with the manufacturer's recommendations. The

use of admixtures will only be permitted after appropriate field tests on fluid and set grout properties. Admixtures with chlorides shall not be permitted.

5. Mixing – The grout shall consist of a mixture of Portland Cement, fly ash, water fine aggregate (sand), fluidifier, and if necessary, retarder.
 - a. Mix Design: Testing Laboratory, retained by Contractor, shall design a mix to produce concrete as specified and perform tests as required. Certified test reports (duplicate) shall be submitted. Reports shall include proportions of design mix.
 - b. Mix the cement grout with approved equipment and accurately measure all materials by volume or weight per the Contractors' mix design. The grouting equipment shall produce a colloiddally mixed grout free of lumps and undispersed cement. The grouting equipment shall be sized to enable the grout to be pumped in one continuous operation. The mixer shall be capable of continuous agitation of the grout.
 - c. Concrete-mix design adjustments may be considered if characteristics of materials, Project conditions, weather, test results, or other circumstances warrant. Resubmit and obtain approval from the Owner's Representative/Engineer of proposed changes to concrete-mix design.
 - d. Improper Mix: Immediately notify the Concrete Testing Laboratory and the Owner's Representative/Engineer if at any time during construction the accepted mix design proves to be unsatisfactory for any reason. The Contractor's Concrete Mix Designer shall modify the design, subject to the review of the Resident Engineer, until a satisfactory mix is obtained.

B. Reinforcing Steel

1. Reinforcement shall be ASTM A615, Grade 60 or high strength; ASTM A615, Plates and Shapes: Refer to requirements in Section 05 12 33, Structural Steel.

- C. Centralizers: Centralizers shall be fabricated from plastic, steel, or material that is non-detrimental to the reinforcing steel. Wood shall not be used.

PART 3 – EXECUTION

3.01 GENERAL REQUIREMENTS:

- A. Install the ACP's only in the presence of the Owner's Representative/Engineer. Provide a minimum of 48 hours' notice to the Owner's Representative/Engineer that their presence is required.
- B. The Contractor is responsible for determining the viable drilling technique(s) for the project conditions, including considerations of access, support of equipment, and space constraints. Changes made to the drilling techniques during the project shall not be cause for delay or impact claims.
- C. Spoils from ACP installation shall be managed in accordance with all applicable project specific, state, and federal requirements.

- D. Install in general accordance with FHWA HIF-07-03, Design and Construction of Continuous Flight (CFA) Piles.
- E. Sequence of drilling of bond zone, central reinforcing steel placement, grout injection, and removal of continuous flight auger procedures used for production piles shall be consistent with the sequence used for test pile installation operations.
- F. All installation techniques shall be determined and scheduled such that there will be no damage to ACP's in which the grout has not achieved final set.
- G. The Contractor shall control and properly dispose of drill fluids and construction related waste, including excess grout, in accordance with any related specifications within the contract documents and all applicable codes and regulations.
- H. During construction, the Contractor shall observe the ground conditions in the vicinity of the ACP construction site daily for signs of ground heave or subsidence. Immediately notify the Owner's Representative/Engineer if signs of movement are observed. The ACP Contractor shall immediately suspend or modify drilling or grouting operations if ground heave or subsidence is observed, if the ACP structure is adversely affected, or if adjacent structures are damaged from the drilling or grouting. If the Owner's Representative/Engineer evaluates that the movements require corrective action, the ACP Contractor shall take corrective actions necessary to stop the movement or perform repairs.
- I. Notify the Owner's Representative/Engineer immediately of any damage or deviation that may affect the acceptability of the ACP so that corrective measures, if required, may be carried out with a minimum of delay.
- J. The following will be sufficient cause for the rejection of ACP's by the Owner's Representative/Engineer:
 - 1. Deviation from location or vertical alignment requirements specified herein.
 - 2. The ACP bonding zone or bearing zone is not within the correct strata and/or has insufficient bond length.
 - 3. Installation methods not approved by Owner's Representative/Engineer.
 - 4. Inadequate grout strength.
- K. Correct, abandon, and/or replace rejected ACP's to the satisfaction of the Owner's Representative/Engineer. Replace at no cost to the Owner.
- L. Provide the Owner's Representative/Engineer free and safe access to the work areas at all times.

3.02 INSTALLATION:

- A. The drilling equipment and methods shall be suitable for drilling through the conditions to be encountered, without causing damage to the overburden, any overlying or adjacent structures, buried structures or utilities, or services.
- B. Locate piles as shown in the plans. Do not place piles closer than 1050 mm (3.5 feet)

center to center until grout in adjacent piles has set for 24 hours. In locations where there are no concrete slabs or other means of distributing load of the equipment placing piles, the equipment shall be kept at least 3000 mm (10 feet) away from pile location, or upper 3000 mm (10 feet) of pile shall be cased.

- C. Advance the auger at a continuous rate that prevents removal of excess soil. Stop advancement after reaching the required depth or refusal criteria.
- D. Auger refusal is defined as a rate of auger penetration of less than 300 mm (1 foot) per minute of drilling.
- E. The hole in the bottom of the auger shall be closed while being advanced into the ground with a suitable plug. The plug shall be removed by grout pressure or with the reinforcing bar.
- F. Place continuous center reinforcing through the hollow-stemmed auger prior to placement of grout. Tie top of reinforcing in place after removal of auger. Use bar spacers to center reinforcing bars.
- G. At the start of pumping grout, raise the auger from 150 to 300 mm (6 to 12 inches) and after the grout pressure builds up sufficiently, redrill the auger to the previously established tip elevation.
- H. Maintain at least 3000 mm (10 feet) of grout on the auger flighting above the injection point during raising of the auger. Positive rotation of the auger shall be maintained throughout placement of the grout. Rate of grout injection and rate of auger withdrawal from the soil shall be coordinated as to maintain at all times the minimum grout head and a positive pressure on the gauges. The total volume of grout shall be at least 115 percent of the theoretical volume for each pile, except, after grout is flowing at the ground surface from the auger flighting, the rate of grout injection and auger withdrawal shall be coordinated so that there is a constant grout flow at the surface. If pumping of grout is interrupted for any reason, the Contractor shall reinsert the auger at least 1500 mm (5 feet) into the pile and regROUT.
- I. Minimum volume of grout placed in hole shall be at least the nominal volume plus 15 percent of hole. Volume of grout per linear meter (linear foot) of pile shall be not less than volume of grout per meter (volume of grout per foot) of the load test pile. Make volume measurements in the presence of Resident Engineer.
- J. Auger hoisting equipment shall be provided that will enable the auger to be rotated while being withdrawn smoothly and steadily.
- K. The spoil that accumulates around the auger during injection of the grout shall be promptly cleared away upon completion of the installation.
- L. Provide OSHA protective caps on all projecting reinforcement.
- M. Materials shall be accurately measured by volume or by weight as they are fed to the mixer. Order of placing the materials in mixer shall be as follows: (1) water, (2) fluidifier, and (3) other solids in order of increasing particle size. Provide grout injection equipment

with a pressure gage in clear view of the equipment operator. A second pressure gauge shall be located near auger rig where it can be observed. Rate of injection and rate of auger withdrawal from soil shall be so coordinated as to maintain at all times a positive pressure on gage which will indicate existence of a removing pressure on bottom of auger flight. Magnitude of this pressure and performance of other augering and grouting procedures, such as rate of augering, rate of grout injection, and control of grout return around the auger flight, are dependent on soil conditions, and equipment capability shall be at option of Contractor, subject to approval of Owner's Engineer. Equipment for pumping grout shall be positive displacement pump capable of developing a pressure at pump not less than 2.5 MPa (350 psi). Pump shall be calibrated by an approved method to verify accuracy of indicated discharge. Remove oil or other rust inhibitors from mixing drums and pumps. Auger hoisting equipment shall be capable of withdrawing auger smoothly and at a constant rate. If the auger jumps upward during withdrawal, it shall be reinserted, and rate of withdrawal decreased to prevent further jumping.

- N. Where pile top is near surface or above bottom of excavation, place metal sleeves of proper diameter around pile top.
- O. Cut off the tops of piles, square with pile axis and at the elevations indicated by removing fresh grout from the top of the pile or by cutting off hardened grout down to final cutoff point at any time after initial set has occurred. Where the pile cut-off is near the surface or above the bottom of the excavation, sleeves or casing of the proper diameter and at least 457 mm (18 inches) in length shall be placed around the pile tops. (Special conditions may require metal sleeves of additional length).
- P. Redrill the pile to the original depth at no additional cost to the Owner if any of the following occurs:
 - 1. The design pile reinforcement cannot be placed manually in the top of any pile following completion of grouting.
 - 2. The trap door at the bottom discharge outlet fails to open completely, effectively creating a side discharge condition.
 - 3. Loss of grout head occurs for any reason during pile installation.
 - 4. There is more than a twenty-minute delay during the grouting of any individual pile.
 - 5. There is a drop in grout level after completion of the pile, which exceeds the average for the remainder of the pile installations by more than 600 mm (2 feet).
- Q. The Contractor shall install additional piles at no additional cost for damaged, misaligned and/or mislocated piles. Contractor shall also be responsible for costs of concrete and reinforcing for required modifications to pile caps/grade beams due to damaged piles and/or misaligned or mislocated piles.
- R. If the grout level in any completed pile drops, the pile shall be rejected and replaced.
- S. No pile shall be loaded until the grout has attained full design strength.

3.04 OBSTRUCTIONS:

- A. Obstructions are defined as any object encountered below ground surface during drilled ACP installation that prevents advancement of the pile element to the design depth.
- B. If an obstruction is encountered, the Contractor shall document the following items, and submit them to the Owner's Representative/Engineer at the end of each work week.
 - 1. Date and time that the obstruction was encountered.
 - 2. Duration that the obstruction prevented Work progress.
 - 3. Depth or depth range of the obstruction.
 - 4. Date and time that the obstruction was passed, and production Work resumed.
 - 5. Nature of the obstruction, and how the obstruction prevented the Work progress.
 - 6. Measures implemented to overcome the obstruction.
 - 7. Cost impact of the obstruction on the Work (labor, equipment, materials).
- C. The Owner's Representative/Engineer will also document the above information when notified by the Contractor that obstructions are encountered.
- D. Where obstructions interfere with installing an element at the location shown on the plans and to the required depth, the Contractor shall propose methods and submit details to the Owner's Representative/Engineer for removal of or advancement through obstructions if encountered during the installation of the ACPs. No excavation for obstruction removal shall be conducted except in the presence of the Owner's Representative/Engineer. Pre-excavations shall be backfilled with sand.
- E. If an obstruction is encountered that the installation rig cannot overcome, the Contractor shall move to another production location and continue the Work, while the obstruction is removed, or the Owner's Representative/Engineer selects an alternate element location to replace the obstructed location.
- F. Fill with grout any ACP abandoned because of obstructions encountered before reaching the anticipated depth at no additional cost to the Owner.

3.05 QUALITY CONTROL AND ASSURANCE:

- A. The Contractor shall retain the services of a qualified Independent Testing and Inspection Agency (Agency), licensed in the state of the project, to provide Quality Control through testing and inspection services during the installation of all foundation piling involved in this Work.
- B. The Owner shall employ an Owner's Representative/Engineer to provide Quality Assurance through general observation and consultation of all pile operations.
- C. The Contractor and their Agency shall cooperate with the Owner's Representative/Engineer in the performance of the Work. The presence of Owner's Representative/Engineer shall in no way relieve the Contractor of his obligation to perform the pile installation in accordance with the Contract Documents and these Specifications.

- D. Grout Mix: The grout mix shall be tested by making a minimum of nine, 50 mm (2 inches) cubes for each day during which piles are placed. A set of nine cubes shall consist of three cubes to be tested at seven days, and three cubes to be tested at 28 days and three cubes held in reserve. Test cubes shall be cured and tested in accordance with ASTM C109/C109M. Cube specimens may be restrained from expansion as described in ASTM C942.
- E. Pile Acceptance: The Agency shall immediately notify the Owner's Representative/Engineer if any pile is not in conformance with these Specifications. The volume of grout placed in each pile shall be a minimum of 115% of theoretical volume of the pile. The amount of grout placed in each 1500 mm (5 feet) increments of the pile shall be checked continuously during installation. The cost of removing and replacing Auger Cast Piles, which are not in conformance, shall be borne by the Pile Contractor.
- F. Reports: The Contractor shall maintain an installation record of each pile. The record shall note the project name and number, name of Contractors, pile location, design pile capacity, pile tip elevation, pile top elevation, depth of auger advancement, (total and continuous) quantity of grout placed, reinforcing steel placement, and any unusual occurrences during the pile installation. The grout quantity shall be determined by recording grout pump displacement or by other acceptable means. The Owner's Representative/Engineer shall also maintain a daily report, which summarizes all work performed by the Owner's Representative/Engineer have a bond zone which starts below the top of the bonding stratum and extends to at least the required minimum length to develop frictional capacity as determined by the design calculations and confirmed by static load testing.

3.06 REJECTED PILES:

- A. The Owner's Representative/Engineer will determine the acceptability of all ACP's placed and may reject those piles which do not conform to the Contract Documents.
- B. As required by the Owner's Representative/Engineer, for those ACP's which have been rejected, ACP's shall either be left in place or cut off and then install one or more new ACP's at locations designated by the Owner's Representative/Engineer to replace the rejected pile and maintain symmetry of the pile group or cluster at no additional cost to the Owner.

3.08 WASTE MANAGEMENT:

- A. Separate and dispose of waste in accordance with the Project's Waste Management Plan, if applicable. Site cleanup shall be performed to the satisfaction of the General Contractor.

END OF SECTION

SECTION 333150

WASTEWATER COLLECTION SYSTEM BYPASS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The WORK covered by this Section consists of providing all temporary bypassing to perform all operations in connection with the flow of wastewater around pipe segment(s) or pump stations. The purpose of bypassing is to prevent wastewater overflows and provide continuous service to all wastewater customers. The Contractor shall maintain wastewater flow in the construction area in order to prevent backup and/or overflow and provide reliable wastewater service to the users of the wastewater system at all times.
- B. Contractor shall employ the services of vendor or subcontractor who can demonstrate to Engineer that they specialize in design, installation, operation, and maintenance of temporary bypass pumping systems. Pre-approved vendors include Godwin Pumps, Global Pumps, Rain for Rent, Thompson Pumps and Mersino. Contractor shall provide a list of references for projects that their vendor or subcontractor has completed in the past of similar size and complexity. Design, installation, operation, and removal of temporary pumping system shall be contractor's responsibility. Bypass pumping system shall meet the requirements of all codes and regulatory agencies having jurisdiction. Vendor or subcontractor performing the Bypass pumping shall have a minimum of five (5) projects of equal or larger scope and complexity within the last five (5) years.
- C. Contractor shall submit bypass pumping plan for Engineer review and approval. Contractor, in collaboration with vendors/subcontractors, shall prepare detailed plans and description of bypass pumping system according to requirements in Contract Documents. Contractor shall outline all provisions and precautions he will take regarding safe handling of bypass pumped wastewater. No bypass pumping shall begin until the City and Engineer has reviewed and approved all submittals.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The Contractor shall have all materials, equipment, and labor necessary to complete the repair, replacement, or rehabilitation on the job site prior to isolating the gravity main segment, manhole, or pump station. The Contractor shall demonstrate that the pumping system is in good working order and is sufficiently sized to successfully handle flows by performing a test run for a period of 24 hours prior to beginning the WORK.

2.02 PUMPS

- A. All pumps used shall be fully automatic, self-priming, quiet pack type and shall not require the use of foot valves. Vacuum-assisted or compressor- assisted dry priming pumps are NOT acceptable. The pumps may be electric, or diesel powered. All pumps used must be designed to allow dry running for extended periods of time.
- B. Contractor shall provide a standby pump for each size pump used in the bypass pumping system. The standby pumps shall be placed in-line by means of a manifold. The manifold shall be complete with isolating valves and non-return check valves to allow pumping to continue without disturbing the piping system in the event the primary pump should fail. Contractor shall provide appropriate automatic start/stop control panel necessary for each pump. The Bypass pumping system shall be capable of accommodating peak flow conditions without use of the standby pump.
- C. The contractor shall be responsible for observing wastewater flow conditions in order to develop the Bypass pumping system. The estimated peak flow condition listed shall not relieve the contractor of his responsibility to adequately size the Bypass pumping system based on his field evaluation of wastewater flow conditions.

2.03 PIPING

- A. All piping shall be designed to withstand at least twice the maximum system pressure or 50 psi minimum, whichever is greater.
- B. Pipeline must be located off the street except where pipeline crosses side streets and private driveways. At these locations, the Contractor must place bypass pipelines in trenches and cover them with temporary asphalt pavement or provide ramps.
- C. When needed, air release valve must be placed in-line properly to alleviate trapped air and result in high pressure within the discharge line.

2.04 TEMPORARY PIPE PLUGS

- A. Plugs if used shall be multiple layer style inflatable plugs. Each plug shall be properly tagged and tested under required pressure for each specific condition. Flow through plugs will be necessary for suction and discharge lines for bypass system.
- B. Plugs must be used with proper restraints that meet or exceed industry standards.
- C. All plugs shall be firmly attached to a stationary object aboveground by a steel cable in order to prevent loss of plug in pipeline.

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor shall have all materials, equipment, and labor necessary to complete the repair, replacement or rehabilitation on the job site prior to isolating the gravity main segment, manhole, or pump station. The Contractor shall demonstrate that the pumping system is in good working order and is sufficiently sized to successfully handle flows by performing a test run for a period of 24 hours prior to beginning the WORK.
- B. Contactor shall include 100 percent redundancy for bypass piping; 2 or more pipes (same size or larger) shall be installed. Redundancy shall be such that if 1 line is damaged during operation, a second or third pipe can immediately take its place.
- C. The Contractor shall abide by all OSHA regulations for duration of project. Contractor will also proceed with extreme caution when working in a confined space or around toxic gases. Employees working in confined spaces shall have proper certifications.
- D. The Contractor shall have and maintain all materials, equipment, and labor necessary to complete any repair or replacement of any part of the bypass pumping system on the job site prior to isolating the pipeline to be taken out of service.
- E. Contractor is responsible for installing bypass pipeline below grade as necessary to avoid roadway, sidewalk, and driveway closures. Contractor is responsible for locating and protecting existing utilities in the area where he chooses to install the bypass system. Contractor shall install bypass pipelines so as to minimize disturbance to existing utilities and shall obtain approval of pipeline locations from Engineer prior to installation. Contractor shall pay all costs associated with bypass pumping system, including restoration, locating and/or relocating utilities, and obtaining approvals.
- F. Lift Station Flows and Pressures:

Lift Station No.	ADF (gpm)	PHF (4xADF) (gpm)	Tie-In Pressure (ft)
5	32	128	20 to 60
14	8	33	30 to 60
17	15	61	20 to 50
20	0	0	NA
32	21	83	20 to 50
46	23	91	20 to 50
54	191	765	40 to 70
55	284	1135	40 to 90
88	12	49	20 to 50
97	31	123	40 to 80

3.02 TRAFFIC CONSIDERATIONS

- A. The Contractor shall locate bypass pumping suction and discharge lines so as to not cause undue interference with the use of streets, private driveways and alleys to include the possible temporary trenching of piping at critical intersections. Bypass pumping setup and operations shall be coordinated with maintenance of traffic operations shown on the MOT drawings. Should an alternate MOT plan be proposed by the contractor and accepted by the CITY and Engineer, the Contractor shall modify the bypass plan and shall coordinate the bypass plan with the revised MOT plan at no additional cost to the City. Ingress and egress to adjacent properties shall be maintained at all times. Ramps, steel plates or other methods shall be deployed by the Contractor to facilitate traffic over surface piping. High traffic commercial properties may require alternate methods.

3.03 BYPASS PLAN

- A. The Contractor shall submit a comprehensive written plan to The City for approval and acceptance that describes the intended bypass for the maintenance of flows during construction. The Contractor shall also provide a sketch showing the location of bypass pumping equipment for each pump station or line segment(s) around which flows are being bypassed. The plan shall include any proposed tanker(s), pump(s), bypass piping, backup plan and equipment, work schedule, monitoring log for bypass pumping, monitoring plan of the bypass pumping operation and maintenance of traffic plan. Any contractor proposed modifications to the bypass pumping plan shall require acceptance by the City and Engineer. Should the modifications be accepted, they shall be performed at no additional cost to the City. Any assumption during bidding of utilization of a revised bypass pumping or MOT plan shall be at the contractor's risk. The bypass pumping plans must also include the following:

1. Quantity and location of the pumps (primary and standby).
2. Model, size, flow capabilities, and brief description of each pump.
3. Size, length, joints and material type of the suction and discharge piping.
4. Power requirements and source for electric driven units (if applicable).
5. Complete set of pump specification with system demand curve.
6. Schematic drawing of bypass pumping system, including profile of suction and discharge piping.
7. Method of discharge pertaining to manholes.
8. Description of discharge manifold, including isolation valve and non- return valves.
9. Method of noise control for pumps.

10. Size, type and intended use of pipe plugs.

- B. The Contractor shall cease bypass operations and return flows to the new and/or existing sewer when directed by The City. All piping shall be designed to withstand at least twice the maximum system pressure or a minimum of 50 psi, whichever is greater. During bypassing, no wastewater shall be leaked, dumped, or spilled in or onto, any area outside of the existing wastewater system. The Contractor shall immediately clean up any wastewater spills that take place on the project and correct the condition that caused the spill to occur. When bypass operations are complete, all bypass piping shall be drained into the wastewater system prior to disassembly.

3.04 BYPASS OPERATION

- A. The City shall accept the bypass plan prior to implementation of the bypass. The Contractor shall plug off and pump down the sewer manhole or line segment in the immediate WORK area and shall maintain the wastewater system so that surcharging does not occur.
- B. Where WORK requires the line to be blocked beyond NORMAL WORKING HOURS and bypass pumping is being utilized, the Contractor shall be responsible for onsite monitoring of the bypass operation 24 hours per day, 7 days per week. Electronic monitoring in lieu of onsite monitoring shall require acceptance by the City. If accepted in the bypass plan by The City, any electronic monitoring in lieu of onsite monitoring must be detailed in the comprehensive written plan and approved by the City. If an electronic monitoring system is used, Contractor must furnish a list of emergency numbers and contacts that will be programmed into the telemetry system.
- C. If any failure of the bypass pumping operation occurs while being electronically monitored, the Contractor shall be required to revert back to on- site monitoring of the bypass pumping operation 24 hours per day, 7 days per week by onsite personnel for the remaining duration of the project.
- D. The Contractor shall ensure that no damage will be caused to private property as a result of bypass pumping operations. The Contractor shall complete the WORK as quickly as possible and satisfactorily pass all tests, inspect, and repair all deficiencies prior to discontinuing bypassing operations and returning flow to the sewer manhole or line segment.
- E. The Contractor shall immediately notify the City should a sanitary sewer overflow occur and take the necessary action to clean up and disinfect the spillage to the satisfaction of the City and/or another governmental agency. If sewage is spilled onto public or private property, the Contractor shall wash down, clean up and disinfect the spillage to the satisfaction of the City and/or another governmental agency. When bypassing a pump station, one back-up pump equal to the primary unit shall be required. Bypass pumps shall have a maximum rating of 55 decibels for sound attenuation.

3.05 CONTRACTOR LIABILITY

- A. The Contractor shall be responsible for all required pumping, equipment, piping, and appurtenances to accomplish the bypass and for any and all damage that results directly or indirectly from the bypass pumping equipment, piping and/or appurtenances. The Contractor shall also be liable for all City personnel and equipment costs, penalties and fines resulting from sanitary sewer overflows. It is the intent of these specifications to require the Contractor to establish adequate bypass pumping as required regardless of the flow condition.
- B. The Contractor shall also be liable for all damage claims, penalties, and fines that the City incurs resulting from a sanitary sewer overflow or spill. In addition to the aforementioned costs, the Contractor will be fined \$5,000 per each 24-hour period following an overflow that the wastewater overflow or spill is not completely cleaned, disinfected and sewer system returned to operational status.
- C. Contractor shall be responsible for all physical damage to the local sewer lines and laterals caused by Contractor's equipment or employees.

END OF SECTION

SECTION 333200

SUBMERSIBLE NON-CLOG PUMPS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall provide submersible non-clog pumps and appurtenances, complete and operable, in accordance with the Contract Documents.
- B. The Supplier shall examine the Site conditions, intended application, and operation of the pump system and recommend the pump which will best satisfy the indicated requirements.

1.02 WARRANTY

- A. The pump manufacturer shall warrant the units being supplied against defects in workmanship and material in accordance with Section 017836, Warranties and Bonds. In addition, the manufacturer shall provide an extended prorated warranty for a period of five (5) years.

1.03 CONTRACTOR SUBMITTALS

- A. Submittals shall be in accordance with Section 013300 – Submittal Procedures.
- B. Contractor shall submit shop drawings including manufacturer's data, performance data curves, cut sheets, UL or FM rating certificate, and factory test data.
- C. Contractor shall submit operation and maintenance manuals.

1.04 QUALIFICATIONS

- A. The pumps covered by these Specifications are intended to be standard pumping units of proven ability as manufactured by a manufacturer having a minimum of five (5) years experience in the production of such pumps. The pumps shall be designed, constructed and installed in accordance with the best practice and methods, and shall operate satisfactorily when installed. Pumps shall be manufactured in accordance with the Hydraulic Institute Standards.
- B. All equipment furnished under this Specification shall be new and unused, shall be the standard product of manufacturers having a successful record of manufacturing and servicing the equipment and systems specified herein for a minimum of five (5) years.
- C. The pumps shall be furnished complete with accessories and shall be manufactured by or Sulzer (ABS), Xylem (Flygt), or Wilo USA.

PART 2 -- PRODUCTS

2.01 GENERAL DESCRIPTION

- A. Identification: See Contract Drawings for the lift station name and location.
- B. Operating Conditions: The Work of this Section shall be suitable for long term operation under the following conditions:
- | | | |
|-----|-------------------------------------|-------------------------------------|
| 1. | Duty | - Intermittent |
| 2. | Drive | - Constant speed |
| 3. | Ambient environment | - Outdoors, submerged |
| 4. | Ambient temperature, (degrees F) | - 30 to 120 |
| 5. | Ambient relative humidity (percent) | - 30 to 100 |
| 6. | Fluid service | - Municipal Wastewater |
| 7. | Fluid temperature, (degrees F) | - 35 to 100 |
| 8. | Fluid pH range | - 5 to 10 |
| 9. | Fluid specific gravity | - 1 |
| 10. | Project site elevation | - As shown on the Drawings |
| 11. | Minimum available NPSH (ft) | - As per manufacturer's instruction |
| 12. | Pump removal method | - Rails |
- C. Performance Requirements: Pumps shall be furnished according to "Table 333200-A, Pump Performance Schedule".

2.02 PUMP REQUIREMENTS

- A. General:
- Each pump, with its cable and appurtenances, shall be able to withstand continuous submergence to a depth of 40 feet, when running or off, without leakage.
 - Each pump shall be able to operate for short periods at zero static suction head without causing any damage to any part of the unit.

B. Pump Construction: Construction of submersible non-clog pumps shall conform to the following requirements:

1. Connections - Machined metal-to-metal quick disconnect type, for withdrawal of unit from above without disconnecting pipe. When lowered into place, the pump shall automatically connect and lock into the discharge pipe, allowing for zero leakage at all anticipated pump heads.
2. Pump Design - Single stage, centrifugal type, close-coupled to sealed or submersible electric motor, for operation in wet well, without external cooling.
3. Impeller - Non-clog type with replaceable wear rings on impeller and in casing, to handle raw unscreened sewage, solids, and fibrous materials.
4. Bearings - Permanently lubricated, heavy-duty axial and radial ball or roller bearings, top and bottom, with a minimum L-10 life of 60,000 hours, at continuous, maximum load and speed, supported by detailed calculations, to be submitted with the shop drawings.
5. Seals - Dual mechanical tandem, one stationary and one revolving shaft seals with individual springs, tungsten carbide ring, each not requiring any maintenance, and capable of withstanding 1.5 times pump shutoff head.
6. Oil Chamber - To supply oil for lubrication and cooling of the shaft seals.
7. Support - Use existing cast duckfoot bend or discharge elbow with machined face, anchored to sump floor.
8. Cables - Include necessary cables for power connection, moisture detection, and overload protection, sheathed, coded, and suitable for submersible pumps, and of sufficient length for direct connection to the terminal boxes indicated. Provide 5 ft. slack in all cables. All cables shall be connected to the pumps and tested at the factory.
9. Lifting Chains - Include American made Type 316 lifting chains for pump removal. Provide 5 ft. slack in all lifting chains.

C. Materials:

1. Pump, volute, oil casing - Cast iron sliding, bracket, motor frame, ASTM A-48 Class 35B

2. Impeller - Cast iron, statically and dynamically balanced.
3. Pump shaft - American made Type 420 stainless steel, or 1045 carbon steel with Type 420 stainless steel sleeve.
4. Exposed bolts, nuts, washers - American made Type 316 stainless steel.
5. Mechanical seals - Independently operating tandem tungsten carbide or silicon carbide and carbon rings with stainless steel springs.
6. Wear rings - American made Type 304 or 416 stainless steel and nitrile rubber with steel insert, with a Brinell hardness of 300 on impeller and 350 on case.

2.03 MOTOR

- A. Insulation: The pump motors shall be designed for continuous duty in hazardous locations. The stator and stator leads shall be moisture-resistant, insulated using the trickle impregnation method, capable of withstanding a temperature rise of up to 130 degrees C. The allowable temperature rise of the motor at full load condition shall not exceed 40 degrees C.
- B. Stator: The motor stator shall be mounted in an air-filled, watertight casing, and shall not be fixed in place by externally mounted screws that may cause leakage in the motor.
- C. Motor Rating: Motor shall have a minimum service factor of 1.15. For motors driven by variable frequency drives, motor horsepower shall be the greater of:
 1. Non-overloading conditions throughout the pump curve.
 2. 1.15 times the horsepower required by the pump at maximum indicated flow.
- D. Junction Box: The motor shall have a junction box capable of being sealed completely from the stator casing to prevent leakage through the junction box into the stator housing should a motor cable be damaged, or some other means to prevent leakage into the junction box under any condition.
- E. Cable Entry: The pump cable entry seal design shall accommodate specific torque requirements to ensure a watertight and submersible seal. The cable entry shall be comprised of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the entry body containing a strain relief function, separate from the function of sealing the cable. The assembly shall bear against a shoulder in the pump top. The cable entry junction chamber and motor shall be separated by a stator lead sealing gland or terminal board, which shall isolate the motor interior from foreign material gaining access through the pump top. If Secondary-sealing system is used, the manufacturers shall supply a cable cap as part of the spare parts for each pump. All cables shall be continuous, without splices from the motor to the control panel or associated

junction box. The junction chamber, containing the terminal board, shall be leak proof.

- F. Cooling System: Each pump shall be provided with an adequately designed cooling system using a wastewater jacket and thermal radiator integrally cast with the stator casing. Cooling medium channels and ports shall be non-clogging by virtue of their dimensions. Wastewater jackets are not required for motors that are designed to operate continuously at full load with ambient cooling.

2.04 PUMP CONTROLS

- A. Pumps shall be controlled as shown on the Electrical Drawings.

2.05 SPARE PARTS

- A. For each pump furnished:
 - 1. One pump impeller to match type and size installed.
 - 2. One set of pump wear rings.

2.06 FACTORY TESTING AND SHIPMENT

- A. The following procedures shall be included with the factory test for all pumps prior to shipment:
 - 1. Verification of the pump characteristic curves by testing at 1/4, 1/2, 3/4 and full flow and recording the measured head and motor current for each flow.
 - 2. Verification of cavitation-free service and absence of motor overheating during conditions simulating the actual operating conditions after installation, whether submerged, semi-submerged, or dry.
 - 3. Pump seals shall be designed for complete water tightness at 65 feet submergence for 30 minutes and data on factory testing and quality control shall be submitted with the shop drawings.
 - 4. All parts shall be properly lubricated and protected so that no damage or deterioration will occur even during a prolonged delay from the time of shipment until installation is completed and the pumps are ready for operation.
 - 5. Finished ferrous surfaces not painted shall be properly protected to prevent rust and corrosion.
 - 6. The finished surfaces of all exposed flanges shall be protected by strong wooden blind flanges.
 - 7. Each pump shall be properly crated to protect the units against damage during shipment.

PART 3 -- EXECUTION

3.01 INSTALLATION

- A. The Contractor is responsible for connecting to the power junction box per the Contract Drawings. Contractor shall provide sufficient conduits and wire in accordance with Specification 260533.13 to establish power connection to the pump station. Sizing of conduit and wire per Contract Drawings.
- B. The Contractor shall coordinate with pump manufacturer and electric motor manufacturer to ensure that pump and electric motor match the requirements of the pump station and work properly

3.02 SERVICES OF MANUFACTURER

- A. Inspection, Startup, and Field Adjustment: The Contractor shall demonstrate that all equipment meets the specified performance requirements. Contractor shall provide the services of an experienced, competent, and authorized service representative of the manufacturer of each item of major equipment who shall visit the site of Work to perform the following tasks:
 - 1. Assist the Contractor in the installation of the equipment.
 - 2. Inspect, check, adjust if necessary, and approve the equipment installation.
 - 3. Start-up and field-test the equipment for proper operation, efficiency, and capacity. A start-up test report shall be provided showing the results of the installation.
 - 4. Perform necessary field adjustments during the test period until the equipment installation and operation are satisfactory to the City.
 - 5. Instruct the City's personnel in the operation and maintenance of the equipment. Instruction shall include step-by-step trouble shooting procedures with all necessary test equipment.
- B. Start-up Testing shall be performed as follows:
 - 1. Draw down test for each pump individually under normal flow conditions; calculate pump discharge flow (gpm) and measure pressure at pump-out connection (psi).
 - 2. Draw down test for both pumps running under normal flow conditions; calculate pump discharge flow (gpm) and measure pressure at pump-out connection (psi).

3. The following test data shall be recorded for each of the start-up test scenarios:
 - a. Phase Conductor megger tests;
 - b. Voltage Phase Measurements;
 - c. Neutral/Ground current measurement;
 - d. Phase Amperage measurements;
 - e. Listing of Pump model, HP, Impeller, Voltage, Serial numbers, and Overload Type;

C. Contractor shall provide the Start-Up data test reports to the City within 7 days of the completion of the start-up testing.

**TABLE 333200-A
PUMP PERFORMANCE SCHEDULE**

Parameter	Lift Station Wet Well No. 5	Lift Station Wet Well No. 14	Lift Station Wet Well No. 17
Operating Points	95 gpm @ 77 ft TDH 630 gpm @ 45 ft TDH	95 gpm @ 56 ft TDH 520 gpm @ 35 ft TDH	95 gpm @ 77 ft TDH 630 gpm @ 45 ft TDH
Nominal Pump Speed (rpm)	1760	1760	1760
Allowable Starts per Hour	15	15	15
Minimum NPSH Available (ft)	15	15	15
Motor Horsepower (Minimum)	10	7.5	10
Voltage	230	230	230
Power Supply (LCEC) Electrical Phase	Three	Three	Three
Pump Motor Electrical Phase	Three	Three	Three
Variable Speed Drive	No	No	No
Pump Discharge Size	DN100 (4 inches)	DN100 (4 inches)	DN100 (4 inches)
Manufacturer and Model – Basis for Design	Sulzer XFP100E CB1 3PH/230V/60HZ	Sulzer XFP100E CB1 3PH/230V/60HZ	Sulzer XFP100E CB1 3PH/230V/60HZ
Impeller Size (inches)	8 9/16	7 11/16	8 9/16
Wet Well Depth (ft)	16	14	10
Length of Cables for Power Connection, Moisture Detection, and Overload Protection (ft)	100	100	100

TABLE 333200-A
PUMP PERFORMANCE SCHEDULE (continued)

Parameter	Lift Station Wet Well No. 20	Lift Station Wet Well No. 32	Lift Station Wet Well No. 46
Operating Points	95 gpm @ 77 ft TDH 630 gpm @ 45 ft TDH	80 gpm @ 44 ft TDH 450 gpm @ 28 ft TDH	80 gpm @ 44 ft TDH 450 gpm @ 28 ft TDH
Nominal Pump Speed (rpm)	1760	1760	1760
Allowable Starts per Hour	15	15	15
Minimum NPSH Available (ft)	15	15	15
Motor Horsepower (Minimum)	10	5	5
Voltage	230	230	208
Power Supply (LCEC) Electrical Phase	Three	Single	Three
Pump Motor Electrical Phase	Three	Three	Three
Variable Speed Drive	No	Yes	No
Pump Discharge Size	DN100 (4 inches)	DN100 (4 inches)	DN100 (4 inches)
Manufacturer and Model – Basis for Design	Sulzer XFP100E CB1 3PH/230V/60HZ	Sulzer XFP100C CB1 3PH/230V/60HZ	Sulzer XFP100C CB1 3PH/208V/60HZ
Impeller Size (inches)	8 9/16	7 1/16	7 1/16
Wet Well Depth (ft)	12	20	20
Length of Cables for Power Connection, Moisture Detection, and Overload Protection (ft)	100	100	100

TABLE 333200-A
PUMP PERFORMANCE SCHEDULE (continued)

Parameter	Lift Station Wet Well No. 54	Lift Station Wet Well No. 55	Lift Station Wet Well No. 88
Operating Points	340 gpm @ 80 ft TDH 570 gpm @ 68 ft TDH	400 gpm @ 88 ft TDH 800 gpm @ 63 ft TDH	95 gpm @ 77 ft TDH 630 gpm @ 45 ft TDH
Nominal Pump Speed (rpm)	1750	1750	1760
Allowable Starts per Hour	15	15	15
Minimum NPSH Available (ft)	15	15	15
Motor Horsepower (Minimum)	15	20	10
Voltage	480	480	230
Power Supply (LCEC) Electrical Phase	Three	Three	Single
Pump Motor Electrical Phase	Three	Three	Three
Variable Speed Drive	No	No	Yes
Pump Discharge Size	DN100 (4 inches)		DN100 (4 inches)
Manufacturer and Model – Basis for Design	Sulzer XFP100E CB1 3PH/480V/60HZ	Flygt CP3152.181 3PH/480V/60HZ	Sulzer XFP100E CB1 3PH/230V/60HZ
Impeller Size (inches)	9 7/16	10 13/16 (275 mm)	8 9/16
Wet Well Depth (ft)	19	14	18
Length of Cables for Power Connection, Moisture Detection, and Overload Protection (ft)	100	100	100

TABLE 333200-A
PUMP PERFORMANCE SCHEDULE (continued)

Parameter	Lift Station Wet Well No. 97
Operating Points	95 gpm @ 77 ft TDH 630 gpm @ 45 ft TDH
Nominal Pump Speed (rpm)	1760
Allowable Starts per Hour	15
Minimum NPSH Available (ft)	15
Motor Horsepower (Minimum)	10
Voltage	208
Power Supply (LCEC) Electrical Phase	Three
Pump Motor Electrical Phase	Three
Variable Speed Drive	No
Pump Discharge Size	DN100 (4 inches)
Manufacturer and Model – Basis for Design	Sulzer XFP100E CB1 3PH/230V/60HZ
Impeller Size (inches)	8 9/16
Wet Well Depth (ft)	20
Length of Cables for Power Connection, Moisture Detection, and Overload Protection (ft)	100

END OF SECTION