PROJECT MANUAL

FOR

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)

PROJECT #1931

CITY OF GEORGETOWN

SOUTH CAROLINA

DATE OF ISSUE: WEDNESDAY, OCTOBER 30, 2024

REV	DATE	DESCRIPTION	BY	CHK	APR

CITY OF GEORGETOWN
ELECTRIC UTILITIES DEPARTMENT
2520 HIGHMARKET STREET
GEORGETOWN SC 29440
(843) 545-4600

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00005
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FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
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SECTION 00010
ENUMERATION OF THE DOCUMENTS

The drawings, specifications and addenda, which form a part of this contract as set forth in Paragraph 1 of the General Conditions, Contract and Contract Documents are enumerated in Section 00005 - Table of Contents.

The order of precedence when conflicts in the documents occur is as follows:

1. Permits from other Agencies as may be required by law
2. Change Orders and/or supplemental agreements according to the latest date
3. Contract Agreement
4. Addenda
5. Bid Form or Contractor's Proposal
6. Request for Bids or Proposals
7. Bidding Instructions
8. Approved Shop Drawings
9. General and Supplemental Conditions or Requirements
10. Technical Specifications
11. Plans and Details
12. City's Standard Specifications
13. State's Standard Specifications
14. Referenced Specifications: IEEE

The figured dimensions shown on the Drawings and in the Specifications may not, in every case agree with the scale dimension. Figured dimensions take precedence over scaled dimensions and finer scaled drawings take precedence of coarser scaled drawings, i.e. one inch equals twenty feet drawings takes precedence over one inch equals fifty feet drawings.

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00015
REFERENCES

The following reference shall be used hereinafter:

Owner: City of Georgetown, SC PO Box 939 Georgetown, SC 29442	The City of Georgetown hereinafter will be referred to as the "Owner" and/or the "City".
City Administrator: Mr. Scott Whittier PO Box 939 Georgetown, SC 29442	Mr. Scott Whittier hereinafter will be referred to as the "City Administrator".
Risk Manager: Mr. Charles Cribb PO Box 939 Georgetown, SC 29442	Ms. Mr. Charles Cribb hereinafter will be referred to as the "Risk Manager".
Purchasing Agent: Mr. Nereo Parreno 1134 North Fraser Street Georgetown, SC 29440	Mr. Nereo Parreno hereinafter will be referred to as the "Purchasing Agent".
Electric Utilities Director: Mr. Ryan Courtemanche Director of Electric Utilities	Mr. Courtemanche hereinafter will be referred to as the "Electric Utilities Director".
Project Manager Mr. Orlando Arteaga, P.E. City Engineer	Mr. Arteaga hereinafter will be referred to as the "Project Manager".
Engineer Utility Technology Engineers-Consultants	Utility Technology will be referred to as the "Engineer" or "UTEC"

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

00020
ADVERTISEMENT FOR BIDS

The City of Georgetown, requests sealed bids from qualified contractors for the above-referenced project.

Front St Phase 3 UG Infrastructure Upgrade (T4), Project #1931 – Request for Bid (RFB)

Bids will be opened at **2:00 pm** (EST), **Wednesday, November 27, 2024**.

Bidder must make positive efforts to use women-owned or minority-owned businesses.

Bid documents including, but not limited to forms, specifications and milestone events, may be downloaded free of charge from the City website: www.georgetownsc.gov, under "Business/Bids RFPs". You may also send an email request to purchasing@georgetownsc.gov for a direct link.

Owner: City of Georgetown.

Any prospective bidder, offeror, contractor or subcontractor who is aggrieved in connection with the solicitation of this contract may protest to Engineer (or) Owner in accordance with Section 11-35-4210 of the SC Code of Laws, within 15 days of the date of issuance of the Notice of Intent to Award.

No bid will be considered unless the bidder is legally qualified under the provisions of the South Carolina Contractor's Licensing Law (South Carolina Code of Laws as amended on April 1, 1999, Chapter 11, Sections 40-11-10 through 40-11-428).

Contractors shall have a classification of:

GENERAL CONTRACTOR-PUBLIC ELECTRICAL UTILITY (1U/2U)

No bidder may withdraw the bid within 90 days after the actual date of the opening and thereof.

Bid documents will be modified only by written addenda. It is the responsibility of the Bidder to obtain information regarding projects directly from the City's website, www.georgetownsc.gov, under "Business/Bids/RFPs". Bids received after the due date and specified time will not be considered for any reason.

When the Procurement Division is closed due to force majeure, bid openings will be postponed to the same time on the next official business day.

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

00100
INFORMATION FOR BIDDERS

1. PROJECT SUMMARY

This project is Phase 3 of Underground Electrical Upgrades along Front St. Phase 3 consists of upgrading the power distribution system associated with existing Transclosure T4 including single phase pad mounted transformers, primary and secondary cables, service cables as necessary, new electrical conduit, modifications to existing duct bank, and refurbishment of existing pull boxes and manhole.

2. RECEIPT AND OPENING OF BIDS

The City of Georgetown (hereinafter called the "Owner") invites bids on the form (s) attached hereto, all blanks of which must be appropriately filled in.

All procurement procedures are subject to the City's procurement policies as outlined in Section 2-187 of the City's municipal code.

The City's Purchasing Ordinance can be found in its entirety on the City's website.

Your bid must be submitted electronically to ensure it remains sealed until the scheduled bid opening date and time.

Submittals may be rejected if deemed non-responsive. To be considered, interested parties **must** submit the following no later than the aforementioned deadline:

It is the sole responsibility of the bidder to have their Bids delivered to the City before the closing hour and date. The City assumes no responsibility **for technological failure in submitting Bids electronically.** It is the sole responsibility of the bidder to consider that their Bid was submitted on time, and that their PDF file/files are not corrupt.

Bids **MUST BE** submitted electronically through the City of Georgetown's website, www.georgetownsc.gov, under "Business/Bids". As always, bids received after the due date and time will not be considered for any reason.

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The City **WILL NOT** accept bids by:

Hard copy

Fax

Email

Bid openings will be streamed live via the City's public Facebook page, https://www.facebook.com/cityofgtown/.

To be considered responsive, interested parties **must** comply with the following:

Submit bid electronically through the City website, www.georgetownsc.gov, under "Business/Bids".
Click here to submit electronically.

1. Submittal package must include include **all** of the following items. The PDF file upload limit is 5. If more than one PDF file is uploaded, each PDF file should be clearly labeled as such:

    1. Bid Security 5%
    2. Bid Form– See Section 00311
    3. Bid Bond – See Section 00350
    4. Mandatory Vendor Submittal Form – See Section 01000
    5. Certification of Site Visit – See Section 00100

2. Electronic bid proposal must be received electronically through the City's website, www.georgetownsc.gov, no later than the aforementioned deadline. Bids will be publicly opened and read aloud via the City's public Facebook page, https://www.facebook.com/cityofgtown/. **It is the sole responsibility of the bidder to have their bid delivered to the City before the closing hour and date. The City assumes no responsibility for technological failure in submitting Bids electronically. It is the sole responsibility of the bidder to consider that their Bid was submitted on time, and that their PDF file/files are not corrupt.**

    Late bids will not be accepted nor considered. The official clock shall be that of the City's Purchasing Agent, or designee.

    The City reserves the right to accept or reject any or all bids and to waive any informalities and technicalities in the bid process. No additional fees, costs, or any other reimbursable expenses will be allowed.

The City reserves the right to waive any technicalities or informalities and to accept or reject any and/or all submissions as deemed by its sole judgment to be in its best interest. The City also reserves the right to terminate the selection process without notice, to waive any irregularities in any submittal, and to request additional information from any of the bidders submitting a bid.

The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. Bid price shall be firm for a period of ninety (90) days

3. PREPARATION OF BID

Each bid must be submitted on the prescribed form. All blank spaces for bid prices must be filled in with ink or typewritten.

Bids that are incomplete, unbalanced, conditional or obscure, or which contain additions not called for, erasures, alterations, or irregularities of any kind, or which do not comply with the Information for Bidders, may be rejected at the option of the Owner.

The correct total amount bid for the completed work is defined as the correct sum total of the amounts bid for the individual items in the proposal. The correct amount bid for each unit price item is defined as the correct product of the quantity listed for the item by the unit price bid.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the Bidder, Bidder's address, Contractor's license number, Bidder's license number, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified above.

4. SUBCONTRACTS

The bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract must be acceptable to the Owner.

5. QUALIFICATION OF BIDDER AND ITS SUBCONTRACTORS

The Owner may make such investigations as is deemed necessary to determine the ability of the bidder and proposed subcontractors to perform the work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request.

The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids will not be acceptable.

6. BID SECURITY

Bid security shall be a legitimate bid bond provided by a surety company authorized to do business in South Carolina, or the equivalent in, certified check, cashiers' check, or money order." A digital copy of the Bid Security must be submitted along with the electronic bid. The hard copy bid bond or check must be received by the purchasing agent within three (3) working days of the solicitation deadline. Mail or hand deliver only to:

City of Georgetown
Attn. Purchasing Agent
1134 N. Fraser Street
Georgetown, SC 29440

Each bid must be accompanied by certified check of the bidder, or a bid bond prepared on the form of bid bond attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company approved by the Owner, in the amount of five percent (5%) of the bid. Checks will be returned to all except the three (3) lowest bidders within three (3) days after the opening of bids, and the remaining cash or checks will be returned promptly after the Owner and the accepted bidder have executed the contract, or, if no award has been made within ninety (90) days after the date of the opening of the bids, upon demand of the bidder at any time thereafter so long as bidder has not been notified of the acceptance of its bid.

7. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

The successful bidder, upon failure or refusal to execute and deliver the contract and bonds required within ten (10) days after they have received notice of the acceptance of their bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with the bid.

8. TIME OF COMPLETION AND LIQUIDATED DAMAGES

Bidder must agree to commence work on or before a date to be specified in a written "Notice to Proceed" of the Owner and to fully complete the project within the number of consecutive calendar days thereafter as indicated on the Bid Form. Bidder must agree also to pay as liquidated damages the sum indicated on the Bid Form for each consecutive calendar day thereafter as hereinafter provided in General Conditions.

9. CONDITIONS OF WORK

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of the obligation to furnish all material and labor necessary to carry out the provisions of the contract.

Insofar as possible, the Contractor in carrying out the work must employ such methods and means as will not cause any interruption of, or interference with, the work of any other contractor.

10. ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the plans, specifications, or other pre-bid documents will be made to any bidder orally. Each request for such interpretation should be in writing and addressed to the Purchasing agent. To be given consideration, the request must be received at least five (5) days prior to the date fixed for the opening of bids.

Any and all such interpretations and any supplemental instructions will be in the form of written addenda which, if issued, will be posted in the Project listing that is located at the City of Georgetown website http://www.georgetownsc.gov. no later than three (3) days prior to the date fixed for the opening of bids. It shall be the bidder's responsibility to check for addenda before issuing its bid. Failure of any bidder to receive any addendum shall not relieve the bidder from any obligation under its bid as submitted. All addenda so issued shall become part of the contract documents.

11. BID, PAYMENT AND PERFORMANCE BONDS

When a construction contract is awarded in excess of One Hundred Thousand Dollars ($100,000) a payment and performance bond shall be delivered by the successful bidder to the City and shall become binding on the parties upon execution of the contract.

Simultaneously with bidder's delivery of the executed contract, the Contractor shall furnish a surety bond or bonds as secured for the faithful performance of this contract and for the payment of all persons performing labor on the project under this contract, as specified in General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company. An agent must be provided with a South Carolina license authorized to sign and execute the bond(s). Countersignature by an agent residing in South Carolina will not be required, but execution by an agent holding a South Carolina non-resident license is required. The Bid Bond shall be an amount equal to or at least five percent (5%) of the amount of the bid. The Performance Bond shall be in the amount of one-hundred and ten percent (110%) of the bid and the Payment Bond shall be in the amount of one-hundred percent (100%) of the bid.

12. POWER OF ATTORNEY

Attorneys-in-fact who sign bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

13. NOTICE OF SPECIAL CONDITIONS

Attention is particularly called to those parts of the contract documents and specifications which deal with the following:

A. Inspection and testing of materials
B. Insurance requirements
C. Stated allowances
D. Permits and Rights-of-way
E. Hazardous Gas Safety (Section 01060)

14. LAWS AND REGULATIONS

The Bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

15. METHOD OF AWARD - LOWEST QUALIFIED BIDDER

If at the time this contract is to be awarded, the lowest base bid or alternate bid submitted by a responsible bidder does not exceed the amount of funds then estimated by the Owner as available to finance the contract, the contract will be awarded on the base bid or alternate bid. If such bid exceeds such amount, the Owner may reject all bids or may award the contract on the base bid combined with such deductible alternates applied in numerical order in which they are listed in the Form of Bid, as produces a net amount which is within the available funds.

The Owner will decide which the lowest qualified bidder is, and in determining such bidder, the following elements will be considered for each bidder:

- Maintains a permanent place of business.
- Has successfully completed other work with the City
- Has adequate plant equipment and personnel to perform the Work properly and expeditiously.
- Has a suitable financial status to meet obligations incident to the work.
- Has appropriate technical experience with a minimum of five (5) years of practice.

16. RIGHT TO INCREASE OR DECREASE THE AMOUNT OF WORK

The work comprises approximately the quantities shown in the bid form which will be used as a basis for comparison of Bids and not for final estimate. The Owner does not, by expression or by implication, agree that the actual amount of work shall correspond with the estimated quantities. The Owner reserves the right to increase or decrease the amount of work under the Contract of the work contemplated, at the unit prices quoted in the Bid.

17. OBLIGATION OF BIDDER

At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and been thoroughly familiar with the plans and contract documents, including all addenda. If a site visit is required, contact the Project Manager to schedule a date and time. The failure or omission of any bidder to examine any form, instrument, or document shall in no way relieve any bidder from any obligation with respect to its bid.

18. SITE VISIT PRIOR TO BID

At the time of bid, submit "Certification Regarding Site Visit Prior to Bid". See certification form at the end of the Section.

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CERTIFICATION REGARDING SITE VISIT PRIOR TO BID

PROJECT: FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)

CITY PROJECT NO.: 1931

_____, representing the bidding contractor, visited the project (Name of Representative) site on _____, 20__ and became fully aware of all site conditions pertaining to site access and working conditions associated with the work to be performed on this project. This site condition information has been conveyed to all necessary personnel and sub-contractors preparing the bid for work on this project.

I certify that the bid for this work includes all costs associated with the site conditions, including but not limited to access, and restoration for a complete project.

Submitted by: _____
Signature

_____
Printed Name

_____
Title

_____
Company

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00110
CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE REQUIREMENTS

1. As required under Paragraph 29 of the General Conditions, the Contractor shall not commence work under this Contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the Contractor allow any Subcontractor to commence work on his Subcontract until all similar insurance required of the Subcontractor has been so obtained and approved.

2. Unless otherwise specified in this Contract, the Contractor shall, at its sole expense, maintain in effect at all times, during the performance of work, insurance coverage with limits not less than those set forth below with insurers and under forms of policies satisfactory to Owner.

3. The Contractor shall deliver Certificates of Insurance to the Engineer no later than ten (10) days after award of the Contract but in any event, prior to execution of the Contract by the Owner and prior to commencing work on the site as evidence that policies providing such coverage and limits of insurance are in full force and effect.

    A. Certificates shall provide not less than thirty (30) days advance notice will be given in writing to the Owner prior to cancellation, termination, or material alteration of said policies of insurance.

    B. Certificates shall identify on their faces the project name "**FRONT ST PHASE 3 UG IFRASTRUCTURE UPGRADE (T4)**" and the "**PROJECT NUMBER 1931**".

4. Additional Insured: The Commercial General Liability, Auto Liability, and Excess Liability (Umbrella) insurance policies shall be endorsed to include the Owner as an additional insured.

5. The Owner is not maintaining any insurance on behalf of the Contractor covering against loss or damage to the work or to any other property of the Contractor unless otherwise specifically stated herein and as may be described by appendix hereto. In the event the Contractor maintains insurance against physical loss or damage to the Contractor's construction equipment and tools, such insurance shall include an insurer's waiver of rights of subrogation in favor of the Owner.

6. The Contractor shall indemnify the Owner and the Engineer, as stated in Part 47 of The General Conditions.

7. Insurance Requirements:

Contractor shall provide coverage for not less than the following amounts, or greater where required by Laws and Regulations:

a. Workers' Compensation and Employer's Liability

Workers' Compensation	Statutory
Employer's Liability	
Each Accident	$ 500,000.00
Each Employee	$ 500,000.00
Policy Limit	$ 500,000.00

b. Commercial General Liability

General Aggregate	$ 2,000,000.00
Products - Completed Operations Aggregate	$ 2,000,000.00
Personal and Advertising Injury	$ 1,000,000.00
Bodily Injury and Property Damage—Each Occurrence	$ 1,000,000.00

c. Automobile Liability

Combined Single Limit (Bodily Injury and Property Damage)	$ 1,000,000.00

d. Excess or Umbrella Liability

Per Occurrence	$ 2,000,000.00
General Aggregate	$ 2,000,000.00

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00311
BID FORM

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)

Date: _____
Project No.: 1931

PROPOSAL OF _____, doing business as a corporation / a partnership / an individual (Strike out inapplicable terms), with its principal office in the City of _____, County of _____, State of _____, (hereinafter called "Bidder").

TO: City of Georgetown, SC

Gentlemen:

The Bidder, in compliance with your invitation for bids for the **Front St Phase 3 UG Infrastructure Upgrade (T4)** having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the project in accordance with the Contract Documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this proposal is a part.

The bidder hereby agrees to commence work under this contract on or before a date to be specified in written "Notice to Proceed" of the Owner and to fully complete the project within **90 consecutive calendar days** thereafter as stipulated in the specifications. Bidder further agrees to pay as liquidated damages the sum of **$500 for each consecutive calendar day** thereafter as hereinafter provided in Paragraph 19 of the General Conditions.

The plans, specifications, and addenda are complementary of each other. What is called for by one shall be as binding as if called for by all. If a conflict between any of the above is discovered by the contractor, the problem shall be referred to the Engineer as soon as possible for resolution by the Engineer. Should a conflict occur which is not resolved before bid time and/or is necessary to comply with mandatory requirements (i.e., codes, ordinances, etc.), it shall be the contractor's responsibility to price and bid the more expensive method.

Bidder acknowledges receipt of the following addendum:

No: _____Dated:_____

No: _____Dated:_____

No: _____Dated:_____

Bidder agrees to perform the work as described in the specifications and shown on the plans for the following unit or lumps sum (LS) prices:

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No.	Description	Qty.	Unit	Unit Price ($)	Cost ($)
1	Mobilization	1	LS		
2	Install T4 Transformers, Foundation	1	LS		
3	Modifications to Existing Duct Bank	1	LS		
4	Refurbish Manholes MHT4A and MHT4B, and Pull Box PB11	1	LS		
5	Primary Cables and Connections	1	LS		
6	Secondary Cables and Connections	1	LS		
7	Installation of Conduits and new Conduit Exits in Manhole MHT4B	1	LS		
8	Grounding	1	LS		
9	Demolition and Removal of Existing T4 Transclosure	1	LS		
10	Safety and Traffic Control	1	LS		
11	Electrical Testing	1	LS		
				TOTAL BID AMOUNT	

Amounts shall be shown in both words and figures. In case of discrepancy, the amount in words shall govern.

Base Bid Lump Sum of:

_____Dollars $ (_____)

The lump sum price indicated above shall include all labor, materials, equipment, overhead, profit, insurance, taxes, business license, construction permit fees, etc., to cover all expenses incurred in performing the work required under the Contract Documents, of which this proposal is a part of.

The Bidder declares that he/she understands that the quantities shown in the Proposal are subject to adjustment by either increase or decrease and that should the quantities of any of the items of the work be increased, the undersigned proposed to do the additional work at the unit prices stated herein, and should the quantities be decreased, he also understands that payment will be made on actual quantities at the unit price bid, and will make no claim for anticipated profits for any decrease in the quantities and that actual quantities will be determined upon completion of the work, at which time adjustment will be made to the contract amount by direct increase or decrease.

Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

The Bidder agrees that this bid shall be good and may not be withdrawn for a period of 90 calendar days after the scheduled closing time for receiving bids.

Upon receipt of written notice of the acceptance of this bid, Bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or Bonds as required by Paragraph 30 of the General Conditions. The bid security attached in the sum of _____ _____ Dollars _____ Cents ($_____ _____) is to become the property of the Owner in the event the contract and bond

are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

By submission of this bid, each bidder certifies, and in the case of a joint bid, each party thereto certifies as to its own organization, that this bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this bid, with any other bidder or with any competitor.

[SEAL – (If bid is by a corporation)]

Respectfully submitted:

BY: _____

_____
(Print Name)

_____
(Title)

_____
(Business Address)

_____
(Email)

_____
(Telephone)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00350
BID BOND

KNOW ALL MEN BY THESE PRESENT:

That we, the undersigned _____, as Principal, and _____, as Surety, are hereby held and firmly bound unto the City of Georgetown, South Carolina, as Owner, in the penal sum of (5% of total bid) _____ Dollars _____ Cents ($ _____), for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed this _____ day of _____, 20_____.

The condition of the above obligation is such that:

WHEREAS, the Principal has submitted to _____ a certain Bid, attached hereby and by reference made a part hereof, to enter into a contract in writing for the **FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)**.

NOW, THEREFORE,

(A) If said Bid shall be rejected, or

(B) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said Bid) and shall furnish a Bond for faithful performance of said contract, and for the payment of all persons performing labor furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid, then this obligation shall be void; otherwise the same shall remain in force and effect - it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its Bond shall be in no way impaired or affected by an extension of the time within which the Owner may accept such Bid, and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____
Principal

(Corporate Seal)

By :_____(L.S)

_____
Surety

(Corporate Seal)

By :_____(L.S)

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.

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00500
CONTRACT

STATE OF SOUTH CAROLINA

COUNTY OF GEORGETOWN

THIS AGREEMENT, entered into this _____ day of _____, 20_____ and effective immediately by and between _____ , doing business as a (individual/partnership/corporation), with its principal office in the City of _____, _____ County, _____State,(hereinafter called the "Contractor") and the City of Georgetown, a duly organized and validly existing politic body of the State of South Carolina (hereinafter called "City"),

WITNESSETH THAT WHEREAS, The City desires to engage the services of a professional contractor for the purpose of **Front St Phase 3 UG Infrastructure Upgrade (T4)**, hereinafter referred to as "Project"; and,

WHEREAS, The City has solicited bids for same by that certain Request for Bids for Construction Services, hereinafter referred to as "RFB", a copy of which is attached hereto for all purposes as **EXHIBIT "1"**; and,

WHEREAS, The Contractor has represented to City that it has the qualifications, experience, expertise, training, and personnel to timely perform the Project for City; and,

WHEREAS, The Contractor has expressed its desire to do so by their bid opened _____, 20____, hereinafter referred to as "Bid", a copy of which is attached hereto for all purposes as **EXHIBIT "2"**;and,

WHEREAS, the parties desire to enter in an agreement for the Contractor to perform the Project for City per all the terms and conditions more particularly set out herein below;

NOW, THEREFORE, for and in consideration of the foregoing, and of other good and valuable consideration, the adequacy of which is hereby acknowledged, the parties hereto agree as follows:

(1) **SCOPE OF SERVICES:**

a. Contractor hereby agrees to perform a project for the **Front St Phase 3 UG Infrastructure Upgrade (T4)** as outlined in the Project Manual, incorporated into this Agreement as **ATTACHMENT "A"** and hereinafter referred to as "Work";

b. Contractor further agrees to commence and complete any and all extra work in connection therewith, under the terms as stated in the General and Special Conditions of the Contract; and at his/hers (it's or their) own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendents, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal and the General Conditions, Supplemental General Conditions, and Special Provisions of the Contract, the plans, including all maps, plats, blueprints, and other drawings and printed or written explanatory matters thereof, the specifications and contract documents therefore as prepared by the Engineer, and as enumerated in Paragraph 1 of the General Conditions, all of which are made a part hereof and collectively evidence and constitute the Contract.

c. City may, from time to time require changes in the Work of the Contractor to be performed hereunder. Such changes, which are mutually agreed upon by and between City and the Contractor, shall be incorporated by written amendment to this Agreement.

(2) **COMPENSATION:**

a. City agrees to pay Contractor a sum not to exceed _____ dollars ($_____.___) in accordance with the Schedule of Values, incorporated into this Agreement as **ATTACHMENT "B"** and hereinafter referred to as "Compensation";

b. In the event funds are not appropriated or become non-appropriated for an included fiscal year by City, it is agreed by the parties that this Agreement will become null and void and the City's obligations cannot extend beyond the date of non-appropriation.

(3) **PERIOD OF SERVICES:**

a. the Work to be performed hereunder by the Contractor shall begin upon the date outlined to the City's Notice to Proceed letter to the Contractor, incorporated into this Agreement as **ATTACHMENT "C"** and hereinafter referred to as "NTP"

b. The Work shall be completed in accordance with the Schedule, incorporated into this Agreement as **ATTACHMENT "D"** and hereinafter referred to as "Schedule".

c. Modifications to the Schedule may be required Such modifications, which are mutually agreed upon by and between City and the Contractor shall be incorporated by written amendment to this Agreement

(4) **FORCE MAJEURE:**

a. Force majeure includes acts of God, acts of other branches of government in either their sovereign or contractual capacities, or any similar cause beyond the reasonable control of the parties.

b. Any delays in or failure of performance by either party that are caused by a Force Majeure shall not constitute breach of this Agreement.

c. In the event that any event of force majeure, as herein defined occurs, both parties shall be entitled to a reasonable extension of time for performance of its WORK.

(5) **NOTICES:**

a. Any notices, bills, invoices, or reports required by this Agreement shall be sufficient if sent by the parties in the United States mail or electronic mail to the addresses of the Project Manager (See Section 00015)

(6) **RECORDS AND INSPECTIONS:**

a. Contractor shall maintain full and accurate records with respect to all matters covered under this Agreement for a period of one year after the completion of the project.

b. City shall have free access at all proper times to such records, and the right to examine and audit the same and to make transcripts there from, and to inspect all program data, documents, proceedings, and activities.

(7) **COMPLETENESS OF AGREEMENT:**

a. This Agreement and any additional or supplementary document or documents incorporated herein by specific reference contain all the terms and conditions agreed upon by the parties hereto, and no other agreements, oral or otherwise, regarding the subject matter of this Agreement or any part thereof shall have any validity or bind any of the parties hereto
b. This Agreement is entered into with full understanding and awareness of such requirement.
c. City shall be allowed to rely upon the representations of Contractor as set out in the Proposal.
d. With the exception of the foregoing, this Agreement constitutes the entire agreement between the parties hereto and may not be modified or amended except in writing signed by both parties hereto.

(8) **CONFLICTS:**

a. In the case of any conflict between the terms and conditions of this Agreement and the terms of any other agreement between the parties hereto, the terms of this Agreement shall control
b. If there is a conflict between the City's Requests for Bids and this Agreement, then this Agreement shall control.
c. If there is a conflict between the City's Request for Bids and the Contractor's Proposal, the City's Request for Bids shall control.
d. Both parties agree that all conflicts arising under this Agreement that cannot be settled between the parties shall be resolved in the Georgetown County Court of Common Pleas (Non-Jury)

(9) **SEVERABILITY:**

a. If any part or provision of this Agreement is held invalid or unenforceable under applicable law, such invalidity or unenforceability shall not in any way affect the validity or enforceability of the remaining parts and provisions of this Agreement.

(10) **NONWAIVER:**

a. The waiver by City or Contractor of a breach of this Agreement shall not operate as a waiver of any subsequent breach, and no delay in acting with regard to any breach of this Agreement shall be construed to be a waiver of the breach.

b. In no event shall the making of any payment by City to the Contractor constitute or be construed as a waiver by City of any breach of covenant, or any default which may exist on the part of the Contractor.

c. The making of any such payment by City while any such breach or default shall exist in no way impairs or prejudices any right or remedy available to City in respect to such breach or default.

(11) **GOVERNING LAW:**

a. This Agreement and the rights, obligations and remedies of the parties hereto, shall in all respects be governed by and construed in accordance with the laws of the State of South Carolina.

(12) **RESPONSIBILITY:**

a. Each party shall be responsible for its own acts as provided under the law of South Carolina and will be responsible for all damages, costs, fees and expenses which arise out of the performance of this Agreement which are due to that party's own negligence, tortious acts and other unlawful conduct and the negligence, tortious action and other unlawful conduct of its respective agents, officers and employees.

(13) **FREEDOM OF INFORMATION ACT (FOIA)**

a. The parties acknowledge that all documents are subject to release under the South Carolina Freedom of Information Act (FOIA) and will be released to the public unless exempt from disclosure under the FOIA.

b. If the Contractor contends a document is exempt from disclosure under the FOIA, it shall mark any such documents plainly, and seek protection from disclosure by filing an appropriate action in Circuit Court and shall bear the cost of the action and any monetary or attorney's fees awarded to the person or entity making the FOIA request.

c. If the Contractor objects to release and litigation is commenced against the City under the FOIA, the City agrees to promptly notify the Contractor, who shall move in intervene as a party. The Contractor agrees to hold the City harmless from and indemnify for all costs (including plaintiff's attorney's fees if awarded by the Court) incurred by the City in defending the lawsuit and the funds necessary to satisfy any judgment and all costs on appeal, if any.

(14) **THIRD-PARTY OBLIGATIONS:**

a. Neither party shall be obligated or liable hereunder to any party other than the second party to this Agreement.

(15) **RESTRICTIONS ON LOBBYING:**

a. The Contractor shall comply with all requirements of Section 1352, Title 31 of the U.S. Code, which prohibits all recipients of federal funds from using appropriated monies for lobbying activities.

(16) **SUCCESSORS AND ASSIGNS:**

a. The rights and obligations herein shall inure to and be binding upon the successors and assigns of the parties hereto.

IN WITNESS WHEREOF, City and the Contractor have executed this agreement as of the date first written above.

CITY OF GEORGETOWN, SOUTH CAROLINA
(OWNER)

_____
(SIGNATURE)

By: _____

(SEAL) Title: _____

_____
(CONTRACTOR)

_____
(SIGNATURE)

By: _____

(CORPORATE SEAL) Title: _____

Attest:

_____
It's Secretary

_____
Witness

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00600.1
PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS THAT

_____
(NAME OF CONTRACTOR)

_____
(ADDRESS OF CONTRACTOR)

A Corporation Partnership, hereinafter called Principal, and

_____
(NAME OF SURETY)

_____
(ADDRESS OF SURETY)

Hereinafter called Surety, are held and firmly bound unto

THE CITY OF GEORGETOWN, SOUTH CAROLINA
(NAME OF OWNER)

PO BOX 939, GEORGETOWN, SC 29442
(ADDRESS OF OWNER)

hereinafter called Owner, in the penal sum of (110% of total bid)
_____ Dollars _____ Cents ($ _____),
in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these present.

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal entered into a certain Contract with the Owner dated the _____ day of _____, 20____, a copy of which is hereto attached and made part hereof for **FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4).**

NOW, THEREFORE, if the Principal shall well, truly, and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if he shall satisfy all claims and demands incurred under such contract and fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extensions of time, alteration, or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications.

PROVIDED FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in three (3) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20____.

Signed, sealed and delivered in the presence of:

_____
(PRINCIPAL - CONTRACTOR)

_____ _____
(SIGNATURE)

_____
As to Principal

By: _____

Title: _____

_____
(SURETY)

_____ _____
(SIGNATURE)

_____
As to Surety

By: _____
ATTORNEY-IN-FACT
(Power of Attorney to be attached)

By: _____
(AGENT)

_____
(AGENT COMPANY NAME)

_____

_____
(AGENT COMPANY ADDRESS)

_____

_____
(AGENT ADDRESS)

NOTES:

1. Date of Bond must not be prior to date of Contract.

2. If Contractor is a Partnership, all partners should execute Bond.

3. 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.

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00601.1
PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS THAT

_____
(NAME OF CONTRACTOR)

_____
(ADDRESS OF CONTRACTOR)

A Corporation Partnership, hereinafter called Principal, and

_____
(NAME OF SURETY)

_____
(ADDRESS OF SURETY)

Hereinafter called Surety, are held and firmly bound unto

THE CITY OF GEORGETOWN, SOUTH CAROLINA
(NAME OF OWNER)

PO BOX 939, GEORGETOWN, SC 29442
(ADDRESS OF OWNER)

hereinafter called Owner, in the penal sum of (100% of total bid)
_____ Dollars_____ Cents ($ _____),
in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these present.

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal entered into a certain Contract with the Owner dated the _____ day of _____, 20____, a copy of which is hereto attached and made part hereof for **FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4).**

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension of modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extensions of time, alteration, or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications.

PROVIDED FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in three (3) counterparts, each one of which shall be deemed an original, this _____ day of _____, 20____.

Signed, sealed and delivered in the presence of:

_____
(PRINCIPAL - CONTRACTOR)

_____ _____
(SIGNATURE)

_____
As to Principal

By: _____

Title: _____

_____
(SURETY)

_____ _____
(SIGNATURE)

_____
As to Surety

By: _____
ATTORNEY-IN-FACT
(Power of Attorney to be attached)

By: _____
(AGENT)

_____
(AGENT COMPANY NAME)

_____

_____
(AGENT COMPANY ADDRESS)

_____

_____
(AGENT ADDRESS)

NOTES:

1. Date of Bond must not be prior to date of Contract.

2. If Contractor is a Partnership, all partners should execute Bond.

3. 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.

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00601.2

NOTICE OF INTENT TO AWARD

OWNER: City of Georgetown
2520 Highmarket St
Georgetown, SC 29440

PROJECT NO.: 1927

PROJECT DESCRIPTION: Front St Phase 3 UG Infrastrucgture Upgrade (T4)

TO ALL BIDDERS:

This is to notify all bidders that it is the intent of the Owner to award a contract as follows:

NAME OF BIDDER: _____

DATE BIDS WERE RECEIVED: _____

AMOUNT OF BASE BID: _____ $_____

The Owner has determined that the above-named Bidder is responsible and has submitted the lowest responsive bid. The Owner may enter into a contract with this Bidder subject to the contract review and approval by the RIA and City Council.

_____	_____
(Print or Type Name)	(Title)
_____	_____
(Signature)	(Date Posted)

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00602.4
NOTICE OF AWARD

TO: _____

PROJECT: Front St Phase 3 UG Infrastructure Upgrade (T4)

PROJECT NO. : 1931

DATE: _____

The City of Georgetown (Owner) has considered your proposal in response to the Request for Bid (RFB) dated October 30, 2024.

You are hereby notified that Owner has approved your bid in the amount of $_____.

You are required to provide the following documents: W-9 form, Employment Verification Affidavit, City's business license (or per-job business license), Payment and Performance bonds, and Certificate of Insurance naming the City of Georgetown as additionally insured, within ten (10) business days from the date of this notice to you. A Purchase Order and contract agreement will then be prepared once the requested documents are on hand.

Please sign and return this form in acknowledgment of this Notice of Award to the Owner.

CITY OF GEORGETOWN, SOUTH CAROLINA

By: _____

Title: _____

Acceptance of Notice

Receipt of the above Notice of Award is hereby acknowledged this _____day of _____ , 20_____.

_____
(Signature)

By: _____

Title: _____

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00604
EMPLOYMENT ELIGIBILITY VERIFICATION REQUIREMENT

A. Contractor is required to comply with all applicable State and Federal employment eligibility verification requirements including but not limited to the following:

1. By signing its bid or proposal, Contractor certifies that it will comply with the applicable requirements of Title 41, Chapter 8 of the South Carolina Code of Laws and agrees to provide to the City of Georgetown upon request any documentation required to establish either: (a) that Title 41, Chapter 8 is inapplicable both to Contractor and its subcontractors or sub-subcontractors are in compliance with Title 41, Chapter 8. Pursuant to Section 41-8-70, "In addition to other penalties provided by law, a person who knowingly makes or files any false, fictitious, or fraudulent document, statement, or report pursuant to this chapter is guilty of a felony, and upon conviction, must be fined within the discreti9on of the court or imprisoned for not more than five years, or both. "Contractor agrees to include in any contracts with its subcontractors language requiring its subcontractors to (a) comply with the applicable requirement of Title 41, Chapter 8, and (b) include in their contracts with the sub-subcontractors language requiring the sub-subcontractors to comply with the applicable requirements of Title 41, Chapter 8.

B. Contractor is required to complete and submit the attached affidavit along with the executed contract documents.

C. E-Verify.

1. In addition to completing and maintaining the federal employment eligibility verification form (Form I-9), Contractor must, within three (3) business days after employing a new employee, verify the employee's work authorization through the E-Verify federal work authorization program administered by the U.S. Department of Homeland Security. Employers may no longer confirm a new employee's employment authorization with a driver's license or state identification card.

2. Contractor shall enroll in E-Verify at www.dhs.gov/e-verify.

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

CONTRACTOR AFFIDAVIT

SOUTH CAROLINA ILLEGAL IMMIGRATION REFORM ACT (Amended)

In accordance with the requirements of the South Carolina Illegal Immigration Reform Act, Contractor hereby certifies that it is currently in compliance with the requirements of Title 40, Chapter 8 of the S.C. Code Annotated and will remain in compliance with such requirements throughout the term of its contract with the Owner.

The Contractor hereby acknowledges that in order to comply with the requirements of S.C. Code Annotated Section 41-8-20:

(A) All private employers in South Carolina shall be imputed a South Carolina employment license, which permits a private employer to employ a person in this State. A private employer may not employ a person unless the private employer's South Carolina employment license and any other applicable licenses as defined in Section 41-8-10 are in effect and are not suspended or revoked. A private employer's employment license shall remain in effect provided the private employer complies with the provisions of this chapter.

(B) All private employers who are required by federal law to complete and maintain federal employment eligibility verification forms or documents must register and participate in the E-Verify federal work authorization program, or its successor, to verify the work authorization of every new employee within three business days after employing a new employee. A private employer who does not comply with the requirements of this subsection violates the private employer's licenses.

(C) The South Carolina Department of Employment and Workforce shall provide private employers with technical advice and electronic access to the E-Verify federal work authorization program's website for the sole purpose of registering and participating in the program.

(D) Private employers shall employ provisionally a new employee until the new employee's work authorization has been verified pursuant to this section. A private employer shall submit a new employee's name and information for verification even if the new employee's employment is terminated less than three business days after becoming employed. If a new employee's work authorization is not verified by the federal work authorization program, a private employer must not employ, continue to employ, or reemploy the new employee.

(E) To assist private employers in understanding the requirements of this chapter, the director shall send written notice of the requirements of this section to all South Carolina employers and shall publish the information contained in the notice on its website.

Nothing in this section shall create a legal requirement that any private employer receive actual notice of the requirements of this chapter through a written notice from the director, nor create any legal defense for failure to receive notice.

(F) If a private employer is a contractor, the private employer shall maintain the contact phone numbers of all subcontractors and sub-subcontractors performing services for the private employer. The private employer shall provide the contact phone numbers or a contact phone number, as applicable, to the director pursuant to an audit or investigation within seventy-two hours of the director's request.

The Contractor agrees to provide to the Owner upon request any documentation required to establish the applicability of the South Carolina Illegal Immigration Reform Act (Amended) to the contractor, subcontractor or sub-subcontractor. The Contractor further agrees that it will upon request provide the Owner with any documentation required to establish that the Contractor and any subcontractors or sub-subcontractors are in compliance with the requirements of Title 41, Chapter 8 of the S.C. Code Annotated.

Date:_____

_____
(Signature)

By: _____

Title: _____

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00606
NOTICE TO PROCEED

TO:

OWNER: City of Georgetown, South Carolina

PROJECT: Front St Phase 3 UG Infrastructure Upgrade (T4)

PROJECT NUMBER: 1931

DATE:

This is your Notice to Proceed with the Work, on the above-mentioned Project, in accordance with

The Agreement dated _____, 20_____. You are authorized to commence

Work on _____ 20_____, and you are required to complete the Work

within **Ninety (90)** consecutive calendar days thereafter.

The date of final completion for all Work is therefore: _____ 20_____.

Kindly return this Notice to Proceed to the Owner in acknowledgement.

CITY OF GEORGETOWN, SOUTH CAROLINA

_____
(Signature)

By: _____

Title: _____

Acceptance of Notice

Receipt of the above Notice to Proceed is hereby acknowledged this the _____day of _____ , 20_____.

_____
(Signature)
By:_____

Title:_____

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00610
APPLICATION FOR PAYMENT

Contractor may submit other Pay Request form for Engineer's approval in lieu of the following:

Owner: City of Georgetown

Contractor:

Contract No.
Pay Estimate No.
Period of Estimate: From _____ to _____

CONTRACT CHANGE ORDER SUMMARY

No.	Approval Date	Additions	Deductions
Totals:			
Net Change:			

ESTIMATE

1. Original Contract	$
2. Change Orders	$
3. Revised Contract (1+2) ...	$
4. Work Completed*	$
5. Stored Materials*	$
6. Subtotal (4+5)	$
7. Retainage	$
8. Previous Payments	$
9. Amount Due (6-7-8)	$

** Detailed breakdown attached*

CONTRACT TIME

Original (days): _____ On Schedule: Yes____ No ____

Revised: _____ Starting Date: _____

Remaining: _____ Projected Completion: _____

Contractor's Certification:

The undersigned certifies that to the best of their knowledge, information, and belief the work covered by this payment estimate has been completed in accordance with the contract documents, that all amounts due subcontractors and suppliers have been paid by the Contractor for work for which previous payment estimates were issued and payments received from the Owner, and that the current payment shown herein is now due.

(Signature): _____

By: _____

Date: _____

Engineer's Certification:

The undersigned certifies that to the best of their knowledge and belief, the quantities shown in this estimate are correct and the work has been performed in accordance with the contract documents. Based on periodic but less than full-time field representation, to the best of our information the quantities, items and schedule of values, work completed and material and equipment delivered are accurate as indicated on this request for payment. Some defects or problems with construction items may not be determined until final testing and operation of the system are performed. The Engineer cannot be held liable for approval for partial payments for the installation of these items from which the evidence of defects or problems were not determined until after the request for payment was approved.

(Signature): _____

By: _____

Date: _____

Approved by Owner:

(Signature): _____

By: _____

Date: _____

PAY ESTIMATE NO. ___________________ DATE _____________________

Page ___ of ___

PROJECT: ____ PROJECT NUMBER: _______________

		CURRENT CONTRACT				TOTAL THIS PERIOD		PREVIOUS TOTAL		TOTAL TO DATE		
Item No	Description	Quantity	Units	Unit Cost	Total Cost	Quantity	Total Cost	Quantity	Total Cost	Quantity	Total Cost	%
										0.00	$0.00	#DIV/0!
										0.00	$0.00	#DIV/0!
										0.00	$0.00	#DIV/0!
										0.00	$0.00	#DIV/0!
										0.00	$0.00	#DIV/0!
										0.00	$0.00	#DIV/0!
										0.00	$0.00	#DIV/0!
										0.00	$0.00	#DIV/0!
										0.00	$0.00	#DIV/0!
										0.00	$0.00	#DIV/0!
										0.00	$0.00	#DIV/0!
										0.00	$0.00	#DIV/0!
										0.00	$0.00	#DIV/0!
	TOTALS				$0.00		$0.00		$0.00		$0.00	#DIV/0!

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00620
CONTRACTOR'S AFFIDAVIT

The State of _____ Date: _____

The County of _____ The City of _____

_____ of _____
(Officer's Name) (Officer's Title) (Contractor's Name)

being duly sworn, deposed and says that _____ has furnished
(Contractor's Name)
Labor and materials entering into the **Front St Phase 3 UG Infrastructure Upgrade (T4)** dated _____ with the City of Georgetown, South Carolina.

_____ states further that this officer has full knowledge of all
(Contractor's Name)
obligations for such labor and materials which have entered into and become part of that certain project known and designated above, and that this officer further deposes and says that all debts and other obligations for such labor and materials have been fully and completely paid for in good and lawful money of the United States of America and that there are no suits for damages against them proceeding, prospective and/or that there are no suits for damages against them proceeding, prospective, or otherwise, in consequence of their operations on the above said project.

The said _____ will hold the Owner, the City of Georgetown
(Contractor's Name)
South Carolina, blameless of any and all mechanic's liens that may be hereafter entered or filed for record, so as to constitute a charge against said premises for work or labor done or materials furnished by them.

IN WITNESS HEREOF, this officer has heretofore put his hand and seal:

_____
(Officer's Name)

I, _____, Notary Public in and for the above named County and State do hereby certify that _____ personally know to me to be the
(Officer's Name)
affiant in the foregoing Affidavit, personally appeared before me this day and, having been duly sworn, deposed and says the facts set forth in the above Affidavit are true and correct.

WITNESS my hand and seal this _____ day of _____ 20_____.

_____

Notary Public for the State of _____

My Commission Expires: _____

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00630
CONTRACT CHANGE ORDER

DATE: _____ PROJECT: _____
CHANGE ORDER #: _____ PROJECT #: _____

Description of and Reason for Change: _____

_____

_____

_____

Itemization of Proposed Change and Basis for Payment

Original Contract Price . . . . $_____

Previous Change Orders . . . . . $_____

This Change, (An Addition) (A Deduction) of . . . . . .$_____

Proposed Revised Contract Price . . . . . $_____

Additional funds shall be provided in the following manner: _____

_____

Extension of Contract Time Required: _____ days.

Revised Contract Completion Date: _____

Accepted by the Contractor:

By: _____ Date: _____

Recommended by the Engineer:

By: _____ Date: _____

Approved by the Owner:

By: _____ Date: _____

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00700
GENERAL CONDITIONS

1. CONTRACT AND CONTRACT DOCUMENTS. The plans, specifications and addenda, hereinafter enumerated in Paragraph 1 of Supplemental General Conditions, shall form part of this contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents titles, heading, running headlines and marginal notes contained herein and in said documents are solely to facilitate reference to various provisions of the contract documents and in no way affect, limit or cast light on the interpretations of the provisions to which they refer.

Contents

2. DEFINITIONS. The following terms as used in this contract are respectively defined as follows:

   (a) Contractor. A person, firm or corporation with whom the contract is made by the Owner.

   (b) Subcontractor. A person, firm or corporation supplying labor and materials, or only labor, for work at the site of the project for and under separate contract or agreement with the Contractor.

   (c) Work on or at the Project. Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor and any Subcontractor.

3. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS. The Contractor will be furnished additional instructions and detail drawings as necessary to carry out the work included in the Contract. The additional drawings and instructions thus supplied to the Contractor will coordinate with the Contract Documents and will be so prepared that they can be reasonably interpreted as part thereof. The Contractor shall carry on the work in accordance with the additional detail drawings and instructions. The Contractor and the Engineer will prepare jointly:

   (a) A schedule fixing the dates at which special detail drawings will be required; such drawings, if any, to be furnished by the Engineer in accordance with said schedule; and

   (b) A schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies, and equipment, and the completion of the various parts of the work; each such schedule to be subject to change from time to time in accordance with the progress of the work.

4. SHOP DRAWINGS AND SAMPLES. The Contractor shall submit complete manufacturer's data and drawings to the Engineer for review as specified herein. Drawings will be for the exact material or equipment to be supplied or installed and shall be clearly marked to show specific model and any options or modifications. Drawings shall be submitted within 30 days after receipt of the Purchase Order.

   4.1 Samples. Contractor shall also submit to the Engineer for approval, all samples required by this specification. All samples will have been checked by and stamped with the approval of the Contractor, identified clearly as to material, manufacturer, any pertinent catalog numbers and the use for which intended.

   4.2 Deviations. At the time of each submission, Contractor shall in writing call the Engineer's attention to any deviations that the Shop Drawings or samples may have from the requirements of the Contract Document.

   4.3 Engineer's Review. Engineer will review and approve with reasonable promptness Shop Drawings and samples, but his review and approval shall be only for conformance with the design concept of the project and for compliance with the information given in the Contract Documents. The approval of a separate item as such will not indicate approval of the assembly in which the item functions. Contractor shall make any

corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and resubmit new samples until approved. Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections called for by Engineer on previous submissions. Contractor's stamp of approval on any Shop Drawing or sample shall constitute a representation to Owner and Engineer that Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers and similar data or he assumes full responsibility for doing so, and that he has reviewed or coordinated each Shop Drawing or sample with the requirements of the work and Contract Documents.

4.4 Contractor's Records. Where a Shop Drawing or sample submission is required by the Specifications, no related work shall be commenced until the submission has been approved by Engineer. A copy of each approved shop drawing and each approved sample shall be kept in good order by Contractor at the site and shall be available to Engineer.

4.5 Contractor's Responsibility. Engineer's approval of Shop Drawings or sample shall not relieve Contractor from his responsibility for any deviations from the requirements of the Contract Documents unless Contractor has in writing called the Engineer's attention to such deviation at the time of submission and Engineer has given written approval to the specific deviation, nor shall any approval by Engineer relieve Contractor from responsibility for errors or omissions in the Shop Drawings.

5. MATERIALS, SERVICES, AND FACILITIES shall be furnished by the Contractor.

(a) It is understood that except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, gas lights, power, transportation, superintendence, taxes, insurance, temporary construction of every nature, and all other services and facilities of every nature whatsoever necessary to execute, complete and deliver the work within the specified time.

(b) Any work necessary to be performed after regular working hours, on Sundays, or legal holidays, shall be performed without additional expense to the Owner.

6. CONTRACTOR'S TITLE TO MATERIALS. No materials or supplies for the work shall be purchased by the Contractor or by any subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

7. INSPECTION AND TESTING OF MATERIALS. Unless otherwise specifically provided for in the specifications, the inspection and testing of material and finished articles to be incorporated in the work at the site shall be made by bureaus, laboratories, or agencies approved by the Owner. The cost of such inspection and testing shall be paid by the Contractor.

7.1 Certification by Contractor. Where the detailed specifications call for certified copies of mill or shop tests to establish conformance of certain materials with the specifications, it shall be the responsibility of the Contractor to assure delivery of such certifications to the Owner. No materials or finished articles shall be incorporated in the work until such materials and finished articles have passed the required tests. The

Contractor shall promptly segregate and remove rejected material and finished articles from the site of the work.

7.2 Guaranty. The testing and approval of materials by the laboratory, or laboratories, shall not relieve the Contractor of any of his obligations to fulfill his contract and guarantee of workmanship and materials as called for in paragraph entitled "General Warranty for One Year After Completion of Contract" herein. The Contractor may, at his option and at his own expense, cause such other tests to be conducted as he may deem necessary to assure suitability, strength, and durability of any material or finished article.

8. "OR EQUAL" CLAUSE. The phrase "or equal" shall be construed to mean that material or equipment will be acceptable only when, in the judgment of the Engineer, they are composed of parts of equal quality, or equal workmanship and finish, designed and constructed to perform or accomplish the desired result as efficiently as the indicated brand, pattern, grade, class, make or model. Written approval will be obtained from the Engineer prior to installation.

9. PATENTS. The Contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents. If the Contractor uses any design, device or material covered by letter, patent, or copyright, he shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood that, with exception, the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or his sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringements by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract, and shall indemnify the Owner for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

10. SURVEYS, LAWS AND REGULATIONS. The Contractor shall comply with the following:

10.1 Construction staking shall be in accordance standard construction staking practice or with the requirements of Section 01050 entitled "Field Engineering".

10.2 Laws and Regulations. The Contractor shall keep himself fully informed of all laws, ordinances, and regulations of State, City and County in any manner affecting those engaged or employed in the work, or the materials used in the work, or in any way affecting the conduct of the work, and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over same. If any discrepancy or inconsistency should be discovered in this contract, or in the drawings or specifications herein referred to, in relation to any such law, ordinance, regulation, order or decree, he shall forthwith report the same in writing to the Owner. He shall, at all times, himself observe and comply with all such existing and future laws, ordinances and regulations (to the extent that such requirements do not conflict with Federal laws or regulations) and shall protect and indemnify the Owner and its agents against any claims or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by himself or by his employees.

11. CONTRACTOR'S OBLIGATIONS. The Contractor shall, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities, and means, except as herein otherwise expressly specified, necessary or proper to perform and complete all the work required by this contract, within the time herein specified, in accordance with provisions of this contract and said specifications, and in accordance with the plans and drawings covered by this contract and any and all supplemental plans and drawings and in accordance with the directions of the Engineer as given from time to time during the progress of the work. He shall furnish, erect, maintain and remove such construction plant and such temporary works as may be required. The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements and limitation of the contract and specifications, and shall do, carry on and complete the entire work to the satisfaction of the Engineer and the Owner.

12. WEATHER CONDITIONS. In the event of temporary suspension of work or during inclement weather, or whenever the Engineer shall direct, the Contractor will, and will cause his subcontractors to, protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of his Subcontractors to so protect its work, such materials shall be removed and replaced at the expense of the Contractor.

13. PROTECTION OF WORK AND PROPERTY, EMERGENCY. The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this contract. He shall at all times safely guard and protect his own work and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the contract or by the Owner or by his duly authorized representatives. In case of emergency which threatens loss or injury of property and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Engineer, in a diligent manner. He shall notify the Engineer immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Engineer for approval. Where the Contractor has not taken action but has notified the Engineer of an emergency threatening injury to persons or damage to the work of any adjoining property, he shall act as instructed or authorized by the Engineer. The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in paragraph entitled "Changes in Work" of these specifications.

14. INTERPRETATIONS. If any person contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of these proposed contract documents, he may submit to the Engineer a written request for an interpretation thereof. The person submitting the request will be responsible for its prompt and actual delivery. Any interpretation of such documents will be made only by addendum duly issued, and a copy of such addendum will be mailed or delivered to each person receiving a set of such documents. The Owner will not be responsible for any other explanation or interpretation of such documents which anyone presumes to make on behalf of the Owner before expiration of the ultimate time set for the receipt of bids.

15. REPORTS RECORDS AND DATA. The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.

16. SUPERINTENDENCE BY CONTRACTOR. The Contractor shall employ only competent and skilled men on the work. The Contractor shall have competent

Superintendent or Foreman present at all times when the work is in progress, who shall have full authority to act for the Contractor. It is understood that such representative shall be acceptable to the Engineer and shall be one who can be continued in that capacity for the particular job involved unless he ceases to be on the Contractor's payroll. The Contractor shall, upon demand from the Engineer, immediately remove any superintendent, foreman or workman whom the Engineer may consider incompetent or undesirable.

17. CHANGES IN WORK. No changes in the work covered by the approved contract documents shall be made without having prior written approval of the Owner. Charges or credits for the work covered by the approved change shall be determined by one or more, or a combination of, the following methods:

(a) Unit bid prices previously approved.

(b) An agreed lump sum.

(c) The actual cost of:

1. Labor, including foremen.
2. Materials entering permanently into the work.
3. The ownership or rental cost of construction plant and equipment during the time of use on the extra work.
4. Power and consumable supplies for the operation of power equipment.
5. Insurance.
6. Social security.

To the cost under (c) there shall be added a fixed fee to be agreed upon but not to exceed 10 percent of the estimated cost of the work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expenses.

18. EXTRAS. Without invalidating the contract, the Owner may order extra work or make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly, and the consent of the surety being first obtained where necessary or desirable. All the work of the kind bid upon shall be paid for at the price stipulated in the proposal, and no claims for any extra work or materials shall be allowed unless the work is ordered in writing by the Owner, or the Engineer acting officially for the Owner, and the price is stated in such order. Extra work shall be performed only upon the execution of authorized change orders as set forth in the preceding paragraph.

19. TIME FOR COMPLETION AND LIQUIDATED DAMAGES. It is hereby understood and mutually agreed by and between the Contractor and the Owner that the date of beginning and the time for completion as specified in the contract of the work to be done hereunder are essential conditions of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the Notice to Proceed.

19.1 Regular Prosecution of Work. The Contractor agrees that said work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for completion of the work described herein is a reasonable time for completion of same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

19.2 Liquidated Damages. If the Contractor shall neglect, fail, or refuse to complete the work within the time herein specified, or any proper extensions thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount specified in the contract not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the contract for completing the work. The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticality and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

19.3 Extensions of Time for Completion. It is further agreed that time is of the essence of each and every portion of this contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the contractor an additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this contract. Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

(a) To any preference, priority or allocation order duly issued by the Government.

(b) To unforeseeable cause beyond the control and without the fault or negligence of the Contractor including, but not restricted to, acts of the public enemy, acts of the Owner, acts of another contractor in the performance of a contract with the Owner; fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, hurricanes, tornadoes; and

(c) To any delays of subcontractors or suppliers occasioned by any of the causes specified in subsections (a) and (b) of this article.

Provided, further that the Contractor shall, within seven (7) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner in writing of the causes of delay, who shall ascertain the facts and extent of delay and notify the Contractor within a reasonable time of its decision in the matter, and grant such extension of time as the Owner shall deem suitable and just.

Normal weather conditions for the project area are taken into consideration in the time for completion of the contract; therefore, no extension of time will be extended for normal weather conditions, with the exception of hurricanes and tornadoes.

20. CORRECTION OF WORK. All work, all materials, whether incorporated in the work or not, all processes of manufacturer, and all methods of construction, shall be at all times and places subject to the inspection of the Engineer, who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction of the purposes for which they are used. Should they fail to meet his approval, they shall be forthwith reconstructed, made good, replaced and/or corrected, as the case may be, by the Contractor at his own

expense. Rejected material shall immediately be removed from the site. If in the opinion of the Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the contract documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as, in the judgment of the Engineer, shall be equitable.

21. SUBSURFACE CONDITIONS FOUND DIFFERENT. Should the Contractor encounter subsurface and/or latent conditions at the site materially differing from those shown on the plans or indicated in the specifications, he shall immediately give notice to the Engineer of such conditions before they are disturbed. The Engineer will thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the plans or indicated in the specifications, he will at once make such changes in the plans and/or specifications as he may find necessary; any increase or decrease of cost resulting from such changes to be adjusted in the manner provided in paragraph 17 of these specifications.

    (a) Where no specific subsurface conditions are indicated or specified, no increase in cost will be considered in regards to subsurface conditions encountered.

22. CLAIMS FOR EXTRA COSTS. No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Engineer, as aforesaid, and the claim presented with the first estimate after the changes or extra work is done. When work is performed under the terms of subparagraph 17(c) of these specifications, the Contractor shall furnish satisfactory bills payrolls and vouchers covering all items of cost and when requested by the Owner, give the Owner access to accounts relating thereto.

23. RIGHT OF OWNER TO TERMINATE CONTRACT. In the event that any of the provisions of this contract are violated by the Contractor or by any of his subcontractors, the Owner may serve written notice upon the Contractor and the surety of its intention to terminate the contract, such notices to contain the reasons for such intention to terminate the contract, and unless within 10 days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement or correction be made, the contract shall, upon the expiration of said 10 days, cease and terminate. In the event of any such termination, the Owner shall immediately serve notice thereof upon the surety and the Contractor, and the surety shall have the right to take over and perform the contract; provided, however, that if the surety does not commence performance thereof within 10 days from the date of the mailing to such surety of notice of termination, the Owner may take over the work and prosecute same to completion by the contract or by force account for the account and at the expense of the Contractor, and the Contractor and his surety shall be liable to the Owner for any excess cost occasioned thereby, and in such event the Owner may take possession of and utilize in completion the work such materials, appliances and plant as may be on the site of the work and necessary therefore. If the Contractor should die, be declared an incompetent, be declared bankrupt or insolvent, make an assignment for the benefit of creditors during the term of his contract, the Owner may terminate the contract in the manner and under the procedure set forth above with the exception that no notices to the Contractor shall be required, but in lieu thereof the Owner must make a reasonable effort to notify the estate of the Contractor, his guardian, assignee, or legal representative of the intention to terminate and fact of termination, if there is any such guardian, assignee, or legal representative at the time the Owner desires to terminate.

24. CONSTRUCTION SCHEDULE AND PAYMENT ESTIMATES. Immediately after execution and delivery of the contract and before the first partial payment is made, the Contractor shall deliver to the Owner an estimated construction progress schedule in form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the contract documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule.

24.1 Contractor's Payment Estimate. The Contractor shall also furnish:

(a) A detailed payment estimate, giving a complete breakdown of the contract price; and

(b) Periodic itemized estimates of work done for the purpose of making partial payments thereon. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for addition to or deductions from the contract price.

24.2 Equipment Delivery Schedule. The Contractor shall also prepare a schedule of anticipated shipping dates for materials and equipment. It is intended that equipment and materials be so scheduled as to arrive at the job site just prior to time for installation to prevent excessive materials on hand for inventory and the necessity for extensive storage facilities at the job site.

25. PAYMENTS TO CONTRACTOR shall be made according to the following:

(a) Payments to the Contractor will be made within thirty (30) days upon receipt of a duly certified approved estimate of the work performed during the preceding calendar month under this contract, but to insure the proper performance of this contract, the Owner will retain a portion of each estimate until final completion and acceptance of all work covered by this contract in accordance with the following:

1) Retention of up to 10% of payment claimed until construction is complete.

(b) In preparing the payment request, the material delivered on the site and preparatory work done may be taken into consideration.

(c) All material and work covered by partial payments shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the Owner to require the fulfillment of all the terms of the contract.

25.1 Owner's Right to Withhold Certain Amounts and Make Application Thereof. The Contractor agrees that he will indemnify and save the Owner harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this contract. The Contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid,

discharged, or waived. If the Contractor fails so to do, then the Owner may, after having served written notice on the contractor, either pay unpaid bills, of which the Owner has written notice, direct, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed in accordance with the terms of this contract, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor or his surety. In paying any unpaid bills of the Contractor, the Owner shall be deemed the agent of the Contractor, and any payment so made by the Owner shall be considered as a payment made under the contract by the Owner to the Contractor, and the Owner shall not be liable to the Contractor for any such payment made in good faith.

26. ACCEPTANCE OF WORK AND FINAL PAYMENT. Before final acceptance of the work and payment to the Contractor of the percentage retained by the Owner, the following requirements shall be complied with:

(a) Final Inspection. Upon notice from the Contractor that his work is completed, the Engineer will make a final inspection of the work and shall notify the Contractor of all instances where his work fails to comply with the contract drawings and specifications, as well as any defects he may discover. The Contractor shall immediately make such alterations as are necessary to make the work comply with the contract drawings and specifications, and to the satisfaction of the Engineer.

(b) Operating Test. After the alterations for compliance with the contract drawings and specifications have been made, and before acceptance of the whole or any part of the work, it shall be subjected to test to determine that it is in accordance with the contract drawings and specifications. The Contractor shall maintain all work in first class condition for a thirty (30) day operating period after the work has been completed as a whole, the final inspection has been made, and the Engineer has notified the Contractor in writing that the work has been finished to his satisfaction. The retained percentage as provided herein will not become due or payable to the Contractor until after the thirty (30) day operating period has expired.

(c) Cleaning Up. Before the work is considered as complete, all rubbish and unused material due to or connected with the construction must be removed and the premises left in a condition satisfactory to the Owner. Streets, curbs, crosswalks, pavements, sidewalks, fences and other public and private property disturbed or damaged should be restored to their former condition. Final acceptance will be withheld until such work is finished.

(d) Liens. Final acceptance of the work will not be granted and the retained percentage will not be due or payable until the Contractor has furnished the Owner proper and satisfactory evidence under oath that all claims for labor and material employed or used in the construction of the work under this contract have been settled, and that no legal claims can be filed against the Owner for such labor or material.

(e) Final Payment. Upon completion of all cleaning up, alterations and repairs required by the final inspection or operating test, the satisfactory completion of the operating test, and upon submitting proper and satisfactory evidence to the Owner that all claims have been settled, the Contractor shall then prepare his final payment estimate. After review and approval of the final

payment estimate by the Engineer and the Owner, the payment shall then become due.

27. ACCEPTANCE OF FINAL PAYMENT AS RELEASE. The acceptance by the Contractor of final payment shall be and shall operate as a release to the owner of all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of this work. No payment, final or otherwise, shall operate to release the Contractor or his sureties from any obligations under this Contract or his sureties from any obligations under this contract or the performance and payment bond.

28. PAYMENTS BY CONTRACTOR. The Contractor shall pay:

(a) For all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered;

(b) For all materials, tools, and other expendable equipment to the extent of ninety (90) percent of the cost thereof not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof not later than the 30th day following completion of that part of the work in or on which such materials, tools, and equipment are incorporated or used; and

(c) To each of his subcontractors not later than the 5th day following each payment to the Contractor, the respective amounts allowed the Contractor on account of the work performed by his subcontractors to the extent of each subcontractor's interest therein.

29. INSURANCE. The Contractor shall procure and shall maintain during the life of this contract, whether such operation be by himself or by a subcontractor or anyone directly or indirectly employed by either of them, such insurance as required by statute and/or ordinance to adequately protect the Owner from any claims or damages, including bodily injury or death, which may arise from them during operations under this contract.

29.1 Limits of Liability. Insurance shall be obtained for not less than the limits of liability as specified in Section 00110-Insurance Requirements.

29.2 Certificates of Insurance. The Contractor shall furnish the Owner, if requested, certificates showing the type, amount, class of operations covered, effective dates and dates of expiration of the policies. Such certificates shall contain substantially the following statement: "The insurance covered by this certificate will not be cancelled or materially altered except after 30 days written notice has been received by the Owner".

30. PAYMENT AND PERFORMANCE BONDS. The Contractor shall furnish a 110 percent performance bond and a 100 percent payment bond as security for the faithful performance of this contract, as security for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract. The performance bond and payment bond shall be in separate instruments. Before the final acceptance, each bond must be approved by the Owner.

31. ASSIGNMENTS. The Contractor shall not assign the whole or any part of this contract or any sums of money due or to become due hereunder without the written

consent of the Owner. In case the Contractor assigns all or any part of any sums of money due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that is agreed that the right of the assignee in and to any sums of money due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for the performance of the work called for in this contract.

32. MUTUAL RESPONSIBILITY OF CONTRACTORS. If through acts of neglect on the part of the Contractor, any other contractor or any subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other contractor or subcontractor by agreement or arbitration. If such other contractor or subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any such claim.

33. SEPARATE CONTRACTS. The Contractor shall coordinate his operations with those of other contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including his subcontractor, shall keep informed of the progress and the detail work of other contractors and shall notify the Engineer immediately of lack of progress or defective workmanship on the part of other contractors. Failure of a contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with his own work.

34. SUBCONTRACTING shall comply with the following:

(a) The Contractor may utilize the services of specialty contractors on those parts of the work that under normal contracting practices are performed by specialty subcontractors.

(b) The Contractor shall not award any work to any subcontractor without the prior written approval of the Owner, which approval will not be given until the Contractor submits to the Owner a written statement concerning the proposed award to the subcontractor, which statement shall contain such information as the Owner may require.

(c) The Contractor shall be as fully responsible to the Owner for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons employed by him.

(d) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and other contract documents insofar as applicable to the work of subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contract under any provisions of the contract documents.

(e) Nothing contained in this contract shall create any contractual relation between any subcontractor and the Owner.

35. ENGINEER'S AUTHORITY. The Engineer shall determine the amount, quality, acceptability and fitness of the several kinds of work and materials which are to be paid for under this contract and shall decide all questions which may arise in

relation to said work and the construction thereof. The Engineer's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said contract or specifications, the determination or decision of the Engineer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

35.1 Interpretation of Drawings and Specifications. The Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work that may arise between the Contractor under this contract and other contractors performing work for the Owner shall be adjusted and determined by the Engineer.

36. ALLOWANCES: N/A.

37. USE OF PREMISES AND REMOVAL OF DEBRIS. The Contractor expressly undertakes at his own expense:

(a) To take every precaution against injuries to persons or damage to property.

(b) To store his apparatus, materials, supplies, and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other contractors.

(c) To place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work.

(d) To clean up frequently all refuse, rubbish, scrap materials, and debris caused by his operations, to the end that at all times the site of the work shall present a neat, orderly and workmanlike appearance.

(e) Before final payment to remove all surplus material, falsework, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from his operations, and to put the site in a neat, orderly condition.

(f) To effect all cutting, fitting or patching of his work required to make the same conform to the plans and specifications, and, except with the consent of the Engineer, not to cut or otherwise alter the work of any other contractor.

38. QUANTITIES OF ESTIMATE. The estimated quantities of work to be done and materials to be furnished under this contract, shown in any of the documents, including the proposal, are given for use in comparing bids, and the right is specially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this contract, and such increase or diminution shall in no way vitiate this contract, nor shall any such increase or diminution give cause for claims or liability for damages.

39. RIGHT-OF-WAY AND SUSPENSION OF WORK. The Owner shall furnish all land and rights-of-way necessary for the carrying out of this contract and the completion of the work herein contemplated, and will use due diligence in acquiring said land and rights-of-way as speedily as possible. But it is possible that all lands and rights-of-way may not be obtained as herein contemplated before construction begins, in which event the Contractor shall begin his work upon such land and rights-of-way as the Owner may have previously acquired, and no claim for

damages whatsoever will be allowed by reason of the delay in obtaining the remaining lands and rights-of-way.

Should the Owner be prevented or enjoined from proceeding with the work, or from authorizing its prosecution, either before or after the commencement, by reason of any litigation or by reason of its ability to procure any lands or rights-of-way for said work, the Contractor shall not be entitled to make or assert claim for damage by reason of said delay or to withdraw from the contract except by consent of the Owner; but time for completion of the work will be extended to such time as the Owner determines will compensate for the time lost by such delay, such determination to be set forth in writing.

40. GENERAL WARRANTY FOR ONE YEAR AFTER COMPLETION OF CONTRACT. For a period of at least one year after the completion of the contract, the Contractor warrants the fitness and soundness of all work done and materials and equipment put in place under the contract, and neither the final certificate of payment nor any provision in the Contract Documents nor partial or entire occupancy of the premises by the Owner shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting there from, which shall appear within a period of one year from the date of final acceptance of the work, unless a longer period is specified. The Owner will give notice of observed defects with reasonable promptness. This warranty period shall be extended as necessary to include additional warranty periods required by permitting agencies.

41. NOTICE AND SERVICE THEREOF. Any notice to any Contractor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted by registered mail to said Contractor or his authorized representative on the work or is deposited in the regular United States Mail in a sealed, postage prepaid envelope and the receipt thereof is acknowledged by the Contractor.

    41.1 Owner's Notice. All papers required to be delivered to the Owner shall be delivered as indicated in Section 00800 entitled Supplemental General Conditions.

42. REQUIRED PROVISIONS DEEMED INSERTED. 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 by physically amended to make such insertion or correction.

43. PROTECTION OF LIVES AND HEALTH. In order to protect the lives and health of his employees under the contract, the Contractor shall comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the contract. The Contractor alone shall be responsible for the safety, efficiency and adequacy of his plant, appliances and methods, and for any damage that may result from their failure or their improper construction, maintenance or operation.

44. WAGES AND OVERTIME COMPENSATION. The Contractor and each of his subcontractors shall comply with all applicable State and local laws or ordinances

with respect to the hours worked by laborers and mechanics engaged in work on the project and with respect to compensation for overtime.

45. PROHIBITED INTERESTS. No official of the Owner, who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction, or material supply contract or any subcontract in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No officer, employee, architect, attorney, engineer, or inspector of and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project shall become directly or indirectly interested personally in this contract or in any part hereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the project.

46. CONFLICTING CONDITIONS. Any provisions in any of the Contract Documents which may be in conflict or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or inconsistency.

47. INDEMNIFICATION

47.1 The CONTRACTOR will indemnify and hold harmless the OWNER, the ENGINEER and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the WORK, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting there from; and is caused in whole or in part by any negligent or willful act of omission of the CONTRACTOR and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

47.2 In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by an employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.

47.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, its agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, design or specifications.

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00800
SUPPLEMENTARY CONDITIONS

1. WORKING HOURS

   The Contractor is allowed to work during regular working hours from 7:00 AM to 6:00 PM unless warranted due to emergency conditions.

   Weekend work must be approved in advance by the Owner.

2. ELECTRICAL OUTAGES

   The Contractor is advised that electrical outages will need to be scheduled with the Owner. The work must be scheduled in a manner to minimize the electric power outage time. Overnight outages are expected to perform the swap from existing transclosure T4 to new pad mounted transformers. The Contractor shall notify the Owner at least 5 days before the outage is expected to begin and at least 25 hours before the power is disconnected.

3. BUSINESS LICENSE AND PERMITS

   The selected contractor shall be required to obtain a per-job city business license. Contact the Finance Department, at 843-545-4007, to obtain a City business license. Business fee is based on the total contract amount.

4. PROJECT SCHEDULE OF EVENTS

The following is the schedule of events listed in the order of occurrence, showing the major milestones from issuance of the RFB to the contract completion:

No.	PROJECT MILESTONE EVENTS	DATE	LOCAL TIME
1	Request for Construction Bid (RFB) Release	Wed, October 30, 2024	
2	Non-mandatory Pre-Bid Meeting	Thurs, November 7, 2024	10:30 AM
3	Deadline for questions - emailed to: purchasing@georgetownsc.gov	Wed, November 13, 2024	4:00 PM
4	Deadline for addenda to be posted to the City's website, www.georgetownsc.gov, under “Bids”	Tues, November 19, 2024	4:00 PM
5	Bid opening date	Wed, November 27, 2024	2:00 PM
6	City Council approval (Tentative)	Thurs, December 19, 2024	
7	Construction Notice of Award (Tentative)	Thurs, January 2, 2025	
8	Construction Notice to Proceed (Tentative)	Mon, January 20, 2025	
9	Construction Contract Completion (90 calendar days after NTP)	April 20, 2025	
10	Project Closeout (30 calendar days after completion)	May 30, 2025	

When the Purchasing Division is closed due to force majeure, bid openings will be postponed to the same time on the next official business day.

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 00900

DRAWING INDEX

TITLE	DRAWING NO.
TITLE SHEET	G3001
OVERALL EQUIPMENT LOCATION PLAN	E3001
ELECTRICAL PLAN EXISTING	E3002
ELECTRICAL PLAN NEW	E3003
CONSTRUCTION SEQUENCE	E3004
BILL OF MATERIALS	E3005
MISCELLANEOUS DETAILS	E3011
MANHOLE T4A	E3016
MANHOLE T4B	E3017
PULLBOX 11	E3031
CONDUIT AND CABLE SCHEDULE	E3040
CABLE TAGS	E3041
TRANSFORMER DETAILS	E3050
ONE-LINE DIAGRAM EXISTING	E3100-1
ONE-LINE DIAGRAM NEW	E3100-2
STRUCTURAL GENERAL NOTES	S3001
TRANSFORMER PAD	S3002

(END OF SECTION)

SECTION 01000
LOCAL VENDOR PREFERENCE OPTION – MANDATORY VENDOR SUBMITTAL FORM

Local Vendor Preference Option

1. A vendor shall be deemed a Local Georgetown City/County vendor for the purposes of this Section if such vendor is an individual, partnership, association or corporation that is authorized to transact business within the State, maintains an office in Georgetown County, and maintains a representative inventory or commodities within the City/County on which the bid is submitted, and has paid all taxes and business license fees duly assessed.

2. This option allows the lowest local bidder whose bid is within five-percent (5%) of the lowest non-local Bidder to match the bid submitted by the non-local Bidder and thereby be awarded the contract. This preference shall apply only when (a) the total dollar purchase is $10,000 or more; (b) the vendor has a physical business address located and operating within the limits of Georgetown County and has been doing business in the City/County for a period of twelve (12) months or more; and (c) the vendor provides proof of payment of all applicable Georgetown City/County taxes, business license and fees if so requested.

3. Should the lowest responsible and responsive Georgetown City/County bidder not exercise its right to match the bid as granted herein, the next lowest qualified Georgetown City/County bidder shall have that right and so on. The right to match the non-Georgetown City/County bidder's bid shall be exercised within 24 hours of notification.

4. In order to qualify for the local preference authorized by this Section, the vendor seeking same shall be required to submit with its bid a statement containing relevant information which demonstrates compliance with the provisions of this Section. This statement shall be on the "MANDATORY VENDOR SUBMITTAL" form included in this bid document. Failure to provide such affidavit at the time the bidder submits its bid shall constitute a waiver of any claim for preference.

5. For all contracts for architecture, professional engineering, or other professional services governed by Section 2-187, Professional and Construction Services, the City shall include the local business status of a firm among the factors considered when selecting which firms are "most highly qualified." In determining which firm is the "most qualified" for purposes of negotiating a satisfactory contract, preference shall be given to a local business where all other relevant factors are equal.

6. Local preference shall not apply to the following categories of contracts:

(a) Goods or services provided under a cooperative purchasing agreement or similar "piggyback" contract;

(b) Contracts for professional services except as provided for in Section 2-187 above;

(c) Purchases or contracts which are funded, in whole or in part, by a governmental or other funding entity, where the terms and conditions of receipt of the funds prohibit the preference;
(d) Purchases or contracts made pursuant to a noncompetitive award process, unless otherwise provided by this section; or
(e) Any bid announcement which specifically provides that the general local preference policies set forth in this section are suspended due to the unique nature of the goods or services sought, the existence of an emergency as found by either
City Council or City Administrator, or where such suspension is, in the opinion of the City Attorney, required by law.

MANDATORY VENDOR SUBMITTAL FORM

☐ I certify that [Company Name] _____

is a **Resident Bidder** of Georgetown City/County as defined in the City of Georgetown Ordinance Chapter 2 Administration, Article IV Procurement, Section 2-185, and our principal place of business is _____ [City and State].

☐ I certify that [Company Name] _____

is a **Non-Resident Bidder** of Georgetown City/County as defined in the City of Georgetown Ordinance Chapter 2 Administration, Article IV Procurement, Section 2-185, and our principal place of business is _____ [City and State].

(X)_____

Signature of Company Officer

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 01001
SUMMARY OF THE WORK

Project Description

The work in this contract consists of the upgrade and replacement of the downtown Front Street electric power distribution system in Georgetown, SC; including all its appurtenances, site work, and any off-site improvement required or necessary; shown on the drawings; all in accordance with the Bidding and Contract Requirements, Specifications and the accompanying Drawings, excepting only those items specifically shown, noted or specified as not in contract.

Scope of Services

The successful candidate must be able to provide materials and labor to perform work at the Georgetown Front St electric power distribution system in Georgetown, SC. The work will be performed for the City of Georgetown, SC.

The project includes but is not limited to the below described work as indicated on the drawings and in the project specifications. Details for the sequence of work to be completed is shown in the drawings.

- Remove existing underground three phase 12.47 kV primary underground cables between West Dip Pole and existing transclosure T4 (via manholes MHT4A and MHT4B), and between existing transclosure T4 and T3's junction cabinet JCT3. The existing primary underground cable between will be replaced with to new cable pulled from new pad mount transformers T4.
- Remove existing three phase 240 V and single phase 120/240 V secondary underground cables serving pull box PB11 via manholes MHT4A and MHT4B from existing transclosure T4. Existing service cables will be reused or replaced as necessary.
- Existing services directly connected inside existing transclosure T4 will need to be relocated to be served from existing manhole MHT4B.
- Remove existing transclosure T4, including the enclosed pole-type transformers.
- Clean up and repair areas remaining after existing equipment has been removed. Including removal of unused concrete, wood structures, or signs, leveling and grass seeding, and restoration of pavement.
- Clean and drain water out of manholes MHT4A and MHT4B and pull box PB11. Clean and inspect manhole and pull box interior surfaces. Advise the City of any concerns about integrity.
- Remove existing cable wall supports and cable support brackets in manholes and pull box and replace with new cable wall supports and cable support brackets. Remove existing ground wire and replace with new ground wire and rods. Make ground connections to new cable wall supports.
- Provide and install cast-in-place or precast transformer foundation as indicated on the drawings. Install new pad mount transformers T4.
- Provide and install new underground conduits for new T4 pad mount transfomers as indicated on the drawings. These conduits will need to be connected into existing underground duct bank.
- Locate and modify existing underground duct bank to add new T4 pad mount transfomers to Front St underground distribution loop. Care should be taken to return all decorative pavers in the area back to original condition as much as possible. Restore all pavement disturbed during modifications.
- Provide and install new underground conduits for services from manhole MHT4B as indicated on the drawings.
- Install and test new three phase, 12.47 kV primary underground cables, including terminations at new transformers T4 and junction cabinet JCT3.

- Install new three phase 240 V and single phase 120/240 V secondary underground cables from new T4 pad mounted transformers as shown on the drawings. Connect existing underground service cables to the new secondary underground cables.
- Install all ground rods, ground conductors, and connections at all equipment.
- Provide and install name labels for all new pad-mounted transformers and cable tags for all cables as indicated on the drawings.
- Perform and document medium voltage cable tests as specified.
- Provide all required warning road signs, DOT traffic cones, pedestrian sidewalk safety guards etc. required to maintain a safe working environment as specified herein. Provide all traffic control as necessary.
- Provide all necessary equipment and permitting required for confined space entry.

The work must be scheduled in phases and in a manner to minimize the electric power outage time. The Contractor shall discuss and coordinate all outages with the Owner and notify the Owner at least 5 days before the outage is expected to begin and at least 24 hours before the power is disconnected.

The new pad mounted transformers and materials listed on drawing E3005 will be provided by the Owner. The transformers and other material shall be retrieved from the Owner's warehouse, transported, set in place and electrically connected by the Contractor. The Contractor is responsible for all materials not identified on E3005 including all conduit, labels, cable taping, cable tags, etc.

Site Work will include:

- Grading levelling, sloping, seeding as required around new pad-mounted transformer and removal of existing transclosure.
- Grade levelling, asphalt patching, paver repair, curb repair and seeding as required around duct bank modification.

Location of Underground Utilities

Obtain digging permits prior to start of excavation, and comply with installation requirements for locating and marking underground utilities. Verify existing utility locations indicated on contract drawings, within area of work.

Verify the elevations of existing piping, utilities, and any type of underground obstruction not indicated or specified to be removed in locations to be traversed by piping, ducts, and other work to be conducted or installed.

Owner Furnished Equipment

The City will furnish the following materials and equipment for installation by the Contractor:

- Pad mounted transformers, medium and low voltage cables, cable connectors, junction cabinets, pedestals, wall supports and brackets, grounding material, and connection hardware.

Salvage Material and Equipment

Items designated by the Engineer to be salvaged remain the property of the City. Segregate, itemize, deliver and off-load the salvaged property at the City designated storage area located within 5 miles of the construction site.

Provide a salvage plan, listing material and equipment to be salvaged, and their storage location. Maintain property control records for material or equipment designated as salvage. Use a system of property control that is approved by the Engineer. Store and protect salvaged materials and equipment until disposition by the Engineer.

(END OF SECTION)

SECTION 01002
INCORPORATION OF GENERAL CONDITIONS AND SUPPLEMENTARY GENERAL CONDITIONS

All requirements of the General Conditions and Supplementary General Conditions apply to all sections of the specifications and drawings for this project.

(END OF SECTION)

FRONT ST PHASE 3 UG INFRASTRUCTURE UPGRADE (T4)
CITY OF GEORGETOWN

SECTION 01003
OPERATION MANUALS

An operation manual shall be compiled by the contractor containing instructions, maintenance manuals, test reports and warranties for all material and equipment incorporated in the work.

At the completion of the work, the Contractor shall provide 5 sets of manufacturer's literature referencing specifications, operation, and maintenance for all equipment, combined in individual loose-leaf binders: 4 sets shall be provided to the CITY and 1 set shall be provided to the ENGINEER.

(END OF SECTION)

SECTION 02110
SITE PRESERVATION

GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other applicable Specification Sections, apply to this Section.

SUMMARY

This Section includes the following:

- Protection of trees
- Disposal of Undesirable Material Off-Site

Related Sections: The following Sections contain requirements that relate to this Section:

- Seeding Disturbed Areas (02900)

EXISTING CONDITIONS

Site Conditions:

- Contractor shall visit the site, familiarize himself with actual conditions and verify existing conditions in the field. Contractor shall notify the Engineer immediately upon finding any discrepancies between the existing site conditions and information shown on the plans.
- Record Information: Existing conditions are shown on the Demolition plan and are incorporated into Construction Documents.

PROTECTION

Bench Marks: Maintain carefully all bench marks, monuments and other reference points. If disturbed or destroyed, replace as directed by the Engineer.

Existing Utilities: Should any functioning underground utilities be uncovered during the work, the Contractor shall promptly notify the Engineer immediately in writing. The Contractor shall be held responsible for any damage to underground or overhead utility services and shall immediately repair and restore services at no additional cost to the Owner.

Existing Trees and Vegetation: Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning and bruising of bark, smothering of trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within drip line. Provide temporary guards to protect trees and vegetation to be left standing. Any vegetation designated to remain which is damaged by construction work shall be replaced with new vegetation of the same kind by the contractor responsible for such damage.

EXECUTION

CLEARING AND GRUBBING

Disposition: Objects and materials to be removed shall be removed cleanly, completely, and legally disposed of offsite at the expense of the Contractor. Salvageable topsoil to be reused on this project shall be stored at a location designated on site by Owner. Excess topsoil shall be disposed of off-site at the expense of the Contractor.

Limits of Work: Generally, all existing trees, whether shown on the Drawings or not, shall not be removed.

Coordination: Loose sticks, roots, branches, or other debris shall not be left on the site. The Contractor shall avoid the admixture of foreign matter to the topsoil.

PROTECTION OF EXISTING TREES TO REMAIN AND UNDISTURBED AREAS

Fencing: Trees to remain shall be protected by temporary fences constructed of wood, wire mesh, and metal as required, to provide complete protection. Erect fences at perimeter of spread of trees to protect feeding roots.

Cutting: Do not cut low-hanging branches on trees to be saved, unless approved by the ENGINEER. Any such branches which must be cut to eliminate obstructions shall be pruned by experienced treemen. Any such cuts, or any accidental injuries to the bark or trunk shall be immediately and properly trimmed.

Grading: Grades surrounding trees to remain shall be warped up or down, where possible, between existing grades of root area and new finished grades. Where fills under 2' occur, the fill shall consist of broken stone or washed gravel, for a distance of 3' from the trunk in all directions, the remaining fill being of light, friable topsoil. Do not disturb root system.

Prohibited Work: Stripping of topsoil, cutting, filling, or dumping of materials, will not be permitted within the spread of branches of trees to remain. Burning of combustible material is not permitted on the OWNER'S property

PROTECTION OF EXISTING SIDEWALKS, WALKWAYS, PARKING LOTS, AND PUBLIC ROADS.

The Contractor shall take preventative measures to ensure existing concrete sidewalks within the project working area are not chipped, stained, cracked, scratched or otherwise damaged. If any concrete sidewalk is damaged, the damaged area shall be repaired as specified.

The Contractor shall take preventative measures to ensure existing walkways, parking lots and public roads within the project working area are not damaged. If any damage occurs the Contractor shall repair the damaged area as specified. This includes gravel or paved parking lots and walkways beyond the street sidewalks.

(END OF SECTION)

SECTION 02900
SEEDING DISTURBED AREAS

GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other applicable Specification Sections, apply to this Section.

SUMMARY

All existing grass areas which are disturbed or denuded during the project by either trenching or otherwise shall be seeded as required and as shown on the Drawings and specified.

STORAGE OF MATERIALS

Store all materials in weather proof place with care to prevent loss of effectiveness or intrusion of foreign materials.

MATERIALS

Lime: Lime shall be ground limestone (Dolomite) containing not less than 85% total carbonates and shall be ground to such fineness that 50% will pass through a 100-mesh sieve and 90% will pass through a 20-mesh sieve.

Fertilizer: Commercial fertilizers shall be 16% Nitrogen, 4% Phosphate, 8% potash, and 0-20-0 Superphosphate, and shall conform to the applicable State of South Carolina Board of Agriculture fertilizer laws. It shall be uniform in composition, dry and free flowing, and shall be delivered to the site in the original unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer which becomes caked or otherwise damaged will not be acceptable.

Permanent Seed: Seed shall be a 50/50 blend of Rebel and Falcon fescues and shall have a minimum purity of 98%, minimum germination of 90%, and be free of noxious weed seeds. Seed shall be delivered to the site in sealed standard size containers, showing weight, analysis, name of vendor and germination test. Seed which has become wet, moldy, or otherwise damaged will not be accepted.

Topsoil: Topsoil shall be from project stockpile and shall be prepared by the contractor as to be free of sub-soil roots, branches, stones over 2” in diameter and other extraneous material. Waste shall be disposed of offsite by the Contractor.

Water: Water shall be potable and will be provided by the Contractor.

EXECUTION

SITE CONDITIONS

Unless otherwise approved by the Engineer, all other site work required by this Contract shall be complete and in place before grassing operations are begun. Work may be completed in parts if so requested by the Contractor and approved by the Engineer.

The Contractor shall locate, or have located, all public and private underground utilities which may affect work in this Section. Any utility damaged by work under this Section shall be repaired promptly by the Contractor. Repairs shall be done to the satisfaction of the respective utility Owner and all costs shall be borne by the Contractor.

PREPARATION OF AREAS TO BE SEEDED AND DENUDED AREAS

Prior to redistribution of topsoil and seeding, verify that all denuded areas are at required subgrade and scarify to a 4" depth and pulverize until the surface is smooth, friable and of a uniformly fine texture.

Remove stones and foreign material over 2" in any direction and grade for positive drainage.

Prepared topsoil shall be redistributed to a 4" minimum depth, over denuded areas to be planted with grass, ground covers, shrubs and trees. Pulverize until the surface is smooth, friable and of a uniformly fine texture.

All equipment shall be of size and type required for specified preparation of all areas to be seeded and shall be approved by the Engineer. Upon approval of the Engineer, the method of preparation may be varied by the Contractor under his responsibility to provide optimum conditions for seeding.

SEEDING AND FERTILIZATION

The following rates shall be applied:

- Lime shall be applied to all areas at the rate of 90 pounds per 1000 sq. ft.
- 16-4-0 fertilizer shall be applied to all areas at the rate of 20 pounds per 1000 sq. ft.
- 0-20-0 superphosphate shall be evenly distributed in all areas at the rate of 12 lbs. per 1000 sq. ft.

Fescue seed shall be evenly distributed over the prepared seed bed of proposed lawn areas, at the rate of 6 pounds per 1000 sq. ft. of area. Apply annual rye grass at the rate of 2 lbs. per 1000 sq. ft. only if seeded between October 15 and February 15.

Asphalt tack-coat shall be applied in the method and quantity required to hold mulch together and prevent displacement by wind or surface drainage.

All areas shall be seeded, and fertilized evenly at the rate specified, rolled once with a roller weighing not less than 100 pounds per lineal foot, tack coated as required, and watered thoroughly with a fine spray.

ACCEPTANCE

The Engineer shall be the sole judge as to whether or not the seeded areas are acceptable.

GUARANTEE FOR PERMANENT GRASS: The Contractor shall guarantee a live and vigorous stand of permanent grass at the time of acceptance of the work consisting of 90 percent coverage minimum of seeded grass. (No bare spots greater than 5 square feet, the total of which shall not exceed 2% of the lawn area).

CLEANUP: Upon completion of initial seeding work in this Section, the Contractor shall remove all equipment and materials not required for maintenance. All debris and waste material resulting from work in this Section shall be removed from the site.

(END OF SECTION)

SECTION 03100
CONCRETE FORMWORK

GENERAL

RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

DESCRIPTION OF WORK

Work Included This Section:

Work shall consist of providing all concrete formwork, form coatings and accessories required to complete the formwork for the pad mounted transformer pads as shown on the drawings.

Related Work Specified Elsewhere:

- Concrete Reinforcement (03200)
- Cast-In-Place / Ready-Mix Concrete (03300)

QUALITY ASSURANCE

Codes and Standards:

Unless otherwise shown or specified, design, construct, erect, maintain, and remove forms and related structures for cast-in-place concrete work in compliance with the American Concrete Institute Standard ACI 347, "Recommended Practice for Concrete Formwork".

MATERIALS

Forms for Exposed Finish Concrete:

Unless otherwise shown or specified, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood-faced or other acceptable panel type materials to provide continuous straight, smooth exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly placed concrete without bow or deflection.

Plywood for formwork for smooth exterior concrete shall be plywood complying with U. S. Products Standard PS-1 "B-B High Density Overlaid Concrete Form" Class I. Plywood for all other exposed concrete formwork shall not be less than 5/8", 5-ply Douglas fir plywood especially processed to resist moisture and conforming to Plyform Class I, B-B Ext-DFPA of U. S. Product Standard PS 1-66.

Forms for Unexposed Finish Concrete:

Form concrete surfaces which will be unexposed in the finished structure with plywood, boards, metal or other acceptable material. Provide lumber that is dressed on at least 2 edges and 1 side for tight fit.

ACCESSORIES

Form Ties: Shall be reviewed by the Engineer. Spreaders or wire ties shall not be used. Snap ties will be permitted except on exposed exterior surfaces where pull ties will be required. Ties shall have a minimum working strength when fully assembled of at least 3,000 pounds and shall be adjustable in

length as to permit complete tightening of forms and of such type as to leave no metal closer than 1-1/2" to the surface. They shall not be fitted with any lugs, cones, washers or other devices to act as a spreader within the forms or for any other purpose which will leave a hole or depression larger than 7/8" in diameter or a depression in excess of 1/8" back of the exposed surface. Furnish a sample of each exposed type.

Corner Formers: Corner formers shall be plastic with 3/4" radius equivalent to "Green Streak" corner formers, manufactured by:

- Grace Construction Products
- EFCO Corp.
- Vinylex Corporation

Form Releasing Agent: Form releasing agent Commercial Formulation Compounds with a maximum VOC of 350 Mg/L shall be non-staining "Debond" as manufactured by L & M Construction Chemicals or "Nox-Crete" Form Coating by Nox-Crete Chemical Co. or approved equivalent.

STORAGE OF MATERIALS

All materials shall be properly stored and protected from damage during time of non-use.

EXECUTION

DESIGN FORMWORK

Design, erect, support, brace and maintain formwork so that it will safely support all vertical and lateral loads that might be applied until such loads can be supported by the concrete structure. Carry vertical and lateral loads to the ground by the formwork system and by the in-place construction that has attained adequate strength for that purpose.

Design formwork to be readily removable without impact, shock or damage to the Cast-In-Place concrete surfaces and adjacent materials.

Side forms of footings may be omitted and concrete placed directly against the neat excavation only when requested by the Contractor and accepted by the Engineer. When omission of forms is accepted, provide additional concrete required beyond the minimum design profiles and dimensions of the footings as detailed to maintain 3 inch cover at all sides of reinforcing steel. Earth forms shall be wetted (damp), but not muddy before concrete is placed.

FORM CONSTRUCTION

General Requirements for Form Construction:

Construct forms to the exact sizes, shapes, lines and dimensions shown, and as required to obtain accurate alignment, location, grades, level and plumb work in the finished structures. Provide for openings offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and insets to obtain the required finishes. Formwork shall be constructed sufficiently tight to prevent leakage of concrete; to securely brace, shore and safely support construction loads and to prevent displacements.

CONTRACTOR shall be fully responsible for adequacy of formwork units. CONTRACTOR shall also be responsible for forms in conjunction with any structural steel work. Forms shall support loads that might be applied until concrete structure can support such loads and shall maintain their dimensional and surface correctness to produce members required by drawings.

Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent the loss of concrete mortar. Locate temporary openings on forms in as inconspicuous location as possible, consistent with the requirements of the work.

Provide openings in concrete formwork to accommodate work of other trades. Size and location of openings, recesses and chases are the responsibility of the trade requiring such items. Accurately place and securely support items to be built into forms.

Carefully form intersecting planes to provide true, clean-cut corners, with edge grain of plywood not exposed as form for concrete.

Form Ties:

Provide factory fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete surfaces upon removal. Ties that are to be removed from the wall shall be coated with cup grease or other approved material to facilitate removal.

The rods that are to be entirely removed from the walls shall be loosened 24 hours after the concrete is poured. All but a sufficient number of ties to hold the forms in place may be removed at that time.

Provide shores and struts with positive means of adjustment capable of taking up form work settlement during concrete placing operations, using wedges or jacks or a combination thereof. Provide trussed supports when adequate foundations for shores and struts cannot be secured.

Preparation of Form Surfaces: Coat the contact surfaces of forms with a form-coating compound before reinforcement is placed. Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces and will not impair subsequent treatment of concrete surfaces requiring bond or adhesion, or impede the wetting of surfaces to be cured with water or curing compounds. Thin form-coating compounds only with the thinning agent of the type and in amount and under the conditions of the form-coating compound manufacturer's directions. Do not allow excess form coating material to accumulate in the forms or to come into contact with concrete surfaces or reinforcing steel against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions. In no case shall the reinforcing steel and inserts be coated with this material.

INSTALLATION

Shall be in accordance with ACI 301 with particular attention being given to tolerances.

Inserts, Sleeves and Fastening Devices:

- See drawings, coordinate with all other trades and other Sections of the Specifications for extent, location, and details of materials to be embedded or placed in concrete.

- Sufficient time between erection of forms and placing of concrete shall be given to the various trades to permit the proper installation of their work. All devices installed in the forms shall be maintained in position and protected until the concrete pouring is completed.

- The installation of inserts, miscellaneous pipe sleeves, hangers, ties, angle supports, anchors, bolts, angle guards, dowels, thimbles, anchor slots, reglets blocking, nailers, and other materials for attachment of their work to concrete shall be under this Section under the super-vision and at the location furnished by the trades requiring these devices. Do not install sleeves in any concrete footing, slab, or pier without Engineer’s approval.

Control Joints: See Section 03300 for treatment of control and construction joints, including wood screeds, metal keyways and sawcuts. Locate as indicated within the drawings and specifications.

Edge Forms and Screeds Strips For Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in the finished slab surface. Provide and secure units to support types of screeds required.

Removal of Forms: Forms shall be removed in accordance with requirements of ACI Manual of Concrete Practice without damage to concrete and in a manner to insure complete safety to the structure. Leave shoring in place until concrete member will safely support its own weight plus any live loads that may be placed upon it or until the concrete has obtained a strength acceptable to the Engineer. Upon removal of forms, the Contractor shall notify the Engineer in order that a review of the newly stripped surfaces may be made prior to patching. Should the forms be removed sooner than 7 days after pouring, the resulting exposed surfaced shall be sprayed with the curing compound specified in Section 03300.

RESHORING

Reshoring for the purpose of early form removal, where permitted by the Engineer, shall be performed so that at no time will large areas of new construction be required to support their own weight. When reshores are required, they shall be installed not later than the end of the working day in which stripping occurs.

While reshoring is underway, no live loads shall be permitted on the new construction. Reshores shall be tightened to carry their required loads but they shall not be over tightened so that the new construction is overstressed. Reshores shall remain in place until the concrete has reached its specified 28 day strength, unless otherwise specified or permitted.

RE-USE OF FORMS

Clean and repair the surfaces of forms that are to be reused in the work, except that split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Apply new form coating compound material to all concrete contact form surfaces as specified for new formwork.

When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance and tighten forms to close all joints. Align and secure all joints to avoid offsets. Do not use "Patched" forms for exposed concrete surfaces, except as acceptable to the Engineer. Any form works deemed unacceptable by Engineer shall be rejected.

(END OF SECTION)

SECTION 03200
CONCRETE REINFORCEMENT

GENERAL

RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

DESCRIPTION OF WORK

Work Included This Section: Work shall include providing the following and all other items related to concrete reinforcement:

- Metal Reinforcement
- Metal Accessories
- Plastic Accessories

Related Work Specified Elsewhere:

- Concrete Formwork (03100)
- Cast-In-Place / Ready-Mix Concrete (03300)

QUALITY ASSURANCE

Standard Reference:

The Standard Reference shall be the ACI 301, hereinafter called ACI; The American Welding Society Structural Welding Code and ASTM Specifications as listed.

The current edition of the following standard reference shall apply to the work of this Section. CONTRACTOR shall be responsible for obtaining latest edition.

1. ASTM A82: Specifications for Cold Drawn Steel Wire for Concrete Reinforcement.
2. ASTM A185: Specification for Welded Steel Wire Fabric For Concrete Reinforcement.
3. ASTM A615: Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
4. ACI 301: Specifications for Structural Concrete for Buildings.
5. ACI 315: Manual for Standard Practice for Detailing Reinforced Concrete Structures.
6. ACI 318: Building Code Requirements for Reinforced Concrete.
7. AWS D1.1: Structural Welding Code.

SUBMITTALS

Shop Drawings:

Drawings shall be prepared under supervision of a registered Professional Engineer in the State of South Carolina. Shop Drawings shall show for fabrication, bending, and placement of concrete reinforcement. Comply with ACI SP-66, "ACI Detailing Manual," showing bar schedules, stirrup spacing, diagrams of bent bars, bar lists, and arrangement of concrete reinforcement. placing plans, bending details, and bar lists. Wall reinforcing shall be shown in elevation. Location and arrangement of sleeves, inserts, accessories, etc. shall be clearly indicated.

Reinforcing bars shall not be erected or set in place before the approved shop drawings have been returned to the Contractor.

Only shop drawings completely checked by the Fabricator and General Contractor will be considered by the Designer. Approval of shop drawings is for design only. Contractor is responsible for dimensions, quantities, and coordination with other trades.

As specified and in accordance with Section 03300-1 "Cast-In-Place Concrete". Submit copies of Manufacturer's printed technical literature and performance data on the fiber reinforcing proposed for use in project.

STORAGE OF MATERIALS:

Reinforcing steel delivered to the job, and not immediately placed in forms, shall be stored under cover and protected from mud, rusting, oil, grease or distortion.

CLEANING:

At the time of placing concrete, reinforcing shall be free from rust, oil, corrosion, scale or other coatings that will destroy or reduce bond.

PRODUCTS

MATERIALS

Steel Reinforcement: Steel Reinforcement shall be deformed type bars conforming to ASTM A 615. Reinforcement shall be manufactured from new billet steel of American manufacture, and shall conform to ASTM A 615, Grade 60 with a yield strength of 60,000 psi.

Welded Wire Fabric: Welded Wire Fabric shall conform to the requirements of ASTM A 185. Size and gauge shall be as indicated on Drawings.

Steel Accessories: Include all spacers, ties, chairs, bolsters and other devices required to properly support and fasten reinforcing steel in place in accordance with the requirements of ACI 315. Chairs and other accessories shall have plastic-tipped feet. Location and types of supports shall be shown on shop drawings. Accessories and elements required by other trades shall be shown on shop drawings, furnished by those trades, and installed under this Section.

Shop Fabrication: Reinforcing steel shall be fabricated to shapes and dimensions indicated on the Drawings and in compliance with applicable provisions of ACI 315 and ACI 318. Bars shall be bent cold in the shop and no bars shall be bent in the field.

INSPECTION

The Contractor must examine the conditions under which concrete reinforcement is to be placed, and notify the Engineer in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Contractor.

INSTALLATION

Placement:

- Reinforcement shall be placed accurately in accordance with the Drawings and adequately secured in position with metal chairs, spacers with ties and other devices to properly support and fasten in accordance with ACI.

- Steel reinforcement, at the time concrete is placed, shall be free from rust, scale, mud or other coatings that will destroy or reduce bond. Bars with kinks or bends not shown on the plans shall not be used. Steel reinforcement shall be accurately placed in accordance with the plans. Secure in position with not less than 16-gauge annealed wire or suitable clips at intersections. Hold securely the required distance from the forms by concrete or metal chairs and spacers. Nails shall not be driven into outside forms or support reinforcement.

Splicing: Splices and offsets of reinforcing shall be in accordance with ACI 318 and as shown and noted on the drawings. All reinforcing splices shall have a minimum lap of 36 bar diameters unless noted otherwise. All reinforcement shall be accurately placed in the forms and securely tied in position prior to placement of concrete.

Wire Fabric: Install as indicated on Drawings. Lap all joints 6" and wire securely. Extend mesh to within 2" of all sides and ends of slabs.

(END OF SECTION)

SECTION 03300
CAST-IN-PLACE / READY-MIX CONCRETE

GENERAL

RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

DESCRIPTION OF WORK

Work Included This Section:

Work of this Section shall include furnishing all labor and materials required to provide all cast-in-place / ready-mix concrete.

All structural concrete work shall be done in accordance with the applicable sections of ACI 301, Specifications for Structural Concrete. The project superintendent and concrete foreman shall have a copy of the ACI Field Reference Manual, SP-15, on the Project site and shall be familiar with the contents thereof.

Related Work Specified Elsewhere:

- Concrete Formwork (03100)
- Concrete Reinforcement (03200)

CODES AND STANDARDS

Standards and Specifications: All standards and specifications mentioned in this Section refer to the latest edition, unless otherwise noted, and shall be considered as a part of the specification except where otherwise specified herein.

ASTM Standards:

- C33 Specification for Concrete Aggregates.
- C94 Specification for Ready-Mixed Concrete.
- C150 Specification for Portland Cement.
- C233 Testing Air-Entraining Admixtures for Concrete.
- C260 Specification for Air-Entraining Admixture for Concrete.
- C309 Specification for Liquid Membrane Forming Compounds for Curing Concrete.
- C494 Standard Specification for Chemical Admixtures for Concrete.

DELIVERY AND PROTECTION OF MATERIALS

Deliver ready-mixed concrete in compliance with requirements set forth in ASTM C-94, except as otherwise indicated.

Severe Weather Provisions: Protect concrete from physical damage or reduced strength due to weather extremes. In cold weather, comply with ACI 306.

PRODUCTS

MATERIALS

Portland Cement: ASTM C150, Type 1. Use one brand of cement throughout project. No Fly Ash shall be used.

Aggregate: The maximum size of coarse aggregate for reinforced concrete shall be 3/4 the distance between bars, or 1/5 narrowest dimension between forms, or 1/3 the depth of slabs, whichever is the smallest. Provide aggregates from a single source for exposed concrete.

Normal Weight Aggregates: ASTM C33.

Water: Water shall be potable and free from deleterious amounts of oils, acids, alkalies, and organic matter. (Drinkable).

Ready-Mix Concrete: The concrete shall be mixed in accordance with the recommendations of the National Ready-Mix Concrete Association. Attention is called to Paragraph 14 of ASTM C94; the certification in its entirety, as called for by this paragraph shall be obtained by the Contractor and kept on file at the Project site.

INSPECTION OF WORK BEFORE PLACING

The Contractor shall inspect the work to receive cast-in-place concrete for deficiencies which would prevent proper execution of the finished work. Do not proceed with placing until such deficiencies are corrected. Do not place concrete on earth until the fill or excavation has been compacted as set forth under Applicable Sections of the Specifications.

Do not place concrete in forms until all foreign matter has been removed from the forms and the reinforcing steel is in proper position for the placement of concrete.

PLACEMENT OF CONCRETE

Preparation of Equipment and Place of Deposit: Before placing concrete, all equipment for mixing and transporting concrete shall be cleaned, all debris and ice removed from place to be occupied by the concrete, forms thoroughly wetted, except in freezing weather, or coated, and reinforcement thoroughly cleaned of ice or other coatings. Water shall be removed from place of deposit before concrete is placed.

Mixing: Concrete shall be mixed until uniform distribution of materials is obtained, and shall be discharged completely before the mixer is recharged. Ready-mix concrete shall be mixed and delivered in accordance with requirements set forth in the "Standard Specifications for Ready-Mixed Concrete", ASTM C94.

Conveying: Concrete shall be conveyed from mixer to place of deposit by methods which will prevent separation or loss of materials. Equipment for chute, pumping, or pneumatically conveying concrete shall be of such size and design as to assure practically a continuous flow of concrete at delivery without separation of materials.

Depositing: Concrete shall be deposited as near as practical to its final position to avoid segregation due to rehandling or flowing. Depositing shall proceed at such a rate that concrete is at all times plastic and flows readily into space between the bars. No concrete that has partially set or been contaminated by foreign material shall be deposited, nor shall retempered concrete be used. Maximum free-fall of concrete shall not exceed distance specified in ACI 301 and no deviation from the specifications will be permitted. Pouring, when once started, shall be carried on as a continuous operation until the pad is completed. The top surfaces shall be generally level. All concrete shall be thoroughly compacted by

suitable means during placing, and thoroughly worked around reinforcement and embedded fixtures and into corners of forms.

CURING AND PROTECTION

Concrete shall be allowed to cure for 7 days.

(END OF SECTION)

SECTION 03400
PRECAST CONCRETE STRUCTURES

GENERAL

RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

DESCRIPTION OF WORK

Work Included This Section:

Work of this Section shall include furnishing all labor and materials required to provide all precast concrete structures. Precast concrete underground structures may be provided in lieu of cast-in-place subject to the requirements specified below. Precast units must be the product of a manufacturer regularly engaged in the manufacture of precast concrete products, including precast manholes.

GENERAL

Precast concrete structures must have the same accessories and facilities as required for cast-in-place structures. Likewise, precast structures must have plan area and clear heights not less than those of cast-in-place structures. Concrete materials and methods of construction must be the same as for cast-in-place concrete construction, as modified herein.

Slope in floor may be omitted provided precast sections are poured in reinforced steel forms. Concrete for precast work must have a 28-day compressive strength of not less than 4000 psi. Structures may be precast to the design and details indicated for cast-in-place construction, precast monolithically and placed as a unit, or structures may be assembled sections, designed and produced by the manufacturer in accordance with the requirements specified.

Structures must be identified with the manufacturer's name embedded in or otherwise permanently attached to an interior wall face.

DESIGN FOR PRECAST STRUCTURES

ACI 318M. In the absence of detailed on-site soil information, design for the following soil parameters/site conditions:

Angle of Internal Friction (phi) = 30 degrees

Unit Weight of Soil (Dry) = 110 pcf, (Saturated) = 130 pcf

Coefficient of Lateral Earth Pressure (Ka) = 0.33

Ground Water Level = 3 feet below ground elevation

Vertical design loads must include full dead, superimposed dead, and live loads including a 30 percent magnification factor for impact. Live loads must consider all types and magnitudes of vehicular (automotive, industrial, or aircraft) traffic to be encountered. The minimum design vertical load must be for H20 highway loading per AASHTO HB-17.

Horizontal design loads must include full geostatic and hydrostatic pressures for the soil parameters, water table, and depth of installation to be encountered. Also, horizontal loads imposed by adjacent structure foundations, and horizontal load components of vertical design

loads, including impact, must be considered, along with a pulling-in iron design load of 6000 pounds.

Each structural component must be designed for the load combination and positioning resulting in the maximum shear and moment for that particular component.

Design must also consider the live loads induced in the handling, installation, and backfilling of the manholes. Provide lifting devices to ensure structural integrity during handling and installation.

CONSTRUCTION

Structure top, bottom, and wall must be of a uniform thickness of not less than 6 inches. Thin-walled knock-out panels for designed or future duct bank entrances are not permitted. Provide quantity, size, and location of duct bank entrance windows as directed, and cast completely open by the precaster.

Size of windows must exceed the nominal duct bank envelope dimensions by at least 12 inches vertically and horizontally to preclude in-field window modifications made necessary by duct bank misalignment. However, the sides of precast windows must be a minimum of 6 inches from the inside surface of adjacent walls, floors, or ceilings.

Form the perimeter of precast window openings to have a keyed or inward flared surface to provide a positive interlock with the mating duct bank envelope. Provide welded wire fabric reinforcing through window openings for in-field cutting and flaring into duct bank envelopes.

Provide additional reinforcing steel comprised of at least two No. 4 bars around window openings. Provide drain sumps a minimum of 12 inches in diameter and 4 inches deep for precast structures.

JOINTS

Provide tongue-and-groove joints on mating edges of precast components. Shiplap joints are not allowed. Design joints to firmly interlock adjoining components and to provide waterproof junctions and adequate shear transfer.

Seal joints watertight using preformed plastic strip conforming to ASTM C990. Install sealing material in strict accordance with the sealant manufacturer's printed instructions. Provide waterproofing at conduit/duct entrances into structures, and where access frame meets the top slab, provide continuous grout seal.

(END OF SECTION)

SECTION 16010
BASIC ELECTRICAL REQUIREMENTS

GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this and the other sections of Division 16.

SUMMARY

This Section includes general administrative and procedural requirements for electrical installations. The following administrative and procedural requirements are included in this Section to expand the requirements specified in Section 00700 – GENERAL CONDITIONS.

- Shop Drawings.
- Record documents.
- Operation manuals.
- Shipment.

SUBMITTALS

General: Follow the procedures specified in Section 00700, Subsection 4 - SHOP DRAWINGS AND SAMPLES

RECORD DOCUMENTS

The Contractor shall maintain an orderly and adequate file of up-to-date copies of all Engineer's drawings and specifications, manufacturer's prints and specifications, and other contract documents and supplementary data. In addition, the Contractor shall maintain a continuous record of all field changes by means of a set of drawings marked to indicate current "as-built" conditions. This "as-built" set of drawings shall be available for check by the Engineer in order for him to ascertain that it is being kept current. At the conclusion of work, the "as-built" drawings and other engineering data, accurately and neatly marked with field changes, shall be submitted to the Engineer in the required number of copies. The "as-built" drawings and data shall include all revisions to the work made under this Contract, including those made by subcontractors. The installed conditions shall include:

- Major raceway systems underground duct banks, size and location, for both exterior and interior; locations of control devices; distribution and branch electrical circuitry; and fuse and circuit breaker size and arrangements.
- Wood Poles, Electrical Pull Boxes, Man Holes, Junction Cabinets, Junction Boxes, Pedestals, Pad-mounted Transformers, and Equipment locations (exposed and concealed), dimensioned from prominent building lines.
- Approved substitutions, Contract Modifications, and actual equipment and materials installed.
- A wiring log as described in Section 16195.

MAINTENANCE MANUALS

Prepare maintenance manuals in accordance with Section 01003 – OPERATION MANUAL. In addition to the requirements specified in Section 0**Error! Reference source not found.**1003, include the following information for equipment items:

- Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.

- Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
- Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
- Servicing instructions and lubrication charts and schedules.

DELIVERY, STORAGE, AND HANDLING

Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

ROUGH-IN

Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.

Refer to equipment specifications in Divisions 2 through 16 for rough-in requirements.

ELECTRICAL INSTALLATIONS

General: Sequence, coordinate, and integrate the various elements of electrical systems, materials, and equipment. Comply with the following requirements:

- Verify all dimensions by field measurements.
- Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
- Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work.
- Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents. Where coordination requirements conflict with individual system requirements, refer conflict to the Engineer.
- Install systems, materials, and equipment level and plumb, and parallel.
- Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
- The Contractor should limit all outages to customers to four (4) hours at a time wherever possible.

CUTTING AND PATCHING

Perform cutting, fitting, and patching of electrical equipment and materials required to:

1. Uncover Work to provide for installation of ill-timed Work.
2. Remove and replace defective Work.
3. Remove and replace Work not conforming to requirements of the Contract Documents.
4. Remove samples of installed Work as specified for testing.
5. Install equipment and materials in existing structures.
6. Upon written instructions from the Engineer, uncover and restore Work to provide for Engineer observation of concealed Work.

Cut, remove, and legally dispose of selected electrical equipment, components, and materials as indicated, including but not limited to removal of electrical items indicated to be removed and items made obsolete by the new Work.

Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

(END OF SECTION)

SECTION 16050
BASIC ELECTRICAL MATERIALS AND METHODS

GENERAL

RELATED DOCUMENTS

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

Requirements specified in Section 16010 "Basic Electrical Requirements" apply to this Section.

SUMMARY

This Section includes limited scope general construction materials and methods for application with electrical installations as follows:

- Selective demolition including dismantling electrical materials and equipment made obsolete by these installations.
- Excavation for underground utilities and services, including underground raceways, vaults, and equipment.
- Miscellaneous metals for support of electrical materials and equipment.

DEFINITIONS

The following definitions apply to excavation operations:

- Additional Excavation: Where excavation has reached required subgrade elevations, if unsuitable bearing materials are encountered, continue excavation until suitable bearing materials are reached. The Contract Sum may be adjusted by an appropriate Contract Modification.
- Subbase: as used in this Section refers to the compacted soil layer used in pavement systems between the subgrade and the pavement base course material.
- Subgrade: as used in this Section refers to the compacted soil immediately below the slab or pavement system.
- Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction from the Engineer.

SUBMITTALS

General: Submit the following in accordance with General Conditions.

- Product data for the following products:

    1. 15 kV elbow connectors, arresters, splices, and terminators
    2. 600 V submersible connectors and terminal lugs
    3. 15 kV underground primary cable
    4. 600 V secondary cable
    5. Cable support brackets and cable clamps

- Shop drawings detailing fabrication and installation for metal fabrications and anchorage for electrical materials and equipment.

- Schedules indicating proposed methods and sequence of operations for selective demolition prior to commencement of Work. Include coordination for shut-off of electrical service.

PROJECT CONDITIONS

Conditions Affecting Selective Demolition: The following project conditions apply:

- Protect adjacent materials indicated to remain.
- Locate, identify, and protect electrical services passing through demolition area and serving other areas outside the demolition limits. Maintain services to areas outside demolition limits. When services must be interrupted, install temporary services for affected areas.
- Conditions Affecting Excavations: The following project conditions apply:

    1. Maintain and protect existing building services which transit the area affected by selective demolition.
    2. Existing Utilities: Locate existing underground utilities in excavation areas. If utilities are indicated to remain, support and protect services during excavation operations.
    3. Remove existing underground utilities indicated to be removed.
    4. Uncharted or Incorrectly Charted Utilities: Contact utility owner immediately for instructions.
    5. Provide temporary utility services to affected areas. Provide minimum of 48-hour notice to Engineer prior to utility interruption.
    6. Use of explosives is not permitted.

SEQUENCE AND SCHEDULING

Coordinate the shut-off and disconnection of electrical service with the Owner and the utility company.

Notify the Engineer at least 5 days prior to commencing demolition operations.

PRODUCTS

SOIL MATERIALS

Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, or natural or crushed sand.

Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, with 100 percent passing a 1-1/2-inch sieve, and not more than 5 percent passing a No. 4 sieve.

Backfill and Fill Materials: Materials complying with ASTM D2487 soil classification groups GW, GP, GM, SM, SW, and SP; free of clay, rock, or gravel larger than 2 inches in any dimension; debris; waste; frozen materials; and vegetable and other deleterious matter.

EXECUTION

WORK RULES

All electrical work shall be performed in compliance with ANSI C2 “National Electrical Safety Code”, Part 4. Clothing and equipment while working on or near energized lines, parts, or equipment shall be arc rated for a minimum of 4 cal/cm² incident energy.

EXAMINATION

Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

SELECTIVE DEMOLITION

General: Demolish, remove, demount, and disconnect abandoned electrical materials and equipment.

Disposal and Cleanup: Remove from the site and legally dispose of demolished materials and equipment not indicated to be salvaged.

EXCAVATION

Slope sides of excavations to comply with local codes and ordinances. Shore and brace as required for stability of excavation.

Shoring and Bracing: Establish requirements for trench shoring and bracing to comply with local codes and authorities. Maintain shoring and bracing in excavations regardless of time period excavations will be open.

Remove shoring and bracing when no longer required. Where sheeting is allowed to remain, cut top of sheeting at an elevation of 30 inches below finished grade elevation.

Install sediment and erosion control measures in accordance with local codes and ordinances.

Dewatering: Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.

- Do not allow water to accumulate in excavations. Remove water to prevent softening of bearing materials. Provide and maintain dewatering system components necessary to convey water away from excavations.
- Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey surface water to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.

Material Storage: Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.

- Locate and retain soil materials away from edge of excavations. Do not store within drip-line of trees indicated to remain.
- Remove and legally dispose of excess excavated materials and materials not acceptable for use as backfill or fill.
- Excavation for Underground Vaults and Electrical Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 foot; plus a sufficient distance to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.

    1. Excavate, by hand, areas within drip-line of large trees. Protect the root system from damage and dry-out. Maintain moist conditions for root system and cover exposed roots with burlap. Paint root cuts of 1 inch in diameter and larger with emulsified asphalt tree paint.
    2. Take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed.

Trenching: Excavate trenches for electrical installations as follows:

- Excavate trenches to the uniform width, sufficiently wide to provide ample working room and a minimum of 6 to 9 inches clearance on both sides of raceways and equipment.

- Excavate trenches to depth indicated or required.
- Limit the length of open trench to that in which installations can be made and the trench backfilled within the same day.
- Where rock is encountered, carry excavation below required elevation and backfill with a layer of crushed stone or gravel prior to installation of raceways and equipment. Provide a minimum of 6 inches of stone or gravel cushion between rock bearing surface and electrical installations.
- NO TRENCHES SHALL BE LEFT OPEN OVER NIGHT!

Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 deg F.

- Backfilling and Filling: Place soil materials in layers to required subgrade elevations for each area classification listed below, using materials specified in Part 2 of this Section.

    1. Under walks and pavements, use a combination of subbase materials and excavated or borrowed materials.
    2. Under building slabs, use drainage fill materials.
    3. Under piping and equipment, use subbase materials where required over rock bearing surface and for correction of unauthorized excavation.
    4. For raceways less than 30 inches below surface of roadways, provide 4-inch-thick concrete base slab support. After installation of raceways, provide a 4-inch thick concrete encasement (sides and top) prior to backfilling and placement of roadway subbase.
    5. Other areas, use excavated or borrowed materials.

- Backfill excavations as promptly as work permits, but not until completion of the following:

    1. Inspection, testing, approval, and locations of underground utilities have been recorded.
    2. Removal of concrete formwork.
    3. Removal of shoring and bracing, and backfilling of voids.
    4. Removal of trash and debris.

Placement and Compaction: Place backfill and fill materials in layers of not more than 8 inches in loose depth for material compacted by heavy equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification specified below. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

Place backfill and fill materials evenly adjacent to structures, piping, and equipment to required elevations. Prevent displacement of raceways and equipment by carrying material uniformly around them to approximately same elevation in each lift.

Compaction: Control soil compaction during construction, providing minimum percentage of density specified for each area classification indicated below.

- Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density for soils which exhibit a well-defined moisture-density relationship (cohesive soils), determined in accordance with ASTM D 1557 and not less than the following percentages of relative density, determined in accordance with ASTM D 2049, for soils which will not exhibit a well-defined moisture-density relationship (cohesionless soils).

- Areas Under Structures, Building Slabs and Steps, Pavements: Compact top 12 inches of subgrade and each layer of backfill or fill material to 90 percent maximum density for cohesive material, or 95 percent relative density for cohesionless material.
- Areas Under Walkways: Compact top 6 inches of subgrade and each layer of backfill or fill material to 90 percent maximum density for cohesive material, or 95 percent relative density for cohesionless material.
- Other Areas: Compact top 6 inches of subgrade and each layer of backfill or fill material to 85 percent maximum density for cohesive soils, and 90 percent relative density for cohesionless soils.
- Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water. Apply water in minimum quantity necessary to achieve required moisture content and to prevent water appearing on surface during, or subsequent to, compaction operations.
- Subsidence: Where subsidence occurs at electrical installation excavations during the period 12 months after Substantial Completion, remove surface treatment (i.e., pavement, lawn, or other finish), add backfill material, compact to specified conditions, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent areas.

(END OF SECTION)

SECTION 16100
RACEWAY, BOXES, AND CABINETS

GENERAL

RELATED DOCUMENTS

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

SUMMARY

This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

- Raceways include the following:

    1. Rigid metal conduit
    2. Intermediate metal conduit
    3. Electrical metallic tubing (EMT)
    4. Liquidtight flexible conduit
    5. Rigid nonmetallic conduit
    6. Wireway
    7. Surface raceways

- Boxes, enclosures, and cabinets include the following:

    1. Device boxes
    2. Outlet boxes
    3. Pull and junction boxes
    4. Cabinets and hinged cover enclosures

- Related Sections: The following Sections contain requirements that relate to this Section:

    1. Section 16190 "Supporting Devices" for raceway and box supports.
    2. Section 16119 "Underground Ducts and Utility Structures."

SUBMITTALS

General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

Product data for surface raceway, wireway and fittings, floor boxes, hinged cover enclosures, and cabinets.

Shop drawings for nonstandard boxes, enclosures, and cabinets. Include layout drawings showing components and wiring.

QUALITY ASSURANCE

Comply with NFPA 70 "National Electrical Code" for components and installation.

Listing and Labeling: Provide products specified in this Section that are listed and labeled.

- The Terms "Listed and Labeled": As defined in the "National Electrical Code," Article 100.

- Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

Comply with NECA "Standard of Installation."

Coordinate layout and installation of raceway and boxes with other construction elements to ensure adequate headroom, working clearance, and access.

PRODUCTS

MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, Manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

Metal Conduit and Tubing:

- Monogram Co., AFC.
- Alflex Corp.
- Allied Tube and Conduit, Grinnell Co.
- Anamet, Inc., Anaconda Metal Hose.
- Anixter Brothers, Inc.
- Carol Cable Co., Inc.
- Cole-Flex Corp.
- Flexcon, Inc., Coleman Cable Systems, Inc.
- Spiraduct, Inc.
- Triangle PWC, Inc.
- Wheatland Tube Co.

Nonmetallic Tubing and Conduit:

- Anamet, Inc., Anaconda Metal Hose.
- Arnco Corp.
- Breeze-Illinois, Inc.
- Can-Tex Industries, Harsco Corp.
- Carlon.
- Certainteed Corp, Pipe & Plastics Group.
- Cole-Flex Corp.
- Condux International, Electrical Products.
- Electri-Flex Co.
- George-Ingraham Corp.
- Hubbell, Inc., Raco, Inc.
- R&G Sloan Manufacturing Co., Inc.
- Spiraduct, Inc.
- Thomas & Betts Corp.

Conduit Bodies and Fittings:

- Scott Fetzer Company, Adalet-PLM.
- American Electric, Construction Materials Group.
- Emerson Electric Co., Appleton Electric Co.
- Carlon.

- Hubbell, Inc., Killark Electric Manufacturing Co.
- General Signal, O-Z/Gedney Unit.
- Spring City Electrical Manufacturing Co.

Wireway:

- Hoffman Engineering Co.
- Keystone/Rees, Inc.
- Square D Co.

Surface Metal Raceway:

- Airey-Thompson Co., Inc., A-T Power Systems.
- American Electric, Construction Materials Group.
- Butler Manufacturing Co., Walker Division.
- The Wiremold Co., Electrical Sales Division.

Surface Nonmetallic Raceway:

- Anixter Brothers, Inc.
- Butler Manufacturing Co., Walker Division.
- Hubbell, Inc., Wiring Device Division.
- JBC Enterprises, Inc., Enduro Fiberglass Systems.
- Panduit Corp.
- United Telecom, Premier Telecom Products, Inc.
- Thermotools Co.
- The Wiremold Co., Electrical Sales Division.

Boxes, Enclosures, and Cabinets:

- Scott Fetzer Company, Adalet-PLM.
- Butler Manufacturing Co., Walker Division.
- Cooper Industries, Midwest Electric.
- Electric Panelboard Co., Inc.
- Erickson Electrical Equipment Co.
- American Electric, FL Industries.
- Hoffman Engineering Co., Federal-Hoffman, Inc.
- Hubbell Inc., Killark Electric Manufacturing Co.
- General Signal, O-Z/Gedney.
- Oldcastle Infrastructure
- Parker Electrical Manufacturing Co.
- Raco, Inc., Hubbell Inc.
- Robroy Industries, Inc., Electrical Division.
- Spring City Electrical Manufacturing Co.
- Square D Co.
- Thomas & Betts Corp.
- Woodhead Industries, Inc., Daniel Woodhead Co.

METAL CONDUIT AND TUBING

Rigid Steel Conduit: ANSI C80.1.

Intermediate Metal Conduit: ANSI C80.6.

Electrical Metallic Tubing and Fittings: ANSI C80.3 with set-screw or compression-type fittings.

Liquidtight Flexible Metal Conduit: Flexible steel conduit with PVC jacket.

Fittings: NEMA FB 1, compatible with conduit/tubing materials.

NONMETALLIC CONDUIT AND TUBING

Rigid Nonmetallic Conduit (RNC): NEMA TC 2, Schedule 40 or 80 PVC.

PVC Conduit and Tubing Fittings: NEMA TC 3; match to conduit or conduit/tubing type and material.

OUTLET AND DEVICE BOXES

Sheet Metal Boxes: NEMA OS 1.

Cast Metal Boxes: NEMA FB 1, type FD, cast feralloy box with gasketed cover.

Nonmetallic Boxes: NEMA OS 2.

FLOOR BOXES

Floor Box: Cast metal, fully adjustable, rectangular.

PULL AND JUNCTION BOXES

Small Sheet Metal Boxes: NEMA OS 1.

Cast Metal Boxes: NEMA FB 1, cast aluminum with gasketed cover.

EXECUTION

EXAMINATION

Examine surfaces to receive raceways, boxes, enclosures, and cabinets for compliance with installation tolerances and other conditions affecting performance of the raceway system. Do not proceed with installation until unsatisfactory conditions have been corrected.

WIRING METHODS

Outdoors: Use the following wiring methods:

- Exposed: Rigid metal conduit.
- Concealed: Rigid or intermediate metal conduit.
- Underground, Single Run: Rigid nonmetallic conduit.
- Underground, Grouped: Rigid nonmetallic conduit.
- Connection to Vibrating Equipment (including transformers and hydraulic, pneumatic, or electric solenoid or motor-driven equipment): Liquidtight flexible metal conduit.
- Boxes and Enclosures: NEMA Type 3R.

INSTALLATION

- Install raceways, boxes, enclosures, and cabinets as indicated, according to manufacturer's written instructions.

- Install raceways level and square and at proper elevations.
- Complete raceway installation before starting cable installation.
- Use temporary closures to prevent foreign matter from entering raceway.
- Protect stub-ups from damage where conduits rise through pads. Arrange so curved portion of bends is not visible above the finished slab.
- Make bends and offsets so the inside diameter is not reduced. Unless otherwise indicated, keep the legs of a bend in the same plane and the straight legs of offsets parallel.
- Use raceway fittings compatible with raceway and suitable for use and location. For intermediate steel conduit, use threaded rigid steel conduit fittings, except as otherwise indicated.
- Run concealed raceways with a minimum of bends in the shortest practical distance except as otherwise indicated.
- Raceways Underneath Slabs: Install below compacted stone. All 90 degree bends shall be below compacted stone with conduit penetrations of slab fully vertical.
- Transition nonmetallic tubing to rigid steel conduit before rising above floor.
- Run parallel or banked raceways together, on common supports where practical.
- Make bends in parallel or banked runs from same center line to make bends parallel. Use factory elbows only where they can be installed parallel; otherwise, provide field bends for parallel raceways.
- Join raceways with fittings designed and approved for the purpose and make joints tight.
- Make raceway terminations tight. Use bonding bushings or wedges at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.
- Tighten set screws of threadless fittings with suitable tool.
- Terminations: Where raceways are terminated with locknuts and bushings, align the raceway to enter squarely, and install the locknuts with dished part against the box. Where terminations cannot be made secure with one locknut, use two locknuts, one inside and one outside the box.
- Where terminating in threaded hubs, screw the raceway or fitting tight into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align the raceway so the coupling is square to the box, and tighten the chase nipple so no threads are exposed.
- Install pull cord in empty raceways. Use 200 pound test nylon cord.
- Raceways 2-Inch Trade Size and Smaller: In addition to the above requirements, install in maximum lengths of 150 feet (45 m) and with a maximum of two 90-deg bends or equivalent. Install pull or junction boxes where necessary to comply with these requirements.
- Install raceway sealing fittings according to the manufacturer's written instructions. Locate fittings at suitable, approved, accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish

similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points and elsewhere as indicated:

- Where conduits enter or leave hazardous locations.
- Where conduits pass from warm locations to cold locations, such as the boundaries of refrigerated spaces and air-conditioned spaces.
- Where otherwise required by the NEC.

- Stub-Up Connections: Extend conduits through concrete pad with an adjustable top or coupling threaded inside for plugs, and set flush with the finished pad. Transition to nonmetallic conduit to ridged steel conduit before penetrating pad. Extend cables to equipment with rigid steel conduit. Where equipment connections are not made under this Contract, install screwdriver-operated threaded flush plugs flush with floor. Install grounding hubs for all conduit stub-ups.

- Do not install aluminum conduit embedded in or in contact with concrete.

- Provide grounding connections for raceway, boxes, and components as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torqueing requirements are not indicated, tighten connectors and terminals according to tightening torques specified in UL Standard 486A.

PROTECTION

Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, to ensure that coatings, finishes, and cabinets are without damage or deterioration at Substantial Completion.

Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

Repair damage to PVC or paint finishes with matching touch-up coating recommended by the manufacturer.

CLEANING

Upon completion of installation of system, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

(END OF SECTION)

SECTION 16119
UNDERGROUND DUCTS & UTILITY STRUCTURES

GENERAL

RELATED DOCUMENTS

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

SUMMARY

This Section includes underground conduits and ducts, pull boxes, handholes, concrete-encased duct banks, and other underground utility structures.

Related Sections: The following Sections contain requirements that relate to this Section:

- Section 16050 Basic Electrical Materials and Methods for general requirements for excavation, backfill and related items for ducts, manholes, and handholes.
- Section 03300 “Cast-In-Place / Ready Mix Concrete” for cast-in-place concrete requirements.

DEFINITIONS

Duct: Electrical conduit and other raceway, either metallic or nonmetallic, used underground, embedded in earth or concrete.

SUBMITTALS

General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.

Product data for metal accessories for conduit and miscellaneous components.

QUALITY ASSURANCE

Comply with NFPA 70 “National Electric Code” and ANSI C2 “National Electrical Safety Code” for components and installation.

Listing and Labeling: Provide products specified in this Section that are listed and labeled.

- The Terms “Listed” and “Labeled”. As defined in the “National Electrical Code,” Article 100.
- Coordinate layout and installation of ducts with final arrangement of other utilities as determined in the field.

DELIVERY, STORAGE, AND HANDLING

Deliver ducts to site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.

PRODUCTS

MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- Nonmetallic Ducts:

    1. Arnco Corp.
    2. Breeze-Illinois, Inc.
    3. CANTEX, Inc.
    4. Carlon; Lamson & Sessions Company
    5. Pipe & Plastic Group; Certainteed Products Corp.
    6. Cole-Flex Co.
    7. Electri-Flex Co.
    8. Spiraduct, Inc.

CONDUIT AND DUCT

Rigid Steel Conduit: ANSI C80.1, galvanized.

Plastic Conduit for Direct Burial and Riser Applications: EPC-40-PVC UL 651 and NEMA TC 2.

Plastic Conduit for Concrete Encasement: DB-60-PVC UL 651 and NEMA TC 6 & 8.

Manufactured Bends: Not less than 36 inch (900 mm) radius.

High Density Polyethylene (HDPE) Electrical Conduit for Directional boring. Smoothwall, approved/listed for directional boring, minimum Schedule 80 UL 651 and NEMA TC 7.

ACCESSORIES

Duct Supports: Rigid PVC spacers selected to provide minimum duct spacings.

Duct Sealing Compound: Nonhardening, safe for human skin contact, not deleterious to cable insulation, workable at temperatures as low as 35 deg F (1 deg C), withstands temperature of 300 deg F (149 deg C) without slump, and adheres to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and the common metals.

EXECUTION

APPLICATION

Direct buried or concrete encased PVC conduit.

EXAMINATION

Examine site to receive ducts for compliance with installation tolerances and other conditions affecting performance of the underground ducts. Do not proceed with installation until unsatisfactory conditions have been corrected.

EARTHWORK

Excavation and Backfill: Conform to Section 16050, “EXCAVATION”, but do not use heavy-duty, hydraulic-operated compaction equipment.

Restore surface features at areas disturbed by excavation, and re-establish original grades except as otherwise indicated. Replace removed sod as soon as possible after backfilling is completed. Restore all areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, or mulching.

Paving: Where cuts are made in any paving, the paving and subbase shall be restored to their original condition. South Carolina Department of Transportation (SCDOT) standards shall be followed wherever applicable.

Utilities: Where existing utilities are shown or noted on the Drawings to be altered or removed by others, or by a local utility company or municipality for installation of the new construction, give sufficient notice to applicable parties so that such alteration can be made.

CONDUIT & DUCT INSTALLATION

Install nonmetallic conduit and duct as indicated according to manufacturer's written instructions.

Depths to the top of conduits shall not be less than 24 inches for conduits with secondary and service cables and not less than 30 inches for conduits with primary cables. Conduits shall slope toward manholes or pull boxes and shall not have low points between ends.

Direct buried conduits shall be PVC schedule 40 or Schedule 80.

All underground concrete-encased conduits shall be Type DB encased in a 4,000 minimum psi concrete, to a minimum thickness of 3 inches from any conduit. Concrete encasement shall be reinforced with ½" steel rebar. The top of the encasement shall be a minimum of 21" below earth grade and a magnetically detectable tape (minimum width 1") is to be buried 6" below finished grade and following the centerline of the encasement. Conduits' outer edges within the encasement are to be spaced a minimum of 1" apart as shown on the drawings. All conduit segments are to be supplied with a nylon pull rope or ribbon of sufficient tensile strength to facilitate the installation of cables.

Rigid PVC interlocking spacers shall be used in concrete, selected to provide minimum conduit spacings and cover depths indicated while supporting conduits during concreting and backfilling; produced by the same manufacturer as the conduits.

Provisions shall be taken to prevent conduits from floating during concreting process, either by fastening spacers to trench bottom or by placing weights on entire conduit and spacer assembly. Ensure that conduits are adequately spaced to allow concrete to fill all voids between conduits.

All concrete-encased conduits shall be plugged during the concreting and backfilling processes. Duct plugs shall be manufactured from high impact plastic components and shall be corrosion proof. Duct plugs shall contain a durable elastic compressible gasket which will make it effective as a long term or temporary seal. They shall be removable and reusable. They shall meet or exceed the following mechanical requirements:

a. Air Pressure 7.5 psi
b. Water Head 15 ft.
c. Pull Out 100 Kgf

Duct plugs used on spare conduits shall be equipped with a rope tie device on the back compression plate to allow the securing of a pull rope. This will allow excess rope slack to be stored within the conduit.

Curves and Bends: Use manufactured elbows for stub-ups at equipment and at building entrances. Use manufactured long sweep bends with a minimum radius of 36" both horizontally and vertically at other locations.

- Make joints in ducts and fittings watertight according to manufacturer's instructions. Stagger couplings so those of adjacent ducts do not lie in the same plane.

CONNECTIONS TO EXISTING CONCRETE PADS

For duct bank connections to concrete pads, break an opening in the pad out to the dimensions required and preserve steel in pad. Cut the steel and extend into the duct bank envelope. Chip out the opening in the pad to form a key for the duct bank envelope.

CONNECTIONS TO EXISTING DUCTS

Where connections to existing duct banks are indicated, excavate the banks to the maximum depth necessary. Cut off the banks and remove loose concrete from the conduits before new concrete-encased ducts are installed. Provide a reinforced concrete collar, poured monolithically with the new duct bank, to take the shear at the joint of the duct banks.

DIRECTIONAL BORING

HDPE conduits must be installed below the frostline and as specified herein.

FIELD QUALITY CONTROL

Testing: Demonstrate capability and compliance with requirements upon completion of installation of underground duct and utility structures.

Duct Integrity: Rod ducts with a mandrel ¼ inch (6 mm) smaller in diameter than internal diameter of ducts. Where rodding indicates obstructions in ducts, remove the obstructions and retest.
Correct installations where possible, and retest to demonstrate compliance. Otherwise, remove and replace defective products and retest.

CLEANING

Pull brush through full length of ducts. Use round bristle brush with a diameter ½ inch (12 mm) greater than internal diameter of duct.

(END OF SECTION)

SECTION 16120
WIRES AND CABLES

GENERAL

RELATED DOCUMENTS

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

SUMMARY

This Section includes wires and cables and associated splices, connectors, and terminations for wiring systems rated 600 volts and less.

Related Sections: The following Sections contain requirements that relate to this Section:

- Division 16 Section 16124 "Medium-Voltage Cables."
- Division 16 Section 16190 "Supporting Devices" for supports and anchors for fastening cable directly to building finishes.
- Division 16 Section 16195 "Electrical Identification" for insulation color coding and wire and cable markers.

SUBMITTALS

General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

Field test reports indicating and interpreting test results relative to compliance with performance requirements of testing standard.

Submit manufacturer's catalog descriptions of each wire, cable, or conductor for engineer’s approval before ordering cable.

QUALITY ASSURANCE

Comply with NFPA 70 "National Electrical Code" for components and installation.

Listing and Labeling: Provide products specified in this Section that are listed and labeled.

The Terms "Listed and Labeled": As defined in the "National Electrical Code," Article 100.

SEQUENCING AND SCHEDULING

Coordination: Coordinate layout and installation of cable with other installations.

Revise locations and elevations from those indicated as required to suit field conditions and as approved by the Engineer.

DELIVERY, STORAGE, AND HANDLING

Deliver wire and cable according to NEMA WC-26.

PRODUCTS

MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, Manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

Wires and Cables:

- American Wire Group
- Houston Wire & Cable
- Prysmian Group
- Southwire Co.
- Okonite Co.

Connectors for Wires and Cables:

- AFC, Monogram Co.
- AMP, Inc.
- Anderson, Square D Co.
- Electrical Products Division, 3M Co.
- O-Z/Gedney Unit, General Signal
- Thomas & Betts
- Burndy

LOW VOLTAGE INSULATED CONDUCTORS AND CABLES

Insulated conductors must be rated 600 volts and conform to the requirements of NFPA 70, including listing requirements, or in accordance with NEMA WC 70. Service entrance conductors must conform to UL 854, type USE.

CONNECTORS AND SPLICES

UL-listed factory-fabricated wiring connectors of size, ampacity rating, material, and type and class for application and for service indicated. Select to comply with Project's installation requirements and as specified in the below "Applications" Article. All control circuits are to be terminated with "ring tongue" insulated compression lugs.

Low voltage cables in manholes or pull boxes shall be terminated with compression NEMA spade terminals with insulated sleeves. Connectors shall be submersible insulated multi-port bus, Thomas & Betts Homac Flood-Seal, 125 Series or 175 Series as noted on the drawings, or acceptable equal.

EXECUTION

EXAMINATION

Inspect each cable reel for correct storage positions, signs of physical damage, and broken end seals prior to installation. If end seal is broken, remove moisture from cable prior to installation in accordance with the cable manufacturer's recommendations.

Examine raceways to receive wires and cables for compliance with installation tolerances and other conditions. Do not proceed with installation until unsatisfactory conditions have been corrected.

APPLICATIONS

Primary 12.47 kV distribution: Refer to Medium Voltage Cables Section 16124

Secondary and Services: Refer to above Connectors and Splices section above.

INSTALLATION

- Install wires and cables as indicated, according to manufacturer's written instructions and the NECA "Standard of Installation."
- Pull cables into raceway simultaneously where more than one is being installed in same raceway.
- Use pulling compound or lubricant where necessary; compound used must not deteriorate cable or insulation.
- Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
- Install exposed cable, parallel and perpendicular to surfaces or exposed structural members, and follow surface contours where possible.
- Cable Splices: Splices are not allowed unless noted on drawings.
- Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque-tightening values for equipment connectors.
- Where manufacturer's torqueing requirements are not indicated, tighten connectors and terminals according to tightening torques specified in UL Standard 486A.

FIELD QUALITY CONTROL

TESTING

Secondary or service low-voltage cable, complete with splices, shall be tested for insulation resistance after the cables are installed, in their final configuration, ready for connection to the equipment, and prior to energization. The test voltage shall be 500 volts dc, applied for one minute between each conductor and ground and between all possible combinations of conductors in the same trench, duct, or cable, with other conductors in the same trench, duct, or conduit. The minimum value of insulation shall be:

R in megohms = (rated voltage in kV + 1) x 1000 ÷ (length of cable in feet)

Each cable failing this test shall be repaired or replaced. The repaired cable shall then be retested until failures have been eliminated.

PROCEDURES

Perform each visual and mechanical inspection and electrical test stated in NETA Standard ATS, Section 7.3.2. Certify compliance with test parameters.

CORRECTIONS

Correct malfunctioning products at site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units, and retest.

(END OF SECTION)

SECTION 16124
MEDIUM VOLTAGE CABLES

GENERAL

RELATED DOCUMENTS

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

SUMMARY

This Section includes cables and related splices, terminations, and accessories for electrical distribution systems rated above 2,000 volts.

This Section also includes medium voltage cable testing and acceptance requirements.

Related Sections: The following Sections contain requirements that relate to this Section:

- Division 16 Section 16190 “Supporting Devices” for cable and termination supports.
- Division 16 Section 16195 “Electrical Identification” for cable markers.

SUBMITTALS

General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

- Product data for cables and cable accessories, including splices and terminations including warranty statement.
- Product certificate signed by manufacturer that its products comply with the specified requirements.
- Product Test Reports: Certified reports of manufacturers’ design and production tests indicating compliance of cable and accessories with referenced standards.
- Field test reports indicating and interpreting test results relative to compliance with performance requirements specified. Include certified copies of field test records.
- Maintenance Data: For cables and accessories, to be included in the “Project Manual” specified in Division 1.
- In-Service Data: Include periodic tests of cables in service.
- Provide certification of compliance with the Engineer's design requirements for each directional bore, including: HDPE conduit size and type, bend radius, elevation changes, and vertical and horizontal path deviations. Record location and depth of all directional-bore installed HDPE conduits using Global Positioning System (GPS) recording means with "resource grade" accuracy

QUALITY ASSURANCE

Installer Qualifications: Engage an experienced and certified cable splicer to install, splice, and terminate medium voltage cables.

Manufacturer Qualifications: Firm experienced in manufacturing medium voltage cable and accessories similar to those indicated for this project, with a record of successful in-service performance.

Comply with NFPA 70 “National Electric Code” for components and installation.

Listing and Labeling: Provide products specified in this Section that are listed and labeled.

The terms “listed and labeled”: As defined in the “National Electrical Code”, Article 100.

Single-Source Responsibility: All medium voltage cable shall be the product of a single manufacturer.

DELIVERY, STORAGE & HANDLING

CABLE REELS

Deliver medium voltage cables on factory reels conforming to NEMA WC26.

The Contractor shall inspect each reel of cable upon delivery. At this time, the cable protective covering shall be inspected for damage. Any damage found shall be reported to the Engineer without delay.

Loading and unloading shall be accomplished so that the lifting equipment does not contact the cable protective wrap or the cable surface. If a crane is used, the either a cradle supporting the reel flanges or a shaft through the arbor hole shall be used. If a fork lift is used, the forks shall lift the reel at 90 degrees to the reel flanges and the fork shall be long enough to make complete lifting contact with the flanges. Under no circumstances shall the forks contact the cable surface or the protective wrap. If an inclined ramp is used, the ramp shall be at the bottom of the ramp shall be accomplished by using the reel flanges and not the surface of the cable.

Under no circumstances shall the reels be dropped from any vehicle or equipment onto the ground or any other surface.

Reels shall be stored, standing on the flange edges, on a rigid surface to ensure that the flanges do not sink into the earth and do not allow the weight of the reel and cable to rest on the cable surface. Reels shall not be stored resting on the flat side of the flanges.

Cable shall not be stored in any area where it may be contacted by vehicles, equipment, falling objects, chemicals, petroleum, or other harmful materials, or where it may be damaged by high heat.

When the cable is to be installed at ambient temperatures 32 F (0 C), it shall be stored in a heated area at least 24 hours prior to installation. The cable shall not be installed at temperatures below 14 F (-10 C).

Whenever cable reels are moved by rolling, roll in the correct direction to avoid loosening the cable on the reel. Clear the rolling area of objects which could contact or possibly damage the cable or the protective wrap.

CABLE END SEALING

All cable ends shall be sealed when in storage or when installed and temporarily not terminated.

Procedure: The cable end shall be cleanly and squarely cut off. To the cable end apply a 3 ¾ inch square section on vinyl plastic seal over the exposed tape shall be applied lengthwise over the end of the cable first, and then wrapped tightly over the length of the cable for 3 inches to completely cover the seal material. The wrapping tape shall be overlapped by at least half the tape width.

The vinyl plastic seal shall be Aqua Seal or equivalent.

PRODUCTS

MANUFACTURERS

Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- Power Cable:
    1. Cablec Corp.
    2. Hubbell Inc., The Kerite Co.
    3. The Okonite Co.
    4. Power Cable Division, Pirelli Cable Corp.
- Cable Splicing and Terminating Products and Accessories:
    1. Cooper Power Systems, Inc., RTE Components
    2. Elastimold
    3. Raychem Electrical Products Division
    4. 3M Electrical Products Division
- Separable Insulated Connector Components and Accessories:
    1. Cooper Power Systems, Inc., RTE Components
    2. Elastimold
    3. Joslyn Manufacturing Co.

CABLE

Type: MV105, Primary UD EPR cable

Conductor: Aluminum phase conductor, stranded

Conductor Stranding: Filled with water swellable agent meeting or exceeding ICEA T-31-610 water penetration resistance and ANSI/NEMA class A connectorability requirements.

Rated System Voltage Class: for 12.47 kV application: 15 kV, Primary UD

Insulation: Discharge resistant ethylene propylene rubber (EPR) conforming to ANSI/ICEA S-94-649, UL 1072, RUS 1728F-U1 and AEIC CS8. Insulation shall be of a color contrasting with the extruded semi-conducting shield. Insulation rating shall equal or exceed 100 percent of the rated system voltage class. The cable shall be heat, moisture, ozone and corona resistant, for use at 105 C conductor temperature. The insulation compound shall be compounded by the manufacturer in its own facility.

Concentric Neutral: Bare copper wires.

Jacket: Insulating linear low density polyethylene applied over the insulation shield. The jacket shall be oil, acid, alkali and sunlight resistant and meet or exceed NEMA WC74 and UL 1072.

Standards: The cable shall meet or exceed the following standards: ANSI/ICEA S-94-649, UL 1072, RUS 1728F-U1 and AEIC CS8

SPLICE KITS

Connectors: IEEE 404, compression type, as recommended by cable or splicing kit manufacturer for the application.

Splicing Products: As recommended in writing by the splicing kit manufacturer for the specific sizes, ratings, and configurations of cable conductors and splices specified. Include all components required for complete splice, with detailed instructions.

Heat-shrink splicing kit of uniform cross-section polymeric construction with outer heat-shrink jacket.

Premolded, cold-shrink rubber, inline splicing kit.

LOAD BREAK ELBOW CONNECTORS

The molded rubber 15 kV class, fused, load break, elbow cable connector termination kits shall be designed and manufactured for terminating the specified power cables. Contractor shall coordinate with manufacturers' data to determine exact diameters. Insulation class shall be equivalent to that of the cable.

Elbow connectors shall meet ANSI and IEEE standards C37.40, C37.41, C37.47, and 386-2006. Elbow connectors shall be fully shielded and insulated capable of full range current limiting fuse protection. Molded materials shall of high quality peroxide-cured insulating and semi-conducting EPDM rubber. Standard features shall include a copper probe adapter, coppertop connector, copper load break probe with an ablative arc-follower tip and stainless steel reinforced pulling eye. Feed-thru elbow connectors shall be provided where indicated on the drawings.

CABLE TERMINATIONS

The terminations shall be Class 1 for shielded cable, meeting the latest release of IEEE Standard 48, and suitable for use outdoors on underground circuit dip poles. The terminations shall be of the molded elastomer, prestretched elastomer, or heat-shrinkable elastomer.type, with multiple molded nontracking skirt modules, and compression-type connector. Terminations for shielded cables shall include a shield ground strap.

Terminations, must be provided with mounting brackets suitable for the intended installation and with grounding provisions for the cable shielding. Terminations must be provided in a kit, including: skirts, stress control terminator, ground clamp, connectors, lugs, and complete instructions for assembly and installation. Terminations must be the product of one manufacturer, suitable for the type, diameter, insulation class and level, and materials of the cable terminated.

SOURCE QUALITY CONTROL

Test and inspect cables according to NEMA WC74 before shipping.

MEDIUM VOLTAGE CABLE WARRANTY

The cable manufacturer shall warrant each reel of cable to be free from defects in material, design and workmanship to provide reliable performance for a twenty-five (25) year life.

The warranty assumes the cable is installed, spliced, terminated and maintained in accordance with manufacturer's recommendations.

Prior to termination or splicing of cable, the contractor responsible for same shall submit qualifications of his personnel responsible for this work and their qualification to do same. Upon approval by the engineer in writing, contractor may proceed with this portion of the work.

Defective cable shall be replaced at no cost to the owner.

- When the manufacturer and the owner mutually determine a portion of or all the cable is defective, the cable manufacturer shall furnish replacement of said cable without charge.
- The replacement cable shall comply with these requirements and be delivered to the original delivery point free of any charge to the owner or the state of North Carolina.

Contractor shall state on his bid form the name of the cable manufacturer he intends to supply. Failure to do this places the contractor at risk of rejection of his bid.

Cable shop drawings shall include said described warranty from the cable manufacturer properly signed, and having the manufacturer's corporate seal affixed thereto.

EXECUTION

EXAMINATION

Examine raceways to receive medium voltage cables for compliance with installation tolerances and other conditions affecting performance of the cable. Do not proceed with installation until unsatisfactory conditions have been corrected.

INSTALLATION

Install medium voltage cable as indicated, according to manufacturer's written instructions and IEEE 576.

Pull cables simultaneously where more than one cable is indicated in same raceway. Use NRTL-listed and manufacturer-approved pulling com
pound or lubricant where necessary. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

Use pulling means including fish tape cable, rope, and basket-weave wire/cable grips that will not damage cables or raceways. Do not use rope hitches for pulling attachment to cable.

In manholes, handholes, pull boxes, junction boxes, and cable vaults, train cables around walls by the longest route from entry to exit and support cables at intervals adequate to prevent sag.

Install splices at pull points and elsewhere as indicated using standard kit. Conform to kit manufacturer's written instructions.

Install terminations at ends of cables and seal multiconductor cable ends with standard kits. Conform to manufacturer's written instructions. Comply with classes of terminations indicated.

GROUNDING

Ground shields of shielded cable at terminations, splices, and separable insulated connectors. Ground metal bodies of terminators, splices, cable and separable insulated connector fittings, and hardware according to manufacturer's written instructions.

IDENTIFICATION

Identify cable in accordance with Section 16195 "Electrical Identification".

FIELD QUALITY CONTROL

Testing: Upon installation of medium voltage cable and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA Standard ATS, Section 7.3.3. Certify compliance with test parameters.

Correct malfunctioning units at site, where possible, and retest to demonstrate compliance, otherwise, remove and replace with new units and retest.

PROTECTION

Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer, to prevent entrance of moisture into the cable and ensure that medium voltage cable is without damage or deterioration at Substantial Completion.

TESTING AND ACCEPTANCE

After installation, prior to connection to an existing system, and before the operating test, the medium-voltage cable system shall be given a high potential test. Direct-current voltage shall be applied on each phase conductor of the system by connecting conductors at one terminal and connecting grounds or metallic shieldings or sheaths of the cable at the other terminal for each test. Prior to the test, the cables shall be isolated by opening applicable protective devices and disconnecting equipment. The method, voltage, length of time, and other characteristics of the test for initial installation shall be in accordance with IEEE 400.1 for the particular type of cable installed, and shall not exceed the recommendations of IEEE 404 for cable joints unless the cable and accessory manufacturers indicate higher voltages are acceptable for testing. Should any cable fail due to a weakness of conductor insulation or due to defects or injuries incidental to the installation or because of improper installation of cable, cable joints, terminations, or other connections, the Contractor shall make necessary repairs or replace cables as directed. Repaired or replaced cables shall be retested.

Test work method and data sheet, including test date, time, and voltages shall be submitted to and approved by the Engineer prior to test voltage being applied to cables.

If new cable is spliced into existing cable, the new cable should be tested as specified prior to splice. After completing the splice, the completed connection shall be tested at the system operating voltage.

(END OF SECTION)

SECTION 16190
SUPPORTING DEVICES

GENERAL

RELATED DOCUMENTS

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

Requirements of the following Division 16 Sections apply to this section:

- Division 16 Section 16010 "Basic Electrical Requirements."
- Division 16 Section 16050 "Basic Electrical Materials and Methods."

SUMMARY

This Section includes secure support from the building structure for electrical items by means of hangers, supports, anchors, sleeves, inserts, seals, and associated fastenings.

Related Sections: The following Sections contains requirements that relate to this Section:

- Refer to other Division 16 sections for additional specific support requirements that may be applicable to specific items.

SUBMITTALS

General: Submit the following in accordance with General Conditions.

Product data for each type of product specified.

Shop drawings indicating details of fabricated products and materials.

QUALITY ASSURANCE

Electrical Component Standard: Components and installation shall comply with NFPA 70 "National Electrical Code."

Electrical components shall be listed and labeled by UL, ETL, CSA, or other approved, nationally recognized testing and listing agency that provides third-party certification follow-up services.

PRODUCTS

MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, Manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- Slotted Metal Angle and U-Channel Systems:

    1. Allied Tube & Conduit
    2. American Electric
    3. B-Line Systems, Inc.
    4. Cinch Clamp Co., Inc.
    5. GS Metals Corp.
    6. Haydon Corp.

7. Kin-Line, Inc.
8. Unistrut Diversified Products

- Conduit Sealing Bushings:

1. Bridgeport Fittings, Inc.
2. Cooper Industries, Inc.
3. Elliott Electric Mfg. Corp.
4. GS Metals Corp.
5. Killark Electric Mfg. Co.
6. Madison Equipment Co.
7. L.E. Mason Co.
8. O-Z/Gedney
9. Producto Electric Corp.
10. Raco, Inc.
11. Red Seal Electric Corp.
12. Spring City Electrical Mgf. Co.
13. Thomas & Betts Corp.

COATINGS

Coating: Supports, support hardware, and fasteners shall be protected with zinc coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish, or inherent material characteristic. Products for use outdoors shall be hot-dip galvanized.

MANUFACTURED SUPPORTING DEVICES

Raceway Supports: Riser clamps, conduit straps, threaded C-clamps with retainers, and spring steel clamps.

Fasteners: Types, materials, and construction features as follows:

- Expansion Anchors: Carbon steel wedge or sleeve type.
- Toggle Bolts: All steel springhead type.
- Powder-Driven Threaded Studs: Heat-treated steel, designed specifically for the intended service.

Conduit Sealing Bushings: Factory-fabricated watertight conduit sealing bushing assemblies suitable for sealing around conduit, or tubing passing through concrete floors and walls. Construct seals with steel sleeve, malleable iron body, neoprene sealing grommets or rings, metal pressure rings, pressure clamps, and cap screws.

Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser conduits. Provide plugs with number and size of cable gripping holes as required to suit individual risers. Construct body of malleable-iron casting with hot-dip galvanized finish.

U-Channel Systems: 16-gage steel channels, with 9/16-inch-diameter holes, at a minimum of 8 inches on center, in top surface. Provide fittings and accessories that mate and match with U-channel and are of the same manufacture.

FABRICATED SUPPORTING DEVICES

General: Shop- or field-fabricated supports or manufactured supports assembled from U-channel components.

Steel Brackets: Fabricated of angles, channels, and other standard structural shapes. Connect with welds and machine bolts to form rigid supports.

EXECUTION

INSTALLATION

Install supporting devices to fasten electrical components securely and permanently in accordance with NEC requirements.

Raceway Supports: Comply with the NEC and the following requirements:

- Conform to manufacturer's recommendations for selection and installation of supports.

Strength of each support shall be adequate to carry present and future load multiplied by a safety factor of at least four. Where this determination results in a safety allowance of less than 200 lbs, provide additional strength until there is a minimum of 200 lbs safety allowance in the strength of each support.

- Support individual horizontal raceways by separate pipe hangers. Use spring steel fasteners that are specifically designed for supporting single conduits or tubing.
- Space supports for raceway in accordance with NEC.
- Conduit Seals: Install seals for conduit penetrations of slabs on grade and exterior walls below grade and where indicated. Tighten sleeve seal screws until sealing grommets have expanded to form watertight seal.

(END OF SECTION)

SECTION 16195
ELECTRICAL IDENTIFICATION

GENERAL

RELATED DOCUMENTS

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

Requirements of the following Division 16 Sections apply to this section:

- Division 16 Section 16010 "Basic Electrical Requirements."
- Division 16 Section 16050 "Basic Electrical Materials and Methods."

SUMMARY

This Section includes identification of electrical materials, equipment, and installations. It includes requirements for electrical identification components including but not limited to the following:

- Buried electrical line warnings.
- Identification labeling for raceways, cables, and conductors.
- Operational instruction signs.
- Warning and caution signs.
- Equipment labels and signs.

Related Sections: The following Sections contain requirements that relate to this Section:

- Division 16 Section 16120 "Wires and Cables" for requirements for color coding of cables for phase identification.

Refer to other Division 16 sections for additional specific electrical identification associated with specific items.

SUBMITTALS

General: Submit the following in accordance with General Conditions.

Product Data for each type of product specified.

Schedule of identification nomenclature to be used for identification signs and labels.

Samples of each color, lettering style, and other graphic representation required for identification materials; samples of labels and signs.

Cable schedule for inclusion in Project Maintenance Manual.

Proof copy of one line diagram sign for approval before production.

QUALITY ASSURANCE

Electrical Component Standard: Components and installation shall comply with NFPA 70 "National Electrical Code."

ANSI Compliance: Comply with requirements of ANSI Standard A13.1, "Scheme for the Identification of Piping Systems," with regard to type and size of lettering for raceway and cable labels.

PRODUCTS

MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, Manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- American Labelmark Co.
- Calpico, Inc.
- Cole-Flex Corp.
- Emed Co., Inc.
- George-Ingraham Corp.
- Ideal Industries, Inc.
- Kraftbilt
- LEM Products, Inc.
- Markal Corp.
- National Band and Tag Co.
- Panduit Corp.
- Radar Engineers Div., EPIC Corp.
- Seton Name Plate Co.
- Standard Signs, Inc.
- W.H.Brady, Co.

ELECTRICAL IDENTIFICATION PRODUCTS

Underground Line Marking Tape: Permanent, bright-colored, continuous-printed, plastic tape compounded for direct-burial service not less than 6 inches wide by 4 mils thick. Printed legend indicative of general type of underground line below and as indicated on the drawings.

Brass or Aluminum Tags: Metal tags with stamped legend, punched for fastener. Dimensions: 2 inches by 2 inches by 19 gage.

Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking nylon cable ties, 0.18-inch minimum width, 50-lb minimum tensile strength, and suitable for a temperature range from minus 50 deg F to 350 deg F. Provide ties in specified colors when used for color coding.

Heat Shrink Sleeves: Premanufactured heat shrinkable sleeves installed at each cable end, yellow or orange color with indeliable marking.

EXECUTION

INSTALLATION

Identify Junction, Pull, and Connection Boxes: Code-required caution sign for boxes shall be pressure-sensitive, self-adhesive label indicating system voltage in black, preprinted on orange background. Install on outside of box cover. Also label box covers with identity of contained circuits. Use pressure- sensitive plastic labels at exposed locations and similar labels or plasticized card stock tags at concealed boxes.

Underground Electrical Line Identification: During trench backfilling, for exterior underground power, signal, and communications lines, install continuous underground plastic line marker, located directly above line at 6 to 8 inches below finished grade. Where multiple lines installed in a common trench or

concrete envelope, do not exceed an overall width of 16 inches; install a single line marker. Install line marker for all underground cable and wiring, both direct-buried and in raceway.

Cable Color Coding:

Phase Identification: Apply colored, pressure-sensitive plastic tape in half- lapped turns for a distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply the last two laps of tape with no tension to prevent possible unwinding. Use 1-inch-wide tape in colors as specified. Do not obliterate cable identification markings by taping. Tape locations may be adjusted slightly to prevent such obliteration. Tape colors are to be as shown on drawing E3011 Miscellaneous Details.

Power Circuit Identification: Securely fasten identifying metal tags or aluminum wraparound marker bands to cables, feeders, and power circuits in pull boxes, manholes, and transformer enclosures with 1/4-inch steel letter and number stamps with legend to correspond with designations on Drawings. If metal tags are provided, attach them with approximately 55-lb test monofilament line or one-piece self-locking nylon cable ties.

Tag or label cables as follows at the conduit entry:

- Primary and Secondary Cables – manhole, pull box, or transformer number
- Service Cables – service address

(END OF SECTION)

SECTION 16320
PAD MOUNTED TRANSFORMERS

GENERAL

RELATED DOCUMENTS

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

SUMMARY

This section describes the setting and installation of the Owner supplied pad mounted transformers. The use of the term “pad mounted transformer” describes all transformers to be installed with medium voltage windings on the primary and low voltage windings on the secondary.

Related Sections: The following Section contains requirements that relate to this Section.

- Division 2 Section 02110: “Site Preservation”
- Division 3 Section 03300: Cast in Place / Ready Mix Concrete for equipment pads.
- Division 16 Section 16124: “Medium Voltage Cables”

QUALITY ASSURANCE

Comply with NFPA 70, “National Electrical Code”.

EXECUTION

INSTALLATION

The Contractor shall set and anchor all owner supplied transformers as indicated on the drawings.

The Contractor shall make all medium voltage, low voltage power, neutral, and ground connections necessary for proper operation of each pad mounted transformer. This shall include the installation of all necessary underground ducts and raceways

Contractor shall install transformers and accessory items according to manufacturer’s written installation instructions and the following specifications.

IDENTIFICATION

Identify field-installed wiring and components and provide warning signs according to Division 16 Section “Electrical Identification”.

Transformer labels: Stencil the transformer number and primary phase in durable, long lasting paint on each new pad-mounted transformer and existing pad-mounted transformer. Three-phase pad-mounted transformers should be listed as ØABC.

GROUNDING

Connections: Ground transformers to grounding system as indicated on the drawings and in Division 16 “Grounding”.

CONNECTIONS

Install medium voltage, low voltage, neutral and ground connections.

Tighten all electrical connectors and terminals according to manufacturer's published torque-tightening values. Where these values are not indicated, use those specified in UL 486A and UL 486B.

CLEANING

Inspect exterior of installed transformers. Remove paint splatters and other spots, dirt, and debris and thoroughly clean finish to restore a new appearance. Touch up scratches and mars of finish to match original finish.

Ensure transformer enclosure open and close properly with no binding or excessive force required. Ensure all enclosure safety locks and anti-tamper devices are working properly.

PROTECTION

Protect transformer finish and components during construction work by covering with tarpaulins or other appropriate cover.

(END OF SECTION)

SECTION 16452
GROUNDING

GENERAL

RELATED DOCUMENTS

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

Requirements of the following Division 16 Sections apply to this Section:

- Division 16 Section 16010"Basic Electrical Requirements."
- Division 16 Section 16050 "Basic Electrical Materials and Methods."

SUMMARY

This Section includes solid grounding of electrical systems and equipment. It includes basic requirements for grounding for protection of life, equipment, circuits, and systems. Grounding requirements specified in this Section may be supplemented in other sections of these Specifications.

SUBMITTALS

General: Submit the following in accordance with General Conditions.

Product data for ground rods, connectors and connection materials, and grounding fittings.

Report of field tests and observations certified by the testing organization.

QUALITY ASSURANCE

Listing and Labeling: Provide products specified in this Section that are listed and labeled. The terms "listed" and "labeled" shall be defined as they are in the National Electrical Code, Article 100.

Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

Field-Testing Organization Qualifications: To qualify for acceptance, the independent testing organization must demonstrate, based on evaluation of organization-submitted criteria conforming to ASTM E 699, that it has the experience and capability to conduct satisfactorily the testing indicated.

Electrical Component Standard: Components and installation shall comply with NFPA 70, "National Electrical Code" (NEC).

PRODUCTS

MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

- Anixter Bros., Inc.
- Bashlin Industries, Inc.
- Buckingham Mfg. Co.
- A.B. Chance Co.
- Dossert Corp.

- Engineered Products Co.
- Erico Products, Inc.
- Galvan Industries, Inc.
- GB Electrical, Inc.
- General Machine Products Co., Inc.
- Hastings Fiber Glass Products, Inc.
- Ideal Industries, Inc.
- Kearney-National.
- McGill Mfg.
- O-Z/Gedney Co.
- Post Glover Resistors, Inc.
- Raco, Inc.
- Thomas & Betts Corp.
- W.H. Salisbury & Co.
- Utilco Co.
- DMC Power

GROUNDING AND BONDING PRODUCTS

Products: Of types indicated and of sizes and ratings to comply with NEC. Where types, sizes, ratings, and quantities indicated are in excess of NEC requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.

Conductor Materials: Copper.

WIRE AND CABLE CONDUCTORS

General: Comply with Division 16 Section "Wires and Cables." Conform to NEC Table 8, except as otherwise indicated, for conductor properties, including stranding.

Equipment Grounding Conductor: Green insulated.

Grounding Electrode Conductor: Bare Stranded cable.

Bare Copper Conductors: Conform to the following:

- Solid Conductors: ASTM B-3.
- Assembly of Stranded Conductors: ASTM B-8.
- Tinned Conductors: ASTM B-33.

MISCELLANEOUS CONDUCTORS

Ground Bus: Bare annealed copper bars of rectangular cross section.

Braided Bonding Jumpers: Copper tape, braided No. 30 gage bare copper wire, terminated with copper ferrules.

Bonding Strap Conductor/Connectors: Soft copper, 0.05 inch thick and 2 inches wide, except as indicated.

CONNECTOR PRODUCTS

General: Listed and labeled as grounding connectors for the materials used.

Pressure Connectors: High-conductivity-plated units.

Bolted Clamps: Heavy-duty units listed for the application.

Exothermic Welded Connections: Provided in kit form and selected for the specific types, sizes, and combinations of conductors and other items to be connected.

Swage Compression Connections: Swage ground connection system as manufactured by DMC Power may be installed as an alternative to exothermic welded connections.

GROUNDING ELECTRODES

Ground Rods: Copper-clad steel with high-strength steel core and electrolytic-grade copper outer sheath, molten welded to core.

Size: 5/8 inch by 8 feet.

EXECUTION

APPLICATION

Install grounding at transformers in accordance with drawings. Bond transformer enclosures to the grounding system.

Install grounding in manholes and pull boxes to bond all wall support channels to existing grounding electrodes. If the existing grounding electrodes are corroded such that the copper cladding is not intact or it is not practicable to make exothermic weld connections to the ground conductors, notify the Engineer.

GROUNDING ELECTRODES

Provide cone pointed driven ground rods driven full depth plus 6 inches, installed to provide an earth ground of the appropriate value for the particular equipment being grounded.

If the specified ground resistance is not met, an additional ground rod must be provided in accordance with the requirements of NFPA 70 (placed not less than 6 feet from the first rod). Should the resultant (combined) resistance exceed the specified resistance, measured not less than 48 hours after rainfall, notify the Engineer immediately.

CONNECTIONS

General: Make connections in such a manner as to minimize possibility of galvanic action or electrolysis. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

Use electroplated or hot-tin-coated materials to assure high conductivity and make contact points closer in order of galvanic series.

Make connections with clean bare metal at points of contact.

Coat and seal connections involving dissimilar metals with inert material such as red lead paint to prevent future penetration of moisture to contact surfaces.

Exothermic Welded or Swage Compression Connections: Use for connections to structural steel and for underground connections. Install at connections to ground rods and plate electrodes. Comply with manufacturer's written recommendations. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

Terminate insulated equipment grounding conductors for feeders and branch circuits with pressure-type grounding lugs. Where metallic raceways terminate at metallic housings without mechanical and electrical connection to the housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to the ground bus in the housing. Bond electrically noncontinuous conduits at both entrances and exits with grounding bushings and bare grounding conductors.

Tighten grounding and bonding connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts. Where manufacturer's torqueing requirements are not indicated, tighten connections to comply with torque tightening values specified in UL 486A and UL 486B.

Compression-Type Connections: Use hydraulic compression tools to provide the correct circumferential pressure for compression connectors. Use tools and dies recommended by the manufacturer of the connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on the ground conductor.

Moisture Protection: Where insulated ground conductors are connected to ground rods or ground buses, insulate the entire area of the connection and seal against moisture penetration of the insulation and cable.

FIELD QUALITY CONTROL

Tests: Measure the resistance of each ground rod using the fall-of-potential method defined in IEEE 81. If the resistance is greater than 25 ohms, notify the Engineer. Maintain records of all resistance tests.

(END OF SECTION)

APPENDIX A – BID TABLE

UNIT PRICES

Unit prices quoted and accepted shall apply throughout the life of the contract, except as otherwise specifically noted. Unit prices shall be applied, as appropriate, to compute the total value of changes in the scope of the work, all in accordance with the contract documents.

The unit adjustment prices will be a major consideration in the bid evaluations.

	Unit Adjustment Price	
	Labor & Material	Labor Only
Conduit trenching, machine dug, per cubic yard		
Conduit trenching, hand dug, per cubic yard		
Rock excavation, per cubic yard		
Cut and replace asphalt pavement (furnish all materials), per square yard		
Cut and replace decorative concrete sidewalk (furnish all materials), per square yard		
Re-seed and mulch (furnish all materials), per square yard		
Re-sod (furnish all materials), per square yard		
Concrete for transformer pads, including reinforcing and formwork, per cubic yard		
Bore under roadway, including 4-inch conduit installation, per foot		
Setup for bore, including excavation and backfill of pit, each		
Conduit, including fittings and supports, installed, per foot:		
4 inch PVC schedule 40 direct buried		
1-1/2 inch rigid steel		
2 inch rigid steel		
2 inch flexible liquid-tight conduit		

	Unit Adjustment Price	
	Labor & Material	Labor Only
Install 5/8 inch by 10 foot ground rod, install, test resistance, and connect to equipment with copper conductor (furnish exothermic welded connections to ground rod), each		
No. 2/0 AWG bare copper ground wire, installed, per foot		
No. 2/0 AWG copper exothermic welded connection, installed, each		
Three No. 1/0 AWG aluminum 15 kV URD cables in conduit, installed, per foot		
600 V cable in conduit, installed, per foot:		
Four 500 kcmil and one 350 kcmil aluminum		
Three 500 kcmil and one 350 kcmil aluminum		
Three 750 kcmil and one 350 kcmil aluminum		
Triplex, 4/0-2/0 AWG aluminum		
Triplex, 2/0-2/0 AWG aluminum		
Quadruplex, 4/0-2/0 AWG aluminum		
One 2/0 AWG aluminum		
15 kV loadbreak elbow, installed, each		
600 V submersible connector, six 2-hole NEMA pad outlets with insulating sleeves, installed, each		
600 V submersible connector, three 1-hole NEMA pad outlets with insulating sleeves, installed, each		
600 V terminal lugs, installed, each:		
750 kcmil aluminum 2-hole NEMA		
500 kcmil aluminum 2-hole NEMA		
350 kcmil aluminum 2-hole NEMA		
No. 4/0 AWG aluminum 2-hole NEMA		

	Unit Adjustment Price	
	Labor & Material	Labor Only
No. 2/0 AWG aluminum 2-hole NEMA	X	
No. 10 AWG aluminum 2-hole NEMA	X	
No. 12 AWG aluminum 2-hole NEMA	X	
No. 2/0 AWG aluminum 1-hole NEMA	X	
No. 10 AWG aluminum 1-hole NEMA	X	
No. 12 AWG aluminum 1-hole NEMA	X	
Cable support bracket, stainless steel slotted channel, 18” long, 1-5/8” x 1-5/8”, 12 GA, installed, each	X	
Cable clamp, 1-7/8”, polymer, with stainless steel strap, installed, each	X	
Manhole wall support, stainless steel slotted channel, 72” long, 13/16” x 1-5/8”, 12 GA, installed, each	X	
Pull box wall support, stainless steel slotted channel, 38” long, 13/16” x 1-5/8”, 12 GA, installed, each	X	
Perform dc hipot cable test on completed single phase 15 kV cable section, each		X
Perform dc hipot cable test on completed three phase 15 kV cable section, each		X
Install 50 kVA single phase pad-mounted transformer, each	X	
Install 100 kVA single phase pad-mounted transformer	X	
Install 167 kVA single phase pad-mounted transformer	X	

SUBCONTRACTORS

Provide a list of all Subcontractors with name, address, and phone number. The Contractor shall not change Subcontractors without written permission of the Owner.

Contractor Name	Contact Information	Work Subcontracted