

BID AND CONTRACT DOCUMENTS

FOR

**BALLFIELD PUMP STATION
IMPROVEMENTS**

**NORTH CHARLESTON SEWER DISTRICT
NORTH CHARLESTON, SC**

BID AND CONTRACT DOCUMENTS
FOR
Ballfield Pump Station Improvements

Located in
The City of North Charleston,
Charleston County, South Carolina

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INFORMATION FOR BIDDERS

BACKGROUND:

Ballfield lift station needs an upgrade. New pumps were installed during a previous project upgrade and are not part of this project. Because this station falls in FEMA flood zone AE, it requires an elevated concrete platform to raise all equipment to BFE +2'. Prior to the commencement of any on-site work, Contractor shall be required to pull the approved Construction Work Permits from the North Charleston Permits Office. Once platform has been erected, Contractor shall install a refurbished 125 kw backup generator (Owner supplied), and all associated equipment to include but not limited to: New Meter Base, Main Disc. Switch, ATS (Owner supplied), MTS, Load Bank Docking station (Owner supplied), SPD, Pump Control Panel (Owner supplied), RTU (Relocate existing), Level Probe and Controller (Contractor supplied), and all associated conduit, fittings, junction boxes, and wiring for a complete and proper installation. Contractor is responsible for supplying all equipment not supplied by Owner. Existing system shall remain in operation until outage to complete pump changeover to new control panel and relocate existing RTU. Upon completion of changeover, all existing above ground equipment shall be removed.

The Engineer for this project is McCall Thomas Engineering

RECEIPT AND OPENING OF BIDS: Bids will be received at the North Charleston Sewer District Administrative offices until **2:00 PM, June 01, 2020**, at which time all bids received will be publicly opened and read aloud.

Bids may be **delivered** to:

Purchasing Department
North Charleston Sewer District
7225 Stall Road
North Charleston, South Carolina 29406

Or

Bids may be **mailed** to:

Purchasing Department
North Charleston Sewer District
PO Box 63009
North Charleston, South Carolina 29419

MAIL IS ONLY PICKED UP FROM THE US POSTAL SERVICE ON MONDAYS AND THURSDAYS AROUND 10:30 A.M. (EXCLUDING WEEKENDS AND HOLIDAYS).

LICENSES: The attention of Bidders is directed to the provisions of the acts for licensing of General Contractors for the State of South Carolina and all requirements of such acts which have

bearing upon this work shall be deemed as part of the Specifications as if written therein in full. The showing by the Contractor of his license number shall be deemed as the Contractor's representation that he is legally qualified to enter the prescribed Contract for any or all portions of the work included in his Bid.

All Bidders submitting a Bid shall have a current valid Contractor's License for the State of South Carolina. This license number shall be shown on the bid form immediately below the signature identification and on the face of the sealed envelope containing the submitted Bid. Subcontractors who will be engaged by the General Contractor shall also hold the required licenses. The successful Bidder and all subcontractors will be required to obtain any business license required prior to beginning work, if said Bidder does not have the required license.

BID SECURITY: Each Bid must be accompanied by a certified check of the Bidder, or a Bid Bond duly executed by the Bidder as principal and having as surety thereon a surety company qualified to do business under the laws of the State of South Carolina and satisfactory to the Owner, in an amount not less than five percent (5%) of the Bid.

Such check or Bid Bond will be returned to all except the three (3) lowest Bidders upon request, and the remaining checks or Bid Bonds will be returned upon request after the Owner and the accepted Bidder have executed the Agreement. If no award has been made within ninety (90) calendar days after the date of the opening of Bids, such check or Bid Bond will be returned upon request of the Bidder at any time thereafter, so long as he has not been notified of the acceptance of his Bid.

GUARANTY BONDS: The Bidder to whom the contract is awarded will be required to execute the Agreement and obtain the Performance Bond and Payment Bond, each in the sum of the full amount of the Contract Price, within ten (10) calendar days from the date when Notice of Award is delivered to the Bidder.

The Bonds must be duly executed and acknowledged by the Bidder as principal and by a corporate surety company qualified to do business under the laws of the State of South Carolina and satisfactory to the Owner as surety, for the faithful performance of the Contract and payment for labor and materials. The premiums for such bonds shall be paid by the Contractor.

Each Bond must be irrevocable, and valid for two years beyond the date of final acceptance of the project.

EXECUTION OF CONTRACT: The Owner, within ten (10) calendar days of receipt of acceptable Performance Bond, Payment Bond, and Agreement signed by the party to whom the Agreement was awarded, shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Owner not execute the Agreement within such period, the Bidder may by written notice withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

POWER OF ATTORNEY FOR BONDS: Attorneys-in-fact who sign Bid or Performance or Payment Bonds must file with each Bond a certified and dated copy of their power of attorney.

LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT: The successful Bidder, upon his failure or refusal to execute and deliver the Contract and Bonds required within ten (10) calendar days after he has received notice of the acceptance of Bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his bid.

LAWS AND REGULATIONS: All applicable laws, 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 as though herein written out in full.

IMPORTANT TAX NOTICE - NONRESIDENTS ONLY:

Withholding Requirements for Payments to Nonresidents: Section 12-8-550 of the South Carolina Code of Laws requires persons hiring or contracting with a nonresident conducting a business or performing personal services of a temporary nature within South Carolina to withhold 2% of each payment made to the nonresident. The withholding requirement does not apply to (1) payments on purchase orders for tangible personal property when the payments are not accompanied by services to be performed in South Carolina, (2) nonresidents who are not conducting business in South Carolina, (3) nonresidents for contracts that do not exceed \$10,000 in a calendar year, or (4) payments to a nonresident who (a) registers with either the S.C. Department of Revenue or the S.C. Secretary of State and (b) submits a Nonresident Taxpayer Registration Affidavit - Income Tax Withholding, Form I-312 to the person letting the contract.

The withholding requirement applies to every governmental entity that uses a contract ("Using Entity"). Nonresidents should submit a separate copy of the Nonresident Taxpayer Registration Affidavit - Income Tax Withholding, Form I-312 to every Using Entity that makes payment to the nonresident pursuant to this solicitation. Once submitted, an affidavit is valid for all contracts between the nonresident and the Using Entity, unless the Using Entity receives notice from the Department of Revenue that the exemption from withholding has been revoked.

For information about other withholding requirements (e.g., employee withholding), contact the Withholding Section at the South Carolina Department of Revenue at 803-898-5383 or visit the Department's website at: <https://dor.sc.gov>

This notice is for informational purposes only. This agency does not administer and has no authority over tax issues. All registration questions should be directed to the License and Registration Section at 803- 898-5872 or to the South Carolina Department of Revenue, Registration Unit, Columbia, S.C. 29214-0140. All withholding questions should be directed to the Withholding Section at 803-896-1420.

<https://dor.sc.gov/forms-site/Forms/I312.pdf>

EXAMINATION OF DRAWINGS AND SPECIFICATIONS: Each Bidder shall carefully examine Drawings and Specifications and all Addenda or other revisions thereto and thoroughly familiarize himself with the detailed requirements thereof prior to submitting a Bid. If any Bidder is in doubt as to the true meaning of any part of the Drawings, Specifications, or other Documents, or if any error, discrepancy, conflict, or omission is noted, the Bidder shall immediately contact the Owner in writing and request clarification. The Owner will clarify the intent of the Documents and/or correct such error, discrepancy, conflict, or omission, and will notify all Bidders by Addendum in cases where the extent of work or cost thereof will be appreciably affected. No allowance will be made after Bids are received for oversight by Bidder.

EXAMINATION OF SITE: Each Bidder must visit the site of proposed work and fully acquaint himself with conditions relating to construction and labor so he may fully understand facilities, difficulties, and restrictions attending execution of work under contract. By executing the Agreement, the Contractor represents that he has visited the site, familiarized himself with the local conditions under which the work is to be performed, and correlated his observations with the requirements of the Contract Documents.

The Bidder shall confine examination to the specific areas designated for the proposed construction, including easements and public Right-of-ways. If, due to some unforeseen reason, the Owner's proceedings for obtaining the proposed construction site (including easements) have not been completed, the Bidder may enter the site only with the express consent of the property owner. The Bidder is solely responsible for any damages caused by his examination of the site.

INFORMATION NOT GUARANTEED: All information given on the Drawings or in the Contract Documents relating to subsurface conditions, existing structures, location of utilities, sewer inverts, or other information on existing facilities is from the best sources at present available to the Owner. All such information is furnished only for the information and convenience of the Bidders.

It is agreed and understood that the Owner does not warrant or guarantee that the conditions, pipes, or other structures encountered during construction will be the same as those indicated on the Drawings or in the Contract Documents. The Bidder must satisfy himself regarding the character, quantities, and conditions of the various materials and the work to be done.

It further is agreed and understood that the Bidder or the Contractor will not use any of the information made available to him or obtained in any examination made by in any manner as a basis or ground of claim or demand of any nature against the Owner or Engineer, arising from or by reason of any variance which may exist between the information offered and the actual materials or structures encountered during the construction work, except as may otherwise be provided for in the Contract Documents.

If any work is performed by the Contractor, or any subcontractor, prior to adequate verification of applicable data, any resultant extra cost for adjustment of work necessary to conform to existing conditions, or damage to existing facilities, shall be assumed by the Contractor without reimbursement or compensation by the Owner.

COMPLETE WORK REQUIRED: It is the intent of the Drawings and Specifications to provide a complete and usable facility. The Contractor's work shall be based on the Drawings and Specification but shall include all materials and appurtenances are shown on the Drawings or described in the Specifications.

The Drawings, Specification, and all supplementary documents are essential parts of the Contract, and requirements occurring in one are as binding as though occurring in all. They are intended to be cooperative, to describe and provide for a complete work. In case of discrepancy on the Drawings, figured dimensions shall govern. In case of omissions from the Specification as to items of equipment and materials or quantities therefore, the Drawing shall govern.

It shall be the responsibility of the Bidder to call to the attention of the Engineer obvious omissions of such magnitude as to affect the strength, adequacy, function, completeness, or cost of any part of the work in ample time for amendment by Addendum prior to bid opening date.

ADDENDA AND INTERPRETATIONS: No interpretation of the meaning of the Drawings, Specifications, or other Bid Documents will be made orally to any Bidder by the Engineer or Owner prior to award of the contract.

Every request for such interpretation should be in writing and emailed to purchasing@ncsd.sc.gov. To be given consideration, such request must be received no later than **10:00 am May 27, 2020**. All such interpretations and any supplemental instructions will be made in the form of written Addenda to the Specifications which, if issued, will be posted on the Purchasing website at www.ncsd.sc.gov/purchasing. Failure of any bidder to receive any such Addendum or interpretation shall not relieve such Bidder from any obligation under his Bid as submitted. All Addenda so issued shall become part of the Contract Documents.

ABILITY AND EXPERIENCE OF BIDDER: It is the purpose of the Owner not to award this Contract to any Bidder who does not furnish satisfactory evidence that he has the experience of successfully completing projects of this type and magnitude and that he has sufficient capital, equipment, plant, and personnel to enable him to prosecute the work successfully and to complete it in the time named.

The Owner may make such investigations as it deems necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the Owner, under oath if so required, all such information and data for this purpose as the Owner may request.

BIDS AND QUALIFICATIONS: Before a Bid is considered for award, the Bidder may be requested by the Engineer or Owner to submit a statement of facts in detail as to his previous experience in performing similar or comparable work, and of his business and technical organization and financial resources and plant available to be used in performing the contemplated work.

TIME FOR COMPLETION: The Bidder must agree to commence work within 15 days of the notice to proceed stipulated in the Agreement. The Bidder also must agree to fully complete the project within **90** consecutive calendar days.

LIQUIDATED DAMAGES: The Bidder must agree to pay as liquidated damages the amount set forth in the Agreement for each consecutive calendar day that the work is incomplete after the agreed upon date of completion.

WITHDRAWAL OF BIDS: Any Bidder may withdraw his Bid, either personally or by written request, at any time prior to the scheduled opening of Bids or authorized postponement thereof. Otherwise, Bidder may not withdraw his Bid for a period of ninety (90) calendar days after the date set for the opening thereof, and all Bids shall be subject to acceptance by the Owner during this period.

IRREGULAR BIDS: A Bid will be considered irregular and may be rejected for any one of the following reasons:

1. If the Bid is on a form other than that furnished by the Owner, or if the form is altered or any part detached.
2. If there are unauthorized additions, conditional or alternate bids, or irregularities of any kind which tend to make the Bid incomplete, indefinite, or ambiguous in its meaning.
3. If the Bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award.
4. If the Bid does not contain a price for each item listed.
5. If the Bid does not contain the aggregate of the Bid, obtained by adding the extended amounts of the various items, if applicable.
6. If the Bid contains obviously unbalanced bid prices.
7. If there is reason to believe that any Bidder is interested in more than one Bid on the same project or that there has been collusion among the Bidders.

DISQUALIFICATION OF BIDDERS: More than one Bid from an individual, a firm or partnership, a corporation, or any association, under the same or different names, will not be considered. Reasonable grounds for believing that any Bidder is interested as a principal in more than one Bid for the work contemplated will cause the rejection of all Bids in which such Bidder is believed to be interested. Any or all Bids will be rejected if there is reason to believe that collusion exists among the Bidders. Contracts will be awarded only to responsible Bidders capable of performing the class of work contemplated within the time specified and having sufficient resources and finances to carry on the work properly.

ACCEPTANCE OR REJECTION OF BIDS: The Owner reserves the right to reject any and all Bids when such rejection is in the interest of the Owner; to reject the Bid of a Bidder who has previously failed to perform properly or complete on time contracts of a similar nature; and to reject the Bid of a Bidder who is not, in the opinion of the Engineer or Owner, in a position to perform the Contract. The Owner reserves the right to waive any informalities and technicalities in bidding. The Owner may also accept or reject any of the alternates that may be set forth on the Bid.

METHOD OF AWARD: The Contract will be awarded to the responsive, responsible Bidder submitting the lowest Bid complying with the conditions of the Contract Documents. Award will be made based on the prices given in the Base Bid or a combination of the Base Bid and Alternate, at the Owners option. The Bidder to whom the award is made will be notified.

A responsive Bidder submits a Bid in the proper form without qualifications or intent other than as called for in the Contract Documents and who binds himself or herself on behalf of the Bid to the Owner with the proper Bid Bond completed and attached, and who properly completes all forms required to be completed and submitted at the time of the Bidding. The Bidder shall furnish all data required by these Contract Documents. Failure to do so may result in the Bid being declared non-responsive.

A responsible Bidder can fulfill the following requirements:

- a. The Bidder shall maintain a permanent place of business. This requirement applies to the Bidder where the Bidder is a division of a corporation, or where the Bidder is 50 percent or more owned by a person, corporation, or firm.
- b. The Bidder shall demonstrate adequate construction experience and sufficient equipment resources to properly perform the work under and in conformance with the Contract Documents. This evaluation will be based upon a list of completed or active projects and a list of construction equipment available to the Bidder to perform the work. The Owner may make such investigations as deemed necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may reasonably 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 Project contemplated therein.
- c. The Bidder shall demonstrate financial resources of sufficient strength to meet the obligations incident to the performance of the work covered by these Contract Documents. The ability to obtain the required Performance and Payment bonds will not alone demonstrate adequate financial capability.

Acceptance of the Bidder's documentation and substantiation or Contract Award by the Owner does not relieve the Bidder of liability for non-performance covered in the Contract Documents, nor will the Bidder be exempted from any other legal recourse the Owner may elect to pursue.

PRE-CONSTRUCTION CONFERENCE: After the Contractor signs the AGREEMENT, and submits all required documents, and prior to issuance of the NOTICE TO PROCEED, a pre-construction conference will be held with representatives of the Owner, Contractor, and the Engineer. At this conference, the construction schedule and inspection schedule will be approved. Any problems with the Plans & Specifications will be resolved, and the Project Staff of the Owner and the Contractor will receive approval.

NOTICE TO PROCEED: The Notice to Proceed will be issued within ten (10) calendar days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and Contractor. If the Notice to Proceed has not been issued within the ten (10) calendar day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

ESTIMATED QUANTITIES: Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid Schedule by examining the site and reviewing the Specifications, Drawings, and Addenda. After Bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done.

COMPARISON OF BIDS: Bids will be compared on the basis of the prices stated in the Bid. If there is a discrepancy between the unit price and or the computed total amount, the unit price shall govern.

EASEMENTS: The Owner has obtained, or will obtain, permanent easements and temporary construction easements through private property. The temporary construction easements entitle the Contractor to the occupancy and use of the designated area near or adjacent to the work for purposes related to the work. The Contractor will not encroach on any property unless it has been established that easements have been obtained. On all other land, the Contractor has no rights unless he obtains permission from the proper parties.

WORK IN STATE AND COUNTY RIGHT-OF-WAYS: The Owner will obtain the necessary easements and permits for construction across City, County and State Highway rights-of-way. The Contractor shall abide by all rules, regulations, and requirements of these agencies in regard to construction under this contract, including the giving of notices, provisions for inspections, and employment of such methods of construction as may be required. Wherever these Specifications may conflict with the regulations or requirements of these agencies, such regulations shall govern, and these Specifications shall be modified to such extent as necessary to conform to the said rules, regulations, and requirements. Wherever additional costs are incurred due to requirements of these agencies, such additional periods of maintenance, special features of construction, etc., all such costs shall be included in the prices bid. No additional compensation will be allowed for such costs after award of the Contract.

ITEMS AND INDETERMINATE ITEMS: The work to be done under this Contract has been divided into items so that the actual quantity of work executed under each item may be paid for at the unit price bid for the particular item even though such quantity is greater or less than the estimated quantity stated in the Bid.

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 alter the quantities of work to be performed or to extend or shorten the improvements at any time when and as found necessary, and the Contractor shall perform the work as altered, increased or decreased. Payment for such increased or decreased quantity will be in accordance with General Conditions subsection 7.11 entitled Payment for Extra Work. No allowance will be made for any change in anticipated profits nor shall such changes be considered as waiving or invalidating any conditions or provisions of the Contract and Bond.

FORM OF BID: All Bids must be submitted on the blank bid form provided therefore and must state the total price for which the Bidder will complete the work in accordance with the terms of the Contract Documents. All blank spaces must be filled in and there shall be no interpretations, alterations, or erasures.

The Bid must be signed manually by a principal or an officer duly authorized to make contracts. The Bidder's legal name must be fully stated and the name and title of the person signing must be typed below his signature.

SUBMITTING BIDS: Each Bid must be submitted on the prescribed bid form. All blank spaces for bid prices must be filled in, in ink or typewritten, and the Bid must be fully completed and executed when submitted. Only one copy of the bid form is required.

Bidders are cautioned that it is the responsibility of each individual Bidder to assure that his Bid is in the possession of the responsible official or his designated alternate prior to the stated time and at the stated place of the bid opening. Owner is not responsible for Bids delayed by mail or delivery services of any nature.

CONFLICT OR INCONSISTENCIES: Bidders are also cautioned that if more than one set of conditions are included in the contract, then in case of a conflict between any of the conditions the strictest will apply.

BID SUBMISSION REQUIREMENTS: Bids shall be submitted at the time and place indicated in the Advertisement or Invitation to Bid and shall be enclosed in an opaque sealed envelope, marked with the project title (and if applicable, the designated portion of the Project for which the Bid is submitted) and name, address of the Bidder and accompanied by the bid bond and other required documents. If the bid is sent through the mail or other delivery system, the sealed envelope shall be enclosed in a separate envelope with notation "**Bid Enclosed**" on the face of it.

(End Information for Bidders)

BID

TO: North Charleston Sewer District Purchasing Department
PO Box 63009
North Charleston, SC 29419

FROM: _____

of the City of _____, County of _____, and
State of _____, hereinafter called "Bidder".

PROJECT: Ballfield Pump Station Improvements

Gentlemen:

The Bidder, in compliance with your Advertisement or Invitation for Bids for the construction of above-referenced project, having examined the 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 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 declares that he has carefully examined the site of the proposed Work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed Work, and the difficulties attendant upon its execution, and that he has carefully read and examined the Drawings, and the Specifications and other Contract Documents therein referred to, and knows and understands the terms and provisions thereof.

Bidder understands that information relative to existing structures, apparent and latent conditions, and natural phenomena, as furnished to him on the Drawings, in the Contract Documents, or by the Owner or the Engineer, carries no guarantee expressed or implied as to its completeness or accuracy, and he has made due allowance therefore.

TIME FOR COMPLETION AND LIQUIDATED DAMAGES: Bidder hereby agrees to commence work under this contract within 15 days of receipt of the Notice to Proceed and to fully complete the project within 90 consecutive calendar days thereafter.

Bidder also agrees to pay \$500 /day as liquidated damages for each consecutive calendar day thereafter as hereinafter provided in the General Conditions.

ADDENDA: Bidder acknowledges receipt of the following Addenda:

Addendum No. _____ Date _____
 Addendum No. _____ Date _____
 Addendum No. _____ Date _____
 Addendum No. _____ Date _____

Item	Description	Quantity	Unit	Extended Price
1.	Ballfield Pump Station Improvements	1	LS	

NOTE: ALL QUANTITIES ARE APPROXIMATE.

TOTAL BASE BID (ITEMS 1, INCLUSIVE) \$ _____

The above Lump Sum price shall include all labor, materials, dewatering, shoring, removal, overhead, profit, insurance, taxes, fees, etc., to cover the finished work of the several kinds called for.

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

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

Upon receipt of written notice of the acceptance of this Bid, Bidder will execute the formal Agreement attached with 10 days and deliver Surety bonds as required by the General Conditions. The bid security attached in the sum of _____ (\$ _____) is to become the property of the Owner in the event the Agreement 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.

The undersigned declares that the person or persons signing this proposal is fully authorized to sign the proposal on behalf of the firm listed and to fully bind the firm listed to all the conditions and provisions thereof.

It is agreed that no person or persons or company other than the firm listed below or as otherwise indicated hereinafter has any interest whatsoever in this proposal or the contract that may be

entered into as a result thereof, and that in all respects the proposal is legal and fair, submitted in good faith, without collusion or fraud.

Respectfully Submitted:

Contractor

(SEAL)
(Corporations)

By: _____

(Title)

(Address)

SC General Contractor's License No. _____

(End Bid)

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____ as Principal, and _____ as Surety, are hereby held and firmly bound unto the North Charleston Sewer District as OWNER in the penal sum of 5% (five percent) of BID 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 the North Charleston Sewer District a certain BID, attached hereto made a part hereof to enter into a contract in writing, for the **Ballfield Pump Station Improvements** Documents dated _____, by the Owner.

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 his faithful performance of said contract, and for the payment of all persons performing labor or 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 stipulated 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.

_____ (LS)

(Principal)

Surety

By: _____

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.

AGREEMENT

THIS AGREEMENT, made this _____ day of _____, 20_____, by and between **North Charleston Sewer District** acting herein through its _____ Purchasing Manager _____ (Kimberly J Caver)

hereinafter called "OWNER" and _____ (Name of Contractor)

doing business as _____ (an Individual), (a Partnership) or (a Corporation)

of the City of _____ County of _____ and

State of _____ hereinafter called "Contractor."

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The CONTRACTOR hereby agrees with the OWNER to commence and complete the construction described as follows:
Ballfield Pump Station Improvements hereinafter called the PROJECT.
2. The CONTRACTOR will furnish all of the materials, supplies, tools, equipment, labor, and other services necessary for the construction and completion of the PROJECT described herein.
3. The CONTRACTOR will commence the work required by the CONTRACT DOCUMENTS within 15 calendar days after the date of the NOTICE TO PROCEED and will fully complete the PROJECT within 90 consecutive calendar days unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS. The CONTRACTOR further agrees to pay, as liquidated damages, the sum of \$ 500 for each consecutive calendar day thereafter as hereinafter provided in the GENERAL CONDITIONS.
4. The CONTRACTOR agrees to perform all the WORK described in the CONTRACT DOCUMENTS and comply with the terms therein for the sum of _____ Dollars (\$ _____) or as shown in the Bid Schedule.
5. The term "CONTRACT DOCUMENTS" means and includes the following:
 - A. Advertisement for Bids

- B. Information for Bidders
- C. Bid
- D. Bid Bond
- E. Agreement
- F. General Conditions
- G. Supplemental Conditions
- H. Performance Bond
- I. Payment Bond
- J. Notice of Award
- K. Notice to Proceed
- L. Change Orders
- M. Specifications prepared by North Charleston Sewer District
- N. Addenda
 - No. _____ Dated _____
 - No. _____ Dated _____
 - No. _____ Dated _____
 - No. _____ Dated _____

- 6. The OWNER agrees to pay the CONTRACTOR in the manner and at such time as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.
- 7. The Agreement shall be binding on all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

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

(Owner)

(SEAL)

By: _____

ATTEST:

(Title of Authorized Official)

(Witness)

(Witness)

(Contractor)

By: _____
(Name)

(Title)

(Address)

ATTEST:

(Witness)

(Witness)

(End of Agreement Section)

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal and
(Corporation, Partnership or Individual)

(Name of Surety)

(Address of Surety)

Hereinafter called Surety, are held and firmly bound unto

NORTH CHARLESTON SEWER DISTRICT

(Name of Owner)

7225 STALL ROAD, NORTH CHARLESTON, SC 29406

(Address of Owner)

Hereinafter called OWNER, in the penal sum of _____ Dollars, (\$ _____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents. 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 a part hereof for the **Ballfield Pump Station Improvements**.

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 during the two year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall 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, extension 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 wise

affect its obligation 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 four (4) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20_____.

(Principal)

ATTEST:

(Principal) Secretary (SEAL)

By: _____(S)

Address

Witness to Principal

Address

WITNESS:

Surety

(Surety)

By: _____

Attorney-in-Fact

(SEAL)

Address

Witness as to Surety

Address

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is a partnership, all partners should execute BOND.

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

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal and
(Corporation, Partnership or Individual)

(Name of Surety)

(Address of Surety)

Hereinafter called Surety, are held and firmly bound unto

NORTH CHARLESTON SEWER DISTRICT

(Name of Owner)

7225 STALL ROAD, NORTH CHARLESTON, SC 29406

(Address of Owner)

Hereinafter called OWNER, in the penal sum of _____ Dollars, \$(_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents. 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 a part hereof for **Ballfield Pump Station Improvements**.

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 or 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 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, extension 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 wise 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 four (4) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20__.

ATTEST: _____
Principal

(Principal) Secretary (SEAL)

By: _____ (S)

Address

Witness to Principal

Address

WITNESS:

Surety

(Surety)

By: _____
Attorney-in-Fact

(SEAL)

Address

Witness as to Surety

Address

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is a partnership, all partners should execute BOND.

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

CERTIFICATION

Any person signing documents under **CERTIFICATE OF ACKNOWLEDGMENT OF CONTRACTOR IF A CORPORATION FOR CONTRACT BONDS** section shall also make the following certification:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

Date of Signature _____

Signature _____

Title _____

Name of Firm _____

Address _____

Telephone No. _____

NOTICE OF AWARD

TO: _____ Date: _____

PROJECT DESCRIPTION: Ballfield Pump Station Improvements

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement or Invitation for Bids dated _____, 20____, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$_____

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR’S Performance BOND, Payment Bond, and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER’S acceptance of you BID as abandoned and as forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this ____ day of _____, 20____.

Owner

By:_____

Title:_____

ACCEPTANCE OF NOTICE

Receipt of the NOTICE OF AWARD is hereby acknowledged by _____

this the ____ day of _____, 20____.

By:_____

Title:_____

NOTICE TO PROCEED

TO: _____ Date: _____

Project: **Ballfield Pump Station Improvements**

You are hereby notified to commence WORK in accordance with the Agreement dated _____,20____, on or before _____,20____, and you are to complete the WORK within _____consecutive calendar days thereafter. The date of completion of all WORK is therefore _____, 20____.

Owner

By:_____

Title:_____

ACCEPTANCE OF NOTICE

Receipt of the NOTICE OF AWARD is hereby acknowledged by _____

this the _____day of _____, 20____.

By: _____

Title: _____

CHANGE ORDER

Order No.: _____ Date: _____

Agreement Date:

NAME OF PROJECT: **Ballfield Pump Station Improvements**

OWNER: _____

CONTRACTOR: _____

The following changes are hereby made to the CONTRACT DOCUMENTS:

Justification:

Change to CONTRACT PRICE: \$ _____ .
Original CONTRACT PRICE: \$ _____ .
Current CONTRACTOR PRICE adjusted by previous CHANGE ORDER: \$ _____
The CONTRACT PRICE due to this CHANGE ORDER will be (increased) (decreased) by:
\$ _____ .

Change to CONTRACT TIME:

The CONTRACT TIME will be (increased) (decreased) by _____ calendar days.

The date for completion of all work will be _____
(Date)

Approvals Required:

To be effective this Order must be approved by the State agency if it changes the scope or objective of the PROJECT.

ENGINEER: _____ OWNER: _____

North Charleston Sewer District: _____

CONTRACTOR: _____

REQUEST FOR PAYMENT

CONTRACTOR:

ENGINEER:

REQUEST FOR PAYMENT

DATE: _____

TO: _____

MONTHLY PAYMENT NO. _____

PROJECT: **Ballfield Pump Station Improvements**

LOCATION: _____

FOR PERIOD _____

TO

TOTAL VALUE OF WORK COMPLETED TO DATE
(SEE ATTACHED SHEETS)

\$ _____

TOTAL VALUE MATERIALS STORED FOR PROJECT
(SEE ATTACHED SHEETS)

\$ _____

SUB-TOTAL

\$ _____

DEDUCTIONS: _____ LESS _____% RETAINED

\$ _____

LESS PREVIOUS PAYMENTS

\$ _____

TOTAL AMOUNT THIS PAYMENT

\$ _____

PREVIOUS PAYMENTS

1. _____ 4. _____ 7. _____ 10. _____

2. _____ 5. _____ 8. _____ 11. _____

3. _____ 6. _____ 9. _____ 12. _____

CONTRACTOR'S CERTIFICATION:

I HEREBY CERTIFY THE ABOVE WORK PERFORMED AND MATERIALS STORED ON PROJECT ARE AS PER THE PROVISIONS OF THE CONTRACT AGREEMENT.

CONTRACTOR

BY: _____

DATE: _____

APPROVED FOR ENGINEER

BY: _____

DATE: _____

APPROVED FOR OWNER

BY: _____

DATE: _____

APPROVED FOR ADMINISTRATOR

BY: _____

DATE: _____

GENERAL CONDITIONS

1.0 GENERAL

1.1 THE CONTRACT DOCUMENTS: The Contract Documents consists of the Advertisement of Bids, Information for Bidders, Bid, Bid Bond, Agreement, Payment Bond, Performance Bond, Conditions of the Contract (General, Supplemental and Other Conditions), Drawings, Specifications, Addenda, Notice of Award, Notice to Proceed, and Change Orders.

1.2 CORRELATION AND INTENT OF DOCUMENTS: The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all.

The intent of the Drawings and Specifications is to provide a complete and usable facility. The Contractor's work shall be based on the Drawings and Specifications, but the Contractor shall furnish all labor, supplies, materials, tools, machinery, equipment, transportation, supervision, temporary construction of any nature, and all other services, facilities and means necessary to produce a complete and workable facility whether or not such material and appurtenances are shown on the Drawings or described in the Specifications.

Any mention in the Specifications or indication on the Drawings of articles, materials, methods or operations shall require the Contractor to furnish such item or services as if it were fully specified unless it is noted or specified as not in the Contract. It is intended that all materials shall be new and best quality in every respect unless otherwise noted or specified. All workmanship, methods of assembly, and erection shall be first class in every respect.

1.3 CONFLICT OR INCONSISTENCY: If there is any conflict or inconsistency between the provisions of the Supplemental Conditions and the provisions of the other Contract Documents, the provisions of the Supplemental Conditions shall prevail. If there is any conflict or inconsistency between the provisions of the General Conditions and the provisions of any of the Contract Documents, other than the Supplemental Conditions, the provisions of the General Conditions shall prevail.

In case of conflict the Drawings and Specifications, the Specifications shall govern. Figure dimensions on Drawings shall govern over scale dimensions, and detailed Drawings shall govern over general Drawings.

In case of difference between small-scale and large-scale drawings, the large scale drawings shall govern. Schedules on any contract drawing shall take precedence over conflicting information on that or any other contract drawing.

On any of the drawings where a portion of the work is detailed or drawn out and the remainder is shown in outline, the parts detailed or drawn out shall apply also to all other like portions of the work. Where the word "similar" occurs on the drawings, it shall have a general meaning and not be interpreted as being identical, and all details shall be worked out in relation to their location and their connection with other parts of the work.

Any discrepancies found between the Drawings and Specifications and site conditions or any inconsistencies or ambiguities in the Drawings or Specifications shall be immediately reported to the Engineer, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. Work done by the Contractor after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the Contractor's risk.

Should a conflict be discovered within the Contract Documents, the Contractor shall be deemed to have estimated the higher quality way of doing the Work unless he shall have asked for and obtained a decision in writing from the Engineer before entering into this Contract.

1.4 ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS: The contractor may be furnished additional instructions and detail drawings, by the Engineer, as necessary to carry out the Work required by the Contract Documents. The additional drawings and instructions thus supplied will become a part of the Contract Documents. The Contractor shall carry out the Work in accordance with the additional detail drawings and instructions.

1.5 SPECIFICATION HEADINGS: For convenience of reference, these Specifications are divided into various divisions, Sections, subsections and Paragraphs, The titles of these headings shall not be taken as a correct or complete segregation of the various types of material and labor nor as an attempt to outline jurisdictional procedures. The headings shall not be deemed to limit or restrict the content, meaning or effect of such section, subsection, paragraph, provision or part.

The organization of the Specifications into the various headings, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. Each subcontract shall be dependent upon its own definite confines, regardless of Divisions of these Specifications. No responsibility, either direct or implied, is assumed by the Owner for omissions or duplications by the Contractor or by any of his subcontractors due to real or alleged errors in arrangement of matter in Contract Documents.

1.6 DRAWINGS AND SPECIFICATIONS FOR CONSTRUCTION PURPOSES: The Contractor will be furnished four (4) complete sets of Drawings and Specifications to be used during construction. If more than four (4) sets are needed, the Contractor will be required to pay the actual cost of printing and handling.

1.7 CONTRACT MODIFICATION: All changes which affect the cost of the construction of the Project must be authorized by means of a contract change order. All change orders and contract modifications must be approved by the Owner prior to becoming effective. The contract change order will include extra work, work for which quantities have been altered from those shown in the bidding schedule as well as decreases or increases in the quantities of installed units which are different from those shown in the bidding schedule because of final measurements. All changes should be recorded on a contract change order as they occur so that they may be included in the partial payment estimate.

1.8 COMPUTATION OF QUANTITIES: For estimating quantities in which the computation of areas by geometric methods would be comparatively laborious, it is agreed that the planimeter shall be considered an instrument of precision adapted to the measurement of such areas. It is

further agreed that the computation of the volume of prisms shall be by the method of average end areas.

1.9 SIGNS: The Owner reserves the right to all advertising privileges about the job and no signs shall be posted by the Contractor anywhere on the premises without approval by the Owner except those signs, posters, or bulletins required by Federal, State, or local authorities. Directional signs identifying offices and/or storage areas of the Contractor may be erected as required to facilitate work, provided:

1. The Contractor shall submit to the Owner for approval a scale drawing or sketch of the proposed sign showing size, type of material, painting, and proposed location. All submittal data shall be in triplicate.
2. The size of the individual sign shall be not greater than 24 inches wide by 12 inches high.
3. Signs shall be neatly painted on weather-resistant materials.
4. The signs will be removed upon completion of the job.
5. No sign shall be erected prior to approval by the Owner.

1.10 PUBLICITY: All prime contractors and their subcontractors shall submit to the Owner for approval all publicity items, including photographs, relating to the work of this project. Owner shall approve any and all material prior to release for publication.

1.11 DEFINITIONS: Wherever the words hereinafter defined, or pronouns used in their stead occur in the Contract Documents, they shall have the following meanings:

ADDENDA: Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the Contract Document, Drawings and Specifications by additions, deletions, clarifications, or corrections. Such addendum or addenda will take precedent over the position of the general drawings and specifications concerned and will be considered as part of the Contract Documents.

AGREEMENT: The Agreement represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, including the bidding documents. The Agreement may be amended or modified by a Change Order.

BID: The written offer or proposal of the Bidder, submitted on the prescribed form, properly signed and guaranteed, to perform the work at the prices quoted by the Bidder.

BID BOND: The security furnished by the Bidder with his proposal for the Project is guaranty he will enter into a contract for the work if his proposal is accepted.

BIDDER: Any individual, firm or corporation or combination of same submitting a

bid for work contemplated, acting directly or through a duly authorized representative.

BONDS: Bid, Performance and Payment Bonds and other instruments of security furnished by the Contractor and his Surety in accordance with the Contract Documents.

CALENDAR DAY: Every day shown on the calendar, Sundays and holidays included.

CHANGE ORDER: A written order to the Contractor authorizing an addition, deletion, or revision in the Work within the general scope of the Contract Documents or authorizing an adjustment in the Contract Price or Contract Time.

CONTRACT: The Contract Documents form the Contract. The Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral, including the bidding documents. The Contract may be amended or modified by a Change Order.

CONTRACT DOCUMENTS: The Contract Documents consist of the Advertisement for Bids, Information for Bidders, Bid, bid Bond, Agreement, Payment Bond, Performance Bond, the Conditions of the Contract (General, Supplemental, and other Conditions), the Drawings, the Specifications, Addenda issued prior to execution of the Contract, Notice of Award, Notice to Proceed, Change Orders and Supplemental Conditions.

CONTRACT PRICE: The total moneys payable to the Contractor under the terms and conditions of the Contract Documents.

CONTRACTOR: The individual, firm or corporation with whom the Owner has executed the Agreement by which the Contractor is obligated directly, or through Subcontractors, to perform work in connection with the Project.

The Contractor is the person or organization identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative.

CONTRACT TIME: The number of calendar days stated in the Contract Documents for the completion of the Work.

DRAWINGS: The part of the Contract Documents which show the characteristics and scope of the Work to be performed and which have been prepared or approved by the Engineer.

EARTH: An excavated material or material to be excavated; all kinds of material other than rock.

ELEVATION: The figures given on the Drawings or in the other Contract F

Documents after the work “elevation” or abbreviation of it shall mean the distance in feet above the datum adopted by the Engineer.

ENGINEER: The person, firm or corporation named as such in the Contract Documents and duly appointed by the Owner to undertake the duties and powers herein assigned to the Engineer, acting either directly or through duly authorized representatives.

EQUIPMENT: All machinery, together with the necessary supplies for upkeep and maintenance, and all tools and apparatus necessary for the proper construction and acceptable completion of the work.

FIELD ORDER: A written order effecting a change in the Work not involving an adjustment in the Contract Price or an extension of the Contract Time, issued by the Engineer to the Contractor during construction.

FURNISH: Furnish and install complete, in place, and ready for use.

INFORMATION FOR BIDDERS: The Notice to Contractors containing all necessary information as to provisions, requirements, date, place, and time of submitting bids.

INCLEMENT WEATHER: Weather affecting the work area severe enough to warrant cessation of all work activities. This includes heavy rain, hail, hurricane, earthquake, freezing rain, heavy fog, tornado, or any other weather condition for which a weather alert, warning or watch is issued, and which affects the project area. Additional time may be afforded for inclement weather.

MATERIALS: Any substance specified for use in the construction of the Project and its appurtenances.

NET COST: The cost to the Contractor after application of all credits and discounts (excepting only cash discounts) and without the addition of any factor for burden, overhead or indirect cost or profit.

NOTICE OF AWARD: The written notice of the acceptance of the Bid from the Owner to the successful Bidder.

NOTICE TO PROCEED: Written communication issued by the Owner to the Contractor authorizing him to proceed with the Work and establishing the date of commencement of the Work.

OPTIMUM MOISTURE CONTENT FOR COMPACTION: The moisture content of a soil calculated based on dry weight of soil at which the soil can be compacted to the approximate density under a specified standard method of compaction.

OWNER: A public or quasi-public body or authority, corporation, association, partnership, or individual for whom the Work is to be performed.

PAYMENT BOND: The approved of security furnished by the Contractor to guarantee the payment to all persons supplying labor and materials in the prosecution of the work in accordance with the terms of the Contract.

PERFORMANCE BOND: The approved form of security furnished by the Contractor to guarantee the completion of the work in accordance with the terms of the Contract.

PRECONSTRUCTION CONFERENCE: A conference following award and prior to start of construction to be attended by a duly authorized representative of the Engineer and by the responsible officials of the Contractor and other affected parties.

PROJECT: The understanding to be performed as provided in the Contract Documents.

PROPOSAL: The written offer of the Bidder, submitted on the prescribed form, properly signed and guaranteed, to perform the work at the prices quoted by the Bidder.

PROPOSAL FORM: The approved form on which the Owner requires formal bids to be prepared and submitted for the work.

PROPOSAL GUARANTY: The security furnished by the Bidder with his proposal for a Project, as guaranty he will enter into a contract for the work if his proposal is accepted.

PROVIDE: Furnish and install complete, in place, and ready for use.

RESIDENT PROJECT REPRESENTATIVE: The authorized representative of the Owner who is assigned to the Project site or any part thereof.

ROCK : An excavated material or material to be excavated; only boulders and pieces of concrete or masonry exceeding ½ cu. yd. in volume, or solid ledge rock which, in the opinion of the Engineer, requires, for its removal, drilling and blasting, wedging, sledging, barring, or breaking up with a power-operated tool. No soft or disintegrate rock which can be removed with hand pick or power-operated excavator or shovel, no loose shaken, or previously blasted rock or broken stone in rock fillings or elsewhere, and no rock exterior to the maximum limits of measurement allowed, which may fall into the excavation will be classified as rock.

SHOP DRAWINGS: All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a Subcontractor, manufacturer, Supplier or distributor, which illustrate how specific portions of the Work shall be fabricated or installed.

SPECIALIST: An individual or firm of established reputation which is regularly engaged in, and which maintains a regular force of workmen skilled in either manufacturing or fabricating items required by the Contract, installing items required by the Contract, or otherwise performing work required by the Contract. Where the contract specifications require installation by a specialist, that term shall also be deemed to mean either the manufacturer of the item, an individual or firm licensed by the manufacturer, or an individual or firm who will perform the work under the manufacturer's direct supervision.

STRUCTURES: Bridges, culverts, catch basins, drop inlets, manholes, retaining walls, cribbing, endwalls, buildings, sewers, service pipes, under drains, foundation drains, and other miscellaneous items which may be encountered in the work, and which are not otherwise classified herein.

SUBBASE: The layer or layers of specified or selected material of designated thickness or rate of application placed on a sub grade to comprise a component of the pavement structure to support the base course, pavement or subsequent layer of the construction.

SUBCONTRACTOR: An individual, firm or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work at the site. The term subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative.

SUB-SUBCONTRACTOR: An individual, firm or corporation having a direct or indirect contract with Subcontractor to perform any of the Work at the site. The term Sub-subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Sub-subcontractor or an authorized representative thereof.

SUBGRADE: The top surface of a roadbed upon which the pavement structure and shoulders are constructed.

SUBSTANTIAL COMPLETION: That date as certified by the Engineer when the construction of the Project or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the Project or specified part can be utilized for the purposes for which it is intended.

SUPPLEMENTAL CONDITIONS: Conditions of that Contract other than the General Conditions.

SUPERINTENDENT: The Contractor's authorized representative in responsible charge of the Work.

SUPPLIER: Any person or organization who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.

SURETY: The corporation, partnership or individual bound with and for the Contractor for the full and complete performance of the Contract, and for the payment of all debts pertaining to the Work.

TITLES (OR HEADINGS): The titles or headings of the sections and subsections herein are intended for convenience of reference and shall not be considered as having any bearing on their interpretation.

WORK: All labor necessary to produce the construction required by the Contract Documents, and all materials and equipment incorporated or to be incorporated in the Project.

WRITTEN NOTICE: Any notice to any part of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the Work.

1.12 ADDITIONAL DEFINITIONS: Wherever in the Specifications or on the Drawings, the words, “as designated”, “as detailed”, “as detailed”, “as directed”, “as ordered”, “as permitted”, “as prescribed”, “as provided”, “as requested”, “as required”, or words of like import are used, it shall be understood that the designation, detail, direction, order, permission, prescription, provision, request or requirement of the Engineer is intended.

Similarly, the words “approved”, “acceptable”, “satisfactory”, and words of like import shall mean approved by, acceptable to, or satisfactory to the Engineer.

1.13 ABBREVIATIONS: Where any of the following abbreviations are used in the Specifications, they shall have the meaning set forth opposite each.

AA	Aluminum Association
AWWA	American Water Works Association
AAMA	Architectural Aluminum Manufacturers Association
BHMA	Builders Hardware Manufacturers Association
AAN	American Association of Nurserymen
CABRA	Copper and Brass Research Association
AAR	Association of American Railroads
CDA	Copper Development Association
AASHTO	American Association of State Highway and Transportation Officials
CEMA	Conveyor Equipment Manufacturers Association
AATC	American Association of Textile Chemists and Colorists

CGA	Compressed Gas Association
CRSI	Concrete Reinforcing Steel Institute
ACI	American Concrete Institute
CS	Commercial Standards, U.S. Department of Commerce
ACPA	American Concrete Pipe Association
AED	American Equipment Dealers
CSI	Construction Specification Institute
AFBMA	Anti-Friction Bearing Manufacturers Association
DCDMA	Diamond Core Drill Manufacturers Association, Inc.
AFI	American Filter Institute
EIA	Electronic Industries Association
AGA	American Gas Association
FCI	Fluid Controls Institute
AGC	Associated General Contractors
FGJA	Flat Glass Jobbers Association
AGMA	American Gear Manufacturers Association
FIA	Factory Insurance Association
AHAM	Association of Home Appliance Manufacturers
FM	Factory Manual
FMEC	Factory Mutual Engineering Corporation
AHDGA	American Hot Dip Galvanizers Association
FS	Federal Specification
AIA	American Institute of Architects
FSPT	Federation of Societies for Paint Technology
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
FSS	Federal Specifications, General Services Administration
AISI	American Iron and Steel Institute
ALS	American Lumber Standards
FHWA	Federal Highway Administration
AMA	Acoustical Materials Association
GA	Gypsum Association
AMCA	Air Moving and Conditioning Association
IBI	Insulation Board Institute
ANS	American Nuclear Society
IBR	Institute of Boiler and Radiator Manufacturers
ANSI	American National Standards Institute
APA	American Plywood Association
IEEE	Institute of Electric and Electronics Engineers
API	American Petroleum Institute
ARA	American Railway Association
IES	Illuminating Engineering Society
AREA	American Railway Engineering Association
ILIA	Indiana Limestone Institute of America
ARI	Air Conditioning and Refrigeration Institute
IME	Institute of Makers of Explosives

ASA	Acoustical Society of America
IP	Institute of Petroleum (London)
ASCE	American Society of Civil Engineers
IPC	Institute of Printed Circuits
ASHRAE	American Society of Heating and Refrigerating Air Conditioning Engineers
IPCEA	Insulated Power Cable Engineers Association
ASLA	American Society of Landscape Architects
ISA	Instrument Society of America
ASLE	American Society of Lubricating Engineers
ISO	International Organization for Standardization
ASME	American Society of Mechanical Engineers
ASQC	American Society for Quality Control
ITE	Institute of Traffic Engineers
ASSE	American Society of Sanitary Engineers
LIA	Lead Industries Association
ASTM	American Society for Testing and Materials
MBMA	Metal Building Manufacturers Association
AVATI	Asphalt and Vinyl Asbestos Tile Institute
MIA	Marble Institute of America
AWI	Architectural Woodwork Institute
MLA	Metal Lath Association
AWPA	American Wood Preservers' Association
MLMA	Metal Lath Manufacturers Association
AWPI	American Wood Preservers' Institute
MPTA	Mechanical Power Transmission Association
AWS	American Welding Society
MRIS	Maritime Research Information Service
PDCA	Painting and Decorating Council of America
MS	Military Specification
MSTD	Military Standard
PEI	Porcelain Enamel Institute
NAAMM	National Association of Architectural Metal Manufacturers
PI	Perlite Institute
RIS	Redwood Inspection Service
NAFM	National Association of Fan Manufacturers
RMA	Rubber Manufacturers Association
NBFU	National Board of Fire Underwriters
RTI	Resilient Tile Institute
NBS	National Bureau of Standards
RWMA	Resistance Welder Manufacturers Association
NCCLS	National Committee for Clinical Laboratory Standards
SAE	Society of Automotive Engineers
NCMA	National Concrete Masonry Association
SAMA	Scientific Apparatus Makers Association
NEC	National Electrical Code

SBI	Steel Boiler Institute
NECA	National Electrical Contractors Association
SCDOT	South Carolina Department of Transportation
NEMA	National Electrical Manufacturers Association
SCPI	Structural Clay Products Institute
NFC	National Fire Code
SCSH	South Carolina State Highway Department
NFPA	National Fire Protection Association
SDI	Steel Deck Institute
NHLA	National Hardware Lumber Association
SIS	Swedish Standards Association
NLA	National Lime Association
SJI	Steel Joist Institute
NLGI	National Lubricating Grease Institute
SMA	Screen Manufacturers Association
NLMA	National Lumber Manufacturers Association
SMACCNA	Sheet Metal and Air Conditioning Contractors National Association
NMA	National Microfilm Association
SPIB	Southern Pine Inspection Bureau
NMWIA	National Mineral Wool Insulation Association
SPR	Simplified Practice Recommendation, U.S. Department of Commerce
NPC	National Plumbing Code
SSBC	Southern Standard Building Code
NRCA	National Roofing Contractors Association
SSGC	Southern Standard Gas Code
NRMCA	National Ready Mixed Concrete Association
SSPC	Steel Structures Painting Council
NSF	National Sanitation Foundation
TAPPI	Technical Association of the Pulp and Paper Industry Institute
NTMA	The National Terrazzo and Mosaic Association
TCA	Tile Council of America
NWMA	National Woodwork Manufacturers Association
TRB	Transportation Research Board
OSHA	Occupational Safety and Health Act
UL	Underwriters' Laboratories, Inc.
PCA	Portland Cement Association
WWPA	Western Wood Products Association
PCI	Pre-stressed Concrete Institute

2.0 OWNERS RIGHTS AND RESPONSIBILITIES

2.1 CHANGES IN THE WORK: The Owner, without invalidating the Contract, may make changes in the Work and in the Drawings and Specifications therefore by making alterations therein, additions thereto, or omissions therefrom. All work resulting from such changes shall be

performed and furnished under and pursuant to the terms and conditions of the Contract. If such changes result in an increase or decrease in the work to be done hereunder, or increase or decrease the quantities thereof, adjustment in compensation shall be made therefore as provided in Subsection 7.12 PAYMENT FOR EXTRA WORK.

Except in an emergency endangering life or property, no change shall be made unless in pursuance of a written order from the Engineer authorizing the change, and no claim for additional compensation shall be valid unless the change is so ordered.

The Contractor agrees that he shall neither have nor assert any claim for, or be entitled to, any additional compensation for damages or for loss of anticipated profits on work that is eliminated.

2.2 PROJECT ENGINEER: McCall Thomas Engineering

2.3 ENGINEER'S AUTHORITY: The Engineer will be the Owner's representative during the construction period and he will observe the work in progress on behalf of the Owner. The Engineer will have the authority to act on behalf of the Owner in the following matters consistent with Owner's right and obligations as set forth in these Contract Documents.

1. Interpretation of Contract Documents.
2. Approval of samples and shop drawings.
3. Preparation of supplementary details and instructions.
4. Inspection and approval of construction work.
5. Preliminary approval of progress payment applications.

2.4 LIABILITY OF OWNER: No person, firm, or corporation, other than the Contractor, who signed this Contract as such, shall have any interest herein or right hereunder. No claim shall be made or be valid either against the Owner or any agent of the Owner and neither the Owner nor any agent of the Owner shall be liable for or be held to pay any money, except as herein provided. The acceptance by the Contractor of the payment as fixed in the final estimate shall operate as and shall be a full and complete release of the Owner and of every agent of the Owner of and from any and all claims, demands, damages and liabilities of, by or to the Contractor for anything done or furnished for or arising out of or relating to or by reason of the work or for or on account of any act or neglect of the Owner or of any agent of the Owner or of any other person, arising out of, relating to or by reason of the work, except the claim against the Owner for the unpaid balance, if any there be, of the amounts retained as herein provided.

2.5 RIGHTS-OF-WAY AND SUSPENSION OF WORK: The Owner shall furnish all land and rights-of-way necessary for carrying out 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. It is possible that all lands and rights-of-way may not be obtained as contemplated herein before construction begins. In this event the Contractor shall begin his work upon such land and rights-of-way as the Owner may have previously acquired. No claim for damages will be allowed whatsoever by reason of 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 inability to procure any lands or rights-of-way for the 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.

2.6 SURVEYS, PERMITS AND REGULATIONS: The Owner will furnish all boundary surveys and establish all base lines for location the principal component parts of the Work together with a suitable number of bench marks adjacent to the Work as shown in the Contact Documents.

Encroachment permits, easements for permanent structures and permits for permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified.

2.7 LINES, GRADES AND MEASUREMENTS: The Owner's Engineer will set sufficient base lines and elevations as shown on the Drawings for location of the Work. The Contractor shall employ a registered civil engineer, or land surveyor and shall require said Engineer to establish all lines, elevations, reference marks, batter boards, etc., needed by the Contractor during the progress of the work, and from time to time to verify such marks by instrument or other appropriate means.

The datum adopted by the Engineer is NAVD 29. All elevations shown on the Drawings or referred to in these specifications refer to this datum.

The Owner's Engineer shall be permitted at all times to check the lines, elevations, reference marks, batter boards, etc., set by the contractor, who shall correct any errors in lines, elevation, reference marks, batter boards, etc., disclosed by such check. Such check shall not be construed to be an approval of the Contractor's work and shall not relieve or diminish in any way the responsibility of the Contractor for the accurate and satisfactory construction and completion of the entire work.

The Owner's Engineer shall have access to all field notes. Field notes will be recorded in bound field books, and carbon copies given the Owner's Inspector at the close of each shift.

2.8 OWNER'S RIGHT OF AUDIT : The Owner is to have a full and complete right to audit and make copies of Contractor's or Subcontractor's records with respect to any payment that the Owner may be requested to make, or may make, for any work done on the project. Further, the contractor will furnish all documents necessary for the Owner to obtain a Certified Audit of the entire project.

2.9 OWNER'S RIGHT TO SEPARATE CONTRACTS: The Owner reserves the right to let other contracts in connection with the Work under similar General Conditions. The Contractor shall afford other contractors reasonable opportunity for introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

The Owner may perform additional Work related to the Project by himself, or he may let other contracts containing provisions similar to these. The Contractor will afford the other contractors who are parties to such contracts (or the Owner, if he is performing the additional Work himself),

reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work and shall properly connect and coordinate his Work with theirs.

2.10 OWNER'S RIGHT TO DO WORK: If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the Owner, after three (3) days' written notice to the Contractor may, without prejudice to any other remedy he may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor. If such expense shall exceed the unpaid balance, the Contractor shall pay the difference to the Owner on demand.

The Engineer's certificate setting forth the fair and reasonable cost of repairing, replacing, rebuilding or restoring any damaged or defective work or equipment when performed by one other than the Contractor shall be binding and conclusive as to the amount thereof upon the Contractor.

2.11 OWNER'S RIGHT TO TERMINATE CONTRACT : The Owner may, without prejudice to any other right or remedy, and after giving the Contractor and his surety, if any, seven days' written notice, terminate the employment of the Contractor and take possession of the premises and of such materials as it may deem expedient if:

1. The Contractor should be adjudged a bankrupt,
2. The Contractor should make a general assignment for the benefit of his creditors,
3. A receiver or trustee should be appointed on account of the Contractors insolvency,
4. The Contractor should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials,
5. The Contractor should fail to make prompt payment to Subcontractors or suppliers of material or labor,
6. The Contractor should persistently disregard laws, ordinances or the instructions of the Owner and his representatives, or otherwise be guilty of substantial violation of any provision of the Contract

In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price shall exceed the expense of finishing the work including compensation for additional engineering, managerial and administrative services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the Owner.

2.12 SUSPENSION OF WORK, TERMINATION AND DELAY: The Owner may suspend the Work or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the Contractor, by written notice to the Contractor and the Engineer, which notice shall fix the date on which Work shall be resumed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension.

2.13 INSPECTIONS AND TESTING: If the Contract Documents, Owner's instructions, laws,

ordinances or any public authority having jurisdiction require any work to be specially tested or approved, the Contractor shall give the Owner timely notice of its readiness for observation by the Owner or inspection by another authority and, if the inspection is by another authority rather than the Owner, of the date fixed for such inspection.

The required certificates of such inspection shall be secured by the Contractor. Observations by the Owner shall be promptly made and, where practicable, at the source of supply. If any work should be covered up without approval or consent of the Owner, it must, if required by the Owner, be uncovered for examination at the Contractor's expense.

2.14 INSPECTION OF WORK AWAY FROM THE SITE: If the work to be done away from the construction site is to be inspected on behalf of the Owner during its fabrication, manufacture, or testing or before shipment, the Contractor shall give notice to the Engineer of the place and time where such fabrication, manufacture, testing, or shipping is to be done. Such notice shall be in writing and delivered to the Engineer in ample time so that the necessary arrangements for the inspection can be made.

2.15 PIPE LOCATION: Exterior pipelines will be located as indicated on the Drawings, but the Owner reserves the right, acting through the Engineer, to make such modifications in location as may be found desirable to avoid interference with structures or for other reasons. Where fittings, etc., are noted on the Drawings such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required.

2.16 PRIOR USE OR OCCUPANCY: The Owner reserves the right to use or occupy the Work or portion thereof, and to use equipment installed under the Contract, prior to final acceptance. Such use or occupancy will not constitute acceptance of the Work or any part thereof. Despite such use or occupancy, guarantee periods will not begin until the completion of all work under the Contract, unless agreement to the contrary is made in writing between the parties.

2.17 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 so to protect its work, such materials shall be removed and replaced at the expense of the Contractor.

2.18 OWNER'S RIGHT TO CLEAN UP: If a dispute arises between the separate contractors as to their responsibility for cleaning up, the Owner may clean up, the Owner may clean up and charge the cost thereof to the Contractor as the Engineer shall determine to be just.

3.0 CONTRACTOR'S RIGHTS AND RESPONSIBILITIES

3.1 ACCESS TO WORK: The Owner, the Engineer, and their officers, agents, servants, and employees plus representatives of the various participating Federal or State agencies may, at any and all times and for any and all purposes, enter upon the work and site thereof and the premises used by the Contractor, and the Contractor shall at all times provide safe and proper facilities

therefore.

3.2 ACCIDENT PREVENTION : In the performance of the Contract the Contractor shall comply with the applicable provisions of the regulations issued by the Secretary of Labor pursuant to section 107 of the Contract Work Hours and Safety Standards Act entitled “Safety and Health Regulations for Construction” (29 CFR 1518, renumbered as Part 1926). Occupational Safety and Health Standards (29 CFR Part 1910) issued by the Secretary of Labor pursuant to the Williams-Steiger Occupational Safety and Health Act of 1970 are applicable to work performed by the Contractor subject to the provisions of the Act.

3.3 STATED ALLOWANCES: The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. These allowances shall cover the net cost of the materials and equipment delivered and unloaded at the site and all applicable taxes. The Contractor’s handling costs on the site, labor, installation costs, overhead, profit and other expenses contemplated for the original allowance shall be included in the Contract Sum and not in the allowance. If the cost, when determined, is more than or less than the allowance, the Contract Sum shall be adjusted accordingly by Change Order which will include additional handling costs on the site, labor, installation costs, overhead, profit and other expenses resulting to the Contractor from any increase over the original allowance.

3.4 ARCHAEOLOGICAL RIGHTS: There is a possibility that items of archaeological significance may be found during the excavation of the site. In such event, the Contractor shall stop excavation in the vicinity of the find and notify the Engineer immediately; subsequent excavation work shall proceed as directed by the Engineer. All items found which are considered to have archaeological significance are the property of the Owner.

3.5 AS-BUILT DRAWINGS: The Contractor shall designate one set of Drawings for “As-Built Drawings”. The Contractor shall indicate on these drawings all field changes affecting various mechanical, electrical, piping and other items as well as locations as actually installed. The “As-Built Drawings” will be kept current by the Contractor. The “As-Built Drawings” shall be delivered to the Engineer upon completion and acceptance of the Work. Final payment for the Work will not be made until the “As-Built Drawings” have been completed and delivered as indicated above.

3.6 SURVEYS, PERMITS AND REGULATIONS : From the information provided by the Owner, unless otherwise specified in the Contract Documents, the Contractor shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets. The Contractor shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

The Contractor shall obtain any required state and local permits, licenses, inspections, and certificates necessary for the prosecution of the work. The Contractor shall obtain these documents, and pay the fees assessed, for each division of work for which such permits, licenses, and inspections are required. The Contractor shall also obtain and pay the fees for general permits

such as Building Permits and Certificates of Occupancy.

The Contractor shall give all notices and comply with all applicable Federal, State and municipal laws, codes, ordinances, rules and regulations bearing on the conduct of the Work as drawn and specified. If the Contractor observes that the Contract Documents are at variance therewith, he shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in Subsection 2.1 entitled CHANGES IN THE WORK.

3.7 LINES, GRADES AND MEASUREMENTS: The Contractor shall employ, at his own expense, a competent civil engineer or land surveyor who shall be registered in South Carolina and who shall be thoroughly experienced in field layout work. Said Engineer shall establish all lines, elevations, reference marks, etc., needed by the Contractor during the progress of the Work, and from time to time he shall verify such marks by instrument or by other appropriate means.

Alignment and grade of all pipe, tunnels, and borings shall be continuously controlled by use of lasers established through the pipe or casing, not transferred from another medium. The Contractor shall furnish lasers and accessories as required and approved by the Engineer. The Contractor's Engineer will set and check each laser each day that work is in progress or more often as required to assure continuous accurate control.

The Contractor shall make all measurements and check all dimensions necessary for the proper construction of the work called for by the Drawings and Specifications. During the prosecution of the Work, he shall make all necessary measurements to prevent mis-fitting in said work, and he shall be responsible therefore, and for the accurate construction of the entire work.

The Contractor's Engineer responsible for lines and grades shall verify to the Owner in writing that work has been constructed to lines and grades as shown on the Drawings. This certification shall accompany each request for payment.

3.8 OBLIGATIONS OF CONTRACTOR : The Contractor shall and will, in good workmanlike manner, do and perform all work and furnish all supplies and materials, tools, machinery, equipment, transportation, supervision, temporary construction of any nature, and all other services, means and facilities except as herein otherwise expressly specified, necessary or proper to perform and complete all work required by this Contract, within the time herein specified, in accordance with the provisions of this Contract and in accordance with the Drawings and Specifications and in accordance with the direction 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 limitations of the Contract and Specifications, and shall do, carry on, and complete the entire work to the satisfaction of the Engineer and the Owner.

The Contractor shall check all dimensions, elevations, quantities and instructions shown on the Drawings or given in the Specifications and shall notify the Engineer should any discrepancy of any kind be found in the Drawings, Specifications or conditions at the site. He will not be allowed

to take advantage of any discrepancy, error or omission in the Contract Documents. If any discrepancy is discovered, the Engineer will issue full instructions pertaining thereto and the Contractor shall carry out these instructions as if originally specified.

3.9 CLAIMS FOR ADDITIONAL COST: If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give written notice thereof within twenty days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property, in which case the Contractor shall proceed in accordance with Subsection 3.28 entitled PROTECTION OF WORK, PROPERTY AND PERSONS IN AN EMERGENCY. No such claim shall be valid unless so made. If the Owner and the Contractor cannot agree on the amount of the adjustment in the contract Sum, it shall be determined by the Engineer. Any change in the Contract sum resulting from such claim shall be authorized by Change Order.

3.10 CLAIMS FOR DAMAGE: If the Contractor makes claim for any damages alleged to have been sustained by breach of contract or otherwise, he shall, within ten (10) days after occurrence of the alleged breach or within ten (10) days after such damages are alleged to have been sustained, whichever date is the earlier, file with the Engineer a written, itemized statement in triplicate of the details of the alleged breach and the details and amount of the alleged damages. The Contractor agrees that unless such statement is made and filed as so required, his claim for damages shall be deemed waived, invalid and unenforceable, and that he shall not be entitled to any compensation for any such alleged damages. Within ten (10) days after the timely filing of such statement, the Engineer shall file with the Owner one copy of the statement together with his recommendations for action by the Owner.

The Contractor shall not be entitled to claim any additional compensation for damages by reason of any direction, instruction, determination or decision of the Engineer, nor shall any such claims be considered, unless the Contractor shall have complied in all respects with the last paragraph of Subsection 2.3 entitled ENGINEER'S AUTHORITY, including, but not limited to, the filing of written protest in the manner and within the time therein provided.

3.11 CUTTING AND PATCHING: The Contractor shall leave all chases or openings for the installation of his own or any other contractor's subcontractor's work, or shall cut the same in existing work, and shall see that all sleeves or forms are at the work and properly set in ample time to prevent delays. He shall see that all such chases, openings, and sleeves are located accurately and are of proper size and shape and shall consult with the Engineer and the contractors and subcontractors concerned in the reference to this work.

In case of his failure to leave or cut all such openings or have all such sleeves provided and set in proper time, he shall cut them or set them afterwards at his own expense, but in so doing he shall confine the cutting to the smallest extent possible consistent with the work to be done. In no case shall piers or structural members be cut without the written consent and approval of the Engineer.

The Contractor shall carefully fit around, close-up, repair, patch, and point around the work specified herein to the satisfaction of the Engineer.

All his work shall be done by careful workmen competent to do such work and with the proper

small hand tools. Power tools shall not be used except where, in the opinion of the Engineer, the type of tool proposed can be used without damage to any work or structure and without inconvenience or interference with the operation of any facility. The Engineer's approval of the type of tool shall not in any way relieve or diminish the responsibility of the Contractor for such damage, inconvenience or interference resulting from the use of such tools.

The Contractor shall not cut or alter the work of any subcontractor or any other contractor, nor permit any of his subcontractors to cut or alter the work of any other contractor or subcontractor except with the written consent of the contractor or subcontractor whose work is to be cut or altered or with the written consent of the Engineer. All cutting and patching or repairing made necessary by the negligence, carelessness, or incompetence of the Contractor or any of his subcontractors shall be done by or at the expense of the Contractor and shall be the responsibility of the Contractor.

3.12 CLEANING UP: The Contractor at all times shall keep the site of the work free from rubbish and debris caused by his operation under the Contract. When the work has been completed, the Contractor shall remove from the site of the work all of his plant, machinery, tools, construction equipment, temporary work and surplus materials so as to leave the work and the site clean and ready for use.

All public streets adjacent to the site and all private ways at the site shall be kept clean of debris, spilled materials, and wet and dry earth at all time and shall be cleaned at the end of each working day. When wet earth is encountered, it shall be cleaned from the vehicles before they leave the site and enter streets and private ways.

3.13 NON-COMPLIANCE WITH CONTRACT REQUIREMENTS : In the event the Contractor, after receiving written notice from the Owner of non-compliance with any requirement of this Contract, fails to initiate promptly such action as may be appropriate to comply with the specified requirement within a reasonable period of time, the Owner shall have right to order the Contractor to stop any or all work under the Contract until the Contractor has complied or has initiated such action as may be appropriate to comply within a reasonable period of time. The Contractor will not be entitled to any extension of contract time or payment for any costs incurred as a result of being ordered to stop work for such cause.

3.14 OVERALL PROJECT COORDINATION: The Contractor shall coordinate all Work of his Contract to produce the required finished Project in accordance with the Contract Documents. Special attention shall be given to the submission of shop drawings, samples, color charts, and requests for substitution within the specified time; furnishing the proper shop drawings to Subcontractors and material suppliers, whose work and equipment is affected by and related thereto; and the furnishing of all information concerning location, type, and size of built-in equipment and materials and equipment utilities. This coordination is in addition to all other coordination requirements called for in the technical sections of the Specifications.

3.15 COMMUNICATIONS: The Contractor shall forward all communications to the Owner through the Engineer.

3.16 NO DISCRIMINATION IN EMPLOYMENT: In connection with the performance of work under this Contract, the Contractor agrees not to discriminate against any employee or applicant for employment because of race, religion, color, or national origin. The aforesaid provision shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

3.17 DRAWINGS AND SPECIFICATIONS AT THE SITE: The Contractor shall maintain at the site one complete set of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders and other Modifications, in good and readable condition and marked to record all changes made during construction. These shall be available to the Engineer. The Drawings, marked to record all changes made during construction, shall be delivered to the Engineer for the Owner upon completion of the work.

3.18 EMPLOY COMPETENT PERSONS: The Contractor shall endeavor to employ only competent persons on the Work. Whenever the Engineer notifies the Contractor in writing that in his opinion any person on the Work is incompetent, unfaithful, disorderly, or otherwise unsatisfactory, or not employed in accordance with the provisions of the Contract, such person shall be discharged from the Work and shall not again be employed on it, except with the written consent of the Engineer. Provided, however, that the failure of the Owner or Engineer to object to an employee is not to be considered acknowledgment or approval of the employee's competence by the Engineer or Owner.

3.19 EMPLOY SUFFICIENT LABOR AND EQUIPMENT: If, in the judgment of the Engineer, the Contractor is not employing sufficient labor, plant, equipment or other means to complete the Work within the time specified, the Engineer may, after giving written notice, require the Contractor to employ such additional labor, plant, equipment and other means as the Engineer may deem necessary to enable the Work to progress properly.

3.20 EXISTING STRUCTURES: Where the dimensions and locations of existing structures are of importance in the installation or connection of any part of the Work, the Contractor shall verify such dimensions and locations in the field before the fabrication of any material or equipment which is dependent on the corrections of such information.

3.21 BENCHMARKS, PROPERTY CORNERS AND MONUMENTS: The Contractor shall maintain, carefully, all benchmarks, property corners, monuments and other reference points encountered. If disturbed or destroyed, the Contractor shall obtain the services of a Registered Land Surveyor to replace them, or pay for the replacement by appropriate authorities, at the Contractor's own expense.

3.22 INDEMNIFICATION : The Contractor shall indemnify and hold harmless the Owner and the Engineer and their agents and employees from and against all claims, damages, losses and expenses, including attorneys' fees, arising out of or resulting from the performance of the Work, provided that any such claim, 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 therefrom; and is caused in whole or in part by any negligent or willful act or omission

of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable.

In any and all claims against the Owner or the Engineer, or any of their agents or employees, by any employee of the Contractor, any Subcontractor, anyone directly or indirectly 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 any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under worker's compensation acts, disability benefit acts or other employee benefits acts.

3.23 INTOXICATING LIQUORS: The Contractor shall not sell and shall neither permit nor suffer the introduction or use of intoxicating liquors upon or about the Work.

3.24 LEGAL ADDRESS OF CONTRACTOR: The Contractor's business address and his office at or near the site of the Work are both hereby designated as places to which communications may be delivered. The depositing of any letter, notice, or other communication in a postpaid wrapper directed to the Contractor's business address in a post office box regularly maintained by the U. S. Postal Service or the delivery at either designated address of any letter, notice, or other communication by mail or otherwise shall be deemed sufficient service thereof upon the Contractor, and the date of such service shall be the date of deposit. The first-named address may be changed at any time by an instrument in writing, executed and acknowledged by the Contractor and delivered to the Engineer. Service of any notice, letter or other communication upon the Contractor personally shall likewise be deemed sufficient service.

3.25 MUTUAL RESPONSIBILITY OF CONTRACTORS: The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials/equipment and the execution of their work, and shall properly connect and coordinate his Work with theirs.

If any part of the Contractor's Work depends for proper execution or results upon the work of any other separate contractor, the Contractor shall inspect and promptly report to the Owner any apparent discrepancies or defects in such work that render it unsuitable for such proper execution and results. Failure of the Contractor so to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper to receive his Work, except as to defects which may develop in the other separate contractor's work after the execution of the contractor's Work. To ensure proper execution of the subsequent work, the Contractor shall measure work already in place and shall at once report to the owner any discrepancy between the executed work and the Contract Documents.

Should the Contractor cause damage to any separate contractor on the Work, the Contractor agrees, upon due notice, to settle with such contractor by agreement or arbitration, if he will so settle. If such separate contractor sues the Owner on account of any damage alleged to have been so sustained, the Owner shall notify the Contractor, who shall defend such proceedings at the Contractor's expense, and if any judgment against the Owner arises therefrom, the Contractor shall pay or satisfy it and pay all costs incurred by the Owner.

3.26 WORK HOURS: The Contractor shall maintain a normal work schedule, consisting of five (5) days of eight (8) hours each or four (4) days of ten (10) working hours each per week. Night,

Weekend, and Holiday work will not be permitted unless it meets the requirements of the following section AND has written approval of the Owner.

Work performed by the Contractor at his own volition outside such customary working hours shall be at no additional expense to the Owner.

Any requests received by the Contractor from occupants of existing buildings to change the hours of work shall be referred to the Owner for determination.

3.27 NIGHT AND SUNDAY WORK: No work shall be done at night or on Sunday except:

1. Usual protective work, such as pumping and the tending of lights and fires;
2. Work done in case of emergency threatening injury to persons or property;
3. When provided for under Supplemental Conditions as herein specified;

If all of the conditions set forth in the next paragraph below are met no work other than that included in (1), (2), and (3) above, shall be done at night except when:

- a. In the judgment of the Engineer, the work will be of advantage to the Owner and can be performed satisfactorily at night;
- b. The work will be done by a crew organized for regular and continuous night work;
- c. The Engineer has given written permission for such night work.

Any work necessary to be performed after regular hours, on Sundays, or on Legal Holidays shall be performed without additional expense to the Owner.

3.28 OCCUPYING PRIVATE LAND: The Contractor shall not (except after written consent from the proper parties) enter or occupy with men, tools, materials, or equipment, any land outside the rights-of-way or property of the Owner. A copy of the written consent shall be given to the Engineer prior to occupation of private land.

3.29 DEWATERING EXCAVATIONS: The Contractor shall remove and dispose of water in all excavations for pipelines, structures, and appurtenances so that construction can be carried out under relatively dry conditions. The dewatering shall be accomplished by the use of pumps, ditches, well points, or other approved methods, as required. Excavations shall be de-watered and brought to the specified grade prior to installation of any permanent structure and shall be maintained in this relatively dry condition throughout project construction.

3.30 PRECAUTIONS DURING ADVERSE WEATHER: During adverse weather and against the possibility thereof, the Contractor shall take all necessary precautions so that the Work may be properly done and satisfactory in all respects. When required, protection shall be provided by use of tarpaulins, wood and building-paper shelters, or other approved means.

During cold weather, materials shall be preheated, if required, and the materials and adjacent structure into which they are to be incorporated shall be made and kept sufficiently warm so that a proper bond will take place and a proper curing, aging, or drying will result. Protected spaces

shall be artificially heated by approved means which will result in a moist or a dry atmosphere according to the particular requirements of the work being protected. Ingredients for concrete and mortar shall be sufficiently heated so that the mixture will warm throughout when used.

The Engineer may suspend construction operations at any time when, in his judgment, the conditions are unsuitable or the proper precautions are not being taken, whatever the weather may be, in any season. The Contractor agrees that he shall not have or assert any claim for or be entitled to any additional compensation or damages on account of any such suspension.

3.31 PROTECTION OF WORK, PROPERTY AND PERSONS: The Contractor will be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the Work and other persons who may be affected thereby, all the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

The Contractor will comply with all applicable laws, ordinances, rules, regulations, and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection. He will notify owners of adjacent utilities when prosecution of the Work may affect them. The Contractor will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any subcontractor, or anyone directly or indirectly employed by any of them or anyone for which acts any of them maybe liable, except damage or loss attributable to the acts or omissions of the Owner or the Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Contractor.

3.32 PROTECTION OF WORK, PROPERTY AND PERSONS IN AN EMERGENCY: In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Owner, shall act to prevent threatened damage, injury or loss. He will give the Engineer prompt Written Notice of any significant changes in the Work or deviations from the Contract Documents caused thereby, and a Change Order shall thereupon be issued covering the changes and deviations involved.

3.33 PROTECTION AGAINST WATER AND STORM: The Contractor shall take all precautions necessary to prevent damage to the Work by storms or by water entering the site of the Work directly or through the ground. In case of damage by storm or water, the Contractor

shall at his own cost and expense make such repairs or replacements or rebuild such parts of the Work as the Engineer may require in order that the finished work may be completed as required by the Contractor.

3.34 PROTECTION OF EXISTING VEGETATION, STRUCTURES, UTILITIES, AND IMPROVEMENTS: The Contractor will preserve and protect all existing vegetation such as trees,

shrubs, and grass on or adjacent to the site of the work which is not to be removed and which does not unreasonably interfere with the construction work. Care shall be taken in removing trees authorized for removal to avoid damage to vegetation to remain in place. Any limbs or branches of trees broken during such operations or by the careless operation of equipment or by workmen shall be trimmed with a clean cut and painted with a tree pruning compound as approved by the Engineer.

The Contractor will protect from damage all existing improvements or utilities at or near the site of the work, the location of which is made known to him, and will repair or restore any damage to such facilities resulting from failure to comply with the requirements of this Contract or the failure to exercise reasonable care in the performance of the Work. If the Contractor fails or refuses to repair any such damage promptly, the Owner may have the necessary work performed and charge the cost thereof to the Contractor.

The Contractor shall enclose the trunks of trees adjacent to his work and not to be cut with substantial wooden boxes of such height as may be necessary to protect them from injury from piled material, from equipment, from his operation, or otherwise due to his work. Excavating machinery and cranes shall be of suitable type and shall be operated with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.

On paved surfaces, the Contractor shall not use or operate tractors, bulldozers or other power operated equipment, the treads or wheels of which are so shaped as to cut or otherwise injure such surfaces.

3.35 RESTORATION OF PROPERTY: All existing surfaces, including lawns, grassed and planted areas which have been injured by the Contractor's operations, shall be restored to a condition at least equal to that in which they were found immediately before work was begun. Suitable materials and methods shall be used for such restoration. All restored plantings shall be maintained by cutting, trimming, fertilizing, etc., until acceptance. The restoration of existing property or structures shall be done as promptly as practicable and shall not be left until the end of the construction period.

3.36 INTERFERENCE WITH AND PROTECTION OF STREETS: The Contractor shall not close or obstruct any portion of a street, road, or private way without obtaining permits therefore from the proper authorities. If any street, road or private way shall be rendered unsafe by the Contractor's operations, he shall make such repairs or provide such temporary ways or guards as shall be acceptable to the proper authorities.

Streets, roads, private ways, and walks not closed shall be maintained passable and safe by the Contractor, who shall assume and have full responsibility for the adequacy and safety of provisions made therefore.

The Contractor shall, at least 24 hours in advance, notify the highway, police and fire departments in writing, with a copy to the engineer, if the closure of a street or road is necessary. He shall cooperate with the police department in the establishment of alternate routes and shall provide adequate detour signs, plainly marked and well lighted, to minimize confusion.

3.37 WORK IN STATE, CITY AND COUNTY RIGHTS-OF-WAY: Attention is directed to the fact that work will be going on in County, City and State rights-of-way. The Owner has obtained permission for the Contractor to encroach on these rights-of-way for work.

The Contractor will be required to conform to the requirements of the South Carolina Department of Highways and Public Transportation, the Charleston County Public Works Department, and the North Charleston Public Works while working within the rights-of-way.

Attention is directed to the fact that existing drainage pipes and ditches will be disturbed during the course of work. Any pipe which is damaged during construction shall be replaced with new pipe of the same size and material. Drainage ditches disturbed by the construction are to be graded to drain and grassed upon completion of the construction.

3.38 SCDHEC DISTRICT ENGINEER INSPECTION: All the work constructed on this project, related to water and sewer lines and appurtenances, is subject to the inspection and approval by the South Carolina Department of Health and Environmental Control District Engineer. This inspection and acceptance is in addition to inspection and acceptance of the Engineer.

3.39 EASEMENTS: The Owner has obtained, or will obtain, permanent easements and temporary construction easements through private property. The temporary construction easements entitle the Contractor to the occupancy and use of the designated area near or adjacent to the work for purposes related to the work.

The Contractor will not encroach on any property unless easements have been obtained. On all land, the Contractor has no rights unless he obtains permission from the proper parties.

3.40 TRAFFIC CONTROL: The Contractor will comply with the South Carolina Department of Highways and Public Transportation manual entitled "Traffic Controls for Street and Highway Construction and Maintenance Operations, Part V, of the South Carolina Manual on Uniform Traffic Control Devices for Streets and Highways, 1982" and provide traffic control as required and approved by the South Carolina Department of Highways and Public Transportation.

Upon completion and acceptance of the work or as the need for temporary traffic control devices ceases, they shall be removed by the Contractor. Signs shall be used where warranted to maintain traffic or to call attention to conditions on, or adjacent to, the construction work. Such signs shall be removed when they are no longer required.

All traffic control and marking devices shall be in accordance with the provisions of the "State of South Carolina Uniform Manual on Traffic Control Devices". Upon completion and acceptance of the work or as the need for temporary traffic control devices ceases, they shall be removed by the Contractor and shall remain the property of the Contractor.

3.41 DANGER SIGNALS AND SAFETY DEVICES: The Contractor shall make all necessary precautions to guard against damages to property and injury to persons. He shall put up and maintain in good condition, sufficient red or warning lights at night, suitable barricades and other

devices necessary to protect the public.

In case the Contractor fails or neglects to take such precautions, the Owner may have such lights and barricades installed and charge the cost of this work to the Contractor. Such action by the Owner does not relieve the Contractor of any liability incurred under this Specification or contract.

3.42 CONSTRUCTION DRAINAGE: The Contractor shall furnish all labor, materials, and necessary equipment for the temporary control of surface water and seepage water during construction and keep all excavations, pits and trenches free from water at all times.

The Contractor shall furnish and operate pumps and other equipment required. Dikes and ditches shall be constructed around excavations and elsewhere as necessary to prevent surface water from flooding the excavations or standing in areas adjacent to excavations, in work areas or in material storage areas. The Contractor shall take all necessary precautions to protect adjacent areas and properties at points other than that which would be considered the natural flow, prior to construction, without the expressed consent of the Owner in writing with a copy to the Engineer. He shall take steps to prevent the erosion of soil, earth and other material and the conduction of the eroded materials onto adjacent properties and shall be responsible for the removal of such materials and the restoration of adjacent areas to their original condition.

3.43 RETURNS OF DRAWINGS: All copies of Drawings, Specifications and other Documents furnished by the Owner or the Engineer to the Contractor may be used only in connection with prosecution of the Work and shall be returned by the Contractor upon completion of the Work.

3.44 SITE INVESTIGATION: The Contractor acknowledges that he has investigated and satisfied himself as to the conditions affecting the Work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, river stages, water table, tides or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during prosecution of the Work.

The Contractor further acknowledges that he has satisfied himself as to character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonable ascertainable from an inspection of the site, including all exploratory work done by the Owner, as well as from information presented by the Drawings and Specifications made a part of this Contract.

Any failure by the Contractor to acquaint himself with the available information will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the Owner.

3.45 SOIL EROSION AND SEDIMENT CONTROL: The Contractor's attention is directed to the fact that unless exposed earth areas are properly cared for during construction, they may result in substantial sedimentation damage downstream from the construction area.

The Contractor shall be responsible for conducting his site grading and drainage operations in such manner as to prevent soil erosion of the construction site work areas. He shall at all times provide satisfactory means to prevent the movement and washing of soil onto pavements or into adjacent ditches, swales, inlets, and drainage pipes, to avoid the possibility of these structures becoming clogged with soil. He shall promptly repair all areas which may become eroded and shall clear drainage ditches, swales, and structures of siltation.

The Contractor shall indemnify and save harmless the Owner and Engineer from and against any and all claims, demands, fines, or assessments, including attorneys' fees and cost of defense arising out of or caused by the Contractor's failure to provide soil erosion and sediment control.

3.46 SUBSURFACE CONDITIONS: The Contractor shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the Owner by Written Notice of:

1. Subsurface or latent physical conditions of the site differing materially from those indicated in the Contract Documents.
2. Unknown physical conditions at the site of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents.

The Owner shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause and increase or decrease in the cost of, or in the time required for, performance of the Work, and equitable adjustment shall be made and the Contract Documents shall be modified by the Change Order. Any claim of the Contractor for adjustment hereunder shall not be allowed unless he has given the required Written Notice: provided that the Owner may, if he determines that the facts so justify, consider and adjust any such claims asserted before the date of final payment.

3.47 SUBCONTRACTING: The Contractor may utilize the services of specialty Subcontractors on those parts of the Work which, under normal contracting practices, are performed by specialty Subcontractors. The Contractor will, without additional expense to the Owner, utilize the services of specialty Subcontractors on those parts of the Work which are specified to be performed by specialty Subcontractors.

The Contractor shall not award any work to a subcontractor without 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. No request for payment will be approved before this list has been received and reviewed by the Owner.

The Contractor shall not award Work to Subcontractor(s) more than fifty (50%) percent of the Contract Price without prior written approval of the Owner.

The Contractor will be 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

or omissions of persons directly employed by him.

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 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 Contractor under any provisions of the Contract Documents.

If any other contractor or any subcontractor of such other contractor shall suffer or claim to have suffered loss, damage or delay by reason of the acts or omissions of the Contractor or of any of his subcontractors, the Contractor agrees to assume the defense against any such claim and to reimburse such other contractor or subcontractor for such loss, damage or delay and from and against any and all claims, demands, costs and expenses, including attorney's fees, arising out of, relating to or resulting from such claims.

The Contractor shall be responsible for the coordination of the trades, subcontractors, and material men engaged upon his Work. The Owner or Engineer will not undertake to settle any differences between the Contractor and his subcontractors or between subcontractors. If any Subcontractor on the project, in the opinion of the Engineer, proves to be incompetent or otherwise unsatisfactory, he shall be replaced if and when directed in writing.

3.48 SUPERVISION: The Contractor shall keep on his Work, during its progress, a competent superintendent, and any necessary assistants, all satisfactory to the Owner. The superintendent shall not be changed except with the consent of the Owner unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ. The superintendent shall represent the Contractor in his absence and all directions given to him shall be as binding as if given to the Contractor. Important directions shall be confirmed in writing to the Contractor. Other directions shall be so confirmed on written request in each case. The Owner shall not be responsible for the acts or omissions of the superintendent or his assistants.

The Contractor shall give efficient supervision to the Work, using his best skill and attention. He shall carefully study and compare all Drawings, Specifications and other instructions and shall at once report to the Owner any error, inconsistency, or omission which he may discover.

3.49 TAXES: The Contractor shall promptly pay all federal, state and local taxes which may be assessed against him in connection with the Work or his operations under the agreement and/or the other Contract Documents, including, but not limited to, taxes attributable to the purchase of materials and equipment, to the performance of services, and the employment of persons in the prosecution of the Work.

3.50 TEMPORARY HEAT: The Contractor shall provide temporary heat whenever necessary to protect all Work and materials against injury from dampness and cold and to dry out moisture from the building. Fuel, equipment and method of heating shall be satisfactory to the Owner's Insurer and the Engineer.

3.51 TEMPORARY UTILITIES: The Contractor shall make arrangements for and furnish as a

part of the Contract, all electricity, water lighting and other utilities needed to do the Work called for by the Contract. Any separate contractors having a contract with the Owner shall make arrangements for and share the cost with the Contractor for the use of the required utilities on a pro-rated schedule based on an agreed basis. All Electrical Work shall comply with the National Electric Code.

The Contractor shall provide and pay for all temporary wiring, switches, connections and meters. The Contractor shall provide sufficient electric lighting so that all work may be done in a workmanlike manner when there is not sufficient daylight.

3.52 UNCOVERING AND CORRECTION OF WORK: The Engineer shall be furnished by the Contractor with every reasonable facility for examining and inspecting the Work and for ascertaining that the Work is being performed in accordance with the requirements and intent of the Contract, even to the extent of requiring the uncovering or taking down of portions of finished Work by the Contractor.

Should the Work thus uncovered or taken down prove satisfactory, the cost of uncovering or taking down and the replacement thereof shall be considered as extra Work unless the original Work was done in violation of the Contract in point of time or in the absence of the Engineer or his inspector and without his written authorization, in which case said cost shall be borne by the Contractor. Should the Work uncovered or taken down prove unsatisfactory, said cost shall likewise be borne by the Contractor.

The inspection of the Work shall not relieve the Contractor of any of his obligations to perform and complete the Work as required by the Contract. Defective Work shall be corrected and unsuitable materials, equipment, apparatus and other items shall be replaced by the Contractor, notwithstanding that such Work, materials, equipment, apparatus and other items may have been previously overlooked or accepted or estimated for payment.

If the Work or any part thereof shall be found defective at any time before the final acceptance of the Work, the Contractor shall forthwith make good such defect in any manner satisfactory to the Engineer. If any materials, equipment, apparatus or other items brought upon the site for use or incorporation in the Work, or selected from the same, are condemned by the Engineer as unsuitable or not in conformity with the Specifications or any of the other Contract Documents, the Contractor shall forthwith remove such materials, equipment, apparatus and other items from the site of the Work and shall at his own cost and expense make good and replace the same and any material furnished by the Owner which shall be damaged or rendered defective by the handling of improper installation by the Contractor, his agents, servants, employees or subcontractors.

If the Owner deems it inexpedient to correct Work injured or done not in accordance with the Contract, an equitable deduction from the Contract Price shall be made therefore.

3.53 COOPERATION WITH UTILITIES: The Owner will notify all utility companies, all pipe line owners, or other parties affected, and endeavor to have all necessary adjustments of the public or private utility fixtures, pipe lines, and other appurtenances within or adjacent to the limits of construction, made as soon as practicable.

During the course of construction, the Contractor shall maintain in operating condition all active utilities such as gas, electric, telephone, water, sewer, gutters and other drains encountered in the new utility installation: and shall repair to the satisfaction of the Owner any surface, aerial or subsurface utility damage unless such utility is shown to be abandoned or removed.

Water lines, gas lines, wire line, sewer lines, water and gas meter boxes, water and gas valve boxes, manholes, light standards, cableways, signals, and all other utility appurtenances within the limits of the proposed construction which are to be relocated or adjusted are to be moved by the Owners under separate agreement, except as otherwise noted on the Drawings.

The Drawings will show all known utilities located within the limits of the contract according to information obtained. The accuracy of the Drawings in this respect is not guaranteed by the Owner. The Contractor shall have considered in his bid all of the permanent and temporary utility appurtenances in their present or relocated position. No additional compensation will be allowed for any delays, inconveniences, or damages sustained by him due to any interference from the said utility appurtenances or the operation of moving them.

Unless otherwise provided, the cost of temporary rearrangement of utilities made only to facilitate the construction of the Work will be borne by the Contractor.

3.54 WORK WITHIN DRAINAGE DITCH RIGHTS-OF-WAY: Where any portion of the project is to be constructed within the rights-of-way maintained by the County Public Works Department for drainage, the Owner will obtain permission from these agencies to construct within their rights-of-way. The Contractor will be required to conform to the requirements of the County Public Works Department while working within the drainage rights-of-way.

3.55 WORK ADJACENT TO TELEPHONE, POWER AND GAS COMPANY STRUCTURES: Where work is being performed within the telephone company or electric and gas company rights-of-way, the Owner has acquired, or will acquire, permission from these agencies to construct facilities within their rights-of-way or easements. In all cases where work is being performed near telephone company or electric or gas company facilities, the Contractor will notify the respective companies of areas in which work is being performed.

3.56 WORK BEING PERFORMED NEAR WATER LINES: The Contractor will inform the Town or City having jurisdiction as to the areas where work is being performed. It is required of a Contractor to obtain permission from the appropriate Water Authority where alterations to their system are required.

3.57 WORK IN RAILROAD RIGHTS-OF-WAY: Some work for this project may occur within railroad rights-of-way. The Contractor will be required to conform to the requirements of each railroad company while working within the rights-of-way. The Contractor must contact the Engineer and each railroad company prior to commencing any work within the rights-of-way.

3.58 UTILITY LOCATIONS: Prior to beginning any excavation, the Contractor shall notify all public utility companies and have their lines located and marked.

3.59 VERIFICATION OF DIMENSIONS AND ELEVATIONS: Dimensions and elevations indicated on the Drawings in reference to existing structures, location of utilities, sewer inverts, or other information on existing facilities, are the best available data obtainable but are not guaranteed by the Engineer. The Engineer will not be responsible for their accuracy. Before proceeding with any work dependent upon the data involved, the Contractor shall field check and verify all dimensions, grades, inverts, lines, elevations, or other conditions or limitations at the site of the work to avoid construction errors or damage to existing facilities. If any work is performed by the Contractor or a subcontractors prior to adequate verification of applicable data, any resultant extra cost for adjustment of work necessary to conform to existing facilities shall be assumed by the Contractor without reimbursement or compensation by the Owner.

If the Contractor, in the course of the work, finds any discrepancy between the Drawings and the physical conditions of the locality, or any errors or omissions in the Drawings or in the layout as given by survey points and instructions, he shall immediately inform the Engineer, in writing. The Engineer will promptly investigate the reported conditions and issue such instructions as may be necessary for the proper execution of the work. Any work done after such discrepancy and prior to receipt of such instructions shall be at the risk of the Contractor.

4. MATERIALS, EQUIPMENT AND WORKMANSHIP

4.1 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.

4.2 CORRECTION OF WORK BEFORE COMPLETION: The Contractor shall promptly remove from the premises all work condemned by the Owner as failing to conform to the Contract Documents, whether incorporated or not and the Contractor shall promptly replace and re-execute his own work in accordance with the Contract and without expense to the Owner and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement. The fact that the Engineer may have previously overlooked such defective work shall not constitute an acceptance of any part of it.

If the Contractor does not remove such condemned work within a reasonable time, fixed by written notice, the Owner may remove it, and after storing it at the job site for 30 days, due written notice thereof being given the Contractor, the Owner may offer the material for sale and removal from the premises. Net proceeds from such sale shall be for the Contractor's credit against the "Owner's Right To Do Work". If the material has no sale value, the Owner may remove it from the premises and/or otherwise dispose of it. The cost of such disposition shall be deducted for payments to the Contractor as provided in Subsection 2.10 entitled OWNER'S RIGHT TO DO WORK.

4.3 CORRECTION OF WORK AFTER COMPLETION: The Contractor shall remedy any defects due to faulty materials or workmanship and pay for any damage to other work resulting therefrom which shall appear within a period of two years from the date of final acceptance of the

work except where longer periods are specified and in accordance with the terms of any special guarantees provided in the Contract.

4.4 CORRECTIONS OF WORK AFTER GUARANTEE PERIOD: It shall be the responsibility of the Contractor to permanently correct all defective items called to his attention within the guarantee period, whether such correction be made within the guarantee period or not. The Contract shall not be fully performed until such permanent corrections are made.

4.5 GENERAL GUARANTY: The Contractor warrants to the Owner that all materials and equipment furnished under this Contract will be new unless otherwise specified, and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All Work not so conforming to these standards may be considered defective. If required by the Owner, the Contractor shall furnish all satisfactory evidence as to the kind and quality of materials and equipment.

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 further guarantee for a period of 24 months that any building or buildings, constructed under this Project, shall be watertight and leak proof at every point in every area, except where leaks can be attributed to damage to the building by external forces other than storm or foundation settlement. He shall, immediately upon notification by the Owner of water penetration, determine the source of water penetration and, at his own expense, repair or replace any other damaged material to return the building or buildings to the original accepted condition.

In addition to the foregoing stipulations, the Contractor shall comply with all other guarantees and warranties referred to in any portions of the Contract Documents, the more stringent requirement governing. Unless otherwise specifically stated elsewhere in the Specifications, the date of beginning of all guarantee or warranty periods shall be the date of acceptance of the project.

If for any reason, the Contractor cannot guarantee any part of his work using material or construction methods which have been specified, or shown, he shall notify the Engineer in writing before Contracts are signed, giving reasons together with the name of the product and data on substitutions he can guarantee. Should the Contractor fail to so notify the Engineer prior to the signing of the Contracts, he will be held to have agreed to guarantee all Work specified of shown.

4.6 WARRANTY REPAIR WORK: The Contractor shall fully and unconditionally warrant the materials and workmanship of the project for a period of two years, beginning on the date of project completion.

The Contractor shall maintain both the Performance Bond and the Payment Bond in force throughout the two-year warranty period.

The Contractor warrants that he shall investigate, in a sincere, thorough and workmanlike manner, all claims for warranty work within 48 hours of receipt of notice from the Owner of the need for same of existence of deficient parts or portions of the Project. Workmen responding to such notices, shall be skilled craftsmen prepared to perform best quality work. Deficiencies shall be corrected immediately.

The Contractor or his representative shall immediately upon investigation of a notice of deficiency, deliver a report of his findings in writing with 72 hours of receipt of a warranty work at the Contractors expense therefore.

The Contractor warrants that he shall pay all invoices for warranty work performed by the Owner due to his default under this clause. Should the Contractor fail or refuse to pay such invoice rendered by the Owner within 15 days of receipt, the Owner may enter claim with any court of competent jurisdiction for collection of same with interest at the maximum legal rate, together with all associated legal costs and attorney's fees, as a breach of this Contract.

4.7 HANDLING AND DISTRIBUTION: The Contractor shall handle, haul and distribute all materials and all surplus materials in the different portions of the work as necessary or required; shall provide suitable and adequate storage room for materials and equipment during the progress of the work; and shall be responsible for the protection, loss of, or damage to materials and equipment furnished by him, until the final completion and acceptance of the Work.

Storage and demurrage charges by transportation companies and vendors shall be borne by the Contractor.

4.8 RIGHT TO MATERIALS: Nothing in the Contract shall be construed as vesting in the Contractor any right of property in the materials, equipment, apparatus and other items furnished after they have been installed or incorporated in or attached or affixed to the work or the site, but incorporated, attached or affixed, become the property of the Owner.

4.9 STORAGE OF MATERIAL AND EQUIPMENT: All excavated materials, construction equipment, and materials and equipment to incorporated in the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work. Materials and equipment shall be kept neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.

4.10 MANUFACTURER'S DIRECTIONS: All manufactured articles, material and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer, unless herein specified to the contrary.

If the specifications or plans are contrary to the manufacturer's directions, the manufacturer shall be contacted by the Contractor before proceeding with the Work and the Engineer advised if the manufacturer has any objections to the specified application.

4.11 MATERIALS, SERVICES AND FACILITIES: It is understood that, except otherwise

specifically stated in the Contract Documents, the Contractor shall provide and pay for all labor, supplies and materials, tools, machinery, equipment, transportation, supervision, temporary construction of any nature, and all other services, means and facilities of any nature whatsoever necessary to execute, complete, and deliver the Work within the specified time.

Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the Work. Stored materials and equipment to be incorporated in the Work shall be located to facilitate prompt inspection.

Materials supplied and equipment shall be in accordance with samples submitted by the Contractor and approved by the Engineer.

4.12 MISCELLANEOUS ITEMS: The work to be done by the Contractor, specified and enumerated under this Contract, shall include any minor details of the Work not specifically mentioned in the Specifications or shown on the Drawings, but obviously necessary for the proper completion of the Work, which shall be considered incidental and as being a part of and included with the Work for which prices are given in the Bid. The Contractor will not be entitled to any additional compensation therefore.

Miscellaneous items and accessories which are not specifically mentioned, but which are essential to produce a complete and properly operating installation or usable structure or plant, providing the indicated function, shall be furnished and installed without change in the contract price. Such miscellaneous items and accessories shall be of the same quality standards, including material, style, finish, strength, class, weight and other applicable characteristics as specified for the major component of which the miscellaneous item or accessory is an essential part, and shall be approved by the Engineer before installation. The above requirement is not intended to include major components not covered by or inferable from the Drawings and Specifications.

4.13 MISTAKES OF CONTRACTOR: The Contractor shall promptly correct and make good any and all defects, damages, omissions, or mistakes, for which he and/or his agents, servants, employees or subcontractors are responsible, and he shall pay the Owner all costs, expenses, losses, and damages resulting therefrom or by reason thereof as determined by the Engineer.

4.14 PROTECTION AGAINST ELECTROLYSIS: Where dissimilar metals are used in conjunction with each other, or against concrete surfaces, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or other approved materials.

4.15 ROYALTIES AND PATENTS: The Contractor shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular process or the product of a particular manufacturer or manufacturers is specified, but if the Contractor has information that the process of article specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Owner in writing.

4.16 CONSTRUCTION SCHEDULE: A construction schedule shall be submitted by the Contractor at the PRE-CONSTRUCTION conference for approval by the Engineer.

The construction schedule shall consist of a bar chart incorporating the bid items. Further breakdown of each bid item may be required for clarity. A cost curve shall be plotted on the bar chart. An update of the schedule will be furnished at the Engineer's request, normally with each monthly submittal of Partial Pay Estimate.

The schedule shall be supported by copies of the proposed equipment, quotations showing the item identification, stated delivery time, and the date of expiration of the quotation. Current and valid quotations are required. These quotations shall be presented to the Engineer with the construction schedule.

4.17 SUBMITTAL SCHEDULE: Within twenty (20) days after execution and delivery of the Contract, the Contractor shall prepare and deliver to the Engineer a Submittal Schedule. This includes a list of all submittals required under the Contract. This list shall identify each major group of shop drawings, coordination drawings and schedules and each sample and the planned submission date for each.

After the Engineer's review of the list of submittals, the Engineer will meet with the Contractor for a joint review and correction and adjustment, as necessary, for agreement on the submittal. In addition, at the meeting the duration of the review period for each submittal will be established. The Contractor's planned submission date for each submittal shall allow no less than fifteen (15) working days for review and appropriate action before approval of the submittal becomes critical to the progress of the Contractor's work. Within five (5) calendar days after the joint review, the Contractor shall make any necessary revisions to the list of submittals, including duration's of the review periods, in accordance with the agreements reached during the joint review and submit two (2) revised copies to the Engineer. No application for partial payment will be approved until the submittal schedule is approved. The Engineer shall not review more than two sets of submittal data (original submittal and one re-submittal) for each item or material without compensation by the Contractor. If additional reviews are required, The Contractor shall compensate the Engineer at a rate of \$100.00 per hour for such review.

4.18 SHOP DRAWINGS: Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor or any Subcontractor, manufacturer, supplier or distributor, and which will illustrate some portion of the Work. It shall be the Contractor's responsibility to furnish Shop Drawings as required by the technical specifications or as requested by the Engineer. These submittals must be made no later than is required by the submittal schedule.

Shop Drawings shall show the principal dimensions, weight, structural and operating features, space required, clearance, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the drawing. When it is customary to do so, when the dimensions are of particular importance, or when so specified, the drawings shall be certified by the manufacturer of fabricator as correct for the Contract.

When so specified or if considered by the Engineer to be acceptable, manufacturer's specifications, catalog data, descriptive manner, illustrations, etc., may be submitted for approval in place of shop and working drawings. In such case, the requirements shall be as specified for shop and working drawings, insofar as applicable except that the submission shall be in quadruplicate.

The Contractor shall be responsible for the prompt and timely submittal for all shop and working drawings so that there shall be no delay to the work due to the absence of such drawings.

The Contractor shall check the Shop Drawings, shall coordinate them (by means of coordination drawings wherever required) with the work of all trades involved before submission and shall indicate thereon his approval. Drawings and schedules submitted without evidence of the Contractor's approval may be returned for re-submission.

By approving and submitting Shop Drawings, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or will do so, and that he has checked and coordinated Shop Drawings with the requirements of the Work and of the Contract Documents.

If drawings or schedules show variations from the contract requirements because of standard shop practice or for other reasons, the Contractor shall describe such variations in his letter of transmittal. If acceptable, the Engineer may approve any or all such variations and issue an appropriate change order. If the Contractor fails to describe such variations, he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings or schedules may have been approved.

Each Shop Drawing or Coordination Drawing shall have a blank area 5 by 5 inches located adjacent to the title block. The title block shall display the following:

- Number and Title of Drawing
- Date of Drawing
- Revision number and date (if applicable)
- Project Title
- Name of the project building or facility
- Name of Contractor
- Name of Subcontractor (if applicable)
- Clear identity of contents and location of work

Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Drawings and Specifications in all respects. All drawings which are correct shall be marked with the date, checker's name, and indication of the Contractor's approval, and then shall be submitted to the Engineer; other drawings shall be returned for correction.

The Contractor shall stamp all drawings which are to be submitted to the Engineer for approval. The rubber stamp shall incorporate the following items:

PROJECT TITLE
CONTRACTOR'S NAME
APPROVED BY
SPECIFICATION SECTION

DATE
TRANSMITTAL NO.

The review of the Shop Drawings will be general only and shall not relieve or in any respect diminish the responsibility of the Contractor for details of design, dimensions, etc., necessary for the proper fitting and construction of the work as required by the Contract and for achieving the result and performance specified thereunder.

Should the Contractor submit for approval equipment that required modifications to the structures, piping, layout, etc., detailed on the Drawings, he shall also submit for approval details of the proposed modifications. If such equipment and modifications are approved, the Contractor, at no additional cost to the Owner, shall do no work necessary to make such modifications. Required structural changes shall be designed and detailed by an Engineer registered in the state in which the project will be constructed. Drawings shall be signed and show registration number or may have seal affixed.

Submission of Shop Drawings shall be accompanied by a copy of a transmittal letter containing Project name, Contractor's name, number of drawings, titles, specifications section, and other pertinent data. The submittal shall include the following:

Four (4) legible copies of Shop Drawings or printed matter

The review of Shop Drawings will be performed by the Engineer as follows:

When the submittal conforms fully with the Contract Drawings and Specifications, the Engineer will approve it. The reproducible of each drawing or page of approved submittals will be stamped approved, signed, dated, and returned to the Contractor. No changes shall be made on approved drawings by the Contractor. If the Contractor desires to make any changes from approved drawings, or pages of approved submittals, he shall notify the Engineer in writing that the approved material has been withdrawn and shall submit the substitution set in accordance with the above procedure.

When the submittal clearly does not conform with the Contract Drawings and Specifications, the Engineer will disapprove it by stamping "Rejected". Rejected submittals shall be corrected and resubmitted within fourteen (14) calendar days from the date of rejection. Submittals which are rejected shall not be released for any work.

When the submittal has only minor deviations from the Contract Drawings and Specifications, the Engineer will note the deviations and omissions as may be appropriate and approve the submittal subject to the notations by stamping it "Approved as Noted". Approved as Noted submittals may be released for fabrication of work at the Contractor's risk; in any event the submittal shall be corrected and resubmitted for approval within fourteen (14) calendar days from the date of approval as noted.

The Contractor shall be responsible for delays resulting from the rejection or approval as noted of incomplete, inadequate, incorrect, or otherwise unacceptable submittals.

The Contractor shall assure that only drawings and pages of printed materials bearing the Engineer's "Approved" stamp are allowed on the job site.

The Contractor shall submit, at the completion of the Project, one set of all reviewed and correct shop drawings, catalog cuts, and descriptive literature for all Work previously submitted. These sets shall be sent to the Engineer for the Owner before the final Certificate of Payment is issued.

4.19 OPERATING AND MAINTENANCE MANUALS: One copy of each is required Operating and Maintenance Manual must be submitted to the Engineer with the first submittal of shop drawings. Five additional copies of each required Operating and Maintenance Manual must be submitted to the Engineer within fourteen (14) calendar days of the return of the approved shop drawings to the Contractor. No payment will be approved on any equipment for which Operating and Maintenance Manuals are required until the Operating and Maintenance Manuals are received by the Engineer. These O&M manuals must be addressed specifically to the piece of equipment supplied and shall not be general in nature; each item must be clearly identified and located. Each page must be printed on 8 1/2" x 11" paper or folded to that size in a manner which will be suitable for insertion in a 3-ring binder.

4.20 SAMPLES: Samples are physical examples furnished by the Contractor to illustrate materials, equipment, or workmanship, and to establish standards by which the Work will be judged. It shall be the Contractor's responsibility to furnish samples as required by the technical specifications or as required by the Engineer. These samples must be submitted no later than is required by the Submittal Schedule.

Each sample shall have a label indication:

- Project Title
- Name of the project building or facility
- Name of Contractor
- Name of Subcontractor (if applicable)
- Identification of material with specification section
- Name of producer and brand (if any)

Samples shall be submitted in duplicate unless otherwise noted in the technical specifications and shall be accompanied by a copy of a transmittal letter containing Project Name, Contractor's Name, number of samples, specification section and other pertinent data.

If the Engineer so requires, either prior to or after commencement of the work, the Contractor shall submit samples of materials for such special tests as the Engineer deems necessary to demonstrate that they conform to the Specifications. Such samples shall be furnished, taken, stored, packed and shipped by the Contractor as directed. Except as otherwise expressly specified, the Contractor shall make arrangements for, and pay for, the tests.

All samples shall be packed so as to reach their destination in good condition. To insure consideration of samples, the Contractor shall notify the Engineer by letter that the samples have been shipped and shall properly describe the samples in the letter. The letter of notification shall be sent separate from and should not be enclosed with the samples.

The Contractor shall submit data samples, or place his orders, sufficiently early to provide ample time for consideration, inspection, testing, and approval before the materials and equipment are needed for incorporation in the work. The consequences of his failure to do so shall be the Contractor's sole responsibility.

In order to demonstrate the proficiency of workmen, or to facilitate the choice among several textures, types, finishes, surfaces, etc., the Contractor shall provide such samples of workmanship of wall, floor finish, etc., as may be required.

When required, the Contractor shall furnish to the Engineer triplicate sworn copies of manufacturer's shop or mill tests (or reports from independent testing laboratories) relative to materials, equipment performance ratings, and concrete data.

4.21 INSPECTION AND TESTING: All materials and equipment used in the construction of the Project shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Contract Documents.

The Owner shall provide all inspection and testing services not required by the Contract Documents.

The Contractor shall provide at his expense the testing and inspection services required by the Contract Documents.

If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority have jurisdiction require any Work to specifically be inspected, tested, or approved by someone other than the Contractor, the Contractor will give the Engineer timely notice of readiness. The Contractor will then furnish the Engineer the required certificates of inspection, testing or approval.

Inspections, tests, or approvals by the Engineer or others shall not relieve the Contractor from his obligations to perform the Work in accordance with the requirements of the Contract Documents.

The Engineer and his representatives will at all times have access to the Work. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all work, materials, payrolls, records, records of personnel, invoices of materials, and other relevant data and records. The Contractor will provide proper facilities for such access and observation of the Work and for any inspection or testing thereof.

If any Work is covered contrary to the written instructions of the Engineer, it must, if requested by the Engineer, be uncovered for his observation, and replaced at the Contractor's expense.

If the Engineer considers it necessary or advisable that covered Work be inspected or tested by others, the Contractor, at the Engineer's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the Work in question, furnishing all necessary labor, materials, tools and equipment. If it is found that such Work is defective, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection, and testing and if satisfactory reconstruction. If, however, such Work is not found to be defective, the Contractor will be allowed to increase in the Contract Price or and extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate Change Order shall be issued.

4.22 SUBSTITUTIONS: The Contractor may recommend the substitution of a material, article, or piece of equipment of equal function for those referred to in the Contract Documents by reference to brand name or catalogue number, and if, in the opinion of the Engineer, such material, article, or piece of equipment is of equal function to that specified, the Engineer may approve its substitution and use by the Contractor. Any cost differential shall be deductible from the Contract Price and the Contract Documents shall be appropriately modified by Change Order.

The Contractor warrants that if substitutes are approved, no major changes in the function or general design of the Project will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time.

4.23 "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 and are designed and constructed to perform or accomplish the desired result as efficiently as the indicated brand, pattern, grade, class, make or model.

When a material, article or piece of equipment is identified on the Drawings or in the Specifications by the reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard of quality and function; and any materials, article, or equipment of other manufactures and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed, is, in the opinion of the Engineer, of equal substance and function. It shall not be purchased or installed by the Contractor without the Engineer's written approval.

4.24 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.

4.25 NO WAIVER: Neither the inspection by the Owner or the Engineer, nor any order, measurement, approval, determination, decision or certificate by the Engineer, nor any order by the Owner for the payment of money, nor any payment for or use, occupancy, possession or

acceptance of the whole or any part of the work by the Owner, nor the extension of time, nor any other act or omission of the Owner or the Engineer shall constitute or be deemed to be an acceptance of any defective or improper work, materials, or equipment nor operate as a waiver of any requirement or provision of the Contract, or of any remedy, power or right of or herein reserved to the Owner, nor of any right and remedy provided for herein or by law, the Owner shall be entitled as of right to a writ of injunction against any breach or threatened breach of the Contract by the Contractor, by his Subcontractors or by any other person or persons.

4.26 WORK TO CONFORM: During its progress and on its completion, the work shall conform truly to the lines, levels, and grades indicated on the Drawings or given by the Engineer and shall be built in a thoroughly substantial and workmanlike manner, in strict accordance with the Drawings, Specifications, and other Contract Documents and the directions given from time to time by the Engineer.

All work done without instruction having been given therefore by the Engineer, without prior lines or levels, or performed during the absence of the Engineer, will not be estimate of paid for except when such work is authorized by the Engineer in writing. Work so done may be ordered uncovered or taken down, removed, and replaced at the Contractor's expense.

5. INSURANCE, LEGAL RESPONSIBILITY AND SAFETY

5.1 COMPLIANCE WITH LAWS: The Contract shall be governed by the law of the State of South Carolina. The Contractor shall abide by all local and State Laws or ordinances to the extent that such requirements do not conflict with more stringent Federal laws or regulations. The Contractor shall keep himself fully informed of all existing and future Federal, State and local laws, ordinances, rules and regulations affecting those engaged or employed on the work, the materials and equipment used in the work of the conduct of the work, and of all orders, decrees and other requirements of bodies or tribunals having any jurisdiction or authority over the same, including, but not limited to the US Department of Labor and Bureau of Standards Safety and Health Regulations for Construction and its amendments as set up under the Williams-Steiger Occupational Safety and Health Act of 1970. If any discrepancy or inconsistency is discovered in the Drawings, Specifications or other Contract Documents in relation to any such law, ordinance, rule, regulation, order, decree or other requirement, the Contractor shall forthwith report the same to the Engineer in writing.

The Contractor shall at all times observe and comply with, and cause all his agents, servants, employees, and subcontractors to observe and comply with, all such existing requirements, and he shall protect, indemnify and save harmless the Owner, its officers, agents, servants, and employees from and against any and all claims, demands, suits, proceedings, liabilities, judgments, penalties, losses, damages, costs and expenses, including attorney's fees, arising from or based upon any violation or claimed violation of any such law, ordinance, rule, regulation, order, decree, or other requirement, whether committed by the Contractor or any of his agents, servant employees, or subcontractors.

5.2 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. If through mistake or otherwise any such provision is not inserted or is not correctly inserted, then upon the application of either party the Contract shall forthwith be physically amended to make such insertion or correction.

5.3 LIENS: If at any time any notice of lien is filed for labor performed or materials or equipment manufacturers, furnished, or delivered to or for the Work, the Contractor shall, at its own cost and expense, promptly discharge, remove or otherwise dispose of the same and until such discharge, removal or disposition, the Owner shall have the right to retain from any moneys payable hereunder and amount which, in its sole judgment, it deems necessary to satisfy such liens and pay the costs and expenses, including attorney's fees, of defending any actions brought to enforce the same or incurred in connection therewith or by reason thereof.

5.4 CLAIMS: If at any time there is any evidence of any claims for which the Contractor is or may be liable of responsible hereunder, the Contractor shall promptly settle or otherwise dispose of the same, and until such claims are settled or disposed of, the Owner may retain from any moneys which would otherwise be payable hereunder so much thereof as, in its judgment, it may deem necessary to settle or otherwise dispose if such claims and to pay the costs and expenses, including attorney's fees of defending any actions brought to enforce such claims or incurred in connection therewith or by reason thereof.

5.5 PERFORMANCE BOND AND PAYMENT BOND: Unless otherwise noted in the Supplemental Conditions, a Performance Bond and a Payment Bond are required. The Contractor shall obtain a Performance Bond and Payment Bond, (acceptable to the Owner in a surety company authorized to do business in the same state in which the Project is constructed), each for the full amount of the Contract Sum, The bonds shall guarantee the Contractor's faithful performance of the Contract and the payment of all obligations arising thereunder. The bonds shall remain in force until:

The Project has been completed and accepted by the Owner;

The provisions of all guaranteed required by these Contract Documents have been fulfilled or the time limitation for all guarantees has expired; and

The time for the filing of all mechanics' liens has expired after which it shall become void.

The Contractor shall pay all charges in connection with the bonds as a part of the Contract. One executed copy of the bonds shall be attached to each copy of the Contract before they are returned to the Engineer for the Owner's signature.

If the Contractor defaults, the Contractor, or his Surety shall reimburse the Owner for any additional Engineering fees for additional services made necessary because of the Contractor's default.

5.6 ADDITIONAL OR SUBSTITUTE BOND: If at time the Owner for justifiable cause, shall be or become dissatisfied with the surety or sureties for the Performance and/or Payment Bonds, the

Contractor shall, within 5 days after notice from the Owner to do so, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished such an acceptable bond to the Owner.

5.7 CHANGES NOT TO AFFECT BONDS: It is distinctly agreed and understood that any changes made in the Work or the Drawings or Specifications therefore (whether such changes increase or decrease the amount thereof or the time required for its performance) or any changes in the manner or time of payments made by the Owner to the Contractor, or any other modifications of the Contract, shall in no way annul, release, diminish or affect the liability of the Surety on the Contract Bonds given by the Contractor, it being the intent hereof that notwithstanding such changes the liability of the Surety on said bonds continue and remain in full force and effect.

5.8 OWNER'S INSURANCE AUTHORITY: During all phases of construction, the Contractor will be required to perform his operations to comply expeditiously with the recommendations of the Owner's Insurance Authority.

5.9 ASSIGNMENTS: The Contractor shall not assign the whole or any part of this Contractor any moneys due or to become due hereunder without written consent of the Owner. If the Contractor assigns all or any part of the moneys 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 moneys 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.

5.10 INSURANCE: The Contractor shall not commence any work until he obtains, at his own expense, all required insurance (such as Workers Compensation, Commercial General Liability (CGL) and Comprehensive Automobile Liability etc. as required). Such insurance must have the approval of the Owners as to limit, form, and amount. The contractor will not permit any Subcontractor to commence work on this project until the same insurance requirements have been complied with by the Subcontractor.

The Contractor shall furnish the Owner with the certificates showing the type, amount, class of operations covered, effective dates and dates of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be canceled or materially altered, except after ten (10) days notice in writing and delivered by registered mail to the Owner." Should any policy be canceled before final payment by the Owner to the Contractor and the Contractor fail immediately to procure other insurance as specified, the Owner reserved the right to procure such insurance and to deduct the cost thereof from any sum due the Contractor under this Contract.

Any insurance bearing on adequacy of performance shall be maintained after completion of the project for the full guaranty period. Should such insurance be canceled before the end of the guaranty period and the Contractor fails immediately to procure other insurance as specified, the Owner reserves the right to procure such insurance and to charge the cost thereof to the Contractor.

Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's responsibility for payment for damages resulting from his operations under this Contract.

The Contractor is required to obtain and maintain for the full period of the Contract the following types of insurance coverage with limits not less than stated below:

WORKER'S COMPENSATION INSURANCE: As required by the State of South Carolina, with Statutory Limits, and Employer's Liability Insurance with limit of no less than \$1,000,000 per accident for bodily injury or disease.

COMMERCIAL GENERAL LIABILITY (CGL): Insurance Services Office (ISO) Form CG 00 01 12 07 covering CGL on an "occurrence" basis, including products-completed operations, personal and advertising injury, with limits no less than \$1,000,000 per occurrence. If a general aggregate limit applies, the general aggregate limit shall be twice the required occurrence limit. This contract shall be considered to be an "insured contract" as defined in the policy.

COMPREHENSIVE AUTOMOBILE LIABILITY: ISO Form Number CA 00 01 covering any auto (Code 1), or if Contractor has no owned autos, hired, (Code 8) and non-owned autos (Code 9), with limits no less than \$1,000,000 per accident for bodily injury and property damage.

SUBCONTRACTOR'S LIABILITY INSURANCE:

Same limits as required by the General Contractor.

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

5.12 SAFETY: In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property affected directly by his operations during the performance of the work. This requirement will apply continuously 24 hours per day until acceptance of the Work by the Owner and shall not be limited to normal working hours.

The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to:

All employees on the Work and all other persons who may be affected thereby.

All the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody, or control of the Contractor or any of the Subcontractors of Sub-subcontractors; and

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

The Contractor shall comply with all applicable laws, ordinances, rules, regulations, and lawful orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss. He shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.

When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the Owner and the Engineer.

The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

THE CONTRACTOR SHALL NOTIFY THE OWNER IMMEDIATELY OF ANY INJURIES OR PROPERTY DAMAGE DURING PROGRESS OF THE WORK.

6. PROGRESS AND COMPLETION OF WORK

6.1 NOTICE TO PROCEED: Following the execution of the Agreement by the Owner and the Contractor, written Notice to Proceed with the work shall be given by the Owner to the Contractor. The Contractor shall begin and shall prosecute the work regularly and uninterruptedly thereafter (except as provided for herein) with such force as to secure the completion of the work within the Contract Time.

6.2 CONTRACT TIME: The Contractor shall complete, in as acceptable manner, all the work contracted for in the time stated in the Agreement. Computation of Contract Time shall commence the day to be specified in the Notice to Proceed and every calendar day following, except as herein provided, shall be counted as Contract Time.

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

6.4 WORK CHANGES: The Owner may, as the need arises, order changes in the work through additions, deletions, or modification to the extent of 25% of the Contract Amount, without

invalidating the Contract. Compensation and time of completion affected by the change shall be adjusted at the time of ordering such change.

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

6.6 EXTENSION OF CONTRACT TIME: A delay beyond the Contractor's control occasioned by an Act of God, by act or omission on the part of the Owner or by strikes, lockouts, fire, etc., may entitle the Contractor to an extension of time in which to complete the work as agreed by the Owner, provided, however, that the Contractor shall immediately give written notice to the Owner of the cause of such delay.

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

All claims for extension of time shall be made in writing to the engineer no more than twenty days after the occurrence of the delay; otherwise they shall be waived. In the case of continuing cause of delay only one claim is necessary. Any claim should include complete justification for the extent of the delay claimed.

The Subsection does not exclude the recovery of damages for delay for either party under other provisions of the Contract Documents.

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

6.8 TERMINATION OF CONTRACTOR'S RESPONSIBILITY: The Contract will be considered complete when all work has been finished, the final review made up by the Engineer, and the project accepted in writing by the Owner. The Contractor's responsibility shall then cease, except as set forth in his Performance Bond, as provided in Subsection 4.6 entitled GENERAL GUARANTY, and as provided in Subsection 6.9 entitled CORRECTION OF FAULTY WORK AFTER FINAL PAYMENT.

6.9 CORRECTION OF FAULTY WORK AFTER FINAL PAYMENT: The making of the final payment by the Owner to the Contractor shall not relieve the Contractor of responsibility for faulty materials or workmanship. The Contractor shall promptly replace any such defects discovered within two years, except where longer periods are specified, from the date of written acceptance of the work.

6.10 PROGRESS SCHEDULE : Within twenty (20) days after execution and delivery of the Agreement and not less than ten (10) days prior to making an application for partial payment, the Contractor shall prepare and deliver to the Engineer a Progress Schedule on forms approved by the Engineer.

The schedule shall be set up in a Critical Path format and shall show the proposed dates of commencement and completion of the various subdivisions of work required under the Contract Documents.

The schedule shall show the dates of commencement and completion of the various subdivisions of work required by the Contract Documents and all activities required to accomplish the Work. No activity included in the schedule shall have a duration greater than fifteen (15) days. After approval of the Submit Schedule, the Contractor shall incorporate this schedule into the CPM schedule.

The schedule shall be updated monthly. No progress payments will be made unless application is accompanied by the updated schedule.

6.11 SCHEDULES, REPORTS AND RECORDS: The Contractor shall submit to the Owner such schedules of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the Contract Documents for the Work to be performed.

The Contractor shall also submit, in a format as approved by the Engineer, a schedule of payments that he anticipates he will earn during the course of the Work.

6.12 ABANDONMENT OF WORK OR OTHER DEFAULT: The Contractor may be declared in DEFAULT of the contract for the following reasons:

If the CONTRACTOR:

1. abandons the work.
2. sublets any part of the work without previous written permission of the OWNER.
3. assigns the contract of any moneys payable hereunder in any manner other than as specified herein or, if at any time the Engineer shall be of the opinion, and shall so certify in writing, that:

1. The conditions herein specified as to rate of progress are not being complied with.
2. The work or any part thereof is being unnecessarily or unreasonably delayed.

3. The Contractor has violated or is in default under any of the provisions of the Contract.
4. The Contractor becomes bankrupt or insolvent.
5. The Contractor goes or is put into liquidation or dissolution, either voluntarily or involuntarily.
6. The Contractor petitions for an arrangement or reorganization under the Bankruptcy Act.
7. The Contractor makes a general assignment for the benefit of creditors or otherwise acknowledges insolvency.

Upon a finding of DEFAULT by the Contractor, the Owner may notify the Contractor in writing with a copy of such notice mailed to the Surety, to discontinue such work or any part thereof.

The Contractor shall discontinue such work or such part thereof as the Owner may designate; and the Owner may, upon giving notice, by contract or otherwise as it may determine, complete the work or such part thereof and charge the entire cost and expense of so completing the work or such part thereof to the Contractor as specified under 2.10: OWNERS RIGHT TO DO WORK.

In addition to the said entire cost and expense of completing the work, the Owner shall be entitled to reimbursement from the Contractor and the Contractor agrees to pay the Owner any losses, damages, costs and expenses, including attorneys' fees, sustained or incurred by the Owner by reasons of any of the foregoing causes.

For purposes of such completion the Owner may for itself or for any contractors employed by the Owner take possession of any and use or cause to be used any and all materials, equipment, plant machinery, appliances, tools, supplies and such other items of every description that may be found or located at the site of the Work. No equipment or materials may be removed from the Work without the written consent of the Owner.

All costs, expenses, losses, damages, attorneys' fees and any and all other charges incurred by the Owner under this Subsection shall be charged against the Contractor and deducted and/or paid by the Owner out of any moneys due or payable or to become due or payable to the Contractor under the Contract.

In computing the amounts chargeable to the Contractor, the Owner shall not be held to a basis of the lowest prices for which the completion of the work or any part thereof might have been accomplished; but all sums actually paid or obligated therefore to effect its prompt completion shall be charged to and against the account of the Contractor.

In case the costs, expenses, losses, damages, attorneys' fees and other charges together with all payment there-to-fore made to or for the account of the Contractor are less than the sum which would have been payable under the Contract if the work had been properly performed and completed by the Contractor, the Contractor shall be entitled to receive the difference.

In case such costs, expenses, losses, damages, attorneys' fees and other charges, together with all payments there-to-fore made to or for the account of the Contractor, shall exceed the said sum, the Contractor shall pay the amount of the excess to the Owner.

6.13 FINAL INSPECTION: When the work has been completed and finished in accordance with the Contract, the Contractor shall notify the OWNER in writing, and request a final inspection.

The Owner and Engineer shall jointly review the work, after the Engineer is otherwise satisfied that all work on the project has been substantially completed in accordance with the contract documents and change orders.

A list shall be made of all deviations from the Contract requirements (commonly termed "punch list") and a copy of such list furnished to the Contractor. The Contractor shall with reasonable haste remedy all defects so noted and shall notify the Owner upon the completion of such work.

When inspection by the Owner's authorized representatives shows the work to be complete in accordance with the Contract, application for final payment may be made.

After project completion, funds may be withheld from the Contractor only if they are required to insure specific performance of deficient portions of the contract. The contractor shall be required to provide a representative for all work reviews and regulatory agency inspections. Work noted as requiring the attention of the Contractor, after satisfaction of the "Final Punch List" shall be considered as warranty work.

7. PAYMENTS TO THE CONTRACTOR

7.1 PRICES FOR WORK: The Owner shall pay and the Contractor shall receive the prices stipulated in the Bid made a part hereof as full compensation for everything performed and furnished and for all risks and obligations undertaken by the Contractor under and as required by the Contract.

7.2 SCHEDULE OF VALUES: Except in cases where unit prices form the basis for payment under the Contract, the Contractor shall, within twenty (20) days of the execution of the Contract and not less than ten (10) days prior to making an application for partial payment, submit to the Owner in a form approved by the Owner a schedule of values showing a breakdown of the Contract Sum itemized by trade and/or specification sections or as otherwise directed by the Owner and for each item shall show the total value including the Contractor's overhead and profit. Upon approval by the Owner, this schedule will be used in determining the value of the work done for the purpose of partial payments.

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 additions to or deductions from the Contract Price.

7.3 APPLICATIONS FOR PARTIAL PAYMENT: Before the first day of each month, or as otherwise directed by the Owner, the Contractor shall make applications for the value of the work

done and the materials installed and/or delivered to the site for installation in the project during the previous month.

Such applications shall show the breakdown of the project into the same items as the schedule of values specified in Subsection 7.2 entitled SCHEDULE OF VALUES, and showing for each item the total value, the value previously reported as complete, the value completed during the month, the cumulative value completed and the value remaining to be done.

The application shall also show the value of materials delivered to the site which have not been incorporated into the work and whose value is not included in the amount shown for the work of which they are a part. The value of such materials shall be established by attaching copies of invoices covering the materials to the application,

The application shall include a summary of value of the work performed during the previous month, plus the value of the material delivered to the job site but not incorporated in the work, and minus the amount of the retainage indicated in Subsection 7.4 entitled RETAINAGE.

The Engineer will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the Owner, or return the partial payment estimate to the Contractor indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate.

7.4 RETAINAGE: The Owner shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all work covered by the Contract Documents. The Owner at any time, however, after fifty (50) percent of the work has been completed, if he finds that satisfactory progress is being made, may make further partial payments in full on the current and remaining estimates, but amounts previously retained shall not be paid to the Contractor at fifty (50) percent completion.

Any time thereafter, when, in the opinion of the engineer, the progress of the Work is not satisfactory, additional amounts may be retained but in no event shall the total retainage be more than ten (10) percent of the value of the work completed. Upon substantial completion of the work, any amount retained may be paid to the Contractor.

When the Work has been substantially completed except for Work which cannot be completed because of weather conditions, lack of materials or other reasons which in the judgment of the Owner are valid reasons for non-completion, the Owner may make additional payments, retaining at all times an amount sufficient to cover the estimated cost of the Work still to be completed.

7.5 PAYMENTS WITHHELD: The Owner may withhold payment or, on account of subsequently discovered evidence, nullify the whole or part of any application to the extent necessary to protect himself from loss on account of:

1. Defective work not remedied;

2. Claims filed or reasonable evidence indicating the probable filing of claims;
3. Failure of the Contractor to make payments to Subcontractors, material suppliers, or employees;
4. A reasonable doubt that the Contract work can be completed for the balance unpaid; or
5. Damage to another Contractor.

When the above grounds are removed, payment will be made for the amounts withheld because of them.

7.6 PAYMENT OF APPLICATIONS FOR PARTIAL PAYMENT: Upon verification and approval of the application for partial payment made as specified, the Owner will make payment of the amount found properly due. No payment made to the Contractor nor partial or entire use or occupancy of the Work by the Owner shall be an acceptance of any work or materials not in accordance with this Contract.

7.7 RELEASE OF LIENS : Neither the final payment nor any part of the retained percentage shall become due until the Contractor shall deliver to the Owner a complete and notarized release of all liens arising out of this Contract, or receipts in full in lieu thereof, and if required in either case, an affidavit that so far as he had knowledge or information the releases and receipts include all the labor and material for which a lien could be filed; but the Contractor may, if any Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner, to indemnify him against any lien. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such a lien, including all costs and reasonable attorneys' fees.

7.8 USE OR PARTIAL PAYMENT NOT ACCEPTANCE: It is agreed that this is an entire contract for one whole and complete work or result and that neither the Owner's entrance upon nor use of the Work or any part thereof nor any partial payments by the Owner shall constitute an acceptance of the Work or any part thereof before its entire completion and final acceptance.

7.9 PAYMENT FOR UNCORRECTED WORK: Should the Owner direct the Contractor not to correct work that has been damaged or that was not performed in accordance with the Contract Documents, an equitable deduction from the Contract Amount shall be made to compensate the Owner for the Uncorrected Work.

7.10 PAYMENT FOR REMOVAL OF REJECTED WORK AND MATERIALS: The removal of work and materials rejected in accordance with Subsection 4.3 entitled **CORRECTION OF WORK BEFORE COMPLETION** and the re-execution of acceptable work by the Contractor shall be at the expense of the Contractor, and he shall pay the cost of replacing the work of other contractors destroyed or damaged by the removal of the rejected work or materials and the subsequent replacement of acceptable work.

Removal of rejected work or materials and storage of materials by the Owner, in accordance with Subsection 4.3 entitled CORRECTION OF WORK BEFORE COMPLETION, shall be paid by the Contractor within thirty (30) days after written notice to pay is given by the Owner. If the Contractor does not pay the expenses of such removal and after ten (10) days' written notice being given by the Owner of his intent to sell the materials, the Owner may sell the materials at auction or at private sale and will pay the Contractor the net proceeds therefrom after deducting all the costs and expenses that should have been borne by the Contractor.

7.11 PAYMENT FOR EXTRA WORK: Written notice of claims for payment for Extra Work shall be given by the Contractor within ten days after receipt of instructions from the Owner to proceed with the Extra Work and also before any work is commenced, except in emergency endangered life or property. No claim shall be valid unless so made. In all cases, the Contractor's itemized estimate sheets showing all labor and material shall be submitted to the Owner.

Owner's order for Extra Work shall specify any extension of the Contract Time and one of the following methods of payment:

1. Unit price or combinations or unit prices which form the basis of the original Contract.
2. A lump sum based on the Contractor's estimate and accepted by the Owner.
3. Net cost plus a fixed fee. Net costs are defined as follows:
 - 3.1 Labor costs, including time of foreman while engaged directly upon extra work at rates not greater than the scale of rated for each respective classification of labor customary in the area where the work is performed for each respective job classification.
 - 3.2 Labor, insurance, and taxes, including amounts paid on a percent of such labor rates or on a cents per hour basis for Worker's Compensation, Public Liability, Contractor's Contingent Liability and Contractual Liability Insurance and all Federal Old Age and Unemployment Taxes and any other taxes applicable as well as fringe benefits as may be approved by the Engineer.
 - 3.3 Materials and supplies actually used on the work.
 - 3.4 Rental charges are necessary equipment, as agreed upon by the Owner and Contractor. Rental charges shall not exceed those published in Rental Rates for Construction Equipment issued by the American Equipment Distributor. Equipment and tools having a value of \$100.00 or less are considered to be "small tools" and as such, are considered to be part of overhead.

To the cost under (3) there shall be added a fixed fee to be agreed upon but not to exceed fifteen (15) 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. On work performed by subcontractors, the fixed fee shall not exceed five (5) percent of the cost of work.

7.12 PAYMENT FOR WORK SUSPENDED BY THE OWNER: If the work or any part thereof shall be suspended by the Owner and abandoned by the Contractor as provided in Subsection 2.12 entitled SUSPENSION OF WORK, TERMINATION AND DELAY, the Contractor will then be entitled to payment for all work done on the portions so abandoned.

7.13 PAYMENT FOR WORK BY THE OWNER: The cost of the work performed by the Owner, in accordance with Subsection 2.10 entitled OWNER'S RIGHT TO DO WORK, shall be paid to the Contractor.

7.14 PAYMENT FOR WORK BY THE OWNER FOLLOWING TERMINATION OF CONTRACT BY OWNER: Upon termination of the Contract by the Owner in accordance with Subsection 2.11 entitled OWNER'S RIGHT TO TERMINATE CONTRACT, no further payment shall be due the Contractor until the work is completed. If the unpaid balance of the Contract Amount Shall Exceed the cost of completing the work shall exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The cost incurred by the Owner, as herein provided, and the damage incurred through the Contractor's default shall be certified by the Owner.

7.15 PAYMENT FOR SAMPLES AND TESTING OF MATERIALS: Samples furnished in accordance with Subsection 4.18 entitled SAMPLES shall be furnished by the Contractor at his expense.

Testing of samples and materials furnished in accordance with Subsection 4.18 entitled SAMPLES shall be arranged and paid for by the Owner.

7.16 ACCEPTANCE AND FINAL PAYMENT: When the Contractor shall have completed the work in accordance with the terms of the Contract Documents, he shall certify completion of the work to the Owner and submit a final Request for Payment. This request shall be the Contract Amount plus all approved additions, less all approved deductions, less previous payments made.

The Contractor shall furnish evidence that he has fully paid all debts for labor, materials, and equipment incurred in connection with the work. Upon acceptance, the Owner will release the Contractor (except as to the conditions of the Performance Bond and the Payment Bond, and any legal rights of the Owner, required guaranties, and Correction of Faulty Work after Final Payment), and will pay the Contractor's final Request for Payment.

The Contractor will allow enough time for the Engineer to assemble and check all necessary data. The Contractor shall deliver to the Owner a complete release of all liens arising out of this Contractor before the retained percentage of before the final Request for Payment is paid.

7.17 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 other than claims in stated amounts as may be specifically excepted by the Contractor for all things done or furnished in connection with this Work and for every act and

neglect of the Owner and other relating to or arising out of this Work. Any payment, however, final or otherwise, shall not release the Contractor or his sureties from any obligations under the Contract Documents or the Performance Bond and Payment Bond.

7.18 DELAYS AND DAMAGES: The date of beginning and the time of completion of the Work are essential conditions of the Contract Documents and the Work embraced shall be commenced on a date specified in the Notice to Proceed.

The Contractor will proceed with the Work at such a rate of progress to insure full completion within the Contract Time. It is expressly understood and agreed by and between the Contractor and the Owner that the Contract Time for the completion of the Work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the Work.

If the Contractor refuses or fails to prosecute the Work, or any separable part thereof, with such diligence as will insure its completion within the time specified in the Contract, or any extension thereof, or fails to complete said Work within such time, the Owner may, by written notice to the Contractor and his Surety, terminate his right to proceed with the Work or such part of the work as to which there has been delay.

In such event the Owner may take over the Work and prosecute the same to completion, by contract and otherwise, and may take possession of and utilize in completing the work such materials, appliances, and plant as may be on the site of the work and necessary therefore.

Whether or not the Contractor's right to proceed with the Work is terminated, he and his sureties shall be liable for any damage to the Owner resulting from his refusal or failure to complete the Work within the specified time.

If fixed and agreed liquidated damages are provided in the Contract and if the Owner so terminated the Contractor's right to proceed, the resulting damage will consist of such liquidated damages until such reasonable time as may be required for final completion of the Work together with any increased costs occasioned by the Owner in completing the Work.

If fixed and agreed liquidated damages are provided in the Contract, and if the Owner does not so terminate the Contractor's right to proceed, the resulting damage will consist of such liquidated damages until the Work is completed or accepted.

The Contractor's right to proceed shall not be so terminated nor the Contractor charged with resulting damage if:

1. The delay in the completion of the Work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, Acts of God, acts of the public enemy, acts of the Government in either its sovereign or contractual capacity, acts of another contractor in the performance of a contract with the Owner, fires, flood, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather, or delays or subcontractors or suppliers arising

from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and such subcontractors or suppliers: and

2. The Contractor, within ten (10) days from the beginning of any such delay (unless the Owner grants a further period of time before the date of final payment under the Contract), notifies the Owner in writing of these causes of delay.

As used in subparagraph 1, above, the term “subcontractors or suppliers” means subcontractors or suppliers at any time.

The Engineer shall ascertain the facts and the extent of the delay and extend the time for completing the Work when, in his judgment, the findings of fact justify such an extension, and his findings of fact shall be final and conclusive on the parties, subject only to appeal as provided in these General Conditions.

The rights and remedies of the Owner provided in this clause are in addition to any other rights and remedies provided by law or under this Contract.

(End of Conditions)

**NORTH CHARLESTON SEWER DISTRICT
BALLFIELD PUMP STATION
ELECTRICAL UPGRADE SPECIFICATION**

PART 1 GENERAL

1.1 DESCRIPTION

The below listed work must be installed on an elevated concrete platform due to it being in VE flood zone. The platform dimensions are 12' x 20' at BFE +2'.

A. Work included: Provide a complete electrical system as indicated on the Drawings, as specified herein, and as needed for a complete and proper installation including, but not necessarily limited to:

1. Main service, distribution equipment and transformers.
2. Feeder system, in conduit.
3. Branch circuit wiring, in conduit, for lighting, receptacles, junction boxes and motors.
4. Surge suppression device.
5. Other items and services required to complete the systems whether particularly mentioned or not.
6. Demo all existing equipment after pumps are connected to new Pump Control Panel through new NEMA 4X boxes.

1.2 ABBREVIATIONS

A	Ampere (Amps)	Disc.	Disconnect
AFF	Above Finished Floor	Dn	Down
AFG	Above Finished Grade	EMT	Electrical Metallic Tubing
AHJ	Local Authority Having Jurisdiction	FLA	Full Load Amps
AIC	Amps Interrupting Current	FPM	Fuse Manufacturer Requirements
AFCI	Arc-Fault Circuit Interrupter	FS	Federal Specifications
ANSI	The American National Standards Institute Association	G or Gnd.	Ground
BF	Ballast Factor	GFCI	Ground Fault Circuit Interrupter
BFE	Base Flood Elevation	GFP	Ground Fault Protection
Bkr.	Breaker	HD	Heavy Duty
C	Conduit	HP	Horsepower
Ckt.	Circuit	IBC	International Building Code
CRI	Color Rendering Index	IEEE	Institute of Electrical and Electronic Engineers
CU	Copper Conductor	IMC	Intermediate Metallic Conduit
DETD	Dual Element Time Delay Fuse	KVA	Kilovolt-Amps
Disc.	Disconnect	KW	Kilo Watt
DHEC	Department of Health and	KA	Kilo Amps
		LCCF	Lamp Current Crest Factor

MCA	Minimum Circuit Amps	SCCR	Short-Circuit Current Rating
MCC	Motor Control Center	SPD	Surge Suppression Device
MCM	1000 Circular Mils (KCMIL)	Sym.	Symmetrical
MOCP	Maximum Over-Current Protection	THD	Total Harmonic Distortion
N	Neutral	TSP	Twisted Shielded Pair
NEC	2020 National Electrical Code	TST	Twisted Shielded Triplet
NEMA	National Electrical Manufacturers	TVSS	Transient Voltage Surge Suppressor
NFPA	National Fire Protection Association	UL	Underwriters Laboratories Inc.
NIC	Not in Contract	UON	Unless Otherwise Noted
OSHA	Occupational Safety and Health Act	V	Volts
PF	Power Factor	W	Watts
PLC	Programmable Logic Controller	WFC	Watertight Flexible Conduit
PVC	Polyvinyl Chloride Conduit	WG	Wire Guard
RGSS	Rigid Galvanized Steel Conduit	XFMR	Transformer
RTU	Remote Terminal Unit		
SCADA	Supervisory Control and Data Acquisition		

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section. These shall include, but not be limited to, an electrical supervisor who is a licensed master electrician, a field foreman with a minimum journeyman electrician's license and adequate electricians and helpers.
- B. Without additional cost to the Owner, provide such other labor and materials required to complete the work of this Section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents.
- C. Electrical subcontractor shall furnish a 100 percent performance bond and a 100 percent payment bond to the Contractor as security for the faithful performance of this Section, as security for the payment of all persons performing labor on the project under this Section and furnishing materials in connection with this Section. The performance bond and payment bond shall be in separate instruments.

1.4 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product data: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
 1. Materials list of items proposed to be provided under this Section.
 2. Manufacturer's specifications, other data and shop drawings needed to prove compliance with the specified requirements. Provide the following approval drawings:
 - a. Panels
 - b. Transformers.

- c. Wiring devices and cover plates.
 - d. Conduit and fittings.
 - e. Conductors.
 - f. Connectors.
 - g. Surge Suppression Device.
3. Manufacturer's recommended installation procedures which, when approved by the Engineer, will become the basis for accepting or rejection actual installation procedures used on the Work.
- C. Layouts:
1. In additions to manufacturer's equipment shop drawings, submit electrical installation working drawings containing the following:
 - a. Plans shall be drawn on high quality reproducible, media, size 22" by 34" and shall be presented in a neat, professional manner.
- D. Manual: Upon completion of this portion of the Work and as a condition of its acceptance, provide operation and maintenance manuals in accordance with the provisions of Section 01650 of these Specifications. Include within each manual:
1. Copy of the approved Record Documents for this portion of the Work.
 2. Copies of all circuit directories.
 3. Copies of all warranties and guaranties.

1.5 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01640.

1.6 WARRANTY

- A. Provide standard two (2) years warranty on all labor and materials.
- B. Provide minimum five (5) year warranty on Surge Protection Devices, incorporating unlimited replacements of suppressor parts if destroyed by transients during the warranty period.
- C. Comply with Section 01650.

1.7 RULES AND PERMITS

- A. The entire installation shall be in accordance with the latest edition of the NEC, OSHA, and all local codes.
- B. Apply and pay for all permits and inspections required by local or state laws.
- C. Furnish the Owner with certificate of inspection and final approval from all authorities having jurisdiction.

1.8 DRAWINGS

- A. The drawings and specifications are complementary to each other and what is called for by one shall be as binding as if called for by both. The drawings are diagrammatic and are to be followed as closely as the construction will permit.

- B. The drawings show the general location of panel layout & conduits arrangement. The Contractor shall carefully investigate the structural and finish conditions affecting all his Work and shall arrange such work accordingly, furnishing such fittings, junction boxes and accessories as may be required to meet such conditions.

1.9 ELECTRICAL OUTAGE

- A. Coordinate all outages with the Owner, 72 hours prior. Schedule all outages such that they will not interfere with normal plant operation and that there will be no delays in equipment startup and placing the facilities in operation.

1.10 SPARE PARTS

- A. Provide the following spare parts to Owner in neatly packaged box marked with contents:
 1. Keys: One (1) set of spare panelboard keys with lists to Owner.
 2. SPD: One (1) SPD protection module per unit as an on-site spare.
 3. Control Lamps: Ten (10) percent of quantity furnished, minimum of one of each type.

PART 2 PRODUCTS

2.1 GENERAL

- A. Provide only materials that are new, of the type and quality specified. Where Underwriters' Laboratories, Inc. have established standards for such materials, provide only materials bearing the UL label. Materials called for are to be considered as standard that, however, implies no right on the part of the Contractor to substitute other materials and methods without written authority from the Engineer.
- B. Where any material or operation is specified by reference to published specifications or standards or the specifications or standards of any other organization; the referenced specification or standard shall be as much a part of this Section as if quoted in full herein.

2.2 RACEWAYS

- A. Applicable Standards:
 1. ANSI C80.1: Rigid Steel Conduits, Zinc-Coated.
 2. ANSI C80.3: Electrical Metallic Tubing, Zinc Coated.
 3. ANSI C80.5: Rigid Aluminum Conduits.
 4. ANSI C80.6: Intermediate Metallic Conduits.
 5. ANSI/NEMA FB1: Fittings and Supports for Conduit and Cable Assemblies.
 6. UL 6: Rigid Steel Conduit – Zinc Coated.
 7. UL 651-2002: Schedule 40 PVC and schedule 80 Rigid PVC Conduit.
 8. UL 514B: Flexible conduit fittings.
 9. NEMA FB 1: Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing and Cable.
 10. ASTM F512: Polyvinyl Chloride (PVC) Conduit.

11. ASTM D870: Standard Practice for Testing Water Resistance of Coatings Using Water Immersion.
 12. ASTM D1151: Standard Practice for Effect of Moisture and Temperature on Adhesive Bonds.
 13. FS WW-C 581E: Federal Specification for Rigid Galvanized Steel Conduit.
 14. FS-WW-C-563A: Federal Specification for Electrical Metallic Tubing.
 15. FS-WW-C-540C: Federal Specification for Rigid Aluminum Conduit.
 16. FS WW-C 566: Federal Specification for Flexible Metal Conduit.
- B. Acceptable Manufacturers:
1. Wheatland.
 2. Allied Tube.
 3. Carlon.
- C. Provide conduit and fittings conforming to the above standards.
1. Provide threaded type fittings and form 8 conduit bodies with material to match conduit.
 2. Provide seal fittings for rigid aluminum conduit where indicated on the plans equal to Crouse-Hinds series EYSX.
 3. Provide sealing compound and fiber by Crouse-Hinds or approved equal:
 - a. Sealing Compound: Chico A
 - b. Sealing Fiber: Chico X.
- D. Rigid aluminum conduit:
1. Provide thread type fittings and conduit bodies with matching material.
 2. Provide standard electric conduit couplings.
 - a. Do not use pipe couplings or sleeves.
 3. Provide full weight galvanized fittings.
 4. Do not imbed aluminum conduit concrete containing chlorides, unwashed beach sand, sea water, or coral bearing aggregates.
 5. Isolate from other metals with heat shrink tubing (Raychem or equal) or plastic-coated hangers.
 6. Use strap wrenches for tightening aluminum conduit.
 - a. Do not use Pipe wrenches, channel locks, chain wrenches, pliers, etc.
 7. Clean and coat all threads on aluminum conduit and fittings with "No-Oxide" compound before using.
 8. Completely cover Aluminum conduit installed in concrete or below grade with two (2) coats of bitumastic paint.

9. Terminate aluminum conduit entering manholes and below grade pull boxes with grounding type bushings and connected to a 3/4" x 10' copper clad rod with a #6 bare copper wire.
10. All risers from underground, concrete pads, floors, etc.
 - a. Provide heat shrink tubing (Raychem or equal) from a point 12 inches below bottom of slab or grade to a point not less than 6 inches above grade or surface of slab.
- E. Provide hot-dipped, galvanized, watertight type fittings for liquid tight flexible conduit as manufactured by O-Z/Gedney or approved equal.
- F. Conduit/Cable supports – properties:
 1. Provide 316 stainless steel supports for all exposed metallic conduit as manufactured by Unistrut or approval equal.
 2. Provide fiberglass supports for all exposed non-metallic conduit/cable as manufactured by Aickinstrut or approved equal.
 3. Provide stainless steel strain relief and cable grips/supports for power cables. Tie each support of to the hanger support.
- G. All conduits to conform to the following specifications:
 1. Installations under concrete slab: Schedule 80 PVC
 2. Exposed outdoor locations: Schedule 80 PVC
 3. Exposed Interior locations: Rigid aluminum conduit
 4. Concealed Interior Locations: Rigid aluminum conduit
 5. Installations underground exposed to earth: Schedule 80 PVC
 6. Rigid aluminum conduit shall be used at all locations (underground and within structures) as raceways for shielded process instrumentation wiring, shielded control wiring, data highway wiring and I/O wiring.

2.3 CONDUCTORS

- A. Applicable Standards:
 1. NEMA WC 3: Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
 2. NEMA WC 5: Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
 3. UL 44 - 2002: Rubber-Insulated Wires and Cables.
 4. UL 83 – 1999: Thermoplastic-Insulated Wires and Cables.
 5. UL 854 – 2002: Service Entrance Cables.
- B. Conductors Acceptable Manufacturers:
 1. Okonite.
 2. Pirelli.

3. Southwire.
4. Superior Essex.
5. Belden.

C. Connectors Acceptable Manufacturers:

1. ILSCO
2. Polaris

D. Conductor types:

1. Low voltage conductors (0 to 600V):

- a. For secondary service entrance, feeders, underground, under floor, in damp or wet locations, and to any process associated equipment provide copper, 600V, 90°C, Type XHHW.
- b. For all other low voltage conductors, provide copper, 600V, 75°C, Type THWN.
- c. Provide stranded conductors for sized #12 and larger.
- d. Provide same type of equipment grounding conductors as specified above.
- e. Provide all branch circuit wiring installed within ballast compartment of light fixtures rated 90°C, Type THHN.
- f. Analog Control/Communications (TSP or TST) – Provide tinned copper, polyethylene insulated, twisted pair or triplet, aluminum-polyester, overall shield with 20-gauge drain.
- g. Provide analog signal conductors sized as shown on drawings with minimum size of 18-gauge.
- h. For all discrete signal conductors, provide copper stranded, 600V, Type THWN with a minimum size of #14, unless otherwise noted.
- i. For all control conductors installed in underground conduits provide cable listed as suitable for direct burial.

2. Splices, Connections and Terminations (0 to 600V):

- a. For #8 AWG, use solderless pressure connectors with insulating covers for copper wire splices and taps. Use insulated spring wire connectors with plastic caps for #10 AWG and smaller.
- b. Use insulated, mechanical connectors for copper wire splices and taps, #6AWG and larger. Tape connectors with electrical tape to prevent moisture infiltration.
- c. Where connections are located in manholes or handholes use insulated submersible type.

2.4 GROUNDING AND BONDING

A. Applicable standards:

1. UL 467-1998: Grounding and Bonding Equipment.
2. NFPA 70: National Electrical Code.

3. ANSI/IEEE 32: Requirements, Terms and Test Procedures for Neutral Grounding Devices.
 4. IEEE 80: Guide for Safety in Substation Grounding.
 5. IEEE 81: Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.
 6. NETA ATS: Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Associates).
- B. Grounding electrodes (Roy type):
1. Acceptable Manufacturers:
 - a. LTV Copperweld.
 - b. Line Material
 2. Material: Copper-clad steel.
 3. Diameter: 3/4".
 4. Length: 10'-0".
 5. Type: Sectional.
- C. Mechanical connectors:
1. Acceptable Manufacturers:
 - a. Burndy.
 - b. Robbins.
 - c. Harger.
 2. Material: Bronze.
- D. Exothermically-welded connections:
1. Acceptable Manufacturers:
 - a. Cadweld.
- E. Grounding Electrode Conductor:
1. Material: Bare, soft-drawn, stranded, copper.
 2. Minimum size: Meet NFPA 70 requirements.
- F. Bonding Material:
1. Material: Bare, soft-drawn, stranded, copper.
 2. Minimum size: Meet NFPA 70 requirements.
- G. Regulatory Requirements:
1. Products: Listed and classified by UL as suitable for the purpose specified and indicated.
 2. Rated for a minimum of 20,000 lbs.
 3. Provide Harger GAW series or approved equal.

2.5 SURGE SUPPRESSION DEVICE

A. Applicable standards:

1. UL 149 3rd Edition – Standard for Safety of Surge Protection Devices.
2. ANSI/IEEE C62.41 – IEEE Recommended Practice on Surge Voltages in Low Voltage AC Power Circuits.
3. IEEE C62.45 – IEEE Guide on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits.
4. UL 67 – Panelboards (when mounted in panelboards).
5. UL 891 – Dead-Front Switchboards (when mounted in switchboards).
6. NEMA LS1 – National Electrical Manufacturer’s Association – 1992, R2000.
7. MIL STD. 220B – Test Methods of Insertion Loss Measurement.

B. Acceptable Manufacturers:

1. Advanced Protection Technologies, Inc. (APT).
2. American Power Conversion Corporation (APC).
3. EFI Electronics.
4. Cutler Hammer.
5. Current Technology.
6. Leviton.

C. Surge Suppression Device (SPD):

1. Manufacturer’s published UL 1449 Third Edition test results shall reflect SPD connected lead length of 6” or greater.
2. Provide SPD devices with a minimum EMI/RFI filtering of -50dB at 100 kHz using MIL-STD-220A methodology.
3. Provide SPD for Analog Signal inputs to PLC.
4. Provide a SPD unit with a short circuit current rating clearly marked and install at a point on the system where the available fault current is in excess of that rating.
5. Provide dedicated circuit breaker/disconnect for the SPD.
6. Provide SPD with one set of NO/NC dry contacts.
7. Provide SPD with protection-indicating LED’s that are visible without opening enclosure.
8. Provide NEMA 4X 316 stainless steel enclosures for all interior process area and exterior installations. Provide NEMA 12 (stainless steel) in all other installations.
9. Provide SPD that meets or exceeds the following criteria:
 - a. Maximum UL Suppression Voltage Rating (SVR) and Maximum Operating Voltage (MCOV):

System Voltage	L-N	L-G	N-G	L-L	MCOV
240V 3 ϕ	150	150	150	300	320
	H-L	H-N	H-G		
H-LEG DELTA	470	320	320		320

b. Minimum Surge Capacity and modes of protection:

SPD Location	Modular Parallel Protection	Modes of Protection	RFI Filtering	Surge Capacity Per Mode
Service Entrance > 200A, <800A	320	700	600	1200

2.6 OUTLET BOXES

A. Applicable Standards:

1. ANSI/NEMA OS 1: Sheet-steel Outlet Boxes, Devices Boxes, Covers and Box Supports.
2. ANSI/NEMA OS 2: Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.
3. NEMA 250: Enclosures for Electrical Equipment (1000 Volts Maximum).
4. NEMA FB 1: Type FD, Cast Ferroalloy Boxes.
5. UL 508: UL Standard for Safety Industrial Control Equipment.

B. Types and properties:

1. Outlet boxes:

- a. Sheet metal outlet boxes (ANSI/NEMA OS1: galvanized steel, with 1/2" male fixture studs where required).
- b. Nonmetallic outlet boxes (ANSI/NEMA OS2).
- c. Cast boxes (NEMA FB1; deep type, gasketed cover, threaded hubs).

C. Pull and junction boxes:

1. Sheet metal boxes:

- a. Indoor location installations:
 - (i) Provide the type specified in ANSI/NEMA OS1, 316 stainless steel unless stated otherwise on drawings.
 - (ii) Provide hinged-type enclosure for enclosures larger than 12 inches in any dimension.
- b. Indoor location installations: Provide hinged-type enclosure for enclosures larger than 12 inches in any dimension.

2. Stainless Steel boxes:
 - a. Outdoor and wet location installations: Conform to NEMA Type 4 , flat-flanged, surface-mounted junction box, UL listed as rain tight, cast aluminum box cover with ground flange, neoprene gasket, and stainless steel cover screws as manufactured by Cooper Crouse-hinds.
 3. Non-metallic boxes:
 - a. Above ground location installations: Conform to UL 508, NEMA type as shown on drawings, molded fiberglass polyester, with removable hinged cover, neoprene gasket, and stainless steel cover screws as manufactured by Hoffman.
 - b. In Ground location installations: Conform to UL 508, NEMA type as shown on drawings, pre-cast polymer concrete, with removable, heavy-duty bolted cover, and stainless steel cover screws as manufactured by Strongwell.
- D. Outlet box schedule, unless otherwise noted:
1. Interior boxes
 - a. Galvanized extensions and rings.
 - b. Ganged where two or more devices occur at the same location.
 - c. One-piece type.
 - d. Studs for lighting fixtures, when required.
 - e. Lugs or ears to secure covers or plaster rings.
 - f. As required, covers or plaster rings.
 - g. Small exposed boxes – galvanized cast type with hubs.
 - h. Large exposed and exterior boxes – NEMA 4X type.
 2. Ceiling boxes, minimum 4"x4"x2-1/8" deep, or 4" octagon x 2-1/8" deep, of one-piece construction, except where otherwise specified herein or when larger size is required by code.
 3. Provide masonry type boxes in block walls.
 4. Provide concrete type in poured slabs.
 5. Provide non-metallic boxes for underground installations.
- E. Box locations:
1. Provide electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance.
 - a. Electrical box locations shown on Contract Drawings are approximate unless dimensioned.
 - b. Verify the location of all boxes and outlets prior to rough in.
 - c. Locate the boxes to allow access.
 - d. Locate and install boxes such that headroom is maintained and a neat appearance is presented.

2.7 WIRING DEVICES

A. Applicable Standards:

1. FS W-C-596: Electrical Power Connector, Plug, Receptacle, and Cable Outlet.
2. FS W-S-896: Switch, Toggle.
3. NEMA WD 1: General Purpose Wiring Devices.
4. NEMA WD 2: Semiconductor Dimmers for Incandescent Lamps.
5. NEMA WD 5: Specific Purpose Wiring Devices.
6. UL 943: Standard for Ground Fault Circuit Interrupters.

B. Acceptable Manufacturers:

1. Hubbell.
2. Pass and Seymour.
3. General Electric.
4. TayMac.
5. Lutron.
6. Leviton.

C. Wall Switches:

1. Provide wall switches for lighting circuits and motor loads under 1/2 HP conforming to NEMA WD; FS W-S-896; AC-general use snap switch with toggle handle, rated 20 amperes and 120-277VAC.
2. Provide switch with gray handle.
3. For exterior applications, provide cast box and weatherproof actuating lever toggle switch cover.

D. Receptacles:

1. Provide convenience and straight-blade receptacle conforming to NEMA WD 1, locking blade receptacles conforming to NEMA WD 5, and convenience receptacle configuration conforming to NEMA WD 1; Type5-2-, gray plastic face.
2. Provide specific-use receptacle configuration conforming to NEMA WD 1 type as indicated on the drawings, and with a brown plastic face.
3. Provide GFCI duplex convenience receptacles with integral ground fault current interrupter and gray plastic face.

E. Wall Plates:

1. Provide type 304 stainless steel oversized (jumbo) interior wall plates.
2. Provide continuous-use rated exterior device cover. Provide cover constructed entirely of UV stabilized high impact poly carbonate material with gasket, stainless steel mounting screws and UL listed for wet location continuous-use. Provide cover equal to TayMac Specification Grade series.

3. Design plates to fit the device or devices on which they are used.

2.8 PANELBOARDS

A. Applicable Standards:

1. FS W-C-375: Circuit Breakers, Molded Case, Branch Circuit and Service.
2. FS W-F-870: Fuse Holders (for Plug and Enclosed Fuses).
3. FS W-F-115: Power Distribution Panel.
4. FS W-S-865: Enclosed Knife Switch.
5. NEMA AB 1: Molded Case Circuit Breakers.
6. NEMA PB 1: Panelboards.
7. NEMA PB 1.1: Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
8. NEMA PB 1.2: Application Guide for Ground-fault Protective Devices for Equipment.
9. UL 67: Panelboards.

B. Acceptable Manufacturers:

1. General Electric.
2. Square D.
3. Cutler-Hammer.
4. Siemens Energy & Automation.

C. Power Distribution panelboards:

1. Panelboards: NEMA PB 1; circuit breaker type.
2. Enclosure: NEMA PB 1, Type 12, unless shown otherwise on the Drawings.
3. Panelboard mounting as shown on the Drawings.
4. Provide cabinet front with concealed trim clamps, and hinged door with flush lock. Finish in manufacturer's standard gray enamel.
5. Provide panelboards with tin plated, copper bus, ratings as scheduled.
6. Provide copper ground bus in all panelboards. Minimum integrated short circuit rating: As shown in a panel schedules.
7. Molded case circuit breakers: NEMA AB 1; provide bolt-in-type circuit breakers with integral thermal and instantaneous magnetic trip in each pole.
8. Provide circuit breakers UL listed as type HACR for air conditioning equipment branch circuits.
9. Molded case circuit breakers with current limiters: AB 1; provide circuit breakers with replaceable current limiting elements, in addition to integral thermal and instantaneous magnetic trip in each pole.
10. Provide panelboards with typed directory as shown on panel schedules.

11. Provide panelboards keyed alike.

D. Branch circuit panelboards:

1. Lighting and appliance branch circuit panelboards: NEMA PB 1; circuit breaker type.
2. Enclosure: NEMA PB 1, Type 12, unless shown otherwise on the Drawings.
3. Cabinet size: 5-3/4" deep; 20" wide.
4. Panelboard mounting as shown on the Drawings.
5. Provide cabinet front with concealed trim clamps, concealed hinge and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.
6. Provide panelboards with tin plated, copper bus, ratings as schedule on Drawings.
7. Provide copper ground bus in all panelboards.
8. Minimum integrated short circuit rating: As show in panel schedules.
9. Molded cast circuit breakers: NEMA AB 1; bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles.
 - a. Provide circuit breakers UL listed as Type SWD for lighting circuits.
10. Provide UL Class A ground fault interrupter circuit breakers where scheduled on Drawings.
11. Provide panelboards with typed directories as shown on panel schedules.
12. Provide panelboards keyed alike.

2.9 MINI-POWER ZONE UNIT SUBSTATION

A. Applicable Standards:

1. FS W-C-375: Circuit Breakers, Molded Case, Branch Circuit and Service.
2. FS W-F-115: Power Distribution Panel.
3. NEMA AB 1: Molded Case Circuit Breakers.
4. NEMA PB 1: Panelboards.
5. NEMA PB 1.1: Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
6. UL 67: Panelboards.
7. NEMA ST20: Dry Type Transformers for General Applications.
8. UL 1561: Standard for Safety for Dry-Type General Purpose and Power Transformers.
9. UL 506: Specialty Transformers.
10. NEMA TP1: Guide for Determining Energy Efficiency for Distribution Transformers.
11. NEMA TP2: Standard Test Method for Measuring the Energy Consumption of Distribution Transformers.
12. ANSI C89: Specialty Transformers.
13. Department of Energy (DOE) 10 CFR 431 r1

B. Acceptable Manufacturers:

1. General Electric.
2. Square D.
3. Cutler-Hammer.

C. Mini-Power Zone Unit Substation

1. The Contractor shall furnish and install single-phase and/or three-phase general purpose individually mounted mini-power zones of the two-winding type, self-cooled, as specified herein and as shown on the contract drawings.
2. kVA and voltage ratings shall be as shown on the drawings.
3. Units shall be designed for continuous operation at rated kVA, for 24 hours a day, 365 days a year operation, with normal life expectancy as defined in ANSI C57.96.
4. Transformer sound levels shall not exceed the following ANSI and NEMA levels for self-cooled ratings: Up to 9 kVA – 40 db and 10 to 30 kVA – 45 db.
5. Each unit shall include a primary main breaker, an encapsulated dry-type transformer and a panelboard with secondary main breaker.
6. Primary main, secondary main and feeder breakers shall be enclosed with a pad lockable hinged door.
7. Each unit shall be suitable for service entrance application and labeled as such.
8. Secondary bus shall be copper.
9. All interconnecting wiring between the primary breaker and transformer, secondary main breaker and transformer and distribution section shall be factory installed.
10. Each mini-power center shall include a primary main breaker with an interrupting rating 65 kA at 277/480 volts; and a secondary main breaker with an interrupting rating of 10 kA at 120/240 volts, and a panelboard.

D. Transformer

1. Transformer shall be insulated with a 180 degrees C insulation system and rated at 115 degrees C temperature rise.
2. Required performance shall be obtained without exceeding the above-indicated temperature rise in a 40 degrees C maximum ambient, with a 30 degrees C average over 24 hours.
3. All insulation materials shall be flame-retardant and shall not support combustion as defined in ASTM Standard Test Method D635.
4. Transformer core shall be constructed with high-grade, non-aging, silicon steel with high magnetic permeability, and low hysteresis and eddy current losses. Maximum magnetic flux densities shall be substantially below the saturation point. The transformer core volume shall allow efficient transformer operation at 10% above the nominal tap voltage. The core laminations shall be tightly clamped and compressed. Coils shall be wound of electrical grade copper with continuous wound construction.

5. The core and coil assembly shall be completely encapsulated in a proportioned mixture of resin and aggregate to provide a moisture proof, shock-resistant seal. The core and coil encapsulation system shall minimize the sound level.
6. The core of the transformer shall be grounded to the enclosure.
7. Provide two (2) 5% FCBN taps.
8. All transformers shall be equipped with a wiring compartment suitable for conduit entry and large enough to allow convenient wiring.

2.10 MISCELLANEOUS MATERIALS

- A. Provide support framing, channel and associated accessories of 316 stainless steel conforming to the Drawings and to Section 05990 and 06800 of these specifications, except in areas containing chemicals, whereby fiberglass reinforced plastic only shall be utilized.
- B. Provide and install equipment racks for panels as shown on the drawings and as described in the specifications, with the following as a minimum:
 1. Provide cross members consisting of two (2) horizontal pieces of pre-drilled 1-1/2" x 1-1/2" mounting channel, manufactured by Kindorff.
 2. Attach all struts with spring-loaded nuts and associated hardware provided by manufacturer of strut, and specifically designed for this purpose.
 3. Use 316 stainless steel stud nuts, manufactured by Kindorff.
 4. Support the mounting channel "cross bars" vertically by C-channels, 3" x 2" x 8'.
 5. Mount channels a maximum of 24" apart, center-to-center, quantity as required to accommodate equipment.
 6. Installation is inside an existing building, sized as shown on plans with a minimum of 36" clear walking space in front of control panels and 12" on sides of rear of panel.
 7. Provide 3/4" chamfer on all concrete edges.
- C. Provide 316 stainless steel (bolts, nuts, washers, U-bolts, anchors, threaded rods, etc.) attachment hardware.

2.11 LABELING

- A. Mark all 480-volt equipment with red laminated plastic nameplates having one-half inch (1/2") engraved lettering, reading "DANGER 480-VOLTS". Attach plate to equipment with stainless steel crews.
- B. Mark conductors within panelboards with self-sticking label bearing the number corresponding to the circuit number on the drawings. Connect these conductors to corresponding breaker in panel. Mark circuit numbers in outlet boxes only where color-coding is repeated by having two or more conductors of the same color.
- C. Mark equipment, switchboards, panelboards, cabinets, transformers, control devices, starters, switches, etc.
- D. Labels shall be created by means of black phenolic material having engraved Micarta letters with white core having 1/4" engraved lettering.
- E. Provide designations as indicated on the drawings to include:

1. Name of the equipment or equipment that is being served,
 2. Power source and circuit of origin along with room location
 3. Voltage and number of phases.
- F. Attach plates to equipment with stainless steel screws.
- G. Mark all junction boxes with the voltages contained internal to it. If multiple power sources are internal to the junction boxes, it shall be labelled "Contains Multiple Power Sources"
- H. Panelboards shall contain typed and laminated panel schedules indicating circuit numbers and loads

2.12 RTU

- A. The RTU shall transmit all data and alarms via the Owner's existing radio network.
- B. RTU shall accept the following inputs as a minimum:
1. Pump 1 Running
 2. Pump 1 Failure
 3. Pump 1 Seal Failure (Moisture)
 4. Pump 1 Motor High Temperature
 5. Pump 2 Running
 6. Pump 2 Failure
 7. Pump 2 Seal Failure (Moisture)
 8. Pump 2 Motor High Temperature
 9. Pump 1 VFD Failure
 10. Pump 1 VFD Speed Feedback
 11. Pump 2 VFD Failure
 12. Pump 2 VFD Speed Feedback
 13. Pump 1 Check Valve Status
 14. Pump 2 Check Valve Status
 15. Wet Well Level 1 (Primary)
 16. Wet Well Level 2 (Secondary)
 17. Emergency Bypass Circuit Status
 18. Float Backup Mode Active (Discrete)
 19. Wet Well High-High-High (SSO)
 20. Wet Well High-High
 21. Wet Well High
 22. Wet Well Low
 23. Wet Well Low-Low

24. 480V Power Supply Avail (On)
 25. Pump Station Intrusion Alarm
 26. Grinder Run Status
 27. Grinder Failure Alarm
 28. Pump Station Flow
 29. Force Main Header Pressure
 30. 480V Power Supply "ON"
 31. Diesel Generator Running
 32. Diesel Generator Fuel Level
 33. Spare
 34. Spare
 35. Spare
 36. Spare
- C. All analog inputs shall be routed through a Kamikaze SPD.
- D. The RTU shall be capable of reporting alarms and all supervisory information to the Owner's existing SCADA system.
- E. The SCADA system shall be configured to display all RTU alarms and supervisory data.
- F. The SCADA system shall be configured to produce and deliver weekly reports which summarize alarms and responses, pump runtimes and flow.
- G. RTU shall receive input from the PLC located within the pump station control panel.
- H. The SCADA system integrator is MR Systems, Inc. located in Norcross, GA. Contact Sothorn Khel at (678) 325-2824.
- I. MR Systems will provide the following hardware and services to integrate the Pump Station to the existing NCSD SCADA System:
1. RTU – Radio-based Remote Telemetry Unit
 - a. Power Backup: Battery Backup Charger/Power Supply with Relay Socket
 - b. Communications: Reuse Existing GE/MDS SD-4 Remote Radio, UHF, Serial
 - c. Bulkhead Mounted RF Surge Protector
 - d. 3-point Door Latch and Padlocking Handle
 - e. Ethernet Switch, Unmanaged, 5-port, 100 MB
 - f. AC Power Surge Protector
 - g. Communicates To: Ingleside Pump Station
 2. Antenna Hardware and Cabling
 - a. Yagi Antenna, 1/2" Coaxial Cable, 1/2" Connectors, etc.

- b. 9 db Yagi Antenna with Pigtail, Astron 460-6
 - c. 100 ft. – Andrew 1/2” Heliac Cable, LDF-4
 - d. 2 - Andrew 1/2” Grounding Kits
 - e. 4 - Andrew Type N 1/2" Connectors
 - f. 1 – 1/2” Weatherproofing Kit
 - g. One Lot – Miscellaneous Mounting Hardware
3. RF Surge Protector Enclosure – Phoenix Contact CoaxTrab RF Surge Protector mounted in polycarbonate enclosure.
 4. Onsite Radio Path Testing – MR Systems will use 55 ft. Manlift with 30 ft. extension, yagi-directional Antenna, and GE/MDS SD-4 UHF 5-watt radio with diagnostics, to test the radio path from PS in 10 ft. increments from ground level to maximum achievable height. Information will be provided for the General Contractor to provide and install the appropriate wooden pole height based on survey results. MR Systems will coordinate installation with the Contractor so that antenna hardware and cabling can be mounted at the time of pole installation.
 5. Programming and Verification of Pump Station – MR Systems will provide HIM programming and IO checkout of the vendor supplied PLC-Based Pump Control Panel. Programming will also be provided at the Ingleside Polling Master to account for polling of IO to be monitored and controlled for the Pump Station PLC.
 6. The supply and physical installation of conduit or wire unless specifically noted above will be the responsibility of the electrical contractor.
 7. The physical installation of control panels, antennas, masts, wooden poles, or other equipment will be the responsibility of the electrical contractor.
 8. Wiring terminations will be the responsibility of the electrical contractor.
 9. The supply, physical installation, termination and testing for Fiber Optic Cable will be the responsibility of the electrical contractor.
 10. The supply and physical installation of coaxial cable and ancillary components as specifically noted above will be the responsibility of MR Systems.
 11. The supply and physical installation of Communication Towers or Poles will be the responsibility of the electrical contractor.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Coordination:

1. Coordinate as necessary with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
 2. Coordinate the installation of electrical items with the schedule for work of other trades to prevent unnecessary delays in the total Work.
 3. Where lighting fixtures and other electrical items are shown in conflict with locations of structural members and mechanical or other equipment, provide required supports and wiring to clear the encroachment.
- B. Data indicated on the Drawings and in these Specifications, are as exact as could be secured, but their absolute accuracy is not warranted. The exact locations, distances, levels, and other conditions will be governed by actual construction and the Drawings and Specifications should be used only for guidance in such regard.
- C. Where outlets are not specifically located on the Drawings, locate as determined in the field by the Engineer. Where outlets are installed without such specific direction, relocate as directed by the Engineer and at no additional cost to the Owner.
- D. Verify all measurements at the building. No extra compensation will be allowed because of differences between work shown on the Drawings and actual measurements at the site of construction.
- E. Branch circuit wiring and arrangement of home runs have been designed for maximum economy consistent with adequate sizing for voltage drops and other considerations. Install the wiring with circuits arranged exactly as shown on the Drawings, except as otherwise approved in advance by the Engineer.

3.3 CONDUCTORS

- A. Install no conductor smaller than #12 AWG unless otherwise indicated.
- B. Provide copper conductors.
- C. Provide conductors as shown on the plans or as specified here in.
- D. Provide continuous wiring from outlet to outlet, identified by color and marked with size, grade and manufacturer.
- E. Provide continuous wiring without joints, through pull boxes.
- F. Provide minimum of #10 AWG conductors on branch circuits, which exceed 100' at 120 volts and 200' at 277 volts from panel to load center.
- G. Terminate #14 AWG stranded conductors where indicated for control, using insulated compression-type spade lugs.
- H. Terminate #12 AWG stranded conductors using insulated compression-type spade lugs.
- I. Install an equal number of conductors for each phase for a circuit in the same raceway or cable.
- J. The conductor lengths for parallel circuits must be made equal.
- K. Neatly train and lace all wiring inside boxes, equipment, and panelboards.
- L. Connect circuits sharing a common neutral to different phases regardless of the numbering.

- M. Provide phase, neutral, and ground conductors as required to accommodate meter installed. Any additional conductors required for meter to function properly shall be installed at the Contractor's expense.

3.4 COLOR CODE AND MARKERS

- A. Provide color-coding for #12 and #10 conductors as follows:

	277/480-Volt	120/208(240)-Volt
Phase "A"	Brown	Black
Phase "B"	Orange	Red
Phase "C"	Yellow	Blue
Neutral	White with Tracer	White
Ground	Green	Green

- B. Mark all conductors #8 and larger and all feeders with plastic tape to match the above color-coding.

3.5 SPLICES, CONNECTIONS, AND TERMINATIONS IN 600V. CONDUCTORS

- A. Provide final connections and/or terminations for all wiring indicated on the electrical drawings and in this division of the specifications. Equipment supplied under other divisions of the specifications that require electrical connections under this division shall be provided with Engineer approved wiring and termination diagrams.
- B. Splice only in accessible junction boxes.
- C. Thoroughly clean wires before installing lugs and connectors.
- D. Terminate spare conductors with electrical tape.

3.6 RACEWAYS AND FITTINGS

- A. Apply cold galvanizing compound to all field-cut threads prior to installation.
- B. In general, follow the raceway installation layout shown on the plans, however, this layout is diagrammatic only, and where changes are necessary due to structural conditions, other apparatus or other causes, make such changes without any additional cost to the Owner.
- C. Cut all conduits square using a saw or pipe cutter and de-burr cut ends.
- D. Install the conduit to the shoulder of fittings and couplings and fastened securely.
- E. Use conduit hubs, or sealing locknuts, for fastening conduit to cast boxes and for fastening conduit to sheet metal boxes in damp or wet locations.
- F. No more than the equivalent of three 90-degree bends may be installed between boxes.
- G. Use conduit bodies to make sharp changes in direction, as around beams.

- H. Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 2" size.
- I. Avoid Moisture traps where possible; where moisture traps are unavoidable, there must be a junction box with drain fitting provided at the conduit low point. Use suitable conduit caps to protect installed conduit against entrance of dirt, concrete, plaster, mortar, and moisture.
- J. Size all conduits for conductor type installed with $\frac{3}{4}$ " being the minimum size conduit allowed.
- K. Arrange conduit to maintain headroom and present a neat appearance.
- L. Route any exposed conduit and conduit above accessible ceilings parallel and perpendicular to walls and adjacent piping.
- M. Provide at all times a minimum of 6" clearance between conduit and piping and a 12" clearance between conduit and heat sources such as flues, steam pipes, and heating appliances.
- N. Arrange all conduit supports to prevent distortion of alignment by conductor pulling operations.
- O. Fasten conduits above finished ceilings using straps, lay-in adjustable hangers, clevis hangers or bolted split stamped hangers.
 - 1. Do not fasten conduit with wire or perforated pipe straps. All wire that was used for temporary conduit support during construction must be removed before conductors are pulled.
 - 2. All conduits must be supported at a maximum distance of 5' on centers.
- P. Group conduits in parallel runs where practical using a conduit rack.
- Q. Make all underground conduit joints watertight by applying manufacturer's recommended thread compound. Thread compound must be conductive and be compatible with conduit and conductor-jacket material.
- R. Provide suitable pull string or #12 AWG insulated conductor in empty conduit, except sleeves and nipples.
- S. Maintain minimum 12" clearance between all conduits containing signal circuits and conduits containing power circuits.
- T. Install expansion-deflection joints where conduit crosses building expansion or seismic joints.
- U. Where conduit penetrates fire-rated walls and floors, the opening around the conduit must be sealed with UL listed foamed silicon elastomer compound.
- V. Install exposed raceways either parallel or perpendicular to building walls.
- W. Install raceways exposed on walls or free standing perpendicular to the floor.
- X. Install exposed raceways on channel so as to provide a minimum spacing of $\frac{1}{2}$ " between raceway and the surface to which it is mounted.
- Y. Bends:

1. Where emerging from walls, ceilings, floor or concrete slabs, all conduit bends shall be made entirely within the structure (i.e.: the conduit shall emerge perpendicular to the surface and the bend shall be covered).
 2. Make all 90-degree conduit turns with factor-bent, rigid galvanized steel, long radius elbows.
- Z. Install no metal conduit in contact with the earth or concrete slab unless protected with two coats of bitumastic coating.
- AA. Provide necessary sleeves and chases where conduits pass through floors and walls, and provide other necessary openings and spaces, arranging for in proper time to prevent unnecessary cutting in connection with the Work.
- BB. Perform cutting and patching in accordance with the provisions for the original Work.
- CC. Refer to Section 02221 for minimum cover of underground conduits.
- DD. Sealing Conduit:
1. Install watertight conduit hubs on all conduits terminating in the top or sides of NEMA 3R, 4, or 4X enclosures.
 2. Use a sealing locknut having an integral gasket on conduits terminating in the bottom of NEMA 3R, 4 or 4X enclosures.
 3. Seal all conduits terminating in NEMA 3R, 4 or 4X enclosures with duct seal.
 4. Seal watertight all conduits terminating in NEMA 6 or watertight rated enclosures.
 5. Install sealing compound and fiber, per manufacturer's recommendation, in hazardous location conduit sealing fittings. Tighten plugs per manufacturer's recommended torque.
 6. Rubber conduit seal offs at junction box between junction box and wet well.
- EE. Make motor lead connections and connections to other electrical equipment subject to vibration, or where indicated with flexible weatherproof type steel core conduit with wrapping and cover, factory assembled.
- FF. Conduit installations in hazardous locations as defined by Article 500 of the NEC must conform to the special requirements of Articles 501, 502, and 503 of the NEC.
- GG. Chapter 9 of the NEC shall apply unless larger raceways are specified.
- HH. Ensure all threads are fully installed into fittings, boxes, enclosures and equipment per NEC and UL listing requirements to provide mechanical integrity, grounding and sealing. Provide fittings and adapters to ensure full length of conduit or conduit fitting threads are installed per code and listing requirements.
- II. Liquid-tight flexible metal conduit shall be supported and securely fastened within 12 inches of each box, cabinet, conduit body or other conduit body termination and shall be supported and secured at intervals not to exceed 4-1/2 feet. Flexible metal conduit shall not exceed 6 feet in length except for luminaire connections as allowed per the NEC.
- JJ. Provide plastic threaded type bushings for all conduits terminated in enclosures.

3.7 CONDUIT SUPPORTS

- A. Seal all ends non-metallic conduit support with manufacturer's recommended sealer.
- B. Provide UL listed vinyl end caps for all ends of strut-type metallic conduit supports.
- C. Provide all miscellaneous materials and supports as required by the NEC and these specifications to provide support for conduits, raceways, boxes, fittings and equipment.

3.8 GROUNDING AND BONDING

- A. Ground and bond the electrical system and motors in accordance with Article 250 of the NEC.
- B. Install electric bond around panels, cabinets, pull boxes, enclosures, etc., to incoming and outgoing sub-feed raceways by use of grounding type bushings.
- C. Install rod electrodes at locations installed. Install additional rod electrodes as required to achieve specified resistance to ground.
- D. Provide grounding electrode conductor(s) and connect as shown on drawings.
- E. Bond together metal siding not attached to grounded structure; bond to ground.
- F. Provide separate, insulated, green equipment grounding conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or busing.
- G. Provide grounding type bushings for conduits 1" or larger and bond to ground bar or lug of enclosure.
- H. Bond neutral and ground at service entrance only.
- I. Provide exothermic-type weld grounding connections that are buried or otherwise normally inaccessible, and excepting specifically those connections for which access is required for periodic testing.
- J. Make each grounding connection strictly in accordance with the manufacturer's written instructions. Failure to follow manufacturer's written instructions shall result in immediate rejections.
- K. Welds which have "puffed up" or which show convex surfaces, indicating improper cleaning, are not acceptable. Provide grounding connection devices compatible with the conductor(s) and/or rods being joined.
- L. Maximum acceptable resistance to earth ground is 25 Ohms. Provide testing of the service entrance system ground and verify the resistance to earth ground is within the specified requirements. If the existing service entrance ground does not meet the specified requirements, install additional rod electrodes as required to achieve specified resistance to ground.

3.9 SURGE SUPPRESSION DEVICE (SPD)

- A. Field Installed:
 - 1. Connect SPD ground to service entrance grounding electrode conductor or to equipment grounding conductor if SPD located downstream of service entrance equipment. Confirm SPD installed per manufacturer's recommendation.
 - 2. Install SPD on the load side of the automatic transfer switch.

3. Install SPD in accordance with manufacturer instructions.
4. Maximum lead length 12”.
5. Provide an externally mounted SPD on ATS.

3.10 OUTLET BOXES

- A. Do not install boxes back-to-back in walls. Install the boxes at a minimum of 6” apart except in acoustic-rated walls with a minimum separation of 12”.
- B. Locate boxes in masonry walls such that only the cutting of the masonry unit corner is required. Coordinate masonry cutting such that neat openings for the boxes can be achieved.
- C. Provide knockout closures for unused openings.
- D. Support boxes independently of the conduits.
- E. Use multiple gang boxes where more than one device is mounted together; do not use sectional boxes. Provide barriers to separate wiring of different voltage systems.
- F. Install boxes in the walls without damaging wall insulation.
- G. Install outlets to locate luminaires as shown on plans. In inaccessible ceiling areas, position outlets and junction boxes within 6” of recessed luminaires, to be accessible through luminaire ceiling opening.
- H. Provide recessed outlet boxes in finished areas; secure boxes to interior wall and partition studs, accurately positioning to allow for surface finish thickness.
- I. Use stamped steel stud bridges for flush outlets in hollow stud wall, and adjustable steel channel fasteners for flush ceiling outlet boxes.
- J. Align wall mounted outlet boxes for switches, thermostats, and similar devices.
- K. Provide cast outlet boxes in locations (exposed to the weather) and indoor wet locations.
- L. Size all boxes in strict accordance with Article No. 370 of the NEC, except that no box will be less in than the minimum specified.
- M. Check the location of all outlets to see that the outlets will clear any new or existing wall fixture, shelving, work tables, sinks, bulletin boards, etc. and the outlet will fit the area intended.
- N. Set floor boxes level and flush with finish flooring material. Use cast iron floor boxes for installations in slab on grade.
- O. Locate pull and junction boxes above accessible ceilings or in unfinished areas. Support pull and junction boxes independently of conduit.
- P. Install underground boxes as shown on drawings with top of box approximately 2” above finished grade. Install bottom of box over 12” of gravel to allow for adequate drainage.

3.11 CONVENIENCE OUTLETS AND SWITCHES

- A. Install wall switches at 48” above the floor level and 6” from edge of door jam on strike side, unless otherwise noted on Drawings.
- B. Install wall switches with the OFF position down.

- C. Install convenience receptacles at 18" above the floor level or 6" above counter or backsplash.
- D. Install convenience receptacles with the grounding pole on top.
- E. Install all specific-use receptacles at heights shown on Contract Drawings.
- F. Install decorative plates on switch, receptacle, and blank outlets in finished areas using jumbo size plates for outlets installed in masonry walls.
- G. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface-mounted outlets.
- H. Install devices and wall plates flush and level.

3.12 POWER EQUIPMENT

- A. Provide power and control wiring for motor starters and safety switches as shown on the Drawings.
- B. Connections to miscellaneous building equipment:
 - 1. Wire to, and connect to, all items of building equipment not specifically described but to which electrical power is required.
 - 2. Coordinate as necessary with other trades and suppliers to verify types, numbers, and locations of equipment.

3.13 MOUNTING OF CONTROL PANELS AND ELECTRICAL EQUIPMENT

- A. Install all equipment per the manufacturer's recommendations and the contract drawings.
- B. Install surface-mounted panelboards plumb, in conformance with NEMA PB 1.1.
- C. Mount floor and wall mounted equipment utilizing Type 316 stainless steel anchors and fasteners of the size and number recommended by the manufacturer.
- D. Provide necessary hardware to secure the assembly in place.
- E. Provide 316 stainless steel fasteners for all other installation types.
- F. Inspect panelboards for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers, fusible switches, and fuses.
- G. Install and check all equipment in accordance with the manufacturer's recommendations.
- H. Ensure that equipment mounting pad locations are level to within 0.125 inches per three foot of distance in any direction. Notify Engineer immediately if any discrepancies are found in the field.
- I. Ensure that all equipment bus bars are torqued to the manufacturer's recommendations.
- J. Assemble all equipment shipping sections, remove all shipping braces and connect all shipping split mechanical and electrical connections.
- K. Provide filler plates for unused spaces in panelboards and switchboards.
- L. Provide typed circuit directory with protective plastic sleeve secured to inside of panel door for each branch circuit panelboard.

- M. Provide Micarta type labels located adjacent to each breaker operator, delineating equipment served for each circuit breaker in all switchboards.
- N. Measure steady state load currents at each panelboard feeder. Should the voltage difference measured at the equipment between any two phases exceed 20 percent, rearrange circuits to balance the phase loads within 20 percent. Take care to maintain proper phasing for multi-wire branch circuits.
- O. Measure and recording Megger readings phase-to-phase, phase-to-ground, and neutral-to-ground (four wire systems only).

3.14 UNIT RESPONSIBILITY

- A. Panelboards, relays, switches, starters, etc. furnished under this Section of the specifications shall be supplied by the same manufacturer so as to give unit responsibility and ease of maintenance.

3.15 TESTING AND INSPECTION

- A. Provide personnel and equipment, make required tests, and secure required approvals from the Engineer and governmental agencies having jurisdiction.
- B. Provide written notice to the Engineer adequately in advance of each of the following stages of construction:
 - 1. In the underground condition prior to placing concrete floor slab, when all associated electrical work is in place.
 - 2. When all rough-in is complete, but not covered.
 - 3. At completion of the work of this Section.
- C. When material and/or workmanship are found to not comply with the specified requirements, replace items within three days after receipt of notice at no additional cost to the Owner.
- D. Provide a qualified field serviceman, representing the manufacturer of each piece of major electrical equipment, to make proper and complete adjustments of all adjustable devices, load switches, etc. after final installation and completion of all field wiring. Verify and approve all connections prior to any initial or test operation of equipment. Submit confirmation in writing by the manufacturer's authorized representative of said services to the Engineer.

3.16 HAZARDOUS LOCATIONS

- A. Wiring and equipment in hazardous locations, as defined by the NEC, shall conform to the special requirements of the NEC, unless otherwise indicated or specified.

3.17 CLEANING AND PAINTING

- A. Collect and remove from the premises all debris, scraps and other waste material after completion of work.
- B. Tamp and level all trench work.
- C. Remove excess dirt and debris, when and as directed by the Engineer.

- D. Thoroughly clean all electrical equipment, lighting fixtures, exposed conduit, enclosures and boxes of all foreign materials and paint in accordance with Section 09900 of these Specifications unless noted or directed otherwise.
- E. Clean any exposed threaded area of raceway of cutting oil and paint with a cold galvanizing compound prior to final finish painting.

3.18 ELECTRIC EQUIPMENT BY OTHERS

- A. The equipment manufacturer shall furnish all motors for equipment.
- B. Verify voltage, dimensions, extent, type, etc. of this and all other such electrical equipment.
- C. Furnish and install all electrical supply and control equipment and material required to put all the items in proper operative condition.
- D. Refer to other sections of these specifications for verification of other equipment and devices requiring electrical connections, wiring and devices not included in this section.
- E. Refer to other drawings for details not indicated on the electrical drawings.
- F. Prior to connection any piece of such equipment, check the nameplate data against the information shown on the drawings and call to the immediate attention of the Engineer any discrepancies discovered.

3.19 PROJECT COMPLETION

- A. Test all 600-Volt service entrance and feeder wiring using an instrument, which applies a voltage of approximately 500 volts DC to provide a direct reading of resistance.
- B. Perform test on ground system utilizing Fall-Of-Potential method. Meg grounding systems to measure ground resistance, and provide not more than 25 ohms resistance, adding ground rods as necessary to achieve that level.
- C. Conduct all tests in presence of Engineer or his representative. Identify and properly record all readings. Submit readings to Engineer for acceptance.
- D. Measure voltages as directed by the Engineer and report to him these values.
- E. Provide entire system free from all shorts and grounds.
- F. Fully comply with local and national codes for equipment bonding and grounding.
- G. Test system in the presence of the Engineer and operate to his complete satisfaction in accordance with true intent of plans and specifications. Defray cost of all adjustments necessary to bring system up to standards set forth by Contract Documents at no additional cost.
- H. Thoroughly indoctrinate the Owner's operation and maintenance personnel in the contents of the operations and maintenance manual.
- I. On the first day the facility is in operation, for at least eight (8) hours at a time directed by the Engineer, provide a qualified foreman and crew to perform such electrical work as may be required by the Engineer.

3.20 MEASUREMENT AND PAYMENT

- A. No separate measurement or direct payment will be made for his work and all costs for same shall be included in the price bid for the work to which it pertains.

NORTH CHARLESTON SEWER DISTRICT BALL FIELD PUMP STATION WASTEWATER SYSTEM IMPROVEMENTS

HOBSON AVENUE,
NORTH CHARLESTON, SOUTH CAROLINA

DRAWING:

SINGLE LINE DIAGRAM

GENERATOR PLATFORM DETAILS

STAIR LANDING FOUNDATION

GENERAL ARRANGEMENT PLAN

GENERATOR PLATFORM ARRANGEMENT
PLAN, SECTIONS AND DETAILS

GENERATOR PLATFORM GUARDRAIL,
STAIR AND PANEL MOUNTING RACK
DETAILS

SHEET:

E-1

F-1

F-2

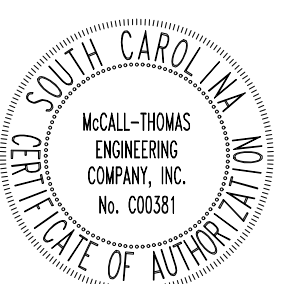
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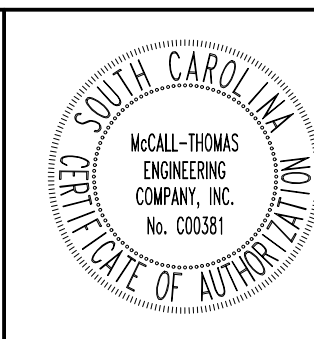
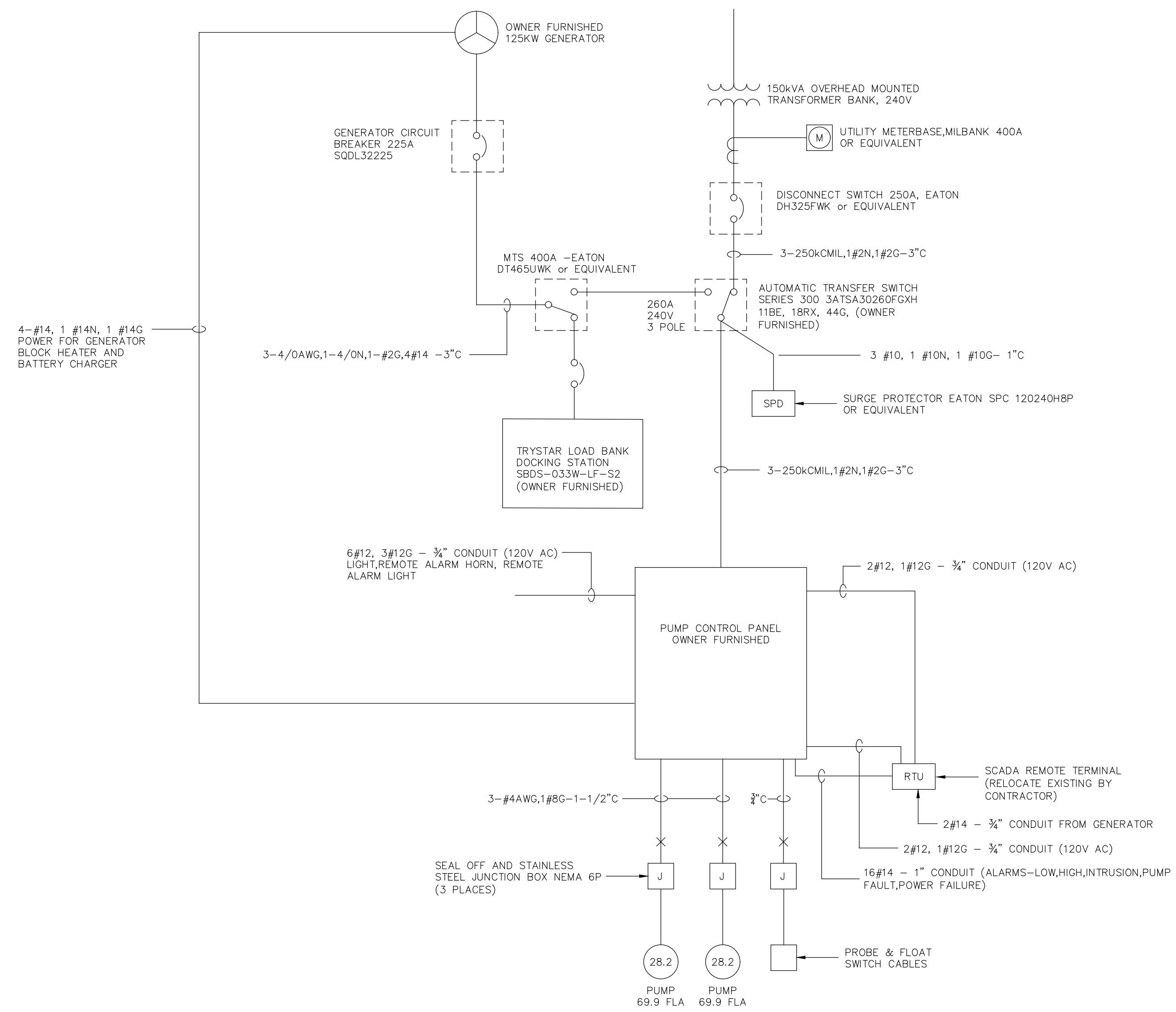
GA-2

GA-3



McCall-Thomas Engineering Co, Inc.
Consulting Electrical and Communications Engineers
Orangeburg, South Carolina

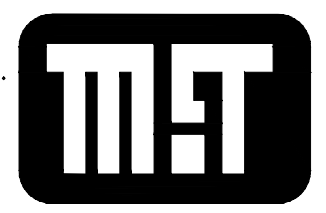




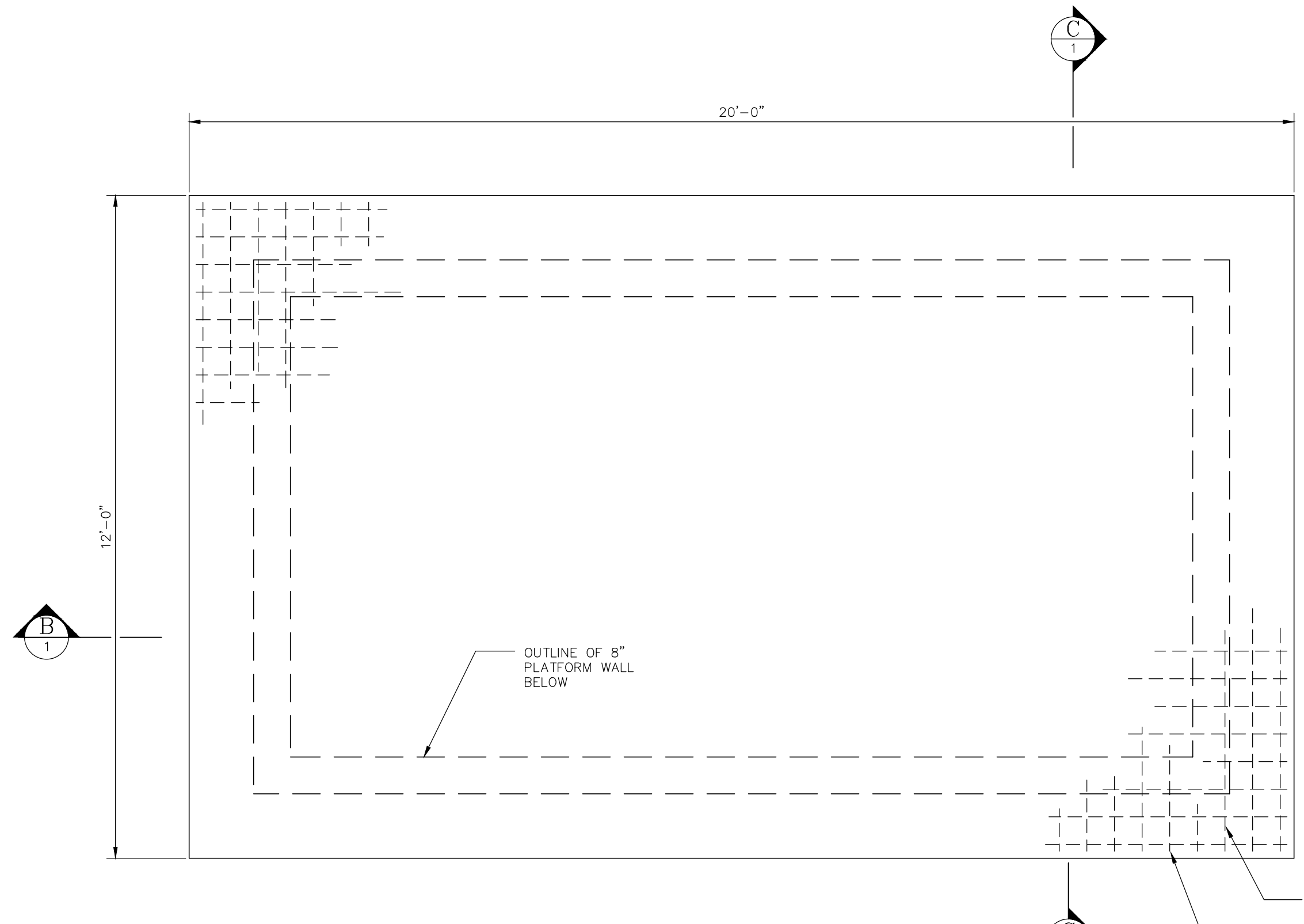
REFERENCE DRAWINGS		REV.	DATE	DESCRIPTION	BY
DWG. NO.	DRAWING TITLE	0	5-14-20	ISSUE FOR BIDS	SKS

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 845 Stonewall Jackson Blvd.
 Orangeburg, SC 29115
 803.534.1040
 www.McCallThomas.com

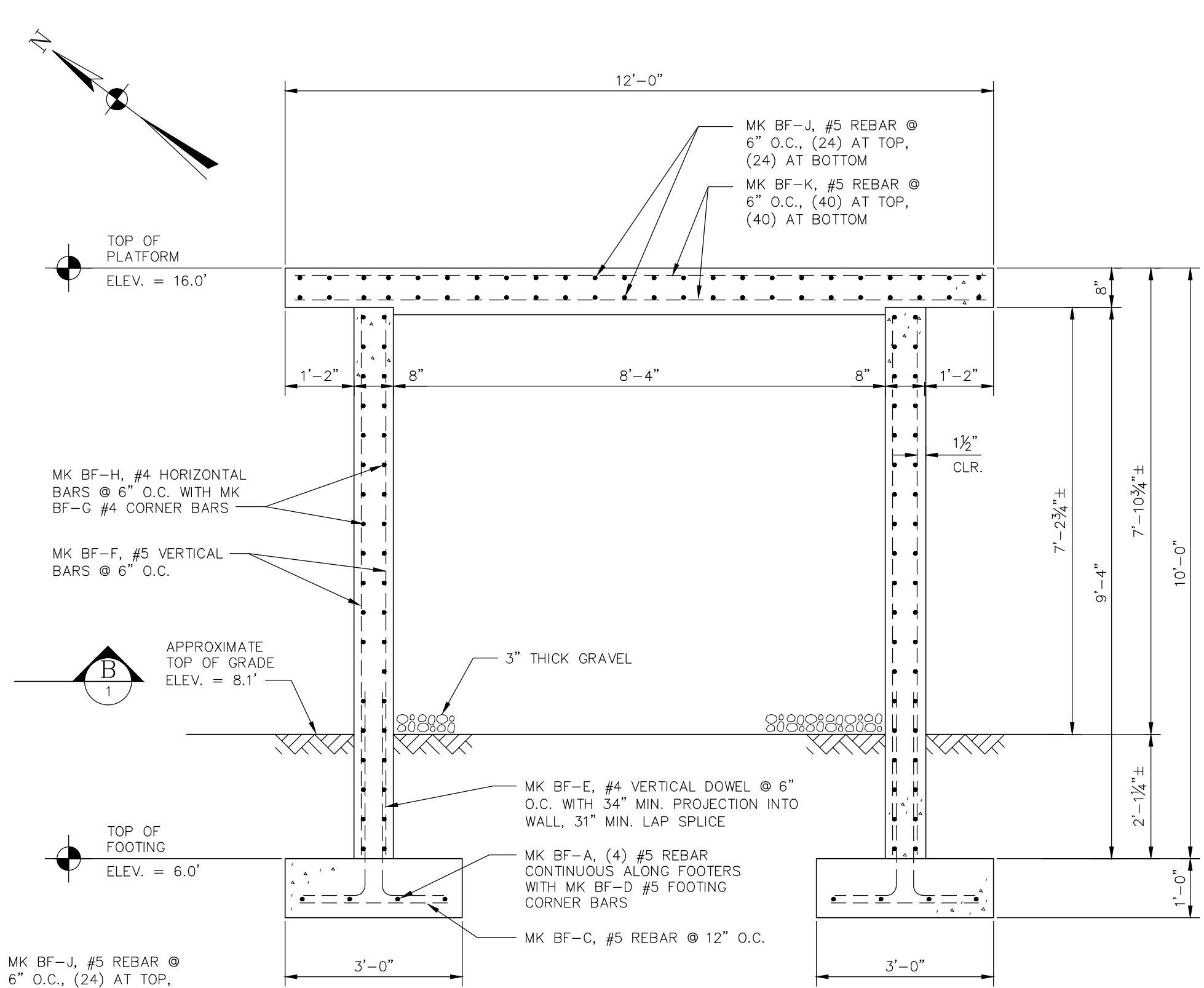
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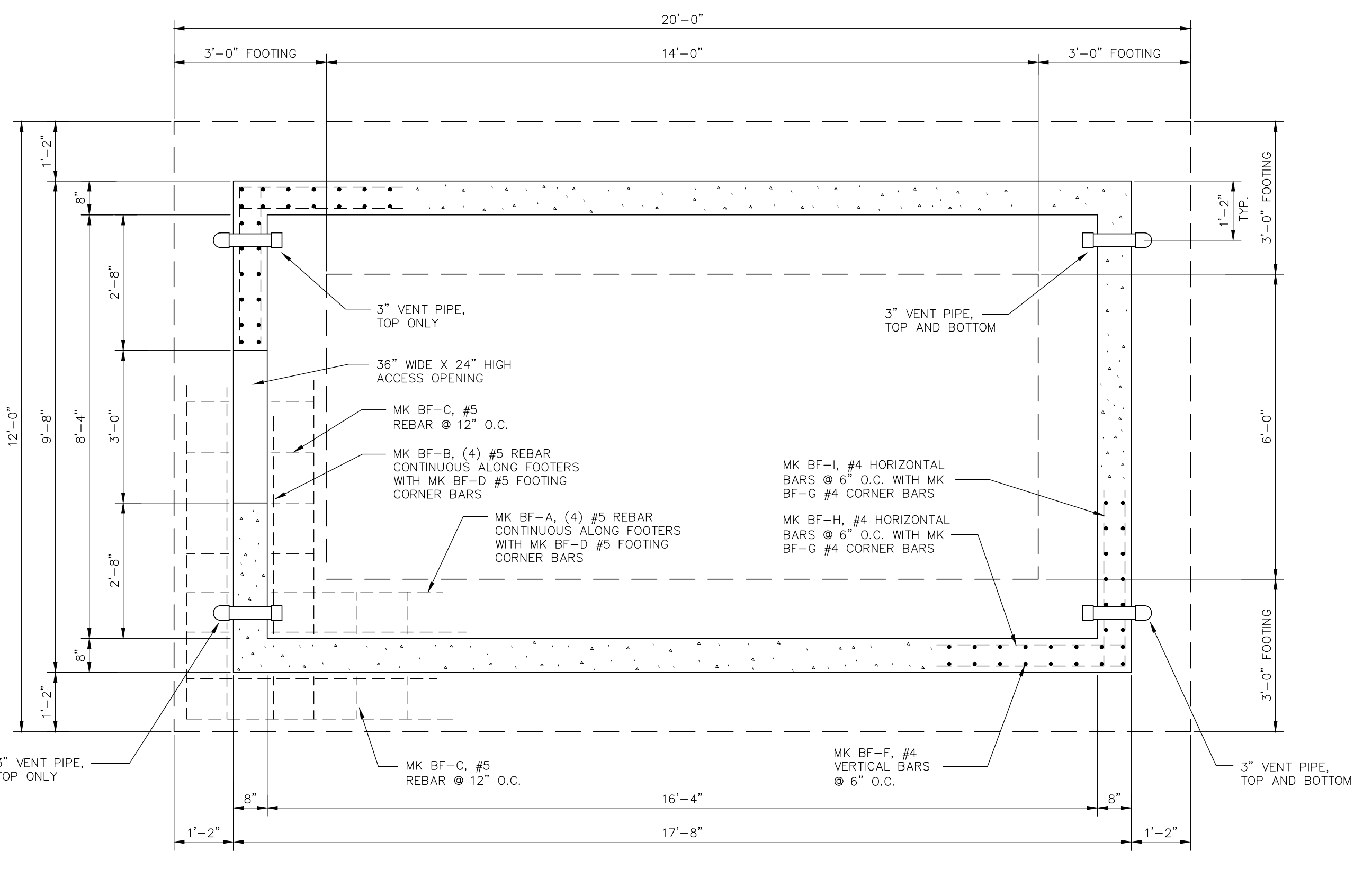
NORTH CHARLESTON SEWER DISTRICT
 NORTH CHARLESTON, SOUTH CAROLINA
BALL FIELD PUMP STATION
 WASTEWATER SYSTEM IMPROVEMENTS
 SINGLE LINE DIAGRAM



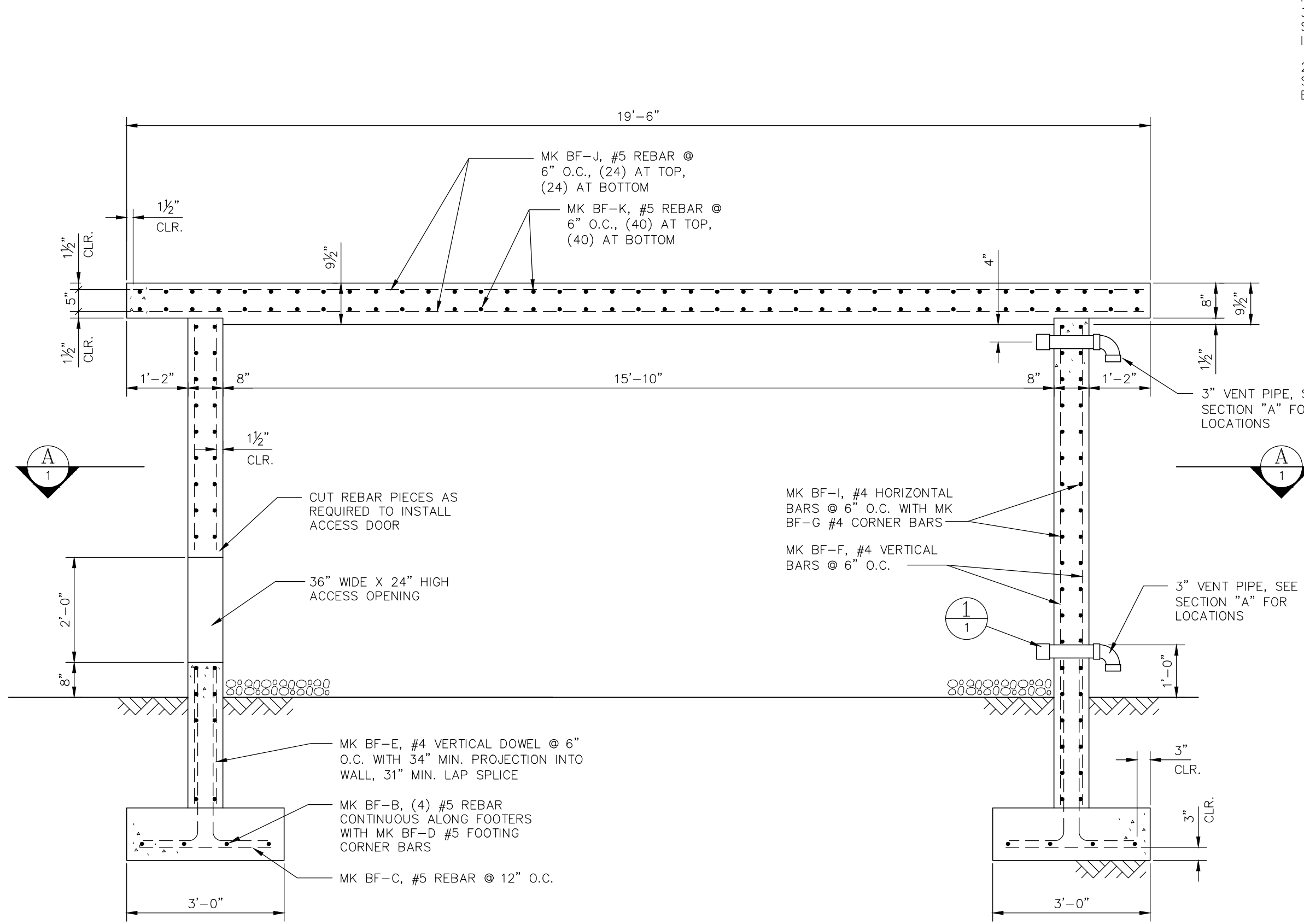
PLAN VIEW
SCALE: 1/2" = 1'-0"



SECTION
SCALE: 1/2" = 1'-0"

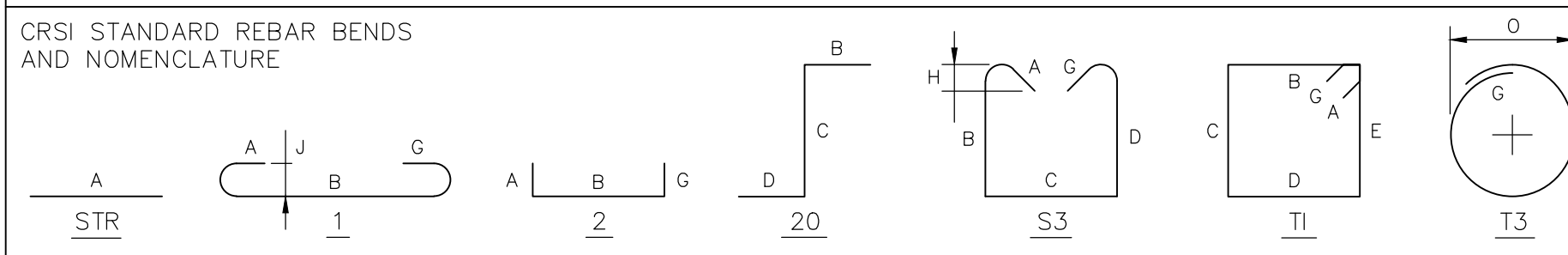


SECTION
SCALE: 1/2" = 1'-0"



SECTION
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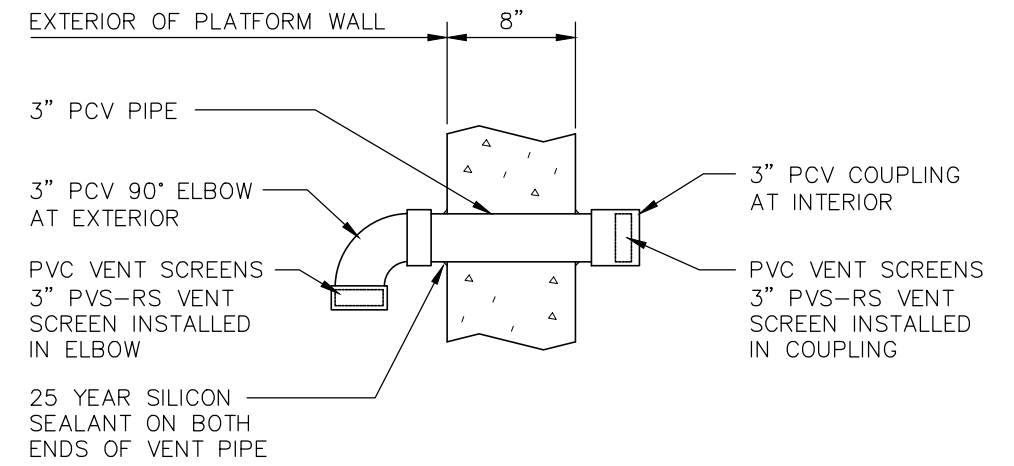
REBAR SCHEDULE
FOR ONE (1) GENERATOR PLATFORM



PIECE MARK	QTY. PER FDN.	BAR TYPE	BAR SIZE	DIMENSIONS																LENGTH PER PIECE	UNIT WEIGHT LB/FT	WEIGHT PER PIECE	TOTAL WEIGHT
				A	B	C	D	E	F	G	H	J	O										
BF-A	8	STR	#5	19'-6"														19'-6"	1.043	20.34	162.71		
BF-B	8	STR	#5	11'-6"														11'-6"	1.043	11.99	95.96		
BF-C	40	STR	#5	2'-6"														2'-6"	1.043	2.61	104.3		
BF-D	16	2	#5	2'-6"	2'-6"							0"						5'-0"	1.043	5.22	83.44		
BF-E	212	2	#4	1'-0"	3'-8"							0"						4'-8"	0.668	3.12	661.35		
BF-F	212	STR	#4	9'-2"														9'-2"	0.668	6.12	1298.19		
BF-G	152	2	#4	2'-6"	2'-6"							0"						5'-0"	0.668	3.34	507.68		
BF-H	76	STR	#4	17'-5"														17'-5"	0.668	11.63	884.23		
BF-I	76	STR	#4	9'-5"														9'-5"	0.668	6.29	478.08		
BF-J	48	STR	#5	19'-9"														19'-9"	1.043	20.6	988.76		
BF-K	80	STR	#5	11'-9"														11'-9"	1.043	12.26	980.42		

COLOR CODE: RED [Redacted] TOTAL REBAR WEIGHT (POUNDS) 6,245.12

- REBAR NOTES:
1. THE REBAR SUPPLIER SHALL DESIGN, FABRICATE, AND PROVIDE AN ADEQUATE NUMBER OF "STANDEES AND CHAIRS" FOR EACH FOUNDATION.
 2. ALL REBAR SHALL CONFORM TO THE LATEST REVISION OF ASTM A615, GRADE 60, FOR DEFORMED STEEL.
 3. ALL REBAR BENDS SHALL BE AS PER THE LATEST REVISION OF ACI 318.
 4. FOR TYPE 1, 2, 20, AND S3 BARS WITH A BEND AT EACH END, THE HOOKS SHALL LIE IN THE SAME PLANE OF BENDING AFTER FABRICATION (BENDING) OCCURS.
 5. ALL LIKE MARK NUMBERS SHALL BE BUNDLED IN SECURED LIFTS WITH A WEATHERPROOF TAG SPECIFYING THE MARK NUMBER, QUANTITY, AND PURCHASE ORDER NUMBER.
 6. ALL REBAR FOR LIKE FOUNDATION TYPES SHALL BE COLOR-CODED AS INDICATED IN THE BOX ABOVE.
 7. ALL DIMENSIONS ARE OUT-TO-OUT OF BAR EXCEPT "A" AND "G" ON STANDARD 180° AND 135° HOOKS.

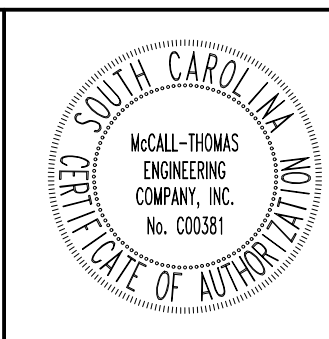


VENT PIPE DETAIL
SCALE: 1" = 1'-0"

SIX (6) REQUIRED
REFERENCE pvcventscreens.com
FOR VENT SCREEN INSTALLATION
INSTRUCTIONS AND INSTALLATION
KITS

- NOTES:
1. ALL CONCRETE SHALL BE 4000 PSI AT 28 DAYS.
 2. 24.91 CUBIC YARDS OF CONCRETE REQUIRED.
 3. ALL REBAR TO BE GRADE 60, SIZE AS NOTED.
 4. UNSUITABLE BEARING MATERIAL SHALL BE EXCAVATED UNTIL SUITABLE SOIL IS REACHED AND REPLACED WITH #67 R.O.C. GRANITE, COMPACTED IN LIFTS NOT EXCEEDING 3" IN THICKNESS.
 5. SOIL BACKFILL SHALL BE COMPACTED TO AT LEAST 95% OF STANDARD PROCTOR.
 6. FOOTING INTERFACE BETWEEN 8" WALL SHALL BE ROUGHENED WITH FULL AMPITUDE OF APPROXIMATELY 1/4".

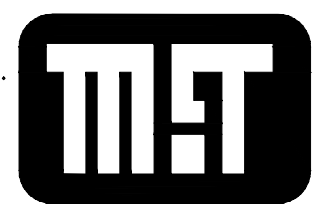
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0	5-14-20	ISSUE FOR BIDS	RMB/PS

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845 Stonewall Jackson Blvd.
Orangeburg, SC 29115
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DSGN BY: RMB CHKD BY: RMB DATE: 4-27-2020
DRN BY: PBS APPVD BY: SKS SCALE: AS NOTED

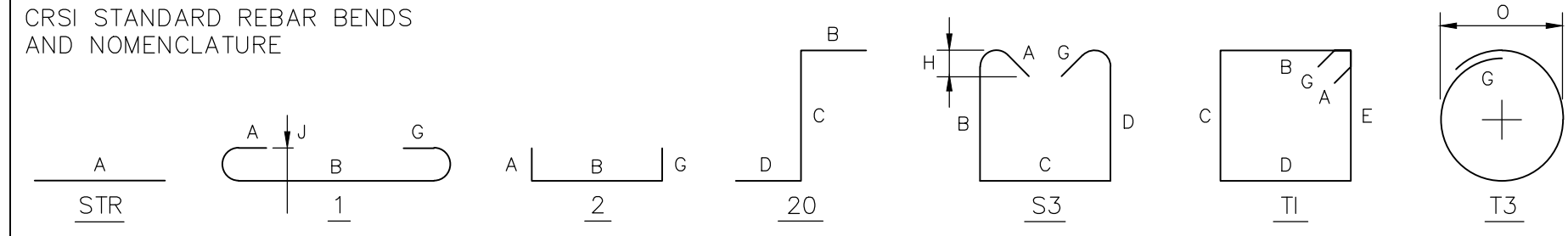


NORTH CHARLESTON SEWER DISTRICT
NORTH CHARLESTON, SOUTH CAROLINA
BALL FIELD PUMP STATION
GENERATOR PLATFORM
PLAN, SECTIONS AND DETAILS

F-1
SHT. 1 OF 1

REBAR SCHEDULE
FOR ONE (1) STAIR LANDING FOUNDATION

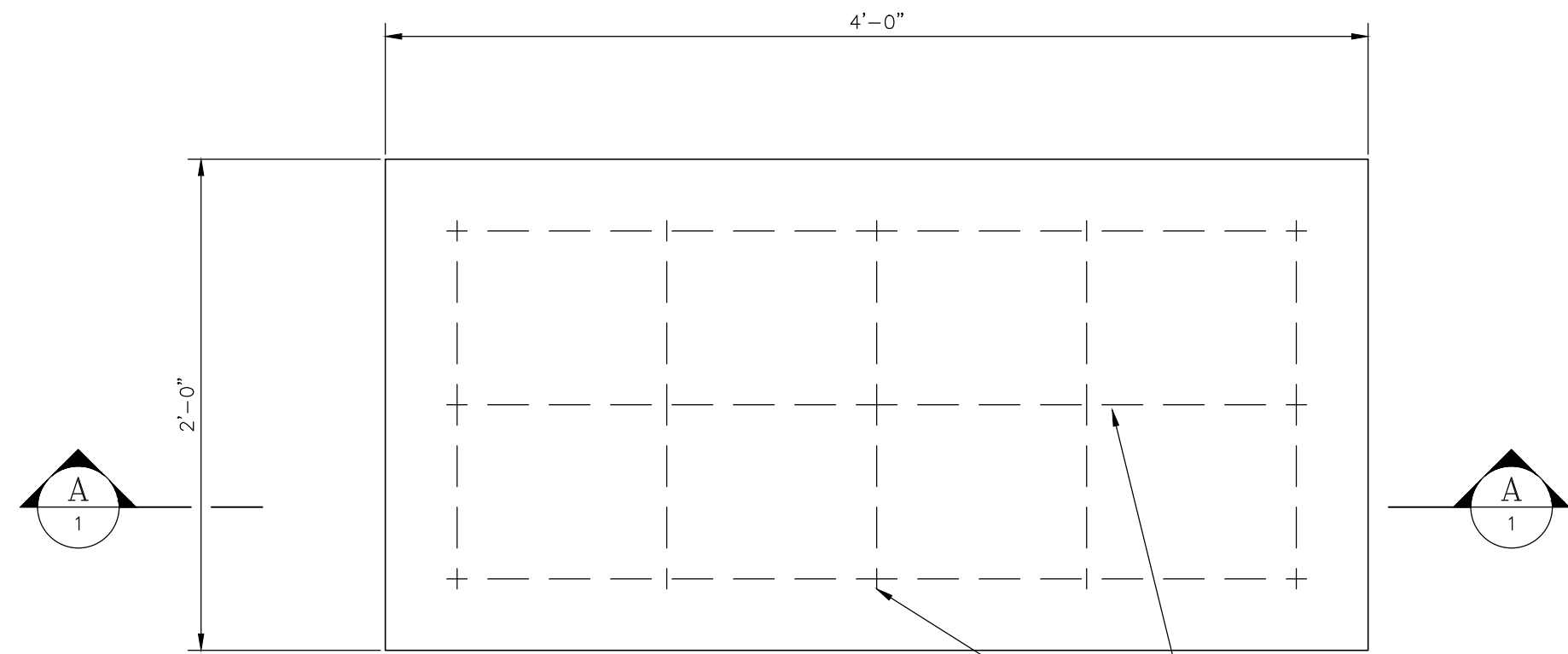
CRSI STANDARD REBAR BENDS AND NOMENCLATURE



PIECE MARK	QTY. PER FDN.	BAR TYPE	BAR SIZE	DIMENSIONS										LENGTH PER PIECE	UNIT WEIGHT LB/FT	WEIGHT PER PIECE	TOTAL WEIGHT		
				A	B	C	D	E	F	G	H	J	O						
SL-A	3	STR	#5	3'-6"												3'-6"	1.043	3.65	10.95
SL-B	5	STR	#5	1'-6"												1'-6"	1.043	1.56	7.82

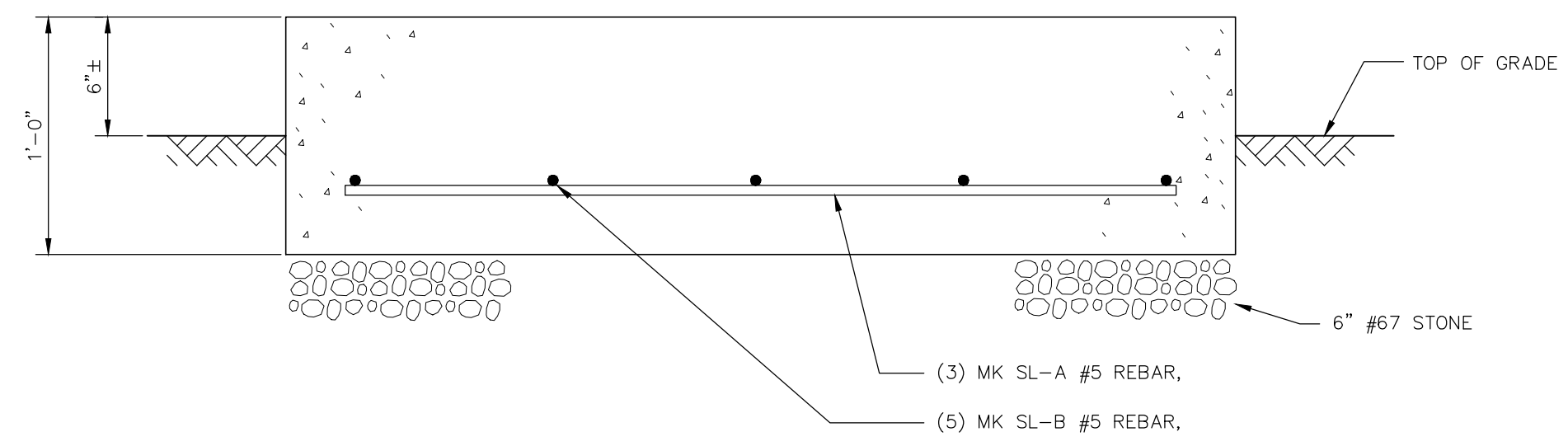
COLOR CODE: WHITE XXXXXXXXXX TOTAL REBAR WEIGHT (POUNDS) 18.77

- REBAR NOTES:**
1. THE REBAR SUPPLIER SHALL DESIGN, FABRICATE, AND PROVIDE AN ADEQUATE NUMBER OF "STANDEES AND CHAIRS" FOR EACH FOUNDATION.
 2. ALL REBAR SHALL CONFORM TO THE LATEST REVISION OF ASTM A615, GRADE 60, FOR DEFORMED STEEL.
 3. ALL REBAR BENDS SHALL BE AS PER THE LATEST REVISION OF ACI 318.
 4. FOR TYPE 1, 2, 20, AND S3 BARS WITH A BEND AT EACH END, THE HOOKS SHALL LIE IN THE SAME PLANE OF BENDING AFTER FABRICATION (BENDING) OCCURS.
 5. ALL LIKE MARK NUMBERS SHALL BE BUNDLED IN SECURED LIFTS WITH A WEATHERPROOF TAG SPECIFYING THE MARK NUMBER, QUANTITY, AND PURCHASE ORDER NUMBER.
 6. ALL REBAR FOR LIKE FOUNDATION TYPES SHALL BE COLOR-CODED AS INDICATED IN THE BOX ABOVE.
 7. ALL DIMENSIONS ARE OUT-TO-OUT OF BAR EXCEPT "A" AND "G" ON STANDARD 180° AND 135° HOOKS.



PLAN VIEW
SCALE: 1/2" = 1'-0"

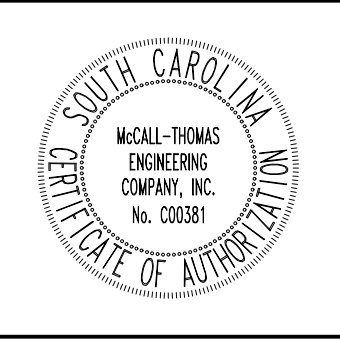
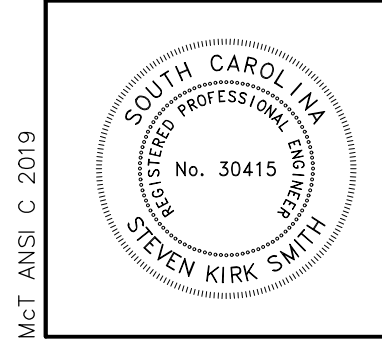
(3) MK SL-A #5 REBAR,
(5) MK SL-B #5 REBAR,



SECTION
SCALE: 1/2" = 1'-0"

(3) MK SL-A #5 REBAR,
(5) MK SL-B #5 REBAR,

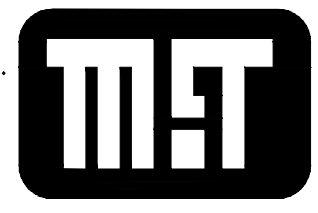
- NOTES:**
1. ALL CONCRETE SHALL BE 4000 PSI AT 28 DAYS.
 2. 0.3 CUBIC YARDS OF CONCRETE REQUIRED.
 3. ALL REBAR TO BE GRADE 60, SIZE AS NOTED.
 4. UNSUITABLE BEARING MATERIAL SHALL BE EXCAVATED UNTIL SUITABLE SOIL IS REACHED AND REPLACED WITH #67 R.O.C. GRANITE, COMPACTED IN LIFTS NOT EXCEEDING 3" IN THICKNESS.
 5. SOIL BACKFILL SHALL BE COMPACTED TO AT LEAST 95% OF STANDARD PROCTOR.



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0	5-14-20	ISSUE FOR BIDS	

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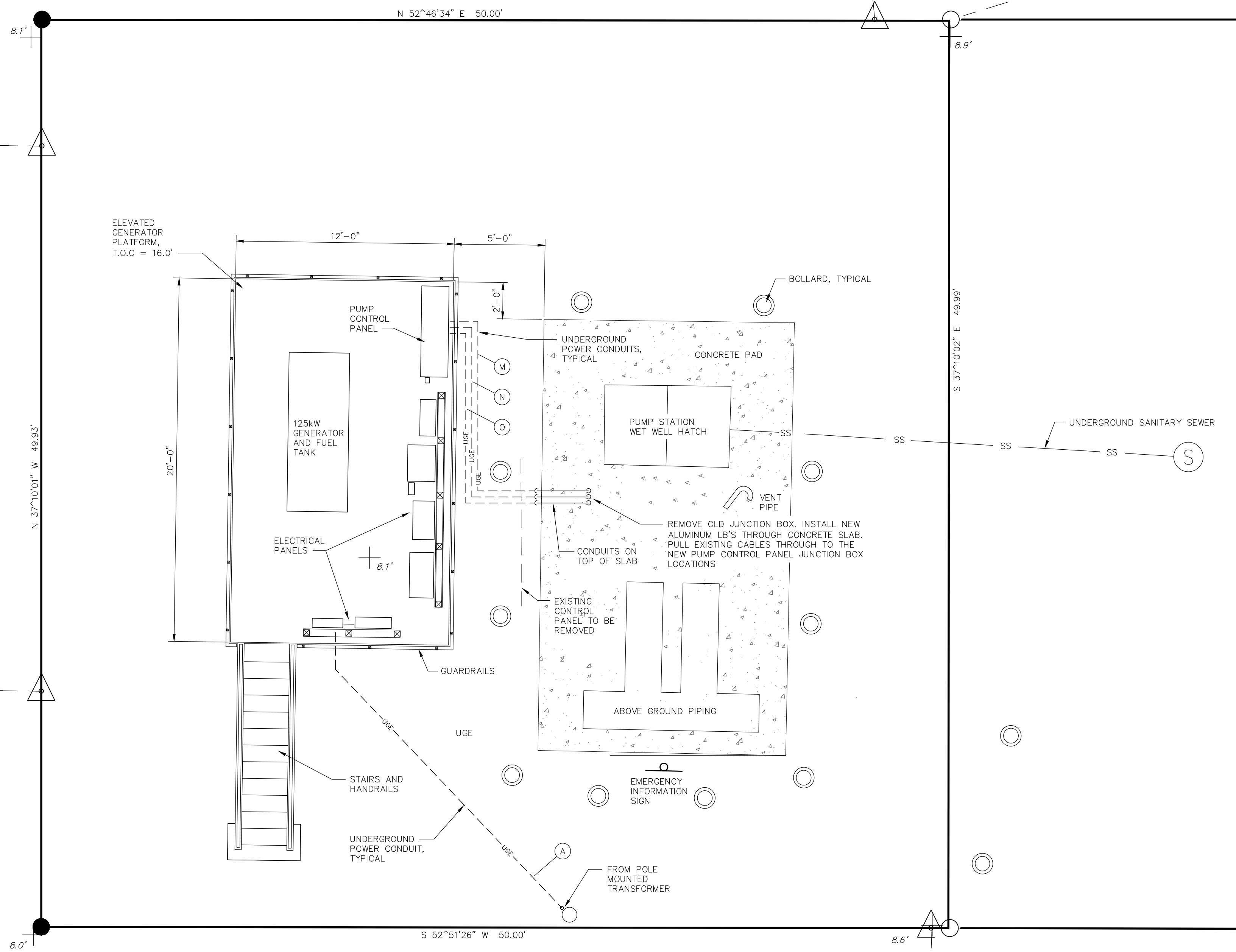
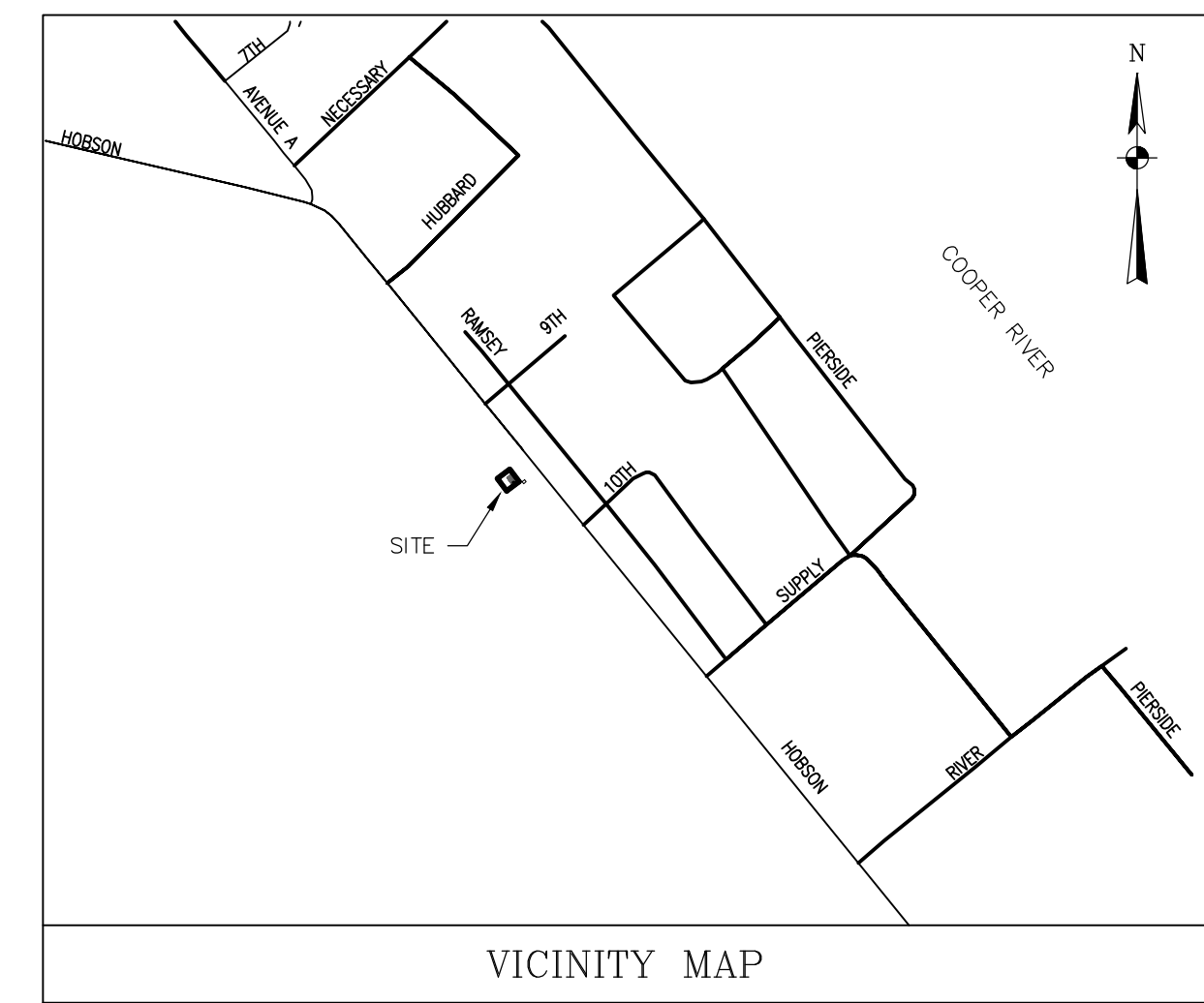
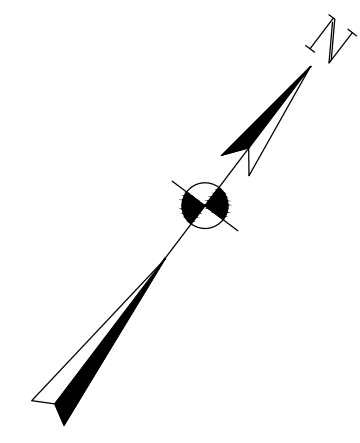
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DRN BY: PBS APPVD BY: SKS SCALE: 1/2" = 1'-0"



NORTH CHARLESTON SEWER DISTRICT
NORTH CHARLESTON, SOUTH CAROLINA
BALL FIELD PUMP STATION
STAIR LANDING FOUNDATION

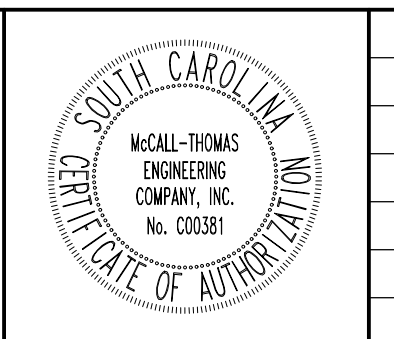
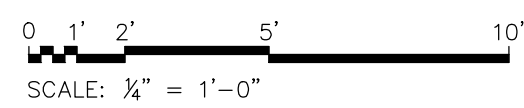
F-2

SHT. 1 OF 1



GENERAL ARRANGEMENT PLAN
SCALE: 1/4" = 1'-0"

- NOTES:**
1. REFERENCE PLATFORM ARRANGEMENT DRAWING GA-2 FOR CONDUIT SCHEDULE.
- LEGEND:**
 (A) CONDUIT DESIGNATION, SEE CONDUIT SCHEDULE, DRAWING GA-2
 --- UGE --- UNDERGROUND CONDUIT



REFERENCE DRAWINGS		REV.	DATE	DESCRIPTION	BY
DWG. NO.	DRAWING TITLE				SKS/PS
		0	5-14-20	ISSUE FOR BIDS	

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 803.534.1040
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DSGN BY: SKS CHKD BY: SKS DATE: 4-07-2020
 DRN BY: PBS APPVD BY: SKS SCALE: 1/4" = 1'-0"



NORTH CHARLESTON SEWER DISTRICT
 NORTH CHARLESTON, SOUTH CAROLINA
BALL FIELD PUMP STATION

WASTEWATER SYSTEM IMPROVEMENTS
GENERAL ARRANGEMENT PLAN

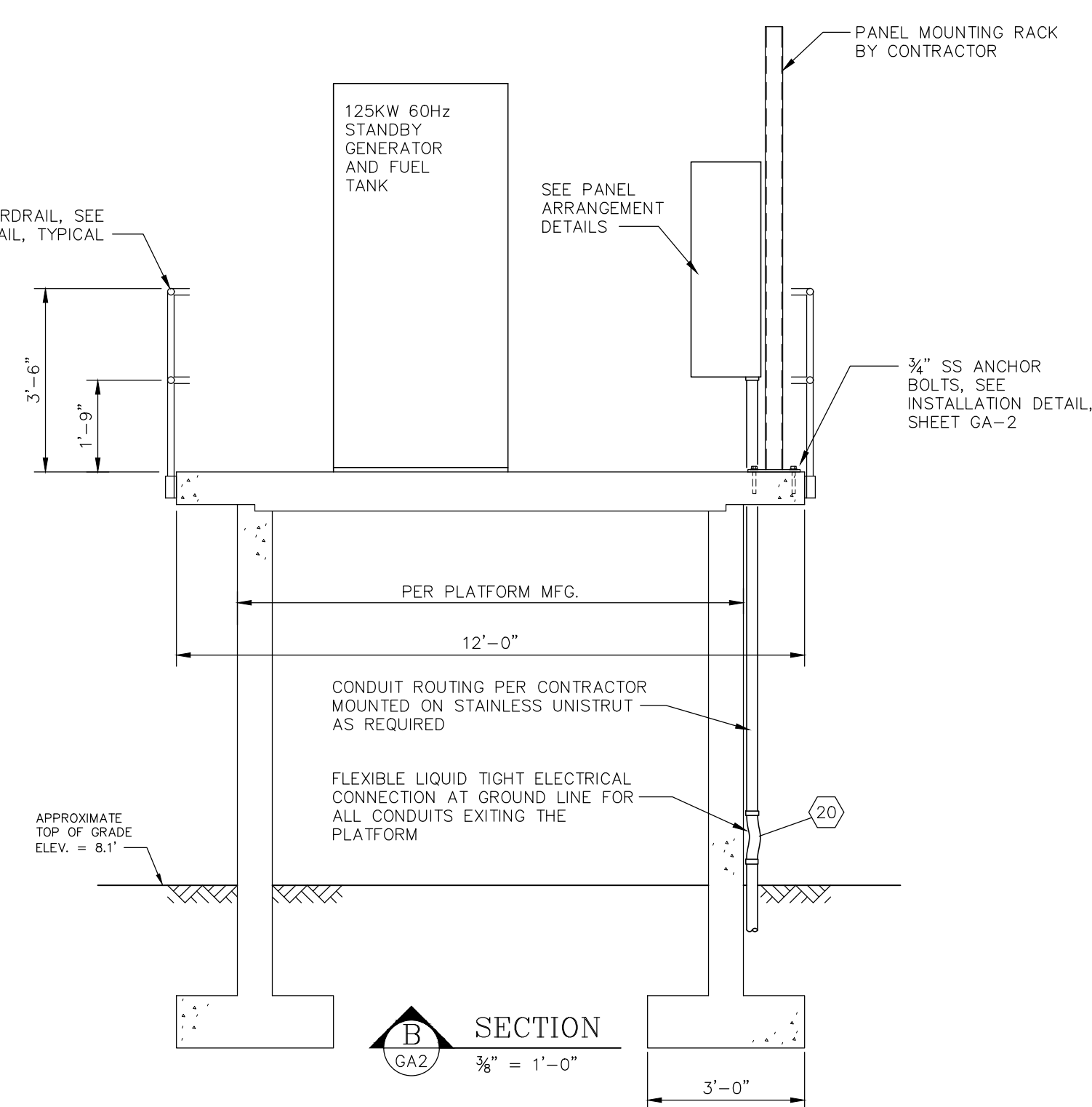
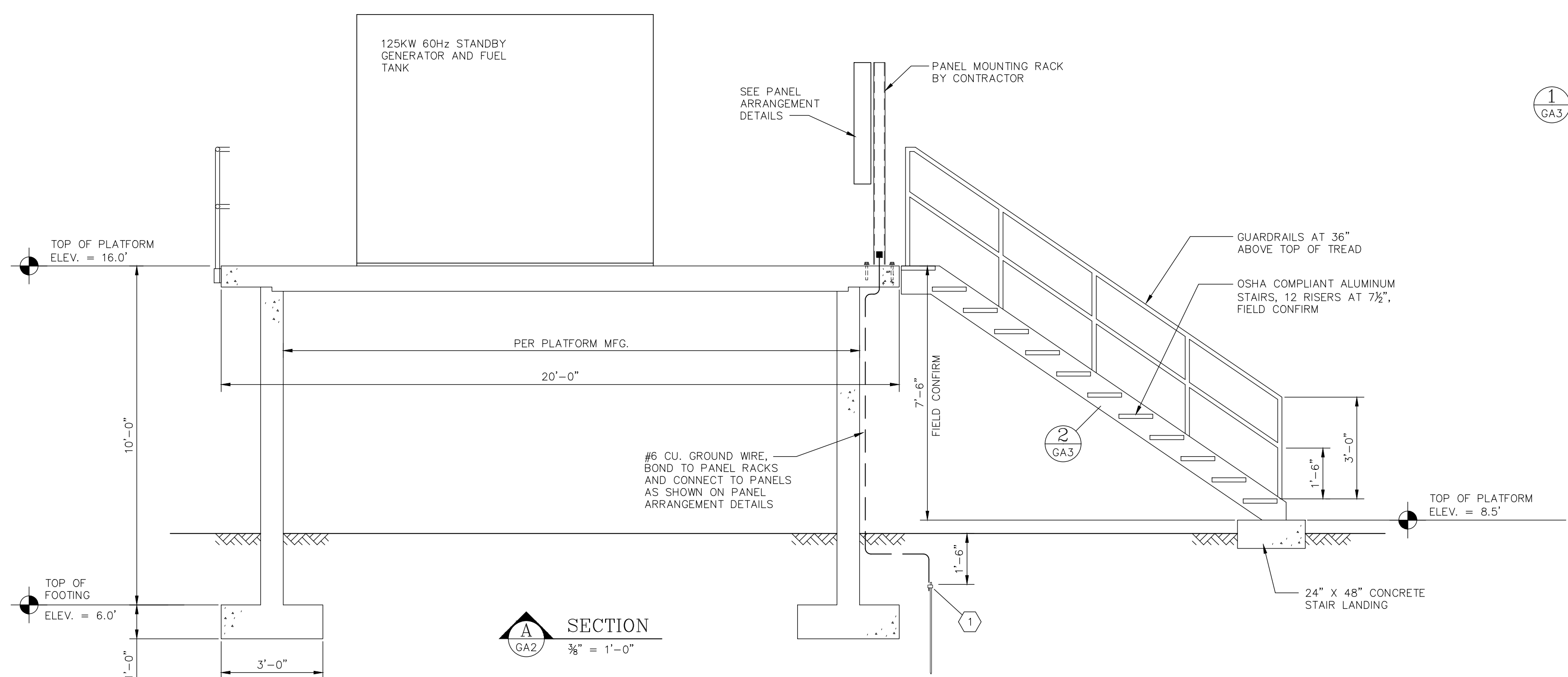
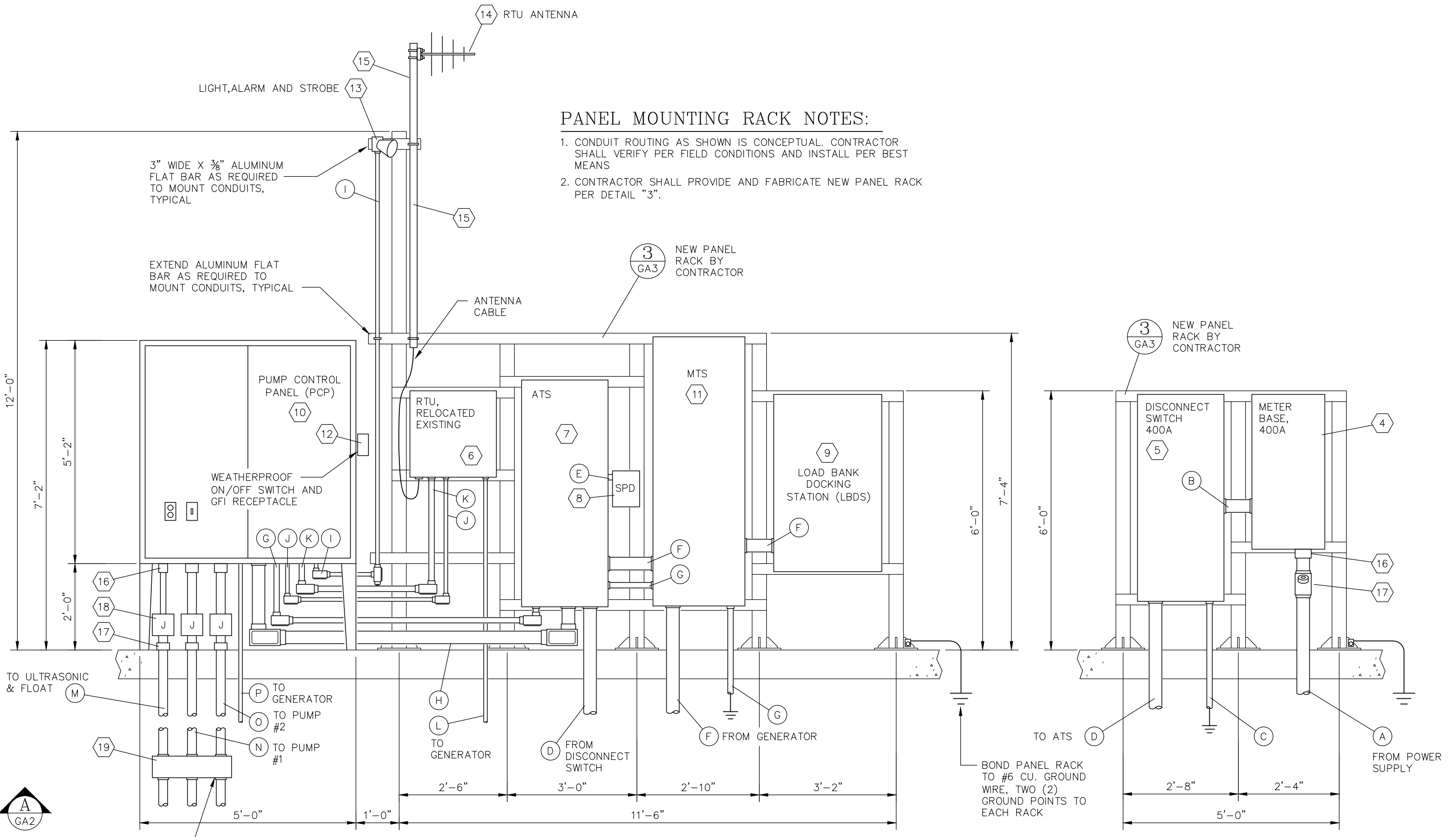
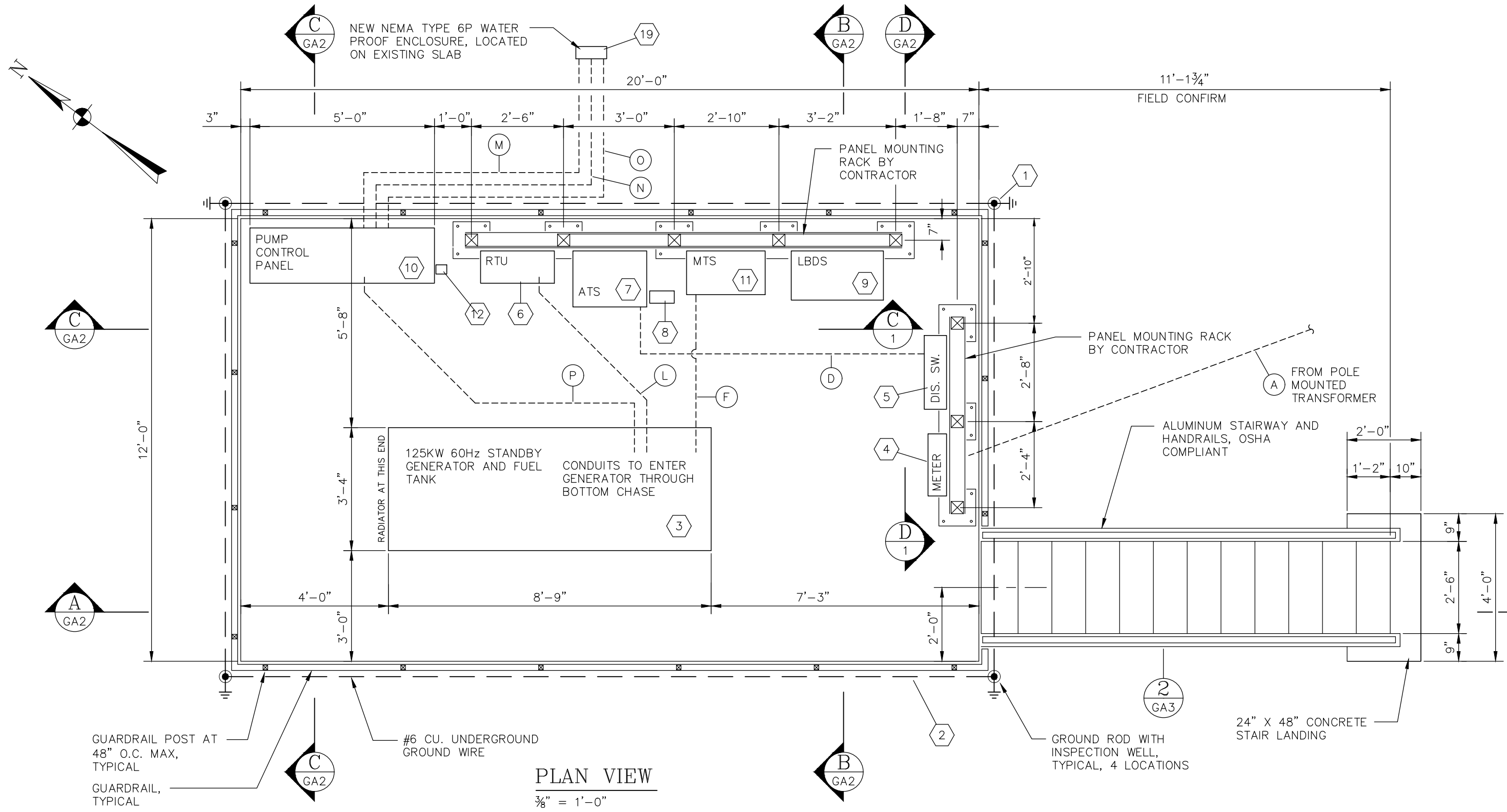
GA-1

SHT. 1 OF 1

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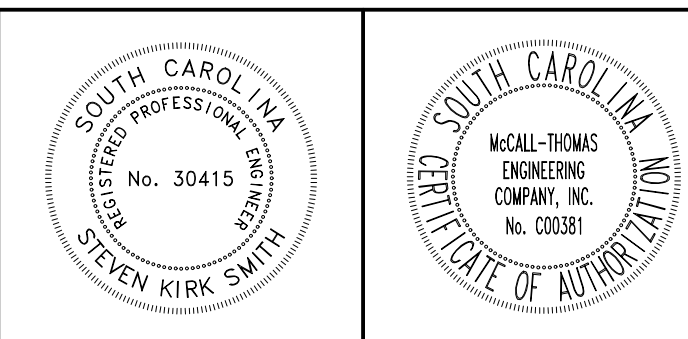
MATERIAL AND EQUIPMENT SCHEDULE:

- | | | |
|---|---|---|
| <p>1 GROUNDING ELECTRODE SYSTEM, FOUR (4) 10' X 3/4" DIA. COPPERCLAD GROUND RODS AND INSPECTION WELLS, BOND TO PLATFORM WITH EXOTHERMIC WELDS</p> <p>2 GROUND GRID, #6 CU. BARE ELECTRODE CONDUCTOR, INSTALL 18" BELOW GRADE</p> <p>3 STANDBY GENERATOR AND FUEL TANK, 125kW, 60 Hz, OWNER FURNISHED</p> <p>4 METER BASE, MILBANK 400A</p> <p>5 DISCONNECT SWITCH, EATON 240V, 400A WITH NEUTRAL KIT, DH325FWK W/250A FUSES, 304 STAINLESS STEEL</p> <p>6 REMOTE TERMINAL UNIT (RTU), RELOCATE EXISTING</p> <p>7 AUTOMATIC TRANSFER SWITCH (ATS), ASCO D03ATS30260FGHX, OWNER FURNISHED</p> | <p>8 SELF CONTAINED SURGE PROTECTIVE DEVICE (SPD) WITH INDICATING LIGHTS FOR EACH PHASE, EATON SPC 120240HBP, OWNER FURNISHED</p> <p>9 LOAD BANK DOCKING STATION, TRYSTAR SBDS-033W-LF-52, OWNER FURNISHED</p> <p>10 PUMP CONTROL PANEL, 40A, PETE DUTY & ASSOCIATES, OWNER FURNISHED</p> <p>11 MANUAL TRANSFER SWITCH (MTS), EATON 400A DT465UWK OR EQUAL, WITH 250A FUSES</p> <p>12 WEATHERPROOF ON/OFF SWITCH AND GFI DOUBLE OUTLET RECEPTACLE WITH WEATHERPROOF ENCLOSURE</p> <p>13 75W LED FIXTURE RAB #XLED78 WITH PHOTOELECTRIC CELL, REMOTE ALARM AND STROBE LIGHT, WITH MOUNTING HARDWARE</p> <p>14 RTU ANTENNA AND CABLE WITH MOUNTING HARDWARE</p> | <p>15 ALUMINUM CONDUIT, 1 1/2" FOR ANTENNA SUPPORT, WITH MOUNTING HARDWARE</p> <p>16 MEYERS SEALING HUB</p> <p>17 Oz-GEDNEY CONDUIT SEALING BUSHING</p> <p>18 NEMA TYPE 3/7 HINGED COVER JUNCTION BOX WITH LOCKING PROVISIONS</p> <p>19 NEMA TYPE 4X WATER PROOF ENCLOSURE, STAINLESS STEEL</p> <p>20 FLEXIBLE WATER TIGHT ELECTRICAL CONNECTION, CARLON OR EQUAL</p> |
|---|---|---|



- CONDUIT SCHEDULE**
- (A) POWER SUPPLY FROM POLE MOUNTED 150KVA TRANSFORMER TO METER, 3" CONDUIT
 - (B) METER TO DISCONNECT SWITCH, 3" SCH. 80 PVC CONDUIT
 - (C) GROUND, 1" SCH. 80 PVC CONDUIT
 - (D) DISCONNECT SWITCH TO ATS, 3" SCH. 80 PVC CONDUIT, 3-250 MCM CU., 1-#2 NEU., 1-#2 GND.
 - (E) ATS TO SPD, 1" SCH. 80 PVC CONDUIT, 3-#10, 1-#10N, 1-#10 GND.
 - (F) MTS, ATS & LBDS, TO GENERATOR, 3" SCH. 80 PVC CONDUIT, 3-4/0 CU., 1-4/0 NEU, #2 GND., 4-#14 GROUND, 1" SCH. 80 PVC CONDUIT
 - (G) ATS TO PUMP CONTROL PANEL, 3" SCH. 80 PVC CONDUIT, 3-250 MCM CU., 1-#2 NEU, 1-#2 GND.
 - (H) PUMP CONTROL PANEL TO LIGHT AND ALARM, 120V AC, 3/4" SCH. 80 PVC CONDUIT, 6-#12, 3-#12 GND.
 - (I) PUMP CONTROL PANEL TO RTU, 120V AC, 3/4" SCH. 80 PVC CONDUIT, 2-#12, 1-#12 GND.
 - (J) PUMP CONTROL PANEL TO RTU, 1" SCH. 80 PVC CONDUIT, 16-#14
 - (K) RTU TO GENERATOR, 3/4" SCH. 80 PVC CONDUIT, 2-#14
 - (L) PUMP CONTROL PANEL TO PROBE & FLOAT, 1 1/2" SCH. 80 PVC CONDUIT
 - (M) PUMP CONTROL PANEL TO PUMP #1, 1 1/2" RIGID ALUMINUM CONDUIT
 - (N) PUMP CONTROL PANEL TO PUMP #2, 1 1/2" RIGID ALUMINUM CONDUIT
 - (O) PUMP CONTROL PANEL TO GENERATOR, 3/4" SCH. 80 PVC CONDUIT, 4-#13, 1-#14N, 1-#14G

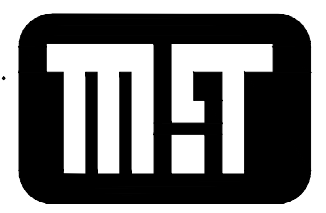
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REFERENCE DRAWINGS		REV.	DATE	DESCRIPTION	BY
DWG. NO.	DRAWING TITLE	0	5-14-20	ISSUE FOR BIDS	SKS/PS

McCALL-THOMAS ENGINEERING CO., INC.
845 Stonewall Jackson Blvd.
Orangeburg, SC 29115
803.534.1040
www.McCallThomas.com

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DRN BY: PBS APPVD BY: SKS SCALE: AS NOTED



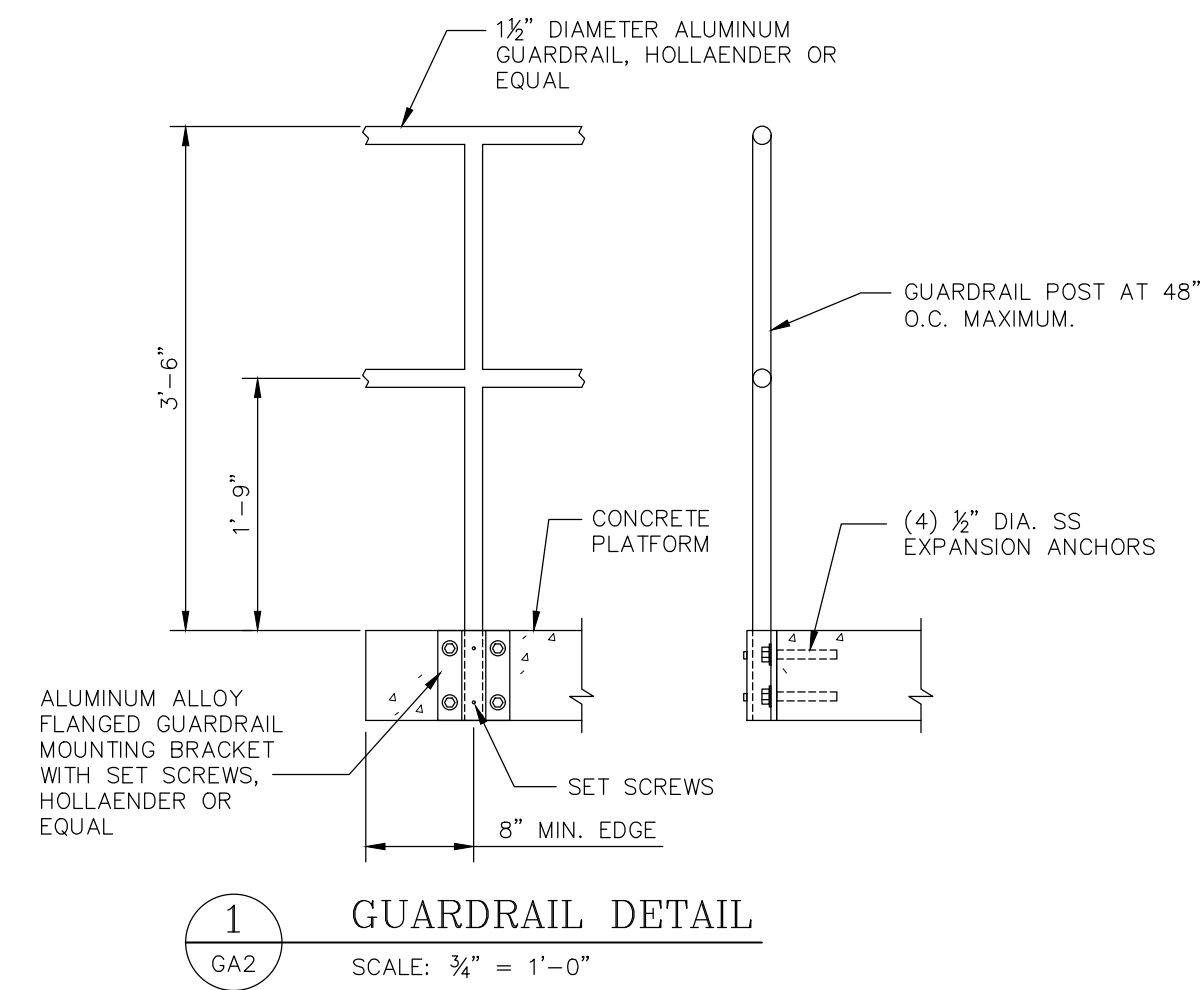
NORTH CHARLESTON SEWER DISTRICT
NORTH CHARLESTON, SOUTH CAROLINA

BALL FIELD PUMP STATION

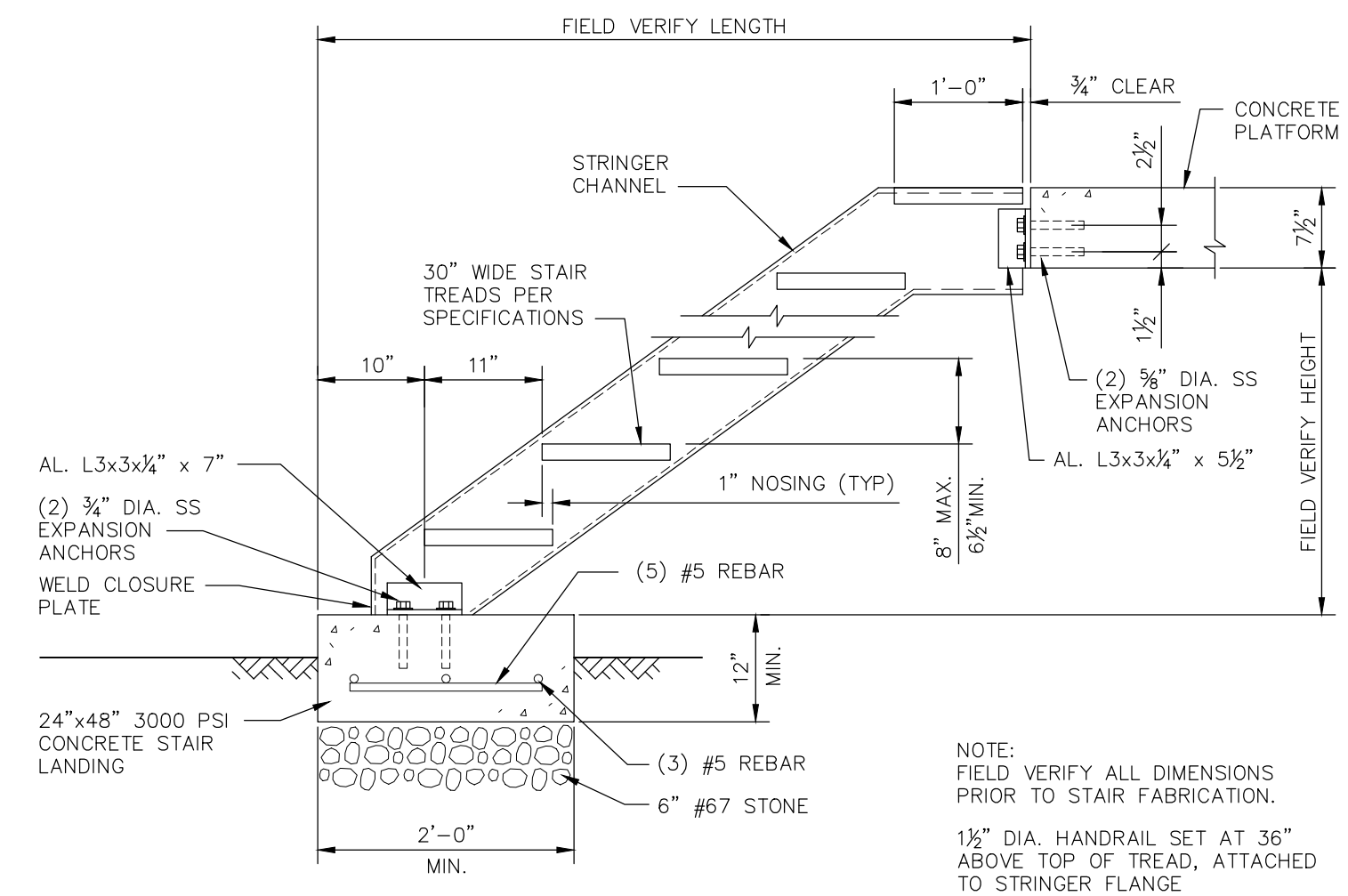
WASTEWATER SYSTEM IMPROVEMENTS
GENERATOR PLATFORM ARRANGEMENT
PLAN, SECTIONS AND DETAILS

GA-2

SHT. 1 OF 1

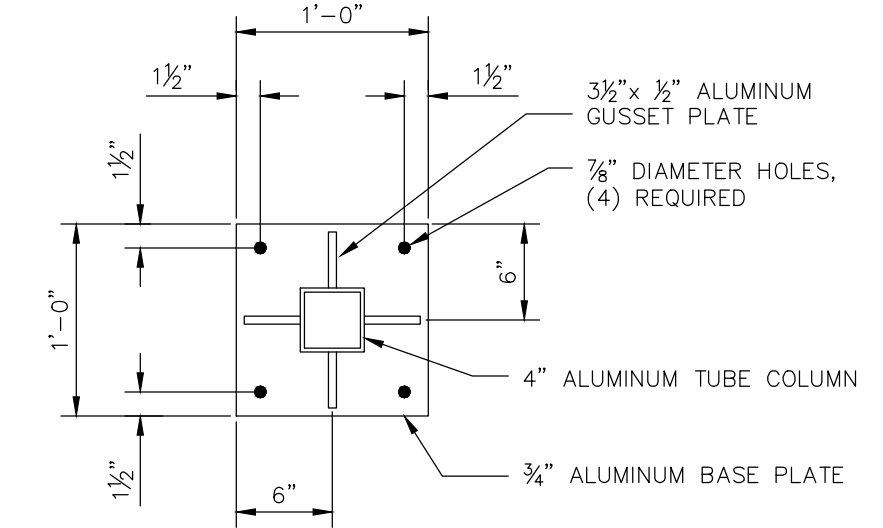
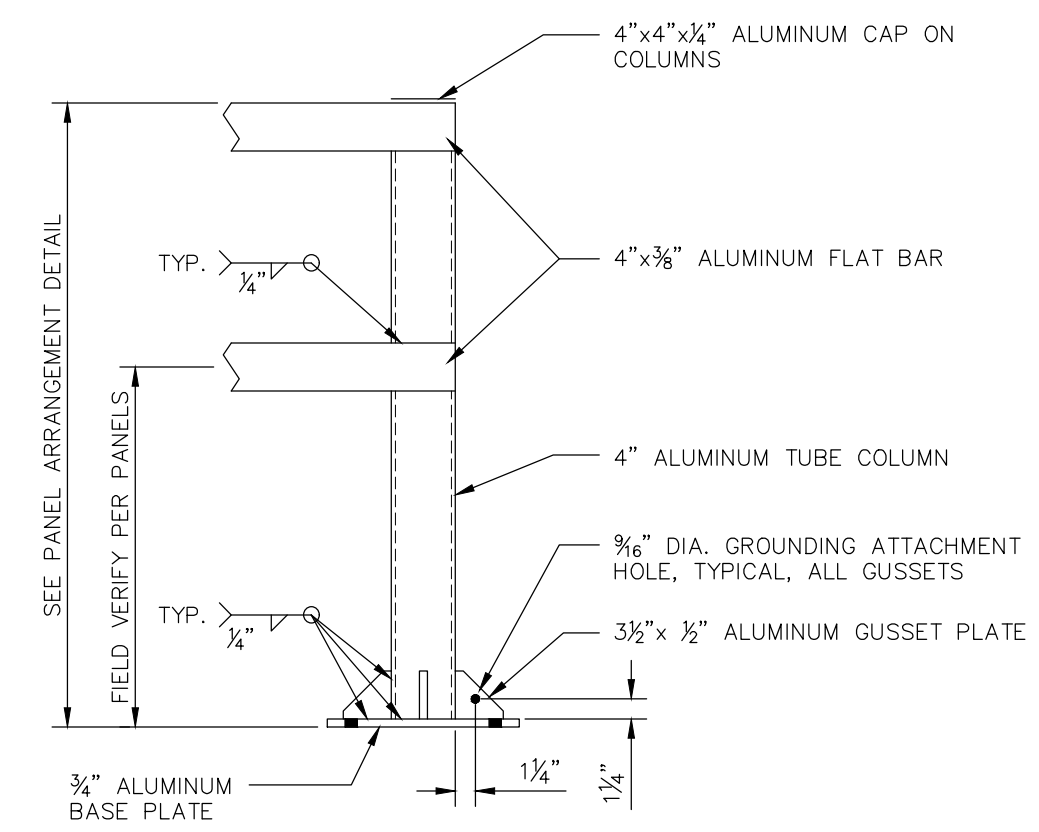


1
GA2
GUARDRAIL DETAIL
SCALE: 3/4" = 1'-0"



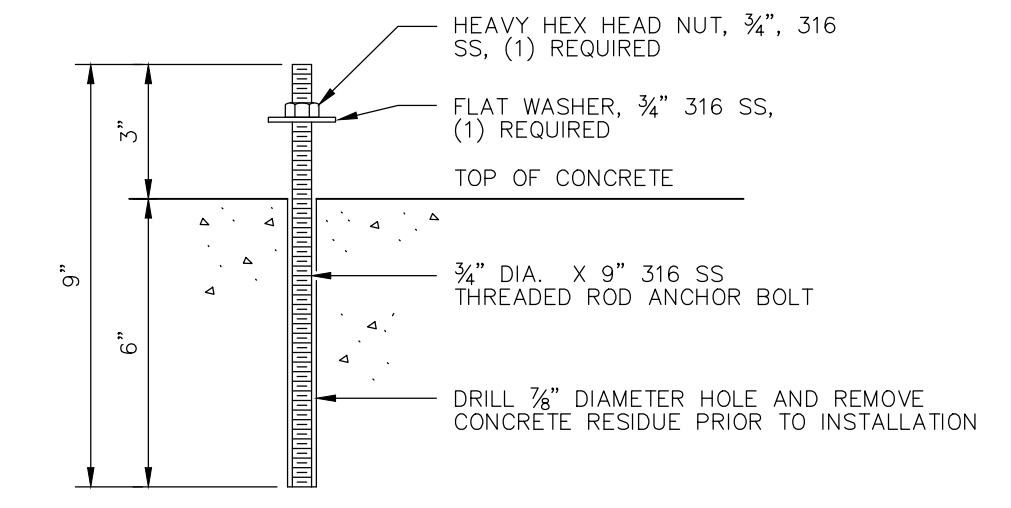
2
GA2
ALUMINUM STAIR DETAIL
SCALE: 3/4" = 1'-0"

NOTE:
FIELD VERIFY ALL DIMENSIONS
PRIOR TO STAIR FABRICATION.
1 1/2" DIA. HANDRAIL SET AT 36"
ABOVE TOP OF TREAD, ATTACHED
TO STRINGER FLANGE



3
GA2
PANEL MOUNTING RACK DETAIL
SCALE: 1" = 1'-0"

NOTES:
1. ALL MATERIAL TO BE 6061-T6 ALUMINUM. RACK TO BE WELDED CONSTRUCTION
2. CONTRACTOR SHALL FIELD VERIFY LOCATION OF FLAT BAR LOCATIONS BASED ON PANEL MOUNTING HOLE ARRANGEMENTS.

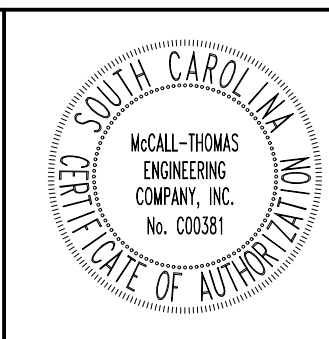


NOTES:
1. INSTALL ANCHOR BOLT WITH HILTI HIT-RE 500-3 EPOXY PER MFG. SPECS. APPROXIMATELY 1/2 TUBE REQUIRED PER ANCHOR BOLT.
2. GRIND OFF EXISTING ANCHOR BOLTS FLUSH WITH TOP OF CONCRETE.
3. REFERENCE THE BREAKER OUTLINE DRAWING FOR THE ANCHOR BOLT PATTERN.

ANCHOR BOLT INSTALLATION DETAIL

PCB INSTALLATION APPLICATION
NOT TO SCALE

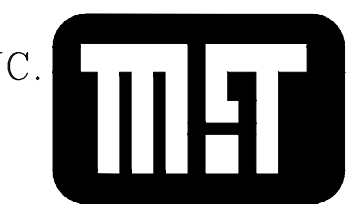
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BALL FIELD PUMP STATION
WASTEWATER SYSTEM IMPROVEMENTS
GENERATOR PLATFORM ARRANGEMENT
PLAN, SECTIONS AND DETAILS

GA-3

SHT. 1 OF 1



2020 DETAILED SPECIFICATIONS FOR CONCRETE WORK

BALL FIELD PUMP STATION PS-254



Prepared by:
McCall-Thomas Engineering Company, Inc.
Orangeburg, South Carolina
April 27, 2020

Site Locations:

Ball Field Pump Station
Corner of Hobson Blvd. and Borie St
North Charleston, SC 29405

1.0 Specifications for Concrete Work

- 1.1 The Contractor shall furnish and install all concrete foundations as shown on the Plans and drawings herein. The Contractor is responsible for locating all foundations. The site is cleared and graded.
- 1.2 The work will be performed in proximity to an operating sewer pump station. It is the responsibility of each bidder to coordinate a visit to the site with the owner to view the actual site conditions. The Contractor will need to plan with the Owner accessing the site.
- 1.3 At the earliest date coordinated between Owner and the Contractor the foundations shall be installed. Approximate time frame is the third quarter of 2020.
- 1.4 No existing foundations are required to be removed.
- 1.5 Concrete shall be air entrained Class A, 4000-psi minimum, reinforced with steel rebar. Anchor bolts shall be accurately placed to fit the various steel mounting plates, as indicated on the drawings. Concrete and reinforcing steel, including all formwork and materials, are to be furnished by the Contractor. Test samples shall be taken at the beginning, middle and end of each load to be tested. The concrete cylinders shall be tested to meet the minimum strength requirements stated herein at 7 days and at 28 days. Should the samples not reach the minimum strength requirements by the 28th day the third sample shall be held until 56 days before final testing. The contractor shall have the testing organization email or mail the test results as they are complete to the owner and the engineer. If the tests performed on the concrete samples do not meet the minimum requirements stated herein it shall be the Contractor's responsibility to completely remove, dispose of, and replace all substandard concrete.
- 1.5 The top floor finish of each platform shall have a broom finish after troweling of the concrete. The platform sides and the walls shall have an ordinary formed surface finish.
- 1.7 Expansion anchors will be used to secure or attach all equipment to the platform.
- 1.7 A one-inch chamfer strip shall be placed around the top of all forms to eliminate square corners and to minimize chipping of the finished concrete on exposed edges.
- 1.8 Contractor shall cover exposed concrete with plastic and shall keep it wet to allow concrete to cure slowly. This shall be done for five (5) consecutive days after pouring.
- 1.9 Soil Boring and Geotechnical Report are not available. It is the responsibility of the Contractor to use whatever means necessary to properly install the foundations.
- 1.10 Billing to the owner shall be limited to one bill per month.
- 1.11 A summary of cubic yard requirements, foundation layout and details concerning the foundation

work can be found herein.

CONCRETE FOUNDATIONS SUMMARY

	<u>Description</u>	<u>Quantity</u>	<u>CYDS</u>	<u>Total CYDS</u>
1.	Ball Field Generator Platform	1	24.91	24.91
2.	Ball Field Stair Landing	1	0.30	0.30
		<u>Total Cubic Yards</u>		<u>25.21</u>

Section 2 – Conduit

- 2.1 The Contractor is required to supply and install conduit
- 2.2 The conduit shall be made of homopolymer polyvinyl chloride, PVC or rigid aluminum. Molded fittings shall also be made from PVC compound or rigid aluminum. PVC conduit and fittings shall be UL Listed, electrical grade quality, heavy wall UV resistant and designed for installation above ground, concrete encasement, direct earth burial without encasement in concrete and exposed applications. PVC conduit and fittings shall be homogeneous plastic material free from visible cracks, holes or foreign inclusions. Conduit bore shall be smooth and free of blisters, nicks and other imperfections, which could mar conductors or cables. All connections to electrical control panels shall be made with UL Listed, UV resistant, Liquid-tight flexible metal conduit with UL listed fittings.