SECTION 7

OTHER CONTRACT FORMS
SARASOTA COUNTY GOVERNMENT
CONSENT OF SURETY TO FINAL PAYMENT

SURETY:
BOND NO.:

OWNER: SARASOTA COUNTY BOARD OF COUNTY COMMISSIONERS
PROJECT TITLE:
CONTRACT #

CONTRACTOR:

EFFECTIVE DATE OF BOND:

In accordance with the provisions of the Contract referenced above between the above Owner and Contractor, the Surety Company named below:

SURETY COMPANY NAME:
SURETY COMPANY ADDRESS:

under Bond with the Contractor named below:

CONTRACTOR NAME:
CONTRACTOR ADDRESS:

Hereby approves final payment by the Owner to the Contractor and agrees that final payment does not relieve the Surety of its obligations under the Bond to the Owner named below:

SARASOTA COUNTY COMMISSION
1660 RINGLING BOULEVARD
SARASOTA, FL 34234

IN WITNESS WHEREOF, the Surety has hereto set its hands on this date________, 20__

______________________________
Surety

______________________________
Signature of Authorized Representative

______________________________
Printed Name and Title

Attest/Witness:
(Seal):________________________

Attached: Notarized Power of Attorney
**SARASOTA COUNTY**
**LOCAL HIRING INITIATIVE**
**Participation Form**

**Instructions:**
In Sarasota County’s Local Hiring Initiative Resolution No. 2013-127, the CONTRACTOR is encouraged to work with Career Source Suncoast (formerly known as Suncoast Workforce, Inc.), or any other agency designated by the State of Florida as a Workforce development agency, to increase employment opportunities for local residents. Local residents are defined as “residents of Sarasota County,” but that definition may be expanded to include Manatee and Charlotte Counties if the requisite skill-set is not available in Sarasota County. Resolution No. 2013-127 establishes an aspirational goal for contractor and subcontractors to hire 15% minimum local residents as the new hires for construction and construction related projects.

The CONTRACTOR shall complete the information below to provide information on any new hires needed by the Contractor or their subcontractor(s) to complete the Project. **This information must be submitted as part of the monthly pay requests.**

Date: __________________________
Project Name: _____________________   Contract Number: _________________
Contractor:     _____________________   Submitted by: ____________________

**Report on New Hires – Please indicate Any New Hires during the past month.**

<table>
<thead>
<tr>
<th>County of Resident</th>
<th>Number of New Hires Required to Complete Project</th>
<th>Number New Hires Local Residents</th>
<th>Cumulative New Hires to Date (Include previous months totals)</th>
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<tr>
<td>Sarasota</td>
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<tr>
<td>Other</td>
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☐ - By checking this box, the CONTRACTOR hereby acknowledges Sarasota County’s Local Hiring Initiative and indicates that no New Hires were required by the CONTRACTOR or their subcontractor(s) to complete the Project.
Standard Form For
CONTRACTOR’S FINAL AFFIDAVIT & RELEASE of LIEN

STATE OF FLORIDA, COUNTY OF SARASOTA

Before me, the undersigned authority, personally appeared _________________________, who, after being by me first duly sworn, deposes and says that:

1. He is ______________________________________ of __________________________, (Title of Officer) __________________ (Name of Company) doing business in the State of Florida, hereinafter called "Contractor".

2. Contractor pursuant to a Contract dated __________________________, hereinafter referred to as "Contract", with Sarasota County, Florida, hereinafter referred to as "County", has heretofore furnished or caused to be furnished labor, material and services for the construction of certain improvements as more particularly set forth in said contract.

3. Contractor represents that all work to be performed under the aforesaid Contract has been fully completed and that all persons and firms who furnished material, labor and/or services incident to the completion of said work have been paid in full except to the following:

   (Write in "None" if all persons and firms have been paid in full)

   NAME                                          ADDRESS                                      AMOUNT DUE

4. The undersigned affiant for and in consideration of final payment to him in the amount of $___________________, and all other previous payments paid by County to contractor, does hereby for and in behalf of the Contractor, waive, release, remise and relinquish the contractor’s right to claim, demand or impose a lien or liens for work done or materials and/or services furnished or any other class of lien whatsoever, on any of the premises owned by County on which improvements have been completed in connection with the aforementioned contract.

5. The affiant herein does hereby represent that he has authority to execute a full and final Release of Lien for and in behalf of the Contractor as set forth above.

6. The affiant herein makes this Affidavit and Release of Lien for the express purpose of inducing County to make final disbursement and payment to the Contractor in the amount of $_______________________.

7. This Affidavit and Release of Lien is made by affiant with full knowledge of the applicable laws of the State of Florida. In addition to such rights as may be afforded to County under said applicable laws, affiant expressly agrees to indemnify and save County harmless from any and all actual costs and expenses, including reasonable attorney’s fees, arising out of claims by laborers, subcontractors or materialmen who might claim that they have not been paid for services or material furnished by or through the contractor in connection with the work performed under the aforementioned Contract.
Name of Corporation

By: _______________________________________
   President

(CORPORATE SEAL)

ATTEST:

Name of Corporation

_____________________________________
   Secretary

Sworn to and subscribed before me this day
   (date)

_____________________________________
   Notary Public

(NOTARY SEAL)

My Commission Expires: _____________________
STORED MATERIALS AFFIDAVIT

STATE OF FLORIDA, COUNTY OF SARASOTA

Before me, the undersigned authority, personally appeared ______________________, who being duly sworn, says that he is a subcontractor for ______________________ of Sarasota, Florida, General Contractor for ______________________ Project, and that all materials billed on the attached invoice are being held in the subcontractor’s warehouse at ______________________, Florida, for this project, and are fully insured against loss or damage.

______________________________________________
(Subcontractor Firm Name)

By: ____________________________________________
(Name of Representative)

______________________________________________
(Title of Representative)

SWORN TO AND SUBSCRIBED BEFORE ME THIS ___ DAY OF ___________________, 20___

Notary Public:

My commission expires: ________________

FOR

General Contractor for this project states that the stored materials constitute a part of the Performance, payment and guarantee bond, and are for this project only.

SWORN TO AND SUBSCRIBED BEFORE ME THIS ___ DAY OF ___________________, 20___

Notary Public:

My commission expires: ____________
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<td><strong>CONTRACTOR PHONE NO.:</strong></td>
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<td><strong>SURETY COMPANY:</strong></td>
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<tr>
<td><strong>SURETY AGENT:</strong></td>
<td></td>
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<tr>
<td><strong>OWNER NAME:</strong></td>
<td>Sarasota County Board of County Commissioners</td>
</tr>
<tr>
<td><strong>OWNER ADDRESS:</strong></td>
<td>1660 Ringling Boulevard Sarasota FL 34236</td>
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<tr>
<td><strong>OWNER PHONE NO.:</strong></td>
<td>941-861-5000</td>
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<td><strong>BOND AMOUNT:</strong></td>
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<tr>
<td><strong>CONTRACT NO.:</strong> (if applicable)</td>
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<tr>
<td><strong>DESCRIPTION OF WORK:</strong></td>
<td>Construction of a booster pump station including one County supplied diesel powered booster pump, twenty inch (20&quot;) bypass piping, telemetry, fencing, drive approach and road restoration.</td>
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<tr>
<td><strong>PROJECT ADDRESS:</strong></td>
<td>There is no address as this is an easement.</td>
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<tr>
<td></td>
<td>Latitude: N 27° 15’ 36.9653”</td>
</tr>
<tr>
<td></td>
<td>Longitude: W 82° 30’ 20.1101”</td>
</tr>
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</table>
LEGAL DESCRIPTION:

COMMENCE AT THE INTERSECTION OF THE SOUTH LINE OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 16, TOWNSHIP 37 SOUTH, RANGE 18 EAST WITH THE EASTERLY RIGHT-OF-WAY LINE OF LOCKWOOD RIDGE ROAD AS DESCRIBED IN OFFICIAL RECORDS BOOK 429, PAGE 823 OF THE PUBLIC RECORDS OF SARASOTA COUNTY, FLORIDA; THENCE ALONG SAID EASTERLY RIGHT-OF-WAY LINE, N 00°11'22" E, A DISTANCE OF 51.61 FEET TO THE POINT OF BEGINNING; THENCE CONTINUE ALONG SAID EASTERLY RIGHT-OF-WAY LINE, N 00°11'22" E, A DISTANCE OF 40.00 FEET; THENCE DEPARTING THE EASTERLY RIGHT-OF-WAY LINE OF LOCKWOOD RIDGE ROAD, N 90°00'00" E, A DISTANCE OF 25.00 FEET; THENCE S 00°00'00" E, A DISTANCE OF 8.00 FEET; THENCE N 90°00'00" E, A DISTANCE OF 64.00 FEET; THENCE S 00°00'00" E, A DISTANCE OF 24.00 FEET; THENCE S 90°00'00" W, A DISTANCE OF 64.00 FEET; THENCE S 00°00'00" E, A DISTANCE OF 8.00 FEET; THENCE S 90°00'00" W, A DISTANCE OF 25.00 FEET TO THE POINT OF BEGINNING.

CONTAINING A DESCRIBED AREA OF 2,536 SQUARE FEET OR 0.06 ACRES MORE OR LESS.

By this bond, we, _________________________, as Principal and _________________________, a corporation, as Surety, are bound to Sarasota County Board of County Commissioners, herein called Owner, in the sum of $_______________________________, for payment of which we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally.
The condition of this bond is that if Principal:

1. Performs the Contract dated __________, between principal and Owner for construction of **Lockwood Ridge Booster Pump Station, Bid # 176579CS** the contract being made a part of this bond by reference, at the times and in the manner prescribed in the contract; and

2. Promptly makes payments to all claimants, as defined in Section 255.05(1) Florida Statutes, supplying principal with labor, materials, or supplies, used directly or indirectly by principal in the prosecution of the work provided for in the contract; and

3. Pays Owner all losses, damages, expenses, costs, and attorney’s fees, including appellate proceedings, that Owner sustains because of a default by principal under the contract work; and

4. Performs the guarantee of all work and materials furnished under the contract for the time specified in the contract, then this bond is void; otherwise it remains in full force.

Any changes in or under the contract documents and compliance or noncompliance with any formalities connected with the contract or the changes does not affect surety’s obligation under this bond.

Any action instituted by a claimant under this bond for payment must be in accordance with the notice and time limitation provisions in Section 255.05(2), Florida Statutes.
In witness whereof, the said Principal and Surety have signed and sealed this instrument this ________________________
(date)

__________________________
Principal

By: _______________________
    As President
    (SEAL)

__________________________
Surety

By: _______________________

Approved as to form and execution:
By: _______________________
    Attorney to Board of
    County Commissioners of
    Sarasota County, Florida

Any Claims under this bond may be addressed to
(name and address of Surety):

__________________________
__________________________
__________________________

 Telephone No: _______________________

Name and address of agent or representative in Florida if different from above:

__________________________
__________________________
__________________________

 Telephone No: _______________________
SECTION 8

GENERAL CONDITIONS
## INDEX
### GENERAL CONDITIONS

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GENERAL CONDITIONS

1.0 DEFINITIONS AND TERMS

1.1 GENERAL: Wherever used in the Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural, as well as pronouns used in their place. This list is not meant to be all inclusive, as other terms may be defined elsewhere in the Contract Documents printed with initial capital letters.

ADDENDA: Written or graphic instruments issued prior to the opening of bids which clarify, correct, or change the Contract Documents.

ADMINISTRATIVE AGENT: The County staff person acting as the County’s authorized representative, responsible for the performance and final acceptance of the Work. This agent, named in the Contract, has responsibility for Contract Document interpretations, Contractor compliance with the terms of the Contract, and resolutions in cases of Contract Document discrepancies, claims, disputes, and non-compliance.

APPLICATION FOR PAYMENT: The form acceptable to the County which is to be used by the Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract.

CLAIM: A written demand or assertion by the County or the Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract.

CONFORMED CONTRACT DOCUMENTS: The formal Contract Documents prepared by the County, incorporating all addenda, completed bid form, Performance and Payment Bond, Insurance Certificate(s), and other forms required by the Contract into a bound set of final documents which will be exclusively used and recognized during the construction of the Work. Each set of Conformed Contract Documents will be so labeled and sequentially numbered as to be readily identifiable as copies of the authentic Contract Documents.

CONSTRUCTION CONTRACT: The written Contract executed by the County and the Contractor for the performance of the Work, which incorporates by reference, all Contract Documents.

CONSTRUCTION PLANS/DRAWINGS: A set of drawings prepared and/or approved by the Engineer/Architect of Record, which graphically shows the scope, extent, and character of the work to be furnished and performed by the Contractor. Shop Drawings and other Contractor submittals are not Construction Plans/Drawings as so defined.

CONSTRUCTION/PROGRESS SCHEDULE: A time schedule prepared and submitted by the Contractor in an approved form and in a Primavera compatible approved format, describing the sequence and duration of activities comprising the Contractor’s plan to accomplish the Work within the prescribed Contract Times.

CONSTRUCTION PROJECT MANAGER: Authorized County representative with specific responsibilities and duties as defined by the County for management of specified portions of the Contract.

CONTRACT: The totality of the Contract Documents.

CONTRACT AMENDMENT: A form of Contract Modification requiring formal Sarasota County Commission approval.

CONTRACT DOCUMENTS: All documents listed in Article III of the Construction Contract.

CONTRACT MODIFICATION: A document signed by the County and the Contractor authorizing an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Contract.

CONTRACT PRICE: The Contractor’s bid price accepted by the County, including or excluding additive or deductive alternates, as stipulated in Article II of the Construction Contract.
CONTRACT TIMES: The number of calendar days stipulated in Article VIII of the Construction Contract provided to the Contractor to achieve Milestones (as stipulated), Substantial Completion, and Final Completion of the Work, as defined herein.

CONTRACTOR: The person, firm, or corporation who executed the Construction Contract with the County, and who is responsible for the completion of the Work.

COUNTY: Political subdivision of the State of Florida including the SARASOTA COUNTY COMMISSION, the entity with whom the Contractor has entered into the Contract and for whom the Work is to be performed, including the County Engineer or designated representative.

DAY: The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

EFFECTIVE DATE OF THE CONTRACT: The date the Construction Contract is approved and signed by the County, on which date the Contract becomes effective.

ENGINEER/ARCHITECT OF RECORD: The person, firm or corporation registered in the State of Florida as a Professional Engineer/Architect, or Professional Engineering/Architectural Company, responsible for the preparation and approval of the Construction Plans/Drawings and Technical Specifications; the permitting of the project with Federal, State, and local agencies having jurisdiction over the Work; and for certification that the Work completed was in substantial conformance with the approved plans and specifications, and/or noting and recording exceptions that did not substantially affect the functionality or quality of the Work required for its intended use. The Engineer/Architect of Record may be one or more persons, firms or corporations.

FIELD ADJUSTMENT: A minor modification to the Construction Plans/Drawings directed by the County, which may involve a structure location or quantity change as may be found desirable to avoid any obstructions, interference with existing structures, or for other reasons that would benefit the Work, without causing or creating a scope change to the Work.

FINAL COMPLETION AND ACCEPTANCE: The date when the Work is completed and approved by the County and the Contractor, including completion of all punch list items, submittal of approved as-built drawings, and completion of all other project close-out requirements, all as defined in the Contract Documents. Evidence witnessing this date will be issued in the “Final Completion and Acceptance Certificate”.

INTERIM FIELD CHANGE AGREEMENT (IFCA): A form of Contract Modification within the general scope of the Contract, which does not result in the Contract Price exceeding the amount stipulated in the Construction Contract. This Contract document, approved and signed by the County and the Contractor, authorizes an addition, deletion, or revision in the Work or an allocation of the Contract contingency or adjustment to the Contract Times, issued on or after the Effective Date of the Contract.

JOBSITE: Lands or areas indicated in the Contract Documents as being furnished by the County upon which the Work is to be performed, including rights-of-ways and easements for access thereto, and such other lands indicated by the County which are designated for the use of the Contractor.

MILESTONE: A principal event or Work item, specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

NOTICE: A formal written correspondence rendered by the Contractor or the County for the purposes of providing notice to the parties of transmittals, requesting information, conditions discovered, pending actions, claims, and other actions pursuant to the Contract requirements.

NOTICE TO PROCEED: A written notice given by the County to the Contractor fixing the date on which the Contract Times will commence to run and on which date the Contractor shall start to perform the Work under the Contract. The Notice to Proceed will fix the dates of Milestones, where applicable, Substantial Completion, and Final Completion of the Contract, based on the stipulated Contract Times.

“OR EQUAL”/SUBSTITUTION: An item reviewed and approved by the County following the effective date of the Contract based on the Contractor’s submittal of alternates or substitutions for equipment/supplies/materials in response to the Technical Specifications denoting the item by a brand name followed by the term “or equal”.

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PROJECT: The entire construction or installation to be performed which the Work under this Contract may be the whole or part.

PROJECT REPRESENTATIVE (PR)/ INSPECTOR: Authorized field representative of the County, responsible for periodic oversight of the Work, with specific duties and limitations as outlined in these General Conditions.

SCHEDULE OF SUBMITTALS: A schedule of submittals required by the Contract Documents prepared and maintained by the Contractor, of required submittals and the time requirements to support scheduled performance of related Work activities.

SCHEDULE OF VALUES: A cost schedule prepared and maintained by the Contractor, allocating portions of the Contract Price to various Lump Sum items of the Work as defined in the Contract Documents, and used as the basis for reviewing and approving the Contractor’s application for payment.

SHOP DRAWINGS: All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for the Contractor and submitted by the Contractor to illustrate some portion of the Work.

SUBCONTRACTOR: An individual or entity having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work.

SUBSTANTIAL COMPLETION: Occurs when the Work is sufficiently complete, in accordance with the Contract Documents, so that the Project or specified part of the Project can be utilized for the purpose for which it was intended. The date of Substantial Completion will be evidenced in writing by the “Certificate of Substantial Completion”, approved and signed by the Contractor and the County’s Administrative Agent.

SUPPLEMENTAL GENERAL CONDITIONS: That part of the Contract Documents which amends or supplements these General Conditions.

SURETY: Any person, firm, or corporation that has executed as Surety the Contractor's Bid Bond and/or Performance and Payment Bond securing the performance of the Construction Contract.

TECHNICAL SPECIFICATIONS: That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

UNDERGROUND FACILITIES: All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other facilities or attachments, and encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone, or other communications, cable television, water, wastewater, reuse water, storm water, other liquids or chemicals, or traffic or other control systems.

WORK: The entire construction required to be provided under the Contract. Work includes and is the result of performing or providing all plant, labor, equipment, tools, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

2.0 CONTRACTOR REQUIREMENTS

2.1 GENERAL: The Work covered by the Contract Documents includes the furnishing of all plant, labor, equipment, tools, materials and performing all operations and construction work, including all appurtenant work, in accordance with the Contract Documents. The Contractor shall perform all operations, construction, and incidentals necessary to complete the Work in a turnkey condition. The Contractor may subcontract a portion of the Work, but shall perform with his own organization work amounting to not less than fifty one percent (51%) of the total Contract Price.
3.0 CONTRACT DOCUMENTS

3.1 CONTRACT DOCUMENTS: Refer to Article III of the Construction Contract for the list of Contract Documents included in the Contract. The Contract Documents comprise the entire Contract between the County and Contractor.

3.2 INTENT:

A. It is the intent of the Contract Documents to describe the Work (or part thereof) to be constructed by the Contractor, which results in a complete and functional product. Any plant, labor, materials, equipment, tools, and services that may be reasonably inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended results will be provided whether or not specifically called for at no additional cost to the County.

B. The several parts of the Contract are intended to be complimentary in describing the Work and the responsibilities of the Contractor and the County and any requirements stipulated in one part of the Contract Documents is as binding on the parties as though occurring in all. In the event there are any conflicting provisions or requirements among the Contract Documents, the provisions and requirements of the Contract Documents shall take the following order of precedence:

1. IFCA and Contract Amendments
2. Construction Contract
3. Special Conditions
4. Supplemental General Conditions
5. General Conditions
6. Technical Specifications
7. Construction Plans/Drawings

In case of discrepancy concerning dimension, quantity, and location, graphic drawings will take precedence over the specifications; explanatory notes on the drawings will take precedence over conflicting drawn indications; and large scale details will take precedence over smaller scaled drawings. In case of discrepancy concerning quality and/or quantity within the documents, the Contractor shall include the better quality and/or the greater quantity, unless otherwise determined in writing by the County.

Interpretations and resolution of discrepancies within the Contract Documents shall be made solely by the County’s Administrative Agent and issued in writing upon receipt of the Contractor’s written request.

C. The Contractor shall fully comply with all requirements of the Contract. No verbal agreement or conversation with any agent or employee of the County, Construction Project Manager or the Engineer/Architect of Record either before or after the execution of the Construction Contract shall affect or modify any of the terms or obligations contained in the Contract.

3.3 CONFORMED CONTRACT DOCUMENTS: Following award of the Contract, the County will prepare the Conformed Contract Documents, providing one (1) originally signed and executed set to the Contractor. Up to three (3) additional copies of the Conformed Contract Documents will be provided to the Contractor at no charge. Additional copies of the Conformed Contract Documents may be obtained from the County upon payment of reproduction costs. One complete set of Construction Plans/Drawings and Technical Specifications shall be maintained at the Jobsite for as-built drawings preparation by the Contractor, and shall be available for review by the County at all times.

3.4 CONSTRUCTION PLANS/DRAWINGS:

A. Refer to Article III of the Construction Contract for the list of Construction Plans/Drawings.

B. The general character and scope of the work is illustrated by the Construction Plans/Drawings. These drawings, which show the scope, extent and character of the work to be furnished and performed by the Contractor have been prepared and/or approved by the Engineer/Architect of Record, and are referred to in the Contract Documents. Shop drawings are not Construction Plans/Drawings as so defined.
C. Checking of Drawings and Dimensions:
   1) The Contractor shall check all drawings immediately upon their receipt and shall promptly notify the County in writing of any discrepancies. Anything shown on the drawings and not mentioned in the Technical Specifications, or mentioned in the Technical Specifications and not shown on the drawings, shall be of like effect as if shown or mentioned in both.
   2) Figures marked on all drawings shall, in general, be followed in preference to scale measurements. Large-scale drawings shall, in general, govern small-scale drawings. The Contractor shall compare all drawings and verify the figures before laying out the work and will be responsible for any errors which might have been avoided thereby. When dimensions on the drawings are affected by the type of equipment selected, the Contractor shall adjust such dimensions as conditions may require, upon written notification and approval of the County.

3.5 AMENDING AND SUPPLEMENTING CONTRACT DOCUMENTS:
   A. The Contract may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by an Interim Field Change Agreement (IFCA), or a Contract Amendment.
   B. The requirements of the Contract may be supplemented and minor variations and deviations in the Work may be authorized by a written interpretation or clarification, or by a Field Adjustment as directed by the County.

3.6 REFERENCE STANDARDS:
   A. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to laws or regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or laws or regulations in effect on the Effective Date of the Contract, except as may be otherwise specifically stated in the Contract.
   B. No provision of any such standard, specification, manual, or any instruction of a manufacturer or supplier shall be effective to change the duties or responsibilities of the County or the Contractor or any of their Subcontractors, consultants, agents, or employees from those set forth in the Contract. No such provision or instruction shall be effective to assign to the County or any of their authorized representatives, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract.

3.7 REUSE OF DOCUMENTS:
   A. The Contractor and any Subcontractor or supplier or other individual or entity performing or furnishing all or any portion of the Work, shall not:
      1) Have or acquire any title to or ownership rights in any of the drawings, specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of the Engineer/Architect of Record or the Engineer/Architect of Record’s consultants, including electronic media editions.
      2) Reuse any of such drawings, specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of the County and the Engineer/Architect of Record and specific written verification or adaption by the Engineer/Architect of Record.
   B. The prohibition of this paragraph will survive final payment, or termination of the Contract. Nothing herein shall preclude the Contractor from retaining copies of the Contract Documents for record purposes.
4.0 PRE-CONSTRUCTION ACTIVITIES

4.1 PRE-CONSTRUCTION CONFERENCE:
   A. Following award of the Contract, the County may schedule a pre-construction conference. Attendees of the conference shall be the Contractor and the Contractors proposed superintendent, the County and authorized representative(s), utility company representatives, and other interested parties.
   B. The pre-construction conference is intended to establish a working understanding among the parties, and to review work schedules, procedures for handling shop drawings and other submissions, processing of progress payments, and such other matters as may be pertinent to the Work. The Contractor shall submit, for approval by the County, a summary of the proposed work approach, a preliminary Schedule of Values, a preliminary Submittals Schedule, a preliminary Construction/Progress Schedule, emergency contact phone numbers, Labor and Equipment Rate Schedule (excluding overhead and profit), and any other information as required for the pre-construction conference.

4.2 PRELIMINARY SCHEDULES SUBMISSION AND ACCEPTANCE:
   A. SCHEDULE OF VALUES:
      1) This schedule includes quantities and prices for all Lump Sum bid items, which when added together equal the Lump Sum Contract Price for each such item bid, and subdivides the Lump Sum items into component parts in sufficient detail to serve as the basis for the review and approval of progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each Lump Sum item of Work bid.
      2) The Contractor’s Schedule of Values will be acceptable to the County as to form and substance if it provides a reasonable allocation of the Lump Sum Contract Prices to component parts of the Lump Sum item of Work.
   B. SUBMITTALS SCHEDULE:
      1) This schedule, which is incorporated into the Construction/Progress Schedule, provides for the review and acceptance of the Contractor’s submittals required by the Contract Documents, and must provide sufficient time for the County review so as to comply with the Contract Times.
      2) This schedule shall also include any Contractor proposed substitutions/“or equal” products requiring review by and approval of the County. The Contractor shall provide sufficient time in the Construction/Progress Schedule for such product review.
      3) The Contractor’s schedule of submittals will be acceptable to the County if it provides for a workable arrangement for reviewing and processing the required submittals as shown on the Progress Schedule.
   C. CONSTRUCTION/PROGRESS SCHEDULE:
      1) This construction schedule, prepared in Primavera compatible critical path format, indicating the times (numbers of days or dates) for starting and completing the various items and stages of the Work, including the scheduling of any Milestones specified in the Contract Documents, Substantial Completion, and Final Completion. The initial submittal shall, at a minimum, indicate the late start dates and late finish dates required to meet the Contract Times.
      2) The Contractor’s Progress Schedule will be acceptable to the County if it provides for an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on the County responsibility for the Progress Schedule, for Sequencing, scheduling, or progress of the Work, nor interfere with or relieve the Contractor from the Contractor’s full responsibility therefore.
   D. The County will provide the Contractor with its comments to the above schedules. No Progress Payment will be made to the Contractor until acceptable schedules are submitted to the County.

4.3 NOTICE TO PROCEED: A written Notice will be provided to the Contractor by the County affirming the date on which the Contract Times will commence to run. The date of the Notice to Proceed generally begins the Contract Times unless another date is otherwise agreed to by the County and the Contractor, and is the date on which the Contractor shall start to perform the Contractor’s obligations under this Contract. This Notice to Proceed will also set the completion dates for Milestones (where applicable),
Substantial Completion, and Final Completion of the Work. No work shall commence at the Jobsite prior to the date on which the Contract Times commence to run.

4.4 EARTH MOVING PERMIT:

A. Temporary storage and stockpiling of materials resulting from earthmoving activities on private property will require a permit based on the Sarasota County Earthmoving Ordinance. The Contractor is responsible for obtaining an Earthmoving Permit prior to commencing construction, in the event the Contractor plans on storing and stockpiling such materials on private property.

B. Earthmoving activities, such as excavating, hauling, receiving, and stockpiling, performed in connection with a Sarasota County construction or maintenance project, and performed within and upon County owned property and rights-of-ways, is authorized under the Sarasota County Earthmoving Ordinance as an exemption. These activities, however, may be subject to certain submittals per the Earthmoving Ordinance. The Contractor is responsible for determining what, if any, submittals are required in order to comply with the Earthmoving Ordinance.

4.5 NOTIFICATIONS:

A. Notice to the County: The Contractor shall give the County five (5) days advanced written notice of the date scheduled to commence Work under this Contract in order that required County actions may be started sufficiently in advance of the Contractor's operations. This Notice to the County shall be given within the time frame of the issuance of the Notice to Proceed.

B. Notification of Utility Companies: The Contractor shall notify the utility companies and agencies well ahead of the proposed Work. The Contractor shall cooperate with all affected utility companies and provide schedules, etc., when requested.

C. Emergency Vehicle Notification: The Contractor shall notify the police, fire department, and ambulance services of the proposed construction schedule one week in advance of the proposed Work.

D. Resident Notification: The Contractor will provide notification to all residents affected by, and adjacent to the Work. The notification will be delivered no less than one week prior to construction commencement. Notices shall be hand-delivered door to door to the properties first affected by the construction; thereafter properties to be affected within five (5) days of construction shall receive notice thereof. The door hanger format shall be developed by the County for use by the Contractor.

4.6 AUDIO-VISUAL PRE-CONSTRUCTION RECORD: Prior to commencing the Work, the Contractor shall have a continuous color audio-video record in digital video format taken at and around the Jobsite, and along the length of the proposed Work, to serve as a record of pre-construction conditions. No construction shall begin prior to review and acceptance of the digital video’s covering the Work area(s) by the County. The County shall have the authority to reject all or any portion of the audio-video recordings not conforming to the specifications and order that it be redone at no additional charge. The Contractor shall promptly reschedule the re-recording of unacceptable coverage after being notified. The County will designate those areas, if any, to be omitted from or added to the audio-video coverage. The audio-video recordings shall not be made more than thirty days prior to construction start. All audio/video recordings and written records related to the recordings shall become property of the County. Submittals of pre and post Construction digital video recordings will be as specified in the Contract Documents.

4.7 COMMUNICATIONS/NOTICES:

A. Communications: Except as otherwise provided in the Contract, the County and the Contractor shall endeavor to communicate to each other on matters arising out of or relating to the management of the Work. Communications by and with the County’s consultants shall be through the County. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the County.

B. Notices: All forms of notices given by the Contractor or the County must be in writing, and delivered to the other party in the manner of and within the time prescribed by the Contract Documents. If a written notice is not presented in a timely manner, it is presumed not to have been given.
5.0 PROGRESS AND CONTROL OF THE WORK

5.1 TIMELY PERFORMANCE OF THE WORK:

A. Time limits stated in the Construction Contract are of the essence of the Contract. By executing the Contract, the Contractor confirms that the Contract Times stated in the Construction Contract are reasonable periods for performing the Work.

B. The Contractor shall execute the Work in such time and with such forces of workers, materials, equipment and tools as are required to complete the Work as contemplated in the Contract Documents and detailed in the current Construction/Progress Schedule. If at any time the workers, materials, equipment and tools used are insufficient or improper for securing the quality of work required, or the required rate of progress, the Contractor shall increase its efficiency and improve the quality of its work to comply with the Contract Documents and as is necessary to complete the Work within the Contract Times.

5.2 SEQUENCE OF WORK:

A. The Contractor shall schedule the Work as set forth in the Contract Documents, and where shown, perform the Work in stages as indicated in the Contract Documents.

B. The Contractor shall submit a Work sequence schedule/plan to the County for review prior to any construction activity. This Work sequencing, once approved, shall be reflected in the Construction/Progress Schedule. The Contractor shall take into consideration any special conditions, restrictions and allowances identified in the Contract Documents, when developing the sequence schedule and implementing the Work.

C. Special conditions, restrictions and allowances may be required to minimize inconvenience to the general public and to expedite the restoration efforts.

5.3 TEMPORARY FACILITIES/STAGING AND STORAGE AREA(S):

A. The Contractor shall provide adequate facilities at every stage of performing the Work.

B. The types of facilities and utility services required for general temporary use at the Jobsite may include the following (other specific services may be required for specific construction methods or operations):
   1) Water service (potable for certain uses).
   2) Portable sanitary facilities.
   3) Drainage and run-off control facilities.
   4) Compressed air service.
   5) Electric power service.

C. In setting up temporary facilities, the Contractor shall:
   1) Follow all applicable codes and ordinances that may govern the permitting and inspection by governing authorities in establishing the temporary facilities.
   2) Comply with pollution and environmental protection regulations for the use of water and other services, and for the discharge of wastes and storm water drainage from the Work area.
   3) Enforce strict discipline in the use of utility services. Limit availability to essential uses, so as to minimize waste. Do not allow the installations to be abused or endangered.
   4) Provide adequate signs, fences, barricades, and flashing lights, and take all necessary precautions for the protection of the Work area and the safety of the public.

D. Staging and Storage Areas:
   1) The Contractor shall be responsible for locating, securing, and paying for staging and storage areas located outside of the County owned property and rights-of-ways.
   2) The Contractor’s attention is directed to the County requirements involving permitting for Earth Moving activities. (See Article 4 – Pre-Construction Activities).
E. Storage of Materials:

1) All materials, supplies and equipment, including the County supplied materials, supplies and equipment, intended for use in the Work shall be suitably stored by the Contractor at the Contractor’s expense, to prevent damage from exposure to the elements of nature, mixture with foreign substances, vandalism or theft, or other cause. The Contractor shall take all precautions against any such damage occurrence, and shall be responsible for damage resulting there from. Delivered materials shall be stored in a manner recommended by the manufacturer or supplier and acceptable to the County before any payment will be made.
2) The County will refuse to accept, or sample for testing any materials, supplies or equipment that have been improperly stored or have become contaminated in any way. Materials found unfit for use shall not be incorporated in the Work and shall immediately be removed from the Jobsite.
3) All materials removed from the Jobsite for disposal as called for in the Contract Documents or directed by the County, shall be performed in a legal manner in conformance with all local, State, and Federal laws and regulations.

5.4 USE OF JOBSITE AND OTHER AREAS:

A. The Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Jobsite and other areas permitted by laws and regulations, and shall not unreasonably encumber the Jobsite and other areas with construction equipment or other materials or equipment. The Contractor shall allow use of the Jobsite by other contractors, by the County, and by the public, as applicable.

B. The Contractor shall keep the Jobsite free of rubbish and waste materials on a continual basis, and shall restore to their original condition those portions of the Jobsite disrupted by the construction.

5.5 MOBILIZATION:

A. The Contractor shall mobilize as required for the proper performance and completion of the Work.

5.6 WORK HOURS:

A. Regular working hours are defined as up to ten (10) hours per day, Monday through Friday, beginning no earlier than 7:00 A.M. and ending no later than 7:00 P.M., excluding Saturdays, Sundays, and Holidays.

B. Whenever the Contractor is performing any part of the Work, with the exception of equipment maintenance and cleanup, inspection of the Work will be required.

C. Requests for approval by the County to work other than regular working hours must be submitted to the County at least 48 hours prior to any proposed weekend work or scheduled extended workweek hours.

D. Periodic unscheduled work hours on weekdays will be permitted provided that two hours notice is provided to the County. Maintenance and cleanup may be performed during hours other than regular working hours.

5.7 REIMBURSEMENTS TO THE COUNTY FOR UNSCHEDULED WORK HOURS: The Contractor shall reimburse the County for additional construction management and/or inspection costs incurred as a result of unscheduled work in excess of regular working hours. At the County's option, unscheduled work costs may either be deducted from the Contractor's monthly payment request or deducted from the Contractor's retention prior to release of final payment. Construction management/inspection costs shall be as follows: Overtime and Saturday rates shall be at 1.5 times the prevailing staff rates; and Sunday and holiday rates will be at 2 times the prevailing staff rates.

5.8 PROGRESS MEETINGS:

A. On days and at a location mutually agreed upon at the pre-construction conference, regular progress meetings shall be held at the Jobsite, at the County’s designated office, or at the Contractor’s project office, to review the progress of the Work, identify any utility issues and potential delays or problems, review any required project submittals, review progress payment applications, and discuss other issues that may arise.
5.9 CONSTRUCTION/PROGRESS SCHEDULE:
A. The Contractor shall adhere to the currently accepted Construction/Progress Schedule as it may be adjusted from time to time as provided below, and as may be further detailed in the Contract Documents.

1) Schedule adjustments with no change in Contract Times: The Contractor shall submit to the County for acceptance, proposed adjustments in the Construction/Progress Schedule that will not result in changing the Contract Times. Such adjustments, if accepted, shall be incorporated into a revised Progress Schedule which will be submitted with the Contractor’s next progress payment application.

2) Proposed schedule adjustments with a change in Contract Times: Proposed changes to the Construction/Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11. Adjustments in Contract Times may only be modified by an IFC or Contract Amendment.

5.10 AS-BUILT DOCUMENTS:
A. The Contractor shall maintain in a safe place at the Jobsite one record set of Conformed Contract Documents, IFCAs, Contract Amendments, and written interpretations and clarifications in good order and annotated to show changes made during construction.

B. All approved shop drawings, product data sheets, and samples, are to be made available to the County at all times during the progress of the Work.

C. During the progress of the Work, the Contractor shall maintain accurate daily written records of the Work performed and conditions of the Work.

D. The record set of Construction Plans/Drawings, which will become the “as-built” drawings, shall be “red-lined” by the Contractor to show all changes in the Work, including approved materials and equipment changes and approved changes in horizontal and vertical alignments made during the course of the Work. All locations and dimensions shall be referenced by two (2) point swing-ties taken from permanent, readily identifiable reference points, such as building walls and corners, columns, utility poles, hydrants, valves, etc. All depths or elevations are to be taken from finished floors, finished grades, or from permanent bench marks shown on the Construction Plans/Drawings.

E. Prior to approval of the Contractor’s monthly payment applications, the County shall review the as-built drawings to ensure that they are up-to-date, and accurate. The County may withhold progress payments should the review reveal that the as-built drawings have not been properly maintained.

F. Upon completion of the Work, and as a pre-requisite to Final Completion and Acceptance, these as-built drawings shall be delivered in good condition to the County.

G. The Contractor shall be held responsible for the accuracy of the as-built drawings, and shall bear any costs incurred in finding utilities or other concealed or buried Work items, as a result of incorrect data furnished by the Contractor. The review of the as-built drawings by the County does not relieve the Contractor from obligations under the Contract, and for providing the necessary information on Work completed for the Engineer/Architect of Record’s certification.

5.11 PERMITS, LICENSES, TAXES, AND LAWS AND REGULATIONS:
A. Unless otherwise provided in the Contract, the Contractor shall obtain and pay for all necessary permits and licenses required by Federal, State, and local agencies having jurisdiction over the Work, prior to the start of construction. The Contractor shall adhere to the permit conditions provided in the permits issued by all such agencies, and shall post all permits in a conspicuous location at the Jobsite.

B. The Contractor shall pay all sales, consumer, use and other similar taxes required by the laws and regulations of the place where the Work is performed.

C. The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations related to the Work.
5.12 WORK WITHIN THE COUNTY/STATE RIGHTS-OF-WAYS:
A. The Contractor shall refer to the latest revised editions of the Sarasota County Mobility standards, and the Florida Department of Transportation specifications and regulations for all work within the County and State rights-of-ways.
B. Contractor shall apply for, pay, and obtain the necessary city, County, and State Right-of-Way Permit(s) prior to the start of any Work within a public right-of-way.
C. All private and public right-of-ways, which are used or affected by the Work, will be maintained and preserved from damage during the Contractor’s operations and restored to their original or better condition upon completion or cessation of Work.

5.13 OPEN EXCAVATIONS:
A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons, and damage to property.
B. The Contractor shall comply with all provisions of the Florida Trench Safety Act. The Contractor shall comply with all OSHA regulations referenced in the Florida Trench Safety Act, and applicable to the construction of the Work.
C. The Contractor shall, at his own expense, provide suitable and safe bridges and other crossings for accommodating travel by vehicles, pedestrians and workmen.
D. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the County may require special construction procedures such as limiting the length of open trench and prohibiting stacking excavated material in the street.
E. Access to driveways must be maintained and, if disturbed or damaged, restored as soon as practical by the Contractor.
F. The maximum length of open trench shall be forty (40) feet at any one time. Trenches shall not remain open overnight.
G. The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be barricaded and well lighted at all times when construction is not in progress.
H. All costs in connection with open excavations shall be included in the Unit Price and/or Lump Sum prices.

5.14 EROSION CONTROL:
A. The Contractor shall develop and maintain a plan to control erosion at the Jobsite, and submit the plan to the County for approval prior to the start of construction. The plan shall incorporate best management practices in the use of erosion control methods, be complete and in place prior to the start of construction in accordance with the Contract Documents, and as directed by the County.
B. The Contractor shall not commence clearing, grubbing, grading, or other construction activities which may cause erosion until the erosion control plan is in place, and approved by the County.
C. Where certain thresholds are met relative to the amount of area disturbed by the Work, a National Pollutant Discharge Elimination System (NPDES) permit will be required to be obtained by the Contractor, in accordance with the Contract Documents.
D. The Contractor shall regularly inspect, maintain, and repair or replace damaged components of the erosion control system. The Contractor shall maintain the erosion control system until final acceptance, and thereafter, remove the temporary erosion and sediment control system promptly.

5.15 MAINTENANCE OF TRAFFIC (MOT):
A. The Contractor shall be responsible for the design, submittal, and approval by the proper reviewing agencies, of maintenance of traffic (MOT) plans for each stage of the Work. It will be the Contractor’s responsibility to set up and maintain the MOT according to State and local transportation agency regulations. All MOT work shall conform to the requirements of the Sarasota County Mobility standards.
B. The Contractor’s work under this section includes preparing, constructing, and maintaining of approved ingress and egress features at the temporary storage/staging facility to reduce/eliminate tracking of mud, silt, and dust onto public and private residential streets.

C. The Contractor shall at all times so conduct his work as to insure the least possible obstruction to traffic and inconvenience to the general public and the residents in the vicinity of the Work, and to insure the protection of persons and property, in a manner satisfactory to the County.

D. The Contractor may not begin work until the maintenance of traffic (MOT) plan is approved in writing by Sarasota County Mobility. Any modification to the MOT plan requires Sarasota County Mobility written approval.

E. All spills caused by the Contractor’s operation will be cleaned up immediately.

F. All public and private streets affected by the Contractor’s hauling operations, shall be cleared of dust, debris, and minor drippings at the end of each work day.

G. Unless otherwise provided in the Bid Form, all costs in connection with the maintenance of traffic work shall be included in the Unit Price and/or Lump Sum prices.

5.16 SUBSURFACE AND PHYSICAL CONDITIONS:

A. Geotechnical Reports and Soil Borings: Technical data, such as reports and explorations and tests of subsurface conditions at or contiguous to the Jobsite are included, if applicable, in the Contract Documents, and were used by the Engineer/Architect of Record in preparing the Construction Drawings.

B. Limited Reliance by the Contractor on Technical Data: The Contractor may rely upon the general accuracy of the technical data contained in such reports. Except for such reliance on such technical data, the Contractor may not rely upon or make any claim against the County or the Engineer/Architect of Record, or any of their representatives or agents with respect to:
   1) The completeness of such reports for the Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by the Contractor, and safety precautions and programs incident thereto; or
   2) Other data, interpretations, opinions, and information contained in such reports; or
   3) Any Contractor interpretation of or conclusion drawn from any technical data or any such other data, interpretations, opinions, or information.

C. Differing Subsurface or Physical Conditions:
   1) Immediately upon discovery by the Contractor of substantially differing subsurface and physical conditions than those shown in the Contract Documents, or unusual from conditions normally expected at Jobsites of this type, the Contractor shall promptly notify the County to obtain a determination on how to proceed with the Work. Except in an emergency, the Contractor shall not further disturb the Jobsite until the County investigates the conditions, provides further testing where required, resolves the issue, and directs the Contractor to proceed with the Work.
   2) Should the County determine the conditions differ materially and increase or decrease the Contractor’s costs or time in the performance of the Work, and upon approval of the County, an IFCA or Contract Amendment will be prepared in accordance with the Contract.
   3) If the County determines that the conditions are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the County shall promptly notify the Contractor in writing, stating the reasons therefore.
   4) In such cases, the Contractor shall move to another area of the Work until the issue is resolved.

5.17 EXISTING UNDERGROUND FACILITIES:

A. The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Jobsite is based on information and data furnished to the County or the Engineer/Architect of Record by the owners of such underground facilities, including the County, or by others. The County and the Engineer/Architect of Record shall not be responsible for the accuracy or completeness of any such information or data.
B. The Contractor shall be responsible to maintain water, telephone, electric, cable TV, sewer, gas and other related utility services throughout the construction of the Work at no additional cost to the County.

C. The Contractor shall fully cooperate with all private and public utilities during the installation of their new facilities, or repair or relocation of their existing facilities. The Contractor shall coordinate his work accordingly and shall have no claim except for time extension for delays associated with the proposed utility improvements.

D. The Contractor shall be fully responsible for providing all temporary piping, electrical hook-ups, lighting, temporary structures, or whatever is required to maintain the existing utility systems.

E. The cost of all of the following will be included in the Contract Price and the Contractor shall have full responsibility for:
   1) Reviewing and checking all such Underground Facilities information and data.
   2) Locating all Underground Facilities shown or indicated in the Contract Documents.
   3) Coordination of the Work and cooperating with the owners of such Underground Facilities, including the County, during construction.
   4) The safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

F. If an Underground Facility is uncovered or revealed at or contiguous to the Jobsite which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, or not field located by the utility owner(s) with the accuracy required by Sunshine State One Call of Florida, the Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency), identify the owner of such Underground Facility and give notice to that owner of the facility, and to the County.
   1) The County will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, the Contractor shall be responsible for the safety and protection of such Underground Facility.
   2) If the County concludes that the conflict can be avoided with a minor modification of the Work, the County will require a Field Adjustment, instructing the Contractor how to proceed with the Work, and document the event.
   3) If the County concludes that a change in the Contract Documents is required, an IFCA or Contract Amendment will be issued to reflect and document the event and the required adjustments to the Work. Following consultation with the utility owner, either the utility owner will relocate the existing Underground Facility, or an IFCA or Contract Amendment will be issued to the Contractor for the relocation of the existing utility.
   4) An equitable adjustment shall be made in the Contract Times, to the extent attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents or field locates.

G. In order to comply with Chapter 556 of the Florida Statutes, the Contractor is responsible for contacting Sunshine State One Call of Florida (SSOCOF) @ 811, or 1-800-432-4770, to request a locate ticket so that SSOCOF members that own or operate underground facilities can locate and mark their underground facilities at and adjacent to the Jobsite. This requirement includes all operations such as demolition, grading, dredging, ditching, drilling, boring, cable plowing or other such activities. Notification requirements are as follows:
   1) The Contractor must notify SSOCOF a minimum of two (2) full business days, excluding Saturdays, Sundays and legal holidays, prior to excavating. Day one begins the day after the call is made.
   2) If the Contractor’s dig site is in an area that is underwater, the Contractor must call ten (10) full business days before digging.
5.18 QUALITY CONTROL:
A. The Contractor shall establish and maintain appropriate quality control for the Work. The Contractor shall record any problems in complying with laws, regulations and ordinances, and corrective actions taken. Any problems with the Work shall be reported to the County immediately, followed by written notification of the occurrence of the incidences.

B. The Contractor shall not deviate from the approved Project permits, Construction Plans/Drawings and Technical Specifications, without specific authorization from the County. In the event that the Contractor determines modifications are required, the Contractor shall prepare and submit a written request to the County including an explanation of the problem and justification for the suggested modification.

C. The Contractor shall establish and maintain the Contractor’s own quality control program for the Work.

D. Cutting and Patching: The Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. The Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of the County and the others whose work will be affected.

5.19 MATERIALS, EQUIPMENT, AND WORKMANSHIP:
A. Unless otherwise stated in the Contract Documents, all workmanship, materials, and articles incorporated in the Work shall be of good quality and new and of the most suitable grade of their respective kinds for the purpose and shall be acceptable to the County. The County shall decide the question of quality where the terms, “or equal”, “approved equal” or “equivalent”, are used in the Technical Specifications following reference to a specific manufacturer of equipment or materials. When and to the extent required by the Technical Specifications or by the County for review, the Contractor shall provide full information, including reports and tests, concerning the materials, equipment, or methods of work which the Contractor contemplates incorporating in the Work. Samples of materials shall be submitted for review where required. Materials and equipment installed or used, or unusual methods of work used without such review may be rejected without liability to the County.

B. Defective Material, Equipment, or Work:
1) When any material or equipment not conforming to the requirements of the Contract Documents has been delivered to the Jobsite, or incorporated in the Work, or whenever any Work performed does not conform to the Contract Documents or is of inferior and unacceptable quality, then such material, equipment, or work shall be deemed to be defective. All such defective materials, equipment, or Work shall be corrected, removed, replaced or made satisfactory to the County at no additional cost to the County.
2) The Contractor shall not be entitled to an extension of the Contract Time for correcting or removing and replacing defective Work.

C. All materials, equipment, and installation shall be applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the manufacturer or applicable supplier, except as otherwise may be provided in the Contract Documents.

D. Special Warranties and Guaranties: All special warranties and guaranties required by the Technical Specifications shall expressly run to the benefit of the County.

5.20 INSPECTION AND TESTING OF MATERIALS AND EQUIPMENT:
A. Unless otherwise provided in the Bid Form, all testing shall be at the expense of the Contractor.

B. The Contractor shall employ and pay for the services of an independent testing laboratory approved by the County, to perform all inspections and tests required by the Contract Documents.

C. The Contractor shall arrange for all such testing, and give the County timely notice of the readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
D. The Contractor shall pay for all factory tests required on equipment and materials. Copies of test results or where acceptable, certifications of compliance on equipment and materials made at the factory or manufacturing plant, shall be furnished to the County. Test reports on equipment shall be reviewed by the County before the equipment covered by the tests is delivered to the Jobsite. Test requirements are set out in the detailed Technical Specifications for the particular equipment and materials.

E. If laws or regulations of any public body having jurisdiction require any portion of the Work specifically to be inspected, tested, or approved by an employee or other representative of such public body, the Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish the County the required certificates of inspection or approvals.

F. Copies of all test results shall be provided to the County as soon as they are available.

G. Uncovering Work:
   1) If any Work required to be inspected, tested, or approved, is covered prior to such inspection, testing, or approval without written concurrence of the County, it must, if requested by the County, be uncovered for the County’s inspection, testing, and approval, and replaced at the Contractor’s expense.
   2) If, after written concurrence by the County to cover the Work, the County considers it necessary or advisable that the covered Work be observed, inspected, or tested by others, the Contractor, at the County’s request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as the County may require, that portion of the Work in question, furnishing all necessary labor, tools, material, and equipment.
   3) If it is found that the uncovered Work is defective, the Contractor shall pay all costs arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory repairing, replacing, or reconstructing the defective Work, including but not limited to all costs of repair or replacement of work of others.
   4) If it is found that the uncovered Work previously consented in writing by the County to be covered, is not found to be defective, the Contractor shall submit a Claim to the County for an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction.

H. Correction or Removal and Replacement of Defective Work: Within seven (7) days of issuance of a written notice of defective Work by the County, the Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by the County, remove it from the Jobsite and replace it with Work that is not defective. The Contractor shall pay all costs arising out of or relating to such correction or removal and replacement, including but not limited to all costs of repair or replacement of work of others, caused by the defective Work.

5.21 SANITARY REGULATIONS: Adequate sanitary facilities for the use of persons employed in the Work, properly secluded from public observations, shall be provided and maintained by the Contractor in such a manner and at such points as shall be approved by the County. These facilities shall be maintained at all times without nuisance and their use shall be strictly enforced. Upon completion of the Work, they shall be removed from the Jobsite, leaving it clean and free from nuisance.

5.22 SAFETY AND HEALTH REGULATIONS/ PROTECTION OF PROPERTY:

A. The Contractor shall comply with, and ensure that the Contractor's personnel and subcontracted personnel comply with all current applicable local, State and Federal policies, regulations, laws, and standards relating to safety and health, including the Occupational Safety and Health Administration (OSHA) for the General Industry (29 CFR 1910) and for the Construction Industry (29 CFR 1926). The Contractor shall follow the Federal Environmental Protection Agency Standards and Florida Trench and Safety Act under Florida Statutes Section 553.60-553.64. The Contractor shall observe, follow and comply with all OSHA permitting instructions and regulations for Confined Space Entry, 29 CFR 1910.146 as related to the project. These forms can be obtained electronically from OSHA's website. The Contractor shall post all required OSHA notices at the Jobsite.
B. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1) All persons on the Jobsite or who may be affected by the Work.
2) All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Jobsite.
3) Other property at the Jobsite or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of the Work.

C. The Contractor shall comply with all applicable laws and regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. The Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when execution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

D. All damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any Subcontractor, supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be promptly remedied by the Contractor.

E The Contractor’s duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed, and the County has issued the Final Completion and Acceptance Certificate.

5.23 HAZARDOUS ENVIRONMENTAL CONDITIONS:

A. If the Contractor encounters a hazardous environmental condition or if the Contractor or anyone for whom the Contractor is responsible creates a hazardous environmental condition, the Contractor shall immediately:

1) Secure or otherwise isolate such condition.
2) Stop all Work in connection with such condition and in any area affected thereby except in an emergency.
3) Notify the County promptly and thereafter within 48 hours in writing confirming such notice.
4) The County shall promptly determine the necessity for the County to retain a qualified expert to evaluate such condition or take corrective action, if any.

B. In such cases where a hazardous environmental condition is discovered, the Contractor shall move to another area of the Work until the issue is resolved.

C. The Contractor shall not resume Work in connection with such condition or in any affected area until after the County has obtained any required permits or clearances related thereto and delivered to the Contractor written notice:

1) Specifying that such condition and any affected area is or has been rendered safe for the resumption of the Work; or
2) Specifying any special conditions under which such Work may be resumed safely.
3) The County shall prepare an IFCA for an adjustment in Contract Times, as a result of such delay, and stipulate any special conditions under which Work is agreed to be resumed by the Contractor.

D. Contractor shall not be responsible for any hazardous environmental condition uncovered or revealed at the Jobsite which was not shown, indicated, or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a hazardous environmental condition created with any materials brought to the Jobsite by Contractor, Subcontractors, suppliers, or anyone else for whom Contractor is responsible.

5.24 SALVAGED EQUIPMENT AND MATERIALS:

A. Unless otherwise directed by the County, salvaged materials, equipment or supplies are the property of the County and shall be kept clean and properly stored as directed by the County.
B. Should the County choose to not accept these materials they shall be removed from the Project site by the Contractor as soon as practical.

C. All materials excavated by the Contractor and suitable for fill shall be stockpiled and used by the Contractor as fill material for the Work. Excess suitable fill material not required for the Work shall remain the property of the County and shall be transported by the Contractor within a 5 mile radius and unloaded at a location determined by the County at no additional cost.

D. All materials excavated by the Contractor and not suitable for fill, and material not required by the County shall be hauled and be properly disposed of by the Contractor at no additional expense to the County.

5.25 CLEAN-UP AND DISPOSAL:

A. Cleanup and restoration shall be accomplished on a continuing basis throughout the performance of the Work, and in such a manner as to maintain a minimum of nuisance and interference to the County, residents and workers at or adjacent to the Jobsite.

B. Removal of Debris during Performance of the Work: During the progress of the Work, the Contractor shall keep the Jobsite and other areas free from accumulations of construction debris, waste materials, rubbish, and other debris. The Contractor shall, within a reasonable time, dispose of all residues resulting from the Work, and shall remove and properly dispose of any surplus excavation, broken pavement, concrete, brick, lumber, and other construction materials, and any refuse as these items accumulate.

C. Removal and disposal of such construction debris, waste materials, rubbish, and other debris shall conform to applicable laws and regulations.

D. Removal of Temporary Facilities: At the time the need for temporary structures or temporary utility services or a substantial portion thereof has ended, or when the temporary structures and services have been replaced by permanent Work, and not later than the time of substantial completion, the Contractor shall promptly remove the installations. The Contractor shall complete and restore work, which may have been delayed or affected by the installation and use of the temporary facilities, including any required repairs, grading, restoration, and cleaning of exposed surfaces, and replace any work damaged beyond acceptable restoration.

E. Final Clean-up: Prior to Final Completion and Acceptance of the Work, the Contractor shall clean the Jobsite and the Work and make it ready for utilization by the County. At the completion of the Work, the Contractor shall remove from the Jobsite all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition or better, all property not designated for alteration by the Contract Documents.

6.0 COUNTY’S RIGHTS

6.1 COUNTY ACCESS TO WORK: The County, including its authorized representatives and agents, and governmental agency representatives with jurisdictional interests, shall at all times have access to the Work wherever it is in preparation or progress, and may visit the Jobsite and observe the Work to ensure compliance with the Contract. The Contractor shall provide the County and its agents proper and safe conditions for such access and advise them of the Contractor’s Jobsite safety procedures and programs so that they may comply.

6.2 COUNTY MAY STOP WORK:

A. If the Contractor’s work is repeatedly defective, or the Contractor fails to supply sufficient skilled workers or suitable materials or equipment to complete the Work, or fails to correct a safety issue brought to the Contractor’s attention, or fails or neglects to perform the Work in such a way that the completed Work will not meet the Contract Time requirements, or violates in a substantial way any provisions of the Contract, the County, may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.
B. The County may terminate payments to the Contractor for those portions of the Work affected by a stop work order.

C. The Contractor, upon receipt of a stop work order, shall, after securing the Jobsite, immediately cease work, and shall not be entitled to a Change in Contract Price or Contract Times as a result of such order.

D. The Contractor may be allowed to resume work following the submission and acceptance of a work plan addressing the cause of the stop work order, and provided that the corrective work is carried out within seven (7) days of resuming work.

6.3 COUNTY MAY CORRECT DEFECTIVE WORK:

A. The County may, without prejudice to other remedies the County may have, issue a stop work order to the Contractor for failure or neglect to carry out the provisions of the Contract as noted above, and after seven (7) days written notice to the Contractor, proceed to correct or remedy any such deficiencies either by its own forces or through the services of another contractor.

B. In such case, an appropriate IFCA or Contract Amendment shall be issued deducting from payments then or thereafter due the Contractor the reasonable costs of correcting such deficiencies, including the County’s expenses for additional services made necessary by such default, neglect, or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor, or Surety, shall pay the difference to the County.

C. The Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by the County of the County’s rights and remedies under the Contract.

6.4 RIGHT TO RETAIN DEFECTIVE WORK:

A. If, instead of requiring correction or removal and replacement of defective Work, the County finds and decides that any part or portion of the imperfect work is not of sufficient magnitude or importance as to make the Work dangerous or undesirable, or if the removal of such Work would create conditions which are dangerous or undesirable, and the County prefers to accept the defective Work or portions thereof, the County may do so. Any portion of work not so accepted by the County shall be removed and replaced as required by the Contract Documents. The Contractor shall be responsible for all attributable costs of the County’s evaluation of and determination to accept such defective Work as well as the diminished value of the Work to the extent not otherwise due to the Contractor.

B. If any such acceptance of defective Work occurs prior to final payment, an IFCA may be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and the County shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted, and the cost of evaluating the defective Work for acceptance. If the acceptance occurs after final payment, the appropriate costs will be paid by the Contractor, or Surety, to the County.

C. Such retention of a portion of the Work that would be considered defective shall not constitute a waiver by the County of the Contractor’s remaining obligations under the Contract.

6.5 COUNTY MAY SUSPEND WORK:

A. The County may, at any time and without cause, suspend the work or any portion thereof for a period of not more than ninety (90) consecutive days by notice in writing to the Contractor. Such Notice shall fix the date on which the Work shall be resumed. The Contractor shall resume the Work on the date so fixed. The Contractor may request an increase in Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if a timely Claim is made pursuant to the Contract.
COUNTY MAY TERMINATE FOR CAUSE:

A. The occurrence of any one or more of the following events will justify termination for cause:

1) The Contractor’s persistent failure to perform the Work in accordance with the Contract Documents including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the approved Construction/Progress Schedule, adjusted from time to time pursuant to the Contract Documents.

2) The Contractor’s disregard of laws or regulations of any public body having jurisdiction.

3) The Contractor’s disregard of the authority of the County’s authorized agents.

4) The Contractor’s failure to repair or remove and replace defective materials or Work.

5) The Contractor’s violation in any substantial way of any provisions of the Contract.

B. If one or more of the events identified above occur, the County may, after giving the Contractor and Surety seven (7) days written notice of its intent to terminate the services of the Contractor:

1) Exclude the Contractor from the Jobsite, and take possession of the Work and of all the Contractor’s tools, appliances, construction equipment, and machinery at the Jobsite, and use the same to the full extent they could be used by the Contractor (without liability to the Contractor for trespass or conversion),

2) Incorporate in the unfinished Work all materials and equipment stored at the Jobsite or elsewhere for which the County has paid the Contractor, and

3) Complete the Work as the County may deem expedient.

C. If the County proceeds as provided above, the Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price (less any unused Allowance balances), exceeds all claims, costs, losses, and damages sustained by the County arising out of or relating to completing the Work, such excess will be paid to the Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, the Contractor or Surety shall pay the difference to the County. When exercising any rights or remedies allowed under the Contract, the County shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding the above, the Contractor’s services will not be terminated if the Contractor begins within seven (7) days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure all such noted failures within no more than thirty (30) days of receipt of said notice.

E. Where the Contractor’s services have been so terminated by the County, the termination will not affect any rights or remedies of the County against the Contractor then existing or which may thereafter accrue. Any retainage or payment of moneys due the Contractor by the County will not release the Contractor from liability under the Contract.

F. In the case of termination of the Contract for any cause before completion, the Contractor, if notified to do so by the County, shall promptly remove any part or all of the Contractor’s equipment and supplies at the expense of the Contractor.

COUNTY MAY TERMINATE FOR CONVENIENCE:

A. Upon seven (7) days written notice to the Contractor, the County may, without cause and without prejudice to any other right or remedy of the County, terminate the Contract for the County’s convenience. In such case, the Contractor shall, upon properly securing the Jobsite, be paid for (without duplication of any items):

1) Completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination.
2) Documented expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work.

3) Documented claims, costs, losses, and damages incurred in settlement of terminated contracts with subcontractors, suppliers, and others.

4) Reasonable expenses directly attributable to termination.

B. The Contractor shall not be paid on account of loss of anticipated profits or revenue for Work not completed by the Contractor, or for other economic losses arising out of or resulting from such termination.

6.8 PARTIAL UTILIZATION:

A. Prior to Substantial Completion of all the Work, the County may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which the County and the Contractor agree constitutes a separately functioning and usable part of the Work that can be used by the County for its intended purpose without significant interference with the Contractor’s performance of the remainder of the Work, subject to the following conditions:

1) The County at any time may request the Contractor in writing to permit the County to use or occupy any such part of the Work which the County believes to be ready for its intended use and substantially complete. If and when the Contractor agrees that such part of the Work is substantially complete, the Contractor will certify to the County that such part of the Work is substantially complete and request the County to inspect that portion of the Work, and issue, with the County’s approval, a certificate of Substantial Completion for that part of the Work.

2) The Contractor at any time may notify the County in writing that the Contractor certifies any such part of the Work ready for its intended use and substantially complete and request the County to inspect that portion of the Work, and, with the County’s approval, issue a certificate of Substantial Completion for that part of the Work.

3) Within a reasonable time after either such request, the County and the Contractor shall make an inspection of that part of the Work to determine its status of completion. If the County does not consider that part of the Work to be substantially complete, the County will notify the Contractor in writing giving the reasons therefore. If the County considers that part of the Work to be substantially complete, the County will prepare a Certification of Substantial Completion of that part of the Work, designating the date of the Substantial Completion, noting any work remaining to bring that portion of Work to final completion, and list the division of responsibilities between the County and the Contractor for partial utilization of the Work, including the start of any warranty period and the transfer of property insurance coverage, where applicable.

6.9 PROJECT AUDIT:

A. Authorized representatives of the County, its agents, and governmental agency representatives with jurisdictional interests, shall have access to all books, documents, papers, and records of the Contractor specifically relating and directly pertinent to the Work for the purpose of conducting a project audit.

B. The Contractor, its employees and agents including all Subcontractors, shall allow access to its records during normal business hours following sufficient notification.

7.0 CONTRACTOR’S RIGHTS AND RESPONSIBILITIES

7.1 GENERAL:

A. The Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. The Contractor shall strictly comply with all specifications, drawings and terms of the Contract.
B. The Contractor shall cooperate with the County during the progress of the Work, and coordinate with utility companies and the County’s other contractors (when applicable), working at or in the vicinity of the Jobsite, to ensure continuous workflow while minimizing delays.

C. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, procedures, and coordination of all portions of the Work under the Contract.

D. It is understood and agreed that the Contractor, by careful examination, is satisfied as to the nature and location of the Work, the conditions of the Jobsite, the character, quality and quantity of the materials to be employed, the character of equipment and facilities needed for the execution of the Work, the general and local conditions, and all other matters which can in any way affect the performance of the Work.

E. The Contractor shall provide and assume full responsibility for all plant, materials, equipment, tools, labor, services, transportation, construction equipment and machinery, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, bonds and insurance policies, overhead, office, and all other costs and expenses of facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

F. The Contractor shall be responsible to the County for acts and omissions of the Contractor, the Contractor’s employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

G. The Contractor shall be responsible for inspection of portions of work performed by others to determine that such portions are in proper condition to receive subsequent Work by the Contractor. The Contractor shall immediately notify the County if any such work is defective or unsuitable to accept the Work by the Contractor.

7.2 SUPERVISION AND SUPERINTENDENCY:

A. The Contractor representative named in the Construction Contract, shall have full power and authority to act on the Contractor’s behalf, in all matters dealing with the Contract. All communications and directions given to, received by, or received from the Contractor representative shall be binding on the Contractor.

B. The Contractor shall assign a competent superintendent, who may be the Contractor’s representative or authorized designee, who shall personally oversee and direct the Work on a daily basis. The superintendent will be the Contractor’s representative on the Jobsite and shall have complete authority to act on behalf of the Contractor. All communications and directions given to, received by, or received from the superintendent shall be binding on the Contractor, unless otherwise conveyed to the County in writing.

C. The Contractor shall assign other supervisory personnel as necessary to assure faithful prosecution and timely delivery of services pursuant to the requirements of the Contract. The Contractor shall notify the County in writing of the names and credentials of the superintendent and supervisory personnel at the pre-construction conference.

D. The Contractor representative and superintendent shall be the points of contact for the County.

E. The Contractor representative and superintendent shall not be changed except by written consent of the County, unless this person or persons cease to be employed by the Contractor. The Contractor shall provide written notice to the County of any such changes within two (2) working days.

7.3 SUBCONTRACTORS AND MATERIAL SUPPLIERS:

A. The Contractor shall provide an initial list of proposed Subcontractors, including the portions of Work to be performed by each of the Subcontractors. The list of Subcontractors shall be finalized and submitted to the County at the pre-construction conference for approval. The list of material suppliers shall be developed through Shop Drawing reviews.

B. If the County has reasonable objection to any Subcontractor or material supplier, whether identified in the Bid or subsequently, the Contractor shall submit an acceptable substitute without entitlement to any change in Contract Price. After acceptance by the County of any particular Subcontractor or
material supplier, the Contractor shall make no substitution without written approval of the County, which will not be unreasonably withheld.

C. The Contractor is fully responsible to the County for the acts and omissions of its Subcontractors and material suppliers, and of persons either directly or indirectly employed by them.

D. Nothing contained in the Contract Documents shall create any contractual relationship between any Subcontractor or material/equipment supplier and the County.

E. Work performed for the Contractor by a Subcontractor, and materials and equipment provided by material/equipment suppliers will be pursuant to appropriate Contracts between the Contractor and the Subcontractor or supplier, which specifically binds the Subcontractor or supplier to the applicable terms and conditions of the Contract for the benefit of the County.

7.4 LABOR:

A. The Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. The Contractor shall at all times maintain good discipline and order at the Jobsite.

B. The Contractor shall ensure that all key personnel, support personnel and other agents are fully qualified and capable to perform their assigned tasks. The County shall have the right to require the Contractor to remove personnel assigned at any level for their performance of the Work or conduct on the Jobsite.

7.5 REPORTING DISCREPANCIES:

A. The Contractor’s Review of Contract Documents Before Starting Work: Before undertaking each part of the Work, the Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. The Contractor shall promptly report in writing to the County any conflict, error, ambiguity, or discrepancy which the Contractor may discover and shall obtain a written interpretation or clarification from the County before proceeding with any Work affected thereby.

B. The Contractor’s Review of Contract Documents During Performance of Work: If, during the performance of the Work, the Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any law or regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any manufacturer/supplier, the Contractor shall immediately report it verbally to the County and provide written, along with a fully detailed explanation, within 48 hours of discovery. The Contractor shall not proceed with the Work affected thereby (except in an emergency) until receiving a written interpretation or clarification from the County.

7.6 PROJECT LAYOUT:

A. The Contractor is responsible for laying out the Work based on the reference points provided by the County, and shall protect and preserve the established reference points and any property monuments existing prior to the start of the Work. The Contractor shall make no changes or relocations to these reference points or property monuments without the prior written approval of the County.

B. The Contractor shall report to the County whenever any reference point or property monument is lost or destroyed or requires relocation. If such relocation is necessary due to changes in grade or Work location, the County will be responsible for their removal and relocation. If the reference point or property monument is lost or destroyed as a result of the Contractor’s operations, the Contractor shall be responsible for the accurate replacement or relocation of such reference point or property monument by a State of Florida Registered Professional Surveyor and Mapper.

C. The Contractor shall furnish all labor, stakes, surveys, batter boards for structures, grade lines and other materials and supplies, as necessary and required for the Work, and shall set construction stakes and batter boards for establishing lines, position of structures, slopes and other controlling points necessary for the proper prosecution of the Work.
7.7 COORDINATION WITH OTHER CONTRACTORS: The Contractor shall coordinate the Work with other contractors that may be working in the Project vicinity performing other work.

7.8 EMERGENCIES: In emergencies affecting the immediate safety or protection of persons or the Work or property at the Jobsite or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. The Contractor shall give the County prompt Notice if the Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by or are required as a result of an emergency.

7.9 PATENT FEES AND ROYALTIES: The Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others.

7.10 SAFETY REPRESENTATIVE: The Contractor shall designate a qualified and experienced safety representative at the Jobsite whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.11 HAZARD COMMUNICATION PROGRAM: The Contractor shall be responsible for coordinating any exchange with the County of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employees at the Jobsite in accordance with laws or regulations.

7.12 RISK OF LOSS: Prior to the Final Completion and Acceptance of the Work by the County, risk of loss for the Work shall remain at the risk of the Contractor and said Contractor shall be required to repair, replace, renew and make good at the Contractor’s own expense all damages caused by force or violence of the elements or any cause whatsoever, provided however, that in such cases the Contractor shall be entitled to a reasonable extension of time within which to complete the Work, unless the delay is due to the negligence, fault, or omission of the Contractor.

7.13 PROTECTION AND RESTORATION OF PUBLIC AND PRIVATE PROPERTY:

A. The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work on the part of the Contractor, or Subcontractors or agents, such property shall be restored by the Contractor, at the Contractor’s expense, to its original or better condition to that existing before the damage was done, or the Contractor shall make good the damage in another manner acceptable to the County.

B. Should any claim be made by any adjacent property owner or occupant because of the performance of the Work, the Contractor shall promptly settle with such owners or occupants by negotiation or otherwise resolve the claim.

C. Along the location of the Work, all sidewalks, streets, driveways, mailboxes, walks, lawns, landscaped areas, bushes, trees, shrubbery, irrigation systems and other above and below ground physical features shall be protected by the Contractor, and where disturbed or damaged, promptly restored to their original or better condition by use of similar or comparable materials. Fences, walls, and other features removed by the Contractor shall be replaced as soon as conditions permit. All grassed areas, which have been damaged by the Contractor, shall be re-graded, and sodded or seeded and mulched as directed by the County.

D. Trees close to the Work shall be boxed or otherwise protected against injury. The Contractor shall trim all branches and roots that are liable to damage because of the Contractor’s operations, but in no case shall any tree be cut or removed without prior notification of the County. All injuries to bark, trunk, limbs and roots of trees shall be repaired by dressing, cutting, and painting according to approved methods, using only approved tools and materials. The Contractor shall abide by the County’s Tree Protection Ordinance.

E. The protection, removal, replacement, and restoration of existing physical features along the line of Work shall be a part of the Work under the Construction Contract. Final acceptance will not be
provided, and final payment will not be made until all public and private property has been restored to the satisfaction of the County.

F. In case of failure on the part of the Contractor to promptly restore damaged property, or make good such damage or injury, the County may, after providing seven (7) days written notice to the Contractor, proceed to repair, rebuild or otherwise restore such property and the cost thereof will be deducted from any monies due or which may become due the Contractor under the Contract.

G. Weather Conditions: Sarasota County is subject to severe weather conditions such as hurricanes, tropical storms, tornadoes, strong winds, heavy rains, lightning, and the like. It is the Contractor’s responsibility at all times to: (1) monitor current and developing weather conditions; (2) to develop and implement appropriate contingency plans to ensure proper storage of materials, supplies, and equipment, and (3) to secure the Project site so as to not endanger public health and safety, or public and private property. The Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work, as required by the Contract Documents and all laws, codes, and standards. Contractor shall take all necessary precautions for the safety of, and protection to prevent damage, injury or loss to:
   1) Persons on and adjacent to the Site.
   2) The Work, including materials, supplies, and equipment incorporated therein.
   3) Public and private property adjacent to the Site.

7.14 PROTECTION OF ENVIRONMENTAL RESOURCES: The Contractor shall comply with all applicable Federal, State, and local environmental laws and regulations. The environmental resources within and adjacent to the Jobsite (not impacted by permit), shall be protected during the entire period of the Work. The Contractor shall confine activities to areas defined by the Contract Documents.

7.15 PROTECTION OF HISTORIC AND ARCHEOLOGICAL RESOURCES:
   A. If historic or archeological resources are encountered during the Contractor’s operations, the Contractor shall notify the County immediately, stop Work in the area until directed to restart, and proceed as directed below.
   B. The Contractor shall comply with Sarasota County Ordinance #2004-073 and with the Historic Preservation chapter of Apoxsee: The Revised and Updated Sarasota County Comprehensive Plan.
   C. According to Florida Statutes Chapter 872, it is unlawful to disturb, vandalize, or damage a human burial.
   D. In such cases, the Contractor shall move to another area of the Work until the issue is resolved.

8.0 COUNTY’S RESPONSIBILITIES AND DUTIES

8.1 STATUS OF THE CONSTRUCTION PROJECT MANAGER: The Construction Project Manager shall be the authorized County representative with specific responsibilities and duties as defined by the County for management of specified portions of the Contract.

8.2 REVIEW AND APPROVAL OF THE WORK: The Contractor’s Work shall at all times be subject to the review, testing and approval of the County or authorized designee(s). The County shall decide any and all questions which may arise as to the quality and acceptability of the materials and equipment furnished, the Work performed, the rate of progress of Work, the conditions of the Jobsite, the maintenance of schedules, the interpretation of the Contract Documents through the County’s Administrative Agent, and all questions as to the acceptable performance of the Contractor relative to the requirements of the Contract Documents.

8.3 RESOLUTION OF DISCREPANCIES: In case of differences discovered and reported by the Contractor between the Construction Plans/Drawings and Technical Specifications, the County, through the Administrative Agent, shall make a determination whether the Construction Plans/Drawings or Technical Specifications represent the intent of the Contract, and such determination shall be communicated to the Contractor in writing. Should the County discover a discrepancy between the Construction Plans/Drawings and Technical Specifications, a written determination shall be provided to the Contractor.
8.4 RECOMMENDATION OF PROGRESS PAYMENTS:
A. The County will evaluate the Contractor’s payment application and if in agreement, will sign the application indicating the County’s recommendation to pay the amounts shown.
B. Should the County disagree with any item of Work shown on the application, the County will promptly return it to the Contractor for correction and re-submittal.
C. Should the Contractor disagree with the County’s determination of Work completed and monies due, the Contractor may request approval of the Work items that are not in question by resubmitting the payment application and file a timely Claim in reference to items of disagreement. In such a case, the County shall recommend approval of the resubmitted payment application for only those items of Work recommended for payment.

8.5 INSPECTION AND EXAMINATION OF THE WORK:
A. The County and/or authorized designee(s), shall have free access to the Work of the Contractor at any time for purposes of inspection and testing, and shall be reasonably assisted by the Contractor in conducting such inspections and testing of the Work performed and the nature of same. Such assistance of the Contractor shall, if necessary, include the uncovering, testing or removal of portions of finished Work.
B. The County will not supervise, direct, control, or have authority over or be responsible for the Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the Contractor to comply with laws and regulations applicable to the performance of the Work.
C. All materials and equipment shall be subject to inspection, examination and testing by the County at any time during manufacture, and at places where manufacturing of the materials and equipment is taking place. The County may reject defective materials and equipment during manufacture or before or after they have been incorporated into the Work. If the Contractor fails to replace defective Work or rejected materials and equipment, the County may replace such materials and equipment or correct such defective Work and charge the cost thereof to the Contractor.
D. No final inspection, acceptance of Work, materials or equipment or final or interim acceptance of same by the County or certification of the Engineer/Architect of Record shall relieve the obligation of the Contractor to the County to do the Work in a good, workmanlike manner, and to furnish proper, specified equipment and materials, and to perform properly all terms and any obligations of the Contract.

8.6 PROJECT REPRESENTATIVE/INSPECTOR: The Construction Project Manager’s duly authorized on-site Project Representative (PR), or the County’s duly authorized Inspector may be assigned to the Project, or any part thereof, at any time. The presence or absence of the RPR/Inspector does not lessen the responsibility of the Contractor to perform the Work in accordance with the Contract Documents. In case of dispute between the Contractor and the PR/Inspector as to materials furnished, or the manner and method of performing the Work, the PR/Inspector has authority to reject materials or Work, and to stop the Work until the issue can be referred to, and decided by the County. The PR/Inspector is not authorized to revoke, alter, enlarge, relax, release, or amend any of the Contract requirements, nor to issue any instructions on, nor to approve or accept any portion of the Work, or materials, or equipment; nor are any of his/her actions, authorized or unauthorized, to be so construed.

8.7 RIGHT TO REJECT DEFECTIVE WORK:
A. The County has the authority to reject Work which the County believes to be defective, or that the County believes will not produce a completed Work that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Work as a functioning whole as indicated by the Contract Documents. The County also has authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
B. Prompt notice of all defective Work of which the County has actual knowledge will be given to the Contractor.
8.8 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES:

A. The Contractor shall submit Shop Drawings, product data sheets, and samples to the County for review and acceptance in accordance with the approved Schedule of Submittals.
   1) Shop Drawings: Submit number of copies specified in the Contract Documents. The Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show the services, materials, and equipment the Contractor proposes to provide and to enable review of the information as required for approval.
   2) Product Data: Submit number of product data sheets specified in the Contract Documents. The data sheets shall include standard printed information on materials, products, and systems not custom prepared, from which selections can be designated by the Contractor. Information shall include product dimensions, tolerances, manufacturer’s recommendations for application and use, compliance with standards, and other information indicating that the material, product, or system meets or exceeds the Technical Specifications requirements.
   3) Samples: Submit number of samples specified in the Contract Documents. Clearly identify each sample as to material, supplier, pertinent data such as catalog numbers, the use for which intended and other data as the Engineer/Architect of Record may require, enabling review of the information as required for approval.

B. Where a Shop Drawing, product data sheet, or sample is required by the Contract Documents or the Schedule of Submittals, any related Work shall not be performed by the Contractor until the review and approval process of the pertinent submittal is complete. Shop Drawings, product data sheets, and samples submittals will be at the sole expense and responsibility of the Contractor.

C. The Engineer/Architect of Record will review, or take other appropriate action on submittals only for the limited purpose of checking for conformance with the information provided to the requirements of the Contract Documents. The Contractor shall be responsible for the adequacy of the performance of the materials and equipment submitted.

D. Submittal Procedures:
   1) Before submitting each Shop Drawing, product data sheet, and sample, the Contractor shall have determined and verified:
      a. All field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto.
      b. The suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work.
      c. All information relative to the Contractor’s responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
      d. The review and coordination of each Shop Drawing, product data sheet, or sample with other Shop Drawings, product data sheets, and samples and with the requirements of the Work and the Contract Documents.
   2) Each submittal shall bear a stamp or specific written certification that the Contractor has satisfied its obligations under the Contract Documents with respect to the Contractor’s review and approval of that submittal.
   3) With each submittal, the Contractor shall give the County specific written notice of any variations, that the Shop Drawing, product data, or sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing, product data sheet, or sample submittal; and, in addition, by a specific notation made on each Shop Drawing, product data sheet, or sample submitted to the County for each such variation.

E. Re-submittals: The Contractor shall make corrections required and shall return the required number of corrected copies of Shop Drawings and product data; and submit, as required, new samples for review and approval. The Contractor shall direct specific attention in writing to revisions other than the corrections called for on previous submittals.
8.9 “OR EQUAL” AND SUBSTITUTIONS:

A. “Or Equal” Items: Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier, the specification or description is intended to establish the type, function, appearance, and quality of the material or equipment required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or-equal” item or no substitution is permitted, other items of material or equipment or material or equipment of other suppliers may be submitted to the County for review under the following circumstances:

1) “Or-Equal” Items: If in the County’s sole discretion an item of material or equipment proposed by the Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by the County as an “or-equal” item, in which case review and approval of the proposed item may, in the County’s sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. A proposed item of material or equipment will be considered functionally equal to an item so named if:
   a. It is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics.
   b. It will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Work as a functioning whole.
   c. It has a proven record of performance and availability of responsive service.

2) The Contractor certifies that, if approved and incorporated into the Work:
   a. There will be no increase in cost to the County or increase in Contract Times, and
   b. It will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. Substitute Items:

1) If in the County’s sole discretion an item of material or equipment proposed by the Contractor does not qualify as an “or-equal” item, it may be considered a proposed substitute item or it may be rejected entirely.

2) The Contractor shall submit sufficient information as provided below to allow the County to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefore. Requests for review of proposed substitute items of material or equipment will not be accepted by the County from anyone other than the Contractor.

3) The requirements for review by the County will be as set forth below, as may be supplemented elsewhere in the Contract Documents, and as the County may decide is appropriate under the circumstances.

4) A substitute will not be considered by the County unless there is an associated reduction in cost for its use.

5) The Contractor shall make written application to the County for review of a proposed substitute item of material or equipment that the Contractor seeks to furnish or use. The application shall include the following:
   a. The Contractor shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design; be similar in substance to that specified; and be suited to the same use as that specified.
   b. The Contractor will state the extent, if any, to which the use of the proposed substitute item will prejudice the Contractor’s achievement of Substantial Completion on time; whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with the County for other work on the Project) to adapt the design to the proposed substitute item; and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
   c. The Contractor will identify all variations of the proposed substitute item from that specified; provide information on available engineering, sales, maintenance, repair,
and replacement services; and shall contain an itemized estimate of all credits that will result directly or indirectly from use of such substitute item.

6) Special Warranty and Guarantee: The County may require the Contractor to furnish at the Contractor’s expense a special performance warranty and guarantee with respect to any substitute accepted by the County.

C. COST REIMBURSEMENT: The County will record costs of evaluating a substitute proposed or submitted by the Contractor. Whether or not the County approves a substitute item so proposed or submitted by the Contractor, the Contractor shall reimburse the County for the charges of evaluating each such proposed substitute. The Contractor shall also reimburse the County for the charges for making changes in the Contract Documents (or in the provisions of any other direct contract with the County) resulting from the acceptance of each proposed substitute.

D. CONTRACTOR’S EXPENSE: The Contractor shall provide all data in support of any proposed “or equal” or substitute at the Contractor’s expense, and shall have no claim for additional cost or time should the item be rejected.

E. The County’s approval or rejection of any “or equal” or substitute item submitted by the Contractor is final.

8.10 CLAIMS: All Contractor claims shall be submitted to the County for evaluation, review, and recommendation to the County. Claims must be filed in accordance with Article 12 of these General Conditions.

8.11 RECOMMENDATION OF SUBSTANTIAL COMPLETION AND FINAL PAYMENT:

A. Upon receipt of a written request by the Contractor, the County shall schedule and conduct a Substantial Completion inspection. Should the County determine that the Work is Substantially Complete, the County will prepare and sign a Certificate of Substantial Completion in accordance with Article 13 of these General Conditions.

B. Upon receipt of a written request by the Contractor, the County shall schedule and conduct a Final Completion inspection. Should the County determine that the Work is complete and ready for the County’s acceptance, the County will prepare and sign a Final Completion and Acceptance Certificate in accordance with Article 13 of these General Conditions.

8.12 COOPERATION: The County shall endeavor to cooperate with the Contractor to achieve successful completion of the Work. The County will promptly respond to requests for information and Construction Document interpretations; and will make all reasonable efforts to work with the Contractor to resolve any Claims or disputes.

8.13 AVAILABILITY OF LANDS FOR WORK:

A. The County represents that it owns the lands, or is permitted to perform work on and over the land, upon which the Work is to be constructed. Upon request of the Contractor, the County shall furnish copies of available land surveys of the Jobsite. Permanent easements for permanent structures or utilities, and temporary easements shall be secured and paid for by the County.

B. The County shall notify the Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Jobsite with which the Contractor must comply in performing the Work, including any permit conditions required under any Federal, State, and local permit obtained by the County for the Work.

C. The Contractor shall provide all necessary additional land required for the erection of temporary construction facilities and storage of materials and equipment, together with right of access to the same.

8.14 SURVEY/PROJECT CONTROLS:

A. The County shall provide Construction Plans/Drawings based on surveys establishing both horizontal and vertical reference points, which in the Engineer/Architect of Record’s/County’s judgment are necessary to enable the Contractor to layout the Work.
B. The Contractor shall be responsible for laying out the Work based on the reference points provided, shall protect and preserve the established reference points and any property monuments existing prior to the start of the Work, and shall make no changes or relocations without the prior written approval of the County.

9.0 WORK BY OTHERS

9.1 CONSTRUCTION BY THE COUNTY OR BY SEPARATE CONTRACTORS:

A. The County reserves the right to perform construction or operations related to the Project with the County’s own forces, or under separate contracts with other contractors. The Contractor shall have no claims for delay or additional cost involved due to such actions by the County.

B. The County shall be responsible for and provide coordination of the activities of the County’s own forces and other contractors with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other contractors and the County in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after joint review and mutual agreement. This construction schedule shall then constitute the schedules to be used by the Contractor, the County’s own work force, and separate contractors unless subsequently revised.

C. Work in the Project area may also be performed by utility owners repairing or relocating their existing facilities or constructing new facilities. The Contractor shall coordinate his Work with that of these utility owners and cooperate with them fully.

D. The County will endeavor to provide sufficient written notice to the Contractor prior to starting any such work by others.

E. The Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and the County’s forces, proper and safe access to the Jobsite, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs.

F. If the proper execution or results of any part of the Contractor’s Work depends upon work performed by others, the Contractor shall inspect such other work and promptly report to the County in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of the Contractor’s Work. The Contractor’s failure to so report will constitute an acceptance of such other work as fit and proper for integration with the Contractor’s Work except for latent defects and deficiencies that may be later discovered in such other work.

10.0 COST OF THE WORK

10.1 LUMP SUM WORK:

A. Where the Contract Documents provide that all or part of the Work is to be Lump Sum Work, the Contract Price will be deemed to include an amount equal to the sum of all the items appearing in the Bid Form as “Lump Sum.”

B. At the pre-construction conference, the Contractor will be required to submit a Schedule of Values which breaks down the Lump Sum items into smaller components as approved by the County, and includes the cost of each component. The Schedule of Values, which requires approval by the County, will be used to review and approve the Contractor’s progress payments based on the approved Work performed on each component of the Lump Sum item in the previous month.

C. Each Lump Sum item will be deemed to include an amount considered by the Contractor to be adequate to cover the Contractor’s total expenses required to complete each such item on the Bid Form, including all overhead, profit, and direct and indirect expenses for each such identified item.

10.2 UNIT PRICE WORK:

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price work, initially, the Contract Price will be deemed to include an amount equal to the sum of all the unit prices bid for each separately identified item times the estimated quantity of each item as indicated in the Bid Form.
B. The estimated quantities of items of Unit Price work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price work performed by the Contractor will be made by the County, and based on the approved actual quantities installed in the Work.

C. Each Unit Price will be deemed to include an amount considered by the Contractor to be adequate to cover the Contractor’s total expenses required to complete each item on the Bid Form, including all overhead, profit, and direct and indirect expenses for each separately identified item.

D. The Contractor shall not be allowed an adjustment in the Contract Price if the quantity of any item of Unit Price work performed by the Contractor differs materially and significantly from the estimated quantity of such item indicated in the Bid Form.

E. Final payment will be issued as recommended by the County, to reflect actual amounts due the Contractor for approved Work covered by Unit Prices, and the final Contract Price shall be correspondingly adjusted.

10.3 ALLOWANCES:

A. It is understood that the Contractor has included in the Contract Price all allowances shown in the Bid Form and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to the County.

B. The allowances indicated on the Bid Form and as defined in the Contract Documents, include the cost to the Contractor of materials and equipment required by the allowances to be delivered to the Jobsite, all applicable taxes, and the Contractor’s costs for unloading and handling at the Jobsite. It is also agreed that all labor, equipment and installation costs, as well as overhead, profit, and other expenses contemplated for the Work have been included in the Contract Price, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance: The Contractor agrees that contingency allowance items, as defined in the Contract Documents, are for the sole use of the County.

D. Final payment will be issued as approved by the County to reflect actual amounts due the Contractor on account of Work covered by allowances, and the final Contract Price shall be correspondingly adjusted.

11.0 CHANGES, DELAYS, AND TIME EXTENSIONS

11.1 CHANGES IN THE WORK:

A. AUTHORIZED CHANGES IN THE WORK:

1) Without invalidating the Contract and without notice to any surety, the County may, at any time or from time to time, order additions, deletions, or revisions in the Work by issuance of a Contract Modification. Upon receipt, the Contractor shall sign the Contract Modification and proceed with the Work involved, which will be performed under the applicable conditions of the Contract.

2) If the Contractor is unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that is allowed by the Contract Modification, a Claim may be made as provided in Article 12 of these General Conditions.

B. UNAUTHORIZED CHANGES IN THE WORK:

1) The Contractor shall not make any changes or substitutions in the Work without the express written consent of the County, and only after evaluation by the County in accordance with the Contract Documents.

2) The Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented by an executed Contract Modification, except in the case of an emergency.
C. MINOR VARIATIONS TO THE WORK: The County may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Work as a functioning whole as indicated by the Contract Documents. These minor variations shall be accomplished by the Contractor, who shall perform the work involved promptly.

11.2 INTERIM FIELD CHANGE AGREEMENT (IFCA)/CONTRACT AMENDMENT:
A. A Contract Modification will either be an IFCA or a Contract Amendment, depending on whether the Contract Price stipulated in the Construction Contract will be exceeded or not.
   1) An IFCA will be issued for changes within the general Scope of the Work that will not exceed the Contract Price. Once the IFCA is signed by the County and the Contractor, the Contractor shall promptly proceed with the Work involved.
   2) A Contract Amendment will be issued for changes in the Scope of Work or any change that will increase the Contract Price. The County, with the Contractor’s input, will determine the extent of adjustment to Contract Price and Contract Times and will prepare the Contract Amendment. The Contract Amendment shall be signed by the Contractor and approved by the County.
B. The IFCA/Contract Amendment will include a detailed description of the Work covered under the Contract Modification, and any adjustments in the Contract Price or Contract Times, or both which are agreed to by the parties. The IFCA/Contract Amendment may also include supporting data detailing the costs associated with the change in the Work.
C. Except in an emergency endangering life or property, no changes in the Work shall be performed by the Contractor unless a properly executed IFCA or Contract Amendment is received by the Contractor.

11.3 CHANGE IN CONTRACT PRICE:
A. The County, without invalidating the Contract, may order extra work or make changes by altering, adding to, or deducting from the Work; the Contract Price being adjusted accordingly. All such work shall be performed under the conditions of the Contract.
B. For any such changes in the Work, a Contract Modification shall be prepared and authorized as above described.
C. The value of any such changes in the Work, whether by additions or deletions in the original scope of the Work, shall be determined in one or more of the following ways:
   1) By established Contract Unit Price.
   2) By an agreed upon Unit Price if the item of Work is not included in the Bid Form.
   3) By an agreed upon Lump Sum price.
   4) By the Cost-Plus method described below.
D. Cost-Plus: In the event that unit prices are not available, or a lump sum price cannot be agreed upon, then the value of the change in the Work shall be determined by the following cost items during their time of use in completing the change in the Work:
   1) Labor costs, including foremen, but excluding superintendent and overhead and profit.
   2) Materials or equipment entering permanently into the work.
   3) Construction plant and equipment (owned or rented).
   4) Power and consumable supplies for the operation of power equipment.
   5) Insurance, Social Security, retirement and unemployment contributions.
   6) A fixed Contractor’s fee in the form of a percentage applied to the above items.
E. Labor and equipment costs under the Cost-Plus method shall be determined from the Labor and Equipment Rate Schedule provided by the Contractor at the start of Work on or about the date of the pre-construction conference. The Labor and Equipment Rate Schedule shall exclude overhead and profit.
F. Contractor’s Fee: The Contractor’s fee for overhead and profit under the Cost-Plus method shall be determined as follows:
   1) A mutually acceptable fixed fee, or
2) Based on the following percentages:
   a. For Work performed by the Contractor’s work force: ten (10%) percent.
   b. For Work performed by a Subcontractor, regardless of tier: fifteen (15%) percent.
   c. Maximum Contractor’s fee for overhead and profit under the Cost-Plus method: 15%

G. The amount of credit to be allowed under the Cost-Plus method by the Contractor to the County for any change in the Work which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in the Contractor’s fee by an amount equal to ten (10%) percent of such net decrease.

H. When both additions and credits are involved in any one change in the Work under the Cost-Plus method, the adjustment in the Contractor’s fee shall be computed on the basis of the net change in the costs.

I. The value of the changes in the Work shall be determined at the time that the IFCA or Contract Amendment is authorized and agreed upon. No change in the Work shall proceed until a fully signed and authorized IFCA or Contract Amendment is received by the Contractor.

11.4 CHANGE IN CONTRACT TIMES:

   A. Time extensions for changes in the Work or allowable delays, will depend upon the extent, if any, by which the changes or delays cause additional time in the completion of the critical path elements of Work as shown on the most current Construction/Progress Schedule. The IFCA/Contract Amendment granting the time extension may provide that the Contract Time be extended only for those specific elements so delayed. The remaining Contract completion dates for all other portions of the Work will not be altered. Approved time extensions will provide for an adjustment of Contract Times under the resulting revised Construction/Progress Schedule.

   B. The Contract Times may only be changed by an IFCA or a Contract Amendment.

   C. If the Contractor does not agree with the Contract Times adjustment approved by the County, the Contractor may make a written Claim, provided the Claim is timely and submitted in accordance with the provisions of Article 12 of these General Conditions.

11.5 DELAYS AND TIME EXTENSIONS:

   A. No Claims for Delays:
      1) No claim for damages or any claim other than for an extension of Contract Times shall be made or asserted against the County by reason of any delays caused by the County or others.
      2) The Contractor shall not be entitled to an increase in the Contract Price or payment or compensation of any kind from the County for direct, indirect, consequential, impact or other costs, expenses, or damages, including but not limited to cost of acceleration or inefficiency, arising because of delay, disruption, interference or hindrance from any cause.
      3) This provision shall not preclude recovery of damages by the Contractor for hindrances or delays due solely to bad faith or willful, malicious, or grossly negligent conduct on the part of the County or its agents.

   B. Delay Claims: No extension of Contract Times shall be granted by the County unless a timely Claim is made by the Contractor in writing to the County within seven (7) days of the event or incident causing the delay. The Contractor shall demonstrate in its Claim the impact on the critical path of the Construction/Progress Schedule to justify the extension of time requested. Any identified float is not time for the exclusive use or benefit of either the County or the Contractor. Extensions of time for performance may be granted by the County only to the extent that equitable time adjustments for the activity or activities affected exceed the total float. Such justification must be submitted, in writing, within fifteen (15) days of the Claim. If the Contractor can, or could have moved to another part of the Work without affecting the Construction/Progress Schedule’s critical path, a time extension will not be granted by the County.
      1) Delays by the County: If the Contractor should be delayed at any time in the progress of the work by any act or neglect of the County or its agents or employees, or by any other contractor employed by the County, or by utility owners, or by changes ordered in the Work, or by fire, unusual delay in transportation, unavoidable casualties or by delay authorized by
the County pending mediation, or by any cause which the County determines justifies the delay, then the time of completion may be reasonably extended by the County.

2) Utility Conflicts: The Contractor may be granted an extension of time for delays caused by utility conflicts discovered during the prosecution of the Work, provided a timely Claim is submitted, and the Contractor was unaware of such potential conflict. If, however, the potential conflict was shown on the Construction Plans/Drawings and the Contractor failed to uncover the potential conflict ahead of the Work, the Claim for additional time will not be granted.

3) Rain Delays: Reasonable extensions of time, as determined by the County, will be granted to the Contractor for time lost due to rainfall over and above the norm for the County, based on U.S. Weather Bureau statistics. If the Contractor can show that the rain caused additional delays at the Jobsite beyond the actual rain events, additional time extensions may be granted.

4) Force Majeure: The Contractor will be granted a reasonable time extension for a Force Majeure occurrence: an unexpected event that crucially affects the Contractor’s ability to perform the Work, and includes forces of nature (Act of God), such as natural fires, floods, hurricanes, tornados, epidemics; or an event beyond the Contractor’s control, such as major workers strikes, government shut down; or other major catastrophic events. Except as otherwise expressly provided herein, neither party shall be liable for any delay due to causes not reasonably within its control, including but not limited to, acts of civil or military authority, including courts and regulatory agencies, acts of God, war, riot or insurrection, inability to obtain required construction permits, blockades, embargoes, sabotage, epidemics, fires, floods, strikes, lockouts or other labor difficulties, provided such labor difficulties do not arise from inequitable labor practices. In the event of any delay resulting from such causes, the time for performance hereunder shall be extended for a period of time reasonably necessary to overcome the effect of such delays. This shall constitute the sole remedy to either party in the event of such delays.

5) Time Extension Only: Should the Contractor be delayed in the commencement, prosecution or completion of the work by the act, omission or default of the County, or anyone employed by them on the Project, or utility owners or other contractors, or the results of differing subsurface or physical conditions, or the discovery of hazardous environmental conditions, then the Contractor may submit a Claim for an adjustment of Contract Times if justified and as approved by the County, and there shall be no damages for delays.

6) Contractor Delays: The Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of the Contractor. Delays attributable to and within the control of a Subcontractor or supplier shall be deemed to be delays within the control of the Contractor.

7) Delay of Other Projects: The County shall not be liable to the Contractor for any claims, costs, losses, or damages, including reasonable attorney’s fees, and court costs sustained by the Contractor on or in connection with any other project or anticipated project resulting from delays of any kind.

11.6 NOTICE TO SURETY: When required, it is the Contractor’s responsibility to provide notice to its Surety of any changes affecting the general scope of the Work or change in the Contract Price or Contract Times, and to ensure that the amount of the applicable Performance and Payment Bond be adjusted accordingly.

A. IFCA: The Contractor shall furnish proof of notice to Surety of an adjustment to the Contract Times by providing the County with a copy of a letter confirmation from the Surety within fifteen (15) days following the issuance of the IFCA affecting the change.

B. Contract Amendment: The Contractor shall furnish, with the executed Contract Amendment, a performance and payment bond rider, or similar instrument approved by the County, signed by an authorized Surety representative, in the amount of any addition to the Contract Price affected by the Contract Amendment.
12.0 CLAIMS AND DAMAGES

12.1 TIME OF CLAIM:
   A. No claim of the Contractor shall be allowed by the County unless:
      1) The Contractor has given written notice to the County within seven (7) Days of the incident arising to the Claim.
      2) Within fifteen (15) Days after the Contractor has given the written Notice, the Contractor shall submit to the County a detailed claim setting forth the Contractor's justification for adjustments in Contract Price, Contract Times, or both, or other matters in dispute or question, in accordance with the Contract.
   B. No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment has been made under the Contract.

12.2 VALUE OF CLAIM:
   A. The value of a Claim will be limited to only those additional or incremental costs required because of any change in the Work. Such costs shall be in amounts no higher than those prevailing in the locality of the Work.
   B. The procedure for determining the value of the Claim shall be as set forth in Article 11 – Changes, Delays, and Time Extensions.

12.3 CLAIM FORM:
   A. The responsibility to substantiate a Claim shall rest with the party making the Claim.
   B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of the event or events giving rise to the Claim.
   C. Documentation: The Contractor will provide a narrative of the basis of the Claim, including all details and supporting documentation relating to the Claim. The Contractor shall establish and maintain records of all such details and documentation in accordance with generally accepted accounting practices and submit this information, along with any associated itemized cost breakdown and/or time adjustment calculations, in a form acceptable to the County.

12.4 CLAIMS FOR CONTRACT PRICE AND CONTRACT TIMES ADJUSTMENT:
   A. A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 11.3 above.
   B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 11.4 above.

12.5 CONTINUATION OF THE WORK: The Contractor shall carry on the Work and adhere to the Construction/Progress Schedule during all disputes, claims, or disagreements with the County. No Work shall be delayed or postponed pending resolution of any disputes, claims, or disagreements, except in the case where Work is stopped by the County in accordance with the Contract, or as the County and the Contractor may otherwise mutually agree in writing.

12.6 COUNTY’S ACTION:
   A. The County will review each Claim and, within fifteen (15) days after receipt of the last submittal of the Contractor, take one of the following actions in writing:
      1) Deny the Claim in whole or in part setting forth the reasons for the decision.
      2) Suggest a compromise between the parties.
      3) Recommend approval of the Claim, and prepare an IFCA or Contract Amendment adjusting the Contract Price, or Contract Times, or both for the County’s approval.
      4) Notify the parties that the County is unable to resolve the Claim. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
5) In the event that the County does not take action on a Claim within said fifteen (15) days, the Claim shall be deemed denied.

B. The County’s written action, or inaction will be final and binding upon the Contractor, unless the Contractor invokes the dispute resolution procedure set forth in the Construction Contract within thirty (30) days of such action, inaction, or denial.

C. At its sole discretion, the County may deny the Claim in whole or in part. If such action is taken, the County shall provide written notice, with a copy to the Contractor, setting forth the reasons for such the County’s decision. The County’s written action will be final and binding upon the Contractor, unless the Contractor invokes the dispute resolution procedure set forth in the Construction Contract within thirty (30) days of such action.

13.0 PAYMENTS TO CONTRACTOR AND COMPLETION

13.1 GENERAL:

A. On or about the day of the month agreed to at the pre-construction conference, but not more often than once a month, the Contractor may submit for the County’s review, a payment application covering the work completed the previous month up to the date of the application. The progress payment application shall be submitted on the form prescribed and approved by the County.

B. Contractor’s Warranty of Title: The Contractor warrants and guaranties that title to all work, materials and equipment covered by any application for payment, whether incorporated in the Work or not, will pass to the County at the time of payment, free and clear of all liens, claims, security interests and encumbrances (hereafter in these General Conditions referred to as “Liens”). The Contractor will not sublet, sell, transfer, assign or otherwise dispose of the Contract or any portion of it, or of rights, title, or interest therein without the express written consent of the County.

13.2 SUPPORTING DOCUMENTATION:

A. As-Builts: The Contractor shall maintain a set of as-built drawings at the Jobsite. At the time payment application is made, the County shall review the as-built drawings to ensure they are current, accurate, and reflect all changes in the Work as of the date of the application. The County may withhold payment if the as-built drawings have not been maintained by the Contractor in accordance with the Contract Documents.

B. Schedule of Values: The Contractor shall submit the approved Schedule of Values with each progress payment application, indicating the amount of work completed for the previous month on the various components of the Lump Sum Bid Items. The County will review the Schedule of Values for accuracy, and, if in agreement, shall recommend payment.

C. Construction/Progress Schedule: With each payment application, the Contractor shall submit an updated Construction/Progress Schedule using Primavera compatible scheduling software for review and approval by the County. The County may withhold payment if the Contractor fails to submit an updated and approved Construction/Progress Schedule. Should the schedule show that the Contractor is lagging behind the initial (baseline) schedule approved at the start of construction, the County may withhold additional sums as indicated on the “Retainage Table Guidelines” below.

D. Release of Liens: Beginning with the second application for payment, the Contractor shall furnish an affidavit stating that all laborers, material and equipment suppliers, and Subcontractors have been paid for Work covered by all previous months’ applications for payment and shall obtain a partial or complete Release of Lien, as may be necessary, properly executed by all laborers, material and equipment suppliers, and Subcontractors sufficient to secure the County from any claims whatsoever arising out of the Work.

13.3 PROGRESS PAYMENTS: Progress Payments will be made once a month as Work progresses. Said payments will be based upon estimates prepared by the Contractor and approved by the County, of the value of the work performed and materials delivered. Any payment application not approved by the County shall be promptly returned to the Contractor for correction and re-submittal. The payment applications shall be submitted with all required documentation specified in the Contract Documents. Payment applications shall be prepared by the Contractor and submitted to: Sarasota County Public
Works, 1001 Sarasota Center Boulevard, Sarasota, FL 34240, through the County’s web-based contract management software. Should the web-based program be off-line for any length of time, the payment application may be mailed or hand delivered to: Sarasota County Public Works, 1001 Sarasota Center Boulevard, Sarasota, FL 34240 Attn: Project Manager. The Contractor shall contact the County to coordinate access to the website and training on the use of the County’s contract management software.

13.4 PAYMENT FOR STORED MATERIALS: If requested by the Contractor, progress payments may be made to the extent of the delivered cost of materials to be incorporated in the Work, provided the materials are identified in the Bid Form, sufficiently covered from loss by appropriate property insurance, and meet the requirements of the Construction Plans/Drawings and Technical Specifications when delivered to the Jobsite or stored in an acceptable storage location off-site. The Contractor shall submit a “Stored Materials Affidavit” on the form prescribed, for materials for which payment is sought. In any event, progress payments for materials on hand shall not exceed the price of the item bid, and shall not be made without an invoice marked “PAID” and acceptable to the County.

13.5 RETAINAGE: From the total of the amounts ascertained as payable, an amount as indicated in the “Retainage Table” below will be deducted and retained by the County until completion of the entire Contract in an acceptable manner, unless otherwise released by the County in accordance with the Contract Documents. The balance, less all previous payments, shall be certified by the Contractor and recommended by the County for payment.

<table>
<thead>
<tr>
<th>Value of Contract</th>
<th>% of Contract Amount ($) Earned</th>
<th>Total Retainage at Substantial Completion*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 to &lt; 25</td>
<td>25 to &lt; 50</td>
</tr>
<tr>
<td>Less than $1M</td>
<td>10%</td>
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<tr>
<td>&gt;$1M to &lt;$5M</td>
<td>5%</td>
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<td>&gt;$5M</td>
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</tbody>
</table>

* Provided Work has been performed within the Contract Times.

** The cost for deficient work that is not corrected may be estimated at an amount of up to one and one half (1.5) times the value of the work, and may be withheld in addition to the retainage amounts shown in the above table.

13.6 COUNTY MAY WITHHOLD PAYMENTS:

A. The County may reduce or withhold payments in the amounts and to such extent as may be necessary to protect itself from loss for which the Contractor is responsible, including:
   1) Defective Work not remedied.
   2) Third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the County is provided by the Contractor.
   3) Failure of the Contractor to make payments to Subcontractors or material or equipment suppliers.
   4) Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Price.
   5) Damage to the County or a separate contractor.
   6) Reasonable evidence that the Work will not be completed within the Contract Times, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay.
   7) Repeated failure to carry out the Work in accordance with the Contract Documents.

13.7 LIQUIDATED DAMAGES:

A. For each Day any work remains uncompleted after the Contract Times specified, the sum of money per day specified as liquidated damages in the Construction Contract will be deducted from any money due the Contractor. The Contractor will not pay liquidated damages for days in which an
extension of time was granted pursuant to an approved IFCA or Contract Amendment. Allowing the Contractor to finish any of the Work after the Contract Times, including time extensions, does not waive the County’s rights under the Contract.

B. Additional County Expense: Should the Contractor fail to complete the Work within the specified Contract Times, it is agreed that for each day of overrun until final completion, all costs of construction management supervision and inspection furnished by the County shall be at the costs of the Contractor and/or his Surety. Such construction management costs shall be considered to be equal to the job payroll of the County plus 150 percent thereof for overhead, plus on-the-job mileage. Such costs will be deducted from monies due the Contractor at final payment. The amount of such expenses shall be construed to be in addition to other damages that might be assessed by the County.

13.8 PROMPT PAYMENT: The County shall pay the Contractor through payments issued by the Sarasota County Clerk of Courts in accordance with the Local Government Prompt Payment Act, Section 218.70 F.S., upon receipt of the invoice approved by the County and with written approval by the County’s Administrative Agent or his assigned designee indicating that the services have been rendered in conformity with this Contract. The Contractor shall submit an invoice for payment on a monthly basis for those specific services that were completed during the invoicing period, as described in the Bid Form or as listed on the approved Schedule of Values.

13.9 SUBSTANTIAL COMPLETION:

A. When the Contractor considers the entire Work, or a portion thereof (see GC 6.8), ready for its intended use, the Contractor shall notify the County in writing that the Work is substantially complete, listing items of work remaining to be completed by the Contractor (Punch List), and request that the County schedule a Substantial Completion inspection.

B. Promptly after the Contractor’s notification, the County and the Contractor, shall make an inspection of the Work to determine the status of completion.

C. Should the County discover major Work items left uncompleted, or defective Work requiring correction or removal and replacement, the County shall discontinue the inspection, notify the Contractor of the deficiencies observed, and advise the Contractor to re-schedule the Substantial Completion inspection and of potential additional costs which may be incurred.

D. If uncompleted or defective Work is discovered during the initial inspection, the Contractor shall promptly complete the Work, and if required, remove from the Jobsite any and all materials and Work rejected by the County as failing to conform to the Contract Documents, whether incorporated into the work or not. The Contractor shall promptly replace the defective Work in accordance with the Contract Documents without expense to the County, including bearing the costs of making good all work by others damaged or destroyed by the Contractor’s removal and replacement of such defective Work.

E. If the County considers the Work substantially complete with only minor corrections, adjustments, and clean-up items remaining, the County will prepare, sign, and date the Certificate of Substantial Completion, which shall fix the date of Substantial Completion. The County shall prepare a tentative list of items to be completed or corrected for final completion of the Project (Punch List), and attach the list to the Certificate. The items noted at the time of Substantial Completion should not be considered as all inclusive of the necessary actions required by the Contractor to achieve Final Acceptance and Completion. The Contractor and the County shall likewise sign the Certificate of Substantial Completion.

F. At the time of preparation of the Certificate of Substantial Completion, the County will deliver to the Contractor a written recommendation as to division of responsibilities pending final completion, acceptance, and payment between the County and the Contractor with respect to security, operations, safety, protection of the Work, maintenance, heat, utilities, insurance, and warranty and guarantee issues. These recommendations, once agreed upon by the County and the Contractor, shall be incorporated into the Certificate of Substantial Completion.

G. Substantial Completion shall be achieved within the Contract Time stipulated for Substantial Completion of the Work, including approved time extensions.
H. Provided Substantial Completion is reached by the Contractor in a timely manner, and based on the value of the work remaining, the Contractor may submit a payment application requesting a reduction in retainage, prior to Final Completion and Acceptance. The County will review the request, and based on the value of work remaining, make a recommendation to release a portion of the retainage, while allowing sufficient funds to remain with which to complete the Work. The County may accept or reject this recommendation, based solely on its discretion, and information which may become available to the County, which may warrant withholding a larger portion or all of the retainage.

I. The County shall have the right to exclude the Contractor from the Jobsite after the date of Substantial Completion subject to allowing the Contractor reasonable access to complete or correct items on the Punch List.

13.10 FINAL INSPECTION:

A. When the Contractor has completed the Work and has provided all as-built information to the County in compliance with the Contract Documents, the Contractor shall notify the County in writing that the Work is ready for final inspection. The County will then advise the Contractor as to the arrangements for final inspection and what is required to prepare the Work or a portion thereof for final inspection. When the County determines the Work or portion thereof is ready for final inspection, the County and the Contractor shall perform the final inspection. Upon completion of the final inspection, the County will prepare a list of defects, if any, of either commission or omission by the Contractor reasonably observable and determined under the conditions governing and restricting said final inspection. When all such defects have been corrected, a final re-inspection will be made. The process will be repeated until, in the opinion of the County, the Work has been completed in compliance with the Contract Documents as can best and reasonably be observed and determined under the conditions governing and restricting said final inspection. The County will then, pursuant to such inspection and re-inspection(s) (if required), certify as to completion of final inspection. It is understood that the certification covers only those items which can be physically inspected and that the County’s certification indicates compliance within the standards of the construction industry as interpreted by the County.

B. Should the final re-inspection find items not completed from the list of defects prepared as part of the final inspection, the Contractor shall be responsible for all additional construction management and inspection costs associated with correcting the items on the list of defects. The additional costs shall include construction management supervision and inspection furnished by the County following the first re-inspection of the Work. Such construction management costs shall be considered to be equal to the job payroll of the County staff performing the re-inspections plus 150 percent thereof for overhead, plus on-the-job mileage. Such costs will be deducted from monies due the Contractor at final payment.

13.11 FINAL ACCEPTANCE:

A. When the County recommends that the Work has been fully completed and all supporting documents required under the Contract Documents have been submitted and approved, the Contractor may make request for final payment. With the request for final payment, the Contractor shall furnish satisfactory evidence to the County that the Contractor has fully paid all claims for labor, materials, and equipment incurred in connection with the Work. The Contractor shall provide all evidence and supporting documentation required by the Contract Documents to assure the County of complete compliance with all terms of the Contract. Such supporting documentation shall include extended insurance and bond coverage, as-built drawings, operations and maintenance manuals, system diagrams, warranties and guaranties and special warranties and guarantees, and other documents all as required under the Contract. When the County has satisfied itself as to compliance with the terms of the Contract and has recommended final completion, the County will notify the Contractor of final acceptance.

B. Final acceptance of the Work will be evidenced by the “Final Completion and Acceptance Certificate” recommended and signed by the County and signed by the Contractor which will stipulate the date of final completion of the Contract and acceptance of maintenance by the County.
13.12 RELEASE OF LIENS: Neither the final payment nor any part of the retained percentage shall become due until the Contractor delivers to the County a complete release of all liens arising out of this Contract, or receipts in full in lieu thereof, and in addition thereto, in either case, an affidavit stating that so far as the Contractor has knowledge or information, the releases and receipts include all labor, material and equipment supplies, and Subcontracting services for which a lien could be filed. The Contractor may, if any Subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the County to indemnify the County against any lien. If any lien remains unsatisfied after all payments are made, the Contractor or Surety shall refund to the County all money payments that the County may be compelled to pay in discharging such liens, including all costs and interest, including attorney’s fees and court costs.

13.13 FINAL PAYMENT:

A. The County shall make final payment to the Contractor through payment issued by the Sarasota County Clerk of the Courts in accordance with the Local Government Prompt Payment Act, Section 218.70 F.S., upon receipt of the Contractor's final invoice and written approval of same by the County and the County's Administrative Agent indicating that all contracted services have been rendered in conformity with the Contract.

B. Waiver of Claims: Acceptance of final payment by the Contractor shall constitute a waiver of all Claims by the Contractor against the County.

13.14 FINAL COMPLETION DELAYED: If, through no fault of the Contractor, final completion of the Work is significantly delayed, the County, shall upon receipt of the Contractor's final application for payment (for Work fully completed and accepted), and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.0 MANUFACTURER'S INSTRUCTIONS AND SERVICES

14.1 MANUFACTURER'S INSTRUCTION, SERVICE AND PARTS MANUAL: Before final payment is made, the Contractor shall furnish to the County, five (5) complete sets of manufacturer's instructions, and service and parts manuals on each piece of equipment furnished under the Contract. This includes descriptive literature, installation and operating instructions, maintenance requirements, lubrication requirements, parts lists, and other pertinent data. All data shall be bound in a hardback, 3-ring loose leaf binder(s).

14.2 MANUFACTURER'S SUPERVISION: The Contractor shall provide the services of a qualified representative of the manufacturer as required in the Contract Documents, to supervise the installation, testing, adjusting and starting-up and initial operation of each item of equipment furnished under the Contract. This representative shall also instruct the County's personnel on-site, at an agreeable date and time, as to the proper operation and maintenance of the equipment.

15.0 WARRANTY AND GUARANTEE PROVISIONS

15.1 WARRANTY AND GUARANTEE PROVISIONS:

A. All materials and equipment furnished by the Contractor and all Work and workmanship involved in the Contract shall be free from defects due either to faulty materials or equipment or faulty workmanship and the same is hereby warranted and guaranteed by the Contractor for a minimum period of one (1) year from the date of the Final Completion and Acceptance Certificate issued by the County, or such longer period of time as may be prescribed by the terms of any applicable special guarantees and warranties required by the Contract Documents. All materials, equipment and workmanship furnished, installed and performed by the Contractor shall be warranted and guaranteed by the Contractor to the County to meet the required Technical Specifications and applicable standards; and to accomplish the purposes and functions of the Work as defined, detailed and specified in the Contract Documents.
B. The County shall, following discovery thereof, promptly provide written notice to the Contractor and Surety of defective materials, equipment, or workmanship within the period of the warranty and guarantee. Any part of the material, equipment, or workmanship which does not comply with the warranty and guarantee shall be repaired or removed and replaced by the Contractor within ten (10) days from the date of the County’s notice, at the Contractor’s expense and at no cost to the County.

C. In addition to the above repair and replacement costs, the Contractor is responsible to the County for all costs incurred with respect to all warranty and guarantee items under this Contract, including all construction management expenses such as expense for repetitive trips by the County required for the warranty and guarantee work. Such expense shall be considered to be equal to the job payroll of the County, plus 150 percent thereof for overhead plus on-the-job mileage.

D. If the Contractor does not promptly comply with the terms of the County’s written notice, or in the case of an emergency where delay would cause serious risk of loss or damage, the County may, after providing notice to the Contractor and Surety, have the defective Work corrected or repaired, or may have the defective Work removed and replaced. All claims, costs, losses, and damages, including but not limited to all fees and charges for construction management and inspection, attorneys, and other professionals, and all court costs arising out of or relating to such correction or repair or such removal and replacement, including but not limited to all costs of repair or replacement of work of others resulting there from, will be paid by the Contractor or Surety.

E. Where defective Work and damage to other work resulting from such defective Work has been corrected or removed and replaced, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

F. The warranty and guarantee provisions create no limitations on the County as to any claims or actions for breach of warranty or breach of guarantee that the County might have against parties other than the Contractor, and do not constitute exclusive remedies of the County against the Contractor and are not intended to and shall not limit any other rights, remedies, or causes of action which the County might exercise against the Contractor, and shall not alter or modify the application of the Statute of Limitations as established by the Statutes of the State of Florida.

G. Survival of Obligations: All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations stipulated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of the Contractor.

16.0 MISCELLANEOUS

16.1 CERTIFIED CHEMICALS:

A. The Contractor shall only use U.S.D.A. or E.P.A. or F.D.A. certified chemicals during the performance of all Work under the Contract. All chemicals used in or furnished for the Work, whether herbicide, pesticide, disinfectant, polymer, reactant or other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residue shall be in strict conformance with manufacturer’s instructions and local, State and Federal rules and regulations.

B. The Contractor shall submit two (2) copies of all chemical Material Safety Data (M.S.D.) information forms to the County. One (1) set of M.S.D. information forms shall be posted at the Jobsite at all times and shall be available for inspection.

16.2 FUELS ADJUSTMENTS: The County will not adjust the Contract Price to reflect increases or decreases in gasoline and diesel fuel prices from those in effect on the Effective Date of the Contract.

16.3 EQUIPMENT MAINTENANCE: Equipment shall be maintained to prevent fuel, oil, and lubricant spills. Refueling, repairs, and lubrication will be performed at safe distances from any watercourse or drainage conveyance devices. Should a fuel or oil leak or hydraulic pipe rupture occur during construction, the Contractor’s operators shall immediately cease operation and remove the equipment to a safe area and take prompt action to minimize damage and safeguard the Jobsite. The Contractor shall immediately
report the spill or discharge in accordance with applicable State or Federal rules and regulations; the requirements of the Florida Statute Chapter 376 Pollution Discharged Prevention and Removal will also be followed. In addition, the County shall immediately be notified.

16.4 SPILL PREVENTION/CONTAINMENT: An OSHA-approved spill containment kit must be kept at the Jobsite and staging area(s), and shall be sized for the maximum potential spill/leak volume associated with the largest single equipment unit at the Jobsite. It is the Contractor’s responsibility to provide and maintain the required spill containment equipment.

16.5 DISPOSAL OF POLLUTANTS: The Contractor shall provide tanks or barrels to be used for off-site disposal of chemical pollutants such as drained lubricating or transmission oils, greases, etc. produced as a by-product of the Work. Washing, fueling or servicing of equipment will not be permitted where spillage or wash water can enter any watercourse or drainage conveyance device. Removal and disposal of all pollutants shall be in strict accordance with all local, State and Federal rules and regulations.

END OF GENERAL CONDITIONS
SECTION 9

SUPPLEMENTAL GENERAL CONDITIONS
1.0 DEFINITIONS AND TERMS

ADD the following Definitions to the General Conditions Section 1.1 GENERAL:

DOH: Sarasota County Department of Health

FDEP: Florida Department of Environmental Protection

NASSCO: National Association of Sewer Services Companies

STANDARD SPECIFICATIONS: Standard Specifications shall refer to the current edition of the FDOT’s Standard Specifications for Road and Bridge Construction, unless otherwise specified herein.

Where FDOT specifications refer to “Department”, "Engineer", "Engineer of Tests", or "Division of Tests", it shall mean the County.

UTILITY SYSTEMS CODE: All construction shall meet or exceed the requirements of the Sarasota County Uniform Water, Wastewater and Reclaimed Water Systems Code, latest revision, and the Contract Documents. In case there is a conflict between the Code and Specification, the most stringent requirement shall be met.

3.0 CONTRACT DOCUMENTS

ADD the following to the General Conditions Section 3.2 INTENT

D. The Contractor shall recognize that the primary function of this project is to provide utility service to the residents of Sarasota County. The Contractor shall provide temporary utility service to any businesses or dwellings affected during the construction of this project.

4.0 PRE-CONSTRUCTION ACTIVITIES

ADD the following to the General Conditions Section 4.2 PRELIMINARY SCHEDULES SUBMISSION AND ACCEPTANCE:

A.3) The Contractor’s Schedule of Values must be prepared using the County’s Primavera Contract Manager Software System.

REMOVE the last sentence of the General Conditions Section 4.2.B.2) and REPLACE with the following: “The Contractor shall provide a minimum of 15 days in the Construction/Progress Schedule for such product review.”

ADD the following paragraph to the General Conditions Section 4.6 AUDIO-VISUAL PRE-CONSTRUCTION RECORD:

Contractor shall have preliminary construction survey stakeout completed, center line of pipe or offsets, and Sunshine One Call locate flags completed prior to any photos or video work to allow the work zone area to be identified with existing and proposed condition locations.
SUPPLEMENTAL GENERAL CONDITIONS - UTILITIES

ADD the following to the General Conditions Section 5.10 AS-BUILT DOCUMENTS:

H. Utility Projects: The Contractor shall maintain, during the progress of the project, accurate records of the location, length and elevation of all new and existing pipelines and appurtenances. Information to be shown for utility mains shall include the location of all crosses, tees, wyes, bends, valves, curb stops, meter boxes, hydrants, stub-outs, blow-offs, air release valves, etc., by using a two (2) point swing measurement from permanent physical features that can readily be found on the drawing and in the field, in a table format. The Contractor shall furnish "as-built" top of pipe elevations and finish grade for top of trench for all utility mains at maximum intervals of one hundred feet (100’) and at all utility crossings, service connections, gravity and vacuum laterals, at all fittings and valves, and all changes in grade and pipe type. For directional drilled utility mains, the “as-built” top of pipe elevations shall be recorded every rod length change and plotted on the plan and profile drawing sheets. In addition, the Contractor shall reference all new utility mains by the distance to the right-of-way or property markers.

I. Utility Projects: All visible utility features shall be surveyed using conventional and/or GPS equipment at survey grade level and in accordance with Sarasota County Survey/GPS Standards. The recorded/blue booked GPS control monument, recorded benchmark elevation, and the vertical datum used shall be as noted on the Construction Plans. Coordinates shall be based on the State Plane, Florida West 1983.

ADD the following to the General Conditions Section 5.11 PERMIT, LICENSES, TAXES, AND LAWS AND REGULATIONS:

D. Permit Fee Allowance: When applicable, this allowance will be established to cover the expenses of the permits and is supplemental to the bid, as indicated in the Bid Form. Permit fees will be paid at actual cost for the permit required and identified in the Contract Documents. The Contractor is advised that the total bid price shall include the amount of the allowance. Payment under this allowance shall be based on receipts of permit fees presented to the County. No payments shall be made for administrative or other costs of the Contractor. The allowance line item, when included in the Bid Form, can only be committed for the

ADD the following to the General Conditions Section 5.17 EXISTING UNDERGROUND FACILITIES:

H. Connections to Existing Mains: Where connections are required between new work and existing utility mains, the connection shall be made in a thorough and first class manner, using proper and acceptable fittings to suit the actual conditions. Ductile iron mechanical joint sleeves shall be used for connection to existing utility mains. When a connection is made to an existing fitting in the line, the Contractor shall schedule his work so that excavation and locating the existing fittings can be completed prior to starting trench work on the line. Cut-ins into lines shall be done at a time approved by the County, following proper notification to and approval by the County’s Utilities Operations and Maintenance staff. The Contractor shall not make any connections or service taps into existing utility mains until the work has been tested and accepted by the County.

I. Utility Service Interruption: Interruptions to any utility service or operation shall be minimized. The Contractor shall submit plans and schedules to the County for approval by the proper authority before any shutdown or any interruption in service takes place. The Contractor shall provide a minimum five (5)-business day notice to Utility Operations and Maintenance (941-316-1071) to locate and exercise valves prior to the shutdown. County will complete a Water Shutdown Request to Utility Operations and Maintenance and shall include a utility map with all valves identified within the shutdown service area.
SUPPLEMENTAL GENERAL CONDITIONS - UTILITIES

After the plans and schedule for the utility service interruption shutdowns have been approved, the Contractor shall be responsible for posting shut-off notices to customers five (5) business days prior to shut down. The County shall be present at the time of the shutdown and assure the shutdown requirements are coordinated during the tie-in. All work is to be accomplished in accordance with Department of Health rules and policies. If commercial properties are affected, then the Contractor shall provide bottled water to the consumers/businesses that cannot boil water onsite. All costs in connection with the interruption of Utility Services shall be considered incidental and included under the Items Bid.

7.0 CONTRACTOR’S RIGHTS AND RESPONSIBILITIES
ADD the following New Sections to the General Conditions:

7.16 FPL SERVICE (Florida Power & Light):

A. Where required in the Contract Documents, the Contractor shall provide all necessary coordination with FPL for power supply to the proposed Utility Facilities; including sewage lift stations, vacuum sewer pump stations, water pumping and storage facilities, water or sewer booster stations, and similar facilities. The Contractor shall incorporate FPL’s schedule within the Construction/Progress Schedule. All costs associated with temporary and permanent power shall be borne by the Contractor, unless otherwise provided in the Contract Documents.

B. The Contractor is responsible for all on-site improvements including poles, transformers, panels, conduit, power wiring, concrete mounting pads, and related equipment and materials necessary for a complete and fully operational system. The Contractor shall transfer service to the County upon the date of Substantial Completion of the Project, unless otherwise provided in the Contract Documents.

7.17 UTILITY SERVICES: Existing service locations as shown on the drawings are approximate. Upon completion of service relocation or replacement as called for on the drawings, the Contractor shall relocate or install the meter and/or reconnect the building service line as directed by the County. A Florida Licensed Plumber shall complete all plumbing work on the discharge side of the meter.

11.0 CHANGES, DELAYS, AND TIME EXTENSIONS
ADD the following to the General Conditions Section 11.3.A CHANGE IN CONTRACT PRICE:

1. At any time the County may request a quotation from Contractor for a proposed change in the work. Within ten (10) days following the receipt of such a request, the Contractor shall prepare and submit a written and sufficiently detailed proposal for the estimated cost increase of the proposed change. The County shall review the proposal within five (5) days, and shall:
   a) Accept the proposal in total, or portions thereof;
   b) Negotiate the scope and cost of the proposal; or
   c) Reject the proposal in total.
2. The proposal shall include any request for a change in contract times resulting from the proposed change in the work. Any time extensions shall also be subject to negotiations.
SUPPLEMENTAL GENERAL CONDITIONS - UTILITIES

3. Itemized estimates shall be in sufficient detail for County’s review, including all material, labor, equipment, subcontracted work, and overhead costs and fees, and shall cover all work involved in the change, whether such work involves additions to, or deletions from the original Contract scope and price.

4. Any changes in the Contract price or Contract times shall be formalized in a Contract Modification.

5. Notwithstanding the request for quotation, Contractor shall continue to carry on the work and maintain the progress schedule. Delays in the submittal of the written and detailed proposal will not be considered as basis for a time extension.

13.0 PAYMENTS TO CONTRACTOR AND COMPLETION

ADD the following to the General Conditions Section 13.2 SUPPORTING DOCUMENTATION:

E. Monthly Status Reports: With each payment application, the Contractor shall submit an updated monthly status report for review and approval by the County. The report shall contain specific construction progress over the past month; expected work to be accomplished over the coming month; and specify any potential problems that may interfere with the proposed work schedule. The County may withhold payment if the Contractor fails to submit an updated and approved monthly status report.

ADD the following to the General Conditions Section 13.9 SUBSTANTIAL COMPLETION

J. The Work will be considered substantially complete when each of the following portions of the Work is completed to the satisfaction of the County:
   1) All components of the Work have been installed, tested, approved, and certified to be placed into operation.
   2) A “punch list” of items to complete the Work has been submitted by the Contractor.
   3) Final As-Builts have been provided in accordance with the Contract Documents.
   4) All training and instructions have been provided to the designated County’s representative(s) in accordance with the Contract Documents.
   5) Operation and Maintenance (O&M) Manuals submitted and accepted.
   6) 90% of all private property has been restored.
   7) 90% of all restoration in the right-of-way is completed.

ADD the following to the General Conditions Section 13.11 FINAL ACCEPTANCE:

C. The Work will be considered complete when each of the following portions of the Work is completed to the satisfaction of the County:
   1) All “punch list” work has been completed.
   2) All Close-Out Items have been completed and submitted to the County, including:
      a. Final Clean-up.
      b. Complete Demobilization.
      c. 100% of all private property has been restored.
      d. 100% of all restoration in the right-of-way is completed.
      e. Contractor’s Final Affidavit & Release of Lien (Contract Form Pages RL-1 and RL-2).
      f. Releases of Liens.
      g. Consent of Surety to Final Payment.
      h. Private Owner(s) acceptance of restoration.
      i. All Warrantees/Guarantees.
      j. All other Close-Out Items required by the Contract Documents.
15.0  WARRANTY AND GUARANTEE PROVISIONS

REMOVE the first sentence of the General Conditions Section 15.1.A., and REPLACE with the following: “All materials and equipment furnished by the Contractor and all Work and workmanship involved in the Contract shall be free from defects due either to faulty materials or equipment or faulty workmanship, whether patent or latent, and the same is hereby warranted and guaranteed by the Contractor for a minimum period of one (1) year from the date of the Final Completion and Acceptance Certificate issued by the County, or such longer period of time as may be prescribed by the terms of any applicable special guarantees and warranties required by the Contract Documents, or as prescribed by Florida law or State or Local regulations.”

END OF SUPPLEMENTAL GENERAL CONDITIONS
SECTION 10

TECHNICAL SPECIFICATIONS
98-1 General: Furnish and install project signs at locations indicated in the plans. Furnish one copy of the shop drawing to the Engineer for approval before manufacturing the project signs. Install project funding signs at locations indicated in the plans or as approved by the Project Manager. The Contractor is to follow Florida State Statute 556, Underground Facility Damage Prevention and Safety Act procedures, as required.

98-2 Materials:

98-2.1 General: Meet the material requirements shown below and any additional requirements which the plans might show.

98-2.2 Wood Posts: Posts shall be 4”x4” square and 12 feet long-pressure treated lumber.

98-2.3 Wood Sheeting: Sheeting shall be exterior-grade plywood five feet wide by three feet high by one-half inch thick.

98-2.4 Sign Content: Sign content shall be as shown on the following page including the funding sources which will be provided by the Project Manager. Relationship of lettering size will be similar to that depicted. The background shall be white. Seasons are defined as:

- Winter = December, January, February
- Spring = March, April, May
- Summer = June, July, August
- Fall = September, October, November

98-3 Construction Requirements.

98-3.1 General: Project signs remain the property of the Contractor for the duration of the project and shall be maintained by the Contractor to the satisfaction of the Engineer. Project signs may need to be relocated due to conflicts during construction, at no additional cost to the County.

Upon completion of the project, and with the permission of the Engineer, remove and dispose of the sign and supports, and restore the site to the satisfaction of the Engineer.

98-3.2 Installation: Install project sign posts four feet below ground and leave four feet of clearance from the bottom of the sign face to the ground.

98-4 Method of Measurement: The quantities to be paid will be:

a. the number of project signs, complete, and
b. the number of funding signs, complete.

98-5 Basis of Payment: Price and payment will be full compensation for furnishing and installing all materials necessary to complete the signs in accordance with the details shown in the plans, including sign panels complete with sheeting, painting, and message, sign posts and supports, footings, excavation, etc., furnishing and installing project percentage stickers, and all other work specified in this Section, including all incidentals necessary for he complete item. Payment will be made under:

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End of SCSS 98
DANIEL B. SCHMIDT
LICENSE
No 40233
STATE OF
FLORIDA
JUN 21 2017
Name: __________________________
Date: _________________________
Florida Professional Engineer's Registration Number: __________

JEAN PAUL SILVA
LICENSE
No 66522
STATE OF
FLORIDA
JUN 21 2017
Name: __________________________
Dole: _________________________
Florida Professional Engineer's Registration Number: ___________________
**LOCKWOOD RIDGE BOOSTER PUMP STATION**

**BID SUBMITTAL**

**TECHNICAL SPECIFICATIONS**

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PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The Work to be performed under this Contract shall consist of furnishing, tools, equipment, materials, supplies, and manufactured articles, and furnishing all labor, transportation, and services, including fuel, power, water, and essential communications, and performing all Work or other operations required for the fulfillment of the Contract in strict accordance with the Contract Documents. The Work shall be complete, and all Work, materials, and services not expressly indicated or called for in the Contract Documents, which may be necessary for the complete and proper construction of the Work in good faith, shall be provided by the Contractor as though originally so indicated, at no increase in cost to the Owner.

B. The term "Owner" or "County" shall be defined as Sarasota County, its agents and authorized representatives. The term "Engineer" shall be defined as the Engineer-of – Record for this project, which is Hazen and Sawyer. The site where the work is to take place is the Lockwood Ridge Booster Pump Station, herein referred to as the LWR BPS.

C. The Contractor shall be responsible for and perform all Work, whether by self-performance or by subcontract to qualified entities, as required for such construction in accordance with the Contract Documents and subject to the terms and conditions of the Contract, complete and ready for use. Wherever the Contract Documents reference a third party, i.e., subcontractor, manufacturer, etc., it is to be considered as falling under the Contractor's overall responsibility even when provided through a third party.

D. The principal features of the Work to be performed under this Contract includes installation of the new LWR BPS, which includes, but is not limited to, the following:

1. Performing site work at the proposed LWR BPS location, including construction of an access driveway, site grading, and new stone surface in Pump Station Area, as specified and shown in the Contract Documents.

2. Installation of cast-in-place concrete pads and pipe supports, and installation of a perimeter polyethylene fence and gate, as specified and shown in the Contract Documents.

3. Installation of below grade and above grade piping, fittings, valves, as specified and shown in the Contract Documents.

4. Installation of a new diesel driven pump skid (provided by County), as specified and shown in the Contract Documents.

5. Improvements and/or upgrades required to the utility power, and electrical power distribution associated with the above work, including a new RTU panel, a new
meter for connection to FPL power, new flow meter, new pressure transmitters and pressure gauges, as specified and shown in the Contract Documents.

6. Isolation of existing 20-inch force main along Lockwood Ridge Road, cutting in new piping, and connection of newly installed piping to existing force main, as specified and shown in the Contract Documents.

7. Maintenance of wastewater flows as required to perform the tie-in to the existing 20-inch FM, as specified and shown in the Contract Documents.

8. Performance of necessary start-up testing per Contract Documents.

E. The foregoing description(s) shall not be construed as a complete description of all Work required.

1.2 CONTRACT DOCUMENTS

A. The term “Contract Documents” refers to the entire set of Bid Proposal, Agreement, General Conditions, Supplementary Conditions, Technical Specifications and Drawings issued at the time of the bid along with any modifications of the bid documents by way of official addendum issued prior to bid opening.

B. The Drawings included in the Contract Documents are entitled “Sarasota County Lockwood Ridge Booster Pump Station”. The numbers and titles of all Drawings appear on the index sheet of the Drawings, Sheet G-1. All drawings so enumerated shall be considered an integral part of the Contract Documents as defined herein. Supplemental drawings developed during construction as may be required to be submitted by the Contractor per the specifications shall also be considered a part of the Contract Documents, along with all supplemental drawings issued as part of the response to requests for information (RFIs) during construction or as approved by change order during construction.

C. The Specifications included in the Contract Documents are entitled “Sarasota County Lockwood Ridge Booster Pump Station” and are as listed in the table of contents included in the specifications. Certain specifications sections or drawings refer to “Divisions” of these specifications. Sections are each individually numbered portions of the Specifications (numerically) such as 08110, 13182, 15206, etc. The term Division is used as a convenience term meaning all Sections within a numerical grouping. For example, Division 16 would thus include Sections 16000 through 16999 and would mean all electrical specifications.

D. Contractor shall perform the work in accordance with the Contract Documents, and in accordance with applicable local and national building codes. Where there is an apparent discrepancy between the Drawings, Specifications, or any local and/or national codes, the more stringent of the requirements shall apply unless otherwise approved by the Engineer.

1.3 GENERAL ARRANGEMENT

A. Drawings indicate the extent and general arrangement of the Work. If any departures from the Drawings are deemed necessary by the Contractor to accommodate the materials and equipment he proposes to furnish, details of such departures and reasons
therefore shall be submitted as soon as practicable to the Owner for approval. No such departures shall be made without the prior written approval of the Owner. Approved changes shall be made without additional cost to the Owner for this Work or related Work under other Contracts of the Project.

B. The specific equipment proposed for use by the Contractor on the project may require changes in structures, auxiliary equipment, piping, electrical, mechanical, controls or other Work to provide a complete satisfactory operating installation. The Contractor shall submit to the Owner, for approval, all necessary drawings and details showing such changes to verify conformance with the overall project requirements and overall project operating performance. All costs in connection with the preparation of supplemental drawings and details and all changes to construction Work to accommodate the proposed equipment, including increases in the costs of other Contracts, shall be borne by the Contractor.

1.4 CONSTRUCTION PERMITS, EASEMENTS AND ENCROACHMENTS

A. The Contractor shall obtain, keep current and pay all fees for any necessary construction permits from those authorities, agencies, or municipalities having jurisdiction over land areas, utilities, or structures which are located within the Contract limits and which will be occupied, encountered, used, or temporarily interrupted by the Contractor's operations unless otherwise stated. Record copies of all permits shall be furnished to the Owner.

B. When construction permits are accompanied by regulations or requirements issued by a particular authority, agency or municipality, it shall be the Contractor's responsibility to familiarize himself and comply with such regulations or requirements as they apply to his operations on this Project.

C. If required to perform work, County building permits shall be obtained by the Contractor. The Contractor shall pull, pay for, obtain, and comply with all required trade permits based on the Conformed Documents provided to the Contractor. Payment for the County building permits will be reimbursed to the Contractor through the Permit Allowance included in the bid. Copies of invoices for permit payment shall be submitted with the pay application to be considered for reimbursement.

D. The Contractor shall provide any required Performance and Indemnity Bond(s).

1.5 ADDITIONAL ENGINEERING SERVICES

A. In the event that the Engineer is required to provide additional engineering services resulting from project changes, refer to the Contract's General Conditions and Supplemental General Conditions sections for guidance, terms, administration, financial obligations, definitions, and requirements.

1.6 ADDITIONAL OWNER'S EXPENSES

A. In the event of additional Owner's Expenses, refer to the Contract's General Conditions and Supplemental General Conditions sections for guidance, terms, administration, financial obligations, definitions, and requirements.
1.7 LABOR EMPLOYED

A. All labor employed by the Contractor and subcontractors for the Work shall abide by all applicable Owner labor laws for non-discrimination. The Contractor further understands and agrees that it is the Contractor’s responsibility to assure that all laborers are legal US citizens or legally registered aliens of the US.

1.8 SANITARY PROVISIONS

A. Provide and maintain, in a neat and sanitary condition, such accommodations for the use of the Contractor’s employees as are necessary to comply with the requirements and regulations of the State and Federal Government, committing no public nuisance. The Contractor understands and agrees that the Owner’s existing facilities are not to be used by construction personnel.

1.9 CONTRACTOR’S RESPONSIBILITY FOR WORK

A. Until acceptance of the Work by the Owner, it shall be under the charge and custody of the Contractor who shall take every necessary precaution against injury or damage to the Work by the action of the elements or from any other cause whatsoever, arising either from the execution or from the non-execution of the Work. The Contractor shall protect, rebuild, repair, restore and make good, without additional compensation, all injury or damage to any portion of the Work occasioned by any cause before its completion and acceptance.

1.10 MAINTENANCE OF ACCESS AND TRAFFIC

A. Provide all measures to ensure continuous, safe access for the Owner’s operations and maintenance staff in the performance of their duties. Submit maintenance of personnel, vehicular access, and traffic patterns for maintenance of traffic associated with roadwork. Contractor’s actions shall make no disruption of public roadway traffic at any time.

1.11 NOISE AND DUST CONTROL

A. Eliminate noise within the project area to the extent possible. "Residential" type mufflers shall be installed on all gasoline and diesel engines. All local ordinances and regulations covering noise control shall be observed.

B. Control dust emissions at all times through appropriate construction techniques, containment of dust to confined areas of the work, and by regular wetting of unpaved temporary construction access ways during dry weather.

1.12 STORAGE

A. Refer to Contract’s General Conditions and Supplemental General Conditions sections for guidance, terms, administration, financial obligations, definitions, and requirements regarding storage.

B. The Contractor may utilize the space within the limits of the temporary construction easement for location of storage of materials and equipment and as a staging area. The
staging area shall be finished graded, seeded, and a healthy stand of grass established upon completion of the Work at no additional cost to the Owner.

C. Refer to Specification 01550 titled “Site Access and Storage” for more detailed information regarding equipment and material storage requirements, enclosed storage, material handling, protection of equipment/existing facilities, placement of materials, maintenance of storage, etc.

1.13 FIRE PROTECTION

A. Contractor shall take all necessary precautions to prevent fires at or adjacent to the Work, buildings, etc., and shall provide adequate facilities for extinguishing fires which do occur. Open fires shall not be permitted.

B. When fire or explosion hazards are created in the vicinity of the Work as a result of the locations of fuel tanks, or similar hazardous utilities or devices, the Contractor shall immediately alert the local Fire Marshal and the Owner of such tank or device. The Contractor shall exercise all safety precautions and shall comply with all instructions issued by the Fire Marshal and shall cooperate with the Owner of the tank or device to prevent the occurrence of fire or explosion.

1.14 CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, or reactant of other classification, must show approval of either the EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with all applicable rules and regulations.

1.15 FIRST AID FACILITIES AND ACCIDENTS

A. First Aid Facilities: The Contractor shall provide at the site such equipment and facilities as are necessary to supply first aid to any of his personnel who may be injured in connection with the Work.

B. Accidents

1. The Contractor shall refer to the Contract’s General Conditions and Supplemental General Conditions sections for guidance, terms, administration, financial obligations, definitions, and requirements for additional information regarding accidents.

2. The Contractor shall promptly report, in writing, to the Owner all accidents whatsoever out of, or in connection with, the performance of the Work, whether on or adjacent to the site, which cause death, personal injury or property damage, giving full details and statements of witnesses.

3. If death, serious injuries, or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Owner and the Engineer.
4. If any claim is made by anyone against the Contractor or a Subcontractor on account of any accidents, the Contractor shall promptly report the facts, in writing, to the Owner, giving full details of the claim.

1.16 DISPOSITION OF CLAIMS RELATED TO OTHER CONTRACTORS

A. The Contractor shall refer to the Contract’s General Conditions and Supplemental General Conditions sections for guidance, terms, administration, financial obligations, definitions, and requirements for additional information regarding disposition of claims related to other Contractors.

1.17 LIMITS OF WORK AREA

A. The Contractor shall confine his construction operations to within the Contract limits of the temporary construction easement shown on the Drawings. Storage of equipment and materials, or erection and use of sheds outside of the Contract limits, if such areas are the property of the Owner, shall be used only with the Owner’s approval. Such storage or temporary structures, even within the Contract’s limits, shall be confined to the Owner’s property and shall not be placed on properties designated as easements or rights-of-way unless specifically permitted elsewhere in the Contract Documents.

1.18 WEATHER CONDITIONS

A. The Contractor shall refer to the Contract’s General Conditions and Supplemental General Conditions sections for guidance, terms, administration, financial obligations, definitions, and requirements for additional information regarding weather conditions.

B. No Work shall be done when the weather is unsuitable. The Contractor shall take necessary precautions (in the event of impending severe weather, including hurricanes, tropical storms or major rain/wind storms) to protect all Work, materials, or equipment from damage or deterioration due to floods, driving rain, and/or wind. The Owner reserves the right, to order that additional protection measures over and beyond those proposed by the Contractor, be taken to safeguard all components of the Project.

C. The mixing and placing of concrete or pavement courses, and installation of sewers shall be stopped during rainstorms, and all freshly placed Work shall be protected by canvas or other suitable covering in such manner as to prevent running water from coming in contact with it. Sufficient coverings shall be provided and kept ready at hand for this purpose. The limitations and requirements for mixing and placing concrete, or laying of masonry, in cold weather shall be as described elsewhere in these Specifications.

1.19 PERIODIC CLEANUP: BASIC SITE RESTORATION

A. During construction, the Contractor shall regularly remove from the site of the Work all accumulated debris and surplus materials of any kind which result from his operations. Unused equipment and tools shall be stored at the Contractor’s yard or base of operations for the Project.

B. When the Work involves installation of sewers, underground structures, or other disturbance of existing features in or across access roads and paths, driveways, public
streets, rights-of-way, easements, or private property, the Contractor shall (as the Work progresses) promptly backfill, compact, grade, and otherwise restore the disturbed area to the basic condition which will permit resumption of pedestrian or vehicular traffic and any other critical activity or functions consistent with the original use of the land. The requirements for temporary paving of streets, walks, and driveways are specified elsewhere. Unsightly mounds of earth, large stones, boulders, and debris shall be removed so that the site presents a neat appearance.

C. The Contractor shall perform the cleanup Work on a regular basis and as frequently as ordered by the Owner. Basic site restoration in a particular area shall be accomplished immediately following the installation or completion of the required facilities in that area. Furthermore, such Work shall also be accomplished, when ordered by the Owner, if partially completed facilities must remain incomplete for some time period due to unforeseen circumstances.

D. Upon failure of the Contractor to perform periodic cleanup and basic restoration of the site to the Owner's satisfaction, the Owner may, upon five days prior written notice to the Contractor, without prejudice to any other rights or remedies of the Owner, cause such Work for which the Contractor is responsible to be accomplished to the extent deemed necessary by the Owner, and all costs resulting therefrom shall be charged to the Contractor and deducted from the amounts of money that may be due him.

1.20 USE OF FACILITIES BEFORE COMPLETION

A. The Owner reserves the right to enter and use any portion of the constructed facilities before final completion of the whole Work to be done under this Contract. However, only those portions of the facilities which have been completed to the Owner's satisfaction, as evidenced by his issuing a Certificate of Substantial Completion to the Contractor covering that part of the Work, shall be placed in service.

B. It shall be the Contractor's responsibility to prevent premature connections to or use of any portion of the installed facilities before the Owner issues a Certificate of Substantial Completion covering that portion of the Work to be placed in service.

C. Consistent with the approved progress schedule, the Contractor shall cooperate with the Owner to accelerate completion of those facilities, or portions thereof, which have been designated for early use by the Owner.

1.21 WORK PLANNING FOR CRITICAL FUNCTIONS

A. When the work involves requests for after-hours work, interruption of operations of any kind, demolition of any kind, tie-ins to existing processes and piping, and/or training events, written notice shall be given to the County in the form of a detailed work plan a minimum of five (5) calendar days prior to the early start date for the work being considered.

B. In as much as possible, such critical work functions shall be identified and brought up at the progress meeting preceding the need for such work.
C. The County will have final approval on the details, timing, and scheduling of all such work to best avoid any potential for non-compliance of permit conditions and to assure adequate County personnel are available as needed.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -
SECTION 01020

CONSTRUCTION SEQUENCING / CONSTRAINTS

PART 1 -- GENERAL

1.1 OVERALL SEQUENCE OF CONSTRUCTION

A. Work under the Contract shall be scheduled and performed in such a manner as to result in the least possible disruption to the operation of the existing force main facilities and the ability for the Owner’s personnel to meet all permit conditions.

B. Constraints: In preparation of a proposed construction schedule, the Contractor shall incorporate provisions to address the following specific constraints:

- No overflows or open discharges are allowed during any part of this project, including the isolation and tie-in of proposed mechanical piping to existing force main.
- Temporary one-lane road closure to Lockwood Ridge Road will be required for the 20-inch FM cut-in and connection. Closure must be coordinated with the County’s Transportation Department and kept to a minimum time period.

C. Suggested Construction Sequence: The following paragraphs represent a suggested sequence of construction, does not include all items necessary to complete the work, and is intended to identify the sequence of critical events necessary to minimize disruption to the on-going wastewater flow operations and to ensure compliance with discharge requirements. It shall be understood by the Contractor that the critical events identified are not all inclusive and that additional items of work not shown may be required. The sequence of construction is a precedence requirement and does not attempt to schedule the Contractor's work. It is intended only to indicate which activities must precede other activities in order to minimize interferences and disruptions.


a. Mobilize for work - set up staging area, obtain permits, develop and submit construction schedule, shop drawing schedule and begin shop drawing submittals

b. Submit shop drawings and obtain approval for equipment and materials

c. Install temporary erosion control measures as identified in the contract documents and stake out site to verify equipment location, pipe routing and location of tie-in to existing 20-inch FM.

d. Install new 20-inch FM for suction and discharge connections between eastern edge of right-of-way going east to the 20-inch plug valve on either line.
2. Stage 2 – Tie - In to Existing 20-inch Force Main and Installation and start-up of LWR BPS Components
   a. The County will isolate existing 20-inch force main along Lockwood Ridge Road by closing existing upstream and downstream valves.
   b. Excavate and cut into top of existing 20-inch force main, relive pressure in the pipe, and begin removing sewage from the isolated force main section via vacuum trucks to provide dry conditions for pipe installation.
      1) Contractor to protect area of tie-in and provide wastewater spill prevention per regulatory requirements.
      2) The estimated distance between the upstream and downstream isolation valves is 5,200 feet of 20-inch Force main. This is approximately 85,000 gallons of wastewater
   c. When isolated force main section is dewatered, cut-in wye and piping assemblies with 20-inch plug valve and connect new piping to previously installed 20-inch suction and discharge piping at eastern edge of right-of-way.
   d. When tie-in is complete, the Contractor shall request the County to open all closed isolation valves that were closed in step a, and verify if there are any leaks in the new piping, fittings, and valves.
   e. Once the new piping components have passed a visual leakage inspection, the pipe can be backfilled and a temporary road surface can be installed to maintain traffic on Lockwood Ridge Road.
   f. Perform installation of remaining project components, including pump installation, above ground piping, fittings, and valves, perimeter fence, access driveway installation, Pump Station Area grading, and electrical and instrumentation items.
   g. Perform required pressure testing of pipe, installation verifications, electrical and instrumentation system check outs, and start-up and field testing on newly installed components.

3. Stage 3 – Close Out and Demobilization
   a. Complete final site improvements and site clean-up.
   b. Complete project closeout in accordance with Section 01700, "Project Closeout."
   c. Final acceptance of the project.
D. At no time shall the Contractor undertake to close off any pipelines, or open valves, or take any other action which would affect the operation of the force main and conveyance of sewage without coordination with OWNER personnel.

1.2 DETAILED PLAN OF OPERATION FOR SHUTDOWNS

A. All short-term system or partial system shutdowns or diversions shall be submitted to the Owner/Engineer in writing. No shutdowns or diversions shall be allowed without written approval from the Owner/Engineer.

1. Assumed project components that will require shutdowns of the existing 20-inch force main along Lockwood Ridge Road and the maximum duration of the disruption:

a. Tie-in of new piping, fittings, and plug valve on the existing 20-inch force main, (8 hours)
   1) Contractor to coordinate with the OWNER for location of valves and ability to isolate flows from the section of pipe that is being modified
   2) Contractor shall plan for this to occur overnight during low flow periods
   3) Any operation of Tank Trucks including but not limited to engine noise, equipment connected to truck, and/or pumping shall not exceed 65 dB or requirements per Sarasota County Code, whichever is more restrictive.
   4) Lockwood Ridge Road shall remain open to traffic during school hours and for special events

B. The Contractor shall submit a detailed, written plan of operation for each work item related to proposed shutdowns to the Owner/Engineer for their review and approval. The plan of operation shall be submitted at least 14 days prior to the scheduled commencement date for that work. The Owner/Engineer will review and return the plan with comments within 7 days. The Contractor shall schedule a meeting between the Contractor, Owner and Engineer to incorporate Owner/Engineer comments and finalize scheduling of the work. A final (revised) written plan of operation shall then be submitted to the Owner/Engineer. The final plan shall be submitted to the Owner/Engineer at least 3 days prior to the scheduled commencement date for that work. All work shall then be conducted in accordance with this final written plan of operation, unless agreed to in writing between the Contractor, Owner and Engineer. The written plan of operation shall address the following items:

1. Step-by-step detailed sequence for performing the work.
2. Anticipated duration of each activity.
3. Plan and/or schematic drawings to clearly identify work to be performed. Sequence steps shall be identified on drawings using a keynote legend or similar means.

4. Contractor shall prepare an Emergency Contingency Plan if the existing pipeline is damaged or fails during the anticipated operation. At a minimum, it shall include the process that will be used for spill protection, maintaining service within the existing pipeline and/or emergency bypass. The Owner’s Representative and Engineer shall be provided with this information as reasonable assurance that the Contractor or Subcontractor is prepared in the event an emergency should arise.

5. Proposed operations and staffing for temporary systems along with any extended hours needed for Owner staff to be available during temporary operations or shutdowns.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -
SECTION 01026
MEASUREMENT AND PAYMENT

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. Payment for the various items in the Schedule of Payment items, as further specified herein, shall include all compensation to be received by the Contractor for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, taxes, materials, commissions, transportation and handling, bonds, permit fees, insurance, overhead and profit, and incidentals appurtenant to the items of Work being described, as necessary to complete the various items of the Work all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA). Such compensation shall also include payment for any loss or damages arising directly or indirectly from the Work.

B. The Contractor's attention is called to the fact that the quotations for the various items of Work are intended to establish a total price for completing the Work in its entirety. Should the Contractor feel that the cost for any item of Work has not been established by the Schedule of Payment items or this Section, it shall include the cost for that Work in some other applicable bid item, so that its proposal for the project does reflect its total price for completing the Work in its entirety.

C. The following explanation of measurement and payment for the bid form items is made for information and guidance. The omission of reference to any item in this description shall not, however, alter the intent of the bid form or relieve the Contractor of the necessity of furnishing such as part of the contract at no additional cost.

1.2 PAYMENT ITEMS FOR BID

A. Items are as enumerated on the Bid Form.

1. Mobilization and Demobilization (Bid Item No. 1)
   a. The lump sum price for Mobilization and Demobilization shall not exceed 5% of the total of all other items (excluding this item). The Contractor shall provide a breakdown of the lump sum bid for mobilization. The breakdown shall identify items of preparatory work and operations with the corresponding cost per item. The demobilization portion of the item shall be a minimum of 25% payable in the final project close-out payment.
   b. Payment for Mobilization and Demobilization, Bid Item No. 1, will be payable based on agreed schedule of values for the contract lump sum price for mobilization and demobilization, which price and payment shall include, but not be limited to, full compensation for the preparatory work and operations in mobilizing for beginning Work on the project including, but not limited to,
those operations necessary for the movement of personnel, equipment, supplies and incidentals to the project site, safety equipment and first aid supplies, sanitary and other facilities, as required by these Contract Documents, and State and local laws and regulations; and any other preconstruction expenses necessary for the start of the Work; including the cost of field engineering, coordination with existing utilities, location of existing utilities, removal and disposal of cleared and grubbed material and debris, permits and fees, construction schedules, preconstruction video and photographs, project signs, shop drawings, temporary facilities, lay down storage area, construction aids, work associated with Contractor support during OWNER/Engineer testing, reviews and inspection, re-inspection and any rework resulting from same, cleaning, fees for bonds and insurance, project record documents, and operating and maintenance data.

2. Survey and Control (Bid Item No. 2)
   a. Measurement of separate items for Survey and Control will not be made for payment and all items shall be included in the lump sum price.
   b. Payment for Survey and Control, Bid Item No. 2, will be payable based on agreed schedule of values for the contract lump sum price for survey and control, which price and payment shall include, but not be limited to, full compensation for the preparatory work and operations in survey control within the project limits, delineation of any underground utilities (as required), any equipment necessary to perform survey and control, locating benchmarks, leveling of equipment, providing labor team to perform survey, required research and planning, reconnaissance, office data processing, documentation, monumentation, safety equipment, required field instruments, quality control, and the preparation of field notes. The survey shall include preparation of a complete as-built/survey drawings that include horizontal and vertical dimensions of all structures, equipment, lines, bends, valves, materials, etc. in order to provide the necessary information as required by the Contract Documents. The format shall be acceptable to the OWNER, and the requirements of the Contract. All marker locations shall be shown on record drawings and in accordance with the Engineer's direction.

3. Site Work, Pavement Milling and Restoration, Maintenance of Traffic (MOT) and Sediment and Erosion Control (Bid Item No. 3)
   a. Measurement of separate items for Site Work, Pavement Milling and Restoration, Maintenance of Traffic (MOT) and Sediment and Erosion Control will not be made for payment and all items shall be included in the lump sum price.
   b. Payment for Site Work, Pavement Milling and Restoration, Maintenance of Traffic (MOT) and Sediment and Erosion Control, Bid Item No. 3, will be payable based on agreed schedule of values for the contract lump sum price sediment and erosion control, which price and payment shall include, but not be limited to, all equipment, labor, and materials associated with site work, Pavement Milling and Restoration, and sediment and erosion control. The item includes, but is not limited to, all work associated with designing, providing, maintaining, and removing temporary sediment and erosion control.
controls as indicated on Drawings, and Contract Documents and required during construction and will be provided within acceptable limits as established by the OWNER and satisfy any and all federal, state, and OWNER regulations. Work includes tree protection during construction required to protect existing trees to safely construct new facilities without harming existing trees. Work shall include site improvements and repairs, as required in the Contract Documents. Work shall include sidewalk and curb demolition and replacement, installation of a new 8-foot tall perimeter polyethylene fence with an 10-foot wide access gate, grading and new stone surface for new Pump Station Area, geoblock access driveway with sod, milling of existing road and replacement of asphalt surface, installation of road markings and any signage on new road surface and repair of road markings on existing road surface to match existing, site restoration, which can include sidewalk and curb restoration, seeding, sodding, and other necessary efforts to return the existing site to the conditions prior to work being performed.

4. Vacuum/Tanker Truck Hauling for Force Main Tie In (Bid Item No. 4)
   a. Measurement of various items for Vacuum/Tanker Truck Hauling for Force Main Tie In required for pipe dewatering shall be performed on a unit price basis based on an hourly rate which shall include all the following in the unit price.
   b. Payment for the Vacuum/Tanker Truck Collection/Hauling from Force Main Tie-In shall be full compensation for all labor, materials, and equipment necessary for work as shown in the Contract Documents. Payment will be full compensation for furnishing, transporting, handling, and installing the materials specified, and includes, but is not limited to, furnishing and installation of temporary suction piping and fittings, lining existing trench, vacuum/tanker trucks for removal and hauling of raw sewage, raw sewage disposal at County Lift Station, fuel and travel time for tanker truck operation, and any other equipment and/or labor required to allow shut down of pump stations and maintenance of wastewater flow for the duration of force main tie-ins. The payment shall include all labor, tools, equipment, and incidentals necessary to complete the work. Work, transportation, and disposal of sewage shall be performed in accordance to all federal, state, and OWNER regulations.

5. 20-Inch Force Main Connection Piping, Fittings, and Valve (Bid Item No. 5)
   a. Measurement of various items for 20-Inch Force Main Connection Piping and Valve will not be made for payment, and all items shall be included in the lump sum price.
   b. Payment for 20-Inch Force Main Connection Piping and Valves, Bid Item No. 5, will be made at the Contract lump sum price for the item, which price shall be full compensation for all labor, materials, tools, and equipment as required in the Contract Documents. This bid item includes, but is not limited to, furnish and installation of all below ground permanent piping, spools, caps, fittings and valve, restraining devices, couplings, painting and coating, backfill, compaction, bedding, labels, and flushing and hydrostatic testing, as
required for complete and operational piping systems. The payment item shall also include the excavation required to make the connection to the existing force main and road restoration in this area. Payment will be based on percentage of work completed during the pay period at time of pay application. The cumulative total shall not exceed the lump sum bid pay item amount.

6. Booster Pump Station (Bid Item No. 6)
   a. Measurement for various items for the Booster Pump Station Construction will not be made for payment, and all items shall be included in the lump sum price.
   b. Payment for the Booster Pump Station Construction, Bid Item No. 6, will be made at the Contract lump sum price for the item, which price shall be full compensation for all labor, materials, and equipment as required in the Contract Documents. This bid item includes, but is not limited to: furnishing and installation of above ground piping, fittings, and valves, installation of pump skid (County provided diesel pump skid), concrete pads and pipe supports, field testing, startup, anchoring systems, pressure gauges, spare parts, grouting, preparation of O&M manuals, and required field visits. Work performed shall include site restoration, which can include seeding, sodding, and other necessary efforts to return the existing site to the conditions prior to work being performed. Payment will be based on percentage of work completed during the pay period at time of pay application. The cumulative total shall not exceed the lump sum bid pay item amount.

7. Electrical and Instrumentation and Control Improvements (Bid Item No. 7)
   a. Measurement for the various items for the Electrical Improvements will not be made for payment, and all items shall be included in the lump sum price.
   b. Payment for the Electrical Improvements, Bid Item No. 7, will be made at the Contract lump sum price for the item, which price and payment shall be full compensation for all labor, materials, tools, and equipment as required in the Contract Documents. This bid item includes, but is not limited to: furnish and installation of spare parts, wiring and cables, connections to new power and instrumentation wiring, field instruments and devices, conduit, connections to diesel powered booster pump, labeling / testing as required for a complete and operational electrical and instrumentation and control system. The pay item also includes control system integration, programing of the RTU PLC, and coordination with the power company. Payment will be based on percentage of work completed during the pay period at time of pay application. The cumulative total shall not exceed the lump sum bid pay item amount.

1.3 PAYMENT ITEMS

   A. The Contractor shall submit a Schedule of Payment Values within ten days of execution of contract. The schedule shall contain the installed value of the component parts of Work broken down into “submitted, delivered and installed” categories for the purpose of making progress payments during the construction period.
B. The schedule shall be given in sufficient detail for proper identification of Work accomplished. The Schedule of Payment Values shall complement the items of work detailed in the construction progress schedule and the construction network analysis in order to accurately relate construction progress to the requested payment. Each item shall include its proportional share of all costs including the Contractor's overhead, contingencies and profit. The sum of all scheduled items shall equal the total value of the Contract.

C. If the Contractor bills for delivered materials stored on the project site or off-site in bonded warehouse, it shall also submit copies of vendor invoices for each delivered item, and the invoice amounts shall correspond to the “delivered” amount requested in the payment application.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

(NOT USED)

- END OF SECTION –
SECTION 01040
COORDINATION

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall allow the Owner or their agents, and other project Contractors or their agents, to enter upon the work for the purpose of constructing, operating, maintaining, removing, repairing, altering, or replacing such pipes, sewers, conduits, wires, or other structures and appliances which may be required to be installed at or in the work. The Contractor shall cooperate with all aforesaid parties and shall allow reasonable provisions for the prosecution of any other work by the Owner, or others, to be done in connection with his work, or in connection with normal use of the facilities.

B. The Contractor shall cooperate fully with the Owner and all other contractors employed on the work, to effect proper coordination and progress to complete the project on schedule and in proper sequence. Insofar as possible, decisions of all kinds required from the Owner shall be anticipated by the Contractor to provide ample time for inspection, or the preparation of instructions.

C. The Contractor shall assume full responsibility for the correlation of all parts of the Work with that of other contractors. The Contractor's superintendent shall correlate all work with other contractors in the laying out of work. The Contractor shall lay out the Work in accordance with the Drawings, Specifications, and instructions of latest issue and with due regard to the work of other contractors.

D. Periodic coordinating conferences shall be held in accordance with Section 01200, Project Meetings, of these Contract Documents.

1.2 COORDINATION WITH OWNER AND ENGINEERING REPRESENTATIVES

A. In order to communicate effectively between all parties, County operations, County inspectors, Engineering staff and subconsultants, Contractors personnel, subcontractors, and testing laboratories, the Contractor shall utilize the County’s Primavera Contract Manager software for the duration of the project.

B. All crucial project documentation, including Conformed Documents, pay applications, RFIs, Shop Drawings, requests for change, permits, etc., shall be accessible to all applicable parties over the County’s Primavera system.

PART 2 -- PRODUCTS

(NOT USED)
PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -
# PART 1 -- GENERAL

## 1.1 THE REQUIREMENT

A. Wherever in these specifications references are made to the standards, specifications, or other published data of the various national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. As a guide to the user of these specifications, the following acronyms or abbreviations which may appear in these specifications shall have the meanings indicated herein.

## 1.2 ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AASHTO</td>
<td>American Association of the State Highway and Transportation Officials</td>
</tr>
<tr>
<td>ACI</td>
<td>American Concrete Institute</td>
</tr>
<tr>
<td>ACIFS</td>
<td>American Cast Iron Flange Standards</td>
</tr>
<tr>
<td>ACOE</td>
<td>Army Corps of Engineers</td>
</tr>
<tr>
<td>ACPA</td>
<td>American Concrete Pipe Association</td>
</tr>
<tr>
<td>AFBMA</td>
<td>Anti-Friction Bearing Manufacturer's Association, Inc.</td>
</tr>
<tr>
<td>AGMA</td>
<td>American Gear Manufacturer's Association</td>
</tr>
<tr>
<td>AHGDA</td>
<td>American Hot Dip Galvanizers Association</td>
</tr>
<tr>
<td>AI</td>
<td>The Asphalt Institute</td>
</tr>
<tr>
<td>AIA</td>
<td>American Institute of Architects</td>
</tr>
<tr>
<td>AISC</td>
<td>American Institute of Steel Construction</td>
</tr>
<tr>
<td>AISI</td>
<td>American Iron and Steel Institute</td>
</tr>
<tr>
<td>AITC</td>
<td>American Institute of Timber Construction</td>
</tr>
<tr>
<td>AMCA</td>
<td>Air Moving and Conditioning Association</td>
</tr>
<tr>
<td>ANSI</td>
<td>American National Standards Institute, Inc.</td>
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<tr>
<td>APA</td>
<td>American Plywood Association</td>
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<tr>
<td>API</td>
<td>American Petroleum Institute APHA</td>
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<tr>
<td>APWA</td>
<td>American Public Works Association</td>
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<tr>
<td>ASA</td>
<td>Acoustical Society of America</td>
</tr>
<tr>
<td>ASAE</td>
<td>American Society of Agriculture Engineers</td>
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<tr>
<td>ASCE</td>
<td>American Society of Civil Engineers</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Name</td>
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<td>-------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ASHRAE</td>
<td>American Society of Heating, Refrigerating, and Air-Conditioning Engineers</td>
</tr>
<tr>
<td>ASLE</td>
<td>American Society of Lubricating Engineers</td>
</tr>
<tr>
<td>ASME</td>
<td>American Society of Mechanical Engineers</td>
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<tr>
<td>ASMM</td>
<td>Architectural Sheet Metal Manual</td>
</tr>
<tr>
<td>ASSE</td>
<td>American Society of Sanitary Engineers</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society for Testing and Materials</td>
</tr>
<tr>
<td>AWPA</td>
<td>American Wood Preservers Association</td>
</tr>
<tr>
<td>AWPI</td>
<td>American Wood Preservers Institute</td>
</tr>
<tr>
<td>AWS</td>
<td>American Welding Society</td>
</tr>
<tr>
<td>AWWA</td>
<td>American Water Works Association</td>
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<tr>
<td>CEMA</td>
<td>Conveyor Equipment Manufacturer’s Association</td>
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<tr>
<td>CMA</td>
<td>Concrete Masonry Association</td>
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<tr>
<td>CRSI</td>
<td>Concrete Reinforcing Steel Institute</td>
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<tr>
<td>DIPRA</td>
<td>Ductile Iron Pipe Research Association</td>
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<tr>
<td>EIA</td>
<td>Electronic Industries Association</td>
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<tr>
<td>ETL</td>
<td>Electrical Test Laboratories</td>
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<tr>
<td>FBC</td>
<td>Florida Building Code</td>
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<tr>
<td>FDEP</td>
<td>Florida Department of Environmental Protection</td>
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<tr>
<td>FDOT</td>
<td>Florida Department of Transportation</td>
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<tr>
<td>FS</td>
<td>Federal Specifications</td>
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<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
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<tr>
<td>IES</td>
<td>Illuminating Engineering Society</td>
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<tr>
<td>IPCEA</td>
<td>Insulated Power Cable Engineers Association</td>
</tr>
<tr>
<td>ISA</td>
<td>Instrument Systems and Automation</td>
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<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
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<tr>
<td>MBMA</td>
<td>Metal Building Manufacturers Association</td>
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<tr>
<td>MMA</td>
<td>Monorail Manufacturers Association</td>
</tr>
<tr>
<td>MTI</td>
<td>Marine Testing Institute</td>
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<tr>
<td>NAAM</td>
<td>National Association of Architectural Metal Manufacturers</td>
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<tr>
<td>NACE</td>
<td>National Association of Corrosion Engineers</td>
</tr>
<tr>
<td>NBS</td>
<td>National Bureau of Standards</td>
</tr>
<tr>
<td>NEC</td>
<td>National Electrical Code</td>
</tr>
<tr>
<td>NEMA</td>
<td>National Electrical Manufacturer's Association</td>
</tr>
</tbody>
</table>
PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION –
SECTION 01090
REFERENCE STANDARDS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Wherever reference is made to any published standards, codes, or standard specifications, it shall mean the latest standard code, specification, or tentative specification of the technical society, organization, or body referred to, which is in effect at the date of invitation for Bids.

B. All materials, products, and procedures used or incorporated in the work shall be in strict conformance with applicable codes, regulations, specifications, and standards.

C. A partial listing of codes, regulations, specifications, and standards includes the following:

Air Conditioning and Refrigeration Institute (ARI)

Air Diffusion Council (ADC)

Air Moving and Conditioning Association (AMCA)

The Aluminum Association (AA)

American Architectural Manufacturers Association (AAMA)

American Boiler Manufacturer's Association (ABMA)

American Concrete Institute (ACI)

American Gas Association (AGA)

American Gear Manufacturers Association (AGMA)

American Hot Dip Galvanizers Association (AHDGA)

American Institute of Steel Construction, Inc. (AISC)

American Iron and Steel Institute (AISI)

American National Standards Institute (ANSI)

American Society of Civil Engineers (ASCE)

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE)

American Society of Mechanical Engineers (ASME)
American Society for Testing and Materials (ASTM)
American Standards Association (ASA)
American Water Works Association (AWWA)
American Welding Society (AWS)
American Wood-Preserver's Association (AWPA)
Anti-Friction Bearing Manufacturers Association (AFBMA)
Building Officials and Code Administrators (BOCA)
Consumer Product Safety Commission (CPSC)
Factory Mutual (FM)
Federal Specifications
Florida Building Code
Industrial Risks Insurers (IRI)
Instrument Society of America (ISA)
Institute of Electrical and Electronics Engineers (IEEE)
National and Local Fire Codes
Lightning Protection Institute (LPI)
National Electrical Code (NEC)
National Electrical Manufacturer's Association (NEMA)
National Electrical Safety Code (NESC)
National Electrical Testing Association (NETA)
National Fire Protection Association (NFPA)
Regulations and Standards of the Occupational Safety and Health Act (OSHA)
Southern Building Code Congress International, Inc. (SBCCI)
Sheet Metal & Air Conditioning Contractors National Association (SMACCNA)
Standard Building Code
Standard Mechanical Code
Standard Plumbing Code
Uniform Building Code (UBC)
Underwriters Laboratories Inc. (UL)

D. Contractor shall, when required, furnish evidence satisfactory to the Engineer that materials and methods are in accordance with such standards where so specified.

E. In the event any questions arise as to the application of these standards or codes, copies shall be supplied on-site by the Contractor.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -
PART 1 – GENERAL

1.1 PRECONSTRUCTION MEETING

A. A preconstruction meeting will be held after Award of Contract, but prior to starting work at the site. The Engineer shall prepare and distribute the meeting agenda and shall preside at the meeting. The Engineer shall record and distribute minutes of the proceedings and decisions.

B. Attendance:
   1. Owner
   2. Engineer
   3. Contractor

C. Minimum Agenda:
   1. Proposed construction schedule and proposed schedule of payment values
   2. Critical work sequencing
   3. Designation of responsible personnel
   4. Processing of Field Decisions and Change Orders
   5. Adequacy of distribution of Contract Documents
   6. Proposed Schedule of Submittals and handling of Shop Drawings and samples
   7. Procedures for maintaining project and record documents – required use of project management software such as Primavera.
   8. Use of site and Owner’s requirements
   9. Major equipment deliveries and priorities
   10. Safety and first aid procedures
   11. Security procedures
   12. Housekeeping procedures
   13. Processing of Partial Payment Requests
   14. General regard for community relations
1.2 PROGRESS MEETINGS

A. Progress meetings will be held biweekly at the Contractor's Field Office, or otherwise determined during the Pre-construction meeting, during the performance of the work of this Contract. Additional meetings may be called as progress of work dictates.

B. The Engineer or County representative will prepare and distribute agenda, preside at meetings and record minutes of proceedings and decisions; and will distribute copies of minutes to participants.

C. Attendance:
   1. Owner
   2. Engineer
   3. Contractor
   4. Subcontractors, as required

D. Minimum Agenda:
   1. Review and approve minutes of previous meetings.
   2. Updated construction schedule review
   3. Review progress of Work since last meeting.
   4. Review proposed planned work in next work period.
   5. Review of outstanding submittals, RFI's, and possible changes in the work
   6. Note and identify problems/needs which may impede planned progress.
   7. Develop corrective measures and procedures to regain planned schedule.
   8. Review of coordination for other work on site, work quality, adherence to standards, safety issues, and other concerns from Owner.
   9. Schedule next progress meeting.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

(NOT USED)

- END OF SECTION -
PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. This section specifies the means of all submittals. A general summary of the format and types of submittals required is as follows:

<table>
<thead>
<tr>
<th>Format of Submittal</th>
<th>Type of Submittal</th>
</tr>
</thead>
<tbody>
<tr>
<td>digital and hard copy</td>
<td>Construction Schedule</td>
</tr>
<tr>
<td>digital and hard copy</td>
<td>Schedule of Payment Items</td>
</tr>
<tr>
<td>digital</td>
<td>Shop Drawings</td>
</tr>
<tr>
<td>digital and hard copy</td>
<td>Warranties</td>
</tr>
<tr>
<td>digital or hard copy</td>
<td>Certificates</td>
</tr>
<tr>
<td>actual samples</td>
<td>Product Samples</td>
</tr>
<tr>
<td>digital and hard copy</td>
<td>O&amp;M Materials</td>
</tr>
<tr>
<td>digital</td>
<td>Photographs</td>
</tr>
</tbody>
</table>

B. At the preconstruction meeting, submit a detailed list of items for which shop drawings, construction drawings, and samples will be submitted. Included in this list shall be the names of all proposed Suppliers furnishing specified items. Review of this list by the Engineer shall not relieve Contractor from submitting complete drawings and data and providing materials, equipment, etc., fully in accordance with the Contract Documents.

C. All submittals shall be submitted in digital, electronic, pdf format, in the Primavera Contract Management system, other than samples. When hard copies are required, as noted above, submit the number of copies as noted herein. The Engineer will certify one electronic file of each submittal with engineer's stamp and response comments and post on the project management software site with notification to the Contractor and County via e-mail. The Contractor shall be responsible to distribute the submittal response as needed to subcontractors impacted by each individual submittal. In the case of samples, an electronic submittal transmittal shall still be made with a description of the sample submitted with all samples delivered to an address approved by the Owner.

1.2 SUBMITTAL PROCEDURES

A. Transmit each submittal with an approved transmittal form, the enclosed material and other pertinent information specified in other parts of this section. Identify any and all variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed Work.

B. The transmittal form shall include:
1. Project name and address of project

2. Owner’s name and contract number

3. Engineer’s name and project number

4. Contractor’s name and job number

5. Date of submittal

6. Submittal number *

7. Description of the submittal contents and number of pages included

8. Reference to specification and/or drawing pertinent to the submittal

9. Signature of Contractor’s PM indicating that the material has been reviewed by the Contractor

10. Blank space of at least 1/4 of the page for the Engineer’s stamp.

* The submittal number shall be in sequential, chronological order (001 through 999) with subsequent resubmittals marked 001A, 001B, etc. for any given submittal item.

C. Submittals will be returned by the Engineer as “Furnish as Submitted” (no changes required), “Furnish as Corrected” (minor corrections as noted to be furnished, no resubmittal required unless specifically noted), or “Revise and Resubmit”, revise and resubmit submittal per comments made and identify all changes made on each subsequent resubmittal.

D. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.3 CONSTRUCTION SCHEDULES

A. The scheduling of the work under the Contract shall be performed by the Contractor in accordance with the requirements of this section. The development of the schedule, monthly payment requisitions and project status reporting requirements of the Contract shall employ computerized Critical Path Method (CPM) scheduling. Method employed shall be precedence diagramming method (PDM).

B. The Contractor shall have the capability of preparing and utilizing the specified progress scheduling techniques. A statement of capability shall be submitted in writing to the Owner with the return of the executed Agreement to the Owner and will verify that either the Contractor’s organization has in-house capability qualified to use the technique or that the Contractor employs a consultant who is so qualified. Capability shall be verified by description of the construction projects to which the Contractor or his consultant has successfully applied the scheduling technique and which were controlled throughout the duration of the project by means of systematic use and updating of the construction progress schedule, the network analysis and associated reports. The statement shall also provide the contact persons for the referenced projects with current telephone and
address information. The submittal shall include the name of the individual on the Contractor's staff or qualified scheduling Consultant who will be responsible for the construction progress schedule and associated reports and for providing the required updating information of same.

C. Activity durations shall be in whole working days. The workday calendar date correlation shall include an allowance for standard holidays, normal weather, and other special requirements.

D. If the Contractor desires to make changes in his method of operating which affect the construction progress schedule and related items with regard to start or finish dates for overall work areas or dates impacting planned system shutdowns, connections or other interfaces, he shall notify the Owner in writing stating what changes are proposed and the reason for the change. If the Owner accepts these changes, in writing, the Contractor shall revise and submit, without additional cost to the Owner, all of the affected portions of the construction progress schedule, and associated reports. The construction progress schedule and related items shall be adjusted by the Contractor only after prior acceptance, in writing by the Owner. Adjustments may consist of changing portions of the activity sequence, activity durations, division of activities, or other adjustments as may be required. The addition of extraneous, nonworking activities and activities which add restraints to the construction progress schedule shall not be accepted.

E. Except where earlier completions are specified, schedule dates which show completion of all work prior to the contract completion date shall, in no event, be the basis for claim for delay against the Owner by the Contractor.

F. Construction progress schedules and related items which contain activities showing negative float or which extend beyond the contract completion date will not be accepted by the Owner.

G. Whenever it becomes apparent from the current construction progress schedule and associated reports that delays to the critical path have resulted and the contract completion date will not be met, or when so directed by the Owner, the Contractor shall take some or all of the following actions at no additional cost to the Owner. They shall submit to the Owner for approval, a written statement of the steps they intend to take to remove or arrest the delay to the critical path in the current construction progress schedule.

1. Increase construction manpower in such quantities and crafts as will substantially eliminate the backlog of work.

2. Increase the number of working hours per shift, shifts per day, working days per week, the amount of construction equipment, or any combination of the foregoing, sufficiently to substantially eliminate the backlog of work.

3. Reschedule activities to achieve maximum practical concurrency of accomplishment of activities, and comply with the revised schedule.

H. If when so requested by the Owner, the Contractor should fail to submit a written statement of the steps they intend to take or should fail to take such steps as reviewed and accepted in writing by the Owner, the Owner may direct the Contractor to increase the level of effort
in manpower (trades), equipment and work schedule (overtime, weekend and holiday work, etc.) to be employed by the Contractor in order to remove or arrest the delay to the critical path in the current construction progress schedule, and the Contractor shall promptly provide such level of effort at no additional cost to the Owner.

I. If the completion of any activity that impacts the finish date for any overall work area, whether or not critical, falls more than 100 percent behind its previously scheduled and accepted duration, the Contractor shall submit for approval a schedule adjustment showing each such activity divided into two activities reflecting completed versus uncompleted work.

J. Shop drawings which are not approved on the first submittal or within the time scheduled, and equipment which does not pass the specified tests and certifications shall be immediately rescheduled.

K. The contract time will be adjusted only in accordance with the Contractor’s Prime Agreement and other portions of the Contract Documents as may be applicable. If the Owner finds that the Contractor is entitled to any extension of the contract completion date, the Owner’s determination as to the total number of day’s extension shall be based upon the current construction progress schedule and on all data relevant to the extension. Such data shall be included in the next updating of the schedule and related items. Actual delays in activities which, according to the construction progress schedule, do not affect any contract completion date will not be the basis for a change therein.

L. From time to time it may be necessary for the contract schedule of completion time to be adjusted by the Owner in accordance with the General Conditions and other portions of the Contract Documents as may be applicable. Under such conditions, the Owner will direct the Contractor to reschedule the work or contract completion time to reflect the changed conditions, and the Contractor shall revise the construction progress schedule and related items accordingly, at no additional cost to the Owner.

M. Available float time may be used by the Owner.

N. Float or slack time within the construction schedule is not for the exclusive use or benefit of either the Owner or the Contractor, but is jointly owned, as an expiring project resource available to both parties as needed to meet contract milestones and completion dates. The Owner controls the float time and, therefore, without obligation to extend either the overall completion date or any intermediate completion dates the Owner may initiate changes that absorb float time only. Owner initiated changes that affect the critical path on the network diagram shall be the sole grounds for extending the completion dates. Each change request shall include a change impact schedule indicating the effect of this change on the detailed construction schedule. This schedule shall include a narrative description of the schedule change and a computer generated schedule comparison of the current schedule and the schedule revised to indicate the additional work required by the change and its impact on the critical path. Contractor-initiated changes that encroach on the float time may be accomplished only with the Owner's concurrence. Such changes, however, shall give way to Owner-initiated changes competing for the same float time.

O. To the extent that the construction project schedule, or associated report or any revision thereof shows anything not jointly agreed upon, it shall not be deemed to have been accepted by the Owner. Owner shall notify the Contractor in writing of any deemed
deficiencies related to the schedule as submitted within 21 calendar days of submission. Failure to include on a schedule any element of work required for the performance of this Contract shall not excuse the Contractor from completing all work required within any applicable completion date, notwithstanding the review of the schedule by the Owner.

P. Review and acceptance of the construction progress schedule, and related reports, by the Owner is advisory only and shall not relieve the Contractor of the responsibility for accomplishing the work within the contract completion date. Omissions and errors in the construction progress schedule, and related reports shall not excuse performance less than that required by the Contract and in no way make the Owner an insurer of the Contractor's success or liable for time or cost overruns flowing from any shortcomings in the construction progress schedule, and related reports.

Q. Monthly progress payment amounts shall be determined from the monthly progress updates of the CPM schedule activities as correlated to the Schedule of Values.

R. Contractor is responsible for determining the sequence of activities, the time estimates of the detailed construction activities and the means, methods, techniques and procedures to be employed.

S. Detailed network activities shall include: construction activities, the submittal and approval of samples of materials and shop drawings, the procurement of materials and equipment, fabrication of materials and equipment and their delivery, installation, and testing, start-up and training. Schedule, logic, and operating constraints and sequences shall be as listed in Section 01010 entitled "Summary of Work". Milestones shall be selected by Contractor and Owner.

T. Contractor shall consult with his Subcontractors (and suppliers) relating to the preparation of his construction plan and Construction Schedule. Subcontractors shall receive copies of the Contractor's Construction Schedule and shall be continually advised of any updates or revisions to the Construction Schedule as the work progresses. When Contractor submits his Construction Schedule to the Owner or makes any proposed updates or revisions to such Schedule, it will be assumed by the Owner and the Engineer that Contractor has consulted with and has the concurrence of his Subcontractors. Contractor shall be solely responsible for ensuring that all Subcontractors comply with the requirements of the Construction Schedule for their portions of the work.

U. Responsibility codes shall be established for the Contractor, Engineer, Owner, subcontractors, suppliers, etc.

1.4 CPM SCHEDULE SUBMITTALS

A. All schedule submittals including revisions and updates shall include electronic versions in both Primavera P6 and PDF format.

B. Preliminary CPM Schedule Submittals: The Contractor shall submit three short term schedule documents at the Pre-construction Conference which shall serve as the Contractor's Plan of Operation for the initial 60 day period of the contract time and to identify the manner in which the Contractor intends to complete all work within the Contract Time. The Contractor shall submit (1) a 60 Day Plan of Operation Bar Chart, (2) a Project Overview Bar Chart, and (3) a Preliminary Schedule of Values.
1. **60 Day Plan of Operation:** During the initial 60 days of the Contract Time, the Contractor shall conduct Contract operations in accordance with the 60 day bar chart Plan of Operations. The bar chart so prepared and submitted shall show the accomplishment of the Contractor's early activities (mobilization, permits, and submittals necessary for early material and equipment procurement, submittals necessary for long-lead equipment procurement, initial site work and other submittals and activities required for the first 60 days.

2. **Project Overview Bar Chart:** The overview bar chart shall indicate the major components of the project work and the sequence relations between major components and subdivisions of major components. The overview bar chart shall indicate the relationships and time frames in which the various components of the work will be made substantially complete in order to meet the project milestones and contract completion date.

3. **The schedule of values shall be developed with the development of the CPM schedule activities to minimize changes when cost loading the CPM schedule.** At the Pre-construction Conference, the Contractor shall submit a preliminary Schedule of Values for the major components of the work correlated to the activities listed on the project overview bar chart (2). The total sum of the schedule of values shall equal the project contract total amount.

C. **Preliminary CPM Schedule and Revised Original CPM Schedule Submittals:** The Preliminary CPM Schedule shall be submitted within thirty (30) days from the Pre-construction Conference. Owner shall review the Preliminary CPM Schedule within ten (10) days and will schedule the Preliminary CPM Schedule Review Meeting. The Preliminary CPM Schedule Review Meeting shall be attended by the Contractor's project manager, scheduling staff (in-house or consultant), superintendent, and major subcontractors. The Revised Original CPM Schedule shall be submitted within thirty (30) days from the return of the Preliminary CPM Schedule. Both the Preliminary CPM Schedule and Revised Original CPM Schedule submittals shall have identical format. The following required reports must be included:

1. A critical path report which shall identify all activities with zero (0) duration.

2. A milestone bar chart.

D. **Upon acceptance of the Original CPM Schedule, the Early Start and Early Finish dates for all activities shall be fixed as Planned Start and Planned Finish dates, except where Late Start and Late Finish dates are specifically agreed to by Owner and the Engineer, for future variance calculations.**

E. **Following acceptance of the Original CPM Schedule, the Contractor shall monitor the progress of the work and adjust the schedule each month to reflect actual progress and any changes in planned future activities.** Progress shall be evaluated monthly by the Contractor and the Owner. Not less than seven (7) days prior to submittal of each monthly progress payment estimate, they shall meet at the jobsite and jointly evaluate the status of each activity on which work has started or is due to start, based on the preceding construction schedule; to show actual progress, to identify those activities started and those completed during the previous period; to show the estimated time required to
complete or the percent complete of each activity started but not yet completed; and to reflect any necessary changes to the schedule, network analysis or report to accurately reflect progress. Activities shall not be considered to be complete until they are, in fact, 100 percent complete. Each schedule update must be complete including all information requested in the Original CPM Schedule submittal shown in paragraph B.

1. In addition, each update shall include the following tabular report formats:
   a. Should have Started Tasks (a Current Activities Report)
   b. Tasks in progress (a Current Activities Report)
   c. Slipping Tasks (a Current Activities Report)

2. Neither the submission nor the updating of the Contractors Revised Original CPM Schedule submittal, nor the submission, updating, change or revision of any other report, curve, schedule or narrative, shall have the effect of amending or modifying or limiting in any way the Contractor’s obligations under this Contract. Only a signed, fully executed Interim Field Change Agreement (IFCA) or Board of County Commissioners approved Change Order can modify these contractual obligations.

3. Upon approval of a(n) IFCA or Change Order, or upon receipt by the Contractor of authorization to proceed with additional work, the change shall be reflected in the next submittal of the CPM Schedule by the Contractor. The Contractor shall utilize a sub-network in the schedule depicting the changed work and its effect on other activities. The sub-network shall be tied to the main network with the appropriate logic so that a true analysis of the critical Path can be made.

4. Monthly schedule updates shall be submitted with the Application for Progress Payment.

F. A three (3) week rolling schedule shall be provided for each bi-weekly meeting showing the items worked the previous week and those scheduled to be in progress during the next two (2) weeks. The three-week rolling schedule shall use a bar chart format and be accompanied by a tabular report of the activities included. The previous week’s schedule shall be indicated as a “target” schedule for comparison.

G. A shop drawing submittal schedule shall be provided.

1.5 SCHEDULE OF PAYMENT VALUES

A. The Contractor shall prepare a preliminary Schedule of Values to correspond with the Project Overview Bar chart as required under Paragraph 1.04 B.2 for submission at the Pre-construction Conference and a Detailed Schedule of Values to correspond with the Revised Original CPM Schedule as required under Section 1.04C in conjunction with the Revised Original CPM Schedule submission.

1. Because the ultimate requirement is to develop a detailed schedule of values sufficient to determine appropriate monthly progress payment amounts through cost loading of the CPM Schedule activities, sufficient detailed breakdown shall be provided to meet this requirement. If, in the opinion of the Owner, a greater number
of Schedule of Value items than proposed by the Contractor is necessary the Contractor shall add the additional items so identified by the Owner.

2. A cross-reference list shall be developed in two parts:
   a. List each schedule activity with the respective valued items making up the total cost of the activity.
   b. List each valued item with the respective schedule activity or activities that make up the total cost indicated. In the case where a number of schedule items make up the total cost for a valued item (shown in the schedule of values) the total cost for each scheduled item should be indicated.

B. The schedule shall be given in sufficient detail for the proper identification of Work accomplished. Each item shall include its proportional share of all costs including the Contractor's overhead, contingencies and profit. The sum of all scheduled items shall equal the total value of the Contract.

C. If the Contractor anticipates the need for payment for materials stored on the project site, the schedule shall include specific submitted, delivered and installed activities for such items.

D. The Contractor shall expand or modify the above schedule and materials listing as required by the Owner's initial or subsequent reviews.

E. The Contractor's schedule of payment items shall be, at a minimum, categorized by the WBS breakdown in the Contractor's CPM schedule.

1.6 SHOP DRAWINGS

A. The Contractor shall submit a preliminary Schedule of Shop Drawing Submittals at the Pre-Construction Conference, organized by Specification Section Number.

B. The Contractor shall submit for review shop drawings for piping layout and appurtenances, wiring, color selection charts, Contractor Furnished Equipment, materials and equipment fabricated especially for this Contract, and materials and equipment for which such Drawings are specified or specifically requested by the Engineer.

C. Shop drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish or shop coat, grease fittings, installation/erection drawings, etc., depending on the subject of the Drawings.

D. When so specified, or if considered by the Engineer to be acceptable, the manufacturer's specifications, catalog data, descriptive matter, illustrations, etc. may be submitted for review in place of shop drawings. In such case, the requirements shall be as specified for shop drawings, insofar as applicable.

E. The Contractor shall be responsible for the prompt submittal of all shop drawings so that there shall be no delay to the Work due to the absence of such Drawings. The Engineer will review the shop drawings within 14 calendar days of receipt of such Drawings.
Reviewed shop drawings will be returned to the Contractor by regular mail, posted no later than 14 days after receipt.

F. Time delays caused by rejection of submittals are not cause for extra charges to the Owner or time extensions.

G. Requirements: All shop drawings shall be submitted electronically into the County’s Primavera Contract Manager system to the Owner through the Contractor. The Contractor is responsible for obtaining shop drawings from his subcontractors and returning reviewed Drawings to them. All Drawings shall be clearly marked with the name of the project, Owner, Contractor, and site, equipment, or structure to which the drawing applies. Drawings shall be suitably numbered and stamped by the Contractor. Each shipment of Drawings shall be accompanied by a letter of transmittal giving a list of the drawing numbers and the names mentioned above.

H. Product Data: Where manufacturer’s publications in the form of catalogs, brochures, illustrations, or other data sheets are submitted in lieu of prepared shop drawings, such submission shall specifically indicate the particular item offered. Identification of such items and relative pertinent information shall be made with indelible ink. Submissions showing only general information will not be accepted. Non-applicable information shall be crossed out.

I. Product data shall include materials of construction, dimensions, performance characteristics, capacities, wiring diagrams, piping and controls, etc.

J. Warranties: When warranties are called for, a sample of the warranty shall be submitted with the shop drawings. The sample warranty shall be the same form that will be used for the actual warranty. Actual warranties shall be originals and notarized.

K. Work Prior to Review: No material or equipment shall be purchased, fabricated especially for this Contract, or delivered to the project site until the required shop drawings have been submitted, processed and marked either "FURNISH AS SUBMITTED" or "FURNISH AS CORRECTED". All materials and Work involved in the construction shall be as represented by said Drawings.

L. The Contractor shall not proceed with any portion of the Work (such as the construction of foundations) for which the design and details are dependent upon the design and details of equipment for which submittal review has not been completed, unless mutually agreed to by Contractor and Owner in writing.

M. Contractor’s Review: Only submittals which have been checked and corrected should be submitted to the Contractor by its subcontractors and vendors. Prior to submitting shop drawings to the Owner, the Contractor shall check thoroughly all such Drawings to satisfy itself that the subject matter thereof conforms to the Drawings and Specifications. Drawings which are correct shall be marked with the date, checker’s name and indications of the Contractor’s approval, and then shall be submitted to the Owner.

N. Contractor’s Responsibility: The Engineers review of shop drawings will be general and shall not relieve the Contractor of the responsibility for details of dimensions, etc., necessary for proper fitting and construction of the Work required by the Contract and for achieving the specified performance.
O. **Contractor's Modifications**: For submissions containing departures from the Contract Documents, the Contractor shall include proper explanation in his letter of transmittal. Should the Contractor submit for review equipment that requires modifications to the structures, piping, layout, etc. detailed on the Drawings, he shall also submit for review details of the proposed modifications. If such equipment and modifications are accepted, the Contractor, at no additional cost to the Owner, shall do all Work necessary to make such modifications.

P. **"Or Equal" Items**: Whenever a particular brand or make of material, equipment, or other item is specified, or is indicated on the Drawings, it is for the purpose of establishing a standard of quality, design, and type desired and to supplement the detailed specifications and unless it is followed by the words "NO SUBSTITUTION", or "SUBSTITUTIONS ARE NOT ALLOWED" any other brand or make which is equivalent to that specified or indicated may be offered as an "or equal" item subject to the provisions discussed in Section 01600.

Q. **Complete Submittals**: Each submittal shall be complete in all aspects incorporating all information and data required to evaluate the products' compliance with the Contract Documents. Partial or incomplete submissions shall be returned to the Contractor without review.

R. **Shop Drawing Distribution**: The Contractor shall submit shop drawings to the Engineer for review per the format under 1.01.A. Where full size drawings are required, the Contractor shall submit one reproducible vellum and two bluelines or blacklines. Shop drawings will be reviewed, stamped and distributed with the appropriate box checked either "FURNISH AS SUBMITTED", "FURNISH AS CORRECTED" or "REVISE AND RESUBMIT". The distribution of processed shop drawings will be through email or appropriate FTP site, if size of file dictates.

S. If the Contractor requires additional copies of returned shop drawings, it shall include extra Drawings in its original submittal. The Engineer will process the Drawings and return them to the Contractor.

1.7 **WARRANTIES**

A. Warranties called for in the Contract Documents shall be originals and submitted to the Owner. When warranties are required they shall be submitted prior to request for final payment.

B. When advance copies of warranties are requested, they shall be submitted with, and considered as shop drawings.

1.8 **CERTIFICATES**

A. Four copies of certificates of compliance and test reports shall be submitted for requested items to the Owner prior to request for final payment. Certificates shall be submitted digitally unless otherwise unavailable.

1.9 **PRODUCT SAMPLES**
A. Contractor shall furnish for review all product samples as required by the Contract Documents or requested by the Engineer to determine compliance with the specifications.

B. Samples shall be of sufficient size or quantity to clearly illustrate the quality, type, range of color, finish or texture and shall be properly labeled to show complete project identification, the nature of the material, trade name of manufacturer and location of the Work where the material represented by the sample will be used.

C. Samples shall be checked by the Contractor for conformance to the Contract Documents before being submitted to the Owner and shall bear the Contractor's stamp certifying that they have been so checked.

D. Engineer's review will be for compliance with the Contract Documents, and its comments will be transmitted to the Contractor with reasonable promptness.

E. Acceptable samples will establish the standards by which the completed Work will be judged.

1.10 OPERATION AND MAINTENANCE MANUALS

A. The Contractor shall submit preliminary and final Operations and Maintenance (O&M) Manuals for each item of equipment at or before the time the equipment is delivered to the project site in accordance with Section 01730 of these specifications.

1.11 CONSTRUCTION PHOTOGRAPHS

A. Construction Photographs Required

1. Photographs shall be taken daily on all major activities of the work prior to beginning the work and after the work is completed. Contractor shall discuss with the PROJECT REPRESENTATIVE what photos are to be taken each day.

2. Views and Quantities Required

   a. Two (2) views of each activity, one before and one after completion of work.

   b. Provide one electronic digital file copy of each view

   c. Submit construction photograph digital files on CD on a weekly basis on the Monday following the week photos are taken. Update digital file copy set on a daily basis.

B. File name of each digital file shall include the date the photo was taken. Photos shall be in color and have high resolution and sharpness to be useful in future inquiries to the work record.

PART 2 – PRODUCTS
SECTION 01385

PRE-CONSTRUCTION VIDEO

PART 1 -- GENERAL

1.1 SCOPE

A. Prior to the commencement of any work, including Contractor mobilization, the Contractor shall have a continuous color digital audio-video DVD recording taken of the areas that are likely to be impacted by construction activities. The audio-video record is to serve as a record of preconstruction conditions. The CD/DVD recording shall be suitable for viewing on standard laptop and/or desk top computers used by the Engineer and Owner. Two copies of the CD/DVD recording shall be kept at the temporary construction office, one with the Owner and one with the Contractor until completion of the work at which time at least one copy shall be turned over to the Owner.

1.2 CONSTRUCTION SCHEDULE

A. Digital recordings shall not be made more than 30 days prior to construction in any area. No construction shall begin prior to review and approval of the digital recordings, covering the construction area, by the Engineer. The Engineer shall have the authority to reject all or any portion of the digital recording not conforming to the specifications and order that it be redone at no additional charge. The Contractor shall reschedule unacceptable coverage within five (5) days after being notified. The Engineer shall designate those areas, if any, to be omitted from or added to the audio-video coverage. All master CD/DVD’s and written records shall be well maintained without any damage and shall become the property of the County.

1.3 PROFESSIONAL VIDEO-GRAPHERS

A. The Contractor shall engage the services of a professional video-grapher. The color audio-video digital recordings shall be prepared by a responsible commercial firm known to be skilled and regularly engaged in the business of pre-construction color audio-video digital documentation. The video-grapher shall furnish to the Engineer a list of all equipment to be used for the audio-video recording, i.e., manufacturer's name, model number, technical specifications and other pertinent information. Additional information to be furnished by the video-grapher shall include the names and addresses of two (2) references that the video-grapher has performed color audio-videotaping for on projects of a similar nature, including one (1) within the last twelve (12) months.
PART 2 -- PRODUCT

2.1 GENERAL

A. The total audio-video digital recording system and the procedures employed in its use shall be such as to produce a finished product that will fulfill the technical requirements of the project. The video portion of the recording shall produce bright, sharp, and clear pictures with accurate colors and shall be free from distortion or any other form of picture imperfection. All video recordings shall, by electronic means, display on the screen the day, the time, the month, and the year of the recording. This date and time information must be continuously and simultaneously generated with the actual recording. The audio portion of the recording shall produce the commentary of the camera operator with proper volume, clarity, and be free from distortion.

2.2 EQUIPMENT

A. Audio/Video Recorder: Digital voice and video recorder, MPEG-4 recording technology for TV quality video recording, built-in microphone for high quality voice and sound recording, 3.15 Mega Pixel CDD Sensor with up to 640x480 video resolution, 4X digital zoom, 16MB internal memory, SD/MMC compatible, compatible with software needed and cabling provided to interface with a Windows XP based computer for creating high quality CD/DVD file records.

B. Video CD/DVDs: Used to create and store digital video, audio and multimedia files. Stores up to 4.7GB or more than two hours of MPEG2 Video, compatible for playback with most DVD players and DVD-ROM drives on Windows XP based computers. The DVDs shall be new and shall not have been used for any previous recording.

PART 3 -- EXECUTION

3.1 COVERAGE

A. The recordings shall contain coverage of all surface features located within the construction areas and shall include but not be limited to: all roadways, pavements, detention ponds, ditches, walls, piping, equipment, curbs, driveways, sidewalks, culverts, headwalls, retaining walls, buildings, landscaping, trees, shrubbery, fences, and electrical power poles and equipment. Of particular concern shall be the existence of any faults, fractures, or defects.

B. Recording coverage shall be grouped by structure providing both exterior and interior coverage for all areas that will be affected by the work. The outside areas of the work for the general area grounds shall be covered in grid format to cover the property for the construction areas that will be affected by the work. Coverage shall include all surface conditions located within the zone of influence of construction supported by appropriate audio description.

3.2 AUDIO CONTENT

A. Accompanying the video recording shall be a corresponding and simultaneously recorded audio recording. This audio recording, exclusively containing the commentary of the

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PRE-CONSTRUCTION VIDEO
camera operator, shall assist in viewer orientation and in any needed identification, differentiation, clarification, or objective description of the features being shown in the video portion of the recording including the location relative to construction activities planned. The audio recording shall be free from any conversations between the camera operator and any other production technicians. Panning, zoom-in and zoom-out rates shall be sufficiently controlled to maintain a clear view of all subjects.

3.3 VIDEO CD/DVD LABELING

A. Video CD/DVD Identification: All CD/DVD's for the digital video recordings shall be permanently labeled using commercial CD labeling software and labels. CD/DVD's shall be properly identified by disc number, project title, and date recorded.

B. Video CD/DVD Logs: Each video recording digital file shall have a log of that video recording's contents and what CD/DVD the recording file is stored on. The log shall describe the various segments of coverage contained on that video recording in terms of the location within the plant, extent of coverage, beginning and end points, directions of coverage, and date.

3.4 TIME OF EXECUTION

A. Visibility: All recording shall be performed during times of good visibility. No recording shall be done during periods of significant precipitation, mist, or fog. The recording shall only be done when sufficient sunlight is present for outdoor recordings to properly illuminate the subject, and to produce bright, sharp video recordings of those subjects. For indoor recordings, the Contractor shall provide adequate lighting to produce bright, sharp video recordings. No recording shall be performed when more than 10% of the area to be recorded contains debris or obstructions unless otherwise authorized by the Engineer.

3.5 CONTINUITY OF COVERAGE

A. In order to increase the continuity of the coverage, the coverage shall consist of a single, continuous, unedited recording which begins at one end of a particular construction area and proceeds uninterrupted to the other end of that area. Coverage shall reflect an organized, interrelated sequence of recordings from one construction area to another. Coverage shall be obtained by walking or by other conveyance approved by the Engineer.

3.6 COVERAGE RATES

A. The rate of travel during a particular segment of coverage shall be related to the amount of the surface features within a construction area being recorded. For interior and exterior of existing structures, average rate of travel shall not exceed thirty feet per minute from approximately 10 feet from subject. For open areas within the existing plant, average rate of travel shall not exceed forty-eight feet per minute. For open areas within the project area, average rate of travel shall not exceed sixty feet per minute.

3.7 CAMERA OPERATION

A. Camera Stability: Camera shall be firmly held such that movement of the camera during
the recording process does not cause an unsteady picture.

B. Camera Control: Camera pan, tilt, zoom-in, and zoom-out rates shall be sufficiently controlled such that recorded objects will be clearly viewed during video playback. In addition, all other camera and recording system controls such as lens focus and aperture, video level, pedestal, chroma, white balance, and electrical focus shall be properly controlled or adjusted to maximize picture quality.

C. Viewer Orientation Techniques: The audio and video portions of the recording shall maintain viewer orientation. To this end overall establishing views and visual displays of all visible building distinguishing characteristics shall be incorporated at the beginning of each recording. The narrator shall regularly call out changes in direction, viewing angle, focus zoom, and distinguishing subjects as the video recording progresses.

D. Operator Experience: The operator in charge must have had previous experience with audio-video documenting preconstruction work. Any apprentice operator(s) must be continuously supervised by an experienced operator.

3.8 DVD VIEWING

A. The CD/DVD recordings shall be suitable for playing and video and audible recordings on standard computer desktop or laptop computers as well as conventional DVD players.

- END OF SECTION -
SECTION 01400
QUALITY CONTROL

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. Testing Laboratory Services

1. Laboratory testing and checking required by the Specifications, including the cost of transporting all samples and test specimens, shall be provided and paid for by the Contractor unless otherwise indicated in the Specifications.

2. In the case of a conflict between this Specification Section and the Contractor's Quality Management Plan, the more stringent requirement between the two documents shall govern.

3. Procedure

a. The Contractor shall plan and conduct his operations to permit taking of field samples and test specimens, as required, and to allow adequate time for laboratory tests.

b. The collection, field preparation and storage of field samples and test specimens shall be performed by the Contractor as required by the Specifications and as directed by the Owner.

4. Supplementary and Other Testing

a. Nothing shall restrict the Contractor from conducting tests he may require. Should the Contractor at any time request the Owner to consider such test results, the test reports shall be certified by an independent testing laboratory acceptable to the Owner. Testing of this nature shall be conducted at no additional cost to Contractor’s Guaranteed Maximum Price.

1.2 DEFECTIVE WORK OR MATERIALS

A. Any defective work or materials furnished by the Contractor which is discovered before the final acceptance of the work, as established by the Certificate of Final Completion, or during the subsequent warranty period, shall be removed immediately even though it may have been overlooked by the Owner and estimated for payment. Any materials condemned or rejected by the Owner shall be tagged as such and shall be promptly removed from the site. Satisfactory work or materials shall be substituted for that rejected.

B. The Owner may order tests of defective or damaged work or materials to determine the required functional capability for possible acceptance, if there is no other reason for rejection. The cost of such tests shall be borne by the Contractor; and the nature, tester, extent and supervision of the tests will be as determined by the Owner. If the results of
the tests indicate that the required functional capability of the work or material was not impaired, consistent with the final general appearance of same, the work or materials may be deemed acceptable. If the results of such tests reveal that the required functional capability of the questionable work or materials has been impaired, then such work or materials shall be deemed imperfect and shall be replaced. The Contractor may elect to replace the imperfect work or material in lieu of performing the tests.

1.3 INSPECTION AND TESTS

A. The Contractor shall allow the Owner ample time and opportunity for testing materials to be used in the work. He shall advise the Owner promptly upon placing orders for material so that arrangements may be made, if desired, for inspection before shipment from the place of manufacture. The Contractor shall at all times furnish the Owner and his representatives, facilities including labor, and allow proper time for inspecting and testing materials and workmanship. The Contractor must anticipate possible delays that may be caused in the execution of his work due to the necessity of materials being inspected and accepted for use. The Contractor shall furnish, at his own expense, all samples of materials required by the Owner for testing, and shall make his own arrangements for providing water, electric power, or fuel for the various inspections and tests of structures and equipment.

B. Where other tests or analyses are specifically required in other Sections of these Specifications, the cost thereof shall be borne by the party (Owner or Contractor) so designated in such Sections. The Owner will bear the cost of all tests, inspections, or investigations undertaken by the order of the Owner for the purpose of determining conformance with the Contract Documents if such tests, inspection, or investigations are not specifically required by the Contract Documents, and if conformance is ascertained thereby. Whenever nonconformance is determined by the Owner as a result of such tests, inspections, or investigations, if overtime or standby costs are incurred due to delays in the scheduled work and associated tests, the Contractor shall bear the full cost thereof or shall reimburse the Owner for said cost. In this connection, the cost of any additional tests and investigations, which are ordered by the Owner to ascertain subsequent conformance with the Contract Documents, shall be borne by the Contractor.

1.4 WORK SUPERVISION

A. The Contractor shall at all times, while any work is being performed on the project site, as his agent, a competent superintendent capable of thoroughly interpreting the plans and specifications and thoroughly experienced in the type of work being performed. The superintendent shall have full authority to execute the work as required and to supply promptly any materials, tools, equipment, labor and incidentals which may be required. Such superintendence shall be furnished regardless of the amount of work sublet. For any sublet work, particularly for specialties such as electrical and instrumentation, a similarly competent superintendent shall be on site when any such sublet work is being performed that is not in the Contractor's superintendent's field of expertise.

B. The Contractor's superintendent shall speak and understand English, and at least one responsible person who speaks and understands English shall be on the project during all working hours for all subcontractors.
PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION –
SECTION 01510
TEMPORARY UTILITIES

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The Contractor shall provide temporary light and power, potable water service, and sanitary facilities for their operations. The Contractor shall make arrangements, pay the costs for, and pay for the usage of metered utility connections for electrical and water for use at construction trailers. The Contractor shall make suitable arrangements for disposal of sanitary sewer waste from construction trailer toilet facilities (if applicable). The Contractor shall pay for and arrange for temporary power for construction purposes around the site, bottled water sources for construction staff, and for portable sanitary facilities for construction labor, including legal disposal of collected waste in such facilities.

B. The Contractor shall coordinate and install all temporary services in accordance with the requirements of the utility companies having jurisdiction and as required by applicable codes and regulations.

C. At the completion of the work, or when the temporary services are no longer required, the facilities shall be restored to their original conditions.

D. All costs in connection with the temporary services including, but not limited to, installation, utility company service charges, maintenance, relocation and removal shall be borne by the Contractor at no additional cost to the Owner.

E. Some temporary facilities that may be required may be indicated on the Drawings; however, the Drawings do not necessarily show any or all of the temporary facilities that the Contractor ultimately uses to complete the work.

F. Temporary Power

1. Provide and pay for all temporary power needs for construction purposes through a metered power source from the local power company. Temporary power shall be obtained through a temporary power feed from the local power company that meets all applicable codes. Distribution of power to multiple use sites shall be through suitable power panels and power cords meeting all applicable codes.

G. Temporary Sanitary Service

1. Sanitary conveniences, in sufficient numbers, for the use of all persons employed on the Work and properly screened from public observation, shall be provided and maintained at suitable locations by the Contractor, all as prescribed by State Labor Regulations and local ordinances. The contents of same shall be removed and disposed of in a manner consistent with local and state regulations, as the occasion requires. The Contractor shall rigorously prohibit the committing of
nuisances within, on, or about the Work. Sanitary facilities shall be removed from the site when no longer required.

2. Connection of temporary sanitary waste lines from toilet facilities within construction trailers may be made to the Owner’s raw sewage sanitary gravity system if, how, where, and when approved by the Owner.

H. Temporary Water

1. The Contractor shall provide temporary potable water service for construction purposes, drinking water for construction staff, sanitary facilities, fire protection, field offices and for cleaning. The Contractor shall make all arrangements for connections to a metered, potable water source from the appropriate utility or else provide potable water through bottled water services.

2. The Contractor shall pay all charges for potable water used under this Contract. The Contractor can request a hydrant meter for use during execution of this contract from the County Utilities Connections Department. Contact may be made by calling (941) 861-6767. There is a $1,500.00 refundable deposit upon meter request and a non-refundable $100.00 cleaning/calibration fee for the meter usage.

3. Water service shall be extended and relocated as necessary to meet temporary water requirements and to meet comply with all applicable labor laws.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -
SECTION 01520
MAINTENANCE OF UTILITY OPERATIONS

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The existing flow will be maintained in continuous operation by the Owner during the entire construction period of the Contract as herein specified. The intent of this Section is to outline the minimum requirements necessary to provide continuous conveyance of sewage for the full range of flow through the 20-inch force main along Lockwood Ridge Road throughout the construction period and to provide continuous, uninterrupted service for sanitary waste disposal and maintenance staff in the execution of their duties.

B. Work shall be scheduled and conducted by the Contractor so as not to interrupt any utility service, or cause odor or other nuisance except as explicitly permitted hereinafter. No discharge of raw or inadequately treated wastewater shall be allowed. The Contractor shall pay all civil penalties, costs, assessments, etc., associated with any discharge of raw or inadequately treated wastewater associated with the Contractor's work.

C. The Contractor has the option of providing additional temporary facilities that can eliminate a constraint, provided it is done without cost to the Owner and provided that all requirements of these Specifications are fulfilled. Work not specifically covered in the following paragraphs may, in general, be done at any time during the contract period, subject to the operating requirements and constraints and construction requirements outlined hereinafter. All references to days in this Section shall be consecutive calendar days.

1.2 GENERAL CONSTRAINTS AND CONSTRUCTION SEQUENCE

A. Reference Section 01020, Construction Sequencing / Constraints.

B. The Contractor shall review the Contract Documents and shall be responsible to determine all such connections or modifications, and the scope and cost of all temporary measures required to isolate the work area without the need for a shutdown of the affected facility, process area, piping or utility in as much as possible.

C. Any temporary work, facilities, roads, walks, protection of existing structures, piping, blind flanges, valves, equipment, etc. that may be required within the Contractor's work limits to maintain continuous and dependable plant operation shall be furnished by the Contractor.

D. The Owner shall have the authority to order Work postponed, stopped or prohibited that would, in his opinion, unreasonably result in interrupting the necessary conveyance of sewer and water. No claim for additional time or compensation shall be made due to such stop work orders.

E. If the Contractor impairs conveyance of sewage or water as a result of not complying with specified provisions for maintaining flow, then the Contractor shall immediately make all repairs or replacements and do all work necessary to restore the conveyance to the
satisfaction of the Owner. Such work shall progress continuously to completion on a 24-
hours per day, seven days per week basis.

F. The Contractor shall provide the services of emergency repair crews on call as required.

1.3 GENERAL OPERATING AND CONSTRUCTION REQUIREMENTS

A. Access to Project Site, Roadways, Parking Areas and Sidewalks

1. An unobstructed traffic route shall be maintained at all times for the Owner’s operations personnel and maintenance equipment. The Contractor shall be responsible for providing access to and for preparing and maintaining/approved parking areas.

2. An unobstructed traffic route around the site shall be maintained at all times for the Owner’s operations personnel and maintenance equipment.

3. The Contractor shall repair any damage to existing paved surfaces that occurs during the construction period. Any areas disturbed along the shoulders of the access road and interior roads and elsewhere inside and outside of the project site shall be repaired, graded, seeded, etc. as necessary to match pre-existing conditions.

4. It shall be the responsibility of the Contractor to obtain any permits required from the County and pay all associated fees.

B. Personnel Access

1. Owner personnel shall have access to all areas which remain in operation throughout the construction period. The Contractor shall locate stored material, dispose of construction debris and trash, provide temporary walkways, provide temporary lighting, and other such work as directed by the Owner to maintain personnel access to areas in operation.

C. Power, Light and Communications Systems

1. Electric power, lighting service and communications systems shall be maintained in uninterrupted operation in all areas, which are not under construction activities at the time. Any connections to existing power systems shall not disturb the distribution system that is being connected into. All costs associated with use of temporary services or standby engine generators shall be paid by the Contractor. The Contractor shall coordinate shutdowns required with the Owner to minimize the total number of shutdowns required to complete construction.

D. Draining Water and Wastewater Transmission Mains

1. The contents of all pipes and conduits to be removed, replaced or relocated shall be transferred to a suitable facility in a manner approved by the Owner through hoses or piping, or by using pumps if hydraulic conditions so require them. The Contractor shall provide the pumps, piping and hoses at no additional cost to the Owner. No uncontrolled spillage of a pipe or conduit shall be permitted. Any
spillage, other than potable water, shall be immediately washed down and flushed into the appropriate process flow train. All content of said pipes (i.e. sewage or residual) shall be disposed of in accordance to Federal, State, and local regulations and standards.

2. For tie-ins that involve opening of existing forcemains, the Contractor shall provide impervious spill containment beneath such tie-ins to prevent spillage of sewage or untreated wastewater on to open ground.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -
SECTION 01530

PROTECTION OF EXISTING FACILITIES

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. Contractor shall be responsible for the preservation and protection of property adjacent to the work site against damage or injury as a result of his operations under this Contract. Any damage or injury occurring on account of any act, omission or neglect on the part of the Contractor shall be restored in a proper and satisfactory manner or replaced by and at the expense of the Contractor to an equal or superior condition than previously existed.

B. Contractor shall comply promptly with such safety regulations as may be prescribed by the Owner or the local authorities having jurisdiction and shall, when so directed, properly correct any unsafe conditions created by, or unsafe practices on the part of, his employees. In the event of the Contractor's failure to comply, the Owner may take the necessary measures to correct the conditions or practices complained of, and all costs thereof will be deducted from any monies due the Contractor. Failure of the Owner to direct the correction of unsafe conditions or practices shall not relieve the Contractor of its responsibility hereunder.

C. In the event of any claims for damage or alleged damage to property as a result of work under this Contract, the Contractor shall be responsible for all costs in connection with the settlement of or defense against such claims. Prior to commencement of work in the vicinity of property adjacent to the work site, the Contractor, at his own expense, shall take such surveys as may be necessary to establish the existing condition of the property. Before final payment can be made, the Contractor shall furnish satisfactory evidence that all claims for damage have been legally settled or sufficient funds to cover such claims have been placed in escrow, or that an adequate bond to cover such claims has been obtained.

1.2 PROTECTION OF WORK AND MATERIAL

A. During the progress of the work and up to the date of final payment, the Contractor shall be solely responsible for the care and protection of all work and materials covered by the Contract.

B. All work and materials shall be protected against damage, injury or loss from any cause whatsoever, and the Contractor shall make good any such damage or loss at his own expense. Protection measures shall be subject to the approval of the Owner.

1.3 BARRICADES, WARNING SIGNS AND LIGHTS

A. The Contractor shall provide and maintain such other warning signs and barricades in areas of and around their respective work as may be required for the safety of all those employed in the work, the Owner's operating personnel, or those visiting the site.
B. In the case of a conflict between this Specification Section and the Contractor’s Safety Plan, the more stringent requirement of the two documents shall govern.

1.4 EXISTING UTILITIES AND STRUCTURES

A. The term existing utilities shall be deemed to refer to both publicly-owned and privately-owned utilities such as electric power and lighting, telephone, water, gas, storm drains, process lines, sanitary sewers and all appurtenant structures.

B. Where existing utilities and structures are indicated on the Drawings, it shall be understood that all of the existing utilities and structures affecting the work may not be shown and that the locations of those shown are approximate only. It shall be the responsibility of the Contractor to ascertain the actual extent and exact location of existing utilities and structures. In every instance, the Contractor shall notify the proper authority having jurisdiction and obtain all necessary directions and approvals before performing any work in the vicinity of existing utilities.

C. Prior to beginning any excavation work, the Contractor shall, through field investigations, determine any conflicts or interferences between existing utilities and new utilities to be constructed under this project. This determination shall be based on the actual locations, elevations, slopes, etc., of existing utilities as determined in the field investigations, and locations, elevation, slope, etc. of new utilities as shown on the Drawings. If an interference exists, the Contractor shall bring it to the attention of the Owner as soon as possible. If the Owner agrees that an interference exists, he shall modify the design as required. Additional costs to the Contractor for this change shall be processed through a Change Order as detailed elsewhere in these Contract Documents.

D. The work shall be carried out in a manner to prevent disruption of existing services and to avoid damage to the existing utilities. Temporary connections shall be provided, as required, to ensure interruption of existing services. Any damage resulting from the work of this Contract shall be promptly repaired by the Contractor at his own expense in a manner satisfactory to the Owner or the respective authority having jurisdiction over such work. Where it is required by the authority having jurisdiction that they perform their own repairs or have them done by others, the Contractor shall be responsible for all costs thereof.

E. Where excavations by the Contractor require any utility lines or appurtenant structures to be temporarily supported and otherwise protected during the construction work, such support and protection shall be provided by the Contractor. All such work shall be performed in a manner satisfactory to the Owner or the respective authority having jurisdiction over such work. In the event the Contractor fails to provide proper support or protection to any existing utility, the Owner may, at his discretion, have the respective authority to provide such support or protection as may be necessary to insure the safety of such utility, and the costs of such measures shall be paid by the Contractor.
PART 2 -- PRODUCTS
(NOT USED)

PART 3 -- EXECUTION
(NOT USED)

- END OF SECTION -
PART 1 - GENERAL

1.1 REQUIREMENT
   A. Provide surveying services required for proper layout of work and record information.

1.2 QUALITY CONTROL
   A. A Land Surveyor Registered in the State of Florida shall be used for verifying existing control points and establishing new control points. Contractor shall be responsible to verify the accuracy of the established control points prior to performing layout.

1.3 SUBMITTALS
   A. Submit name, address, and telephone number of Registered Land Surveyor to the Engineer before starting work.
   B. On request, submit documentation verifying accuracy of survey work for project boundary and vertical and horizontal control.
   C. Submit monthly, on-going, record drawing files of all installed work. All work shall be surveyed for accurate locations within the month following installation of the work. Submit survey files as electronic files in CAD .dwg format to the Engineer along with, or prior to each monthly pay application. Coordinate CAD software version with OWNER and ENGINEER. Payment may be withheld if sufficient survey efforts are not made and data accurately and legibly recorded each month.
   D. Submit a certification letter with each survey file submitted, signed by the Surveyor, certifying that elevations and locations of improvements are in conformance with Contract Documents, with any significant deviations clearly listed and described in the certification letter.
   E. All buried, subsurface work shall be surveyed by the Surveyor in sufficient detail to locate the buried work. For pipelines, survey information shall be provided indicating the top of and coordinate location of each fitting and valve at a noted point on the fitting or valve, typically along the centerline and/or intersection of centerlines for bends. Location and top of pipe shall be recorded at a minimum of every 50 feet of straight run of piping that otherwise contains no fitting or valve. Survey work for such locations shall be completed prior to burying the work or within 1 week after installation with temporary markers allowing accurate location of each item if the work has to be buried immediately.
   F. All surface visible work shall be surveyed in sufficient detail to locate all new slabs, valve boxes, and roadways. Survey efforts shall be made monthly for all work that is complete after settling has occurred for structures and after pavement has been place for roadways and any valve boxes or vaults located within paved areas.
1.4 PROJECT RECORD DOCUMENTS

A. Maintain complete, accurate log of control and survey work as it progresses as noted above. Incorporate changes made by Field Order, Change Order, or Construction Change Directive. Incorporate details generated during the construction phase not shown on the original Contract Drawings.

B. Maintain one set of plans that all record drawing information is kept on, included legibly recorded data from survey work which indicates changes from the original locations noted on the Drawings, including any deviations for locations of existing buried or above ground infrastructure or contours. These plans shall show the record information within one week of installation of work or information being made available. Contractor’s record drawing markups shall be available for review by the Owner at any time during the normal workday. Failure to maintain the record drawing set may be cause to delay payment until the record drawing set is brought up to date.

C. Submit record drawing markups as specified in Section 01700 entitled “Contract Closeout”.

PART 2 – PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

3.1 INSPECTION

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Owner of any discrepancies discovered.

3.2 SURVEY REFERENCE POINTS

A. Protect survey control points prior to starting site work; preserve permanent reference points during construction. Make no changes without prior written notice to Owner.

B. Promptly report to Owner the loss or destruction of any reference point or relocation required because of changes in grades or other reasons. Replace dislocated survey control points based on original survey control.

3.3 SURVEY REQUIREMENTS

A. Utilize established bench marks for vertical and horizontal control during construction using or converting to North American Vertical Datum of 1988 (NAVD-88). Contractor shall be responsible for laying out the work, shall protect and preserve the established bench mark and shall make no changes or relocations without prior approval of Owner. Contractor shall report to Owner whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.
B. Contractor shall establish line and levels, locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements, including pavements, stakes for grading, fill and topsoil placement, utility locations, slopes, and invert, or centerline, elevations. Submit cut sheets for gravity sewers to Owner three days prior to construction.
   2. Grid or axis for structures.
   3. Piping locations, slopes, and invert, or centerline, elevations.

C. Periodically verify layouts by same means.

D. Contractor shall provide and incorporate into record drawing markups the horizontal and vertical record locations of improvements, including the following:
   1. Pipe coordinates at changes in direction.
   2. Coordinates of buried and above ground valves, tees and fittings.
   3. All underground piping invert or centerline elevations including at changes in slope.
   4. Pipe invert, or centerline, elevations at crossing with other pipe (if required).
   5. Other horizontal and vertical record data pertinent to completed Work.
   6. Location of existing buried work crossing all new buried work.

E. Ground surface record/information shall include the following:
   1. Spot elevations should be shown at a minimum 100-foot rectangular grid, sufficient to show all the important topographic features.
   2. All elevations shown on the construction drawings shall be confirmed or amended on the record drawing markups if finished elevations are different.

- END OF SECTION -
SECTION 01550

SITE ACCESS AND STORAGE

PART 1 -- GENERAL

1.1 SITE ACCESS

A. Access Roads

1. The Contractor shall use available road as access route. No new access road shall be created without Owner permission prior to construction of route.

2. Any fencing demolished for the purpose of access shall be replaced to match existing.

B. Parking Areas: Contractor shall negotiate with the Owner a specific area within the project area for Contractor and Subcontractor parking. The designated area shall not interfere with completion of Contract, daily operation, maintenance of construction, and/or the ability for the Owner to access the site. The parking area must be contained within County owned property.

C. Restoration: At the completion of the work, the surfaces of land used for access roads and parking areas shall be restored by Contractor to its original condition and to the satisfaction of the Owner. At a minimum, such as restoration shall include establishment of a permanent ground cover adequate to restrain erosion for all disturbed areas.

D. Traffic Regulations: Contractor shall obey all traffic laws and comply with all the requirements, rules and regulations of the Florida Department of Transportation and other local authorities having jurisdiction to maintain adequate warning signs, lights, barriers, etc., for the protection of traffic on public roadways.

E. Noise Abatement and Dust Control

1. Eliminate noise within the project area to the extent possible. “Residential” type mufflers shall be installed on all gasoline and diesel engines. All local ordinances and regulations covering noise control shall be observed.

2. Control dust emissions at all times through appropriate construction techniques, containment of dust to confined areas of the work, and by regular wetting of unpaved temporary construction access ways during dry weather.

1.2 PRODUCT DELIVERY

A. Delivery schedules for all products, materials, and equipment shall be controlled to minimize long-term storage of products at site and overcrowding of construction spaces. In particular, Contractor shall provide delivery/installation coordination to ensure minimum holding or storage times for products recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other sources of loss.
B. Owner shall not be responsible for the unloading or receipt of materials delivered to the project site. Contractor shall retain full responsibility to coordinate and schedule the delivery, unloading and placement of equipment in storage during the normal time of work.

1.3 PRODUCT TRANSPORTATION AND HANDLING

A. Contractor shall transport and handle products, materials, and equipment in accordance with manufacturer's written recommendations and by methods and means which will prevent damage, deterioration, and loss, including theft. Contractor shall submit to the Engineer copies of all manufacturers' written instructions regarding the same.

B. Products shall be transported by methods to avoid product damage and delivered in a dry and undamaged condition in manufacturer's unopened containers or packaging.

C. Contractor shall provide equipment and personnel to handle products by methods that will prevent soiling and damage.

D. Contractor shall provide additional protection during handling to prevent marring and otherwise damaging products, packaging, and surrounding surfaces.

1.4 GENERAL STORAGE AND PROTECTION

A. Contractor shall store products and materials, whether off site or on site, in accordance with manufacturer's written recommendations and by methods and means which will prevent damage, deterioration, and loss, including theft. Contractor shall submit to the Engineer copies of all manufacturers' written instructions regarding storage of same.

B. Contractor shall store products and materials at the job site in accordance with the requirements of the General Conditions, the Supplemental Conditions, and as hereinafter specified. All materials shall be stored in accordance with manufacturer's recommendations and as directed by the Owner, and in conformity to applicable statutes, ordinances, regulations and rulings of the public authority having jurisdiction.

C. Contractor shall enforce the instructions of Owner regarding the posting of regulatory signs for loadings on structures, fire safety, and smoking areas.

D. Contractor shall not store materials or encroach upon private property without the written consent of the owners of such private property.

E. Contractor shall not store unnecessary materials on the job site, and shall take care to prevent any structure from being loaded with a weight which will endanger its security or the safety of persons.

F. Materials shall not be placed within ten (10) feet of fire hydrants. Gutters, drainage channels and inlets shall be kept unobstructed at all times.

G. Contractor shall provide adequate temporary storage buildings/facilities, if required, to protect materials on the job site.
H. Products shall be stored with seals and labels intact and legible. Sensitive products shall be stored in weather-tight enclosures, and temperature and humidity ranges shall be maintained within required limits by manufacturer's written instructions.

I. For exterior storage of fabricated products, they shall be placed on sloped supports above ground. Products subject to deterioration shall rest on, and be covered with, impervious material. Ventilation shall be provided to avoid condensation.

J. Storage shall be arranged to provide access for inspection. Contractor shall periodically inspect to assure products are undamaged and maintained under required conditions.

K. Storage shall be arranged in a manner to provide access for maintenance and inspection of stored items.

L. The protection of stored materials shall be the Contractor's responsibility, the Owner shall not be liable for any loss of materials, by theft or otherwise, nor for any damage to the stored materials.

M. Materials accepted based on producers' certification shall be identified by production lot or other acceptable means which shows a direct tie between the certification and the material being used. Such identification will be used by the Owner when doing verification testing. The certification shall be signed by a legally responsible person from the producer on company letterhead.

N. Defective Materials: Materials which will be considered as defective are as follows: All materials not conforming to the requirements of the specifications; segregated materials, even though previously tested and approved; materials which are or have been improperly stored; and materials which are mixed with an excess of foreign material such as clay, coal, sticks, burlap, hay, straw, loam or earth, or other debris. All such materials, whether in place or not, will be rejected and shall, be removed immediately from the site of the Work and from the Contractor's storage areas, at the Contractor's expense. No rejected material, the defects of which have been subsequently corrected, shall be used until approval has been given. Upon failure on the part of the Contractor to comply promptly with any order of the Owner made under the provisions of this Article, the Engineer shall have authority to remove and replace defective material and to deduct the cost of removal and replacement from any moneys due or to become due the Contractor.

1.5 ENCLOSED STORAGE

A. Products subject to damage by the elements shall be stored in substantial, weather-tight enclosures.

B. Temperature and humidity shall be maintained within ranges stated in manufacturer's written instructions.

C. Contractor shall provide humidity control and ventilation for sensitive products as required by manufacturer's written instructions.

D. Unpacked and loose products shall be stored on shelves, in bins, or in neat groups of like items.
1.6  EXTERIOR STORAGE

A. Contractor shall provide substantial platforms, blocking, or skids to support fabricated products above ground and shall slope to provide drainage. Products shall be protected from soiling and staining.

B. Products subject to discoloration or deterioration from exposure to the elements shall be covered with impervious sheet material. Ventilation shall be provided to avoid condensation.

C. Loose granular materials shall be stored on clean, solid surfaces such as pavement or on rigid sheet materials to prevent mixing with foreign matter.

D. Surface drainage shall be provided to prevent erosion and ponding of water.

E. Contractor shall prevent mixing of refuse or chemically injurious materials or liquids.

1.7  MAINTENANCE OF STORAGE

A. Stored products shall be periodically inspected on a scheduled basis. Contractor shall maintain a log of inspections and make said log available to the Owner on request.

B. Contractor shall verify that storage facilities comply with manufacturer's product storage requirements.

C. Contractor shall verify that manufacturer-required environmental conditions are maintained continually.

D. Contractor shall verify that surfaces of products exposed to the elements are not adversely affected and any weathering of finishes is acceptable under requirements of the Contract Documents.

E. Owner may decrease payment when Contractor does not properly store or maintain products.

1.08  OWNER’S FACILITIES

A. The Contractor, subcontractors, suppliers, and others shall park only in the Contractor's designated parking area, which shall be approved by the Owner.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -
PART 1 -- GENERAL

1.1 SCOPE OF WORK

A. The Contractor shall provide means for the elimination or minimizing of noise, vibration, and air pollution caused by construction activities as well as controlling the generation and disposal of solid and hazardous wastes. Temporary erosion and sedimentation controls are specified under Division 2.

1.2 IMPLEMENTATION

A. Criteria

1. Noise Control: Noise Control shall be in accordance with Federal, State, and County regulations. The contractor shall comply with all local ordinances and regulations dealing with noise abatement.

2. Vibration Control: Vibration Control shall be in accordance with Federal, State, and local regulations. It is the Contractor's sole responsibility to prevent damage from vibration to adjacent structures and property.

3. Air Pollution Controls: Air Pollution Control shall be in accordance with Federal, State, and local regulations.

   a. Fugitive Dust

      1) Do not cause or allow the emissions of, from transport, handling, construction or storage activity to remain visible in the atmosphere beyond the property line of the emission source.

      2) Take precautions to minimize dust emissions from operations involving demolition, excavation, grading, clearing of land and disposal of solid waste.

      3) Do not cause or allow particulate matter to exceed 100 mg/m³ when determined as the difference between upwind and downwind samples collected on high volume samples at the property line for a minimum of five hours.

      4) Take precautions to prevent visible particulate matter from being deposited upon public roadways as a direct result of construction or hauling operations. Precautions shall include the removal of particulate matter from equipment before movement to paved streets, or the prompt removal of material from paved streets onto which such material has been deposited.
4. **Solid and Hazardous Waste**: Solid and Hazardous Waste Control shall be in accordance with Federal, State, and local regulations. The Contractor is solely responsible for the disposal of any hazardous waste that is generated by the Contractor's operation.

B. **Execution**: In order to implement these regulations, Contractor shall use the following procedures and techniques:

1. **Air Pollution**
   a. **Dust**
      1) Cover loads of materials, debris and soil transported from construction sites.
      2) Daily water down and sweep streets which have heavy volumes of construction vehicles carrying debris and excavated materials.
      3) Establish regular cycles and locations for washing trucks which haul soil from the site.
      4) Water down construction sites as needed to suppress dust, during handling of excavation soil or debris or during demolition.
   b. Burning of wastes on site is prohibited. Remove scrap and waste material and dispose of in accordance with laws, codes, regulations, ordinances and permits.
   c. Use construction equipment which has been designed and equipped to prevent or control air pollution in conformance with the regulations of the EPA, state and local authorities. Contractor shall have available evidence of such design and equipment shall be maintained and made available for inspection by the Owner.
   d. Establish and maintain records of the routine maintenance program for internal combustion engine powered vehicles and equipment used on the project. These records shall be held available for inspection by the Owner.

2. **Solid and Hazardous Waste**
   a. Solid wastes may be disposed of in a number of ways, including reuse on the project, sale for fuel, through controlled incineration, donation to other public private dump sites, either free or for a fee. The method of disposal is restricted according to the classification of the waste material by the CFR 40 - 190 to 399, and by local requirements. Hazardous material shall be disposed of in Class I or Class II-1 waste disposal facilities.
   b. Haul routes for transporting solid or hazardous wastes are subject to the approval of the Owner.
PART 2 -- PRODUCTS
(NOT USED)

PART 3 -- EXECUTION
(NOT USED)

- END OF SECTION –
SECTION 01600
MATERIALS AND EQUIPMENT

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The word "Products," as used herein is defined to include purchased items for incorporation into the Work, regardless of whether specifically purchased for project or taken from Contractor's stock of previously purchased products. The word "Materials," is defined as products which must be substantially cut, shaped, worked, mixed, finished, refined, or otherwise fabricated, processed, installed, or applied to form units of Work. The word "Equipment" is defined as products with operational parts, regardless of whether motorized or manually operated, and particularly including products with service connections (wiring, piping, and other like items). Definitions in this paragraph are not intended to negate the meaning of other terms used in Contract Documents, including "specialties," "systems," "structure," "finishes," "accessories," "furnishings," "special construction," and similar terms, which are self-explanatory and have recognized meanings in the construction industry.

B. Equipment Specifications may not deal individually with minor items required such as components, parts, controls, and devices which may be required to produce the equipment performance specified or as required to meet the equipment warranties. Where such items are required, they shall be included by the supplier of the equipment, whether or not specifically called for in the Contract Documents.

C. All equipment, materials, instruments or devices incorporated in this project shall be new and unused, unless indicated otherwise in the Contract Documents. Equipment and materials to be incorporated into the work shall be delivered sufficiently in advance of their installation and use to prevent delay in the execution of the work, and they shall be delivered as nearly as feasible in the order required for executing the work.

D. Where the words "furnish", "provide", "supply", "replace", or "install" are used, whether singularly or in combination, they shall mean to furnish and install, unless specifically stated otherwise. In the interest of brevity, the explicit direction "to furnish and install" has sometimes been omitted in specifying materials and/or equipment herein. Unless specifically noted otherwise, it shall be understood that all equipment and/or materials specified or shown on the Drawings shall be furnished and installed under the Contract as designated on the Drawings.

E. The Contractor shall protect all equipment and materials from deterioration and damage, including provisions for temporary storage buildings as needed and as specified in Section 01550 entitled "Site Access and Storage". Storage of equipment and materials shall be in locations completely protected from flooding, standing water, excessive dust, falling rock, brush fire, etc. Storage areas shall be located sufficiently distant from all construction activities and the movement of construction vehicles to minimize the potential for accidental damage. Any equipment or materials of whatever kind which may have become damaged or deteriorated from any cause shall be removed and replaced by good and satisfactory items at the Contractor's expense for both labor and materials.
1.2 INSTALLATION OF EQUIPMENT

A. Equipment and materials shall be installed in accordance with the requirements of the General Conditions, Supplemental Conditions and the respective Specification Sections.

B. Before mounting equipment, the Contractor shall clean the top surface; if necessary, rough it with a star chisel and clean again; and clean out all foundation bolt sleeves. The Contractor shall provide a sufficient number of stainless steel plate shims about 2-inches wide and 4-inches long, and of a varying thickness from 1/8 to 1/2 inch. A combination of these shims shall be placed next to each foundation bolt to bring the bottom of the bedplate or frame about 1/8 inch above the final setting. The equipment shall be lowered by changing the combination of shims. Using stainless steel shim stock of various thicknesses, continue to level the equipment a little at a time and in rotation until it is at the correct elevation in both directions. When the equipment is level, tighten down on the foundation bolts a little at a time in rotation to make certain the equipment remains level and does not shift on the shims. A preliminary alignment check shall be made before grout is placed.

C. Equipment shall be set, aligned and assembled in conformance with manufacturer's drawings or instructions. Run out tolerances by dial indicator method of alignment shall be plus or minus .002 inches, unless otherwise directed by the Owner.

D. All blocking and wedging required for the proper support and leveling of equipment during installation shall be furnished by the Contractor. All temporary supports shall be removed, except stainless steel wedges and shims, which may be left in place with the approval of the Owner.

E. Each piece of equipment or supporting base, bearing on concrete foundations, shall be bedded in grout. The Contractor shall provide a minimum of 1-1/2-inch thick grouting under the entire baseplate supporting each pump, motor drive unit and other equipment. Grout shall be non-shrink grout, as specified under Section 03305 entitled "Grout".

F. When motors are shipped separately from driven equipment, the motors shall be received, stored, meggered once a month, and the reports submitted to the Owner. After driven equipment is set, the motors shall be set, mounted, shimmed, millrighted, coupled and connected complete. Motors shall then be turned once per month and documented by the Contractor to the Owner.

1.3 CONNECTIONS TO EQUIPMENT

A. Connections to equipment shall follow manufacturer's recommendations as to size and arrangement of connections and/or as shown in detail on the Drawings or approved Shop Drawings. Piping connections shall be made to permit ready disconnection of equipment with minimum disturbance of adjoining piping and equipment.

B. The Contractor shall be responsible for bringing proper electrical service to each item of equipment requiring electrical service as shown on the Drawings or approved Shop Drawings. Electrical connections to equipment requiring electrical service shall be made by a qualified electrician.
1.4 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS

A. Approved Materials: Only materials conforming to the requirements of the specifications and approved by the Owner shall be used in the Work. Any materials proposed for use may be inspected or tested at any time during their preparation and use. No material which, after approval, has in any way become unfit for use shall be used in the work. Materials containing asbestos will not be allowed.

B. Notification of Placing Order: The Contractor shall give sufficient notification of the placing of orders for materials and shall order materials sufficiently in advance of their incorporation in the Work to allow time for sampling and testing.

C. Approval of Source of Supply: Representative preliminary samples, of the character and quantity prescribed, shall be submitted by the Contractor or producer for examination, and will be tested in accordance with the standard methods. If, after trial, it is found that a source of supply which has been approved does not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish material from other approved sources.

D. General: If the volume, progress of the work, and other considerations warrant, the Owner may undertake the inspection of materials at the source of supply.

E. The Owner assumes no obligation to make such inspection of materials at the source of supply, and the responsibility for assuring that the materials are satisfactory rests entirely with the Contractor.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: Where more than one choice is available as options for Contractor's selection of a product or material, Contractor shall select an option which is compatible with other products and materials already selected. Compatibility is a basic general requirement of product/material selection.

1.6 LUBRICANTS

A. During testing and prior to acceptance, the Contractor shall furnish all lubricants necessary for the proper lubrication of all equipment furnished under this Contract.

1.7 SPECIAL TOOLS

A. For each type of equipment furnished, the Contractor shall provide a complete set of all special tools (including calibration and test equipment) which may be necessary for the adjustment, operation, maintenance and disassembly of such equipment.

B. Special tools shall be delivered at the same time as the equipment to which they pertain. The Contractor shall properly store and safeguard such special tools until completion of the Work, at which time they shall be delivered to the Owner.
1.8 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, 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 acceptable materials.

1.9 FASTENERS

A. All necessary bolts, anchor bolts, nuts, washers, plates and bolt sleeves shall be furnished by the Contractor in accordance herewith. Bolts shall have suitable washers and, where so required, their nuts shall be hexagonal.

B. All bolts, anchor bolts, nuts, washers, plates, and bolt sleeves shall be Type 316 stainless steel unless otherwise specifically indicated or specified.

C. Unless otherwise specified, stud, tap, and machine bolts shall be of the best quality refined bar iron. Hexagonal nuts of the same quality of metal as the bolts shall be used.

1.10 EXCAVATED MATERIALS

A. Excavated suitable materials needed for backfilling operation shall be stored on site. Where additional area is needed for stockpiling, it shall be obtained by the Contractor.

B. Any excavated unsuitable backfill material shall be removed from the site and properly disposed of. Excess suitable backfill materials shall be delivered to a County site within 7 miles of the project site.

1.11 PROPOSED EQUIPMENT, SUPPLIERS, AND MATERIALS

A. The Technical Specifications include named manufacturers that were the basis of the design along with approved equals for the major equipment items and materials on this project. The Contractor shall use one of the named manufacturers unless substitute items are approved as specified herein.

1.12 SUBSTITUTION "OR EQUAL" ITEMS

A. Requests for substitutions of equipment or materials shall conform to the requirements of the General Conditions, Supplemental Conditions, and as hereinafter specified.

1. Contractor shall submit for each proposed substitution sufficient details, complete descriptive literature and performance data together with samples of the materials, where feasible, to enable the Owner and Engineer to determine if the proposed substitution is equal.

2. Contractor shall submit certified tests, where applicable, by an independent laboratory attesting that the proposed substitution is equal.

3. A list of installations where the proposed substitution is equal.
4. Requests for substitutions shall include full information concerning differences in cost, and any savings in cost resulting from such substitutions shall be passed on to the Owner.

B. Where the approval of a substitution requires revision or redesign of any part of the work, including that of other Contracts, all such revision and redesign, and all new drawings and details therefore, shall be provided by the Contractor at his own cost and expense, and shall be subject to the approval of the Owner and Engineer.

C. In the event that the Engineer is required to provide additional engineering services, then the Engineer's charges for such additional services shall be deducted from monies owed to the Contractor in accordance with the requirements of the General Conditions, and the Supplemental Conditions.

D. In all cases the Owner and Engineer shall be the judge as to whether a proposed substitution is to be approved. The Contractor shall abide by their decision when proposed substitute items are judged to be unacceptable and shall in such instances furnish the item specified or indicated. No substitute items shall be used in the work without written approval of the Owner and Engineer.

E. Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Engineer in considering a substitution proposed by the Contractor or by reason of the failure of the Engineer to approve a substitution proposed by the Contractor.

F. Acceptance of any proposed substitution shall in no way release the Contractor from any of the provisions of the Contract Documents.

G. Order of Precedence: Where a particular type or model number for an item of equipment is specified in addition to a word description of the item, it shall be understood that the word description and model number are intended to complement each other. If there is an apparent conflict or omission between the description and the model number specified, the more stringent requirement shall apply.

H. Variations from Specifications: All variations of the proposed substitute from that specified will be identified in the application, and available maintenance, repair, and replacement service will be indicated. The application shall also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of subcontractors affected by the resulting change, all of which shall be considered by the Engineer in evaluation of the proposed substitute.

I. Means and Methods: If a specific means, method, technique, sequence, or procedure of construction is indicated in or required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, sequence, technique, or procedure of construction acceptable to the Engineer, if the Contractor submits sufficient information to allow the Engineer to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents.

1.13 REQUESTS FOR REVIEW OF SUBSTITUTE ITEMS

A. General: Requests for review of substitute items of material and equipment will not be
accepted from anyone other than the Contractor. If the Contractor wishes to furnish or use a substitute item of materials or equipment, Contractor shall make written application in the form of a standard submittal for acceptance thereof, certifying that the proposed substitute will perform its functions adequately and achieve the results called for by the general design, be of similar substance and quality to that specified, and be suited to the same use and capable of performing the same function as that specified. The application shall state that the evaluation and acceptance of the proposed substitute will not prejudice the Contractor's achievement of substantial completion or any completion milestone on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty.

B. Form of Request: A request for substitution must be in writing in the form of a standard submittal and include descriptive literature, specifications, test report, or samples, as appropriate, to enable the Engineer to determine the acceptability of the product proposed for substitution. If substitution is requested as part of the Contractor's submittal of a proposed equivalent product, the item(s) proposed for substitution shall be clearly indicated. No substitute product shall be used on the Work until written approval has been received from the Engineer. Any revisions to any other portion of the Work made necessary by such substitution must be included in the submittal for the approval of the Engineer and all additional costs of these revisions shall be borne by the Contractor, including such calculations as may be required to substantiate performance.

C. Time for Review By Engineer: The Engineer shall be allowed a reasonable time within which to evaluate each proposed substitute. The Engineer shall be the sole judge of acceptability, and no substitute will be ordered, installed, or utilized without the Engineer’s prior written acceptance which will be evidenced by either a change order or a reviewed shop drawing marked either "FURNISH AS SUBMITTED" or "FURNISH AS CORRECTED." The Engineer shall not unreasonably withhold approval. The Engineer may require the Contractor to furnish at the Contractor's expense a special performance guarantee or other surety with respect to any substitute, the Engineer will record time required for evaluating substitutions proposed by the Contractor and in making changes in the Contract Documents occasioned thereby. Whether or not the Engineer accepts a proposed substitute, the Contractor shall reimburse the Owner by way of deduct from monies owed the Contractor for the charges of the Engineer and/or the Engineer's consultants for evaluating each proposed substitute.

1.14 IDENTIFICATION TAGS FOR EQUIPMENT AND INSTRUMENTS

A. All process equipment, pumps, blowers, valves, gates and process instruments that are identified by a tag number on the Process and Instrumentation Diagrams (P&IDs on Instrumentation contract drawings) shall have an identification tag at the device.

B. The identification tag shall show a unique tag number for the device and the common name of the device as referred to on the Drawings.

C. The identification tag shall be non-corrosive metal tags, ASTM A240 Grade 430 stainless steel with a bright annealed finish.
D. Characters on identification tags shall be 3/16” high and surface cut deep unless otherwise noted. Characters shall be cut into stainless steel tags with a diamond tip cutter.

E. Identification tags shall be buffed around the perimeter to remove any sharp edges or corners.

F. Identification tags shall be attached to the equipment item, valve, or instrument with 0.9 mm diameter wire or stainless steel screws.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -
PART 1 -- GENERAL

1.1 SUBSTANTIAL COMPLETION

A. Substantial Completion is defined as that point when all portions of the Work have been successfully started up and accepted by the Owner and all other ancillary project requirements have been completed such that any remaining work can be completed within two (2) weeks, and as additionally defined in the Contract’s General Conditions and Supplemental General Conditions. Temporary paving and pavement painting should be complete and project area restoration should not require more than two (2) weeks as previously mentioned.

B. When the Contractor believes Substantial Completion has been achieved, Contractor shall request, in writing, to the Engineer, that Substantial Completion be recognized as having been achieved and request that the Owner issue a Certificate of Substantial Completion. Prior to making such a request, the Contractor must have:

1. Completed all work necessary for the safe, proper and complete use or operation of the facility as intended.

2. Prepared a Contractor-generated punch list for submission with the request for issuance of a Certificate of Substantial Completion.

3. Submitted for and received acceptance of accurate record drawings for all work completed to date.

4. Submitted and received acceptance of all specified warranties and guarantees.

C. Upon receipt of the request from the Contractor, the Engineer and designated representatives shall review the request, the Work and the above requirements to determine whether the Contractor has achieved Substantial Completion. If this review fails to support Substantial Completion, the Engineer shall so notify the Contractor in writing citing the reasons for rejection. If the Engineer determines the Contractor has reached Substantial Completion, the following procedures will be followed:

1. The Engineer and Owner will review the Contractor's punch list to assure all deficiencies are noted and add to the list any noted deficiencies or incomplete work found during a pre-final walk-through of the Work. The Final Punch List will be provided to the Contractor with all items listed that must be completed to achieve Final Completion.

2. Along with the Final Punch List, the Engineer shall prepare a Certificate of Substantial Completion establishing the date for Substantial Completion as the date of the pre-final walk-through, assuming the walk-through has verified that the Project is in fact substantially complete.
1.2 FINAL COMPLETION

A. Final Completion will be deemed to have occurred when all work is complete including the following:

1. All Final Punch List items have been corrected, signed off by the Contractor and the Engineer, and demonstrated to the Owner during a final walk through.

2. All updates to the record drawings, and operations and maintenance manuals have been made.

3. Demobilization and site cleanup are complete.

4. The Engineer has issued a Certificate of Final Completion.

5. Remove bitumen from gravel stops, fascias, and other exposed surfaces, regardless if so noted on the Final Punch List.

6. Remove all stains, marks, fingerprints, soil, spots, and blemishes from all finished surfaces, tile, stone, brick, and similar surfaces, regardless if so noted on the Final Punch List.

7. The following documents have been turned over to the Owner:
   a. Outstanding test results, certificates, and performance documents of project components that have not yet been received. The Contractor's attention is directed to the fact that such documents must actually be submitted earlier in accordance with the sequence of construction and at the time of startup for any portion of the Work.
   b. Contractor's written warrantee statement as specified herein.

1.3 CLOSE OUT REQUIREMENTS

A. Final Cleaning

1. At the completion of each phase of the work and prior to startup, as scheduled the Contractor shall remove all rubbish from and about the site of the completed work, and all temporary structures, construction signs, tools, materials, supplies and equipment which he or any of his Subcontractors may have used in the performance of the work. Contractor shall broom clean paved surfaces and rake clean other surfaces of grounds.

2. Contractor shall thoroughly clean all materials, equipment and structures; all marred surfaces shall be touched up to match adjacent surfaces; dirty filters and burned out lights replaced as required; all glass surfaces cleaned and floors cleaned and polished so as to leave work in a clean and new appearing condition.

3. Contractor shall maintain cleaning until project, or portion thereof, is occupied by the Owner.
B. Final Cleanup; Site Rehabilitation

1. Before final acceptance, the Contractor shall wash and clean all exposed surfaces which have become soiled or marked, and shall remove from the site of work all accumulated debris and surplus materials of any kind which result from his operation, including construction equipment, tools, sheds, sanitary enclosures, etc. The Contractor shall leave all fixtures and work, which he has installed, in a clean condition. The completed project shall be turned over to the Owner in a neat and orderly condition.

2. The site of the work shall be rehabilitated or developed in accordance with other sections of the Specifications and the Drawings. In the absence of any portion of these requirements, the Contractor shall completely rehabilitate the site to a condition and appearance equal or superior to that which existed just prior to construction, except for those items whose permanent removal or relocation was required in the Contract Documents or ordered by the Owner.

C. Contractor’s Warrantee: The Contractor shall warrant the Work under this Contract, regardless of whether supplied by a vendor or subcontractor, that the Work is free of defects in workmanship and materials and that the Work meets the requirements of the Contract Documents. The Contractor’s warrantee period shall begin at the date of Final Completion and shall be for a period of one (1) years. During this period, the Contractor shall repair or replace items found either to be defective or deficient in meeting the requirements of the Contract Documents. The Contractor’s warrantee shall be a written warrantee submitted with the final pay application and shall be in addition to the product, materials, systems, and equipment guarantees and warranties called for with the various sections of the specifications.

PART 2 -- PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

(NOT USED)

- END OF SECTION -
SECTION 01720

PROJECT RECORD DRAWINGS

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall keep and maintain, at the job site, one record copy of all drawings, specifications, addenda, change orders, and other modifications to the Contract, approved shop drawings, and field test records.

B. The Contractor shall mark the drawings to indicate all project conditions, locations, configurations, and any other changes or deviations which may vary from the details represented on the original Contract Drawings, including buried or concealed construction and existing utility features which are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of all new and existing buried utilities that differ from the locations indicated, or which were not indicated on the Contract Drawings. Said record drawing markups shall be supplemented by any detailed sketches as necessary or directed to indicate, fully, the Work as actually constructed and those existing features encountered during construction of new work. These master record drawing markups of the Contractor’s representation of as-built conditions, including all revisions made necessary by addenda and change orders, shall be maintained up-to-date during the progress of the Work.

C. Project record drawing markups shall be maintained and updated by the Contractor on a month-to-month basis.

D. Record drawing markups shall be accessible to the Engineer and the Owner at all times during the construction period.

E. Periodic payments shall not be processed prior to Engineer and/or Owner's review and acceptance of record drawing markups development for the pay period submitted.

F. Final payment will not be acted upon until the Contractor has prepared and delivered record drawing markups to the Engineer. Said up-to-date record drawing markups shall be in the form of a set of prints 22 x 34 inch in size with carefully plotted information overlaid in red ink.

G. Upon substantial completion of the Work and prior to final acceptance, the Contractor shall finalize and deliver a complete set of record drawing markups to the Engineer conforming to the construction records of the Contractor. This set of drawings shall consist of corrected drawings showing the reported location of the Work. The information submitted by the Contractor and incorporated by the Engineer into the Record Drawings will be assumed to be correct, and the Contractor shall be responsible for the accuracy of such information, and shall bear the costs resulting from the correction of incorrect data furnished to the Engineer.
1.2 RECORDING

A. Label each document "PROJECT RECORD" in neat large printed letters.

B. Record information concurrently with the progress of construction as specified under Section 01541, Field Surveying.

C. For any Work that required development of electronic drawing files as part of the original submittal on that work, provide one (1) electronic file copy of all such drawings in AutoCAD (Version to be coordinated with Owner and Engineer).

D. Legibly mark drawings to record actual construction
   1. Incorporate changes made by Interim Field Change Agreement, Field Order, Change Order, or Construction Change Directive.
   2. Incorporate details generated during the construction phase not shown on the original Contract Drawings.

1.3 SUBMITTAL

A. Prior to Final Completion, submit Record Documents to the Engineer.

B. Accompany submittal with a transmittal letter in duplicate, containing:
   1. Date.
   2. Project title and number.
   3. Contractor's name and address.
   4. Title and number of each record document.
   5. Signature of Contractor or its authorized representative.

PART 2 – PRODUCTS
(NOT USED)

PART 3 – EXECUTION
(NOT USED)

- END OF SECTION -
SECTION 01730

OPERATION AND MAINTENANCE MANUALS

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. Contractor shall provide operation and maintenance materials as specified herein and as further specified in individual sections of the Contract Document specifications. Format and content of these materials shall be as specified herein.

1.2 SUBMITTALS

A. Written operations and maintenance instructions are required for all equipment items supplied for this project. The amount of detail shall be commensurate with the complexity of the equipment item. Pictorial cuts of equipment are required for operator reference in servicing.

B. Submit the following for each individual piece of equipment, system, materials, or products:

1. Preliminary Operation and Maintenance Manuals: The Contractor shall submit two (2) complete hard copies of preliminary Operations and Maintenance (O&M) Manuals for each item of equipment at the same time the equipment is delivered to the project site (one set to be given to the Owner, the other kept in the Contractor’s field office). Submit a searchable, electronic copy of all such materials in PDF format to the Engineer for review.

2. Final Operation and Maintenance Manuals: Furnish to the Owner three (3) complete hard copies and one (1) electronic copy in searchable PDF format of a fully assembled Operation and Maintenance Manual Volumes after incorporating all Owner's and Engineer's review comments on the preliminary Operation and Maintenance Manual.

3. The Equipment Data Summary (see attached example) shall be completed IN FULL for each equipment item furnished by the Contractor. Completed Equipment Information Summary forms shall be assembled within a separate section so dedicated within the operation and maintenance Manual. An electronic copy of each completed Equipment Data Summary shall be provided as a separate worksheet within a Microsoft Excel workbook file (.xls) on a CD-ROM. Worksheet tabs shall be labeled with the associated equipment item’s Equipment Tag.

1.3 FORMAT AND CONTENTS

A. Each operations and maintenance manual shall contain the following information:

1. Storage instructions and requirements (short term and long term)
2. Installation instructions
3. Assembly and erection drawings/details
4. Dimensional drawings
5. Wiring diagrams including all control and lightning systems
6. Equipment data summary table (see sample form at the end of this section)
7. Equipment preventative maintenance data summary (see sample form at the end of this section)
8. Manufacturer’s operating manual/instructions including equipment start-up, normal operation, shutdown, and emergency operation
9. Manufacturer’s maintenance instructions including equipment calibration and adjustment, preventive and repair maintenance, and lubrication instructions
10. Trouble shooting guide
11. Parts diagram/list
12. Spare parts list (these are parts that the manufacturer recommends having readily available for use during preventative maintenance or are normal wear items, and manufacturers that can provide each of the recommended spare parts)
13. Recommended lubricant types (lubrication schedule shall be included with the preventative maintenance data summary, and manufacturers of the lubricants recommended)
14. Tools list (any tools that will be required for preventative maintenance, disassembly, or re-assembly of the equipment, and manufacturers of the tools)
15. Single line schematic
16. List of electrical relay settings and control and alarm contact settings.
17. Applicable software (if required)
18. Software manuals (if required)
19. Warranty
20. Contact information for the contractor, manufacturer, manufacturer’s representative and nearest service representative
21. Any additional information not covered above that was included in the approved submittal for each item with all comments corrected and addressed.
B. Any equipment that contains multiple components (for example a pump and motor), the above information shall be provided for each component.

C. For valve operation and maintenance manuals, provide one valve schedule giving valve number, location, fluid, and fluid destination for each valve installed. Group all valves in same piping systems together in the schedule. Obtain a sample of the valve numbering system from the Owner.

D. All operation and maintenance manual material shall be printed on 8-1/2”x11” or 11”x17” paper.

E. Each manual shall be bound together in appropriate three-ring binders. Each binder shall be provided with front cover with the following information, as a minimum:

1. Sarasota County logo
2. Project name: Lockwood Ridge Booster Pump Station
3. Date (Month / Year)
4. Equipment name(s)
5. Applicable specification section
6. Manufacturer’s name
7. Contractor’s name

F. Each manual shall also be provided with a binder edge cover that contains, at a minimum, the project name, date and equipment name. If multiple items of equipment or materials are included in a binder, provide the names of each product included in the binder edge cover and on the front cover.

G. Each manual shall be divided into sufficient sections to facilitate ease of use and reference of the manual. Sections shall be identified using heavy section dividers with reinforced holes and numbered plastic index tabs; tabs with section titles shall be acceptable. A detailed table of contents shall be provided. At a minimum, the following sections shall be provided:

1. Equipment technical data summary
2. Storage / installation instructions
3. Operation instructions
4. Maintenance instructions
5. Dimensional/assembly drawings, diagrams, and parts lists
6. Wiring drawings and diagrams
7. Contact information

8. Warranty

H. All operating and maintenance material that comes bound by the equipment manufacturer shall be left in its original bound state. Cross-reference the appropriate sections of the Contractor's operations and maintenance manual to the manufacturers' bound manuals.

I. Label binders Volume 1, 2, and so on, where more than one binder is required. Include the table of contents for the entire set, identified by volume number, in each binder.

J. When manufacturer's manuals and diagrams contain information applicable to multiple models or configurations, the information not applicable to this specific installation shall be stricken.

K. The final operations and maintenance manual shall reflect the most current edition of the shop drawing accepted by the Engineer. Any field changes or modifications shall also be included.

PART 2 - PRODUCTS

(NOT USED)

PART 3 - EXECUTION

(NOT USED)
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<td>3</td>
<td>Equipment Tag (To Be Furnished on Drawings)</td>
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NOTES:


- END OF SECTION -
SECTION 02222
EXCAVATION AND BACKFILL FOR UTILITIES

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. Excavate, grade and backfill as required for the site underground piping systems, as shown on the Drawings and specified herein the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01300 – Submittals
B. Section 03305 – Concrete and Grout
C. Section 15000 – Piping, General

1.3 SUBMITTALS

A. The Contractor shall submit information and samples to the Engineer for review as specified herein in accordance with the Section 01300 entitled "Submittals".

B. Dewatering

1. The Contractor shall submit to the Engineer his proposed methods of handling trench water and the locations at which the water will be disposed of. Methods shall be acceptable to the Engineer before starting the excavation. The Contractor shall pay for and procure all necessary permits for dewatering.

C. Bedding and Backfill Materials

1. The Contractor shall notify the Engineer of the off-site sources of bedding and backfill materials, and submit to the Engineer a representative samples weighing approximately 10 pounds. The samples shall be delivered to a designated location on site.

D. Sheeting System

1. Drawings of any proposed sheeting system and design computations shall be submitted to the Engineer; however, the review of these Drawings shall in no way relieve the Contractor of the responsibility to provide a safe and satisfactory sheeting and shoring system. Sheetling and shoring shall be designed by the Contractor, and the proposed design shall be sealed by a Professional Engineer registered in the State of Florida. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he may order additional supports put in at the Contractor's expense.
1.4 QUALITY CONTROL

A. All soils testing shall be performed by an independent testing laboratory retained by the County as specified in Section 01400 entitled "Quality Control". The Contractor shall schedule his Work so as to permit a reasonable time for testing before placing succeeding lifts of backfill and shall keep the laboratory informed of his progress. In the event any test shows the work is not in conformance with these Contract Documents, the cost of any subsequent testing to show conformance shall be borne by the Contractor. All test results shall be sent directly to the Engineer. All testing invoices shall be sent directly to the County.

1.5 GROUNDWATER

A. The Contractor shall be responsible for anticipating groundwater conditions and shall provide positive control measures as required. Such measures shall ensure stability of excavations, groundwater pressure control, prevention of tanks, pipes, and other structures from being lifted by hydrostatic pressures, and avoiding the disturbance of subgrade bearing materials.

1.6 TRENCH SAFETY ACT COMPLIANCE

A. The Contractor by signing and executing the contract is, in writing, assuring that he will perform any trench excavation in accordance with the Florida Trench Safety Act, Section 553.60 et. seq. The Contractor further identified the separate item(s) of cost of compliance with the applicable trench safety standards as well as the method of compliance as noted in the Contract front-end document.

B. The Contractor acknowledges that this cost is included in the applicable items of the Proposal and Contract and in the Grand Total Bid and Contract Price.

C. The Contractor is, and the County and Engineer are not, responsible to review or assess the Contractor's safety precautions, programs or costs, or the means, methods, techniques or technique adequacy, reasonableness of cost, sequences or procedures of any safety precaution, program or cost, including but not limited to, compliance with any and all requirements of Florida Statute Section 553.60 et. seq. cited as the "Trench Safety Act". The Contractor is, and the County and Engineer are not, responsible to determine if any safety or safety related standards apply to the project, including but not limited to, the "Trench Safety Act". The Contractor is solely responsible for and required to follow all rules applicable in the trench safety act under this contract.

1.7 PROTECTION OF PROPERTY AND STRUCTURES

A. The Contractor shall, at his own expense, sustain in place and protect from direct or indirect injury, all pipes, poles, conduits, walls, buildings, and all other structures, utilities, and property in the vicinity of his work. Such sustaining shall be done by the Contractor. The Contractor shall take all risks attending the presence or proximity of pipes, poles, conduits, walls, buildings, and all other structures, utilities, and property in the vicinity of his work. He shall be responsible for all damage, and assume all expenses, for direct or indirect injury and damage, caused by his work, to any such pipe, structures, etc., or to any person or property, by reason of injury to them, whether or not such structures, etc., are shown on the Drawings.
B. Barriers shall be placed at each end of all excavations and at such places as may be necessary along excavations to warn all pedestrian and vehicular traffic of such excavations. Barricades with flashing lights shall also be placed along excavation from sunset each day to sunrise of the next day until such excavation is entirely refilled, compacted, and paved. All excavations shall be barricaded where required to meet OSHA, local and Federal Code requirements, in such a manner to prevent persons from falling or walking into any excavation within treatment plant fenced property.

1.8 SITE CONDITIONS

A. General

1. The County and/or the Engineer will not assume responsibility for variations of sub-soil quality or conditions at all locations. The Contractor shall examine the site and review the available geotechnical information available to the public, or undertake its own subsurface investigation prior to submitting its bid, taking into consideration all conditions that may affect its work.

PART 2 -- PRODUCTS

2.01 MATERIALS

A. Materials shall be furnished as required from on-site excavations or from acceptable off-site sources as required. The Contractor shall notify the Engineer of the sources of each material at least ten calendar days prior to the anticipated use of the materials.

B. Crushed stone shall be used for bedding of 20-inch and larger diameter pipe as detailed and at other locations indicated on the Drawings. Crushed stone shall consist of hard, durable, subangular particles of proper size and graduation, and clay, excess fines, and other deleterious materials. The stone shall be graded within the following limits:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Finer by Weight</th>
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<tr>
<td>5/8 inch</td>
<td>100</td>
</tr>
<tr>
<td>1/2 inch</td>
<td>40 - 100</td>
</tr>
<tr>
<td>3/8 inch</td>
<td>15 - 45</td>
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<tr>
<td>No. 10</td>
<td>0 - 5</td>
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</table>

C. In general, clean sandy excavated material, that is free from organics clay and construction debris can be used for backfill material. All material to be used as selected backfill shall be able to pass a 3/4-inch sieve. If, in the Engineer's opinion, excavation material is unsuitable for backfill purposes, imported material having a sand equivalent value of not less than 20 percent shall be used for this portion of the trench backfill. All backfill material (placed above select backfill) shall be able to pass through a 6-inch ring. If suitable backfill is not available from the excavations, it shall be obtained from off site sources.
PART 3 -- EXECUTION

3.1 EXCAVATION

A. The Contractor shall perform all excavation of every description and of whatever substance encountered, to the dimensions, grades and depths shown on the Drawings, or as directed. All excavations shall be made by open cut. All existing utilities such as pipes, poles and structures shall be carefully located, supported and protected from injury; in case of damage, they shall be restored at the Contractor's expense.

B. Pipe trenches for piping shall be excavated to a width within the limits of the top of the pipe and the trench bottom so as to provide a clearance on each side of the pipe barrel, measured to the face of the excavation, or sheeting if used, of 8 inches to 12 inches. The clearance shall be from 12 inches to 18 inches. All pipe trenches shall be excavated to a level where suitable material is reached, a minimum of 8 inches below the excavated depth that will allow for a minimum of 36 inches of covering unless otherwise indicated on the Drawings. Excavation depths in other types of materials and conditions shall be made as hereinafter specified.

C. In areas where trench widths are not limited by right-of-way and/or easement widths, property line restrictions, existing adjacent improvements, including pavements, structures and other utilities, and maintenance of traffic, the trench sides may be sloped to a stable angle of repose of the excavated material but only from a point one foot above the crown of the pipe. A substantially and safely constructed movable shield, "box" or "mule" may be used in place of sheeting when the trench is opened immediately ahead of the shield and closed immediately behind the shield as pipe laying proceeds inside the shield.

D. Ladders or steps shall be provided for and used by workmen to enter and leave trenches.

E. Excavation for appurtenances shall be sufficient to provide a clearance between their outer surfaces and the face of the excavation or sheeting, if used, of not less than 12 inches.

F. Excavated unsuitable material shall be removed from the site and disposed of by the Contractor. Materials removed from the trenches shall be stored and in such a manner that will not interfere unduly with plant operations, traffic on public roadways and sidewalks and shall not be placed on private property. In congested areas, such materials as cannot be stored adjacent to the trench or used immediately as backfill shall be removed to other convenient places of storage acceptable to the County at the Contractor's expense.

G. Excavated material that is suitable for use as backfill shall be used in areas where sufficient material is not available from the excavation. All excess excavated suitable material shall be the property of the County and shall be delivered to a designated location within a seven mile one way travel distance from the site.

3.2 SHEETING AND BRACING

A. The Contractor shall furnish, place and maintain sheeting and bracing to support sides of the excavation as necessary to provide safe working conditions in accordance with OSHA requirements, and to protect pipes, structures and other Work from possible damage. Where wood sheeting or certain designs of steel sheeting are used, the sheeting shall be...
cut off at a level of 2 feet above the top of the installed pipe and that portion below the level shall be left in place. If interlocking steel sheeting is used, it may be removed providing removal can be accomplished without disturbing the bedding, pipe or alignment of the pipe. Any damage to the pipe bedding, pipe or alignment of the constructed utility caused by the removal of sheeting shall be cause for rejection of the affected portion of the work. The County may permit sheeting to be left in place at the request and expense of the Contractor.

B. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he may order additional supports put in at the Contractor's expense. The Contractor shall be responsible for the adequacy of all sheeting used and for all damage resulting from sheeting and bracing failure or from placing, maintaining and removing it.

3.3 REMOVAL OF WATER

A. It is a basic requirement of these Specifications that excavations shall be free from water before pipes are installed.

B. The Contractor shall provide pumps, and other appurtenant equipment necessary to remove and maintain water at such a level as to permit construction in a dry condition. The Contractor shall continue dewatering operations until backfilling has progressed to a sufficient depth over the pipe to prevent flotation or movement of the pipe in the trench or so that it is above the water table. If at any point during the dewatering operation it is determined that fine material is being removed from the excavation sidewalls, the dewatering operation shall be stopped if acceptable to the Engineer. If any of the subgrade or underlying material is disturbed by movement of groundwater, surface water, or any other reason, it shall be replaced at the Contractor's expense with crushed stone or gravel.

C. The Contractor shall use dewatering systems that include automatic starting devices, and standby pumps that will ensure continuous dewatering in the event of an outage of one or more pumps.

D. Water from the trenches and excavation shall be disposed of in such a manner as will not cause injury to public health, to public or private property, to the Work completed or in progress, to the surface of the streets, cause any interference with the use of the same by the public, or cause pollution of any waterway or stream. The Contractor shall submit his proposed methods of handling trench water and locations at which the water will be disposed of to the Engineer for review and shall receive acceptance before starting the excavation. Disposal to any surface water body will require silt screens to prevent any degradation in the water body.

3.4 TRENCH STABILIZATION

A. No claim for extras or additional payment will be considered for cost incurred in the stabilization of trench bottoms which are rendered soft or unstable as a result of construction methods, such as improper or inadequate sheeting, dewatering or other causes. In no event shall pipe be installed when such conditions exist and the Contractor shall correct such conditions so as to provide proper bedding or foundations for the proposed installation at no additional cost to the County before placing the pipe or structures.
3.5 PIPE BEDDING

A. Pipe trenches shall be excavated as described in Article 3.01 of this Section. The resulting excavation shall be backfilled with acceptable pipe bedding material, up to the level of the centerline of the proposed pipe barrel. This backfill shall be tamped and compacted to provide a proper bedding for the pipe and shall then be shaped to receive the pipe. Bedding shall be provided under the branch of all fittings to furnish adequate support and bearing under the fitting.

B. Any excavation below the levels required for installation of the pipe bedding shall be backfilled with acceptable bedding material, tamped, compacted and shaped to provide proper support for the proposed pipe, at the Contractor's expense.

3.6 BACKFILL

A. Pipelines

1. Pipeline trenches shall be backfilled to a level 12 inches above the top of the pipe with select backfill obtained from the excavation. Such material shall be placed in 6-inch layers, each compacted to the densities specified in the previous Articles of this Section. Only hand operated mechanical compacting equipment shall be used within six inches of the installed pipe.

2. After the initial portion of backfill has been placed as specified above, and after all excess water has completely drained from the trench, backfilling of the remainder of the trench may proceed. The remainder of the backfill shall be selected material obtained from the excavation and shall be placed in horizontal layers, the depth of which shall not exceed the ability of the compaction equipment employed, and in no event shall exceed a depth of 12 inches. Each layer shall be moistened, tamped, puddled, rolled or compacted to the densities specified in Article 3.07 of this Section.

3.7 COMPACTION AND DENSITIES

A. Compaction of backfill shall be 98 percent of the maximum density where the trench is located under structures or paved areas, and 95 percent of the maximum density elsewhere. More thorough compaction may be required when Work is performed in other regulatory agencies jurisdictions, such as the DOT. Methods of control and testing of backfill construction are:

1. Maximum density of the material in trenches shall be determined by ASTM D 1557.

2. Field density of the backfill material in place shall be determined by ASTM D 1556 or D 2922.

B. Initial Backfill

1. Field test density of each compacted lift of initial backfill in accordance with ASTM D2922 prior to placement of succeeding lifts.

2. Make a least one test per length of trench.
C. Select Final Backfill
   1. Field test density of each compacted lift of select fill in accordance with ASTM D2922 prior to placement of succeeding lifts.
   2. Make a least one test per length of trench.

D. Common Final Backfill
   1. Make at least one test per length of trench.
   2. Field test density of common fill in accordance with ASTM D2922.

E. Additional Field Density Tests
   1. If test density of compacted backfill or fill is less than specified density, make additional tests at locations directed by Engineer.
   2. Make additional field density tests at no additional cost to the County.

F. Proctor
   1. Make one Proctor Test in accordance with AASHTO T-99 for each source of fill. If material from excavation is used as backfill material, take a test proctor from the best available location as determined by the testing lab.
   2. Upon completion of backfill, take an additional proctor from actual material used and compare to test proctor. If actual proctor varies from test proctor, retest backfill.

G. Laboratory: Retain a laboratory approved by Engineer to make field density tests and Proctor Tests as specified below:
   1. Contractor shall pay the cost of initial density test(s).
   2. Contractor shall pay costs for any additional testing required as a result of a failure of any initial test.

H. Trench backfill which does not comply with the specified densities, as indicated by such tests, shall be reworked and recompaed until the required compaction is secured, at no additional cost to the County. The costs for retesting such Work shall be paid for by the Contractor.

3.8 ADDITIONAL EXCAVATION AND BACKFILL

A. Where organic material, such as roots, muck, or other vegetable matter, or other material which, in the opinion of the Engineer, will result in unsatisfactory foundation conditions, is encountered below the level of the proposed pipe bedding material, it shall be removed to a depth of two feet below the outside bottom of the pipe or to greater depths as directed by the Engineer and removed from the site. Sheeting shall be installed if necessary to
maintain pipe trenches within the limits identified by the Engineer. The resulting excavation shall be backfilled with suitable backfill material, placed in 12-inch layers, tamped and compacted up to the level of the bottom of the proposed pipe bedding material. Sufficient compaction of this material shall be performed to protect the proposed pipe against settlement. Construction shall then proceed in accordance with the provisions of Article 3.05 of this Section entitled "Pipe Bedding".

B. Additional excavation (more than two feet below the pipe) as indicated on the trench detail shall be performed only when ordered by the Engineer. Where organic or other material is encountered in the excavation, the Contractor shall bring the condition to the attention of the Engineer and obtain his determination as to whether or not the material will require removal, prior to preparing the pipe bedding. The excavation of material up to a depth of two feet below the outside bottom incidental items of construction and the Work shall be done at the Contractor's expense.

- END OF SECTION –
SECTION 02276
TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall design, provide, maintain and remove temporary erosion and sedimentation controls as necessary.

B. Temporary erosion controls may include, but are not limited to, mulching, netting, and watering, on site surfaces and spoil and borrow are surfaces and providing interceptor ditches at ends of berms and at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits as established by the County.

C. Temporary sedimentation controls include, but are not limited to, silt dams, traps, barriers and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the County.

D. Contractor shall provide effective temporary erosion and sediment control measures during construction or until final controls become effective.

1.2 SUBMITTALS

A. Submit schedule for temporary erosion and sedimentation control.

PART 2 -- PRODUCTS

2.1 EROSION CONTROL

A. Seeding and mulching, fertilization and watering shall be in accordance with Section 570-1 through 570-3 of the FDOT Specifications.

B. Netting: Fabricated of material acceptable to the County or Engineer.

2.2 SEDIMENTATION CONTROL

A. Bales: Clean, seed free cereal hay type.

B. Netting: Fabricated of material acceptable to the County or Engineer.

C. Filter Stone: Crushed stone conforming to FDOT Specifications.
PART 3 -- EXECUTION

3.1 EROSION CONTROL

A. Seeding shall be in accordance with Section 570-4 through 570-5 of the FDOT Specifications. The Contractor shall insure that all seeded areas have sustained growth prior to acceptance.

B. Mulching shall be in accordance with Section 570-4.6 of the FDOT Specifications.

C. Minimum procedures for mulching and netting are:
   1. Apply mulch loosely to a thickness of between 0.75 inches and 1.5 inches.
   2. Apply netting over mulched areas on sloped surfaces.

3.2 SEDIMENTATION CONTROL

A. Install and maintain silt dams, traps and barriers as shown on the approved schedule. Hay bales which deteriorate and filter stone which is lodged shall be replaced as required.

3.3 PERFORMANCE

A. Should any of the temporary erosion and sediment control measures employed by the Contractor fail to produce results which comply with the requirements of the County, Contractor shall immediately take whatever steps are necessary to correct the deficiency at his own expense.

- END OF SECTION -
SECTION 02510

ASPHALT CONCRETE PAVEMENT

PART 1 - GENERAL

1.01 STANDARD SPECIFICATIONS

A. When referenced in this Section shall mean Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, current edition.

1.02 QUALITY ASSURANCE

A. Qualifications:

1. Independent Testing Laboratory: In accordance with ASTM E329.

2. Asphalt concrete mix formula shall be prepared by an approved certified independent laboratory under the supervision of a certified asphalt technician.

1.03 ENVIRONMENTAL REQUIREMENTS

A. Temperature: Do not apply asphalt materials or place asphalt mixes when ground temperature is lower than 10 degrees C (50 degrees F), or air temperature is lower than 4 degrees C (40 degrees F). Measure ground and air temperature in shaded areas away from heat sources or wet surfaces.

B. Moisture: Do not apply asphalt materials or place asphalt mixes when application surface is wet.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Prime Coat: Cut-back asphalt, Grades RC-70 or RC-250 meeting the requirements of Section 916-3 of the Standard Specifications.

B. Tack Coat: Emulsified asphalt, Grade RS-2, SS-1, or SS-1H meeting the requirements of Section 916-4 of the Standard Specifications. The bituminous material shall be heated to a suitable consistency as directed by the ENGINEER.

C. Sand (Blotter Material): Clean, dry, with 100 percent passing a 4.75 mm (No. 4) sieve, and a maximum of 10 percent passing a 75 mm (No. 200) sieve.

2.2 ASPHALT CONCRETE MIX

A. General:

1. Mix formula shall not be modified except with the written approval of ENGINEER.
2. Source Changes:
   a. Should material source(s) change, establish a new asphalt concrete mix formula before the new material(s) is used.
   b. Perform check tests of properties of the plant-mix bituminous materials on the first day of production and as requested by ENGINEER to confirm that properties are in compliance with design criteria.
   c. Make adjustments in gradation or asphalt content as necessary to meet design criteria.

B. Asphalt Concrete: Type SP 9.5 and SP 12.5 meeting the requirements in Section 334 of the Standard Specifications.

C. Composition: Hot-plant mix of aggregate, mineral filler, and paving grade asphalt cement. The several aggregate fractions shall be sized, uniformly graded, and combined in such proportions that the resulting mixture meets the grading requirements of the mix formula.

D. Aggregate:
   1. The aggregate shall meet the requirements in Section 334 of the Standard Specifications.
      a. Mineral Filler shall meet the requirements of Section 917 of the Standard Specifications

E. Asphalt Cement: Paving Grade AC-30 meeting the requirements of Section 916 of the Standard Specifications.

PART 3 - EXECUTION

3.1 GENERAL
   A. Traffic Control: Minimize inconvenience to traffic, but keep vehicles off freshly treated or paved surfaces to avoid pickup and tracking of asphalt.
   B. Driveways: Repave driveways from which pavement was removed. Leave driveways in as good or better condition than before start of construction.

3.2 LINE AND GRADE
   A. Provide and maintain intermediate control of line and grade, independent of the underlying base to meet finish surface grades and minimum thickness.
   B. Shoulders: Construct to line, grade, and cross-section shown.
3.3 PREPARATION

A. Prepare sub base as specified in Section 02710, Limerock Sub Base.

B. Existing Roadway:
   1. Modify profile by grinding, milling, or overlay methods as approved, to provide meet lines and surfaces and to produce a smooth riding connection to existing facility.
   2. Remove existing material per drawings.
   3. Paint edges of meet line with tack coat prior to placing new pavement.

C. Thoroughly coat edges of contact surfaces (curbs, manhole frames) with emulsified asphalt or asphalt cement prior to laying new pavement. Prevent staining of adjacent surfaces.

3.4 PAVEMENT APPLICATION

A. General: Place asphalt concrete mixture on an approved, prepared base in conformance with this Section.

B. Prime Coat:
   1. Heat cut-back asphalt between 100 degrees F and 150 degrees F prior to application.
   2. Apply uniformly to clean, dry surfaces. Avoiding overlapping of applications.
   3. Do not apply when moisture content of upper 3 inches of base exceeds optimum moisture content of base, or if free moisture is present.
   4. Application Rate: Minimum 0.1 gallons per square yard of surface area.
   5. Remove or redistribute excess material.
   6. Allow a minimum of 5 full days for curing of primed surface before placing asphalt concrete.

C. Tack Coat:
   1. Apply uniformly to clean, dry surfaces. Avoiding overlapping of applications.
   2. Do not apply more tack coat than necessary for the day's paving operation.
   3. Touch up missed or lightly coated surfaces and remove excess material.
   4. Application Rate:
      a. Minimum 0.05 gallons to maximum 0.12 gallons of asphalt (residual if diluted emulsified asphalt) per square yard of surface area.
b. Apply at rate, within range specified, sufficient to assure good bonding, but not so heavy that surplus asphalt flushes into asphalt concrete being placed.

D. Pavement Mix:

1. Prior to Paving:
   a. Sweep primed surface free of dirt, dust, or other foreign matter.
   b. Patch holes in primed surface with asphalt concrete pavement mix.
   c. Blot excess prime material with sand.

2. Place asphalt concrete pavement mix in lifts as shown.

3. Compacted Lift Thickness:
   a. Minimum: Twice the maximum aggregate size, but in no case less than 3/4 inch.
   b. Maximum: 4 inches.

4. Total Compacted Thickness: As shown.

5. Apply such that meet lines are straight and edges are vertical.

6. Collect and dispose of segregated aggregate from raking process. Do not scatter material over finished surface.

7. Joints:
   a. Offset edge of each layer a minimum of 6 inches so joints are not directly over those in underlying layer.
   b. Offset longitudinal joints in roadway pavements, so longitudinal joints in wearing layer coincide with pavement centerlines and lane divider lines.
   c. Form transverse joints by cutting back on previous day's run to expose full vertical depth of layer.

8. Succeeding Lifts: Apply tack coat to pavement surface between each lift.

9. After placement of pavement, seal meet line by painting a minimum of 6 inches on each side of the joint with cut-back or emulsified asphalt. Cover immediately with sand.
E. Compaction:
   1. Roll until roller marks are eliminated and compacted to 100 percent of the laboratory compacted mixture.
   2. Joint Compaction:
      a. Place top or wearing layer as continuously as possible.
      b. Pass roller over unprotected end of freshly laid mixture only when placing of mix is discontinued long enough to permit mixture to become chilled.
      c. Cut back previously compacted mixture when Work is resumed to produce a slightly beveled edge for full thickness of layer.
      d. Cut away waste material and lay new mix against fresh cut.

F. Tolerances:
   1. General: Conduct measurements for conformity with crown and grade immediately after initial compression. Correct variations immediately by removal or addition of materials and by continuous rolling.
   2. Completed Surface or Wearing Layer Smoothness:
      a. Uniform texture, smooth, and uniform to crown and grade.
      b. Maximum Deviation: 1/8 inch from lower edge of a 12-foot straightedge, measured continuously parallel and at right angle to centerline.
      c. If surface of completed pavement deviates by more than twice the specified tolerances, remove and replace wearing surface.
   3. Transverse Slope Maximum Deviation: ¼ inch in 12 feet from the rate of slope shown.
   4. Finished Grade:
      a. Perform a field differential level survey on a maximum 50 foot grid and along all grade breaks.
      b. Maximum Deviation: 0.02 foot from the grade shown.

G. Seal Coat:
   1. General: Apply seal coat of paving grade or emulsified asphalt to finished surface at longitudinal and transverse joints, joints at abutting pavements, areas where the asphalt concrete was placed by hand, patched surfaces, and other areas as directed by the ENGINEER.
2. Preparation:
   a. Maintain surfaces that are to be sealed free of holes, dry, and clean of dust and loose material.
   b. Seal in dry weather and when the temperature is above 35 degrees F.

3. Application:
   a. Fill cracks over 1/16 inch in width with an asphalt-sand slurry or approved crack sealer prior to sealing.
   b. When sealing patched surfaces and joints with existing pavements, extend minimum 6 inches beyond edges of patches.

3.5 PAVEMENT OVERLAY

A. Preparation:
   1. Remove fatty asphalt, grease drippings, dust, and other deleterious matter.
   2. Surface Depressions: Fill with asphalt concrete mix, and thoroughly compact.
   3. Damaged Areas: Remove broken or deteriorated asphalt concrete and patch as specified in Article PATCHING.
   4. Portland Cement Concrete Joints: Remove joint filler to minimum 1/2 inch below surface.

B. Application:
   1. Tack Coat: As specified in this Section.
   2. Place and compact asphalt concrete as specified in Article PAVEMENT APPLICATION.
   3. Place first layer to include widening of pavement and leveling of irregularities in the surface of the existing pavement.
   4. When leveling irregular surfaces and raising low areas, the actual compacted thickness of any one lift shall not exceed 2 inches.
   5. The actual compacted thickness of intermittent areas of 120 square yards or less may exceed 2 inches, but not 4 inches.
   6. Final wearing layer shall be of uniform thickness, and meet grade and cross-section as shown.
3.6 PATCHING

A. Preparation:
   1. Remove damaged, broken, or unsound asphalt concrete adjacent to patches. Trim to straight lines exposing smooth, sound, vertical edges.

B. Application:
   1. Patch Thickness: 3 inches or thickness of adjacent asphalt concrete, whichever is greater.
   2. Place asphalt concrete mix across full width of patch in layers of equal thickness.
   3. Spread and grade asphalt concrete with hand tools or mechanical spreader, depending on size of area to be patched.

C. Compaction:
   1. Roll patches with power rollers capable of providing compression of 200 to 300 pounds per linear inch. Use hand tampers where rolling is impractical.
   2. Begin rolling top course at edges of patches, lapping adjacent asphalt surface at least 1/2 the roller width. Progress toward center of patch overlapping each preceding track by at least 1/2 the width of roller.
   3. Make sufficient passes over entire area to remove roller marks and to produce desired finished surface.

D. Tolerances:
   1. Finished surface shall be flush with and match grade, slope, and crown of adjacent surface.
   2. Tolerance: Surface smoothness shall not deviate more than plus 1/4 inch or minus 0 when a straightedge is laid across patched area between edges of new pavement and surface of old surfacing.

3.7 FIELD QUALITY CONTROL

A. General: OWNER shall provide services of an approved certified independent testing laboratory to conduct tests. CONTRACTOR shall bear additional costs associated with re-testing.

B. Field Density Tests:
   1. Perform tests from cores or sawed samples.
   2. Measure with properly operating and calibrated nuclear density gauge.
3. Maximum Density: In accordance with ASTM D2041, using a sample of mix taken prior to compaction from the same location as the density test sample.

C. Testing Frequency:

1. Quality Control Tests:
   a. Asphalt Content, Aggregate Gradation: Once per every 500 tons of mix or once every 4 hours, whichever is greater.
   b. Mix Design Properties, Measured Maximum (Rice’s) Specific Gravity: Once every 1,000 tons or once every 8 hours, whichever is greater.

2. Density Tests: Once every 500 tons of mix or once every 4 hours, whichever is greater.

-END OF SECTION –
SECTION 02580

PAVEMENT MARKING AND TRAFFIC SIGNS

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall stripe pavement, traffic signs and parking stall wheel stops as indicated on the Drawings, specified herein and as required for a complete installation.

1.2 SUBMITTALS

A. The Contractor shall submit shop drawings and other information to the Engineer for review in accordance with Section 01300 entitled "Submittals".

B. The Contractor shall furnish the manufacturer's certification that all signs furnished conform to these specifications and shall replace or repair at his expense all signs that fail to meet this requirement.

1.3 QUALITY CONTROL

A. The phrase "DOT Specifications" shall refer to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction. The DOT Specifications, are referred to herein and are hereby made a part of this Contract to the extent of such references, and shall be as binding upon the Contract as though reproduced herein in their entirety.

PART 2 -- PRODUCTS

2.1 PAVEMENT MARKING

A. Paint for pavement strips shall be Sherwin-Williams or Tnemec traffic paint or equal.

2.2 PARKING STALL WHEEL STOPS

A. Parking stall wheel stops shall be standard precast concrete units to match existing units on the site.

2.3 REFLECTIVE MARKERS

A. Reflective markers shall be installed in the pavement in accordance with OSHA, DOT and County requirements.

2.4 TRAFFIC SIGNS

A. Traffic regulating signs shall conform to the colors, dimensions and requirements of the Manual on Uniform Traffic Control Devices (ANSI) and displaying the lettering and
symbols indicated on the Drawings.

B. Sign panels and support members shall conform to Aluminum Association Alloy 6061-T6.

C. Bolts shall conform to Aluminum Association Alloy 2024-T4 with an anodic coating 0.0002-inches thick minimum and chromate sealed.

D. Nuts shall conform to Aluminum Association Alloy 6269-T9.

E. Reflective sheeting shall conform to DOT Type A requirements.

F. The Contractor shall install traffic and warning signs during construction in accordance with OSHA, DOT and County requirements.

PART 3 -- EXECUTION

3.1 FABRICATION

A. Preparation of sign blanks and fabrication of reflectorized faces shall conform to the applicable requirements of DOT Sections 700-4 and 700-5.

3.2 INSTALLATION

A. Sign and supports shall be erected in accordance with the details shown on the Drawings and as specified herein.

- END OF SECTION -
SECTION 02710

LIMEROCK SUB BASE

PART 1 - GENERAL

1.01 DEFINITIONS

A. Completed Course: Compacted, unyielding, free from irregularities, with smooth, tight, even surface, true to grade, line, and cross section.

B. Completed Lift: Compacted with uniform surface reasonably true to cross-section.

PART 2 - PRODUCTS

2.1 LIMEROCK BASE ROCK

A. The material used in limerock sub base shall be material classified as Miami Oolite Formation.

B. The minimum of carbonates of calcium and magnesium in the limerock shall be 70 percent. The maximum percentage of water-sensitive clay material shall be 3.

C. Limerock material shall be uniform in color and not contain cherty or other extremely hard pieces, or lumps, balls, or pockets of sand or clay size material in sufficient quantities as to be detrimental to the proper bonding, finishing, or strength of the limerock sub base.

D. The limerock sub base shall be uniformly graded from coarse to fine with 97 percent passing a 3-1/2-inch sieve, 80 percent passing a 2-inch sieve. The fine material shall consist entirely of dust of fracture. All crushing or breaking up, which might be necessary in order to meet such size requirements, shall be done before the material is placed on the road.

E. Physical Qualities:

1. Liquid Limit, AASHTO T89: Maximum 35 percent.

2. Nonplastic.

3. Limerock material shall have an average limerock bearing ratio (LBR) value of not less than 100.

2.2 SOURCE QUALITY CONTROL

A. CONTRACTOR: Perform tests necessary to locate acceptable source of materials meeting specified requirements.
B. Final approval of aggregate material will be based on materials' test results on installed materials.

C. Should separation of coarse from fine materials occur during processing or stockpiling, immediately change methods of handling materials to correct uniformity in grading.

PART 3 - EXECUTION

3.1 SUBGRADE PREPARATION

A. Obtain ENGINEER's acceptance of subgrade before placement of limerock sub base rock.

B. Do not place sub base materials on soft, muddy subgrade.

C. Keep subgrade free of water, debris, and foreign matter during compaction or proof-rolling.

D. Bring subgrade to proper grade and cross-section and uniformly compact surface.

E. Do not use sections of prepared ground surface as haul roads. Protect prepared subgrade from traffic.

F. Maintain prepared ground surface in finished condition until next course is placed.

G. COMPACTION

1. Under Earthfill: Compact upper 6 inches to minimum of 80 percent of the maximum density as determined by AASHTO T99, Method C.

2. Under Pavement, Floor Slabs on Grade, or Granular Fill under Structures: Compact the upper 6 inches or as shown on the Drawings, to minimum of 98 percent of the maximum dry density as determined by AASHTO T180.

3. Under pavement within FDOT right-of-way: Compact to minimum of 98 percent of the maximum dry density as determined by FM 1-T 180.

H. MOISTURE CONDITIONING

1. Dry Subgrade: Add water, then mix to make moisture content uniform throughout.

2. Wet Subgrade: Aerate material by blading, discing, harrowing, or other methods, to hasten drying process.

I. TESTING

1. Proof-roll subgrade with equipment specified in Article COMPACTION to detect soft or loose subgrade or unsuitable material, as determined by ENGINEER.
J. CORRECTION
   1. Soft or Loose Subgrade:
   2. Adjust moisture content and recompact, or
   3. Over excavate and replace with suitable material from the excavation.

3.2 EQUIPMENT
   A. Use mechanical rock spreaders, equipped with a device that strikes off the rock uniformly to laying thickness, capable of producing even distribution. For areas where the use of a mechanical spreader is not practicable, the CONTRACTOR may spread the rock using bulldozers or blade graders.

3.3 HAULING AND SPREADING
   A. Hauling Materials:
      1. The limerock shall be transported to the point where it is to be used and dumped on the end of the preceding spread.
      2. Do not haul over surfacing in process of construction.
      4. Maintain consistent gradation of material delivered; loads of widely varying gradations will be cause for rejection.
   B. Spreading Materials:
      1. Distribute material to provide required density, depth, grade and dimensions with allowance for subsequent lifts.
      2. Produce even distribution of material upon roadway without segregation.
      3. Should segregation of coarse from fine materials occur during placing, immediately change methods of handling materials to correct uniformity in grading.

3.4 CONSTRUCTION OF COURSES
   A. General: Complete each lift in advance of laying succeeding lift to provide required results and adequate inspection.
   B. Limerock Sub Base:
      1. Maximum Completed Lift Thickness: 6 inches or equal thickness.
      2. Completed Course Total Thickness: As shown.
3. Spread lift on preceding course to required cross-section.
4. Lightly blade and roll surface until thoroughly compacted.
5. Blade or broom surface to maintain true line, grade, and cross-section.

C. Gravel Surfacing:
   1. Maximum Completed Lift Thickness: 6 inches or equal thickness.
   2. Completed Course Total Thickness: As shown.
   3. Spread on preceding course in accordance with cross-section shown.
   4. Blade lightly and roll surface until material is thoroughly compacted.

3.5 ROLLING AND COMPACTION

A. Commence compaction of each layer of sub base after spreading operations and continue until density of 98 percent of maximum density has been achieved as determined by AASHTO T 180.

B. Roll each course of surfacing until material shall not creep under roller before succeeding course of surfacing material is applied.

C. Commence rolling at outer edges of surfacing and continue toward center; do not roll center of road first.

D. When the material does not have the proper moisture content to ensure the required density, wet or dry, as required. When adding water, uniformly mix it in by disking to the full depth of the course that is being compacted. During wetting or drying operations, manipulate as a unit, the entire width and depth of the course that is being compacted.

E. Place and compact each lift to require density before succeeding lift is placed.

F. Bind up preceding course before placing leveling course. Remove floating or loose stone from surface.

G. Blade or otherwise work surfacing as necessary to maintain grade and cross-section at all times, and to keep surface smooth and thoroughly compacted.

H. Surface Defects: Remedy surface defects by loosening and rerolling. Reroll entire area, including surrounding surface, until thoroughly compacted.
   1. Finished Surface: True to grade and crown before proceeding with surfacing.
3.6 SURFACE TOLERANCES
   A. Finished Surface of Sub Base Course and Leveling Course: Within plus or minus 0.04-foot of grade shown at any individual point.
   B. Compacted Surface of Leveling Course: Within 0.04-foot from lower edge of 10-foot straightedge placed on finished surface, parallel to centerline.
   C. Overall Average: Within plus or minus 0.01-foot from crown and grade specified.

3.7 DRIVEWAY RESURFACING
   A. Replace gravel surfacing on driveways which were gravel surfaced prior to construction.
   B. Provide compacted gravel surfacing to depth equal to original, but not less than 4 inches.
   C. Leave each driveway in as good or better condition as it was before start of construction.

3.8 FIELD QUALITY CONTROL
   A. In-Place Density Tests:
      1. Construct sub base course so areas shall be ready for testing.
      2. Allow reasonable length of time for ENGINEER to perform tests and obtain results during normal working hours.

3.9 CLEANING
   A. Remove excess material; clean stockpile areas of aggregate.

- END OF SECTION -
DIVISION 3

Concrete and Grout
SECTION 03305
CONCRETE AND GROUT

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. The CONTRACTOR shall furnish all materials for concrete in accordance with the provisions of this Section and shall form, mix, place, cure, repair, finish, and do all other work as required to produce finished concrete, all in accordance with the requirements of the Contract Documents.

B. The following types of concrete shall be covered in this Section:

1. Structural Concrete: Concrete to be used in all cases except where noted otherwise in the Contract Documents.

2. Sitework Concrete: Concrete to be used for curbs, gutters, catch basins, sidewalks, cart paths, fence and guard post embedment, and all other concrete appurtenant to pipeline installation unless otherwise shown or noted on the Drawings.

3. Class C Concrete: Concrete to be used for thrust blocks where shown on the Drawings.

C. The following types of grout are covered in this Section:

1. Nonshrink Grout: This type of grout shall be used wherever grout or cementitious grout is called for in the Contract Documents, unless another type is specifically referenced.

2. Epoxy Grout: This type of grout shall be used for grouting reinforcement steel into existing concrete and for grouting beneath equipment base and sole plates.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of these specifications, all work specified herein shall conform to or exceed the requirements of the Florida Building Code and the applicable requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of this Section.

1. ACI 318 - Building Code Requirements of Reinforced Concrete.


1.03 SUBMITTALS

A. Mix Designs: Prior to beginning the Work, the CONTRACTOR shall submit to the ENGINEER, for review, proposed concrete mix designs which shall show the proportions.
and gradations of all materials proposed for each class and type of concrete specified herein in accordance with Section 01300 – Submittals. The mix designs shall be tested by an independent testing laboratory selected by the OWNER.

B. All costs related to such mix design shall be borne by the CONTRACTOR.

C. Certified Delivery Tickets: Where ready-mix concrete is used, the CONTRACTOR shall provide certified weighmaster delivery tickets at the time of delivery of each load of concrete. Each certificate shall show the public weighmaster's signature, and the total quantities, by weight of cement, sand, each class of aggregate, admixtures, and the amounts of water in the aggregate and added at the batching plant as well as the amount of water allowed to be added at the site for the specific design mix. Each certificate shall, in addition, state the mix number, total yield in cubic yards, and the time of day, to the nearest minute, corresponding to when the batch was dispatched, when it left the plant, when it arrived at the job, the time that unloading began, and the time that unloading was finished.

D. The CONTRACTOR shall furnish shop bending diagrams, placing lists, and Drawings of all reinforcing steel prior to fabrication in accordance with the requirements of Section 01300 – Submittals.

1.04 QUALITY ASSURANCE

A. Tests on component materials and for compressive strength and shrinkage of concrete will be performed as specified herein. Test for determining slump will be in accordance with the requirements of ASTM C 143.

B. The cost of all laboratory tests on cement, aggregates, and concrete will be borne by the OWNER. However, the CONTRACTOR shall be charged for the cost of any additional tests and investigation on work performed which does not meet the specifications.

C. Concrete for testing shall be supplied by the CONTRACTOR at no cost to the OWNER, and the CONTRACTOR shall provide assistance to the ENGINEER in obtaining samples. The CONTRACTOR shall dispose of and clean up all excess material.

D. Field Compression Tests:

1. Compression test specimens shall be taken during construction from the first placement of each class of concrete specified herein and at intervals thereafter as selected by the ENGINEER to insure continued compliance with these specifications. At least one set of test specimens shall be made for each 50 yards of concrete placed. Each set of test specimens shall be a minimum of 4 cylinders.

2. Compression test specimens for concrete shall be made in accordance with ASTM C 31. Specimens shall be 6-inch diameter by 12-inch high cylinders.
3. Compression tests shall be performed in accordance with ASTM C 39. One test cylinder will be tested at 7 days and two at 28 days. The remaining cylinder will be held to verify test results, if needed.

1.05 DEFINITIONS

A. In these Specifications, the term "Precast Concrete" shall mean precast manholes, handholes, vaults, pull boxes, and similar structures. It does not include precast restressed concrete elements.

PART 2 -- PRODUCTS

2.1 CONCRETE MATERIALS

A. Materials shall be delivered, stored, and handled so as to prevent damage by water or breakage. Only one brand of cement shall be used. Cement reclaimed from cleaning bags or leaking containers shall not be used. All cement shall be used in the sequence of receipt of shipments.

B. All materials furnished for the work shall comply with the requirements of ACI 301, as applicable.

C. Storage of materials shall conform to the requirements of ACI 301.

D. Materials for concrete shall conform to the following requirements:

1. Cement shall be standard brand Portland cement conforming to ASTM C 150, Type 1.

2. Water shall be potable, clean, and free from objectionable quantities of silty organic matter, alkali, salts, and other impurities.

3. Aggregates shall be obtained from pits acceptable to the ENGINEER, shall be non-reactive, and shall conform to the Florida Building Code and ASTM C33. Maximum size of coarse aggregate shall be as specified in Paragraph 2.5B. Ready-mix concrete shall conform to the requirements of ASTM C 94.

4. Air-entraining agent meeting the requirements of ASTM C260, shall be used. Sufficient air-entraining agent shall be used to provide a total air content of 3 to 5 percent. The OWNER reserves the right, at any time, to sample and test the air-entraining agent received on the job by the CONTRACTOR. The air entraining agent shall be added to the batch in a portion of the mixing water.

5. The solution shall be batched by means of a mechanical batcher capable of accurate measurement.

6. Admixtures: Water reducing and retarding admixture shall be added and measured as recommended by the manufacturer. The addition of the admixture shall be
separate from the air entraining admixture. The addition of the admixture shall be completed within one minute after addition of water to the cement has been completed, or prior to the beginning of the last three quarters of the required mixing, whichever occurs first. Water reducing and set retarding admixtures shall be in conformance with ASTM C 494, Type D.

2.2 CURING MATERIALS

A. Materials for curing concrete as specified herein shall be MB 429 as manufactured by Masterbuilders, Cleveland, OH; or equal. The curing compound shall contain a fugitive dye so that areas of application will be readily distinguishable.

2.3 NONWATERSTOP JOINT MATERIALS

A. Materials for nonwaterstop joints in concrete shall conform to the following requirements:

1. Preformed joint filler shall be a non-extruding, resilient, bituminous type conforming to the requirements of ASTM D 1751.

2. Elastomeric joint sealer shall be a single component, pour grade, polyurethane sealant meeting FS TT-S-230A, Type 1. Material shall attain Shore A Hardness of 40-45.

3. Mastic joint sealer shall be a material that does not contain evaporating solvents; that will tenaciously adhere to concrete surfaces; that will remain permanently resilient and pliable; that will not be affected by continuous presence of water and will not in any way contaminate potable water; and that will effectively seal the joints against moisture infiltration even when the joints are subject to movement due to expansion and contraction. The sealer shall be composed of special asphalts or similar materials blended with lubricating and plasticizing agents to form a tough, durable mastic substance containing no volatile oils or lubricants and shall be capable of meeting the test requirements set forth hereinafter, if testing is required by the ENGINEER.

B. Joint Cleaner: Joint cleaner shall be as recommended by the sealant caulking compound manufacturer.

C. Joint Primer: Joint primer shall be as recommended by sealant manufacturer.

2.4 REINFORCING STEEL

A. All reinforcing steel for all reinforced concrete construction shall conform to the following requirements:

1. Bar reinforcement shall conform to the requirements of ASTM A 615 for Grade 60 Billet Steel Reinforcement with supplementary requirement S-1, and shall be manufactured in the United States.
2. Welded wire fabric reinforcement shall conform to the requirements of ASTM A185. All welded wire fabric reinforcement shall be galvanized.

2.5 CONCRETE DESIGN REQUIREMENTS

A. General: Concrete shall be composed of cement, admixtures, aggregates, and water. These materials shall be of the qualities specified. The exact proportions in which these materials are to be used for different parts of the work will be determined during the trial batch. In general, the mix shall be designed to produce a concrete capable of being deposited so as to obtain maximum density and minimum shrinkage and, where deposited in forms, to have good consolidation properties and maximum smoothness of surface. Mix designs with more than 41 percent of sand of the total weight of fine and coarse aggregate shall not be used. The aggregate gradations shall be formulated to provide fresh concrete that will not promote rock pockets around reinforcing steel or embedded items. The proportions shall be changed whenever necessary or desirable to meet the required results at no additional cost to the OWNER. All changes shall be subject to review by the ENGINEER.

B. Water-Cement Ratio and Compressive Strength: The minimum compressive strength and cement content of concrete shall be not less than that specified in the following tabulation.

1. Structural Concrete - Class A Concrete (all concrete unless otherwise noted)

<table>
<thead>
<tr>
<th>Minimum cementitious materials content, per cubic yard</th>
<th>without flyash added: 611 lbs.</th>
<th>with flyash added: 494 lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum water-cementitious materials ration, by weight</td>
<td>0.42</td>
<td></td>
</tr>
<tr>
<td>Slump range</td>
<td>3” to 4” with water reducing admixture</td>
<td>3” max. before addition of high range water reducing admixture</td>
</tr>
<tr>
<td></td>
<td>8” max. after addition of high range water reducing admixture</td>
<td></td>
</tr>
<tr>
<td>Coarse Aggregate</td>
<td>#57 per ASTM C33</td>
<td></td>
</tr>
<tr>
<td>Compressive strength lbs. per sq. inch at 28 days – F’c</td>
<td>4,000</td>
<td></td>
</tr>
<tr>
<td>Air Content</td>
<td>3% ± 1%</td>
<td></td>
</tr>
</tbody>
</table>
2. Sitework Concrete - Class B Concrete (Concrete fill, pavement, curbs and sidewalks, gutters, catch basins, fence and guard post embedment.)

- Minimum cementitious materials content, per cubic yard: 517 lbs.
- Maximum water-cementitious materials ratio, by weight: 0.50
- Slump, maximum: 5-inches
- Compressive strength lbs. per sq. inch at 28 days - F’c: 4,000
- Coarse Aggregate: Pearock
- Air Content: 3% ± 1%

3. Class C Concrete (pipe encasements in the dry, thrust blocks and electrical duct banks)

- Minimum cementitious materials content, per cubic yard: 500 lbs.
- Maximum water-cementitious materials ratio, by weight: 0.60
- Slump, maximum: 5-inches
- Compressive strength lbs. per sq. inch at 28 days - F’c: 3,000
- Coarse Aggregate: #57 per ASTM C33
- Air Content: 3% ± 1%

Adjustments to Mix Design: The mixes used shall be changed whenever such change is necessary or desirable to secure the required strength, density, workability, and surface finish, and the CONTRACTOR shall be entitled to no additional compensation because of such changes.

2.6 CONSISTENCY

A. The consistency of the concrete in successive batches shall be determined by slump tests in accordance with ASTM C 143.

2.7 READY-MIXED CONCRETE

A. Ready-mixed concrete shall conform to meeting the requirements as to materials, batching, mixing, transporting, and placing as specified herein and in accordance with ASTM C94.

B. Ready-mixed concrete shall be delivered to the site of the work, and discharge shall be completed within one and one-half hour after the addition of the cement to the aggregates or before the drum has been revolved 250 revolutions, whichever is first.

C. In hot weather or under conditions contributing to quick stiffening of the concrete or when the temperature of the concrete is 85 degrees F or above, the time between the introduction of the cement to the aggregates and discharge shall not exceed 60 minutes.
2.8 NONSHRINK GROUT

A. Nonshrink grout shall be a prepackaged, inorganic, non-gas liberating, nonmetallic, cement-based grout requiring only the addition of water. Manufacturer's instructions shall be printed on each bag or other container in which the materials are packaged. The specific formulation for each class of nonshrink grout specified herein shall be that recommended by the manufacturer for the particular application.

B. Nonshrink grouts shall have a minimum 28-day compressive strength of 5000 psi and shall meet the requirements of CRD C 621.

2.9 EPOXY GROUT

A. Epoxy grout shall be a pourable, nonshrink, 100 percent solids system. The epoxy grout system shall have three components: resin, hardener, and specially blended aggregate, all premeasured and prepackaged. The resin component shall not contain any nonreactive diluents. Resins containing butyl glycidyl ether (BGE) or other highly volatile and hazardous reactive diluents are not acceptable. Variation of component ratios is not permitted unless specifically recommended by the manufacturer. Manufacturer's instructions shall be printed on each container in which the materials are packaged.

B. The chemical formulation of the epoxy grout shall be that recommended by the manufacturer for the particular application.

C. The mixed epoxy grout system shall have a minimum working life of 45 minutes at 75 degrees F.

D. The epoxy grout shall develop a compressive strength of 5000 psi in 24 hours and 10,000 psi in seven days when tested in accordance with ASTM C 579, Method B. There shall be no shrinkage (0.0 percent) and a maximum 4.0 percent expansion when tested in accordance with ASTM C 827.

2.10 FORM MATERIALS

A. Except as otherwise expressly accepted by the ENGINEER, all lumber brought on the job site for use as forms, shoring, or bracing shall be new material. All forms shall be smooth surface forms and shall be steel panels, plywood or tongue and groove lumber.

B. Materials for concrete forms, formwork, and falsework shall conform to the following requirements:

1. Lumber shall be Southern Pine, construction grade or better, in conformance with U.S. Product Standard PS20.

2. Plywood for concrete formwork shall be new, waterproof, synthetic resin bonded, exterior type Douglas Fir or Southern Pine plywood manufactured especially for concrete formwork and shall conform to the requirements of PS I for Concrete.
Forms, Class I, and shall be edge sealed. Thickness shall be as required to support concrete at the rate it is placed, but not less than 5/8-inch thick.

2.11 PREFABRICATED FORMS

A. Form materials shall be metal, wood, plywood, or other acceptable material that will not adversely affect the concrete and will facilitate placement of concrete to the shape, form, line, and grade indicated. Metal forms shall be an acceptable type that will accomplish such results. Wood forms for surfaces to be painted shall be Medium Density Overlaid plywood, MDO Ext. Grade.

2.12 FORMWORK ACCESSORIES

A. Unless otherwise shown, exterior corners in concrete members shall be provided with 3/4-inch chamfers. Re-entrant corners in concrete members shall not have fillets unless otherwise shown.

B. Form ties shall be provided with a plastic cone or other suitable means for forming a conical hole to insure that the form tie may be broken off back of the face of the concrete. The maximum diameter of removable cones for rod ties, or of other removable form-tie fasteners having a circular cross-section, shall not exceed 1-1/2 inches; and all such fasteners shall be such as to leave holes of regular shape for reaming.

C. Form release agent shall be a blend of natural and synthetic chemicals that employs a chemical reaction to provide quick, easy and clean release of concrete from forms. It shall not stain the concrete and shall leave the concrete with a paintable surface. Formulation of the form release agent shall be such that it would minimize formation of "Bug Holes" in cast-in-place concrete.

2.13 PRECAST CONCRETE PRODUCTS

A. Precast Concrete Manholes and Electrical Pull Boxes: Precast manholes shall be watertight and conform to the requirements of ASTM C 478 with reinforcement of ASTM A 615, Grade 60 bars and the following modifications thereto:

1. The minimum wall thickness shall be 8 inches.
2. Cement to be used in precast manholes and grout shall be ASTM C 150, Type II.
3. The design and manufacture of precast manholes shall be for an H-20 traffic loading.
4. The date and name of manufacturer shall be marked inside each precast section.
5. No more than 2 lift holes may be cast or drilled in each section.
6. The inside and outside surfaces of precast concrete sections shall be coated as follows: 14 mills dry film thickness of Series 46H-413 Hi-Build Tneme-Tar, or equal.
PART 3 - EXECUTION

3.1 PROPORTIONING AND MIXING

A. Proportioning: Proportioning of the concrete mix shall conform to the requirements of Chapter 3 "Proportioning" of ACI 301.

B. Mixing: Mixing of concrete shall conform to the requirements of Chapter 7 of said ACI 301 Specifications.

C. Slump: Maximum slumps shall be 4 inches, plus or minus 1 inch.

D. Retempering: Retempering of concrete or mortar which has partially hardened will not be permitted.

3.2 PREPARATION OF SURFACES FOR CONCRETING

A. General: Earth surfaces shall be thoroughly wetted by sprinkling, prior to the placing of any concrete, and these surfaces shall be kept moist by frequent sprinkling up to the time of placing concrete thereon. The surface shall be free from standing water, mud, and debris at the time of placing concrete.

B. No concrete shall be placed until the reinforcement steel and formwork have been erected in a manner acceptable to the ENGINEER. The CONTRACTOR shall notify the ENGINEER not less than 2 working days prior to concrete placement, allowing for inspection and any corrective measures which are required.

C. Existing concrete surfaces upon or against which concrete is to be placed shall be given a roughened surface for good bond. Joint surfaces shall be cleaned of all laitance, loose or defective concrete, and foreign material. Such cleaning shall be accomplished by sandblasting followed by thorough washing. All pools of water shall be removed from the surface of construction joints before the new concrete is placed.

D. All anchor bolts called for on the drawings shall be cast-in-place in the concrete. Drilled, impact, adhesive or other types of anchors shall not be substituted for anchor bolts.

E. Corrosion Protection: Pipe, conduit, dowels, and other ferrous items required to be embedded in concrete construction shall be so positioned and supported prior to placement of concrete that there will be a minimum of 2 inches clearance between said items and any part of the concrete reinforcement. Securing such items in position by wiring or welding them to the reinforcement will not be permitted.

F. Anchor bolts shall be accurately set, and shall be maintained in position by templates while being embedded in concrete.

G. Cleaning: The surfaces of all metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar, and other foreign substances immediately before the concrete is placed.
3.3 HANDLING, TRANSPORTING, AND PLACING

A. General: Placing of concrete shall conform to the applicable requirements of Chapter 8 of ACI 301 and the requirements of this Section.

B. Nonconforming Work or Materials: Concrete which upon or before placing is found not to conform to the requirements specified herein shall be rejected and immediately removed from the Work. Concrete which is not placed in accordance with these Specifications, or which is of inferior quality, shall be removed and replaced by and at the expense of the CONTRACTOR.

C. Unauthorized Placement: No concrete shall be placed except in the presence of a duly authorized representative of the ENGINEER. The CONTRACTOR shall notify the ENGINEER in writing at least 24 hours in advance of placement of any concrete.

D. Placement in Slabs: Concrete placed in sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the pour. As the work progresses, the concrete shall be vibrated and carefully worked around the slab reinforcement, and the surface of the slab shall be screeded in an up-slope direction.

3.4 FINISHING CONCRETE SURFACES

A. General: Surfaces shall be free from fins, bulges, ridges, offsets, honeycombing, or roughness of any kind, and shall present a finished, smooth, continuous, hard surface. Allowable deviations from plumb or level and from the alignment, profiles, and dimensions shown on the Drawings are defined as tolerances and are specified herein. These tolerances are to be distinguished from irregularities in finish as described herein. Aluminum finishing tools shall not be used.

B. Unformed Surfaces: After proper and adequate vibration and tamping, all unformed top surfaces of slabs, floors, walls, and curbs shall be brought to a uniform surface with suitable tools. The classes of finish specified for unformed concrete surfaces are designated and defined as follows:

1. Sidewalks: The surface shall be given a light hairbroom finish with brooming perpendicular to drainage unless otherwise shown. The resulting surface shall be rough enough to provide a nonskid finish.

2. Slabs: Slabs shall receive a steel trowel finish without local depressions or high points. In addition, the surface shall be given a light hairbroom finish with brooming perpendicular to drainage unless otherwise shown. The resulting surface shall be rough enough to provide a nonskid finish.
3.5 CURING AND DAMPPROOFING

A. All concrete shall be cured for not less than 14 days after placing, in accordance with the methods specified herein for the different parts of the work, and described in detail in the following paragraphs.

B. The surface shall be sprayed with a liquid curing compound. It shall be applied in accordance with the manufacturer's printed instructions at a maximum coverage rate of 200 square feet per gallon and in such a manner as to cover the surface with a uniform film which will seal thoroughly.

C. Care shall be exercised to avoid damage to the seal during the curing period. Should the seal be damaged or broken before the expiration of the curing period, the break shall be repaired immediately by the application of additional curing compound over the damaged portion.

D. Wherever curing compound may have been applied by mistake to faces against which concrete subsequently is to be placed and to which it is to adhere, said compound shall be entirely removed by wet sandblasting just prior to the placing of new concrete.

E. Curing compound shall be applied as soon as the concrete has hardened enough to prevent marring on unformed surfaces, and within 2 hours after removal of forms from contact with formed surfaces. Repairs required to be made to formed surfaces shall be made within the said 2-hour period; provided, however, that any such repairs which cannot be made within the said 2-hour period shall be delayed until after the curing compound has been applied. When repairs are to be made to an area on which curing compound has been applied, the area involved shall first be wet-sandblasted to remove the curing compound, following which repairs shall be made as provided herein.

3.6 PROTECTION

A. The CONTRACTOR shall protect all concrete against injury until final acceptance by the OWNER. Fresh concrete shall be protected from damage due to rain. The CONTRACTOR shall provide such protection while the concrete is still plastic and whenever such precipitation is imminent or occurring.

3.7 TREATMENT OF SURFACE DEFECTS

A. As soon as forms are removed, all exposed surfaces shall be carefully examined and any irregularities shall be immediately rubbed or ground in a satisfactory manner in order to secure a smooth, uniform, and continuous surface. Plastering or coating of surfaces to be smoothed will not be permitted. No repairs shall be made until after inspection by the ENGINEER. In no case will extensive patching of honeycombed concrete be permitted. Concrete containing minor voids, holes, honeycombing, or similar depression defects shall have them repaired as specified herein. Concrete containing extensive voids, holes, honeycombing, or similar depression defects, shall be completely removed and replaced.
All repairs and replacements herein specified shall be promptly executed by the CONTRACTOR at its own expense.

3.8 CARE AND REPAIR OF CONCRETE

A. The CONTRACTOR shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance by the OWNER. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the CONTRACTOR's expense.

3.9 FABRICATION OF REINFORCING STEEL

A. Reinforcing steel shall be accurately formed to the dimensions and shapes shown on the Drawings, and the fabricating details shall be prepared in accordance with ACI 315 and ACI 318, except as modified by the Drawings.

3.10 PLACING REINFORCING STEEL

A. Reinforcing steel shall be accurately positioned as shown on the Drawings, and shall be supported and wired together to prevent displacement, using annealed iron wire ties or suitable clips at intersections. All reinforcing steel shall be supported by concrete, plastic or metal supports, spacers, or metal hangers which are strong and rigid enough to prevent any displacement of the reinforcing steel. Where concrete is to be placed on the ground, supporting concrete blocks (or dobies) shall be used, in sufficient numbers to support the bars without settlement, but in no case shall such support be continuous. All concrete blocks used to support reinforcing steel shall be tied to the steel with wire ties which are embedded in the blocks. For concrete over formwork, the CONTRACTOR shall furnish concrete, metal, plastic, or other acceptable bar chairs and spacers.

3.11 CLEANING AND PROTECTION OF REINFORCING STEEL

A. Reinforcing steel shall at all times be protected from conditions conducive to corrosion until concrete is placed around it.

B. The surfaces of all reinforcing steel and other metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar, and other foreign substances immediately before the concrete is placed. Where there is delay in depositing concrete, reinforcing shall be reinspected and, if necessary, recleaned.
3.12 GENERAL

A. All surface preparation, curing, and protection of cement grout shall be as specified herein. The finish of the grout surface shall match that of the adjacent concrete.

B. The CONTRACTOR through the manufacturer of nonshrink grout and epoxy grout shall provide on-site technical assistance to the ENGINEER upon request, at no additional cost to the OWNER.

C. All mixing, surface preparation, handling, placing, consolidation, and other means of execution for prepackaged grouts shall be done according to the instructions and recommendations of the manufacturer.

D. Grout shall be placed in such a manner, for the consistency necessary for each application, so as to assure that the space to be grouted is completely filled.

-END OF SECTION-
SECTION 05050
METAL FASTENING

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall furnish all materials, labor, and equipment required to provide all metal welds and fasteners not otherwise specified, in accordance with the Contract Documents.

1.2 SUBMITTALS

A. Submit the following items in accordance with Section 01300 entitled "Submittals":

1. Shop Drawings providing the fastener's Manufacturer and type and certification of the fastener's material and capacity.

2. Copy of valid certification for each person who is to perform field welding.

3. Certified weld inspection reports, when required.

4. Welding procedures.

1.3 QUALITY ASSURANCE

A. Fasteners not manufactured in the United States shall be tested and certification provided with respect to specified quality and strength standards. Certifications of origin shall be submitted for all U.S. fasteners supplied on the project.

B. All steel welding shall be performed by welders certified in accordance with AWS D1.1. Certifications of field welders shall be submitted prior to performing any field welding.

C. Welds used in connections of structural steel will be visually inspected in accordance with Article 3.04 of this Section.

D. The Owner may engage an independent testing agency to perform testing of welded connections and to prepare test reports in accordance with AWS. Inadequate welds shall be corrected or redone and retested to the satisfaction of the Engineer and/or an acceptable independent testing laboratory, at no additional cost to the Owner.

E. Provide a welding procedure for each type and thickness of weld. For welds that are not prequalified, include a Performance Qualification Report. The welding procedure shall be given to each welder performing the weld. The welding procedure shall follow the format in Annex E of AWS D1.1 with relevant information presented.
PART 2 -- PRODUCTS

2.1 ANCHOR BOLTS

A. For all conditions throughout this Contract, all anchor bolts shall be Type 316 stainless steel conforming to ASTM F-593.

B. Nuts shall conform to ASTM F-594, alloy 316.

C. Equipment Manufacturers, fabricators, and suppliers shall design and furnish anchor bolts as required to install the supplied units. The anchor bolt layout shall be coordinated with concrete work as specified herein.

D. Drilled in type anchor bolts, either adhesive types or mechanical types shall not be used unless approved in writing by the Manufacturer/fabricator of equipment or covers, subject to acceptance by the Engineer. All operating pieces of equipment such as pumps, generators, motors etc. shall not be anchored with wedge anchors or other mechanical anchors. Drilled in type anchor bolts shall be Type 316 stainless steel. Drilled in type anchor bolts are specified under Article 2.04 of this Section entitled "Concrete Anchors".

2.2 HIGH STRENGTH BOLTS

A. High strength bolts and associated nuts and washers shall be in accordance with ASTM A325 or ASTM A490. Bolts, nuts and washers shall meet the requirements of AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts".

B. Where high strength bolts are used to connect galvanized steel or are otherwise specified to be galvanized, bolts, nuts, and washers shall be hot-dip galvanized in accordance with ASTM A325.

2.3 STAINLESS STEEL BOLTS

A. Stainless steel bolts shall conform to ASTM F-593. All underwater fasteners shall be Type 316 stainless steel. Unless otherwise specified, fasteners for stainless steel members shall be Type 316 stainless steel.

B. Stainless steel bolts shall have hexagonal heads with a raised letter or symbol on the bolts indicating the Manufacturer, and shall be supplied with hexagonal nuts meeting the requirements of ASTM F594. Nuts shall be of the same alloy as the bolts.

2.4 CONCRETE ANCHORS

A. Where concrete anchors are called for on the Drawings, one of the types listed below shall be used; except, where one of the types listed below is specifically called for on the Drawings, only that type shall be used. Unless otherwise noted, all concrete anchors which are submerged, or which are subject to vibration from equipment such as pumps and generators, shall be adhesive anchors. The determination of anchors equivalent to those listed below shall be on the basis of test data performed by a commercial testing laboratory. There are two types used:

1. Expansion anchors shall be wedge, sleeve, or drop-in mechanical anchors.
2. Adhesive anchors shall be two part injection type.

B. Expansion anchors shall be Kwik Bolt II by Hilti, Inc., Trubolt Wedge Anchor by ITW Ramset/Redhead, or approved equal and shall be embedded to the depths shown on the Drawings. If no embedment depth is given, the minimum embedment depth as recommended by the Manufacturer shall be used.

C. Adhesive anchors shall consist of threaded rods or bolts anchored with an epoxy adhesive system conforming to AC308, into hardened concrete or grout-filled masonry. The epoxy adhesive system shall use a two-component adhesive mix and shall be injected with a static mixing nozzle following Manufacturer's instructions. The embedment depth of the rod/bolt shall provide a minimum allowable bond strength that is equal to the allowable tensile capacity of the rod/bolt (see Table 1) unless noted otherwise on the Drawings. The adhesive system shall be "PE1000 Epoxy Injection Adhesive Anchoring System" as manufactured by Powers Fasteners, "Epcon G5 System" as manufactured by ITW Ramset/Redhead, or "HIT RE-500 SD Injection Adhesive Anchor System" as manufactured by Hilti, Inc., or equal.

D. All concrete anchors shall be Type 316 stainless steel.

<table>
<thead>
<tr>
<th>Table 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allowable Tensile Capacity (Kips)</td>
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<tr>
<td>----------</td>
</tr>
<tr>
<td>Size</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>3/8 inch</td>
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<tr>
<td>1/2 inch</td>
</tr>
<tr>
<td>5/8 inch</td>
</tr>
<tr>
<td>3/4 inch</td>
</tr>
<tr>
<td>7/8 inch</td>
</tr>
<tr>
<td>1 inch</td>
</tr>
</tbody>
</table>

2.5 WELDED STUD CONNECTORS

A. Welded stud connectors shall conform to the requirements of AWS D1.1 Type C.

2.6 ANTISEIZE LUBRICANT

A. Antiseize lubricant shall be Graphite 50 Anti-Seize by Loctite Corporation, 1000 Anti-Seize Paste by Dow Corning, 3M Lube and Anti-Seize by 3M, or equal.

PART 3 -- EXECUTION

3.1 MEASUREMENTS

A. The Contractor shall verify all dimensions and review the Drawings and shall report any discrepancies to the Engineer for clarification prior to starting fabrication.
3.2 BOLT INSTALLATION

A. Anchor Bolts, Concrete Anchors, and Masonry Anchors

1. Anchor bolts shall be installed in accordance with AISC "Code of Standard Practice" by setting in concrete while it is being placed and positioned by means of a rigidly held template.

2. The Contractor shall verify that all concrete and masonry anchors have been installed in accordance with the Manufacturer's recommendations and that the capacity of the installed anchor meets or exceeds the specified safe holding capacity.

3. Concrete anchors shall not be used in place of anchor bolts without Engineer's approval.

4. All stainless steel threads shall be coated with antiseize lubricant.

B. High Strength Bolts

1. All bolted connections for structural steel shall use high strength bolts. High strength bolts shall be installed in accordance with AISC "Specification for Structural Joints, using A325 or A490 Bolts." All high strength bolts installed by the "turn-of-nut" method shall have the turned portion marked with reference to the steel being connected after the nut has been made snug and prior to final tightening. These marks will be considered in inspection.

2. All stainless steel bolts shall be coated with antiseize lubricant.

C. Other Bolts

1. All dissimilar metal shall be connected with appropriate fasteners and shall be insulated with a dielectric or approved equal. Unless otherwise specified, where steel members are connected together they shall be fastened with Type 316 stainless steel bolts and insulated with micarta, nylon, rubber, or equal.

3.3 WELDING

A. All welding shall comply with AWS Code for procedures, appearance, quality of welds, qualifications of welders and methods used in correcting welded work.

B. Welded stud connectors shall be installed in accordance with AWS D1.1.

3.4 INSPECTION

A. High strength bolting will be visually inspected in accordance with AISC "Specification for Structural Joints Using A325 or A490 Bolts." Rejected bolts shall be either replaced or retightened as required. In cases of disputed bolt installation, the bolts in question shall
be checked by a calibrated wrench certified by an independent testing laboratory. The certification shall be at the Contractor’s expense.

B. Field welds will be visually inspected in accordance with AWS Codes. Inadequate welds shall be corrected or redone as required in accordance with AWS Codes.

- END OF SECTION –
PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall furnish all labor, tools, materials, supervision and equipment necessary to do all the work specified herein and as required for a complete installation.

1.2 GENERAL INFORMATION AND DESCRIPTION

A. The term "paint," as used herein, includes emulsions, enamels, paints, varnishes, sealers, and other coatings, whether used as prime, intermediate, or finish coats. The term “paint” does not refer to protective coating system.

B. All paint for final coats shall be fume resistant, compounded with pigments suitable for exposure to sewage gases, especially to hydrogen sulfide and to carbon dioxide. Pigments shall be materials which do not tend to darken, discolor, or fade due to the action of sewage gases. If a paint Manufacturer proposes use of paint which is not designated "fume resistant" in its literature, it shall furnish full information concerning the pigments used in this paint.

C. All components to be painted, as indicated on the Drawings and as specified herein, shall be painted with not less than one shop coat and two field coats, or one prime coat and two finish coats of the appropriate paint. Items to be painted include, but are not limited to, metallic piping, operators, pipe fittings, valves, and all other work which is obviously required to be painted unless otherwise specified.

D. Baked-on enamel finishes and items with standard shop finishes such as panels, electrical equipment, etc., shall not be field painted unless the finish is damaged during shipment or installation. A list of surfaces not to be coated is included in Article 1.09 of this Section.

E. The Contractor shall obtain all permits, licenses and inspections and shall comply with all laws, codes, ordinances, rules and regulations promulgated by authorities having jurisdiction which may bear on the work. This compliance will include Federal Public Law 91-596 more commonly known as the "Occupational Safety and Health Act of 1970".

1.3 MANUFACTURERS

A. All painting materials shall be as manufactured by Tnemec, Carboline, Ameron, DuPont, Sherwin Williams, International, or approved equal.

1.4 SUBMITTALS

A. The Contractor shall submit paint Manufacturer's data sheets, application instructions, and samples of each finish and color to the Engineer for review, before any work is started in accordance with Section 01300 entitled, "Submittals."
B. Submitted samples of each finish and color shall be prepared so that the area of each sample indicates the appearance of the various coats. For example, where a three-coat system is specified, the sample shall be divided into three areas indicating one coat only, two coats, and all three coats. The Engineer will provide written authorization constituting a standard, as to color and finish only, for each coating system.

C. The Contractor shall prepare a complete schedule of surfaces to be coated and shall identify the surface preparation and paint system he proposes to use. The Paint Schedule shall be in conformance with Article 3.03 of this Section. The schedule shall contain the name of the paint Manufacturer, and the name, address and telephone number of the Manufacturer's representative that will inspect the Work. The schedule shall be submitted to the Engineer for review as soon as possible following the Notice to Proceed so that the schedule may be used to identify colors and to specify shop painting systems on order for fabricated equipment.

1.5 MANUFACTURER'S INSTRUCTIONS

A. The Manufacturer's published instructions for use as a guide in specifying and applying the Manufacturers proposed paint shall be submitted to the Engineer. Paint shall not be delivered to the job before acceptance of the Manufacturer's instructions is given by the Engineer.

B. A Manufacturer's paint will not be considered for use unless that Manufacturer's published instructions meets the following requirements:

1. The instructions must have been written and published by the Manufacturer for the purpose and with the intent of giving complete instruction for the use and application of the proposed paint in the locality and for the conditions for which the paint is specified or shown to be applied under this Contract.

2. All limitations, precautions, and requirements that may adversely affect the paint; that may cause unsatisfactory results after the painting application; or that may cause the paint not to serve the purpose for which it was intended; that is, to protect the covered material from corrosion, shall be clearly and completely stated in the instructions. These limitations and requirements shall, if they exist, include, but not be limited to the following:

   a. Methods of application
   b. Number of coats
   c. Thickness of each coat
   d. Total thickness
   e. Drying time of each coat, including primer
   f. Primer required to be used
   g. Primers not permitted
   h. Use of a primer
i. Thinner and use of paint thinner
j. Temperature and relative humidity limitations during application and after application
k. Time allowed between coats
l. Protection from sun
m. Physical properties of paint including solids content and ingredient analysis
n. Surface preparation
o. Touch up requirements and limitations

1.6 QUALITY ASSURANCE

A. The Contractor shall give the Engineer a minimum of three days advance notice of the start of any field surface preparation work of coating application work.

B. All such Work shall be performed only in the presence of the Engineer, unless the Engineer has specifically allowed the performance of such Work in his absence.

C. Review by the Engineer, or the waiver of review of any particular portion of the Work, shall not relieve the Contractor of his responsibility to perform the Work in accordance with these Specifications.

D. Where special coatings are to be performed by a subcontractor, the Contractor shall provide five references which show that the painting subcontractor has previous successful experience with the specified or comparable coating systems. Include the name, address, and the telephone number for the Owner of each installation for which the painting subcontractor provided the protective coating.

1.7 SAFETY AND HEALTH REQUIREMENTS

A. In accordance with requirements of OSHA Safety and Health Standards for Construction (29CFR1926) and the applicable requirements of regulatory agencies having jurisdiction, as well as Manufacturer’s printed instructions, appropriate technical bulletins, manuals, and material safety data sheets, the Contractor shall provide and require use of personnel protective and safety equipment for persons working in or about the project site.

B. Respirators shall be worn by persons engaged or assisting in spray painting. The Contractor shall provide ventilating equipment and all necessary safety equipment for the protection of the workmen and the work.

C. All paints must comply with the requirements of the National Ambient Air Quality Standards and the Air Pollution Regulatory Acts concerning the application and formulation of paints and coatings for an area in which the paints are applied. Specifically, paints shall be reformulated as required to meet the local, State and Federal requirements.
1.8 SURFACES NOT TO BE COATED

A. The following items shall not be coated unless otherwise noted:
   1. Stainless steel work.
   2. Flexible couplings, lubricated bearing surfaces, and insulation.
   3. Packing glands and other adjustable parts of mechanical equipment.
   4. Finish hardware.
   5. Plastic switch plates.
   6. Signs and nameplates.
   7. Signs, nameplates, serial numbers, and operating instruction labels.
   8. Any code-requiring labels, such as equipment identification, performance rating, name or nomenclature plates.
   9. Any moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts, unless otherwise indicated.

1.9 QUALITY WORKMANSHIP

A. The Contractor shall be responsible for the cleanliness of his painting operations and shall use covers and masking tape to protect the work whenever such covering is necessary, or if so requested by the Owner. Any unwanted paint shall be carefully removed without damage to any finished paint or surface. If damage does occur, the entire surface, adjacent to and including the damaged area, shall be repainted without visible lapmarks and without additional cost to the Owner.

B. Painting found defective shall be scraped or sandblasted off and repainted as the OWNER may direct. Before final acceptance of the work, damaged surfaces of paint shall be cleaned and repainted as directed by the Owner. All refinished work that has resulted from defective painting shall have a minimum quality to the finish, prior to the damage.

C. Any pipe scheduled to be painted and having received a coating of a tar or asphalt compound shall be painted with two coats or "Inertol Tar Stop", "Tnemec Tar Bar" or equal before successive coats are applied in accordance with the paint schedule.

1.10 SHIPPING, HANDLING AND STORAGE

A. All painting materials shall be brought to the job site in the original sealed labeled containers of the paint Manufacturer and shall be subject to review by the Engineer. Where thinning is necessary, only the product of the Manufacturer furnishing the paint shall be used. All such thinning shall be done strictly in accordance with the Manufacturer's instructions, and with the full knowledge of the Engineer.

B. Materials and their storage shall be in full compliance with the requirements of pertinent codes and fire regulations. Receptacles shall be placed outside buildings for paint gates and containers. Paint waste shall not be disposed of in plumbing fixtures, process drains or other plant systems or process units.
PART 2 -- PRODUCTS

2.01 MATERIALS

A. Table 09900-1 depicts the coatings referenced in Article 3.03 of this Section entitled, "Paint Schedule". Table 09900-1 lists Tnemec products as a reference. Equivalent products by the Manufacturers listed in Article 1.03 of this Section may be submitted for review.

**TABLE 09900-1**
PRODUCT LISTING

<table>
<thead>
<tr>
<th>Ref. No.</th>
<th>Description</th>
<th>Manufacturer’s Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>105</td>
<td>Polyamidoamine Epoxy</td>
<td>N69 – Color</td>
</tr>
<tr>
<td>110</td>
<td>Aliphatic Acrylic Polyurethane</td>
<td>73 – Color</td>
</tr>
</tbody>
</table>

PART 3 -- EXECUTION

3.1 SURFACE PREPARATION

A. Surfaces to be painted shall be clean and dry, and free of dust, rust, scale and all foreign matter. No solvent cleaning, power or hand tool cleaning shall be permitted unless acceptable to the Engineer or specified herein.

B. Except as otherwise provided, all preparation of metal surfaces shall be in accordance with Specifications SP-1 through SP-10 of the Steel Structures Painting Council (SSPC). Where Steel Structures Painting Specifications are referred to in these Contract Documents, the corresponding Pictorial Surfaces Preparation Standard shall be used to define the minimum final surface conditions to be supplied. Grease and oil shall be removed and the surface prepared by hand tool cleaning, power tool cleaning or blast cleaning in accordance with the appropriate Specification SP-1 through SP-10.

C. Weld flux, weld spatter and excessive rust scale shall be removed by power tool cleaning as per SSPC-SP-3-63.

D. Threaded portions of valve and gate stems, machined surfaces which are limited for sliding contact, surfaces which are to be assembled against gaskets, surfaces or shafting on which sprockets are to fit, or which are intended to fit into bearings, machined surfaces shall be masked off to protect them from the sandblasting of adjacent surfaces. Cadmium-plated or galvanized items shall not be sandblasted unless hereinafter specified, except that cadmium-plated, zinc-plated, or sherardized fasteners used in assembly of equipment to the sandblasted shall be sandblasted in the same manner as the unprotected metal. All installed equipment, mechanical drives, and adjacent painted equipment shall be protected from sandblasting. Protection shall prevent any sand or dust from entering the mechanical drive units or equipment where damage could be caused.
E. Hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place prior to cleaning and painting, and not intended to be painted, shall be protected or removed during painting operations and repositioned upon completion of painting operations.

F. Any abraded areas of shop or field applied coating shall be touched up with the same type of shop or field applied coating, even to the extent of applying an entire coating, if necessary. Touch-up coating and surface preparations shall be in addition to and not considered as the first field coat.

G. Sand from sandblasting shall be thoroughly removed, using a vacuum cleaner if necessary. No surface which has been sandblasted shall be painted until inspected by the Engineer.

H. Exposed Pipe

1. Bituminous coated pipe shall not be used in exposed locations. Pipe which shall be exposed after project completion shall be primed in accordance with the requirements herein. Any bituminous coated ferrous pipe which is inadvertently installed in exposed locations shall be sandblasted to SSPC-SP-5 White Metal before priming and painting.

2. After installation and prior to finish painting, all exterior, exposed flanged joints shall have the gap between adjoining flanges and gaps between the pipe wall and threaded-on flanges sealed with a single component Thiokol caulking to prevent rust stains.

I. Ferrous Metal Surfaces

1. All ferrous metal surfaces not required to be galvanized shall be cleaned of all oil grease, dirt, rust and tight and loose mill scale by blasting in accordance with the following: SSPC-SP-5, White Metal Blast Cleaning and comply with the visual standard NACE 1, for submerged metal. SSPC-SP-10 Near White Metal Blast Cleaning, and comply with the visual standard NACE 2 for all other locations. Pickling, complying with SSPC-SP-8, may be substituted for Near White Blast in areas as determined by the Engineer. Priming shall follow sandblasting before any evidence of corrosion occurs, before nightfall and before any moisture is on the surface.

2. Existing painted ferrous metal surfaces shall be cleaned of all oil, grease and dirt by blasting with a minimum 2,500 psi high pressure blast. All rust shall be removed in accordance with SSPC-SP-3 and spot primed with the applicable primer.

J. Field surface preparation of small, isolated areas such as field welds, repair of scratches, abrasions or other marks to the shop prime or finish shall be cleaned by power tools in accordance with SSPC-SP-3, or in difficult and otherwise inaccessible areas by hand cleaning in accordance with SSPC-SP-2 and spot primed.
K. Shop Finished Surfaces

1. All shop-coated surfaces shall be protected from damage and corrosion before and after installation by treating damaged areas immediately upon detection. Abraded or corroded spots on shop-coated surfaces shall be prepared in accordance with SSPC-SP-2, Hand Tool Cleaning and then touched up with the same materials as the shop coat.

2. All shop coated surfaces which are faded, discolored, or which require more than minor touch-up, in the opinion of the Engineer, shall be repainted. Cut edges of galvanized sheets, electrical conduit, and metal pipe sleeves, not to be finish painted, shall be cleaned in accordance with SSPC-SP-1, Solvent Cleaning and primed with zinc dust-zinc oxide metal primer.

3.2 SHOP PAINTING

A. All fabricated steel work and equipment shall receive at the factory at least one shop coat of prime paint compatible with the paint system required by these Specifications. The Contractor shall coordinate all shop priming to ensure compatibility with paint system specified. Surface preparation prior to shop painting shall be as specified. Finish coats may be applied in the shop if acceptable to the Engineer. All shop painted items shall be properly packaged and stored until they are incorporated in the Work. Any painted surfaces that are damaged during handling, transporting, storage or installation shall be cleaned, scraped, and patched before field painting begins so that Work shall be equal to the original painting received at the shop. Equipment or steel Work that is to be assembled on the site shall likewise receive a minimum of one shop coat of paint at the factory. Surfaces of exposed members that will be inaccessible after erection shall be prepared and painted before erection.

B. The Contractor shall specify the shop paints to be applied when ordering equipment in order to assure compatibility of shop paints with field paints. The paints and surface preparation used for shop coating shall be identified on shop drawings submitted to the Engineer for review. Shop paint shop drawings will not be reviewed until the final project paint system has been submitted by the Contractor and reviewed by the Engineer.

C. Shop finish coats may be the standard finish as ordinarily applied by the Manufacturer if it can be demonstrated to the Engineer that the paint system is equal to and compatible with the paint system specified. However, all pumps, motors and other equipment shall receive at least one field applied finish coat after installation.

3.3 PAINT SCHEDULE

A. The Contractor shall adhere to this paint schedule, providing those paints named or equal. DFT shall mean the minimum dry film thickness per application measured in mils. Products are referenced by numbers listed in Article 2.01 of this Section entitled "Product Listing." The paint schedule identifies the minimum DFT required per coat. If the Contractor does not achieve the specified DFT range in the required minimum coats, he shall provide additional coats as necessary at no additional cost to the Owner.

B. Ductile Iron Pipe, Exterior or Interior Exposure
1. Ductile iron pipe exterior or interior exposure shall receive the following types of paint:

<table>
<thead>
<tr>
<th>Application</th>
<th>No.</th>
<th>Description</th>
<th>DFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>First - 1 coat</td>
<td>105</td>
<td>Hi-Build Epoxoline II</td>
<td>6.0 - 10.0</td>
</tr>
<tr>
<td>Finish - 1 coat</td>
<td>110</td>
<td>Endura Shield III</td>
<td>3.0 - 5.0</td>
</tr>
</tbody>
</table>

Min. Total 12.0 Mils

3.4 INSPECTION OF SURFACES

A. Before application of the prime coat and each succeeding coat, all surfaces to be painted shall be subject to inspection by the ENGINEER. Any defects or deficiencies shall be corrected by the CONTRACTOR before application of any subsequent coating.

B. Samples of surface preparation and of painting systems shall be furnished by the CONTRACTOR to be used as a standard throughout the job, unless omitted by the ENGINEER.

C. When any appreciable time has elapsed between coatings, previously coated areas shall be carefully inspected by the ENGINEER, and where, in his opinion, surfaces are damaged or contaminated, they shall be cleaned and recoated at the CONTRACTOR's expense. Recoating times of manufacturer's printed instructions shall be adhered to.

3.5 EQUIPMENT

A. Effective oil and water separators shall be used in all compressed air lines serving spray painting and sandblasting operations to remove oil or moisture from the air before it is used. Separators shall be placed as far as practicable from the compressor.

B. All equipment for application of the paint and the completion of the work shall be furnished by the CONTRACTOR in first-class condition and shall comply with recommendations of the paint manufacturer.

3.6 PREPARATION OF MATERIALS

A. Mechanical mixers, capable of thoroughly mixing the pigment and vehicle together, shall mix the paint prior to use where required by manufacturer's instructions; thorough hand mixing will be allowed for small amounts up to five gallons.

B. Pressure pots shall be equipped with mechanical mixers to keep the pigment in suspension, when required by manufacturer's instructions. Otherwise, intermittent hand mixing shall be done to assure that no separation occurs. All mixing shall be done in accordance with SSPC Vol. 1, Chapter 4, "Practical Aspects, Use and Application of Paints" and/or with manufacturer's recommendations.

C. Catalysts or thinners shall be as recommended by the manufacturer and shall be added or discarded strictly in accordance with the manufacturer's instruction.
3.7 PAINTING

A. All paint shall be applied by experienced painters with brushes or other applicators acceptable to the Engineer.

B. Paint shall be applied without runs, sags, thin spots, or unacceptable marks. Paints shall be applied at the rate specified by the Manufacturer to achieve the minimum dry mil thickness required. Additional coats of paint shall be applied, if necessary, to obtain thickness specified.

C. Paint shall be applied with spraying equipment only on those surfaces approved by the Engineer. If the material has thickened or must be diluted for application by spray gun, each coat shall be built up to the same film thickness achieved with undiluted brushed-on material. Where thinning is necessary, only the products of the particular Manufacturer furnishing the paint shall be used; and all such thinning shall be done in strict accordance with the Manufacturer’s instructions, as well as with the full knowledge of the Engineer.

D. Surfaces not accessible to brushes or rollers may be painted by spray by dauber or sheepskins and paint mitt. If any of these methods is to be used, it shall be done in strict accordance with the Manufacturer's instructions, as well as with the full knowledge of the Engineer.

E. Drying Time

1. A minimum of twenty-four hours drying time shall elapse between applications of any two coats of paint on a particular surface unless shorter time periods are a requirement of the Manufacturer or specified herein. Longer drying times shall be required for abnormal conditions as defined by the Manufacturer.

F. Weather Restrictions

1. No painting whatsoever shall be accomplished in rainy or excessively damp weather when the relative humidity exceeds 85 percent, or when the general air temperature cannot be maintained at 50 degrees Fahrenheit or above throughout the entire drying period. No paint shall be applied when it is expected that the relative humidity will exceed 85 percent or that the air temperature will drop below 50 degrees Fahrenheit within 18 hours after the application of the paint.

2. Dew or moisture condensation should be anticipated; and if such conditions are prevalent, painting shall be delayed until midmorning to be certain the surfaces are dry. The day’s painting shall be completed well in advance of the probable time-of-day when condensation will occur.

G. Inspection of Surfaces

1. Each and every field coat of priming and finishing paint shall be inspected by the Engineer or his authorized representative before the succeeding coat is applied. The Contractor shall follow a system of tinting successive paint coats so that no two coats for a given surface are exactly the same color. Areas to receive black protective coatings shall in such cases be tick-marked with white or actually gauged as to thickness when finished.
H. Before application of the prime coat and each succeeding coat, any defects or deficiencies in the prime coat or succeeding coat shall be corrected by the Contractor before application of any subsequent coating.

I. Samples of surface preparation and of painting systems shall be furnished by the Contractor to be used as a standard throughout the job, unless omitted by the Engineer.

J. When any appreciable time has elapsed between coatings, previously coated areas shall be carefully inspected by the Engineer, and where, in his opinion, surfaces are damaged or contaminated, they shall be cleaned and recoated at the Contractor's expense. Recoating times of Manufacturer's printed instructions shall be adhered to.

K. Coating thickness shall be determined by the use of a properly calibrated "Nordson-Mikrotest" (or equal) dry mil thickness gauge.

L. The Contractor shall provide free of charge to the Engineer two new "Nordson-Mikrotest" dry film gauges to be used to inspect coating by Engineer and Contractor. One gauge may be used by Contractor and returned each day to the Engineer. Engineer will return gauges to Contractor at completion of job.

M. Special Areas

1. All surfaces which are to be installed against concrete, masonry etc., and will not be accessible for field priming and/or painting shall be back primed and painted as specified herein, before erection. Anchor bolts shall be painted before the erection of equipment and then the accessible surfaces repainted when the equipment is painted.

N. Special attention shall be given to insure that edges, corners, crevices, welds and rivets receive a film thickness equivalent to that of the adjacent painted surfaces.

O. Safety

1. Respirators shall be worn by persons engaged or assisting in spray painting. The Contractor shall provide ventilating equipment and all necessary safety equipment for the protection of the workmen and the Work.

P. Quality Workmanship

1. The Contractor shall be responsible for the cleanliness of his painting operations and shall use covers and masking tape to protect the Work whenever such covering is necessary, or if so requested by the Owner. Any unwanted paint shall be carefully removed without damage to any finished paint or surface. If damage does occur, the entire surface, adjacent to and including the damaged area, shall be repainted without visible lap marks and without additional cost to the Owner.

Q. Painting found defective shall be scraped or sandblasted off and repainted as the Engineer may direct. Before final acceptance of the Work, damaged surfaces of paint shall be cleaned and repainted as directed by the Engineer.
R. Any pipe scheduled to be painted and having received a coating of a tar or asphalt compound shall be painted with two coats or "Intertol Tar Stop", "Tnemec Tar Bar" or equal before successive coats are applied in accordance with the paint schedule.

3.8 SCHEDULE OF COLORS

A. All colors shall be as designated by the Engineer at the shop drawing review. The Contractor shall submit color samples including custom color choices as required to the Engineer as specified in Article 1.04 of this Section. The Contractor shall submit suitable samples of all colors and finishes for the surfaces to be painted. The Engineer shall decide upon the choice of colors and other finishes when alternates exist. No variation shall be made in colors without the acceptance from the Owner. Color names and/or numbers shall be identified according to the appropriate color chart issued by the Manufacturer of the particular product in question.

3.9 COLOR CODING AND LETTERING OF PIPING

A. The Contractor shall paint all piping, valves, equipment, exposed conduits and all appurtenances which are integral to a complete functional mechanical pipe and electrical conduit system, in accordance with Table 09900-2 entitled "Pipe Color Coding Schedule". Where colors are not designated for piping and conduit systems they will be selected during the shop drawing review from the paint Manufacturer's standard color charts.

B. In general, the pumps and equipment shall be painted the same color as the piping system to which it is connected unless otherwise directed by the Engineer. Where colors are not designated for piping and conduit systems they will be selected during the shop drawing review from the paint Manufacturer’s standard color charts.

C. Lettering of Piping

1. The Contractor shall apply identification titles and arrows indicating the direction of flow of liquids to all types and sections of all new and existing piping. Titles shall be as directed by the Engineer. Identification titles shall be located midway between color coding bands where possible. Identification lettering and arrows shall be placed as directed by the Engineer, but shall generally be located each fifteen feet in pipe length and shall be properly inclined to the pipe axis to facilitate easy reading. Titles shall also appear directly adjacent to each side of any wall or slab the pipeline passes through.

D. The titles and arrows shall be painted by use of stencils and shall identify the contents by complete names at least once in each area through which it passes and thereafter be abbreviated. Stencils shall be provided for titles and abbreviations listed in Table 09900-3.

E. Title color shall be black or white as directed and shall have an overall height in inches in accordance with Table 09900-4. Letter type shall be Helvetica Medium upper case. The Manufacturer’s instructions shall be followed in respect to storage, surface preparation and application.
F. Banding

1. Where bands are indicated in the Pipe Color Coding Schedule, the pipe is to be painted for its full circumference with a band of the color indicated. The bands shall be six inches wide, neatly made by masking, and spaced eight feet apart. The Contractor may substitute precut prefinished bands on piping subject to acceptance by the Engineer. Where banded pipes are running concurrently in a space, bands shall be located so that on adjacently located pipes, bands will be grouped beside each other.

3.10 OSHA SAFETY COLORS

A. Items listed in ANSI Z53.1-1971, Section 2.1 shall be painted ANSI Red. In general, these items shall include fire protection equipment and apparatus; wall mounted breathing apparatus, danger signs and locations; and stop bars, buttons or switches. In addition all hose valves and riser pipes, fire protection piping and sprinkler systems, and electrical stop switches shall be painted ANSI Red.

B. Items listed in ANSI Z53.1-1971, Section 2.3 shall be painted ANSI Yellow. Yellow shall be the basic color for designating caution and for marking physical hazards such as striking against, stumbling, falling, tripping, and "caught in between". In addition, an 8-inch wide strip on the top and bottom tread of stairways shall be coated.

3.11 WORK IN CONFINED SPACES

A. The Contractor shall provide and maintain safe working conditions for all employees. Fresh air shall be supplied continuously to confined spaces through the combined use of existing openings, forced-draft fans, or by direct air supply to individual workers. Paint fumes shall be exhausted to the outside from the lowest level in the contained space.

B. Electrical fan motors shall be explosion proof if in contact with fumes. No smoking or open fires will be permitted in, or near, confined spaces where painting is being done.

3.12 CLEANING

A. The buildings and all other Work area shall be at all times kept free from accumulation of waste material and rubbish caused by the Work. At the completion of the painting, all tools, equipment, scaffolding, surplus materials, and all rubbish around the inside the buildings shall be removed and the Work left broom clean unless otherwise specified.

<table>
<thead>
<tr>
<th>EQUIPMENT/PIPING</th>
<th>SUGGESTED COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Sewage</td>
<td>TNEMEC Malachite Green – PL19</td>
</tr>
</tbody>
</table>
### TABLE 09900-3
**PIPE IDENTIFICATION SCHEDULE***

<table>
<thead>
<tr>
<th>PIPE TITLE</th>
<th>PIPE ABBREVIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAW SEWAGE</td>
<td>RS</td>
</tr>
</tbody>
</table>

*Refer to Section 15000, Pipe Schedule for additional pipe titles

### TABLE 09900-4
**HEIGHT OF PIPING LETTERING**

<table>
<thead>
<tr>
<th>Diameter of Pipe or Pipe Covering</th>
<th>Height of Lettering</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4 to 1-1/4 inches</td>
<td>1/2 inch</td>
</tr>
<tr>
<td>1-1/2 to 2 inches</td>
<td>3/4 inch</td>
</tr>
<tr>
<td>2-1/2 to 6 inches</td>
<td>1-1/4 inches</td>
</tr>
<tr>
<td>8 to 10 inches</td>
<td>2-1/2 inches</td>
</tr>
<tr>
<td>Over 10 inches</td>
<td>3-1/2 inches</td>
</tr>
</tbody>
</table>

1. **Letter type shall be Helvetica Medium upper case. The Manufacturer’s instructions shall be followed in respect to storage, surface preparation and application.**

2. **For piping less than 3/4-inch diameter (as identified in Table 09900-2), the Contractor shall furnish and attach corrosion resistant color tags with the required lettering.**

- END OF SECTION –
SECTION 11101

INSTALLING COUNTY FURNISHED PUMPS

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall install one (1) Godwin model CD300M CAT C9 diesel powered sewage pump and appurtenances as supplied by the COUNTY. Installation includes testing as described in the contract documents. The pump will be purchased by the COUNTY through Xylem, who will manufacture the units and deliver the pump to the project staging area or the COUNTY will accept the delivery at a COUNTY owned site. The Contractor shall obtain the pump through acceptance of delivery at the project site from Xylem or by picking the pump up from the County site that the pump was delivered to.

B. Once the Contractor obtains the pump/engines, the Contractor shall assume full responsibility for the handling, storage, coordination, field testing, and satisfactory installation and operation of the pump, engine, and drive and controls.

C. Xylem will include field services for the pump as required under their separate contract with the COUNTY. The Contractor will cooperate fully with Xylem during equipment checkout, startup, training, and commissioning of the pump.

1.2 DIVISION OF RESPONSIBILITY

A. Xylem will furnish, fabricate, and shop test the pump in accordance with their contract with the COUNTY.

B. Xylem will pack, ship, insure, and deliver the pump.

   a. If construction has begun and the Contractor is ready to accept the pump at the project site, the pump shall be delivered to the project site after receiving approval to ship the pump from the COUNTY.

   b. It is anticipated that the pump will be shipped in advance of the start date for construction. If this is the case, and the Contractor is not ready to accept the pump, Xylem will deliver the pump to a COUNTY owned facility and the Contractor will be responsible for coordination with the COUNTY and delivery of the pump to the job site.

C. The Contractor shall receive the delivered pump and provide all necessary equipment to off-load and store the units in accordance with manufacturer’s recommendations. The Contractor shall properly store and maintain the pump until time of actual installation. The Contractor shall store and maintain the pump per manufacturer’s requirements including the cost for lubricants. The stored materials shall be included in the Contractor’s insurance umbrella through the end of the project.

D. The Contractor shall construct all concrete pads with provisions made to properly locate and embed the anchor bolts supplied by the Contractor. Contractor shall coordinate with Xylem
for anchor bolt locations, embedment, and sizing. All work and components not supplied with the pump and engine necessary for a complete and operational installation, including gauges, conduit, disconnects, control panel and other items, whether noted on the Drawings or not, shall be provided by the Contractor at no additional cost to the COUNTY.

E. The Contractor shall coordinate the work with Xylem in accordance with the approved pump shop drawings and written instructions from Xylem. The Contractor shall be responsible for obtaining all such documents in coordinating the work.

F. Xylem shall provide the pump O&M materials to be incorporated into the project O&M manuals supplied by the Contractor.

G. Xylem shall provide the Owner training in operation of the pump and associated appurtenances in accordance with their contract with the COUNTY.

H. The Contractor shall perform the field checkout and performance testing for the pump with Xylem’s field representative’s assistance and in accordance with the requirements stated in Xylem’s scope of work and as specified herein. The wastewater to test the pump shall be coordinated by diverting necessary flow within the conveyance system and shall be coordinated by the COUNTY.

I. The Contractor shall include the pump under the General Contractor’s warrantee terms for all items related to the storage, handling, and installation of the pump. Any damage to the pump after receipt of the pump shall be repaired by the Contractor at no additional cost to the Owner. Should defects in pump’s performance or condition be noted after final acceptance of the pump that are not covered under Xylem’s warrantee, said defects shall be corrected under the Contractor’s warrantee.

1.3 SHOP DRAWINGS

A. Detailed equipment dimensional drawings, setting plans, anchor bolt locations and details, and pipe connection details.

B. General lifting, erection, installation, and adjustment instructions, and recommendations.

C. The total uncrated weight of the equipment plus the approximate weight of shipped materials. Support locations and loads that will be transmitted to bases and foundations. Exact size, placement, and embedment requirements of all anchor bolts.

PART 2 -- PRODUCTS

2.1 ANCHORS AND SUPPORTS

A. The Contractor shall furnish, install, and protect all necessary guides, bearing plates, anchor and attachment bolts, and all other appurtenances required for the installation of the devices included in the equipment specified. Working Drawings for installation shall be furnished by the equipment manufacturer, and suitable templates shall be used by the Contractor when required in the detailed equipment Specifications.

B. Anchor bolts and fasteners shall be furnished in accordance with Section 05050, Metal Fastening, and with the individual equipment Specifications. All anchor bolts shall be...
minimum of 1/2-inch diameter. All anchor bolts, handrail bolts, washers, clips, clamps, and fasteners of any type shall be constructed of 316 stainless steel, unless otherwise specified the individual equipment Specifications.

C. The Contractor shall provide all concrete pads or pedestals required for equipment furnished. All concrete equipment pads shall be a minimum of 6” high, unless otherwise shown on the Drawings and shall be doweled.

D. Pipe sleeves or other means of adjusting anchor bolts shall be provided where indicated or required. Equipment shall be leveled by first using sitting nuts on the anchor bolts, and then filling the space between the equipment base and concrete pedestal with non-shrink grout, unless alternate methods are recommended by the manufacturer and are acceptable to the Engineer (such as shim leveling pumps, or chemical grout). Non-shrink grout shall be as specified in Section 03305, Concrete and Grout.

2.2 ACCESSORIES, SPARE PARTS, AND SPECIAL TOOLS

A. The spare parts shall be packed in containers suitable for long term storage, bearing labels clearly designating the contents and the pieces of equipment for which they are intended.

B. Spare parts shall be delivered at the same time as the equipment to which they pertain. Spare parts shall be stored separately in a locked area, maintained by the Contractor, and shall be turned over to the Owner in a group prior to substantial completion. All of these materials shall be properly packed, labeled, and stored where directed by the Owner and Engineer.

2.3 EQUIPMENT IDENTIFICATION

A. All mechanical equipment shall be provided with a substantial stainless steel nameplate, mechanically fastened with stainless steel hardware in a conspicuous place, and clearly inscribed with the manufacturer’s name, year of manufacture, serial number, and principal rating data.

B. All equipment provided under Divisions 11 and 15, including manual plug valves and valves (aboveground and buried) shall also be identified as to the equipment name and equipment tag number by a suitable stainless steel nameplate mechanically fastened with stainless steel hardware; for example, “Lockwood Ridge BPS: Pump – CD300M. Equipment names and equipment tag numbers shall match the names provided for the equipment as identified on the Drawings and in the Specifications. Equipment names and tag numbers not currently identified in the Drawings and Specifications shall be provided to the Contractor prior to the fabrication of the nameplates. Coordinate name and number with same on remotely located controls, control panel, and other related equipment. For buried valve applications, the valve name and number shall be included in the bronze disc embedded in the valve’s concrete collar as identified on the Drawings.

C. Nameplates shall not be painted over.
PART 3 -- EXECUTION

3.1 GENERAL

A. The pump will be installed by the Contractor in strict accordance with the manufacturer’s instructions and recommendations. The Contractor shall coordinate with Xylem to complete field services as required. The Contractor shall be responsible for ensuring that all other disciplines match the needs of the pump equipment including piping, structural, and electrical components.

3.2 PRODUCT DELIVERY, STORAGE AND HANDLING

A. All equipment will be protected during storage, shipment and handling per Xylem’s recommendations.

B. Painted and coated surfaces shall be protected against impact, abrasion, discoloration, and other damage. Grease and lubricating oil shall be applied to all bearings and similar items.

C. The Contractor will perform the unloading operations and shall be responsible for handling, storage, and installation of the equipment and materials per the manufacturer’s recommendations. Xylem will be allowed to oversee the unloading operations to ensure that the equipment and materials are handled and lifted in a proper manner in accordance with the manufacturer’s recommendations.

3.3 INSTALLATION

A. The Contractor shall obtain written installation manuals from the equipment manufacturer prior to installation. Equipment shall be installed strictly in accordance with recommendations of the manufacturer. A copy of all installation instructions shall be furnished the Engineer’s field representative one week prior to installation.

B. The Contractor shall have on hand sufficient personnel, proper construction equipment, and machinery of ample capacity to facilitate the work and to handle all emergencies normally encountered in work of this character. To minimize field erection problems, mechanical units shall be factory-assembled insofar as practical.

C. Equipment shall be erected in a neat and workmanlike manner on the foundations at the locations and elevations shown on the Drawings.

D. All equipment sections and loose items shall be match-marked prior to shipping.

E. For equipment such as pumping units, which require field alignment and connections, the Contractor shall provide the services of the manufacturer’s qualified mechanic, millwright, or machinist, to align the pump and motor prior to making piping connections or anchoring the pump base. Alignment shall be as specified herein.

F. The Contractor shall furnish oil and grease for initial operation and testing. The manufacturer and grades of oil and grease shall be in accordance with the recommendations of the equipment manufacturer.
3.4 ALIGNMENT

A. Set equipment to dimensions shown on drawings. Dimensions shall be accurate to +/- 1/16 inch unless otherwise noted on the drawings. Wedges shall not be used for leveling, aligning, or supporting equipment.

F. Assembled equipment shafts shall be set level to .0015 inches per foot of shaft length (+/- 0.0005 inches) up to a maximum of 0.015 inches for any length shaft unless the manufacturers’ requirements are more stringent or unless otherwise noted in the equipment specifications. Use the machined surfaces on which the equipment sets for the base/mounting frame leveling plane. Use the machined shaft surface for equipment leveling plane.

3.5 FIELD STARTUP AND EQUIPMENT TESTING

A. The Contractor shall obtain certification from Xylem that the pump has been tested in accordance with the following:

1. Field Tests: The pumping unit shall be field tested after installation to demonstrate satisfactory operation, without causing excessive noise, vibration, cavitation, and overheating of the bearings. The field testing shall be performed by an experienced field representative of the manufacturer, who shall supervise the following tasks and shall certify in writing that the equipment and controls have been properly installed, aligned, lubricated, adjusted, and readied for operation:

a. Start-up, check, and operate the equipment over the entire speed range. The vibration shall be measured and recorded per Hydraulic Institute 9.6.4. Vibration shall be recorded at a minimum of 4 pumping conditions defined by the Engineer (typically the maximum, two intermediate, and minimum speeds).

b. Pump performance shall be documented by obtaining pump suction head and pump discharge head, for at least 4 pumping conditions at each pump rpm.

c. Electrical and instrumentation testing shall demonstrate the specified functions have been met to the satisfaction of the COUNTY.

d. Impeller and engine ratings shall be checked.

e. The pump shall be run initially to verify correct rotation and mechanical integrity.

f. The pump shall be run continuously for 2 hours under load with no damage to the engine. During this test, the pump shall demonstrate compliance with the specified performance for flow, head, and horsepower and shall experience a heat rise of not greater than 45°C (80°F) above ambient temperature.
B. Demonstration Testing: The pump placed in service, a demonstration test shall be performed, witnessed by the Engineer and COUNTY, to verify the pump, engine, drive, instruments, sensors, signals, and control functions is operating as intended and as specified. Demonstration test procedures shall be submitted to the Engineer for approval at least 30 days prior to placing the pump in service. Documentation shall provide include test procedures and/or previous testing results to demonstrate both the physical (vibration, volume, head, temperature) performance and control function (manual, automatic, staging, alarms, operator interface) performance meet the requirements of the specifications.

- END OF SECTION -
DIVISION 15

Mechanical
SECTION 15000

PIPING, GENERAL

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall furnish and install to the required line and grade, all piping together with all fittings and appurtenances, required for a complete installation.

B. The Contractor shall furnish and install fittings, couplings, connections, sleeves, adapters, harness rods and closure pieces as required to connect pipelines of dissimilar materials and/or sizes herein included under this Section and other concurrent Contracts for a complete installation.

C. The Contractor shall furnish all labor, materials, equipment, tools, and services required for the furnishing, installation and testing of all piping as shown on the Drawings, specified in this Section and required for the Work. Piping shall be furnished and installed of the material, sizes, classes, and at the locations shown on the Drawings and/or designated in this Section. Piping shall include all fittings, adapter pieces, couplings, closure pieces, harnessing rods, hardware, bolts, gaskets, supports, sleeves, and/or all other associated appurtenances for required connections to equipment, valves, or structures for a complete installation.

D. The Contractor shall provide a boss or tapping saddle (direct taps are not allowed) on piping where required or shown on the Drawings.

E. The work shall include, but not be limited to, the following:

1. Connections to existing pipelines.
2. Test excavations necessary to locate or verify existing pipe and appurtenances.
3. Installation of all new pipe and materials required for a complete installation.
4. Cleaning, testing and disinfecting as required.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01300 - Submittalss

B. Section 02222 - Excavation and backfill for utilities

C. Section 03305 – Concrete and Grout

D. Section 09900 - Painting

E. Division 15 - Mechanical
1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

A. Commercial Standards

1. ANSI B16.1 Cast Iron Pipe Flanges and Flanged Fittings, Class 125.

2. ANSI B16.5 Pipe Flanges and Flanged Fittings, Steel Nickel Alloy and other Special Alloys.


5. ASTM A 325 Specification for High Strength Bolts for Structural Steel Joints.


1.4 CONTRACTOR SUBMITTALS

A. The Contractor shall submit complete shop drawings and certificates, test reports, affidavits of compliance, of all piping systems, in accordance with the requirements in the Section entitled, "Submittals," and as specified in the individual piping sections.

B. Each shop drawing submittal shall be complete in all aspects incorporating all information and data listed herein and all additional information required to evaluate the proposed piping material's compliance with the Contract Documents. Partial or incomplete submissions will be returned to the Contractor without review.

C. Data to be submitted shall be in accordance with Specification 01300, and include, but not be limited to:

1. Catalog Data consisting of specifications, illustrations and a parts schedule that identifies the materials to be used for the various piping components and accessories. The illustrations shall be in sufficient detail to serve as a guide for assembly and disassembly.

2. Complete layout and installation drawings with clearly marked dimensions and elevations. Piece numbers which are coordinated with the tabulated pipe layout schedule shall be clearly marked. Piping layout drawings shall indicate the following additional information; pipe supports, location, support type, hanger rod size, insert type and the load on the hanger in pounds.

3. Weight of all component parts.

4. Design calculations when requested.

5. Tabulated pipe layout schedule which shall include the following information for all pipe and fittings: service, pipe size, working pressure, wall thickness and piece number.
D. Certifications: Prior to installation, the Contractor shall furnish an Affidavit of Compliance certified by the pipe manufacturer that the pipe, fittings and specials furnished under this Contract comply with all applicable provisions of AWWA and these specifications. No pipe or fittings will be accepted for use in the Work on this project until the affidavits have been submitted and accepted in accordance with Section 01300 entitled "Submittals."

E. All expenses incurred in providing samples for certification of tests shall be borne by the Contractor.

1.5 QUALITY ASSURANCE

A. Tests: Except where otherwise specified, all materials used in the manufacture of the pipe shall be tested in accordance with the applicable Specifications and Standards.

1.6 MANUFACTURER’S SERVICE REPRESENTATIVE

A. Where the assistance of a manufacturer’s service representative is advisable, in order to obtain correct pipe joints, supports, or special connections, the Contractor shall furnish such assistance at no additional cost to the Owner.

1.7 MATERIAL DELIVERY, STORAGE, AND PROTECTION

A. All piping materials, fittings, valves, and accessories shall be delivered in a clean and undamaged conditions and stored off the ground, to provide protection against oxidation caused by ground contact. All defective or damaged materials shall be replaced with new materials.

1.8 CLEANUP

A. After completion of the work, all remaining pipe cuttings, joining and wrapping materials, and other scattered debris, shall be removed from the site. The entire piping system shall be handed over in a clean and functional condition.

PART 2 -- PRODUCTS

2.1 GENERAL

A. All pipes, fittings, and appurtenances shall be installed in accordance with the requirements of the applicable Sections of Division 2 and 15 and furnished as specified herein.

B. Pipe Supports: All pipes shall be adequately supported in accordance with the requirements of Section 15020 entitled "Pipe Supports," and as shown.

C. Lining: All requirements pertaining to thickness, application, and curing of pipe lining, shall be in accordance with the requirements of the applicable Sections of Division 15, unless otherwise specified.

D. Coating: All requirements pertaining to thickness, application, and curing of pipe coating, are in accordance with the requirements of the applicable Sections of Division 15, unless otherwise specified. Pipes above ground or in structures shall be field-painted in accordance with Section 09900 entitled "Painting."
E. All specials and every length of pipe shall be marked with the manufacturer's name or trademark, size, class, and the date of manufacture. Special care in handling shall be exercised during delivery, distribution, and storage of pipe to avoid damage and unnecessary stresses. Damaged pipe will be rejected and shall be replaced at the Contractor's expense. Pipe and specials stored prior to use shall be stored in such a manner as to keep the interior free from dirt and foreign matter.

F. Testing of pipe before installation shall be as described in the corresponding ASTM or AWWA Specifications and in the applicable standard specifications listed in the following sections. Testing after the pipe is installed shall be as specified in Section 3.09.

G. ALL PRESSURE PIPING (NON-GRAVITY PIPING) SHALL HAVE RESTRAINED OR FLANGED JOINTS FOR THRUST PROTECTION. ALL EXPOSED EXTERIOR PIPING SHALL HAVE FLANGED JOINTS, UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS.

H. The Contractor shall verify existing above ground and buried piping tie-in connections before fabricating new piping assemblies. The Contractor shall verify size, type, and location of all existing buried piping and appurtenances by excavating test pits as required of all buried connections and crossings which may affect the Contractor's work prior to ordering pipe and fittings to determine sufficient information for ordering materials. The Contractor shall take whatever measurements that are required to complete the work as shown or specified.

I. Before setting wall sleeves, and pipes, the Contractor shall check the Drawings and equipment manufacturer's drawings which may have a direct bearing on the pipe locations.

J. Piping shall be attached to pumps, valves, equipment, etc., in accordance with the respective manufacturers' recommendations. This includes the use of flexible connectors as required.

2.2 PIPE FLANGES

A. Flanges: Flanges shall conform to ANSI/AWWA C115/A21.15 Special Thickness Class 53. Flanges shall have flat faces and shall be attached with bolt holes straddling the vertical axis of the pipe unless otherwise shown. Attachment of the flanges to the pipe shall conform to the applicable requirements of ANSI/AWWA 115/21.15. Flanges for miscellaneous small pipes shall be in accordance with the standards specified for these pipes.

B. Blind Flanges: Blind flanges shall be in accordance with ANSI/AWWA C207, or with the standards for miscellaneous small pipes. All blind flanges for pipe sizes 12-inches and over shall be provided with lifting eyes in the form of welded or threaded eye bolts.

C. Flange Coating: All machined faces of metal blind flanges and pipe flanges shall be coated with a temporary rust-inhibitive coating to protect the metal until the installation is completed.

D. Flange Bolts: If studs are required, they shall be stainless steel, AISI Type 316, with heavy hex nuts conforming to the requirements of ASTM F594 (ASME B18.2.2), and shall be Type 316. Machine bolts shall normally be used on all flanged connections and shall be stainless steel, AISI Type 316, with heavy hex nuts conforming to the requirements of ASTM F594 (ASME B18.2.2), and shall be Type 316. If studs are required, they shall extend through the nuts a minimum of 1/4-inch.
E. Flange Gaskets: Gaskets for flanged joints shall be of materials as specified in piping sections. Blind flanges shall have gaskets covering the entire inside face of the blind flange and shall be cemented to the blind flange. Ring gaskets shall not be permitted.

F. Flange Gasket Suppliers shall be the following, or equal:

1. John Crane
2. Garlock

2.3 FLANGED COUPLING ADAPTERS

A. Flanged coupling adapters shall be furnished as required and as shown on the Drawings.

B. Flanged adapters shall have a restraint system that utilizes a mechanical restraint, which is an integral part of the follower gland, which utilizes multiple single tooth wedges. Flange adapters shall meet requirements of ANSI/AWWA C111/A21.11 and AWWA C219. Wedges for ductile iron applications shall be heat treated and coated black. The mating flange shall be compatible with the existing pipe that is being connected to.

C. Pressure and service shall be the same as connected piping.

D. Materials of construction:

1. Gaskets and rubber components that will come in touch with the wastewater being conveyed shall be neoprene.
2. Bolts and nuts shall be alloy steel, corrosion-resistant and prime coated.
3. Body shall be carbon steel
4. Gland shall be 65-45-12 ductile iron (A536)
5. Breakaway nuts shall be carbon steel
6. Actuating bolts shall be 60-40-18 ductile iron (A536)

E. Flanged adapters shall be shop primed with a premium quality primer compatible with the paint system specified in Section 09900 – Painting. Field painting of wetted area shall be done prior to installation.

F. Flanged adapters shall be as manufactured by EBAA Iron, or approved equal.

2.4 MECHANICAL JOINT RESTRAINT FOR PVC PIPE

A. Mechanical joint restraint shall be incorporated in the design of the follower gland. The restraint mechanism shall consist of a plurality of individually activated gripping surfaces to maximize restraint capability. Glands shall be manufactured of ductile iron conforming to ASTM A536-80. The gland shall be such that it can replace the standardized mechanical joint gland and can be used with the standardized mechanical joint bell conforming to ANSI/AWWA A21.11/C111 and ANSI/AWWA A21.53/C153 of latest revision. Twist-off nuts, sized same as tee-head bolts, shall be used to insure proper actuating of restraining devices. The restraining glands shall have a pressure rating equal to that of the PVC pipe
on which it is used and shall be Megalug Series 2000 PV as manufactured by EBAA, Iron Inc., or equal.

2.5 PIPE SADDLES

A. Pipe saddle shall fit to the maximum O.D. of the saddle's range, and extend a minimum of 160 degrees around the pipe. When the saddle is used on pipe to the minimum pipe size of the range, the saddle shall extend 180 degrees around the pipe. Straps shall have ends chamfered and be provided with Class 2 fit, National Coarse Threads. Saddle casting shall be type 304 stainless steel with a double strap. Straps shall be stainless steel. Valve gaskets shall be self-sealing, neoprene. Pipe saddle shall be Romac type 305, or approved equal.

PART 3 -- EXECUTION

3.1 GENERAL

A. The Contractor shall furnish all labor, tools, materials, and equipment necessary for installation and jointing of the pipe. All piping shall be installed in accordance with the Drawings in a neat workmanlike manner and shall be set for accurate line and elevation. All piping shall be thoroughly cleaned before installation, and care shall be taken to keep the piping clean throughout the installation.

B. Before setting wall sleeves and pipes, the Contractor shall check the Drawings and equipment manufacturer's drawings which may have a direct bearing on the pipe locations. The Contractor shall verify existing piping tie-in connections and verify size, type, and location before fabricating new piping assemblies.

C. Piping shall be attached to pumps, valves, equipment, etc., in accordance with the respective manufacturers' recommendations. This includes the use of flexible connectors as required.

D. For piping assembled with threaded, solvent cemented, welded or soldered joints, liberal use of threaded or flanged true unions shall be made. Unions shall be provided close to main pieces of equipment and in branch lines to permit ready dismantling of piping without disturbing main pipe lines or adjacent branch lines. A minimum of one union per straight run of pipe between fitting and/or valves with multiple lengths of pipe shall be used.

E. All changes in directions or elevations shall be made with fittings, unless otherwise shown.

3.2 SHIPPING, HANDLING AND STORAGE

A. Special care in handling shall be exercised during delivery, distribution and storage of pipe to avoid damage and setting up stresses. Damaged pipe will be rejected and shall be replaced at the Contractor's expense. Pipe and specials stored prior to use shall be stored in such a manner as to keep the interior free from dirt and foreign matter.

B. No pipe shall be dropped from cars or trucks to the ground. All pipe shall be carefully lowered to the ground by mechanical means. In shipping, pipe and fittings shall be blocked in such manner as to prevent damage to castings or lining. Any broken or chipped lining
shall be carefully patched. Where it is impossible to repair broken or damaged lining in pipe because of its size, the pipe shall be rejected as unfit for use.

C. All mechanical joint pipe shall be laid with 1/8-inch space between the spigot and shoulder of pocket.

3.3 LAYING PIPE

A. Proper and suitable tools and appliances for the safe convenient handling and laying of pipe shall be used and shall, in general, agree with manufacturer's recommendations. At the time of laying, the pipe shall be examined carefully for defects, and should any pipe be discovered to be defective after being laid, it shall be removed and replaced with sound pipe by the Contractor at his expense.

B. The Contractor shall perform all earthwork including excavation, backfill, bedding, compaction, sheeting, shoring and bracing, dewatering and grading in accordance with the Section entitled, "Excavation and Backfill for Utilities".

C. Upon satisfactory excavation of the pipe trench and completion of the pipe bedding, a continuous trough for the pipe barrel and recesses for the pipe bells, or couplings, shall be excavated by hand digging. When the pipe is laid in the prepared trench, true to line and grade, the pipe barrel shall receive continuous, uniform support and no pressure shall be exerted on the pipe joints from the trench bottom.

D. Pipe shall be installed in accordance with the manufacturer's recommendation. Before being lowered into the trench, the pipes and accessories shall be carefully examined and the interior of the pipes shall be thoroughly cleaned of all foreign matter and other acceptable methods. At the close of each work day and during suspension of work for any reason at any time, a suitable stopper shall be placed in the end of the pipe last laid to prevent mud or other foreign material from entering the pipe.

E. Lines shall be laid straight and depth of cover shall be maintained uniform with respect to finish grade, whether grading is completed or proposed at time of pipe installation. Where a grade or slope is shown on the Drawings, the Contractor shall use laser based surveying instruments to maintain alignment and grade. At least one elevation shot shall be taken on each length of pipe and recorded. No abrupt changes in direction or grade will be allowed.

F. Pipe shall be cut by means of saws, power driven abrasive wheels or pipe cutters, which will produce a square cut. No wedge-type roller cutters will be permitted. After cutting, the end of the pipe shall be beveled using a beveling tool, portable type sander or abrasive disc.

G. After pipe has been laid, inspected and found satisfactory, sufficient backfill shall be placed along the pipe barrel to hold the pipe securely in place during the conduction of the hydrostatic test. No backfill shall be placed over the joints until the hydrostatic tests is satisfactorily completed, leaving the joints exposed to view for the detection of visible leaks. Upon satisfactory completion of the hydrostatic test, backfilling of the trench shall be completed. Pipe trenches may be backfilled prior to hydrostatic testing subject to the permission of the Engineer.
3.4 FLANGED JOINTS

A. Flanged joints shall be made up with full face gaskets as specified in the piping paragraphs. Flange faces shall have a uniform bearing on the gaskets. Flanges shall be drawn together uniformly until the joint is tight. No washers shall be permitted for the bolt and nut assemblies. The length of the bolts shall be uniform and in accordance with the standards specified herein. The bolt’s maximum projection beyond the end of the nut shall be 0.25-inch nor shall the bolt fall short of the end of the nut. All buried flanges shall be installed with 316 SS nuts and bolts.

3.5 THREADED JOINTS

A. All threads shall be clean, machine cut and all pie shall be reamed before erection. Taps and dies shall be cleaned, sharpened and in good condition. All threaded joints on metallic pipe shall be made tight with Teflon tape. Threaded joints where either end is a plastic fitting shall be made tight with Teflon-based pipe dope (liquid tape).

B. After having been set up, a joint shall not be backed off unless the joint is broken, the threads cleaned and new tape is applied.

3.6 THRUST RESTRAINT

A. All sleeve type couplings shall be harnessed except where noted specifically on the Drawings. The harnessing shall be as shown on the Drawings or as specified herein.

B. Where the distance between adjacent flanges is in excess of ten feet or where a harness can not be used, the pipe supports adjacent to the coupling shall restrain the piping preventing any linear or angular movement resulting in the pipe separating from the coupling or misalignment in the joint.

C. Where expansion joints are used, control units shall be provided. All tie rods and control units shall be installed in accordance with the manufacturer’s recommended procedures.

D. All buried tie rods and associated hardware shall be 316 stainless steel.

E. In general, all valves and fittings shall be restrained in an acceptable manner such that the unbalanced force developed at them shall be supported independent of the piping system.

3.7 PIPE SCHEDULE

A. This section includes schedule of piping specified in other sections of Division 15.

B. The following abbreviations are used in the schedule:

1. Material

   HDPE - High Density Polyethylene
   DI - Ductile Iron
   PVC - Polyvinylchloride
   FRP - Fiberglass-Reinforced Plastic
2. Wall Thickness

PS  - Pipe Stiffness
DR  - Dimension Ratio
CL  - Class
Sch - Schedule
SDR - Standard Diameter Ratio

3. Joint Type

FLG - Flanged
PO  - Push on Joint
RJ  - Restrained Joint
WJ  - Welded Joint

4. Fitting Type

DI  - Ductile Iron
PVC - Polyvinylchloride
Stl  - Steel
MOL - Molded HDPE

5. Interior Surface Protection

CL  - Cement Lined
EL  - Epoxy Lined

6. Exterior Surface Protective Coating

P   - Painted (above ground only)
AC  - Asphalt Coated
**PIPE SCHEDULE**

<table>
<thead>
<tr>
<th>Service</th>
<th>Nominal Pipe Diameter (In)</th>
<th>Material</th>
<th>Thickness Class or Schedule</th>
<th>Working Pressure (PSIG)</th>
<th>Type of Joints</th>
<th>Type of Fittings</th>
<th>Protective Coating</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>BURIED FORCEMAIN (FM)</td>
<td>All</td>
<td>DIP</td>
<td>See Note 1</td>
<td>75</td>
<td>RJ</td>
<td>DI</td>
<td>EL</td>
<td>AC Refer to Specifications for type of restrained joint.</td>
</tr>
<tr>
<td>ABOVE GRADE FORCEMAIN (FM)</td>
<td>All</td>
<td>DIP</td>
<td>See Note 1</td>
<td>75</td>
<td>FLG</td>
<td>DI</td>
<td>EL</td>
<td>P</td>
</tr>
<tr>
<td>INSTRUMENT LINES</td>
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<td>0.035</td>
<td>80</td>
<td>CJ</td>
<td>316SS</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

**NOTES:**
1. Refer to Section 15006 entitled "Ductile Iron Pipe" for thickness class requirements.

- END OF SECTION –
SECTION 15006

DUCTILE IRON PIPE

PART 1 -- GENERAL

1.1 WORK INCLUDED

A. The Contractor shall furnish and install ductile iron pipe and all appurtenant Work, complete in place, all in accordance with the requirements of the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01300 - Submittals
B. Section 09900 - Painting
C. Section 15000 – Piping, General

1.3 REFERENCED SPECIFICATIONS, CODES, AND STANDARDS

A. Commercial Standards:
   
   ANSI/AWWA C110/A21.10 Ductile-Iron and Gray-Iron Fittings 3-in. Through 60-in. for Water and Other Liquids
   
   ANSI/AWWA C111/A21.11 Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
   
   ANSI/AWWA C151/A21.51 Ductile-iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids
   
   ANSI/AWWA C600 Installation of Ductile-Iron Water Mains and Appurtenances

1.4 SUBMITTALS

A. Shop Drawings: The Contractor shall submit Shop Drawings of pipe and fittings in accordance with the requirements set forth in the Sections entitled “Piping” and “Submittals”.

1.5 SCHEDULE OF PIPING MATERIALS

A. A schedule of piping materials is included in the Section entitled “Schedules”.

PART 2 -- PRODUCTS

2.01 GENERAL

A. Pipe shall be centrifugally cast in metal molds or sand lined molds in accordance with ANSI A21.51 (AWWA C151) of grade 60-42-10 ductile iron. The above standard covers ductile iron pipe with nominal pipe sizes from three inches up to and including sixty-four
inches in diameter. Working pressure shall be as specified herein, unless higher pressure is indicated on the Piping Schedule in Section 15390 - Schedules.

B. Wall Thickness

1. The following design parameters shall be provided for all buried push-on, mechanical, and restrained joint ductile iron pipe. Wall thickness shall conform to the following classes of AWWA C150, as specified in Table 14 and Table 15, for the following sizes unless noted otherwise in the Piping Schedule. Flanged pipe shall not be less than Class 53 as identified in Table 15 of AWWA C150.

**Buried Pipe**

<table>
<thead>
<tr>
<th>Size</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot; - 54&quot;</td>
<td>51</td>
</tr>
</tbody>
</table>

2. Where groove type couplings are used, the wall thickness shall be increased by one Class.

C. Joints

1. Ductile iron pipe above grade shall be flanged. All ductile iron pipe below grade shall have thrust restrained joints.

2. Mechanical and push-on type joints shall be in accordance with ANSI A21.11 (AWWA C111).

3. Flanges for flanged pipe shall be in accordance with ANSI A21.15 (AWWA C115), shall be ductile iron, shall be rated at 250 psi maximum working pressure, and shall be similar to flange Class 125 per ANSI B16.1. Where shown on the drawings, pipe and fittings shall be furnished with flanges similar to flange Class 250 per ANSI B16.1. Fittings shall be provided with flanges having a bolt circle and bolt pattern the same as the adjacent pipe and/or mechanical devices. Joint materials shall be ANSI sized and approved and shall consist of hot dip galvanized carbon steel bolts and nuts and full faced 1/8" thick neoprene gaskets.

4. No raised face flanges shall be used. The raised faces shall be milled flat.

5. Flange gaskets shall be full face neoprene rubber.

D. Restrained Push-on Joints (Single Gasket)

1. Restrained joints in pipe and fittings shall be of the single gasket push-on type, and shall conform to all applicable provisions of ANSI/AWWA Standard C111/A21.11, except that gaskets for pipe and fittings shall be neoprene, and the following requirements:

   a. Thickness of the pipe barrel remaining at grooves cut, if required in the design of restrained end joints, shall not be less than the nominal wall thickness of equal sized non restrained pipe as specified in Item 2.01B.
b. Restrained joints using field welding, set screws, or gaskets with expanding metal inserts will not be acceptable.

c. The restraining components, when not cast integrally with the pipe and fittings, shall be ductile iron or a high strength non-corrosive alloy steel.

d. Tee head bolts and hexagonal nuts for all restrained joints in pipe and fittings shall be of high strength cast iron with composition, dimensions and threading as specified in ANSI/AWWA Standard C111/A21.11, except that the length of the bolts shall meet the requirements for the restrained joint design.

e. The proper number of gaskets, bolts, nuts and all necessary joint material, plus one extra gasket for every 10 joints or fraction thereof, shall be furnished with each order. The gaskets and joint accessories shall be shipped in suitable protection containers.

f. Each thrust-restraint joint and the pipe and fitting of which it is a part, shall be designed to withstand the axial thrust from an internal pipeline pressure of at least 150 psi at bulkhead conditions without reduction because of its position in the pipeline nor for support from external thrust blocks.

g. Restrained push-on joint pipe and fittings shall be capable of being deflected after assembly. During deflection, all components in the restrained system shall be in contact to provide an equal force on all contact areas.

h. When restrained spigot ends are ordered the corresponding bell ends of the pipe to be restrained.

2. Restrained push-on joints for ductile iron pipe and fittings shall be TR-FLEX (4-inch through 36-inch) and HP-Lok (42-inch through 64-inch) and as manufactured by U.S. Pipe and Foundry, Flex-Ring (4-inch to 36-inch) and Lok-Ring (42-inch to 64-inch) by the American Ductile Iron Pipe Co., or equal. The restraining components, when not cast integrally with the pipe and fittings, shall be ductile iron or a high strength noncorrosive alloy steel. For cut grooved retainers, the thickness of barrel left after grooving shall not be less than the nominal wall thickness of equal sized nonrestrained pipe as specified herein above for the centrifugally cast ductile iron pipe.

3. Restrained Mechanical Joint: Mechanical joints shall be restrained with Megalug Series 1100 as manufactured by Ebaa Iron, Inc., or equal. Restrained mechanical joint pipe shall only be used in special cases when restrained push-on joints are not available and when requested by the Contractor and acceptable to the Engineer. Tee head bolts and hexagonal nuts for all restrained joints in pipe and fittings shall be of high strength cast iron with composition, dimensions and threading as specified in ANSI/AWWA Standard C111/A21.11, except that the length of the bolts shall meet the requirements for the restrained joint design.

E. Fittings

1. Shall be manufactured in accordance with ANSI A21.10 (AWWA C110) for nominal pipe sizes three inches to sixty-four inches, and shall be either flanged, mechanical
joint or restrained joint. Any other fittings, not included in ANSI A21.10 (AWWA C110) shall conform in design and performance to the requirements of this Standard.

2. Shall have a rated pressure equal to or greater than the specified working pressure for nominal pipe sizes of three inches to sixty-four inches (350 psi fittings available through and including twenty-four inches, only).


F. Pipe Coating General: All ductile iron pipe and fittings shall be supplied with the same coating material throughout the project. Coating shall be provided in the interior and exterior of the pipe as described hereinafter.

1. The standard asphaltic coating shall be applied prior to shipment to the exterior wall of buried pipe and fittings in accordance with ANSI A21.51 (AWWA C151).

2. A coating of rust inhibitive primer, compatible with the coating system specified in Section 09900 – Painting, shall be applied prior to shipment to all exposed and interior piping.

3. Cement-Mortar Lining: Pipe and fittings not for sewage (secondary effluent, filter effluent, reclaimed water, plant service water and potable water) and used when asked for on the Drawings shall be cement-lined and seal-coated in accordance with ANSI/AWWA Standard C104/A21.4-90, Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.

4. The interior of all ductile iron pipe and fittings for untreated or partially treated wastewater, wastewater mixed liquor, sludge, scum, and process drain services shall be lined with an epoxy lining. The epoxy lining shall be Protecto 401 Ceramic Epoxy as manufactured by the Protecto Division of Vulcan painters, Inc. All pipe and fittings shall be lined with a minimum dry film thickness of 40 mils, except for the gasket groove and spigot end up to six inches back from the end of the spigot which shall be lined with ten mils of the material. All ductile iron pipe and fittings shall be checked for dry film thickness in accordance with the SSPC-PA2. Each pipe joint and fitting shall be marked with the date of application of the lining system and with its numerical sequence of application on that date. The pipe Contractor shall furnish a certificate stating that lining applicator has complied with all specification requirements relative to the material, its application and inspection. Surface preparation, number of coats, application of the lining material and field touch-up shall be in strict accordance with the lining material manufacturer’s recommendations. During the installation of the pipe, the lining material manufacturer shall provide the services of a field Engineer to instruct and demonstrate to the Contractor’s personnel the procedure for the field touch-up of lining where field cuts and taps were required. Holiday inspection shall be conducted using test equipment described in American Water Works Association Standard, AWWA C210, Section 5.3.3.1. In accordance with coating manufacturer’s recommendation, holiday testing may be conducted any time after the coating has reached sufficient cure.

5. Polyethylene Encasement: All ductile iron pipe, fittings and valves installed underground shall be encased with polyethylene film in accordance with ANSI
Standard A21.5, Method A or B at the Contractors option. Encasement shall terminate 3-inches to 6-inches above ground where pipe is exposed.

PART 3 -- EXECUTION

3.01 INSTALLATION

A. The Contractor shall perform all earthwork including excavation, backfill, bedding, compaction, sheeting, shoring and bracing, dewatering and grading in accordance with Division 2 - Sitework.

B. Unless otherwise directed, ductile iron pipe shall be laid with the bell ends facing upstream in the normal direction of flow and in the direction of laying.

C. Thrust restrained and mechanical joints shall be made in accordance with the manufacturer's standards except as otherwise specified herein. Joints between mechanical joint pipe and/or fittings shall be made in accordance with ANSI/AWWA Standard C600, except that deflection at joints shall not exceed one-half of the manufacturer's recommended allowable deflection, or one-half of the allowable deflection specified in ANSI/AWWA C600, whichever is the lesser amount.

D. Before laying thrust restrained and mechanical joint pipe and fittings, all lumps, blisters and excess bituminous coating shall be removed from the bell and spigot ends. The outside of each spigot and the inside of each bell shall be wire brushed, and wiped clean and dry. The entire gasket groove area shall be free of bumps or any foreign matter which might displace the gasket. The cleaned spigot and gasket shall not be allowed to touch the trench walls or trench bottom at any time. Vegetable soap lubricant shall be applied in accordance with the pipe manufacturer's recommendations, to aid in making the joint. The workmen shall exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Deflections shall only be made after the joint has been assembled.

E. Prior to making up flanged joints in ductile iron pipe and fittings, the back of each flange under the bolt heads and the face of each flange shall have all lumps, blisters and excess bituminous coating removed and shall be wire brushed and wiped clean and dry. Flange faces shall be kept clean and dry when making up the joint, and the workmen shall exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Bolts and nuts shall be tightened by opposites in order to keep flange faces square with each other, and to insure that bolt stresses are evenly distributed.

F. Bolts and nuts in thrust restrained, mechanical and flanged joints shall be tightened in accordance with the recommendations of the pipe manufacturer for a leak-free joint. The mechanics shall exercise caution to prevent overstress. Torque wrenches shall be used until, in the opinion of the Engineer, the mechanics have become accustomed to the proper amount of pressure to apply on standard wrenches.

G. Cutting of the ductile iron pipe for inserting valves, fittings, etc., shall be done by the Contractor in a neat and workmanlike manner without damage to the pipe, the lining, or the coating. Pipe 16 inches and larger in diameter shall be cut with a mechanical pipe saw. After cutting the pipe, the plain end shall be beveled with a heavy file or grinder to remove all sharp edges.
H. If it is discovered that the existing force main consist of PVC pipe, the cutting of the PVC pipe for inserting fittings, shall be done by the Contractor in a neat and workmanlike manner without damage to the pipe. The pipe shall be cut with a mechanical pipe saw. After cutting the pipe, the cut end of the pipe shall be beveled with a heavy file or grinder to remove all sharp edges. The wye fittings and valve shall be installed via spool PVC pieces, rigid coupling, and the appropriate mechanical restraints to secure the connection. The force main shall be cut 90 degrees to the pipe’s longitudinal direction and free from defects.

I. Areas of loose or damaged lining associated with field cutting shall be repaired or replaced as recommended by the pipe manufacturer and required by the Engineer. Repair methods shall be as recommended by the manufacturer and shall be submitted to the Engineer for review.

J. Any work within the pipe shall be performed with care to prevent damage to the lining. No cable, lifting arms or other devices shall be inserted into the pipe. All lifting, pulling or pushing mechanisms shall be applied to the exterior of the pipe barrel.

K. Homing the pipe shall be accomplished by the use of a hydraulic or mechanical pulling device, unless otherwise accepted by the Engineer. No pipe shall be driven or struck in order to seat it home.

L. Cleaning: Cleaning methods shall be acceptable to the Engineer, and must be sufficient to remove silt, rocks, or other debris which may have entered the pipeline during its installation and shall also follow the requirements of Section 15000, "Basic Mechanical Requirements".

- END OF SECTION -
SECTION 15020
PIPE SUPPORTS

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall provide all tools, supplies, materials, equipment, and all labor necessary for the furnishing, construction, and installation of all pipe supports, guides, and anchors shown, specified, or required for a complete and operable piping system, in accordance with the requirements of the Contract Documents.

1.2 CONTRACTOR SUBMITTALS

A. Shop Drawings: The Contractor shall furnish, prior to fabrication or installation, complete shop drawings of all pipe supports, anchors, and guides, as well as calculations for special supports and anchors, in accordance with Section 01300 entitled “Submittals” and as specified herein.

B. Provide line drawings of each piping system to the scale shown in the Drawings, locating each support. Identify each type of support by the manufacturer's catalog number or figure.

C. Provide installation drawings and manufacturer's catalog information on each type of support used. Clearly indicate the actual pipe outside diameter (not just nominal pipe size) that is used for the supports.

PART 2 -- PRODUCTS

2.1 GENERAL REQUIREMENTS

A. The Contractor shall note that all pipe support locations are not shown on the Drawings, and he shall follow the Specifications herein in locating supports. Where deviations and modifications are required, they shall be made subject to review by the Engineer.

B. Code Compliance: All piping systems and pipe connections to equipment shall be properly supported, to prevent undue deflection, vibration, and stresses on piping, equipment, and structures. All supports and parts thereof shall conform to the requirements of ANSI/ASME B31.1 and ANSI / ASME B31.3, except as supplemented or modified by these Specifications and details on the Drawings.

C. Unless otherwise indicated on the Drawings, piping supports shall consist of concrete piers or fabricated Type 316 stainless steel supports as specified below. Materials and workmanship shall be in full compliance with Division 3, of these Specifications.

D. Supporting appurtenances shall be arranged to prevent undue stress on equipment to which piping is connected. Supporting appurtenances shall provide the desired pitch as specified or required for proper drainage of the piping. The pipe suspension shall prevent
excessive stress, excessive variation in supporting force, and possible resonance with imposed vibration while the system is in operation. All valves and valve operators shall be rigidly supported independently of the piping. Vertical runs of pipe shall be supported independently of the connected horizontal runs. All vertical pipes shall be supported at each floor or at intervals of at least ten (10) feet by approved pipe collars, clamps, brackets or wall rests. All piping shall be supported independently of the equipment to which it is connected. All in-line devices (flow meters, etc.) shall be removable without the need for temporary supports for adjacent and connecting piping.

E. Wall bracket supports shall be used where shown for pipe to be installed adjacent to a wall. The Contractor shall install pipe supports in conformance with these Specifications unless otherwise shown on the Drawings. Where deviations and modifications are required, they shall be made only with the permission of the Engineer, and at the risk of the Contractor. A detailed layout of pipe supports for each building shall be submitted to the Engineer for review prior to pipe fabrication or installation.

F. For all couplings, supports shall be placed on each side and as close to the coupling as possible.

G. **Structural Members:** Wherever possible, pipes shall be attached to structural members. Where it is necessary to frame structural members between existing members, such supplementary members shall be provided by the Contractor at no additional cost to the Owner. All supplementary members shall be in accordance with the requirements of the appropriate building code and the American Institute of Steel Construction.

H. Freestanding pipe connections to equipment shall be firmly attached to fabricated Type 316 stainless steel frames made of angles, channels, or I-beams anchored to the structure. All materials shall be Type 316 stainless steel.

I. **Point Loads:** Any meters, valves, heavy equipment, and other point loads on all plastic pipes shall be supported on both sides according to manufacturer's recommendations to avoid undue pipe stresses and failures. To avoid point loads, all supports on plastic and fiberglass piping shall be equipped with extra wide pipe saddles or Type 316 stainless steel shields with minimum length equal to circumference of pipe.

J. Where a specific pipe support is called for on the Drawings, this support shall be used as and where indicated for the specific application. In general, spacing of supports shall be as specified herein unless specifically modified by the Engineer.

K. All supports, saddles, and bearing plates shall support by direct contact the pipe a minimum of 120 degrees around, except as specified herein.

L. Where continuous concrete inserts are used, the maximum concentrated load on the end two (2) inches of inserts, with laying lengths of eight (8) inches or longer, shall not be more than 50 percent of the maximum recommended loading of the channel. All pipe supports shall be positioned such that they will not interfere with the use of hoisting equipment, where provided.
M. Wherever expansion and contraction of piping is expected, a sufficient number of expansion loops or joints shall be provided together with the necessary rolling or sliding supports, anchors, guides, pivots, and restraints. They shall permit the piping to expand and contract freely in directions away from the anchored points and shall be structurally suitable to withstand all loads imposed. Pipes subject to thermal expansion shall be installed perfectly aligned and concentrically guided. These piping support systems shall be submitted to the Engineer for review prior to erection and installation. The submittal shall show locations of anchors, concentric pipe guides and expansion couplings (single or double).

N. Riser Supports: Where practical, risers shall be supported on each floor with riser clamps and lugs, independent of the connected horizontal piping.

2.2 PIPE SUPPORT SPACING

A. Supports for piping with the longitudinal axis in approximately a horizontal position shall be spaced to prevent excessive sag, bending and shear stresses in the piping, with special consideration given where components, such as flanges and valves, impose concentrated loads.

B. The distance between supports for each size of pipe shall not exceed those listed in the attached schedule. However, if the pipe size to be supported is not listed in the schedule, the next smaller nominal pipe size spacing shall be used. In all cases, there shall be a minimum of one (1) support per laying length of pipe on uninterrupted horizontal runs. This support shall be placed within one (1) foot of the joint. If the pipe manufacturer recommends a smaller spacing interval than specified herein, then the manufacturer's spacing shall be used.

C. The distance between supports shall not exceed that listed in the following schedule unless otherwise indicated on the Drawings:

<table>
<thead>
<tr>
<th>Nominal Pipe Size (in.)</th>
<th>Metallic Piping (ft.)</th>
<th>Plastic, Fiberglass and Copper Piping (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 and larger</td>
<td>10</td>
<td>6</td>
</tr>
</tbody>
</table>

2.3 SADDLES

A. Pipe saddles shall be used to cradle horizontal piping when being supported from below. All saddles shall be capable of being adjusted after installation.

2.4 BASE ELBOWS, TEES AND CONCRETE PEDESTALS

A. Base elbows, tees and concrete pedestals shall be provided at the locations shown on the Drawings and as specified. All vertical runs of pipe shall be supported on a base elbow and/or concrete pedestal. After completion of curing of the concrete pedestal, the piping shall be adjusted to the proper grade.
2.5 HARNESSSED PIPE SUPPORTS

A. Pipe harness straps shall be provided on concrete pedestal supports where shown on the Drawings and required by these Specifications.

B. Harness straps shall be 1/4-inch thick, Type 316 stainless steel and attached to the concrete pedestal supports by Type 316 stainless steel anchors.

C. Unless otherwise indicated on the Drawings, strap width shall be in accordance with the following table:

<table>
<thead>
<tr>
<th>Pipe Diameter</th>
<th>Strap Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 inches and above</td>
<td>3 inches</td>
</tr>
</tbody>
</table>

2.6 THRUST RESTRAINT

A. Pipe anchors shall be spaced to divide pipe into sections. Anchors shall be located at valves, changes in direction of piping, and major branch connections. Anchors shall be of a type recommended by the pipe manufacturer and reviewed by the Engineer.

B. On all piping where sleeve type couplings and flanged adapters are located near fittings or valves, tie rods shall span across the coupling as specified herein to restrain movements of the pipe along its axial direction. Such restraints can be deleted if both ends of the pipe are anchored in a concrete structure with no fitting or valve occurring within the span length.

C. All sleeve type couplings shall be harnessed except where noted. The harnessing shall be as shown on the Drawings or as specified herein. Harnesses for steel pipe shall be in accordance with AWWA Manual M11 for the pipe size and pressure, working or test whichever is greater.

D. Harnesses for ductile iron pipe shall be tie rods spanning between adjacent flanges. Friction clamps shall not be permitted. The size and number of tie rods shall be the same as for steel pipe for the same pressure and pipe size.

E. Where the distance between adjacent flanges is in excess of ten (10) feet or where a harness cannot be used, the pipe supports adjacent to the coupling shall restrain the piping preventing any linear or angular movement resulting in the pipe separating from the coupling or misalignment in the joint.

F. Where expansion joints are used, control units shall be provided. All tie rods and control units shall be installed in accordance with the manufacturer’s recommended procedures.

G. Tie rods and associated hardware shall be Type 316 stainless steel.

H. In general, all valves and fittings shall be restrained in an approved manner such that the unbalanced force developed at them shall be supported independent of the piping system.
2.7 MANUFACTURED SUPPORTS

A. Stock Parts: Where not specifically shown or detailed, designs generally accepted as exemplifying good engineering practice, stock or production parts shall be utilized wherever possible. Such parts shall be locally available, new, of best commercial quality, designed and rated for the intended purpose.

B. Suppliers, or equal:
   1. Basic Engineers, Pittsburgh, PA;
   2. Bergen Paterson Corp., Boston, MA;
   3. Elcen Metal Products Company, Franklin Park, IL;
   5. NPS Industries, Inc., Secaucus, NJ;
   6. Unistrut Corp., Itasca, IL;
   7. ITT-Grinnell Corp., Warren, OH;

2.8 ANCHOR BOLTS AND SCREWS

A. Anchor bolts and screws for attaching pipe supports to walls and floors, shall be Type 316 stainless steel, ASTM A 276. Nuts shall be Type 316 stainless steel, ASTM A 194, Grade 8M, or ASTM F 594, Type 316 stainless steel.

PART 3 -- EXECUTION

3.1 INSTALLATION

A. General: All pipe supports, brackets, anchors, guides, and inserts shall be fabricated and installed in accordance with the manufacturer's printed instructions and ANSI/ASME B31.1 and ANSI / ASME B31.3. All concrete inserts for pipe supports shall be coordinated with the formwork.

B. Appearance: Pipe supports shall be positioned in such a way as to produce an orderly, neat piping system. All supports shall be installed to prevent interference with other Work.

C. Pipe Support Spacing: The distance between supports for each size of pipe shall not exceed those specified in Paragraph 2.02.

D. Provide separate supports at each valve. Provide one support around each end of the valve body or on the adjacent connecting pipe within one (1) pipe diameter of the valve end. Provide additional hangers or supports to relieve eccentric loadings imposed by offset actuators.
E. Install piping without springing, forcing, or stressing the pipe or any connecting valves, pumps, and other equipment to which the pipe is connected.

F. Use 1-5/8-inch high channel frames unless 3-1/4-inch is needed to provide clearance from walls. Use multiple back-to-back channels if additional clearance is needed.

3.2 FABRICATION

A. Quality Control: Pipe supports shall be fabricated and installed by experienced welders and fitters using the best welding procedures available. Welding shall conform with AWS Standards. Fabricated supports shall be neat in appearance without sharp corners, burrs, and edges.

- END OF SECTION –
SECTION 15095
VALVES, GENERAL

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. The Contractor shall furnish and install, complete with all assemblies and accessories, all valves shown on the Drawings and specified herein, including all fittings, appurtenances and transition pieces required for a complete and operable installation.

B. The Contractor shall provide all tools, supplies, materials, equipment, and labor necessary for furnishing, epoxy coating, installing, adjusting, and testing of all valves and appurtenant work, complete and operable, in accordance with the requirements of the Contract Documents.

C. The provisions of this Section shall apply to all valves and valve operators specified in the various Sections of these Specifications except where otherwise specified in the Contract Documents. Valves and operators in particular locations may require a combination of units, sensors, limit switches, and controls specified in other sections of these Specifications.

D. The equipment covered by these specifications is intended to be standard equipment of proven performance as manufactured by reputable companies. Equipment shall be designed, constructed and installed in accordance with the best practice of the trade, and shall operate satisfactorily when installed as shown on the Drawings.

1.2 SUBMITTALS

A. Each submittal shall be complete in all aspects incorporating all information and data listed herein and all additional information required to evaluate the proposed valve's compliance with the Contract Documents. Partial or incomplete submissions shall be returned to the Contractor disapproved without review.

B. Shop Drawings conforming to the requirements of Section 01300, Submittals, are required for all valves, and accessories. Submittals shall include all layout dimensions, size and materials of construction for all components, information on support and anchoring where necessary, pneumatic and hydraulic characteristics and complete descriptive information to demonstrate full compliance with the Documents.

Shop Drawings for electrically operated/controlled valves shall include all details, notes, and diagrams which clearly identify required coordination with the electrical power supply and remote status and alarm indicating devices. Electrical control schematic diagrams shall be submitted with the Shop Drawings for all electrical controls. Diagrams shall be drawn using a ladder-type format in accordance with JIC standards.

Shop Drawings for pneumatically operated/controlled valves shall include all details, notes, and diagrams which clearly identify required coordination with the compressed air (service air) system and electrical controls.
C. Data to be submitted shall include but not be limited to:

1. Catalog data consisting of specifications, illustrations and a parts schedule that identifies the materials to be used for the various parts and accessories. The illustrations shall be in sufficient detail to serve as a guide for assembly and disassembly.

2. Complete assembly and installation drawings with clearly marked dimensions. This information shall be in sufficient detail to serve as a guide for assembly and disassembly and for ordering parts.

3. Weight of all component parts and assembled weight.

4. Design calculations.

5. Listing of all lubricants required for the equipment with a minimum of two equivalent and compatible natural and/or synthetic lubricants produced by different manufacturers. The listing shall include the estimated quantity of lubricant required for one year of operation.

6. Sample data sheet of equipment nameplate(s) including information contained thereon.

7. Spare parts list

8. Special tools list

D. Operation and maintenance manuals and installation instructions shall be submitted for all valves and accessories in accordance with the Specifications. The manufacturer(s) shall delete all information which does not apply to the equipment being furnished.

E. Valve Labeling: The Contractor shall submit a schedule of valves to be labeled indicating in each case the valve location and the proposed wording for the label.

1.3 CONTRACTOR’S RESPONSIBILITIES

A. The Contractor shall provide the services of a qualified representative of the manufacturer(s) to verify and certify the installation, to supervise the initial operation, and to instruct the Owner's operating personnel in proper operation and maintenance procedures in accordance with the following schedule:

<table>
<thead>
<tr>
<th>Service</th>
<th>Number of Trips</th>
<th>Number of Days/Trip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation and Testing</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Startup and Training</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

B. Any additional time required to achieve successful installation and operation shall be at the expense of the Contractor. The manufacturer's representative shall sign in and out at the office of the Engineer's Resident Project Representative on each day he is at the project.
C. A written report covering the representative’s findings and installation approval shall be mailed directly to the Engineer covering all inspection and outlining in detail any deficiencies notes.

D. The times specified are exclusive of travel time to and from the facility and shall not be construed as to relieve the manufacturer of any additional visits to provide sufficient service to place the equipment in satisfactory operation.

E. **Valve Testing:** Unless otherwise specified, each valve body shall be tested under a test pressure equal to twice its design water-working pressure.

F. **Bronze Parts:** Unless otherwise specified, all interior bronze parts of valves shall conform to the requirements of ASTM B62, or, where not subject to dezincification, to ASTM B 584.

G. The Contractor shall obtain from the manufacturer and submit to the Engineer copies of the results of all certified shop tests.

H. The Contractor shall obtain from the manufacturer and submit to the Engineer copies of certified letters of compliance in accordance with the General Conditions and Division 1.

I. All buried metallic valves in direct contact with soil shall be wrapped in polyethylene encasement in accordance to AWWA C105/A21.5-10.

PART 2 -- PRODUCTS

2.1 VALVES

A. All valves shall be constructed of first quality materials which have strength, wearing, and corrosion resistance characteristics entirely suitable for the types of service for which the individual valves are designated. Cast iron valve bodies and parts shall meet the requirements of the latest revision of ASTM Designation A-126, "Standard Specifications for Gray Iron Castings for Valves, Flanges, and Pipe Fittings, Class B.". Flanged ends shall be flat-faced and have bolt circle and bolt patterns conforming to ANSI B16.1 Class 125 unless otherwise specified hereinafter.

B. All valve body castings shall be clean, sound, and without defects of any kind. No plugging, welding, or repairing of defects will be allowed.

C. Valves shall have flanged ends for exposed service and mechanical joint ends for buried service, unless otherwise shown on the Drawings or specified herein. Flanged ends shall be flat-faced, 125 lb. American Standard unless otherwise shown or specified in accordance with ANSI B16.1. All bolt heads and nuts shall be hexagonal of American Standard size. The Contractor shall be responsible for coordinating connecting piping. Valves with screwed ends shall be made tight with Teflon tape. Unions are required at all screwed joint valves.

D. Gaskets shall be full face and made of natural or synthetic elastomers in conformance with ANSI B16.21 suitable for the service characteristics, especially chemical compatibility and temperature. Nonferrous alloys of various types shall be used for parts of valves as specified. Where no definite specification is given, the material shall be the recognized acceptable standard for that particular application.
E. Where buried valves/line stops are shown, the Contractor shall furnish and install valve boxes to grade, with covers, extensions, and position indicators.

F. All shut-off valves shall have operators with position indicators.

G. All valves shall have a minimum design pressure rating of 150 psi and capable of a test pressure of 300 psi. For service applications with pressures in excess of 150 psi, valves shall have a minimum pressure rating in excess of the service application working pressure.

2.2 VALVE FLANGE

The flanges and gaskets of valves shall be in accordance with Section 15000 entitled "Piping, General."

2.3 PROTECTIVE COATING

Except where otherwise specified, ferrous surfaces, exclusive of stainless steel surfaces, in the water passages of all valves, as well as the exterior surfaces of all submerged valves, shall receive a fusion bonded epoxy coating in accordance with AWWA C550. Flange faces of valves shall not be epoxy coated. The Contractor, through the valve manufacturer, shall certify in writing that such coating has been applied and tested in the manufacturing plant prior to shipment, in accordance with these Specifications.

2.4 VALVE LABELING

A label shall be provided on all shut-off valves. The label shall be of 1/16-inch stainless steel, minimum 2 inches by 4 inches in size, and shall be permanently attached to the valve or on the wall adjacent to the valve or as indicated by the Engineer.

2.5 VALVE BOXES

A. All buried valves shall be provided with cast iron valve boxes unless otherwise indicated. The boxes shall be asphalt varnished, or enameled cast iron, adjustable to grade, and installed perpendicularly, centered around and covering the upper portions of the valve or valve operator, or the pipe. The top of each valve box shall be placed flush with finish grade unless otherwise indicated on the Drawings. Valve boxes shall be as specified elsewhere in this Section.

B. The Contractor shall furnish and install valve boxes as shown on the Drawings and specified herein.

C. All valve boxes shall be placed so as not to transmit shock or stress to the valve and shall be centered and plumb over the operating nut of the valve. The ground in the trench upon which the valve boxes rest shall be thoroughly compacted to prevent settlement. The boxes shall be fitted together securely and set so that the cover is flush with the finished grade of the adjacent surface. A concrete pad and valve box monument, as detailed on the Drawings, shall be provided around the valve box, sloped outwards.

D. All valve boxes shall be 2-piece cast iron, sliding type, 51/4" shaft, with heavy duty traffic weight collar and the lid marked with the appropriate carrier product (i.e.: SEWAGE).
Boxes shall be as manufactured by American-Darling Valve Co., McWane/Clow Corp., Manuel H Valve Company, or Mueller Company.

E. The covers shall be marked “SEWER” and shall have a bell end sufficiently large to fit over the stuffing box of the valve.

F. Valve box and cover assemblies shall be the adjustable slide type with round bases fabricated of asphalt coated cast iron and designed to withstand heavy traffic loads. They shall be Model No. F2450 by Clow Corporation, or equivalent models by Mueller or equal. Base shall be Clow’s Model No. F-2480 for valves 4 inches and smaller, Model F-2465 for valves 6 inches and 8 inches, and Model F-2484 for valves 10 inches and larger. The cover shall be Clow’s Model F-2494.

G. Valve boxes shall be of the adjustable telescope type, cast iron, suitable to withstand heavy traffic. They shall be manufactured by U.S. Foundry or equal. The covers shall be marked SEWER. Bases shall be the round type. Boxes shall be coated with asphalt.

H. Extension sleeves, Clow Model No. F2475, shall be provided as required.

I. Valves shall be provided with extension stems to bring the operating nut within 18 to 24 inches of the finished grade.

J. Two operating “T” wrenches, suitable for use with the AWWA operating nut, shall be provided.

PART 3 -- EXECUTION

3.1 INSTALLATION

A. Except where noted otherwise herein, all valves shall be installing and tested in accordance with the latest revision of AWWA C500. Before installation, all valves shall be lubricated, manually opened and closed to check their operation and the interior of the valves shall be thoroughly cleaned. Valves shall be placed in the positions shown on the Drawings. Joints shall be made as directed under the Piping Specifications. The valves shall be so located that they are easily accessible for operating purposes, and shall bear no stresses due to loads from the adjacent pipe. The Contractor shall be responsible for coordinating connecting piping.

B. All valves shall be tested at the operating pressures at which the particular line will be used. Any leakage or "sweating" of joints shall be stopped, and all joints shall be tight. All motor operated and cylinder operated valves shall be tested for control operation as directed by the Engineer.

C. Provide valves in quantity, size, and type with all required accessories as shown on the Drawings.

D. Install all valves and appurtenances in accordance with manufacturer's instructions. Install all valves so that operating handwheels or wrenches may be conveniently turned from operating floor/slab but without interfering with access, and as approved by Engineer. Unless otherwise approved, install all valves plumb and level. Valves shall be installed free from distortion and strain caused by misaligned piping, equipment or other causes.
E. Valve boxes shall be set plumb, and centered with the bodies directly over the valves so that traffic loads are not transmitted to the valve. Earth fill shall be carefully tamped around each valve box to a distance of 4 feet on all sides of the box, or to the undisturbed trench face, if less than 4 feet.

F. The procedures regarding unloading, inspection, storage and where applicable installation, described in the Appendix of AWWA C500 entitled "Installation, Operation and Maintenance of Gate Valves," shall be used for all valves.

G. All valves shall be manually opened and closed before installation to check their operation, and the interior of the valves shall be cleaned. Valves shall be placed in the positions shown on the Drawings. Joints shall be made as directed under the piping specifications.

H. **Access**: All valves shall be installed to provide easy access for operation, removal, and maintenance and to avoid conflicts between valve operators and structural members or handrails.

I. **Valve Accessories**: Where combinations of valves, sensors, switches, and controls are specified or shown on the Drawings, it shall be the responsibility of the Contractor to properly assemble and install these various items so that all systems are compatible and operating properly. The relationship between interrelated items shall be clearly noted on shop drawing submittals.

3.2 **SHOP AND FIELD TESTING**

A. Shop and field testing of valves shall be as follows:

1. Certified factory testing shall be provided for all components of the valve and operator system. Valves and operators shall be shop tested in accordance with the requirements in the latest revision of AWWA C500, including performance tests, leakage test, hydrostatic tests, and proof-of-design tests. The manufacturer through the Contractor shall submit certified copies of the reports covering the test for acceptance by the Engineer.

2. Shop testing shall be provided for the operators consisting of a complete functional check of each unit. Any deficiencies found in shop testing shall be corrected prior to shipment. The system supplier through the Contractor shall submit written certification that shop tests for the electrical/pneumatic system and all controls were successfully conducted and that these components provide the functions specified and required for proper operation of the valve operator system.

3. The Contractor shall conduct field tests to check and adjust system components, and to test and adjust operation of the overall system. Preliminary field tests shall be conducted prior to start-up with final field tests conducted during start-up. The factory service representative shall assist the Contractor during all field testing and prepare a written report describing test methods, and changes made during the testing, and summarizing test results. The service representative shall certify proper operation of the valve operator system upon successful completion of the final acceptance field testing.
4. Preliminary and final field tests shall be conducted at a time approved by the Engineer. The Engineer shall witness all field testing.

5. All costs in connection with field testing of equipment such as energy, light, lubricants, water, instruments, labor, equipment, temporary facilities for test purposes, etc. shall be borne by the Contractor. The Contractor shall be fully responsible for the proper operation of equipment during tests and instruction periods and shall neither have nor make any claim for damage which may occur to equipment prior to the time when the Owner formally takes over the operation thereof.

6. Preliminary field tests shall be conducted prior to start-up and shall include a functional check of the entire valve operator system and all system components. Preliminary field tests shall demonstrate that the valve operator system performs according to specifications and that all equipment, valves, controls, alarms, interlocks, etc., function properly. The preliminary field test report must be approved by the Engineer prior to conducting final field acceptance tests. Based on results of preliminary field tests, the Contractor shall make any adjustments required to settings, etc., to achieve the required valve closing time and operation specified or otherwise directed by the Engineer.

7. Final field acceptance tests shall be conducted simultaneously with the start-up and field testing of the pumps. Field tests shall be conducted for the full range of operating modes and conditions specified and as directed by the Engineer. Each of the valves shall be tested at minimum, maximum, and normal head/flow conditions, and under all specified conditions of opening and closing. Performance of pneumatic valves under normal operating conditions and during simulated power failures shall be checked.

8. Field testing shall include optimization of opening and closing times of the valves. The Contractor shall provide the means for accurate measurement of pipeline pressures as directed by the Engineer. Valve opening and closing times shall be adjusted based on process requirements to optimize operation of the valves. Final valve opening and closing times as determined by field tests shall be approved by the Engineer prior to final acceptance of the system.

9. Field Testing: All valves shall be hydrostatically field tested at the pipeline test pressures specified in the piping sections. Any leakage or “sweating” of joints shall be stopped, and all joints shall be tight. Valves shall be tested for bi-directional shut-off where required by conditions of service.

The Owner may, at its discretion, visit and inspect the manufacturer's facilities. During the inspection visit, a witnessed shop test shall be performed for all standard tests listed in applicable standards.

The Contractor shall obtain and submit certified statements that the valves and hydrants comply with the requirements of the standards specified herein.
3.3 PAINTING AND COATINGS

A. Valves shall be shop primed for interior and exposed piping service in accordance with Division 9 and shall be coated for buried service with a one (1) mil coating in conformance with the outside coatings specified for ductile iron pipe.

- END OF SECTION -
SECTION 15100

VALVE OPERATORS

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. Equipment shall be provided in accordance with the requirements of Section 15095, Valves, General.

B. Valve operators shall be designed to unseat, open or close, and seat the valve under the most adverse operating condition to which the valves will be subjected.

C. Operator mounting arrangements shall be as indicated on the Drawings or as directed by the manufacturer and/or Engineer.

D. The valve operators shall be the full and undivided responsibility of the valve manufacturer in order to ensure complete coordination of the components and to provide unit responsibility.

1.2 SUBMITTALS

A. The following items shall be submitted with the Shop Drawings in accordance with, or in addition to the submittal requirements specified in Section 01300 - Submittals;

1. Certification that the force required to operate all valves is as specified herein.

1.3 WARRANTY AND GUARANTEE

A. The equipment furnished under this Section shall be guaranteed to be free from defects in workmanship, design and/or materials for a period of two (2) years. The period of such warranties shall start on the date the valve is placed in use by the Owner with corresponding start-up certification provided by the manufacturer's technical representative as specified herein, provided that the equipment demonstrates satisfactory performance during the operational period after the equipment startup. If the equipment does not perform satisfactorily during the operational period, the start of the warranty period will be delayed until the equipment demonstrates proper operation. The Equipment Supplier shall repair or replace without charge to the Owner any part of equipment which is defective or showing undue wear within the guarantee period, or replace the equipment with new equipment if the mechanical performance is unsatisfactory; furnishing all parts, materials, labor, etc., necessary to return the equipment to its specified performance level.
PART 2 -- PRODUCTS

2.1 GENERAL

A. Manual operators shall be provided on all valves. Manual operator type shall be as specified herein and as shown on the Drawings.

B. Plug valves 14” and greater in size shall have geared operators.

C. Operators/actuators shall be furnished with conservatively sized extension bonnets, extension stems, or torque tubes, and all required appurtenances required for a complete installation. Operators furnished with extension bonnets shall include stainless steel extension stems, or stainless steel torque tubes.

D. Valves shall be furnished with operators, provided by the valve manufacturer. All operators of a given type shall be furnished by the same manufacturer. All valve operators, regardless of type, shall be installed, adjusted, and tested by the valve manufacturer at the manufacturing plant. Operator orientation shall be verified with the Engineer prior to installation. If this requirement is not met, changes to orientation shall be made at no additional cost.

E. The Contractor, through the valve manufacturer, shall be solely responsible for the selection of the proper operator to meet the operating conditions specified herein. Field calibration and testing of the operators and valves to ensure a proper installation and an operating system shall be the responsibility of the Contractor.

F. All valve operators shall be provided with the valve by the valve manufacturer.

2.2 MANUAL OPERATORS

A. Unless otherwise specified or shown on the Drawings, manual operator type shall be as follows:

1. Exposed valves shall be handwheel operated.
2. Buried valves shall be 2-inch square nut operated.

B. Manual operators shall be rigidly attached to the valve body unless otherwise specified or shown on the Drawings.

C. All operators shall turn counter-clockwise to open and shall have the open direction clearly and permanently marked.

D. Valve operators shall be designed so that the force required to operate the handwheel does not exceed 80 pounds applied at the extremity of handwheel. Design pressures for sizing of valve operators shall be the piping test pressure for the piping in which the valve is to be installed as listed in Section 15000.

E. Handwheels for valves operators shall not be less than 12 inches in diameter. The maximum diameter of any handwheel shall not exceed 24 inches.
F. Nut operators shall have standard 2-inch square AWWA operating nuts designed in accordance with AWWA C504-94.

G. Geared manual operators shall be of the worm gear, traveling nut or scotch yolk type, unless otherwise indicated in the individual valve specification. Gear operators shall be of the worm gear or bevel gear type. Gear box designs incorporating end of travel stops in the housing shall be equipped with AWWA input stops. Each gearbox shall require a minimum of 10 turns for 90-degree rotation or full valve stem travel and shall be equipped with a mechanical valve position indicator.

H. Manual operators on below grade (and vault installed) valves shall be permanently lubricated and watertight under an external water pressure of 10 psi.

I. All manual operators shall have handwheels, unless otherwise shown. Where buried, the valves shall have extensions with square nuts or floor stands. Unless otherwise shown or specified, valves of sizes 4 inches and larger shall have gear-assisted operators.

PART 3 -- EXECUTION

3.1 MANUFACTURER'S FIELD SERVICES

A. The services of a qualified manufacturer's technical representative shall be provided based on the following:

<table>
<thead>
<tr>
<th>Service</th>
<th>Number of Trips</th>
<th>Number of Days/Trip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation and Testing</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

3.2 INSTALLATION

A. All valve actuators shall be installed in accordance with the manufacturer's published recommendations and the applicable specification sections for valves, and motor controls.

B. Valve actuators shall be factory coated in accordance with the manufacturer’s standard paint system.

3.3 FIELD TESTS

A. Field testing shall be in accordance with the following:

1. Valve actuators shall be field-tested together with the associated valves.

2. Test all valves at the operating pressures at which the particular line will be used.

B. Preliminary Field Tests

1. General: Preliminary field tests shall be conducted prior to start-up and shall include a functional check of the entire valve operator system and all system components.
2. **Scope:** Preliminary field tests shall demonstrate that the valve operator system performs according to specifications and that all equipment, valves, operators, etc., function properly.

3. Based on results of preliminary field tests, the Contractor shall make any adjustments required to settings, etc., to achieve the required valve operation.

C. Final Field Tests

1. Final field tests shall be conducted in accordance with the latest revision of AWWA C500.

2. Final field tests shall be conducted simultaneously with the start-up and field testing of the pumps.

- END OF SECTION -
PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. Reference Section 15095, Valves, General.

B. Valves shall be constructed of materials suitable for municipal wastewater service.

C. The Contractor shall furnish and install all check valves in the types and sizes shown and specified, complete and operable, including epoxy coating, appurtenances and accessories, in accordance with the requirements of the Contract Documents.

1.2 WARRANTY

A. The equipment furnished under this Contract shall be guaranteed to be free from defects in workmanship, design and/or materials for a period of two (2) years. The period of such warranties shall start on the date the valve is placed in use by the Owner with corresponding start-up certification provided by the manufacturer’s technical representative as specified herein, provided that the equipment demonstrates satisfactory performance during the operational period after the equipment startup. If the equipment does not perform satisfactorily during the operational period, the start of the warranty period will be delayed until the equipment demonstrates proper operation. The Equipment Supplier shall repair or replace without charge to the Owner any part of equipment which is defective or showing undue wear within the guarantee period, or replace the equipment with new equipment if the mechanical performance is unsatisfactory; furnishing all parts, materials, labor, etc., necessary to return the equipment to its specified performance level.

PART 2 -- PRODUCTS

2.1 SWING FLEX CHECK VALVES

A. Check valves shall be swing flex type as manufactured by Valmatic, or equal.

1. Check valves shall be designed, manufactured, and tested in accordance with AWWA C508

2. Check valves shall be rated for 250 psig.

3. The valve body and cover shall be ASTM A536 Grade 65-45-12 ductile iron

4. Valve disc shall be precision molded Buna-N, per ASTM D2000-BG, reinforced with alloy steel, O-ring sealing surface and shall be warranted for 25 years. Disc shall have a 35 degree stroke to provide non-slam closing. Disc shall have a cracking pressure of 0.25 psi.

5. Seating surface shall provide a 45 degree angle to minimize disc travel
6. Valve shall be provided with a backflow actuator and mechanical position indicator

7. Top access port shall be full size allowing removal of disc

8. Valve shall be capable of passing 3-inch solids

9. Valves shall have Type 316 stainless steel hardware.

10. Flanged valves shall have flanges per ANSI B16.1, Class 125 and are compatible with the connecting piping

11. Interior and exterior of the valve shall have a fusion bonded epoxy coating

2.2 LIMIT SWITCH

A. Where applicable, the Swing Check Valves shall be provided with a Limit Switch to remotely indicate the OPEN/CLOSE status.

B. The Limit Switch shall be manufactured by Allen-Bradley Model 802M, or equal. The Limit Switch shall be a Factory Sealed, Corrosion Resistance type switch with a spring return lever. The enclosure shall be rated NEMA-4, UL listed. The electrical rating of the switch shall be SPDT 15 AMPS @120 Volts A.C. The pre-wired switch cable shall include a common wire, normally open wire and normally closed wire.

C. The Check Valve manufacturer shall provide a solid mechanical support to secure the Limit Switch. The Limit Switch support shall also be provided with a mechanical adjustment to properly position the snapping of the Limit Switch.

- END OF SECTION –
SECTION 15109
PLUG VALVES

PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. Reference Section 15095, Valves, General.

B. The Contractor shall furnish and install plug valves, complete and operable, as shown on
the Drawings and specified herein including operators, protective coatings, and
appurtenant work, all in accordance with the requirements of the Contract Documents.

1.2 WARRANTY

A. The equipment furnished under this Section shall be guaranteed to be free from defects
in workmanship, design and/or materials for a period of two (2) years. The period of such
warranties shall start on the date the valve is placed in use by the Owner with
the equipment's technical representative as specified herein, provided that the equipment demonstrates satisfactory
performance during the operational period after the equipment startup. If the equipment
does not perform satisfactorily during the operational period, the start of the warranty
period will be delayed until the equipment demonstrates proper operation. The Equipment
Supplier shall repair or replace without charge to the Owner any part of equipment which
is defective or showing undue wear within the guarantee period, or replace the equipment
with new equipment if the mechanical performance is unsatisfactory; furnishing all parts,
materials, labor, etc., necessary to return the equipment to its specified performance level.

PART 2 -- PRODUCTS

2.1 PLUG VALVES

A. Plug valves shall be of the non-lubricated, eccentric seating plug type with synthetic
rubber-faced plugs as manufactured by Henry Pratt Company, DeZurik Company, or
equal.

B. The construction of the valve shall require the opening movement of the valve to cause
the plug to rise off the seat contact rather than sliding from its seat.

C. All valves shall be provided with limit stops and rotate 90 degrees from fully open to fully
closed and shall be capable of providing shut-off up to the full working pressure rating in
either direction working pressure ratings are as follows:

<table>
<thead>
<tr>
<th>Nominal Pipe Size (in.)</th>
<th>Working Pressure (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 12</td>
<td>175</td>
</tr>
<tr>
<td>Above 12</td>
<td>150</td>
</tr>
</tbody>
</table>
D. The port area of valves shall be at least 80 percent of full pipe area for valves less than 12-inches and 100 percent for valves 12-inches and larger.

E. The body materials shall be of epoxy coated cast iron or semi-steel, unless specified otherwise. Seats shall have a welded overlay of 90 percent pure nickel and machined to a finish containing no stress cracks. Plug facings shall be of Hycar, or equal and completely suitable for use with domestic sewage.

F. The shaft seal shall be either the bronze cartridge type with at least two O-Rings, monolithic V-Type, or pull down packing type. If monolithic V-Type or pull down packings are utilized, it shall be self-adjusting, self-compensating type. Packing shall be as manufactured by Chevron, or equal. Plug valves with pull down packings shall be designed with an extension bonnet so that repacking can be done without removal of the actuator.

G. All buried valves shall have mechanical joint ends (unless otherwise shown), conforming to ANSI A21.11. (AWWA C 111), and shall be operated with a standard AWWA 2-inch square nut through a totally enclosed worm gear actuator. Valve boxes shall be installed with all buried plug valves and shall be as specified herein.

H. For buried or submerged service, valves shall be provided with an AWWA operating nut. Valves shall have permanently lubricated totally enclosed worm gear actuators.

I. Unless otherwise shown, all exposed valves shall have flanged ends conforming to ANSI B16.1-125/150-pound standard with face-to-face dimensions of standard plug valves. Threaded ends shall conform to the NPT Standard.

J. Manual operated plug valves shall be handwheel operated where required or indicated on the Drawings through totally enclosed worm gear actuators, unless otherwise specified or shown on the Drawings. The actuators shall be properly sized to suit the maximum differential across the valve.

K. The manufacturer shall certify that the plug valves are capable of operating in continuous duty service under these pressures and flow conditions.

L. Each valve shall be hydrostatically tested and tested for bubble tightness after the operator has been mounted and adjusted. Copies of the hydrostatic and leakage test certification and certification of conformance shall be submitted to the Engineer prior to shipment.

M. All internal and external ferrous components and surfaces of the valves, with the exception of stainless steel and finished or bearing surfaces, shall be shop painted with two coats (10 mils min. dry film thickness) of the manufacturer's premium epoxy for corrosion resistance. Damaged surfaces shall be repaired in accordance with the manufacturer's recommendations.

N. All exposed nuts, bolts, springs, washers, etc. shall be Type 316 stainless steel.

O. Valves shall have the standard face to face dimensions of AWWA gate valves for nominal pipe size three (3) to twelve (12) inches with flanged end connection.
P. Valve bearings shall be replaceable Type 316 series stainless steel for both the upper and lower journals.

Q. Gear actuators shall be totally enclosed worm gear type with permanently lubricated bronze bearings and shall be designed to handle the seating and unseating torque at the specified handwheel pull for applications with the maximum pressure differential in either direction.

2.2 TESTING

A. Shop testing of valves shall be as follows:

1. Shop Testing: Certified factory testing shall be provided for all components of the valve and operator system. Valves and operators shall be shop tested in accordance with the requirements in the latest revision of AWWA C500, including performance tests, leakage test, hydrostatic tests, and proof-of-design tests. The Vendor shall submit certified copies of the reports covering the test for acceptance by the Engineer.

PART 3 -- EXECUTION

3.1 GENERAL

A. All plug valves shall be installed in strict accordance with the Supplier's published recommendations and the applicable provisions of Section 15095 entitled "Valves, General."

B. All valve exteriors shall be painted as specified in Section 09900 entitled "Painting." All exposed interior corrosive ferrous surfaces of valves, 4-inch and larger as well as the exterior surfaces of buried valves, shall receive a fusion-bonded epoxy coating conforming to AWWA C550.

- END OF SECTION –
PART 1 -- GENERAL

1.1 THE REQUIREMENT

A. Perform flushing and testing of all pipelines and appurtenant piping, complete, including conveyance of test water from Owner-designated source to point of use and all disposal thereof, all in accordance with the requirements of the Contract Documents.

1.2 SUBMITTALS

A. Submit, in writing, a testing schedule, including proposed plans for source water, water conveyance, control, disposal, for approval a minimum of seven (7) days before testing is to start.

PART 2 -- PRODUCTS

2.01 MATERIALS REQUIREMENTS

A. Determine and furnish all test equipment, temporary valves or bulkheads, temporary vents or drains or other water control equipment and materials, subject to the Engineer's review. No materials shall be used which would be injurious to the construction or its future function.

PART 3 -- EXECUTION

3.1 GENERAL

A. Unless otherwise provided herein, water for testing pipelines will be furnished by the Owner; however, the Contractor shall make all necessary provisions for conveying the water from the Owner-designated source to the points of use.

B. Test all pressure pipelines. Perform all testing operations in the presence of the Engineer.

3.2 HYDROSTATIC TESTING OF PRESSURE PIPING

A. Prior to hydrostatic testing, flush or blow out all pipelines as appropriate. Test all pipelines as a unit. No section of the pipeline shall be tested until all field-placed concrete or mortar have attained an age of 14 days. The test shall be made by closing valves when available, or by placing temporary bulkheads in the pipe and filling the line slowly with water. The Contractor shall be responsible for ascertaining that all test bulkheads are suitably restrained to resist the thrust of the test pressure without damage to, or movement of, the adjacent pipe. Care shall be taken to see that all air vents are open during filling.

B. Fill the pipeline at a rate which will not cause any surges or exceed the rate at which the air can be released through the air valves at a reasonable velocity and all the air within
the pipeline shall be properly purged. After the pipeline or section thereof has been filled, allow it to stand under a slight pressure for at least 24 hours to allow the concrete or mortar lining, as applicable, to absorb what water it will and to allow the escape of air from any air pockets. During this period, bulkheads, valves, and connections shall be examined for leaks. If leaks are found, corrective measures satisfactory to the Engineer shall be taken.

C. Hydrostatic Pressure Testing of Buried Pressure Piping:

1. Conduct hydrostatic tests on buried pipe after the trench has been completely backfilled. The pipe may be partially backfilled and the joints left exposed for inspection during an initial leakage test under moderate pressure so as not to disturb compaction, joints, and bedding. The final pressure test to full test pressure shall not commence until after complete backfill of the trench and fully compacted. In general, the test pressure for pipelines shall be nominally 200 percent of the normal operating pressure listed in the schedule in Section 15000 and the hydrostatic test shall be for a duration of 2 hours.

2. Conduct the leakage test concurrently with the hydrostatic pressure test. Leakage shall be defined by a measured quantity of water that must be supplied from a calibrated container into the newly laid pipe, or valved section thereof, to maintain pressure within plus or minus 1% of the specified pressure after the air in the pipe has been completely expelled and the pipe material fully saturated. Allowable leakage shall be as determined by the following formula:

\[ L = \frac{S \times D \times (P)^{1/2}}{148,000} \]

Where:  
- \( L \) is the allowable leakage in gallons per hour  
- \( S \) is the length of pipe tested in feet  
- \( D \) is the diameter of the pipe in inches  
- \( P \) is the average test pressure in psi

3. In the case of pipelines that fail to pass the prescribed leakage test, determine the cause of the leakage and shall take corrective measures necessary to repair the leaks, re-backfill and compact the pipelines, and retest the pipelines. Provide all reaction blocking and necessary plugs and caps required to test all piping installed as part of this Contract.

D. Hydrostatic Pressure Testing of Above ground or Exposed Piping:

1. The hydrostatic test shall consist of holding the test pressure on the pipeline for a period of 2 hours. In general, the test pressure for pipelines shall be nominally 200 percent of the normal operating pressure listed in the schedule in Section 15000.

2. Examine joints, fittings, valves, and other connections for leaks. The piping systems shall show no signs of leaking or weeping. Repair all leaks in a manner acceptable to the Engineer and then retest until no leakage is detected.
DIVISION 16

Electrical
SECTION 16050

ELECTRICAL - GENERAL PROVISIONS

PART 1 -- GENERAL

1.1 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required for a complete electrical system at the Lockwood Ridge Booster Pump Station (LWR-BPS), Sarasota County, Florida, hereinafter specified and shown on the Drawings.

B. The work, apparatus and materials which shall be furnished under these Specifications and accompanying Drawings shall include all items listed hereinafter and/or shown on the Drawings. Certain equipment will be furnished as specified in other sections of these Specifications which will require wiring thereto and/or complete installation as indicated. All materials necessary for the complete installation shall be furnished and installed by the Contractor to provide complete power, lighting, communication systems, instrumentation, wiring and control systems as indicated on the Drawings and/or as specified herein.

C. The Contractor shall furnish and install the necessary switchgear, cables, motor control centers, generators, protective devices, conductors, exterior electrical system, etc., to serve motor loads, lighting loads and miscellaneous electrical loads as indicated on the Drawings and/or as specified hereinafter.

D. The work shall include complete testing of all equipment and wiring at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment. All workmanship shall be of the highest quality; sub-standard work will be rejected.

E. All work outlined in Division 16 specifications shall be the responsibility of the Division 16 Contractor. It is the intent of the Contract Documents that the Electrical Contractor will have the ultimate responsibility for the coordination of Division 16 systems.

F. Mount and wire speed indicators, variable frequency drives, reduced voltage sort starters, and process instruments furnished under other Divisions of these Specifications.

G. Mount and wire isolation transformers, operator's stations, and power conversion equipment for all variable speed drive systems furnished under other Divisions of these specifications.

H. Make all field connections to process instrument panels and other control panels furnished under other Divisions of these Specifications.

I. For process instrumentation, furnish and install all conduit, wire and interconnections
between primary elements, transmitters, local indicators and receivers.

J. Install and wire all thermostats, aquastats and other devices furnished under other Divisions of this Specification directly controlling heating equipment or fan motors.

K. Wire all ventilation equipment furnished under other Divisions of this Specification.

L. Each bidder or his authorized representatives may, before preparing his proposal, visit all areas of the site in which work under this division is to be performed and inspect carefully the present installation. The submission of the proposal by this bidder shall be considered evidence that he or his representative has visited the proposed site, or otherwise understands all requirements within the bid documents, and noted the locations and conditions under which the work will be performed and that he takes full responsibility for a complete knowledge of all factors governing his work.

M. All power interruptions shall be at the Owner's convenience. Each interruption shall have prior approval.

N. It is the intent of these Specifications that the electrical system shall be suitable in every way for the service required. All material and all work which may be reasonably implied as being incidental to the work of this Section shall be furnished at no extra cost.

1.2 SERVICE & METERING

A. Permanent electrical power shall be provided by Florida Power and Light Inc. (FPL) at voltages indicated on the drawings.

B. The power company contact is Mr. Bennett Wachob, phone number (941)927-4260.

C. Furnish and install the new conduits and wire as required and shown on the Drawings. Primary conduit shall be furnished and installed by the Contractor. The Contractor shall be responsible for coordinating any and all required electrical inspections. The Contractor shall coordinate with FPL all inspections required.

D. The Contractor is responsible for providing all required temporary and permanent power at no cost to the County. The Contractor should assume the cost of FPL temporary and requirements to install permanent power to the site, per Contract documents.

E. CONTRACTOR shall schedule all power interruptions with FPL. All interruptions shall have OWNER approval and 48 hour notification.

1.3 CODES, INSPECTIONS & FEES

A. All material and installation shall be in accordance with the latest edition of the National Electrical Code and all applicable national, local and state codes.

B. Pay all fees required for permits and inspections including any charges associated with the service modifications.
1.4 TESTS

A. Test all systems and repair or replace all defective work. Make all necessary adjustments to the systems and instruct the Owner's personnel in the proper operation of the systems.

B. The following minimum tests and checks shall be made prior to the energizing of electrical equipment. Test report shall be submitted stating that the equipment meets and operates in accordance with the Manufacturer's and job specifications, and that equipment and installation conforms to all applicable Standards and Specifications:

1. Testing and setting of protective relays for calibration and proper operation.

2. Mechanical inspection of all circuit breakers 100 amps and larger to assure proper operation.

3. Motors: Megger to ground each motor winding. Record date, motor temperature, terminal, reading and operator and have Owner representative sign off on each reading.

4. Conductors: Megger to ground prior to termination all 600 volt conductors not used for service conductors. Record the date, conductor, reading and operator and have Owner representative sign off on each reading.

5. Service Conductors: Megger to ground prior to termination in the presence of the Engineer or his representative all 600 volt service conductors. Record date, conductor, reading, operator, and have the Owner representative sign off on each reading.

6. 480 Volt Motor Control Centers, Service Entrance (SE) Rated Automatic Transfer Switches and Power Panels: After installing, with circuit breakers closed, but prior to terminating any conductors or bus to the motor control center, megger each phase to phase and phase to ground. Record the date, test (i.e. A/B or A/G), reading and operator and have Owner representative sign off on each reading.

7. Connections & Terminations: Torque to Manufacturer's values in the presence of the Engineer or his representative. Record the date, conductor, torque, operator and have the Engineer sign off on each reading.

8. Data Base: After equipment suppliers test, calibrations, and inspection, megger all circuits leaving all switchgear and motor control centers. Record the date, conductor, circuit condition (i.e. load connected or unconnected), reading and operator and have Owner representative sign off on each reading.

9. Hot Spot Testing: Perform infrared hot spot inspection of the ATSs, motor control centers and associated equipment as soon as determined by the engineer that representative loads are present. Record the date, gear conditions found,
operator and have the owner’s representative who must be present for the inspection sign off in each instance.

10. Miscellaneous:

a. Meggering must be done at 1000 VDC for one minute. The ground plane used must be the one established at the main source of energy for conductors, switchboards and control centers. The motor frame may be used for the ground plane for motors.

b. In the course of construction, it will become necessary to temporarily energize some systems for testing. Confirm that any motor has been meggered prior to connection and testing. Do not leave any motor or system unattended and energized without written authorization.

c. An unsuccessful test will be one in which any one of the three megger readings differs from another by more than 25%. Engineer shall determine if cables and/or equipment bussing shall be replaced.

1.5 SLEEVES AND FORMS FOR OPERATING

A. Provide and place all sleeves for conduits penetrating floors, walls, partitions, etc. Locate all necessary slots for electrical work and form before concrete is poured.

1.6 CUTTING AND PATCHING

A. All cutting and patching shall be done in a thoroughly workmanlike manner.

1.7 INTERPRETATION OF DRAWINGS

A. The Drawings are not intended to show exact locations of conduit runs.

B. All three-phase circuits shall be run in separate conduits unless otherwise shown on the Drawings.

C. Unless otherwise approved by the Engineer conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.

D. Where circuits are shown as "home-runs" all necessary fittings and boxes shall be provided for a complete raceway installation.

E. The Contractor shall harmonize the work of the different trades so that interferences between conduits, piping, equipment, architectural and structural work will be avoided. All necessary offsets shall be furnished so as to take up a minimum space and all such offsets, fittings, etc., required to accomplish this shall be furnished and installed by the Contractor without additional expense to the Owner. In case interference develops, the Owner's authorized representative is to decide which equipment, piping, etc., must be relocated, regardless which was installed first.
F. Verify with the Engineer the exact locations and mounting heights of lighting fixtures, switches and receptacles prior to installation.

G. The locations of equipment, fixtures, outlets, and similar devices shown on the Drawings are approximate only. Exact locations shall be as approved by the Engineer during construction. Obtain in the field all information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the Engineer and furnish all labor and materials necessary to complete the work in an approved manner.

H. Surface mounted panel boxes, junction boxes, conduit, etc., shall be supported by spacers to provide a clearance between wall and equipment.

I. Circuit layouts shown are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power, lighting, and other electrical systems shown. Additional circuits shall be installed wherever needed to conform to the specific requirements of the equipment.

J. The ratings of motors and other electrically operated devices together with the size shown for their branch circuit conductors and conduits are approximate only and are indicative of the probable power requirements insofar as they can be determined in advance of the purchase of equipment.

K. All connections to equipment shall be made as shown, specified, and directed and in accordance with the Manufacturer's approved shop drawings, regardless of the number of conductors shown on the Drawings.

1.8 SIZE OF EQUIPMENT

A. Investigate each space in the building where equipment must pass to reach its final location. If necessary, the Manufacturer shall be required to ship material in sections, sized to permit passing through such restricted areas in the building.

B. The equipment shall be kept upright at all times. When equipment has to be tilted for ease of passage through restricted areas during transportation, the Manufacturer shall be required to brace the equipment suitably, to insure that the tilting does not impair the functional integrity of the equipment.

1.9 RECORD DRAWINGS

A. Requirements for record drawings are specified in Section 01720: Project Record Documents.

1.10 COMPONENT INTERCONNECTIONS

A. Component equipment furnished under this Specification will not be furnished as integrated systems. Contractor shall field install and wire completely all components.
B. Contractor shall analyze all systems components and their shop drawings, identify all terminals and prepare drawings and wiring tables necessary for component interconnection. Contractor shall provide crimp on wire numbers on both ends of all control wiring installed between all panels furnished under this contract. These numbers shall directly relate to the interconnect wiring drawing furnished by the Contractor and be reflected in the record drawings submitted.

1.11 SHOP DRAWINGS

A. As specified under other sections shop drawings shall be submitted for approval of all materials, equipment, apparatus, and other items as required by the Engineer.

B. Shop drawings shall be submitted for the following equipment:
   1. Remote Telemetry Unit (RTU)
   2. Meter cans
   3. Wire and Cable
   4. Conduit
   5. Equipment Racks
   6. Light Fixtures
   7. Grounding system components
   8. Instruments

C. The Manufacturer name and product designation and catalog data sheet shall be submitted for the following material:
   1. Conduit
   2. Receptacles
   3. Boxes and fittings
   4. Switches
   5. Lamps
   6. Control Relays

D. Prior to submittal by the Contractor, all shop drawings shall be checked for accuracy and contract requirements. Shop drawings shall bear the date checked and shall be accompanied by a statement that the shop drawings have been examined for conformity to Specifications and Drawings. This statement shall also list all discrepancies with the Specifications and Drawings. Shop drawings not so checked and noted shall be returned.

E. The Engineer's check shall be only for conformance with the design concept of the
project and compliance with the Specifications and Drawings. The responsibility of, or the necessity of, furnishing materials and workmanship required by the Specifications and Drawings which may not be indicated on the shop drawings is included under the work of this Section.

F. The responsibility for all dimensions to be confirmed and correlated at the job site and for coordination of this work with the work of all other trades is also included under the work of this Section.

G. No material shall be ordered or shop work started until the Engineer's approval of shop drawings has been given.

1.12 MANUFACTURER SERVICES

A. Provide Manufacturer services for testing and start-up of the following equipment:

1. Items as required by appropriate specification sections.

B. The Manufacturer of the above listed equipment shall provide experienced Field Service Engineer to accomplish the following tasks:

1. The equipment shall be visually inspected upon completion of installation and prior to energization to assure that wiring is correct, interconnection complete and the installation is in compliance with the manufacturer's criteria. Documentation shall be reviewed to assure that all Drawings, operation and maintenance manuals, parts list and other data required to check out and sustain equipment operation is available on site. Documentation shall be red-lined to reflect any changes or modifications made during the installation so that the "As-built" equipment configuration will be correctly defined. Spare parts shall be inventoried to assure correct type and quantity. The Manufacturer shall provide written approval that equipment supplied is approved for energization.

2. The Field Service Engineers shall provide engineering support during the energization and check out of each major equipment assembly. They shall perform any calibration or adjustment required for the equipment to meet the Manufacturer's performance specifications.

3. Upon satisfactory completion of equipment test, they shall provide engineering support of system tests to be performed in accordance with Manufacturer's test specifications.

4. Two (2) 4-hour training sessions on operation, and two (2) 4-hour training sessions (one for each system) on maintenance and trouble-shooting procedures shall be provided for the Owner's maintenance personnel. All training shall be conducted at a facility provided by the Owner. The maintenance and trouble-shooting sessions shall be conducted with record "As-built" electrical drawings sufficient for a class of eight personnel.
5. A final report shall be written and submitted to the Contractor within fourteen days from completion of final system testing. The report shall document the inspection and test activity, define any open problems and recommend remedial action. The Contractor shall forward a copy of this report to the Engineer for approval.

1.13 MATERIALS

A. The materials used in all systems shall be new, unused and as hereinafter specified. All materials where not specified shall be of the very best of their respective kinds. Samples of materials or Manufacturer's specifications shall be submitted for approval as required by the Engineer.

B. Materials and equipment used shall be Underwriters Laboratories, Inc. listed.

C. Electrical equipment shall at all times during construction be adequately protected against mechanical injury or damage by water. Electrical equipment shall not be stored out-of-doors. Electrical equipment shall be stored in dry permanent shelters. If any apparatus has been damaged, such damage shall be repaired by the Contractor at his own cost and expense. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried out and put through such special tests as directed by the Engineer, at the expense of the Contractor, or shall be replaced by the Contractor at his own expense.

1.14 OPERATION & MAINTENANCE DATA

A. Submit complete operations and maintenance data for all equipment furnished under this Division in accordance with Section 01730. The manuals shall be prepared specifically for this installation and shall include all required cuts, Drawings, equipment lists, descriptions, complete part lists, etc. that are required to instruct operating and maintenance personnel unfamiliar with such equipment.

1.15 WARRANTY

A. Provide a warranty for all the electrical equipment in accordance with the requirements of other sections, but in no case less than 1 year from date of owner acceptance.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

(NOT USED)

- END OF SECTION -
SECTION 16110

RACEWAYS AND FITTINGS

PART 1 -- GENERAL

1.1 SCOPE

A. Furnish and install complete raceway systems as shown on the Drawings and as specified herein.

1.2 APPLICATIONS

A. Except where otherwise shown on the Drawings, or hereinafter specified. The following describes the conduit requirements of the project:

1. All exposed raceways shall be in aluminum conduit.
2. All underground raceways shall be in schedule 80 PVC conduit.
3. Conduit installed in "Corrosive" areas shall be PVC schedule 80; all hardware to be non-metallic.

B. Where Schedule 80 PVC is used, all below grade elbows and risers to above grade shall be aluminum. All elbows above grade shall be suitably grounded. Conduit spaces shall be provided for underground conduit installation.

C. All conduits entering or leaving Corrosive Areas shall have Crouse Hinds EYSR conduit seals installed and filled with Chico cement.

D. All conduits shall be tagged/labelled at the point of supply, where exposed and at the equipment.

E. All conduit of a given type shall be the product of one manufacturer.

F. All switch, outlet and control station boxes and fittings shall be cast aluminum FS boxes with aluminum covers.

G. Concealed switch, outlet and control station boxes in NEMA 1 areas shall be aluminum.

H. Terminal boxes, junction boxes, pull boxes, etc.; installed outdoors shall be NEMA 4X stainless steel. All boxes installed indoors (except in corrosive areas) may be aluminum. Boxes in corrosive areas shall be PVC. All penetrations shall use Myers Hub conduit connections.

I. Combination expansion-deflection fittings shall be used where exposed or embedded conduits cross structure expansion joints.
PART 2 – PRODUCTS

2.01 MATERIALS

A. Rigid Metal Conduit

1. Rigid metal conduit shall be for use under the provisions of NEC Article 346.

2. Rigid aluminum conduit shall be 6063 alloy and shall be as manufactured by New Jersey Aluminum Corp., AFC Co., VAW of America, Inc., or equal.

3. PVC coated GRS conduit shall have a 1/50-in thick, polyvinyl chloride coating permanently bonded to the aluminum conduit and an internal phenolic coating, and shall be plasti-bond 2” as manufactured by Robroy Industries, Triangle PWC Inc., Perma-Cote Industries, or equal.

B. Rigid Nonmetallic Conduit

1. Rigid nonmetallic conduit shall be for use under the provisions of NEC Article 347.

2. PVC conduit shall be rigid polyvinyl chloride schedule 80 as manufactured by Carlon, An Indian Head Co., Kraloy Products Co., Inc., Highland Plastics Inc., or equal.

C. Liquidtight Flexible Conduit, Couplings and Fittings

1. Liquidtight flexible conduit shall be for use under the provisions of NEC Article 351A.

2. Liquidtight flexible conduit shall be Carflex by Carlon, or equal.

3. Fittings used with liquidtight flexible conduit shall be nylon.

4. Fittings installed on tanks, filter area, chemical rooms and other outdoor process areas shall be aluminum.

D. Flexible Couplings, Non-metallic

1. Flexible non-metallic couplings shall be as manufactured by the Crouse-Hinds Co., Appleton Electric Co., Killark Electric Manufacturing Co., or equal.

E. Boxes and Fittings:

1. PVC, aluminum and stainless steel switch and outlet boxes shall be manufactured by Carlon, Appleton, or equal.

2. Nema 1 terminal boxes, junction boxes, pull boxes etc., may be fiberglass (FRP)
or stainless steel. Boxes shall be as manufactured by Hoffman Engineering Co., Stahlin, or equal. NEMA 4 boxes located outdoors shall be 316 stainless steel.

3. Cast aluminum boxes and fittings shall be copper-free aluminum with cast aluminum covers and corrosion-proof screws as manufactured by the Killark Electric Co., Crouse-Hinds Co., Appleton Electric Co., or equal.

4. Conduit hubs shall be as manufactured by Meyers Electric Products, Inc., Raco Div., Appleton Electric Co., or equal. Conduit hubs shall be provided for all outdoor conduit terminations.

5. Conduit wall seals shall be Type WSK as manufactured by the O.Z. Electrical Mfg. Co., or equal.

6. Combination expansion-deflection fittings shall be Type XD as manufactured by the Crouse-Hinds Co., or equal.

7. Conduit wall seals for new concrete walls below grade shall be O.Z./Gedney Co., Type WSK, Spring City Electrical Manufacturing Co., Type WDP, or equal.

8. Conduit wall seals for cored holes shall be Type CSML as manufactured by the O.Z./Gedney Co., or equal.

9. Conduit wall and floor seals for sleeved openings shall be Type CSMI as manufactured by the O.Z./Gedney Co., or equal.

10. Conduit sealing bushings shall be O.Z./Gedney Type CSB or equal.

F. Conduit Mounting Equipment:

1. Stainless steel channel and stainless steel hardware shall be used in all areas indoors or outdoors unless otherwise noted.

2. In “Corrosive” areas all mounting equipment shall be “non-metallic.”

PART 3 -- EXECUTION

3.1 INSTALLATION

A. No conduit smaller than 3/4-inch electrical trade size shall be used, nor shall any have more than four 90 degree bends in any one run. Pull boxes shall be provided as required or directed. Minimum size in floor slabs shall be 3/4-inch.

B. No wire shall be pulled until the conduit system is complete in all details; in the case of concealed work, until all rough plastering or masonry has been completed; in the case of exposed work, until the conduit system has been completed in every detail.
C. The ends of all conduits shall be tightly plugged to exclude dust and moisture while the buildings are under construction.

D. Conduit supports shall be spaced at intervals as required to obtain rigid construction, but in no case more than as required by the NEC.

E. Single conduits shall be supported by means of one-hole pipe clamps in combination with one-screw back plates, to raise conduits from the surface. Multiple runs of conduits shall be supported on trapeze type hangers with steel horizontal members and threaded hanger rods. The rods shall be not less than 3/8-inch diameter. Material type shall be as specified in Section 2.

F. Conduit hangers shall be attached to structural steel by means of beam or channel clamps. Where attached to concrete surfaces, concrete inserts of the spot type shall be provided.

G. All conduits on exposed work shall be run at right angles to and parallel with the surrounding walls and shall conform to the form of the ceiling. No diagonal runs will be allowed. Bends in parallel conduit runs shall be concentric. All conduit shall be run perfectly straight and true. Conduits not installed in this fashion shall be replaced.

H. No unbroken run shall exceed 300 feet in length. This length shall be reduced by 75 feet for each 90 degree elbow.

I. Conduit terminating in pressed steel boxes shall have double locknuts and insulated bushings.

J. Conduit terminating in gasketed enclosures shall be terminated with conduit hubs.

K. Conduit wall seals shall be used for all conduits penetrating walls below grade or other locations shown on the Drawings.

L. Liquidtight flexible PVC conduit shall be used for all motor and transformer terminations and other equipment where vibration is present.

M. Flexible couplings shall be used in hazardous locations for all motor and transformer terminations and other equipment where vibration is present.

N. Conduit stub outs for future construction shall be provided with threaded PVC end caps at each end.

O. Galvanized steel conduit entering manholes and below grade pull boxes shall be terminated with grounding type bushings and connected to a 5/8" x 20" rod with a #6 bare copper wire.

P. Underground 120 volt circuits (GRS or Schedule 80 PVC) shall be installed directly to the respective distribution panelboard, lighting panels, etc. Stainless steel pull boxes shall be wall mounted on structures to eliminate excessive
bends. With prior approval, below grade pull boxes, equal to Brooks #2424 (minimum), with hot dip galvanized covers and frames, may be used. Splices shall not be made in above or below grade pull boxes without prior approval.

Q. All field cut threads on galvanized steel conduit shall be cleaned and painted with zinc-rich paint before installing.

R. A 4-inch concrete conduit housekeeping pad shall be required for all exposed conduit stub-ups. This applies to ALL exposed conduits installed indoors or outdoors. Provide couplings within 12" of any slab penetration.

- END OF SECTION -
SECTION 16120
WIRES AND CABLES

PART 1 -- GENERAL

1.1 SCOPE

A. Furnish, install and test all wire, cable, and appurtenances as shown on the Drawings and as hereinafter specified.

1.2 SUBMITTALS

A. Samples of proposed wire and cable shall be submitted to the Engineer for approval. Each sample shall have the size, type of insulation and voltage stenciled on the jacket.

B. Installed, unapproved wire shall be removed and replaced at no additional cost to the Owner.

1.3 APPLICATIONS

A. Wire for lighting and receptacle circuits above grade shall be type THWN/THWN.

B. Wire for all motor circuits and below grade lighting and receptacle circuits shall be type XHHW, stranded.

C. Single conductor wire for control, indication and metering shall be type THWN/THHN No. 14 AWG, 19 strand or type XHHW No. 14 AWG stranded.

D. Multi-conductor control cable shall be No. 14 AWG, 19 strand.

E. Wire for process instrumentation or shielded control cable shall be No. 16 AWG, shielded and stranded.

1.4 MINIMUM SIZES

A. Except for control and signal leads, no conductor smaller than No. 12 AWG shall be used.

PART 2 -- PRODUCTS

2.1 MATERIALS

A. All wires and cables shall be of annealed, 98 percent conductivity, soft drawn stranded copper conductors.
2.2 600 VOLT WIRE AND CABLE

A. Type XHHW shall be cross-linked polyethylene (XLP); as manufactured by the Southwire Co., Collyer Insulated Wire Co., Rome Cable or equal.

B. Type THWN/THHN shall be as manufactured by the Southwire Co., Collyer Insulated Wire Co., Rome Cable or equal.

2.3 INSTRUMENTATION AND CONTROL CABLE

A. Process instrumentation wire shall be twisted pair, 600V, cross-linked polyethylene insulated, aluminum tape shielded, polyvinyl chloride jacketed, type "XLP" as manufactured by the American Insulated Wire Co., Eaton Corp. "Polyset," or equal. Multi-conductor cables shall be supplied with individually shielded twisted pairs.

B. Multi-conductor control cable shall be stranded, 600V, cross-linked polyethylene insulated with PVC jacket, type "XLP" as manufactured by the American Insulated Wire Co., Eaton Corp. "Polyset," or equal.

2.4 TERMINATION AND SPLICES

A. Power Conductors: Terminations shall be die type or set screw type pressure connectors as specified. Splices (where allowed) shall be die type compression connector and waterproof with heat shrink boot or epoxy filling.

B. Control Conductors: Termination on saddle-type terminals shall be wired directly with a maximum of two conductors per termination. Termination on screw type terminals shall be made with a maximum of two spade connectors. Splices (where allowed) shall be made with insulated compression type connectors. Heat shrink boots shall be utilized for all outdoor splices.

C. Instrumentation Signal Conductors (including graphic panel, alarm, low and high level signals): Terminations permitted shall be typical of control conductors. Splices are allowed at instrumentation terminal boxes only.

D. Except where otherwise approved by the Engineer no splices will be allowed in manholes, hand-holes or other below grade located boxes.

E. Splices shall not be made in push button control stations, control devices (i.e., pressure switches, flow switches, etc.), conduit bodies, etc.

PART 3 – EXECUTION

3.1 INSTALLATION

A. All conductors shall be carefully handled to avoid kinks or damage to insulation.
B. Lubrications shall be used to facilitate wire pulling. Lubricants shall be U.L. listed for use with the insulation specified.

C. Shielded instrumentation wire shall be installed from terminal to terminal with no splicing at any intermediate point.

D. Shielded instrumentation wire shall be installed in rigid steel conduit and pull boxes that contain only shielded instrumentation wire. Instrumentation cables shall be separated from control cables in manholes.

E. Shielding on instrumentation wire shall be grounded at one end only, as directed by supplier of the instrumentation equipment.

F. Wire and cable connections to terminals and taps shall be made with compression connectors. Connections of insulated conductors shall be insulated and covered. All connections shall be made using materials and installation methods in accordance with instructions and recommendations of the manufacturer of the particular item of wire and cable. The conductivity of all completed connections shall be not less than that of the uncut conductor. The insulation resistance of all completed connections of insulated conductors shall be not less than that of the uncut conductor.

G. All wire and cable shall be continuous and without splices between points of connection to equipment terminals, except a splice will be permitted by the Engineer if the length required between the points of connection exceeds the greatest standard shipping length available from the manufacturer specified or approved by the Engineer as the manufacturer of the particular item of wire and cable.

H. Steel fish tapes and/or steel pulling cables shall not be used in PVC conduit runs.

I. All control and instrumentation circuits and wiring shall be clearly and permanently numbered and labeled at each end so as to identify the location of the opposite end and the function of the circuit. Individual wires in a multi-wire circuit shall be identified with wire numbers. Labeling shall be in place prior to turnover of any equipment, system or sub-system to Owner.

3.2 TESTS

A. All 600-volt wire insulation shall be tested with a meg-ohmmeter after installation. Tests shall be made at not less than 1,000 VDC. See 16050 for additional testing requirements.

B. All service conductors shall be tested as in paragraph A above. These tests shall be witnessed by the Engineer. A written report shall be submitted to the Engineer for review.
PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish, test, install and place in satisfactory operation the magnetic flow meters, with all spare parts, accessories, and appurtenances as herein specified and as shown on the Drawings.

PART 2 -- PRODUCTS

2.01 MAGNETIC FLOW METER SYSTEMS

A. Magnetic flow meter systems shall include a magnetic flow tube and a microprocessor-based "smart" transmitter that is capable of converting and transmitting a signal from the flow tube. Magnetic flow meters shall utilize the characterized field principle of electromagnetic induction, and shall produce DC signals directly proportional to the liquid flow rate.

B. Each meter shall be furnished with a stainless steel or carbon steel metering tube and carbon steel flanges with a polyurethane, ceramic, neoprene, or Teflon liner as required by the application and/or as specified herein. Liner shall have a minimum thickness of 0.125 inches. The inside diameter of the liner shall be within 0.125 inches of the inside diameter of the adjoining pipe. Liner protectors shall be provided on all flow tubes.

C. The flow tube shall be provided with flush mounted electrodes. Ultrasonic electrode cleaning shall not be acceptable.

D. Grounding rings shall be provided for all meters.

E. All materials of construction for metallic wetted parts (electrodes, grounding rings, etc.) shall be minimum 316 stainless steel, but shall be compatible with the process fluid for each meter in accordance with the recommendations of the manufacturer.

F. Flow tube shall be rated for pressures up to 1.1 times the flange rating of adjacent piping. System shall be rated for ambient temperatures of -30 to +65°C. Meter and transmitter housings shall meet NEMA 4X requirements as a minimum. When meter and transmitter are located in classified explosion hazard areas, the meter and transmitter housings shall be selected with rating to meet the requirements for use in those areas. Non-metallic transmitter housings shall not be acceptable.

G. The transmitter shall provide pulsed DC coil drive current to the flow tube and shall convert the returning signal to a linear, isolated 4-20 mA DC signal. The transmitter shall utilize "smart" electronics and shall contain automatic, continuous zero correction, signal processing routines for noise rejection, and an integral LCD readout capable of displaying
flow rate and totalized flow. The transmitter shall continuously run self-diagnostic routines and report errors via English language messages.

H. The transmitter’s preamplifier input impedance shall be a minimum of \(10^9\text{ }-\text{ }10^{11}\) ohms which shall make the system suited for the amplification of low-level input signals and capable of operation with a material build up on the electrodes.

I. The transmitter shall provide an automatic low flow cutoff below a user configurable low flow condition (0-10%). The transmitter's outputs shall also be capable of being forced to zero by an external contact operation.

J. Each flow tube shall be factory calibrated and assigned a calibration constant or factor to be entered into the associated transmitter as part of the meter configuration parameters. Manual calibration of the flow meter shall not be required. Meter configuration parameters shall be stored in non-volatile memory in the transmitter. An output hold feature shall be provided to maintain a constant output during configuration changes.

K. The transmitter shall be capable of communicating digitally with a remote configuration device via a frequency-shift-keyed, high frequency signal superimposed on the 4-20 mA output signal. The remote configuration device shall be capable of being placed anywhere in the 4-20 mA output loop. The remote configuration device shall be as specified under Section 17700. A password-based security lockout feature shall be provided to prevent unauthorized modification of configuration parameters.

L. Accuracy shall be 0.50% of rate over the flow velocity range of 0.3 to 10.0 m/s. Repeatability shall be 0.1% of rate; minimum turndown shall be 100:1. Minimum required liquid conductivity shall not be greater than 5 uS/cm. Maximum response time shall be adjustable between 1 and 100 seconds as a minimum. Transmitter ambient temperature operating limits shall be -10 to +50°C. Power supply shall be 115 VAC, 60Hz.

M. Flow tubes shall be 150-lb flange mounted unless otherwise noted. The cables for interconnecting the meter and transmitter shall be furnished by the manufacturer. Transmitter shall be mounted integrally on flow tube, wall, or 2-inch pipe mounted as shown in the Drawings and/or as specified.

N. Magnetic flow meter systems shall be as manufactured by Endress & Hauser 400W.

PART 3 -- EXECUTION

3.1 INSTALLATION

A. Ground magnetic flow meter flow tubes and grounding rings in strict accordance with the manufacturer's recommendations.

B. Equipment shall be located so that it is accessible for operation and maintenance. Transmitters shall be oriented such that output indicators are readily visible.
C. Electrical work shall be performed in compliance with all applicable local codes and practices. Where the Contract Documents do not delineate precise installation procedures, API RP550 shall be used as a guide to installation procedures.

D. Control and Signal Wiring: Electrical control and signal wiring connections to transmitters and elements mounted on process piping or equipment shall be made through liquid-tight flexible conduit. Conduit seals shall be provided where conduits enter all field instrument enclosures and all cabinetry housing electrical or electronic equipment.

3.2 ADJUSTMENT AND CLEANING

A. Provide the services of factory trained technicians, tools and equipment to field calibrate, test, inspect and adjust each instrument to its specified performance requirement in accordance with manufacturer's specifications and instructions. Any instrument which fails to meet any Contract requirements, or any published manufacturer performance specification for functional and operational parameters, shall be repaired or replaced, at the discretion of the Engineer, at no cost to the Owner. The Contractor shall bear all costs and provide all personnel, equipment and materials necessary to implement all installation tests and inspection activities for equipment specified herein.

B. Field Instrument Calibration Requirements

1. Check calibration of each instrument at 0, 25, 50, 75 and 100 percent of span using test instruments to simulate inputs and read outputs with readings verified back to the base station through the RTU. Test instruments shall be rated to an accuracy of at least five (5) times greater than the specified accuracy of the instrument being calibrated. Where applicable, such test instruments shall have accuracy's as set forth by the National Institute for Standards and Technology (NIST).

2. Provide a written calibration sheet to the Engineer for each instrument, certifying that it has been calibrated to its published specified accuracy. This sheet shall include but not be limited to date, instrument tag numbers, calibration data for the various procedures described herein, name of person performing the calibration, a listing of the published specified accuracy, permissible tolerance at each point of calibration, calibration reading as finally adjusted within tolerance, defect noted, corrective action required and corrections made.

3. If doubt exists as to the correct method for calibrating or checking the calibration of an instrument, the manufacturer's printed recommendations shall be used as an acceptable standard, subject to the approval of the Engineer.

4. Upon completion of calibration, devices calibrated hereunder shall not be subjected to sudden movements, accelerations, or shocks, and shall be installed in permanent protected positions not subject to moisture, dirt, and excessive temperature variations. Caution shall be exercised to prevent such devices from being subjected to overvoltages, incorrect voltages, overpressure or incorrect air. Damaged equipment shall be replaced and recalibrated at no cost to the Owner.

- END OF SECTION -
SECTION 16750
PRESSURE TRANSMITTERS

PART 1 -- GENERAL

1.01 THE REQUIREMENT

A. Furnish, test, install and place in satisfactory operation the pressure indicating transmitters, with all spare parts, accessories, and appurtenances as herein specified and as shown on the Drawings.

B. Provide all process taps, isolation valves, nipples, penetrations, instrumentation supports, conduit, wiring, terminations, and the installation of process instrumentation on process lines following manufacturer's recommendations.

C. Tapping and connections on process piping shall be sized to suit each individual installation and the requirements of the instrument served. The Contractor shall ensure that the location, supports, orientation and dimensions of the connections and tapping for instrumentation are such as to provide the proper rigid and plumb bracing, the required accuracy of measurement, protection of the sensor from accidental damage, and accessibility for maintenance while in operation. Isolation valves shall be provided at all process taps.

PART 2 -- PRODUCTS

2.1 PRESSURE INDICATING TRANSMITTERS

A. Gauge pressure transmitters shall be of the capacitance type with a process-isolated diaphragm with silicone oil fill, microprocessor-based "smart" electronics, and a field adjustable 30:1 input range. Span and zero shall be continuously adjustable externally over the entire range. Span and zero adjustments shall be capable of being disabled internally. Transmitters shall be NEMA 4X weatherproof and corrosion resistant construction with low-copper aluminum body and 316 stainless steel process wetted parts. Accuracy, including nonlinearity, hysteresis and repeatability errors shall be plus or minus 0.10 percent of calibrated span, zero based. The maximum zero elevation and maximum zero suppression shall be adjustable to anywhere within sensor limits. Output shall be linear isolated 4-20 milli-amperes 24 VDC. Power supply shall be 24 VDC, two wire design. Each transmitter shall be furnished with a 4-digit LCD indicator capable of displaying engineering units and milliamps and mounting hardware as required. Overload capacity shall be rated at a minimum of 25 MPa. Environmental limits shall be -40 to 85 degrees Celsius at 0-100% relative humidity. Each transmitter shall have a stainless steel tag with calibration data attached to body.

B. The capacitance pressure sensor shall be mechanically, electrically, and thermally isolated from the process and the environment, shall include an integral temperature compensation sensor, and shall provide a digital signal to the transmitter's electronics for further processing. Factory set correction coefficients shall be stored in the sensor's non-volatile memory for correction and linearization of the sensor output in the electronics section. The electronics section shall correct the digital signal from the sensor and convert it into a 4-20
mA analog signal for transmission to receiving devices. The electronics section shall contain configuration parameters and diagnostic data in non-volatile EEPROM memory and shall be capable of communicating, via a digital signal superimposed on the 4-20 mA output signal, with a remote interface device utilizing HART protocol. Output signal damping shall be provided, with an adjustable time constant of 0-36 seconds.

C. The Pressure Transmitter shall be complete with a local LCD indicator displaying the process engineering unit (psi).

D. Pressure indicating transmitters shall be as manufactured by Rosemount.

2.2 INSTRUMENT ACCESSORIES

A. Process Tubing: Process tubing shall be 1/2 x 0.065-inch seamless, annealed, ASTM A-269 Type 316L stainless steel with Type 316 - 37 degrees stainless steel flared fittings or Swagelock or Parker-CPI flareless fittings.

B. Diaphragm Seals: Diaphragm seals shall be provided for isolation of pressure transmitters with process connections to sewage lines. Seals shall be oil filled, all 316 stainless steel construction with diaphragms of 316L stainless steel unless a more suitable material of equal corrosion resistance is recommended for lower operating pressures. Seals shall have 1/2" instrument connection upper housing, over-sized 1.5" process connection bottom housing with 1/2-inch NPT valved flush port, and oil fill connection port capable of disassembly without loss of filler fluid. Provide 1/2" stainless steel ball valves for the flush port with hose connection. Provide 1.5" stainless steel ball valves for the process connection. Coordinate process connection type (threaded or flanged) with the process piping supplied. Seals shall be as manufactured by Ashcroft, or approved equal.

C. Filling Medium: The filling medium between instruments, isolating ring seals and diaphragm seals shall be a liquid suitable for operation in an ambient temperature ranging from -10°F to +150°F. Filling medium shall be silicone unless oxidizing agents such as sodium hypochlorite are present, where halocarbon shall be used.

D. Isolation Ball Valves: Isolation valves shall be 316 stainless steel body and 316 stainless steel ball meeting the requirements of Division 15.

PART 3 -- EXECUTION

3.1 INSTALLATION

A. General

1. Equipment shall be located so that it is accessible for operation and maintenance. Transmitters shall be oriented such that output indicators are readily visible.

2. Electrical work shall be performed in compliance with all applicable local codes and practices. Where the Contract Documents do not delineate precise installation procedures, API RP550 shall be used as a guide to installation procedures.
B. Equipment Mounting and Support

1. Mounted the transmitters on two-inch diameter aluminum pipe stands welded to a 10-inch square by 1/2-inch thick aluminum base plate secured to a steel reinforced 12" square, 8" thick concrete pad with a minimum of 4 concrete anchors. Anchors shall be Type 316 stainless steel. Mount instrument between 42 inches above grade.

2. Materials for miscellaneous mounting brackets, fastening hardware, and other support components shall be 316 stainless steel construction.

C. Control and Signal Wiring: Electrical control and signal wiring connections to transmitters and elements mounted on process piping or equipment shall be made through liquid-tight flexible conduit. Conduit seals shall be provided where conduits enter all field instrument enclosures and all cabinetry housing electrical or electronic equipment.

3.2 ADJUSTMENT AND CLEANING

A. Provide the services of factory trained technicians, tools and equipment to field calibrate, test, inspect and adjust each instrument to its specified performance requirement in accordance with manufacturer's specifications and instructions. Any instrument which fails to meet any Contract requirements, or any published manufacturer performance specification for functional and operational parameters, shall be repaired or replaced, at the discretion of the Engineer, at no cost to the Owner. The Contractor shall bear all costs and provide all personnel, equipment and materials necessary to implement all installation tests and inspection activities for equipment specified herein.

B. Field Instrument Calibration Requirements

1. Check calibration of each instrument at 0, 25, 50, 75 and 100 percent of span using test instruments to simulate inputs and read outputs with readings verified back to the base station through the RTU. Test instruments shall be rated to an accuracy of at least five (5) times greater than the specified accuracy of the instrument being calibrated. Where applicable, such test instruments shall have accuracy's as set forth by the National Institute for Standards and Technology (NIST).

2. Provide a written calibration sheet to the Engineer for each instrument, certifying that it has been calibrated to its published specified accuracy. This sheet shall include but not be limited to date, instrument tag numbers, calibration data for the various procedures described herein, name of person performing the calibration, a listing of the published specified accuracy, permissible tolerance at each point of calibration, calibration reading as finally adjusted within tolerance, defect noted, corrective action required and corrections made.

3. If doubt exists as to the correct method for calibrating or checking the calibration of an instrument, the manufacturer's printed recommendations shall be used as an acceptable standard, subject to the approval of the Engineer.
4. Upon completion of calibration, devices calibrated hereunder shall not be subjected to sudden movements, accelerations, or shocks, and shall be installed in permanent protected positions not subject to moisture, dirt, and excessive temperature variations. Caution shall be exercised to prevent such devices from being subjected to overvoltages, incorrect voltages, overpressure or incorrect air. Damaged equipment shall be replaced and recalibrated at no cost to the Owner.

- END OF SECTION -
SECTION 16950

ELECTRICAL TESTING

PART 1 -- GENERAL

1.1 REFERENCES

A. The following is a list of standards that may be referenced in this section:

1. American National Standards Institute (ANSI):
   a. 450, Recommended Practice for Maintenance, Testing, and Replacement of Large lead Storage Batteries for Generator Stations and Substations.
   c. C37.20.1, Metal-Enclosed Low Voltage Power Circuit Breaker Switchgear.
   d. C37.20.2, Metal-Clad and Station-Type Cubicle Switchgear.
   e. C37.20.3, Metal-Enclosed Interrupter Switchgear.

   d. D924, Standard Test Methods for A-Class Characteristics and Relative Permittivity (Dielectric Constant) of Electrical Insulating Liquids.
   e. D971, Standard Test Method for Interfacial Tension of 0.1 Against Water by the Ring Method.
   f. D974, Standard Test Method for Acid and Base Number by Color-Indicator Titration.


3. Institute of Electrical and Electronics Engineers (IEEE):

a. 43, Recommended Practice for Testing Insulating Resistance of Rotating Machinery.

b. 48, Standard Test Procedures and Requirements for High-Voltage Alternating-Current Cable Terminators.

c. 81, Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System.

d. 95, Recommended Practice for Insulation Testing of Large AC Rotating Machinery with High Direct Voltage.


4. National Electrical Manufacturers Association (NEMA):

a. AB 4, Guideline for Inspection and Preventive Maintenance of Molded Case Circuit Breakers Used in Commercial and Industrial Applications.

b. PB 2, Deadfront Distribution Switchboards.

c. WC 7, Cross-Linked-Thermosetting-Polyethylene- Wire and Cable for the Transmission and Distribution of Electrical Energy.

d. WC 8, Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.


a. 70, National Electrical Code (NEC).
b. 70E, Standard for Electrical Safety Requirements for Employee Workplaces.

1.2 SUBMITTALS

A. Administrative Submittals: Submit 30 days prior to performing inspections or tests:
   1. Schedule for performing inspection and tests.
   2. List of references to be used for each test.
   3. Sample copy of equipment and materials inspection form(s).
   4. Sample copy of individual device test form.
   5. Sample copy of individual system test form.

B. Quality Control Submittals: Submit within 30 days after completion of test:
   1. Test or inspection reports and certificates for each electrical item tested.

C. Contract Closeout Submittals:
   1. Operation and Maintenance Data:
      a. In accordance with Section 01430, OPERATION AND MAINTENANCE DATA.
      b. After test or inspection reports and certificates have been reviewed by ENGINEER and returned, insert a copy of each in operation and maintenance manual.

1.03 QUALITY ASSURANCE

A. Test equipment shall have an operating accuracy equal to, or greater than, requirements established by NETA ATS.

B. Test instrument calibration shall be in accordance with NETA ATS.

1.04 SEQUENCING AND SCHEDULING

A. Perform inspection and electrical tests after equipment has been installed.

B. Perform tests with apparatus de-energized whenever feasible.

C. Inspection and electrical tests on energized equipment are to be:
   1. Scheduled with ENGINEER prior to de-energization.
   2. Minimized to avoid extended period of interruption to the operating plant equipment.
D. Notify ENGINEER at least 24 hours prior to performing tests on energized electrical equipment.

PART 2 – PRODUCTS

(NOT USED)

PART 3 -- EXECUTION

3.1 GENERAL

A. Tests and inspection shall establish that:
   1. Electrical equipment is operational within industry and manufacturer’s tolerances.
   2. Installation operates properly.
   3. Equipment is suitable for energization.
   4. Installation conforms to requirements of Contract Documents and NFPA 70, NFPA 70E, and ANSI C2.

B. Perform inspection and testing in accordance with NETA ATS, industry standards, and manufacturer’s recommendations.

C. Set, test, and calibrate protective relays, circuit breakers, fuses, and other applicable devices.

D. Adjust mechanisms and moving parts for free mechanical movement.

E. Adjust adjustable relays and sensors to correspond to operating conditions, or as recommended by manufacturer.

F. Verify nameplate data for conformance to Contract Documents.

G. Realign equipment not properly aligned and correct unlevelness.

H. Properly anchor electrical equipment found to be inadequately anchored.

I. Tighten accessible bolted connections, including wiring connections, with calibrated torque wrench to manufacturer's recommendations, or as otherwise specified.

J. Clean contaminated surfaces with cleaning solvents as recommended by manufacturer.

K. Provide proper lubrication of applicable moving parts.

L. Inform ENGINEER of working clearances not in accordance with NFPA 70.
M. Investigate and repair or replace:
   1. Electrical items that fail tests.
   2. Active components not operating in accordance with manufacturer’s instructions.
   3. Damaged electrical equipment.

N. Electrical Enclosures:
   1. Remove foreign material and moisture from enclosure interior.
   2. Vacuum and wipe clean enclosure interior.
   3. Remove corrosion found on metal surfaces.
   4. Repair or replace, as determined by ENGINEER, door and panel sections having dented surfaces.
   5. Repair or replace, as determined by ENGINEER, poor fitting doors and panel sections.
   6. Repair or replace improperly operating latching, locking, or interlocking devices.
   7. Replace missing or damaged hardware.
   8. Finish:
      a. Provide matching paint and touch up scratches and mars.
      b. If required due to extensive damage, as determined by ENGINEER, refinish the entire assembly.

O. Replace fuses and circuit breakers that do not conform to size and type required by the Contract Documents.

P. Replace transformer-insulating oil not in compliance with ASTM D923.

3.2 LOW VOLTAGE CABLES, 600 VOLTS MAXIMUM

A. Visual and Mechanical Inspection:
   1. Inspect Each Individual Exposed Power Cable No. 6 and Larger for:
      a. Physical damage.
      b. Proper connections in accordance with single-line diagram.
      c. Cable bends not in conformance with manufacturer’s minimum allowable bending radius where applicable.
d. Color coding conformance with specifications.
e. Proper circuit identification.

2. Mechanical Connections for:
   a. Proper lug type for conductor material.
   b. Proper lug installation.
   c. Bolt torque level in accordance with NETA ATS, Table 10.1, unless otherwise specified by manufacturer.

3. Shielded Instrumentation Cables for:
   a. Proper shield grounding.
   b. Proper terminations.
   c. Proper circuit identification.

4. Control Cables for:
   a. Proper termination.
   b. Proper circuit identification.

5. Cables Terminated Through Window Type CT’s: Verify that neutrals and grounds are terminated for correct operation of protective devices.

B. Electrical Tests for Conductors No. 6 and Larger:

1. Insulation Resistance Tests:
   a. Test each conductor with respect to ground and to adjacent conductors per IEEE 118 procedures for 1 minute.
   b. Evaluate ohmic values by comparison with conductors of same length and type.
   c. Investigate values less than 50 megohms.
   d. Utilize 1,000VDC megohmmeter for 600V insulated conductors.

2. Continuity test by ohmmeter method to ensure proper cable connections.

3.3 METERING

A. Visual and Mechanical Inspection:
1. Verify meter connections in accordance with appropriate diagrams.
2. Verify meter multipliers.
3. Verify that meter types and scales conform to Contract Documents.
4. Check calibration of meters at cardinal points.
5. Check calibration of electrical transducers.

3.4 LOW VOLTAGE SURGE ARRESTORS

A. Visual and Mechanical Inspection:
   1. Adequate clearances between arrestors and enclosures.
   2. Ground connections to ground bus or electrode.

B. Electrical Tests:
   1. Varistor Type Arrestors:
      a. Clamping voltage test.
      b. Rated RMS voltage test.
      c. Rated dc voltage test.
      d. Variator arrestor test values in accordance with ANSI C62.33, Sections 4.4 and 4.7.

- END OF SECTION –
SECTION 11

PERMITS
June 21, 2017

David A. Cash, Water/Wastewater Division Manager
Sarasota County
1001 Sarasota Center Blvd.
Sarasota, FL 34240
dcash@scgov.net

Notice of Acceptance to Use a General Permit
Sarasota County
Permit Number: 194025-009-DWC/CG
Project: Lockwood Ridge Booster Pump Station
Connected To: Central County WRF

Dear Mr. Cash,

This letter acknowledges receipt of your Notice of Intent to Use a General Permit for the Construction of a Wastewater Collection/Transmission System, pursuant to Rule 62-604.600, Florida Administrative Code, on June 16, 2017 (Notice).

The Department does not object to your use of such a General Permit. The construction activities shall conform to the description contained in your Notice and any deviation may result in enforcement action and possible penalties. You have 5 years from the date of this letter to perform the work described in your Notice under this General Permit.

Please be advised that the attached requirements apply to your project for constructing a domestic wastewater/collection system pursuant to this General Permit.

Upon completion of construction of the project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, you shall submit Form 62-604.300(8)(b), Florida Administrative Code, to the Department using the contact information provided in the letterhead address. The system shall not be placed into service until the Department clears the project for use.

Should you have any questions, please contact Andrew Price at (239) 344-5621 or by e-mail at Andrew.Price@dep.state.fl.us.

Sincerely,

__________________
Nolin Moon
Environmental Manager
South District
Attachments:
   Specific Requirements for the Use of the General Permit for Domestic Wastewater Collection/Transmission Systems

Copies furnished to:
   Andrew J. Coleman, P.E. acoleman@hazenandsawyer.com
REQUIREMENTS FOR USE OF THE GENERAL PERMIT FOR DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEMS:

1. This general permit is subject to the general permit conditions of Rule 62-4.540, Florida Administrative Code.

2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required [62-604.600(6)(b), Florida Administrative Code].

3. This general permit cannot be revised, except to transfer the permit [62-604.600(6)(b), Florida Administrative Code].

4. Abnormal events shall be reported to the Departments South District Office per Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WARNING POINT TOLL FREE NUMBER (800) 320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department’s South District Office within 24 hours from the time the permittee, or other designee becomes aware of the circumstances [62-604.550, Florida Administrative Code].


For your information: When any existing asbestos cement (AC) pipes are replaced, they shall be done so in accordance with the applicable rules of Federal Asbestos Regulation and Florida DEP requirements. For specific requirements applicable to AC pipes, please contact the Department prior to commencing any such activities. Please be aware that a notification is required to be submitted to the Department for a regulated project.
SECTION 12

EASEMENTS
DESCRIPTION

A PERMANENT UTILITY EASEMENT LYING IN THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 16, TOWNSHIP 37 SOUTH, RANGE 18 EAST, SARASOTA COUNTY, FLORIDA; BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCE AT THE INTERSECTION OF THE SOUTH LINE OF THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 16, TOWNSHIP 37 SOUTH, RANGE 18 EAST WITH THE EASTERLY RIGHT-OF-WAY LINE OF LOCKWOOD RIDGE ROAD AS DESCRIBED IN OFFICIAL RECORDS BOOK 429, PAGE 823 OF THE PUBLIC RECORDS OF SARASOTA COUNTY, FLORIDA; THENCE ALONG SAID EASTERLY RIGHT-OF-WAY LINE, N 00°11'22" E, A DISTANCE OF 51.61 FEET TO THE POINT OF BEGINNING; THENCE CONTINUE ALONG SAID EASTERLY RIGHT-OF-WAY LINE, N 00°11'22" E, A DISTANCE OF 40.00 FEET; THENCE DEPARTING THE EASTERLY RIGHT-OF-WAY LINE OF LOCKWOOD RIDGE ROAD, N 90°00'00" E, A DISTANCE OF 25.00 FEET; THENCE S 00°00'00" E, A DISTANCE OF 8.00 FEET; THENCE N 90°00'00" E, A DISTANCE OF 64.00 FEET; THENCE S 00°00'00" E, A DISTANCE OF 24.00 FEET; THENCE S 90°00'00" W, A DISTANCE OF 64.00 FEET; THENCE S 00°00'00" E, A DISTANCE OF 8.00 FEET; THENCE S 90°00'00" W, A DISTANCE OF 25.00 FEET TO THE POINT OF BEGINNING.

CONTAINING A DESCRIBED AREA OF 2,536 SQUARE FEET OR 0.06 ACRES MORE OR LESS.

RUSSELL P. HYATT, PSM 5303
HYATT SURVEY SERVICES, INC.
11007 8TH AVE. EAST, BRADENTON, FL 34212

11/15/2013

DATE

LOCKWOOD RIDGE BOOSTER PUMP STATION - CIP# 55995
GULF GATE CHURCH - PERMANENT UTILITY EASEMENT

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<th>DESCRIBED AREA: 2,537 SF</th>
<th>DRAWN: JM</th>
<th>DATE: 11/1/2013</th>
<th>SCALE: N/A</th>
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EXHIBIT "A"
SKETCH

GULF GATE CHURCH
PID 0102 02 0035

LOCKWOOD RIDGE ROAD
(ORB 429 PG 823)

WEST LINE NW 1/4 NW 1/4 SE 1/4 16-37-18

L1
N 00°11'22" E 51.61'
L2
N 00°11'22" E 40.00'
L3
N 90°00'00" E 25.00'
L4
S 00°00'00" E 8.00'
L5
N 90°00'00" E 64.00'
L6
S 00°00'00" W 24.00'
L7
S 90°00'00" W 64.00'
L8
S 00°00'00" E 8.00'
L9
S 90°00'00" W 25.00'

PERMANENT
UTILITY EASEMENT
2,536 SF ±

POINT OF BEGINNING

POINOf COMMENCEMENT

SOUTH LINE NW 1/4 NW 1/4 SE 1/4 16-37-18

PID 0102 07 0047

NOTE
SKETCH IS NOT A SURVEY.

LEGEND

R/W  RIGHT-OF-WAY
ORB  OFFICIAL RECORDS BOOK
PG  PAGE
PID  PARCEL IDENTIFICATION
SF  SQUARE FEET

LOCKWOOD RIDGE BOOSTER PUMP STATION - CIP# 55995
GULF GATE CHURCH - PERMANENT UTILITY EASEMENT

DESCRIPTED AREA: 2,537 SF ±
DRAWN: JM
DATE: 11/1/2016
SCALE: 1" = 40'
CHECKED: RH
PROJECT NO.: 16-2013

HEET 2 OF 2
That part of the Northwest Quarter (1/4) of the Northwest Quarter (1/4) of the Southeast Quarter (1/4) of Section 16, Township 37 South, Range 18 East, Sarasota County, Florida, being more particularly described as follows:

Commence at the Northwest corner of Lot 1, Block 35, Gulf Gate Unit No. 9, according to the plat thereof recorded in Plat Book 17, Page 17 of the Public Records of Sarasota County, Florida; thence run N.00'11"22"E. along the East Right-of-Way line of Lockwood Ridge Road for a distance of 236.61 feet to the POINT OF BEGINNING; thence continue N.00'11"22"E. along the East Right-of-way line of Lockwood Ridge Road according to the instrument recorded in Official Records Book 429, Page 823 of said Public Records for a distance of 10.00 feet; thence run East for a distance of 25.00 feet; thence run North for a distance of 8.00 feet; thence run East for a distance of 64.00 feet; thence run North for a distance of 24.00 feet; thence run West for a distance of 64.00 feet; thence run North for a distance of 8.00 feet; thence run West for a distance of 25.00 feet to the intersection with the East Right-of-Way line of said Lockwood Ridge Road; thence run N.00'11"22"E. along said East Right-of-Way line for a distance of 40.00 feet; thence run East for a distance of 149.87 feet; thence run South for a distance of 90.00 feet; thence run West for a distance of 150.17 feet to the Point of Beginning.

Containing 10962.2 square feet, more or less.
TEMPORARY CONSTRUCTION EASEMENT

P.I.D. NO. 0102020035
NOT SUBDIVIDED

POINT OF BEGINNING
S. LINE NW 1/4, NW 1/4, SE 1/4
SEC. 16, TWP. 37 S., RNG. 18 E.

GOODWATER STREET
POINT OF COMMENCEMENT
NW CORNER LOT 1, BLK. 35
LOT 1
BLOCK 35
GULF GATE UNIT NO. 9
P.B. 17, PG. 17

ABBREVIATION LEGEND
R/W = RIGHT-OF-WAY
R.P.B. = ROAD PLAT BOOK
P.B. = PLAT BOOK
PG. = PAGE
SEC. = SECTION
TWP. = TOWNSHIP
RNG. = RANGE
N.T.S. = NOT TO SCALE
NO. = NUMBER
P.T. = POINT OF TANGENCY
C = CENTERLINE
O.R.R. = OFFICIAL RECORDS BOOK
P.I.D. = PROPERTY IDENTIFICATION

SURVEYOR'S NOTES
1. BEARINGS SHOWN ARE BASED ON ASSUMED DATUM THE WEST LINE SE 1/4 SEC. 16, TWP. 37 S., RNG. 18 E. BEING N00°11'22"E.
2. THIS MAP WAS PREPARED WITHOUT THE BENEFIT OF AN ABSTRACT OF TITLE OR AN ATTORNEY'S OPINION OF TITLE, THEREOF, ANY DEED OVERLAP OR HIATUS OR ANY RECORDED OR UNRECORDED RIGHTS-OF-WAY AND OR EASEMENTS MAY NOT BE SHOWN.
3. THIS DRAWING IS A DESCRIPTION SKETCH ONLY AND DOES NOT REPRESENT A FIELD SURVEY OF THE PARCEL DESCRIBED.

TEMPORARY CONSTRUCTION EASEMENT
LOCKWOOD RIDGE ROAD PUMP STATION - CIP#55995
PARCEL NO. 100.03

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<td>DATE 12-15-16</td>
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DRAWN T.Owen DATE 12-15-16 SCALE N.T.S.
JOB NO.
SECTION 13

BEST MANAGEMENT PRACTICES
Best Management Practices

Best Management Practices are included in the plans where applicable.