

**COPB Water Treatment Plant Fuel Tank Replacement
Specifications**

August 26, 2013

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SPECIFICATIONS
TABLE OF CONTENTS

00800 DRAWINGS INDEX

01000 GENERAL REQUIREMENTS

- 01010 Summary of Work
- 01030 Special Project Provisions
- 01050 Field Engineering
- 01110 Environmental Protection Procedures
- 01152 Applications for Payment
- 01153 Change Order Procedures
- 01200 Project Meetings
- 01300 Submittals
- 01310 Construction Schedules
- 01370 Schedule of Values
- 01400 Quality Control
- 01410 Testing and Testing Laboratory Services
- 01500 Temporary Facilities
- 01505 Control of Work
- 01600 Delivery, Storage and Handling
- 01630 Substitutions and Product Options
- 01700 Contract Closeout
- 01710 Cleaning
- 01720 Project Record Documents
- 01740 Warranties and Bonds

02000 SITEWORK

- 02070 Demolition
- 02100 Site Preparation
- 02270 Temporary Erosion and Sedimentation Control
- 02500 Restoration and Cleanup
- 02515 Concrete Pad

03000 CONCRETE

- 03200 Concrete Reinforcement
- 03300 Cast-In-Place Concrete

16000 ELECTRICAL

- 16000 Electrical General Requirements
- 16001 Electrical Demolition
- 16050 Basic Materials and Methods
- 16903 Control Panel
- 16910 Aboveground Storage Tank Monitoring System

20000 EXHIBITS INDEX

SECTION 00800

DRAWINGS INDEX

Sheet No.	Drawing No.	Title
1 of 5	CV	Cover
2 of 5	G-1.0	Tank and Piping Plan
3 of 5	G-1.1	Aboveground Tank Details
4 of 5	G-2.0	Electrical Site Plan
5 of 5	G-3.0	Tank Gauge and Leak Detection

01000 GENERAL REQUIREMENTS

1.01 INTENT AND INTERPRETATION

- A. In the event of a conflict between the City of Pompano Beach (COPB) BID/CONTRACT Documents, pages 1 through 83, including, but not limited to General Conditions of the Contract, Articles 1 through 49, and these subsequent Specifications, the CITY documents shall prevail.

1.02 PLANS AND SPECIFICATIONS, SPECIFICALLY PLAN NOTES

- A. All Plan Notes shown on the Plans applicable to this Contract shall be in effect as Specifications in addition to the Specifications contained herein.

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.01 LOCATION OF WORK

- A. The WORK of this Contract is located in Broward County, Florida in the City of Pompano Beach (OWNER), on the southwest side of the Water Treatment Facility inside the high service pump room and outside to the south of the high service pump room at approximately theoretical NE 12th Street and NE 3rd Avenue, as shown on the Drawings.

1.02 WORK TO BE DONE

- A. The CONTRACTOR shall furnish all labor, materials, equipment, tools, services and incidentals to complete all WORK required by these Specifications and as shown on the Drawings for the installation of one UL approved "FIREGUARD" double wall 2,000 gallon above ground storage tank (DWAST), installation of a reinforced concrete slab on grade with walls, all required fuel piping, valving and appurtenances, installation and testing of the tank and tank monitoring system (TLS300), installation and testing of an Instrumentation and Control (I&C) panel for the existing diesel engine, electrical runs from panel 14LL40 for the tank and engine monitoring control panel, conduits and wiring for monitoring signal connection to the existing PLC 3-LLP-3.1 panel to the east of the mezzanine, installation of an air start powered by the engine's battery upon a set low pressure signal, reconnection of the existing cooling water piping, installation of insulation on the engine's exhaust piping within the pump room, installation of new outside exhaust piping and muffler, completion of all necessary forms and requirements for tank registration with the Broward County Environmental Protection Department (BCEPD), the State of Florida Department of Environmental Protection (FDEP), installation of a finished water piping suction manifold to the engine driven pump, completion of forms and obtaining permits from the City of Pompano Beach Building Department, restoration of the work area, providing certified "as Built" record drawings and a Certificate of Completion from the City's Building Department.
- B. The CONTRACTOR shall perform the WORK complete, in place, and ready for continuous service, and shall include repairs, replacements and restoration required as a result of damages caused during demolition and construction.
- C. The CONTRACTOR shall furnish and install all materials, equipment and labor which is reasonably and properly inferred and necessary for the proper completion of the WORK, whether specifically indicated in the Contract Documents or not.
- D. The CONTRACTOR shall coordinate with the Water Treatment Facility Superintendent, Chief Maintenance Supervisor and the City's Project Manager for the electrical runs and the monitoring runs work.

1.03 GENERAL DESCRIPTION OF CONTRACT

- A. The Drawings and Specifications allow for the installation of the "FIREGUARD" 2,000 gallon DWAST, concrete slab on grade, fuel piping, air and cooling water reconnection piping, electrical work, I&C monitoring systems for the tank and to remotely monitor the existing diesel engine, connection to the existing PLC, the engine's exhaust piping insulation and new exhaust piping and muffler installation and finished water suction manifold installation.
- B. The WORK shall include providing all required survey work for layout and record data.
- C. The WORK shall include all other required work whether implied or incidental to the proper completion of the project.

1.04 WORK SEQUENCE

- A. CONTRACTOR shall perform the WORK to ensure completion of the WORK within the Contract Time. Completion dates of the various stages shall be in accordance with the approved construction schedule submitted by the CONTRACTOR and within the total time allowed by the Contract.

1.05 CONTRACTOR'S USE OF PREMISES

- A. CONTRACTOR shall be aware that there are operating equipment and maintenance duties within the project area which must be kept in service on a continuous basis.
- B. CONTRACTOR shall coordinate use of driveway and pump room access with the OWNER, and the ENGINEER.
- C. CONTRACTOR shall assume full responsibility for security of all materials and equipment stored on the site owned by the CONTRACTOR or any subcontractors.
- D. If directed by the OWNER or ENGINEER, the CONTRACTOR shall move any stored items that interfere with normal operations of existing facilities.

1.06 CONTRACTOR'S RESPONSIBILITIES

- A. The CONTRACTOR accepts full responsibility for proper handling and installation of the WORK described in Section 1.02 (WORK TO BE DONE). The presence of the ENGINEER or OWNER on-site does not relieve the CONTRACTOR of any responsibility as stated above and does not relieve the CONTRACTOR of the responsibility of using proper safety measures.
- B. The CONTRACTOR is responsible for progress, execution, and quality of subcontractors' WORK and is to coordinate and expedite procurement of materials and performance of WORK of respective trades and subcontractors. The CONTRACTOR must have the same qualified responsible superintendent who understands and speaks English fluently on the job at all times, including at the time of final inspection. The CONTRACTOR is responsible for maintaining the site in an accessible condition for inspectors from the City of Pompano Beach and the governing Broward County agencies.
- C. Laws, codes, ordinances and regulations which apply to this WORK shall be rigidly followed. This includes, but is not limited to Florida Department of Environmental Regulation (FDEP), Florida Building Code (FBC), Broward County Department of Planning and Environmental Protection (DPEP), City of Pompano Beach Building Department, City of Pompano Beach Fire Department, OSHA, National Electrical Code (NEC), National Fire Protection Association Standards (NFPA), Broward County Health Department (BCHD) and all others that apply. Determine handling of any variations between plans or specifications and governing ordinances, etc. with the ENGINEER or OWNER before starting WORK.
- D. CONTRACTOR shall verify all dimensions, quantities and details shown on the Drawings, Supplementary Drawings, schedules, Specifications or other data received from the Engineer, and shall notify the ENGINEER of all errors, omissions, conflicts and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the CONTRACTOR of full responsibility for unsatisfactory work, faulty construction or improper operation resulting there from nor from rectifying such conditions at CONTRACTOR's expense. CONTRACTOR will not be allowed to take advantages of any errors or omissions, as full instructions will be furnished by the ENGINEER, should such errors or omissions be discovered. All schedules are given for the convenience of the ENGINEER and the CONTRACTOR and are not guaranteed to be complete. The CONTRACTOR shall assume all responsibility for the making of estimates of the size, kind and quality of materials and equipment included in WORK to be done under the CONTRACT.
- E. **The CONTRACTOR shall be held responsible for having examined the site, the location and the conditions of all proposed WORK, and for the CONTRACTOR being satisfied as to the character of the site, location, surface and underground obstructions, building layout obstructions, known or anticipated and all other physical characteristics pertaining to the Project that could be reasonably determined including the nature of the ground, the**

site-grading conditions, existing site equipment (indoors and outdoors), existing site piping (indoors and outdoors), existing electrical panel, existing PLC, and existing engine in order that the CONTRACTOR may include in the price bid, whether aggregate sums or unit prices, all costs pertaining to the WORK and thereby provide for the satisfactory completion thereof, including the removal, relocation or replacement of any objects or obstruction which will be encountered in doing the proposed WORK.

1.07 SAFETY REQUIREMENTS

- A. The CONTRACTOR shall be in compliance with all applicable provisions of the Occupational Safety and Health Act of 1970. The Contractor's Manual of Safety Practices dealing with the firm's policies on field safety procedures for employees shall be submitted to the ENGINEER and the OWNER for review before "Notice to Proceed" will be issued.

1.08 WORK TO BE PERFORMED BY OTHERS

- A. During the construction period for this project, the OWNER (either with the OWNER's own forces or under a separate contract) may be performing work that will require the cooperation of the CONTRACTORS in scheduling and coordination to avoid conflicts.

1.09 ABBREVIATIONS AND REFERENCES

- A. Whenever reference is made to the furnishing of materials or testing thereof to conform to the standards of any technical society, organization or body, it shall be construed to mean the latest standard, code, specification or tentative specification adopted and published at the date of advertisement for bids, even though reference has been made to an earlier standard. The following list of specifications is hereby made a part of the Contract the same as if herein repeated in full. In the event of any conflict between any of these specifications, standards, codes or tentative specifications, and the Specifications, the latter shall govern. In the event that one of the following conflict with another, the decision as to which shall govern will be decided by the ENGINEER, whose judgment will be final.

- B. Reference to a technical society, organization, or body may be made in the Specifications by abbreviations, in accordance with the following list:

AA	- Aluminum Association
AAMA	- Architectural Aluminum Manufacturer's Association
AAN	- American Association of Nurserymen
AAR	- American Association of Railroads
AASHTO	- American Association of State Highway and Transportation Officials
ACI	- American Concrete Institute
ACPA	- American Concrete Pipe Association
AGA	- American Gas Association
AGMA	- American Gear Manufacturers Association
AI	- Asphalt Institute
AIA	- American Institute of Architects
AIEE	- American Institute of Electrical Engineers
AISC	- American Institute of Steel Construction
AISI	- American Iron and Steel Institute
ALS	- American Lumber Standards
AMCA	- Air Moving and Conditioning Association
ANSI	- American National Standards Institute
APA	- American Plywood Association
API	- American Petroleum Institute
AREA	- American Railway Engineering Association
ASA	- American Standards Association
ASCE	- American Society of Civil Engineers
ASHRAE	- American Society of Heating, Refrigeration and Air Conditioning Engineers

ASLA	- American Society of Landscape Architects
ASME	- American Society of Mechanical Engineers
ASTM	- American Society of Testing Materials
AWG	- American Wire Gage
AWPA	- American Wood Preservers Association
AWPI	- American Wood Preserves Institute
AWS	- American Welding Society
AWWA	- American Water Works Association
BOCA	- Building Officials Code Administration
CABRA	- Copper and Brass Research Association
CBM	- Certified Ballests Manufacturers
CIPRA	- Cast Iron Pipe Research Association
CRSI	- Concrete Reinforcing Steel Institute
CSPA	- Clay Sewer Pipe Association
DIPRA	- Ductile Iron Pipe Research Association
DOT	- Florida Department of Transportation
EPA	- Environmental Protection Agency (Federal)
FBC	- Florida Building Code
FCC	- Federal Communications Commission
FS	- Federal Specifications or Federal Standards
IEEE	- Institute of Electrical and Electronic Engineers
IES	- Illuminating Engineering Society
IPCEA	- Insulated Power Cable Engineers Association
MBMA	- Metal Building Manufacturer's Association
MIL	- Military Specifications
NAAMM	- National Association of Architectural Metals Manufacturers
NAPCA	- National Association of Pipe Coating Applications
NAVY SPEC.	- Navy Department Specification
NBFU	- National Board of Fire Underwriters
NBS	- National Bureau of Standards
NCPI	- National Clay Pipe Institute
NEC	- National Electric Code
NEMA	- National Electrical Manufacturers Association
NESC	- National Electric Safety Code
NETA	- National Electric Testing Association
NFC	- National Fire Code
NFPA	- National Fire Protection Association
NHLA	- National Hardware Lumber Association
NLMA	- National Lumber Manufacturers Association
NPS	- National Park Service (Federal)
OSHA	- Occupation Health and Safety Act
PCA	- Portland Cement Association
PCI	- Prestressed Concrete Institute
SAE	- Society of Automotive Engineers Standards
SBCC	- Standard Building Code Congress International, Inc.
SCPI	- Structural Clay Products Institute
SCS	- Soils Conservation Service (Federal)
SDI	- Steel Deck Institute
SHBI	- Steel Heating Boiler Institute
SJI	- Steel Joist Institute
SMACC	- Sheet Metal and Air Conditioning Contractors
SPI	- Society of the Plastics Industry
SSPC	- Steel Structures Painting Council

- TCA - Tile Council of America Inc.
 - U.L., Inc. - Underwriter's Laboratories, Inc.
 - UBC - Uniform Building Code
 - USSG - Unites States Standard Gage
 - USSWG - United States Steel Wire Gage
- C. When no reference is made to a code, standard, or specification, the standard specifications of the AWS, the ASTM, the ANSI, the ASME, the IEEE, or the NEMA shall govern.

1.10 PLANS AND SPECIFICATIONS

- A. These Specifications consist of three parts: General, Products, and Execution. The General Section contains General Requirements that govern the WORK. Products and Execution modify and supplement these by detailed requirements of the WORK. The CONTRACTOR shall report any conflicts among the parts to the ENGINEER for clarification.
- B. All WORK called for in the Specifications applicable to this Contract, but not shown on the Plans in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. WORK not specified in either the Plans or in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the WORK, is required and shall be performed by the CONTRACTOR as though it were specifically delineated or described.
- C. The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any WORK to be done and materials to be furnished, shall be regarded as meaning that the general practice is to prevail and that material and workmanship of the like quality is to be used, and interpretation of these Specifications shall be made upon that basis.

1.11 WORKING TIME

- A. Regular working hours are defined as 8 hours per day, Monday through Friday, excluding holidays, between the hours of 8:00 AM and 5:00 PM. Requests to work other than regular working hours shall be submitted to the OWNER and the ENGINEER not less than 48 hours prior to any proposed weekend work or scheduled extended work weeks.
- B. CONTRACTOR shall reimburse the OWNER for additional engineering and/or inspection costs incurred as a result of overtime work in excess of the regular working hours stipulated in Paragraph 1.11A.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01030

SPECIAL PROJECT PROVISIONS

PART 1 - GENERAL

1.01 SCHEDULE

- A. The CONTRACTOR shall prepare a schedule for the installation of the "FIREGUARD" 2,000 gallon double wall AST and the I&C panel, electrical and monitoring conduit and wire routing, and piping operations required for the WORK showing sequence, methods and contingencies for each task. The schedule shall be submitted to the ENGINEER for approval not less than ten (10) days prior to start-up.

1.02 HURRICANE PREPAREDNESS PLAN

- A. Within five days of the date of Notice of Award, the CONTRACTOR shall submit to the ENGINEER and the OWNER, for approval, a Hurricane Preparedness Plan. The Plan shall describe in detail the necessary measures which the CONTRACTOR will perform, at no additional costs to the OWNER, in case of a hurricane warning. The CONTRACTOR shall revise Plan as required by the ENGINEER and OWNER.
- B. In the event of inclement weather, the CONTRACTOR shall protect the WORK and materials from damage or injury from the weather. If, in the opinion of the ENGINEER, any portion of the WORK or materials has been damaged by reason of failure on the part of the CONTRACTOR to so protect the WORK, such WORK and materials shall be removed and replaced with new materials and WORK to the satisfaction of the ENGINEER at no additional cost to the OWNER.

1.03 RELOCATIONS

- A. The CONTRACTOR shall be responsible for the relocation of piping, conduits and equipment that interfere with the positioning of the WORK as set out on the Drawings. The cost of all such relocations shall be included in the bid for the project and shall not result in any additional cost to the OWNER.
- B. During the progress of construction, it is NOT EXPECTED that minor relocations of the WORK may be necessary. Such relocations shall be made only by direction of the ENGINEER. If existing conduits or piping are encountered which prevent the construction, and which are not shown on the drawings, notify the ENGINEER before continuing with the construction in order that the ENGINEER may make such field revisions as necessary to avoid conflicts.

1.04 OBSTRUCTIONS

- A. The attention of the CONTRACTOR is drawn to the fact that during excavation at the Project site, the possibility exists of the CONTRACTOR encountering various water, electrical, or other lines not marked by Sunshine 811 or shown on the Drawings. The CONTRACTOR shall exercise extreme care before and during excavation to locate and flag these lines so as to avoid damage to the existing lines.
- B. It is the responsibility of the CONTRACTOR to ensure that the proposed tank's concrete slab and adjacent existing compressors slab, the stability of which may be endangered by the close proximity of excavation, are temporarily stayed in position while WORK proceeds in the vicinity of the said structure.

1.05 MAINTENANCE OF EXISTING FACILITY'S OPERATION

- A. The CONTRACTOR shall take notice that existing electrical, water, air, and monitoring facilities are operated in the WORK area. It is the responsibility of the CONTRACTOR to contact the City's Maintenance Operations Supervisor to ascertain locations, routes, connections, etc.

- B. The CONTRACTOR shall fully cooperate at all times with the OWNER in order to maintain the operation of the existing facility with the least amount of interference and interruption possible. Continuous service, public health and safety considerations shall exceed all others and the CONTRACTOR's schedule, plans and WORK shall at all times be subject to alteration and revision if necessary for above considerations.
- C. The ENGINEER and OWNER reserve the right to require the CONTRACTOR to work 24 hours per day in all cases where, in their opinion, interference with operation of the system may result.
- D. WORK that requires the temporary shutdown of any existing operations shall be planned in detail with appropriate scheduling of the WORK and coordinated with the ENGINEER or CITY PROJECT MANAGER and TREATMENT FACILITY SUPERINTENDENT. The approved schedule for shutdown or restart shall be indicated on the CONTRACTOR's Progress Schedule, and a minimum 48 hours advance notice shall be given in order that the OWNER may witness the shutdown, tie-in and startup and coordinate with affected equipment.
- E. In no case will the CONTRACTOR be permitted to interfere with the existing system until all materials, supplies, equipment, tools and incidentals necessary to complete the interfering portion of the WORK are on the site.

1.06 EXISTING ELECTRICAL, AIR, WATER PIPING, PUMPS, MONITORING, AND ENGINE (INFRASTRUCTURE) PROTECTION

- A. Existing infrastructure have been shown on the Drawings insofar as information is reasonably available; however, it will be the CONTRACTOR's responsibility to preserve all existing infrastructure whether shown on the Plans or not. If infrastructure conflicts are encountered by the CONTRACTOR during construction, the CONTRACTOR shall give sufficient notice to the OWNER and ENGINEER so that they may make the necessary adjustments. Damage to any infrastructure which, in the opinion of the OWNER, is caused by carelessness on the part of the CONTRACTOR shall be promptly repaired at the CONTRACTOR's expense. At the sole discretion of the OWNER, such repairs shall be performed by the CONTRACTOR's forces or by another contractor retained by the prime CONTRACTOR. Any delays ensuing from this damage will be considered as inexcusable.
- B. It shall be the CONTRACTOR's responsibility to contact the City of Pompano Beach Water Treatment Facility and the Engineering Department and call Sunshine 811 at (800) 432-4770 48 hours before starting construction so maintenance personnel can locate and protect facilities, if required.

1.07 PROVISIONS FOR CONTROL OF EROSION

- A. Sufficient precautions shall be taken during construction to minimize the run-off of polluting substances such as silt, clay, fuels, or other polluting materials from reaching the drainage system.

1.08 ON-SITE STORAGE

- A. The CONTRACTOR'S attention is invited to special storage requirements and possible charges for noncompliance of on-site storage requirements for materials and equipment as specified in Section 01600.

1.09 WARRANTIES

- A. All equipment and WORK supplied and performed under these Specifications shall be warranted by the CONTRACTOR and the equipment FABRICATORS for a period of one (1) year. Warranty period shall commence on the date of ACCEPTANCE by BCEPD and COPB Building Department.
- B. The equipment shall be warranted to be free from defects in workmanship, design, and materials. If any part of the equipment should fail during the warranty period, it shall be replaced and the unit(s) restored to service at no expense to the OWNER.
- C. The MANUFACTURER'S warranty period shall run concurrently with the CONTRACTOR'S warranty or guarantee period. No exception to this provision shall be allowed. The

CONTRACTOR shall be responsible for obtaining equipment warranties in accordance with Section 01740 from each of the respective suppliers or MANUFACTURERS for all the equipment specified.

- D. In the event that the MANUFACTURER is unwilling to provide a one year warranty commencing at the time of BCEPD and COPB Building Department final acceptance, the CONTRACTOR shall obtain from the MANUFACTURER a two (2) year warranty starting at the time of equipment delivery to the job site. This two-year warranty shall not relieve the CONTRACTOR of the one-year warranty starting at the time of BCEPD and COPB acceptance of the equipment.

1.10 PROTECTION AGAINST ELECTROLYSIS

- A. Where dissimilar metals are used in conjunction with each other, a dielectric connector or suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resulting electrolysis. The insulating material shall be nonmetallic separators or washers, or other approved materials. This applies to support struts, piping or conduit contact too.

1.11 DAMAGE DUE TO HEAVY RAIN

- A. The CONTRACTOR shall take all reasonable precautions to provide protection against heavy rain damage by building such temporary dikes, channels, or shoring to carry off stormwater as the nature of the WORK may require. The CONTRACTOR will be held responsible for all damage caused by the failure to do so.

1.12 EMERGENCY PHONE NUMBERS AND ACCIDENT REPORTS

- A. Emergency phone numbers (fire, medical, police) shall be posted at the work site and at the CONTRACTOR's field (cellular or radio) phone and its location be made to known to all persons having access to the WORK.
- B. Accidents shall be reported immediately to the ENGINEER and the OWNER by email, phone or text message.
- C. All accidents shall be documented by the CONTRACTOR and a fully detailed written report submitted by the CONTRACTOR to the ENGINEER and the OWNER after each accident.

1.13 WORK ON THE WATER TREATMENT PLANT PROPERTY

- A. The CONTRACTOR shall confine his/her construction operations to within the City WTP property limits. Any damage to property, either inside or outside the limits of the Water Treatment Facility, shall be the responsibility of the CONTRACTOR.

1.14 WORK ADJACENT TO WATER TREATMENT FACILITY'S POWER AND LOOP

- A. The attention of the CONTRACTOR is drawn to existing power loop underground facilities in the area of the WORK. The CONTRACTOR shall protect all existing power loop duct banks in the proximity of the WORK throughout the period of construction.
- B. It is the full and complete responsibility of the CONTRACTOR to determine the exact location of all underground power in the area of the WORK whether or not they are indicated on the Drawings.

1.15 WORK ADJACENT TO SIGNAL (MONITORING) FACILITIES

- A. The CONTRACTOR is advised that existing monitoring lines are located within the pump room, mezzanine and PLC room WORK area. The CONTRACTOR shall contact the Plant Superintendent and the Chief Maintenance Supervisor at least 48 hours prior to the start of WORK to ascertain the location of all signal lines in the WORK area.
- B. It is the full and complete responsibility of the CONTRACTOR to determine the exact location of all existing monitoring lines in the area of the WORK whether or not they are indicated on the Drawings.

1.16 ITEMS SPECIFIED ON DRAWINGS

- A. Items of material, equipment, I&C and the like may be specified on the Drawings and not in the Specifications. Such items shall be provided by the CONTRACTOR in accordance with the Specification on the Drawings.

1.17 SITE RESTORATION

- A. The CONTRACTOR'S attention is invited to the existing driveway, landscaping and grassed area located within the project area.
- B. The CONTRACTOR shall remove all excess material and shall clean up and restore the site to its original condition or better. All damage, as a result of WORK under this Contract, done to existing structures, driveways, equipment, shrubbery, grass, trees, water mains, conduits, drains, and including all obstructions not specifically named herein, shall be repaired.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01050

FIELD ENGINEERING

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. CONTRACTOR shall provide and pay for field engineering services required for the PROJECT.
 - 1. Survey work required in execution of PROJECT.
 - 2. Professional engineering services specified, or required to execute CONTRACTOR's construction methods such as density and concrete testing. See Section 01410.
- B. The CONTRACTOR shall retain the services of a registered land surveyor licensed in the State of Florida in order to:
 - 1. Maintain an accurate record of all elevations and finished slab elevations.
 - 2. Produce and certify signed and sealed "as built" finished slab elevation.
- C. The CONTRACTOR shall retain the services of a registered testing lab to submit density and concrete test results.

1.02 RELATED REQUIREMENTS

- A. COPB Bid/ Contract Documents - General Conditions of the Contract.
- B. Summary of Work is included in Section 01010.
- C. Applications for Payment are included in Section 01152.
- D. Contract Closeout is included in Section 01700.

1.03 QUALIFICATIONS OF SURVEYOR AND/ OR ENGINEER

- A. Registered professional engineer or land surveyor of the discipline required for the specific service on the PROJECT, currently licensed in the State of Florida.

1.04 RECORDS

CONTRACTOR shall comply with COPB Bid/ Contract Documents - General Conditions of the Contract, Article 29 as follows:

- A. Maintain a complete, accurate log of all work as it progresses.
- B. Update the Project Record Documents on a daily basis and for the pay request as a condition for approval of the progress payment.
- C. Maintain an accurate record of piping and conduits location changes, elevation changes, revisions, electrical and monitoring relocations and modifications.

1.05 SUBMITTALS

CONTRACTOR shall:

- A. Submit name and address of registered land surveyor and testing lab professional engineer to the ENGINEER.
- B. On request of the ENGINEER, submit documentation to verify accuracy of field engineering work.
- C. Submit certificate signed by land surveyor certifying that elevations and locations of improvements are in conformance, or nonconformance, with Contract Documents.
- D. Submit certificate signed by testing lab's professional engineer certifying density and concrete testing results are in conformance, or nonconformance, with Contract Documents. See Section 01410.

- E. At the end of the project, and prior to final payment, submit certified drawings (signed and sealed by the registered land surveyor) of the items listed below. These drawings shall be included with, and made a part of, the project record documents:
1. Certified survey shall be at the same scale as the ENGINEER'S drawings indicating lines, grades, elevations and off-sets of tank and slab installation.
 2. Based on the ENGINEER'S drawings, provide a CONTRACTOR'S marked up and signed drawing in reproducible form (.dwg and .pdf) with the CONTRACTOR'S logo showing location of all new piping, fittings, valves, conduits and panels. Said drawing shall be signed by the CONTRACTOR and shall bear the company's corporate seal.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01110

ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The WORK covered by this Section consists of furnishing all labor, materials and equipment and performing all WORK required for the prevention of environmental pollution in conformance with applicable laws and regulations, during and as the result of construction operations under this Contract. For the purpose of these Specifications, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances; adversely affect plants or animals; or degrade the utility of the environment for aesthetic and/or recreational purposes.
- B. The control of environmental pollution requires consideration of air, water and land, and involves management of noise and solid waste, as well as other pollutants.
- C. CONTRACTOR shall schedule and conduct all WORK in a manner that will minimize the erosion of soils in the area of the WORK and provide erosion control measures such as diversion channels, sedimentation or filtration systems, berms, staked hay bales, seeding, mulching or other special surface treatments as are required to prevent silting and muddying of the drainage systems. All erosion control measures shall be in place in an area prior to any construction activity in that area.
- D. The intent of these Specifications is that construction shall be achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the CONTRACTOR's responsibility to determine the specific construction techniques to meet these guidelines.

1.02 APPLICABLE REGULATIONS

- A. CONTRACTOR shall comply with all applicable Federal, State and local laws and regulations and applicable permits and their specific conditions concerning environmental pollution control and abatement.

1.03 NOTIFICATIONS

- A. The ENGINEER will notify the CONTRACTOR in writing of any non-compliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the CONTRACTOR in writing of any non-compliance with State or local requirements. The CONTRACTOR shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the CONTRACTOR or their authorized representative at the site of the WORK, shall be deemed sufficient for the purpose. If the CONTRACTOR fails or refuses to comply promptly, the OWNER may issue an order stopping all or part of the WORK until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the CONTRACTOR unless it is later determined that the CONTRACTOR was in compliance.

1.04 IMPLEMENTATION

- A. Prior to commencement of the WORK, the CONTRACTOR shall meet with the ENGINEER to develop mutual understandings relative to compliance with this provision and administration of the environmental pollution control program.
- B. CONTRACTOR shall remove temporary environmental control features, when approved by the ENGINEER, and incorporate permanent control features into the project at the earliest practical time.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 EROSION CONTROL

- A. CONTRACTOR shall provide positive means of erosion control around the tank slab. Erosion control measures such as silt fencing and other equivalent techniques shall be used as appropriate.

3.02 PROTECTION OF LAND RESOURCES

- A. Land resources within the project boundaries and outside the limits of permanent work shall be restored by the CONTRACTOR to a condition, after completion of construction, that will appear to be natural and not detract from the appearance of the project. CONTRACTOR shall confine all construction activities to areas shown on the Drawings.
- B. **Outside of areas requiring clearing and digging for building the tank's slab on grade foundation, the CONTRACTOR shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval from OWNER and ENGINEER.**
- C. Any trees or other landscape feature scarred or damaged by the CONTRACTOR's equipment or operations shall be restored by the CONTRACTOR as nearly as possible to its original condition.

3.03 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION

- A. During the life of this Contract, the CONTRACTOR shall maintain all facilities constructed for pollution control as long as the operations creating the sediment are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.

3.06 NOISE CONTROL

- A. The CONTRACTOR shall make every effort to minimize noises caused by their operations in accordance with the City of Pompano Beach Noise Ordinance. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with Federal and State regulations, Broward County, and City ordinances.

3.07 NPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION SITE

- A. The CONTRACTOR shall adhere to stormwater discharge regulations and Amendments to the Clean Water Act (33 U.S.C. 1251 et seq.). On September 17, 1992, the State of Florida certified the general permit for stormwater discharges from construction sites for use in Florida. This project is not governed by regulations under this general permit since it is less than five acres.
- B. The CONTRACTOR shall ensure that all employees and subcontractors implement the sediment and erosion control practices specified in the Contract documents.

END OF SECTION

SECTION 01152

APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Submit Applications for Payment to the ENGINEER in accordance with the schedule established by COPB Bid/ Contract Documents - General Conditions of the Contract between OWNER and CONTRACTOR.
- B. The accepted Schedule of Values, Section 01370, shall be used as the basis for the CONTRACTOR's Application for Payment.

1.02 RELATED REQUIREMENT

- A. COPB Bid/ Contract Documents - General Conditions of the Contract, Article 10
- B. Section 01050: Field Engineering.
- C. Submittals are included in Section 01300.
- D. Schedule of Values is included in Section 01370.
- E. Contract Closeout is included in Section 01700.

1.03 FORMAT AND DATA REQUIRED

- A. CONTRACTOR shall submit applications typed on AIA forms or forms approved by the OWNER, Application for Payment, with itemized data typed on 8-1/2 inch x 11 inch white paper continuation sheets.
- B. CONTRACTOR shall provide itemized data on continuation sheet:
 1. Format, schedules, line items and values: Those of the Schedule of Values accepted by the ENGINEER.
- C. CONTRACTOR shall provide construction photographs in accordance with Section 01300.

1.04 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

- A. Application Form:
 1. CONTRACTOR shall fill in required information, including that for Change Orders executed prior to date of submittal of application.
 2. CONTRACTOR shall fill in summary of dollar values to agree with respective totals indicated on continuation sheets.
 3. CONTRACTOR shall execute certification with signature of a responsible officer of Contract firm
- B. Continuation Sheets:
 1. CONTRACTOR shall fill in total list of all scheduled component items of WORK, with item number and scheduled dollar value for each item.
 2. CONTRACTOR shall fill in dollar value in each column for each scheduled line item when WORK has been performed.
 - a. Round off values to nearest dollar, or as specified for Schedule of Values.
 3. CONTRACTOR shall list each Change Order executed prior to date of submission, at the end of the continuation sheets.
 - a. List by Change Order Number, and description, as for an original component item of WORK.
- C. CONTRACTOR shall include the OWNER's project number on all correspondence.

1.05 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

- A. When the OWNER or the ENGINEER requires substantiating data, CONTRACTOR shall submit suitable information, with a cover letter identifying:
 - 1. Project name.
 - 2. OWNER's project number.
 - 3. Application number and date.
 - 4. Detailed list of enclosures.
- B. CONTRACTOR shall submit one copy of data and cover letter for each copy of application.
- C. As a prerequisite for payment, CONTRACTOR is to submit a "Surety Acknowledgment of Payment Request" letter showing amount of progress payment which the CONTRACTOR is requesting.
- D. The CONTRACTOR is to maintain an updated set of drawings to be used as record drawings in accordance with Sections 01050 and 01720. As a prerequisite for progress payments, the CONTRACTOR is to exhibit the updated record drawings for review by the OWNER and the ENGINEER.

1.06 PREPARATION OF APPLICATION FOR FINAL PAYMENT

- A. CONTRACTOR shall fill in Application form as specified for progress payments.
- B. CONTRACTOR shall use continuation sheet for presenting the final statement of accounting as specified in Section 01700 - Contract Closeout.
- C. CONTRACTOR shall submit all Project Record Documents in accordance with Sections 01050 and 01700.

1.07 SUBMITTAL PROCEDURE

- A. CONTRACTOR shall submit Applications for Payment to the ENGINEER at the times stipulated in the Agreement.
- B. CONTRACTOR shall number five copies of each Application.
- C. When the ENGINEER finds Application properly completed and correct, the ENGINEER will transmit certificate for payment to OWNER, with copy to CONTRACTOR.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01153

CHANGE ORDER PROCEDURES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Promptly implement change order procedures.
 - 1. Provide full written data required to evaluate changes.
 - 2. Provide and maintain detailed records of WORK to be done or done on a time-and-material/force account basis.
 - 3. Provide full documentation to ENGINEER on request.
- B. Designate in writing the member of CONTRACTOR's organization:
 - 1. Who is authorized to accept changes in the WORK.
 - 2. Who is responsible for informing others in the CONTRACTOR's employ of the authorization of changes in the WORK.
- C. OWNER will designate the person who is authorized to execute Change Orders.

1.02 RELATED REQUIREMENTS

- A. COPB Bid/ Contract Documents - Bid Form, the amounts of established prices.
- B. COPB Bid/ Contract Documents - General Conditions of the Contract.
- C. Applications for Payment are included in Section 01152.
- D. Schedule of Values are included in Section 01370.
- E. Substitutions are included in Section 01630.
- F. Project Record Documents are included in Section 01720.

1.03 DEFINITIONS

- A. Change Order: See COPB Bid/ Contract Documents - General Conditions of the Contract, Article 32.
- B. Construction Change Authorization: A written order to the CONTRACTOR, signed by OWNER and ENGINEER, which amends the Contract Documents as described and authorized CONTRACTOR to proceed with a change which affects the Contract Sum or the Contract Time, for inclusion in a subsequent Change Order.
- C. Architect's Supplemental Instructions, AIA Document G710: A written order, instructions, or interpretations, signed by Architect/Engineer making minor changes in the WORK not involving a change in Contract Sum or Contract Time.
- D. Field Order: A written order to the CONTRACTOR, signed by the ENGINEER and the CONTRACTOR, which is issued to interpret/clarify the Contract Documents, order minor changes in the WORK and/or memorialize trade-off agreements. The WORK described by a Field Order is to be accomplished without change to the Contract Sum, Contract Time, and/or claims for other costs.

1.04 PRELIMINARY PROCEDURES

- A. OWNER or ENGINEER may initiate changes by submitting a request for a proposal to CONTRACTOR. Request will include:
 - 1. Detailed description of the Change, Products and location of the change in the project.
 - 2. Supplementary or revised Drawings and Specifications.
 - 3. The projected time span for making the change and a specific statement as to whether overtime work is, or is not, authorized.
 - 4. A specific period of time during which the requested price will be considered valid.

5. Such request is for information only and is not an instruction to execute the changes, nor to stop work in progress.
- B. CONTRACTOR may initiate changes by submitting a written notice to ENGINEER, containing:
 1. Description of the proposed changes.
 2. Statement of the reason for making the changes.
 3. Statement of the effect on the Contract Sum and the Contract Time.
 4. Statement of the effect on the WORK of separate contractors.
 5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

1.05 WORK DIRECTIVE CHANGE AUTHORIZATION

- A. In lieu of a request for a proposal, ENGINEER may issue a Work Directive Authorization for CONTRACTOR to proceed with a change for subsequent inclusion in a Change Order.
- B. Authorization will describe changes in the WORK, both additions and deletions, with attachments of revised Contract Documents to define details of the change and will designate the method of determining any change in the Contract Sum and any change in Contract Time.
- C. OWNER and ENGINEER will sign and date the Work Directive Change Authorization as authorization for the CONTRACTOR to proceed with the changes.
- D. CONTRACTOR may sign and date the Construction Change Authorization to indicate agreement with the terms therein.

1.06 DOCUMENTATION OF PROPOSALS AND CLAIMS

- A. Support each quotation for a lump sum proposal which has not previously been established, with sufficient substantiating data to allow ENGINEER to evaluate the quotation.
- B. On request, provide additional data to support time and cost computations
 1. Labor required.
 2. Equipment required.
 3. Products required.
 4. Recommended source of purchase and unit cost
 5. Quantities required.
 6. Taxes, insurance and bonds.
 7. Credit for WORK deleted from Contract, similarly documented.
 8. Overhead and profit.
 9. Justification for any change in Contract Time.
- C. Support each claim for additional costs and for WORK done on a time-and-material/force account basis, with documentation as required for a lump-sum proposal, plus additional information.
 1. Name of the OWNER's authorized agent who ordered the WORK and date of the order.
 2. Dates and times WORK was performed and by whom.
 3. Time record, summary of hours worked and hourly rates paid.
 4. Receipts and invoices for:
 - a. Equipment used, listing dates and times of use.
 - b. Products used, listing of quantities.
 - c. Subcontracts.
- D. Document requests for substitutions for Products as specified in Section 01630.

1.07 PREPARATION OF CHANGE ORDERS AND FIELD ORDERS

- A. ENGINEER will prepare each Change Order and Field Order.
- B. Change Order will describe changes in the WORK, both additions and deletions, with attachments Documents to define details of the change.
- C. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.

- D. Field Order will describe interpretations or clarifications of Contract Documents, order minor changes in the WORK, and/or memorialize trade-off agreements.
- E. Field Order work will be accomplished without change in the Contract Sum, Contract Time, and/or claims for other costs.

1.08 LUMP-SUM/FIXED PRICE CHANGE ORDER

- A. Content of Change Orders will be based on, either:
 - 1. ENGINEER's Proposal Request and CONTRACTOR's responsive Proposal as mutually agreed between OWNER and CONTRACTOR.
 - 2. CONTRACTOR's Proposal for a change, as recommended by ENGINEER.
- B. OWNER and ENGINEER will sign and date the Change Order as authorization for the CONTRACTOR to proceed with the changes.
- C. CONTRACTOR will sign and date the Change Order to indicate agreement with the terms therein.

1.10 TIME AND MATERIAL/FORCE ACCOUNT CHANGE ORDER/WORK DIRECTIVE CHANGE AUTHORIZATION

- A. ENGINEER and OWNER will issue a Work Directive Change Authorization directing CONTRACTOR to proceed with the changes.
- B. At completion of the change, submit itemized accounting and supporting data as provided in the Article "Documentation of Proposals and Claims" of this Section.
- C. ENGINEER will determine the allowable cost of such WORK, as provided in General Conditions and Supplementary Conditions.
- D. ENGINEER will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.
- E. OWNER and CONTRACTOR will sign and date the Change Order to indicate their agreement therewith.

1.11 CORRELATION WITH CONTRACTOR'S SUBMITTALS

- A. Periodically revise Schedule of Values and Request for Payment forms to record each change as a separate item of WORK, and to record the adjusted Contract Sum.
- B. Periodically revise the Construction Schedule to reflect each change in Contract Time.
 - 1. Revise sub-schedules to show changes for other items of WORK affected by the changes.
- C. Upon completion of WORK under a Change Order, enter pertinent changes in Record Documents.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The ENGINEER shall schedule and administer a pre-construction meeting, two progress meetings, and no more than one specially called meeting throughout progress of the WORK. The ENGINEER shall:
 - 1. Prepare agenda for meetings.
 - 2. Make physical arrangements for meetings.
 - 3. Preside at meetings.
 - 4. Record the minutes; include significant proceedings and decisions.
 - 5. Reproduce and distribute copies of minutes within ten (10) working days after each meeting.
 - a. To participants in the meeting.
 - b. To parties affected by decisions made at the meeting.
- B. Representatives of CONTRACTOR, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. The CONTRACTOR shall attend meetings to ascertain that WORK is expedited consistent with Contract Documents and construction schedules.

1.02 RELATED REQUIREMENTS

- A. COPB Bid/ Contract Documents – General Conditions of the Contract.
- B. Section 01300: Submittals.
- C. Section 01720: Project Record Documents.

1.03 PRE-CONSTRUCTION MEETING

- A. Schedule a preconstruction meeting no later than five days after date of Notice to Proceed.
- B. Location: Water Treatment Facility site, conference room or as designated by the OWNER.
- C. Attendance:
 - 1. OWNER's Representative
 - 2. ENGINEER and ENGINEER's professional consultants
 - 3. CONTRACTOR's Superintendent
 - 4. Major Subcontractors (This is especially noted for the I&C vendor/ supplier.)
 - 5. Utilities Department
 - 6. City of Pompano Beach Engineering Department
 - 7. City of Pompano Beach Building Department
 - 8. Others as appropriate.
- D. Suggested Agenda:
 - 1. Distribution and discussion of:
 - a. List of major subcontractors and suppliers.
 - b. Projected Construction Schedules.
 - 2. Critical work sequencing.
 - 3. Deliveries and priorities.
 - 4. Project Coordination.
 - a. Designation of responsible personnel.
 - 5. Procedures and processing of:
 - a. Field decisions.
 - b. Proposal requests.
 - c. Submittals.
 - d. Change Orders.

- e. Applications for Payment.
- 6. Adequacy of distribution of Contract Documents.
- 7. Procedures for maintaining Record Documents.
- 8. Use of premises:
 - a. Work and storage areas.
 - b. OWNER's requirements.
- 9. Construction facilities, controls and construction aids.
- 10. Temporary utilities.
- 11. Housekeeping procedures.

1.04 PROGRESS MEETINGS

- A. Schedule two progress meetings. The progress meetings will be held 15 days apart with the first meeting one week after the pre-construction meeting or 20 days after the date of Notice to Proceed.
- B. Hold called meetings as required by progress of the WORK.
- C. Location of the meetings:
 - City of Pompano Beach
 - Water Treatment Facility
 - 1205 NE 5th Avenue
 - Pompano Beach, FL
- D. Attendance:
 - 1. OWNER's representative.
 - 2. ENGINEER, and ENGINEER's professional consultants as needed.
 - 3. CONTRACTOR
 - 4. Subcontractors as appropriate to the agenda.
 - 5. Suppliers as appropriate to the agenda.
 - 6. Others as appropriate.
- E. Suggested Agenda:
 - 1. Review, approval of minutes of previous meeting.
 - 2. Review of work progress since previous meeting.
 - 3. Field observations, problems, conflicts.
 - 4. Problems which impede Construction Schedule.
 - 5. Review of delivery schedules.
 - 6. Corrective measures and procedures to regain projected schedule.
 - 7. Revisions to Construction Schedule.
 - 8. Progress, schedule, during succeeding work period.
 - 9. Coordination of schedules.
 - 10. Review submittal schedules; expedite as required.
 - 11. Maintenance of quality standards.
 - 12. Pending changes and substitutions.
 - 13. Review proposed changes for effect on Construction Schedule and on completion date.
 - 14. Other business.
 - 15. Construction schedule.
- F. The CONTRACTOR is to attend progress meetings and is to study previous meeting minutes and current agenda items, in order to be prepared to discuss pertinent topics such as deliveries of materials and equipment, progress of the WORK, etc.
- G. The CONTRACTOR is to provide a current submittal log at each progress meeting in accordance with Section 01300.

1.05 PREINSTALLATION CONFERENCES

- A. A pre-installation conference shall be arranged with specialty contractors following the pre-construction meeting and prior to commencing WORK of a particular section.
- B. Require attendance of entities directly affecting, or affected by, WORK of the Section.

- C. Review conditions of installation, preparation and installation procedures, and coordination with related WORK.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

- A. This Section specifies the general methods and requirements of submissions applicable to the following work-related submittals: Shop Drawings, Product Data, Construction Photographs, Construction or Submittal Schedules.
- B. All submittals shall be clearly identified by reference to Section Number, Paragraph, Drawing Number or Detail as applicable. Submittals shall be clear and legible and of sufficient size for sufficient presentation of data.
- C. The CONTRACTOR is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the OWNER and the ENGINEER. This log should include the following items:
 1. Submittal-Description and File Number assigned.
 2. Date to ENGINEER.
 3. Date returned to CONTRACTOR (from ENGINEER).
 4. Status of Submittal (Approved/Resubmit/Rejected).
 5. Date of Resubmittal and Return (as applicable).
 6. Date material released (for fabrication).
 7. Projected date of fabrication.
 8. Projected date of delivery to site.
- D. Distribute reproductions of approved shop drawings and copies of approved product data, where required, to the job site file and elsewhere as directed by the ENGINEER. Number of copies shall be as directed by the ENGINEER but shall not exceed six (6).

1.02 SHOP DRAWINGS AND PRODUCT DATA

- A. Shop Drawings
 1. Shop drawings, as specified in individual WORK Sections include, but are not necessarily limited to, custom-prepared data such as fabrication and erection/installation (working) drawings, scheduled information, setting diagrams, actual I&C shop-work instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports as applicable to the WORK.
 2. All shop drawings submitted by subcontractors for approval shall be sent directly to the CONTRACTOR for checking. The CONTRACTOR shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.
 3. CONTRACTOR shall check all shop drawings (including submittals by subcontractors and suppliers) regarding measurements, size of members, materials and details to make sure that they conform to the intent of the Drawings and related Sections. Shop drawings found to be inaccurate or otherwise in error shall be returned to the subcontractors for correction before submission thereof.
- B. Product Data
 1. Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliance and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the WORK.

1.03 CONTRACTOR'S RESPONSIBILITIES

- A. Review shop drawings, and product data, including those by subcontractors, prior to submission.
- B. Each shop drawing and product data submitted by the CONTRACTOR shall have affixed to it the following Certification Statement including the CONTRACTOR's Company name and signed by the CONTRACTOR: "Certification Statement: by this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements." Shop drawings and product data sheets 11-in x 17-in and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package. Provide to the Owner's Representative a copy of each submittal transmittal sheet for shop drawings and product data at the time of submittal of said drawings, product data and samples to the ENGINEER.
- C. The CONTRACTOR must collect all shop drawings and product data and submit them to the ENGINEER. Piecemeal submittals will not be accepted.
- D. Notify the ENGINEER in writing, at the time of submittal, of any deviations in the submittals from the requirements of the Contract Documents.
- E. The review and approval of shop drawings or product data by the ENGINEER shall not relieve the CONTRACTOR from responsibility with regard to the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the CONTRACTOR.
- F. No portion of the WORK requiring a shop drawing or product data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at the CONTRACTOR's risk. The OWNER will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.
- G. Project WORK, materials, fabrication, and installation shall conform with approved shop drawings and product data.

1.04 SUBMISSION REQUIREMENTS

- A. Make complete submittals promptly in accordance with approved schedule and in such sequence as to cause no delay in the WORK. Piecemeal submittals will not be accepted.
- B. Each submittal, appropriately coded, will be returned within 10 working days following receipt of submittal by the ENGINEER.
- C. Number of submittals required:
 - 1. Shop Drawings: Six copies.
 - 2. Product Data: Five copies.
- D. Submittals shall contain:
 - 1. The date of submission and the dates of any previous submissions.
 - 2. The Project title and number.
 - 3. CONTRACTOR identification.
 - 4. The names of:
 - a. CONTRACTOR
 - b. Vendor/ Supplier
 - c. Manufacturer
 - 5. Identification of the product, with the section number, page and paragraph(s).
 - 6. Field dimensions, clearly identified as such.
 - 7. Relation to adjacent or critical features of the WORK or materials.
 - 8. Applicable standards, such as ASTM or Federal Standards numbers.
 - 9. Identification of deviations from Contract Documents.
 - 10. Identification of revisions on re-submittals.

11. A blank space suitably sized for CONTRACTOR and ENGINEER stamps.

1.05 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES

- A. The review of shop drawings and data and will be for general conformance with the design concept and Contract Documents. They shall not be construed:
1. as permitting any departure from the Contract requirements;
 2. as relieving the CONTRACTOR of responsibility for any errors, including details, dimensions, and materials;
 3. as approving departures from details furnished by the ENGINEER, except as otherwise provided herein.
- B. The CONTRACTOR remains responsible for details and accuracy, for coordinating the WORK with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing WORK in a safe manner.
- C. ENGINEER may review and return shop drawings or data as submitted that describe variations and show a departure from the Contract requirements which ENGINEER finds to be in the interest of the OWNER and to be so minor as not to involve a change in Contract Price or time for performance.
- D. Submittals will be returned to the CONTRACTOR under one of the following codes.
- Code 1 - "APPROVED" is assigned when there are no notations or comments on the submittal. When returned under this code the CONTRACTOR may release the equipment and/or material for manufacture.
- Code 2 - "APPROVED AS NOTED". This code is assigned when a confirmation of the notations and comments IS NOT required by the CONTRACTOR. The CONTRACTOR may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.
- Code 3 - "APPROVED AS NOTED/CONFIRM". This combination of codes is assigned when a confirmation of the notations and comments IS required by the CONTRACTOR. The CONTRACTOR may, at the CONTRACTOR's own risk, release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product. This confirmation shall specifically address each omission and nonconforming item that was noted. Confirmation is to be received by the ENGINEER within 10 calendar days of the date of the ENGINEER's transmittal requiring the confirmation.
- Code 4 - "APPROVED AS NOTED/RESUBMIT". This combination of codes is assigned when notations and comments are extensive enough to require a resubmittal of the package. This resubmittal is to address all comments, omissions and non-conforming items that were noted. Resubmittal is to be received by the ENGINEER within 10 calendar days of the date of the ENGINEER's transmittal requiring the resubmittal.
- Code 5 - "NOT APPROVED" is assigned when the submittal does not meet the intent of the Contract Documents. The CONTRACTOR must resubmit the entire package revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the Contract Documents.
- Code 6 - "COMMENTS ATTACHED" is assigned where there are comments attached to the returned submittal which provide additional data to aid the CONTRACTOR.
- Code 7 - "FOR YOUR INFORMATION" is assigned when the submittal provides information of a general nature that may or may not require a response.
- Codes 1 through 5 designate the status of the reviewed submittal with Code 6 showing there has been an attachment of additional data. Code 7 is used as may be necessary.
- E. Re-submittals will be handled in the same manner as first submittals. On re-submittals the CONTRACTOR shall direct specific attention, in writing on the letter of transmittal and on resubmitted shop drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the ENGINEER, on previous submissions. Any such revisions which are not clearly identified shall be made at the risk of the CONTRACTOR. The

CONTRACTOR shall make corrections to any WORK done because of this type revision that is not in accordance to the Contract Documents as may be required by the ENGINEER.

F. Partial submittals may not be reviewed. The ENGINEER will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the CONTRACTOR and will be considered "Not Approved" until resubmitted. The ENGINEER has the option to provide a list or mark the submittal directing the CONTRACTOR to the areas that are incomplete.

G. Repetitive Review

1. Shop drawings and other submittals will be reviewed no more than two times at the OWNER's expense. All subsequent reviews will be performed at times convenient to the ENGINEER and at the CONTRACTOR's expense, based on the ENGINEER's then prevailing rates. The CONTRACTOR shall reimburse the OWNER for all such fees invoiced to the OWNER by the ENGINEER. Submittals are required until approved.

2. Any need for more than two resubmission, or any other delay in obtaining ENGINEER's review of submittals, will not entitle CONTRACTOR to extension of the Contract Time.

H. If the CONTRACTOR considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the CONTRACTOR shall give written notice thereof to the ENGINEER at least 7 working days prior to release for manufacture or product ordering.

I. When the shop drawings have been completed to the satisfaction of the ENGINEER, the CONTRACTOR shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the ENGINEER.

1.06 DISTRIBUTION

A. Distribute reproductions of approved shop drawings and copies of approved product data, where required, to the job site file and elsewhere as directed by the ENGINEER. Number of copies shall be as directed by the ENGINEER but shall not exceed six (6).

1.07 CONSTRUCTION PHOTOGRAPHS

A. The CONTRACTOR shall provide progress photographs on a weekly basis.

1.08 GENERAL PROCEDURES FOR SUBMITTALS

A. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in advance of performing the related WORK or other applicable activities, or within the time specified in the individual work of other related Sections, so that the installation will not be delayed by processing times including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the CONTRACTOR's failure to transmit submittals sufficiently in advance of the WORK.

END OF SECTION

P.E. OR UL LISTED CERTIFICATION FORM

The undersigned hereby certifies that he/she is a Professional Engineer registered in the State of Florida or UL508 or UL698A listed manufacturer and that he/she has been employed by

_____ to design
(Name of Contractor)

(Insert P.E. or UL Listed Manufacturer Responsibilities)

in accordance with Section _____ for the
_____.
(Name of Project)

The undersigned further certifies that he/she has performed the design of the _____
_____, that said design is in conformance
(Name of Project)

with all applicable local, state and federal codes, rules, and regulations, and that his/her signature and P.E. stamp or manufacturer certification have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the

(Insert Name of Owner)

or OWNER's representative with seven days following written request therefore by the OWNER.

P.E. Name or UL Qualifier

Contractor's Name

Signature

Signature

Address

Title

Address

SECTION 01310

CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The CONTRACTOR shall prepare and submit to the ENGINEER for review, a practical and feasible schedule, showing the order in which the CONTRACTOR proposes to carry on the WORK, and the dates upon which the CONTRACTOR proposes to start and complete each of the salient features, including the dates for submittals and approval of I&C shop drawings, and the procurement of materials, permits and equipment. The Construction schedule shall consist of a critical path network showing contemplated completion percentages and arranged to record actual completion percentages at stated intervals.
- B. The Construction schedule shall be kept up-to-date and the current updated schedule shall be submitted to the ENGINEER with each request for payment. If the CONTRACTOR fails to submit the required updated schedule within the time prescribed, the ENGINEER shall not approve of progress payment estimates until such time as the CONTRACTOR submits the required updated schedule.
- C. The Construction schedule shall in general determine the order in which the WORK is to proceed. The ENGINEER, however, may order and authorize minor changes of this schedule whenever such changes are of definite advantage to the OWNER or necessary for the operations of the OWNER.
- D. The CONTRACTOR shall designate an authorized representative who shall be responsible for development and maintenance of the schedule and of progress and payment reports. This representative of the CONTRACTOR shall have direct project control and complete authority to act on behalf of the CONTRACTOR in fulfilling the commitments of the CONTRACTOR's schedule.
- E. The schedule shall include the individual activities associated with Substantial Completion, Completion, and Final Inspection, and readiness for Final Payment as required by the General and Supplementary Conditions and Contract Closeout procedures.

1.02 RELATED REQUIREMENTS

- A. COPB Bid/ Contract Documents - General Conditions of the Contract.
- B. Section 01010: Summary of Work.
- C. Section 01200: Project Meetings.
- D. Section 01300: Submittals.
- E. Section 01700: Contract Closeout.

1.03 CRITICAL PATH METHOD CONSTRUCTION SCHEDULE

- A. The CONTRACTOR shall submit within five (5) working days after the effective date of the Agreement, a schedule indicating planned operations.
- B. The CONTRACTOR shall submit with each pay request a report of the actual construction progress including Contract Closeout by updating the schedules. All contract changes, including pending and approved change orders and field orders shall be included in the updated schedule.
- C. The schedule shall include the various individual activities associated with obtaining Substantial Completion and readiness for Final Payment.

1.04 DISTRIBUTION

- A. Distribute copies of the reviewed schedules to:
 1. ENGINEER (two copies).
 2. City of Pompano Beach Project Manager (two copies).
 3. City of Pompano Beach Engineering Department (two copies).

4. City of Pompano Beach Plant Superintendent (one copy).
- B. Instruct recipients to report promptly to the CONTRACTOR any problems anticipated by the projections shown in the schedules.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 RESPONSIBILITY FOR SCHEDULE COMPLIANCE

- A. The CONTRACTOR agrees that whenever it becomes apparent from the current schedule and Schedule Report that delays to the critical path have resulted, and hence, that the contract completion date will not be met or when so directed by the ENGINEER, the CONTRACTOR will take some or all of the following actions at no additional cost to the OWNER, submitting to the ENGINEER for approval, a written statement of the steps the CONTRACTOR intends to take to remove or arrest the delay to the critical path in the approved schedule.
 1. Increased construction labor in such quantities and crafts as will substantially eliminate, in the judgment of the ENGINEER, the backlog of WORK.
 2. Increase the number of working hours per shift, shifts per working days per week, the amount of construction equipment, or any combination of the foregoing, sufficiently to substantially eliminate, in the judgment of the ENGINEER, the backlog of WORK.
 3. Reschedule activities to achieve maximum practical concurrence of accomplishment of activities, and comply with the revised schedule.
 4. Costs incurred by the OWNER arising from such lengthening of hours, including furnishing of Inspectors, shall be the CONTRACTOR's responsibility and shall be deducted from monies due the CONTRACTOR. Failure of the CONTRACTOR to comply with the requirements of the ENGINEER may be grounds for determination by the OWNER that the CONTRACTOR is not proceeding at such rates as will insure completion within the specified time and may result in the termination of the right of the CONTRACTOR to continue the WORK.

3.02 ADJUSTMENT OF CONTRACT SCHEDULE AND COMPLETION TIME

- A. If the CONTRACTOR desires to make changes in method of operating which affect the approved CPM schedule, the CONTRACTOR shall notify the ENGINEER in writing stating what CPM changes are proposed and the reason for the change. If the ENGINEER approves these changes, the CONTRACTOR shall revise and submit for approval, without additional cost to the OWNER, all of the affected portion of the CPM network. The CPM schedule shall be adjusted by the CONTRACTOR only after prior approval of the proposed changes by the ENGINEER.

3.03 COORDINATING SCHEDULES WITH OTHER CONTRACT SCHEDULES

- A. Where WORK is to be performed under this contract concurrently with and/or contingent upon work performed on the same facilities or area under other contracts, the CONTRACTOR's CPM schedule shall be coordinated with the schedules of the other contracts. The CONTRACTOR shall obtain the schedules of the other appropriate contracts from the ENGINEER for the preparation and updating of the CONTRACTOR's CPM schedule and shall be make the required changes in the schedule when indicated by changes in corresponding schedules.

END OF SECTION

SECTION 01370

SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Submit to the ENGINEER a Schedule of Values allocated to the various portions of the WORK, within ten (10) days after the effective date of the Agreement.
- B. Upon request of the ENGINEER, support the values with data which will substantiate their correctness.
- C. The accepted Schedule of Values shall be used only as the basis for the CONTRACTOR's Applications for Payment.

1.02 RELATED REQUIREMENTS

- A. COPB Bid/ Contract Documents - General Conditions of the Contract.

1.03 FORM AND CONTENT OF SCHEDULE OF VALUES

- A. Type schedule on an 8-1/2 inch x 11 inch or 8-1/2 inch x 14 inch white paper; CONTRACTOR's standard forms and automated printout will be considered for approval by the ENGINEER upon CONTRACTOR's request. Identify schedule with:
 1. Title of Project and location.
 2. ENGINEER and Project number.
 3. Name and Address of CONTRACTOR.
 4. Contract designation.
 5. Date of submission.
- B. Schedule shall list the installed value of the component parts of the WORK in sufficient detail to serve as a basis for computing values for progress payments during construction.
- C. Identify each line item with the number and title of the respective major section of the specifications.
- D. For each major line item list sub-values of major products or operations under the item.
- E. For the various portions of the WORK:
 1. Each item shall include a directly proportional amount of the CONTRACTOR's overhead and profit.
 2. Progress payments shall be for completed portions of the WORK only; progress payments for stored or ordered items shall not be approved.
- F. The sum of all values listed in the schedule shall equal the total Contract Sum.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1: GENERAL

1.01 WORK INCLUDED

- A. This section covers the WORK as required to provide and/or coordinate:
 - 1. Quality assurance and control of installation.
 - 2. References.
 - 3. Inspection and testing laboratory services.
 - 4. Instrumentation field services report.

1.02 RELATED WORK

- A. COPB Bid/ Contract Documents - General Conditions of the Contract.
- B. Section 01300: Submittals
- C. Section 01410: Testing and Testing Laboratories Services.

1.03 REFERENCES

- A. Conform to reference standard by date of current issue on date for receiving bids.
- B. Should specified reference standards conflict with Contract Documents, request clarification from ENGINEER before proceeding.
- C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over subcontractors, suppliers, manufacturers, products, services, site conditions, and workmanship, to produce WORK of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from ENGINEER before proceeding.
- D. Comply with specified standards as a minimum quality for the WORK except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. WORK is to be performed by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.05 VENDORS OR SUPPLIERS' FIELD SERVICES

- A. When specified in the individual specification Sections, require vendors or suppliers to provide qualified staff personnel to provide installation, observe quality of workmanship, test, adjust and place equipment into operation as applicable.
- B. Submit report in triplicate within three days of observation to ENGINEER for review.

PART 2- PRODUCTS (NOT USED)

PART 3- EXECUTION (NOT USED)

END OF SECTION

SECTION 01410

TESTING AND TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. CONTRACTOR will employ and pay for the services of an independent Testing Laboratory approved by the City to perform testing specifically indicated on the Contract Documents and may at any other time elect to have materials and equipment tested for conformity with the Contract Documents.
 - 1. CONTRACTOR shall cooperate with the laboratory to facilitate the execution of its required services.
 - 2. Employment of the laboratory by the CONTRACTOR shall in no way relieve the CONTRACTOR's obligations to perform the WORK of the Contract for Construction.
 - 3. CONTRACTOR shall schedule the testing requirements with the independent laboratory.

1.02 RELATED REQUIREMENTS

- A. COPB Bid/ Contract Documents - General Conditions of the Contract.
- B. Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.
- C. Respective sections of specifications: Certification of soil compaction, density test, concrete slump and strength tests.
- D. Each specification section listed: Laboratory tests required, and standards for testing.
- E. Testing Laboratory inspection, sampling and testing is required for but not limited to the following:
 - 1. Section 01400: Quality Control
 - 2. Section 03300: Cast-in-Place Concrete
 - 3. As called for in the Drawings

1.03 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

- A. Laboratory is not authorized to:
 - 1. Release, revoke, alter or enlarge on requirements of Contract Documents.
 - 2. Approve or accept any portion of the WORK.
 - 3. Perform any duties of the CONTRACTOR.

1.04 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory personnel and provide access to WORK.
- B. Provide to the laboratory the preliminary design mix proposed to be used for concrete, and other materials mixes which require control by the testing laboratory.
- C. Standard specifications for quality and workmanship are indicated in the Contract Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the CONTRACTOR, and no extra charge to the OWNER shall be allowed on account of such testing and certification.
- D. Furnish incidental labor and facilities:
 - 1. To provide access to WORK to be tested.
 - 2. To facilitate inspections and tests.
 - 3. For storage and curing of test samples.
- E. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES

PART 1: GENERAL

1.01 TEMPORARY OFFICES

- A. Temporary offices are not required; however, the CONTRACTOR or the CONTRACTOR's authorized representative shall be present at the field site at all times while WORK is in progress. Instructions received there from the ENGINEER shall be considered as delivered to the CONTRACTOR.

1.02 TEMPORARY TELEPHONE SERVICE

- A. Maintain one portable cellular telephone on-site during working hours. Pay all costs and service charges for local and long distance calls.

1.03 TEMPORARY WATER

- A. Not Applicable

1.04 TEMPORARY SANITARY FACILITIES

- A. Not Applicable

1.05 FIRE EXTINGUISHERS

- A. If applicable, provide portable UL-rated, fire extinguishers for temporary use. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

1.06 TEMPORARY CONSTRUCTION FENCING

- A. Construction Fence: Commercial grade chain link fence or bright orange-colored, high density, polyethylene safety fence. Minimum fence height shall be four feet.
- B. Provide construction fence to secure entire active construction area at all times when CONTRACTOR's personnel are not present.

1.07 WATER CONTROL

- A. Grade sites to drain. Maintain excavations free of water.
- B. Provide water barriers as required to protect sites from soil erosion.

PART 2: PRODUCTS (NOT USED)

PART 3: EXECUTION (NOT USED)

END OF SECTION

SECTION 01505

CONTROL OF WORK

PART 1 - GENERAL

1.01 CONTRACTOR'S PERSONNEL AND EQUIPMENT

- A. The CONTRACTOR shall furnish personnel and equipment which will be efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will ensure the completion of the WORK within the time stipulated in the Contract. If at any time such personnel appears to the ENGINEER to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, the ENGINEER may order the CONTRACTOR to increase the efficiency, change the character or increase the personnel and equipment, and the CONTRACTOR shall conform to such order. Failure of the ENGINEER to give such order shall in no way relieve the CONTRACTOR of the obligations to secure the quality of the WORK and rate of progress required.

1.02 PRIVATE LAND

- A. The CONTRACTOR shall not enter or occupy private land outside of the City of Pompano Beach Water Treatment Facility.

1.03 PIPE LOCATIONS

- A. Pipelines shall be located substantially as indicated on the Drawings, but the ENGINEER reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings are noted on the Drawings, such notation is for the CONTRACTOR's convenience and does not relieve the CONTRACTOR from laying and jointing different or additional items where required.

1.04 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 take precautions to prevent access by and injury to the Water Treatment Facility staff due to open excavation. All excavated material, equipment, or other obstacles that could be dangerous to the staff shall be well lighted at night.

1.05 SEQUENCE OF OPERATIONS

- A. The WORK designated to be performed under this Contract shall be coordinated in such manner that there shall be a minimum of interference with operation of the existing **WATER TREATMENT FACILITY**. Existing electric and communications shall not be interrupted without prior arrangements having been made with the Chief Maintenance Supervisor, the Plant Superintendent and the City's Project Engineer in addition to the ENGINEER.
- B. The CONTRACTOR shall afford other Contractors, Subcontractors reasonable opportunity for the introduction or storage of their materials and the execution of their work. The CONTRACTOR shall be responsible for all damages or other costs associated with delays in WORK precipitated by such failure. If the City is performing work with the City employees, the CONTRACTOR shall provide reasonable opportunity to the City for the introduction and storage of materials and equipment and the execution of work. The Contractor shall properly connect and coordinate the CONTRACTOR ' s WORK with the work of all other forces at the site.

1.06 CLEANUP

- A. During the course of the WORK, the CONTRACTOR shall keep the site of operations in as clean and neat a condition as is possible. The CONTRACTOR shall dispose of all residue resulting

from the construction WORK and, at the conclusion of the WORK, shall remove and haul away any surplus excavation, existing pipe and appurtenances removed by the CONTRACTOR, broken pavement, lumber, equipment, temporary structures and any other refuse remaining from the construction operation, and shall leave the entire site of the WORK in a neat and orderly conditions.

1.07 MAINTENANCE OF ACCESS

- A. Portions of this WORK are located within the high service pump room driveway. Access for staff, police and emergency equipment is required and must be provided. Do not store materials or equipment that is difficult to move at this location.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 COOPERATION WITHIN THIS CONTRACT

- A. All firms or persons authorized to perform any WORK under this Contract shall cooperate with the General CONTRACTOR and subcontractors or trades, and shall assist in incorporating the WORK of other trades where necessary or required.

END OF SECTION

SECTION 01600

DELIVERY, STORAGE AND HANDLING

PART 1: GENERAL

1.01 SCOPE OF WORK

- A. This Section specifies the general requirements for the delivery handling, storage and protection for all items required in the construction of the WORK. Specific requirements, if any, are specified with the related item.

1.02 TRANSPORTATION AND DELIVERY

- A. Transport and handle items in accordance with MANUFACTURERS or VENDORS' instructions.
- B. Schedule delivery to reduce long term on-site storage prior to installation and/or operation. Under no circumstances shall the AST, electrical and I&C panel be delivered to the site more than one week prior to installation without written authorization from the ENGINEER.
- C. Coordinate delivery with installation to ensure minimum holding time for items that are easily damaged.
- D. All items delivered to the site shall be unloaded and placed in a manner which will not hamper the CONTRACTOR's normal construction operation or those of subcontractors and other contractors and will not interfere with the flow of operations staff necessary traffic.
- E. Provide necessary equipment and personnel to unload all items delivered to the site.
- F. Promptly inspect shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by others (i.e. SUB-CONTRACTORS), perform inspection in the presence of the City Project Manager and or Inspector. Notify ENGINEER in writing of any problems.

1.03 STORAGE AND PROTECTION

- A. Store and protect products in accordance with the MANUFACTURERS or VENDORS' instructions, with seals and labels intact and legible.
- B. All structural, miscellaneous and reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting.

PART 2: PRODUCTS (NOT USED)

PART 3: EXECUTION (NOT USED)

END OF SECTION

SECTION 01630

SUBSTITUTIONS AND PRODUCT OPTIONS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Furnish and install Products specified, under options and conditions for substitutions stated in this Section.
- B. Whenever a product, material or item of equipment is specified or described by using the name of a proprietary product or the name of a particular MANUFACTURER or VENDOR, followed by the phrase "or equal," the specific item mentioned shall be the basis upon which bids are to be prepared, and shall be understood as establishing the type, function, dimension, appearance and quality desired. Other MANUFACTURER's or vendor's products not named will be considered as substitutions, provided the required information is submitted in the manner set forth in this section and provided the substitution will not require substantial revision to the Contract Documents.

1.02 RELATED REQUIREMENTS

- A. COPB Bid/ Contract Documents - General Conditions of the Contract.
- B. Section 01600: Delivery, Storage and Handling.

1.03 CONTRACTOR'S OPTIONS

- A. For Products specified by naming several Products or MANUFACTURERS, select any one of products and MANUFACTURERS named which complies with Specifications.
- B. For Products specified by naming one or more Products or MANUFACTURERS and stating "or equal," submit only the Products or MANUFACTURERS which are specifically named.
- C. **For Products specified by naming only one Product and MANUFACTURER, there is no option and no substitution will be allowed. This applies to all of the AST and fuel piping listed equipment on the BCEPD Permitted Plans provided as bid sets.**

1.04 SUBSTITUTIONS

- A. In order for substitutions to be considered, the CONTRACTOR shall submit, within 5 days of issuance of Notice of Award, complete data as set forth herein to permit complete analysis of all proposed substitutions noted on the CONTRACTOR's substitutions list. No substitution shall be considered unless the CONTRACTOR provides the required data in accordance with the requirements of this Section within the five day period.
- B. Submit separate request for each substitution (All substitution requests must be submitted within five days of the Notice to Proceed). Support each request with:
 1. Complete data substantiating compliance of proposed substitution with requirements stated in Contract Documents:
 - a. Product identification, including MANUFACTURER's name and address.
 - b. MANUFACTURERS literature; identify:
 - 1) Product description.
 - 2) Reference standards.
 - 3) Performance and test data.
 - 4) Operation and maintenance data.
 - c. Samples, as applicable.
 - d. Name and address of similar projects on which product has been used, and date of each installation.
 2. Itemized comparison of the proposed substitution with product specified; List significant variations. Substitution shall not change design intent and shall perform equal to that specified.

3. Data relating to impact on construction schedule occasioned by the proposed substitution.
 4. Any effect of substitution on separate contracts.
 5. List of changes required in other work or Products.
 6. Accurate cost data comparing proposed substitution with product specified.
 - a. Amount of any net change to Contract Sum.
 7. Designation of required license fees or royalties.
 8. Designation of availability of maintenance services, sources of replacement materials.
- C. Substitutions will not be considered for acceptance when:
1. They are indicated or implied on shop drawings or product data submittals without a formal request from CONTRACTOR.
 2. They are requested directly by a subcontractor or supplier.
 3. Acceptance will require substantial revision of Contract Documents.
- D. Requests for substitutions submitted after Notice of Award will not be considered unless evidence is submitted to the ENGINEER that all of the following circumstances exist:
1. The specified product is unavailable for reasons beyond the control of the CONTRACTOR. Such reasons shall consist of strikes, bankruptcy, discontinuance of MANUFACTURER, or acts of God.
 2. The CONTRACTOR placed, or attempted to place, orders for the specified products within five (5) days after Notice of Award.
 3. Request for substitution is made in writing to the ENGINEER within five (5) days of the date on which the CONTRACTOR ascertains that the CONTRACTOR cannot obtain the item specified.
 4. Complete data as set forth herein to permit complete analysis of the proposed substitution is submitted with the request.
- E. The ENGINEER's decision regarding evaluation of substitutions shall be considered final and binding. Requests for time extensions and additional costs based on submission of, acceptance of, or rejection of substitutions will not be allowed. All approved substitutions will be incorporated into the Agreement by Change Order.

1.05 CONTRACTOR'S REPRESENTATION

- A. In making formal request for substitution, CONTRACTOR represents that:
1. The proposed product has been investigated and has been determined to be equal to or superior in all respects to that specified.
 2. The same warranties or bonds will be provided for the substitution as for product specified.
 3. Installation of accepted substitution will be coordinated into the Work, and will make such changes as may be required for the Work to be complete in all respects.
 4. Claims for additional costs caused by substitution which may subsequently become apparent will be waived.
 5. Cost data is complete and includes related costs under the Contract, but not:
 - a. Costs under separate contracts.
 - b. ENGINEER's costs for redesign or revision of Contract Documents.

1.06 ENGINEER DUTIES

- A. Review CONTRACTOR's requests for substitutions with reasonable promptness.
- B. Notify CONTRACTOR, in writing, of decision to accept or reject requested substitution.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Comply with requirements stated in the City of Pompano Beach Bid/ Contract Documents - General Conditions of the Contract and in Specifications for administrative procedures in closing out the Work.

1.02 RELATED REQUIREMENTS

- A. Section 01720: Project Record Documents.
- B. Section 01740: Warranties and Bonds.

1.03 SUBSTANTIAL COMPLETION

- A. Approximately 15 days before CONTRACTOR considers the Work will be Substantially Complete, the CONTRACTOR shall submit to the ENGINEER:
 - 1. A written notice that the WORK, or designated portion thereof, is substantially complete.
 - 2. A list of items to be completed or corrected.
- B. Within a reasonable time after receipt of such notice, the ENGINEER will make an inspection to determine the status of completion.
- C. Should the ENGINEER determine that the Work is not Substantially Complete:
 - 1. The ENGINEER will promptly notify the CONTRACTOR in writing, giving the reasons therefore.
 - 2. CONTRACTOR shall remedy the deficiencies in the Work, and send a second written notice of substantial completion to the ENGINEER.
 - 3. The ENGINEER will reinspect the Work.
- D. When the ENGINEER finds that the Work is Substantially Complete, the ENGINEER will:
 - 1. Prepare and deliver to OWNER a tentative Letter of Substantial Completion with a tentative list of items to be completed or corrected before final payment.
 - 2. After consideration of any objections made by the OWNER as provided in Conditions of the Contract, and when the ENGINEER considers the Work substantially complete, the ENGINEER will execute and deliver to the OWNER and the CONTRACTOR a definite Letter of Substantial Completion with a revised tentative list of items to be completed or corrected.
 - 3. Request the CONTRACTOR to initiate closeout submittals.

1.04 FINAL INSPECTION

- A. When CONTRACTOR considers the Work is complete, the CONTRACTOR shall submit written certification that:
 - 1. Contract Documents have been reviewed.
 - 2. Work has been inspected for compliance with Contract Documents including copies that final acceptance has been obtained from BCEPD and COPB Building Department.
 - 3. Work has been completed in accordance with Contract Documents.
 - 4. Equipment and systems have been tested in the presence of the OWNER's representative and are operational.
 - 5. Work is completed and ready for final inspection.
- B. The ENGINEER will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
- C. Should the ENGINEER consider that the Work is incomplete or defective:

1. The ENGINEER will promptly notify the CONTRACTOR in writing, listing the incomplete or defective work.
 2. CONTRACTOR shall take immediate steps to remedy the stated deficiencies, and send a second written certification to the ENGINEER that the Work is complete.
 3. The ENGINEER will reinspect the Work.
- D. When the ENGINEER finds that the Work is acceptable under the Contract Documents, the ENGINEER shall request the CONTRACTOR to complete any remaining closeout submittals.

1.05 REINSPECTION FEES

- A. Should the ENGINEER perform re-inspections due to failure of the Work to comply with the claims of status of completion made by the CONTRACTOR:
1. CONTRACTOR will compensate the ENGINEER for such additional services.
 2. In the event the ENGINEER has not received payment, the OWNER will deduct the amount of such compensation from the final payment to the CONTRACTOR.

1.06 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ENGINEER

- A. Evidence of compliance with requirements of governing authorities.
- B. Project Record Documents: To requirements of Section 01720.
- C. Warranties and Bonds: To requirements of Section 01740.
- D. Evidence of Payment and Release of Liens to all Vendors and Subcontractors.
- E. Certificate of Insurance for Products and Completed Operations.

1.07 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the ENGINEER.
- B. Statement shall reflect all adjustments to the Contract Sum:
 1. The original Contract Sum.
 2. Additions and deductions resulting from:
 - a. Previous Change Orders.
 - b. Allowances.
 - c. Sub-item bid price.
 - d. Deductions for uncorrected Work.
 - e. Penalties.
 - f. Deductions for liquidated damages.
 - g. Deductions for reinspection payments.
 - h. Other adjustments.
 3. Total Contract Sum, as adjusted.
 4. Previous payments.
 5. Sum remaining due.
- C. ENGINEER will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.08 FINAL APPLICATION FOR PAYMENT

- A. CONTRACTOR shall submit the final Application for Payment in accordance with procedures and requirements stated in the Contract for Construction.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01710

CLEANING

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Execute cleaning, during progress of the work, and at completion of the work, as required by General Conditions.

1.02 RELATED WORK

- A. City of Pompano Beach Bid/ Contract Documents - General Conditions of the Contract.
- B. Each Section: Cleaning for specific products or work.

1.03 DISPOSAL AND CLEANING

- A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations and anti-pollution laws.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 DURING CONSTRUCTION

- A. Execute periodic cleaning to keep the work, the site and adjacent areas free from accumulations of waste materials, rubbish and windblown debris, resulting from construction operations. (This includes lunch wrappings, bottles, cans, etc.)
- B. Provide on-site containers for the collection of waste materials, debris and rubbish.
- C. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas away from the site.
- D. The CONTRACTOR shall also restore in an acceptable manner all property which has been displaced or damaged during the prosecution of the work, and shall leave the site and vicinity unobstructed and in a neat presentable condition.
- E. In the event of delay exceeding two days after written notice is given to the CONTRACTOR by the ENGINEER to remove such rubbish or materials or to restore displaced or damaged property, the ENGINEER may employ such labor and equipment as he/she may deem necessary for the purpose, and the cost of such work, together with the cost of supervision, shall be charged to the CONTRACTOR and shall be deducted from any monies due him/her. The Project shall not be considered as having been completed until all rubbish and surplus materials have been removed and disposed of properly.

3.02 FINAL CLEANING

- A. Execute final cleaning to keep the WORK and the site free from accumulations of waste materials, rubbish and debris, resulting from construction operations.

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Maintain at the site for the OWNER one record copy of:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other Modifications to the Contract.
 - 5. ENGINEER's Field Orders or written instructions.
 - 6. Approved Shop Drawings.
 - 7. Field Test records.
 - 8. Construction photographs.
 - 9. Field engineering records for compliance with field engineering submittals.

1.02 RELATED REQUIREMENTS

- A. COPB Bid/ Contract Documents - General Conditions of the Contract.
- B. Section 01050: Field Engineering
- C. Section 01300: Submittals
- D. Section 01700: Contract Closeout
- E. Individual Specification Sections: Manufacturers' certificates and certificates of inspections.

1.03 MAINTENANCE OF DOCUMENTS

- A. Store documents in CONTRACTOR's field files apart from documents used for construction.
- B. File documents in accordance with CSI/CSC format.
- C. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
- D. Make documents available at all times for inspection by the ENGINEER.
- E. As a prerequisite for progress payments, the CONTRACTOR is to exhibit the currently updated "record documents" for review by the ENGINEER and the OWNER.

1.04 MARKING DEVICES

- A. Provide red ball point marking pens for recording information.

1.05 RECORDING

- A. Label each document "PROJECT RECORD" in neat large printed letters.
- B. Record information concurrently with construction progress.
 - 1. Do not conceal any work until required information is recorded.
- C. Drawings - Legibly mark to record actual construction:
 - 1. All tanks, fuel lines, valves, pumps, controllers and air piping with horizontal and vertical dimensions; changes to panels, conduits or piping location; horizontal and vertical locations of new piping and appurtenances, referenced to permanent building improvements (finished floor or finished grade); actual installed tank, pipe material, schedule, etc.
 - 2. Field changes of dimension and detail.
 - 3. Changes made by Field Order or by Change Order.
 - 4. Details not on original contract drawings.
 - 5. Equipment and piping relocations.
- D. Specifications and Addenda - Legibly mark each Section to record:

1. MANUFACTURER, trade name, catalog number, and Supplier of each Product and item of equipment actually installed.
2. Changes made by Field Order or by Change Order.
- E. Shop Drawings (after final review and approval):
 1. One set of record shop drawings for each submittal.
- F. Certified site drawing showing existing pumps and engine, panels, and fuel line vertical and horizontal dimensions, offsets and tie to existing building and property corner per Section 01050 by a registered land surveyor and registered engineer.

1.06 SUBMITTAL

- A. At Contract close-out, deliver Record Documents listed in Paragraph 1.01A to the ENGINEER for the OWNER. The required field engineering submittals certified by a registered land surveyor and testing laboratory are listed in Section 01050 and Section 01410.
- B. Accompany submittal with transmittal letter in duplicate, containing:
 1. Date.
 2. Project title and number.
 3. CONTRACTOR's name and address.
 4. Title and number of each Record Document.
 5. Signature of CONTRACTOR or CONTRACTOR's authorized representative.
- C. All Record drawings shall be full size 24" x 36" reproducible material and accompanied by an electronic file in DWG format, AutoCad Version 2011 or newer and an electronic file in PDF format. Refer to electronic as-built requirements on the COPB Engineering website.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01740

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Compile specified warranties and bonds as per Section 01030 of these Specifications.
- B. Co-execute submittals when so specified.
- C. Review submittals to verify compliance with City of Pompano Beach Contract Documents.
- D. Submit all executed warranties and bonds to the ENGINEER for review and transmittal to OWNER prior to start-up and performance demonstration specified in Section 01030.

1.02 RELATED REQUIREMENTS

- A. COPB Bid/ Contract Documents - General Conditions of the Contract
- B. Section 01030: Special Project Provisions.
- C. Section 01700: Contract Closeout.
- D. Individual Specification Sections: Warranties required for specific Products or WORK.

1.03 SUBMITTAL REQUIREMENTS

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

1.04 FORM OF SUBMITTALS

- A. Prepare in quintuple packets.
- B. Format:
 1. Size 8-1/2 inches x 11 inches, punch sheets for standard 3-post binder.
 - a. Fold larger sheets to fit into binders.
 2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BONDS".
List:
 - a. Title of Project.
 - b. Name of CONTRACTOR.
- C. Binders:
 1. Commercial quality, three-post binder, with durable and cleanable plastic covers and maximum post width of 2 inches.

1.05 WARRANTY SUBMITTAL REQUIREMENTS

- A. For all major pieces of equipment, submit a warranty from the equipment MANUFACTURER. The MANUFACTURER's warranty period shall be concurrent with the CONTRACTOR's for

one (1) year commencing at the time of completion as determined by the OWNER (see Section 01030).

- B. The CONTRACTOR shall be responsible for obtaining certificates for equipment warranty for all major components specified which have a list price of more than \$1,000. The ENGINEER reserves the right to request warranties for components not classified as major. The CONTRACTOR shall still warrant equipment not considered to be "major" in the CONTRACTOR's one-year warranty period even though certificates of warranty may not be required.
- C. In the event that the equipment MANUFACTURER or supplier is unwilling to provide a one-year warranty commencing at the time of OWNER acceptance, the CONTRACTOR shall obtain from the MANUFACTURER a two (2) year warranty commencing at the time of equipment delivery to the job site. This two-year warranty from the MANUFACTURER shall not relieve the CONTRACTOR of the one-year warranty starting at the time of OWNER acceptance of the equipment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 02070

DEMOLITION

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR shall furnish all labor, materials, equipment, and incidentals required for demolition, removal and disposal work as shown on the Contract Drawings and as specified herein.
- B. The WORK shall include the demolition, remove and disposal of any existing landscaping, electrical disconnects, conduits, racks & supports, piping, plumbing and appurtenances that interfere with the work.
- C. Coordinate with the Chief Maintenance Supervisor and the City's Project Engineer prior to proceeding with the demolition WORK.

1.02 RELATED WORK

- A. COPB Bid/ Contract Documents - General Conditions of the Contract.
- B. Division 1 - General Requirements
- C. Division 3 - Concrete
- D. Division 16 - Electrical

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. **Prior to commencing WORK, the CONTRACTOR shall check all existing electrical conduits and disconnects related to the existing BLUE BELLE diesel engine, cooling water and return piping, air piping, and all equipment in any associated or in the proximity to the items to be removed and shall verify that the proposed fuel and conduits routing do not conflict.**
- B. The CONTRACTOR shall remove and furnish any additional backfill material that is necessary for the installation of the "FIREGUARD" AST concrete slab on grade at no increase in cost to the OWNER. Backfill material shall be cleaned and free from all organic material, clay, marl, unstable materials, or lumps of paving, and shall meet FDOT lime-rock base criteria as per FDOT Specifications Numbers 200, 230 and 4280.

3.02 MECHANICAL REMOVALS

- A. Mechanical removals shall consist of the dismantling and the removing of existing piping or conduits and other appurtenances (i.e fuel hoses) as required for the completion of the project. Disposal of removed electrical and piping items not retained by the City shall be in accordance with local codes and standards. WORK shall include cutting, capping and plugging of the piping as required.
- B. Existing piping or conduits not required shall be abandoned or removed and disposed of off-site in accordance with local codes and standards.
- C. When existing pipe is abandoned, the CONTRACTOR shall plug all resulting open ends whether or not shown. The remaining piping shall be fitted with a removable cap or plug at the dead-end. The same applies to the conduits.

3.03 CLEANUP

- A. The CONTRACTOR shall remove from the Project site all debris resulting from the demolition and removal operations as it accumulates. Upon completion of the demolition work, all materials, equipment, waste and debris of every sort shall be removed and the premises shall be left clean, neat and orderly.
- B. The CONTRACTOR shall dispose of all removed and/or demolished materials, equipment, debris and all other items off the project site in conformance with all local codes and standards at his/her expense.

3.04 DISPOSAL

- A. All materials resulting from the clearing and demolition work not designated to remain by the ENGINEER will become the property of the CONTRACTOR. The materials shall be removed from site to the CONTRACTOR'S place of disposal at CONTRACTOR'S expense in conformance with existing applicable laws and regulations.

END OF SECTION

SECTION 02100

SITE PREPARATION

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials and equipment required and perform all site preparation, complete as shown on the Drawings and as specified herein.
- B. Obtain all permits required for site preparation work prior to proceeding with the WORK, including City's Building Department permits.
- C. Unless otherwise shown on the Drawings or directed by the ENGINEER, the area to be cleared, grubbed and stripped shall generally consist of the work site. The areas to be cleared, grubbed and stripped shall be minimized to the extent possible unless otherwise noted on the plans. No unnecessary site preparation within these area shall be performed.

1.02 RELATED WORK

- A. COPB Bid/ Contract Documents - General Conditions of the Contract
- B. Section 02900: Sodding

1.03 SUBMITTALS

- A. Submit to the ENGINEER copies of all permits required prior to clearing, grubbing, and stripping work.

PART 2 PRODUCTS - (NOT USED)

PART 3 EXECUTION

3.01 CLEARING

- A. The Contractor shall abide by all requirements and conditions of the permit, and shall include all costs under the various Proposal Items, and no other compensation will be provided.

3.02 STRIPPING

- A. Strip topsoil from all designated area to be excavated.
- B. Topsoil shall be free from sod, trash, large stones and other extraneous material. Avoid mixing topsoil with subsoil.
- C. Stockpile and protect topsoil until it is used in sod installation. Dispose of surplus topsoil after all work is completed.

3.03 GRADING

- A. The material excavated shall be transported and spread over the entire work site and shall be graded so that the finished grade shall be within 0.1 feet of the existing grades.
- B. The disposal of large rocks in excess of 8", within the Water Treatment Facility is prohibited.
- C. Following completion of the slab on grade work, the site shall be shaped and graded to match the existing elevations and cross-sections. The finished surface shall be maintained until sod work is completed.

3.04 DISPOSAL

- A. Dispose of material and debris from site preparation operations unless otherwise directed by the OWNER by hauling such materials and debris to an approved offsite disposal area. No rubbish or debris of any kind shall be buried on the project site.

- B. Burning of cleared and grubbed materials, or other fires for any reason will not be permitted.

3.05 PROTECTION

- A. The CONTRACTOR shall provide temporary fences, barricades, coverings, or other protections to preserve existing items indicated to remain and to prevent injury or damage to person or property. Apply protections to adjacent properties as required. Restore damaged work to the condition existing prior to the start of WORK, unless otherwise directed.
- B. Maintain protection until all WORK has been completed.
- C. Restrict construction activities to those areas within the limits of construction designated on the Drawings.

END OF SECTION

SECTION 02270

TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The WORK specified in this Section consists of designing, providing, maintaining and removing temporary erosion and sedimentation controls as necessary.
- B. Temporary erosion controls include, but are not limited to, sodding, grassing, mulching, setting, watering, and reseeding on-site surfaces and spoil and borrow area surfaces and providing interceptor ditches at ends of the work area and at those locations which will ensure that erosion during construction will be either eliminated or maintained within acceptable limits as established by the OWNER.
- 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 OWNER.
- D. CONTRACTOR is responsible for providing effective temporary erosion and sediment control measures during construction or until final controls become effective.

1.02 REFERENCE DOCUMENTS

- A. Florida Building Code, SFWMD Vol. II, Broward County by DPEP.

PART 2 - PRODUCTS

2.01 EROSION CONTROL

- A. Section 02900: Sodding.
- B. Netting - fabricated of material acceptable to the OWNER.

2.02 SEDIMENTATION CONTROL

- A. Bales - clean, seed free cereal hay type.
- B. Netting - fabricated of material acceptable to the OWNER.
- C. Filter stone - crushed stone conforming to Florida Department of Transportation specifications.
- D. Concrete block - hollow, non-load-bearing type.
- E. Concrete - exterior grade not less than one inch thick.

PART 3 - EXECUTION

3.01 EROSION CONTROL

- A. Minimum procedures for grassing are:
 - 1. Scarify slopes to a depth of not less than six inches and remove large clods, rock, stumps, roots larger than 2-inch in diameter and debris.
 - 2. Sow seed within twenty-four (24) hours after the ground is scarified with either mechanical seed drills or rotary hand seeders.
 - 3. Apply mulch loosely and to a thickness of between 3/4-inch and 1-1/2 inches.
 - 4. Apply netting over mulched areas on sloped surfaces.

5. Roll and water seeded areas in a manner which will encourage sprouting of seeds and growing of grass. Reseed areas which exhibit unsatisfactory growth. Backfill and seed eroded areas.

3.02 SEDIMENTATION CONTROL

- A. Install and maintain silt dams, traps, barriers, and appurtenances as shown on the approved descriptions. Hay bales which deteriorate and filter stone which is dislodged shall be replaced.

3.03 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 State of Florida or the Federal Government, CONTRACTOR shall immediately take whatever steps are necessary to correct the deficiency at the CONTRACTOR'S expense.

END OF SECTION

SECTION 02500

RESTORATION AND CLEANUP

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. This section covers the WORK necessary to provide and coordinate the restoration and cleanup of areas disturbed during construction.
- B. All areas disturbed or damaged during construction shall be restored to conditions existing prior to the WORK. Restoration other than or in addition to that indicated by the Drawings or specified herein, but required to return sites to conditions existing prior to WORK, shall be considered incidental. The costs of incidental restoration shall be included in the lump sum base bid.
- C. COPB Bid/ Contract Documents - General Conditions of the Contract. See Contract which contain information and requirements that apply to the WORK specified herein and are mandatory for this project.

1.02 RELATED WORK

- A. All applicable Sections

1.03 SUBMITTALS

- A. Submitted construction progress schedule should indicate restoration. Final cleanup time should also be referenced to the progress schedule.
- B. Submittals shall be in accordance with Section 01300: Submittals.

PART 2 - PRODUCTS

2.01 SOD

- A. Sod shall be of firm texture having a compacted growth and good root development. Sod is to contain no weeds or undesirable native grasses and be free from fungus, vermin and diseases. Sod is to be not less than two (2) years old. Provide sod capable of growth and development when planted (viable, not dormant).
- B. Sod shall be the St. Augustine variety to match the existing as per the CITY's preference.

PART 3 - EXECUTION

3.01 SODDING

- A. Sod shall be placed as indicated on Drawings or to the extent to achieve the conditions existing prior to the WORK.
- B. Properly prepare subgrade prior to placing sod. Remove excess materials, hand rake and level as necessary to place sod evenly and at grades to match adjacent existing surfaces. Finish sod installation shall provide unimpeded sheet flow of surface water drainage.
- C. Lay sod to form a solid mass with tight-fitting joints. Butt ends and sides of sod strips. Do not overlap. Stagger strips to offset joints in courses. Tamp or roll sod lightly to insure uniform contact with subgrade. Fill minor cracks between pieces of sod with sifted soil.
- D. Where necessary to prevent slippage of new installed sod, peg or pin sod securely using 1" x 1" x 6" wood pegs, driven flush with top of sod.
- E. Water sod thoroughly with a fine spray immediately after installation.
- F. Do not install sod on Friday, Saturday or Sunday, unless provisions are made to water manually or automatically.

3.02 HEDGE

- A. CONTRACTOR shall supply and install cocoplum or arboricola capella plantings with a minimum height of 24 inches spaced at 18 inches from planting centerline to planting centerline.

END OF SECTION

SECTION 02515

CONCRETE PAD (SLAB ON GRADE)

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install a concrete pad (slab on grade) with walls as shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Division 2 - Sitework.
- B. Division 3 - Concrete.

1.03 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
 - 2. Deformed reinforcing bars shall conform to ASTM A615
- B. American Association of State Highway and Transportation Officials (AASHTO)
 - 1. AASHTO M213 - Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Concrete shall be as specified in Section 03300, but in no case less than 4,000 psi at 28 days.
- B. Deformed reinforcing bars shall conform to ASTM A615
- C. Expansion joint filler shall be bituminous type, ½-in thick meeting AASHTO Spec. M-213-65.

PART 3 EXECUTION

3.01 INSTALLATION

- A. The subgrade for the concrete pad (slab on grade) shall be shaped to the proposed surface of the tank pad and fill with FDOT 110 mix or thoroughly compacted lime rock. All depressions occurring shall be filled and again compacted until the surface is smooth and hard.
- B. After the subgrade has been prepared, the 110 mix, shall be placed.
- C. Forms
 - 1. Side and transverse forms shall be smooth, free from warp, of sufficient strength to resist springing out of shape, of a depth to conform to the thickness of the pad and of a type satisfactory to the ENGINEER.
 - 2. All mortar or dirt shall be completely removed from forms that have been previously used. The forms shall be well staked and thoroughly braced and set to the established lines with their upper edge conforming to the grade of the finished grade which shall have sufficient pitch to provide for surface drainage, but not to exceed 1/4-in/ft.
 - 3. All forms shall be oiled as specified in Section 03300 before placing concrete.
- D. Steel Rebar Reinforcing
 - 1. Deformed reinforcing bars shall conform to ASTM A615 and be sized as indicated on the Drawings.
 - 2. Grade: 60

3. Minimum yield strength: 60,000 psi

E. Placing and Finishing Concrete

1. Concrete shall be placed in such quantity that, after being thoroughly consolidated in place, it shall be 8-in in depth at the center of the pad and the edges shall of the depth and width called for on the plans. Finishing operations shall be delayed until all bleed water and water sheen has left the surface and concrete has started to stiffen. After water sheen has disappeared, edging operations shall be completed. After edging operations, the surface shall be floated with an aluminum or magnesium float. Immediately following floating, the surface shall be steel troweled. If necessary, edges shall be rerun before and after troweling to maintain uniformity. Finish with broom, then round all edges with 1/4-in radius after brooming.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install all concrete reinforcement as shown on the Drawings and specified herein.

1.02 RELATED WORK

- A. Section 03300: Cast-in-Place Concrete

1.03 SUBMITTALS

- A. Submittals shall be in accordance with Section 01300.
- B. The following shall be submitted at the time of shipment of reinforcing steel.
 - 1. Certified copy of mill test on each heat of reinforcing steel fabricated showing physical and chemical analysis.

1.04 REFERENCE STANDARDS

- A. Steel reinforcement in concrete shall conform to ACI 318 and ACI 350R unless otherwise specified herein.

1.05 PRODUCT DELIVERY AND HANDLING

- A. Reinforcing shall be substantially free from mill scale, rust, dirt, grease, or other foreign matter.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Materials shall be new, be of domestic manufacture and shall conform to the following material specifications.
 - 1. Welded steel wire fabric: ASTM A-185.
 - 2. Deformed Reinforcing Bars: ASTM A-615.
 - 3. Tie Wires: 16 Gauge, black, soft connected wire.

2.02 FABRICATION OF REINFORCEMENT

- A. Fabrication tolerances shall be in accordance with the CRSI, Code of Standard Practice-Fabrication.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Surface condition, bending, spacing, and tolerances of placement of reinforcement shall conform to the CRSI, Code of Standard Practice- Field Erection.
- B. Except as otherwise indicated on the Drawings, the minimum concrete cover of reinforcement shall be as follows:
 - 1. Concrete cast against and permanently exposed to earth; 3-in.

3.02 SPLICING OF REINFORCEMENT

- A. Splices in welded wire fabric shall be lapped not less than 1-1/2 courses or 12 in. The spliced fabrics shall be tied together with wire ties at least 24 in. on center.

3.03 ACCESSORIES

- A. The CONTRACTOR is solely responsible for determining, providing and installing accessories such as chairs, chair bars, and the like in sufficient quantities and strength to adequately support the reinforcement and prevent its displacement during the erection of the steel and the placement of concrete.

3.04 INSPECTION

- A. In no case shall any reinforcing steel be covered with concrete until the amount and position of the reinforcement has been observed by the ENGINEER and the ENGINEER has given permission to proceed with the concreting. The ENGINEER shall be given ample prior notice of the availability of set reinforcement for review.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required to place all cast-in-place concrete, including 2,000 gallon tank pad and walls.
- B. All cast-in-place concrete work shall be performed in accordance with ACI 318 and ACI 350R except as hereinafter specified.

1.02 RELATED WORK

- A. Section 01400: Quality Control
- B. Section 03200: Concrete Reinforcement

1.03 REFERENCE SPECIFICATIONS

- A. American Concrete Institute (ACI)
 - 1. ACI 301 Specifications for Structural Concrete for Buildings.
 - 2. ACI 304 Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.
 - 3. ACI 305 Hot Weather Concreting.
 - 4. ACI 306 Cold Weather Concreting.
 - 5. ACI 308 Standard Practice for Curing Concrete.
 - 6. ACI 309 Standard Practice for Consolidation of Concrete.
 - 7. ACI 318 Building Code Requirements for Reinforced Concrete.
 - 8. ACI 347 Recommended Practice for Concrete Formwork.
 - 9. ACI 350R Concrete Sanitary Engineering Structures.
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM C31 Standard Method for Making and Curing Concrete Compressive and Flexure Test Specimens in the Field.
 - 2. ASTM C33 Specification for Concrete Aggregates.
 - 3. ASTM C94 Specification for Ready-mix Concrete.
 - 4. ASTM C150 Specification for Portland Cement.
 - 5. ASTM C260 Specification for Air-Entraining Admixtures for Concrete.
 - 6. ASTM C494 Specification for Chemical Admixtures for Concrete.
- C. National Ready-Mixed Concrete Association
 - 1. Truck Mixer and Agitator Standards

1.04 SUBMITTALS

- A. Deliver to the ENGINEER concrete mix tickets as specified.

1.05 QUALITY ASSURANCE

- A. The actual acceptance of aggregates and development of mix proportions to produce concrete conforming to the specific requirements shall be determined prior to the placement of any concrete by means of laboratory tests made with the constituents to be used on the WORK.
- B. The limiting strengths, water-cement ratios and cement factors as shown on Table A shall apply. Maximum water-cement (#/#) for water retaining structures shall be 0.45.

TABLE A		
Minimum Comp. Str. Psi at 28 days	Maximum Net Water Content gals/100 lbs*	Minimum Cement Factor 100 lbs/cu yd**
4000	5.4	5.64
*Maximum; decrease if possible. This represents total water in mix at time of mixing, including free water on aggregates, and water in admixture solution. **Minimum; increase as necessary to meet other requirements. These cement factors apply to "controlled" concrete subject to specific inspection.		

- C. When high-early-strength Portland cement is permitted, the same strength requirements shall apply except that the indicated strengths shall be attained at seven (7) days instead of twenty-eight (28) days.
- D. Consistency of the concrete as measured by the ASTM Designation C143 shall be as shown in Table B.

TABLE B		
Slump (inches) Portion of Structure	Maximum	Minimum
Walls, Ballast and Slabs on Ground	3	1

- E. Concrete shall be of such consistency and mix composition that it can be readily worked into the corners and angles of the forms and around the reinforcement, inserts, and wall castings without permitting materials to segregate or free water to collect on the surface, due consideration being given to the methods of placing and compacting.
- F. No excessively wet concrete will be permitted, and if at any time concrete of such consistency beyond the limits of Table B is delivered to the job, the ENGINEER may direct the CONTRACTOR to reject same or to add extra cement for which no additional payment will be made. A supply of the approved cement shall be kept available at the site for this purpose. No additional water shall be added by drivers of transit-mix trucks except that established for the design. Failure to comply with this requirement shall be justification for rejecting the concrete.
- G. The entrained air, as measured by the Pressure Method, ASTM C231, shall be as shown in Table C.

TABLE C	
Total Air Measured at Location	Discharge from truck (%)
Finished slabs	3.0 maximum
All others	5.0 – 7.0

1.06 ACCEPTANCE TESTS

- A. Conformity of aggregates to these Specifications, and the actual proportions of cement, aggregates, and water necessary to produce concrete conforming to the requirements set forth in Table A, shall be determined by tests made with representative samples of the materials to be used on the WORK. Tests will be made by an accredited and acceptable testing laboratory at the CONTRACTOR's expense and approved by the ENGINEER in accordance with Section 01410. Any retests shall be in accordance with Section 01410.
- B. Cement may be subject to testing to determine that it conforms to the requirements of this Specification. Methods of testing shall conform to the appropriate specification, but the place, time, frequency, and method of sampling will be determined by the ENGINEER in accordance with the particular need.

- C. Samples of fine and coarse aggregates shall be delivered to the laboratory for examination and testing at least three weeks before the CONTRACTOR proposes to use them in the WORK.
- D. Water content of the concrete shall be based on a curve showing the relation between water content and 7 and 28-day compressive strengths of concrete made using the proposed materials. The curves shall be determined by four or more points, each representing an average value of at least three test specimens at each age, and shall have a range of values sufficient to yield the desired data, including all the compressive strengths called for on the Drawings, without extrapolation. The water content of the concrete to be used, as determined from the curve, shall correspond to the test strengths of the laboratory trial mixtures as shown on Table D.

TABLE D		
Design Strength (psi)	Minimum Lab Strength (psi) 7 days	Minimum Lab Strength (psi) 28 days
4000	3500	4600

- E. In no case, however, shall the resulting mix conflict with the limiting values for maximum water-cement ratios and minimum cement contents as specified in Table A.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Concrete shall be of Portland cement, fine aggregate, coarse aggregate, water, and admixtures as specified and shall be ready-mixed, or transit-mixed concrete produced by a plant acceptable to the ENGINEER. All constituents, including admixture, shall be batched at the central batch plant in accordance with ASTM C94. Materials shall conform to these Specifications and any State or local specification requirements.
- B. Cement:
 - 1. Cement for all cast-in-place concrete shall be a domestic Portland cement (ASTM C150, Type II) or high early strength Portland cement (ASTM C150, Type III) free from injurious water soluble salts or alkalis.
- C. Aggregates:
 - 1. Fine aggregate shall consist of washed inert sand conforming to the requirements of ASTM C33, and the following detailed requirements:

Fineness Modulus	2.30-3.10
Organics	Organic Plate 2, per ASTM C40
Silt	2.0% maximum
Mortar Strength	95% minimum as per ASTM C87 Section 10
Soundness	8% maximum loss, using magnesium sulfate, subjected to 5 cycles
 - 2. Coarse aggregate shall consist of well-graded crushed rock or washed gravel conforming to the requirements of ASTM C33 and the following detailed requirements:

Organics	Organic Plate 1, per ASTM C40
Silt	1.0% maximum
Soundness	8% maximum loss, using magnesium sulfate, subjected to 5 cycles
 - 3. The following designated sizes of aggregate shall be the maximum employed in concrete:
 - 2-inch for plain concrete
 - 1-inch for reinforced sections 10-in and over in thickness
 - 3/4-inch for reinforced sections less than 10-in thickness

- D. Water:
 - 1. Water shall be clean and free from injurious amounts of oils, acid, alkali, organic matter, or other deleterious substances.
 - 2. When subjected to the mortar strength test described in ASTM C87, the 28 day strength of mortar specimens made with the water under examination and normal Portland cement shall be at least 100 per cent of the strength of similar specimens made with distilled water.
 - 3. Potable tap water will normally fulfill the above requirements.
- E. Mixes:
 - 1. Slab on Grade, Thrust Blocks, sidewalks and Miscellaneous Cast-In-Place
 - a. 28 day comprehensive strength: 4,000 psi
- F. Admixtures:
 - 1. A water reducing agent such as Pozzolith, WRDA or approved equal shall be used in all concrete. The use of a superplasticizer is at the discretion of the CONTRACTOR and will be considered by the ENGINEER during the review process. The admixture shall be free of any chloride ions and shall conform to ASTM C494. Proportioning and mixing shall be as recommended by the MANUFACTURER.
 - 2. Admixtures causing accelerated setting of cement in concrete shall not be used. Air entraining admixtures with demonstrated compatibility with the concrete mix shall be used as required as a moderate addition to the water reducing agent to obtain the specified percent air in the resultant concrete and shall conform to ASTM C-260
- G. Curing Compounds:
 - 1. Normal placement without special finish; approved products:
 - a. Master Builders Company: "Masterseal".
 - b. Sonneborn-Contech: "Kure-N'Seal".

PART 3 - EXECUTION

3.01 MIXING

- A. Concrete shall be ready-mixed, or transit-mixed, as produced by equipment acceptable to the ENGINEER. No hand-mixing will be permitted. Adding water in controlled amounts during the mixing cycle shall be done only with the express approval of, and under the direction of, the ENGINEER.
- B. Ready-mix or transit-mixed concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of rated capacities for the respective conditions as stated on the name plate. Discharge at the site shall be within 1-1/2 hours and within one hour when ambient temperature is above 85 degree F after cement was first introduced into the mix. Central mixed concrete shall be plant-mixed a minimum of 1-1/2 minutes per batch and then shall be truck-mixed or agitated a minimum of 8 minutes. Agitation shall begin immediately after the pre-mixed concrete is placed in the truck and shall continue without interruption until discharge. Transit-mixed concrete shall be mixed at mixing speed for at least 10 minutes immediately after charging the truck, followed by agitation without interruption until discharged.
- C. All central plant and rolling stock equipment and methods shall conform to ACI 304, ASTM C94, and the latest Truck Mixer and Agitator Standards of the Truck Mixer Manufacturers' Bureau of the National Ready-Mixed Concrete Association.
- D. The retempering of concrete or mortar which has partially hardened, that is, mixing with or without additional cement, aggregate, or water, will not be permitted.
- E. Attention is called to the importance of dispatching trucks from the batching plant so that they shall arrive at the site of the WORK just before the concrete is required, thus avoiding excessive mixing of concrete while waiting or delays in placing successive layers of concrete in the forms.
- F. Deliver to the ENGINEER at the time of each truckload transported to the site a mix ticket, showing at least the following: concrete plant identification, date, quantity of ingredients (including water) added at the batch plant, time of charge, and truck number.

3.02 INSPECTION AND CONTROL

- A. Related Work Sections: 01300, 01410 and 03200: Concrete Reinforcement.
- B. The preparation of forms, placing of reinforcing steel, conduits, pipes, and sleeves, batching, mixing, transportation, placing, curing, and testing of concrete shall be at all times under the inspection of the CITY INSPECTOR and ENGINEER.
- C. The CONTRACTOR shall engage the services of an accredited testing laboratory approved by the CITY and ENGINEER in accordance with Section 01300 and 01410 to establish the basic mixtures of concrete as required by the specifications, to test field control cylinder specimens, and to conduct other tests as specified herein or as deemed required by the ENGINEER to ensure the quality of concrete as specified. All tests shall be performed in accordance with the applicable ASTM standard methods.

3.03 FIELD TESTS

- A. Sets of five field control cylinder specimens shall be taken for every eight (8) cubic yards (1 truck) of concrete placed. One slump test shall be performed for each set of test cylinders taken and for each concrete mixer truckload delivery. All specimens shall be taken in conformance with ASTM C31.
- B. The CONTRACTOR shall cooperate in the making of such tests to the extent of allowing free access to the WORK for the selection of samples, providing heated (when required) moist storage facilities for specimens, affording protection to the specimens against injury or loss through the CONTRACTOR's operations, and furnishing material and labor required for the purpose of taking concrete cylinder samples, curing boxes, and shipping boxes.

3.04 CONCRETE APPEARANCE

- A. Concrete for every part of the WORK shall be of homogeneous structure which, when hardened, will have the required strength, durability and appearance.
- B. Formwork, mixtures and concrete placement workmanship shall be such that concrete surfaces, when exposed, will require only minimal finishing with no excess honeycombing, voids or irregular color lines.

3.05 FORMS

- A. Forms shall be so constructed and placed that the resulting concrete will be of the shape, lines, dimensions, appearance, and to the elevations indicated on the Drawings.
- B. Forms shall be made of wood, metal, or other approved material. Wood forms shall be constructed of sound lumber or plywood of suitable dimensions, free from knots and loose knots; where used for exposed surfaces, boards shall be dressed and matched. Plywood shall be sanded smooth and fitted with tight joints between panels. Metal forms shall be of an approved type for the class of work involved and of the thickness and design required for rigid construction.
- C. Edges of all form panels in contact with concrete shall be flush within 1/32-inch and forms for plane surfaces shall be such that the concrete will be plane within 1/16-inch in 4 feet. Forms shall be tight to prevent the passage of mortar and water and grout.
- D. Molding or bevels shall be placed to produce a 3/4-inch chamfer on all exposed projecting corners, unless otherwise shown on the Drawings. Similar chamfer strips shall be provided at horizontal and vertical extremities of all wall placements to produce "clean" separation between successive placements as called for on the Plans.
- E. Forms shall be sufficiently rigid to withstand vibration, to prevent displacement or sagging between supports, and constructed so the concrete will not be damaged by their removal. The CONTRACTOR shall be entirely responsible for their adequacy.
- F. Forms, including new pre-oiled forms, shall be oiled before reinforcement is placed, with an approved nonstaining oil or liquid form coating having a non-paraffin base.

3.06 PLACING AND COMPACTING

- A. Place concrete expeditiously in clean forms that are not hot to the touch; spray forms with water just

prior to placing concrete. Before placing concrete directly against earth, install vapor barrier to prevent water absorption, secure reinforcement in position, inspect, and approve before placing concrete. Do not rest runways for transporting concrete on the reinforcing steel. Deposit concrete as nearly as practical in final position; and, do not allow concrete to drop freely more than 5 feet. Place all concrete during daylight, unless otherwise authorized.

- B. Concrete shall not be placed in the rain or when it looks as if it is going to rain unless specifically authorized by the ENGINEER.
- C. Concrete is not to be placed until reinforcing steel, pipes, conduits, sleeves, hangers, anchors, and other work required to be built into concrete have been inspected and approved by the City Inspector and the ENGINEER. Remove water and foreign matter from forms and excavation. All soil bottom for slabs shall be approved by the City Inspector and ENGINEER before placing concrete.
- D. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which prevent separation of ingredients and displacement of reinforcement, and which avoid rehandling. Partially hardened concrete is not to be used.
- E. Concrete slabs on the ground shall be well-tamped into place and foundation material shall be wet, tamped, and rolled until thoroughly compacted prior to placing concrete.
- F. Place slabs-on-grade carefully to avoid damages to the vapor barrier.

3.07 CURING AND PROTECTION

- A. Begin curing of concrete as soon as practicable after placing, but not more than 3 hours thereafter.
- B. Begin curing of the structural elements immediately after removal of forms.
- C. Apply curing compounds as specified.
- D. Protect all concrete work against injury from the elements and defacements of any nature during construction operations.

3.08 REMOVAL OF FORMS

- A. Except as otherwise specifically authorized by the ENGINEER, forms shall not be removed before the concrete has cured

3.09 FINISHES

- A. Formed surfaces:
 - 1. Patching: immediately after stripping forms, patch all defective areas with mortar similar to the concrete mix; but, without coarse aggregate. Patch minor honeycombs, bulges and other minor defects as designed by the ENGINEER, only where exposed to view. Clean, dampen, and fill all the holes with patching mortar.
 - a. Major defective areas, as judged by the ENGINEER, including those resulting from the leakage of forms, excessive honeycombs, large bulges, and large offsets at form joints: chip away to a depth of at least 3 inch; and, the surfaces that are to be patched coat with an epoxy-polysulfide adhesive. Press patching mortar in for a complete bond and finish to match adjacent areas.
 - b. Minor defective areas, as judged by the ENGINEER, including honeycombs, air bubbles, holes resulting from removal of ties and those resulting from leakage of forms: patch with grout without resorting to chipping. Minor bulges and offsets at form joints: finish as specified herein below.
 - 2. Finishes; locations:
 - a. Rough or board finish: for all concrete surfaces not exposed to view.
 - 3. Finishes; definitions:
 - a. Rough or board finish: reasonably true to line and plane. Tie holes and defects patched, and the fins exceeding 3 inch rubbed down, otherwise, surfaces may be left with texture imparted by forms.
- B. Unformed Surfaces (Flatwork)
 - 1. Finishes

- a. General: grade and screed slab to exact elevation, as required. After screeding, tamp mixture thoroughly to drive the coarse aggregate down from surfaces and apply finish specified hereinafter.
 - 2. Finishes; definitions:
 - a. Broom finish: finish with street type broom as soon as surface water sheen has disappeared.
- 3.10 INSTALLATION SCHEDULE
- A. Concrete pad and walls for the tank shall have a minimum compressive strength at 28 days of 4,000 psi.
- 3.11 FIELD CONTROL
- A. The CONTRACTOR shall advise the ENGINEER of readiness to proceed at least 24 working hours prior to each concrete placement. The ENGINEER will inspect the preparations for concreting including the reinforcing and the alignment and tightness of formwork. No placement shall be made without the prior approval of the ENGINEER.
 - B. Only ready mixed concrete in accordance with ASTM C94 will be accepted.
 - C. Place all concrete within 12 hours after introduction of water to mix.
 - D. Under no circumstances may additional water be added to mix.
 - E. Discard unused concrete older than 12 hours. Retempering is prohibited.
- 3.12 MISCELLANEOUS WORK
- A. All bolts, anchors, miscellaneous metals or other sleeves and steel work required to be set in the concrete forms for attachment of electrical, and mechanical equipment shall be set or installed under this Section. The CONTRACTOR shall be fully responsible for the setting of such materials in the forms and shall correct all such not installed in a proper location or manner at the CONTRACTOR's own expense.
 - B. Electric conduits shall be installed in the concrete as required by the Drawings and specified elsewhere in the Specifications.

END OF SECTION

SECTION 16000

ELECTRICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General Conditions, apply to all the work specified in the Electrical Sections 16000, 16001, 16050, 16903 and 16910.
- B. Section 01300: Submittals
- C. Section 01720: Project Record Documents
- D. Section 01740: Warranties and Bonds
- E. Section 02070: Demolition
- F. Section 02500: Restoration and Cleanup

1.02 LAWS, PERMITS, FEES AND NOTICES

- A. Secure and pay all permits, fees and licenses necessary for the proper execution of the work. Submit all notices and comply with all laws, ordinances, rules and regulations of any public agency bearing on the work. CONTRACTOR shall be a licensed Electrical CONTRACTOR in the county of construction. The I&C Vendor/ Supplier shall be established and licensed firm and UL 508 or UL 698A listed I&C panel manufacturer.

1.03 DEPARTURES

- A. If any departures from the Contract Drawings or Specifications are deemed necessary, details of such departures and the reasons therefore shall be submitted to the Engineer for advance written approval, prior to departure.

1.04 GUARANTEES

- A. Furnish written guarantee covering all materials, workmanship, labor and equipment for a period of one (1) year from the date of acceptance as described in the Contract General Conditions.
- B. The Owner reserves the right to operate and use all materials and equipment failing to meet the requirements of the Contract Documents until such unacceptable materials and equipment are replaced or repaired to the satisfaction of the Engineer.

1.05 AS-BUILT INFORMATION

- A. A set of "red-lined" electrical drawings shall be carefully maintained at the job site. Actual conditions are to be put on the drawings in red on a daily basis so the drawings will continuously show locations and routes of cable trays, conduits, pull-boxes, circuit numbers, and other information required by the ENGINEER and in conformance with Section 01720.

1.06 JOB SITE VISIT

- A. **Visit the project site before submitting a bid. Verify all dimensions shown and determine the characteristics of existing facilities which will affect performance of the work, but which may not be shown on drawings or described within these Specifications.**

1.07 CLEANUP

- A. Maintain a continuous cleanup during the progress of the work and use appointed storage areas for supplies. The premises shall be kept free from accumulations of waste materials and rubbish.

1.08 CUTTING AND PATCHING

- A. Cut and prepare all openings, chases and trenches required for the installation of conduits and wiring.

Repair, remodel and finish in strict conformance with the quality of workmanship and materials in the surroundings. Obtain written permission from the Engineer for any alterations to structural members before proceeding.

1.09 MAINTENANCE

- A. Render all necessary measures to ensure complete protection and maintenance of all systems, materials, and equipment prior to final acceptance. Any materials or equipment not properly maintained or protected to assure a factory new condition at the time of final acceptance shall be replaced immediately at no additional cost to the Owner.

1.10 WATERPROOFING

- A. Whenever any work penetrates any waterproofing, seal and render the work waterproof. All work shall be accomplished so as not to void or diminish any waterproofing bond or guarantee.

1.11 TESTS

- A. Conduct an operating test of equipment (engine start and I&C alarms) prior to the Engineer's inspection. The equipment shall be demonstrated to operate in accordance with the requirements of these Specifications. The tests shall be performed in the presence of the City's Project Manager and the Engineer or an authorized representative. The Electrical CONTRACTOR shall furnish all instruments, electricity and personnel required for the tests.

1.12 SUMMARY OF ELECTRICAL WORK

- A. Provide all labor, materials, tools, supplies, equipment, and temporary utilities to complete the work shown on the drawings and specified herein. All systems are to be completely installed and fully operational. Specifically the work includes, but is not necessarily limited to:
 - 1. Demolition and relocation of existing electrical equipment as called out in the plans and Specification Sections 02070 and 16001.
 - 2. All electrical work associated with the fuel tank and the Blue Belle engine.
 - 3. Power and control conduits, raceways and wires associated with the fuel tank and Blue Belle engine.
 - 4. Power service to battery charger, control panel and panel light, plan notes and specifications description.
 - 5. Power distribution including relocated (new) engine control panel, grounding, surge protection, conduit and wire.
 - 6. PLC-3/CLP 3.1 cabinet penetration.
 - 7. Start-up testing and documentation
- B. I&C START UP SERVICES TO INCLUDE
 - 1. Control loop verifications TLS 300 and Blue Belle engine.
 - 2. Verification of tanks high and low level (TLS 300).
 - 3. Verification of interstitial leak detection (TLS 300).
 - 4. Verification of engine start/stop based on set water pressure settings, opening of cool water N/C 2 inch diameter solenoid valve and open to start N/C air solenoid valve.
 - 5. Alarms testing (engine water overheat, engine oil pressure, engine fuel pressure, battery backup).
 - 6. TLS 300 testing and on-site training sessions.
 - 7. Programming and HMI screen verification to be determined by the City.

1.13 ELECTRICAL POWER SERVICE REQUIREMENTS

- A. The CONTRACTOR shall coordinate with the Plant Superintendent and the City's Project Manager all service installation requirements for the electrical and I&C work and shall include in the bid all cost requirements related to the electrical work and I&C work.
- B. **The CONTRACTOR shall visit the project site before submitting the bid and shall verify all field conditions and characteristics which will affect the work, but which may not be indicated on the drawings or specifications.**
- C. The CONTRACTOR shall pay all costs to the single I&C vendor/ supplier for the design and fabrication of the engine control and monitoring panel including but not limited to installation.

1.14 CODES AND STANDARDS

- A. General Applicable provisions of the following codes and standards and other codes and standards required by the State of Florida and local jurisdictions are hereby imposed on a general basis for electrical work (in addition to specific applications specified by individual work sections of these specifications):
 - 1. U.L.: Electrical materials shall be approved by the Underwriters' Laboratories, Inc. This applies to materials which are covered by U.L. standards. Factory applied labels are required.
 - 2. National Electrical Code.
 - 3. OSHA: Standards of the Occupational Safety and Health Administration are to be complied with.
 - 4. NEMA: National Electrical Manufacturers Association Standards are to be met wherever standards have been established by that agency.
 - 5. ANSI: American National Standards Institute
 - 6. NESC: National Electrical Safety Code

1.15 ELECTRICAL SUBMITTAL

- A. Submittals for Approval
 - 1. Refer to Contract General Conditions for additional instructions on the General Conditions and this Section, the more stringent requirements shall apply.
 - 2. Shop Drawings and manufacturer's data sheets are required for all electrical materials and I&C submittals.
 - 3. Submittals will not be accepted for partial systems. Submit all materials for each specification section at one time. Submittals must be arranged, correlated, indexed and bound in orderly sets for ease of review.
 - 4. Samples are to be supplied for any substitute as requested by the Engineer.
 - 5. The following numbers of copies are required:

Shop drawings	5 sets
Manufacturer's data	5 sets
Certifications	5 sets
Test reports	5 sets
Warranties/Guarantees	5 sets
 - 6. Submit shop drawings, manufacturer's data and certifications on all items of electrical and I&C work prior to the time such equipment and materials are to be delivered. No equipment or materials shall be delivered without approval from the Engineer. Submittals will not be accepted for partial system submittals; submit all data at one time. Submittals will be promptly returned, approved, approved as noted, or not approved. Items "approved as noted"

must be changed to comply with the Engineer's comments and need not be resubmitted for "approved" status. Items "not approved" are not suitable, requiring complete new submittals.

7. Time delays caused by rejection of submittals are not cause for extra charges to Owner or time extensions. CONTRACTOR shall be responsible for investigating existing systems or shop drawings in order to fully integrate the new equipment into the system. Adequate shop drawings may or may not exist for all existing systems.

B. Operation and Maintenance Manuals

1. Submit to the Engineer five (5) copies of all manufacturer's service installation and operation manuals, instructions and bulletins (TLS 300 and Blue Belle Panel). Manuals shall contain, but not be limited to, the following:
 - a. Brief description of system and basic features.
 - b. Manufacturer's name and model number for all components in the system.
 - c. List of local factory authorized service companies.
 - d. Operating instructions (TLS300).
 - e. Maintenance instructions (TLS300).
 - f. Trouble shooting instructions (TLS300).
 - g. Manufacturer's literature describing each piece of equipment.
 - h. Wiring diagrams
 - i. Parts lists

1.16 ELECTRICAL PRODUCTS

A. Standards Products

1. Unless otherwise indicated in writing by the Engineer, the products to be furnished under this Specification shall be the manufacturer's latest design. Units of equipment and components of the same purpose and rating shall be interchangeable throughout the project. All products shall be newly manufactured. Defective equipment or equipment damaged in the course of installation or testing, shall be replaced or repaired in a manner meeting with the approval of the Engineer at no additional expense to the Owner.

B. Delivery, Storage and Handling

1. Deliver products to project properly identified with names, model numbers, types, grades, compliance labels and similar information needed for distinct identification; adequately packaged or protected to prevent deterioration during shipment, storage and handling. Store in a dry, well ventilated, indoor space, except where prepared and protected by the manufacturer specifically for exterior instructions for storage locations.

C. Substitutions

1. Comply with instructions in the Contract General Conditions and Special Conditions and obtain pre-approval of the Engineer regarding substitutions.

1.17 ELECTRICAL IDENTIFICATION

- A. Color Coding Conductor colors shall be in accordance with the N.E.C. and NFPA requirements. Refer also to applicable sections of these specifications. Three phase feeder and branch circuits shall be identified as follows:

120/240	480-3P	120/208-3P	120/240-3P
A-Black	A-Black	A-Black	A-Brown
B-Red	B-Red	B-Red	B-Orange
N-White	C-Blue	C-Blue	C-Yellow
G-Green	N-Gray	N-White	N-White
G-Green	G-Green	G-Green	

B. Nameplates

1. The following items shall be equipped with nameplates: control panels, time switches, disconnects or relays in separate enclosures, receptacles and wall switches. All light switches and outlets shall carry a phenolic plate with the supply identified. Special Electrical systems shall be identified at junction and pullboxes, terminal cabinets and equipment racks.
2. Nameplates shall adequately describe the function of the particular equipment or alarm involved.

C. Wire and Cable Identification

1. All wire and cable shall be identified at each termination point and at each pull box, splice box or junction box. Provide permanent, waterproof, non-metallic (paper unacceptable) tags indicating the circuit number in 3/16 inch letters.
2. Individual wires within equipment enclosures shall be identified using the equipment manufacturer's shop drawing wire numbers. Panel wire numbers and terminal numbers shall agree. Wire markers shall be T&B shrink-kon HVM marker heat shrink system or an approved equal.

D. Signs

1. Warning signs shall comply with OSHA requirements and reasonable safety precautions.

END OF SECTION

SECTION 16001

ELECTRICAL DEMOLITION

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. CONTRACTOR shall take precautionary and safety measures to assure the safety of his personnel. All wires shall be identified and disconnected from power sources before removal.
- B. CONTRACTOR shall coordinate with the OWNER, the Chief Maintenance Supervisor, the Plant Superintendent, the City's Project Engineer, and the Engineer.
- C. The general demolition scope shall also include the following minimum requirements whether indicated on plans or not.
 - 1. Removal of all wire to be abandoned within disconnects, conduits, outlet boxes, and the like associated with the 2000 gallon fuel tank and Blue Belle engine as per plans.
 - 2. CONTRACTOR shall cover all openings and cap conduits as a result of demolition and removals including but not limited to the following:
 - a. Cut and remove conduits, instrumentation lines, etc. related to the WORK as per plans.
 - b. Wall and masonry openings resulting from demolition of specifically related to the WORK.
- D. Operational Systems
 - 1. To the fullest extent possible all required systems shall remain operational (i.e. 5KV MCC and Panel 14LL40). CONTRACTOR shall replace and /or repair existing facilities which may be damaged due to equipment removals.
 - 2. Where required wiring passes through or uses existing enclosures NOT shown for demolition, CONTRACTOR shall provide raceways and wire as required to keep those systems operational.
 - 3. CONTRACTOR shall remove existing equipment designated for removal in an orderly, planned and coordinated fashion. All new specified replacement equipment shall be on-site and ready to install immediately after the removal of existing equipment.

1.02 SPECIFIC EQUIPMENT REMOVALS

- A. The following include but do not limit the specific pieces of equipment for removal and disposition or relocation.
 - 1. Remove and dispose of existing power service (disconnect) for the "Blue Belle" engine's battery charger and abandoned lights as per plans. The power service is currently fed from the HSP 5KV MCC via a reduced voltage feed.

1.03 DISPOSITION OF EQUIPMENT

- A. Except as otherwise indicated, all removed, replaced or to be abandoned electrical equipment, as per plans, shall become the property of the CONTRACTOR. All rubble shall be disposed of by the CONTRACTOR.

END OF SECTION

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SECTION 16050

BASIC MATERIALS AND METHODS

PART 1 – GENERAL

1.01 SUBMITTALS

- A. Submit data sheets on all items per Section 16000.

1.02 CODES AND STANDARDS

- A. General applicable provisions of the following codes and standards and other codes and standards required by the State of Florida and local jurisdictions are hereby imposed on a general basis for electrical work (in addition to specific applications specified by individual work sections of these specifications):
 1. U.L.: Electrical materials shall be approved by the Underwriters' Laboratories, Inc. This applies to materials which are covered by U.L. standards. Factory applied labels are required.
 2. National Electrical Code.
 3. OSHA: Standards of the Occupational Safety and Health Administration are to be complied with.
 4. NEMA: National Electrical Manufacturers Association Standards are to be met wherever standards have been established by that agency, and proof is specifically required with material submittals for switchboards, motor control centers, panel boards, cable trays, motors, switches, circuit breakers, and fuses.
 5. ANSI: American National Standards Institute.
 6. NESC: National Electrical Safety Code.
 7. NFPA: National Fire Protection Association

PART 2 - PRODUCTS

2.01 GROUNDING MATERIALS

- A. All ground rods shall be 10 foot 5/8" copperclad, unless otherwise indicated.
- B. Ground wires shall be soft drawn copper sized per National Electrical Code, unless otherwise indicated.

2.02 CONDUIT

- A. PVC Conduit (only where called for in the plans)
 1. PVC conduit shall be Schedule 80 unless otherwise noted, and shall be U.L. approved. Comply with Federal Spec WC-1094 and NEMA TC-1.
- B. Flexible Conduit (only where called for in the plans)
 1. All flexible conduits shall be liquid tight, made of corrosion resistant plated steel with extruded polyvinyl covering and watertight connectors.
- C. PVC Coated RGS
 1. PVC coated Rigid galvanized steel conduit system shall be coated inside and outside; provided by Pearmacoat or Robroy or equal.
- D. Conduit sealing hubs
 1. Conduit sealing hubs shall be Crouse Hinds ESSG-iron alloy with Chico X Fiber and Chico A sealing compound. Armored gaskets and locknuts shall be provided. Standard finish.

2.03 CABLE, WIRE AND CONNECTORS

- A. 600 Volt Power Wiring

1. Cable shall be rated for 600 volts and shall meet the requirements below:
 - a. Conductors shall be stranded.
 - b. All wire shall be brought to the job in unbroken packages and shall bear the date of manufacturing; not older than 12 months.
 - c. Type of wire shall be THWN except where required otherwise by the contract drawings.
 - d. No wire smaller than No. 12 gauge shall be used unless specifically indicated.
 - e. Conductor metal shall be copper.
 - f. All conductors shall be meggered after installation and insulation must be in compliance with the National Electrical Code.
 - B. Instrumentation and Control Cable
 1. Process instrumentation wire shall be 16 gauge twisted pair, 600 V, cross-linked polyethylene insulated, aluminum tape shielded, polyvinyl chloride jacketed, type "XLP" as manufactured by the American Insulated Wire Co., Eaton Corp. "Polysat", or equal. Multiconductor cables with individually shielded twisted pairs shall be installed where indicated.
 2. Multiconductor control cable shall be stranded 14 gauge, 600 V, cross-linked polyethylene insulated with PVC jacket, type "XLP" as manufactured by the American Insulated Wire Co., Eaton Corp. "Polysat", or equal.
- 2.04 TERMINATIONS AND SPLICES (600 VOLTS AND LESS)
- A. Terminations of power cable shall be by means of U.L. approved connectors. All connectors shall meet U.L. 486B and shall be compatible with the conductor material.
 - B. Terminate all control and instrumentation cable with an approved type connection.
 - C. Splicing of power, control, or instrumentation wiring will not be allowed except by written approval of the Engineer. Where splicing is allowed, splices shall be made with approved compression connectors, and splices shall be made waterproof regardless of location.
- 2.05 BOXES
- A. All indoor and outdoor junction boxes and pull boxes shall be NEMA 4X stainless steel or FRP.
- 2.06 MOUNTING AND SUPPORTING ELECTRICAL EQUIPMENT
- A. Furnish and install all supports, hangers, trapezes and inserts required to mount fixtures, conduits, cables, pull boxes, and other equipment furnished under this section or furnished for installation under this section.
 - B. Perforated straps and wire are not permitted for supporting electrical devices. Anchors shall be of approved types.
 - C. All supports, hangers, hardware, etc. used outdoors, in corrosive atmosphere, or in hazardous areas shall be non-ferrous, corrosion resistant, or stainless steel. Supports shall be selected to avoid galvanic reactions. Support devices shall be submitted for approval.

PART 3 -- EXECUTION

3.01 GROUNDING

- A. Provide ground system as indicated on the drawings and as required by the National Electrical Code.
- B. All raceways require grounding conductors. Bonding conductors through the raceway systems shall be continuous from Panel 14LL40 to new equipment (TLS300 and battery charger) and control panel. **THESE GROUND CONDUCTORS ARE REQUIRED THROUGHOUT THE PROJECT REGARDLESS OF WHETHER CONDUIT RUNS SHOW GROUND CONDUCTORS ON THE DRAWINGS.**

3.02 CONDUIT

A. Locations:

Conduits shall be used as follows:

1. PVC coated Rigid galvanized steel shall be used in hazardous and corrosive environments such as the high service pump room.

B Installation

1. Conduits subjected to rough handling or usage shall be removed from the premises.
2. Where conduits pass through exterior concrete walls, the entrances shall be made watertight. This shall be done by providing pipe sleeves in the concrete with one half inch minimum clearance around the conduits and caulking with askum and sealant, or by means of conduit entrance seals.
3. Conduits entering panelboards, pull boxes, or outlet boxes shall be secured in place by galvanized locknuts and bushings, one (1) locknut outside and one (1) locknut inside of box with bushing on conduit end. The locknuts shall be tightened against the box without deforming the box. Bushings shall be of the insulating type.
4. Field conduit bends shall be made with standard tools and equipment manufactured especially for conduit bending.
5. Exposed runs of conduits shall be installed with runs parallel or perpendicular to walls, structural members or intersections of vertical planes and ceilings, with right angle turns consisting of symmetrical bends or pull boxes as indicated on the drawings. Bends and offsets shall be avoided where possible.
6. Pull wires shall be installed in all empty conduits. Pull wires shall be No. 12 gauge copper. All pull wires shall be identified with conduit number at each end.
7. The use of running threads is prohibited and where some such device is necessary, split couplings, Erickson couplings, or equal shall be used. Where watertight conduit installations are required, watertight conduit unions shall be used.
8. Concrete inserts and pipe straps shall be stainless steel or PVC. Bolts shall be stainless steel. Individual hangers, trapeze hangers and rods shall be stainless steel or PVC.
9. Wire shall not be installed until all work of any nature that may cause damage is completed. Mechanical means shall not be used in pulling in wires No. 8 or smaller.
10. All conduits shall be cleaned by pulling a brush swab through before installing cables.
11. All conduits shall be sealed at each end with electrical putty. Special care shall be taken at all equipment where entrance of moisture could be detrimental to equipment.
12. At least two (2) feet of flexible conduit shall be used at connections of all solenoid operated valves, instruments, and other items of equipment where vibration is present.

3.03 WIRES, CABLES AND CONNECTIONS

- A. Cables pulled into conduits shall be pulled using pulling eyes attached to conductors.
- B. Shields shall be grounded at only one termination point.

3.04 BOXES

- A. Installation of boxes shall be in accordance with the National Electrical Code requirements.
- B. Boxes shall be mounted plumb and level in accessible locations and mounting shall be secure, vibration resistant, and galvanically compatible. Hardware shall be used that is specifically intended for the purpose. When mounted in corrosive, damp or wet locations, stainless steel or PVC hardware shall be utilized.

3.05 WIRING DEVICES

- A. Wiring devices shall be installed in device boxes approved for the application. All connections shall be made with approved terminals.

3.06 SUPPORTING DEVICES

- A. All items shall be supported from the structural portion of the building and studs. Supports and hangers shall be of types approved by Underwriters' Laboratories.
- B. All wall mounted devices (disconnect, TLS 300, Blue Belle control panel, etc.) shall be securely anchored to the wall. Where recommendations are made by manufacturer, these recommendations shall be adhered to.

END OF SECTION

SECTION 16903

CONTROL PANEL

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The CONTRACTOR shall furnish, install and place into service operating process instrumentation, control systems and panel including accessories, related to the Control Panel (C/P) as shown on plans and specified herein.

1.02 SINGLE INSTRUMENT SUPPLIER

- A. **The CONTRACTOR shall assign to the Single Instrument and Control (I&C) SUPPLIER full responsibility for the functional operation of all new control and instrumentation systems. The CONTRACTOR shall have said supplier perform all engineering necessary to select, to furnish, to supervise installation, connection, to calibrate, to place into operation all sensors, instruments, alarm equipment, control panels, accessories and all other equipment as specified herein.**
- B. The foregoing shall enable the CONTRACTOR and the OWNER to be assured that the full responsibility for the requirements of this section will reside in an organization which is qualified and experienced in the control and instrumentation field and its process technology on a functional system basis.
- C. The I&C supplier shall be a UL 508 or UL 698A listed manufacturer, Champion Controls or approved equal.
- D. Major pieces of equipment include:
 - 1. New Control Panel including communication with the existing PLC- 3. PLC- 3 has 6 available spares 24v DC on base rack 0 slot 3 as per the City's Chief Maintenance Supervisor. The CONTRACTOR and I&C VENDOR shall confirm during site visit.
- E. See Section 16000 1.12 Summary of Electrical Work

1.03 INSTALLATION WORK

- A. Nothing in this part of the specifications shall be construed as requiring the CONTRACTOR to utilize personnel supplied by the CONTRACTOR'S assigned instrument manufacturer's organization or any division thereof, to accomplish the physical installation of any elements, instruments, accessories or assemblies specified herein. However, the CONTRACTOR shall employ an I&C subcontractor installer who is skilled and experienced in the installation and connection of all elements, instruments, accessories and assemblies; portions of their work shall be supervised or checked as specified herein.

1.04 PREPARATION OF SUBMITTAL OF DRAWINGS AND DATA

- A. It is incumbent upon the CONTRACTOR to coordinate the WORK specified in these Sections so that a complete instrumentation and control panel will be provided and will be supported by accurate shop and record drawings. As part of the responsibility assigned to the CONTRACTOR, the Single I&C supplier shall prepare and submit through the CONTRACTOR, complete and organized shop control panel drawings to interface between: the engine battery charger for engine starts, TLS 300 tank monitoring unit, engine function and operation monitoring, all connecting to the existing PLC-3. All items shall be included in the CONTRACTOR'S shop drawing submittal.
- B. In order to provide a fully coordinated system, shop drawings by other equipment vendors associated with the I&C control panel systems shall be reviewed and approved by the CONTRACTOR before submittal to the ENGINEER for approval (i.e., solenoid valves, etc.).

1.05 ADDITIONAL TECHNICAL SERVICES

- A. At no additional cost to the OWNER, the CONTRACTOR shall provide the services of qualified technical representatives of the Single I&C supplier:
 - 1. To supervise installation and connection of all instruments, elements and components of every system, including connection of instrument signals to primary measurement elements and to final control elements;
 - 2. To make all necessary adjustments, calibrations and tests, including reprogramming if necessary.
 - 3. I&C START UP SERVICES TO INCLUDE
 - a. Control loop verifications
 - b. Verification of tank high and low levels signals
 - c. Verification of interstitial probe sensing signal
 - d. Verification of engine start/stop settings
 - e. Alarms testing (engine overheat, power failure, battery backup)
 - f. Telemetry testing
 - g. Fuel pressure display
 - h. HMI screen verification with the CITY at a later date
 - 4. To instruct operating and maintenance personnel on instrumentation and trouble shooting. This time shall be in addition to whatever time is required for other facets of work at the site and shall be during the OWNER's normal working days and hours.

1.06 GUARANTEE

- A. The CONTRACTOR shall guarantee all equipment and installation, as specified herein, for a period of one (1) year following the date of completion of the WORK. To fulfill this obligation, the CONTRACTOR shall utilize technical service personnel designated by the Single I&C supplier to which the CONTRACTOR originally assigned project responsibility for instrumentation.

1.07 ADDITIONAL PROVISIONS

- A. The applicable provisions of the following sections under Electrical Work shall apply to the WORK and equipment specified herein, the same as if stated in full herein:
 - 1. Codes and Standards
 - 2. Equipment Materials and Workmanship
 - 3. Testing
 - 4. Grounding
 - 5. Equipment Anchoring
 - 6. Conductor and Equipment Identification
 - 7. Terminal Cabinets and Control Compartments
 - 8. Process Control Devices

1.08 NEWEST MODEL COMPONENTS

- A. All alarms, instruments and other components shall be the most recent field proven models marketed by their manufacturers at the time of the submittal of shop drawings unless otherwise specified to match existing equipment. All technical data publications included with the submittal shall be the most recent issue.

1.09 COORDINATION

- A. **I&C supplier shall coordinate with the I&C supplier field personnel and the CONTRACTOR on the project. The CONTRACTOR and the I&C supplier shall coordinate before the bid to be certain all equipment, engineering and labor are provided.**

Coordination items minimally include: power requirements, control and signal requirements, and interconnection requirements to power panel 14LL40 and PLC-3.

1.10 TEST PROCEDURE DEVELOPMENT AND DOCUMENTATION

- A. I&C subcontractor shall prepare and submit to the ENGINEER for review a detailed description of the test procedures proposed to perform to demonstrate conformance of the complete system of instrumentation and controls to this Specification, specifically the Blue Belle engine start sequence.
- B. It is recommended that the I&C subcontractor develop the test procedures in two steps by first submitting general descriptions and outlines of the tests and then, upon receipt of approval, submit the required detailed procedures and forms.
- C. Operational Acceptance Tests
 - 1. The I&C subcontractor shall prepare check-off sheet(s) for each loop and an instrument calibration sheet for each active I&C element. These check-off and data sheets shall form the basis for these operational tests and this documentation.
 - 2. Each loop check-off sheet shall cite the following information and shall provide spaces for sign-off on individual items and on the completed loop by the I&C subcontractor.
 - a. Project name
 - b. Loop number
 - c. For each elements: Tag number, description, manufacturer and model number, installation bulletin, and Specification sheet number.
 - d. Loop description
 - e. Installation check
 - f. Termination check
 - g. Calibration check
 - h. Adjustment check
 - i. Space for comments
 - j. Space for loop sign-off I&C subcontractor and date.
 - 3. Each instrument calibration sheet shall provide the following information and a space for sign-off on individual items and on the completed unit by OWNER Representative and the I&C subcontractor.
 - a. Project name
 - b. Loop number
 - c. Tag number
 - d. Manufacturer
 - e. Model number
 - f. Serial number
 - g. Calibration range
 - h. Calibration data: Input, output and error at 0, 25, 50, 75, and 100% of span.
 - i. Switch setting, contact action and dead band for discrete elements.
 - j. Space for comments
 - k. Space for sign-off by I&C subcontractor and date.
- D. Functional Acceptance Tests

The I&C subcontractor shall prepare two types of test forms as follows:

 - 1. For those functions that can be demonstrated on a loop-by-loop basis, the form shall include:
 - a. Project name
 - b. Loop number
 - c. Loop description
 - d. Test procedure description
 - e. For each component: Tag number, description, manufacturer and data sheet number.

- f. Space for sign-off and date by both I&C subcontractor and OWNER Representative.
- 2. For those functions that cannot be demonstrated on a loop-by-loop basis, the test form shall be a listing of the specific tests to be conducted. With each test description, the following information shall be included:
 - a. Spec page and paragraph of function demonstrated
 - b. Description of function
 - c. Space for sign-off and date by both I&C subcontractor and ENGINEER.

PART 2 - PRODUCTS

2.01 SPARE PARTS

- A. The CONTRACTOR shall include, as part of the bid package, a list of recommended spare parts covering items required under these specifications.

2.02 CONTROL PANELS

- A. General
 - 1. **I&C supplier shall construct the control panel to properly control internal and external equipment. No attempt is made to specify or indicate on plans, all required equipment but rather to set forth the minimum requirements.**
- B. Engineering
 - 1. **I&C supplier shall provide system engineering and produce detailed fully engineered, coordinated and completed drawings.**
- C. Construction
 - 1. Control panel construction shall be per these specification and plans.
- D. Signal and Control Circuit Wiring
 - 1. Wire Type and Sizes: Conductors shall be flexible stranded copper wire; these shall be UL listed TFFN, THWN, THHN and shall be rated 600v. Wire for control signal circuits shall be #14 AWG unless otherwise noted. All instrumentation cables shall be shielded #18 AWG with a copper drain wire unless otherwise noted. All special instrumentation cable such as between sensor and transmitter shall be supplied by the I&C supplier. CONTRACTOR shall increase wire size per load or impedance requirements.
 - 2. Wiring Instrumentation: All wires shall be run in plastic wire-ways except (1) field wiring, (2) wiring between mating blocks in adjacent sections, (3) wiring run from components on a swing-out panel to components on a part of the fixed structure, (4) wiring run to panel mounted components on the door and the like. Wiring run on a swing out panel to other components on a fixed panel shall be made up in nylon wire ties bundles and secured so that bundles are not strained at the terminals.
 - a. Wiring run to control devices on the front panels shall be tied together at short intervals with nylon ties and secured to the inside face of the panel using adhesive mounts and adhesive strips.
 - b. Wiring to rear terminals on panel mounted instruments shall be run in plastic wares secured to horizontal brackets run above or below the instruments in the same plane as the rear of the instruments.
 - c. Shields of instrument cable shall only be grounded on one side of each circuit. The side to be grounded shall be nearest the source of excitation.
 - d. Care shall be exercised to properly insulate the ungrounded side of the loop to prevent ground loops from occurring.
 - e. Conformance to the above wiring installation requirements shall be reflected by details shown on the shop drawings for the ENGINEER's review.

3. Wire Marking: Each signal, alarm, control, and indicating circuit conductor connected to a given electrical point shall be designated by a single unique number which shall be shown on all shop drawings. These numbers shall be marked on all conductors using white plastic heat-shrink sleeves with typewritten characters. Instrument signal conductors shall be tagged with unique multiple digit numbers. Wires from the circuit breaker panel board shall be tagged indicating the branch circuit breaker number.
 4. Terminal Blocks: Compression type terminal blocks shall be molded plastic with barriers and box lug terminals, and shall be rated 15 amps at 600v and mounted securely to rails. White marking strips fastened to the molded sections shall be provided and wire numbers and circuit identifications shall be marked thereon with machine printed marker on top. Terminal blocks shall be Phoenix or an approved equal.
 5. Wire Color: Wire color shall be, Line Power B Black; Neutral or common B White; AC Control B Red; DC Control B Blue; Equipment or Chassis Ground B Green; specified externally powered circuits B Orange.
- E. Enclosures
1. Unless otherwise indicated, all enclosures shall be provided with the following.
 - a. NEMA 4X, gasketed, all stainless steel, provide cut in bottom for conduit penetration.
 - b. Subplate for mounting equipment.
 - c. Padlockable, pocketed exterior doors.
 - d. Where required, provide stainless steel piano hinged dead fronts with quarter turn latches.
- F. Identification
1. All components shall be identified using Lamicoïd labels or an approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION, CALIBRATION, TESTING, START UP AND INSTRUCTION

A. General

1. Under the supervision of a Single I&C supplier, all systems specified in this section shall be installed, connected, calibrated and tested and in coordination with the OWNER and ENGINEER shall be started to place the Blue Belle engine in operation by a set low pressure reading.

B. Installation and Connection

1. The CONTRACTOR shall install and connect all field mounted components and assemblies under the criteria imposed in 1.03, herein. The installation personnel shall be provided with a final reviewed copy of the shop drawings and data.
2. The instrument process lines, impulse piping lines and air signal tubing shall, in general, be installed in a similar manner to the installation of conduit specified under Section 16000.
3. Bends shall be formed with the proper tools and to uniform radii and shall be made without deforming or thinning the walls of the tubing.
 - a. Unless otherwise indicated, all fittings, adapters, impulse piping, valves, etc. shall be 304 stainless. Valves shall be Whitey Series 40 or an approved equal.
4. **The CONTRACTOR shall have a technical field representative of the I&C supplier to instruct these installation personnel on any and all installation requirements; thereafter the technical field representatives shall be readily available by telephone to answer questions and to provide clarification when needed by installation personnel.**
 - a. Where primary elements (supplied by the I&C supplier) will be part of a mechanical system, the I&C supplier shall coordinate the installation of the primary elements with the mechanical system manufacturer (Blue Belle engine).
5. After all installation and connection work has been completed, the technical field representatives shall check all for correctness, verifying polarity of electric power and signal

connections making sure all process connections are free of leaks and all such similar details. The technical field representative shall certify in writing to the CONTRACTOR that for each loop or system he/ she has completed such check out and that any discrepancies have been corrected by the installation personnel.

6. The field representative of the I&C supplier shall coordinate all work required to interface the new panel and the existing PLC, including all required modifications to the existing equipment such as a new transducer cable and related devices.

C. Calibration

1. All existing and new instruments shall be calibrated.
 - a. All instruments and systems shall be calibrated after installation, in accordance with the component manufacturer's written instructions. This shall provide that those components having adjustable features are set carefully for the specific conditions and applications of this installation and that the components and/or systems are within the specified limits of accuracy. Defective elements which cannot achieve proper calibration or accuracy, either individually or within the system shall be replaced. This calibration work shall be accomplished by the I&C Supplier.
 - b. Proof of Conformance B: The burden of proof of conformance to the specified accuracy and performance is on the CONTRACTOR using the CONTRACTOR's designated I&C supplier. The CONTRACTOR shall supply necessary test equipment and technical personnel if called upon to prove accuracy and performance at no additional cost to the OWNER, wherever reasonable doubt or evidence of malfunction or poor performance may appear within the guarantee period.

D. Testing

1. All systems shall be exercised through operational tests in the presence of the ENGINEER in order to demonstrate achievement of the specified performance. Operational tests depend upon completion of work specified elsewhere in these specifications. The scheduling of the test shall be coordinated by the CONTRACTOR among all parties involved so that the tests may proceed without delays or disruption by incomplete work.
2. All functional/loop tests shall be witnessed and signed off by the OWNER's representative and the I&C subcontractor.

E. Training

1. O&M operating personnel shall be provided with training prior to work completion.
2. One four (4) hour training session shall be provided. Training shall be at a time convenient to the OWNER.
3. Operating and maintenance personnel shall be instructed in the functions and operation of each system and shall be shown the various adjustable and set point features which may require readjustment, resetting or checking, recalibration or maintenance by them from time to time. This instruction shall be scheduled at a time arranged with the OWNER at least two (2) weeks in advance. Instruction shall be given by qualified persons employed by the I&C supplier.

F. Final Start-Up by the CITY

1. When all systems are assessed by the CONTRACTOR to have been successfully carried through complete operational tests with a minimum of simulation and numbered start-ups, and the ENGINEER concurs with the CONTRACTOR's assessment, start-up by the City's staff personnel can follow.

END OF SECTION

SECTION 16910

ABOVEGROUND STORAGE TANK MONITORING SYSTEM

PART 1 - GENERAL

1.01 Environmental Compliance Monitoring Network Installation

- A. The Contractor shall furnish and install a new Veeder-Root Model TLS-300 Aboveground Storage Tank (AST) Monitoring System.
- B. The AST monitoring system shall:
 1. provide an audible and visual indication of all system, in-tank leak detection (0.1GPH), product line leak detection (0.1 GPH) on a continuous 24-hour basis in conjunction with the audible and remote alarm to PLC;
 2. provide the operator with an acknowledgment switch but the audible alarm shall not be disabled until the alarm condition has been corrected.;
 3. have the ability to store up to three alarm occurrences in memory.

1.02 Veeder-Root Model TLS-300 Configuration

The Veeder-Root Model TLS-300 configuration shall include but not be limited to the components listed below. The CONTRACTOR is responsible for providing a complete system that will perform the requested functions above under Environmental Compliance Monitoring Network Installation.

- A. Console: The Console shall be equipped with a two line 24-character liquid crystal display for alarm information, a 24-button front panel keyboard for programming, and a thermal report printer with built-in take-up spool for hard copy documentation of inventory, leak detection, alarm information and facsimile transmissions.
- B. Module Enhancements: The module enhancements shall provide continuous statistical leak detection (CSLD) for 24-hours without tank shut-down and continuously track product inventory through the fuel manager and CSLD modules.
- C. In-Tank Probes for use with CSLD Software Enhancement: The system requires magnetostrictive probes which have been third party tested and certified to perform better than US EPA standards for both 0.1 GPH volumetric tank tightness testing and 0.2GPH automatic tank gauging.
- D. Probe Installation Kits, Interface Module and 4 inch Riser Caps and Ring Kits: Shall be compatible with the in-tank magnetostrictive probes and in-tank product type (gasoline and diesel)
- E. Dual Float Hydrostatic Reservoir Sensor, Interstitial/ Liquid Sensor Interface Module and Universal Sensor Mounting Kits: Shall be compatible with the hydrostatic reservoir sensor and discriminating containment sump probe, as applicable.
- F. Overfill Alarm, Overfill Alarm Acknowledgement Switch and Interfaced Module: The alarm shall be audible and visual and activate when in-tank leak (0.1 GPH), line leak (0.1 GPH), containment sump/dispenser pan fluid detection and sensor failure occurs. The alarm shall provide the operator with the ability to acknowledge the alarm and disable the audible indicator. The external alarm box and acknowledgment switch shall interface to the tank monitoring system (console) via an internal relay module.

1.03 System Start-Up

- A. The CONTRACTOR shall adapt and program the parameter driven software to the on-site tank specifications in the assigned fields at the time of system start-up.
- B. The CONTRACTOR shall set-up all the required parameters, interface modules and communications necessary to operate the fuel management system and environmental

compliance monitoring network, in accordance with MANUFACTURER'S guidelines and recommendations.

- C. Upon installation, the system shall perform in accordance with subpart D of 40CFR 280,

American National Standards Institute (ANSI), and the applicable City/County regulatory agencies.

- D. Any/all surface or subsurface areas which were altered due to the construction or installation phase of this project shall be brought back to its original condition by the Contractor and at no cost to the City.
- E. Upon completion of installation, the CONTRACTOR, with the CITY REPRESENTATIVE present, shall meet a BCEPD inspector to insure any/all documents (i.e., as-builts, tightness tests, etc.) have been registered with BCEPD and that project compliance has been achieved, in accordance with current State and County regulations. The completion of the project requires:
 - 1. that all of the specifications have been met,
 - 2. that a BCEPD operational permit has been obtained,
 - 3. the successful operation of the new fuel system and new environmental compliance monitoring network in accordance with MANUFACTURER'S requirements and guidelines.

1.04 System Training and Warranty

- A. A certified factory representative(s) for the fuel management system and environmental monitoring system shall provide eight (8) hours of on-site training to City Representatives on the programming and troubleshooting of the installed systems. Additional, free telephone support shall be available for up to one (1) year from the date of installation.
- B. The new fuel management system and new environmental compliance monitoring network shall be warranted for a minimum of one (1) year to include 100% of parts and labor with all work performed on-site by an authorized manufacturer's representative(s).
- C. Five complete sets of manuals for the TLS-300 shall be provided to the CITY.
- D. In addition to the standard one year manufacturer's warranty, the CONTRACTOR shall provide an alternate bid for a MANUFACTURER'S one year extension warranty contract at an additional cost to the CITY. The CITY shall have the option to purchase this extended warranty contract prior to the expiration date of the original one year warranty.

END OF SECTION

SECTION 20000

EXHIBITS INDEX

Exhibit	Title
I	Report of Geotechnical Exploration (6 pages)
II	Available Spares at PLC-3, Interconnect Panel 3.1, Rack 0, Slot 3
III	Modern Welding Co., Inc. - FIREGUARD AST (2 pages)



ENGINEERING & TESTING, INC.

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www.floridaengineeringandtesting.com

250 S.W. 13th Avenue

Pompano Beach, FL 33069

**REPORT OF
GEOTECHNICAL EXPLORATION**

FOR:

**Oscar L. Rubio & Associates
151 North Nob Hill Road Suite #248
Plantation, Florida 33324**

PREPARED FOR:

**Proposed 2,000 Gallon Tank Foundation Slab
City of Pompano Beach Water Plant
N.E. 12th Street & N.E. 3rd Avenue
Pompano Beach, Florida**

PREPARED BY:

**Florida Engineering & Testing, Inc.
250 S.W. 13th Avenue
Pompano Beach, Florida 33069
(954) 781-6889**

ON:

July 10, 2013





ENGINEERING & TESTING, INC.

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250 S.W. 13th Avenue

Pompano Beach, FL 33069

July 10, 2013

Job Order No.: 13-1904

Oscar L. Rubio & Associates
151 North Nob Hill Road Suite #248
Plantation, Florida 33324

RE: SUBSOIL INVESTIGATION
Proposed 2,000 Gallon Tank Foundation Slab
City of Pompano Beach Water Plant
N.E. 12th Street & N.E. 3rd Avenue
Pompano Beach, Florida

Dear Sir or Madam;

Pursuant to your request, Florida Engineering & Testing, Inc., has completed a subsoil investigation on July 9, 2013, at the above referenced site. The purpose of our investigation was to verify subsoil conditions relative to the proposed 2,000 gallon tank foundation slab's foundation preparation and design.

A total of one (1) SPT boring(s) was/were performed according to **ASTM D-1586** down to a depth of twenty-five feet (25') below existing ground level (BEGL) (see attached field sketch for locations). The following is a general condition for the subject site:

<u>Depth</u>		<u>Soil Descriptions</u>
<u>From</u>	<u>To</u>	
0'0"	2'0"	Dark Brown to Brown Fine Sand
2'0"	4'0"	Reddish Brown Fine Sand
4'0"	7'0"	Light Gray Fine Sand
7'0"	15'0"	Brown Fine Sand
15'0"	25'0"	Light Brown Fine Sand

Groundwater table elevation was measured immediately at the completion of the boring(s) and was found down to a depth of nine feet seven inches (9'7") BEGL. Fluctuation in water levels should be anticipated due to surface runoff, tidal influences, seasonal variations, varying ground elevation, construction dewatering and pumping activities in the area. Site contractor must familiarize themselves with site conditions in the event groundwater controls and dewatering is needed. The contractor shall make sure that groundwater levels on adjacent properties are not affected by the contractors dewatering activities. Specialty groundwater contractors shall be consulted for all work below the groundwater level.





The boring log(s) attached present(s) a detailed description of the soils encountered at the test location(s). The soil stratification shown on the boring log(s) is based on the examination of the recovered soil samples and interpretation of the driller's field log(s). It indicates only the approximate boundaries between soil types. The actual transitions between adjacent soil types may be gradual.

Based on our understanding of the proposed structure and the information obtained from our field boring log(s); we recommend the following procedures for foundation preparation:

- 1) Strip the entire construction areas plus two feet (2') past the outer perimeter of the structure of topsoil and ground vegetation (when encountered) down to clean granular material.
- 2) Saturate and compact all construction areas with a self-propelled vibratory to a minimum of 95% of the A.S.T.M. D-1557 modified proctor method. Make a minimum of ten (10) passes with the roller in each direction.
- 3) Backfill construction areas to proper elevation if needed using a clean granular material placed in lifts not to exceed twelve inches (12") in thickness and compacted as per item 2.
- 4) Care should be taken when using vibration in case of existing structures in the vicinity of the construction area. If vibration cannot be used for compaction, static compaction may be applied. However, in this case, the compacted layers should not exceed six inches (6") in thickness.
- 5) All construction fill material shall be clean granular soil, free of organics or other deleterious material, and shall contain no more than twelve (12) percent fines passing a U.S. Standard No. 200 sieve (0.075mm).
- 6) Representative samples of the on-site and proposed fill material should be collected and tested to determine the classification and compaction characteristics.
- 7) Verify all densification procedures by taking an adequate number of field density tests in each layer of compacted material and bottom of footing excavations. **This must be scheduled immediately after Tamp and Spray and/or Compaction but before steel placement. If steel is already in-place, it must be removed from all areas to be tested prior to performing densities.**
- 8) All Geotechnical work shall be performed under the supervision of a Geotechnical Engineer or his representative.
- 9) After the installation of any plumbing and electrical piping; we recommend that the disturbed areas be recompacted and additional density tests be performed to verify proper compaction of the disturbed areas.

Provided the above foundation recommendations are achieved and verified; it is our opinion that the proposed structure can be designed for a shallow foundation system with a permissible soil bearing pressure not to exceed 2,500 P.S.F. Bearing capacity certification requires satisfactory completion and verification of all the above foundation recommendations.



If applicable, provisions shall be made by the architect, engineer of record and contractor to address differential settlements when tying in new to existing structures.

Regardless of the thoroughness of a Geotechnical exploration there is always a possibility that conditions may be different from those of the test location(s); therefore Florida Engineering & Testing, Inc., does not guarantee any subsoil condition surrounding the bore test hole(s). For a more accurate portrayal of subsurface conditions, the site contractor should perform test pits. The discovery of any site or subsurface conditions during construction which substantially deviate from the information in our subsoil investigation should be reported to us immediately for our evaluation. In accepting this report the client understands that all data from this soil boring report is intended for foundation analysis only and is not to be used for excavating, backfilling, or pricing estimates. The site contractor must familiarize themselves with the job site conditions prior to bidding.

As mutual protection to clients, the public, and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions, or extracts from or regarding our reports is reserved pending our written approval. All work must be conducted under the supervision of our Geotechnical engineer. All work shall be conducted in compliance with the Florida Building Code FBC and OSHA workers protection rules and all applicable Federal, State, County and City rules and Regulations.

Florida Engineering & Testing, Inc., appreciates the opportunity to be of service to you at this phase of your project. If you have any questions or comments, please give us a call. We would be pleased to help any way we can. It has been a pleasure working with you and look forward to doing so in the near future.

Sincerely,


7/12/13

Reza Javidan, P.E.

Florida Engineering & Testing, Inc.

Florida Reg. No. 60223

Certificate of Authorization No. 6923

SPT Test Boring Report

Client: Oscar L. Rubio & Associates Hole No: B-1

Project: Proposed 2,000 Gallon Tank Foundation Slab Date: 7/9/13

Address: N.E. 12th Street & N.E. 3rd Avenue Pompano Beach, Florida

Location: See Attached Field Sketch

Depth (Ft)	Soil Descriptions	Hammer Blows		N	Penetration "N" Value			
					10	20	30	40
0' - 2'	Dark Brown to Brown Fine Sand	5	5	11				
		6	5					
2' - 4'	Reddish Brown Fine Sand	7	8	16				
		8	8					
4' - 7'	Light Gray Fine Sand	6	7	15				
		8	7					
		6	5					
		6	4					
7' - 15'	Brown Fine Sand	6	5	11				
		5	5					
		6	6					
		--	--					
		--	--					
		--	--					
15' - 25'	Light Brown Fine Sand	6	5	10				
		5	5					
		--	--					
		--	--					
		--	--					
		--	--					
20' - 25'	Light Brown Fine Sand	7	6	10				
		4	5					
		--	--					
		--	--					
25' - 30'	Light Brown Fine Sand	5	3	7				
		4	5					

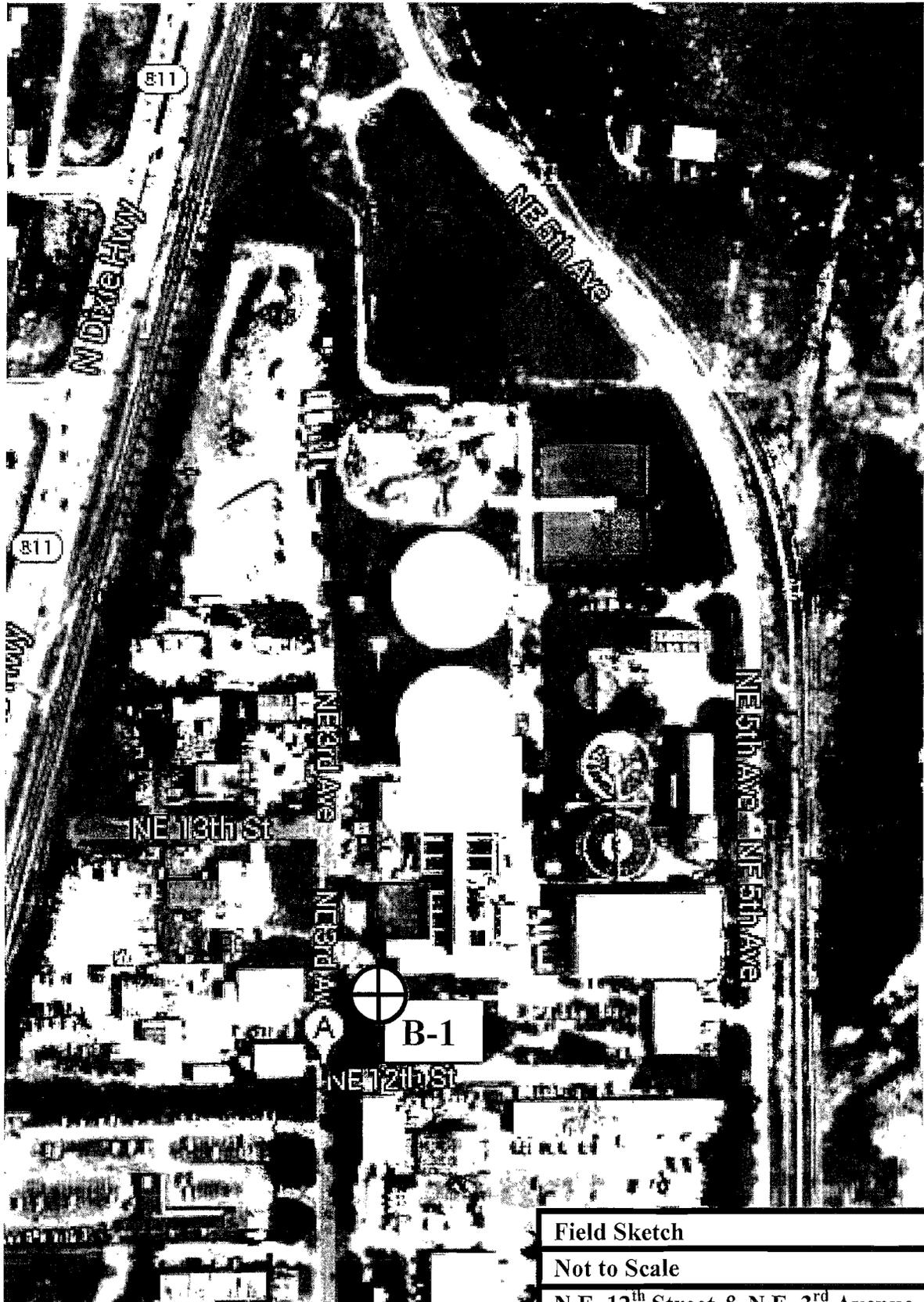
Water Level: 9'7" BEGL

As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

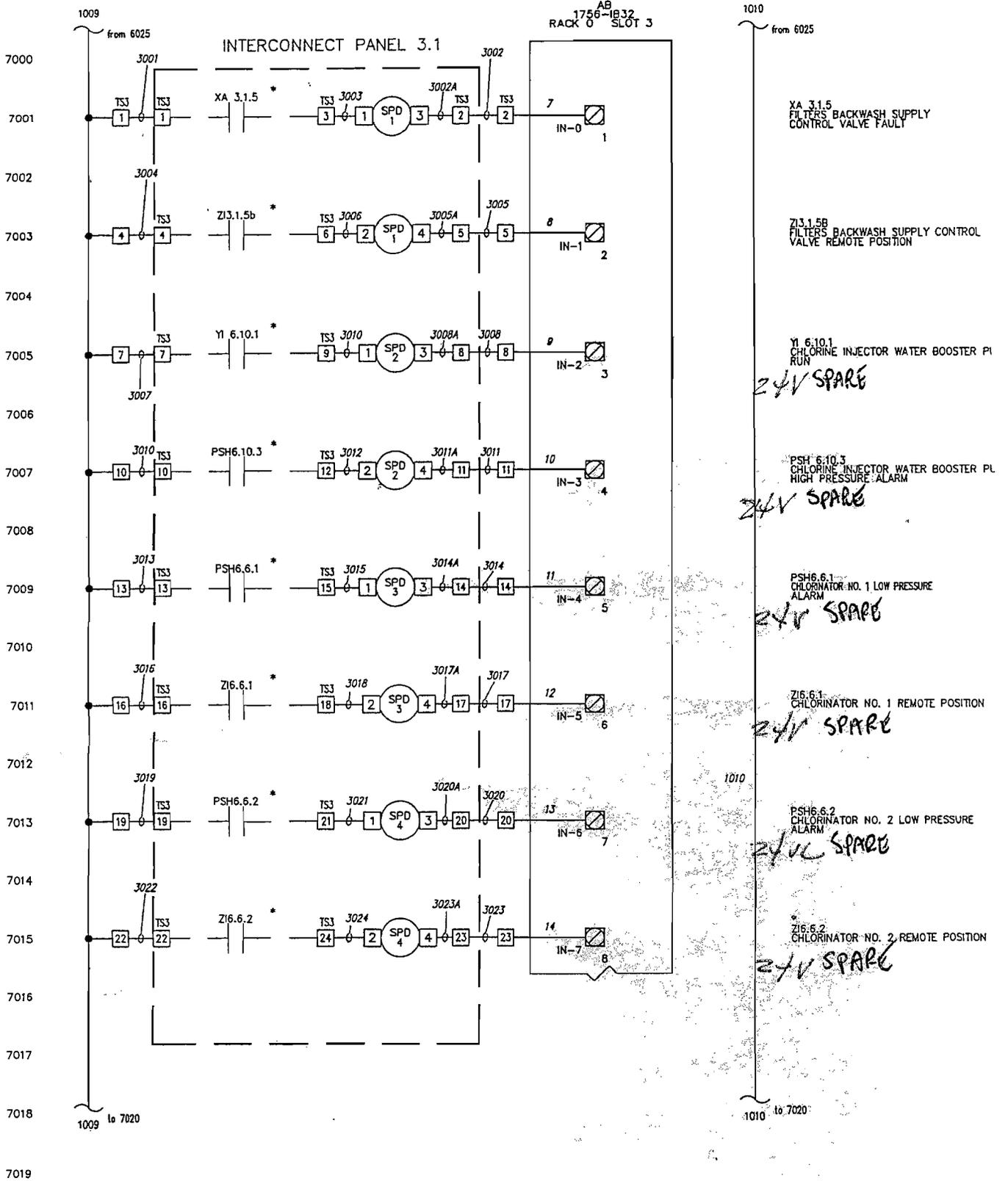
A = Auger
 Ref = Refusal
 BEGL = Below Existing Ground Level
 0 = Weight of Hammer

Reza Javidan
 7/13/13

Reza Javidan, P.E.
Florida Engineering & Testing, Inc.
Florida Reg. No. 60223
Certificate of Authorization No. 6923



Field Sketch
Not to Scale
N.E. 12 th Street & N.E. 3 rd Avenue
Pompano Beach, Florida



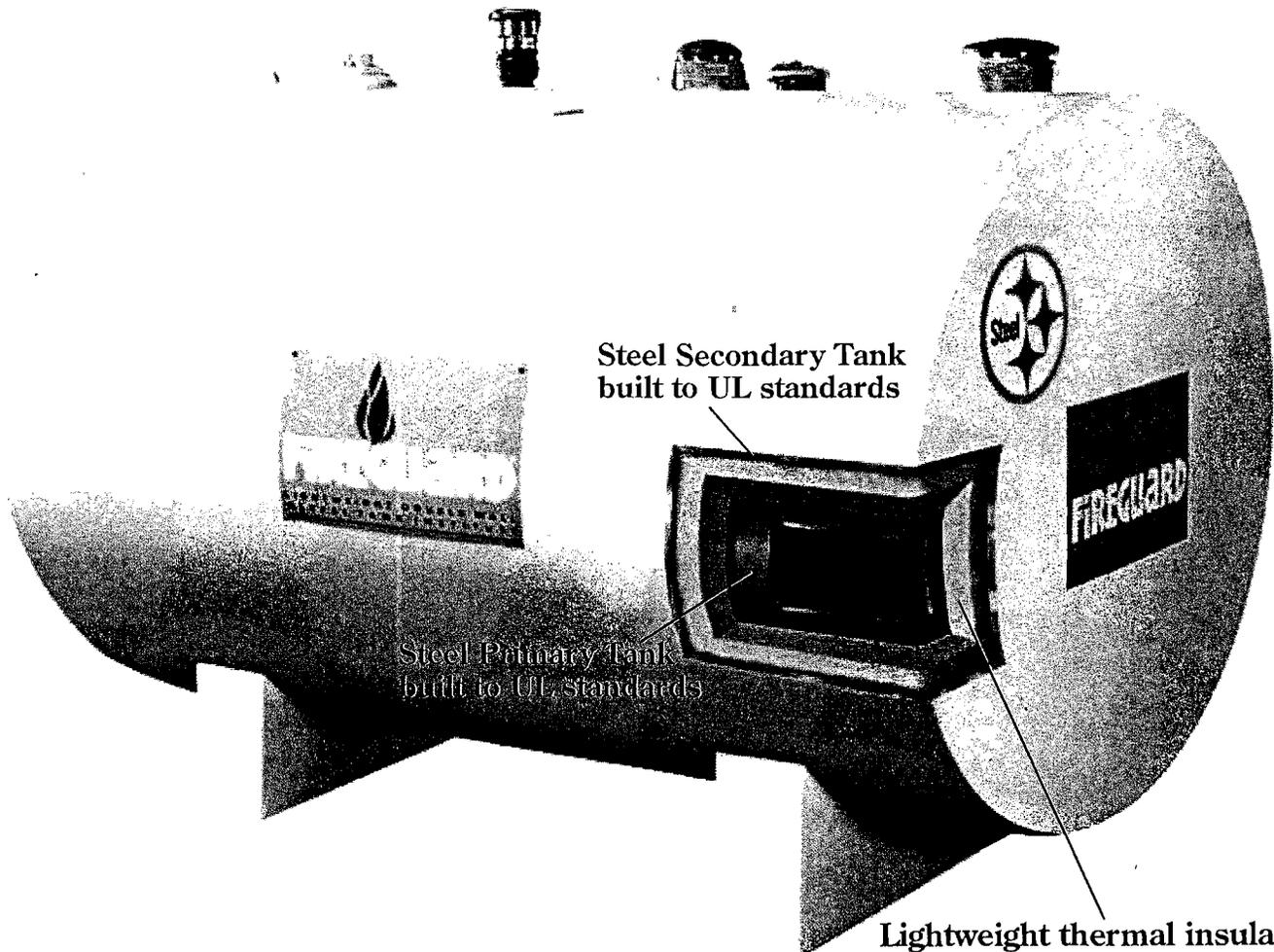
AS BUILT
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 INT. pac

LINE KEY UNLESS OTHERWISE NOTED	NOT SUPPLIED BY GEAS				*
	INDICATES FIELD WIRING				---
	INDICATES PANEL WIRING				---
WIRING KEY UNLESS OTHERWISE NOTED	24VDC - 18g AWG		120VAC - 14g AWG		
	SUPPLY	RED	SUPPLY	BLACK	
	RETURN	BLACK	RETURN	WHITE	
	SWITCHED	BLUE	SWITCHED	RED	0 8/10/01 FLM
	EXT./PWR.	YELLOW	GROUND	GREEN	REV DATE BY

FIREGUARD®

The New Generation of fire-rated AST's, going far beyond those "first generations" tanks which were merely enclosed in concrete.

- Fireguard® was the first AST of its design to obtain a UL Listing for secondary containment.
- Fireguard®'s secondary containment can be tightness tested on-site with standard testing procedures!
- Fireguard®'s exterior steel wall provides superior weatherability and low-cost maintenance. Unlike concrete, cracking or spalling will never be a problem!
- Fireguard®'s unique thermal insulating material is 75% lighter than concrete... Shipping, installation and relocation costs are reduced!
- The Fireguard® technology is patented under U.S. Patent #5695089 and #5809650 for "Lightweight Double Wall Storage Tank."



Lightweight thermal insulation

- Unique feature that helped Fireguard® exceed the UL 2-hour fire test
- Sufficiently porous to facilitate quick emergency venting and/or leak detection

**FIREGUARD® SPECIFICATIONS
CYLINDRICAL DESIGN**

SAMPLE OUTER TANK DIMENSIONS			
ALL DIAMETERS AND LENGTHS ARE NOMINAL			
GALLONS	DIAMETER	LENGTH	APPROX. WEIGHT (lbs.)
186	48	54	2,119
250	48	68	2,513
300	50	72	2,821
500	54	70	2,413
560	54	78	2,606
1,000	54	134	5,338
1,000	70	78	5,005
1,500	70	114	6,537
2,000	70	150	8,309
2,500	70	186	9,644
3,000	70	222	10,979
4,000	78	233	13,523
4,000	90	175	14,072
5,000	79	290	18,998
5,000	103	169	17,149
6,000	79	347	21,961
6,000	103	199	19,206
8,000	103	259	23,319
10,000	103	331	28,256
12,000	103	391	32,370
15,000	127	313	35,821
20,000	127	415	44,506
25,000	127	517	55,891
30,000	127	619	64,575

**FIREGUARD® SPECIFICATIONS
RECTANGULAR DESIGN**

SAMPLE OUTER TANK DIMENSIONS				
ALL DIAMETERS AND LENGTHS ARE NOMINAL				
GALLONS	LENGTH	WIDTH	HEIGHT	APPROX. WEIGHT (lbs.)
186	45	45	56	2,256
250	118	37	37	3,305
250	79	51	37	2,916
500	141	52	37	4,991
750	93	73	37	3,950
1,000	128	73	37	4,607
1,000	89	73	51	4,102
1,500	125	89	45	5,772
2,000	141	87	51	6,679
2,000	141	73	61	6,486
2,500	141	89	61	7,453
3,000	251	73	51	11,572
3,000	118	103	73	9,379
4,000	332	73	51	14,990
4,000	155	103	73	11,640
5,000	337	73	61	16,615
5,000	192	103	73	13,901
6,000	403	73	61	19,631
6,000	229	103	73	16,162
8,000	371	103	61	22,872
8,000	303	103	73	20,684
10,000	461	103	61	27,992
10,000	377	130	73	25,205
12,000	452	103	73	29,788
15,000	387	103	103	38,510
18,000	463	103	103	45,290
24,700	466	138	103	54,539

Please note that all dimensions and weights are approximate. Individual tanks may vary from these values.



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