PART 1 - GENERAL

1.1 SCOPE

1.1.1 General

This Specification provides for the furnishing all labor, materials, equipment, and incidentals required for all cast-in-place concrete including reinforcing steel, forms, water stops and miscellaneous related items such as sleeves, reglets, anchor bolts, inserts, and embedded items specified under other Sections.

1.1.2 Work Included

The Contractor shall, unless specified otherwise, furnish all labor, materials, equipment, tools, and all other associated appurtenances necessary to do the work required under the contract.

1.1.3 Location of the Work

The location of this work is as shown on the bidding documents.

1.1.4 Coordination of the Work

The Contractor shall be responsible for the satisfactory coordination of construction of cast-in-place concrete with other construction and activities in the area. Delays in work resulting from lack of such harmony shall not in any way be a cause for extra compensation by any of the parties.

1.1.5 Working Hours

The work shall be carried out in accordance with local ordinance and not to cause any unreasonable nuisance to affected residents. Under emergency conditions, this limitation may be waived by the consent of Charlotte County Utilities (CCU).

1.2 METHOD OF MEASUREMENT & PAYMENT

The work shall be measured and the compensation determined in the following manner:

1.2.1 Cast-in-place concrete

The cast-in-place concrete shall be considered part of the completed items such as lift station pads, valve pads, and reclaimed water meter bases and paid as defined by that specification.

1.2.2 Miscellaneous

All other items required for the completion of the project and not included as a specific bid item shall be considered incidental to the project and no direct compensation will be made therefore.

1.3 REFERENCED STANDARDS (Latest Revision)

- ACI 301 - Structural Concrete for Buildings
- ACI 305 - Recommended Practice for Hot Weather Concreting
- ACI 306 - Recommended Practice for Cold Weather Concreting
- ACI 315 - Details and Detailing of Concrete Reinforcement
- ACI 347 - Recommended Practice for Concrete Formwork
- ACI 350R – Concrete Sanitary Engineering Structure
- ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement
- ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- ASTM C33 - Concrete Aggregates
- ASTM C94 - Ready-Mixed Concrete
- ASTM C150 - Portland Cement

1.4 PARTIAL LISTING OF RELATED SECTIONS

002340 - Valves
002530 - Submersible Sewage Pump Lift Station-Package Design
002540 - Submersible Sewage Pump Lift Station- Standard Design

Note: This is only a partial listing of related sections. The Contractor shall be responsible to review the entire contract documents.

1.5 SUBMITTALS

1.5.1 Shop Drawings: The Contractor shall submit four (4) sets of completely detailed working drawings and schedules for review by Charlotte County Utilities (CCU).

1.5.2 The contractor submittals shall include the statement that the submittals have been reviewed and the materials meet the contract specifications and/or standard details.

1.5.3 Final approval is at the discretion of CCU.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 General

The materials used in this work shall be all new and conform to the requirements for class, kind, size and material as specified below:

2.1.2 Cement

a. Cement: ASTM C150, Portland Type II

2.1.3 Aggregates

a. Fine aggregate: ASTM C33.

b. Coarse aggregate: ASTM C33, 3/4 inch maximum size.

2.1.4 Admixtures

a. Air Entraining: W.R. Grace "Darex AEA" or equal as approved by CCU.

b. Water Reducing: W.R. Grace "WRDA with Hycol" by W.R. Grace or equal as approved by CCU.

2.1.5 Concrete

a. The proportions of ingredients shall be selected in accordance with ACI 301 Section 3.8.

b. Concrete shall be 3,500 psi except where noted otherwise.

c. All concrete shall be air entrained 6% ± 1%.

2.1.6 Reinforcing

a. Reinforcing Steel: ASTM A615, Grade 60 deformed bars; stirrups and ties Grade 40.

b. Welded Wire Fabric: ASTM A185.

c. Fabricate reinforcing steel per ACI 315.

2.1.7 Forms And Accessories

a. Form Lumber: Form lumber shall be in accordance with ACI 347.

b. Form Ties: Form ties shall be removable metal of fixed length; cone type, 1-1/4 inch maximum diameter; 1 inch break back dimension; and waterproofing washer. Wire ties and wood spreaders not permitted.

c. Form Release Agent: Form release agents shall be a non-staining, non-moisture absorbing, or non-imparing colorless material which will not stain the concrete.

d. Dovetail Anchor Slots: Dovetail anchor slots shall be galvanized steel; easily removed foam filler; bent tab anchors; and securable to concrete formwork.

e. Water stop: Water stop shall be extruded polyvinyl chloride or cold joint water stop (volclay) as shown on the engineering drawings.

PART 3 - EXECUTION

3.1 GENERAL

3.1.1 The Contractor shall design and construct formwork, false work, shoring, and bracing to meet all loads during placement and curing required for the finishes, shapes, lines, and dimensions.

3.1.2 The Contractor shall provide for inserts, openings, sleeves, offsets, recesses, anchorage, blocking, and other penetrations and embedment.

3.1.3 The Contractor shall set required steel frames, angles, bolts, inserts, and other imbedded items required to be anchored in the concrete before the concrete is placed.

3.1.4 The form release agent shall not be applied where concrete surfaces are scheduled to receive special finishes which may be affected by agent. Contact surfaces of untreated forms shall be soaked with clean water, and the surfaces kept wet prior to placing concrete. The form release agent shall be applied in accordance with manufacturer's instructions.

3.2 REINFORCING

3.2.1 Fabrication

3.2.1.1 The Contractor shall fabricate all reinforcement in strict accordance with the contract specifications, engineering drawings, and the approved shop drawings.

3.2.1.2 The Contractor shall not use bars with kinks or bends not shown on the engineering drawings or the approved shop drawings.

3.2.1.3 The Contractor shall not bend or straighten steel in a manner that will damage the material.

3.2.2 Placement

3.2.2.1 The Contractor shall accurately place all concrete reinforcement, securing, and supporting by concrete bricks, metal chairs or spacers, and/or metal hanger.

3.2.2.2 Splicing

a. The Contractor shall place bars with minimum 30 bar diameter overlap at splices.

b. Lapped ends of bars shall be placed in contact and securely wired or shall be separated 1-1/2 inches minimum to permit the embedment of the entire surface of each bar in concrete.

c. The contractor shall stagger the splices of adjacent bars.

d. The contractor shall splice wire fabric at least 1-1/2 meshes wide.

3.2.3 The Contractor shall securely place all required steel dowels in accordance with this specification and engineering drawings.

3.2.4 The Contractor shall notify CCU of any conflicts with conduits, piping, inserts, sleeves, or any other items interfering with placing reinforcement as indicated on the engineering drawings or as otherwise required before placing concrete.

3.2.5 Steel reinforcement shall be free from rust scale, loose mill scale, oil, paint, and all other coatings which will destroy or reduce bond between steel and concrete.

3.3 INSPECTION

3.3.2 The Contractor shall verify that all formwork, reinforcing, and work of other trades are complete and ready for placement of concrete.

3.3.3 The Contractor shall notify CCU for its approval to proceed at least 48 hours before placing concrete.

3.4 CONCRETE MIXING AND PLACEMENT

3.4.2 All cast-in-place concrete shall be transit-mix concrete in accordance with ASTM C94.

3.4.3 Re-tempering of concrete is not permitted.

3.4.4 The Contractor shall not pour concrete when weather conditions are not suitable for the proper placing, finishing, or curing of the concrete unless approved by CCU. The Contractor shall pour concrete only during dry weather. In the event of sudden rainstorms, the Contractor shall cover the exposed, freshly placed concrete to protect from damage. When cold or hot weather concreting is authorized by CCU, the contractor shall comply with ACI 305 and ACI 306.

3.4.5 The Contractor shall convey concrete to the forms as rapidly as practicable utilizing methods to not cause segregation or loss of ingredients. Free fall from mixer or truck to conveyance shall not exceed 3 feet. When pouring concrete in final position, the free fall shall not exceed 5 feet. The Concrete shall be poured in horizontal layers approximately 2 feet thick and avoid the formation of cold joints and poorly bonded sections between layers. The horizontal distribution of concrete by spading or vibration is prohibited.

3.4.6 Unless otherwise specified or directed by CCU, the Contractor shall vibrate all reinforced concrete. Use only approved mechanical vibrators operated by experienced operators. Apply vibrators at uniformly spaced points not further apart than the visible effectiveness of the machine. Vibrate concrete sufficiently to produce satisfactory consolidation without causing segregation. Do not use vibrators to transport concrete in the forms or insert them into lower layers of concrete that have begun to set.

3.5 CONCRETE TESTING

3.5.2 The Contractor shall prepare and cure and have tested by an independent certified laboratory in accordance with ASTM standards: one (1) set of four (4) test cylinders for each concrete placement for each 50 cubic yards of concrete placed in any one day or fraction thereof.

3.5.3 The Contractor shall provide all results to CCU for review.

3.5.4 The Contractor shall pay for all supplemental testing required if the cylinders break at lower than the required strength and replace all inferior concrete material.

3.6 CURING

3.6.2 Concrete shall be water cured, cured using curing compounds or waterproof paper and sheeting, or other ASTM approved methods. The minimum curing period shall be 7 days.

3.7 REMOVAL OF FORMS

3.7.2 The Contractor shall remove forms in accordance with ACI 347 only after concrete has attained sufficient strength to support its own weight, construction live loads placed thereon, and lateral loads all without excessive deflection or damage to the structure.

3.7.3 The Contractor shall be responsible for the proper removal of forms, installing all shoring and reshoring, and removal of shores and reshores. The contractor shall replace any work damage due to improper or early removal of forms, shores, and reshores at no additional cost to CCU.

3.7.4 The Contractor shall remove metal spreader ties on exposed concrete by removing or snapping off inside the wall surface and pointing up and rubbing the resulting pockets to match the surrounding areas.

3.8 FINISHING CONCRETE

3.8.2 The Contractor shall provide finishes in accordance with ACI 301 as follows:

a. Rough Form Finish: All concrete surfaces not exposed to view
b. Grout Cleaned Finish: All concrete surfaces exposed to view
c. Floated Finish: Concrete floor slabs
d. Trowel with Broom Finish: Horizontal slabs exposed to the weather

3.9 QUALITY ASSURANCE

3.9.2 The concrete work shall conform to ACI 301 and ACI 347 except as modified herein.

3.9.3 The concrete reinforcement shall be stored in a manner to prevent excessive rusting and fouling with dirt, grease, and other bond breaking coatings.

END OF SECTION