SECTION UC-570

INSTALLATION OF PUMP STATION

PART 1 - GENERAL

1.01 WORK INCLUDED

The work under this Section includes the installation of precast pump stations and installation of pump stations by Caisson Method.

1.02 RELATED SECTIONS:

A. Section UC-500 - Donation Pump Stations

B. Section 01016 - Safety Requirements and Protection of Property

C. Section 03300 - Cast-In-Place Concrete, Formwork & Reinforcing

D. Section 03600 - Grout

1.03 REFERENCES:

Unless otherwise indicated, all materials, workmanship and practices shall be in accordance with the current editions of the following standards:

A. Florida Building Code

B. ACI 318, Building Code Requirements for Reinforced Concrete

C. PCI MNL 116, Manual for Quality Control for Plants and Production of Precast Concrete Products.

D. ASTM A123 - Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.

1.04 SUBMITTALS:

Submit the following information for approval. Fabrication shall not begin until submission has been approved.

A. Satisfactory evidence that plant and production methods meet the requirements of PCI MNL 116.

B. Complete shop drawings shall be submitted.

1.05 QUALIFICATIONS:

Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

PART 2 - PRODUCTS

2.01 MATERIALS:

Precast pump stations shall conform to the requirements of ASTM C478, the Miami-Dade Water and Sewer Department Standard Details and the following:

A. Reinforcement of Grade 60 bars.

B. Cement shall be Type II.

C. Minimum shell thickness of shall be eight (8) inches.

D. Lifting holes through the structure not permitted.

E. Ram-Nek preformed plastic joint filler, or approved equal, shall be used in filling field assembled joints with inside and outside of the joint grouted.

F. Holes for duct or pipe connections, with a diameter equal to the outside dimension of the connecting duct plus an additional 4-inches, shall be formed in the walls. No cutting or chipping of the pre-formed holes, or cutting additional holes in the precast concrete walls will be permitted.

G. The bottom slab shall be cast with the longitudinal wall reinforcement extending into the slab.

H. Openings shall be filled and sealed with "non-shrink" grout. Expanding grout shall not be used.

2.02 COATINGS/LININGS

A Exterior surfaces of precast structures, below finished grade shall be coated with Carboline Bitumastic 300M, or approved equal coal tar epoxy, 2 coats, total 16 mils minimum dry thickness.

B. All wetwell interior concrete surfaces shall be lined or coated, as selected by the Engineer of Record with the MD-WASD's approval.

1. The MD-WASD reserves the right to approve or reject any lining or coating system proposed for use. Presently the MD-WASD has a number of lining and coating systems considered suitable for use and may, as future experience and testing by the New Technology Committee or others dictates, add to or subtract from this group.

2. Coatings are not acceptable as a substitute for liners, but may be considered on a case-by-case basis. Further, the MD-WASD reserves the right to require lining systems for installations where coating systems are proposed for use and the decision of the MD-WASD shall be final.

3. Lining or coating system shall fully protect openings, such as for pipes, to insure that corrosive attack cannot take place at these locations. Concrete protective system design for these areas will be checked as shop drawings. Note that boot systems are not accepted by the MD-WASD.

4. Some of the coating systems currently considered suitable for use are: "Sauereisen No. 210 and F-120" by Sauereisen Cements Co.; "PPC Coating System WW-200-1a/Damp Concrete" by Polymorphic Polymers Corp.; "SewperCoat", pure fused calcium aluminate cement mortar by Lafarge; and "Polybrid 705", by Polybrid Coatings, Inc.

5. Some of the lining systems currently considered suitable for use are: "AGRU Suregrip" by US Precast and "Armor T-Loc" by Ameron.

6. The above lists are not intended to be exclusive but the MD-WASD completely reserves the right to accept or reject any lining or coating system. Further, any product will be reviewed not only technically in comparison with known products but also looked at in regard to its "proven track record" of successful installations, the length of time those installations have been in service and any test data from either the New Technology Committee or other sources within or without the MD-WASD.

2.03 BRICK UNITS

Concrete brick shall conform to ASTM Standard C55 "Concrete Building Brick". Bricks shall have true edges and sharp corners and shall have been cured for at least 14 days before being placed in any wall.

2.04 MORTAR AND GROUT: As specified in Sections 03600 and 04060.

2.05 REINFORCEMENT: As specified in Section 03300.

2.06 PULLING IN IRONS

Steel bars sized and bent as shown on the Drawings and cast in the walls and floors as shown on the Drawings. Hot-dipped galvanized after fabrication.

2.07 CABLE RACKS

Including hooks and insulators, shall be sufficient to accommodate cables and shall be spaced not more than 18 inches apart horizontally. Wall brackets shall be channel or T section steel. Hooks shall be removable type. Insulators shall be dry-process glazed porcelain. Metal portion of racks shall be hot-dipped galvanized after fabrication.

2.08 SUMP

Sump shall be formed integrally with the base pad. The Contractor shall provide a sump and sump pump in the floor of the dry well in a corner opposite the wet well. The Contractor shall provide a sump and sump pump in the floor of the valve pit adjacent to the emergency discharge connection. The Contractor shall slope the floor from all directions toward to sump. The PVC pump discharge line in the dry well shall contain two swing-disc type check valves and a gate valve, and shall be piped to the top of the dry well before passing through the wall into the wet well.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

A. The Contractor is referred to the provisions in these specifications regarding removal of water, backfill and compaction, for specific procedures, requirements, and testing methods appurtenant to the work of this Section.

B. Excavations for the precast structures shall be extended to a level 6-inches below the level of the outside bottom of the slab. Sheeting and shoring may be required in order to control the excavation dimensions, protect the workmen, and prevent damage to the structure or other adjacent facilities. The resulting excavation shall be backfilled with drainfield limerock or specified pipe bedding material to a level to receive the structures at the proper elevation. Pump station and manhole exteriors shall be painted prior to installation.

C. Necessary sheeting and shoring shall be designed by a Registered Professional Engineer licensed to practice in the State of Florida. Signed, sealed, and dated drawings and design calculations shall be submitted to the Engineer for approval prior to construction.

D. For surfaces of structures exposed to view the Contractor shall fill all depressions and all air holes with mortar, dampen surfaces, and then spread slurry, consisting of one part cement and one and one-half parts sand, by damp loose volume, on the surface with clean burlap pads and sponge rubber floats. The Contractor shall remove any surplus by scraping and hen rubbing with clean burlap. Finish surface shall be suitable to receive paint.

3.02 INSTALLATION OF PRECAST PUMP STATION

A. Pump station structures may be precast with an anchor slab, cast-in-place or they may be constructed by the Caisson Method.

B. Excavations for the cast-in-place or the precast structures shall be extended to a level 6-inches below the level of the outside bottom of the slab. Sheeting and shoring may be required in order to control the excavation dimensions, protect workmen, and prevent damage to the structure or adjacent facilities. The resulting excavation shall be backfilled with drainfield limerock or specified pipe bedding material to a level to receive the structures at the proper elevation. Pump station exteriors shall be painted prior to installation.

C. Sheeting and shoring for the pump station shall be designed by a Registered Professional Engineer licensed to practice in the State of Florida. Signed, sealed and dated drawings and design calculations shall be submitted to the MD-WASD for approval prior to construction.

D. The pump station shall come with an anchor slab, precast to the dimensions shown on the Plans to be lowered in to the excavation separately, or as a complete unit. The structure, with anchor slab shall be securely seated.

3.03 INSTALLATION OF PUMP STATION BY CAISSON METHOD

A. All concrete structures of this type shall be designed in conformance with ACI 318, "Building Code Requirements for Reinforced Concrete", Appendix B - Alternate Design Method and ACI 350, "Concrete Sanitary Engineering Structures"

B. The MD-WASD will check the plans for suitability and compliance with these Specifications and, if found to be satisfactory, two copies will be marked with the Engineer's stamp of approval and returned to the Contractor. Three copies will be retained for MD-WASD use.

C. When the pump station sheeting and shoring have been placed, the material inside the enclosure thus formed, shall be excavated and replaced with sand. The walls of the units shall then be constructed in suitable lifts, painted on the exterior, and lowered to the proper elevation by re-excavating the sand from inside. When the walls of each unit have reached the final elevation, the tremie seal shall be poured inside and the structures dewatered, after which the remainder of the construction may proceed.

D. Sheeting and shoring shall be required in order to control the excavation dimensions, protect the workmen, and prevent damage to the structure or other adjacent facilities.

3.04 STRUCTURAL WORK

A. All structural work shall be in conformance with Section UC-055.

B. All concrete work shall be constructed in accordance with all applicable provisions of Section 03300.

C. If, in performing the concrete work hereunder, the forms holding the concrete should fail, sag or get out of line in any way whatsoever, repair such damage to the complete satisfaction of the Engineer of Record. All completed members shall be straight and true, and present a uniform appearance. The use of excavation walls as forms will not be approved.

D. Concrete surfaces shall be inspected immediately after the forms are removed. Defective areas shall be chipped away to the depth of the imperfections but not less than one inch deep. These areas shall be kept wet for at least two hours before patching. Immediately thereafter, all the holes shall be brushed neat with cement grout. While the grout is still wet, the holes shall be filled with a barely moist grout consisting of one part Portland cement and three parts sand, which shall be driven tight with wooden caulking tools and finished off flush and smooth. The mortar patches shall be cured as specified.

E. The dry well floor and valve pit floor shall slope one inch from the farthest point to the sump.

F. Construct the foundations for the pumps and motors including anchor bolts, nuts, washers, and sleeves as required for the equipment. Anchor bolts shall be in accordance with the equipment manufacturer's recommendations and as approved by the MD-WASD. The foundations shall be poured to heights of not less than one inch below the elevation required to bring the equipment to the correct elevation, leaving room for placing grout to maintain the

equipment at the proper elevation. After the forms have been removed, the foundations above the floor line shall be rubbed smooth with a carborundum brick. Exposed corners shall be chamfered 1-inch. Anchor bolts, nuts, washers, and sleeves shall be hot dip galvanized.

G. The Contractor shall construct concrete foundations for the check valves, including felt paper lining. Foundation and supports shall be allowed to cure for at least 7 days before setting any equipment. The floor shall be thoroughly roughened by chipping where supports are to be poured. After the forms have been removed, the foundations above the floor line shall be rubbed smooth with a carborundum brick. Exposed corners shall be chamfered 1 inch.

END OF SECTION