

SECTION 03400**PRECAST PRESTRESSED CONCRETE****PART 1 - GENERAL****1.01 INCLUDED**

- A. The work under this section includes the design, casting, delivery, erection and shoring of precast prestressed concrete structures as shown on the Contract Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 03300 - Cast-in-Place Concrete
- B. Section 01340 - Shop Drawings

1.03 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. Without limiting the generality of other requirements of these Specifications all work hereunder shall conform to the applicable requirements of the referenced portions of the following documents, to the extent that the requirements therein are not in conflict with the provisions of this Section:
 - 1) South Florida Building Code, latest edition
 - 2) ACI 318-95, Building Code Requirements for Reinforced Concrete
 - 3) PCI MNL 116, Manual for Quality Control for Plants and Production of Precast Concrete Products.
 - 4) ASTM A416, Specification for Uncoated Seven-Wire Stress-Relieved Steel Strand for Prestressed Concrete.

1.04 QUALITY ASSURANCE

- A. Fabricator shall be a recognized prestressed concrete manufacturer with minimum five (5) years experience in the manufacture and erection of similar units and whose design, fabrication and erection operations are supervised by a Florida Registered Professional Engineer.

1.05 CONTRACTOR SUBMITTALS

- A. Shop Drawings: The Contractor shall submit shop and erection drawings for approval, showing concrete design strength; unit dimensions; unit weights; size, number, location and stress in prestressing strands; size, number and location of reinforcing bars including reinforcing for erection and handling stresses; concrete cover over reinforcing and strands; bearing and anchorage details; concrete finish; curing method; erection marks; hoist points and shoring points.

- B. Design Calculations: The Contractor shall submit for approval, neat, legible and complete design calculations prior to fabrication. Calculations shall be by a Florida Registered Professional Engineer whose seal shall appear on calculation sheets and shop drawings.
- 1) Calculations shall include predicted in-place cambers without superimposed loads, with superimposed dead loads and with superimposed dead loads and live loads.
 - 2) Span length in calculations shall be from center of bearing to center of bearing.
 - 3) Include bearing and anchorage details including those in the precast sections and those in the job cast concrete structure.
- C. Certificates: The Contractor shall submit manufacturer's test certificates on prestressing strands and reinforcing.
- D. Concrete Cylinder Tests: The Contractor shall submit copies of cylinder break reports by an approved commercial test laboratory, made from each casting for this project to verify that concrete has attained minimum ultimate prestressed transfer strength specified.

1.06 DEFINITIONS

- A. In these Specifications, where the terms "Precast Concrete" and "Precast Concrete Specialties" are used, they shall have equivalent meaning.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Concrete: Minimum 7 day ultimate compressive strength of 4000 p.s.i. Higher strength will be permitted to suit manufacturer's design. In other respects, concrete shall comply with requirements of Section 03300.
- B. Prestressing Strands: High strength 7 wire strand conforming with ASTM A416-94. Elongation test conforming with ASTM A270-90 with minimum elongation at rupture of 3.5% in 24 inches. Tests need not be made if certification of conformance with specifications is provided by manufacturer. Use strand of U.S. manufacture.
- C. Reinforcing Steel: ASTM A615, grade 60.
- D. Forms: Provide smooth units true to size, shape and detail with flat panes, sharp lines and arises, free from warp, twist, bow or similar distortions, spalling, broken edges, cracks or similar defects. Dimensional tolerances to be as provided in ACI 525 Standards Minimum Requirements For Thin Section Precast Concrete Construction.

2.02 FABRICATION

- A. General: Fabricate units accordance with approved shop drawings and approved design calculations.

- B. Unit design and fabrication: Conform with ACI Standard Building Code Requirements for Reinforced Concrete and the Prestressed Concrete Institute Standards. Fabricator shall design joists and beams in accordance with loads indicated on drawings. Camber under dead load or deflection under total load shall not exceed 1/360 of span.
- C. Inserts: Install hanger inserts and sleeves in unit forms for mechanical and electrical items as provided under other sections and as shown on Drawings.
- D. Curing: Top surface to receive water curing only.
- E. Marking: Distinctively mark each unit with manufacturer's name and mark indicated on erection drawings.
- F. Age: Units shall be minimum 10 days old before shipping or erection.

2.03 PREFORMED JOINT SEALANT

- A. The joint sealing compound shall be Quik-Seal, a preformed, cold applied, ready to use plastic joint sealing compound as supplied by Quikset Utility Vaults, Santa Ana, California; Ram-Nick by K.T. Snyder Company; or approved equal.

2.04 MORTAR

- A. Mortar used between the sections of precast concrete manholes and vaults shall be as recommended by the manhole section manufacturer.

2.05 NON-SHRINK GROUT

- A. Non-shrink grout shall be as specified in the Section 03600, "Grout".

2.06 QUALITY CONTROL

- A. Precast concrete units shall be made by an experienced manufacturer and shall be constructed as shown on the Drawings and specified herein and shall be free of defects, checks and cracks. Care shall be taken in the mixing of materials, casting, curing and shipping to avoid any of the above.
- B. The Contractor shall notify the Department a minimum of 5 days before the units are cast and 5 days before shipment is made, in order to provide for plant inspection, if the Department so directs.

PART 3 - EXECUTION

3.01 ERECTION

- A. Erection to be by manufacturer and supervised by manufacturer's Florida Registered Professional Engineer or his authorized representative. Handle and install units with precision, in conformance with drawings, details and erection drawings.

3.02 INSTALLATION

- A. Required pads, plates and reinforcing bars shall be furnished for casting and anchorage in the adjoining work. The precast concrete units shall be installed in a workmanlike manner with the units tight and at right angles to the supporting beams or walls. The units shall be aligned and leveled in accordance with the procedures recommended by the manufacturer. Units shall be grouted by a mixture of not less than one part cement to three parts fine sand, care being taken to see that joints are filled. Damp grout that may have seeped through shall be removed before it hardens.
- B. All openings in the precast units shall be made by the Contractor and are the responsibility of the Contractor. Where details for an opening are not shown on the Drawings, the opening shall be made in accordance with the recommendation of the manufacturer. When an opening causes a loss in carrying capacity of the unit, the adjacent units shall be designed to carry the additional dead and superimposed load transferred from the unit with the opening. The Contractor shall provide saddle headers as required.
- C. Extreme care shall be used to avoid damaging or soiling concrete as no repairing or cutting will be permitted. Damaged units shall be replaced at the expense of the Contractor. Wooden hammers shall be used, with pinch bars being used on unexposed parts only.

3.03 CLEANING AND REPAIRS

- A. Cleaning: Clean exposed surfaces of units of stains to a uniform appearance. Do not use caustic or acid cleaners.
- B. Repairs: Repair nicks or chips in exposed areas.

END OF SECTION