



SECTION 034500 - PLANT-PRECAST STRUCTURAL CONCRETE PANELS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work Included: These specifications cover precast, prestressed structural concrete construction including product design not shown on contract drawings, manufacture, transportation, erection.
- B. Related Work Specified Elsewhere: Flashing and sheet metal; Sealants and caulking; painting.
- C. Work Furnished and Installed by Others: Reglets for flashing.

1.02 REFERENCE STANDARDS

- A. ACI 301 – Specifications for Structural Concrete; American Concrete Institute International; 2010 (Errata 2012).
- B. ASTM C260/C260M – Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.
- C. AWS D1.1/D1.1M – Structural Welding Code – Steel; American Welding Society; 2011 w/Errata.
- D. PCI MNL 116 – Manual for Quality Control for Plants and Production of Precast Concrete Products;
- E. PCI MNL 120 – PCI Design Handbook – Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; Seventh Edition, 2010.
- F. PCI MNL 123 – Design and Typical Details of Connections for Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; 1988, Second Addition.
- G. PCI MNL 135 – Tolerance Manual for Precast and Prestressed Concrete Construction; Precast/Prestressed Concrete Institute; 2000.

1.03 SUBMITTALS

- A. Shop Drawings: Indicate layout, unit locations, configuration, unit identification marks, integral insulation, panel system connectors, connection details, support items, dimensions, openings, and relationship to adjacent materials. Provide erection drawings.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualification: The precast concrete manufacturing plant shall be certified by the PCI (Prestressed Concrete Institute), Plant Certification Program. Precast concrete manufacturer must have produced product similar to what is being specified for a minimum of two years.
- B. Design Engineer Qualifications: Design precast concrete units under direct supervision of a Professional Engineer experienced in design of precast concrete and licensed in the respective state.
- C. Welder Qualifications: Qualified in accordance with AWS D1.1/D1.1M and AWS D1.4/D1.4M.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Prestressed Structural Precast: Any manufacturer holding a PCI Group C3A Plant Certification for the types of products specified; see www.pci.org.
- B. Integrally Insulated Panel System:

2.02 PRECAST UNITS

- A. Precast Concrete Units: Comply with PCI MNL-120, PCI MNL -122, PCI MNL 123, and PCI MNL-135.
 - Concrete Mix: Minimum 5000 psi, 28 day strength.
 - Design loads: Static loads, anticipated dynamic loading, including positive and negative wind loads, thermal movement loads, and erection forces as defined by applicable code.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C150/C150M.
- B. Admixtures: Air-entraining admixtures, ASTM C260; Water reducing, retarding accelerating, high-range water reducing admixtures, ASTM C494.

- C. Aggregates: ASTM C33 or C330
- D. Water: Potable and free from foreign materials in amounts harmful to concrete and embedded steel.
- E. Reinforcing Steel: **Bars** – Deformed Billet Steel (ASTM A615), Deformed Rail Steel (ASTM A616), Deformed Axle Steel (ASTM A617), Deformed Low-Alloy Steel (ASTM A706); **Wire** – Cold Drawn Steel (ASTM A82); **Wire Fabric** – Welded Steel (ASTM A185), Welded Deformed Steel (ASTM A497).
- F. Strand: Uncoated, 7 wire, stress-relieved or low relaxation strand (ASTM A416) (including supplement) Grade 250K or 270K;
- G. Anchors and Inserts: **Materials** – Structural Steel (ASTM A36 minimum); **Finish** – Manufacturer’s Standards.
- H. Grout: Cement grout – Portland cement, sand and water sufficient for placement and hydration.

2.04 INSULATION

- A. Integral Insulation: Expanded polystyrene insulation.

2.05 ACCESSORIES

- A. Bearing Pads: High density plastic in combination with hard board shims.

2.06 FABRICATION

- A. Fabricate in general conformance with PCI MNL 116.

PART 3 - EXECUTION

3.01 ERECTION

- A. Installation of precast, prestressed concrete shall be performed by the manufacturer or manufacturer’s approved erector under the PCI Certified Erector Program.
 - a. Members shall be lifted by means of suitable lifting devices at points provided by the manufacturer.
 - b. Temporary shoring and bracing, if necessary, as shown on the approved shop drawings, shall comply with the manufacturer’s recommendations.
- B. Alignment: Members shall be properly aligned and leveled as required by the approved shop drawings. Any variations between adjacent members that exceed industry standards shall be reasonably leveled out by jacking, loading or any other industry standard method as recommended by the manufacturer.

3.02 FIELD WELDING

- A. Field welding is to be completed per the approved shop drawings in accordance with AWS D1.1/D1.1M and AWS D1.4/D1.4M.

3.03 ATTACHMENTS

- A. Subject to approval of the architect/engineer, and manufacturer, precast, prestressed products may be drilled or “shot” provided no contact is made with the prestressing steel. Should spalling occur, it shall be required by the trade doing the drilling or the power actualization to make repairs.

END OF SPECIFICATION