PART 1 - GENERAL

1.01 REFERENCES

A. ACI 301 - Structural Concrete for Buildings.

B. ACI 318 - Building Code Requirements for Reinforced Concrete.

C. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

D. ASTM A615 - Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

E. ASTM C150 - Portland Cement.

F. PCI - Manual for the Design of Hollow Core Slabs.

G. PCI MNL-116 - Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products.

H. PCI MNL-120 - Design Handbook - Precast and Prestressed Concrete.

I. PCI - Design Handbook - Precast and Prestressed Concrete.

J. PCI - Tolerances for Precast and Prestressed Concrete.

K. UL - Underwriter’s Laboratories, Inc., Fire Resistance Directory.

L. New York State Building Code

1.02 DESIGN REQUIREMENTS

A. Size components to withstand design loads in an unrestrained condition as follows:
   1. Floor Assemblies above First Floor: See plans for live loads; 18 psf dead loads not including self-weight (does include topping weight).
   2. First Floor Assembly: See plans for live loads; 18 psf dead loads not including self-weight (does include topping weight).
   3. Roof: See plans for live load; 30 psf dead loads not including plank self-weight.

B. Maximum Allowable Deflection of Roof Planks: 1/360 span.

C. Design components to accommodate construction tolerances, deflection of other building structural members and clearances of intended openings.

D. Grouted Keys: Capable of transmitting horizontal shear force as required on plans.

E. Calculate structural properties of framing members in accordance with ACI 318.

F. Utilize the PCI - Manual for the Design of Hollow Core Slabs.

1.03 SUBMITTALS

A. Submit under provisions of Section 013300.

B. Shop Drawings: Indicate plank locations, connection details, edge conditions, bearing requirements, support conditions, dimensions, openings and cut relationship to adjacent materials. Indicate where poured in place concrete is required at sharp angles. Shop drawings shall bear seal and signature of a New York State licensed Profession Engineer.

C. Product Data: Indicate standard component configuration, design loads and deflections.

D. Fabricator's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

E. Provide test data for concrete mix.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with the requirements of PCI MNL-116 and PCI MNL-120.

B. Maintain plant records and quality control program during production of precast planks. Make records available upon request.

1.05 QUALIFICATIONS

A. Fabricator: Company specializing in manufacturing the work of this section with three years documented experience.

B. Erector: Company specializing in erecting the work of this Section with experience approved by fabricator.

C. Design precast concrete members under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of New York.

1.06 REGULATORY REQUIREMENTS

A. Conform to ACI 318 and applicable local code for design load and on-site construction requirements.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 016500.

B. Lifting and Handling Devices: Capable of supporting member in positions anticipated during manufacture, storage, transportation and erection.

1.08 COORDINATION

A. Coordinate work under provisions of Section 013100.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Old Castle Precast Building Systems.

B. Or approved equal.

2.02 MATERIALS

A. Cement: ASTM C150.

B. Aggregate: Normal weight, conform to ASTM C33 for fine to course gradation.

C. Prestressing Strands: Uncoated, ASTM A416, Grade 250 or 270.

D. Non-Shrink Grout: Non-metallic, minimum compressive strength of 5,000 psi at 28 days.

E. Concrete mix:
   1. Minimum compressive strength at 28 days: 5000 psi.
   2. Air-entrainment: Max. 6%.
   3. Water/Cement Ratio: Max. .45.
   4. Slump: 3".

2.03 ACCESSORIES

A. Connecting and Supporting Devices: ASTM A666 stainless steel; conforming to PCI MNL-123; plates, items cast into concrete and inserts.

B. Core Hole End Plugs: Cardboard insert with stiff concrete fill.

C. Bearing Pads: High density plastic, 1/8 inch thick, x 5" smooth on one side, continuous under precast planks.

D. Headers required to safely carry design loads shall be fabricated of steel and be painted with one coat of red oxide primer after fabrication. Determination of header requirements shall be by manufacturers' engineer.

2.04 FABRICATION

A. Conform to PCI MNL-116.

B. Embed anchors, inserts and other items at locations indicated.

C. Provide openings required by other sections, at locations indicated.

D. Cut exposed ends flush.

E. Steam cure for 24 hours.

F. Age precast concrete hollow core planks at least 28 days before shipping.

2.05 COMPONENTS

A. Nominal Thickness: 8 inches.

B. Nominal Plank Width: 48 inches; increase plank width at openings greater than 12 inches wide. Provide 6 inches of concrete minimum between opening and edge of plank.

2.06 FINISHES

A. Plant Finish: Finish members to PCI MNL-116 Commercial Grade.

B. Prepare surface to receive specified finish.

2.07 FABRICATION TOLERANCES

A. Maximum Variation From Nominal Dimensions:
   1. Width: 1/4 inch.
   2. Length: 1/2 inch.
   3. Thickness: 1/4 inch.

B. Connecting and supporting stainless steel devices; Mill finish.

C. Maximum Variation From Intended Camber: 1/4 inch in 10 feet.

D. Maximum Out of Square: 1/8 inch/10 feet, non-cumulative.

E. Maximum Misalignment of Anchors, Inserts, Openings: 1/8 inch.

F. Maximum Bowing of Members: Length of Bow/360.

2.08 SOURCE QUALITY CONTROL AND TESTS

A. Provide testing and analysis of site placed concrete and grout under provisions of Section 014500.

B. Test samples in accordance with specified ASTM and ACI standards.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify site conditions under provisions of Section 011400.

B. Verify that site conditions are ready to receive work and field measurements are as indicated on drawings.

C. Verify supporting structure is ready to receive work.

3.02 PREPARATION

A. Prepare support devices for the erection procedure and temporary bracing.

3.03 ERECTION

A. Erect members without damage to structural capacity, shape, or finish. Replace or repair damaged members.

B. Align and maintain uniform horizontal and end joints, as erection progresses. Minimum bearing shall be 2 ½” on steel and 3” on concrete or masonry.

C. Maintain temporary bracing in place until final connection is made. Protect members from staining.

D. Adjust differential elevation between precast members to tolerance before final attachment.

E. Grout plank joints, trowel smooth.

F. Place sealant backer rod to underside of plank joints to prevent grout leakage.

G. Secure units in place with dowel into grouted bond beam.

3.04 ERECTION TOLERANCES

A. Erect members level and plumb within allowable tolerances. Conform to PCI MNL-116.

B. Erect to the following tolerances:

1. Maximum Variation from Plane or Location Indicated on Drawings: 1/4 inch in 10 feet and 3/8 inch in 100 feet, non-cumulative.
2. Maximum Offset from True Alignment Between Members: 1/4 inch.
3. Maximum Variation From Dimensions: Plus or minus 1/4 inch.

C. Exposed Joint Dimension: 3/8 inch plus or minus 1/4 inch.

3.05 PROTECTION OF FINISHED WORK

A. Protect finished work under provisions of Section 016500.

B. Protect members from damage caused by erection operations.

C. Provide non-combustible shields during welding operations.

3.06 CLEANING

A. Clean weld marks, dirt, or blemishes from surface of exposed members.

END OF SECTION