

NITTERHOUSE CONCRETE PRODUCTS, INC.
2655 Molly Pitcher Highway South
Chambersburg, PA 17201
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Website: www.nitterhouse.com **Phone:** 717-267-4505
E-mail: precast@nitterhouse.com **Fax:** 717-267-4518

**GUIDE SPECIFICATION
FOR
HOLLOW CORE PLANK**

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These guide specifications are subject to change without notice.

This Guide Specification is intended for the use of professional personnel competent to evaluate the significance and limitations of its contents, and who will accept responsibility for the application of the material it contains.

PART I - GENERAL

A. DESCRIPTION

1. Work includes
 - a. These specifications cover manufacture, transportation, and erection of precast/prestressed hollow core plank, as manufactured by Nitterhouse Concrete Products, Inc., including grouting of joints between adjacent slab units.
2. Related Work Specified Elsewhere
 - a. Cast-in place Concrete: Section _____.
 - b. Architectural Precast Concrete: Section _____.
 - c. Precast Structural Concrete: Section _____.
 - d. Structural Metal Framing: Section _____.
 - e. Masonry Bearing Walls: Section _____.
 - f. Underlayments: Section _____.
 - g. Caulking and Sealants: Section _____.
 - h. Holes for Mechanical Equipment: Section _____.
 - i. Painting: Section _____.
 - j. Carpet and Pad: Section _____.
 - k. Roofing and Roof Insulation: Section _____.

B. QUALITY ASSURANCE

If the Engineer requires approval of the manufacturing facility,

1. The precast/prestressed concrete manufacturing plant shall be a PCI-certified plant and have a minimum of fifteen (15) years' experience of being regularly engaged in the manufacture, delivery, and erection of precast/prestressed structural concrete. They must follow the guidelines prescribed by the Precast/ Prestressed Concrete Institute (PCI) manual MNL-116, latest edition.
2. Erector Qualifications: Regularly engaged for at least five (5) years in the erection of precast structural concrete, similar to the requirements of this project.
3. Qualifications of welders: In accordance with the American Welding Society Standards.
4. Testing: In general compliance with applicable provisions of Precast/Prestressed Concrete Institute MNL-116, *Manual for Quality Control for Plants and Production of Precast/Prestressed Concrete Products*.
5. Requirements for Regulatory Agencies: All local codes plus the following specifications, standards, and codes that are a part of these specifications, latest edition:
 - a. ACI 318 *Building Code Requirements for Reinforced Concrete*.
 - b. AWS D1.1 *Structural Welding Code - Steel*.
 - c. AWS D1.4 *Structural Welding Code - Reinforcing Steel*.
 - d. ASTM specifications as referred to in Part 2 - *Products of this Specification*.
 - e. MNL-116 PCI *Manual for Quality Control for Plant and Production of Precast/Prestressed Concrete Products*.
 - f. PCI *Design Handbook*, latest edition.

C. SUBMITTALS

1. Shop drawings
 - a. Erection drawings
 - i. Plans locating and defining all hollow core planks furnished by the manufacturer with all cast-in openings shown and located. Sizes and locations of these openings are to be provided to the manufacturer by the respective trades.
 - ii. Sections and details showing connections, edge conditions, and support conditions of the hollow core planks.
 - iii. All dead, live, and other applicable loads used in the design, as well as typical cross section.
2. Product Design Criteria
 - a. Loading for design.
 - i. Initial handling and erection stresses.
 - ii. All dead and live loads as specified on the contract drawings.
 - iii. All other loads specified for hollow core planks where applicable.
 - b. Design shall be in accordance with ACI 318 and applicable codes.
 - c. The fire rating classification shall be calculated by rational means in accordance with Chapter 9.3 of the *PCI Design Handbook*, latest edition.
3. Permissible Design Deviations
 - a. Design deviations will be permitted only after the Architect/Engineer's written approval of the manufacturer's proposed design supported by complete design calculations and drawings.
 - b. Design deviations shall provide an installation equivalent to the basic intent.
4. Test reports: Reports on concrete and other materials upon request.

PART II - PRODUCTS

A. MATERIALS

1. Portland cement
 - a. ASTM C150, Type I or Type III.
2. Admixtures
 - a. Air-entraining admixtures - ASTM C260.
 - b. Water reducing, retarding, accelerating, high-range water reducing admixtures - ASTM C494.
3. Aggregates
 - a. ASTM C33 or C330.
4. Water
 - a. Potable or free from foreign materials in amounts harmful to concrete and embedded steel.
5. Reinforcing steel
 - a. Bars.
 - i. Deformed billet steel - ASTM A615.
 - ii. Deformed low alloy steel - ASTM A706.
 - b. Wire.
 - i. Cold drawn steel - ASTM A185.
 - ii. Structural welded wire reinforcement – ASTM A496

6. Prestressing strand.
 - a. Uncoated, 7-wire, lo-relaxation strand - ASTM A416 (including supplement) Grade 270K.
7. Welded studs.
 - a. In accordance with AWS D1.1 and ASTM A108.
8. Structural steel plates and shapes.
 - a. ASTM A36.
9. Grout.
 - a. Cement grout – Grout shall be a mixture of not less than one (1) part Portland cement to three (3) parts fine sand, and the consistency shall be such that joints can be substantially filled, but without seepage over adjacent surfaces. Any grout that seeps from the joint shall be completely removed before it hardens. Grout strength shall be 3,500 psi minimum.
10. Bearing pads
 - a. Standard bearing pads.
 - i. Plastics – Multi-monomer continuous plastic strips shall be non-leaching and support construction loads with no visible overall expansion.
 - b. Optional bearing pads.
 - i. Continuous tempered hardboard.
 - ii. Reinforced random-oriented fiber.

B. CONCRETE MIXES

1. Concrete mix shall conform to ACI 211-1, current edition.
2. 28-day, compressive strength - minimum of 5,000 psi.
3. Release strength - minimum of 3,000 psi.
4. The use of calcium chloride ions or other salts is not permitted.

C. MANUFACTURING

1. Manufacturing procedures shall be in general compliance with PCI MNL-116
2. Manufacturing tolerances
 - a. Manufacturing tolerances shall comply with PCI MNL-116.
3. Bottom finish is standard grade form finish as per PCI MNL-116, Appendix C. Any surface preparation for painting is by other trade contractors.
4. Openings
 - a. Manufacturer shall provide for those openings larger than 10" in each direction as shown on the architectural and/or structural contact drawings at the time of bidding.
 - b. Headers will be supplied by the manufacturer, where required by design.
 - c. Other openings shall be located and field drilled or cut by the trade requiring them after the hollow core planks have been erected. Openings and/or cutting of the prestressing strand must be approved by the Architect/Engineer and Manufacturer before drilling or cutting.
5. Patching
 - a. Patching will be acceptable provided the structural integrity of the hollow core plank unit is not impaired as evaluated by the manufacturer's Engineering Department.

PART III - EXECUTION

A. PRODUCT DELIVERY, HANDLING, AND STORAGE

1. Delivery and Handling.
 - a. The hollow core planks shall be lifted and supported during manufacturing, stockpiling, transporting, and erection operations only at the lifting or supporting point, or both, as shown on the shop drawings and with approved lifting devices.
 - b. Transportation, site handling, and erection shall be performed with acceptable equipment, methods, and qualified personnel.
2. Storage.
 - a. Store the planks off the ground.
 - b. Place the stored planks so the identification marks are discernible.
 - c. Separate stacked members by battens across full width of each plank.
 - d. Stack so the lifting devices are accessible and undamaged.
 - e. Do not use upper member of stacked tier as storage for shorter member of heavy equipment.

B. ERECTION

1. Site access.
 - a. The General Contractor shall be responsible for providing suitable access to the building, proper drainage, and firm level bearing for the hauling and erection equipment to operate under their own power.
2. Preparation.
 - a. The General Contractor shall be responsible for:
 - i. Providing true, level bearing surfaces on all field-constructed bearing walls and other field-constructed supporting members.
 - ii. All pipes, stacks, conduits, and other such items shall be stubbed-off at a level lower than the bearing plane of the prestressed concrete products until after the latter are set.
3. Installation
 - a. Installation of the hollow core planks shall be performed by the manufacturer or a competent erector.
 - b. Members shall be lifted at points determined by the manufacturer.
 - c. Bearing pads shall comply with manufacturer's recommendations.
 - d. Grout shall extend to at least the bottom of the shear keys. Concrete settlement of the grout is structurally acceptable and can be feather leveled by others, if required.
4. Slab ends (where shown on drawings).
 - a. Provide suitable dam in voids, as required.
5. Alignment
 - a. Members shall be properly aligned and leveled as required by the approved shop drawings. Variations between adjacent members shall be reasonably leveled-out by jacking, loading, or any other feasible method as recommended by the manufacturer to within 3/8".
6. Clean up
 - a. As work progresses, all excess or foreign materials which would become difficult to remove from finished surfaces, or which would harden on finished surfaces, shall be removed.

- b. Upon completion of the work, all surplus materials, tools, equipment, and debris leaving the building in a clean condition shall be removed to the satisfaction of the Owner.
- c. Final cleaning of all material is the responsibility of the general contractor/ construction manager of the project.

C. FIELD WELDING

- 1. Field welding shall be performed by a certified welder and in accordance with applicable codes and details on NCP's shop drawings.

D. ATTACHMENTS

- 1. Subject to approval of the Architect/Engineer, hollow core planks may be drilled or "shot" provided no contact is made with the prestressing steel. Should spalling occur, it shall be repaired by the trade doing the drilling or the shooting.

E. WARRANTY

- 1. The precast concrete manufacturer shall guarantee the precast concrete products against defects in material and workmanship, for a period of one (1) year, after acceptance of the units by the owner.