ELEMATIC® Hollow-core Plank
ELEMATIC®
Hollow-core
Plank

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Introduction

The purpose of this technical data is to provide assistance in selecting and detailing precast concrete hollow-core plank manufactured by Oldcastle Precast, Inc.

The load tables presented herein are intended as a guide only. Final design is determined by our engineering department based on information presented in the final plans and specifications. To ensure the optimum selection for your application, please contact us for assistance.

Although care has been taken to provide the most accurate data possible, Oldcastle Precast, Inc. does not assume responsibility for errors and omissions.

The Manufacturing Process

Elematic® is a machine extruded, precast, prestressed hollow-core plank. The planks are manufactured on 500-foot-long beds in standard widths of 48 inches and thickness of 6, 8, 10, 12 and 16 inches. High strength prestressing strands are cast into the planks at the spacing and location required for the given span, loading and fire cover conditions. The planks are cut to length for each project using a diamond-blade saw. After the planks are cut, they are removed from the casting beds and placed into storage.

All Elematic® materials equal or exceed the requirements of applicable ASTM specifications. The concrete mix is designed to have release strength of 3,000 psi or 3,500 psi, and a 28-day compressive strength of 5,000 psi. The prestressing strands are uncoated, seven wire, low relaxation with a minimum ultimate strength of 270 ksi.

Load Table Design Criteria

The tables herein list allowable live loads in pounds per square foot for uniformly distributed loading. Non-uniform loading conditions resulting from point loads, line loads, openings and cantilevers require special design consideration.

The allowable load is usually governed by the ultimate capacity of the section. As a design aid, the ultimate moment capacities in governing criterion for short spans may be the horizontal shear stress between the plank and the topping.

Allowable live loads for long-span, heavily reinforced sections are limited to loads that result in a bottom-tension stress equal to the cracking stress. Loads beyond this limit may result in deflections that exceed the allowable value set forth in the ACI code.

The load tables are based on a plank concrete strength of 5,000 psi. Tables for topped sections are based on a topping strength of 3,500 psi and minimum thickness of 2 inches.

Maximum spans and loads shown are not absolutes. Longer spans or heavier loads may be achieved under certain conditions or different criteria than assumed in the tables. Contact us if you need assistance.

Plank Design Considerations

The following items will affect the selection of appropriate plank sizes and should be carefully reviewed by the Architect/Engineer while developing the plans and specifications for a project:

Fire Rating
- The fire rating requirement should be clearly specified in the contract documents.

Loading Conditions
- Specify all uniform loading requirements on structural plans.
- Identify line and point loads resulting from bearing walls, masonry walls, face brick, columns, mechanical equipment, etc.
- Identify diaphragm forces and lateral loads resulting from wind or earth pressures.
- Review roof plans for vertical protrusions such as parapets, penthouses and adjacent buildings that could require designing for snow drift loads.
- Plank supporting stairs require special loading considerations.
- Large openings or closely spaced groups of smaller openings will reduce the plank load carrying capacity.

Topping
- Specify whether or not concrete topping is to be composite. Composite action requires the topping to be bonded to the top surface of the plank. Topping separated by a vapor barrier or insulation is non-composite and must be considered a superimposed load.
- Large cambers resulting from long spans and/or heavy loads will affect the quantity of topping, assuming a level floor is required. Two inches of composite topping at mid span is minimal, and additional thickness at the ends of the plank may be required to maintain level floor elevations.

Camber
- Camber is inherent in all prestressed products. It is the result of the eccentric prestress force required to resist design loads, and cannot be designed in, out, or to an exact number. The amount of camber will depend upon the span, design loads and thickness of plank. Planks stored in the yard for more than 6 weeks, usually due to construction schedule changes, will experience more camber growth.
- Adjacent plank of dissimilar length, strand pattern or with openings will have inherent camber differences.
Fire Rating

Fire rating specifications are as important as all other design parameters. Plank rating requirements are determined by the Architect or Engineer of Record, who is also responsible for establishing the fire rating criteria for the total project.

Three methods generally used in the Northeast for determining hollow-core plank fire-resistant ratings are:

1. 2006 International Building Code
2. Rational analysis as defined by PCI MNL 124, “Design for Fire Resistance of Precast Concrete”
3. Underwriters Laboratories Fire Resistive Ratings
4. MEA product approval (New York City only)

International Building Code “IBC” Fire Rating

The IBC code prescribes fire ratings to any hollow-core plank section. Since 2000, the IBC code has replaced the BOCA, SBC and UBC model codes in many states. The two criteria that are measured to determine the fire rating are:

1. Equivalent concrete thickness – 4.6” inches is required for 2 hrs
2. Bottom strand cover – ¾” cover is required for 2 hrs (restrained condition)

Underwriters Laboratories Fire Ratings

Prior to codes including prescriptive fire-endurance rating methods, fire tests provided the primary source of ratings classifications. While some plank sections were fire tested, others can be evaluated by UL to qualify for existing UL numbers.

The table below lists the UL ratings available with Elematic® plank. Note that these ratings are dependent upon whether or not the ends of the planks are restrained. Determination of the restraint must be made by the Architect or the Engineer of Record, as it is primarily a function of the support structure.

<table>
<thead>
<tr>
<th>UL Number</th>
<th>Rating (Hour)</th>
<th>Plank Thickness (inch)</th>
<th>Topping Thickness (inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>J994</td>
<td>1½</td>
<td>8,10,12</td>
<td>0</td>
</tr>
<tr>
<td>J994</td>
<td>2</td>
<td>8,10,12</td>
<td>3/4” Gypcrete</td>
</tr>
<tr>
<td>J994</td>
<td>3</td>
<td>8,10,12</td>
<td>2½” Topping</td>
</tr>
<tr>
<td>J994</td>
<td>4</td>
<td>8,10,12</td>
<td>3½” Topping</td>
</tr>
</tbody>
</table>

Fire Ratings by Rational Analysis

PCI MNL 124 defines the “rational analysis” method for determining the fire rating of precast, prestressed members. It is useful to use when a fire rating cannot be obtained by either of the two previous methods. Actual practice has shown that this method is very conservative and that the span of the hollow-core plank will have to be reduced (approx. 10% to 20%) to achieve the same fire rating from both IBC and UL.

In using this method, the reduced strength of the prestressed strands at elevated temperatures is determined and the resulting moment capacities are compared to that required for service loads. Strand temperatures are based on the amount of concrete cover and the standard fire exposure as defined by the time-temperature relationship specified in ASTM E119. Fire ratings will also be improved if the plank assembly is restrained against thermal expansion. It should be noted that the only universally accepted definition of full restraint is an interior bay of a multi-bay building.

Sound Ratings

The following tables contain values for the Sound Transmission Class (STC) and the Impact Insulations Class (IIC) of various floor systems utilizing Elematic® hollow-core plank.

Sound Transmission Class (STC)

The values for the Sound Transmission Class were determined by tests which were in accordance with ASTM E90. The STC is a measure (in decibels) of the ease at which air-borne sound is transmitted through a floor system. The larger the value of the STC for a given system, the greater the sound insulation.

<table>
<thead>
<tr>
<th>Sound Transmission Class (STC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6” Elematic®</td>
</tr>
<tr>
<td>6” Elematic® + 2” Topping</td>
</tr>
<tr>
<td>8” Elematic®</td>
</tr>
<tr>
<td>8” Elematic® + 2” Topping</td>
</tr>
<tr>
<td>H8* Heavy Elematic®</td>
</tr>
<tr>
<td>H8* Heavy Elematic® + 2” Topping</td>
</tr>
<tr>
<td>10” Elematic®</td>
</tr>
<tr>
<td>10” Elematic® + 2” Topping</td>
</tr>
<tr>
<td>12” Elematic®</td>
</tr>
<tr>
<td>12” Elematic® + 2” Topping</td>
</tr>
<tr>
<td>16” Elematic®</td>
</tr>
<tr>
<td>16” Elematic® + 2” Topping</td>
</tr>
<tr>
<td>Add Acoustical Ceiling +6</td>
</tr>
</tbody>
</table>

Impact Insulation Class (IIC)

The values for the Impact Insulation Class (IIC) were determined by tests which were in accordance with ASTM ES492. The Impact Insulation Class is the resistance to impact noise transmission and is highly dependent on the floor surface and structural connection details. As with the STC, the higher IIC values are more desirable.

<table>
<thead>
<tr>
<th>Impact Insulation Class (IIC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of Floor Systems</td>
</tr>
<tr>
<td>8” Hollow-core Plank</td>
</tr>
<tr>
<td>8” Hollow-core Plank + ½” wood block flooring adhered directly</td>
</tr>
<tr>
<td>8” Hollow-core Plank + 0.058” vinyl tile</td>
</tr>
<tr>
<td>8” Hollow-core Plank + quarry tile w/reinforced mortar bed with 0.4” nylon and carbon black spinneret matting.</td>
</tr>
<tr>
<td>8” Hollow-core Plank + pad &amp; carpet</td>
</tr>
<tr>
<td>Add Acoustical Ceiling +6</td>
</tr>
</tbody>
</table>
1. GENERAL

1.01 Description

A. Work Included:
   1. These specifications cover manufacture, transportation and erection of precast, prestressed, concrete, hollow-core plank, including grouting of joints between adjacent units.

B. Related Work Specified Elsewhere:
   2. Cast-in-Place Concrete: Section________
   3. Architectural Precast Concrete: Section________
   4. Precast Structural Concrete: Section_______
   5. Underlayments (Floor and/or Roof Leveling): Section________
   6. Caulking and Sealants: Section________
   7. Small Holes for Mechanical/Plumbing: Section_______
   8. Cast-in-Place Embedments: Section_______
   9. Steel Bearing Lintels: Section________
   10. Insulation in Plank Cores: Section________

1.02 Quality Assurance

A. Manufacturer Qualifications: The precast concrete manufacturing plant shall be certified by the Prestressed Concrete Institute (PCI) Plant Certification Program prior to the start of production. Manufacturer shall be certified in category C2.

   The manufacturer shall retain a registered structural engineer to certify that manufacturing is in accordance with design requirements; or

   The manufacturer shall, at his expense, meet the following requirements:

   1. The basis of inspection shall be the Prestressed Concrete Institute’s “Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products”, MNL-116, and the criteria for acceptance shall be the same as the Plant Certification Program.

B. Erector Qualifications: PCI Qualified and regularly engaged for at least 5 years in the erection of precast structural concrete similar to the requirements of this project. Retain a registered structural engineer to certify that erection is in accordance with design requirements.

C. Welder Qualifications: In accordance with AWS D1.1.

D. Testing: In general compliance with applicable provisions of Prestressed Concrete Institute MNL-116, “Manual for Quality Control for Plants and Production of Precast Prestressed Concrete Products”.

E. Requirements of Regulatory Agencies: All local codes plus the following specifications, standards and codes are a part of these specifications:

   1. ACI 318 – Building Code Requirements for Reinforced Concrete;
   2. AWS D1.1 – Structural Welding Code-Steel;
   3. AWS D1.4 – Structural Welding Code-Reinforcing Steel;
   4. ASTM Specifications – As referred to in Part 2-Products, of this Specification.
1.03 Submittals and Design

A. Shop Drawings:
   1. Erection Drawings
      a. Plans locating and defining all hollow-core planks furnished by the manufacturer, with all major openings shown.
      b. Sections and details showing connections, weld plates, edge conditions and support conditions of the hollowcore plank units.
      c. All dead, live and other applicable loads used in the design.
      d. Fire rating.

B. Approvals:
   1. Submit _______ copies of erection drawings for approval prior to fabrication. Fabrication not to proceed prior to receipt of approved drawings.

C. Product Design Criteria:
   1. Loadings for design
      a. Initial handling and erection stresses.
      b. All dead and live loads as specified on the contract documents.
      c. All other loads specified for hollow-core plank where applicable.
   2. Fire rating shall be ______ hour(s).
   3. Design steel plank support headers when such headers are determined necessary by the manufacturer's engineer.
   4. Design calculations shall be performed by an engineer, registered in the state that the project is located in, and experienced in precast prestressed concrete design. Design calculations to be submitted for approval upon request.
   5. Design shall be in accordance with ACI 318 and applicable codes.

D. Permissible Design Deviations:
   1. 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.
   2. Design deviations shall provide an installation equivalent to the basic intent without incurring additional cost to the owner.

E. Test Reports: Test reports on concrete and other materials shall be submitted upon request.

2. PRODUCTS

2.01 Materials

A. Portland Cement:
   1. ASTM C150 – Type I or III.

B. Admixtures:

C. Aggregates:
   1. ASTM C33 or C330

D. Water: Potable or free from foreign materials in amounts harmful to concrete and embedded steel.

E. Reinforcing Steel:
   1. Bars:
      Deformed Billet Steel: ASTM A615
      Deformed Rail Steel: ASTM A616
      Deformed Axle Steel: ASTM A617
      Deformed Low Alloy Steel: ASTM A706
   2. Wire: Cold Drawn Steel: ASTM A82.

F. Prestressing Strand:
   1. Uncoated, 7-Wire, Low Lax strand: ASTM A416 (including supplement) – Grade 250K or 270K.
G. Welded Studs: In accordance with AWS D1.1.

H. Structural Steel Plates and Shapes: ASTM A36.

I. Grout:
   1. Cement grout: Grout shall be a mixture of not less than one part portland cement to three parts fine sand, and the consistency shall be such that joints can be completely filled but without seepage over adjacent surfaces. The grout shall achieve a minimum 28-day compressive strength of 2,000 psi. Any grout that seeps from the joint shall be completely removed before it hardens.

J. Bearings Strips:
   1. Plastic: Multi-monomer plastic strips shall be non-leaching and support construction loads with no visible overall expansion.

2.02 Concrete Mixes

A. 28-day compressive strength: Minimum of 5,000 psi
B. Release strength: Minimum of 3,000 psi
C. Use of calcium chloride or admixtures containing chlorides is not permitted.

2.03 Manufacture

A. Hollow-core plank shall be machine cast in 48-inch widths under the trade name Elematic®, as manufactured by Oldcastle Precast Building Systems.
B. Manufacturing procedures and tolerances shall be in general compliance with PCI MNL 116.
C. Openings: Manufacturer shall provide for rectangular openings 10 inches or larger on all sides and as clearly shown on the architectural and structural drawings. They shall be located by the trade requiring them and then field cut. Round and small openings (less than 10 inches) shall be drilled or cut by the respective trades after grouting. Openings requiring cutting of prestressing strand shall be approved by the precast plank manufacturer before drilling or cutting.
D. Finishes: Bottom surface shall be flat and uniform as resulting from an extrusion process, without major chips, spalls and imperfections. Top surface shall be machine troweled.
E. Patching: Will be acceptable providing the structural adequacy of the hollow core unit is not impaired.

3. EXECUTION

3.01 Product Delivery, Storage and Handling

A. Delivery and Handling:
   1. Hollow-core plank shall be lifted and supported during manufacturing, stockpiling, transporting and erection operations only at the lifting or supporting points designated by the manufacturer.
   2. Transportation, site handling and erection shall be performed by qualified personnel with acceptable equipment and methods.

B. Storage:
   1. Store all units off ground on firm, level surfaces with dunnage placed at bearing points.
   2. Place stored units so that identification marks are discernible.
   3. Separate stacked units by dunnage across full width of each plank.

3.02 Erection

A. Site Access: Erection access suitable for cranes and trucks to move unassisted from public roads to all crane working areas as required by erector, or otherwise indicated herein, will be provided and maintained by the general contractor. Obstructing wires shall be shielded or removed and, when applicable, snow removal and winter heat will be provided by the general contractor.

B. Preparation: The general contractor shall be responsible for:
   1. Providing true, level, bearing surfaces on all field-placed bearing walls and other fieldplaced supporting members. Masonry wall bearing surfaces shall be bond beams with properly filled and cured concrete.
   2. All pipes, stacks, conduits and other such items shall be stubbed off at a level lower than the bearing plane until after the plank are set. Masonry, concrete or steel shall not be installed above plank-bearing surface until after the plank is in place.

C. Installation: Installation of hollow-core slab units shall be performed by the manufacturer. Members shall be lifted with slings at points determined by the manufacturer. Bearing strips shall be set where required. Grout keys shall be filled. Openings shall be field cut only after grout has cured, unless authorized by the manufacturer's engineer.
D. Alignment: Members shall be properly aligned. Variations between adjacent members shall be reasonably leveled out by jacking, bolting or any other feasible method as recommended by the manufacturer.

3.03 Field Welding

A. Field welding is to be done by qualified welders using equipment and materials compatible to the base material.

3.04 Attachments and Small Holes

A. Subject to approval of the Architect/Engineer, hollow-core plank units may be drilled or “shot” provided no contact is made with the prestressing steel. Round holes and those less than 8 inches on any side shall be drilled or cut by the respective trades. Should spalling occur, it shall be repaired by the trade doing the drilling, shooting or cutting.

3.05 Clean up

A. Remove rubbish and debris resulting from hollow-core plank work from premises upon completion.

3.06 Safety

A. The general contractor will provide and maintain all safety barricades, rebar caps and opening covers required for plank in accordance with current industry safety standards.
**Product Tolerances: Hollow-core Slabs**

- **a**: Length .......................... ±1/2 in.
- **b**: Width .................................. ±1/4 in.
- **c**: Depth .................................. ±1/4 in.
- **d_t**: Top flange thickness
  - The top flange area defined by the actual measured values of average d_t x b shall not be less than 85% of the nominal area calculated by d_t nominal x b nominal.
- **d_b**: Bottom flange thickness
  - The bottom flange area defined by the actual measured values of average d_b x b shall not be less than 85% of the nominal area calculated by d_b nominal x b nominal.
- **e**: Web thickness
  - The total cumulative web thickness defined by the actual measured value of e shall not be less than 85% of the nominal cumulative width calculated by ∑e nominal.
- **f**: Blockout location .................. ±2 in.
- **g**: Flange angle ....................... 1/4 in. per 12 in., 1/2 in. max
- **h**: Variation from specified end squareness or skew .......................... ±1/2 in.
- **i**: Sweep (variation from straight line parallel to centerline of member) .............. ±3/8 in.
- **j**: Center of gravity of strand group
  - The CG of the strand group relative to the top of the plank shall be within ±1/4 in. of the nominal strand group CG. The position of any individual strand shall be within ±1/2 in. of the nominal vertical position and ±1/4 in. of nominal horizontal position and shall have a minimum cover of ±3/4 in.
- **k**: Position of plates .................. ±2 in.
- **l**: Tipping and flushness of plates .......................................................... ±1/4 in.
- **m**: Local smoothness .................. ±1/4 in. in 10 ft.
  - (does not apply to top deck surface left rough to receive a topping or to visually concealed surfaces)

Plank weight: Excess concrete material in the plank internal features is within tolerance as long as the measured weight of the individual plank does not exceed 110% of the nominal published unit weight used in the load capacity calculation.

**Erection Tolerances: Hollow-core Floor & Roof Members**

- **a**: Plan location from building grid datum ........................................ a1 in.
- **b**: Plan location from centerline of steel ........................................ a1 in.
- **c**: Top elevation from nominal elevation at member ends
  - Covered with topping .................................. ±3/4 in.
  - Untopped floor ........................................ ±1/4 in.
  - Untopped roof ........................................ ±3/4 in.
- **d**: Maximum jog in alignment of matching edges
  - (both topped and untopped construction) .................................. ±1 in.
- **e**: Joint width
  - 0 to 40 ft. member length .................................. ±3/4 in.
  - 41 to 60 ft. member length .................................. ±1/2 in.
  - 61 ft. plus ........................................ a1 in.
- **f**: Differential top elevation as erected
  - Covered with topping .................................. ±1/4 in.
  - Untopped floor ........................................ ±1/4 in.
  - Untopped roof ........................................ ±1/4 in.
- **g**: Differential bottom elevation of exposed hollow-core slabs
  - (span direction) .................................. ±1/4 in.

---

1. For precast concrete erected on a steel frame building, this tolerance takes precedence over tolerance on dimension ‘a’.
2. It may be necessary to flatter the edges to ±1/4 in. to properly apply some roof membranes.
3. This is a setting tolerance and should not be confused with structural performance requirements set by the architect/engineer.
4. Untopped installation will require a larger tolerance here.
**ELEMATIC® Hollow-core Plank**

**UNIFORMLY DISTRIBUTED SUPERIMPOSED* LOAD IN LBS. PER SQ. FT.**

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>7-Wire P/S Strand Combination</th>
<th>P/S Strand Area Sq. In.</th>
<th>Ultimate Bending Moment, M kip-ft per Unit</th>
<th>Simple Span in Feet</th>
<th>p Vcw in Kips per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.06704</td>
<td>4-7/16&quot;</td>
<td>0.460</td>
<td>39.96</td>
<td>10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33</td>
<td>8.58</td>
</tr>
<tr>
<td>20.06705</td>
<td>5-7/16&quot;</td>
<td>0.575</td>
<td>48.76</td>
<td>104 91 79 68</td>
<td>8.58</td>
</tr>
<tr>
<td>20.06706</td>
<td>6-7/16&quot;</td>
<td>0.690</td>
<td>57.12</td>
<td>217 199 180 159 142 127 114 103 94 85 77</td>
<td>8.58</td>
</tr>
<tr>
<td>20.06707</td>
<td>7-7/16&quot;</td>
<td>0.805</td>
<td>64.64</td>
<td>244 224 206 190 172 154 138 124 112 101 92 84</td>
<td>8.58</td>
</tr>
</tbody>
</table>

* Includes the live load plus any dead load that is additional to the weight of the bare grouted planks in place.

**Notes**

1. Design Standard: ACI 318-2005
2. For complete and detailed calculations consult Oldcastle Precast.
3. For longer spans, heavier loads, or special conditions, consult Oldcastle Precast.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.
5. Values to the left and below the heavy stepped line are controlled by shear.
6. Shaded region indicates expected camber greater than 1°.

Grouted weight of plank is 45 lbs. per sq. ft.

- \( f'c = 5,000 \text{ psi} \)
- \( f'ci = 3,000 \text{ psi} \)
- Area = 173 in\(^2\)
- \( f'pu = 270,000 \text{ psi} \)
- \( I = 719 \text{ in}^4 \)
- \( bw = 10.0 \text{ in} \)
ELEMATIC® Hollow-core Plank

E6 x 48" SECTION
WITH 2" TOPPING (3500 PSI)

UNIFORMLY DISTRIBUTED SUPERIMPOSED* LOAD IN LBS. PER SQ. FT.

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>7-Wire 270 Lolax P/S Strand Combination</th>
<th>P/S Strain Area Sq. In.</th>
<th>Ultimate Bending Moment, ( \phi M_n ) Kip-Ft. per Unit</th>
<th>SIMPLE SPAN IN FEET</th>
<th>( \phi V_{cw} ) in Kips per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>20_06704T</td>
<td>4-7/16&quot;†</td>
<td>0.460</td>
<td>57.36</td>
<td>10</td>
<td>12.30</td>
</tr>
<tr>
<td>20_06705T</td>
<td>5-7/16&quot;†</td>
<td>0.575</td>
<td>70.00</td>
<td>11</td>
<td>12.30</td>
</tr>
<tr>
<td>20_06706T</td>
<td>6-7/16&quot;†</td>
<td>0.690</td>
<td>82.16</td>
<td>12</td>
<td>12.30</td>
</tr>
<tr>
<td>20_06707T</td>
<td>7-7/16&quot;†</td>
<td>0.805</td>
<td>91.84</td>
<td>13</td>
<td>12.30</td>
</tr>
</tbody>
</table>

* INCLUDES THE LIVE LOAD PLUS ANY DEAD LOAD THAT IS ADDITIONAL TO THE WEIGHT OF THE BARE GROUTED PLANKS & TOPPING

NOTES
1. Design Standard: ACI 318-2005
2. For complete and detailed calculations consult Oldcastle Precast.
3. For longer spans, heavier loads, or special conditions, consult Oldcastle Precast.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.
5. Values to the left and below the heavy stepped line are controlled by shear.
6. Shaded region indicates expected camber greater than 1".

Grouted weight of plank & 2" topping is 45+25 = 70 lbs. per sq. ft.

\( f'c = 5,000 \text{ psi} \quad f'ci = 3,000 \text{ psi} \quad \text{Area} = 173 \text{ in.}^2 \)

\( f'pu = 270,000 \text{ psi} \quad Ic = 1,580 \text{ in.}^4 \quad bw = 10.0 \text{ in.} \)
## ELEMATIC® Hollow-core Plank

### E8" x 48" SECTION
WITH NO TOPPING

### UNIFORMLY DISTRIBUTED SUPERIMPOSED* LOAD IN LBS. PER SQ. FT.

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>7-Wire P/S Strand Combination</th>
<th>P/S Area Sq. In.</th>
<th>Ultimate Bending Moment, Mn Kip- ft. per Unit</th>
<th>Simple Span in Feet</th>
<th>( p ) Vcw in Kips per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.08704</td>
<td>4-7/16&quot; P/S 270 Lolax</td>
<td>0.460</td>
<td>58.88</td>
<td>20.08704</td>
<td>0.460</td>
</tr>
<tr>
<td>20.08705</td>
<td>5-7/16&quot; P/S 270 Lolax</td>
<td>0.575</td>
<td>72.52</td>
<td>20.08705</td>
<td>0.575</td>
</tr>
<tr>
<td>20.08706</td>
<td>6-7/16&quot; P/S 270 Lolax</td>
<td>0.690</td>
<td>85.44</td>
<td>20.08706</td>
<td>0.690</td>
</tr>
<tr>
<td>20.08707</td>
<td>7-7/16&quot; P/S 270 Lolax</td>
<td>0.805</td>
<td>98.04</td>
<td>20.08707</td>
<td>0.805</td>
</tr>
<tr>
<td>20.08806</td>
<td>6-1/2&quot; P/S 270 Lolax</td>
<td>0.918</td>
<td>109.96</td>
<td>20.08806</td>
<td>0.918</td>
</tr>
</tbody>
</table>

* Includes the live load plus any dead load that is additional to the weight of the bare grouted planks in place.

### NOTES

1. Design Standard: ACI 318-2005
2. For complete and detailed calculations consult Oldcastle Precast.
3. For longer spans, heavier loads, or special conditions, consult Oldcastle Precast.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.
5. Values to the left and below the heavy stepped line are controlled by shear.
6. Shaded region indicates expected camber greater than 1°.

Grouted weight of plank is 54 lbs. per sq. ft.

\[ f'c = 5,000 \text{ psi} \]
\[ f'ci = 3,000 \text{ psi} \]
\[ f'pu = 270,000 \text{ psi} \]
\[ l = 1,580 \text{ in.} \]
\[ bw = 10.0 \text{ in.} \]

\[ \text{Area} = 207 \text{ in.}^2 \]
**ELEMATIC® Hollow-core Plank**

**E8” x 48” SECTION**
**WITH 2” TOPPING (3500 PSI)**

**UNIFORMLY DISTRIBUTED SUPERIMPOSED* LOAD IN LBS. PER SQ. FT.**

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>7-Wire 270 L0 lax P/S Strand Combination</th>
<th>P/S Strand Area Sq. In.</th>
<th>Ultimate Bending Moment, ( f_{\text{ct}} ) Kip-( \text{ft.} ) per Unit</th>
<th>SIMPLE SPAN IN FEET</th>
<th>( f_{\text{w}} ) Vow in Kips per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>20_08704T</td>
<td>4-7/16”p</td>
<td>0.460</td>
<td>76.28</td>
<td>210.5 205.0 190.5 175.0 160.0 145.0 130.0 115.0 100.0 85.0 70.0 54.0 38.0 22.0 8.0</td>
<td>16.01</td>
</tr>
<tr>
<td>20_08705T</td>
<td>5-7/16”p</td>
<td>0.575</td>
<td>93.72</td>
<td>238.5 225.0 211.0 197.0 183.0 169.0 155.0 141.0 127.0 113.0 99.0 85.0 71.0 57.0 43.0</td>
<td>16.01</td>
</tr>
<tr>
<td>20_08706T</td>
<td>6-7/16”p</td>
<td>0.690</td>
<td>110.63</td>
<td>266.5 252.0 238.0 224.0 210.0 196.0 182.0 168.0 154.0 140.0 126.0 112.0 98.0 84.0 70.0</td>
<td>16.01</td>
</tr>
<tr>
<td>20_08707T</td>
<td>7-7/16”p</td>
<td>0.805</td>
<td>126.48</td>
<td>294.5 280.0 266.0 252.0 238.0 224.0 210.0 196.0 182.0 168.0 154.0 140.0 126.0 112.0</td>
<td>16.01</td>
</tr>
<tr>
<td>20_08806T</td>
<td>6-1/2”p</td>
<td>0.918</td>
<td>141.92</td>
<td>322.5 308.0 294.0 280.0 266.0 252.0 238.0 224.0 210.0 196.0 182.0 168.0 154.0 140.0</td>
<td>16.01</td>
</tr>
</tbody>
</table>

*INCLUDES THE LIVE LOAD PLUS ANY DEAD LOAD THAT IS ADDITIONAL TO THE WEIGHT OF THE BARE GROUTED PLANKS & TOPPING*

**NOTES**

1. Design Standard: ACI 318-2005
2. For complete and detailed calculations consult Oldcastle Precast.
3. For longer spans, heavier loads, or special conditions, consult Oldcastle Precast.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.
5. Values to the left and below the heavy stepped line are controlled by shear.
6. Shaded region indicates expected camber greater than 1°.

**Grouted weight of plank & 2” topping is 54+25 = 79 lbs. per sq. ft.**

\[ f_c = 5,000 \text{ psi} \quad f’c_l = 3,000 \text{ psi} \quad \text{Area} = 207 \text{ in.}^2 \]

\[ f’p_u = 270,000 \text{ psi} \quad I_c = 3,072 \text{ in.}^4 \quad bw = 10.0 \text{ in.} \]
**ELEMATIC® Hollow-core Plank**

**H8" x 48" SECTION WITH NO TOPPING**

**UNIFORMLY DISTRIBUTED SUPERIMPOSED* LOAD IN LBS. PER SQ. FT.**

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>7-Wire 270 Lolax P/S Strand Area Sq. In.</th>
<th>P/S Strand Area Sq. In.</th>
<th>Ultimate Bending Moment, kip-ft per Unit</th>
<th>Simple Span in Feet</th>
<th>( p ) Vcw in Kips per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.08704</td>
<td>4-7/16&quot;p</td>
<td>0.460</td>
<td>58.88</td>
<td>222</td>
<td>16.93</td>
</tr>
<tr>
<td>30.08705</td>
<td>5-7/16&quot;p</td>
<td>0.575</td>
<td>72.52</td>
<td>248</td>
<td>16.93</td>
</tr>
<tr>
<td>30.08706</td>
<td>6-7/16&quot;p</td>
<td>0.690</td>
<td>85.44</td>
<td>274</td>
<td>16.93</td>
</tr>
<tr>
<td>30.08707</td>
<td>7-7/16&quot;p</td>
<td>0.805</td>
<td>98.04</td>
<td>300</td>
<td>16.93</td>
</tr>
<tr>
<td>30.08806</td>
<td>6-1/2&quot;p</td>
<td>0.918</td>
<td>110.12</td>
<td>325</td>
<td>16.93</td>
</tr>
</tbody>
</table>

* INCLUDES THE LIVE LOAD PLUS ANY DEAD LOAD THAT IS ADDITIONAL TO THE WEIGHT OF THE BARE GROUTED PLANKS IN PLACE

**NOTES**

1. Design Standard: ACI 318-2005
2. For complete and detailed calculations consult Oldcastle Precast.
3. For longer spans, heavier loads, or special conditions, consult Oldcastle Precast.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.
5. Values to the left and below the heavy stepped line are controlled by shear.
6. Shaded region indicates expected camber greater than 1°.

Grouted weight of plank is 60 lbs. per sq. ft.

\[ f'c = 5,000 \text{ psi} \quad f'ci = 3,000 \text{ psi} \quad \text{Area} = 230 \text{ in.}^2 \]

\[ f'pu = 270,000 \text{ psi} \quad \text{l} = 1.667 \text{ in.}^4 \quad bw = 13.77 \text{ in.} \]
**ELEMATIC® Hollow-core Plank**

**H8" x 48" SECTION**
**WITH 2" TOPPING (3500 PSI)**

**UNIFORMLY DISTRIBUTED SUPERIMPOSED* LOAD IN LBS. PER SQ. FT.**

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>7-Wire 270 Lolax P/S Strand Combination</th>
<th>P/S Strand Area Sq. In.</th>
<th>Ultimate Bending Moment, ( M_u ) Kip-Feet per Unit</th>
<th>SIMPLE SPAN IN FEET</th>
<th>( \beta ) Vcw in Kips per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>30_08704T</td>
<td>4-7/16'</td>
<td>0.460</td>
<td>76.28</td>
<td>283</td>
<td>239</td>
</tr>
<tr>
<td>30_08705T</td>
<td>5-7/16'</td>
<td>0.575</td>
<td>93.76</td>
<td>356</td>
<td>678</td>
</tr>
<tr>
<td>30_08706T</td>
<td>6-7/16'</td>
<td>0.690</td>
<td>110.36</td>
<td>789</td>
<td>704</td>
</tr>
<tr>
<td>30_08707T</td>
<td>7-7/16'</td>
<td>0.805</td>
<td>126.52</td>
<td>802</td>
<td>716</td>
</tr>
<tr>
<td>30_08806T</td>
<td>6-1/2'</td>
<td>0.918</td>
<td>141.92</td>
<td>802</td>
<td>716</td>
</tr>
</tbody>
</table>

* INCLUDES THE LIVE LOAD PLUS ANY DEAD LOAD THAT IS ADDITIONAL TO THE WEIGHT OF THE BARE GROUTED PLANKS & TOPPING

**NOTES**

1. Design Standard: ACI 318-2005
2. For complete and detailed calculations consult Oldcastle Precast.
3. For longer spans, heavier loads, or special conditions, consult Oldcastle Precast.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.
5. Values to the left and below the heavy stepped line are controlled by shear.
6. Shaded region indicates expected camber greater than 1".

**Grouted weight of plank & 2" topping is** \( 60+25 = 85 \) lbs. per sq. ft.

\[ f'c = 5,000 \text{ psi} \quad f'ci = 3,000 \text{ psi} \quad \text{Area} = 230 \text{ in.}^2 \]

\[ f'pu = 270,000 \text{ psi} \quad Ic = 3,143 \text{ in.}^4 \quad bw = 13.77 \text{ in.} \]
**ELEMATIC® Hollow-core Plank**

**E10" x 48" SECTION WITH NO TOPPING**

**UNIFORMLY DISTRIBUTED SUPERIMPOSED* LOAD IN LBS. PER SQ. FT.**

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>7-Wire 270 Lolax P/S Strand Combination</th>
<th>P/S Strand Area Sq. In.</th>
<th>Ultimate Bending Moment, p Mn Kip-Ft. per Unit</th>
<th>SIMPLE SPAN IN FEET</th>
<th>Vcw in Kips per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20_10706 6-7/16&quot;p</td>
<td>0.690</td>
<td>114.12</td>
<td>15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38</td>
<td>16.01</td>
</tr>
<tr>
<td></td>
<td>20_10708 8-7/16&quot;p</td>
<td>0.920</td>
<td>147.92</td>
<td>392 363 337 314 294 276 259 240 219 201 185 170 157 145 134 125 116 108 100 93 85 77 70</td>
<td>16.01</td>
</tr>
<tr>
<td></td>
<td>20_10710 10-7/16&quot;p</td>
<td>1.150</td>
<td>180.08</td>
<td>413 383 355 332 310 291 274 258 245 225 207 191 177 164 152 141 131 122 114 106 99 93 87 82</td>
<td>16.01</td>
</tr>
</tbody>
</table>

* *INCLUDES THE LIVE LOAD PLUS ANY DEAD LOAD THAT IS ADDITIONAL TO THE WEIGHT OF THE BARE GROUTED PLANKS IN PLACE*

**NOTES**

1. Design Standard: ACI 318-2005
2. For complete and detailed calculations consult Oldcastle Precast.
3. For longer spans, heavier loads, or special conditions, consult Oldcastle Precast.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.
5. Values to the left and below the heavy stepped line are controlled by shear.
6. Shaded region indicates expected camber greater than 1°.

**Grouted weight of plank is 67 lbs. per sq. ft.**

- $f'c = 5,000$ psi
- $f'ci = 3,000$ psi
- $f'pu = 270,000$ psi
- $l = 3,080$ in.
- $bw = 10.0$ in.

**Area = 257 in.$^2$**
ELEMATIC® Hollow-core Plank

**E10' x 48" SECTION**
WITH 2" TOPPING (3500 PSI)

**UNIFORMLY DISTRIBUTED SUPERIMPOSED** LOAD IN LBS. PER SQ. FT.

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>7-Wire Strand Combination</th>
<th>P/S Area Sq. In.</th>
<th>Ultimate Bending Moment, $M_u$ Kip-(\text{ft.}) per Unit</th>
<th>Simple Span in Feet</th>
<th>(\bar{V}_{ow}) in Kips per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>20_10706T</td>
<td>6-7/16&quot; P/S Strand Combination</td>
<td>0.690 138.96 431 398 369 343 320 300 279 252 228 208 189 172 158 141 123 107 93 79 67</td>
<td>19.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20_10708T</td>
<td>8-7/16&quot; P/S Strand Combination</td>
<td>0.920 179.64 448 414 384 357 333 312 293 276 260 245 223 204 187 172 158 145 134 120 107 95 83 72</td>
<td>19.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20_10710T</td>
<td>10-7/16&quot; P/S Strand Combination</td>
<td>1.150 218.44 465 429 398 371 346 324 305 287 271 256 243 231 214 197 181 167 154 143 132 122 112 101 90 80 19.72</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* INCLUDES THE LIVE LOAD PLUS ANY DEAD LOAD THAT IS ADDITIONAL TO THE WEIGHT OF THE BARE GROUTED PLANKS & TOPPING

NOTES

1. Design Standard: ACI 318-2005
2. For complete and detailed calculations consult Oldcastle Precast.
3. For longer spans, heavier loads, or special conditions, consult Oldcastle Precast.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.
5. Values to the left and below the heavy stepped line are controlled by shear.
6. Shaded region indicates expected camber greater than 1°.

Grouted weight of plank & 2" topping is 67+25 = 92 lbs. per sq. ft.

- \(f'c = 5,000\ \text{psi}\)
- \(f'dl = 3,000\ \text{psi}\)
- Area = 257 in.²
- \(f'pu = 270,000\ \text{psi}\)
- \(Ic = 5,238\ \text{in.}^4\)
- \(bw = 10.0\ \text{in.}\)
# ELEMATIC® Hollow-core Plank Technical Data Guide

**UNIFORMLY DISTRIBUTED SUPERIMPOSED* LOAD IN LBS. PER SQ. FT.**

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>7-Wire 270 Lølåx P/S Strand Combination</th>
<th>P/S Strand Area Sq. In.</th>
<th>Ultimate Bending Moment, pm Kip-ft. per Unit</th>
<th>p Vcw per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>20_12706</td>
<td>6-7/16&quot;p</td>
<td>0.690</td>
<td>142.08</td>
<td>28.10</td>
</tr>
<tr>
<td>20_12707</td>
<td>7-7/16&quot;p</td>
<td>0.805</td>
<td>164.52</td>
<td>28.10</td>
</tr>
<tr>
<td>20_12708</td>
<td>8-7/16&quot;p</td>
<td>0.920</td>
<td>186.08</td>
<td>28.10</td>
</tr>
<tr>
<td>20_12709</td>
<td>9-7/16&quot;p</td>
<td>1.035</td>
<td>206.92</td>
<td>28.10</td>
</tr>
<tr>
<td>20_12807</td>
<td>7-1/2&quot;p</td>
<td>1.071</td>
<td>213.36</td>
<td>28.10</td>
</tr>
<tr>
<td>20_12808</td>
<td>8-1/2&quot;p</td>
<td>1.224</td>
<td>240.36</td>
<td>28.10</td>
</tr>
</tbody>
</table>

*INCLUDES THE LIVE LOAD PLUS ANY DEAD LOAD THAT IS ADDITIONAL TO THE WEIGHT OF THE BARE GROUTED PLANKS IN PLACE

**NOTES**

1. Design Standard: ACI 318-2005
2. For complete and detailed calculations consult Oldcastle Precast.
3. For longer spans, heavier loads, or special conditions, consult Oldcastle Precast.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.
5. Values to the left and below the heavy stepped line are controlled by shear.
6. Shaded region indicates expected camber greater than 1".

Grouted weight of plank is 80 lbs. per sq. ft.

- f'c = 5,000 psi
- f'ci = 3,000 psi
- Area = 307 in.²
- f'pu = 270,000 psi
- l = 5.246 in.⁴
- bw = 14.25 in.
# ELEMATIC® Hollow-core Plank

## E12' x 48' SECTION

**WITH 2' TOPPING (3500 PSI)**

### UNIFORMLY DISTRIBUTED SUPERIMPOSED* LOAD IN LBS. PER SQ. FT.

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>7-Wire Strand Combination</th>
<th>P/S Strand Area Sq. In.</th>
<th>Ultimate Bending Moment, ( \phi ) Mn Kip-FT per Unit</th>
<th>Simple Span in Feet</th>
<th>Vcw in Kips per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>20_12706T</td>
<td>6-7/16'</td>
<td>0.690</td>
<td>167.28</td>
<td>0</td>
<td>33.39</td>
</tr>
<tr>
<td>20_12707T</td>
<td>7-7/16'</td>
<td>0.805</td>
<td>192.96</td>
<td>0</td>
<td>33.39</td>
</tr>
<tr>
<td>20_12708T</td>
<td>8-7/16'</td>
<td>0.920</td>
<td>217.56</td>
<td>0</td>
<td>33.39</td>
</tr>
<tr>
<td>20_12709T</td>
<td>9-7/16'</td>
<td>1.035</td>
<td>241.64</td>
<td>0</td>
<td>33.39</td>
</tr>
<tr>
<td>20_12807T</td>
<td>7-1/2'</td>
<td>1.071</td>
<td>249.08</td>
<td>0</td>
<td>33.39</td>
</tr>
<tr>
<td>20_12808T</td>
<td>8-1/2'</td>
<td>1.224</td>
<td>280.20</td>
<td>0</td>
<td>33.39</td>
</tr>
</tbody>
</table>

*INCLUDES THE LIVE LOAD PLUS ANY DEAD LOAD THAT IS ADDITIONAL TO THE WEIGHT OF THE BARE GROUTED PLANKS & TOPPING

### NOTES

1. Design Standard: ACI 318-2005
2. For complete and detailed calculations consult Oldcastle Precast.
3. For longer spans, heavier loads, or special conditions, consult Oldcastle Precast.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.
5. Values to the left and below the heavy stepped line are controlled by shear.
6. Shaded region indicates expected camber greater than 1".

### Grouted weight of plank & 2' topping is 80+25 = 105 lbs. per sq. ft.

\[
\begin{align*}
\text{f}_c &= 5,000 \text{ psi} \\
\text{f}_c' &= 3,000 \text{ psi} \\
\text{Area} &= 307 \text{ in.}^2 \\
\text{f}_{pu} &= 270,000 \text{ psi} \\
\text{I}_c &= 8,393 \text{ in.}^4 \\
\text{bw} &= 14.25 \text{ in.}
\end{align*}
\]
# ELEMATIC® Hollow-core Plank Technical Data Guide

## E16" x 48" SECTION WITH NO TOPPING

### ELEMATIC® Hollow-core Plank

### UNIFORMLY DISTRIBUTED SUPERIMPOSED* LOAD IN LBS. PER SQ. FT.

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>7-Wire 270 Laxa P/S Strand Combination</th>
<th>P/S Strand Area Sq In.</th>
<th>Ultimate Bending Moment Mq Kip-Ft.</th>
<th>11,339 in²</th>
</tr>
</thead>
<tbody>
<tr>
<td>20_16708</td>
<td>8-7/16&quot;</td>
<td>0.920</td>
<td>261.12</td>
<td>30.67</td>
</tr>
<tr>
<td>20_16709</td>
<td>9-7/16&quot;</td>
<td>1.035</td>
<td>292.16</td>
<td>30.67</td>
</tr>
<tr>
<td>20_16808</td>
<td>8-1/2&quot;p</td>
<td>1.224</td>
<td>341.84</td>
<td>30.67</td>
</tr>
<tr>
<td>20_16809</td>
<td>9-1/2&quot;p</td>
<td>1.377</td>
<td>379.44</td>
<td>30.67</td>
</tr>
<tr>
<td>20_16810</td>
<td>10-1/2&quot;p</td>
<td>1.530</td>
<td>416.12</td>
<td>30.67</td>
</tr>
<tr>
<td>20_16811</td>
<td>11-1/2&quot;p</td>
<td>1.683</td>
<td>452.04</td>
<td>30.67</td>
</tr>
</tbody>
</table>

**NOTES**

1. Design Standard: ACI 318-2005
2. For complete and detailed calculations consult Oldcastle Precast.
3. For longer spans, heavier loads, or special conditions, consult Oldcastle Precast.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.
5. Values to the left and below the heavy stepped line are controlled by shear.
6. Shaded region indicates expected camber greater than 1".

---

### Grouted weight of plank is 95 lbs. per sq. ft.

- f'c = 5,000 psi
- f'ci = 3,000 psi
- Area = 365 in²
- f'pu = 270,000 psi
- l = 11.339 in³
- bw = 11.3 in.
**ELEMATIC® Hollow-core Plank**

**Building Systems**

**ELEMATIC® Hollow-core Plank**

---

### UNIFORMLY DISTRIBUTED SUPERIMPOSED* LOAD IN LBS. PER SQ. FT.

#### E16" x 48" SECTION

**WITH 2' TOPPING (3500 PSI)**

<table>
<thead>
<tr>
<th>Standard Designation</th>
<th>7-Wire Strand P/S Combination</th>
<th>P/S Strand Area, Sq. In.</th>
<th>Ultimate Bending Moment, ρ Mn Kip-Feet per Unit</th>
<th>SIMPLE SPAN IN FEET</th>
<th>ρ Vcw in Kips per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>20_16708T</td>
<td>8-7/16&quot;P</td>
<td>0.920</td>
<td>293.52</td>
<td>29</td>
<td>34.87</td>
</tr>
<tr>
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<td>9-7/16&quot;P</td>
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<td>1.224</td>
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<td>20_16809T</td>
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<td>422.84</td>
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<td>20_16810T</td>
<td>10-1/2&quot;P</td>
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<td>464.12</td>
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<td>20_16811T</td>
<td>11-1/2&quot;P</td>
<td>1.683</td>
<td>504.56</td>
<td>34</td>
<td>34.87</td>
</tr>
</tbody>
</table>

* Includes the live load plus any dead load that is additional to the weight of the bare grouted planks & topping.

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**NOTES**

1. Design Standard: ACI 318-2005
2. For complete and detailed calculations consult Oldcastle Precast.
3. For longer spans, heavier loads, or special conditions, consult Oldcastle Precast.
4. The table indicates maximum safe loads. Camber and deflection must always be investigated by the architect, and/or engineer for the contemplated loading and span so that these factors are compatible with the contiguous materials in the proposed structure.
5. Values to the left and below the heavy stepped line are controlled by shear.
6. Shaded region indicates expected camber greater than 1°.

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Grouted weight of plank & 2’ topping is 95+25 = 120 lbs. per sq. ft.

- $f’_{c} = 5,000\ \text{psi}$
- $f’_{ci} = 3,000\ \text{psi}$
- Area = 365 in.$^{2}$
- $f’_{pu} = 270,000\ \text{psi}$
- $I_{c} = 16,348\ \text{in.}^4$
- $bw = 11.3\ \text{in.}$
Elematic® Hollow-core Plank Details

E1.0 Exterior Bearing (Typ. Flr.)

- Butt Joint 1:3 Grout
- Longitudinal Bar as Required
- 1/8"x2" Korolath BRG Pad
- Fill Top Course Solid Not by Obs
- Similar
- #4 Bent Bar Grouted Into Keyway
- 1/8"x2" Korolath BRG Pad
- Wall Reinforcing Not by Obs
- 3" BRG for 8" CMU
- 3 1/2" BRG for 10" CMU
- 4 1/2" BRG for 12" CMU

Refer to AN-1.0 regarding Brick Relieving Angle Details

E2.0 Exterior Bearing (Roof)

- Butt Joint 1:3 Grout
- Longitudinal Bar as Required
- #4 U-Bar Grouted into Pocket @ 4'-0" O/C
- Plank Camber Hidden by Finish Materials
- Wall Reinforcing Not by Obs
- 1" Min. Lap Recommended (Varies with Bldg Layout)

Refer to AN-1.0 regarding Brick Relieving Angle Details

E3.0 Interior Bearing

- Butt Joint 1:3 Grout
- Longitudinal Bar as Required
- #4 U-Bar Grouted into Keyway
- 1/8"x2" Korolath BRG Pad
- Plank Camber Hidden by Finish Materials
- Wall Reinforcing Not by Obs
- Similar
- 1" Min. Lap Recommended (Varies with Obs Layout)

E4.0 Exterior Side Lap

- Butt Joint 1:3 Grout
- Longitudinal Bar as Required
- 3'-0"
- #4 Bent Bar Grouted into Keyway
- 1/8"x2" Korolath BRG Pad
- Wall Reinforcing Not by Obs
- 3" BRG for 8" CMU
- 3 1/2" BRG for 10" CMU
- 4 1/2" BRG for 12" CMU

E5.0 Interior Shear Wall

- Butt Joint 1:3 Grout
- Longitudinal Bar as Required
- #4 Bent Bar Grouted into Keyway
- 1/8"x2" Korolath BRG Pad
- Plank Camber Hidden by Finish Materials
- Wall Reinforcing Not by Obs
- Similar
- 1" Min. Lap Recommended (Varies with Obs Layout)

E6.0 Interior Change of Direction

Refer to AN-1.0 regarding Brick Relieving Angle Details
**E7.0 Header Support at Large Opening**

- Roofing material not shown for clarity.
- #4 x 1'-0" dowel drill & grout after plank erection @ 8'-0" O.C.
- 1'-4" max.
- Fill top course solid not by OBS.
- Plank camber hidden by finish materials.

**E8.0 Plank Header Types**

<table>
<thead>
<tr>
<th>PLANK THK</th>
<th>HEADER ANGLE</th>
<th>EAR PLATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELEMATIC 6&quot;</td>
<td>L 4&quot;x4&quot;x3/8&quot;</td>
<td>PLT 4&quot;x1/2&quot; X 1'-1&quot;</td>
</tr>
<tr>
<td>ELEMATIC 8&quot;</td>
<td>L 6&quot;x4&quot;x3/8&quot;</td>
<td>PLT 4&quot;x1/2&quot; X 1'-1&quot;</td>
</tr>
<tr>
<td>ELEMATIC 10&quot;</td>
<td>L 7&quot;x4&quot;x1/2&quot;</td>
<td>PLT 4&quot;x5/8&quot; X 1'-1&quot;</td>
</tr>
<tr>
<td>ELEMATIC 12&quot;</td>
<td>L 8&quot;x4&quot;x1/2&quot;</td>
<td>PLT 4&quot;3/4&quot; X 1'-1&quot;</td>
</tr>
</tbody>
</table>

- #4 x 1'-0" dowel drill & grout in keyways @ 48" O/C after plank erection.
- Top reinforcing designed by OBS Eng.
- Insulation by others.
- Cantilever length varies.
- 4'-0" max. for 8" plank.
- 5'-0" max. for 10" plank.
- 6'-0" max. for 12" plank.
- *Contact OBS Eng for 6" plank.

**E9.0 Small Side Plank Roof Overhang**

- Steel shim if req’d.
- PC solid balcony slab with 1/4" in 12" pitch.
- Welded connection designed by OBS Eng.
- Drip edge.
- Cantilever length varies.
- 5'-0" max. for T = 4".
- 6'-0" max. for T = 6".
- 7'-0" max. for T = 8".
- 3" BRG.
- Temp. shoring if req’d.

**E10.0 Cantilever Plank for Bay Windows**

- Adj. plank.
- See U-bar detail per section 9.
- PC solid slab w/ integral side balcony.
- 1/4:12 pitch.
- 10'-0" max.

**E11.0 Cantilever Solid Slab Balconies**

- PC solid at connections.
- PC solid at connections.
- 1/8" x 2" Korolath BRG pad.
- Fill top course solid not by OBS.
- Temp. shoring if req’d.

**E12.0 Side Cantilever Balconies**
E13.0 End Bearing on Steel

E14.0 Interior Bearing on Steel

E15.0 Exterior Side Lap on Steel

E16.0 Interior Side Lap on Steel

E17.0 Interior Change of Direction

E18.0 Angle Support at Corridors
Elematic® Hollow-core Plank Details

**E25.0 Exterior Bearing on Metal Stud**
- Field Installed Anchor Not By Obs
- CFS Metal Wall (Nonload Bearing)
- Small Core
- Shimming of Metal Studs Req’d To Adjust for Plank Camber

**E26.0 Exterior Bypass Side on Metal Stud**
- Butt Joint 1:3 Grout
- #4 x 4'-0" Tie Rod Grouted Into Keyway
- Field Installed Anchor Not By Obs

**E27.0 Exterior Side Lap on Metal Stud**
- Butt Joint 1:3 Grout
- #4 x 4'-0" Tie Rod Grouted Into Keyway
- Top Finger Slots In Planks For Grout Access

**E28.0 Interior Bearing on 8" Metal Wall**
- 8" Min. GROUT
- Factroy Slots For Grout Access At Each Core
- 4000 PSI GROUT Cont. Along DB8

**E29.0 Interior Bearing on 6" Metal Wall**

**E30.0 Typ. Girder-Slab System**
Elematic® Hollow-core Plank Details

E31.0 Precast Stair Landing & Stair Down

- 5 1/2" THROAT AT HALF FLIGHT
- 7" THROAT AT FULL FLIGHT
- 8" SOLID LANDING
- CAULKING B.O.
- 1" CLR
- #5 X 11" (2 PER STAIR) DRILLED & GRouted INTO FLOOR SLAB BY ERECTOR
- 1/3 GROUT BY ERECTOR
- WALL REINF. B.O.
- 2" DIa. SLEEVE CAST BY OBS
- 3/16" 4"

E32.0 Precast Stair Landing & Stair Up

- 5 1/2" THROAT AT HALF FLIGHT
- 7" THROAT AT FULL FLIGHT
- 8" SOLID LANDING
- 1/8"x2" KOROLATH BRG PAD
- 1/8"x2" KOROLATH BRG PAD
- WALL REINF. B.O.
- 1/3 GROUT BY ERECTOR
- 2" CLAR
- 1/3 GROUT BY ERECTOR

E33.0 Precast Stair at Ground Slab

- 8" SOLID LANDING
- WALL REINF. B.O.
- 2" LAP

E34.0 Floor Landing End Bearing

- FILL WITH 1:3 GROUT
- EMBED PLT 6"x4"x3/8"
- 8" SOLID LANDING
- 2" CLR
- FILL CMU SOLID NOT BY OBS
- 8" THK
- 3/16" 3"
- L 5"x5"x1/2" X MID-LANDING WIDTH

E35.0 Floor & Mid-Landing Back Side Lap

- HILTI 3/4"Ø HAS SPCG DESIGNED BY OBS ENG.
- 1" CLR
- 2" CLAR

E36.0 Mid-Landing Support Angle
Elematic® Hollow-core Plank Details

E37.0 Elevator Door Support Detail (1)

E38.0 Elevator Door Support Detail (2)

E39.0 Elevator Door Support Detail (3)

E40.0 Elevator Door Support Detail (4)

E41.0 Elevator Stud & Plank at Elevator Wall

E42.0 Exterior Bearing on 6" ICF Wall
OLDCASTLE BUILDING SYSTEMS (OBS) DOES NOT SUPPLY OR INSTALL BRICK RELIEVING ANGLES.

IF GROUT AND INSTALLATION OF PLANK IS TO BE PERFORMED BY OBS THEN THE CONTRACTOR IS TO REFRAIN FROM INSTALLING BRICK RELIEVING ANGLES UNTIL THE WORK HAS BEEN COMPLETED. ESPECIALLY IN SITUATIONS WHERE THE ANGLE WOULD HINDER OBS FROM PERFORMING THE AGREED UPON SCOPE OF WORK.

ALL BRICK RELIEVING ANGLES SHOULD BE ANCHORED INTO THE WALL SYSTEM (SEE SECTIONS BELOW), WHICH HAS BEEN DESIGNED TO ACCOUNT FOR SUCH LOADING. DO NOT INSTALL RELIEVING ANGLES INTO GROUT OR ATTACH DIRECTLY TO THE HOLLOW-CORE (PLANK).

IF YOU NEED ADDITIONAL INFORMATION OR ASSISTANCE PLEASE CONTACT THE OLDCASTLE BUILDING SYSTEMS ENGINEERING DEPARTMENT.

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**E43.0 Interior Bearing on 6" ICF Wall**

- BUTT JOINT 1:3 GROUT
- LONGITUDINAL BAR AS REQUIRED
- #4 X 4'-0" TIE ROD GROUTED INTO KEYWAY
- 1/8"x2" KOROLATH BRG PAD
- WALL REINFORCING NOT BY OBS
- 3" BRG

**E44.0 Exterior Bearing on 8" ICF Wall**

- BUTT JOINT 1:3 GROUT
- LONGITUDINAL BAR AS REQUIRED
- #4 BENT BAR GROUTED INTO KEYWAY
- 1/8"x2" KOROLATH BRG PAD
- WALL REINFORCING NOT BY OBS
- (1/2" CLR FROM PLANK BRG)
- 3" BRG

**E45.0 Interior Bearing on 8" ICF Wall**

- BUTT JOINT 1:3 GROUT
- LONGITUDINAL BAR AS REQUIRED
- #4 X 4'-0" TIE ROD GROUTED INTO KEYWAY
- 1/8"x2" KOROLATH BRG PAD
- WALL REINFORCING NOT BY OBS
- 3" BRG

**AN-1.0 Brick Relieving Angle**

- FLARE TOP OF CIP WALL
- 3" BRG
- FORM AS REQ'D
- 8" WALL REINFORCING NOT BY OBS
- #4 X 4'-0" TIE ROD GROUTED INTO KEYWAY
- 1/8"x2" KOROLATH BRG PAD
- BUTT JOINT 1:3 GROUT