

SECTION 06 12 13
CONCRETE STRUCTURAL PANEL FLOORING SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Concrete Structural Panel floor system consists of steel joists, trusses or framing members and concrete subfloor installed with mechanical fasteners. Structural Panel Concrete Subfloor is a high-strength reinforced concrete panels for use in noncombustible construction. Adhesives are not recommended, nor required.

1.2 RELATED WORK:

- A. Metal stud framing: Section 05 40 00, Cold-Formed Metal Framing
- B. Rough Carpentry: Section 06 10 00, Rough Carpentry
- C. Flooring: See Section 09 65 16.13, Linoleum Flooring

1.3 DESIGN CRITERIA:

- A. Structural Performance: Provide flooring systems capable of withstanding the following loads and stresses within limits and under conditions indicated, as determined by testing manufacturer's current standard products according to referenced procedures in CISCA:
 - 1. Standard Systems: Floor framing shall be design with a minimum deflection of $L/360$, where the Uniform Floor Load is 330 PSF (15.8 kPa) (Ultimate) for framing spaced at 24" (610 mm) on center.
- E. Installed floor is to be level within plus or minus 1.59 mm in 3.05 m (1/16 inch in 10 feet), and plus or minus 3.18 mm (1/8 inch) over the entire area. Floor assembly to be rigid, free of vibration, rocking panels, rattles and squeaks.
- I. Submit seismic calculations which demonstrate that the proposed access floor system meets requirements of seismic loading in accordance with H-18-8, VA "Seismic Design Handbook". Calculations are to be signed and sealed by a Professional Engineer licensed in the state where the project is located and performed using a current seismic program.
- J. Flame Spread Rating: Provide assembly flame spread of 25 or less using ASTM E84 test method.

1.4 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Samples: 6-inch by 6-inch floor panel and each understructure component.

C. Shop Drawings:

1. Floor panel layout, including ramp location.
2. Detail components of assembly, anchoring methods and edge details.

D. Manufacturer's Literature and Data: Concrete structural panel floor system.

E. Manufacturer's Certificates: Flame spread rating.

F. Floor System Test Reports: Submit certified test reports, from a testing laboratory satisfactory to the COR, attesting that the floor system proposed for installation meets all specified requirements. Submit test reports with shop drawings.

G. Manufacturer's Qualifications.

H. Installer's Qualifications.

I. Seismic Calculations.

1.5 QUALITY ASSURANCE:

A. Manufacturer's Qualifications: Manufacturer with three (3) years' experience in providing items of type specified.

B. Installer's Qualifications: Installers who are trained and approved by manufacturer and have a minimum of three (3) years' experience installation of units required for this project.

1.6 DELIVERY, STORAGE AND HANDLING:

A. Delivery:

1. Deliver materials to site in undamaged condition, in original containers or packages, complete with accessories and instructions. Label packages with manufacturer's name and brand designations. Package materials covered by specific references bearing specification number, type, and class as applicable.

B. Storage:

1. Store all materials in original protective packaging in a safe, dry, and clean location. Store panels at temperatures between 4 and 32 degrees C (40 and 90 degrees F) and between 20 and 70 percent humidity. Replace defective or damaged materials.
2. See manufacturer's recommendations for stacking pallets.

C. Handling:

1. Handle and protect materials in a manner to prevent damage during the entire construction period.

1.7 WARRANTY:

- A. Construction Warranty: Comply with FAR clause 52.246-21, "Warranty of Construction".

1.8 APPLICABLE PUBLICATIONS:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. Architectural Aluminum Manufacturers Association (AAMA):
2604-10.....High Performance Organic Coatings on Aluminum Extrusions and Panels.
- C. American National Standards Institute (ANSI/AISI):
S100.....North American Specification for the Design of Cold-Formed Steel Structural Members
S210.....North American Specification for Cold-Formed Steel Framing - Floor and Roof System Design
S214.....North American Specification for Cold-Formed Steel Framing - Truss Design
- D. ASTM International (ASTM):
ASTM A588/A588MStandard Specification for High-Strength Low-Alloy Structural Steel, up to 50 ksi [345 MPa] Minimum Yield Point, with Atmospheric Corrosion Resistance
E84-14.....Surface Burning Characteristics of Building Materials
E119-14.....Standard Test Method for Fire Tests of Building Construction and Materials
ASTM E136-12.....Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750° C
E648-14c.....Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
F150-06(R2013).....Electrical Resistance of Conductive and Static Resilient Flooring
F1066-04(R2014).....Vinyl Composition Floor Tile
F1700-13a.....Solid Vinyl Floor Tile
- E. Code of Federal Regulation (CFR):

40 CFR 59.....Determination of Volatile Matter Content, Water
Content, Density Volume Solids, and Weight
Solids of Surface Coating

C. International Code Council Evaluation Services (ICC-ES):

AC318.....Acceptance Criteria for Structural Cementitious
Floor and Roof Sheathing Panels

AC319.....Acceptance Criteria for Horizontal Diaphragms
Consisting of Structural Cementitious Floor
Sheathing Panels Attached to Cold-Formed Steel
Framing

F. National Association of Architectural Metal Manufacturers (NAAMM):

AMP 500 Series.....Metal Finishes Manual

I. National Fire Protection Association (NFPA):

75-13.....Fire Protection of Information Technology
Equipment

J. Underwriters Laboratory (UL):

94-06(R2014).....Tests for Flammability of Plastic Materials for
Parts in Devices and Appliances

PART 2 - PRODUCTS

2.1 STRUCTURAL CONCRETE PANEL:

A. Concrete Subfloor, A noncombustible structural subfloor panel
manufactured in accordance with Acceptance Criteria AC318.

1. Panel Dimensions:

- a. Thickness: 3/4" (19 mm)
- b. Width: 4' (1220 mm)
- c. Lengths: 8' (2440 mm) or 6' (1829 mm)
- d. Edges: Tongue and Groove

2. Panel Properties:

- a. Moment Capacity: 1585 lb-in/ft (588 N-m/m) tested in accordance
with ASTM C1185, Sec.5
- b. Bending Stiffness: 315,000 lb-in²/ft (3 kN-m²/m) tested in
accordance with ASTM C1185, Sec.5
- c. Density: 75 lb/ft³ (1200 kg/m³) tested in accordance with ASTM
C1185
- d. Weight: 5.0 lbs/ft² (24.4 kg/m²) tested in accordance with ASTM
D1037 at a thickness of 3/4 inch (19 mm)
- e. Noncombustibility: Pass tested in accordance to ASTM E136-12

f. Surface Burning Characteristics: 0 - Flame Spread / 0 Smoke

Developed tested in accordance with ASTM E84

g. Mold Resistance: 10 tested in accordance with ASTM D3273

0 tested in accordance with G21

2.2 FRAMING

A. Per manufacturer's recommendations.

2.3 FASTENERS:

A. Per manufacturer's recommendations.

2.4 ACCESSORIES:

A. Floor Cleaner: Type recommended by the floor covering manufacturer.

2.5 RAMPS:

A. Bolt ramps to framing. Form step nosing, threshold strip, and floor bevel strip from extruded or cast aluminum, with non-slip traffic surface. Close exposed sides of ramp with not thinner than 18 gage aluminum, reinforced on the back to prevent warp. Install ramp shoes to meet main and raised access floor.

B. Ramps: Manufacturer's standard ramp construction of width and slope indicated, but not steeper than 1:12, with manufacturer's standard non-slip floor finish, and of same materials, performance, and construction requirements as access flooring.

2.6 FLOOR COVERINGS AND UNDERLAYMENT:

A. Per floor covering manufacturer's installation procedures.

PART 3 - EXECUTION

3.1 PREPARATION:

A. Install floor sealer, required for dust or vapor control, prior to installation of pedestals, only if the pedestal adhesive will not damage the coating. If the coating and adhesive are not compatible, apply the coating after the pedestals have been installed and the adhesive has cured.

B. Prior to installation, subfloor is to be dry and free of any surface irregularities that will adversely affect access flooring system appearance or performance.

C. Clear the area in which the floor system is to be installed of debris. Clean floor surfaces and remove dust before the work is started.

3.2 INSTALLATION:

A. Framing:

1. The floor joists and other floor framing components must be designed to meet the strength and deflection criteria specified in the contract documents. The attachment flange or bearing edge must be a minimum 1-5/8" (41 mm) wide. Metal framing must be a minimum 16 gauge.
2. Joist bearing shall be provided at the foundation that is uniform and level.
3. Joists shall be located directly over bearing studs or a header installed at the top of the bearing wall to distribute the load.
4. On steel framing, a web stiffener shall be provided at reaction points and/or concentrated loads as specified in the contract documents. End blocking shall be provided where joists ends are not otherwise restrained from rotation.
5. Additional joists shall be provided under parallel partitions and around all floor openings that interrupt one or more spanning members. Framing must be properly fastened to the supporting walls or structure.
6. All blocking or bridging must be installed prior to the installation of Structural Panel Concrete Subfloor.
7. Framing must be of good quality, free of bows, twists or other malformations.

B. Concrete Panel Subfloor:

1. The panels shall be cut to size with a circular saw equipped with carbide-tipped cutting blade and a dry dust collection device or a water-dispensing device that limits the amount of airborne dust. Wear safety glasses and a NIOSH-approved dust mask when cutting the panel. Collected dust shall be disposed in a safe manner and in compliance with local, state and federal ordinances.
2. Structural Panel Concrete Subfloor shall be installed in a horizontal manner (long edges perpendicular to the framing).
3. The fire, sound and structural ratings of the Structural Panel Concrete Subfloor system are based on mechanical attachment only.
4. Begin panel installation by snapping a line across the joists parallel to the rim joist at a distance equal to the width of the first panel being placed. Given that panel width is 48" (1220 mm), plan the layout so the first and last panel row width is a minimum of 24" (610 mm) wide. In the case where the row width is less than

24" (610 mm) wide, panels shall be blocked on all edges by framing (strapping is not sufficient).

5. Ensure that all supporting members are free of debris before placing panels. Place the cut edge or tongue along the rim joist. Place each panel across three or more supports [minimum two-span condition]. Cut panels to length as needed to ensure that the butt end of the panel is centered on the framing member. Install panels in a direction that ensures that the butt end falls over the open side of the joist. This will help keep adjacent ends in the same place.
6. Structural Panel Concrete Subfloor shall be fastened following the fastening schedule listed in the shop drawings. Begin fastening at one end and fan out across the panel. Do not fasten all the corners first. After the installation of one complete row, begin the next row. Slide panels together so that the tongue of the panel being installed fits into the groove of the installed panel. If there is construction debris lodged inside the groove, do not force the tongue into the clogged groove. Clean the plugged groove with a stiff bristle brush to dislodge the trapped debris. Do not gap the panels. Install the second panel and all subsequent panels in a similar manner to complete the row. Install all rows in a running bond pattern so that end joints fall over the center of the framing members and are staggered by at least two supports from where the end joints fall in the adjacent rows.
7. Cutouts in the panels should be made before installing the panel whenever possible. If a cutout is required after the panel is installed, set the depth of the saw blade to ensure that the framing is not scored. Support the ends and edges of cutouts with framing if they are larger than 6" (153 mm) in either direction (refer to SCP14 Installation Guidelines - Treatment of Floor Penetrations).
8. Ensure panel is flush with supporting member, drive fasteners so the heads are flush with the surface of the board. Use manufacturer's recommended fasteners.
9. During Construction Traffic Protection - prior to floor finishing, place sheathing materials on the floor in high traffic areas to newly installed Structural Panel Concrete Subfloor.

3.3 CLEANING:

- A. Remove debris accumulated during installation from beneath the raised floor system. Immediately after completion of the floor installation, apply floor cleaner in accordance with the floor covering manufacturer's instruction. Do not allow any cleaner to remain between individual panels.

3.4 PROTECTION:

- A. Cover cleaned floors with clean building paper before construction traffic is permitted. Remove protective covering at completion of Work.

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