

Standard Specification For Installation of FORTACRETE® Structural Panel Floor/Ceiling System

07-22-08

SECTION 06160

1. GENERAL

1.1. SUMMARY OF WORK

- 1.1.1. Provide all labor, materials, and equipment necessary to properly install the site-applied or panelized FORTACRETE® Structural Panel Floor/Ceiling System. This system combined with the structural framing is designed to carry the axial and shear diaphragm loads as specified in the contract documents.
- 1.1.2. All materials, unless otherwise indicated, shall be manufactured by United States Gypsum Company, and shall be installed in accordance with its printed installation instructions.

1.2. RELATED WORK SPECIFIED ELSEWHERE

- 1.2.1. Section 05200, Metal Joists
- 1.2.2. Section 05400, Cold-Formed Metal Framing
- 1.2.3. Section 06100, Rough Carpentry
- 1.2.4. Section 09100, Metal Support Assemblies
- 1.2.5. Section 09300, Tile
- 1.2.6. Section 09600, Flooring

1.3. DESCRIPTION OF SYSTEM

- 1.3.1. The FORTACRETE® Floor/Ceiling System is a non-combustible, fire resistive floor/ceiling assembly comprised of steel joists or framing members with FORTACRETE® Structural Panels mechanically fastened to the top of the framing to form the sub-floor, and a drywall, plaster or suspended ceiling applied to the bottom of the framing to form the ceiling.
- 1.3.2. The FORTACRETE® Structural Panel is designed to carry the axial and shear loads and many have a finished floor applied over it.

1.4. SYSTEM PERFORMANCE REQUIREMENTS

- 1.4.1. Panel Exposure – FORTACRETE® Structural Panels are water durable and dimensionally stable. They can be installed in weather conditions that include rain and snow, provided job site safety procedures permit. Installed panels shall not be exposed to weather for more than 90 days. Snow and/or ice must not be allowed to accumulate on installed panels. Care must be taken if snow and/or ice removal is required from installed panel surfaces. Snow should be broomed off whenever possible. Excessive shoveling or scraping may damage the installed panel surface. In the event accumulation of snow and ice do occur, temporary

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space heaters should be used to melt the affected areas. At no time should chemical de-icing agents or salt be used on the panels.

- 1.4.2.** Fire resistive performance – For constructions requiring fire performance, materials and construction shall be provided that are identical to those tested for the following fire performance characteristics. Evaluation for fire resistive performance should be accomplished by testing and inspection agencies recognized by the code body having jurisdiction.
 - 1.4.2.1.** Combustibility – Floor sheathing rated as non-combustible according to ASTM E-136-04.
 - 1.4.2.2.** Surface burning Characteristics-Floor sheathing shall have a flame spread index of 0 and a smoke developed index of 5 or less, when tested in accordance with ASTM E-84.
 - 1.4.2.3.** Fire Resistance-For constructions requiring rated fire resistance, provide materials and construction identical to those of assemblies whose fire resistance has been determined according to ASTM E119.

- 1.5. SUBMITTALS**
 - 1.5.1.** Submit to the project architect or design professional, a copy of the FORTACRETE® Floor Sheathing System literature, including component data, standard details, and manufacturer’s specification
 - 1.5.2. Shop Drawings**
 - 1.5.2.1.** For on-site construction, the Architect/Contractor shall submit complete shop drawings showing fabrication and installation of system including plans, elevations, sections, details of components, control expansion joint locations and details, penetration locations and details, and attachment to supporting construction.
 - 1.5.2.2.** For panelized construction, the Architect/Contractor shall submit shop drawings showing panel construction details, panel layout on building, panel-to-building and panel-to-panel connections, panel lifting points and erection sequence.
 - 1.5.3. Design Calculations**
 - 1.5.3.1.** The Architect/Contractor shall submit engineering calculations showing that the floor framing complies with the maximum allowable clear span, maximum allowable uniform loads and design deflection criteria based on framing properties only as required by the contract documents.
 - 1.5.3.2.** The Architect/Contractor shall submit engineering calculations assessing the requirements for expansion/control joints. Location and design of building control joints shall be the responsibility of the Architect/Contractor.

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- 1.5.3.3. The Architect/Contractor shall submit the design of the framing and attachment to the supporting structure as well as the layout of the floor sheathing including fastening schedule.
- 1.5.3.4. For panelized construction, the Architect/Contractor shall submit engineering calculations for panel attachment, panel framing, panel-to-panel connections, and panel lifting and erection loads.
- 1.5.4. Submit two samples of floor sheathing a minimum 4"x 8" that include edge design.
- 1.5.5. Submit independent research reports or evaluation reports of model code organizations acceptable to local authorities having jurisdiction that evidence the FORTACRETE® Floor Sheathing System's compliance with applicable building codes or acceptance criteria.

1.6. QUALITY ASSURANCE

- 1.6.1. Qualifications
 - 1.6.1.1. Manufacturer shall have experience in manufacturing sheathing products and have a record of successful in-service performance.
 - 1.6.1.2. Contractor shall have successfully installed floor-sheathing products of a similar type, size, and geographical location, as this project, within the last five years. These past projects shall have resulted in construction with a record of successful in-service performance.
- 1.6.2. Code-Acceptance-The FORTACRETE® Floor Sheathing System shall have independent research reports or a current product evaluation report acceptable to the code official having jurisdiction over the geographical area for this project.
- 1.6.3. Pre-Installation Conference-At least one week prior to starting the FORTACRETE® Floor Sheathing System work, conduct a pre-installation conference at the project site. Parties present shall include, but not be limited to, the Architect, General Contractor, Structural Engineer, Owners Representative, FORTACRETE® Structural Panel Contractor and the Framing Contractor.
- 1.6.4. Field Quality Control-At frequent Intervals during construction, the job site will be visited by the Owner's representative to confirm that the FORTACRETE® Floor Sheathing System is being installed per this specification.

1.7. DELIVERY, STORAGE, AND HANDLING

- 1.7.1. All materials supplied by United Gypsum Company shall be delivered in their original unopened packages with labels legible and in tact.
- 1.7.2. All materials supplied by United Gypsum Company shall be stored in a covered enclosure providing protection from damage or exposure to the elements (specifically, rain, and snow).

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- 1.7.3. All materials supplied by others shall be delivered and stored according to their instructions.
- 1.7.4. Damaged or deteriorated materials shall be removed from the premises.
- 1.7.5. Material Safety Data Sheets shall be available for all materials.

1.8. PROJECT CONDITIONS

- 1.8.1. Steel framing to receive the FORTACRETE[®] Structural Panel shall be structurally sound, free from bows, twists or other malformations and in general compliance with local building code requirements. Damaged framing shall be replaced before installation of FORTACRETE[®] Structural Panel.
- 1.8.2. During installation of the FORTACRETE[®] Sheathing the temperature shall be at least 0° F during installation if mechanically fastened and shall be at least 40° F and remain at this temperature or higher for at least 24 hours after installation if adhesive is being used, unless the adhesive manufacturer will permit the use of its product at a lower temperature. Prior to the application of finished flooring the FORTACRETE[®] Structural Panel must be conditioned at the same temperature as required for the finished flooring for at least 48 hours. Finished flooring shall not be applied over FORTACRETE[®] Structural Panel that is wet, frozen or contains frost.

1.9. SEQUENCE AND SCHEDULING

- 1.9.1. Sequence the installation of FORTACRETE[®] Structural Panel with related work specified in other sections to ensure that the floor assemblies are protected against damage or abuse during and after construction.
- 1.9.2. Provide sufficient labor and equipment to properly install all materials.

2. PRODUCTS

2.1. MATERIALS

- 2.1.1. Floor Framing-Cold formed steel with minimum G-60 galvanized coating, minimum 18 gauge meeting AISI and ASTM specifications and requirements for use in a structural floor system.
- 2.1.2. Floor Sheathing-3/4" FORTACRETE[®] Structural Panels manufactured by United States Gypsum Company.
- 2.1.3. Fasteners
 - 2.1.3.1. Screws-Self drilling tapping screws meeting the SAE standard J78. 1013-1022 steel wire, 8-18 x 1 5/8" with a minimum 0.36" bugle head design.

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- 2.1.3.2. Screws must be capable of bending 15° without sign of fracture, have a torsion strength of 42 inch-lbs per SAE J81, meet SAE J78 for hardness
- 2.1.3.3. Screws must have a corrosion resistance that sustains 250 hours of ASTM B117 salt spray test prior to development of white corrosion products.
- 2.1.4. Ceiling Framing-1 1/4", 25 gage resilient channels or USG Drywall Suspension System.
- 2.1.5. Ceiling Panel-SHEETROCK® Brand FIRECODE® Core, Type X Gypsum Board or equivalent.

3. EXECUTION

3.1. FRAMING

- 3.1.1. 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 1.625"(41mm) wide. Metal framing must be a minimum 18 gauge.
- 3.1.2. Joist bearing shall be provided at the foundation that is uniform and level.
- 3.1.3. Joists shall be located directly over bearing studs or a header installed at the top of the bearing wall to distribute the load.
- 3.1.4. 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.
- 3.1.5. 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.
- 3.1.6. All blocking or bridging must be installed prior to the installation of the FORTACRETE® Structural Panel sheathing.
- 3.1.7. Framing must be of good quality, free of bows, twists or other malformations.

3.2. STRUCTURAL PANEL SHEATHING APPLICATION

- 3.2.1. 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.

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- 3.2.2.** FORTACRETE® Structural Panel sheathing shall be installed in a horizontal (long edges perpendicular to the framing) manner. Panels may be installed with either surface against the framing. However, because the panel markings that facilitate fastening are on one side only, applying the board with the marking toward the installer is the preferred orientation.
- 3.2.3.** The use of adhesives in the connection of the FORTACRETE® Structural Panels to the framing or to adjacent FORTACRETE® Structural Panels is optional. The fire, sound and structural ratings of the FORTACRETE® Floor/Ceiling System are based on mechanical attachment only.
- 3.2.4.** If the specification calls for an adhesive/mechanical connection, only apply adhesive to the top of the joists that can be covered by one panel at a time.
- 3.2.5.** 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. Plan the layout so the first and last panel row width is a minimum of 24" wide.
- 3.2.6.** Place the cut edge or tongue along the rim joist. Place each panel across three or more supports. 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.
- 3.2.7.** Fasten each panel after it has been placed following the fastening schedule listed in the contract documents. 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. No gaps are required between panels. If adhesives or sealants are specified in the joints, carefully apply a ¼-3/8" diameter bead of adhesive to the bottom of the grooves of the installed panels. Only apply enough adhesive to cover the joint that will be covered by the first panel in the second row. 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.
- 3.2.8.** Cutouts in the panels should be made before installing the panel when ever 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 8" in either direction.

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- 3.2.9. Drive fasteners so the heads are flush with the surface of the board. See the above section for the correct fastener to be used.
- 3.3. **CLEAN-UP**
 - 3.3.1. Left over material shall be removed from the job site.
 - 3.3.2. Remove all foreign material from the floor surface and vacuum all dust from the surface.
- 3.4. **FLOOR FINISH**
 - 3.4.1. Before the application of floor finish materials, ensure that all panels are properly fastened, with the fastener head driven flush or slightly below the surface of the panels. Fill all voids and depressions with cement based patching or leveling compounds.
 - 3.4.2. Underlayment may be secured to FORTACRETE® Structural Panel using mechanical fasteners or adhesive and mechanical fasteners.
 - 3.4.3. Wood flooring-Apply a building paper, No. 15 felt or equivalent, over the FORTACRETE® Structural Panel prior to applying wood flooring. For engineered wood flooring, use the moisture barrier recommended for the engineered wood flooring system specified in lieu of the building paper. Follow the wood flooring manufacturer's installation instructions for applying wood flooring to plywood or OSB floor sheathing. The FORTACRETE® Structural Panels must be kept dry and maintained in a conditioned space for a minimum of 30 days prior to the installation of wood flooring.
 - 3.4.4. Ceramic Tile-Ceramic tile should be installed over a crack isolation or cleavage membrane applied to the FORTACRETE® Structural Panel. Use latex modified thin set mortar that complies with ANSI Standards for application of the tile to the membrane unless the tile or membrane manufacture directs the use of an alternate material that complies with ANSI Standards.
 - 3.4.5. Carpet-Apply tackless strips (designed for concrete application) for the installation of stretched carpet.
- 3.5. **CEILING CONSTRUCTION**
 - 3.5.1. The construction of the ceiling must comply with the building codes and the requirements specified for fire and sound ratings as evidenced by test.
 - 3.5.2. Apply insulation in the joist cavity if required for sound or thermal performance.
 - 3.5.3. A drywall or plaster ceiling may be applied directly to the bottom of the floor framing except in fire and sound rated assemblies that require resilient channels fastened to the bottom of the joists and the finished ceiling attached to the channels.

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- 3.5.4.** As an option, a drywall or acoustical suspended ceiling may be hung from the floor joists. Follow the ceiling manufacturer's instructions for these installations and the requirements specified for fire or sound rated assemblies.