

# USG STRUCTURAL PANEL CONCRETE SUBFLOOR INSTALLATION INSTRUCTIONS

## PRODUCT INFORMATION

### 1. USG Structural Panel Concrete Subfloor Panel Dimensions:

- A. Thickness: 3/4 inch (19 mm)
- B. Width: 47-3/4 inch (1,213 mm—nominally called 4 feet [1,220 mm])
- C. Length: 8 feet (2,440 mm)
- D. Edges: Tongue and Groove

### 2. Product Packaging:

- A. Pallet Count: 20 pieces
- B. Pallet weight: 3,400 lb. (1,542 kg)

### 3. Tools to Attach Panels to Framing: Refer to table below

Framing Type	Compatible Fasteners <sup>4</sup>	Manufacturer & Fastening Model No.	Bits
CFS <sup>1</sup>	CGH8158LG	Grabber Construction Products 7525XT	T2178LN
		Hitachi Power Tools W6vB3SD2	
		Makita 6844 w. extension 194500-1	
		Simpson Strong-Tie Company Quik Drive® PRO250 Subfloor System	
HRS <sup>2</sup>	CC12250LRG	Grabber Construction Products 7525XT	T3178LN
		Hitachi Power Tools W6vB3SD2	
		Makita 6844 w. extension 194500-1	
		Simpson Strong-Tie Company Inc. Quik Drive® PROHSD60 or PROHSD75	
SPF Lumber <sup>3</sup>	CB200L2M	Grabber Construction Products 7525XT	T2178LN
		Hitachi Power Tools W6vB3SD2	
		Makita 6844 w. extension 194500-1	
		Simpson Strong-Tie Company Inc. Quik Drive® PRO250 Subfloor System	
	WSNTLG2S		BIT3SU
	GL24AABF <sup>4</sup>	SENCO <sup>5</sup> SCN65XP	—

#### Notes:

1. Cold-formed steel shall comply with AISI-General, with a minimum 54 mils or .0538-inch base metal thickness (No.16 gauge) and a minimum C60 galvanized coating. (1/2 in. [13 mm] Min. Edge Distance)
2. HRS – Hot-Rolled Steel shall be 1/4 in. (6.5 mm); A36 Hot-Rolled Steel (3/4 in. [19 mm] Min. Edge Distance)
3. SPF Lumber – 5/8 in. (16 mm) Min. Edge Distance
4. Fastener pull-through capacities can be found in [PER 13067](#)
5. SENCO 8d ring shank nails are manufactured with a length of 2-3/8 in. (60 mm), head diameter of 0.266 in. (6.75 mm) and a shank diameter of 0.113 in. (2.87 mm). Equivalent 8d ring shank nails meeting these dimensional requirements may be utilized when approved by the engineer or designer of record.

**General Notes:** In accordance with [PER-13067](#), the minimum screw pattern is 6 in. (153 mm) o.c. along the perimeter of the panels and 12 in. (305 mm) o.c. in the field of the panels. Do not use a larger size screw unless specified by the structural engineer. A qualified architect or engineer should review and approve calculations, framing and fastener spacing for all projects.

## PRODUCT INFORMATION CONT.

## DELIVERY, STORAGE AND HANDLING

### 4. Cutting System:

- A. Cutting the USG Structural Panel requires a carbide-tipped saw blade and a circular saw equipped with dust collection or suppression to control airborne dust. The dust collection systems can be:
  - i. Festool® Dust Extractor CT36 with HEPA filter
  - ii. Makita Model no. 5057KB – Circular Saw with Dust Collector and HEPA filter
  - iii. DeWalt DWE575DC Dust Collection Adapter for DWE575/DWE575SB with HEPA filter
  - iv. DeWalt DWS520SK Track Saw with Dust Collection with HEPA filter
- Note:** Do not use wet-blades or diamond-blades, as these will not efficiently cut the USG Structural Panel.
- B. Use safety glasses and a NIOSH approved N95 dust mask when cutting this panel.

### 1. Delivery:

- A. Deliver material to site promptly without undue exposure to weather.
- B. Deliver in manufacturer's unopened containers, pallets, or panels fully identified with name, brand, type and grade.

### 2. Storage:

- A. Store above ground in dry, ventilated space.
- B. Panels must never be stored in an upright position, on their edges leaning against a wall or vertical support.  
**Note:** This creates a tipping hazard. If these panels tip over, they could cause serious injury or death.
- C. Protect materials from soiling, and damage.  
**Note:** If USG Structural Panels are frozen while stored outdoors, allow to thaw-out naturally. Do not use salts or fertilizers to defrost the panels or try to mechanically separate with a pry bar or other tools.
- D. Panels must be stored over flat and stable soil. Soil must be able to carry the load of the pallets. Each 20 piece pallet weights 3,400 lb. (1,542 kg).
- E. Stacking: When stacking the product for storage, pallets must be stacked in a flat level location, and must never be stacked more than 4 pallets high.
- F. Pallets must not be stacked over +/- 1/2 inches (13 mm) off its edge.
- G. Stacked pallets must be spaced at least 4 inches (102 mm) from all surrounding stacks, to prevent damage.

### 3. Handling:

- A. USG Structural panels weigh between 140 to 170 pounds (63-77 kg) per panel and are designed to be carried and installed by two people.
- B. Due to the weight of these panels, it is important that they are always laid flat on the floor or flat over the framing, in a horizontal position. Prior to installation on the floor framing, panels may be placed on pallets or timbers. Panels may be placed on pallets or timbers spaced a maximum of 4 feet (1,220 mm) o.c. with the end supports within 1 foot (304 mm) of the ends of the panel.
- C. **Forklift Handling:**
  - i. Use forklifts which are adequate to carry the pallet load with a minimum rating of 5,000 lb. (2,268 kg) and a 96 inch (2,440 mm) width.
  - ii. Care must be taken to ensure the forklift does not come in contact with the panel edges. Allowing for 2-inch (50.8 mm) gap between pallet and forklift backrest. Always pick the load up from the Groove side of the pallet, to avoid damage to the Tongue side of the panels.

- 4. **On Site Handling:** When a crane is used to unload the units from the truck or to lift units (or partial units) from the ground to the desired application location—in addition to all the normal safety precautions used for crane operations—it is recommended to use spreader bars with lifting hooks to minimize bending of the pallets and damage to the tongue and groove edges.

- A. Proper fall restraint equipment required.
- B. Pallet Placement: When placing the pallets prior to installation, pallets must be placed directly over load-bearing walls that can support the total load of a 20-piece pallet.
- C. Panel Protection—During Construction:
  - i. Place load spreader planks perpendicular to joists for fixed scaffolding
  - ii. Place additional USG Structural Panels or plywood on the floor in high traffic construction pathways for rolling gang boxes, two-wheel mason carts, board carts and trash boxes.  
**Note:** Pallet jacks are not allowed over the USG Structural Panel.
  - iii. Consult with designer of record for load limits and proper support for all construction loads
- D. USG Structural Panels are cement based and are reinforced with glass fiber. Wear protective gloves and sleeves to prevent any irritation to hands from the cement or glass fiber.

## LIMITATIONS CONT.

## PROJECT CONDITIONS

## EXAMINATION PRIOR TO INSTALLATION

## INSTALLATION REQUIREMENTS

### Typical Construction Equipment Loads

Equipment and size		Maximum allowed weight
Drywall carts	10 sheets of 5/8" X 4' X 12' Gypsum Panels	1,200 lb. (544 kg)
	7 sheets of 3/4" x 4' x 8' USG Structural Panels	1,200 lb. (544 kg)
Rolling trash carts		1,000 lb. (453 kg)
Rolling scaffolds		750 lb. (340 kg)

### 1. Environmental Requirements:

- A. Do not install USG Structural Panel Concrete Subfloor when ambient or conditioned temperature is below 0°F (-18°C).
- B. Prior to the application of finished flooring, USG Structural Panel Concrete Subfloor must be conditioned at the same temperature as required for the finished flooring for a minimum of 48 hours.
- C. Do not apply finished flooring over USG Structural Panel Concrete Subfloor when wet, frozen or has any frost or condensation present.

**Note:** If installed panels have snow or ice, do not use salts or defrosting agents; sand is recommended over slippery surfaces.

- 1. Examine substrates and adjoining construction and conditions under which work is to be installed. Do not proceed with work until unsatisfactory conditions are corrected.

- A. All framing to receive the USG Structural Panel Concrete Subfloor 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 USG Structural Panel Concrete Subfloor.

### 1. Framing:

- A. The floor joists and other floor framing components must be designed to meet the strength and deflection criteria specified in the contract documents.
- B. Floor joists:
  - i. C-Shaped Joists: Cold-Formed steel shall comply with AISI-General, with a minimum 54 mils or 0.0538-inch (1.37 mm) base metal thickness (No.16 gauge) and a minimum G60 galvanized coating.
  - ii. Cold-Formed Steel Trusses: Cold-Formed steel shall comply with AISI-General, with a minimum 43 mils or 0.0428-inch (1.08 mm) base metal thickness (No. 18 gauge) and a minimum G60 galvanized coating.
- C. The attachment flange or bearing edge must be a minimum 1-5/8 inch (41 mm) wide.
- D. Joist bearing shall be provided at the foundation that is uniform and level.
- E. Joists shall be located directly over bearing studs or a header installed at the top of the bearing wall to distribute the load.
- F. 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.
- G. 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.
- H. All blocking or bridging must be installed prior to the installation of USG Structural Panel Concrete Subfloor.

### 2. USG Structural Panel Concrete Subfloor Application:

- A. The panels shall be cut to size with a circular saw equipped with carbide-tipped cutting blade and a dry dust collection 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.
- B. USG Structural Panel Concrete Subfloor shall be installed with long edges perpendicular to framing.
- C. The panel must bear on the supporting flange or edge a minimum of 3/4-inch (19 mm).
- D. The fire, sound and structural ratings of the USG Structural Panel Concrete Subfloor system are based on mechanical attachment only.

**Note:** The use of adhesives may compromise fire-resistance ratings.

## INSTALLATION REQUIREMENTS CONT.

- E. 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-inch (1,220 mm), plan the layout so the first and last panel row width is a minimum of 24-inch (610 mm) wide. In the case where the row width is less than 24-inch (610 mm) wide, panels shall be blocked on all edges by framing.

**Note:** Metal strapping is not a suitable blocking support.

- F. 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.
- G. USG Structural Panel Concrete Subfloor shall be fastened in accordance with 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. 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.  
**Note:** Do not gap the panels.
- H. 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. When installing fasteners at the butt joint, install screws on the open side of the cold-formed steel framing first. This will help keep the adjacent panels in the same place.
- I. 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 inches (153mm) in either direction, refer to *Installation Guidelines—Treatment of Floor Penetrations* (SCP14).
- J. Ensure panel is flush with supporting member; drive fasteners so the heads are flush with the surface of the board. See the accessories section in this guide for the correct fastener to be used.
- K. During Construction Traffic Protection—prior to floor finishing, place sheathing materials on the floor in high traffic areas to newly installed USG Structural Panel Concrete Subfloor (i.e., additional USG Structural Panels or plywood).

### 3. Clean Up:

- A. Leftover material shall be removed from the job site.
- B. Remove all foreign material from the floor surface and vacuum all dust from the surface.

### 4. Floor Underlayment:

#### A. Poured Underlayment:

USG Levelrock® Brand or Durock™ Brand floor underlayment can be poured directly onto USG Structural Panel Concrete Subfloor in lieu of underlayment panels.

- i. All USG Structural Panel Concrete Subfloor panel joints should be prepared using duct tape or equivalent, to prevent underlayment seepage.
- ii. To minimize sound transmission between the floor and wall and to minimize expansion and cracking, install USG Levelrock® Brand Perimeter Isolation Strip. See *USG Levelrock® Brand Perimeter Isolation Strip* (IG1874) submittal sheet.
- iii. Subfloor must be properly prepared and primed with USG Durock™ Primer-Sealer per the non-porous application instructions. See *USG Durock™ Brand Primer-Sealer* (CB519) submittal sheet.
- iv. Install USG Levelrock® or USG Durock™ Brand Underlayment per manufacturer's written guidelines.

#### B. Panel Underlayment:

Installation of USG Fiberock® Underlayment over USG Structural Panel Concrete Subfloor. See *USG Fiberock® Brand Tile Backer Board and Underlayment* (F103) submittal sheet.

- i. Begin laying panels at one corner. Lay cut of USG Fiberock® Underlayment edges against the wall; only factory edges should be joined. Maintain 1/4-inch (6.35 mm) space between panels and perimeter walls.
- ii. Stagger joints a minimum of 16 inches (406 mm) so that four panel corners never meet, and offset end and edge joints of panels a minimum of 12–16 inches (305–406 mm) from subfloor panel joints. Adjoin panel edges and ends lightly together. A maximum 1/32-inch (0.76 mm) gap is allowed.
- iii. The Fiberock® Underlayment must be bonded with modified thin set mortar.

## INSTALLATION REQUIREMENTS CONT.

- iv. Staples 1/4-inch (6.35 mm) crown, 18-gauge (0.0428 inch [1.09 mm]), and 1 inch (25.4 mm) legs) to be installed at 4 inches (102 mm) on center in the field and 1 inch (25.4 mm) on center along the perimeter of the USG Fiberock® Underlayment. Set pneumatic tool pressure to drive fasteners flush or slightly below underlayment surface. To prevent fastener heads from telegraphing through resilient floor covering, do not countersink more than 1/16 inch (1.58 mm) below surface.
    - v. Use USG Durock™ Brand Advanced Skim Coat floor patch sparingly to fill wide joints, repair any surface voids and correct joint lippage (panel edge sitting above or below the floor plane). Carefully fill joints wider than 1/32 inch (0.76 mm) and any surface imperfections with only enough material to infill void—do not feather. Correct joint lip-page by applying patching compound to low side only and feathering to level. Allow compound to dry completely (90 min. minimum), then lightly sand or scrape, taking care not to scuff panel surface; use a flat blade to scrape away any excess material. Remove dust, dirt and debris from underlayment surface before application of floor covering. See *USG Durock™ Brand Advanced Skim Coat* (CB805) submittal sheet.
  - C. Installation of USG Durock® Brand Cement Board Underlayment over USG Structural Panel Concrete Subfloor. See *USG Durock® Brand Cement Board* (CB399) submittal sheet.
    - i. Install cement board with ends and edges closely abutted, but not forced together. Stagger end joints in successive courses.
    - ii. Stagger joints a minimum of 16 inches (406 mm) so that four panel corners never meet, and offset end and edge joints of panels a minimum of 12–16 inches (305–406 mm) from subfloor panel joints.
    - iii. Laminate USG Durock® cement board to subfloor using Type 1 organic adhesive or latex-modified thin-set mortar suitable for bonding cement board.
    - iv. Fasten to USG Structural Panel Concrete Subfloor with 1-1/4 inch (31.75 mm) USG Durock™ Brand Tile Backer Screws for wood framing (or equivalent) or 1-1/2 inch (38.1 mm) hot-dipped galvanized roofing nails spaced 8 inches (204 mm) on center in both directions with perimeter fasteners at least 3/8 inch (9.52 mm) and less than 5/8 inch (15.8 mm) from ends and edges. Drive nails and screws so that bottoms of heads are flush with panel surface to ensure firm panel contact with subfloor. Do not overdrive fasteners.
    - v. Prefill joints with tile-setting mortar or adhesive and then immediately embed USG Durock™ Brand Tile Backer Tape and level joints.
  - D. Tile Membrane:

USG Durock™ Brand Tile Membrane can be installed directly onto USG Structural Panel Concrete Subfloor in lieu of underlayment panels. See *USG Durock™ Brand Tile Membrane* (CB492) submittal sheet.

    - i. For floor applications, precut full width of membrane to provide tight fit to room perimeter.
    - ii. Use USG Durock™ Tile Membrane Adhesive to bond Tile Membrane to USG Structural Panel Concrete Subfloor. For complete installation instructions, see *Durock™ Tile Membrane Adhesive* (CB511) submittal sheet.
- 5. Floor Covering:
  - A. 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. If required, butt joints and T&G joints shall be filled with an elastomeric patching compound.

**Note:** Cement-based compounds, can crack.
  - B. Wood flooring—Apply a building paper, No. 15 felt or equivalent, over USG Structural Panel Concrete Subfloor 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. USG Structural panels must be kept dry and maintained in a conditioned space for a minimum of 30 days prior to installation of wood flooring.
  - C. Ceramic tile—Ceramic tile should be installed over an underlayment panel or poured underlayment as described above. Apply ceramic tile in accordance with ceramic tile manufacturer's instructions.
  - D. Carpet—For residential carpet & pad, apply tackless strips (designed for concrete application) for the installation of stretched carpet. Residential carpet and pad can be installed directly to USG Structural Panel Concrete Subfloor or to an underlayment. For all carpet tile, it is recommended to use an underlayment as described above.

## INSTALLATION REQUIREMENTS CONT.

- E. For vinyl or linoleum flooring, an appropriate underlayment should be used as described above.
- F. If USG Structural Panel Concrete Subfloor is left bare in extremely-light traffic areas, it is recommended that you seal the panels with an acrylic concrete sealer to seal the porous surface.

### PRODUCT INFORMATION

See [usg.com](http://usg.com) for the most up-to-date product information.

### WARNING

Causes skin irritation. Causes serious eye damage.  
May cause an allergic skin reaction. May cause respiratory irritation. May cause cancer by inhalation of respirable crystalline silica. Do not handle until all safety precautions have been read and understood. Avoid breathing dust.  
Use only in a well-ventilated area and wear a NIOSH/MSHA approved respirator. Wear protective gloves/protective clothing/eye protection. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses and continue rinsing. Immediately call a poison center/doctor.  
If on skin: Wash with plenty of water. Take off contaminated clothing and wash before reuse. Contaminated work clothing should not be allowed out of the workplace.  
If skin irritation or rash occurs, or otherwise exposed or concerned: Get medical attention. Store locked up. Dispose of in accordance with local, state and federal regulations.  
For more information call Product Safety: 800 507-8899 or see the SDS at [usg.com](http://usg.com).

**KEEP OUT OF REACH OF CHILDREN.**

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QUIK DRIVE is a trademark of Simpson Strong-Tie Company, Inc.

### NOTE

Products described here may not be available in all geographic markets. Consult your USG Company sales office or representative for information.

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### SAFETY FIRST!

Follow good safety/industrial hygiene practices during installation. Wear appropriate personal protective equipment. Read SDS and literature before specification and installation.

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Manufactured by  
United States Gypsum Company  
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**MSRP based upon full truckload  
delivered to jobsite:  
Subfloor: \$4.50/sf**

SCP50-USA-ENG/rev. 10-18  
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