

# USG STRUCTURAL PANELS

## CONCRETE FOUNDATION WALL

## CONCRETE FOUNDATION WALL XD



**Concrete foundation panels that can be fastened to steel or wood studs to replace concrete block, poured-in-place concrete or existing deteriorated plywood as a residential foundation wall.**

- No form work, no pouring, no setting, no curing
- Nonrotting, termite-, mold- and moisture-resistant
- Strong, durable concrete panel
- Dimensionally stable, panel will not buckle or warp like wood sheathing
- Installs like wood sheathing; circular saw for cutting, screws for fastening
- Noncombustible—meets the criteria of ASTM E136-12 and CAN S114.
- Designed for full-height basements
- Made in the USA

### DESCRIPTION

USG Structural Panel Concrete Foundation Wall and USG Structural Panel Concrete Foundation Wall XD are mechanically fastened to cold-formed-steel- or wood-studs to form the structural foundation wall system in the construction of light-framed buildings up to three stories tall. The Concrete Foundation Wall system can be designed to support backfill loads exceeding 2,000psf (ultimate) as well as carry shear and gravity loads. Combined with a waterproof membrane and footing drainage system, the USG Structural Panel Concrete Foundation Wall and USG Structural Panel Concrete Foundation Wall XD create a strong, fast and dry foundation wall system. Insulation, mechanical and electrical services can be installed in the stud wall cavity, just like a regular light-framed building stud wall; no strapping or furring needed; and then USG Sheetrock® Brand Gypsum Panels fastened to the other side of the studs to complete the wall construction.

USG Structural Panel Concrete Foundation Wall can bear an ultimate uniform load of 2,083psf (99.7kPa) when stud framing is spaced 12" (305 mm) o.c. Shear wall design ratings of up to 1,726plf (25.2kNm) allow this panel to be used as a shear wall in the structural design of the building.

When applied over steel framing, with insulation in the stud wall cavity and 5/8" USG Sheetrock® Brand Firecode® Core Gypsum Panels fastened on the interior side of the studs, the foundation assembly is rated as a one-hour fire wall. This may be necessary in many urban jurisdictions, where buildings are closely spaced and part of the foundation wall rises above grade.

USG Structural Panel Concrete Foundation Wall panels have a linear variation with change in moisture content of less than 0.10%. This means that the panels will not buckle or warp like wood sheathing. There is no need to gap concrete foundation wall panels

Cutting the Concrete Foundation Wall panels requires an ordinary carbide-tipped saw blade and a circular saw equipped with dust collection or suppression to control airborne dust. Fastening is also conventional, using a screw gun and self-drilling No. 8-gauge screws. Because these panels are so durable, they may be installed in most weather conditions including mild precipitation (rain or snow) and temperatures from 0°F to 125°F (-18°C to 52°C).

### LIMITATION

The Concrete Foundation Wall panels must be installed vertically with the long direction parallel to studs and square edges butting up against each other. Adjacent edges must bear a minimum of 3/4" (19mm) on stud flange. Panels must not be gapped. Panels must span a minimum of four stud supports (three-span condition). If not, an additional stud must be added to ensure all panels have a three-span condition. Panels must be single, full-height panels (up to 8' high) and span from the footing to the top of the foundation wall. **Panels must never be cut into multiple sections.** Where the foundation wall depth exceeds panel length (taller than 8' (2440mm), a full length panel of **Concrete Foundation Wall XD** shall be installed on the bottom part of the wall; a cut panel piece shall be installed for the remaining wall height, with a cut panel fully blocked. **A qualified architect or engineer should review and approve calculations, framing and spacing for all projects.**

## LIMITATION CONT.

A waterproofing membrane system shall be installed in accordance with the manufacturer's installation instructions, along with a properly designed drainage system, all as required by applicable codes. Concrete Foundation Wall panels must be protected from construction moisture, damage and impact during and after installation.

## INSTALLATION

To perform in the expected manner, USG Structural Panel Concrete Foundation Walls must be installed according to USG specifications, using only the listed materials and components. See Code Report [PER-15092](#) (available at [www.PER15092.com](http://www.PER15092.com)), section on "General Product Installation" for more information.

As with all types of construction, appropriate safety procedures must be followed to protect installers from personal injuries resulting from lifting incorrectly, falling, and eye, hand and lung irritation from dust.

Care must be taken when placing pallets of USG Structural Panel Concrete Foundation Wall on level ground or floor framing. A pallet of USG Structural Panel Concrete Foundation Wall, 20 sheets, 3/4" x 4' x 8' (19 mm x 1,220 mm x 2,440 mm) weighs approximately 3,400 lbs. (1,542kg). Do not exceed slab floor limits when loading pallets or panels on the ground, open framing or freshly poured floors.

The steel or wood stud framing must be designed to meet the strength and deflection criteria specified in the contract documents. The attachment stud or bearing edge must be a minimum 1-1/2" (38.1 mm) wide with at least 3/4" (19 mm) of each panel bearing on the supporting flange. Metal framing must be a minimum 54 mils (0.0538 inch or 1.37 mm) base metal thickness (16 gauge) and a minimum G60 galvanized coating and spaced no greater than 16" (458 mm) o.c. Use of an alternate, weaker stud gauge or larger stud spacing must be pre-approved by a design professional. For walls less than 8 feet tall, consult a design professional for the proper framing design. Follow the contract documents and the steel framing manufacturer's recommendations for the proper installation and bracing of the framing.

## RECOMMENDED FASTENERS

Manufacturer	16 ga. Cold-Formed Steel (1/2 in. [13 mm] Min. Edge Distance)		SPF Lumber (5/8 in. [16 mm] Min. Edge Distance)		1/4 in. (6.5 mm) A36 Hot- Rolled Steel (3/4 in. [19 mm] Min. Edge Distance)	
	Part #	Fastener Pull-Through <sup>1</sup>	Part #	Fastener Pull-Through <sup>1</sup>	Part #	Fastener Pull-Through <sup>1</sup>
Grabber Construction Products, Inc.	CGH8158LG	581 lb. (264 kg)	C8200L2M	581 lb. (264 kg)	—	—
Simpson Strong-Tie Company Inc.	CBSDQ158S	581 lb. (264 kg)	WSNTLG2S	581 lb. (264 kg)	TBG1260S	581 lb. (264 kg)
SENCO <sup>2</sup>	—	—	GL24AABF <sup>3</sup>	581 lb. (264 kg)	—	—

### Notes:

1. Fastener pull-through capacities are based upon the minimum average **ultimate tested capacity** for all tabulated fasteners. The engineer or designer of record shall apply an appropriate safety factor (ASD) or resistance factor (LRFD).
2. SENCO 8d ring shank nails are manufactured with a length of 2-3/8 in., head diameter of 0.266 in. and a shank diameter of 0.113 in. Equivalent 8d ring shank nails meeting these dimensional requirements may be utilized when approved by the engineer or designer of record.
3. Minimum edge distance for nails is 1/2 in.

**General Notes:** In accordance with [PER-15092](#), 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.**

## BACKFILL MATERIAL AND BACKFILLING PROTECTION

It is recommended that granular drainage material be used as backfill so that the backfill may be drained free of standing moisture, all as per applicable codes. All backfill material placed within 24 inches (610 mm) of the foundation wall shall be free of deleterious debris, frozen clumps, and boulders larger than 6 inches (152 mm).

Heavy loads shall be kept a safe distance away from the foundation wall system during backfilling. As a guide, heavy equipment should be placed a distance away from the foundation trench equal to the depth of the trench. Extreme caution should be maintained while backfilling the area around the Concrete Foundation Wall panels. Backfilled material shall be placed in uniform lifts of no more than 24 inches (610 mm) around the foundation wall and shall be hand compacted. The soil shall not be mechanically compacted.

## APPLICATION

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Cut panels to size with a circular saw equipped with carbide-tipped blade and a dry dust collection device or a water-dispensing device that controls the amount of airborne dust. Wear safety glasses and a NIOSH-approved N95 dust mask when cutting this panel. Dispose of collected dust in a safe manner and in compliance with local, state and federal ordinances.

Install concrete foundation wall panels with the long edges parallel to the framing and in the upright, vertical orientation (do not place foundation panels in the horizontal orientation). **Apply the panel with the print markings facing inward toward the stud framing.** Fasten each panel after it has been placed following the fastening schedule listed in the contract documents. Install panels so that edges fall over the center of the stud framing members. **Adjacent panels should be free of debris and fitted tightly without any gapping.** For all panels less than 24" (610 mm) wide, all edges must be supported by blocking.

Blocking must be cold-formed from steel complying with AISI-General, with a minimum 54 mils (0.0538 inch or 1.37 mm) base metal thickness (16 gauge) and a minimum G60 galvanized coating. The attachment flange or bearing edge must be at least 1-5/8" (41 mm) wide and at least 3/4" (19 mm) of the panel must bear on the supporting flange or edge. **Concrete Foundation Wall panels must be full height panels and span a minimum of four stud supports (three-span condition). If not, an additional stud must be added to ensure all panels have a three-span condition.**

Care must be taken to avoid accumulation of snow and/or ice against installed panels. Brooms should be used for snow removal whenever possible. Excessive shoveling or scraping may damage installed panel surface. Refer to Storage and Maintenance sections of this data sheet to ensure proper product and site care application.

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## PRODUCT DATA

**Sizes and Packaging:** 3/4" x 4' x 8' (19 mm x 1,220 mm x 2,440 mm) panels. Each panel weighs approximately 170 lbs. (77kg) and is intended to be handled by two people. USG Structural Panel Concrete Foundation Walls are packaged in 20 piece units.

**Availability:** USG Structural Panel Concrete Foundation Walls are sold through any USG distributor. Email [usgstructural@usg.com](mailto:usgstructural@usg.com) for information on availability and a dealer in your area.

**Storage:** USG Structural Panel Concrete Foundation Walls are shipped in 20 piece units. Panels should be stored in a horizontal position and uniformly supported. Panels must be covered when stored in unprotected areas.

Excessive moisture and freezing temperatures may result in panels sticking together within the units. Therefore, care should be taken to ensure units of USG Structural Panel Concrete Foundation Walls are not exposed to excessive moisture, ice and snow. In the event that panels do become frozen together within a unit, the unit needs to be brought to a temperature above 32°F (0°C) to allow the ice to melt naturally. Salt, fertilizer or other de-icing agents should not be used at any time. Covering the units completely with tarps or similar coverings is an easy way to avoid panels freezing together.

**Maintenance:** USG Structural Panel Concrete Foundation Walls do not require any regular maintenance except to repair damaged covering foundation membranes and repair damage from abuse. Any cracked or broken panels should be replaced with sound USG Structural Panel Concrete Foundation Walls that are secured following the fastening schedule prescribed in the original installation documents. The replacement panel must be a single, full-height panel extend from the footing to the top of the foundation wall. The panel must span a minimum of four stud supports (three-span support condition), if not, an extra stud must installed inside the cavity to ensure a three-span condition. **Panels must never be cut into multiple sections.**

## TEST DATA

Physical and Mechanical Properties	Test Standard	Approximate Values Standard (Metric)
Fastener lateral resistance <sup>a</sup>	ASTM D1761, Sec. 10.2	> 210 lbf (0.93 kN) dry > 160 lbf (0.71 kN) wet
Density <sup>b</sup>	ASTM C1185	75 lb./ft <sup>3</sup> (1,201 kg/m <sup>3</sup> )
Weight at 3/4" (19 mm) thickness	ASTM D1037	5.3 lb./ft <sup>2</sup> (26 kg/m <sup>2</sup> )
pH value	ASTM D1293	10.5
Linear variation with change in moisture (25% to 90% relative humidity)	ASTM C1185, Sec. 8	<0.10 %
Thickness swell	ASTM D1037, B	max. 3.0 %
Freeze / thaw resistance	ASTM C1185	Passed (50 cycles)
Mold resistance	ASTM D3273 ASTM G21	10 0
Water absorption <sup>c</sup>	ASTM C1185, Sec. 5.2.3.1	<15.0 %
Noncombustibility	ASTM E136-12 (unmodified) CAN/ULC-S114	Passed Passed
Surface-burning characteristics (flame spread/smoke developed)	ASTM E84 CAN/ULC-S102	0/0
Long-term durability	ASTM C1185, Sec. 13	min. 75% retention of physical properties
Water durability	ASTM C1185, Sec. 5	min. 70% retention of physical properties
Termite resistance	AWPA Standard E1-13	9.8
Low VOC emissions	CDPH/EHLB/Standard Method V1.1-2010 <sup>d</sup>	Compliant

(a) Fastener lateral resistance measured with #8, 1-5/8" (41 mm) Flat Wafer head, Winged, Drill Point screw.

(b) Density measured at equilibrium conditioning per Section 5.2.3.1., 28 days after manufacturing.

(c) Absorption measured from equilibrium conditioning followed by immersion in water for 48 hours.

(d) Reference Standard: California Department of Public Health CDPH/EHLB/Standard Method Version 1.1, 2010 (Emission testing method for CA Specification 01350).

## SYSTEM PERFORMANCE

Description	Reference
Code Reports	<a href="#">PER-15092<sup>b</sup></a>
UL 1-, 2-, 3-Hour Fire Resistance Designs <sup>a</sup>	<a href="#">V465, V471</a>

(a) For the most up-to-date UL/ULC Designations, visit [usg.com/structural](http://usg.com/structural)

(b) For the most up-to-date Product Evaluation Report, visit [PER15092.com](#)

## UNIFORM LOAD TABLE

The following table represents the ultimate uniform load-bearing capacity of USG Structural Panel Concrete Foundation Wall. For the most up-to-date load tables, see the Progressive Engineering Inc. *Product Evaluation Report* ([PER-15092](#)). For technical questions, email [usgstructural@usg.com](mailto:usgstructural@usg.com). **A qualified architect or engineer should review and approve calculations, framing and fastener spacing for all projects.**

Ultimate Uniform Load for USG Structural Panel	Concrete Foundation Wall		Concrete Foundation Wall XD	
	12" (305 mm)	16" (406 mm)	12" (305 mm)	16" (406 mm)
Joist Spacing - inches (millimeters)	12" (305 mm)	16" (406 mm)	12" (305 mm)	16" (406 mm)
Capacity - psf (kPa)	1,500 psf (71.8 kPa)	844 psf (40.4 kPa)	2,083 psf (99.7 kPa)	1,172 psf (56.1 kPa)

For SI: 1 inch = 25.4mm, 1 psf = 47.88 Pa.

(1) **Ultimate Load Values have no safety factor included.**

(2) Three framing spans minimum per panel piece.

(3) Ultimate Uniform Load Table for general reference only.

For complete load capacities, consult *Progressive Engineering Inc. Product Evaluation Report* [PER-15092](#).

## SHEAR-WALL LOAD TABLE

The following table represents the shear-load capacity of USG Structural Panel Concrete Foundation Wall. For the most up-to-date load tables, see the Progressive Engineering Inc. *Product Evaluation Report* ([PER-15092](#)). For technical questions, email [usgstructural@usg.com](mailto:usgstructural@usg.com). **A qualified architect or engineer should review and approve calculations, framing and fastener spacing for all projects.**

Panel Sheathing	Panel Orientation	Joints Strapping	Stud Spacing <sup>a</sup>	Fastener Spacing		Ultimate Load <sup>b</sup>
				Perimeter	Field	
Single Side	Vertical	no	16 in. (406.4 mm)	8 in. (203.2 mm)	12 in. (304.8 mm)	914 plf (13.3 kN/m)
				6 in. (152.4 mm)	12 in. (304.8 mm)	1320 plf (19.3kN/m)
				4 in. (101.6 mm)	12 in. (304.8 mm)	1,726 plf (25.2 kN/m)

For SI: 1 inch = 25.4 mm, 1 plf = 14.59 N/m

- (a) **Values are Ultimate Load, no safety factor included.**  
 (b) Stud description: 3-5/8 in. (92.1 mm) deep, with a minimum 54 mils (0.0538 inch or 1.37 mm) base metal thickness (16 gauge) and a minimum G60 galvanized coating Steel Stud.  
 (c) For the most up-to-date Product Evaluation Report, visit [PER15092.com](#)

## SUBMITTAL APPROVALS

Job Name	
Contractor	Date

### PRODUCT INFORMATION

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

### DANGER

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, 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.**

### TRADEMARKS

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### NOTICE

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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:**  
**Foundation Wall SD: \$4.90/sf**  
**Foundation Wall XD: \$7.50/sf**

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