



**USG STRUCTO-CRETE® BRAND
STRUCTURAL ROOF DECK
PANELS
FIELD INSTALLATION GUIDE**



USG STRUCTO-CRETE® STRUCTURAL ROOF DECK PANELS

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USG STRUCTO-CRETE® STRUCTURAL ROOF DECK PANELS FIELD INSTALLATION GUIDE

USG STRUCTO-CRETE® Structural Roof Deck Panels are strong, durable concrete panels that can be combined with other noncombustible materials to create 1- and 2-hour fire-rated roof-ceiling assemblies.

The panels are mechanically fastened to cold-formed steel joists, trusses, or wood framing members to create a structural substrate ideal as low- and steep-slope roof systems, canopies and/or balconies. This roof system is designed to carry gravity and lateral loads. Roof membranes may be applied directly over STRUCTO-CRETE® Roof Deck Panels. For retrofit or renovation projects, STRUCTO-CRETE® Roof Deck Panels can also be installed on wood-joists, trusses or bar joists.

This document provides a guide for proper installation of USG STRUCTO-CRETE Structural Roof Deck Panels.

Note - A qualified architect or engineer should review and approve calculations, framing and fastener spacing for all projects.

For more information, see [USG STRUCTO-CRETE® Structural Roof Deck Panels Submittal Sheet \(SCP355561\)](#) at usg.com.

USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS CONTACT INFORMATION

PRODUCT INFORMATION

See usg.com for the most up-to-date product information.

CUSTOMER SERVICE

800 621-9523

TECHNICAL SERVICE

800 USG.4YOU (874-4968)

SAMPLES, LITERATURE AND PRODUCT INFORMATION

usg.com/structocrete

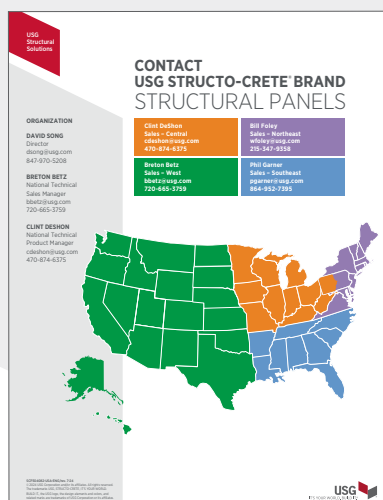
For general inquiries, please email usgstructural@usg.com or click on the contact map for the STRUCTO-CRETE® Brand Representative in your area.

Customer Service Center Orders & Availability

Performance Materials: 800-621-9523, press 2

New Orders: ordersperformancematerials@usg.com

Inquiries: performancematerials@usg.com



USG STRUCTO-CRETE® BRAND STRUCTURAL PANELS TOOLS

Efficiently cutting and fastening USG STRUCTO-CRETE® Brand Structural Panels, requires the proper tools and accessories. These are suggested tools for installing STRUCTO-CRETE® Panels and controlling dust during the cutting of the panels. USG recommends that you review and follow all manufacturer guidelines for the use and care of any tools used to install our products and accepts no responsibility for their use or warranty. Model numbers subject to change by tool manufacturers.

OSHA Respirable Crystalline Silica Standard for Construction - Rule 29 CFR 1926.1153

As the cutting of our product is not specifically covered in Table 1, USG recommends developing a written exposure control plan and following the steps necessary to determine the exposure potential of workers and exposure control methods.

Cutting Tools

For straight cuts, use a hand-held circular saw with a carbide-tipped framing blade. A diamond or other specialty blade is **not** required.

- Blade examples:
 - Diablo D0724X – 7-1/4", 24 T Carbide-Tipped
 - Makita T-01426 – 6-1/2", 24 T Carbide-Tipped

Per OSHA Rule 29, saws used outside with blades 8" or less must be equipped with a dust collection port and a VDC (vacuum dust collector) rated at over 80 cubic feet per minute with a 99% or greater filter efficiency. For improved control of dust, use a HEPA filter on the vacuum.

- Circular saw examples:
 - Makita – 5057KB 7-1/4" (Corded)
 - DeWalt – DWS520K 6-1/2" Track Saw (Corded)
 - SkilSaw – SPT67FMD-01 7-1/4" (Corded)
- VDC examples:
 - Makita – VC4710
 - DeWalt – DWV012

For making small openings, use the appropriate size hole saw or rotary tool with dust collector port and VDC.

- Hole saw examples:
 - Milwaukee 49-56-0734 Carbide Tipped Hole Saw
 - Diablo Tools DHS3000 Bi-Metal Hole Saw
- Rotary tool examples:
 - Roto-Zip® XB-UL1, WD1, XB-TC1

Fastening Tools

Steel Framing: Stand-up style, 2500 RPM or less variable speed screw gun is recommended. Do not use dry or wet lubricants in the drive head mechanism of stand-up drivers. Remove dust frequently with dry, clean compressed air, such as canned air.

- | | | |
|---------------------------------|-------------------------|-----------------------------|
| • Stand-Up Drivers: | • Power Actuated Tools: | • Wood Framing: |
| – Grabber SuperDrive® 75 | – Aerosmith® HN120 | – Senco SCN65XP Coil Nailer |
| – Simpson Quik Drive® Pro250 | – DeWalt DFD270 | |
| – Muro HDVL71 Heavy Duty Driver | – Hilti DX 5-MX | |

See *USG STRUCTO-CRETE® Brand Structural Panels Tools* (SCP297287) at usg.com for further information.

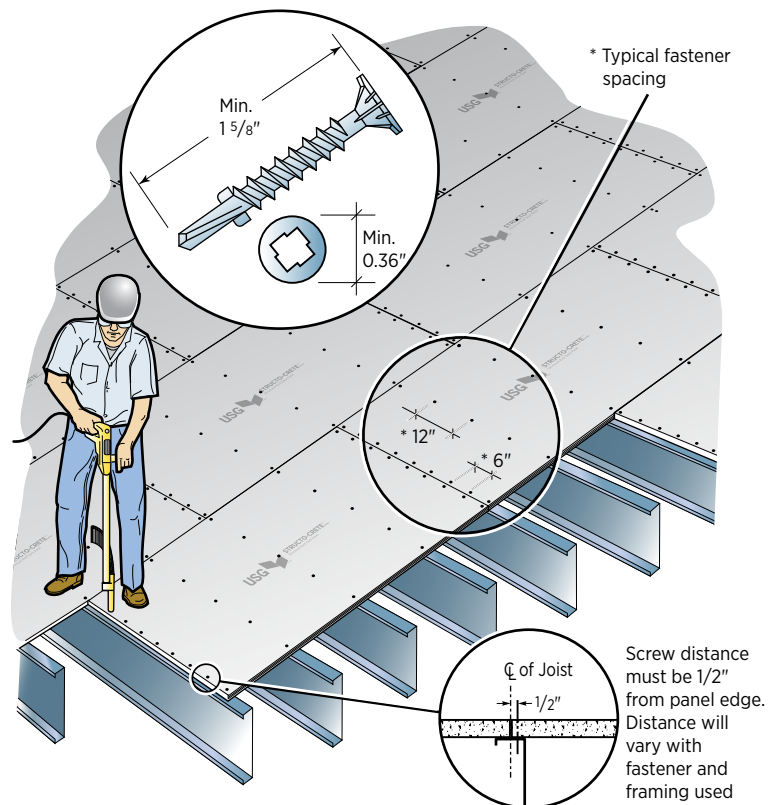
USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS PANEL LAYOUT BASICS

- T&G must run perpendicular to framing.
- Every non-T&G joint must be supported by framing.
- Any panel not at least 24" wide must be supported by katz blocking or fall on framing member.
- Every panel must span 2 frame openings, falling on 3 framing members.
- Firmly engage T&G edges and butt panel ends together prior to fastening.
- Panels must bear a minimum of 3/4" on framing.
- Damaged ends and edges up to 10% of their length may be repaired per *STRUCTO-CRETE® Panels Repair Manual*.

PANEL FASTENING

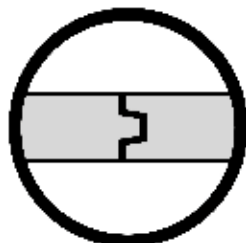
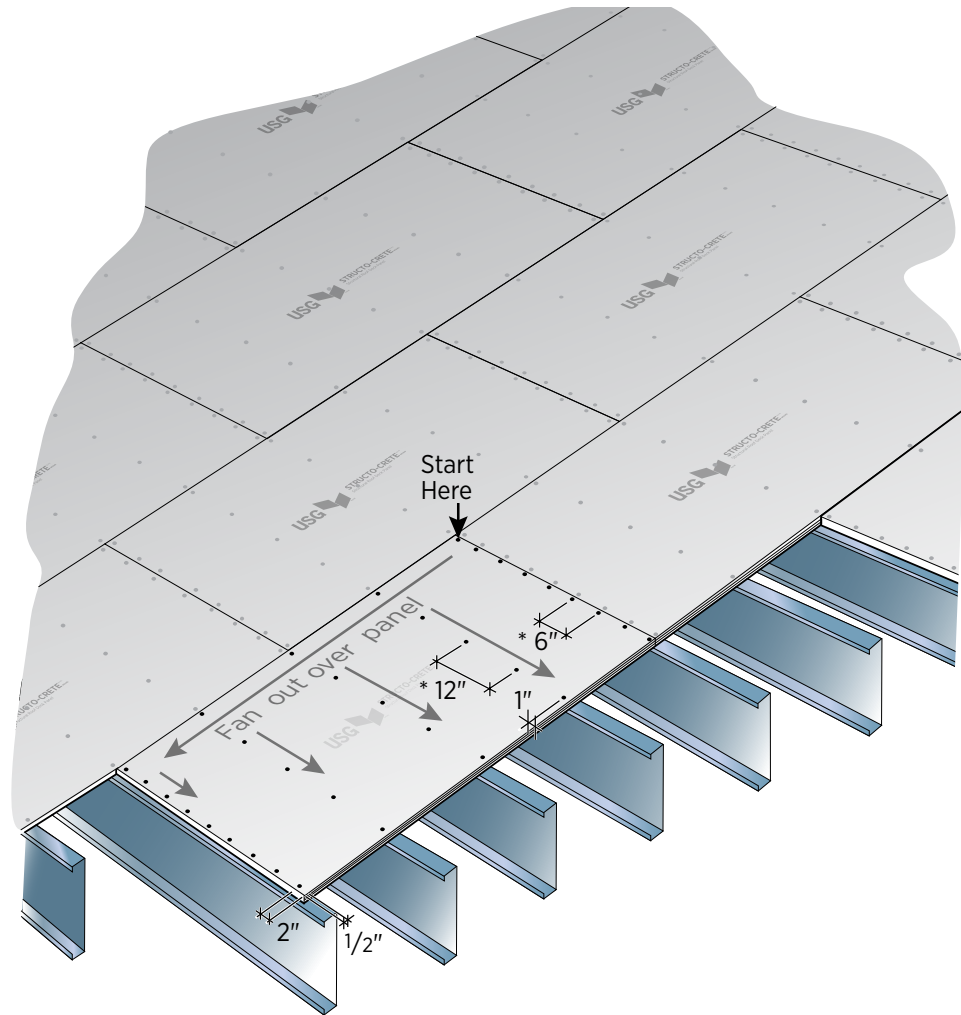
- Use only USG recommended fasteners. See *Recommended Fasteners Submittal*, pgs. 17-19.
- Proper fall restraint equipment required.
- Use only #8 screw with 1-5/8" (41 mm) joist flange.
- Apply screws with a stand-up gun to reduce fatigue.
- Follow fastening schedule in contract documents.

Note: *Fastener schedule is to be specified by designer of record.

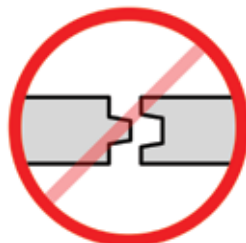


USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS

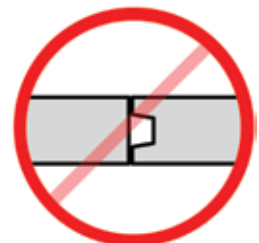
FASTENING THE PANEL



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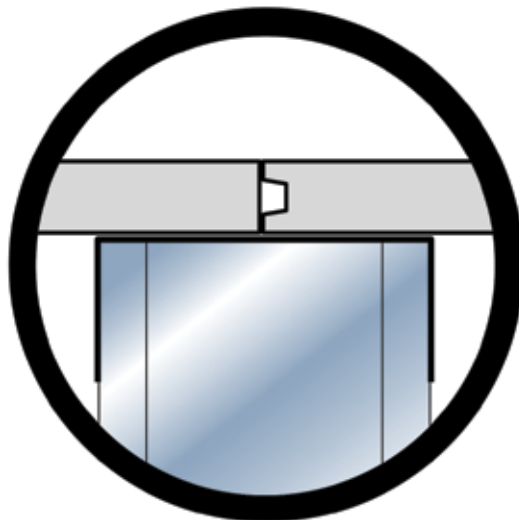
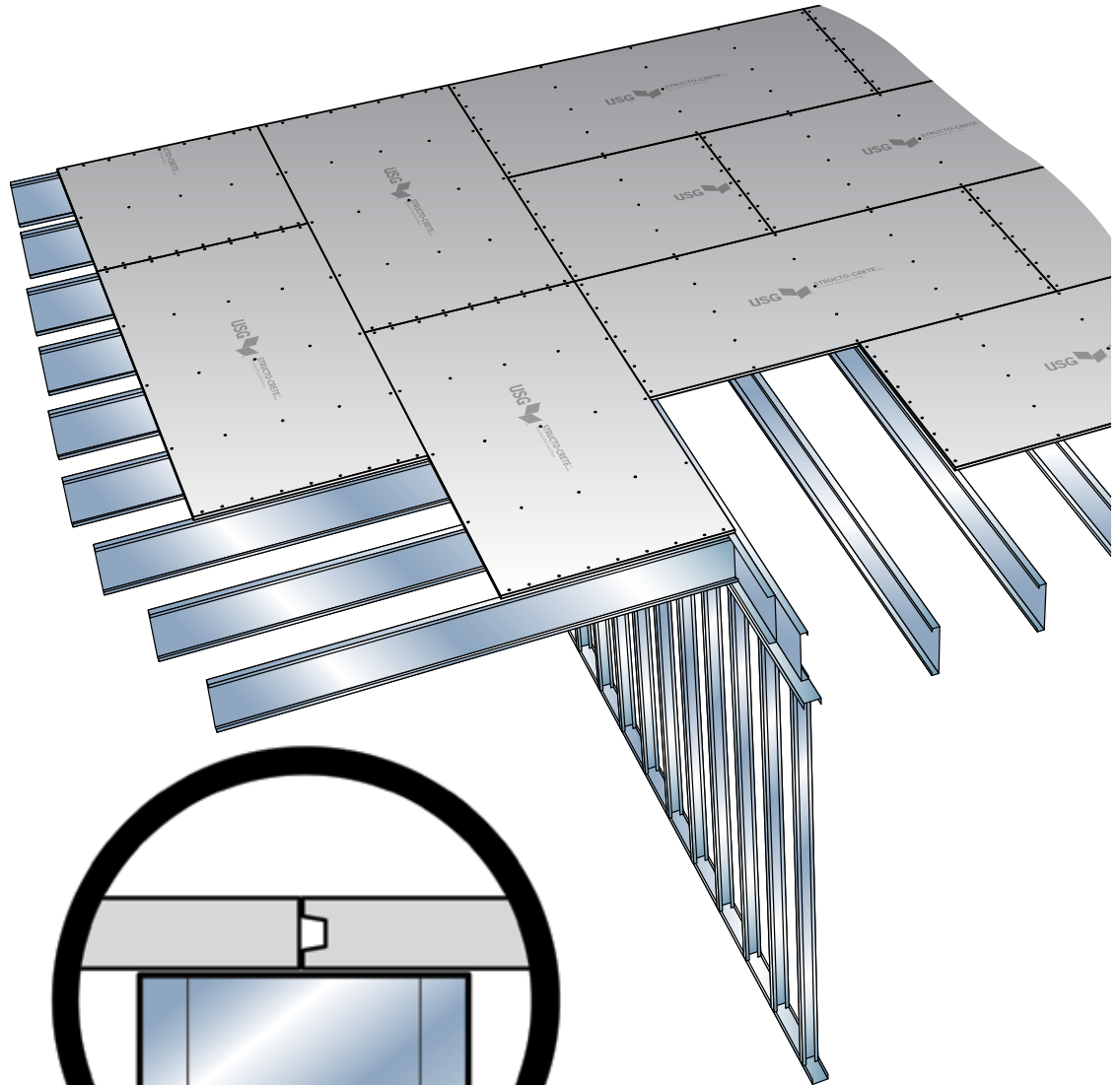
When connecting the tongue and groove, the tongue from the loose panel should be engaged into the groove of the already affixed panel.

To ensure proper panel application, be sure to:

1. Lay board down adjacent to already fastened panel, careful to not damage T&G.
2. Butt square cut ends firmly together.
3. Engage T&G.
4. Fasten one corner and fan out over entire panel.
5. Fastener inset will vary based on the selected fastener but must be a minimum of 1/2" in from square cut ends and 1" in from T&G edges.

USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS FRAMING DIRECTION CHANGE

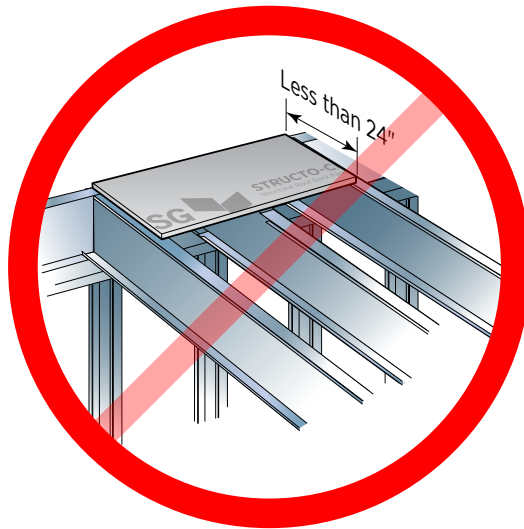
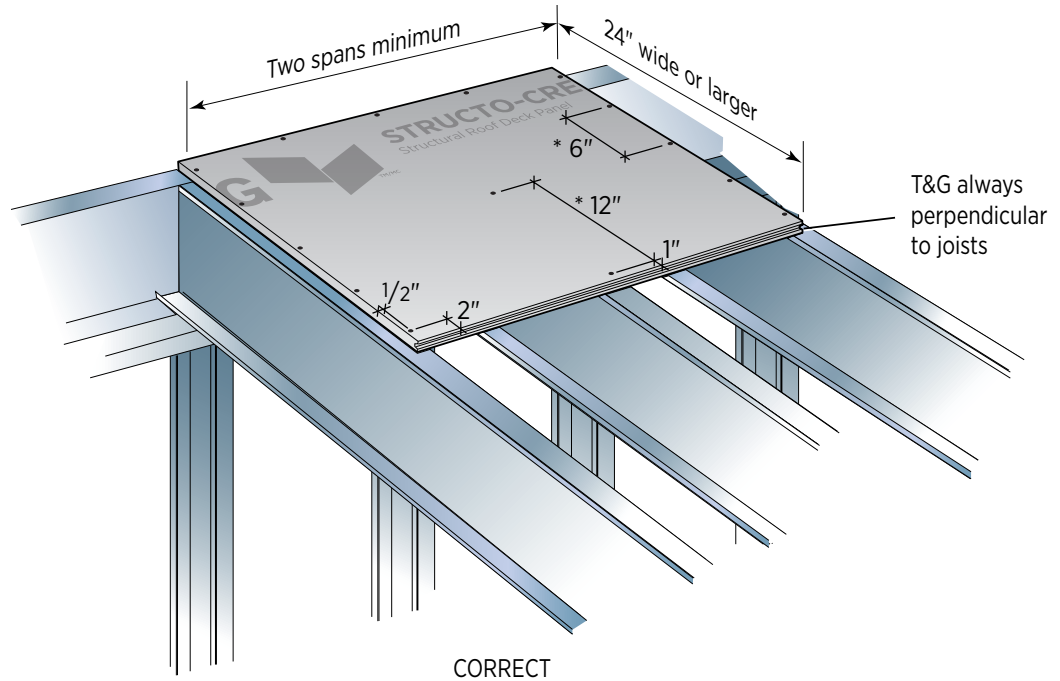
- Always lay panels perpendicular to supporting joists.



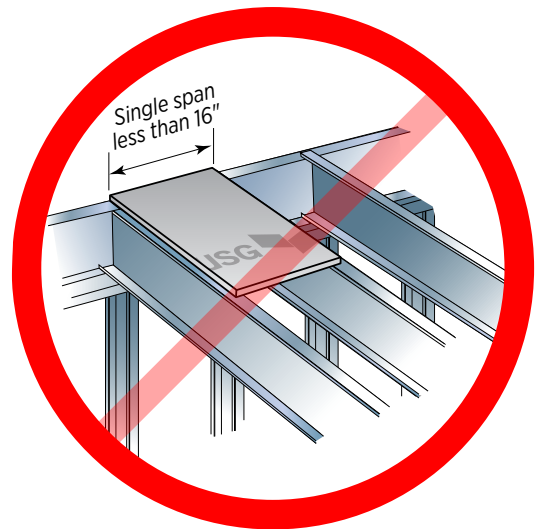
CORRECT

USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS

PANEL LAYOUT: TWO-SPAN CONDITION



INCORRECT



INCORRECT

See Panel Blocking—Page 11

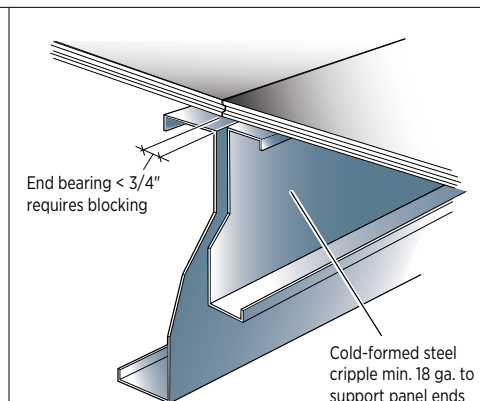
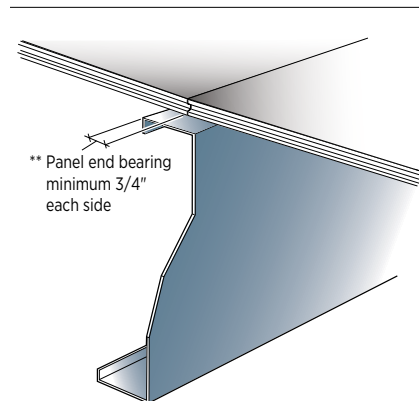
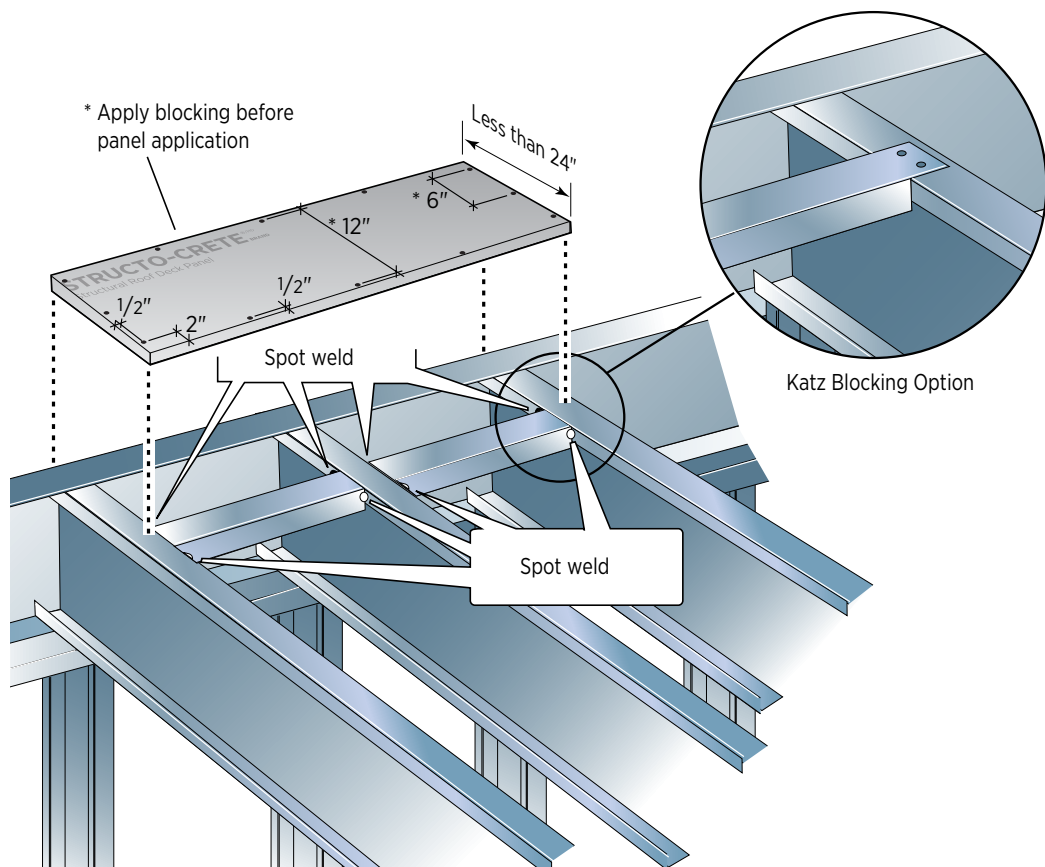
USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS PANEL BLOCKING

- Block edges that are less than 24" (610 mm) wide.
- Spot weld method used with structural stud blocking is only intended to hold stud in place until panel is fastened through it.
- Field welding to cold-formed framing members must be performed by certified welder and approved by structural engineer of record.
- Katz blocking is not fastened independently. Position katz blocking evenly between adjacent panels, place panels over blocking and framing, and fasten through the panel and blocking into joist with a recommended fastener.

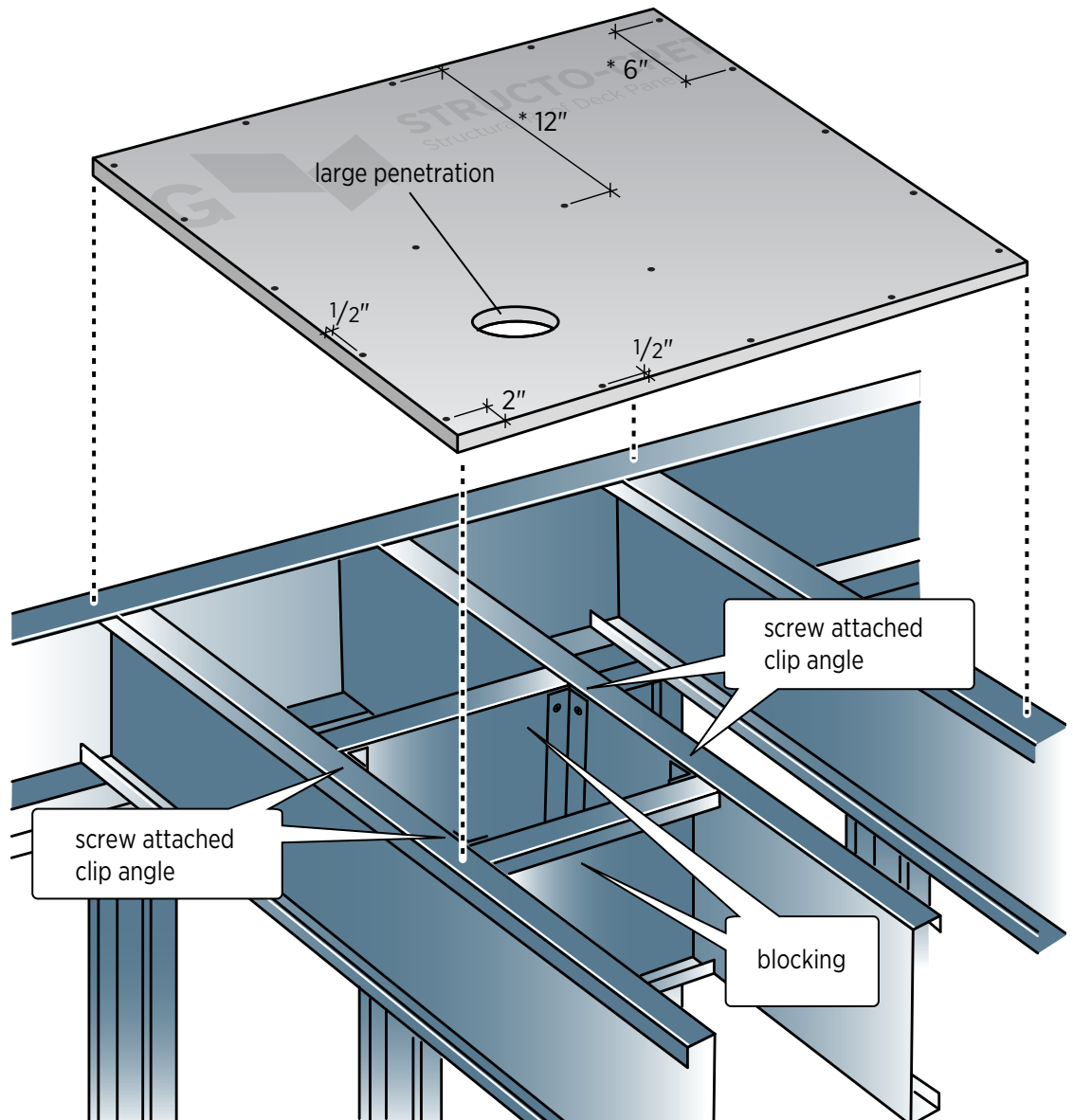
Notes:

*Panel Blocking must be specified by designer of record.

**Panels must bear at least 3/4" (19 mm) over joist flange.



USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS PANEL PENETRATION



Unreinforced Penetrations

- Unreinforced penetrations are limited to a maximum dimension of 6" (153 mm) and do not require supplemental framing or engineer analysis.
- Unreinforced penetrations are generally small openings through decks to accommodate lightly loaded plumbing/electrical runs.

Reinforced Penetrations

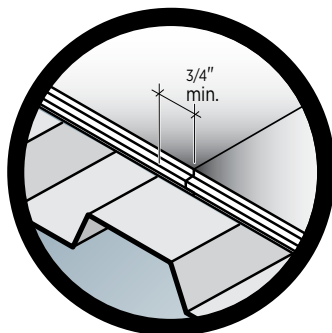
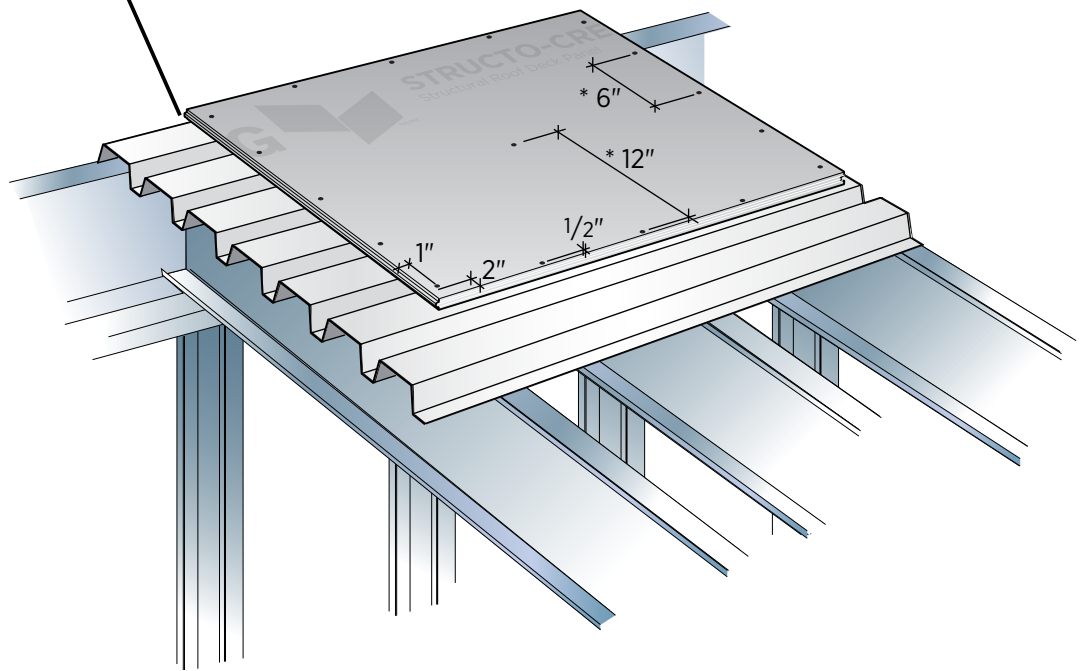
- An opening of any shape with a dimension in any direction greater than 6" (153 mm) requires reinforcement at the perimeter of the opening.
- The framing at reinforced penetrations, as a minimum, must have an equal profile and capacity as the adjacent primary framing (joists) members.
- The maximum penetration dimension is not limited to a single opening, but also includes group effect of multiple, closely spaced openings.

USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS

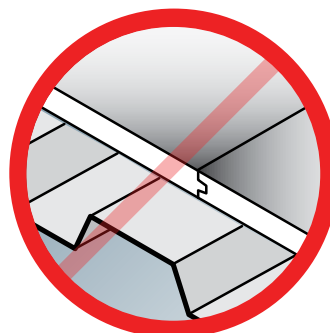
PANEL LAYOUT: OVER FLUTED DECK

- The concrete subfloor on fluted deck is always considered an underlayment.
- The concrete subfloor is not considered a structural component in this application.
- There is no composite action between fluted deck and the concrete subfloor.

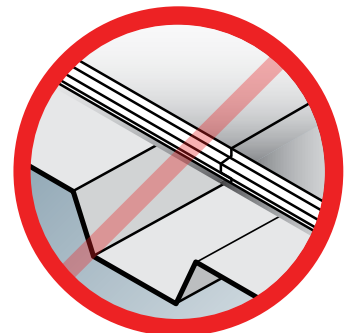
T&G always perpendicular to flutes



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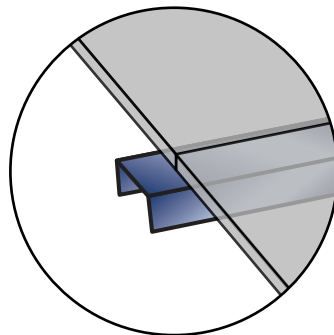
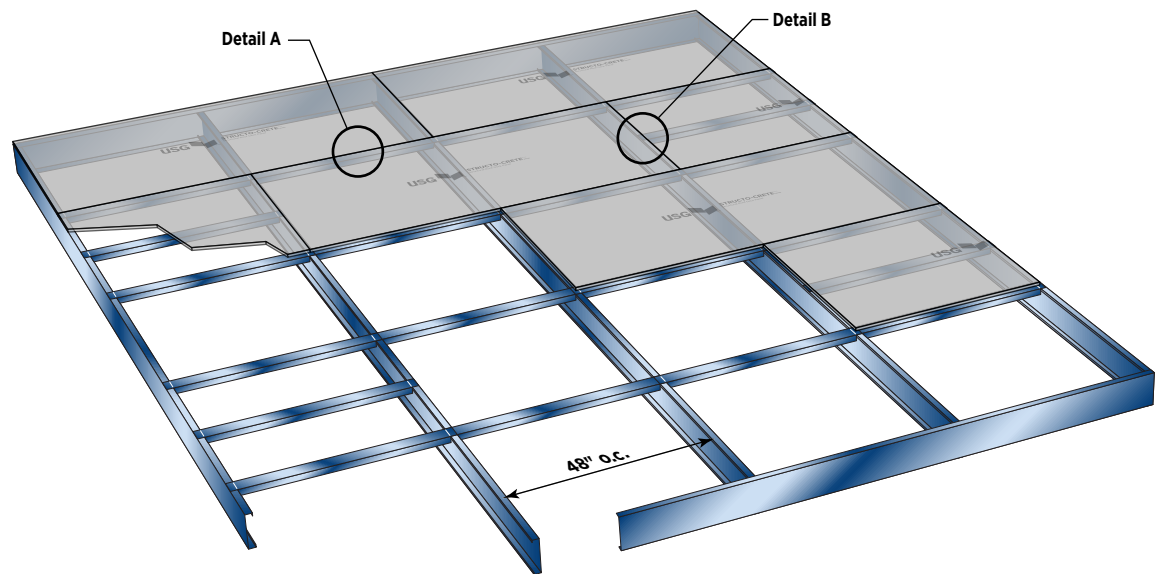
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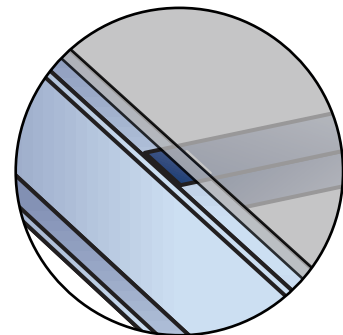
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USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS

PANEL LAYOUT: 48" O.C. JOISTS



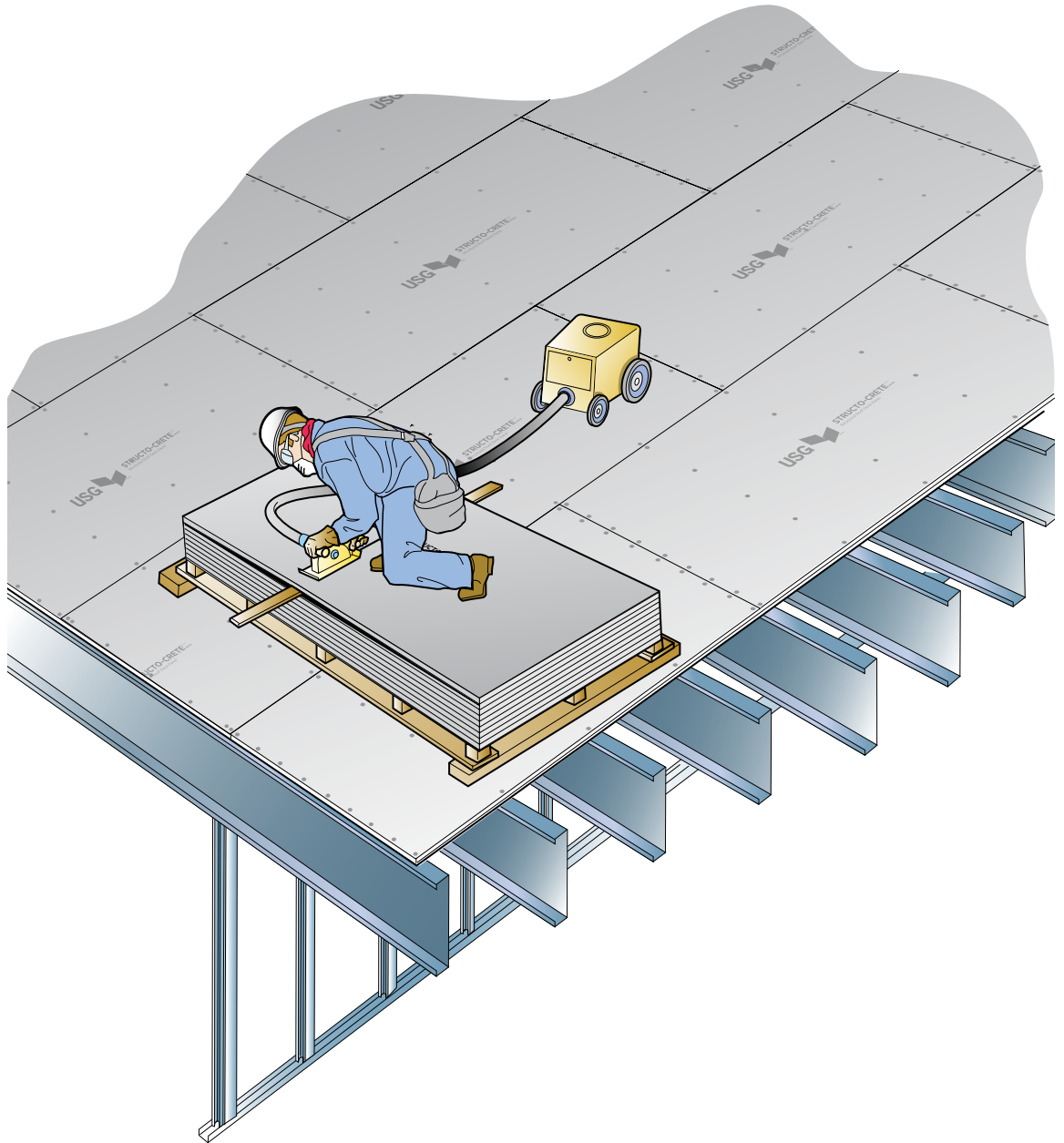
Detail A



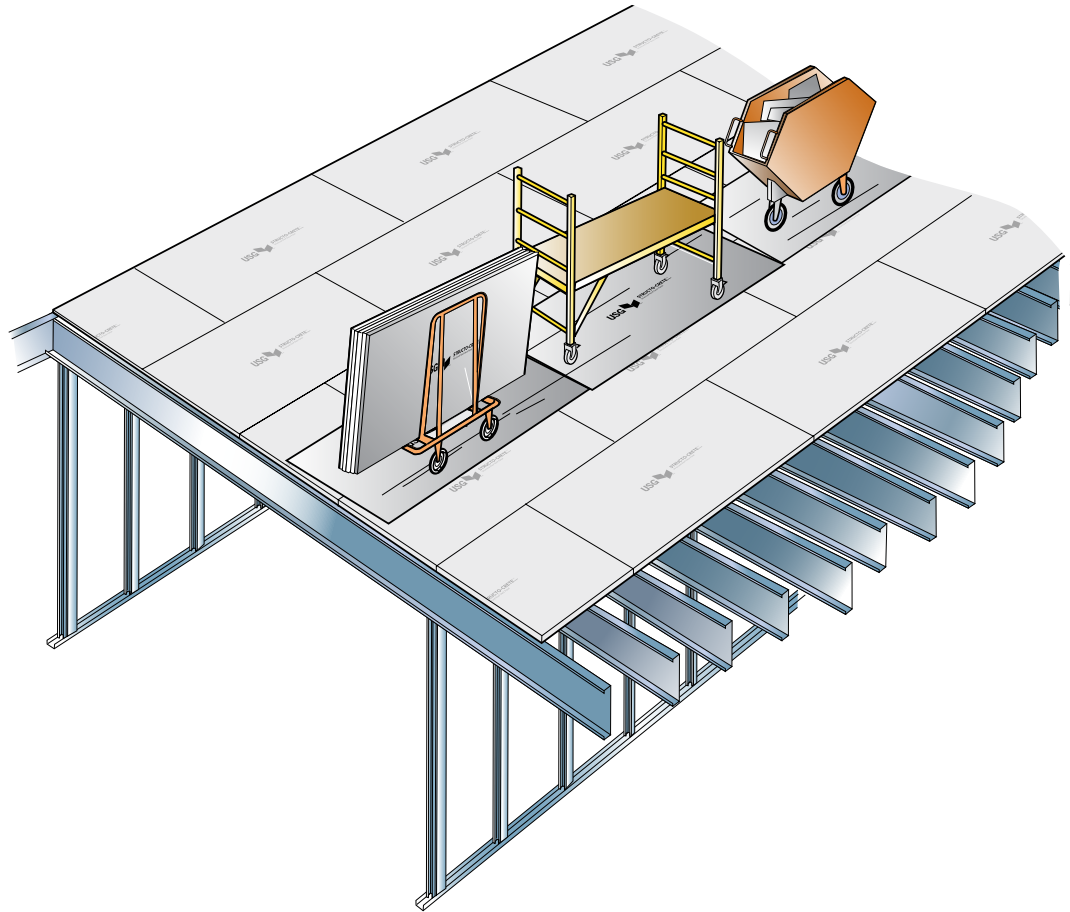
Detail B

USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS PANEL CUTTING

- Use a circular saw with a standard carbide tipped framing blade and a dust collection system.
- Wear appropriate respiratory protection.
- Wear safety glasses.
- Wear gloves.
- Proper fall restraint equipment required.
- Review the Safety Data Sheet (SDS) for use of proper Personal Protective Equipment (PPE).



USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS EQUIPMENT LOADING



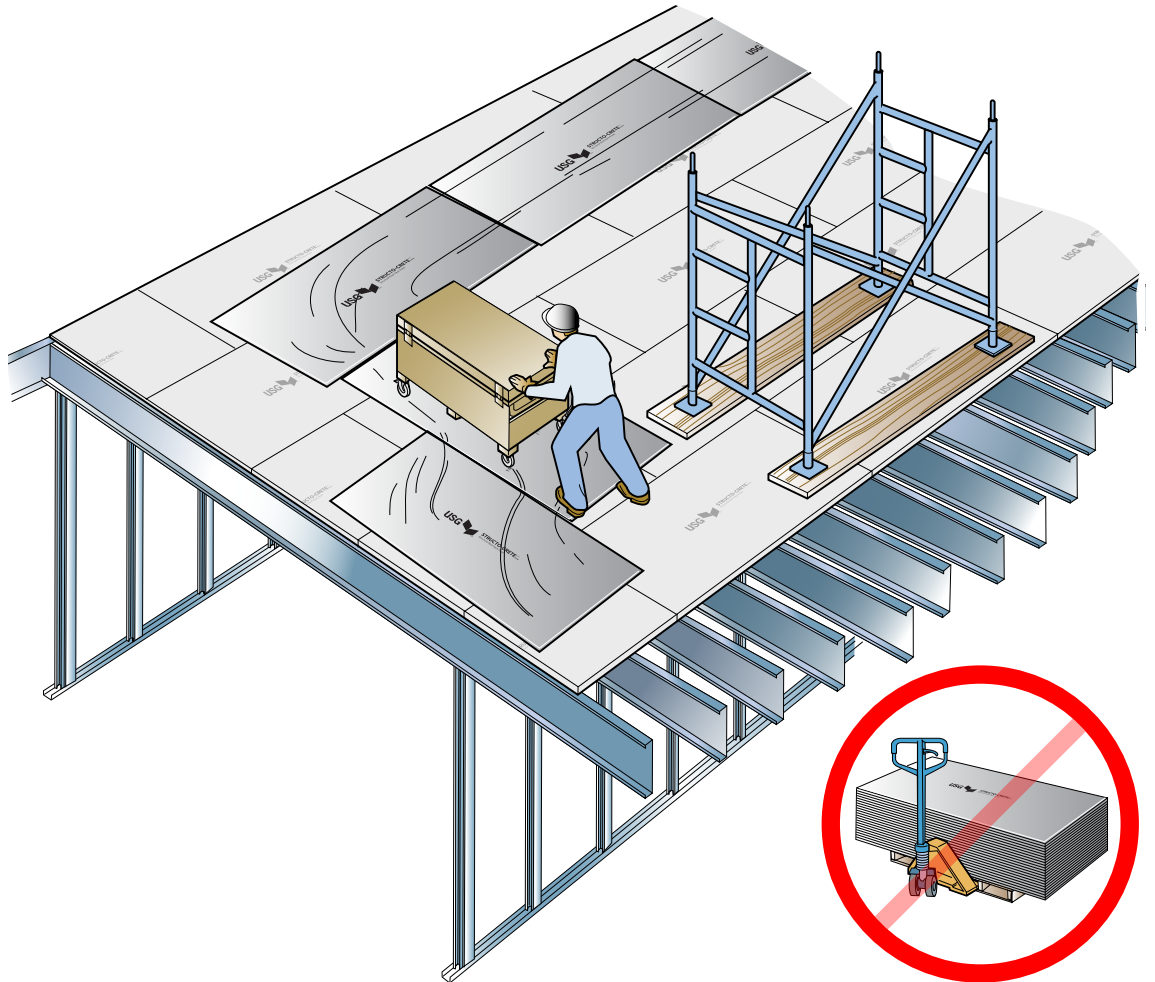
Typical Construction Equipment*	
Drywall Carts	10 Sheets of 5/8" x 4' x 12' (16 mm x 1220 mm x 3660 mm) Gypsum Panels max. 1,200 lbs. (544 kg)
	7 Sheets of 3/4" x 4' x 8' (19 mm x 1220 mm x 2440 mm) USG STRUCTO-CRETE® Roof Deck Panels max. 1,200 lbs. (544 kg)
Rolling Trash Carts	1,000 lbs. max. (453 kg)
Rolling Scaffolds	750 lbs. max. (340 kg)

Note: Secure the cart. *Loads applicable to 24" (610 mm) o.c. maximum framing spacing.

See Panel Protection—Page 17

USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS

PANEL PROTECTION

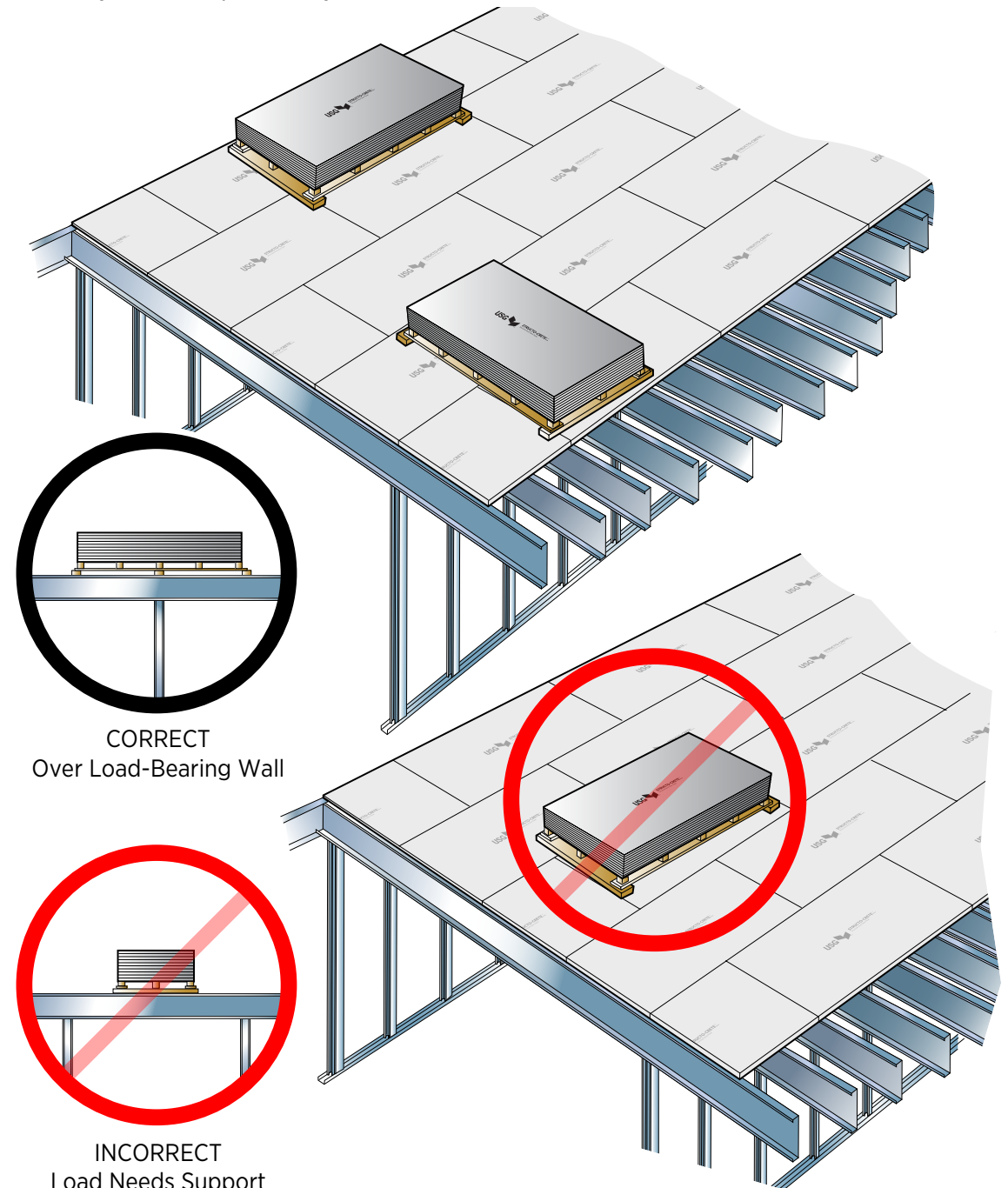


To protect installed panels during construction:

- **Do not use a pallet jack on the floor.**
- Place load spreader planks perpendicular to joists for fixed scaffolding.
- Place additional USG STRUCTO-CRETE® Panels or minimum 3/8" plywood on the floor in high-traffic construction pathways for rolling gang boxes, two-wheel mason carts and trash boxes.
- Avoid rolling carts near protector panel edges.
- Consult with designer of record for load limits and proper support for all construction loads.
- Proper fall restraint equipment required.

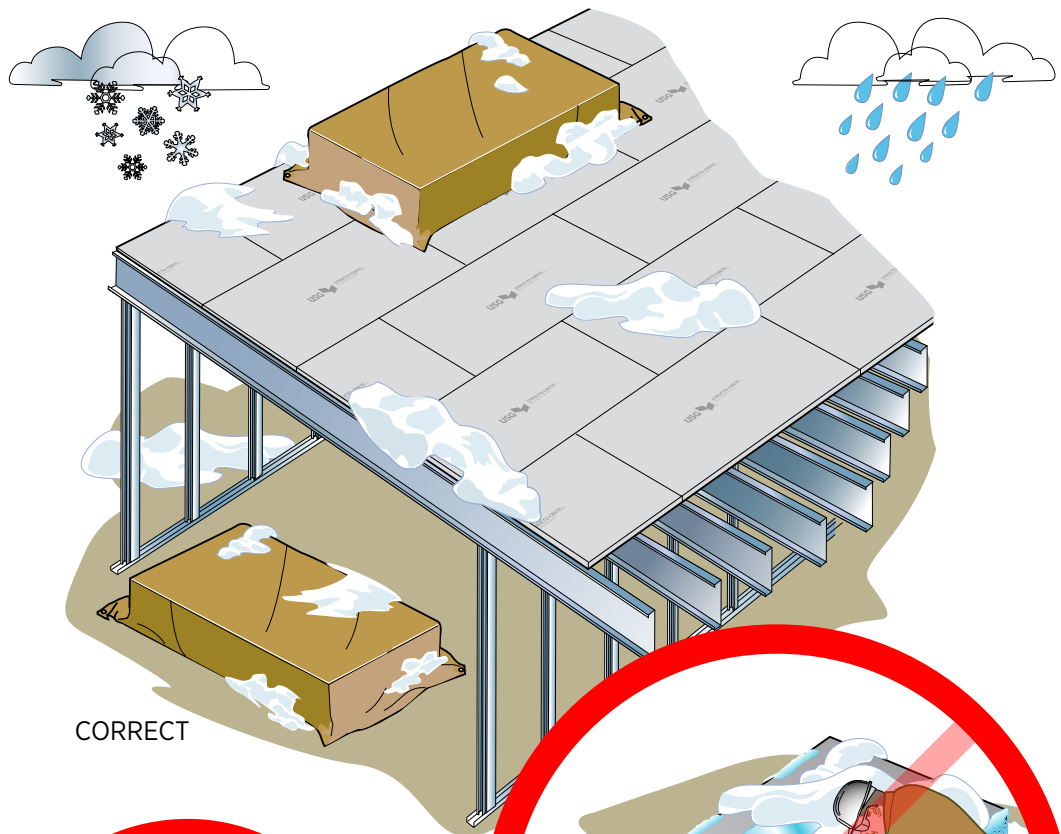
USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS PALLET PLACEMENT*

Note: *Loading must be verified by a structural engineer.



USG STRUCTO-CRETE® BRAND STRUCTURAL ROOF DECK PANELS PROPER PALLET STORAGE

- Ensure unit covers are secure.
- Use plastic edge shovel for snow removal.
- Freezing may result in panels sticking together.
- Allow panels to thaw naturally if frozen.
- **Only use sand when iced over. Do not use salt, fertilizer or ice melt.**



CORRECT



INCORRECT



INCORRECT

3/4" USG STRUCTO-CRETE® BRAND STRUCTURAL PANELS

RECOMMENDED FASTENERS

FASTENING 3/4" USG STRUCTO-CRETE® PANELS TO FRAMING

This information applies to 3/4" USG STRUCTO-CRETE® Brand Structural Panels and 3/4" USG STRUCTO-CRETE® Brand Structural Roof Deck Panels.

Properly fastening 3/4" STRUCTO-CRETE® Panels to cold-formed steel (CFS), hot-rolled steel (HRS), or wood framing is key to ensuring long-term performance as a structural component. Recommended fasteners are required to attain the load capacities as listed in code reports and have been reviewed to ensure that they meet the required pull-out, pull-through, slip performance, and 1,000 hours corrosion resistance. Corrosion resistance is critical because of the panel pH, and when coupled with moisture exposure (including high humidity), may deteriorate a standard fastener.

		Lighter ← → Heavier										
		Cold-Formed Steel						Hot-Rolled Steel				Lumber
		33 mil	43 mil	54 mil	68 mil	97 mil	118 mil	1/8"	1/4"	3/8"	1/2"	SPF
Brand	Part Number	20 ga	18 ga	16 ga	14 ga	12 ga	10 ga	A36	A36	A36	A36	0.42 SG
Grabber	CM10178JBWRG	1" (Min. End Distance)										
Grabber	CGH8158LG		1"	1/2"								
Simpson	CBSDQ158S			1/2"								
Grabber	CC12250LRG							1"	3/4"			
Simpson	TBG1260S								3/4"			
Muro	RSM645WFL-GY								3/4"			
Aerosmith	5324HPG							1"				
DeWalt*	50458-PWR							1"				
Hilti	X-U 32 MX							1"	3/4"			
Grabber	C8200L2M											5/8"
Simpson	WSNTLG2S											5/8"
Senco	GL24AABF											1/2"
Framing Flange Size		2-5/8"		1-5/8"			2-5/8"	2-5/8"	2-1/8"	2-1/8"	2-1/8"	1-7/8"

NOTE* DeWalt 50458-PWR requires a 2-5/8 in. flange.

Minimum Edge Distance: Is shown in the **gray** application bar for each fastener (may vary by framing thickness) and represents the minimum distance from the Edge (square cut) that a fastener may be inserted. See **e = Edge Distance** in illustration on next page.

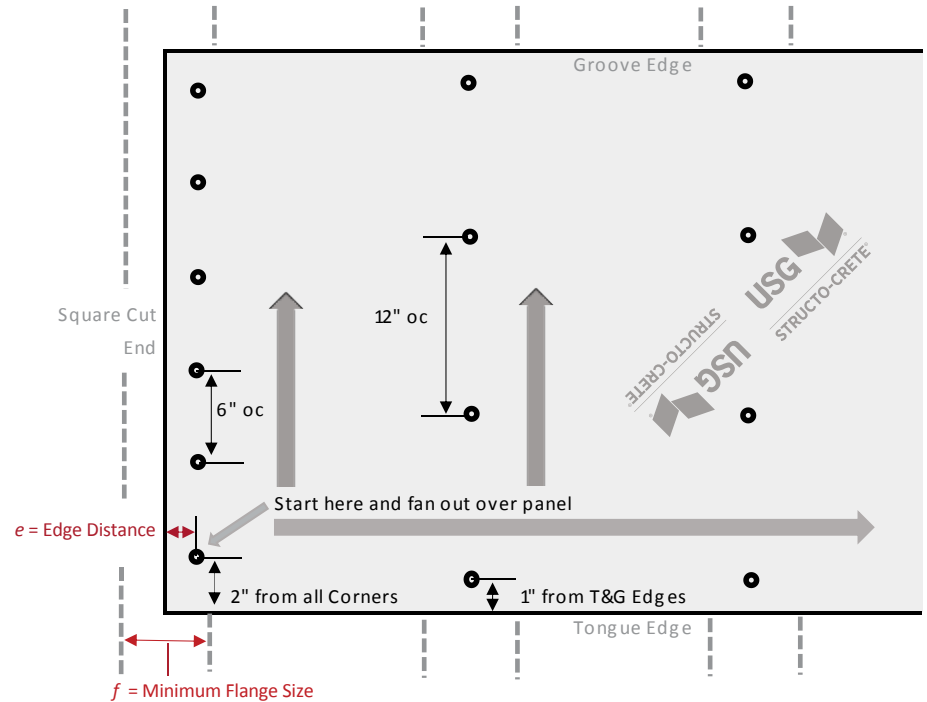
Framing Flange Size: The minimum recommended flange size to allow for proper fastener insertion. See **f = Minimum Flange Size** in illustration on next page. Utilizing framing with at least the minimum flange size is key to attaining the minimum framing bearing required for panel Ends. Refer to *USG STRUCTO-CRETE® Brand Structural Panels Installation Guide* (SCP284784) at usg.com for more information.

Fasteners: Any length of a recommended fastener may be used provided a minimum of three full threads penetrate the steel framing. Do not use a larger diameter fastener unless specified by the structural engineer of record. Fasteners listed are screws except for Senco (nails), Aerosmith, DeWalt, and Hilti (pins). 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 dimensions may be utilized when approved by the structural engineer of record.

FASTENING 3/4" USG STRUCTO-CRETE® PANELS TO FRAMING CONT.

Framing: The gauge, size and type of framing is determined by the engineer, architect or design professional of record. CFS shall comply with AISI-General, with a min. G60 coating. 33 mil (20 ga) CFS framing is for gravity loads only.

General Note: In accordance with *ICC Product Evaluation Report, ESR-1792*, the minimum fastener schedule is max. 6 in. (153 mm) o.c. on the perimeter and max. 12 in. (305 mm) o.c. in the field of the panels. Refer to the appropriate Product Evaluation Report and the specific project specifications for complete fastener schedule details.



Fastener Quantities: This is intended to be a starting point for fastener estimating only. USG recommends that a calculation be made for each project layout to determine the appropriate number of fasteners required and that an excess of at least 10% be added to the calculated quantity for the project.

FASTENING OTHER MATERIALS TO 3/4" USG STRUCTO-CRETE® PANELS

4' (122 cm) x 8' (244 cm) Panel Size	Average Number of Fasteners	
	Per Square Ft.	Per 1,000 Square Ft.
Blocked	1.50	1,500
Un-Blocked	1.25	1,250

Fastening non-load bearing walls, interior doors, fixtures, cabinets, etc. to installed 3/4" STRUCTO-CRETE® Panels can be broken into two categories: Withdrawal Load and Shear Load. Fastening options are listed with each and these apply to fastening only through the panel and not into the framing. Fastening through the panel into the framing may be accomplished using the appropriate length of recommended fastener from the *Fastening 3/4" USG STRUCTO-CRETE® Panels to Framing* table, or the fastener(s) recommended by the manufacturer of the item being installed.

FASTENING OTHER MATERIALS TO 3/4" USG STRUCTO-CRETE® PANELS CONT.

Made in the USA with domestic and imported materials.

PRODUCT INFORMATION

See usg.com for the most up-to-date product information.

DANGER

The following are warnings when installing the panels:
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 swallowed, inhaled, or skin irritation occurs get medical attention. If on skin: Wash with plenty of water. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses and continue rinsing. Wash contaminated clothing before reuse. 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.

KEEP OUT OF REACH OF CHILDREN.

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SAFETY FIRST!

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

Withdrawal Load: Cabinets, chairs, furniture, signage, railings, roof vents, access panels, or other materials that must resist upward movement loading, and cannot be secured through the panel into the framing members.

Brand	Part Number	Description
TOGGLER® Anchor System	BC 3/8" - 16	3/8" SNAPTOGGLE®
TOGGLER® Anchor System	BD 1/2" - 13	1/2" SNAPTOGGLE®
SFS intec Group	TPR-L-6	1/4" x 3" Peel Rivet

Notes:

See *ICC Product Evaluation Report, ESR-1792*, for nominal withdrawal capacities and additional fastener details.

Peel Rivet length to be selected based on thickness of material being secured. Applicable sizes range from 3 in. (76 mm) to 10 in. (254 mm) in length.

SNAPTOGGLE® and Peel Rivet shall be located a minimum of 2 in. from T&G intersection.

Shear Load: Non-load bearing walls that will not be subject to any axial loading, that will not be used as shear walls, and are only required to resist mild impact lateral loads (a person leaning on the wall) can be fastened directly to 3/4" STRUCTO-CRETE® Panels without going through the supporting framing.

Brand	Part Number	Description (20 ga EQ)	Allowable Load (lb)	
			18 mil (20 ga)	30 mil
Ramset® TRAKFAST™ Standard	FPP012	1/2" Plated Steel Pin	100	165
Ramset® TRAKFAST™ Standard	FPP034B	3/4" Black Steel Pin	117	209

Note:

Allowable shear load per tested fastener.

800 USG-4YOU
800 (874-4968)
usg.com/structocrete

Manufactured by
United States Gypsum Company
550 West Adams Street
Chicago, IL 60661

SCP297586-USG-ENG/rev. 8-24
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PRODUCT INFORMATION

See usg.com for the most up-to-date product information.

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United States Gypsum Company
550 West Adams Street
Chicago, IL 60661

Made in the USA with domestic and imported ingredients.

DANGER

The following are warnings when installing the panels: 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 swallowed, inhaled, or skin irritation occurs get medical attention. If on skin: Wash with plenty of water. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses and continue rinsing. Wash contaminated clothing before reuse. 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.

KEEP OUT OF REACH OF CHILDREN.

NOTE

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SAFETY FIRST!

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

