



FORTIFIED
STRUCTURAL SOLUTIONS
USA

ASSEMBLE. FORTIFY. FINISH.

FSS PANEL KIT INSTALLATION MANUAL



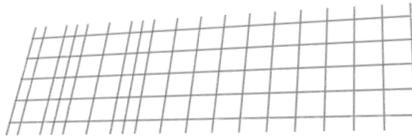
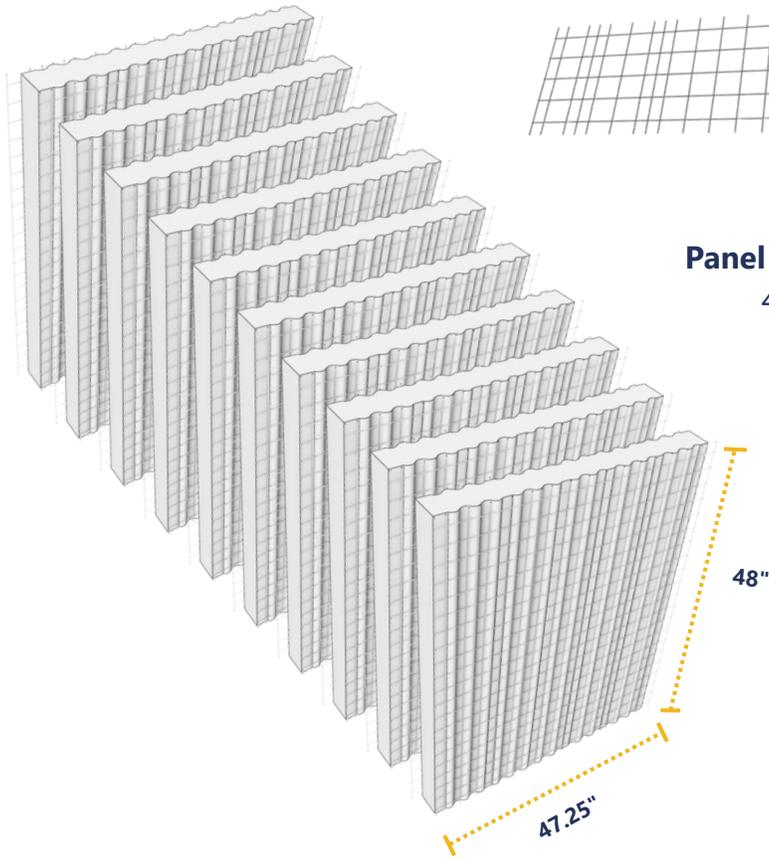
BUILT TO ENDURE. DESIGNED TO LAST.



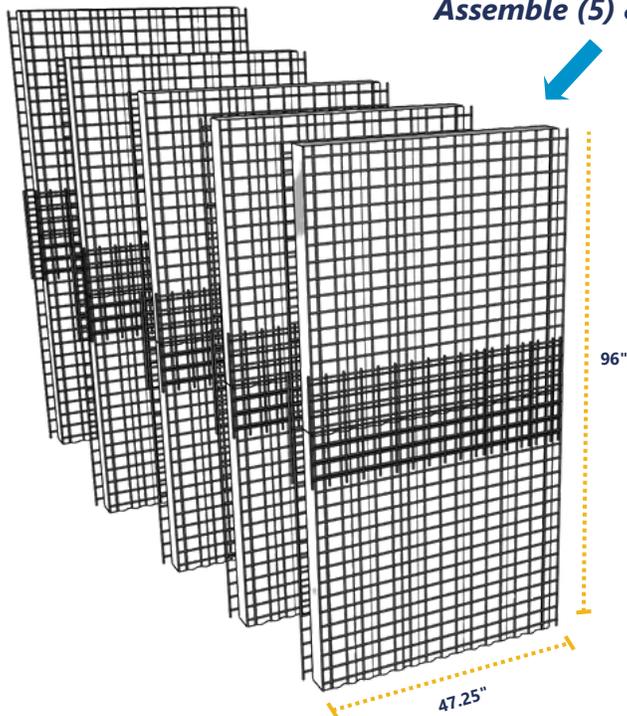


WHAT'S INCLUDED:

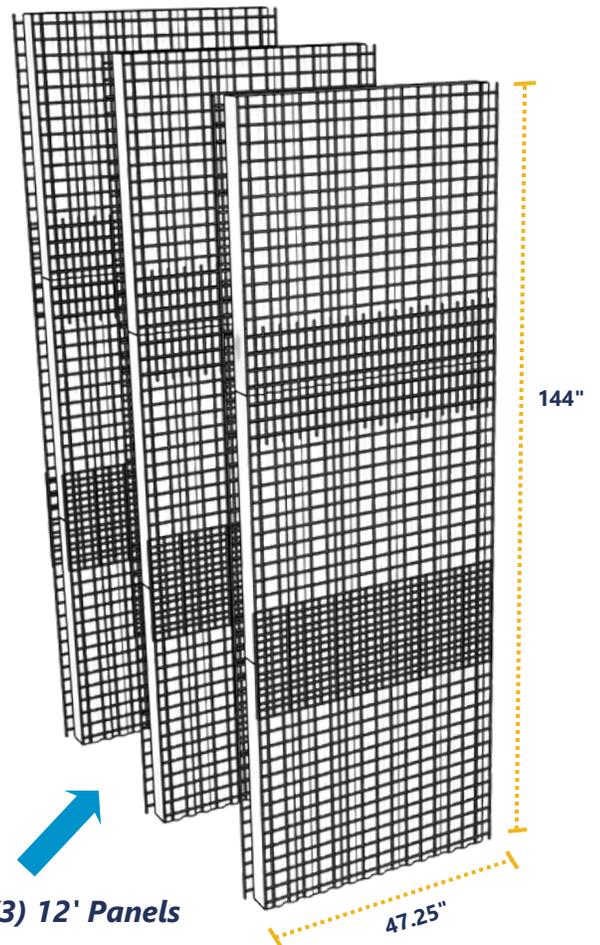
10 PANELS + 12 PANEL CONNECTORS



Panel Connectors
4' x 20"



Assemble (5) 8' Panels or...

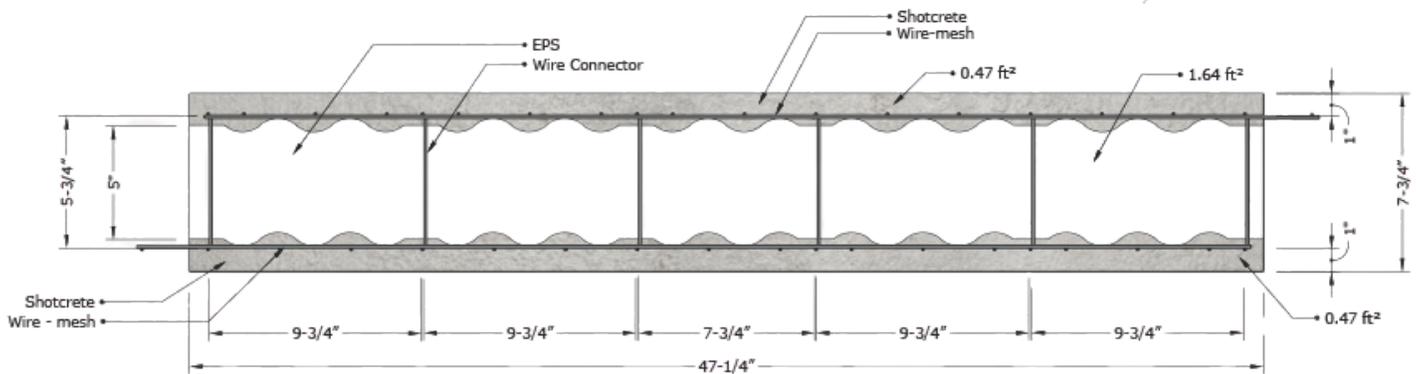
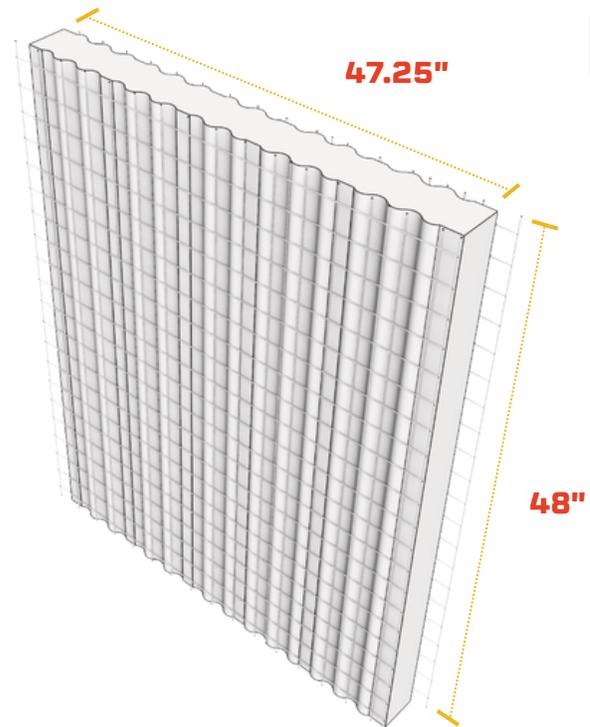
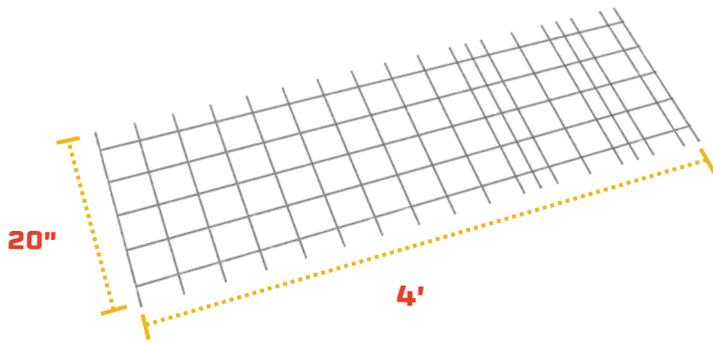


Assemble (3) 12' Panels



FORTIFIED PANEL KIT

PRODUCT SPECIFICATIONS



MATERIALS CHARACTERISTICS

Expanded Polystyrene (EPS) Foam

Type I modified EPS Board - ASTM C578
 Density 1 pound per cubic foot
 Flame-spread index ≤ 25
 Smoke-developed index ≤ 450

Concrete/Mortar (applied in-situ)

Compressive Strength $> 2,500$ PSI
 Thickness > 1 " from Mesh
 Aggregate size $< 5/8$ "
 Slump > 2 "

Weight

Panel sheet: 0.77 lb/ft²
 Finished wall: 25.89 lb/ft²

Wire Connector

11 gauge galvanized wire - ASTM A1064
 Yield Strength: 115 ksi

Thermal coefficient (R Value)

F.hr.ft²/Btu

@ 25 °F | @ 40 °F | @ 70 °F
 21.75 | 20.85 | 19.25

Acoustic coefficient (Cw)

44.5 dB

Wire-mesh Reinforcement

L 3.15" x T 2.95" 11 gauge galvanized wire - ASTM A1064
 Yield Strength: 115 ksi

TOOLS & MATERIALS

Find links to recommended products at store.fortifiedstructuralsolutions.com/tools



Measurement Tool
Chalk Line or Tape



Concrete Drill
Hammer Drill, 6.5-Amp



Epoxy Glue
Anchoring Adhesive



Heat Tool
Temperature Gun or Torch



Rebar Dowels
#3 - 3/8-inch x 2 feet



Tie Wire
16.5-Gauge



Pliers
Slip Joint & Diagonal



Trowel
12 in. x 4 in.



Sponges
7.5 in. All Purpose



Mallet
Rubber or Dead Blow



Mortar Materials
Portland, Sand, Water



Concrete Sprayer
with Air Compressor



Bonding Agent
Adhesive Additive



Cement Fibers
Anti-Cracking Additive



Mixing Container
3.5 Cu.Ft Usable Volume



Screed Guides
Wood/Plastic/Metal ≥ 1"



Level
I-Beam Level



Screed Edge
> 4' Length

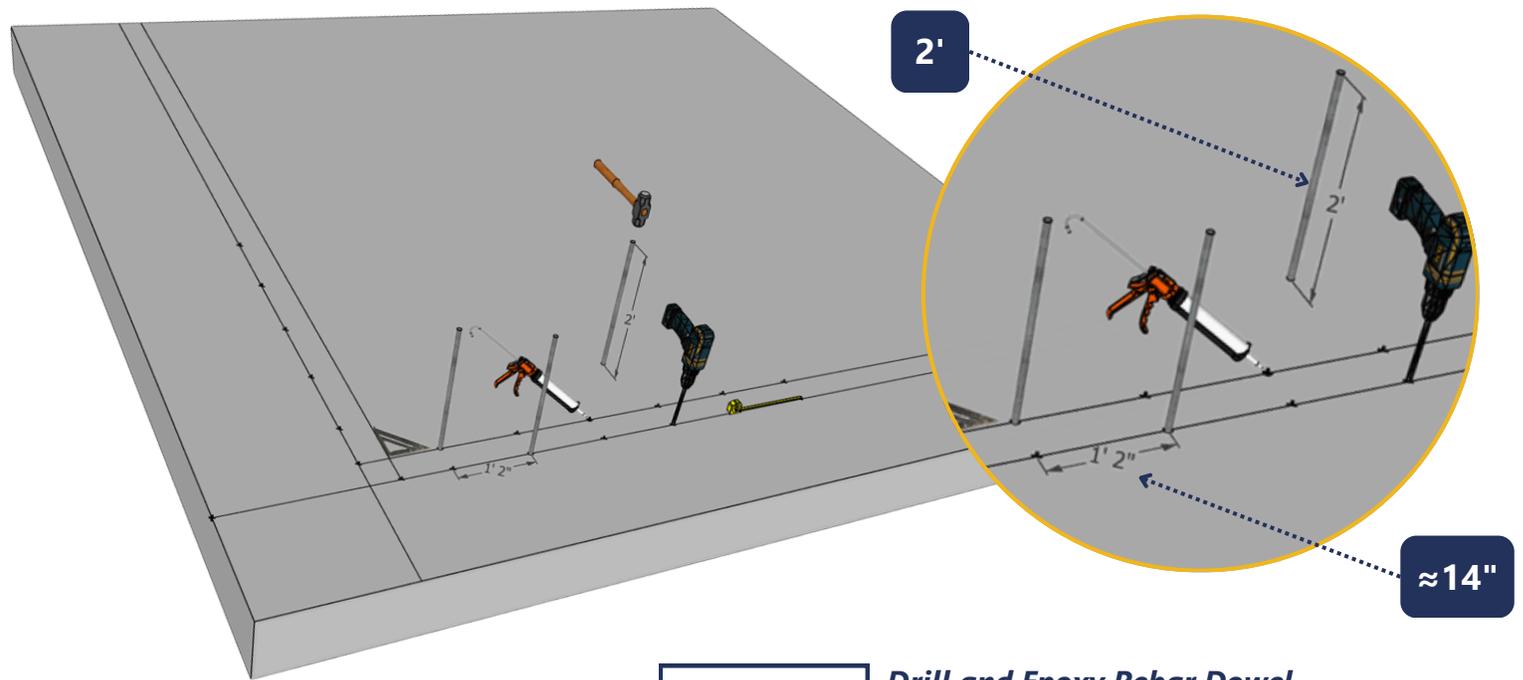
**SCAN TO SHOP
RECOMMENDED
TOOLS &
MATERIALS:**





1 Foundation Preparation and Layout Marking

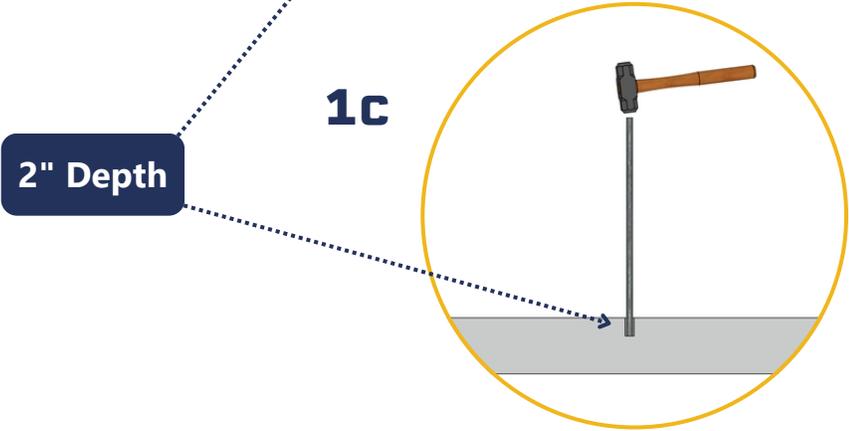
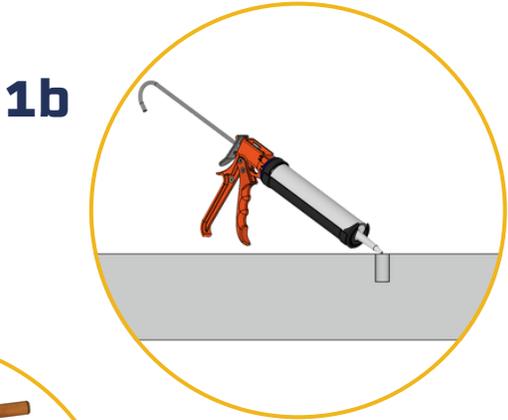
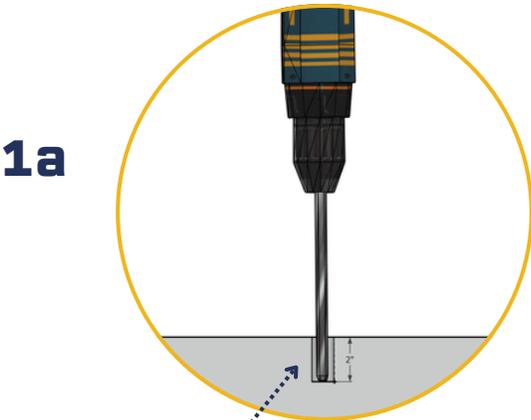
Snap chalk lines or stretch string to mark the perimeter of each wall on the slab or footer. Use measuring tape and squares to define corners and door/window locations. Mark dowel hole positions approximately every 14 inches, alternating sides along the panel for a staggered anchor pattern.



1a - 1c

Drill and Epoxy Rebar Dowel

Drill holes approximately 2 inches deep, fill each with epoxy, insert dowels by hammering them in, and allow to cure fully before panel placement.

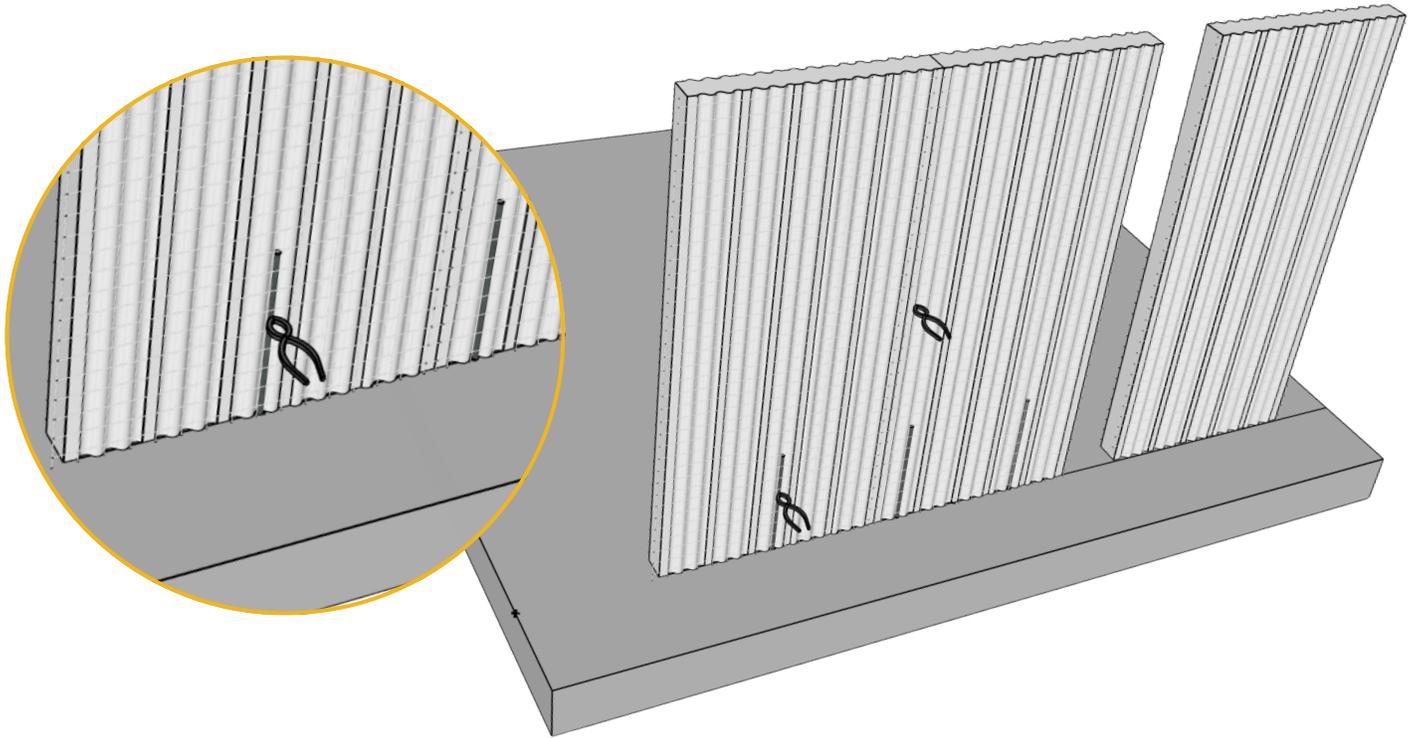




2

Panel Placement with Rebars and Anchoring

Position SCIP panels vertically along marked wall lines, sliding them over pre-installed rebars, then secure using tie wire for structural stability.

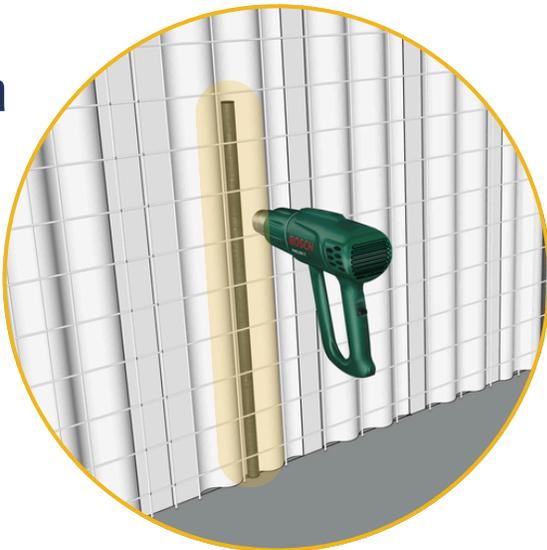


2a - 2b

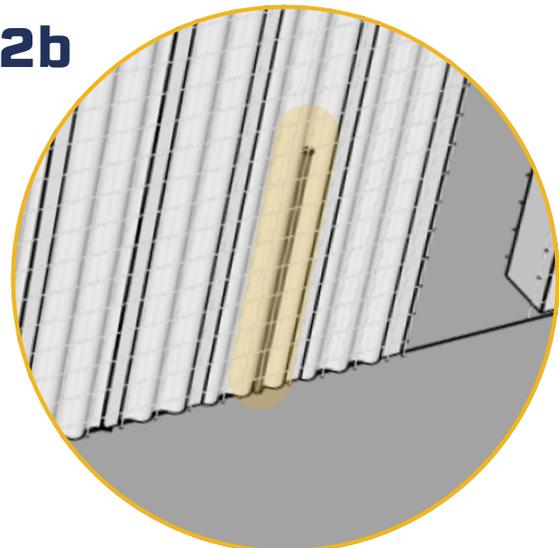
Prepare Panel Base and Slide Over Dowels

Use a heat tool to melt a groove at the panel base, then lower the panel over rebars, guiding them between the foam core and exterior mesh.

2a



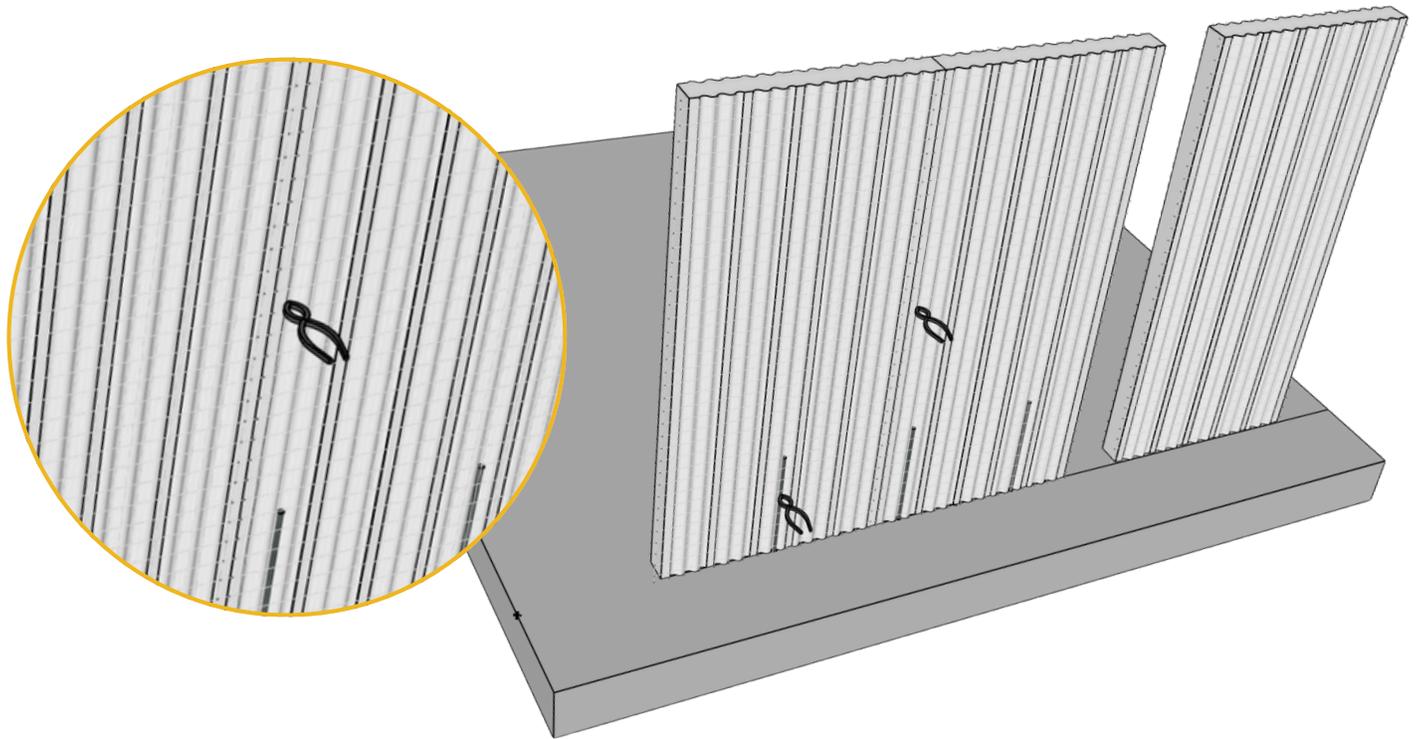
2b





2 Panel Placement with Rebars and Anchoring

Position SCIP panels vertically along marked wall lines, sliding them over pre-installed rebars, then secure using tie wire for structural stability.

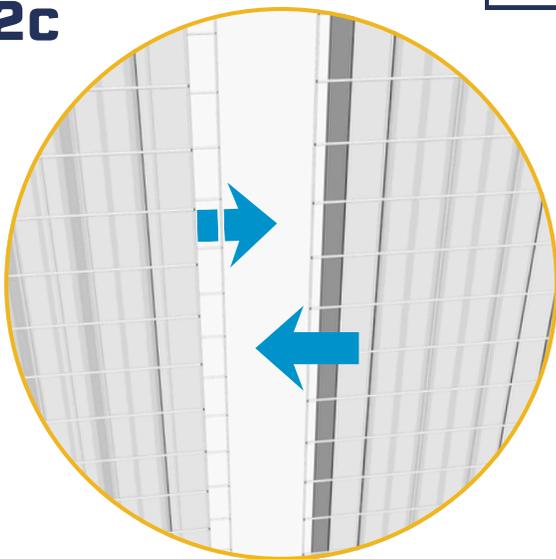


2c - 2d

Overlap and Tie Mesh Between Panels

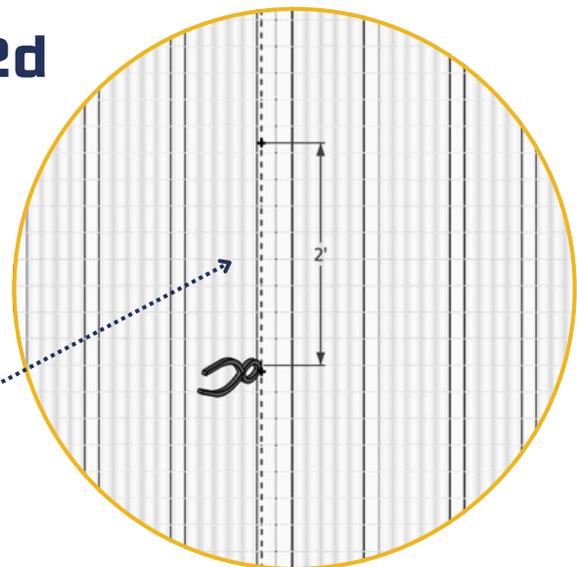
Align panels so edge meshes overlap on both sides, then wire-tie seams securely every 2 feet using pliers.

2c



2d

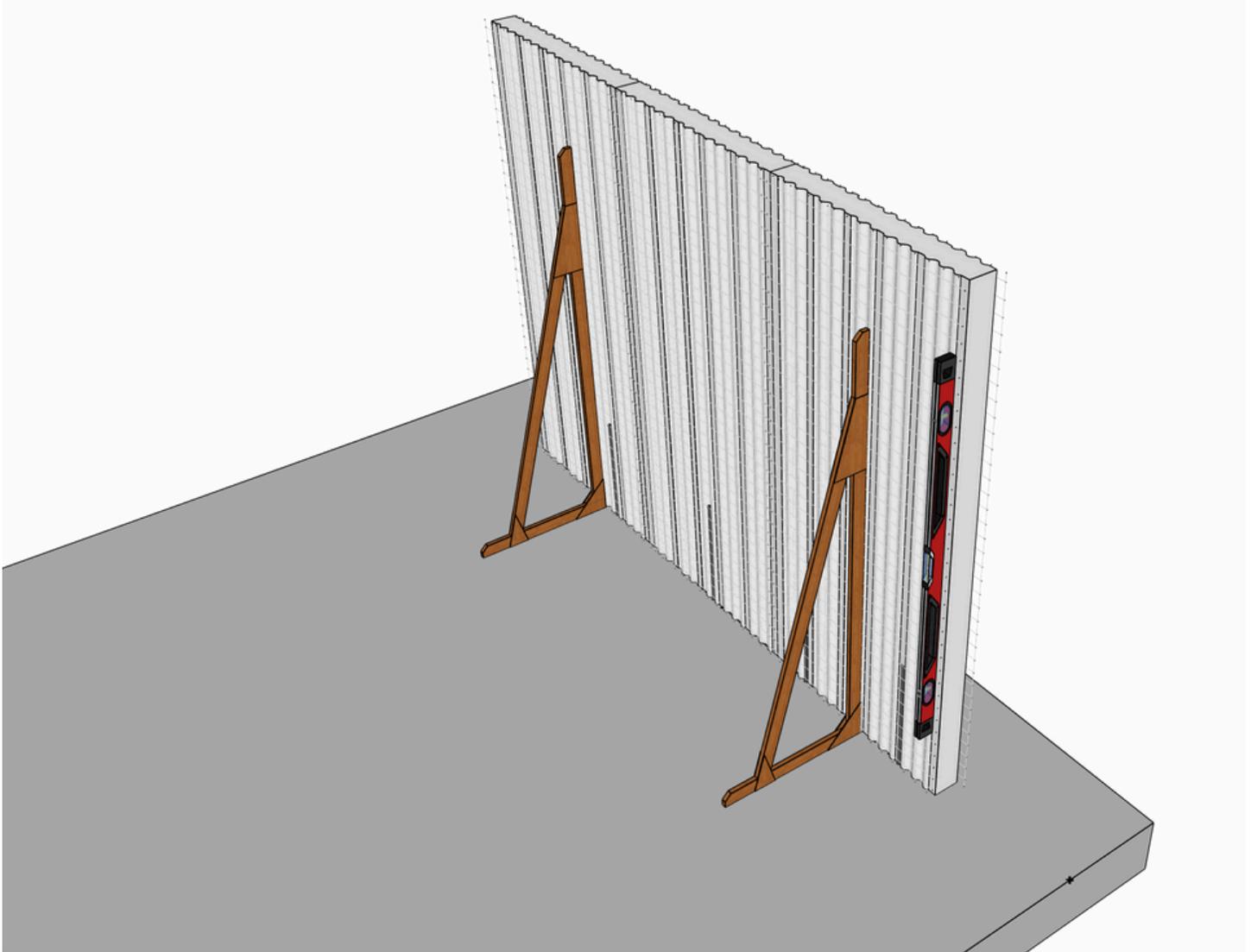
2'



3

Panel Alignment and Bracing

Use a level and plumb line to ensure each panel is vertically aligned. Secure panels with braces fixed at an angle and anchored to the slab or formwork to hold position during installation.



Bracing Options:

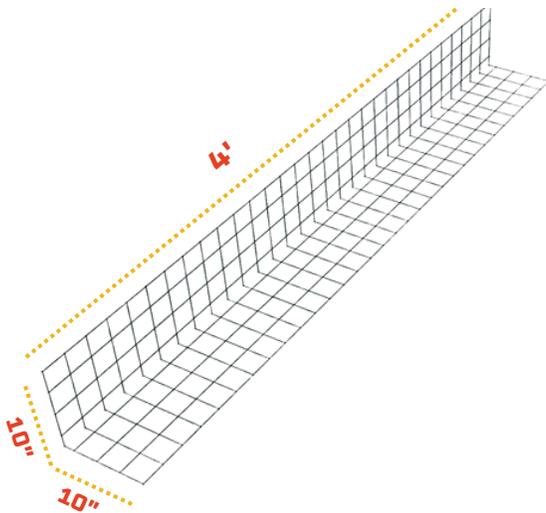
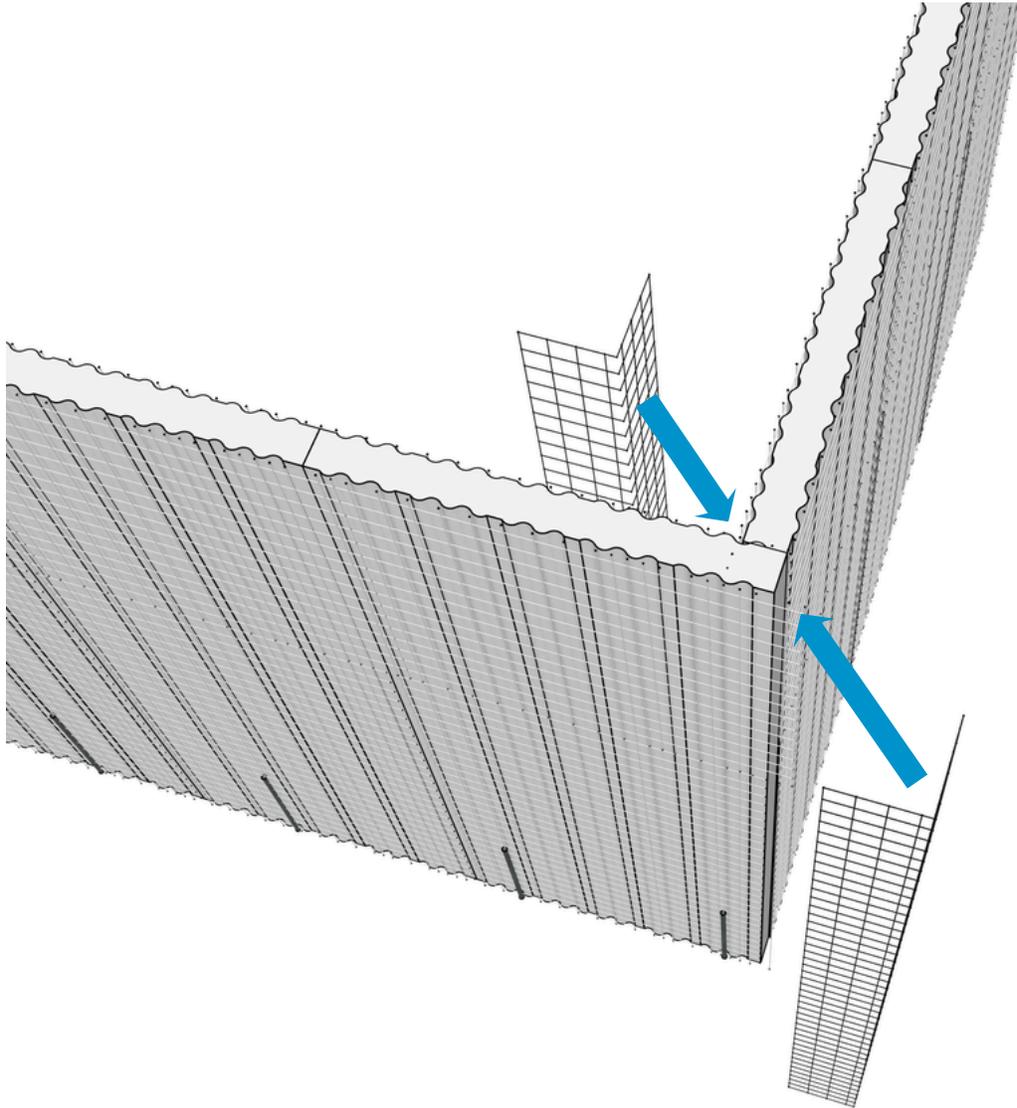
- Wood 2x4s: Easy to cut and nail into angled supports.
- Adjustable metal poles: Also called "jack posts" or "telescoping braces," these can be tightened by hand.
- Metal braces with clamps: Pre-made supports that can be locked in place with simple clamps.
- L-brackets with threaded rods: Useful for tight areas; rods can be turned to adjust pressure.



4

Installing Corner Mesh for 90° Panel Connections

Attach L-shaped mesh to the inside and outside corners where wall panels meet at 90°. Tie the mesh securely to the panel wire on both sides to reinforce the joint and lock the walls together.



Purchase **Corner Mesh** at <https://store.fortifiedstructuralsolutions.com/shop>. Use calculator tool to determine exact quantities needed.

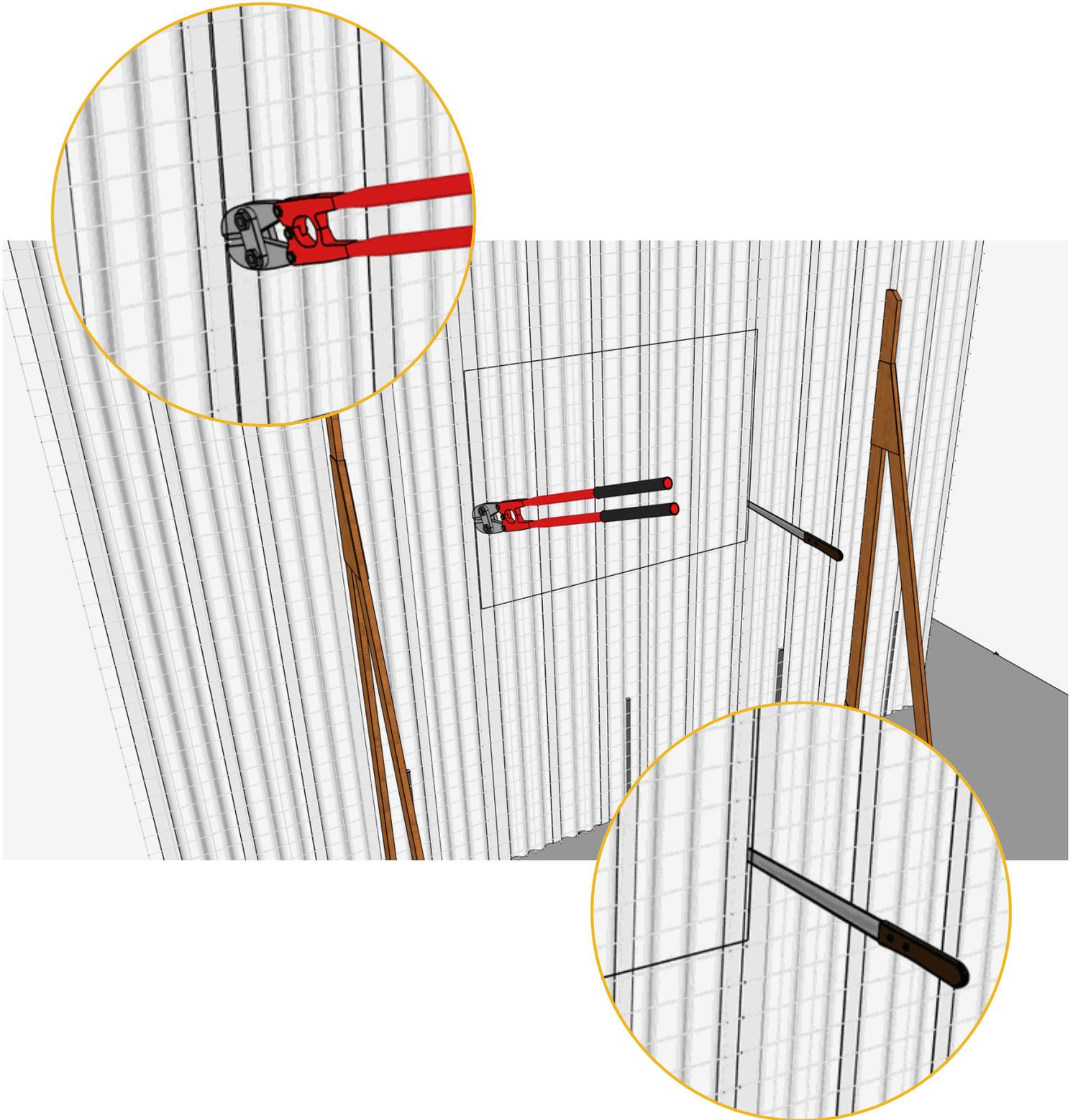
**SCAN TO SHOP
FSS PRODUCTS:**



5

Cutting Panels for Custom Lengths or Openings

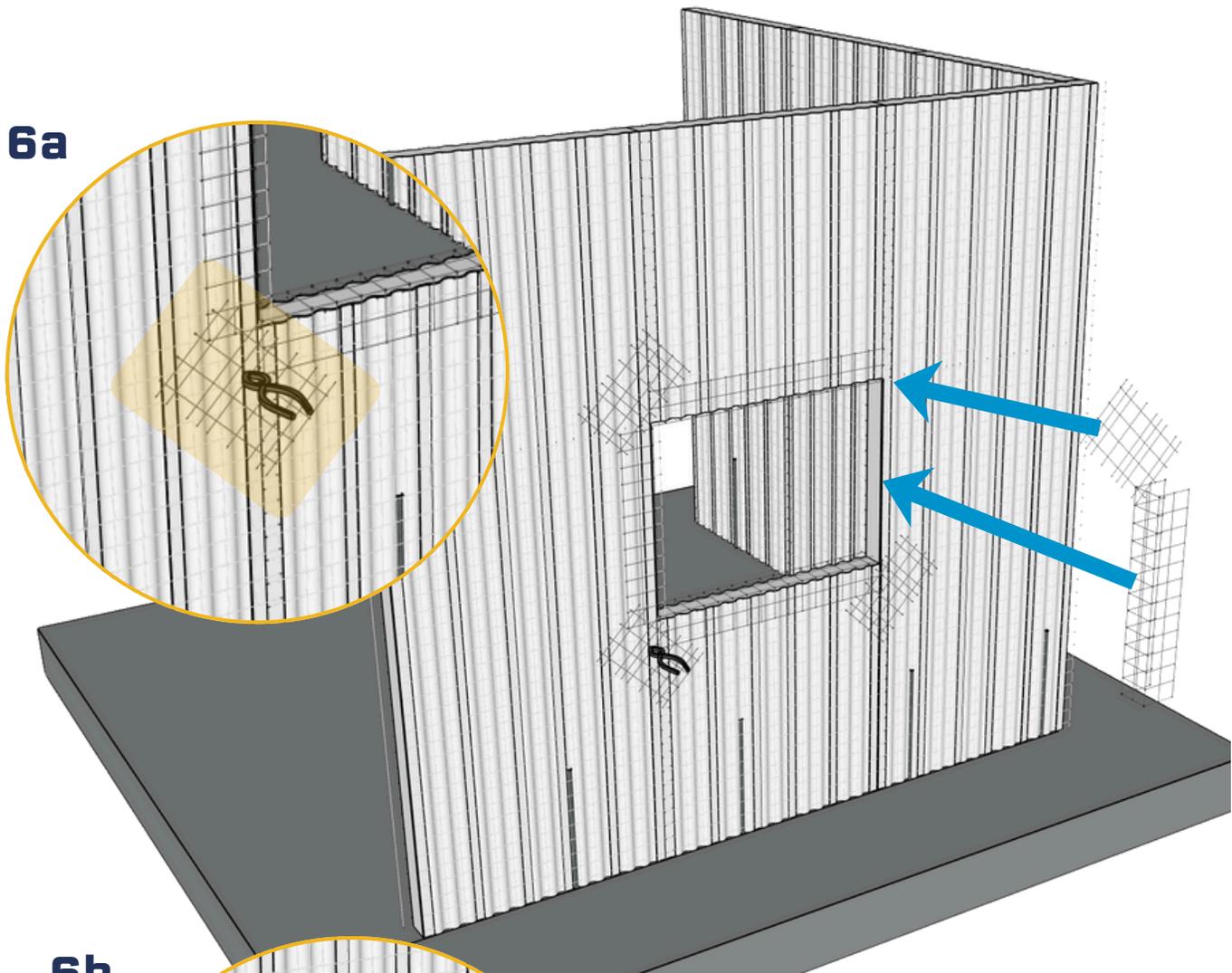
Mark the cut line, then snip through the wire mesh using pliers or wire cutters. Cut the foam core along the same line using a hand saw or heat blade for a clean, even edge.





6 Accessory Mesh Installation for Structural Reinforcement

Install additional mesh reinforcements at key stress points to strengthen the panel assembly before concrete application. This includes U-mesh along panel edges and around openings, and flat mesh placed diagonally at corners of windows and doors to prevent cracking.



6a

6b

6a-6b

Reinforcing Openings with U-Mesh and Flat Mesh

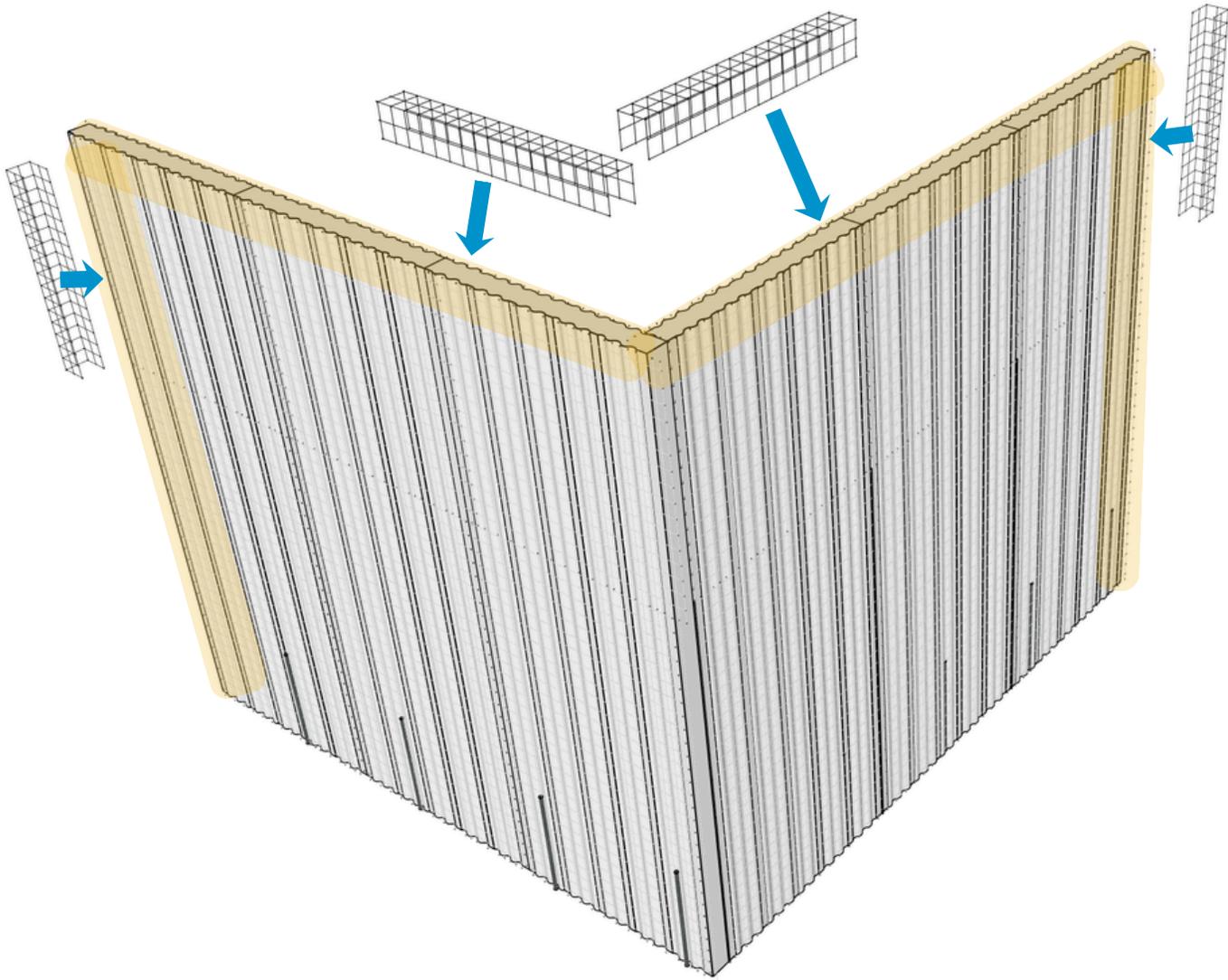
Wrap U-mesh around the full perimeter of each door or window opening, then place flat mesh diagonally at all four corners to strengthen against cracking and movement.



6c

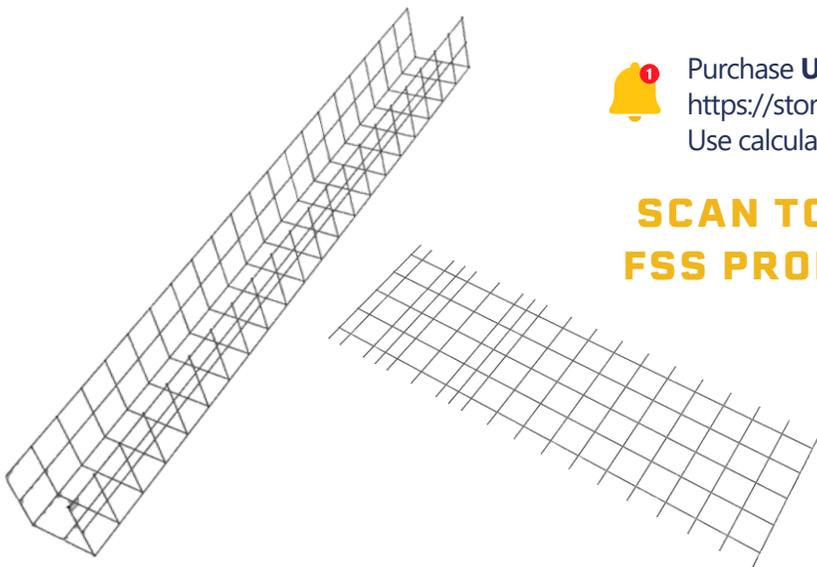
Reinforcing Exposed Panel Edges with U-Mesh

Install U-mesh along the top and any exposed vertical edges of wall panels to connect front and back mesh layers and strengthen the panel ends before concrete application.



Purchase **U Mesh** and **Flat Mesh** at <https://store.fortifiedstructuralsolutions.com/shop>.
Use calculator tool to determine exact quantities needed.

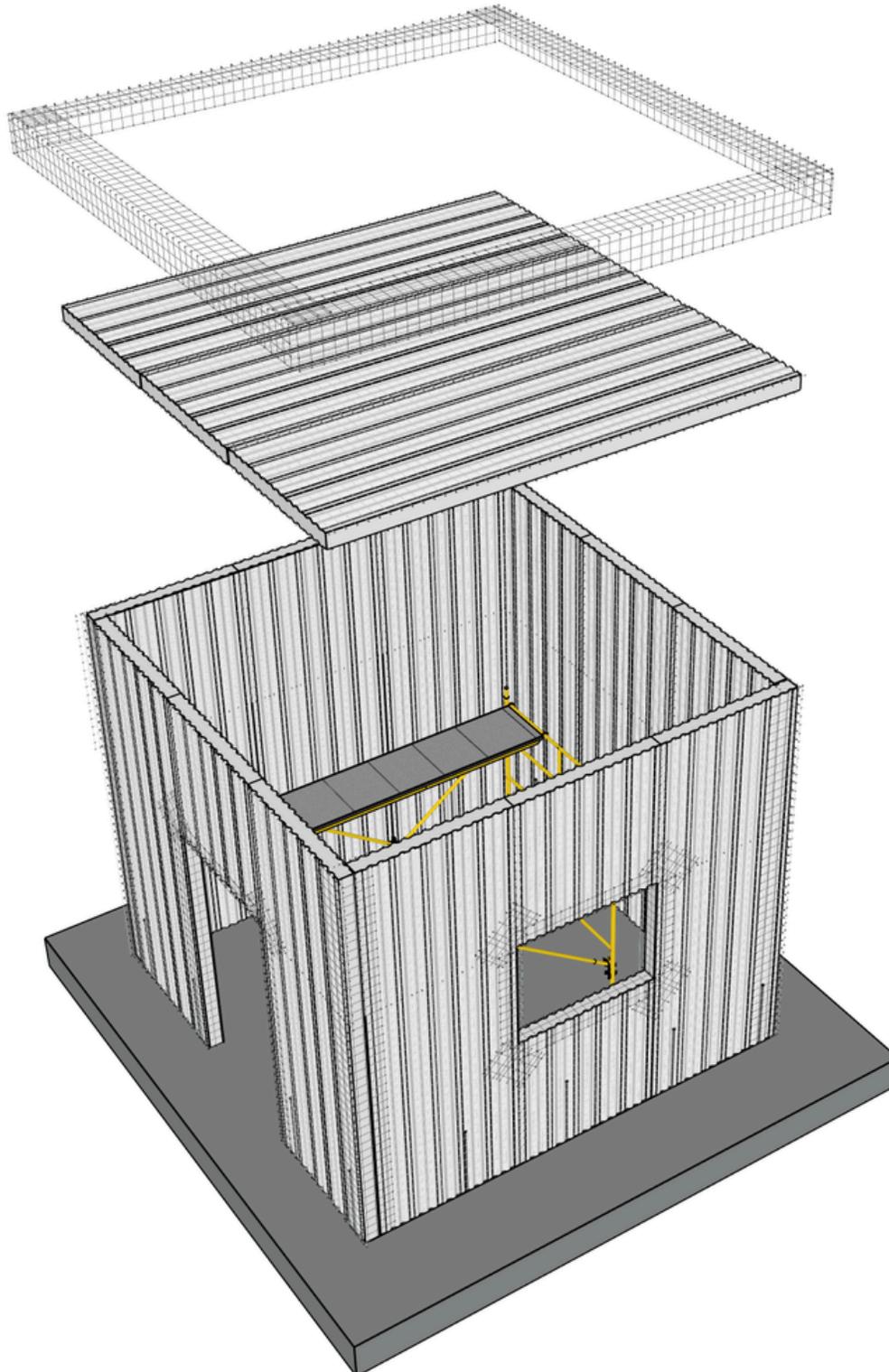
**SCAN TO SHOP
FSS PRODUCTS:**



7

Roof Panel Installation

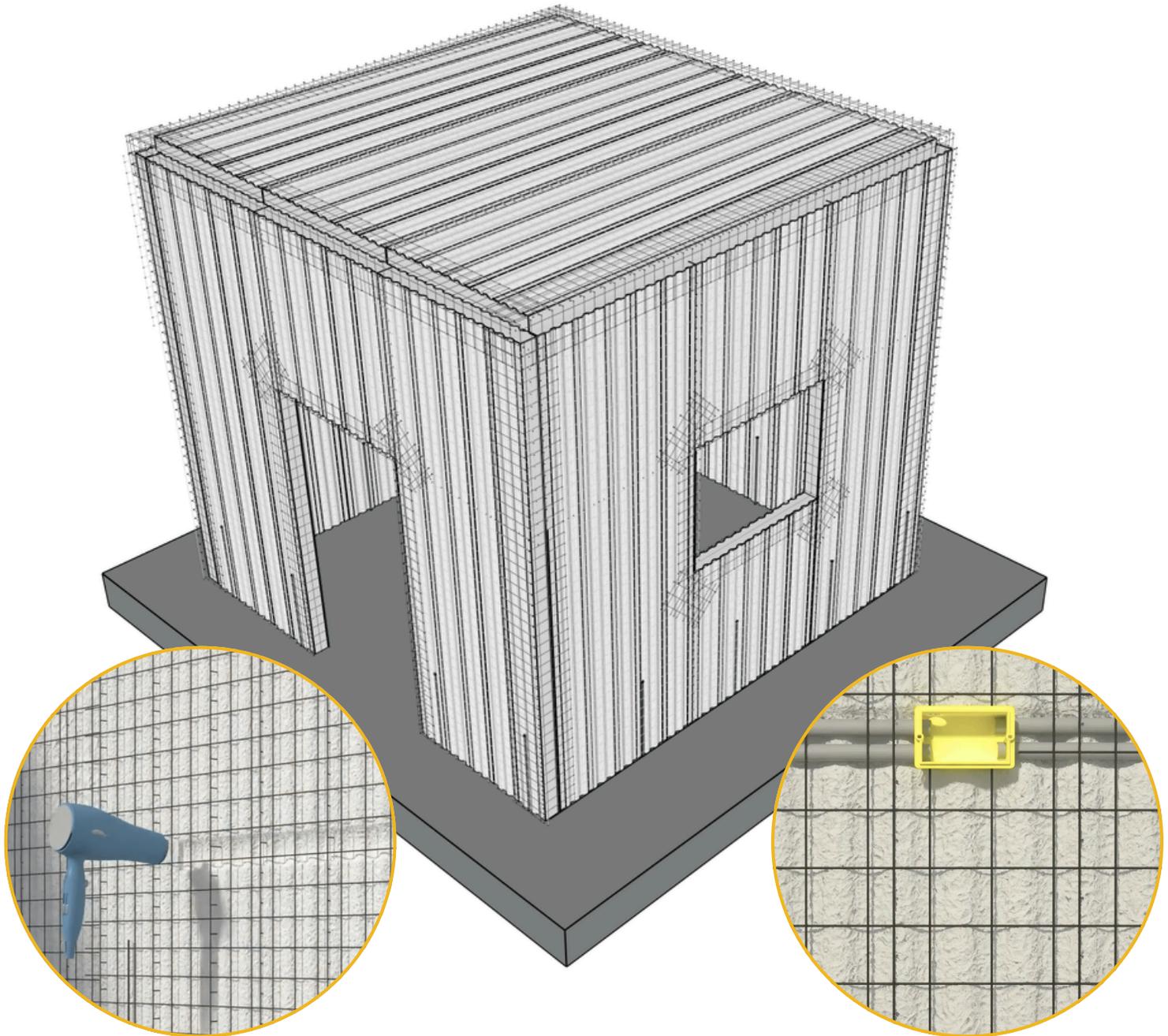
Place roof panels onto the aligned wall perimeter, ensuring they rest securely across supported edges. Tie overlapping mesh seams together, then reinforce interior and exterior connections with corner mesh. Use temporary wood or metal shoring from below to support the roof panels until concrete is applied and cured.



7a

Completed Structure Assembly before Concrete

The fully assembled panel structure should be square, plumb, and fully braced, with all mesh connections tied and reinforcement installed at corners, edges, and openings. Verify that all panels are securely anchored, shored, and ready for concrete application.



Before applying concrete, insert all **MEP (mechanical, electrical, plumbing)** components by creating channels in the EPS foam. Use the same heat tool to melt paths for conduits, plumbing lines, and electrical boxes, ensuring they sit flush with or behind the mesh. Secure components with wire ties as needed to keep them in place during spray application

WET MIX MORTAR RECIPE

Find links to recommended materials at store.fortifiedstructuralsolutions.com/tools

INGREDIENT	PER BATCH (3.5 CU FT)	TOTAL for 315 SQ FT (12 BATCHES)
Portland Cement (Type I/II)	85 lb = 1 full bag + ~10 lb	1,020 lb (~12 bags)
Clean Sand (ASTM C33)	~275 lb = 3.5 full 5-gal buckets	3,300 lb = ~42 buckets = ~1.25 cubic yards
Water	~34 lb = 4.1 gallons	408 lb (~49 gallons)
Synthetic Fibers (PP)	~0.25–0.3 lb = 1 heaping handful	3.0–3.6 lb total
Acrylic Bonding Agent	~0.4 gal = ~50 oz per batch	4.8 gallons total
Plasticizer (optional)	~5 oz = about $\frac{2}{3}$ cup	60 oz (~1.9 quarts)

 **Notes:** The specified mix should achieve a compressive strength range of **approximately 3,000 to 4,500 psi**, depending on curing conditions and exact water content. This exceeds the minimum target of 2,500 psi and is suitable for structural wall coatings applied via sprayer.

The above table is based on estimated concrete coverage for one standard panel kit (315 sq ft at 1 $\frac{3}{8}$ " thickness) and a mixing container with 3.5 cu ft usable capacity (4.2 cu ft total volume). Quantities are approximate and intended for field guidance only.

Disclaimer: Fortified Structural Solutions provides these mix proportions as general recommendations and assumes no responsibility or liability for faulty batching, mixing, or application. For best practices, users should consult ACI 506R (Guide to Shotcrete) and ACI 506.2 (Specification for Shotcrete). For permitted projects, always follow local building codes and project-specific engineering requirements.

Concrete/Mortar (applied in-situ)

- Compressive Strength > 2,500 PSI
- Thickness > 1" from Mesh
- Aggregate size < 5/8"
- Slump > 2"

**SCAN TO SHOP
RECOMMENDED
TOOLS &
MATERIALS:**

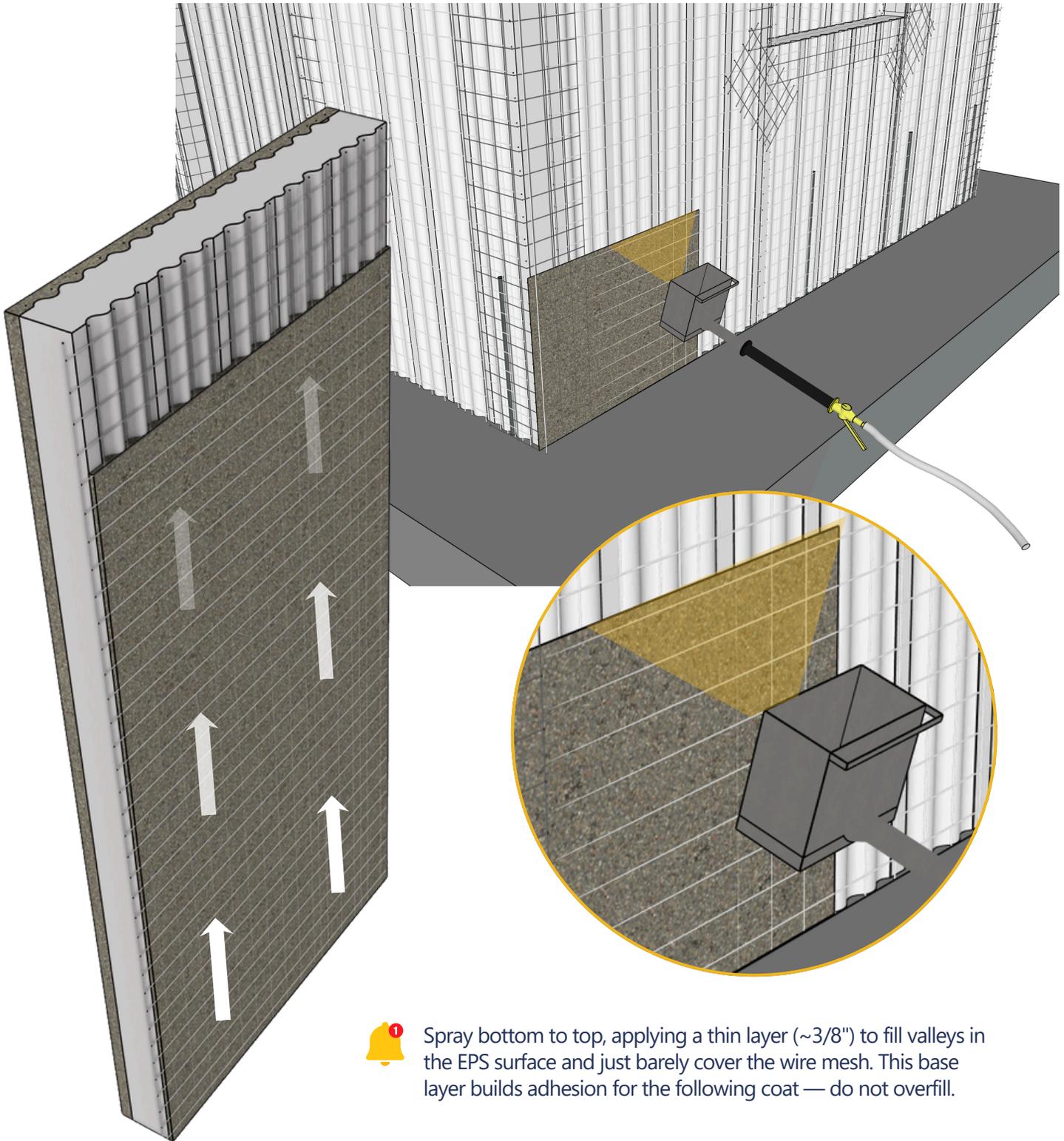




8

Apply Scratch Coat

Spray a thin, even base layer of mortar (scratch coat) over all panels, just enough to fully cover the mesh and create adhesion for the next coat.

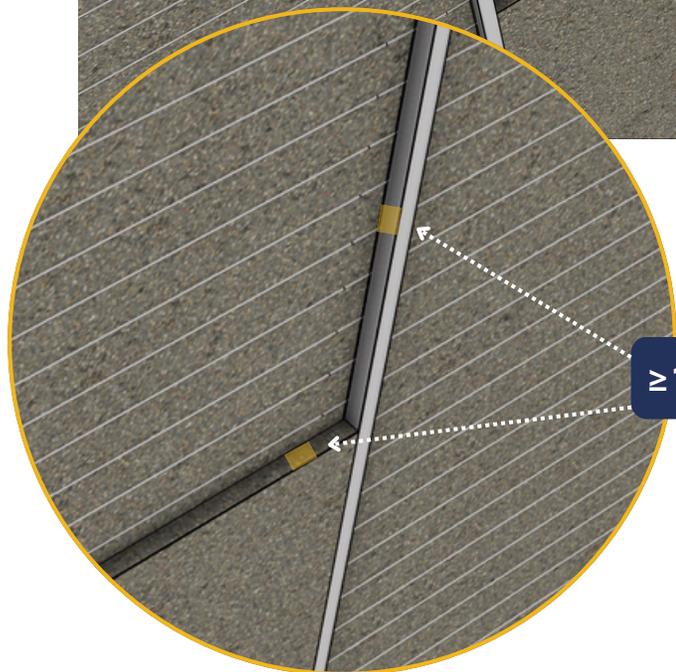
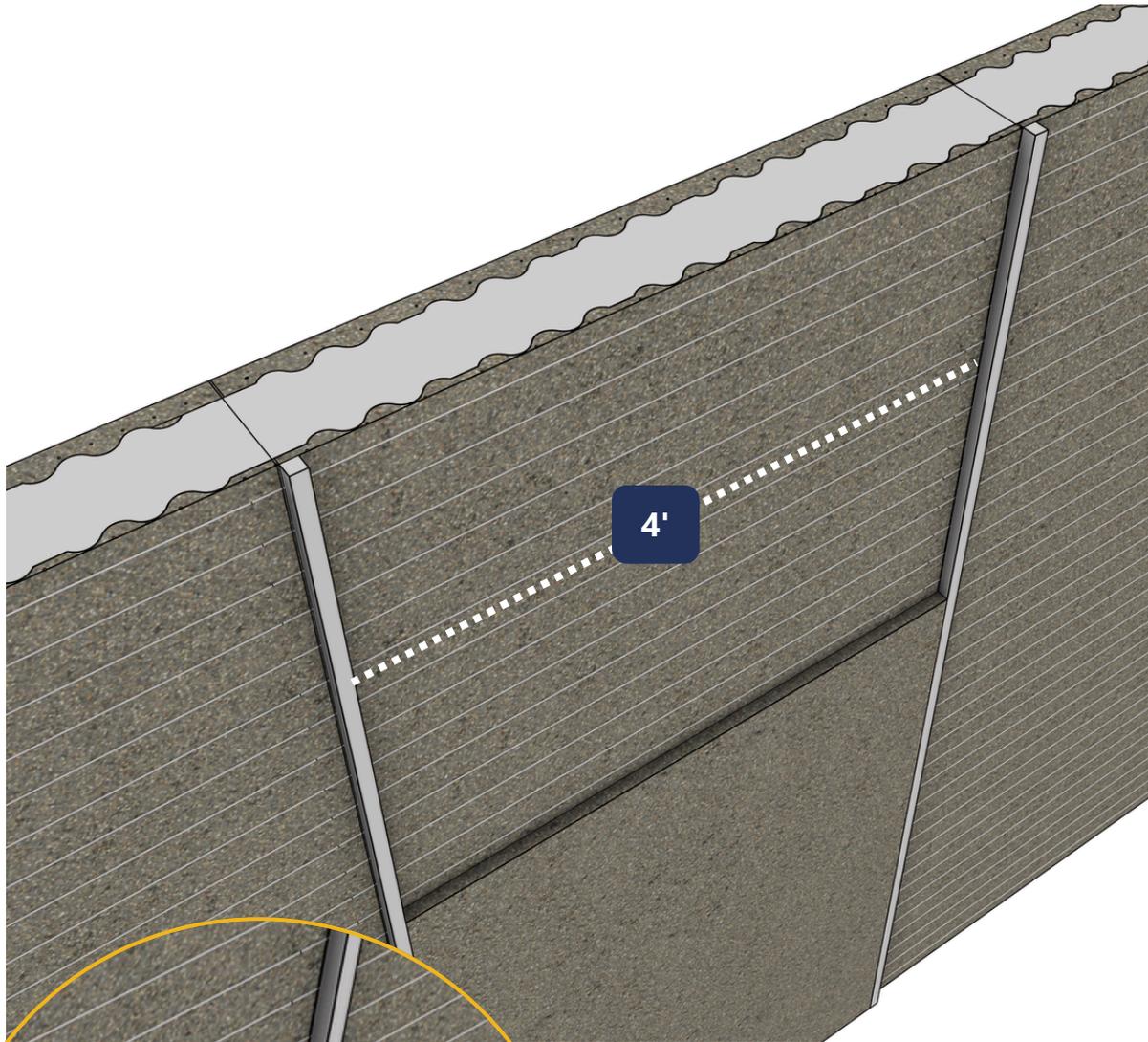


Spray bottom to top, applying a thin layer (~3/8") to fill valleys in the EPS surface and just barely cover the wire mesh. This base layer builds adhesion for the following coat — do not overfill.



9 **Insert Screed Guides**

While the scratch coat is still damp, embed straight screed guides (wood, metal, or pvc strips) vertically at regular intervals to define brown coat thickness - minimum 1" thick from the mesh. Temporarily secure screed guides using tie wire or alternate method.



Re-usable Screed Guide Examples

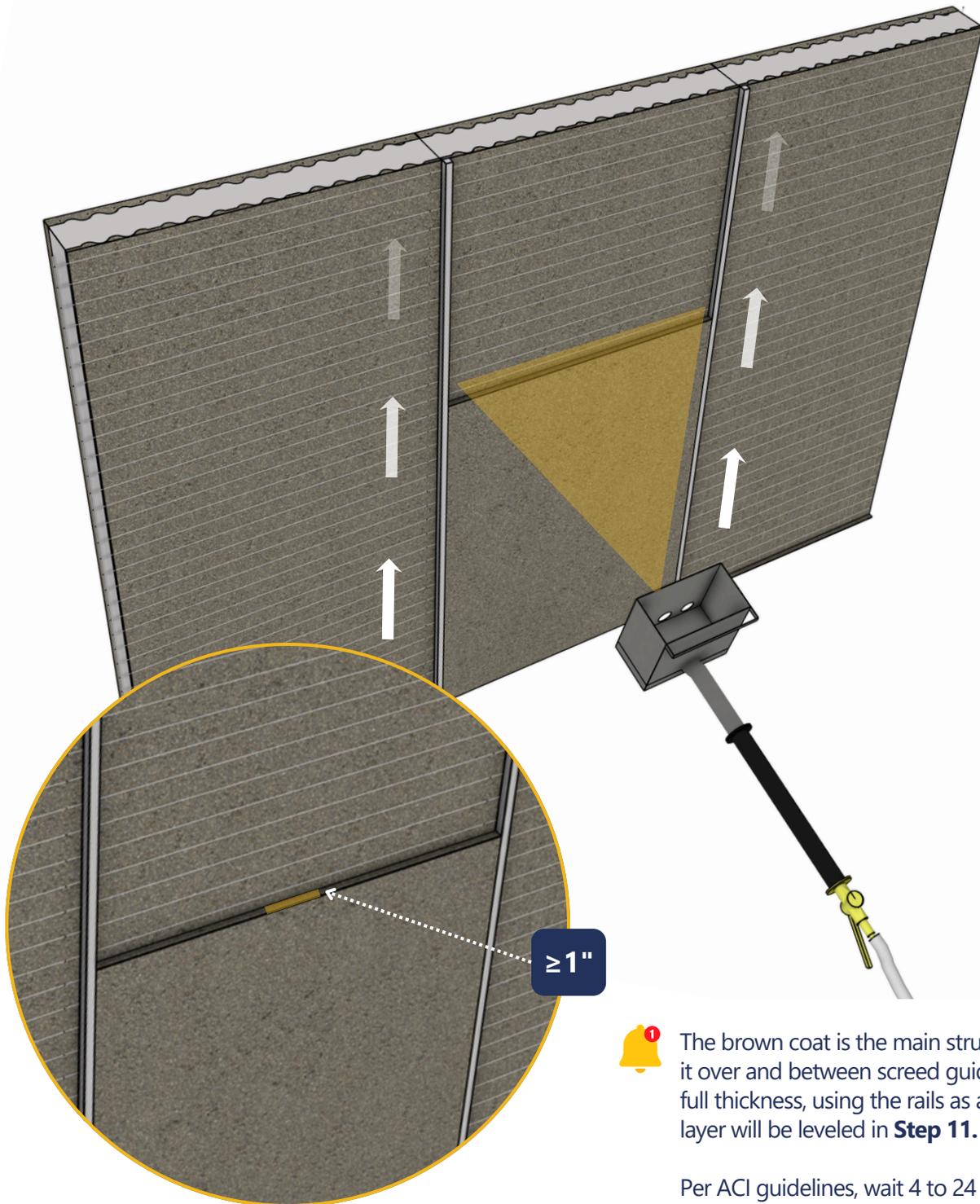
Wood, Plastic, Metal ≥ 1 " Thickness or Diameter





10 Apply Brown Coat

Spray the second mortar layer (brown coat) to build up total thickness ($\geq 1"$), embedding over and between screed guides.



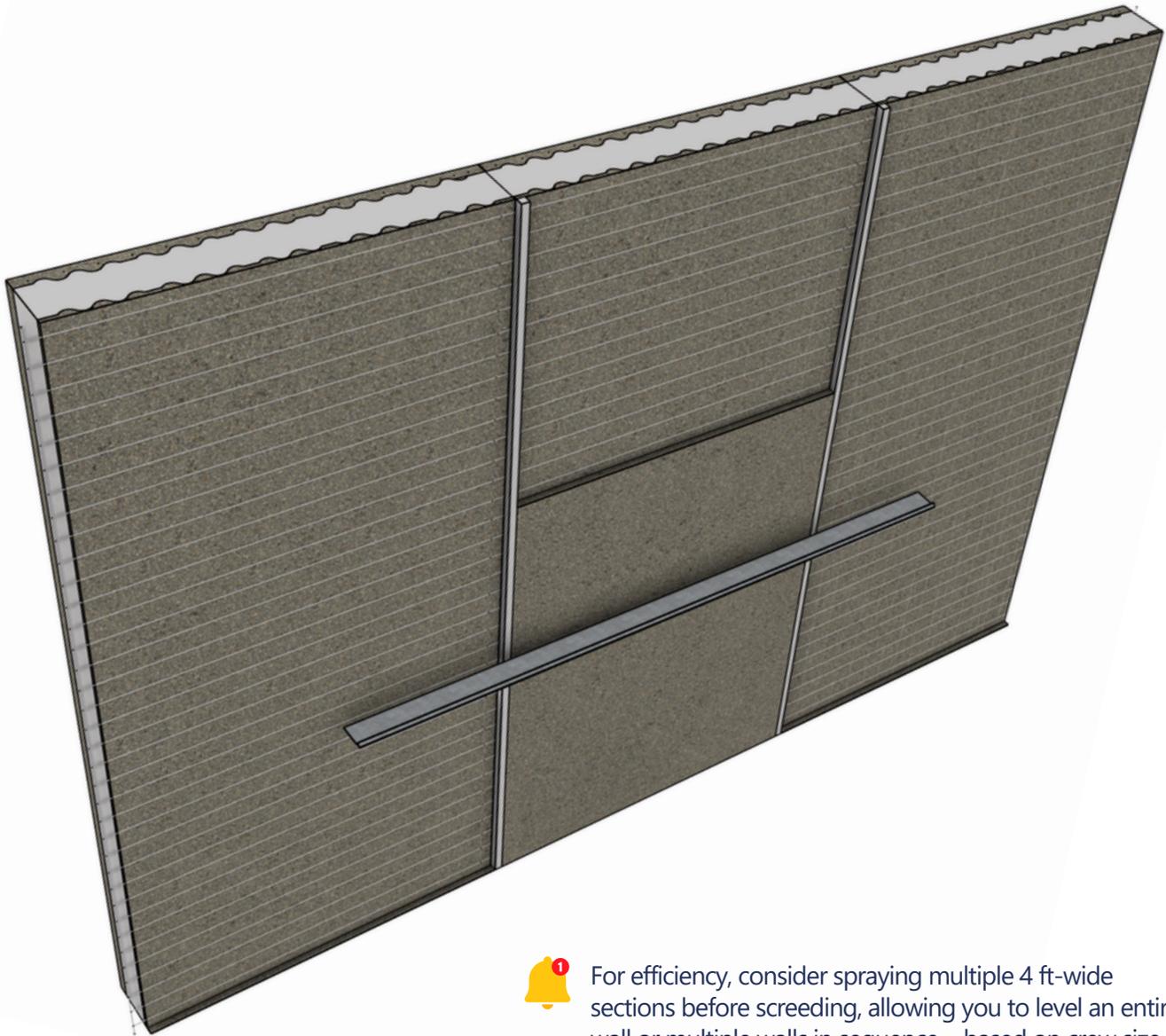
The brown coat is the main structural layer. Apply it over and between screed guides to build up the full thickness, using the rails as a reference. This layer will be leveled in **Step 11**.

Per ACI guidelines, wait 4 to 24 hours after the scratch coat—until it's firm enough to support new material without shifting.

11

Screed the Wall Surface

Use a straight screed board or metal level to drag along screed guides, flattening and leveling the brown coat surface.



For efficiency, consider spraying multiple 4 ft-wide sections before screeding, allowing you to level an entire wall or multiple walls in sequence—based on crew size and timing. Monitor weather and surface temperature closely; ideal conditions are cool and shaded to prevent premature drying.

Per ACI guidelines, screeding should begin as soon as the brown coat holds its shape but is still workable—typically within 30 to 60 minutes after application, depending on conditions.

**12**

Remove Screed Guides

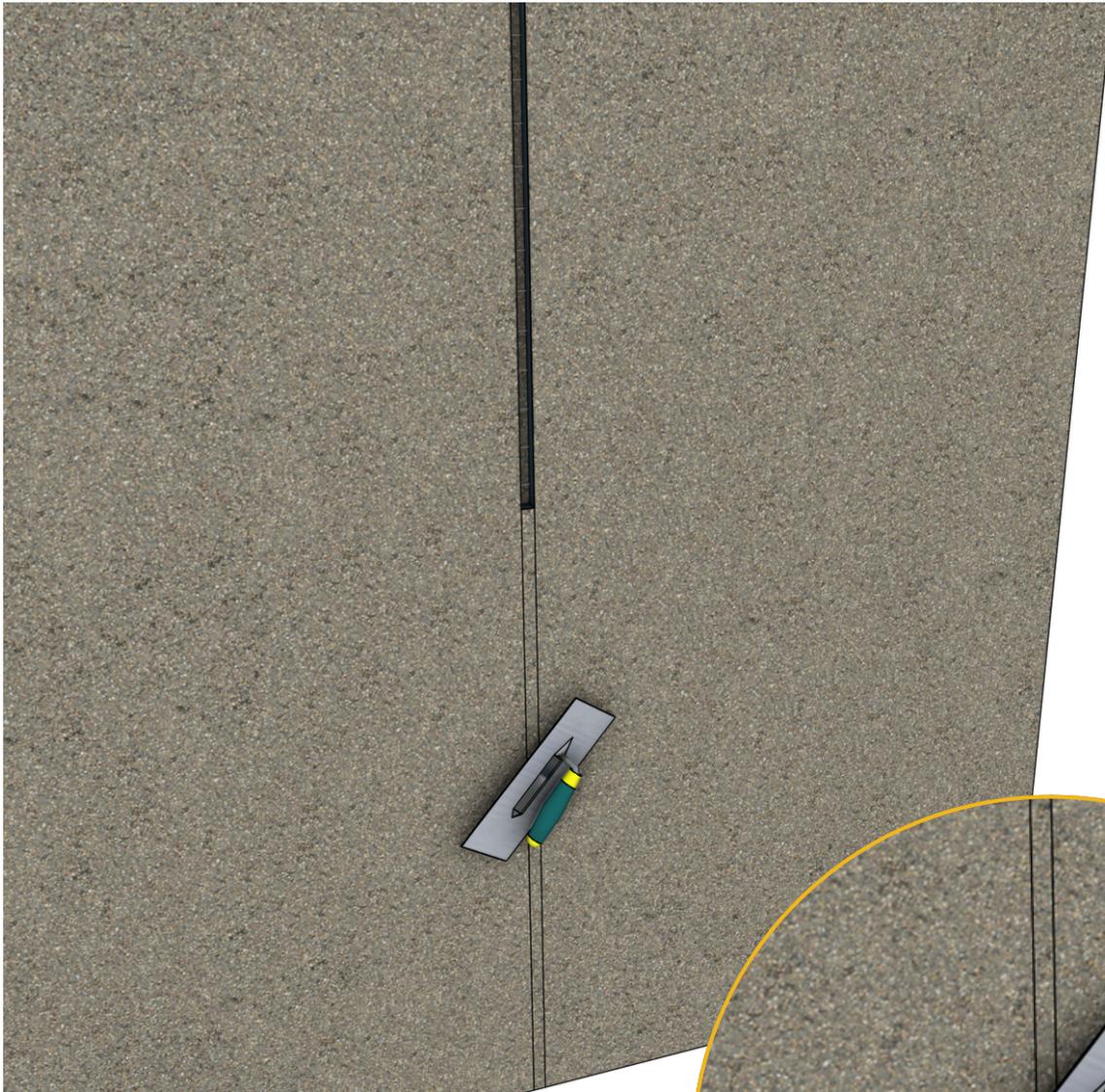
Once brown coat begins to set, carefully remove the screed guides to avoid cracking or disruption.



During screeding (**Step 11**), collect excess mortar removed from the surface and set it aside — this can be reused in **Step 13** to fill screed guide voids and low spots.

13 Patch Brown Coat Where Needed

Fill guide grooves and any low spots with fresh mortar, smoothing it flush with the wall surface.



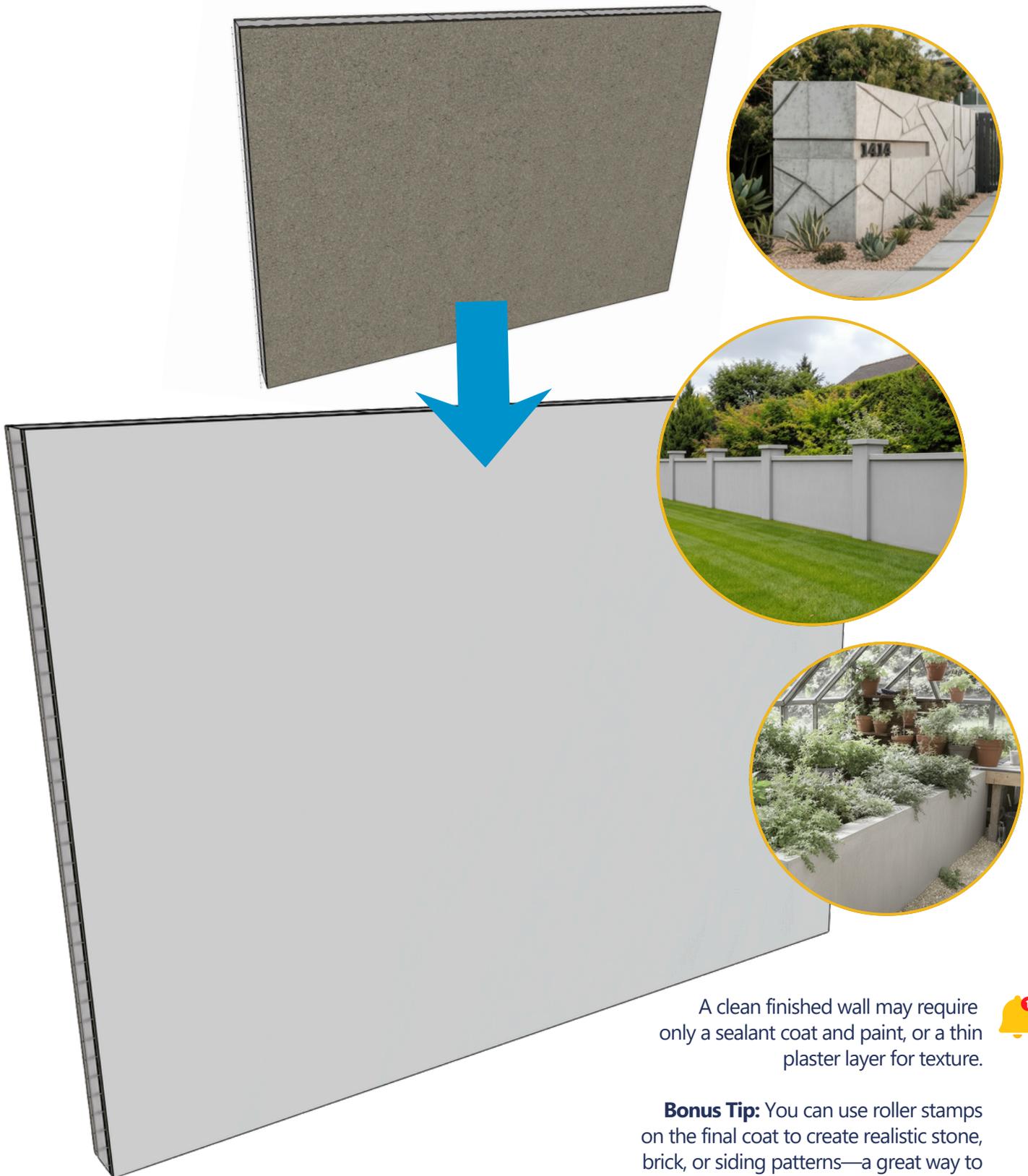
Use excess mortar from screeding to fill gaps or low spots with a trowel. After patching, a damp sponge can be used to lightly buff and blend the patched areas into the surrounding brown coat for a seamless finish before curing begins.





14 *Final Finish Layer*

After mortar cures, apply your selected surface finish — plaster, stucco, paint, or waterproof sealant — to protect and complete the wall.



A clean finished wall may require only a sealant coat and paint, or a thin plaster layer for texture.



Bonus Tip: You can use roller stamps on the final coat to create realistic stone, brick, or siding patterns—a great way to add character without extra materials!

14a

Completed Structure Assembly after Concrete

Once all panels have been coated and screeded, and the concrete has cured, inspect the structure to ensure walls and roof are fully bonded, aligned, and free of gaps or cracks. At this stage, the shell is ready for finish work, including window and door installation.



If using panels as the roof system in a modular structure, the top surface can be finished with traditionally poured concrete to create a monolithic slab. The underside of the roof panels should be coated using the same spray equipment and mortar mix as the walls. Apply the scratch and brown coats from below in the same sequence, ensuring proper coverage, adhesion, and curing. Use scaffolding or platforms as needed for safe overhead application.

LEGAL DISCLAIMERS AND IMPORTANT NOTICES



Building Code Compliance

It is the purchaser's responsibility to ensure that the use and installation of this product comply with all applicable building codes and regulations, including but not limited to the Florida Building Code (FBC), International Building Code (IBC), or local municipal codes. The manufacturer does not guarantee code compliance in any specific jurisdiction. Verify with your local building department before beginning installation on a permitted or habitable project.

Installation Responsibility

This product must be installed in accordance with the manufacturer's installation instructions and all applicable building codes. While installation by a qualified, licensed professional is strongly recommended—especially for structural or permitted projects—experienced DIY users may perform installation at their own risk. Improper installation may result in structural failure, property damage, or personal injury, and will void any applicable warranty. All handling, installation, and jobsite safety are the sole responsibility of the purchaser or installer.

Limited Warranty and Liability

Unless stated otherwise in a written warranty document, this product is provided "as is" with no express or implied warranties, including merchantability or fitness for a particular purpose. The manufacturer's liability is strictly limited to replacement of defective product, if applicable, and excludes any incidental or consequential damages.

Disclaimer of Responsibility

Fortified Structural Solutions is not responsible for:

- Misuse, unauthorized modifications, or off-label applications
- Engineering or architectural decisions
- Installation errors or field conditions
- Permitting or inspection issues

Refer to **ACI 506R** and **ACI 506.2** for best practices on shotcrete and structural panel system application.



BY ACCEPTING DELIVERY OF THIS KIT, THE CUSTOMER ACKNOWLEDGES AND AGREES TO THESE TERMS.

Fortified Structural Solutions LLC
previously known as Concrewall USA LLC

