STRONGIRT®

by STRONGWELL

Pultruded FRP Cladding Attachment Support System

INSTALLATION MANUAL


JLG LIFT

THE PURPOSE OF THIS MANUAL

The purpose of this manual is to aid in the installation of STRONGIRT® portrayed in various installation methodologies however, it may not contain all conditions. We encourage you to contact your local STRONGIRT® representative for assistance with implementation.

ABOUT STRONGWELL

Headquartered in Bristol, Virginia, Strongwell is the recognized world leader in the manufacture of fiber reinforced polymer (FRP) composites utilizing the pultrusion process. Strongwell has pultruded FRP composite structural products since 1956 and offers four manufacturing facilities with over 730,000 sq. ft. of manufacturing space.

All STRONGIRT® manufacturing locations are ISO 9001 Quality Certified. Strongwell operates an in-house 10,000 sq. ft. laboratory for product testing and research and development efforts. A full-service machine shop allows Strongwell to build its own machinery and tooling. Engineers of numerous disciplines are on full-time staff. The company is financially strong, technically advanced, and focused on total quality.

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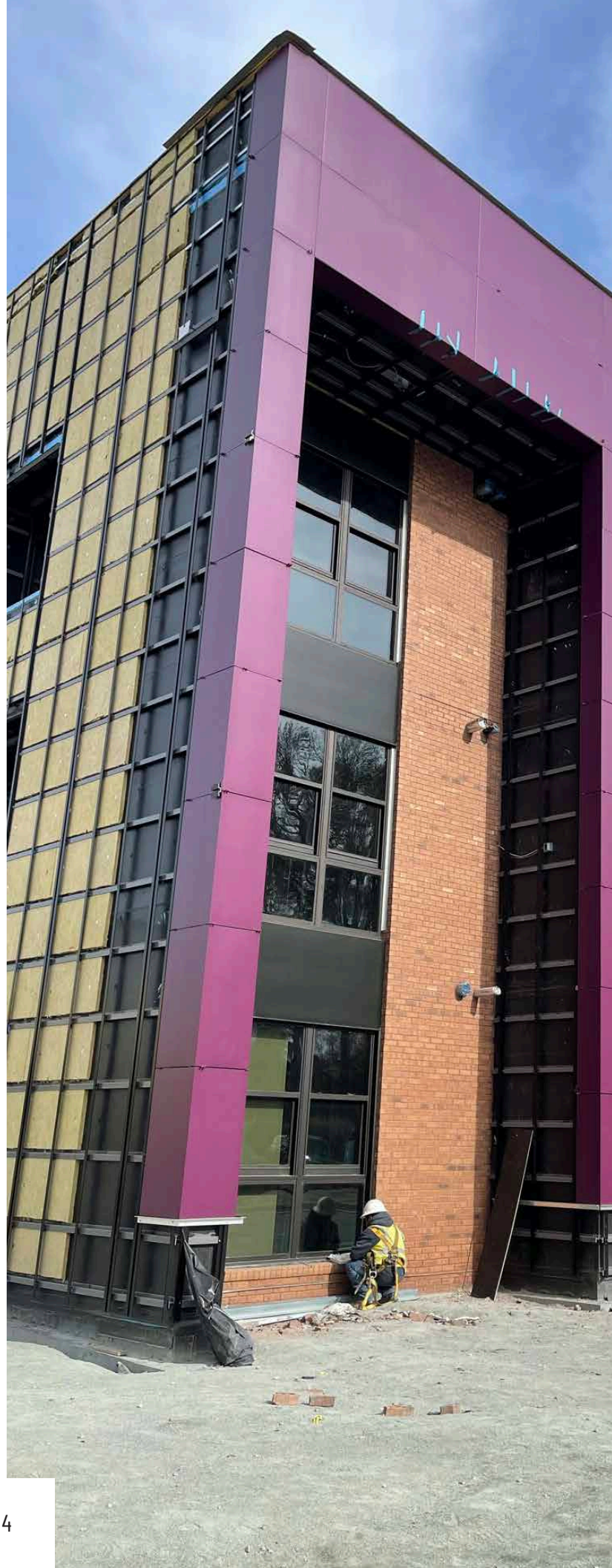
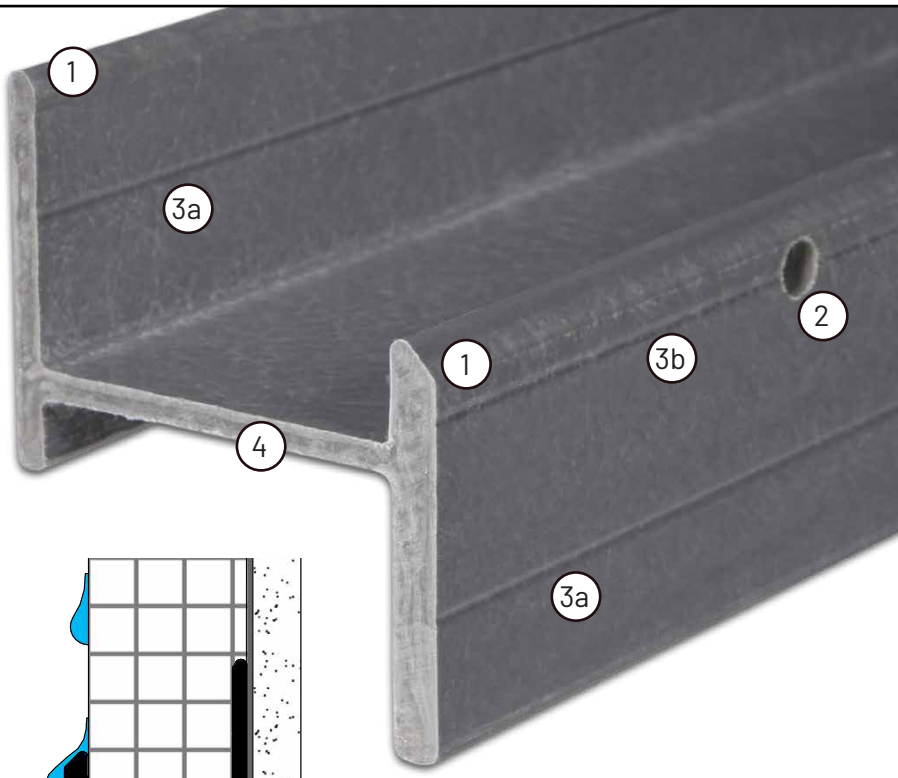


STRONGIRT®



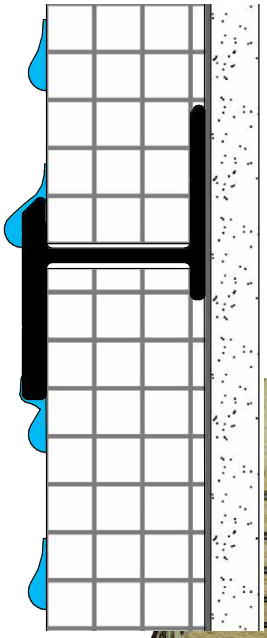
ELEMENTS OF DESIGN

1. Pitched flanges
The pitched flanges directed away from the system allow for water mitigation in diverting any intrusion beyond the facade back into the drainage plane.

2. Weep holes
The optional factory-drilled 5/16" self-draining weep holes can be located based on standard on-center spacing. Contractors can easily locate and drill weep holes as required on-site.

3. Fastening guide lines (a) / Weep hole guide line (b)
The pultruded profile incorporates suggested guides along both the fastening plane to the sheathing in addition to the facade fastening plane to STRONGIRT®.

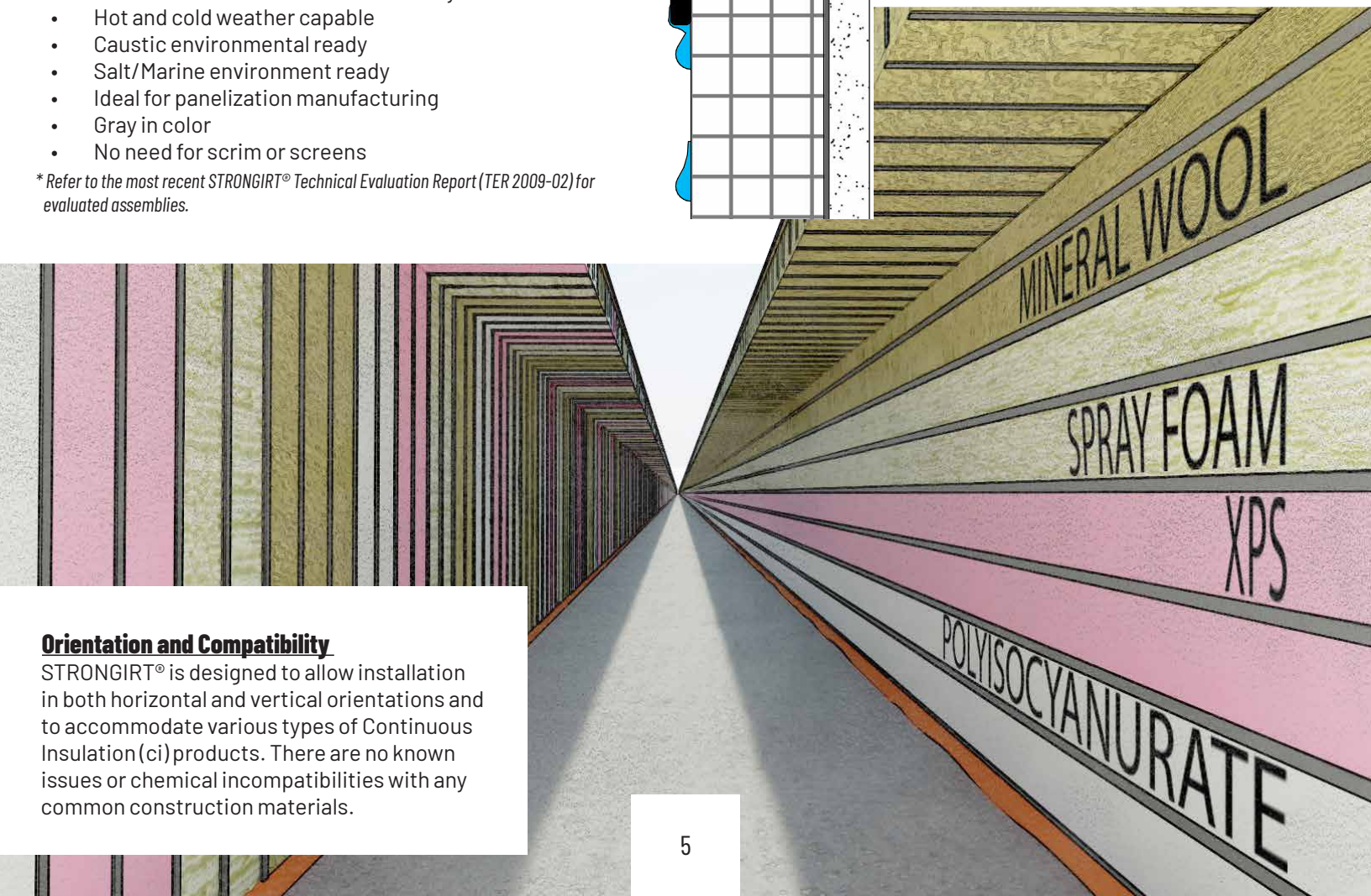
4. Insulation retention system
Insulation within the system is nested within this controlled slot and held in place by subsequent STRONGIRT®.



FEATURES OF DESIGN

- Part of successful NFPA 285 assembly*
- Hot and cold weather capable
- Caustic environmental ready
- Salt/Marine environment ready
- Ideal for panelization manufacturing
- Gray in color
- No need for scrim or screens

** Refer to the most recent STRONGIRT® Technical Evaluation Report (TER 2009-02) for evaluated assemblies.*

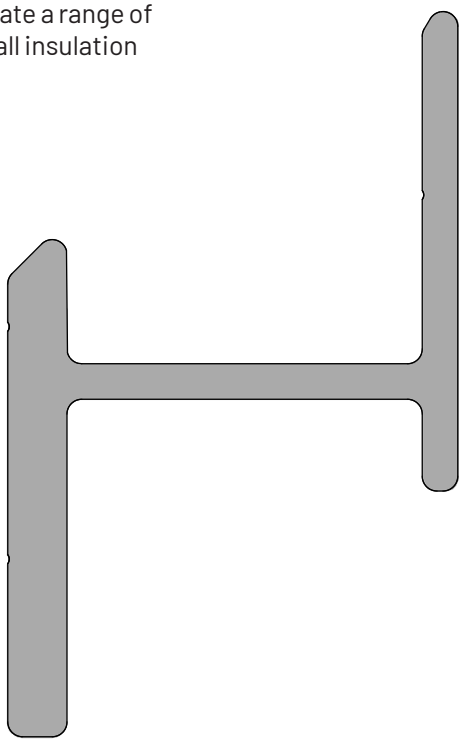


Orientation and Compatibility

STRONGIRT® is designed to allow installation in both horizontal and vertical orientations and to accommodate various types of Continuous Insulation (ci) products. There are no known issues or chemical incompatibilities with any common construction materials.

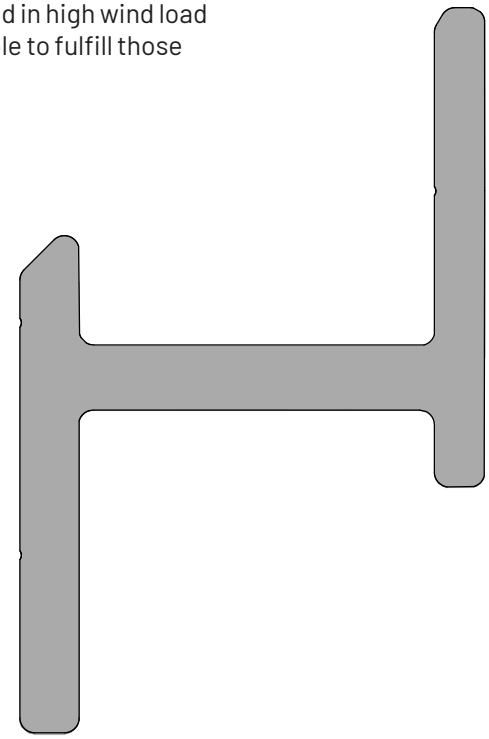
STRONGIRT®

STRONGIRT® profiles are designed to accommodate a range of insulation thicknesses. STRONGIRT® works with all insulation types without proprietary fabrication.

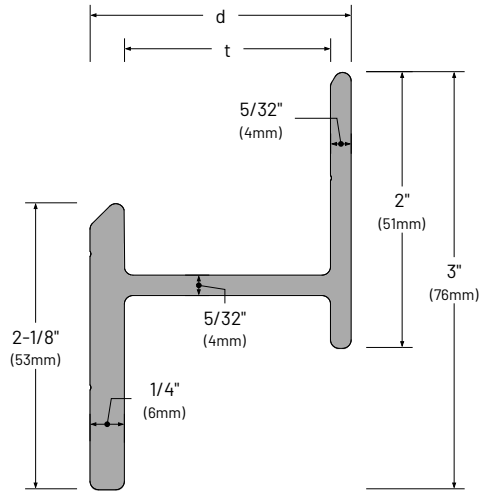


STRONGIRT® ULTRA

When the project requires a heavier cladding application, or includes heavier dead loads, or is simply located in high wind load zones, STRONGIRT® ULTRA profiles are available to fulfill those requirements.

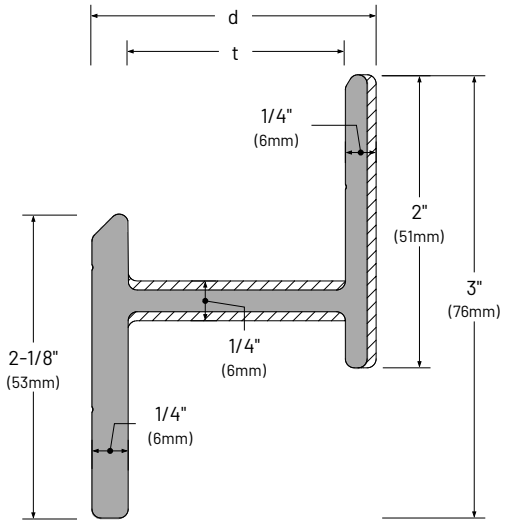


STRONGIRT®



STRONGIRT PROFILES FOR INSULATION THICKNESS	
INSULATION THICKNESS (t)	**STRONGIRT DEPTH (d)**
1.5″ (38.1mm)	1.9″ (48.3mm)
2.0″ (50.8mm)	2.4″ (61.0mm)
2.5″ (63.5mm)	2.9″ (73.7mm)
3.0″ (76.2mm)	3.4″ (86.4mm)
3.5″ (88.9mm)	3.9″ (99.1mm)
4.0″ (101.6mm)	4.4″ (111.8mm)
4.5″ (114.3mm)	4.9″ (124.5mm)
5.0″ (127mm)	5.4″ (137.2mm)
5.5″ (139.7mm)	5.9″ (149.9mm)
6.0″ (152.4mm)	6.4″ (162.6mm)

STRONGIRT® ULTRA

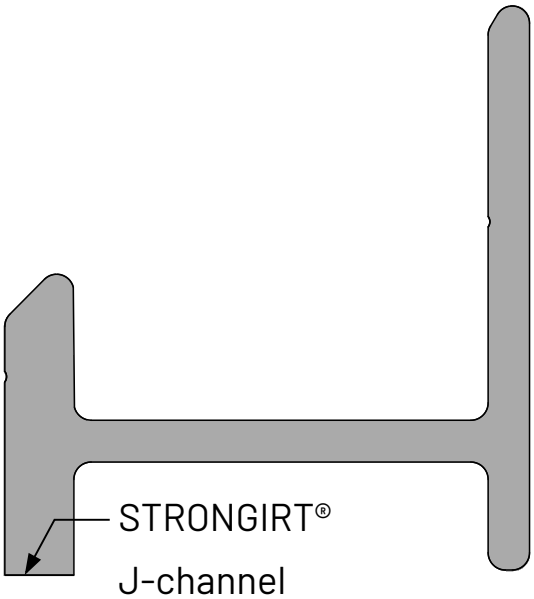


STRONGIRT ULTRA PROFILES	
5.0″ ULTRA (127.0mm)	5.5″ (140.0mm)
5.5″ ULTRA (127.0mm)	6.0″ (152.0mm)
6.0″ ULTRA (127.0mm)	6.5″ (165.0mm)
8.0″ ULTRA (127.0mm)	8.5″ (216.0mm)

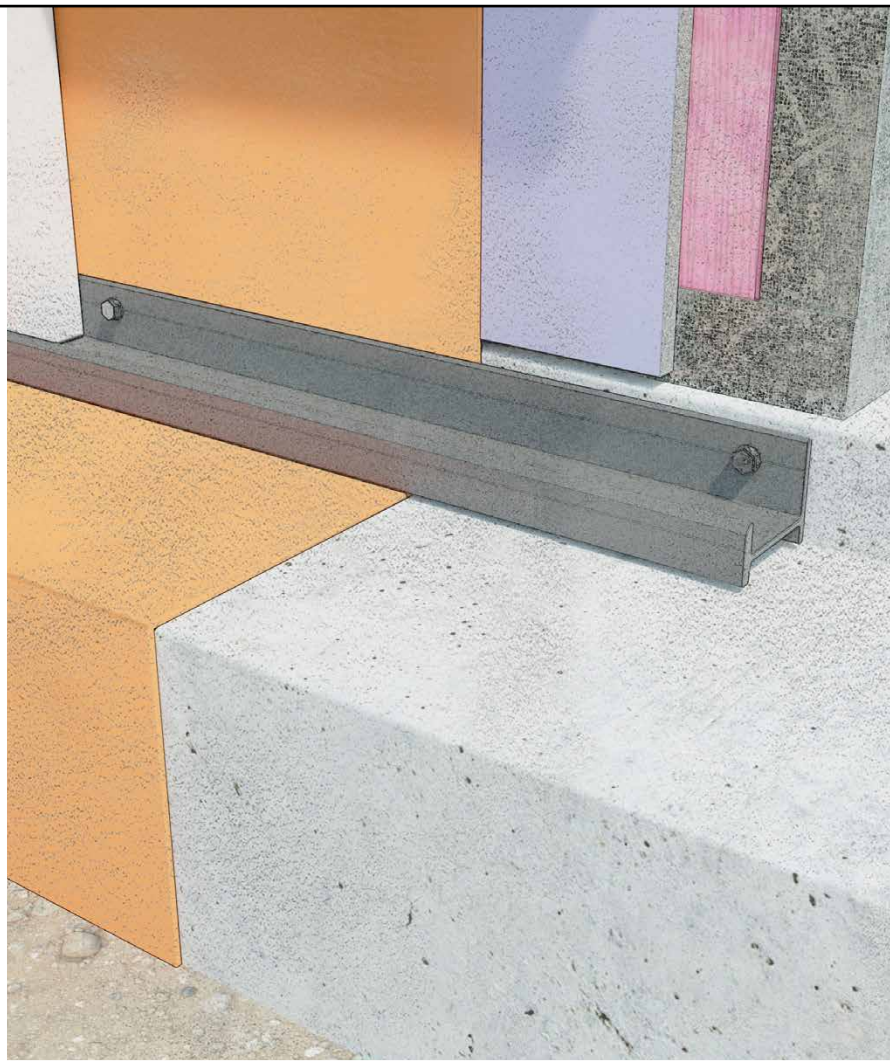
STRONGIRT® WEIGHT TABLE			
UNIT LENGTH	**UNIT DEPTH**	**APPROXIMATE UNIT WEIGHT** *WEIGHT FORMULA*	**SUGGESTED UNIT CARRY APPROXIMATE TOTAL WEIGHT**
10′ STRONGIRT® *(3.04m)*	1.9″ *(48.3mm)*	8.6 lbs (3.90 kg) *0.86 lbs/ft (1.28 kg/m)*	6 Units 51.6 lbs (23.40 kg)
10′ STRONGIRT® *(3.04m)*	6.4″ *(162.6mm)*	13.9 lbs *1.39 lbs/ft (2.07 kg/m)*	4 Units 55.6 lbs (25.22 kg)
10′ STRONGIRT® ULTRA *(3.04m)*	5.5″ *(140.0mm)*	18.4 lbs *1.84 lbs/ft (2.74 kg/m)*	3 Units 55.2 lbs (25.03 kg)
10′ STRONGIRT® ULTRA *(3.04m)*	8.5″ *(216.0mm)*	25.2 lbs *2.52 lbs/ft (3.75 kg/m)*	2 Units 50.4 lbs (22.86 kg)
20′ STRONGIRT® *(3.04m)*	1.9″ *(48.3mm)*	17.2 lbs (7.80 kg) *0.86 lbs/ft (1.28 kg/m)*	3 Units 51.6 lbs (23.40kg)

STRONGIRT® J-CHANNEL (Starter Strip)

The STRONGIRT® J-Channel profile is optional when certain conditions apply such as in the example to the right. STRONGIRT® can arrive on the job-site prepared with this condition or can be easily prepared on-site using a standard profile STRONGIRT® and common job-site tools.

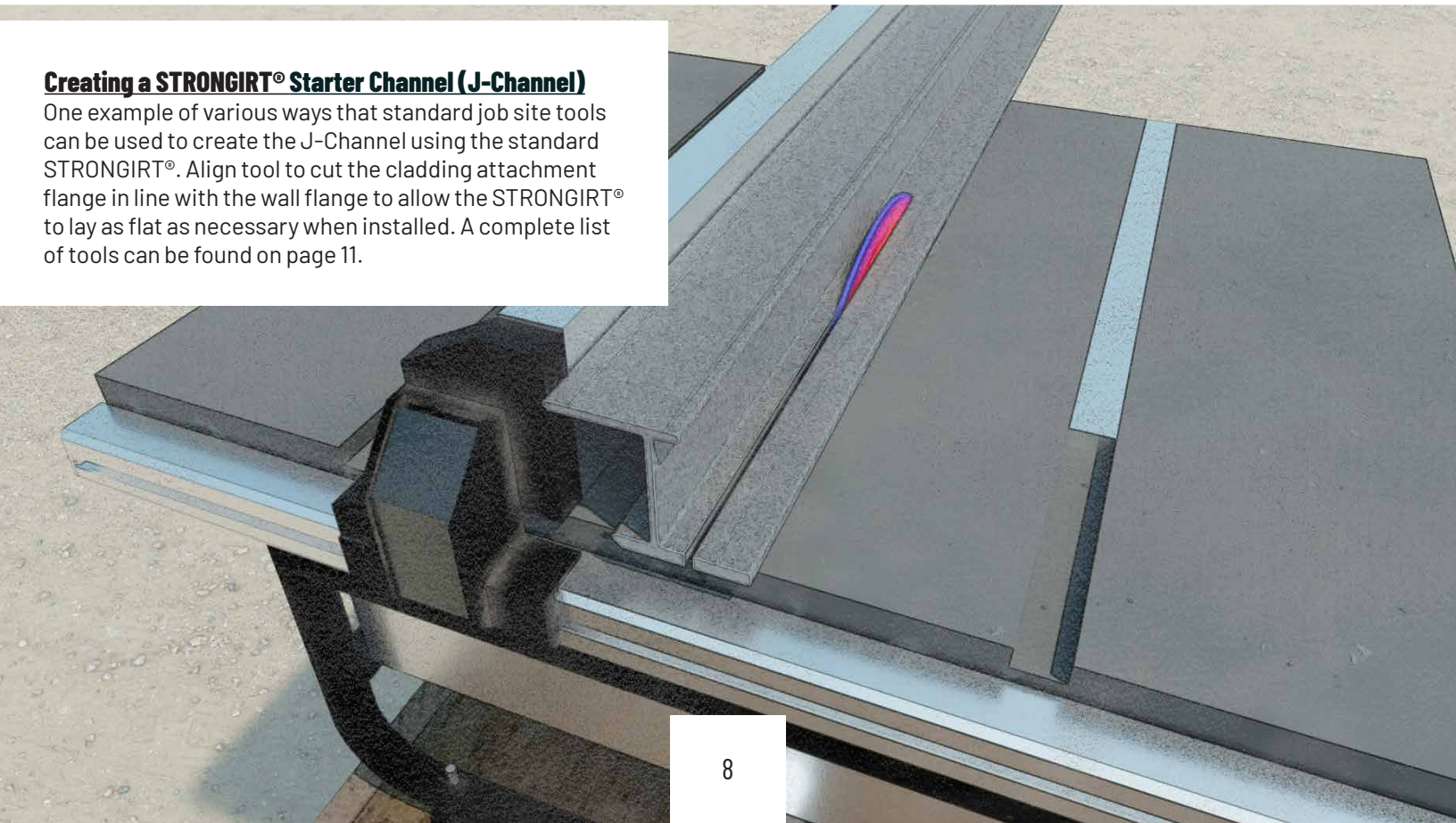


STRONGIRT®
J-channel
(starter strip)
Profile



Creating a STRONGIRT® Starter Channel (J-Channel)

One example of various ways that standard job site tools can be used to create the J-Channel using the standard STRONGIRT®. Align tool to cut the cladding attachment flange in line with the wall flange to allow the STRONGIRT® to lay as flat as necessary when installed. A complete list of tools can be found on page 11.



FASTENER SPECIFICATIONS

Standard Hex

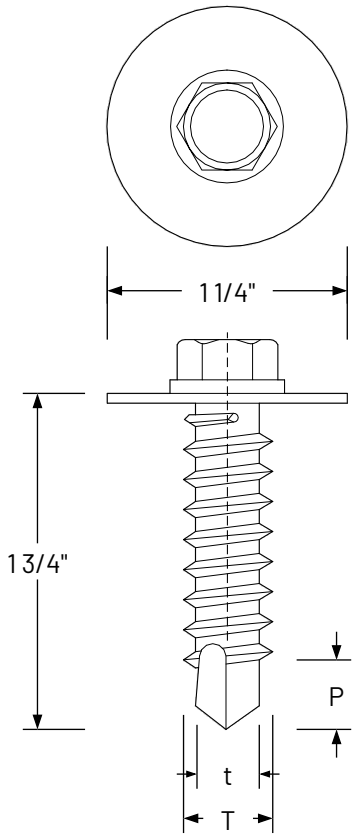
Fasteners and washers are not provided by STRONGWELL. Use approved minimum #14 Hex Head fasteners with 0.485" head. 304 stainless or 316 galvanized fasteners and washers are acceptable. Refer to Application Section 5 Table 2 of the latest STRONGIRT® Technical Evaluation Report (TER 2009-02) for span and wind load data.

Hex with Washer

High wind load locations and/or various heavier cladding solutions may call for implementing a 1 1/4" washer at each fastener. Refer to Application Section 5 Table 2 of the latest STRONGIRT® Technical Evaluation Report (TER 2009-02) for span and wind load data.

SCREW PULLOUT DATA (0.25" FLANGE)				
SIZE OF SCREW	#14	#12	#10	#8
Sample #1	800.31	797.52	854.91	643.75
Sample #2	861.75	779.81	775.40	651.40
Sample #3	814.69	735.01	826.81	672.76
Sample #4	762.47	768.35	723.22	615.29
Sample #5	825.04	837.26	675.25	785.11
Sample #6	815.06	792.85	727.95	782.54
Sample #7	804.22	828.51	729.07	678.40
Sample #8	893.34	829.93	755.14	695.58
Sample #9	900.86	755.28	820.50	702.47
Sample #10	941.02	749.99	721.80	730.50
MEAN Load, (lbf)	841.88	787.45	761.01	730.50
STD, (lbf)	55.32	36.08	57.12	56.51
Coefficient Variation	6.57	4.58	7.51	8.12
Characteristic Value*	668.42	680.12	590.15	524.94

Characteristic Value determined as per ASTM D7290

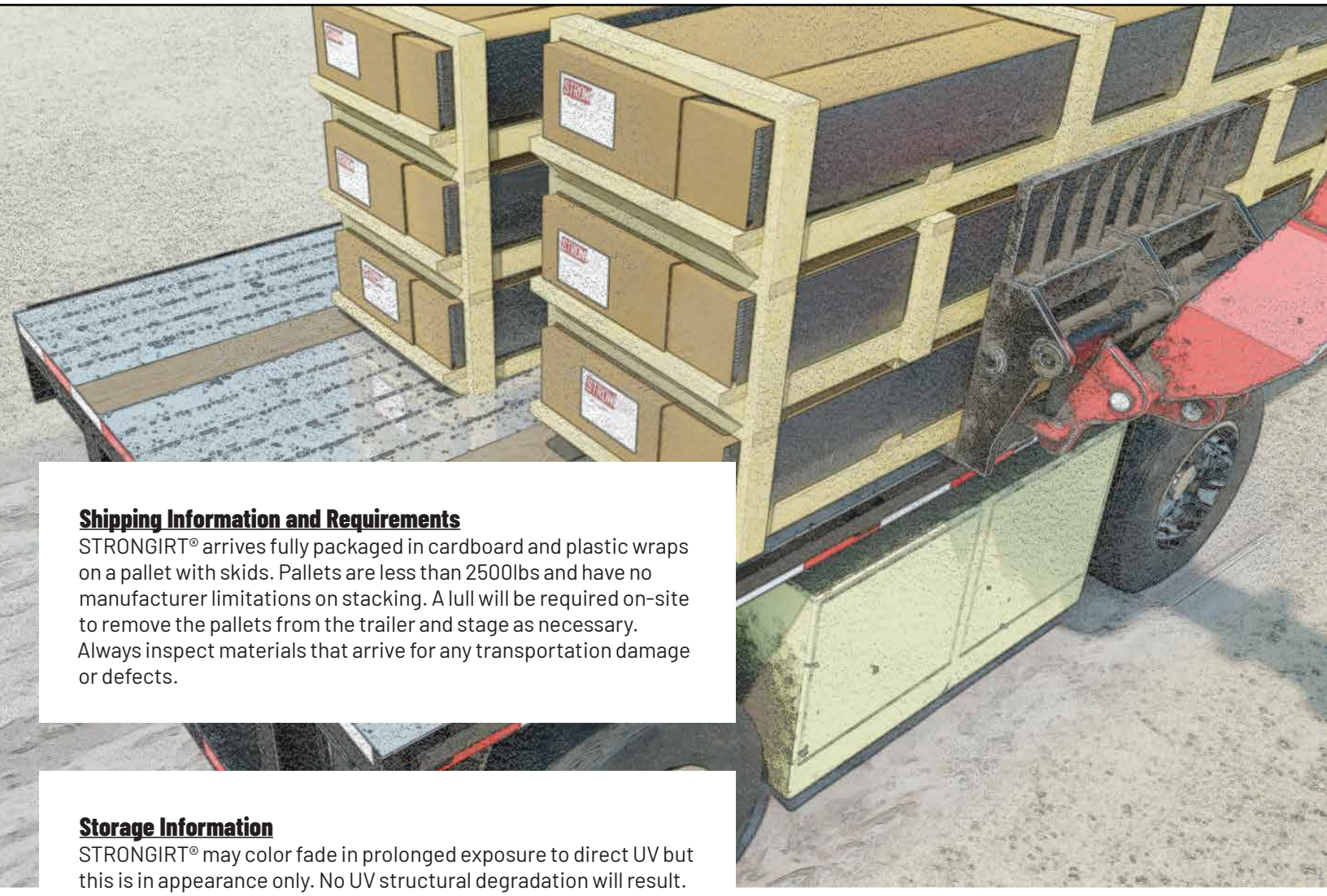


SELF-DRILLING SCREWS								
NOMINAL SIZE OR BASIC SCREW DIAMETER		THREADS PER INCH	T		t		P	
			MAJOR DIAMETER		MINOR DIAMETER		PROTRUSION ALLOWANCE	
			MAX.	MIN.	MAX.	MIN.	#2 PT.	#3 PT.
8	0.1640	18	0.166	0.161	0.122	0.116	0.211	-
10	0.1900	16	0.189	0.183	0.141	0.135	0.235	0.300
12	0.2160	14	0.215	0.209	0.164	0.157	-	0.353
14	0.2500	14	0.246	0.240	0.192	0.185	-	0.393

STANDARDS OF PRACTICE TO GENERATE PULL-OUT LOAD DATA OF STRONGIRT® USING CUSTOM SCREWS

STRONGWELL lab will use ASTM D7332 to determine the pull-out load using the cladding side of the STRONGIRT®.

- The lab needs the type of girt to use, details of the screws, and the name of the project.
- A minimum of 15 screws are needed for the testing.
- The screws specified in the STRONGIRT® certified Technical Evaluation Report shall be used to connect the STRONGIRT® to the structural backup.
- Using ASTM D 7290, a characteristic value of the pull-out load will be reported.
- It is the responsibility of the installer to present the test data to a registered design professional or Engineer of Record for approval before installation.
- The lead time for testing and generation of report upon arrival of screws is typically 2-3 weeks.



Shipping Information and Requirements

STRONGIRT® arrives fully packaged in cardboard and plastic wraps on a pallet with skids. Pallets are less than 2500lbs and have no manufacturer limitations on stacking. A lull will be required on-site to remove the pallets from the trailer and stage as necessary. Always inspect materials that arrive for any transportation damage or defects.

Storage Information

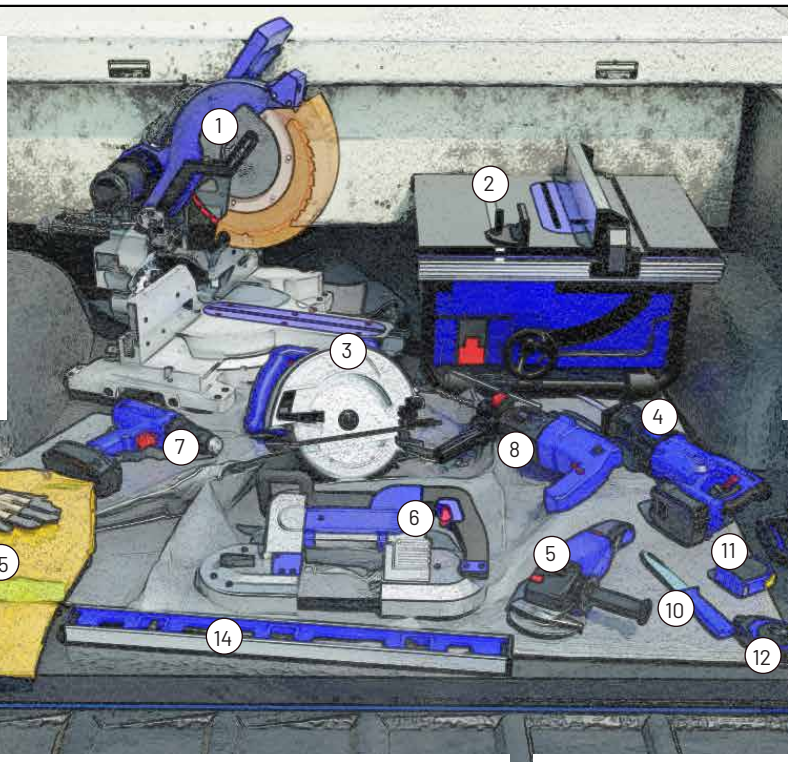
STRONGIRT® may color fade in prolonged exposure to direct UV but this is in appearance only. No UV structural degradation will result. However, it is recommended that STRONGIRT® stay wrapped in the packaging until it is ready to be installed. STRONGIRT® cannot be returned if long term exposure is evident.

Handling Information

STRONGIRT® can be handled without gloves. STRONGIRT® has exceptional rigidity over long spans and is easily carried by hand in unit quantities. See STRONGIRT® Weight Table on page 7 for recommended unit carrying capacities.

Typical Jobsite Tools List

1. Miter Saw
2. Table Saw
3. Circular Saw
4. Reciprocating Saw
5. Hand Saw
6. Band Saw
7. Power Drill
8. Masonry Drill



9. Router
10. Insulation Knife
11. Measuring Tape
12. Chalk Line
13. Marker
14. Level
15. Personal Protective Equipment

Recommended Tools:

Cutting

- Miter and/or Circular Saw: Gritted or Diamond Blade (30-60 grit size)
- Jigsaw: Gritted, Diamond, or Basic Metal Blade (24-32 teeth per inch)

Drilling

- Diamond or Carbide Tipped Drill Bits when drilling holes

Drilling and Torque:

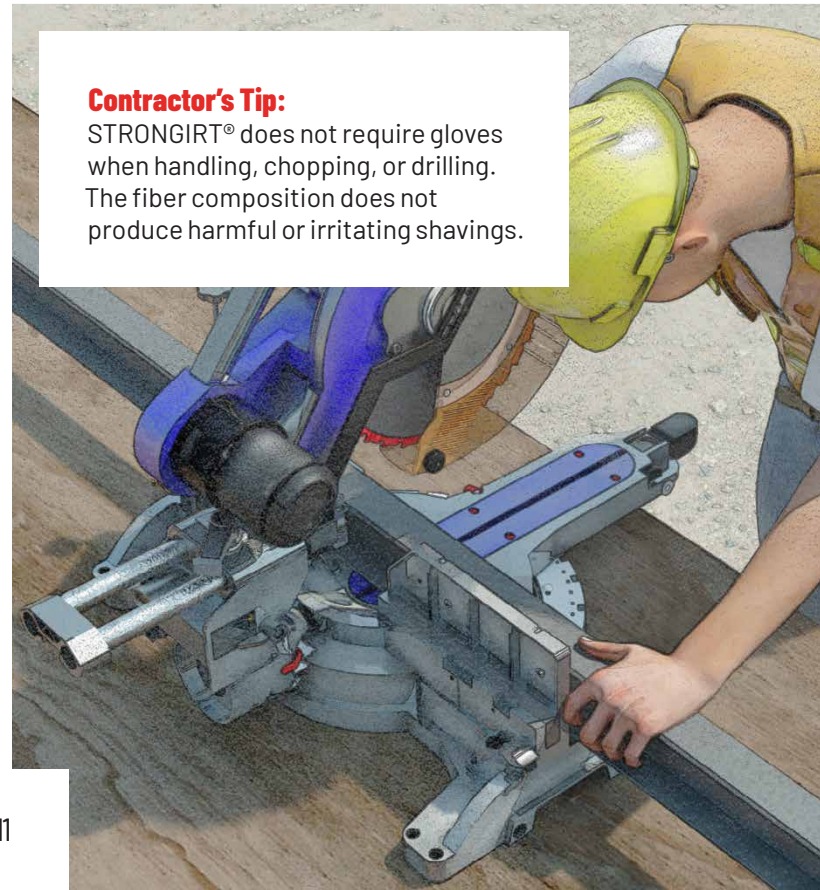
The use of impact drills on STRONGIRT® is acceptable but take care not to over-torque. Avoid drilling-in and pull-back. In that instance or in a case where a clip is to be reinstalled, a new hole must be drilled.

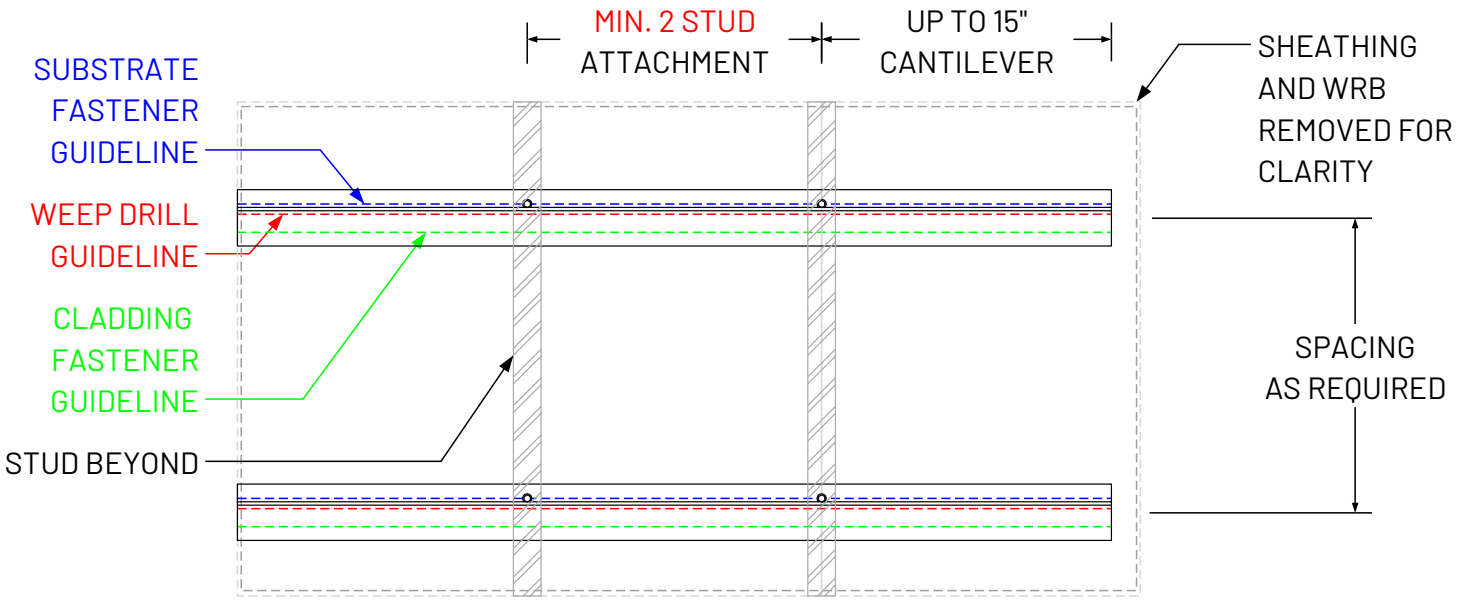
Personal Protective Equipment Information

It is always recommended to wear a dust mask when tooling to avoid any dust particle inhalation.

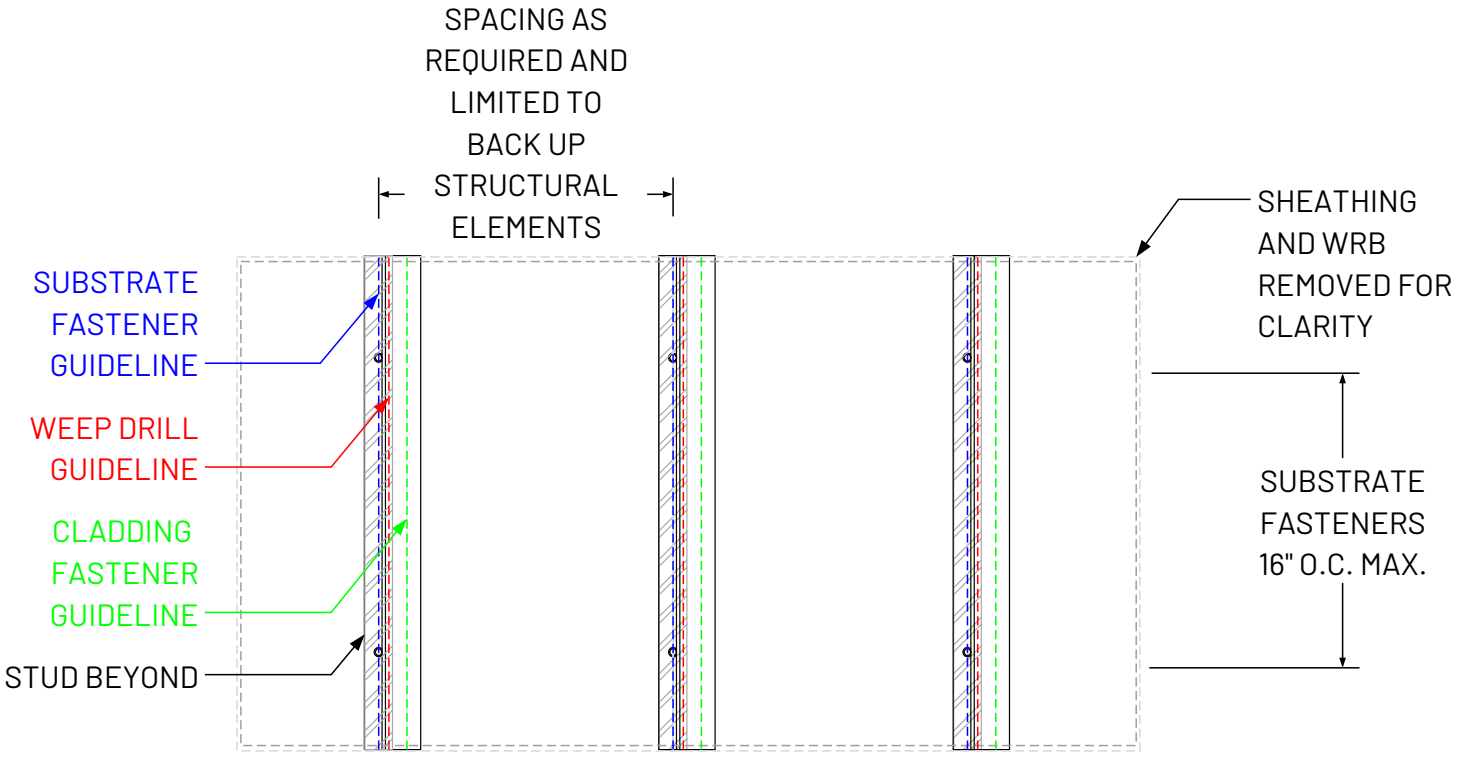
Contractor's Tip:

STRONGIRT® does not require gloves when handling, chopping, or drilling. The fiber composition does not produce harmful or irritating shavings.

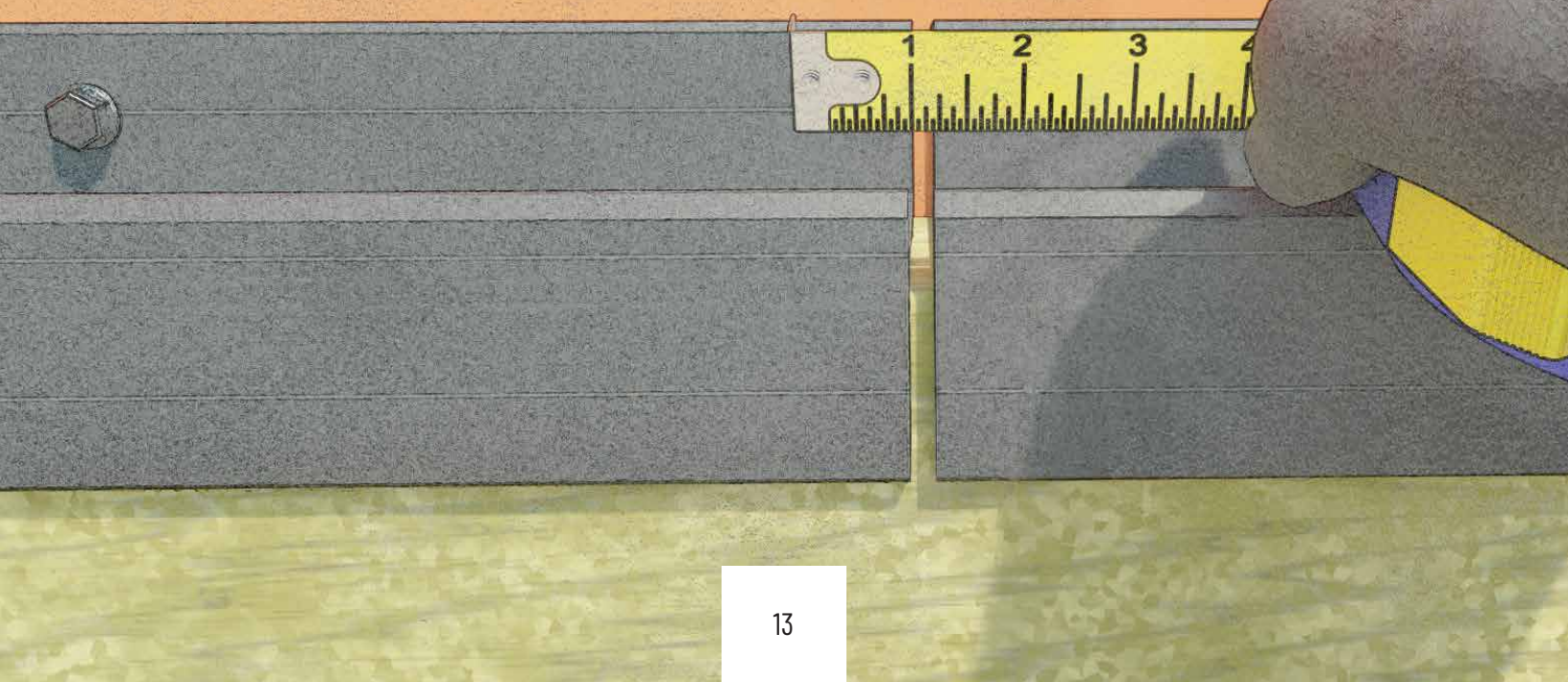




Weep Drill Guideline
Use the weep drill guidelines to help quickly locate where to drill the 5/16" weeps on STRONGIRT®. Follow weep horizontal spacing requirements per the project construction documentation.

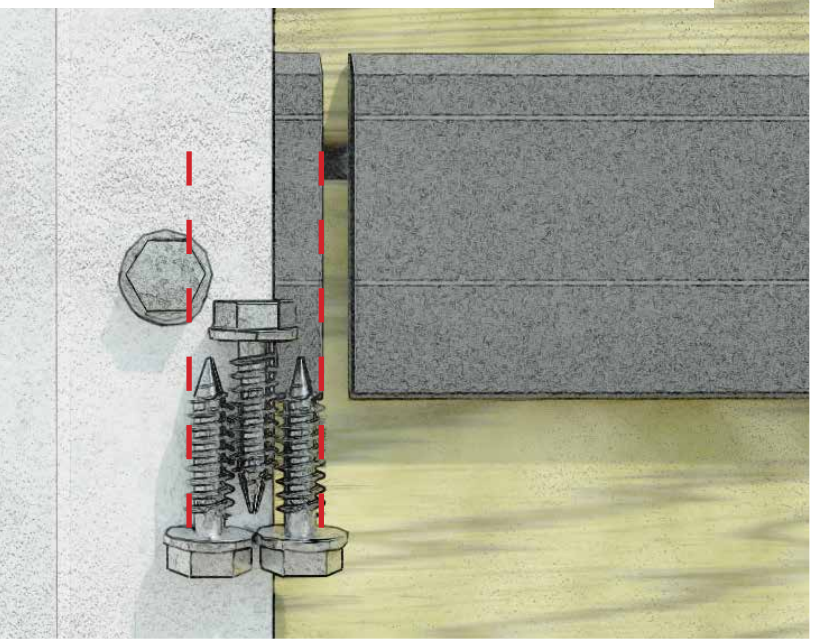


Typical Gaps between STRONGIRT®
Allow for a 3/16" gap at each piece to allow for weep draining and structural movement. It is not necessary for cladding to honor these joints and so can be installed across STRONGIRT®.



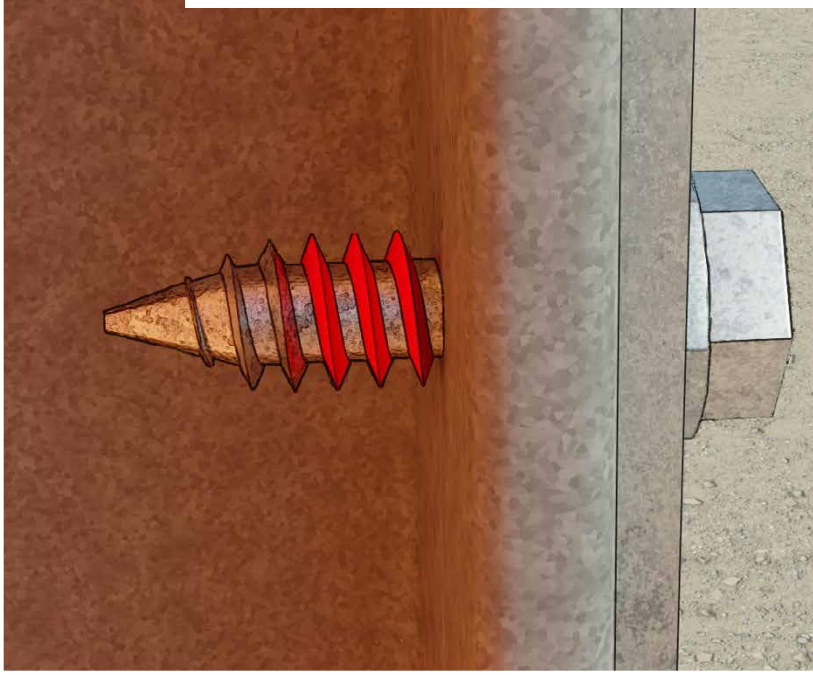
Cladding Attachment at STRONGIRT® Horizontal Edge

When fastening cladding maintain a minimum of three times (3x) the diameter of the screw shank distance away from edge of STRONGIRT®.



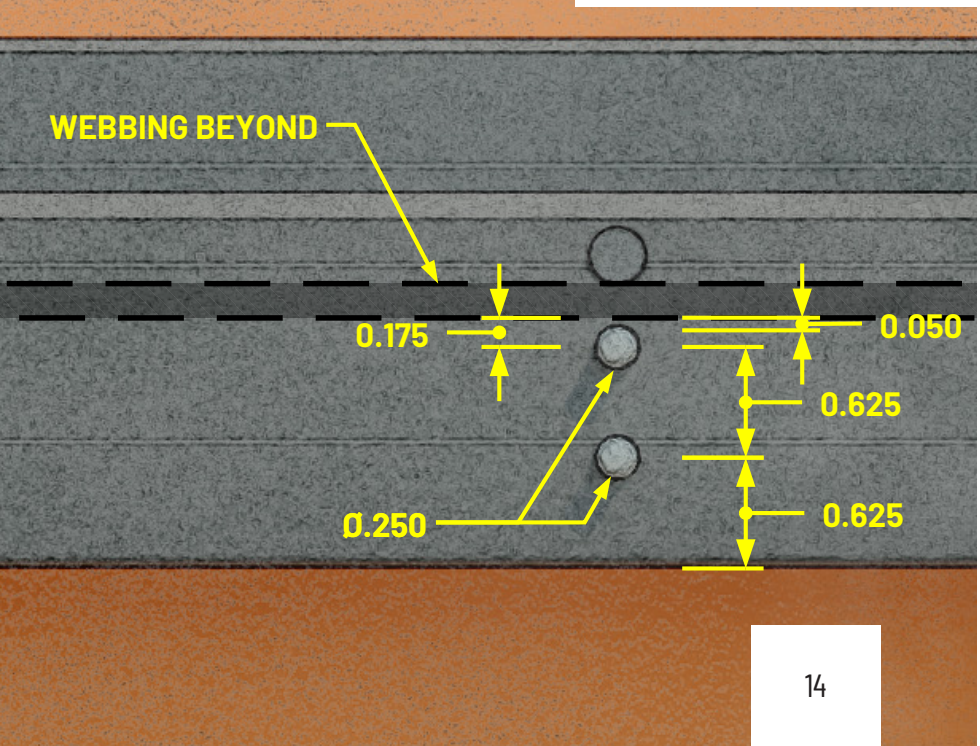
Cladding Attachment Depth

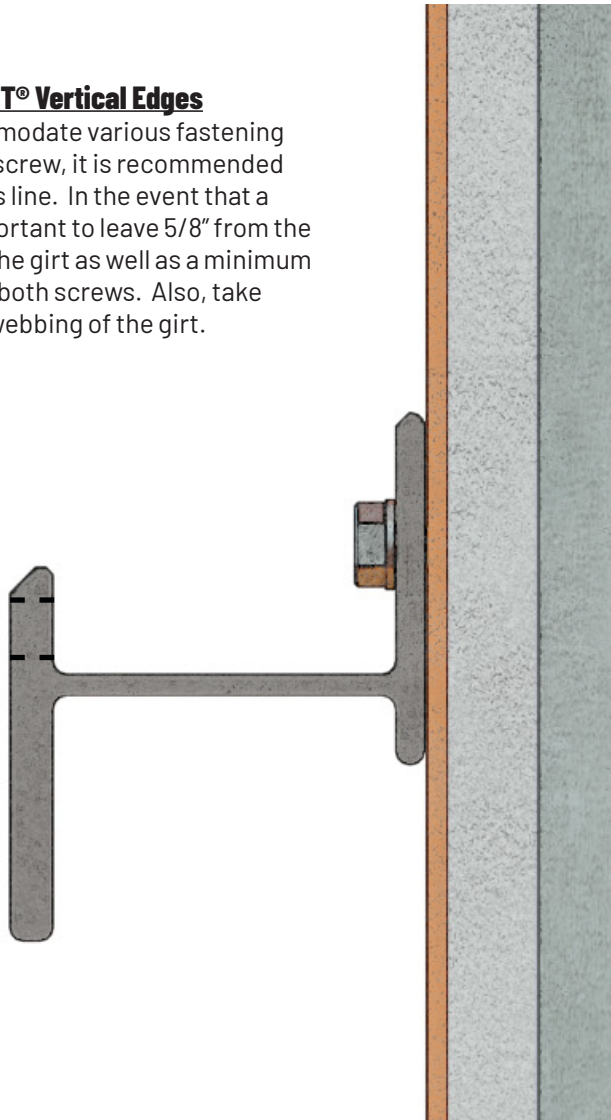
At least three threads must be showing beyond STRONGIRT® when fastening the cladding.



Cladding Attachment at STRONGIRT® Vertical Edges

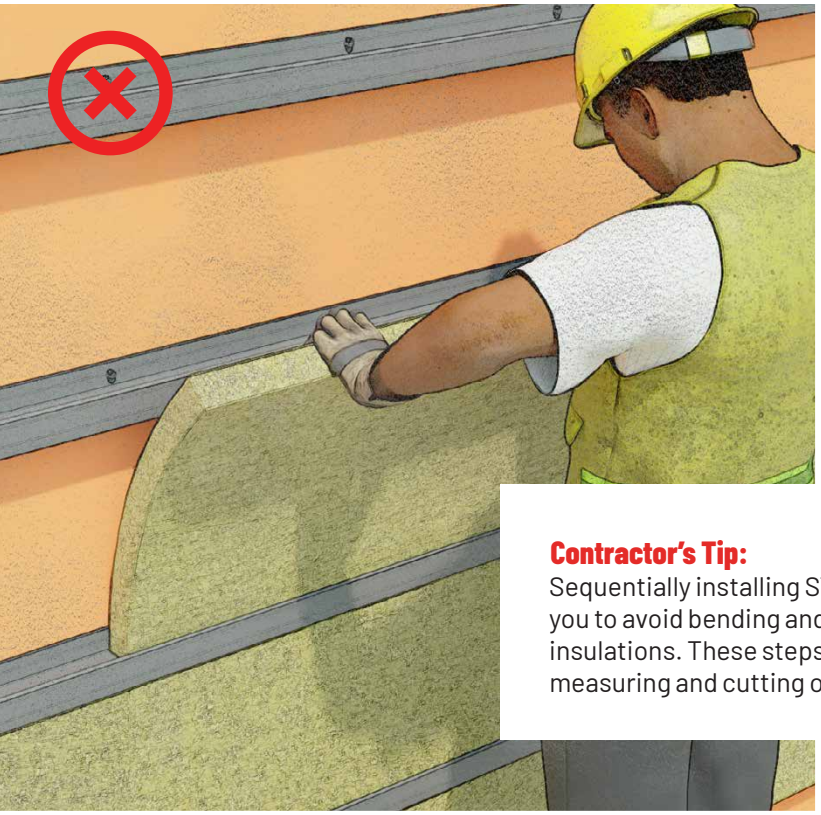
STRONGIRT® is designed to accommodate various fastening patterns. When fastening a single screw, it is recommended to fasten on the primary screw boss line. In the event that a second fastener is needed it is important to leave 5/8" from the center of the screw to the edge of the girt as well as a minimum distance of 5/8" between center of both screws. Also, take care not to screw directly into the webbing of the girt.

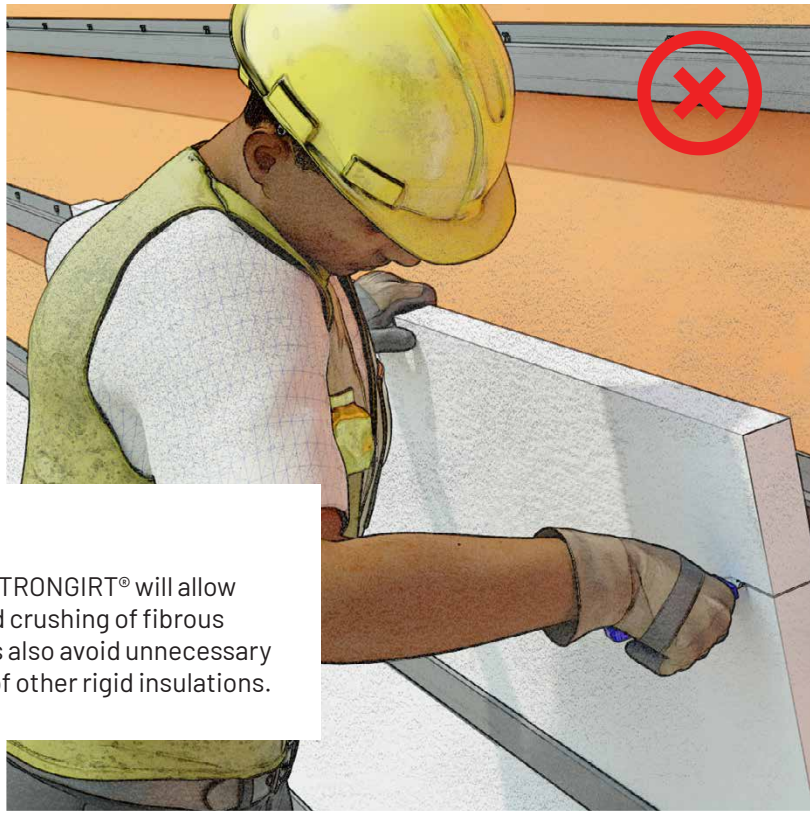




SEQUENTIAL INSTALLATION

STRONGIRT® simplifies parts of the rainscreen system installation when doing so in sequence across all planes. STRONGIRT® installation should start at grade, an initial installation point, or other planar change. Subsequent elements should use the previous to help locate and level the next. This should continue up the wall until complete. This helps alleviate any steps one may find necessary in having to coax rigid insulations into a cavity. It is also necessary to understand the direction to which these elements will be installed.





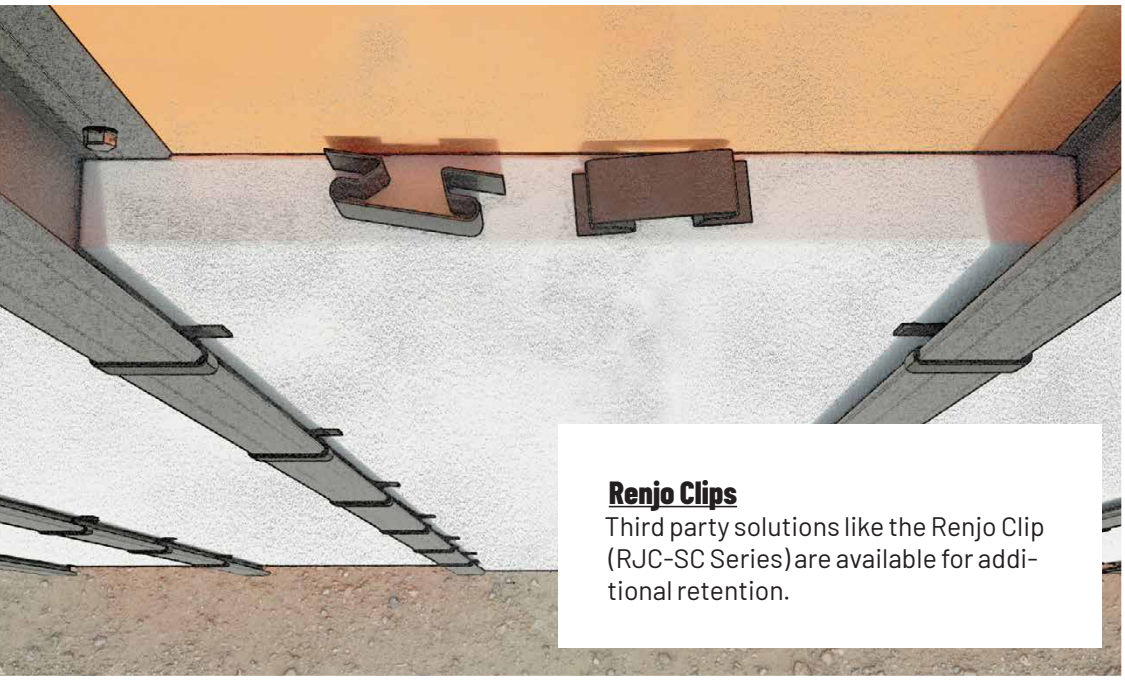
Contractor's Tip:
Sequentially installing STRONGIRT® will allow you to avoid bending and crushing of fibrous insulations. These steps also avoid unnecessary measuring and cutting of other rigid insulations.

EXCEPTION TO THE RULE

The one exception to the sequential installation is when implementing spray foam insulation. In this scenario, installing all STRONGIRT® at once whether horizontal or vertical is acceptable.

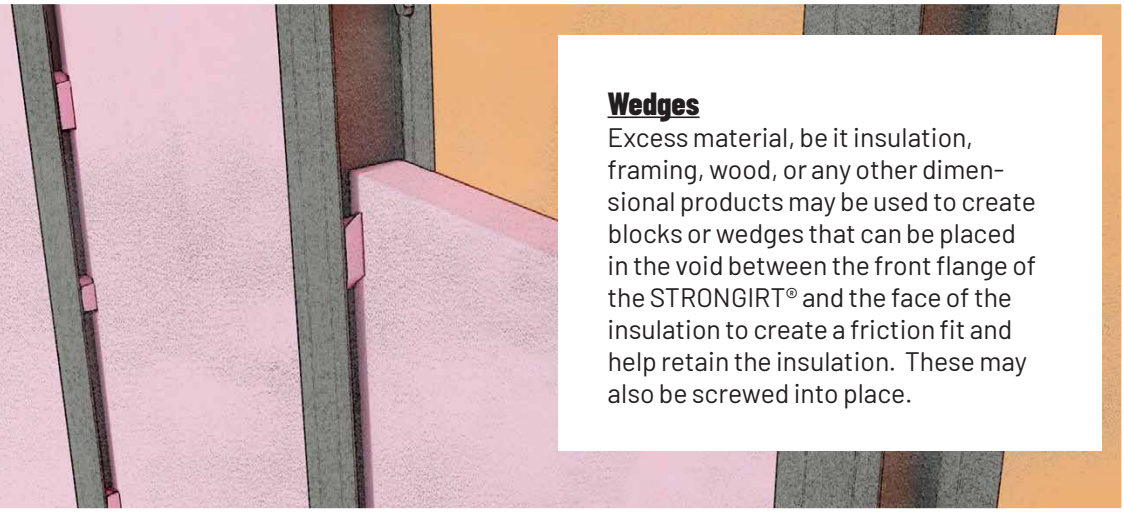
INSULATION RETENTION OPTIONS

STRONGIRT® is designed to naturally retain all types of insulation that match the depth of the respective girt. For Example, a 2" rigid foam board fits perfectly into a 2" STRONGIRT®, and will not require any further retention solutions. However, there are instances where a lesser depth of insulation will be required to be placed in a larger STRONGIRT®. For example, a 2" rigid foam board is often placed into a 3" STRONGIRT®, so as to create additional air gaps in an assembly. In these instances, there are many simple and cost effective solutions that one may use to retain that insulation.

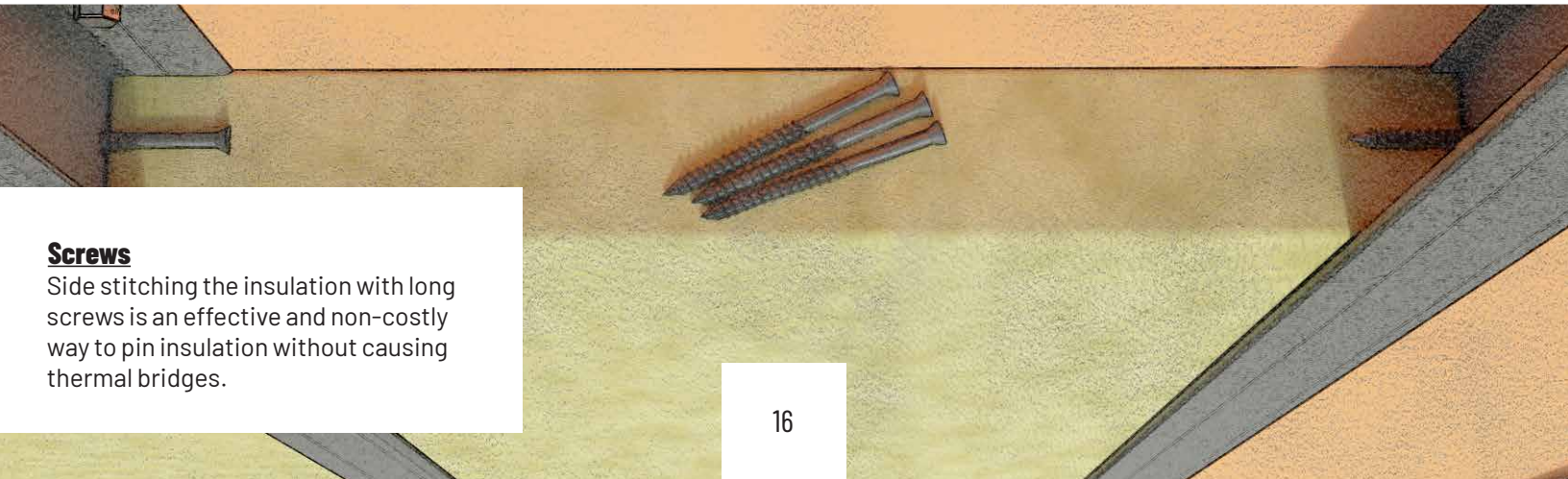


Renjo Clips
Third party solutions like the Renjo Clip (RJC-SC Series) are available for additional retention.

Stick Pins
Traditional stick pins may be used to ensure that the insulation does not move in the excess cavity.



Wedges
Excess material, be it insulation, framing, wood, or any other dimensional products may be used to create blocks or wedges that can be placed in the void between the front flange of the STRONGIRT® and the face of the insulation to create a friction fit and help retain the insulation. These may also be screwed into place.

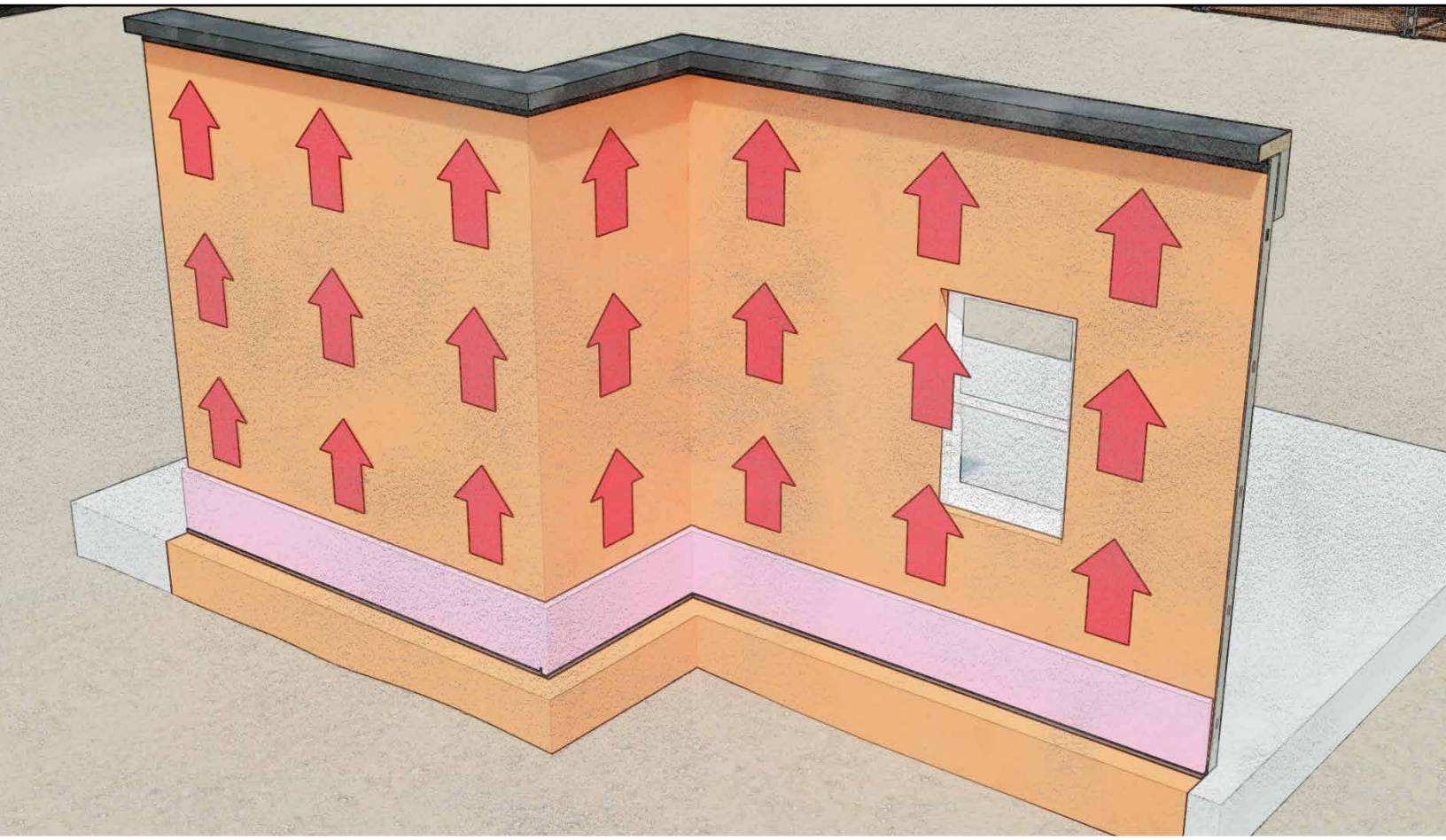


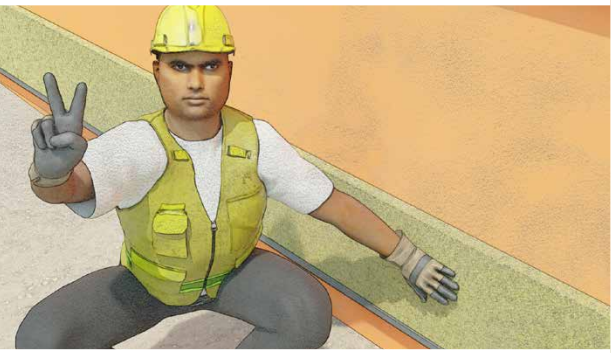
Screws
Side stitching the insulation with long screws is an effective and non-costly way to pin insulation without causing thermal bridges.

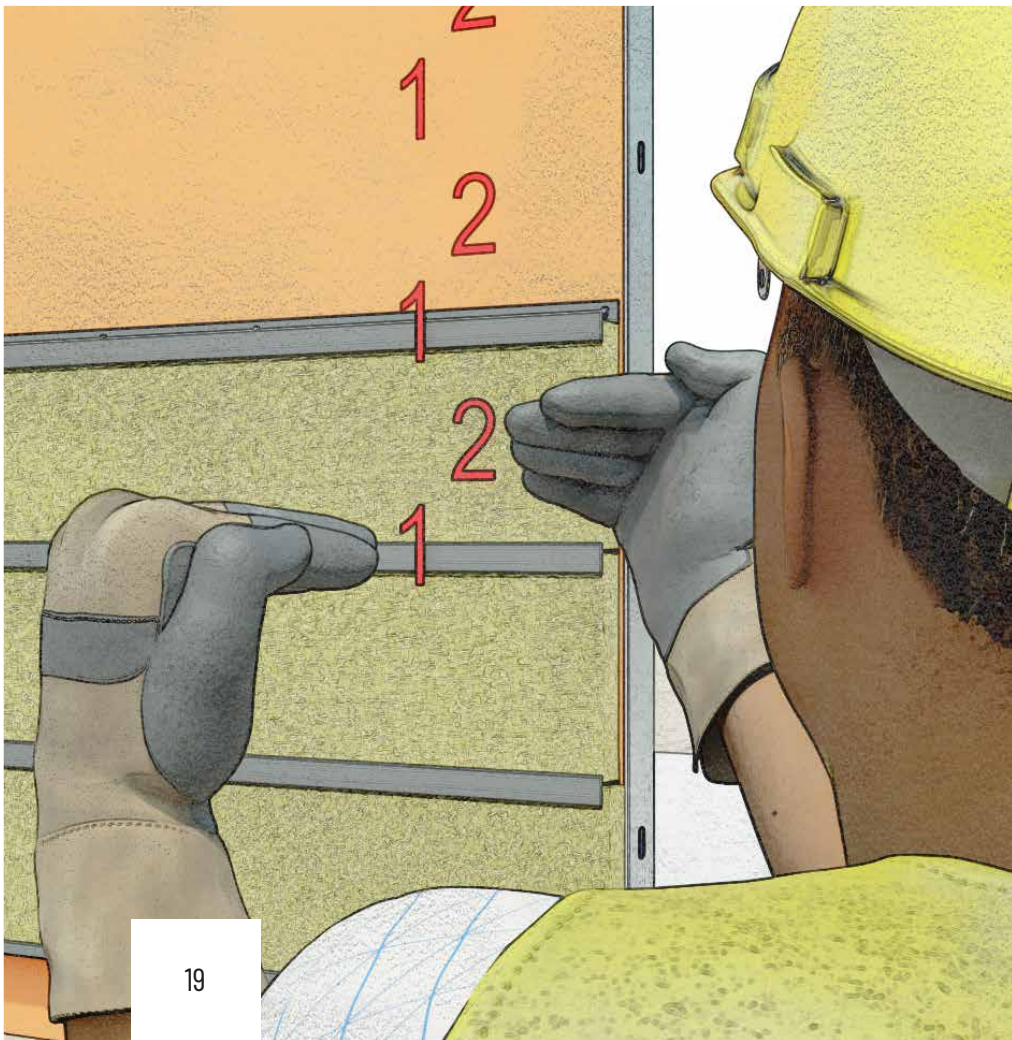
Substrate Observations

Verify wall is flat and plumb and bring to the attention of the contractor anything that may reduce the ability to install STRONGIRT® per this installation manual.

STRONGIRT® Foundation Flush Cutaway Assembly
Elements of the assembly in this illustration have been pulled back to more clearly show each. Starter strip conditions will vary between projects and may or may not include the optional J-Channel profile (Page 8).

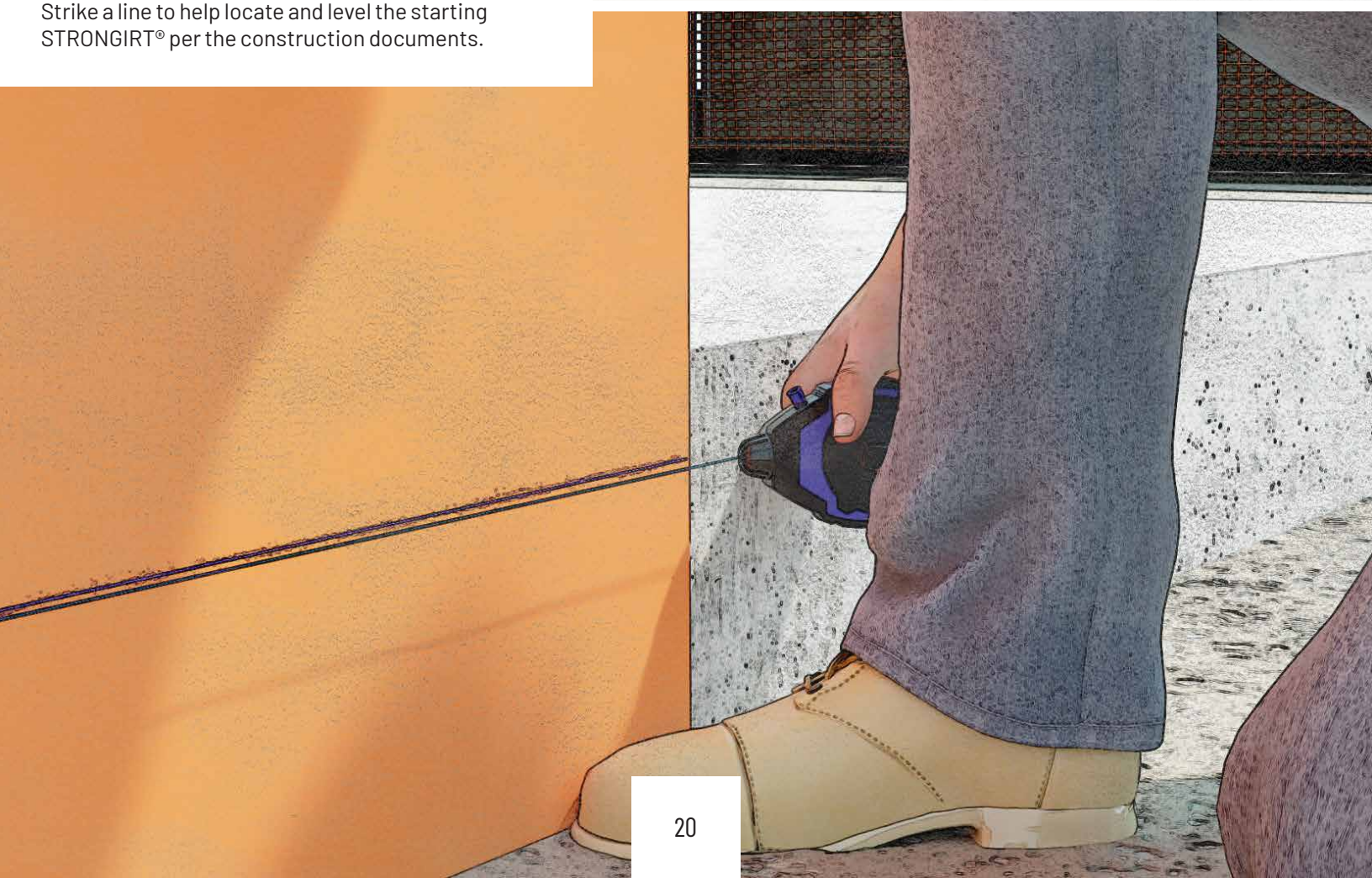




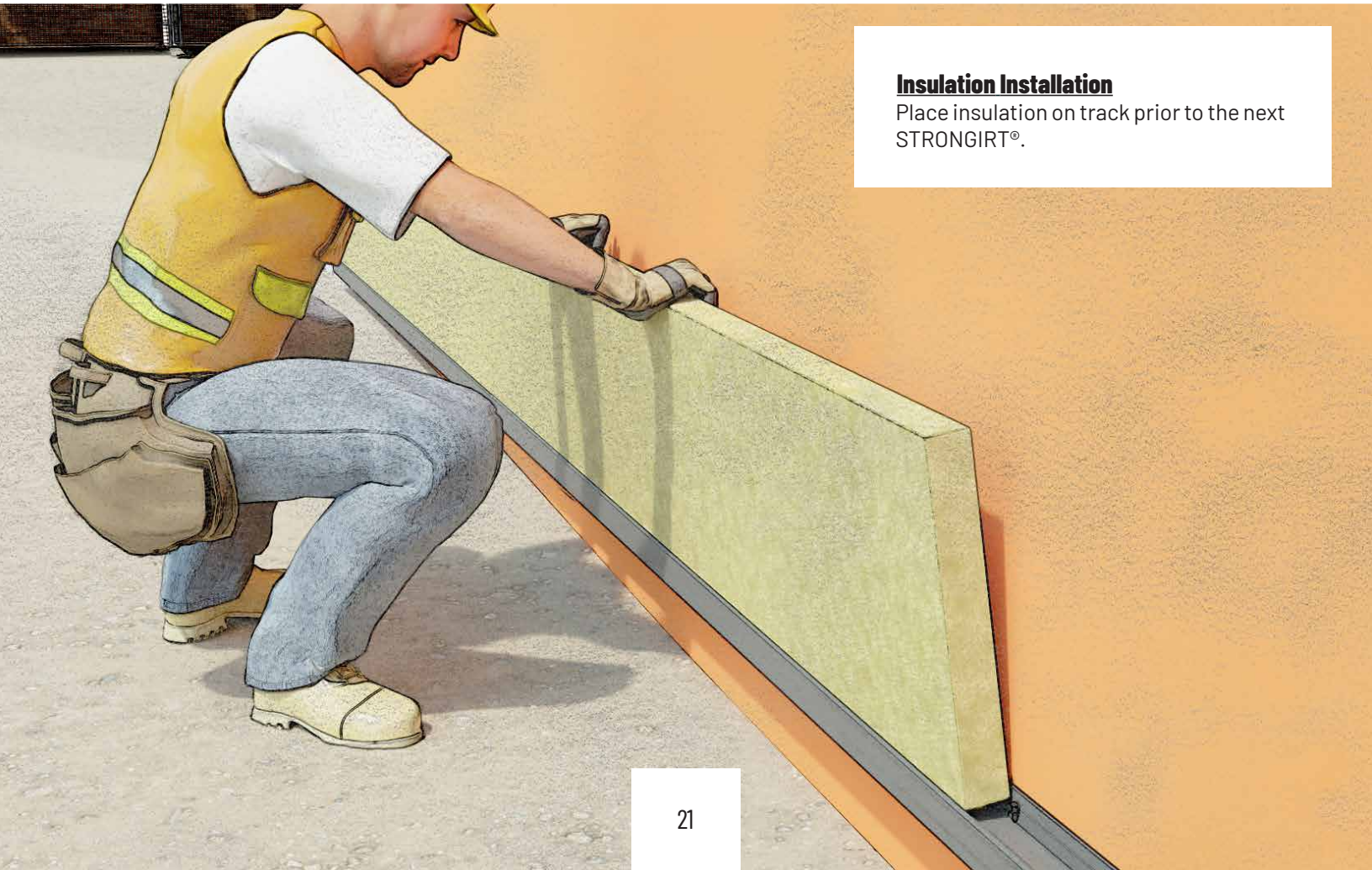

1
2
1
2
1

Starter STRONGIRT®

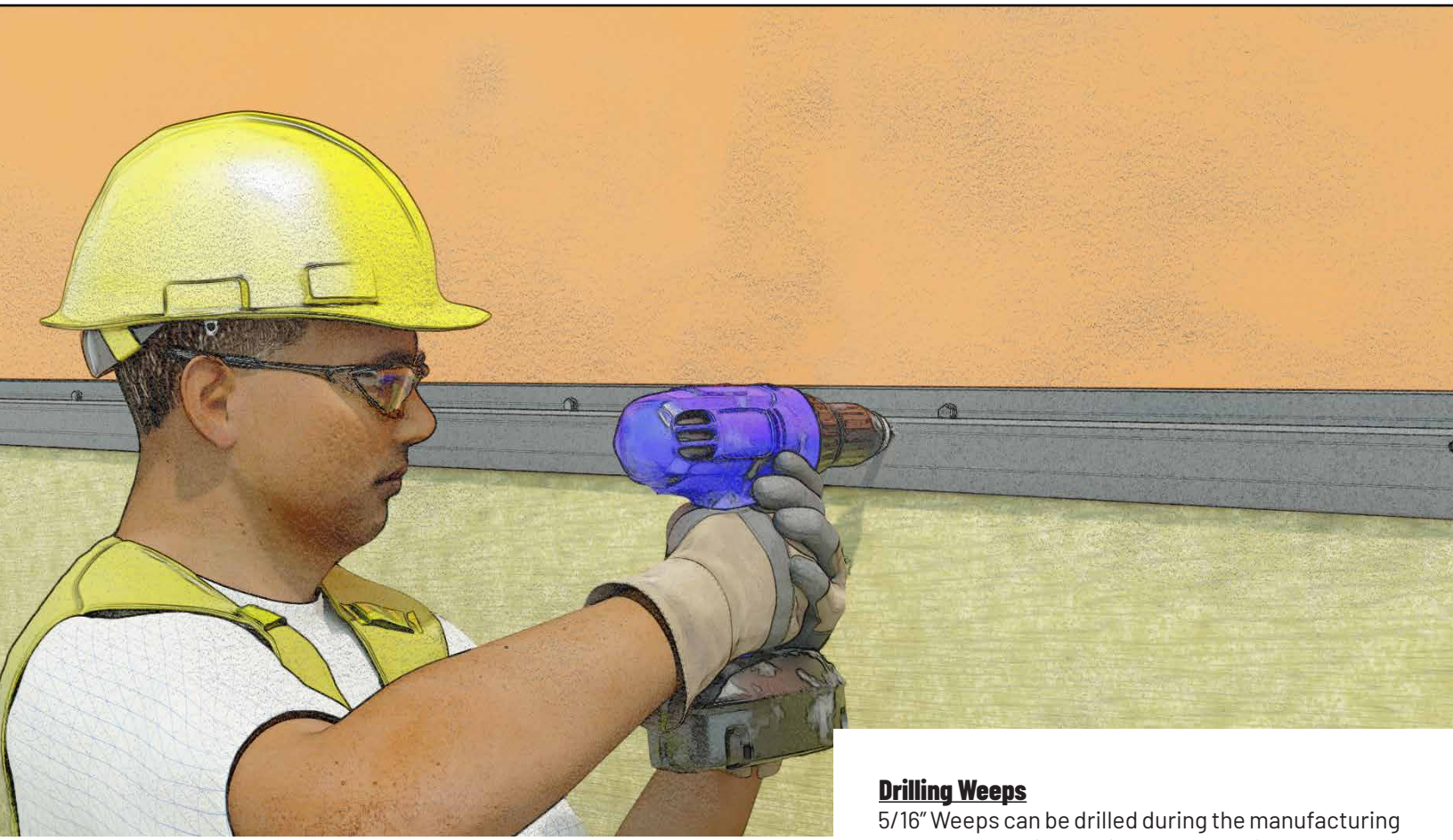
Strike a line to help locate and level the starting STRONGIRT® per the construction documents.



STRONGIRT® Starter Channel (J-Channel) Attachment
Pre-drill through STRONGIRT®, the WRB, and concrete at the chalk line. Always follow fastener manufacturer recommended concrete embedment depths.

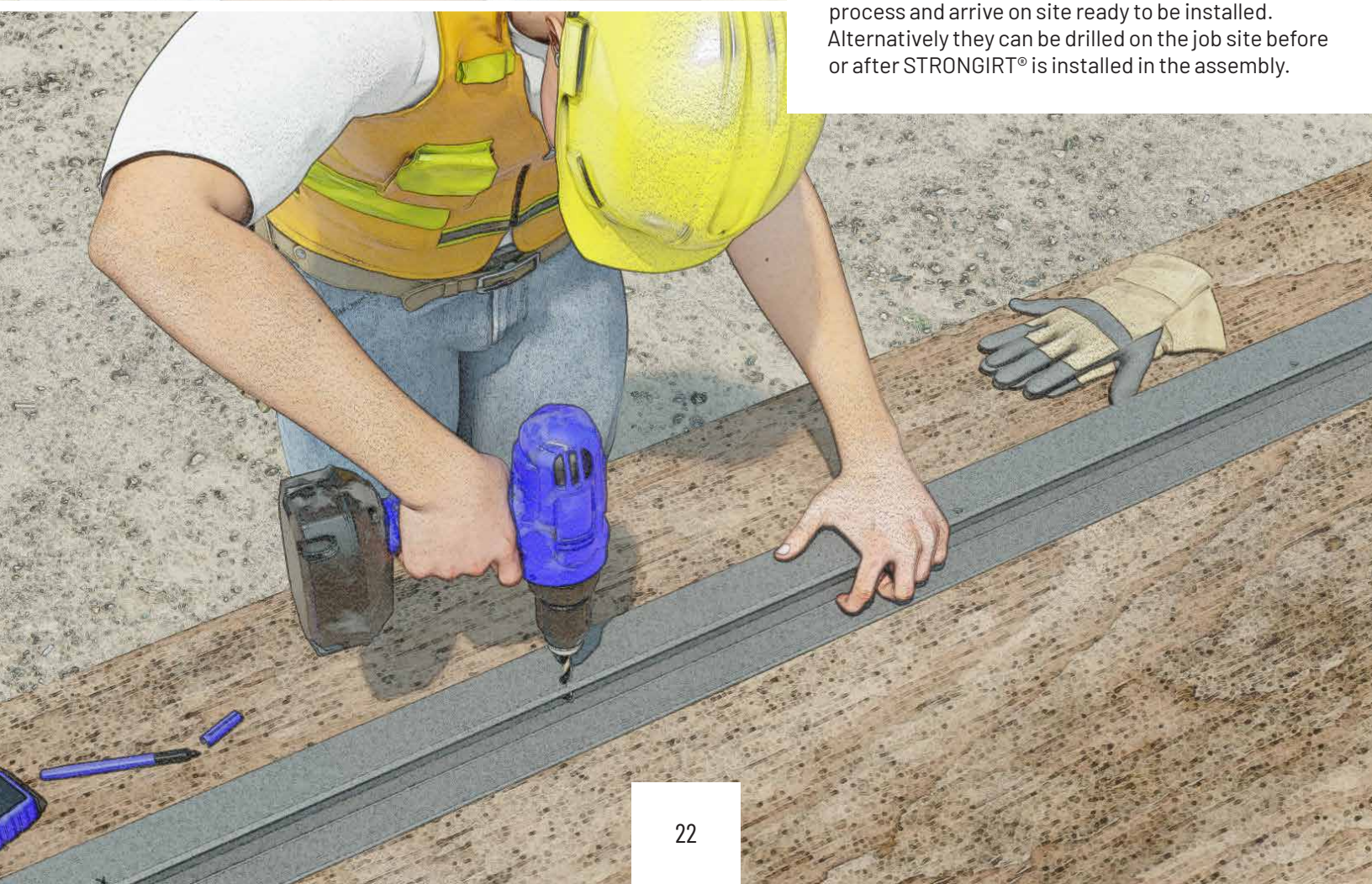


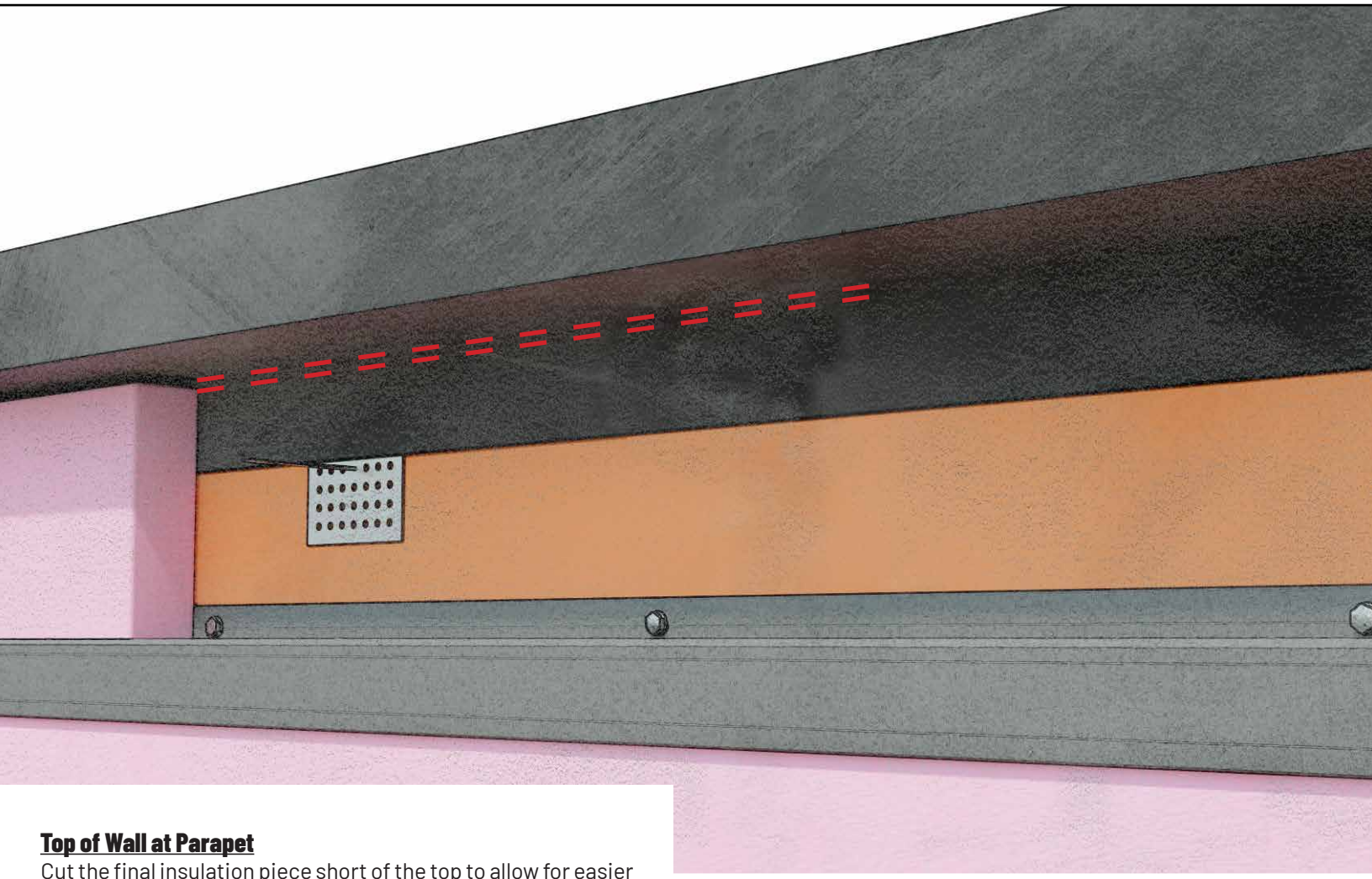
Insulation Installation
Place insulation on track prior to the next STRONGIRT®.



Drilling Weeps

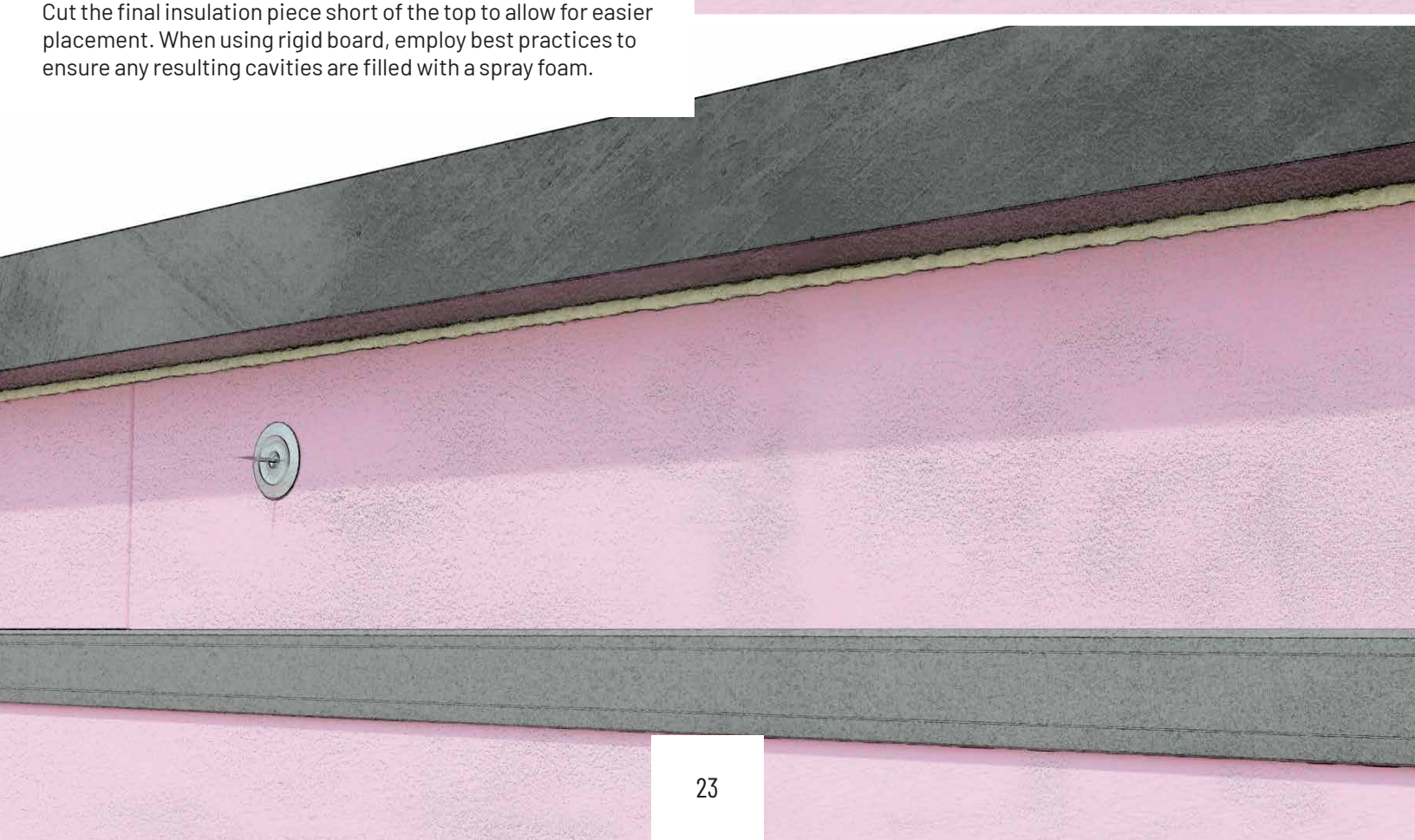
5/16" Weeps can be drilled during the manufacturing process and arrive on site ready to be installed. Alternatively they can be drilled on the job site before or after STRONGIRT® is installed in the assembly.





Top of Wall at Parapet

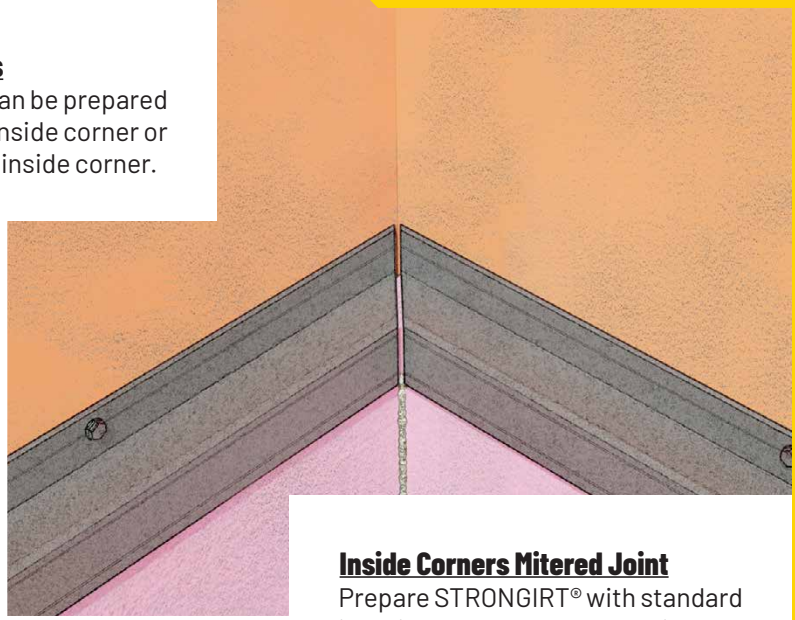
Cut the final insulation piece short of the top to allow for easier placement. When using rigid board, employ best practices to ensure any resulting cavities are filled with a spray foam.



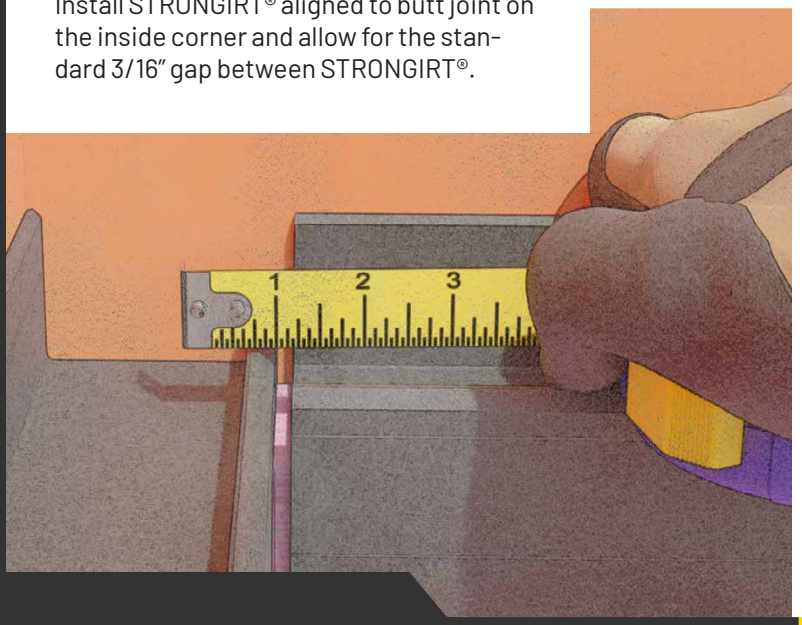
BUTT JOINT CORNER

MITERED JOINT CORNER

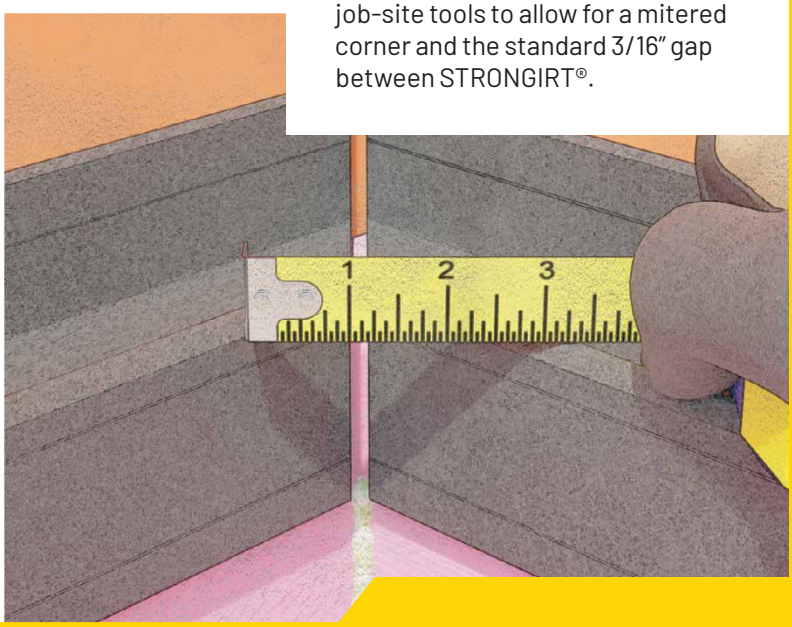
Inside Corners
STRONGIRT® can be prepared as a butt joint inside corner or a mitered joint inside corner.



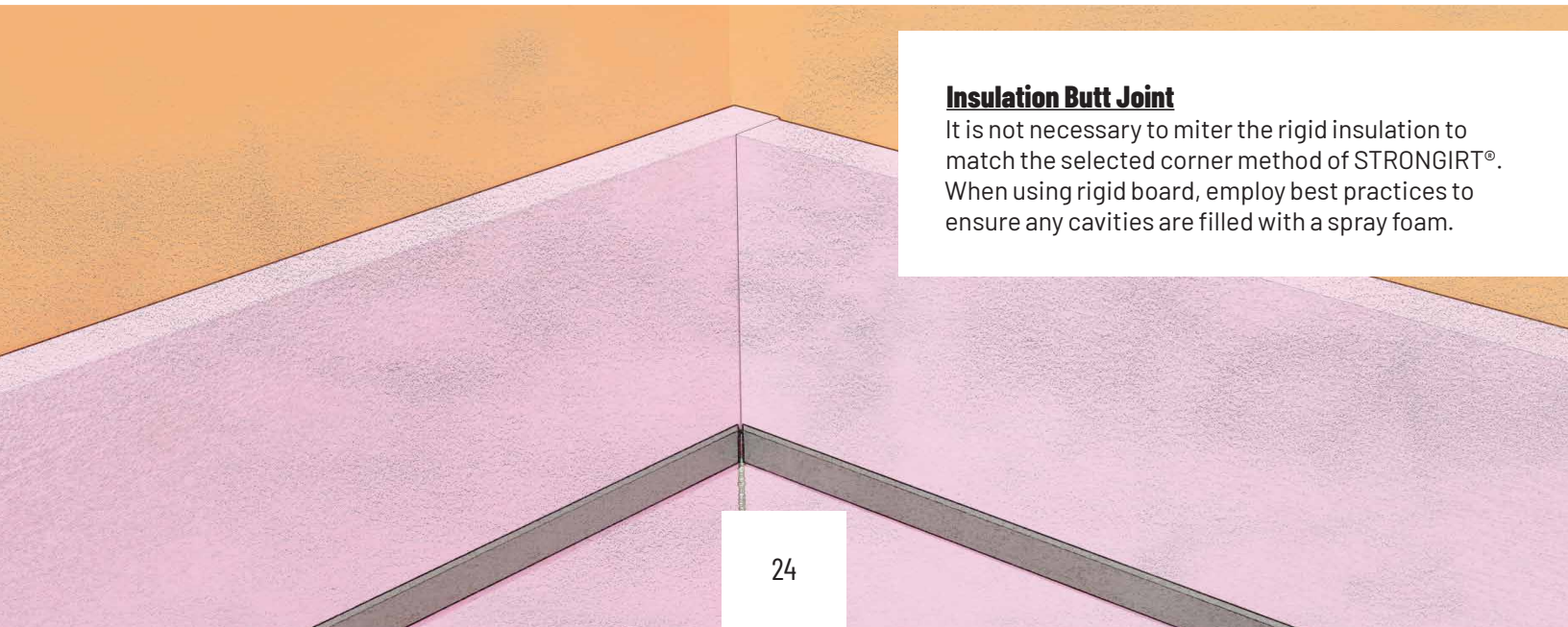
Inside Corners Butt Joint
Install STRONGIRT® aligned to butt joint on the inside corner and allow for the standard 3/16" gap between STRONGIRT®.



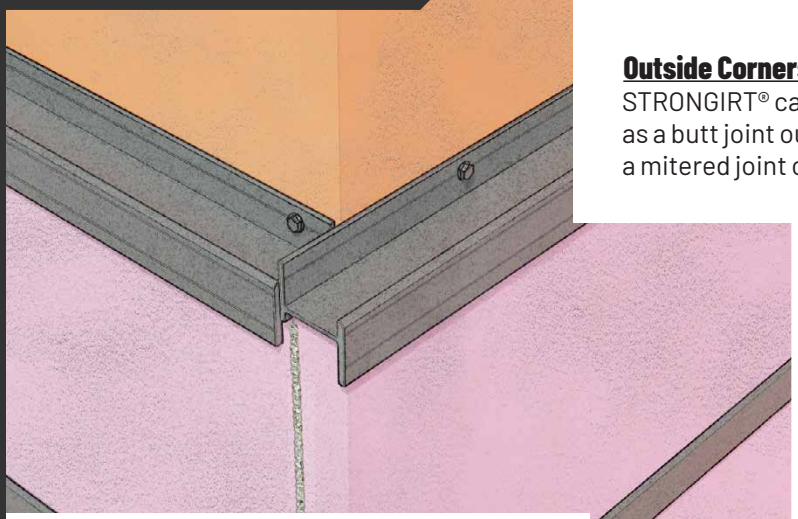
Inside Corners Mitered Joint
Prepare STRONGIRT® with standard job-site tools to allow for a mitered corner and the standard 3/16" gap between STRONGIRT®.



Insulation Butt Joint
It is not necessary to miter the rigid insulation to match the selected corner method of STRONGIRT®. When using rigid board, employ best practices to ensure any cavities are filled with a spray foam.

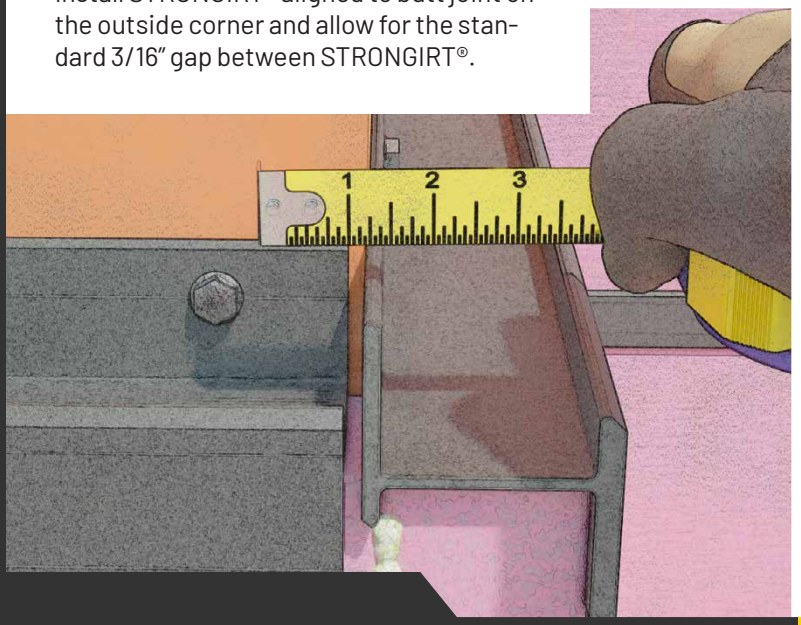


BUTT JOINT CORNER

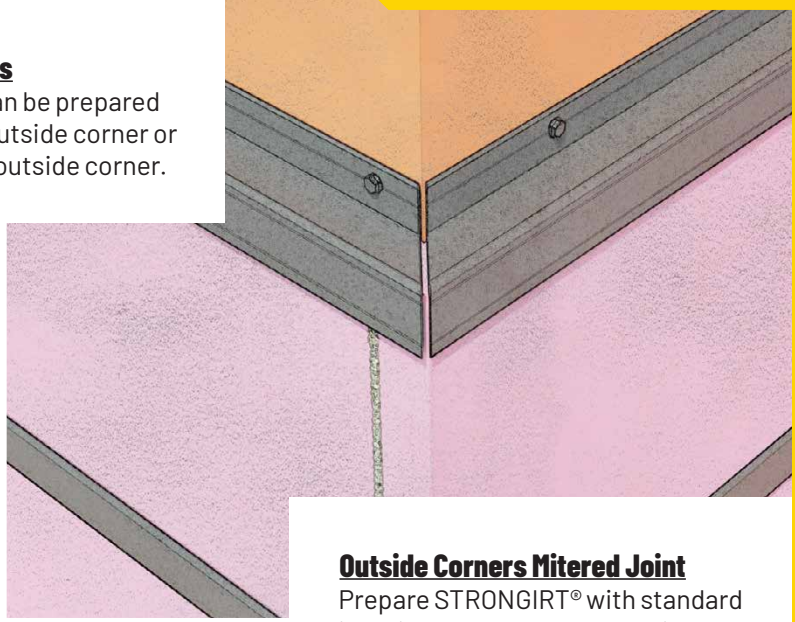


Outside Corners
STRONGIRT® can be prepared as a butt joint outside corner or a mitered joint outside corner.

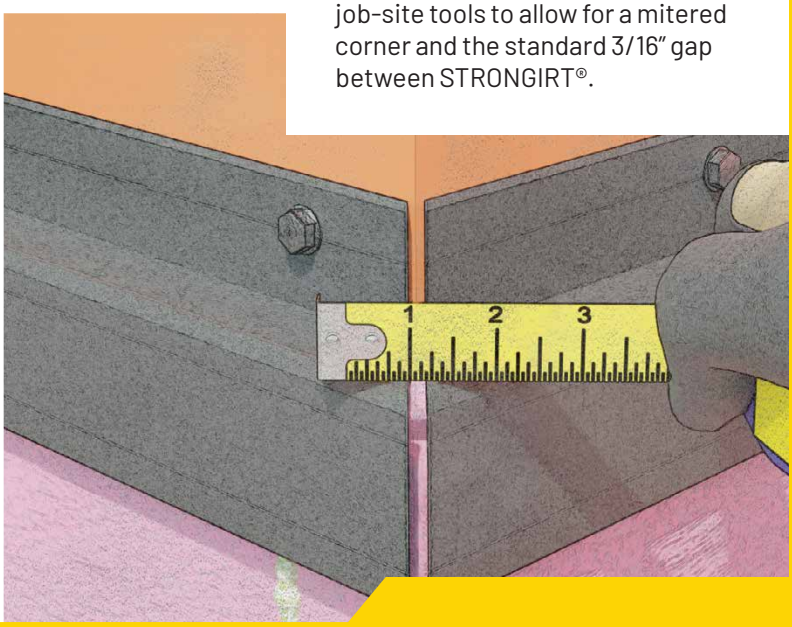
Outside Corners Butt Joint
Install STRONGIRT® aligned to butt joint on the outside corner and allow for the standard 3/16" gap between STRONGIRT®.

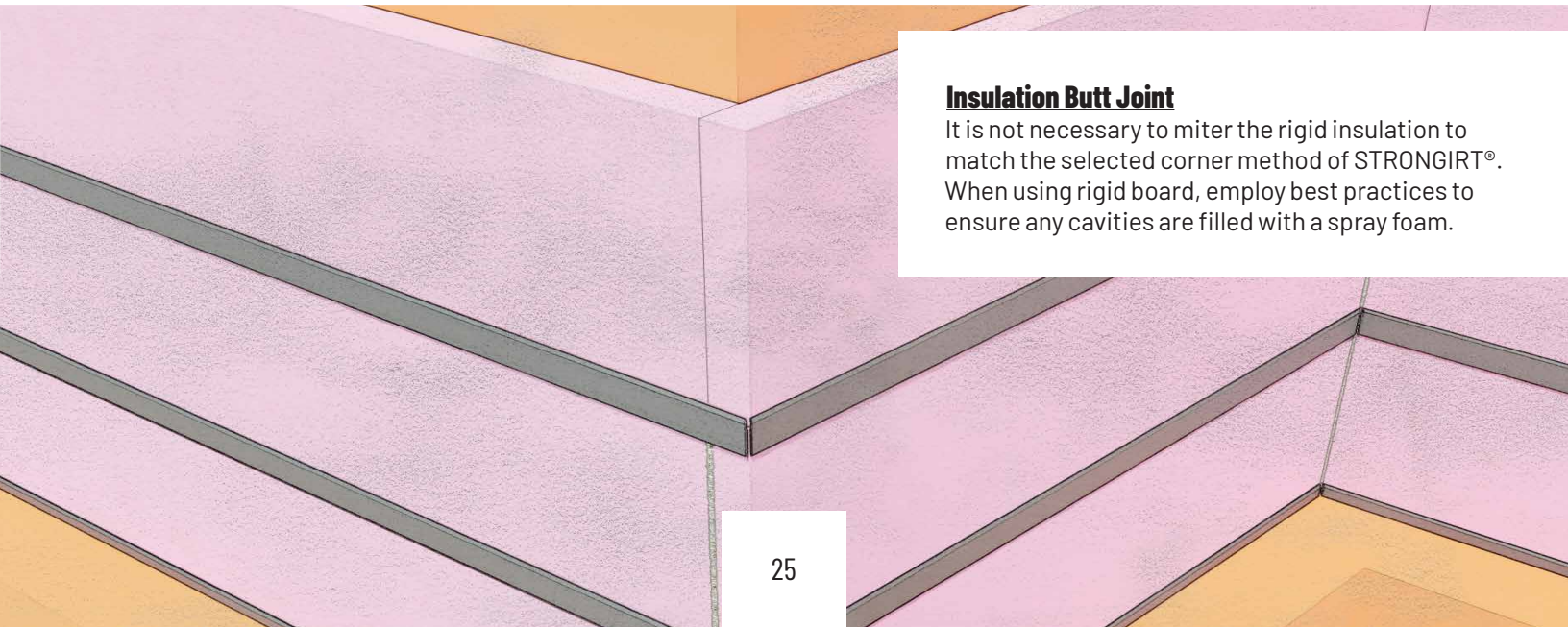


MITERED JOINT CORNER

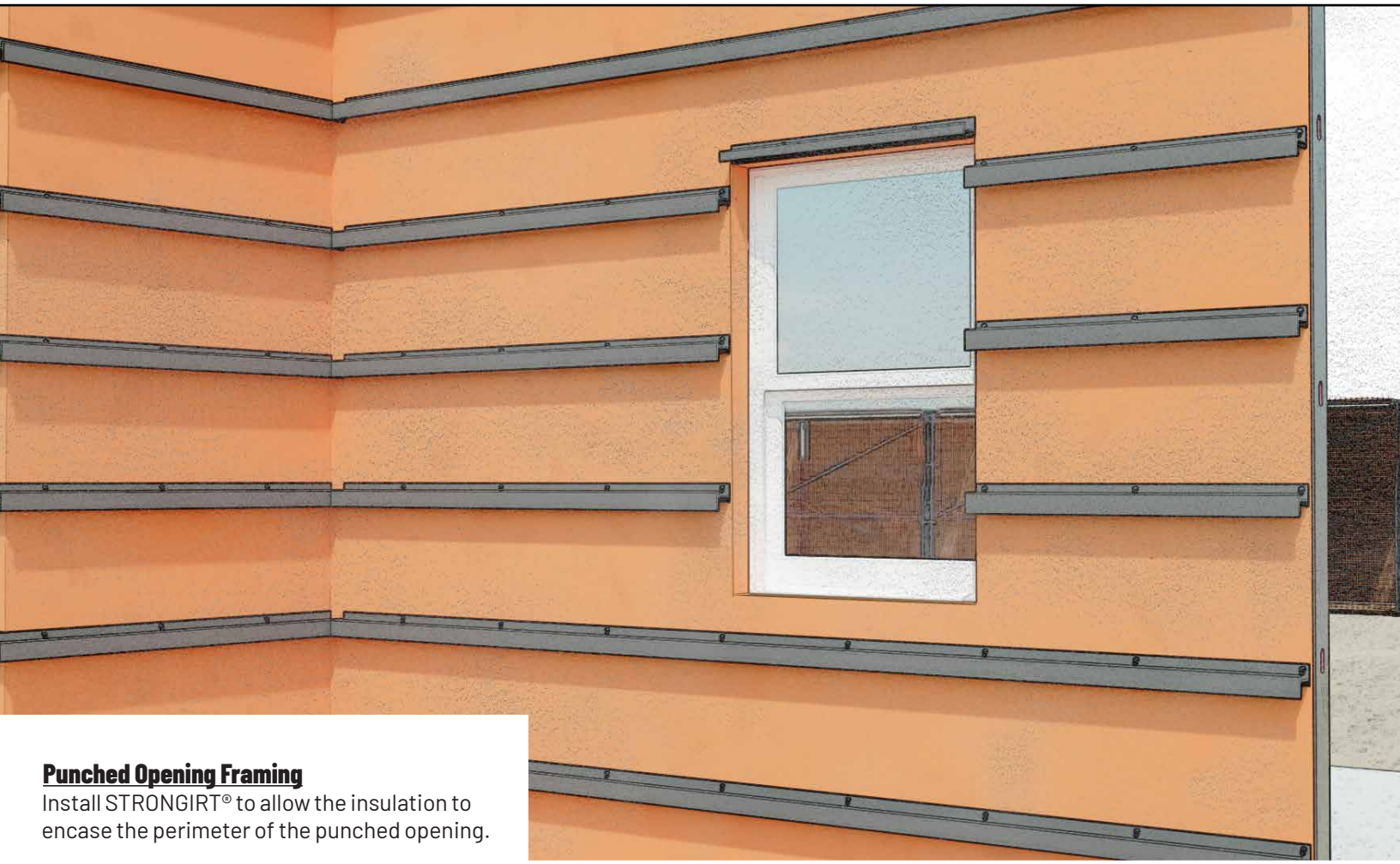


Outside Corners Mitered Joint
Prepare STRONGIRT® with standard job-site tools to allow for a mitered corner and the standard 3/16" gap between STRONGIRT®.





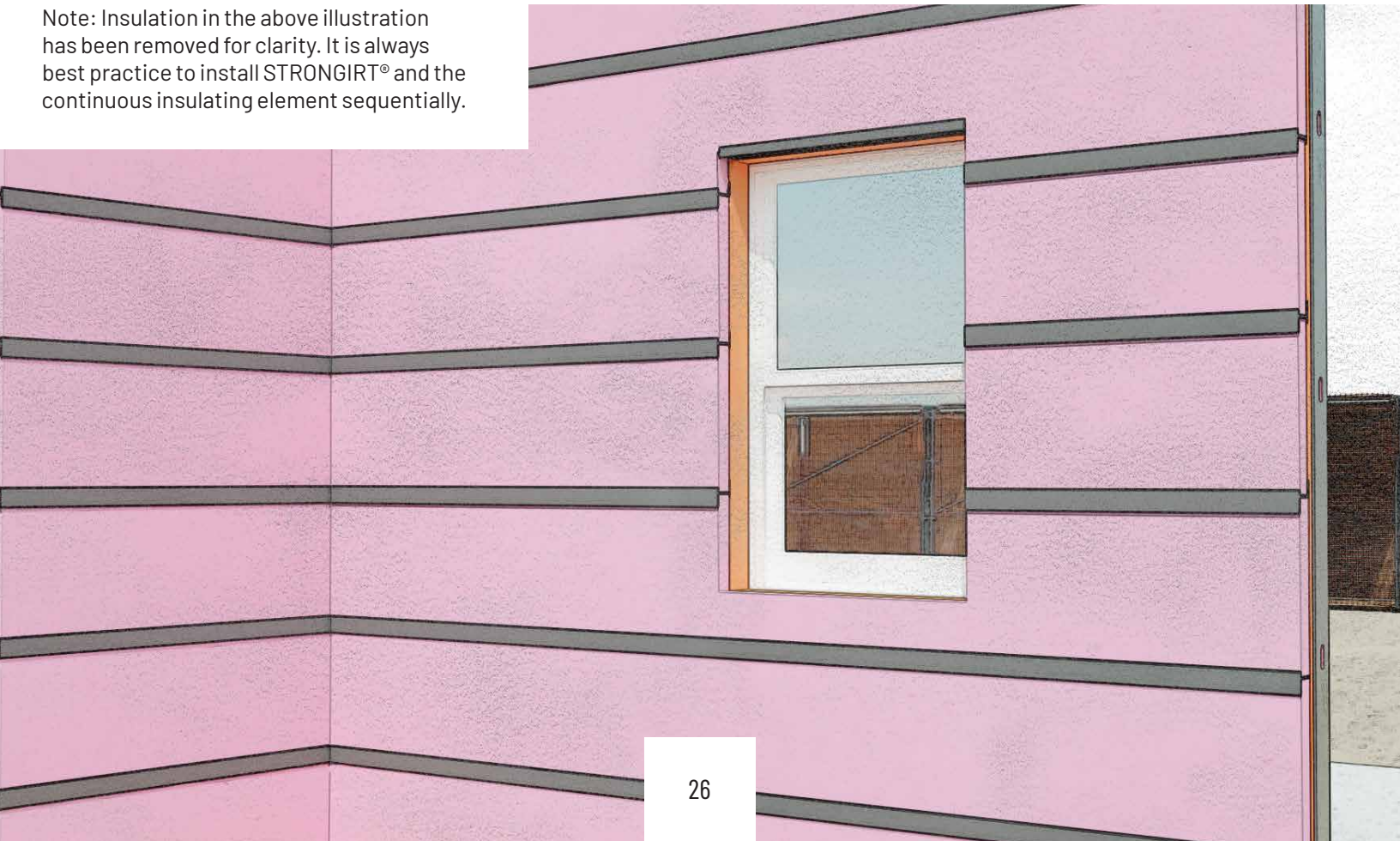
Insulation Butt Joint
It is not necessary to miter the rigid insulation to match the selected corner method of STRONGIRT®. When using rigid board, employ best practices to ensure any cavities are filled with a spray foam.



Punched Opening Framing

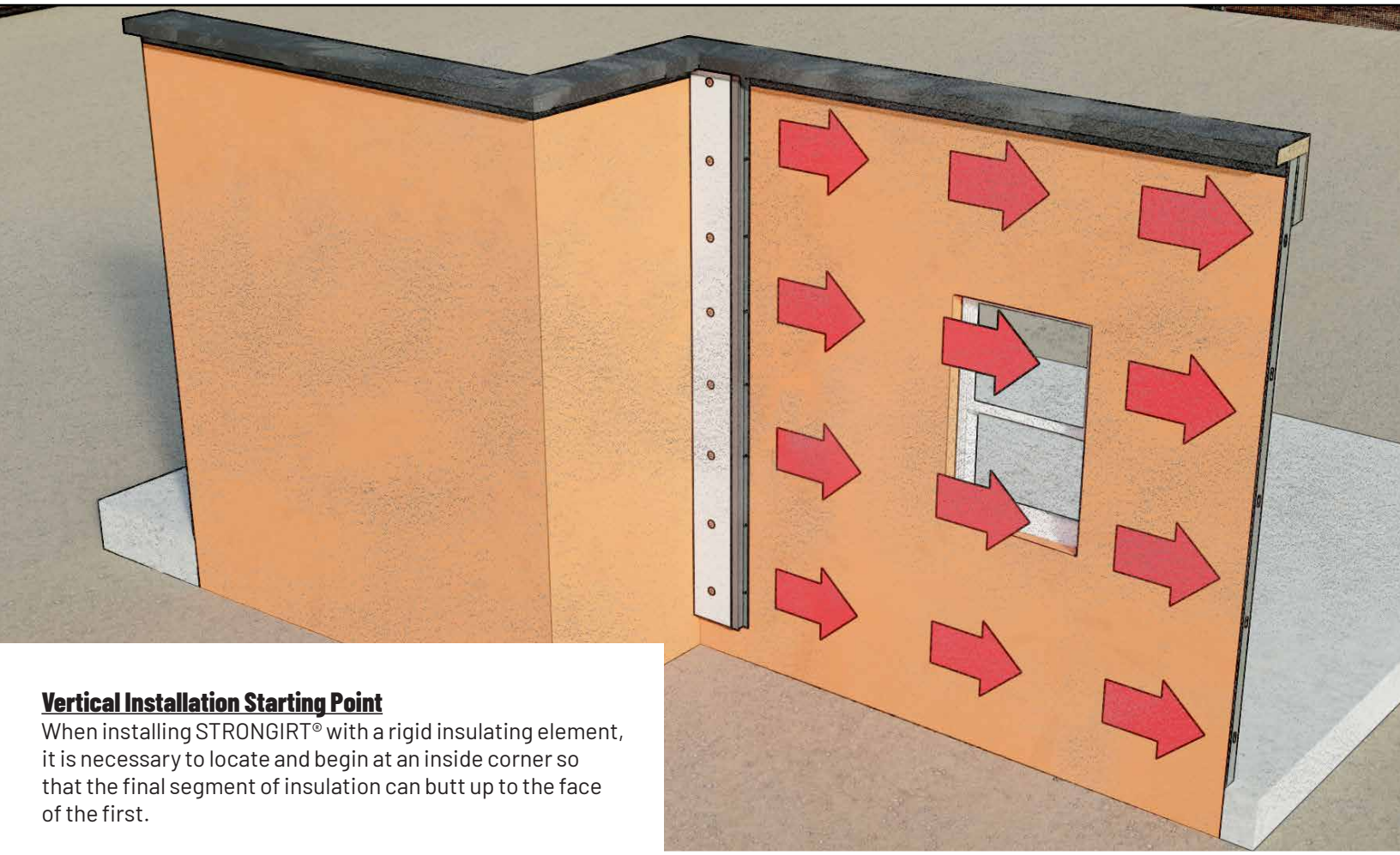
Install STRONGIRT® to allow the insulation to encase the perimeter of the punched opening.

Note: Insulation in the above illustration has been removed for clarity. It is always best practice to install STRONGIRT® and the continuous insulating element sequentially.



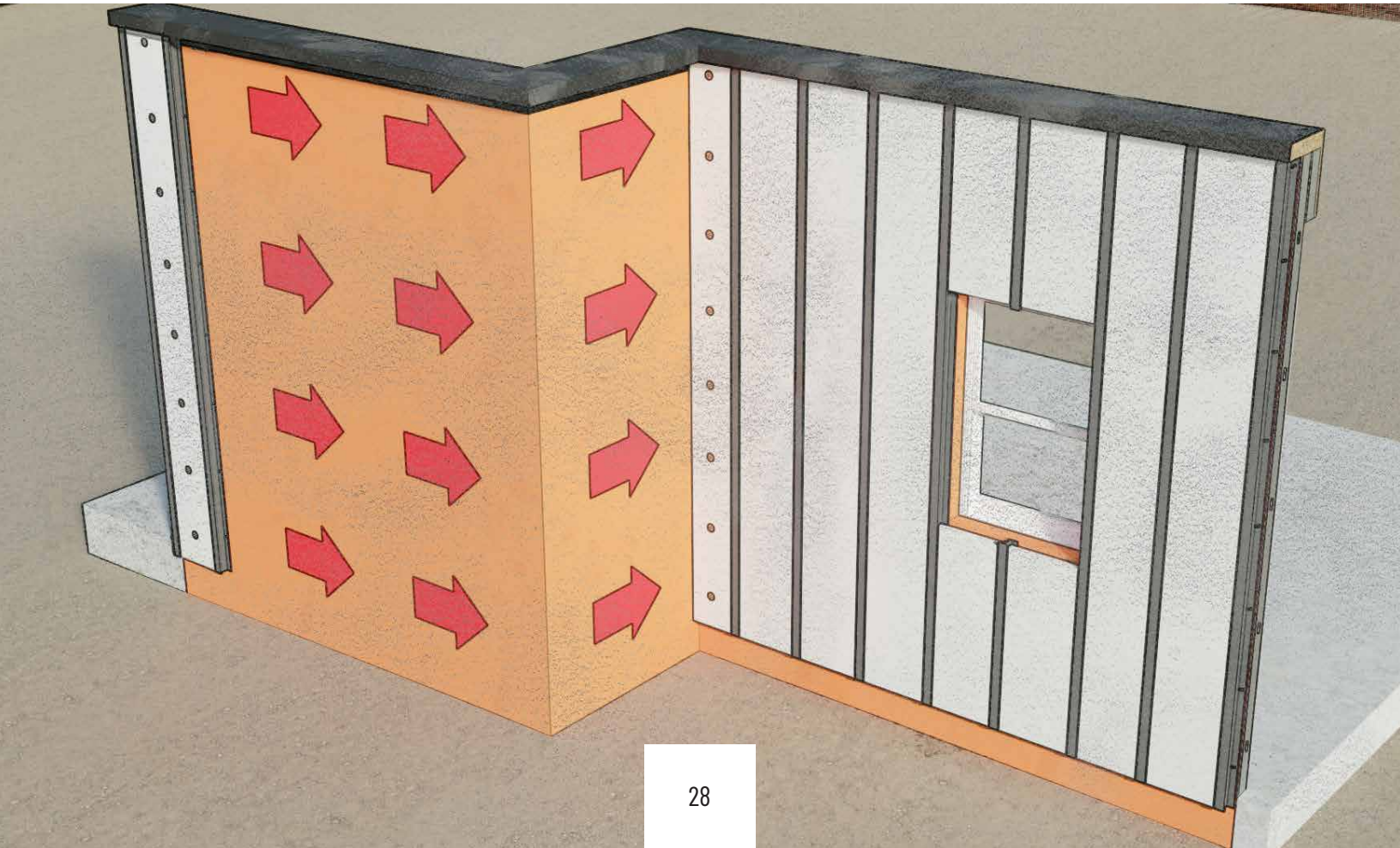
STRONGIRT® on Foundation Ledge with a Lip
The optional STRONGIRT® Starter channel (J-channel) is not required for vertical installations.

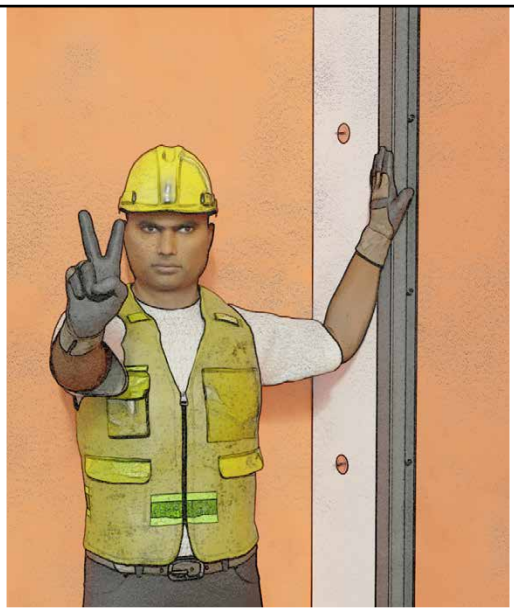
STRONGIRT® on Straight Run Foundation Ledge
The optional STRONGIRT® Starter channel (J-channel) is not required for vertical installations.



Vertical Installation Starting Point

When installing STRONGIRT® with a rigid insulating element, it is necessary to locate and begin at an inside corner so that the final segment of insulation can butt up to the face of the first.



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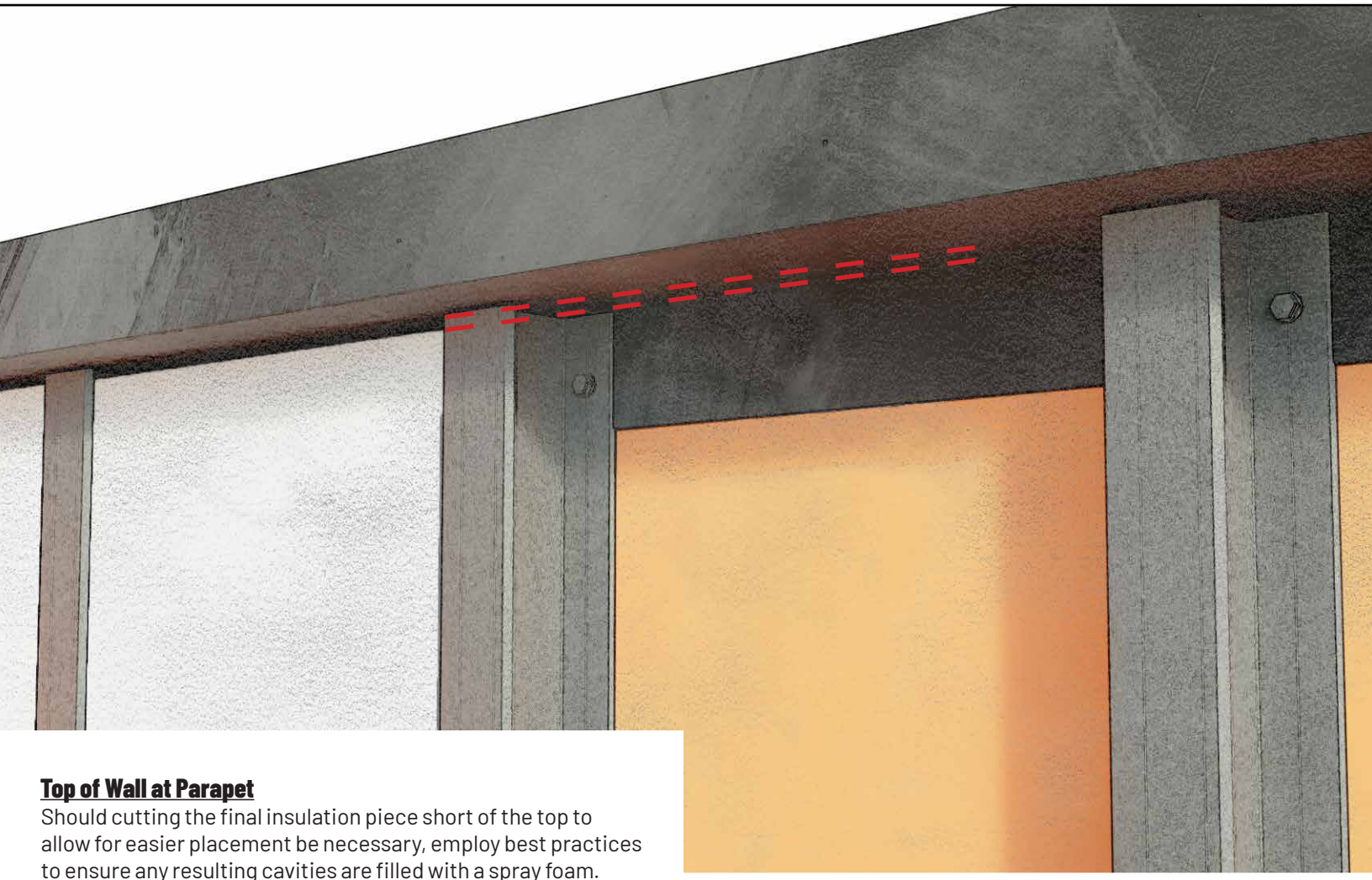
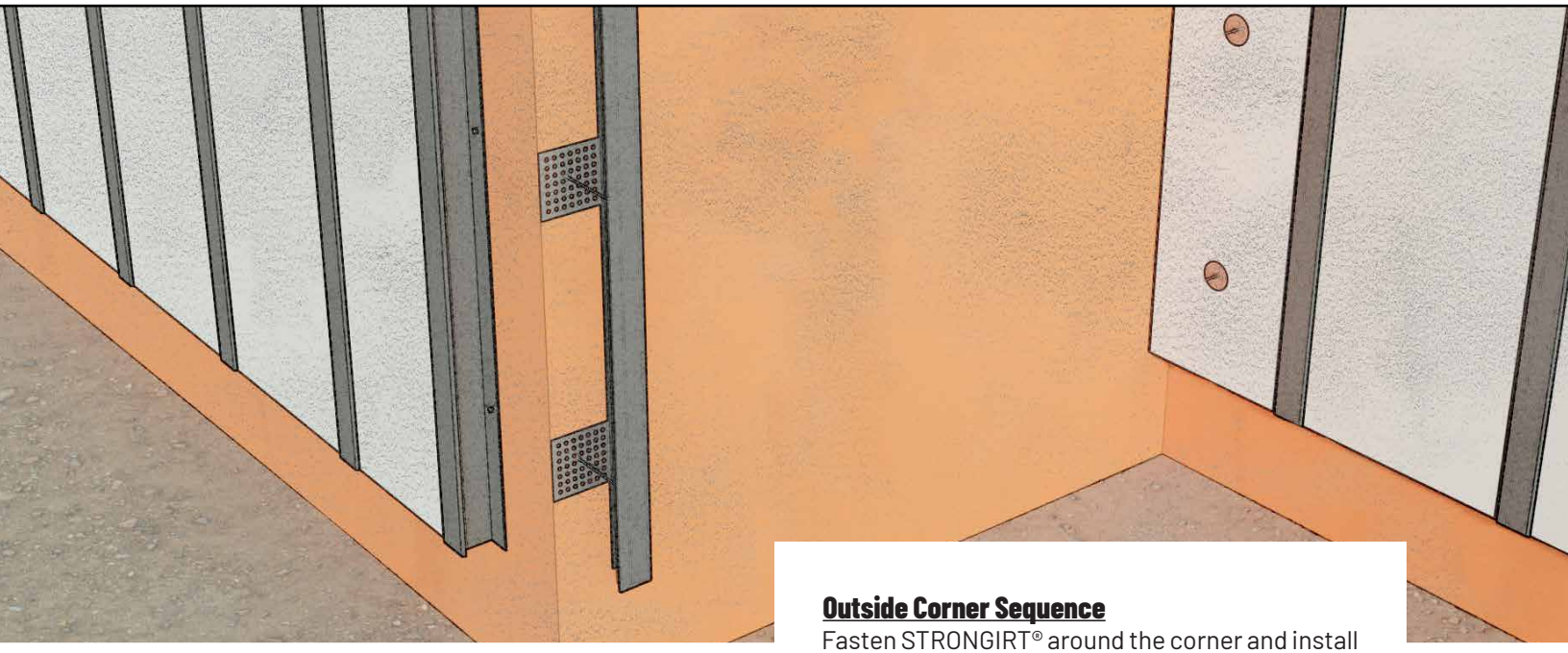


Top of Wall at Parapet

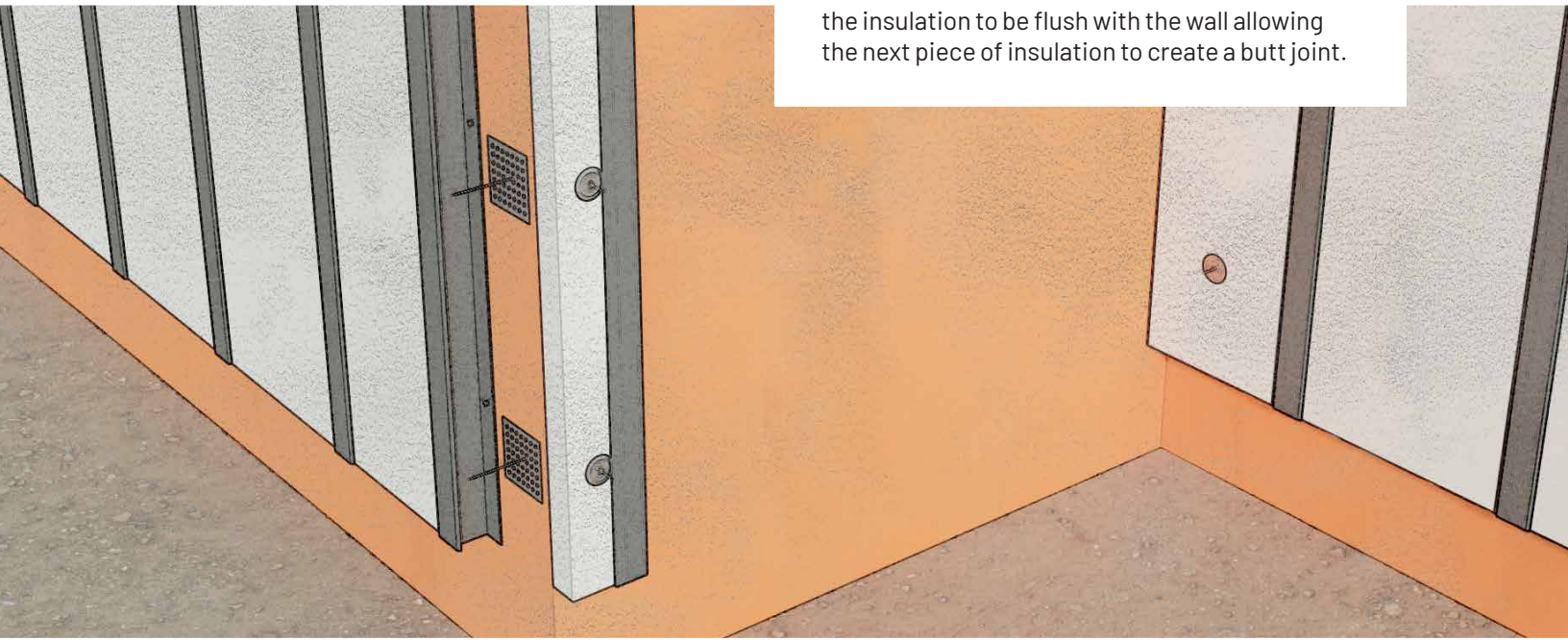
Should cutting the final insulation piece short of the top to allow for easier placement be necessary, employ best practices to ensure any resulting cavities are filled with a spray foam.

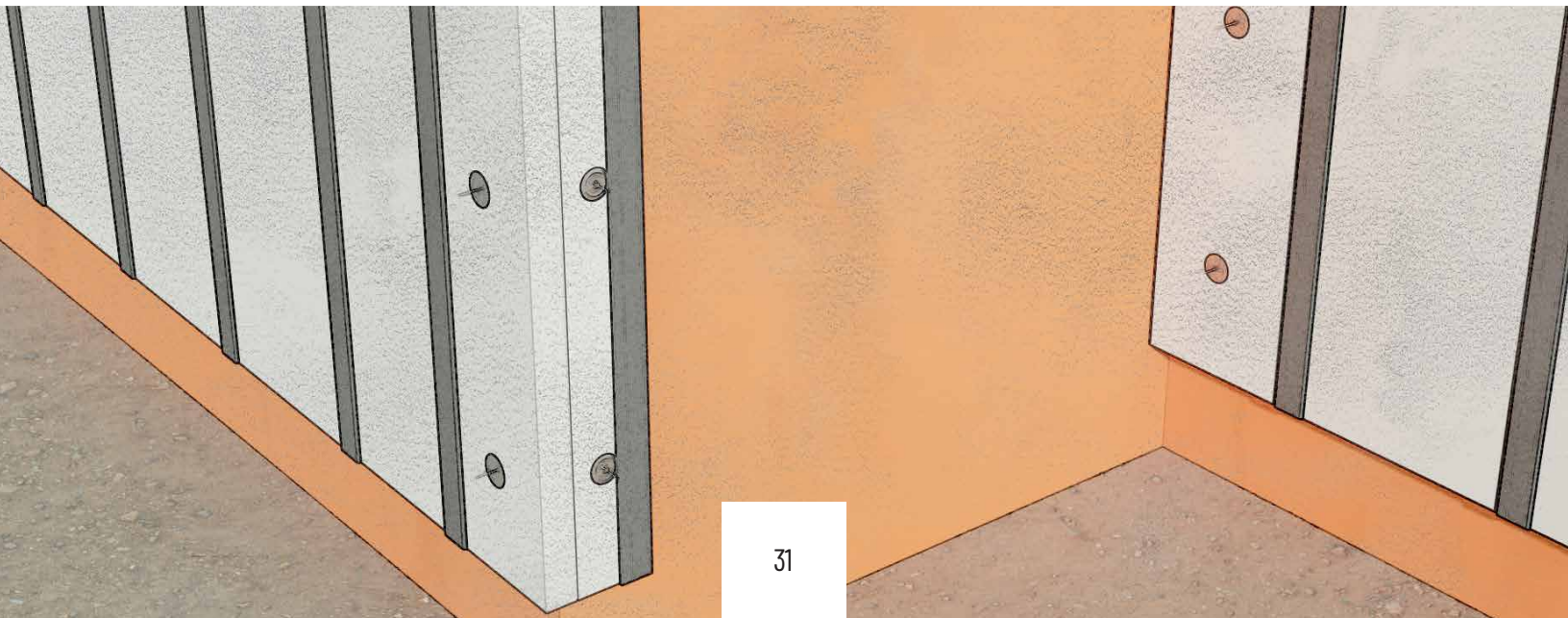
Note: Insulation in the above illustration has been removed for clarity. It is always best practice to install STRONGIRT® and the continuous insulating element sequentially.

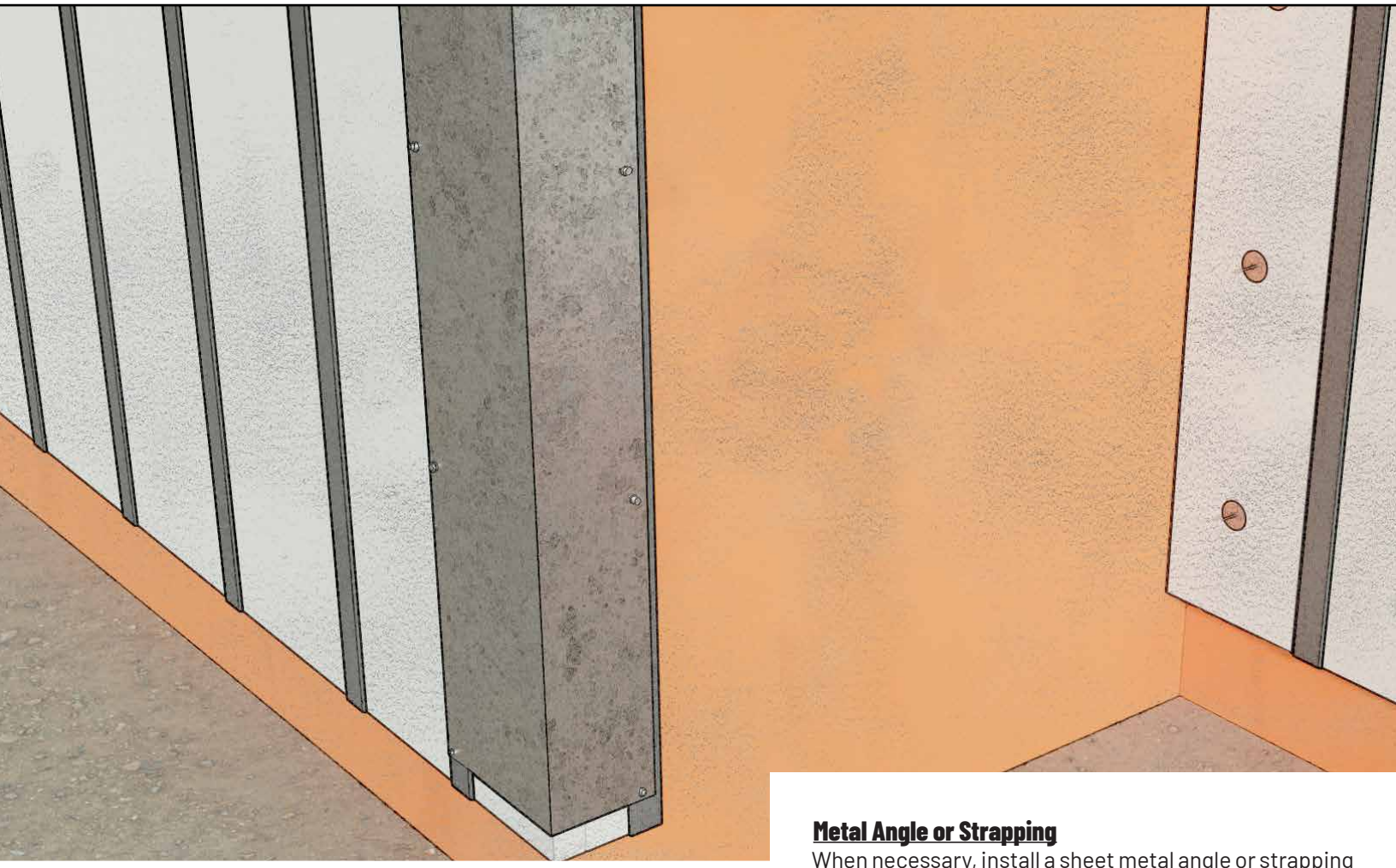


Outside Corner Sequence

Fasten STRONGIRT® around the corner and install the insulation to be flush with the wall allowing the next piece of insulation to create a butt joint.

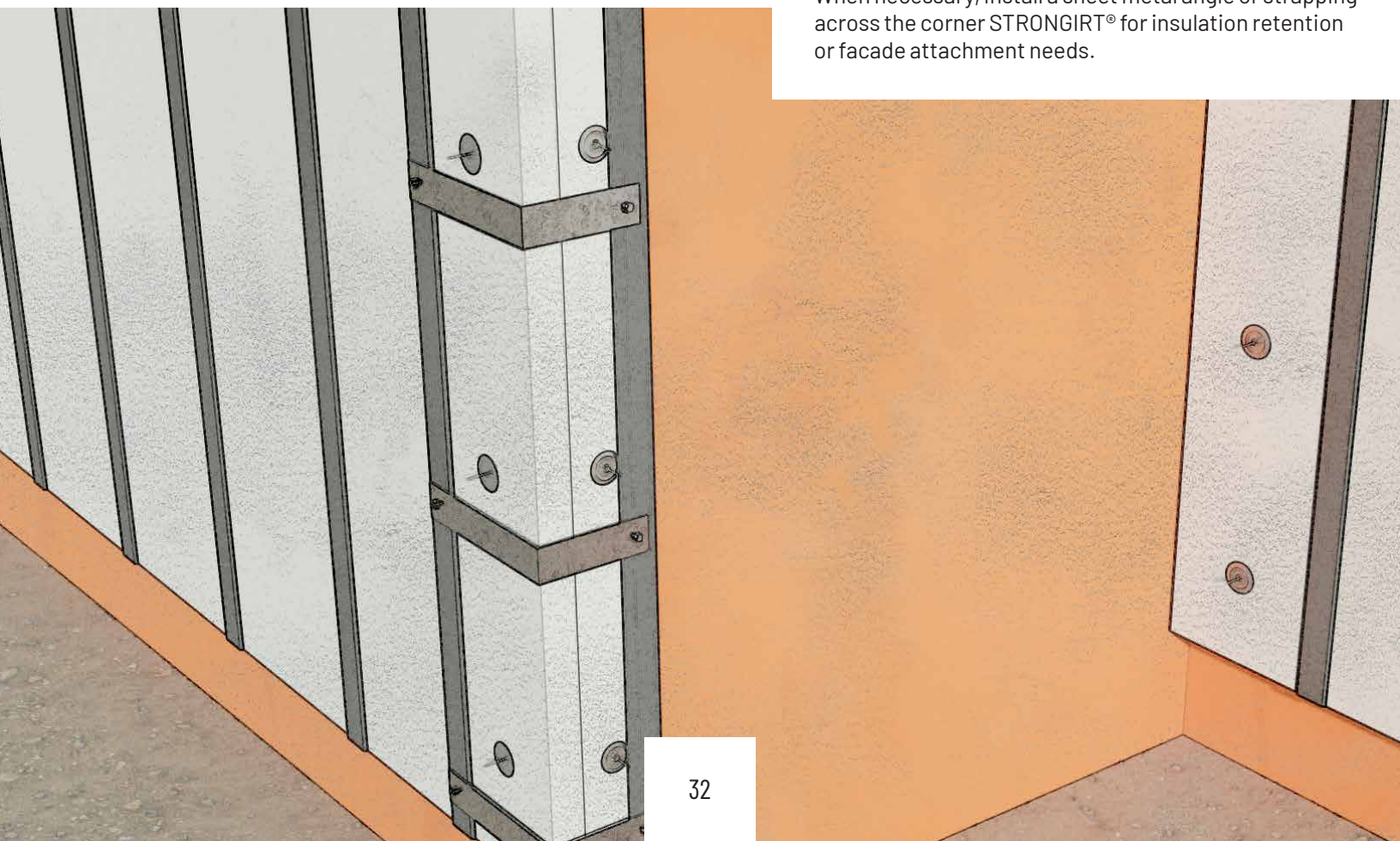


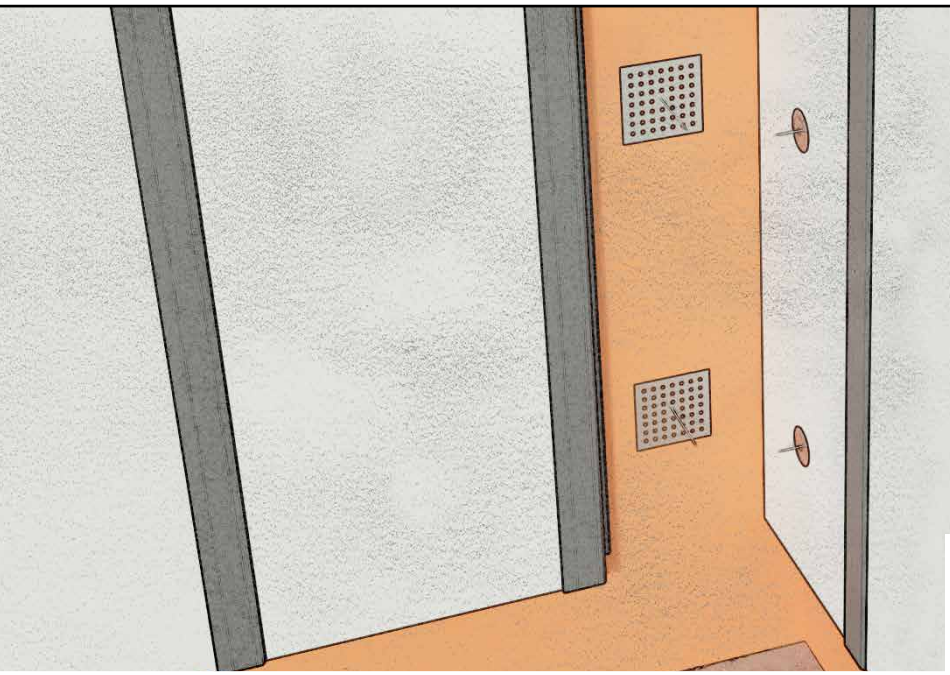




Metal Angle or Strapping

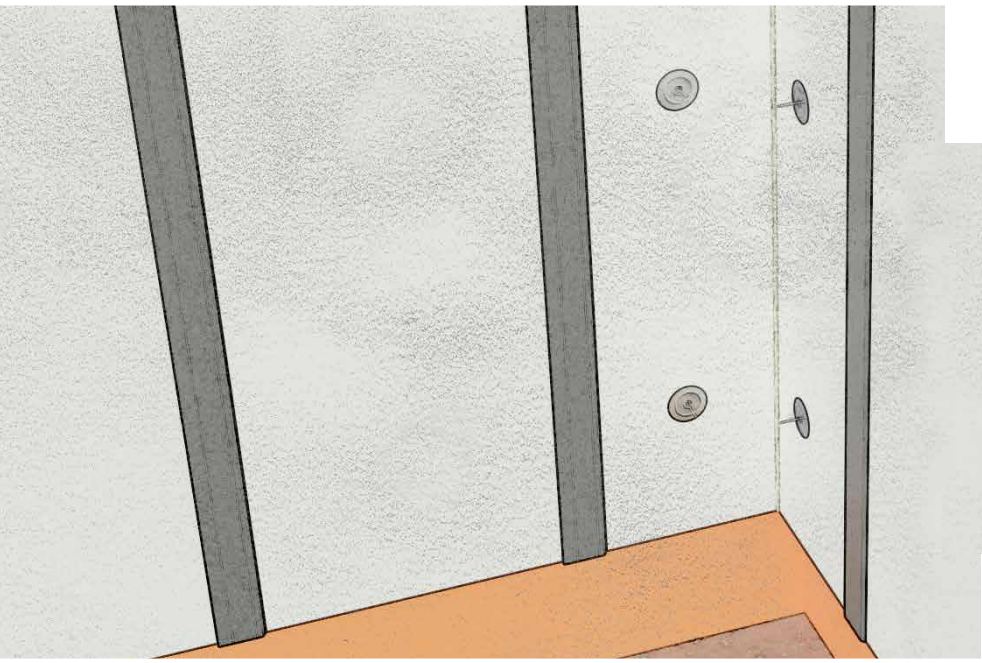
When necessary, install a sheet metal angle or strapping across the corner STRONGIRT® for insulation retention or facade attachment needs.





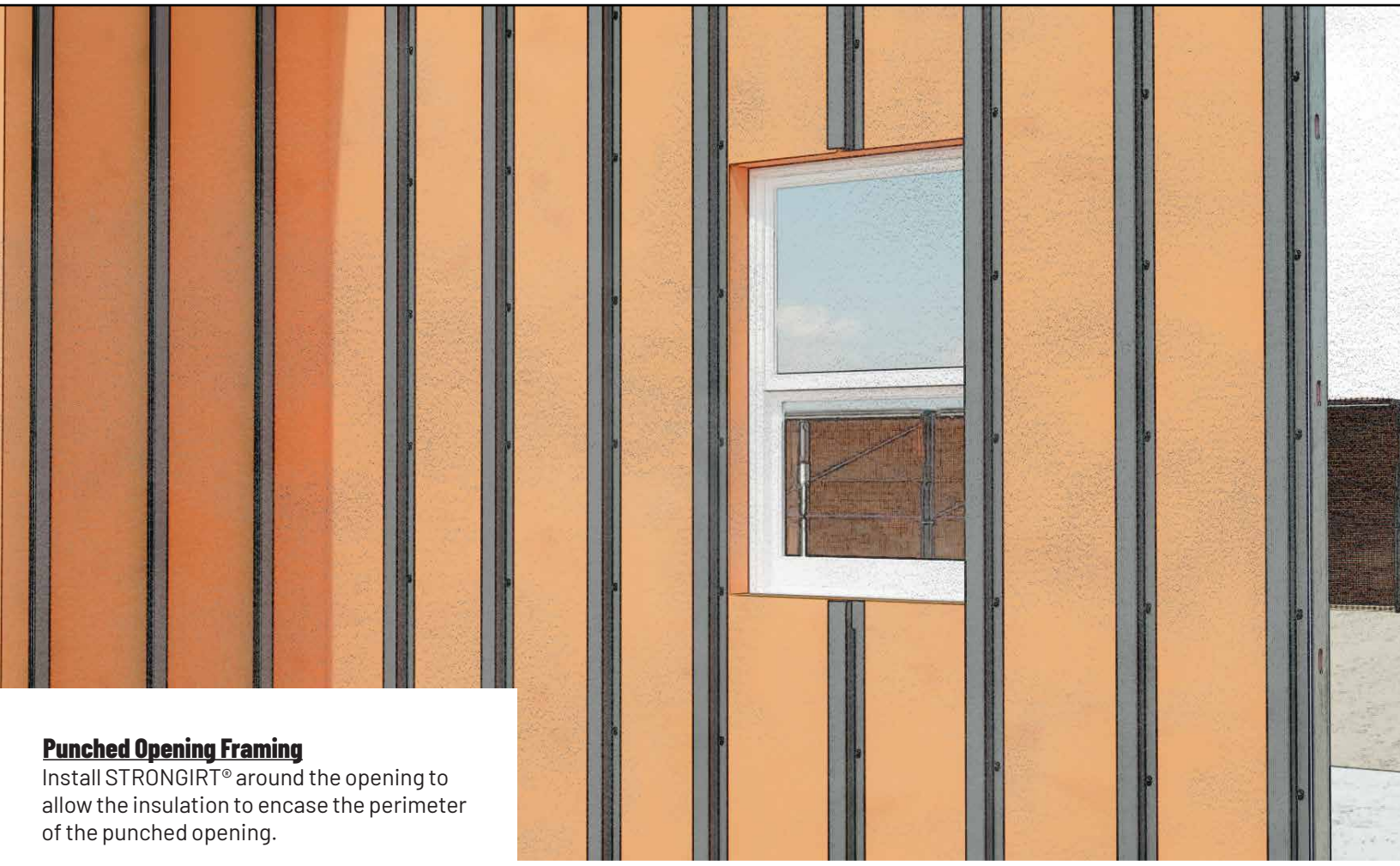
Inside Corner Sequence

Install the final panel of insulation to butt joint at the inside corner. Should cutting the final insulation piece short of the inside to allow for easier placement be necessary, employ best practices to ensure any resulting cavities are filled with a spray foam.



Metal Angle or Strapping

When necessary, install a sheet metal angle or strapping across the corner STRONGIRT® for insulation retention or facade attachment needs.



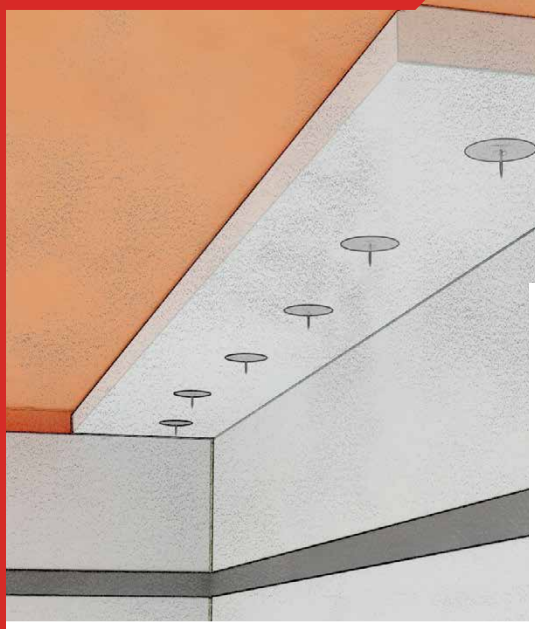
Punched Opening Framing

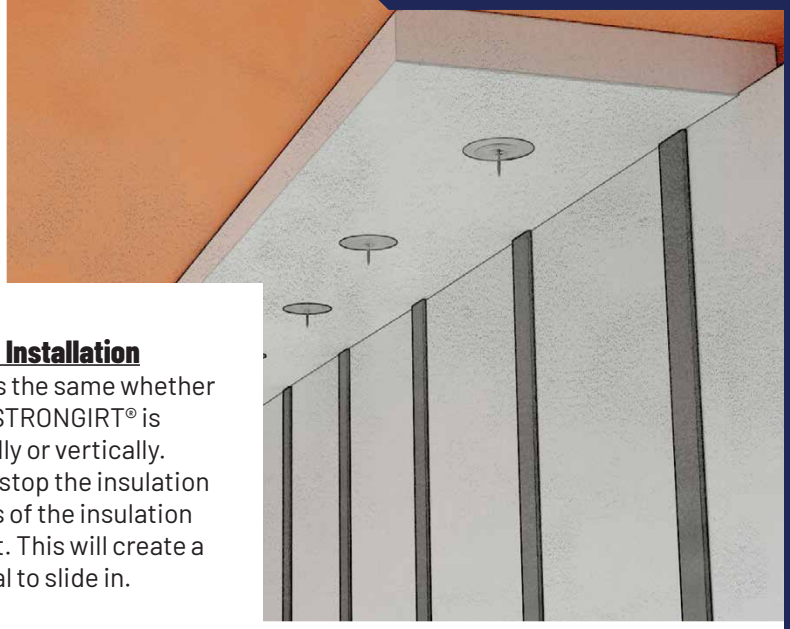
Install STRONGIRT® around the opening to allow the insulation to encase the perimeter of the punched opening.

Note: Insulation and sheet metal corner brackets in the above illustration has been removed for clarity. It is always best practice to install STRONGIRT® and the continuous insulating element sequentially.

HORIZONTAL INSTALLATION

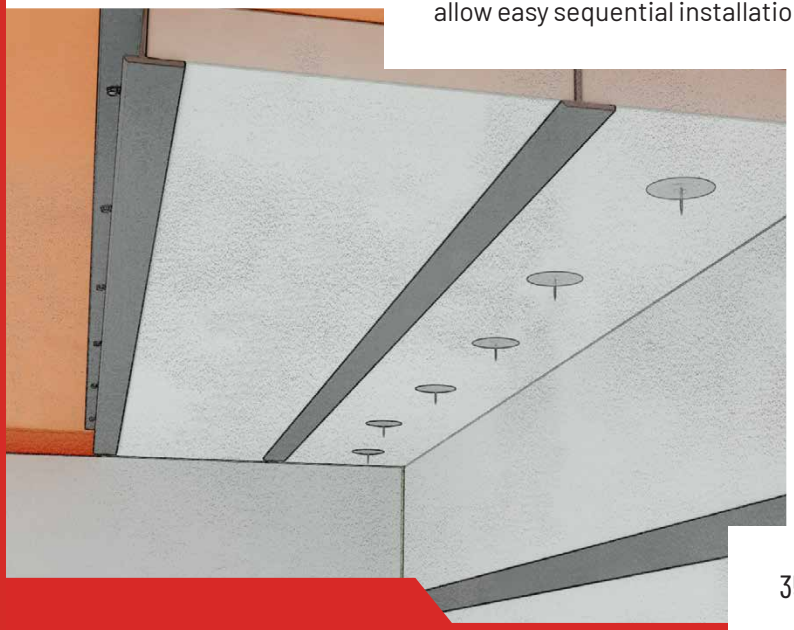
VERTICAL INSTALLATION

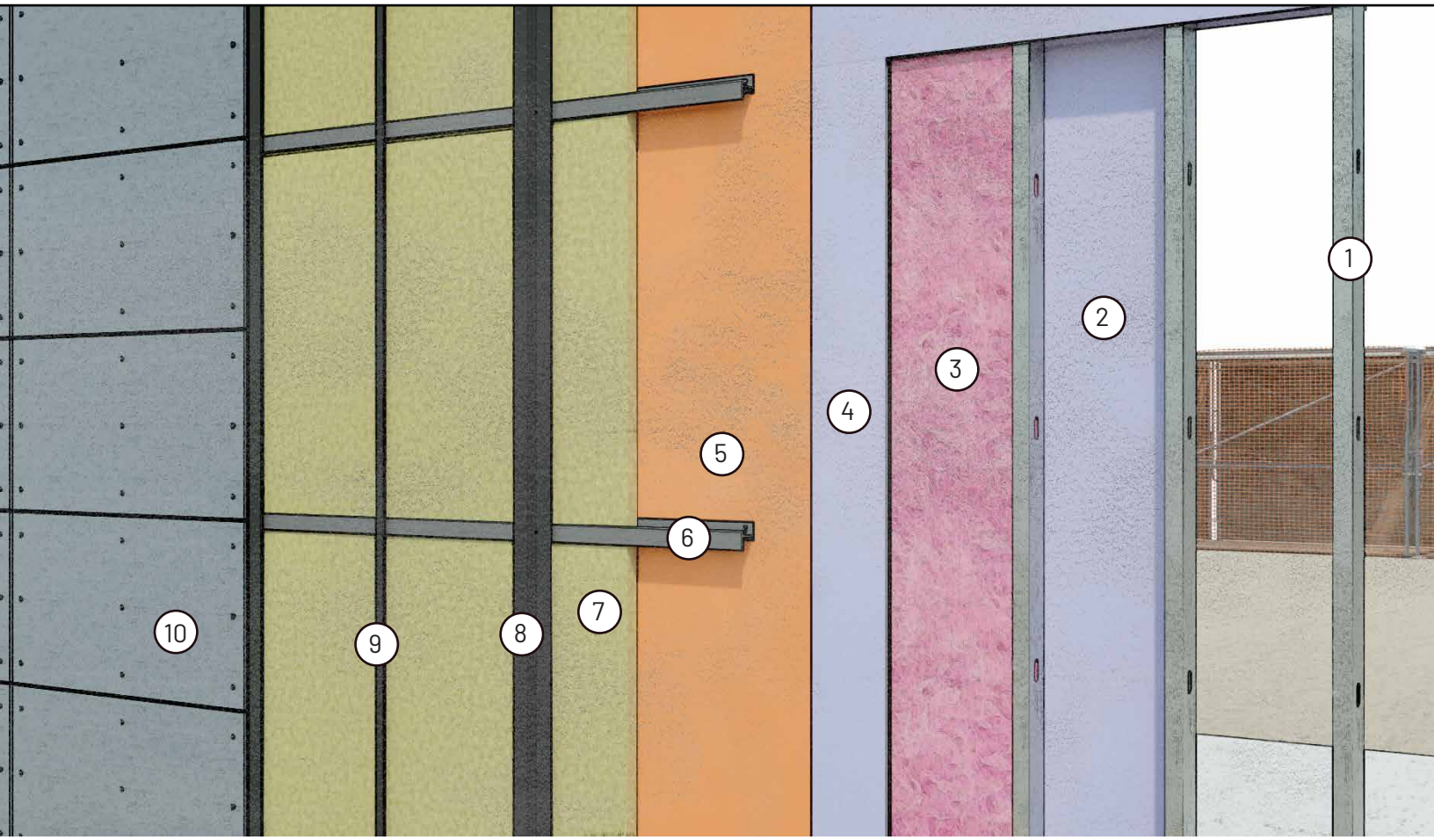




STRONGIRT® Soffit Installation
Soffit installation is the same whether the wall assembly STRONGIRT® is installed horizontally or vertically. In either instance, stop the insulation short the thickness of the insulation used on the project. This will create a lip for the horizontal to slide in.

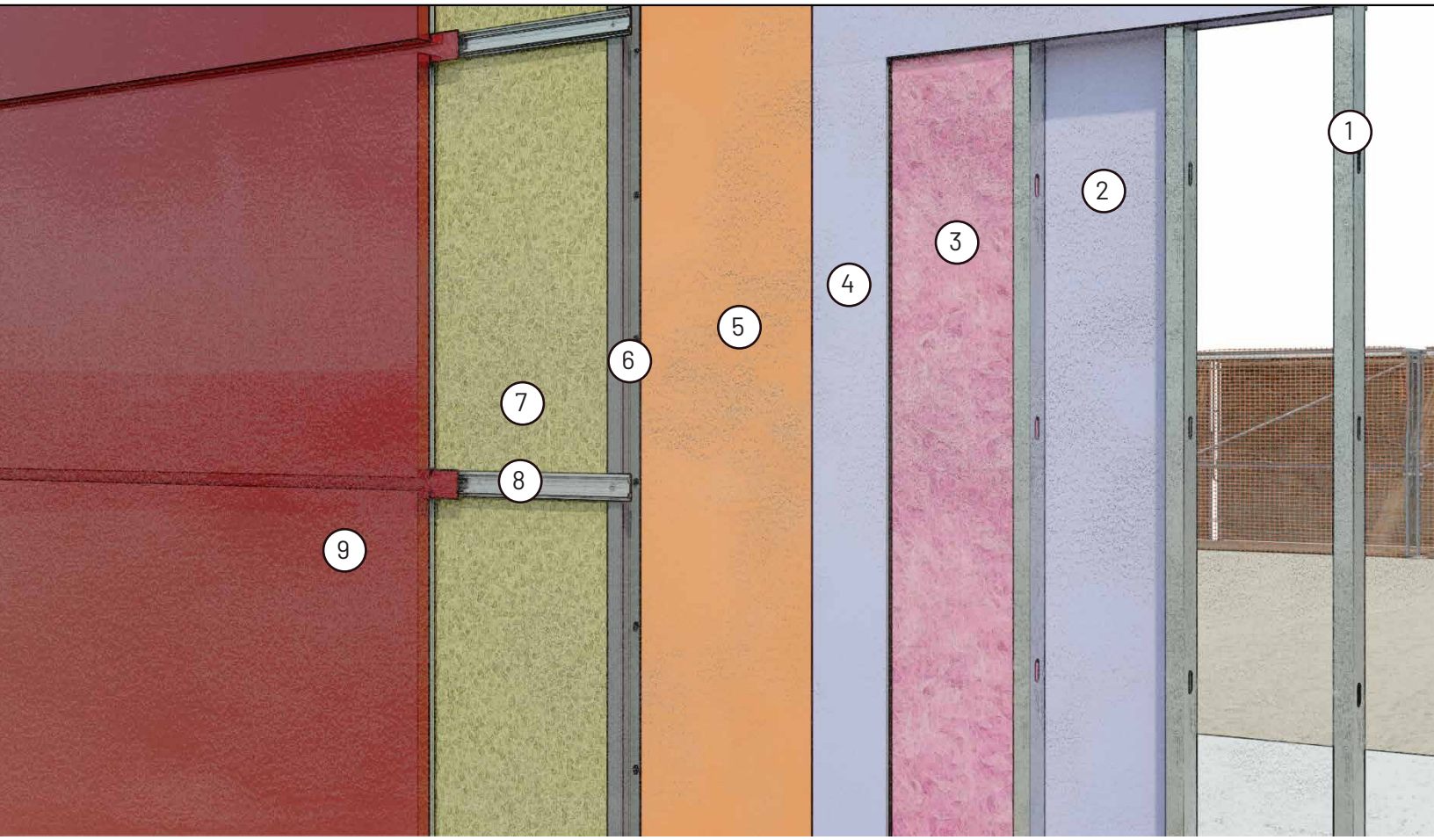
STRONGIRT® Soffit Installation
Install the next STRONGIRT® and insulation pins as necessary to allow easy sequential installation of the remaining elements.





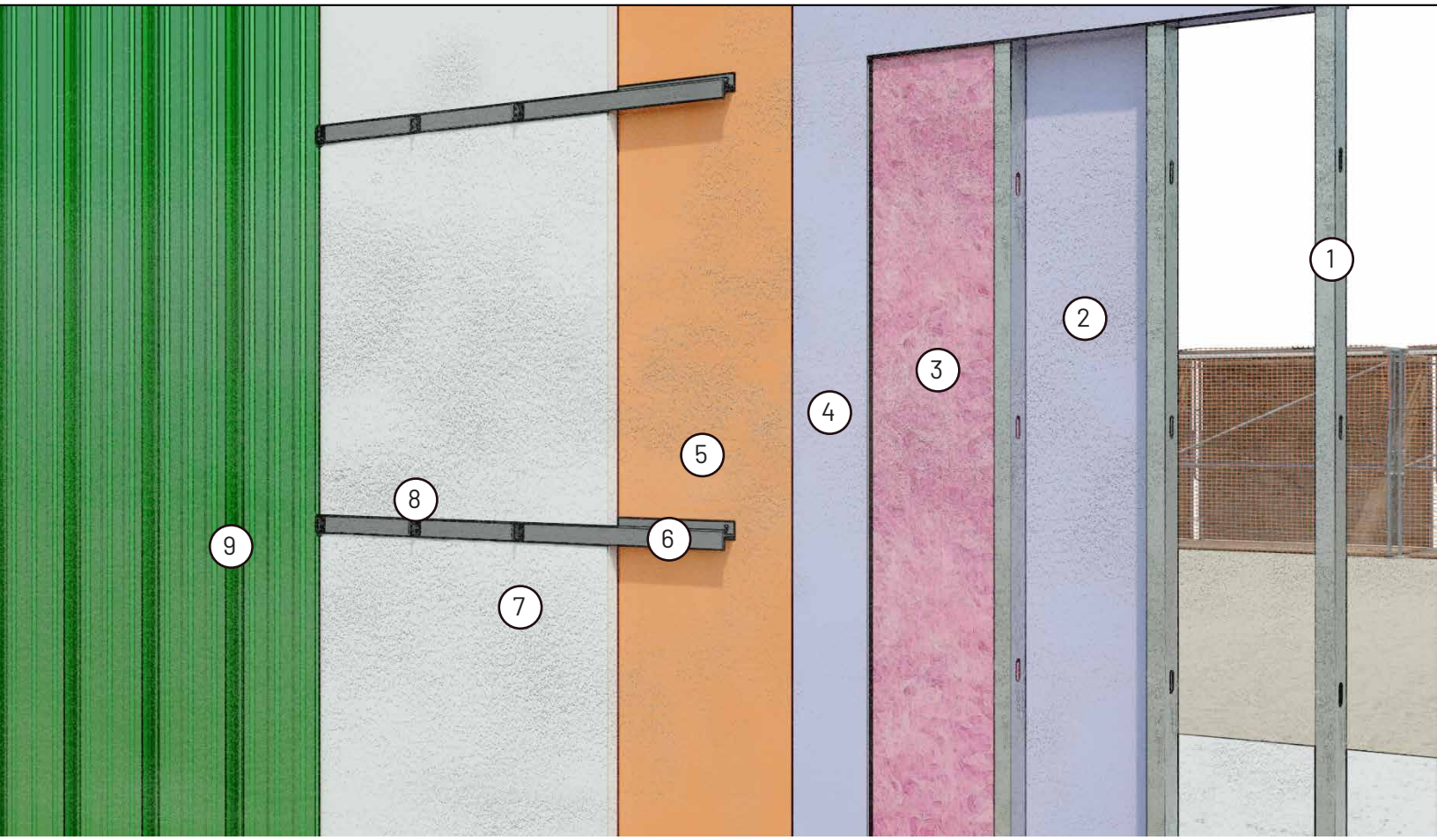
EXAMPLE ASSEMBLY #01

1. Steel Stud Frame
2. Interior Gypsum Sheathing
3. Cavity Insulation
4. Exterior Gypsum Sheathing
5. WRB
6. Horizontally Installed STRONGIRT®
7. Mineral Wool Continuous Insulation
8. Vertical Metal Hat Channel
9. Vertical Metal Zee Girt
10. Exposed Fastener Rainscreen Panel



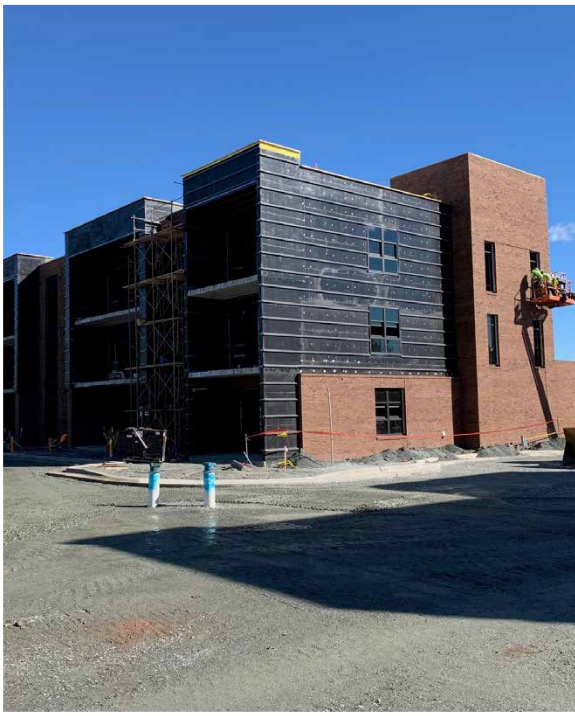
EXAMPLE ASSEMBLY #02

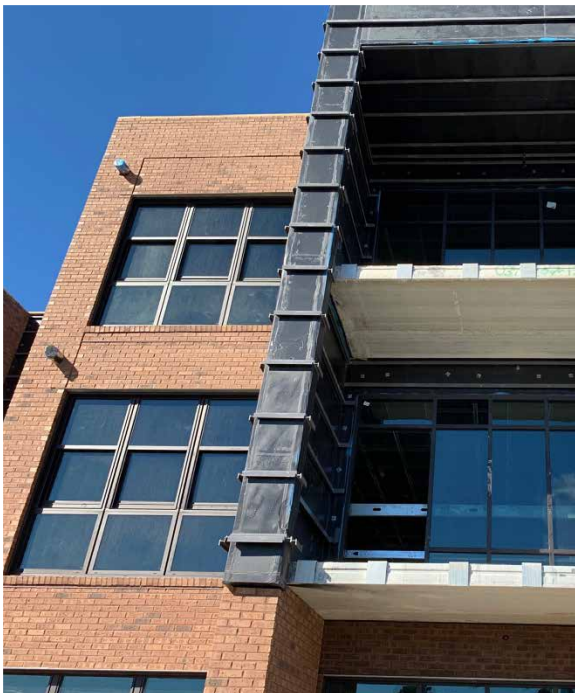
1. Steel Stud Frame
2. Interior Gypsum Sheathing
3. Cavity Insulation
4. Exterior Gypsum Sheathing
5. WRB
6. Vertically Installed STRONGIRT®
7. Mineral Wool Insulation
8. Clip Extrusion
9. ACM Panel



EXAMPLE ASSEMBLY #03

1. Steel Stud Frame
2. Interior Gypsum Sheathing
3. Cavity Insulation
4. Exterior Gypsum Sheathing
5. WRB
6. Horizontally Installed STRONGIRT®
7. Exterior Continuous Insulation
8. Standing Seam Clips
9. Standing Seam Metal Panels





STRONGIRT® is made exclusively by:

STRONGWELL®

The World Leader in Pultrusion and
Pultruded Fiberglass Structures & Shapes

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