



FIRE RATED SYSTEMS

PANEL
SOLUTIONS

INSTALLATION & OWNER'S MANUAL

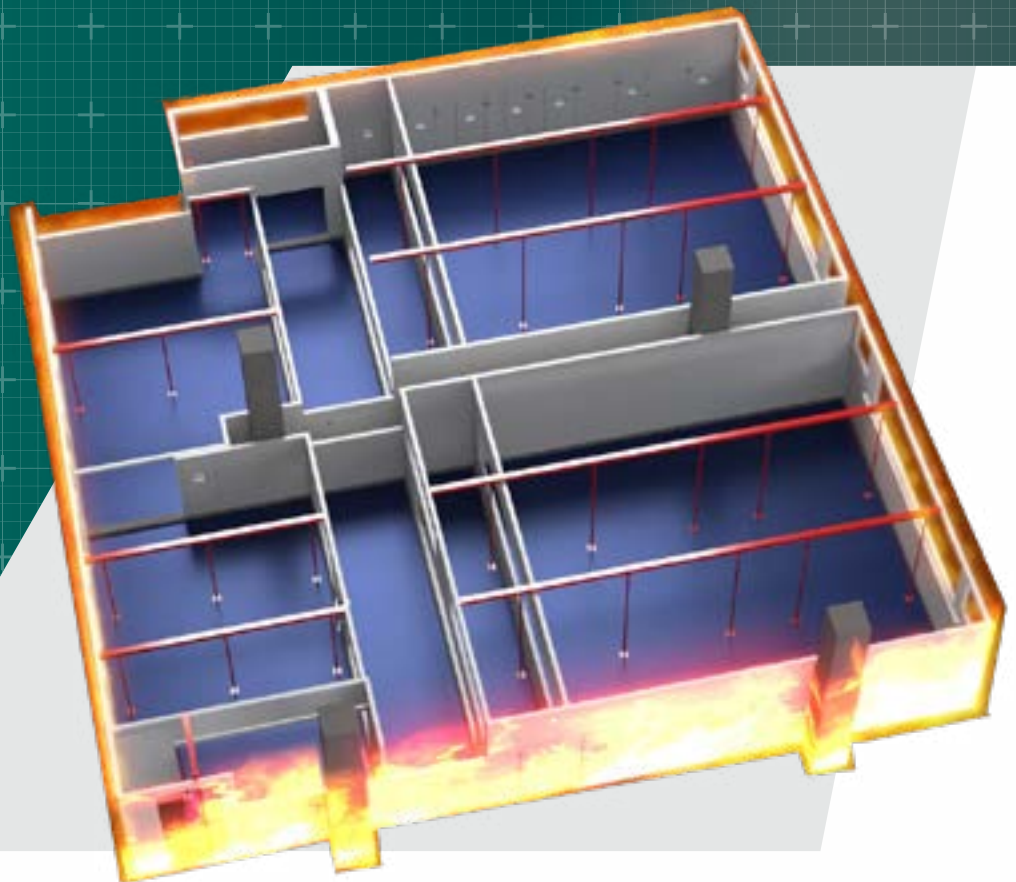


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ABOUT FR-PANEL SOLUTIONS

FläktGroup® SEMCO®’s fire-rated panel system (FR-PANEL) is the Industry’s only fire-resistant panel, which is also building code-compliant. The FR-PANEL system currently includes a one-hour and two-hour fire-protection option.

To ensure the safety and integrity of the FR-PANEL system, FläktGroup SEMCO enlisted a third-party testing agency to perform a series of compliancy tests. These tests have concluded that the FR-PANEL system is National Fire Protection Association (NFPA) 251 compliant for thermal and acoustical panels. All tests were performed using Underwriters Laboratories’ UL-263 standard. UL-263, is a fire test for building construction and materials, which is based off of ASTM-E119 test criteria.

FläktGroup SEMCO’s FR-PANEL has a remarkably low thermal transfer rate. Unlike competitive brands, the FläktGroup SEMCO FR-PANEL system, does not require panel joint fasteners in vertical joints, making it easier to assemble. The FR-PANEL system is held together with a precision roll-formed tongue-and-groove design joint. The tongue-and-groove design make the FR-PANEL ideal for applications such as, stairwell chases, interior walls, elevator shafts, equipment rooms, penthouse construction, building cladding, rectangular ductwork and custom fire protection.

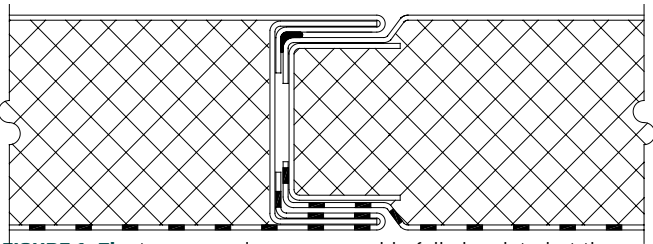


FIGURE 1: The tongue-and-groove panel is fully insulated at the male-female joint, allowing for acoustically and thermally better joints with less installation time.

A computer-aided design (CAD) drawing is provided during the planning stages, so customers are able to optimize layout and minimize the use of costly structural steel.

All panels will arrive on job sites neatly stacked, palletized and individually labeled. The complete finalized ¼” scale “D” size assembly drawings, will be sent with the shipment.

ADVANTAGES

- Roll formed tongue-and-groove construction, fully enclosed and with insulated joints gives it a better fit with closer tolerance.
- Eliminating the use of screws through vertical panel joints, reduces the installation cost and removes the possibility of air and noise leakage.
- The tongue-and-groove panels are fully insulated at the male-female joint eliminating the need for field insulation.
- Complete ¼” scale “D Size” assembly drawings
- Individually piece marked panels
- Internal media provides excellent fire protection and no sound transmission loss.
- Significantly low thermal transfer rate for added protection during fire events.
- Panels up to 12’-0” in length, adding strength and rigidity, making installation easier.
- No-thru-metal panels solving condensation and low temperature issues that may occur with standard panels.
- CAD drawings prevent the over use of structural steel, provides the customer with a calculated safety factor and reduces installation costs by as much as 15%.• The drawings identify areas where factory notches are required, reducing install costs and utilizing equipment efficiently.
- Flexible design options to meet special requirements.
- Auto CAD drawings shorten the approval process and reduce field labor by providing panel layout, installation details and individual panel markings.
- The FR-PANEL system meets critical noise levels criteria for high transmission loss panel systems.

FIRE PANEL PERFORMANCE DATA

The standard fire rated panel features 4” thick construction featuring 18 gauge solid interior and exterior skins, mineral wool insulation and 1 ¼” thick fire stopping material. The maximum size of a standard fire panel is 12’ long and 45.5” wide. The constructed panel weight is 11.42 lbs. per square foot and features FläktGroup SEMCO’s standard roll-formed tongue and grove construction. The FR-Panel is the industry’s only certified fire protection panel that’s also building code-compliant, offering fire protection, integrated structure, and superior transmission loss. The FR-Panel has been third party tested and meets the following standards.

FIRE TESTING

- ASTM-E119 Fire Test
 - In accordance with UL-263
- ASTM E84 – Surface burning
 - Class A, Flame spread: 0; Smoke developed: 5
 - NFPA 251 compliant fire panel

STRUCTURAL TESTING

- ASTM-E72
 - 12’ vertical compression = 11,129 lbs.
 - 4’ horizontal compression = 15,000 lbs.
 - Deflection; L/240 = 0.6”

ACOUSTICAL TESTING:

- ASTM-E90 Sound Transmission Loss, STC 42

THERMAL TESTING:

- ASTM C1363 – R-Value
 - 10.46
- ASTM C236 – U-Value
 - 0.095

ENVIRONMENTAL TESTING

- ASTM E283 – Air Leakage
 - <0.01 cfm/ft2 @ 20 psf
- ASTM E331 – Water Penetration
 - No leakage @ 20 psf

FREQUENCY (HZ)	63	125	250	500	1,000	2,000	4,000	8,000	STC
TRANSMISSION LOSS (DB)	20	28	42	57	63	64	74	71	42

FIGURE 2: Acoustical testing sound transmission loss

PRIOR TO BEGINNING ASSEMBLY

This instruction manual should be used as a general guide for assembling FläktGroup SEMCO’s Fire Panel Enclosures. Carefully read and understand these instructions, as well as, any additional instructions regarding the panel layout drawings before you begin assembling the enclosure. Should you have any questions concerning the assembly procedure, please contact your FläktGroup SEMCO representative.

PLEASE NOTE:

- Maintain a clean work area to avoid debris and dust from collecting on the panels, trim and sealant.
- Special instructions and/or details on the panel layout drawings take precedence over assembly instructions.
- Self-drilling #14 x 3/4” Hex Head Tek® screws are included for the panel trim supplied. (pan head screws will require pilot holes.)
- Butyl rubber sealant is supplied for panel and trim installation but is not required for trim pieces that are joined to the perforated panel skin unless otherwise noted (refer to **STEP 4**) - Sikaflex® is supplied for door installation (refer to **FIGURE 4**).
- Sealants are to be applied in accordance with manufacturer’s instructions.
- Store sealants in accordance with manufacturer’s instructions. If the sealant is exposed to certain weather conditions or is too old, enclosure may leak after unit is completely erected.
- Check shipment when it arrives against the bill of materials (included with drawings). Notify FläktGroup SEMCO within seven days of receipt of panels in case of shortages or damage. FläktGroup SEMCO will not be liable for any shortages or damages claimed beyond seven days.
- Having panels on edge with male edge down usually facilitates selection and accessibility. If enclosure is not to be assembled immediately or if panels are exposed to the weather, take appropriate measures to keep panels dry and allow air circulation between panels. Maintain a clean work area to avoid debris and dust from collecting on panels, curbs and sealant.

STEP 1

BASE CHANNEL

- 1) Using the plan view on the panel layout drawings, chalk a line using the outside dimensions of the enclosure, directly on the curb (or finished structural floor).
- 2) Base channel is supplied in 10 FT lengths with 9/16" holes punched on 24" centers. Cut the base channel to lengths required by the casing outline.

Straight joints are to be butted end-to-end and corner joints are to be lapped. **(FIGURE 3)**

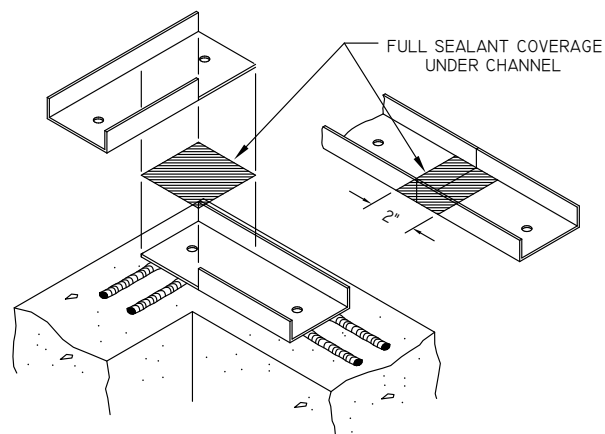


FIGURE 3

- 3) Sweep curb to remove all dust and debris prior to applying sealant. Apply two 1/2" continuous beads of butyl sealant directly on the curb approximately 1/2" to 1" on either side of the base channel center line. **(FIGURE 4)** Do not apply more sealant at one time than will be covered by the base channel within 15 minutes.

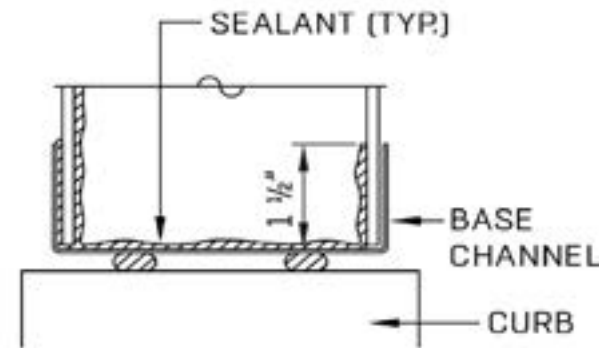
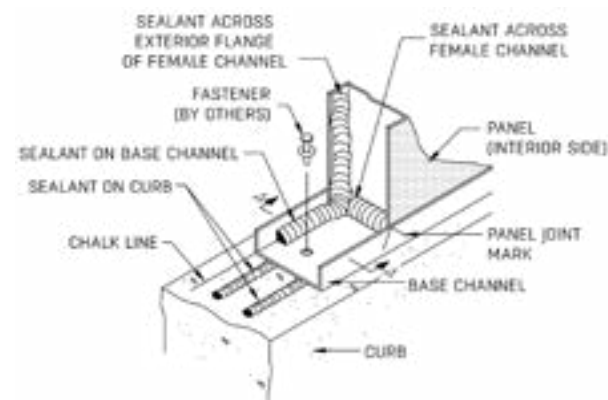


FIGURE 4

- 4) Place the base channel on the sealant keeping the outside edge aligned with the chalk line. Secure the base channel to the curb with the ramset, concrete anchor, expansion studs or other suitable fasteners with 2,000 lb. shear and pullout. (These fasteners are not supplied by FläktGroup SEMCO).

STEP 2

WALL CHANNEL INSTALLATION

- 1) Using the panel layout drawings, follow the wall panel sequence indicated. Beginning with wall #1, mark the dimensioned panel joint for each panel on the base channel for the entire perimeter of the casing. **(FIGURE 5)** Take into account the exposed 1" male edge allowance where indicated on the drawings.

This step will provide a reference point for the location of each panel and will serve to detect and correct any growth in wall length.

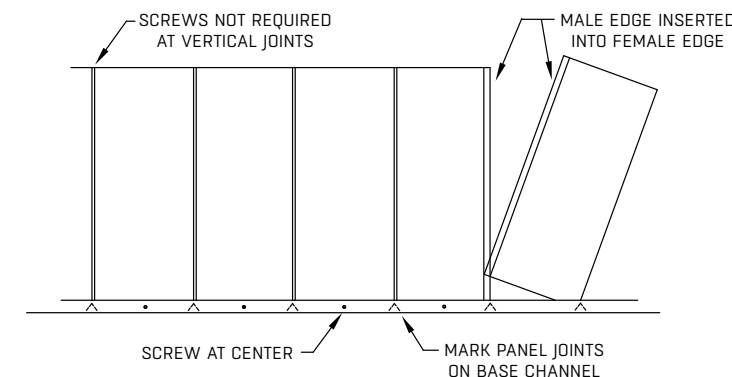


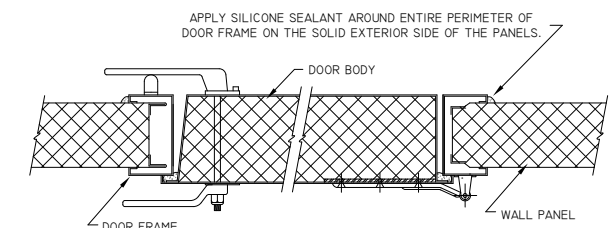
FIGURE 5

- 2) Apply a 1/2" high by 1/2" wide continuous bead of butyl sealant to the outer flange of the base channel for a distance slightly greater than the panel to be installed. Do not apply sealant too far in advance, to avoid potential premature curing or collection of debris.
- 3) All panels are individually piece-marked as indicated on the panel layout drawings and are labeled with these mark numbers on each panel.
Install the first panel, keeping the panel joint aligned with the mark on the base channel. Make certain that the male (<) and female (=) edges are properly indicated on the panel layout drawings.

- 4) Plumb the panel and install a TEK® screw through the base channel at the center line of the panel inside and outside. **(FIGURE 5)**
- 5) Install the next panel in the sequence by placing the female edge near the next joint mark on the base panel. With the panel tilted about 12" above the base, slip the male edge into the female edge of the previously installed panel and lower male edge into place. **(FIGURE 5)** Keep in mind that the panels must be installed with the male edge inserted into the female edge. Adjust the position of the panel

horizontally so that the panel is centered between the joint line marks on the base channel. If necessary, carefully drive the panel into position by driving against a timber placed in the female channel of the panel. *Take extreme care not to damage the roll-formed edges.*

- 6) Install a TEK® screw on the inside of the panel joint, 3" below the top to maintain plumb; however, no additional screws are required in vertical joints for structural rigidity.
- 7) Continue installing panels as described, following the sequence shown on the panel layout drawings. As each panel is installed, the joint line previously placed on the base channel will verify the location of each panel joint.
- 8) **DOOR FRAME INSTALLATION MUST COINCIDE WITH THE PANEL INSTALLATION. IT IS IMPOSSIBLE TO PUT THEM IN AT A LATER DATE.** Doors must be installed to open against air-pressure to ensure an air-tight seal. Caulk the exterior perimeter of the door frame with silicone sealant. **(FIGURE 5)**
- 9) **IMPORTANT:** After the installation of all of the wall panels is complete, TEK® screw both sides of the base channel through each panel joint and at 12" on center between the joints.



STEP 3

ROOF PANEL INSTALLATION

- 1) Review the roof plan on the panel layout drawings and locate the roof panels. If structural reinforcement is required, it must be installed prior to the roof panels.
- 2) Install inside trim at the joint where the roof and walls meet. The upper edge of the trim must be level and flush with the highest point of the wall panels. (FIGURE 6) Fasten the trim to the assembled wall panels with TEK® screws through every panel joint and at 12" on center between joints.

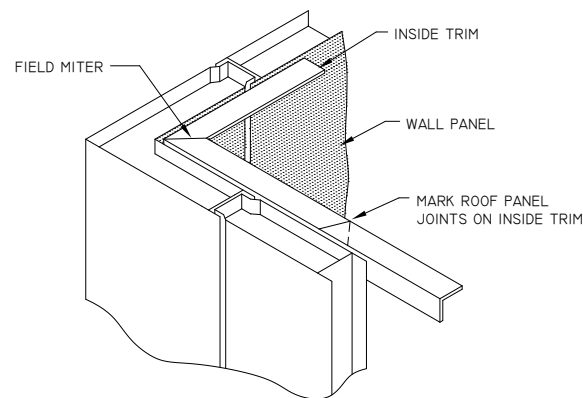


FIGURE 6

- 3) Mark roof panel joints (as dimensioned on the panel layout drawings) on the inside trim before installing roof panels. (FIGURE 6) Take into account the 1" male edge allowance where indicated on the drawings.
- 4) Install the first roof panel keeping the joint aligned with the mark on the inside trim. Square the panels with the walls and fasten both ends of the roof panel through the inside trim near the center line of the panel with the TEK® screws. Make certain that the male (<) and female (=) edges are properly orientated as shown on the panel layout drawings, and place the TEK® screw 12" on center through the male (<) female (=) joint. (FIGURE 7) Keep in mind that the panels must be installed with the male edge inserted into the female edge.

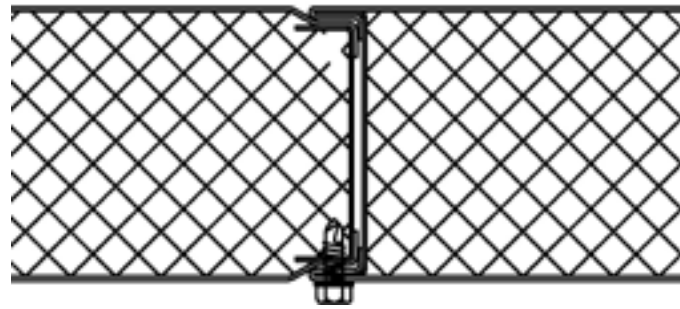


FIGURE 7

- 5) Apply the sealant generously to the exterior flange of the female channel on the previously installed roof panel and install the next panel. Again, it is important to maintain proper alignment with the joint line marks on the inside trim.
- 6) After installation of all roof panels is complete, TEK® screw the inside trim through the roof panel joints internal channels and at 12" on center.

STEP 4

TRIM INSTALLATION

*At all locations where the sealant symbol is shown (●) or sealant is noted, apply a 1/2" x 1/2" continuous bead of butyl sealant.

- 1) All trim is supplied in 10 FT. lengths to be field cut to length as necessary. Trim is to be secured to panels with self-drilling TEK® screws, through each panel joint, internal stiffener and at 12" on center.
- 2) Install inside trim where interior wall panels meet exterior wall panels. (FIGURE 8) Sealant is not required for trim pieces that are joined to interior, perforated panel skin. (FIGURE 8)

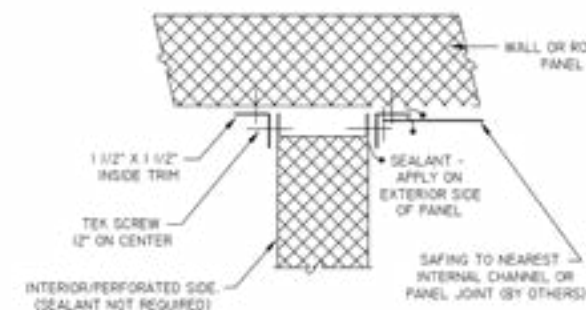


FIGURE 8

- 3) Apply butyl sealant to both legs of outside trim and install vertical outside trim where pre-formed corner panels are not used. Attach the trim such that it runs from the top of the roof panels to the curb, overlapping the base channel. Field notch kicks at trim overlapping the base channel. (FIGURE 9)

Attach vertical inside trim along interior corners where pre-formed corner panels are not used.

- 4) Apply butyl sealant to both legs of horizontal outside trim and fasten it to the roof and wall panels providing a tight seal. Trim is to be secured to panels with self-drilling TEK® screws, through each panel joint, internal stiffener and at 12" on center. The field notch kicks at the trim overlap. Miter as required. (FIGURE 9)

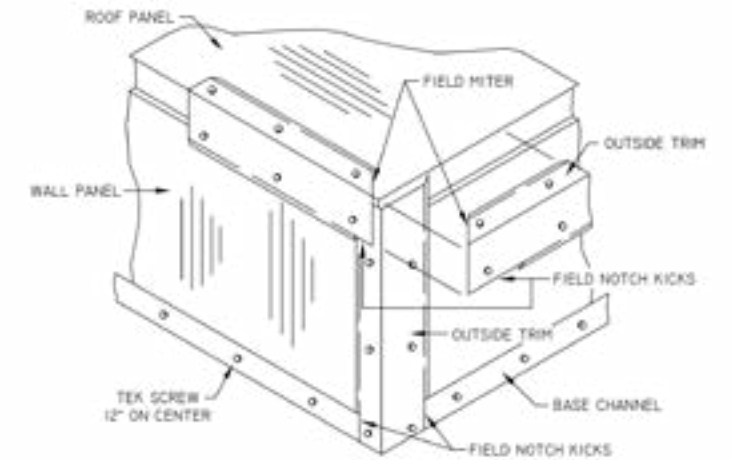


FIGURE 9

- 9) Where splices are necessary, overlap trim by 6" and coat the overlap with butyl sealant. Install TEK® screws at center overlap and 1" beyond. (FIGURE 10)

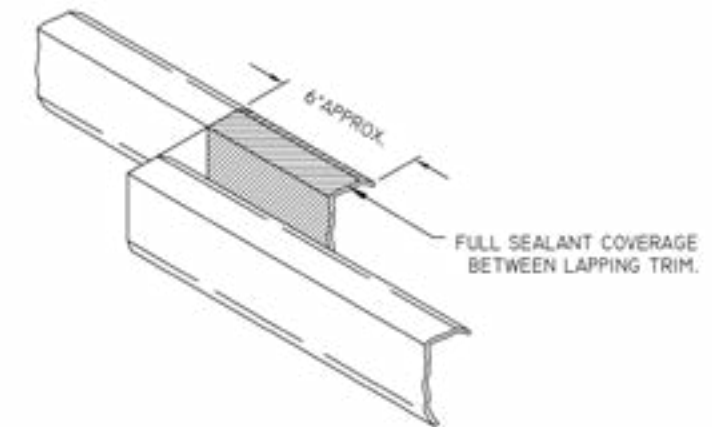


FIGURE 10

- 10) Cap channel is supplied for trimming all exposed panel edges and framing all rectangular openings in the enclosure. Field cut and install cap channel to form a false miter. (FIGURE 11) Apply butyl sealant along the panel's exterior edge and fasten the cap channel to the panels with TEK® screws at 12" on center.

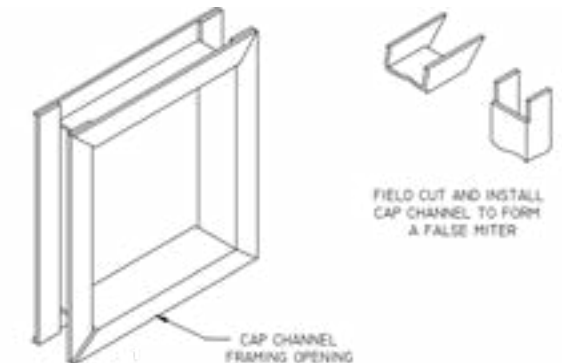


FIGURE 11

PLEASE NOTE: Special trim applications not pictured in this booklet may be required on a particular enclosure and will be detailed on the final panel layout drawings.

STRUCTURAL STEEL

- 8) Structural steel must be field welded and secured in place as necessary. All structural steel is to be secured to panels through tongue and groove panel joints and internal panel stiffeners with a fastener rated at a minimum of 1,000 lb.. shear and pullout.

In positive pressure areas, steel will require additional through bolts through tongue and groove panel joints to prevent uplift of panels at operating pressures. **(FIGURE 12)**

**Structural steel fasteners will not be provided by FläktGroup® SEMCO®.*

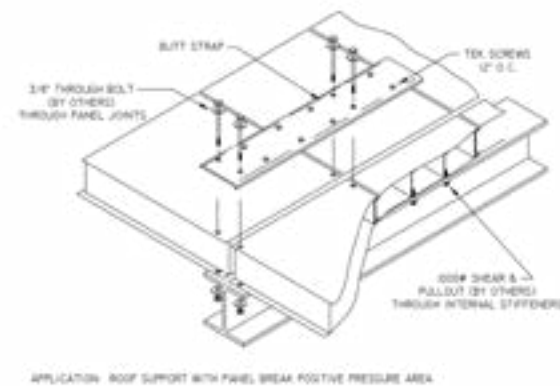
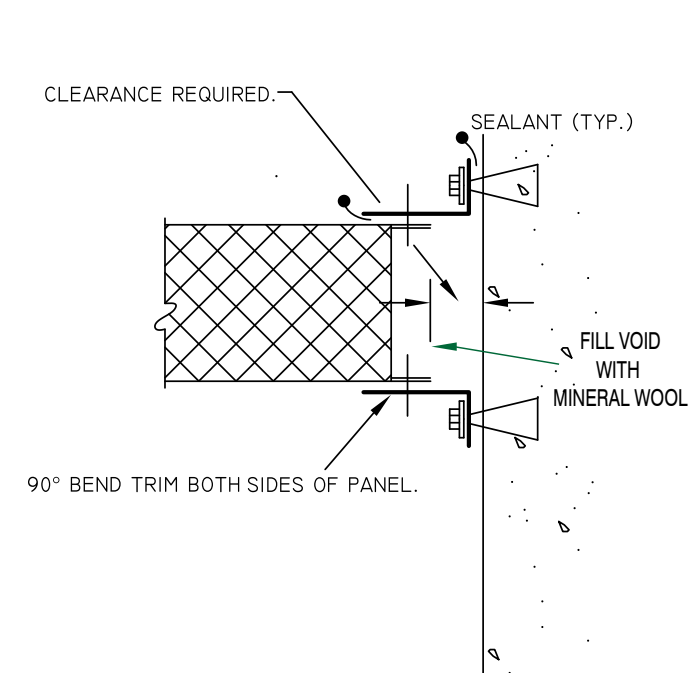


FIGURE 12

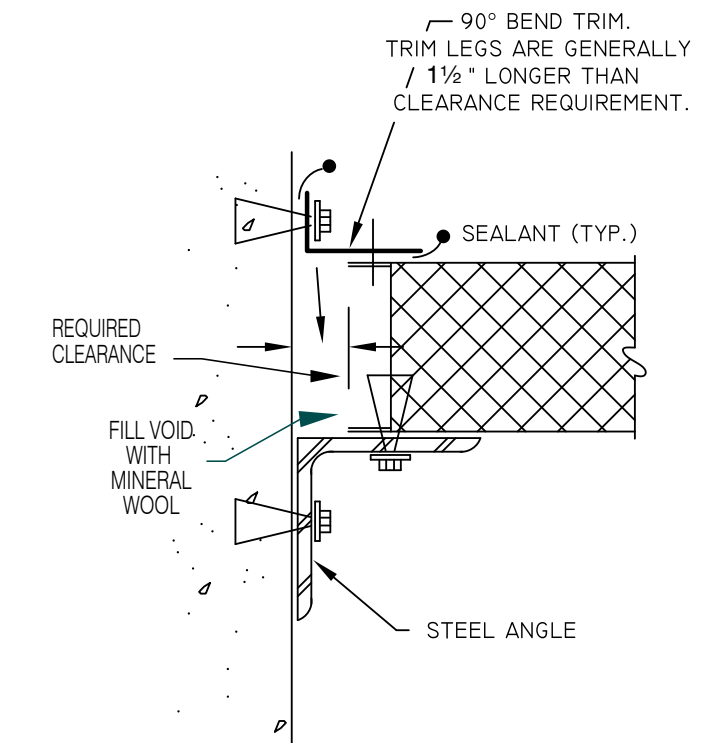
- 9) On enclosures where FläktGroup SEMCO is supplying structural steel, that steel will be supplied in standard 10 FT. and 20 FT. lengths to be field cut as necessary.
- 10) Refer to panel layout drawings for further details on structural steel reinforcement.

DETAILS AND DRAWINGS

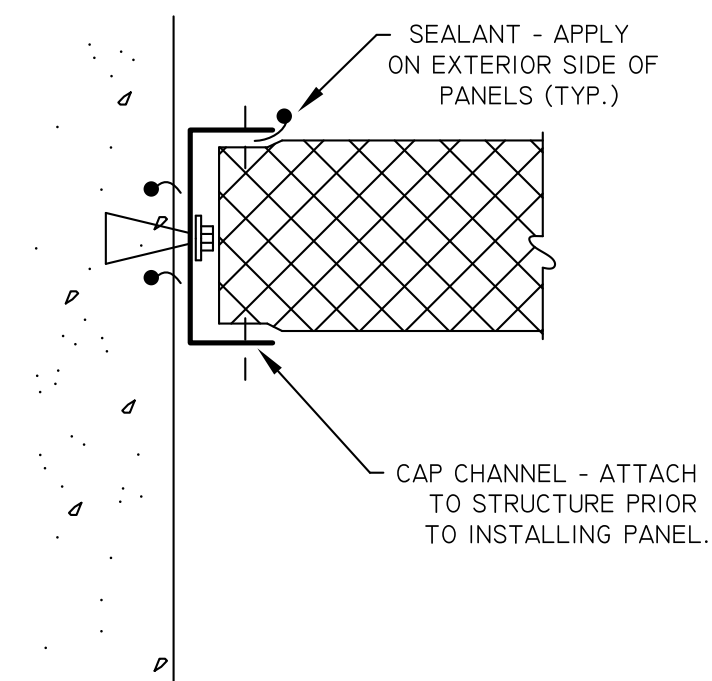
PANEL TO STRUCTURE - ANGLE



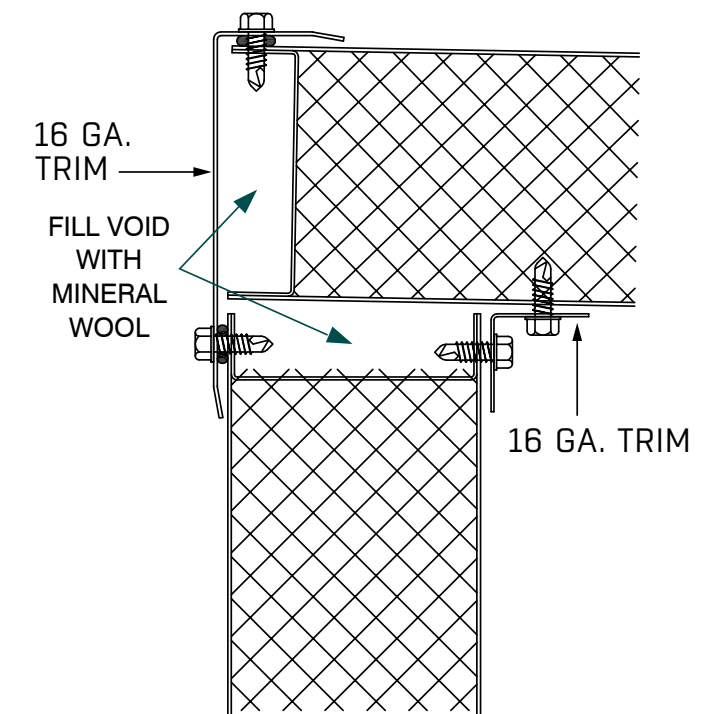
PANEL TO STRUCTURE - HD



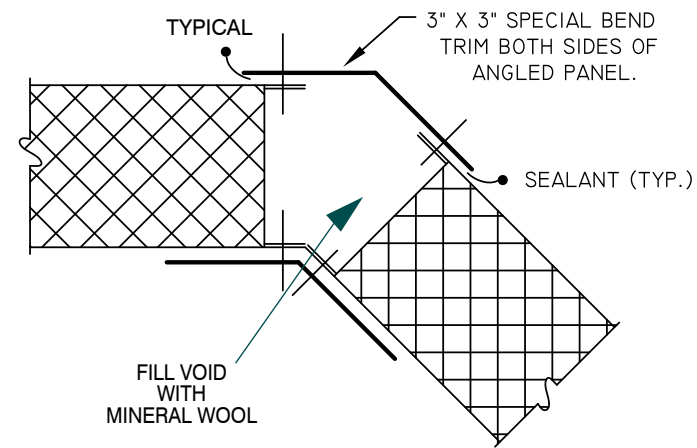
PANEL TO STRUCTURE - CAP



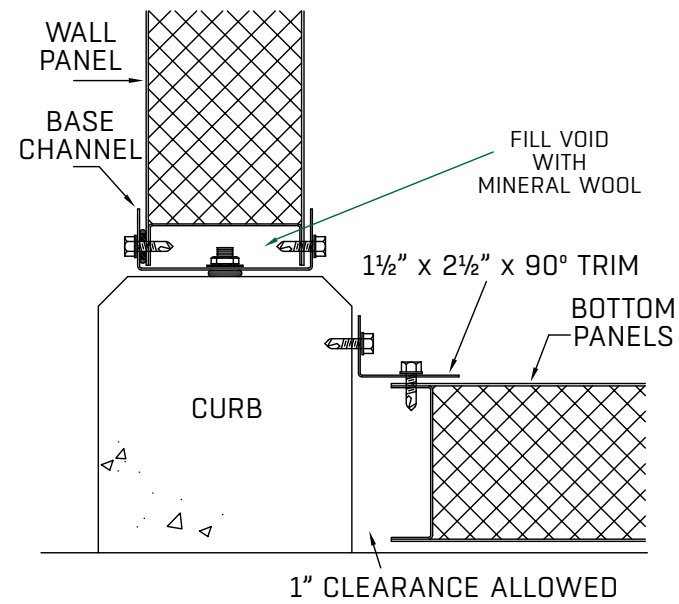
STANDARD 90° CONNECTION



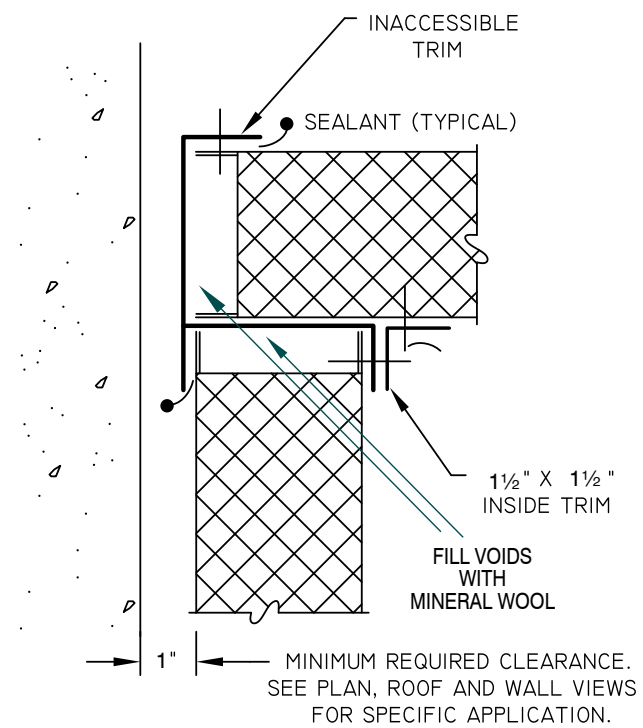
ANGLED PANEL TRIM



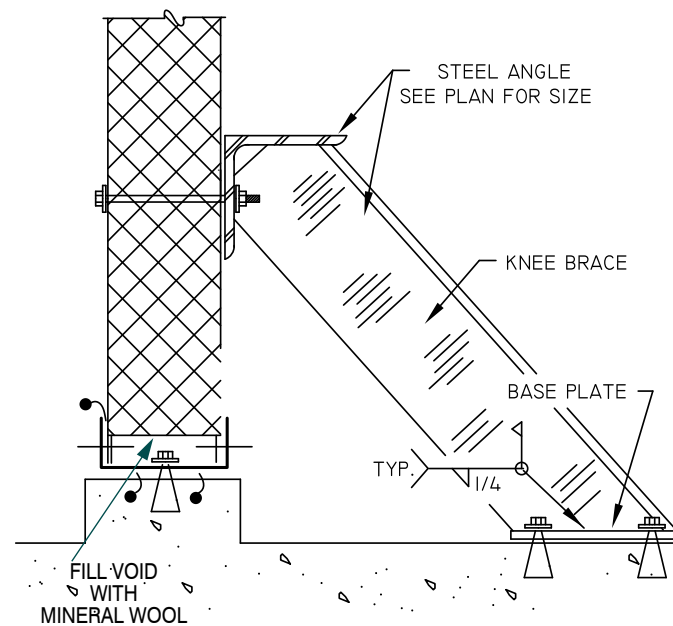
FLOOR CONNECTION AT CURB



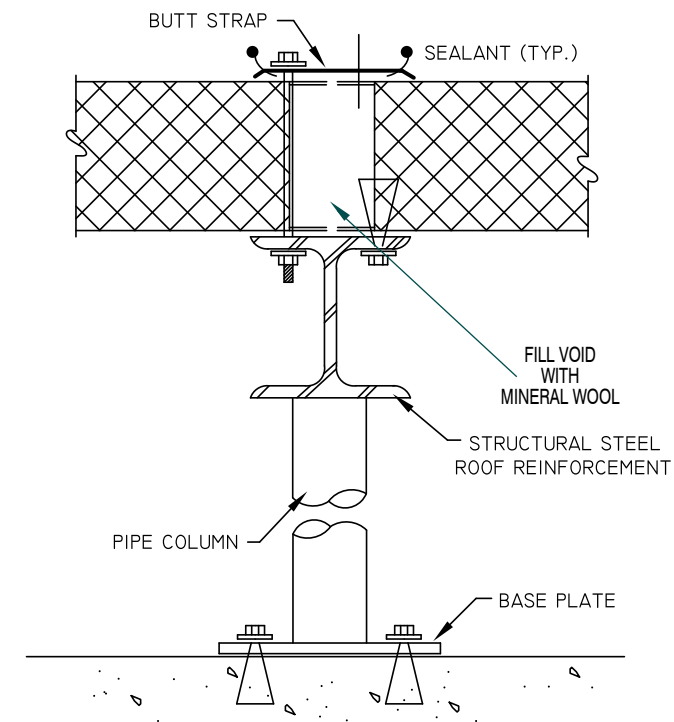
INACCESSIBLE TRIM



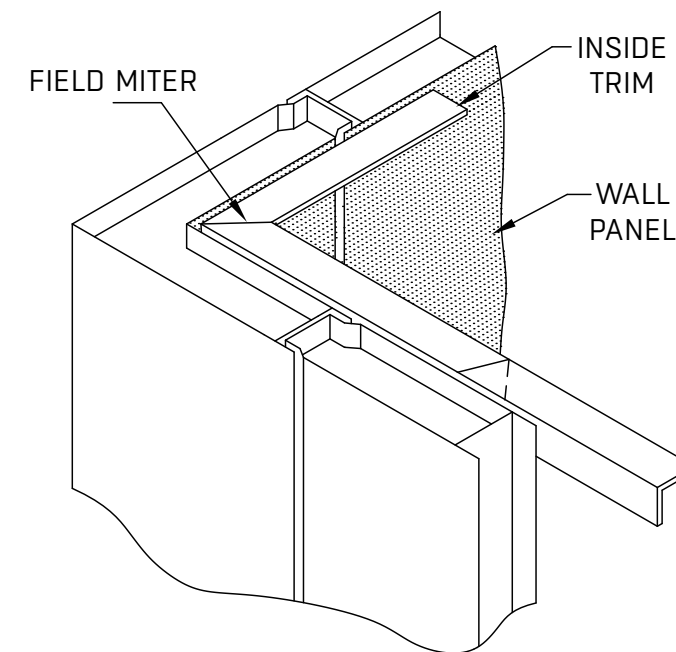
WALL PANEL SUPPORT KNEE BRACE



ROOF PANEL SUPPORT WITH BREAK



ROOF PANEL



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