



# CONSTRUCTION GUIDE

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NOTE: Enercept Technical Bulletins (refer to Enercept website or bulletin updates) supersede drawings, procedures, and requirements shown in this Guide.



This construction guide provides guidance for the installation of your Enercept panel project. Thoroughly read and become familiar with this guide before beginning. The energy efficiency, strength and construction techniques of this building system are a result of extensive engineering, design, testing and experience.

Before starting work on your project, we recommend that you contact your local insurance agent to provide you with the proper coverage in all phases of construction and building management.

Above all, we want your business and are confident you will appreciate our product and doing business with us.

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# SECTION 1

## GENERAL INFORMATION



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# GENERAL CONSTRUCTION PROCEDURES

1. Handling / Panel Storage: Do not lift or carry panels by the top skin recesses (panel edges). Stack panels on an elevated, level, well drained area on blocks (dunnage) spaced 6' or less and protect from the elements with tarps or similar protective coverings. The OSB sheathing and connection members of the panels are wood products and may swell after exposure to moisture.
2. Inventory panels, plate material, beams, connectors, sealants or any other supplied materials upon delivery.
3. Enercept panels are combustible and should not be exposed to flame or other ignition sources.
4. Review all panel layouts, section / details and construction guide before starting construction. Project specifics, panel layouts, sections, and electrical supersede the Enercept construction guide.
5. Footing / Slab / Floor System: Must be LEVEL and SQUARE before the sill plate is installed. Squareness and proper alignment of the sill plates are critical to the Enercept System. (See foundation, basement and wall sections.) Double check foundation or floor system dimensions.
6. All straps and hold downs must be installed as specified.
7. Follow all recommended nail, connector and screw spacings.
8. Drill matching access holes in sill and top plates that align with the vertical electrical chases in the wall panels.
9. Builder must continually check to make sure that all centerline dimensions are maintained. (See basement and wall sections & notes on management of growth.)
10. Enercept is not responsible for on-site alterations or modifications to the panels as manufactured unless: (A) illustrated in the Enercept Construction Guide, (B) approved in advance by authorized Enercept personnel, or (C) shown on the Enercept panel layout /section drawings.  
(CALL BEFORE YOU CUT).
11. Adequate wind and temporary bracing must be used during construction.
12. Seal all penetrations in the panels after plumbing and electrical are in place with expanding foam sealant, including electrical, plumbing and HVAC.

# GENERAL CONSTRUCTION PROCEDURES

13. Before backfilling basement / foundation panels, the upper and lower floor system, framing anchors, joist / truss blocking and any shear walls that are required must be installed. Follow backfill guidelines (see basement section).
14. Use only sealants and sill sealer approved for use with expanded polystyrene foam (EPS). Panel joints must be sealed to prevent air infiltration / exfiltration.
15. Seam tape is applied to interior panel seams only (typically the warm side of the panel).
16. Wall and roof panels must be completely dry before covering with house wraps, building paper, and roofing materials.
17. All over-framed areas must be ventilated.
18. Please make SAFETY your first and foremost consideration.

## IMPORTANT!

Your Enercept home has been designed to be very air tight. We highly recommend that you work with a heating, ventilation, and air conditioning (HVAC) professional to design a ventilation system that will insure indoor air quality and moisture/humidity control. Seam tape, as outlined later, should be installed to protect panels from exposure to indoor moisture and humidity. Failure to control indoor humidity may cause moisture damage to your panels.

Air-to-air heat exchangers / ventilators are commonly used in Enercept structures.

## MATERIALS LIST

The following items are included in the Ready To Assemble (RTA) standard Enercept System package (Wall & Structural Roof panels).

1. 2x sill plate (treated if required)
2. Wall panels with pre-cut door/window R.O.'s
3. 16" horizontal electrical chases / 44" chases at kitchen & bath
4. Vertical electrical chases (door / windows)
5. Gable panels / gabled wall panels
6. 2x single top plate and 1 1/4" cap plate
7. Center ridge / valley beams (optional)
8. Roof panels
9. Wall & roof connectors (as required)
  - A. "T" connectors / beam brackets
  - B. Framing anchors
  - C. SIP screws
10. Wall to roof EPS wedge
11. Wall to roof wood support block
12. 1 1/2" or 3/4" OSB strips (window trim)
13. Sealant
14. Expanding foam sealant & cleaner (optional)

## GENERAL INFORMATION

Window / Door jamb sizes (using 1/2" drywall): 4" wall panels - 4 15/16", 6" wall panels - 6 15/16", 8" wall panels - 8 11/16", 6" basement panels - 7", 8" basement panels - 8 3/4".

**Enercept does not recommend the use of recessed lighting or heating panels in all panels.**

All flame sources, i.e. fireplace, furnace, water heater, etc., require a supply of external combustion air.

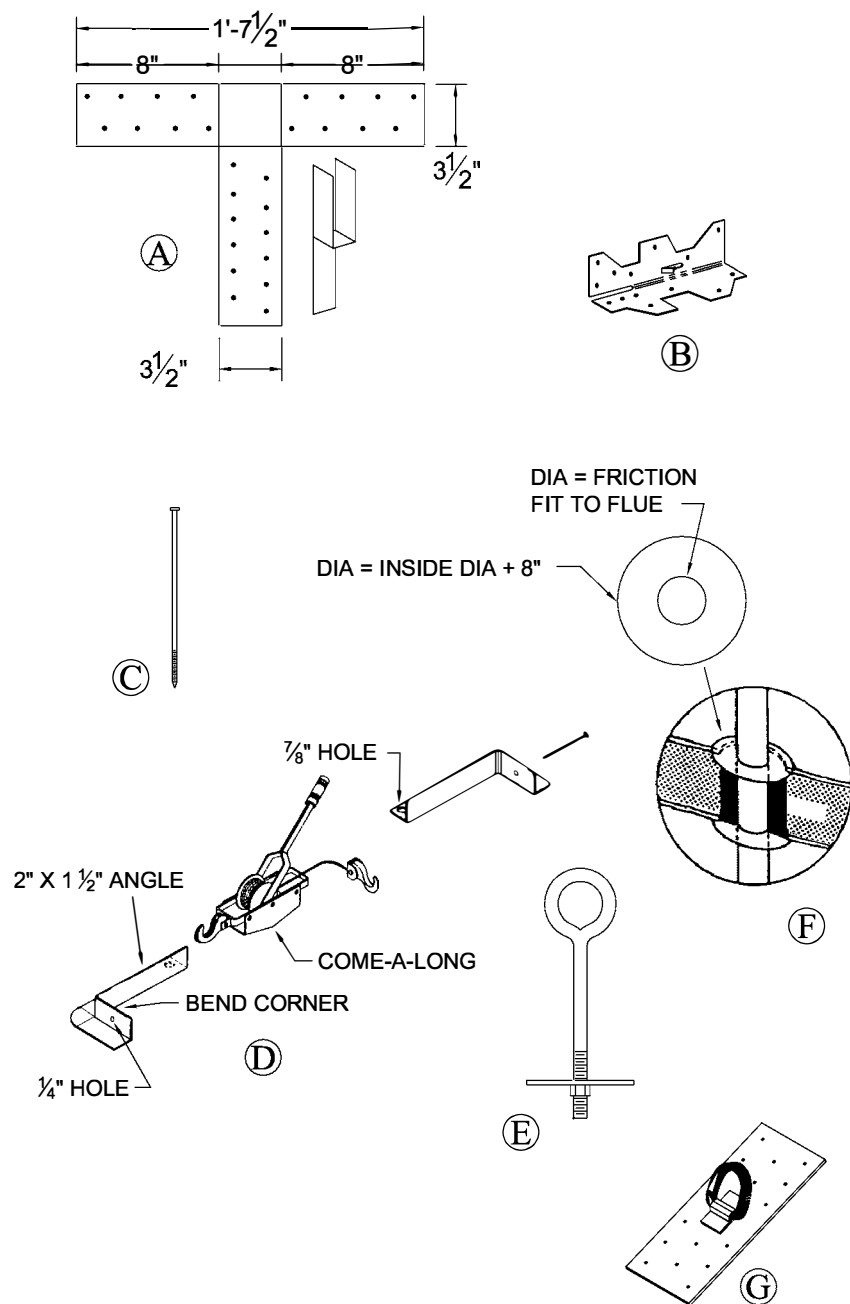
**Copper shingles / copper roof coverings should not be applied directly to Enercept roof panels.**

## TOOLS REQUIRED

- |                      |                             |
|----------------------|-----------------------------|
| 1. Hammer            | 9. Circular saw             |
| 2. Tape measure      | 10. Small flat pry bars     |
| 3. 3'-4' Level       | 11. Ladder(s)               |
| 4. Hand saw          | 12. Stringline              |
| 5. Square            | 13. Pipe clamps             |
| 6. Electric drill    | 14. Come-a-long             |
| 7. Ratchet straps    | 15. Panel lifting equipment |
| 8. 1-1 / 2" Wood bit |                             |

## FASTENERS REQUIRED

1. 8d - Stainless Steel (304) nails (Bsmt. / Fdn.)  
Int. & Ext.
  2. 16d - Stainless Steel (304) nails (Bsmt. / Fdn.)  
Int. & Ext.
  3. 8d nails
  4. 16d nails
  5. 3" Drywall screws (interior wall attachment)
- \* **Enercept does not recommend the use of staples for fastening panels.**
- \* **Use Stainless Steel (304) or hot dipped galvanized nails for interior basement panels.**



## ENERCEPT PANEL CONNECTORS, STRAPS, TIES & SCREWS

### A. "T" Connector

Secures center beam to gable wall beam support post. (26ga)

### B. Framing Anchor

Ties floor system to basement I foundation panel top plates & is used around basement windows. (Simpson A35 or USP MP Al connector)

### C. Structural Insulated Panel (SIP) Screw

Features pancake head, comes in 3 1/2"-18" lengths. Fastening pattern is depicted on panel layout

### D. Come-A-Long w/ "L" Brackets (contractor supplied)

Apparatus to assist in pulling panels together

### E. Roof Eye bolt (contractor supplied\*)

3/4" x 16" eye bolt w/ 3/4" nut & 6" x 1/4" steel plate for lifting roof panels into position. Insert eye bolt through panel and secure with 6" plate & nut, lift into place. Seal hole with expanded foam sealant. Use 1 for 4' wide panels & 2 for 8' wide panels.

### F. Chimney Collars (required) (contractor supplied)

Effectively positions chimney the proper distance from panel opening, creating a 3" cavity for installation of high temperature insulation, i.e. vermiculite, rock wool, etc.

### G. Lifting Plates (contractor supplied\*) for lifting roof panels

Attach (2) lifting plates per 4' wide panel and (4) lifting plates per 8' wide panel

**\* May be purchased from Enercept. Non-refundable and non-returnable.**

# FINISHING YOUR ENERCEPT STRUCTURE

Roof panels must be completely dry before covering with roofing materials, to prevent moisture damage.

Termites / Carpenter Ants - If you are building in an area that has problems with these insects, you should contact a local expert for their recommendations on long term control methods (before completing exterior finishes).

The exterior side of the wall panels must have a weather-resistant exterior wall envelope consisting of flashing, a water-resistive barrier (Tyvek®, TYPAR®, Barricade®, etc.) and an approved wall covering material (siding, brick, etc.).

Lap siding is to be nailed at on 12" center spacings using 6d galvanized ring - shank nails or per the siding manufacturer's recommendation.

When applying brick (the use of brick ledge is recommended), stucco, Dryvit, or any EFIS system to your Enercept structure, building codes require (2) layers of Class D building paper, or a code approved alternative. Panels should also have an additional drainage plane.

Use 3" screws to fasten all interior partition walls to wall & roof panels.

After installation of doors and windows, use expanding foam sealant to fill the spaces between the rough opening and the door or window jamb, carefully following the directions on the canister.

Install the seam tape over the inside (the "warm in winter side" in northern climates) of the exterior wall and roof panels before installing drywall or other interior coverings to protect panels from potential moisture damage.

Apply drywall to the walls and roof of the Enercept home after electrical and plumbing rough-in is complete and before constructing interior non-support walls. This reduces waste and speeds up drywall installation.

# FINISHING YOUR ENERCEPT STRUCTURE

Use 1 ¼" drywall screws for application of drywall. Enercept panel seams and drywall seams must be staggered a minimum of 1'-0".

Seal all penetrations in the panels with expanding foam sealant, including electrical, plumbing and HVAC.

Properly flash openings including windows, doors, skylights, plumbing stacks, chimneys, exterior lights / outdoor fixtures, air exchanger & exterior dryer vents. (Flashing not supplied by Enercept.)

# MATERIAL WEIGHTS

| Panel Weights (Approximate)    |                 |
|--------------------------------|-----------------|
| Panel Size                     | Lbs / Square Ft |
| 4" with 2x connector           | 3.22            |
| 6" with Thermal Post connector | 4.03            |
| 8" with 2x connector           | 4.05            |
| 10" with 2x connector          | 4.5             |
| 12" with 2x connector          | 4.78            |

| Doug Fir Glulam Beam Weights |                    |
|------------------------------|--------------------|
| Size                         | Weight / Lineal Ft |
| 3 1/8 x 6                    | 4.5                |
| 3 1/8 x 7 1/2                | 5.6                |
| 3 1/8 x 10 1/2               | 7.8                |
| 3 1/8 x 12                   | 8.9                |
| 3 1/8 x 13 1/2               | 10.0               |
| 3 1/8 x 15                   | 11.1               |
| 3 1/8 x 16 1/2               | 12.2               |
|                              |                    |
| 5 1/8 x 6                    | 7.3                |
| 5 1/8 x 7 1/2                | 9.1                |
| 5 1/8 x 10 1/2               | 12.8               |
| 5 1/8 x 12                   | 14.6               |
| 5 1/8 x 13 1/2               | 16.4               |
| 5 1/8 x 15                   | 18.3               |
| 5 1/8 x 16 1/2               | 20.1               |
| 5 1/8 x 18                   | 21.9               |
| 5 1/8 x 19 1/2               | 23.7               |
| 5 1/8 x 21                   | 25.6               |
| 5 1/8 x 22 1/2               | 27.4               |
| 5 1/8 x 24                   | 29.2               |
| 5 1/8 x 27                   | 32.9               |
| 5 1/8 x 30                   | 36.5               |
|                              |                    |
| 6 3/4 x 12                   | 19.2               |
| 6 3/4 x 13 1/2               | 21.6               |
| 6 3/4 x 15                   | 24.0               |
| 6 3/4 x 16 1/2               | 26.5               |
| 6 3/4 x 18                   | 28.9               |
| 6 3/4 x 19 1/2               | 31.3               |
| 6 3/4 x 21                   | 33.7               |
| 6 3/4 x 24                   | 38.5               |
| 6 3/4 x 27                   | 43.3               |
| 6 3/4 x 30                   | 48.1               |

| Southern Yellow Pine Glulam Beam Weights |                    |
|------------------------------------------|--------------------|
| Size                                     | Weight / Lineal Ft |
| 3 1/8 x 3 1/8                            | 2.3                |
| 3 1/8 x 5 1/2                            | 4.1                |
| 3 1/8 x 6 7/8                            | 5.1                |
| 3 1/8 x 9 5/8                            | 7.1                |
| 3 1/8 x 11                               | 8.2                |
| 3 1/8 x 12 3/8                           | 9.2                |
| 3 1/8 x 13 3/4                           | 10.2               |
| 3 1/8 x 15 1/8                           | 11.2               |
| 3 1/8 x 17 7/8                           | 13.3               |
| 3 1/8 x 20 5/8                           | 15.3               |
| 3 1/8 x 22                               | 16.3               |
| 3 1/8 x 24 3/4                           | 18.4               |
|                                          |                    |
| 5 1/8 x 5 1/2                            | 6.7                |
| 5 1/8 x 9 5/8                            | 11.7               |
| 5 1/8 x 11                               | 13.4               |
| 5 1/8 x 12 3/8                           | 15.1               |
| 5 1/8 x 13 3/4                           | 16.7               |
| 5 1/8 x 15 1/8                           | 18.4               |
| 5 1/8 x 17 7/8                           | 21.8               |
| 5 1/8 x 20 5/8                           | 25.1               |
| 5 1/8 x 24 3/4                           | 30.1               |
|                                          |                    |
| 6 3/4 x 6 7/8                            | 11.0               |
| 6 3/4 x 9 5/8                            | 15.4               |
| 6 3/4 x 11                               | 17.6               |
| 6 3/4 x 12 3/8                           | 19.8               |
| 6 3/4 x 13 3/4                           | 22.0               |
| 6 3/4 x 15 1/8                           | 24.2               |
| 6 3/4 x 17 7/8                           | 28.7               |
| 6 3/4 x 20 5/8                           | 33.1               |
| 6 3/4 x 24 3/4                           | 39.7               |



# SECTION 2 FOUNDATION PANELS

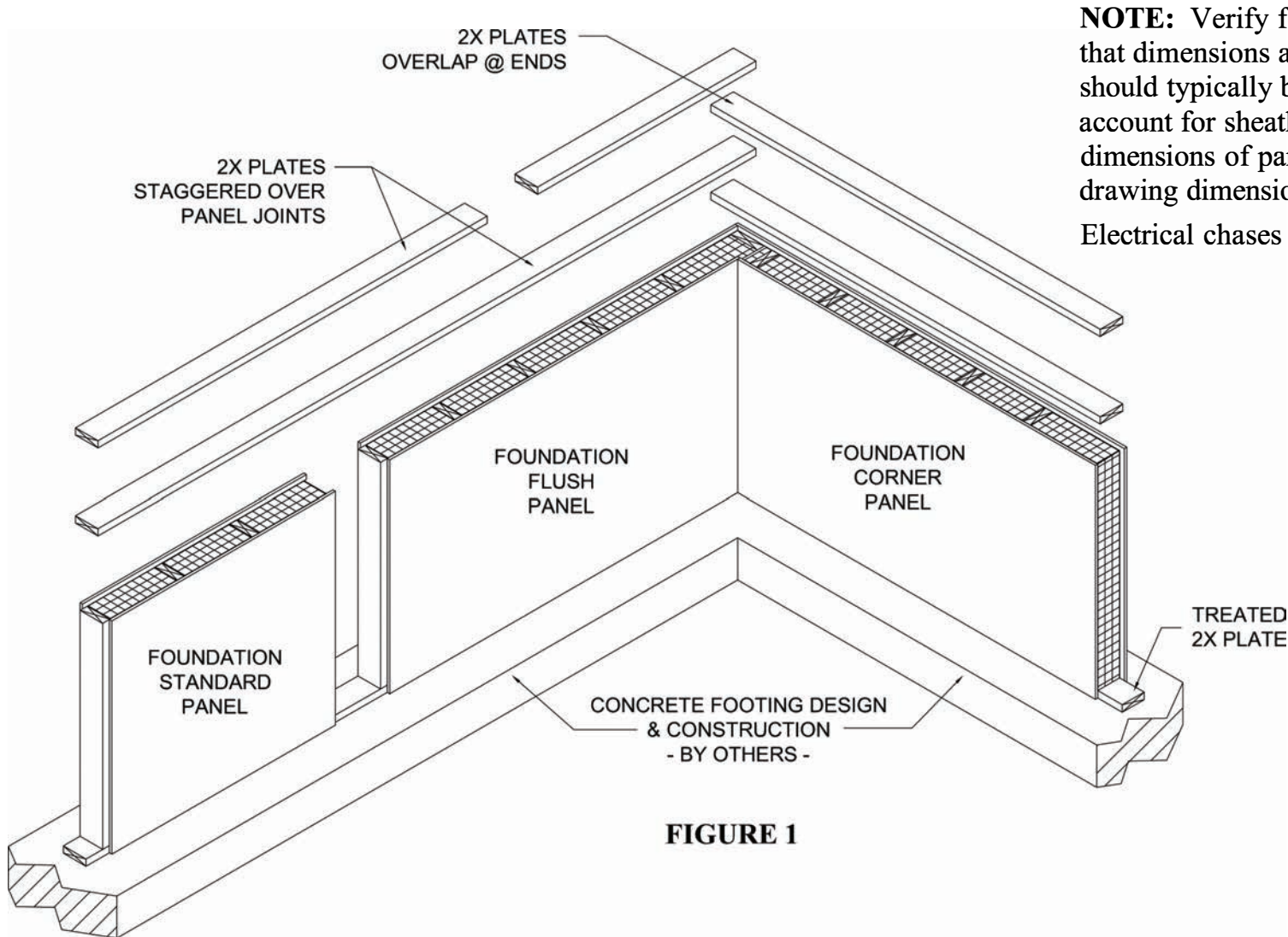


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# FOUNDATION PANELS



**NOTE:** Verify footings are plumb, square, and that dimensions are correct. Treated sill plates should typically be set inwards by 1/2" to account for sheathing and to ensure outside dimensions of panels are consistent with drawing dimensions.

Electrical chases provided by special order only.

**FIGURE 1**

Foundation panels constructed with 3 1/2", 5 1/2", or 7 1/2" EPS core, 1/2" treated plywood interior and exterior sheathing with treated 2x members on 16" centers. Panel height of 4'-0 3/8" unless otherwise specified.

## FOUNDATION, SLAB, BACKFILL AND WALL TREATMENT

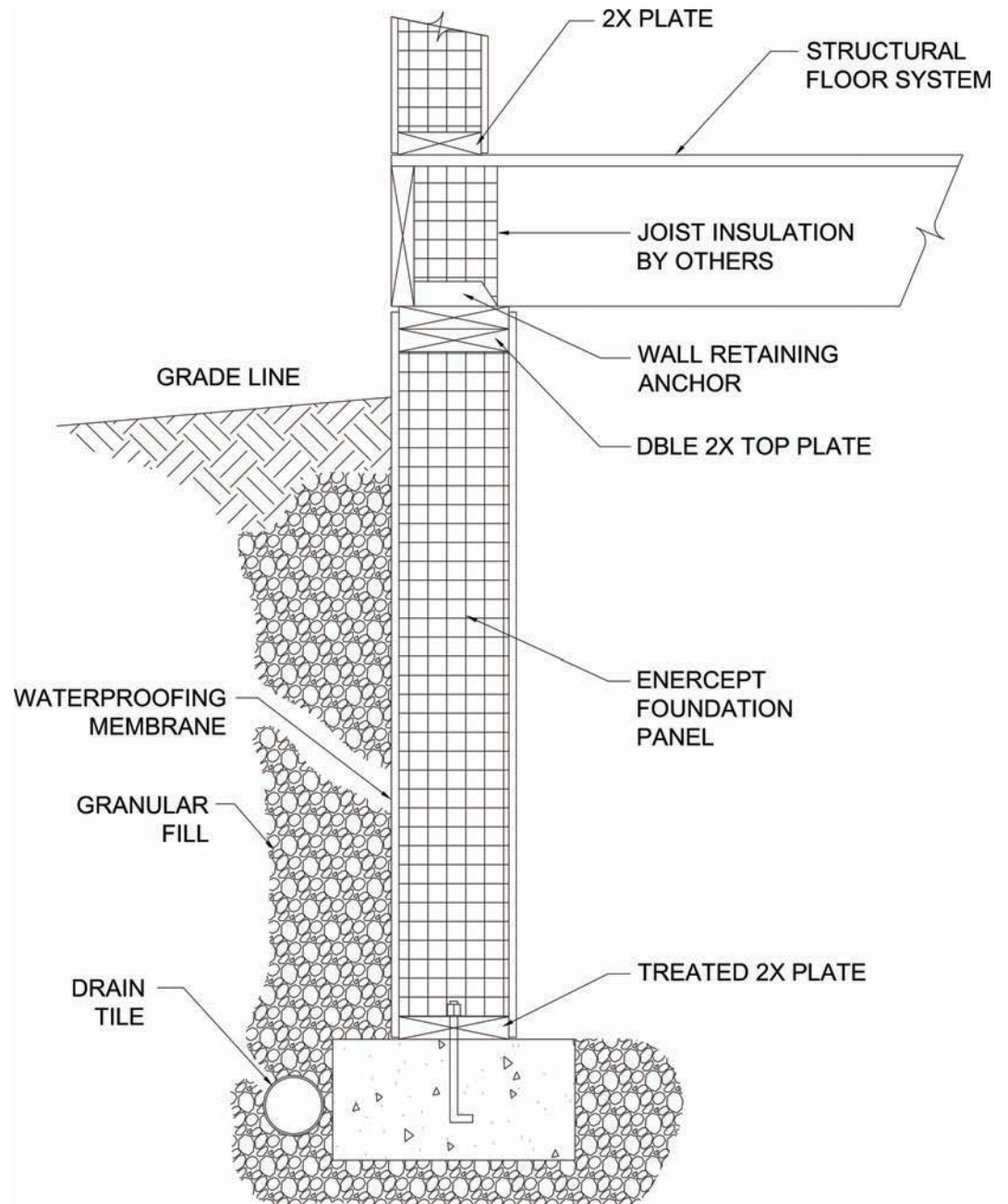
- A. Cover all exterior joints with sealant.
- B. Apply a waterproofing membrane approved for below grade applications per code, from the footing to the top of the foundation panel.
- C. Floor deck for the upper level must be installed before backfilling, including the metal clips at the top of the wall. Refer to item B on page 1-5.
- D. With drain tile in place, crushed rock is used for backfill as shown.
- E. To control drainage, backfill and landscaping must be sloped away from the foundation walls.

### BACKFILL TREATMENT

- A. Panels are designed for 30 pcf hydraulic pressure. Contact your building officials regarding extreme soil conditions in your area.
- B. Backfilling should be completed evenly in 1 foot lifts around the entire structure.
- C. Backfill depth should be consistent on the interior and exterior from the top of the foundation panel.
- D. To control drainage, backfill and landscaping must be sloped away from the foundation walls.

### **NOTE:** FOUNDATION PANEL NAILING PATTERNS

The foundation panel nailing pattern at the vertical joint should alternate with factory nailing 6" O.C. Sill & top plates should be nailed at 6" O.C. All nails should be Stainless Steel (304) nails.



**FIGURE 1**

# SECTION 3 FLOOR PANELS



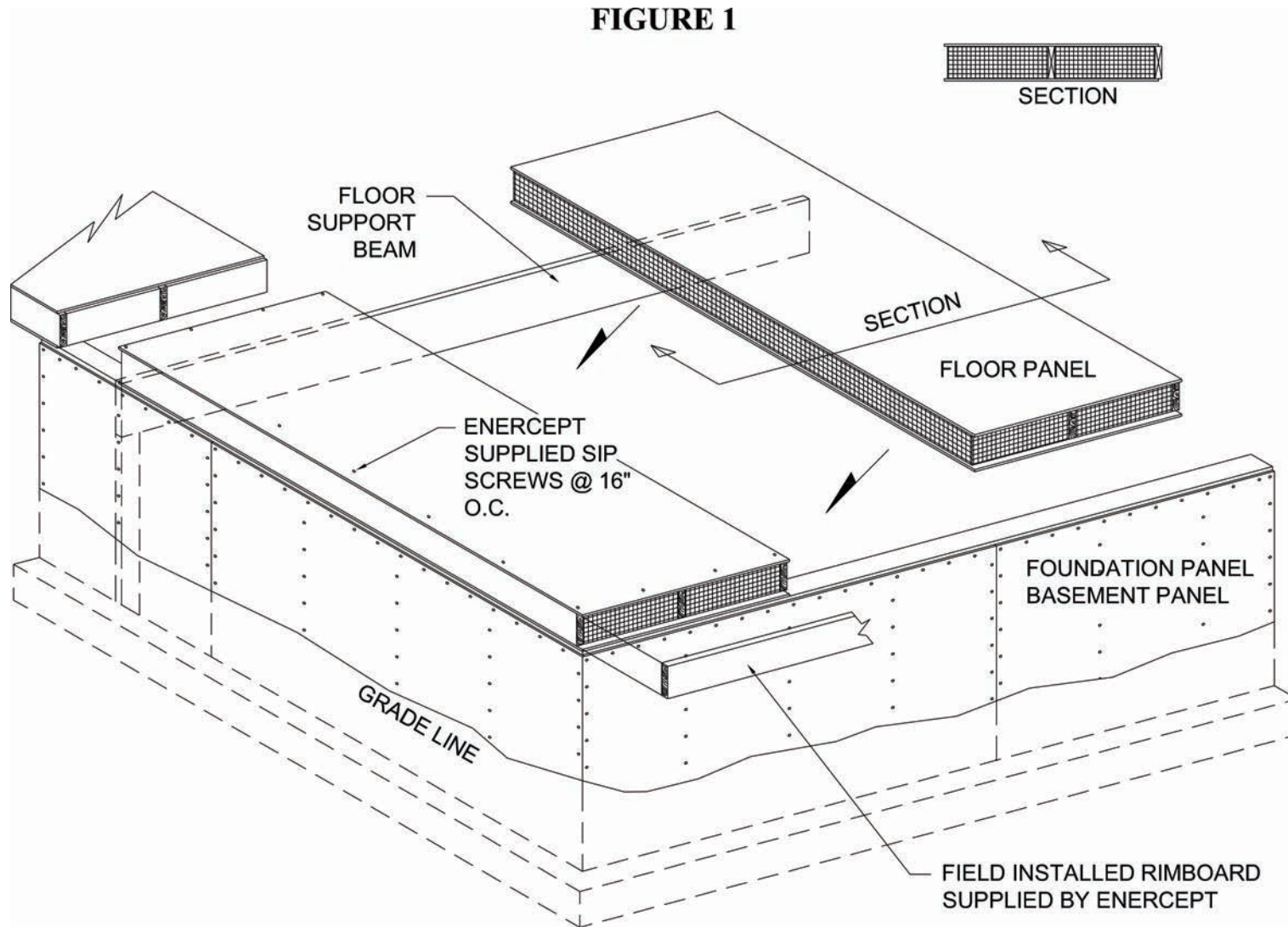
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# TYPICAL FLOOR PANEL LAYOUT



# FLOOR PANELS

1. Before placement of floor panels, make sure all foundation, basement or wall panels are plumb and braced against movement. Double check foundation dimensions are level and square.
2. Apply a continuous bead of sealant or sill seal on the top plate of the foundation wall. Use sealant compatible with EPS.
3. Set and square 1st floor panel into position, with the interior edge centered over the floor support beam, and the exterior edge flush with the outside of the wall.

**NOTE:** It is important that the floor panels sit square with the floor support beam and wall panels.

4. Fasten floor panels to the wall panels and floor support beam with provided screws on 16" centers or as indicated on the panel shop drawings. Apply sealant between each adjoining floor panel. Refer to shop drawing details.
5. Continue setting the floor panels (following steps 3 & 4) as described above until finished. Nail all adjoining panel edges on both sides, using 8d nails 6" o.c. or as indicated on the panel shop drawings.

**NOTE:** Enercept recommends measuring periodically for growth as panels are set in place. If panel growth is occurring, you may have to recess the foam and trim the sheathing back accordingly, to maintain intended dimensions. Failure to check growth could effect location of rough openings.

6. Apply sealant to the outside recess of the floor panel and install the factory supplied 2x / LVL faceplate, using 8d nails on 6" centers to fasten faceplate through the top sheathing layer. Use 16d nails to fasten faceplate to the panels' joists and for toenailing at the bottom of the faceplate into the plates below.
7. After floor panels are installed, they should be protected from exposure to moisture. Moisture may damage panels.
8. The floor panels are intended to have an additional layer of material, such as an underlayment, before installing finished flooring materials.

# SECTION 4 BASEMENT PANELS

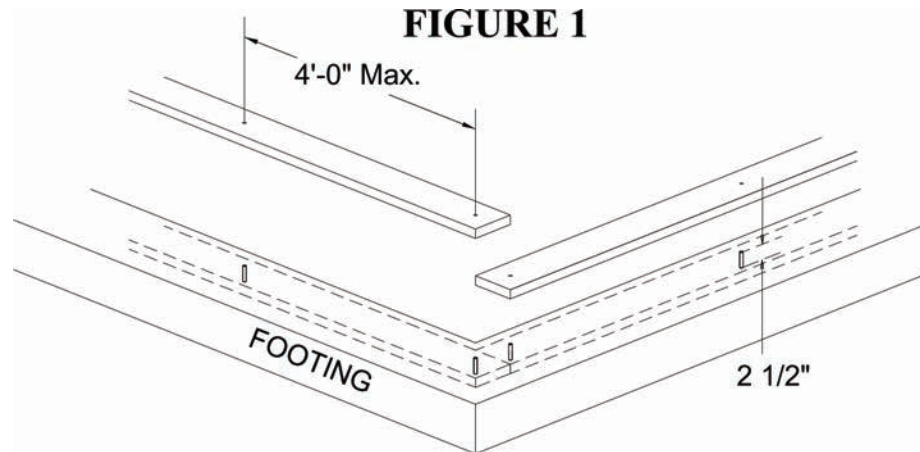


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# BASEMENT FOOTINGS AND SILL PLATES



**NOTE:** The top of the bolts should extend a maximum of 2 1/2" above the footing.

1. Pour a concrete footing of sufficient width and thickness for soil conditions at the construction site.  
**NOTE:** ACCURACY OF THE FOOTING IS A CRITICAL PART OF THE SYSTEM.
2. Set Anchor Bolts ( $\frac{3}{8}$ " min. diameter) in the center of the footing, spaced no more than 4' apart (Alternative approved concrete fasteners may be used.)  
**NOTE:** The tops of the anchor bolts should extend a maximum of 2 1/2" above the footing.
3. Chalk lines for plate layout. Check for squareness, level and overall dimensions.  
**NOTE:** Bottom plates are typically set inwards 1/2" to account for exterior sheathing. Therefore, the outside dimension of the sill plate normally must be 1" less than the overall exterior dimension of the basement. For example, a 26 x 40 basement will have a sill plate dimension of 25'-11" x 39'-11".
4. Before drilling anchor bolt holes in the treated sill plate, check for correct width (2x6 = 5 1/2", 2x8 = 7 1/4") If oversized, rip it down to the correct size.  
**NOTE:** It is recommended that a bead of sealant or sill seal be applied between the sill plate and footing.
5. Sill plate **MUST BE LEVEL AND SQUARE.**  
**NOTE: DO NOT BACKFILL BEFORE READING ALL GUIDELINES!!!**

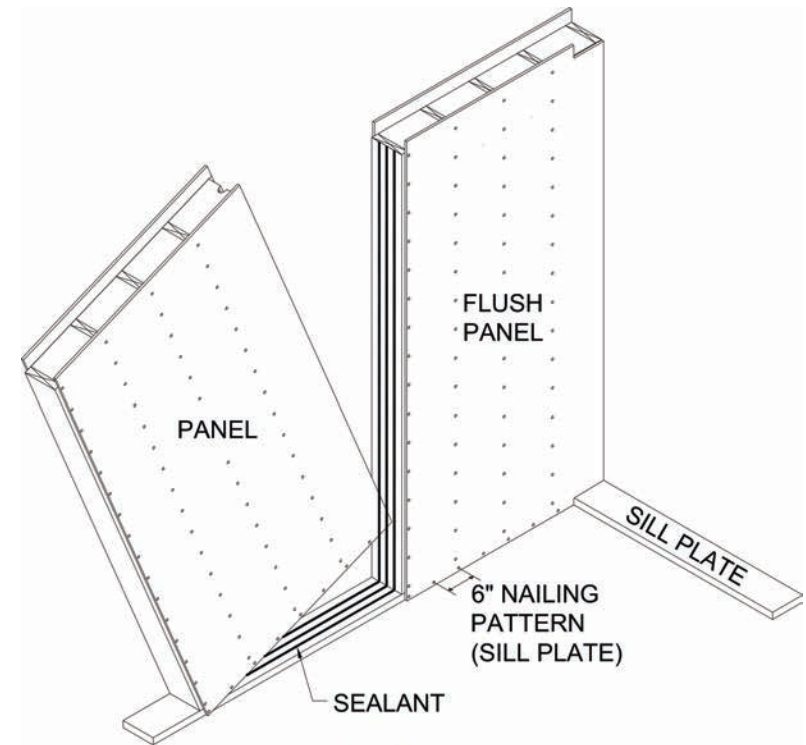


# SETTING BASEMENT PANELS

- A. Start assembly in any corner using a flush panel (as shown). NOTE: Set additional panels counterclockwise as viewed from the inside.
- B. Before setting panels over sill plate, 3 unbroken  $\frac{1}{4}$ " bead of approved sealant compatible with polystyrene must be applied to the plate.
- C. Before nailing the first panel into place, level the interior surface of the panel (to be sure that it is vertically plumb).
- D. When the panel is in the proper position, nail to the sill plate, using 8d Stainless Steel (304) nails.
- E. Use Stainless Steel (304) nails for exterior nailing. Use 8d Stainless Steel (304) or hot dipped galvanized nails on interior nailing.

## NOTE: BASEMENT PANEL NAILING PATTERNS

Nailing pattern at vertical joint should alternate with factory nailing 6" O.C. Sill & top plates should be 6" O.C. See Figure 1 for nailing pattern and spacing.



**FIGURE 1**

## **GROWTH CORRECTION METHODS**

Enercept has designed each corner panel to allow the builder to easily shorten the panel by the amount of growth. It may be necessary to correct panel growth before the end of the wall to ensure that rough openings remain in the proper location. Enercept recommends measuring periodically for growth as the panels are set in place.

1. An electric foam scoop can be purchased from Enercept to recess the foam by the amount of panel growth.
2. Use a skill saw to cut the sheathing back by the same amount.

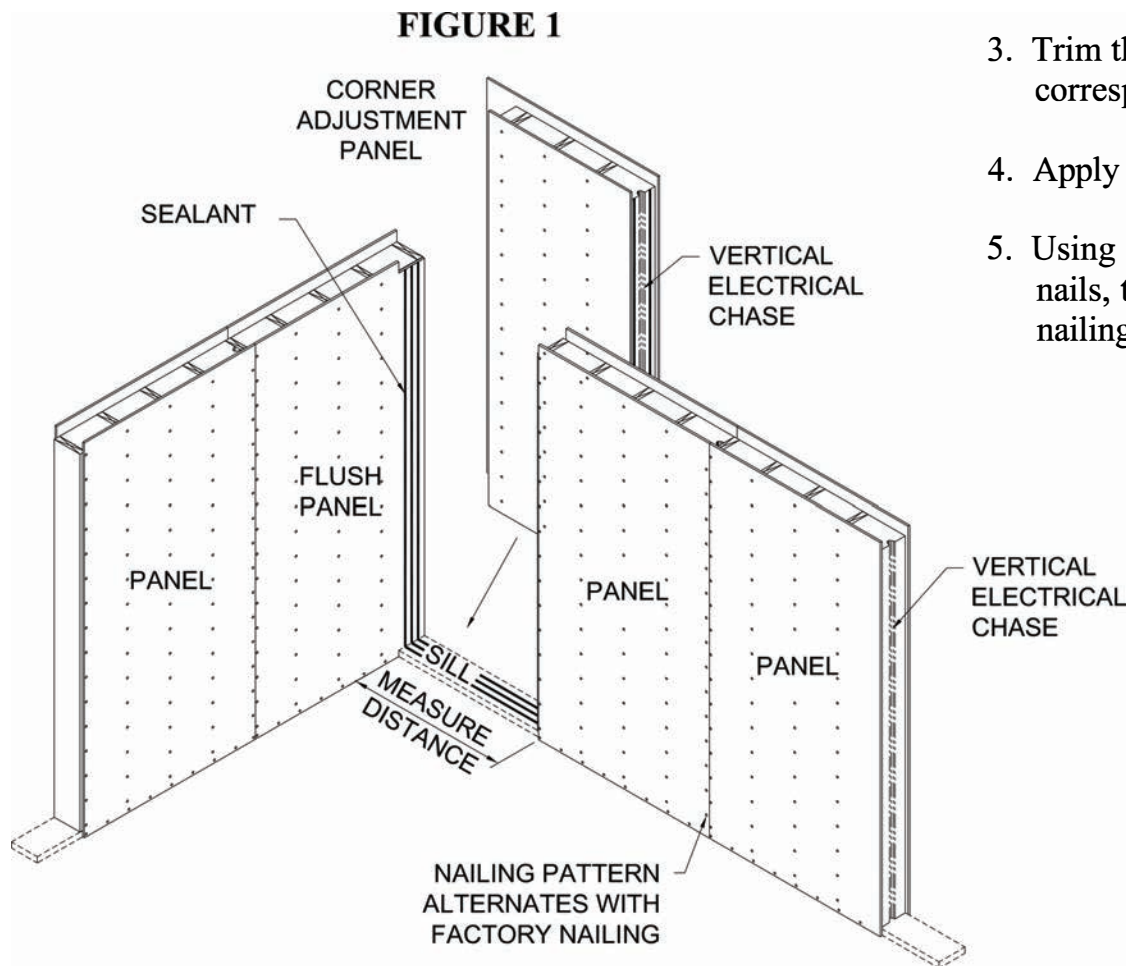
- F. To avoid disturbing the sealant bead on the sill plate, tilt the panel back slightly on the sill plate and slide panel forward.
- G. Repeat the preceding steps when setting successive panels.

## NOTE: PANEL GROWTH (What and Why)

Panel growth refers to the increase in length of panel walls and roofs. Growth can occur due to changes in humidity or failure to achieve tight fit between panels. Growth can effect location of RO's and can be easily corrected if monitored.

# CORNER ADJUSTMENT PANEL INSTALLATION

NOTE: Installation of the adjustment panel in the final corner is slightly different than the previous corners since one corner panel is already in position (the first panel that was erected).

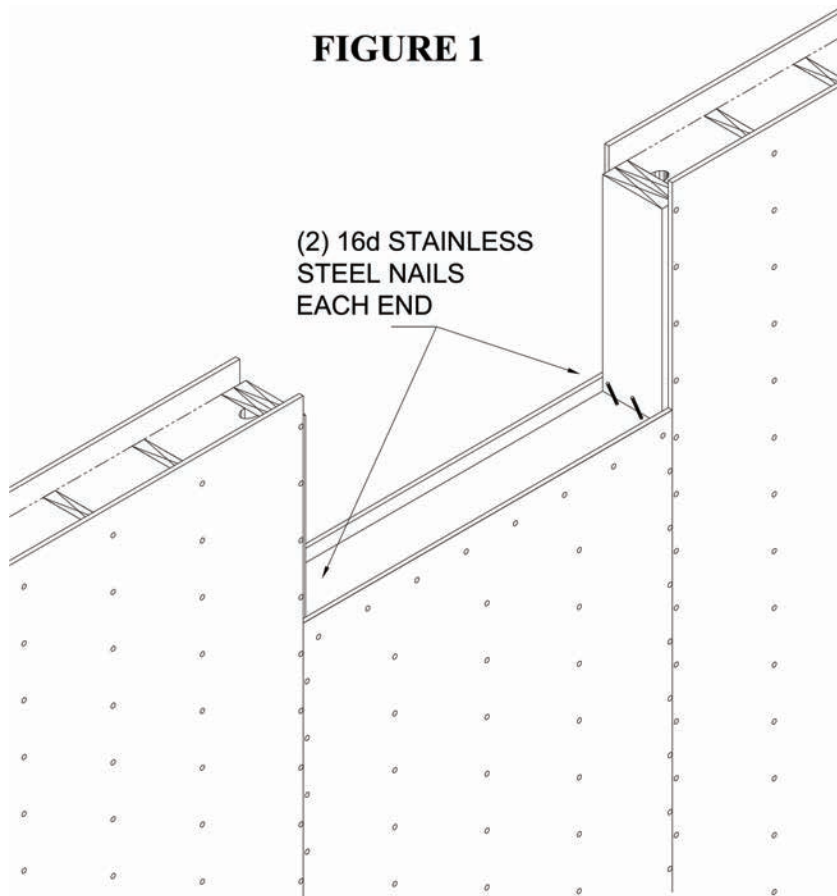


1. Use a level and check flush panel to assure that it has remained plumb.
2. Measure the distance between the inside face of the flush panel and the leading edge of the sheathing at both the top and bottom of the last panel. Trim the interior and exterior sheathing of the corner adjustment panel as needed.
3. Trim the exposed EPS core of the adjustment panel to correspond to these dimensions.
4. Apply sealant and set panel into position.
5. Using 8d Stainless Steel (304) or hot dipped galvanized nails, the nailing pattern should alternate with the factory nailing as shown.

# BASEMENT WINDOW INSTALLATION

## STEP 1

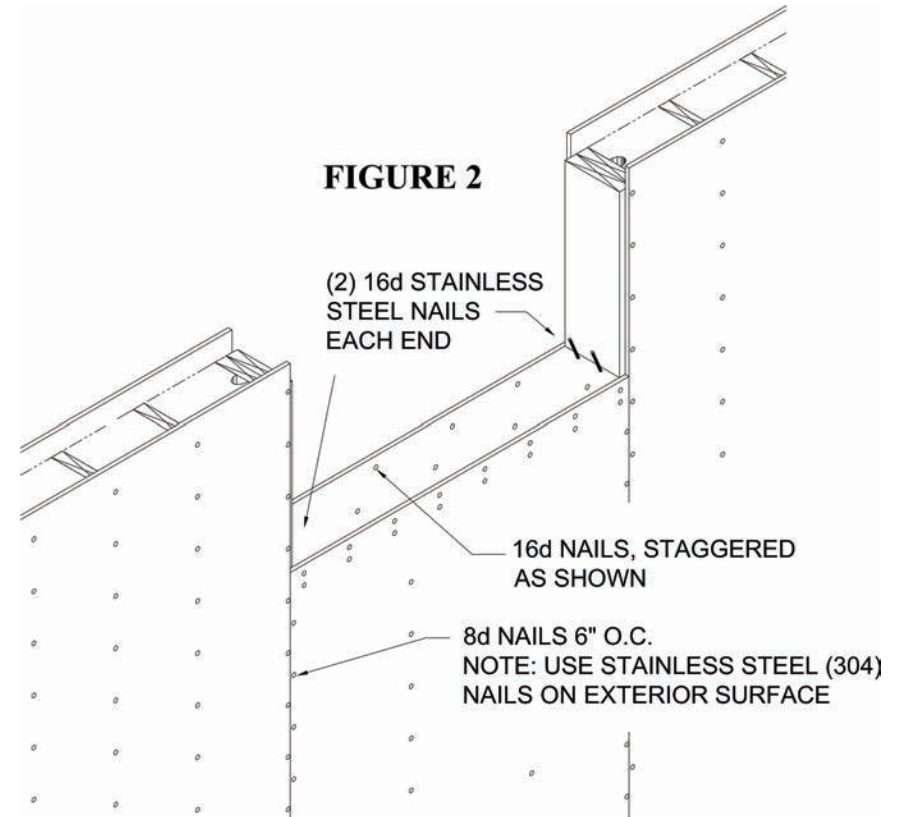
**FIGURE 1**



1. Toenail the 2x8 plate in the lower window panel to the studs in the adjacent panels using (2) 16d nails at each end.

## STEP 2

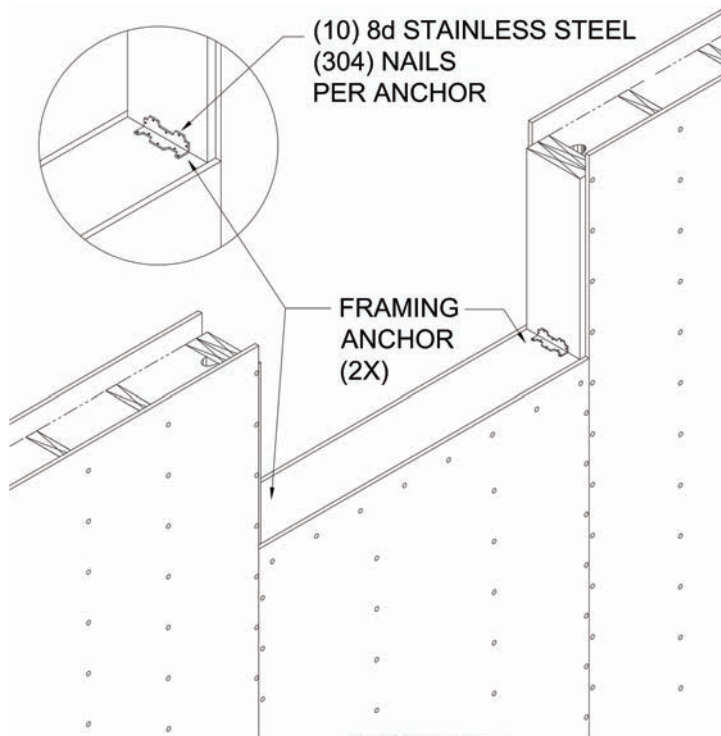
**FIGURE 2**



1. Place bead of sealant on top of the plate in the lower window panel.
2. Cut a length of treated 2x8 to install as the top plate of the lower window panel.
3. Install this plate using the nail sizes and spacing as shown in Figure 2.

# BASEMENT WINDOW INSTALLATION

## STEP 3



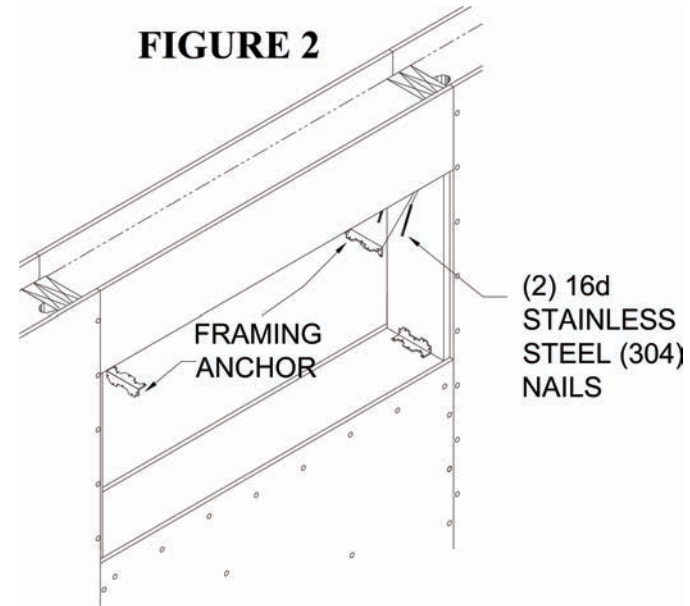
**FIGURE 1**

1. Install framing anchors in both lower corners of the window opening, using (10) 8d Stainless Steel (304) nails for each anchor.

**NOTE:** Anchor must be installed before window filler. When windows are located at the top of the wall panel, there is no header panel. In these cases, the double plate will form the upper side of the rough opening. Skip Step 4.

## STEP 4

**FIGURE 2**



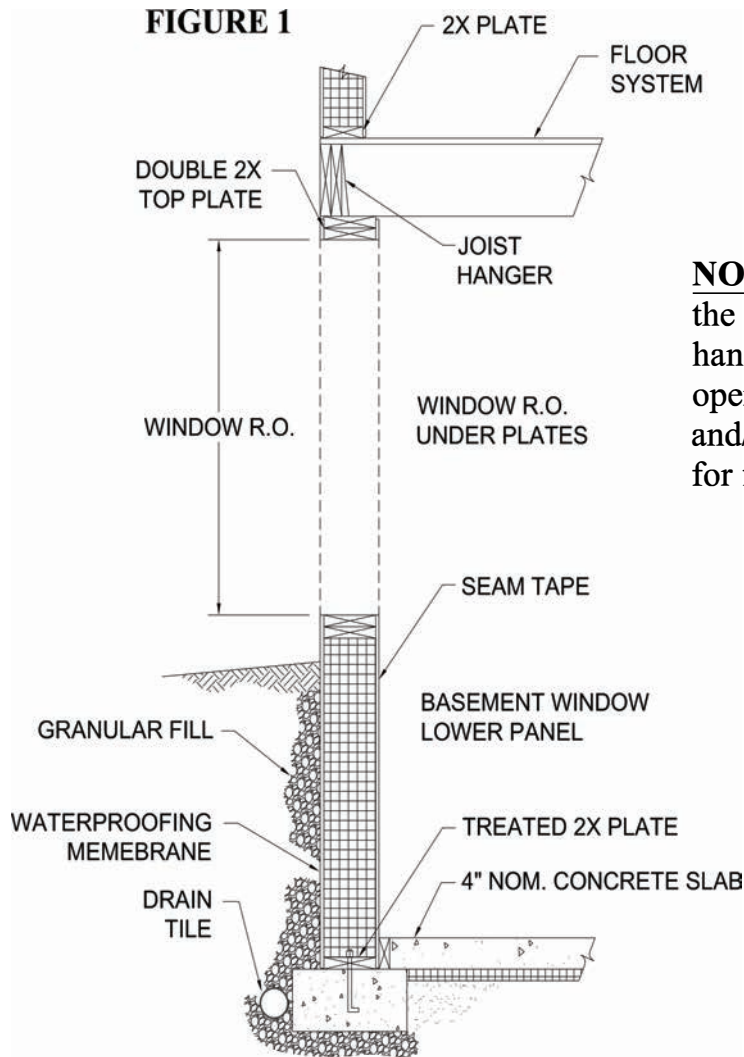
1. Slide window header panel down into position, and toenail into adjacent panels, using (2) 16d Stainless Steel (304) nails at each corner.

**IMPORTANT:** Confirm window rough opening size before permanently securing lintel.

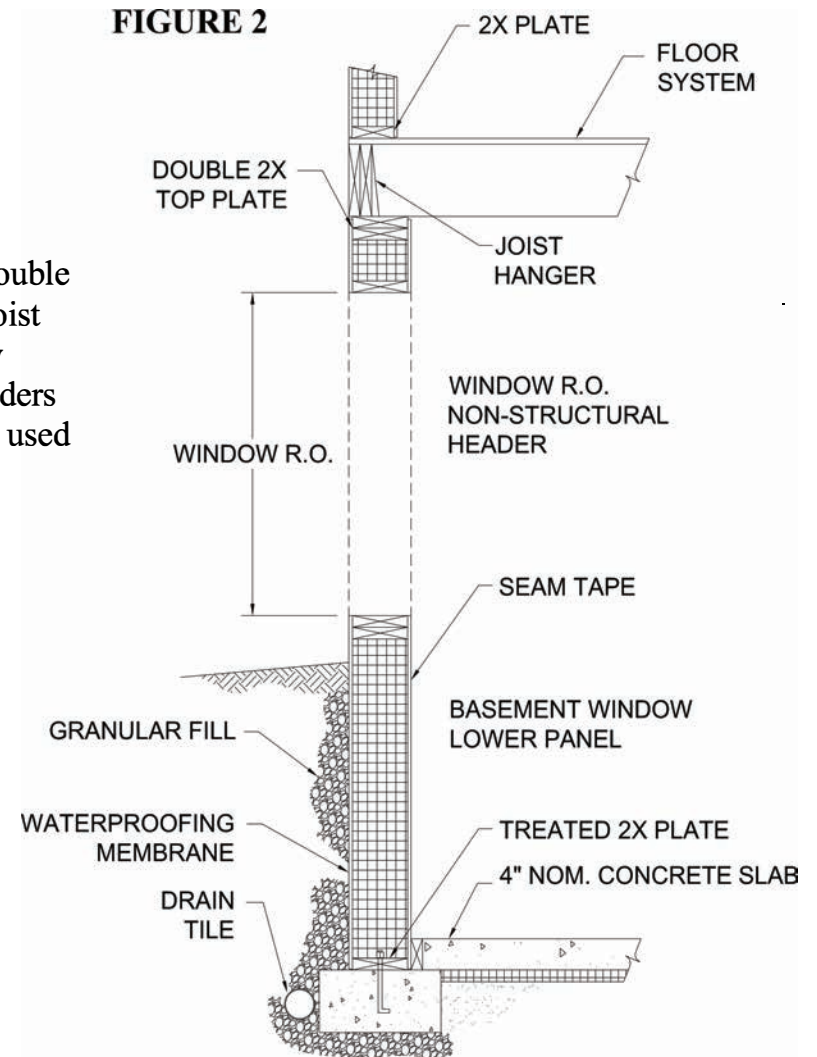
2. Install one framing anchor at each upper corner of the window opening, using (10) 8d Stainless Steel (304) nails per anchor.
3.  $\frac{3}{4}$ " OSB strips are provided to fit over the connecting studs.

**WINDOW -- UNDER PLATES**  
**OPTION #1 (NO PANEL SUPPLIED)**

**WINDOW -- NON-STRUCTURAL HEADER**  
**OPTION #2**



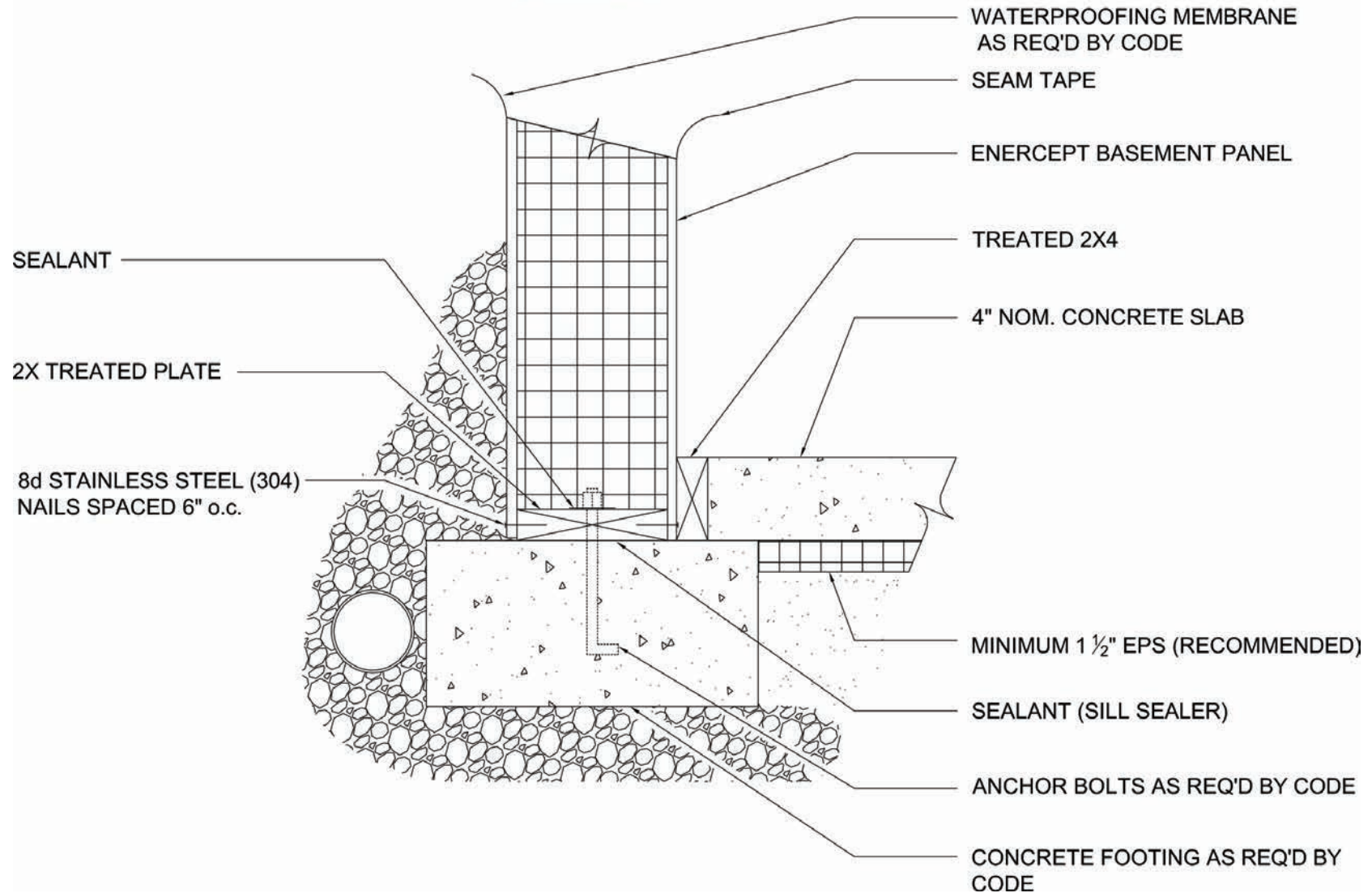
**NOTE:** For either option, double the exterior rim joist & use joist hangers over door & window openings. Non-structural headers and/or top plates must not be used for floor joist support.



**NOTE:** For either option, footing size and depth to be determined by the contractor according to local building codes and job conditions. Bottom of footing must be below frost line.



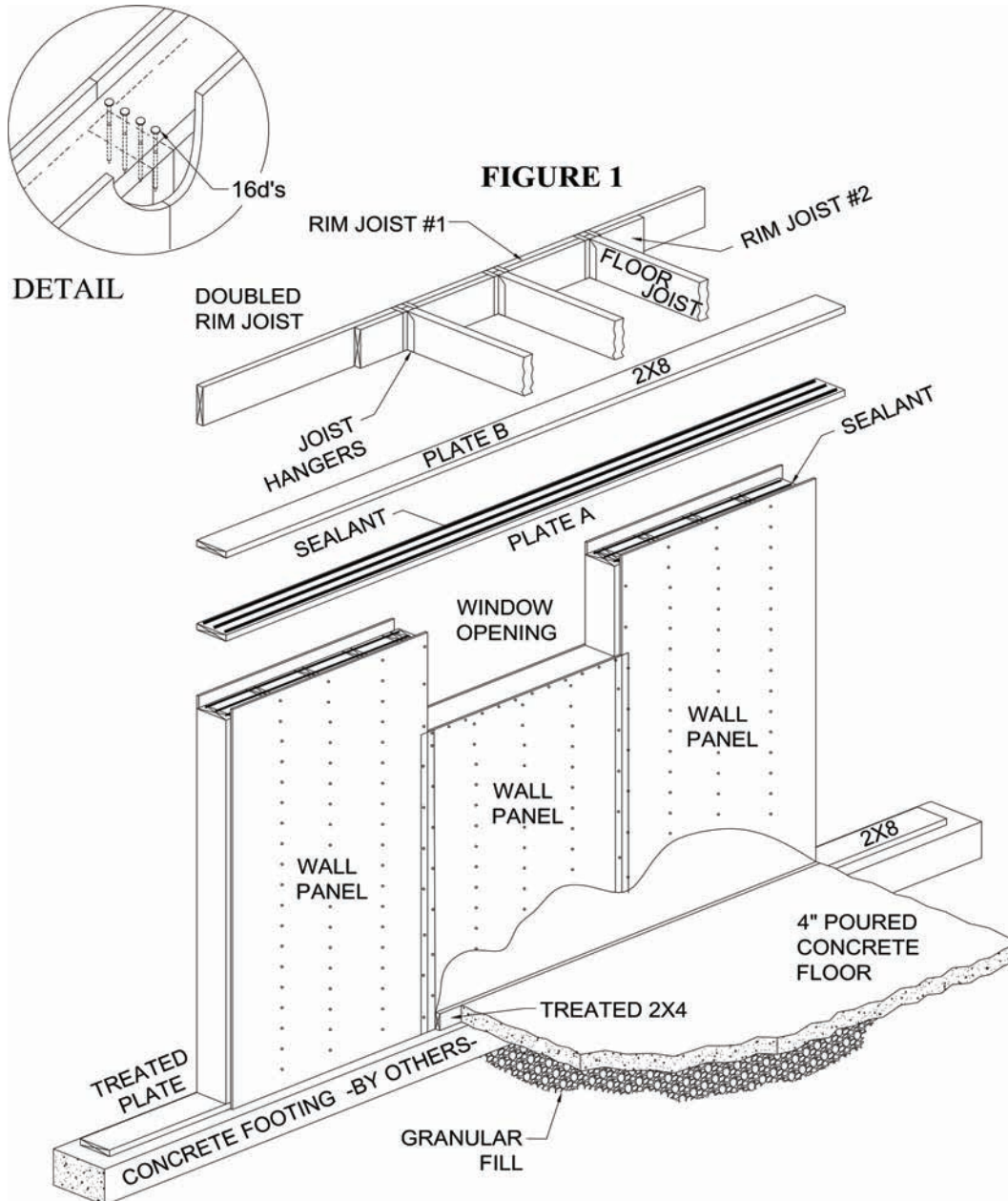
**FIGURE 1**



**CONCRETE FLOOR MUST BE POURED  
BEFORE BACKFILLING**

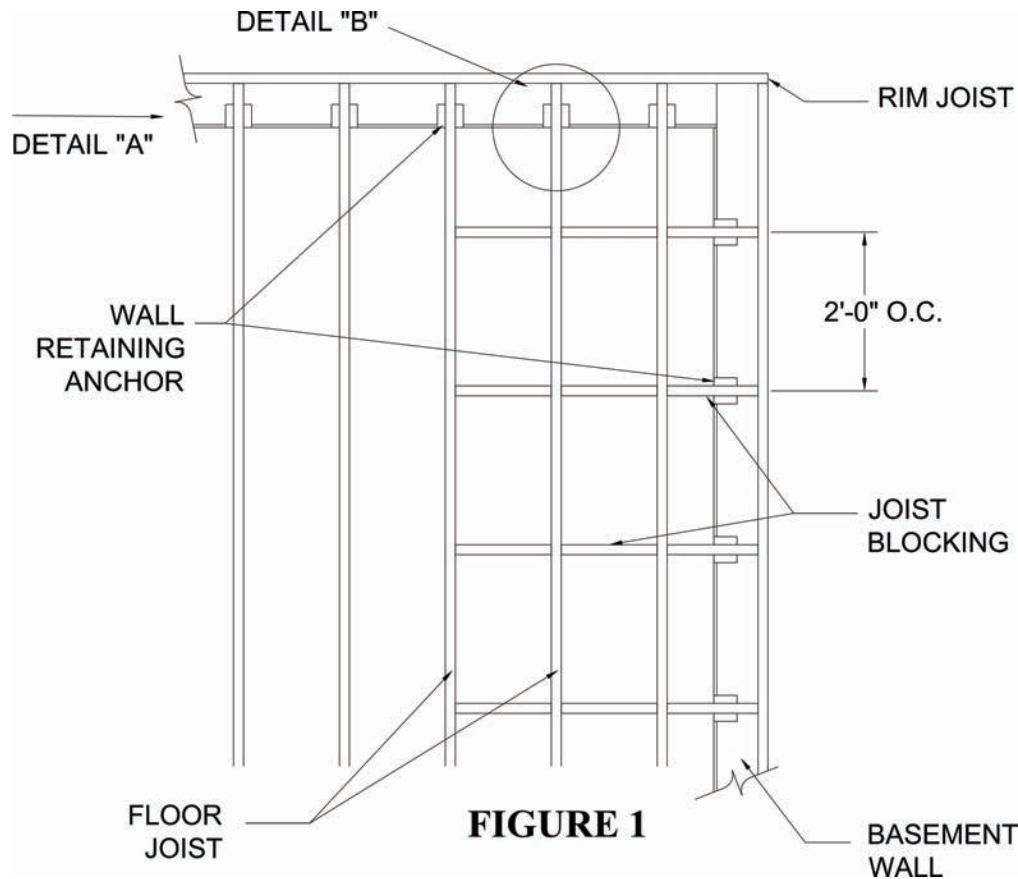
The detail shown is the recommended method of construction for locking in the bottom of the Enercept basement panels with the concrete floor. If other methods of construction are used, it is the owner's / contractor's responsibility to be sure that the bottom of the basement panel is securely connected to the concrete to resist the inward pressure of the backfill.

# BASEMENT PANEL DOUBLE TOP PLATE INSTALLATION



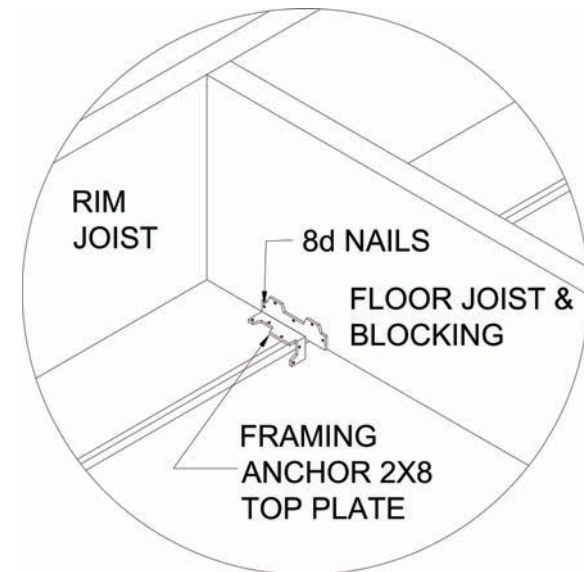
1. Apply 3 unbroken beads of sealant along the plate channel.
2. Place the 2x8 Plate A into the panel recess and secure to each stud using four 16d nails (refer to detail at left).
3. Apply sealant to top Plate A and place Plate B into position.  
**NOTE:** Allow a minimum joint offset of at least four feet. Do not splice over window or door lintels.
4. Secure Plate B to Plate A with (4) 16d nails on 12" staggered centers.
5. Nail top edge of sheathing to both plates using 8d nails on staggered 6" spacing on both interior and exterior edges.  
**NOTE:** Drill all matching electrical holes in both plates prior to setting rim joists.
6. Double rim joist or install approved headers above all door and window openings and use joist hangers for floor joist support.  
**NOTE:** Do not butt or splice rim joist above the door/window openings.
7. Install seam tape on the interior vertical panel joints after all wall panels have been installed.

# FLOOR SYSTEM INSTALLATION

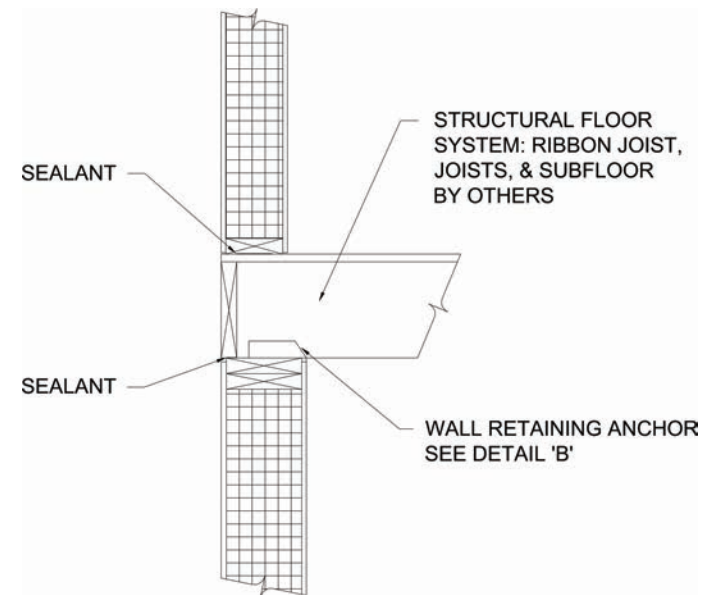


**FIGURE 1**

- A. To provide basement wall support, wall retaining anchors are to be used to tie the wall and floor systems together (Figure 1 and detail A & B) 1 anchor at each end of the joist.
- B. Install joist blocking in the outer 3 joist cavities parallel to the span of the floor framing and shearwalls (if required) prior to backfilling. Refer to Figure 1 for location of joist blocking.



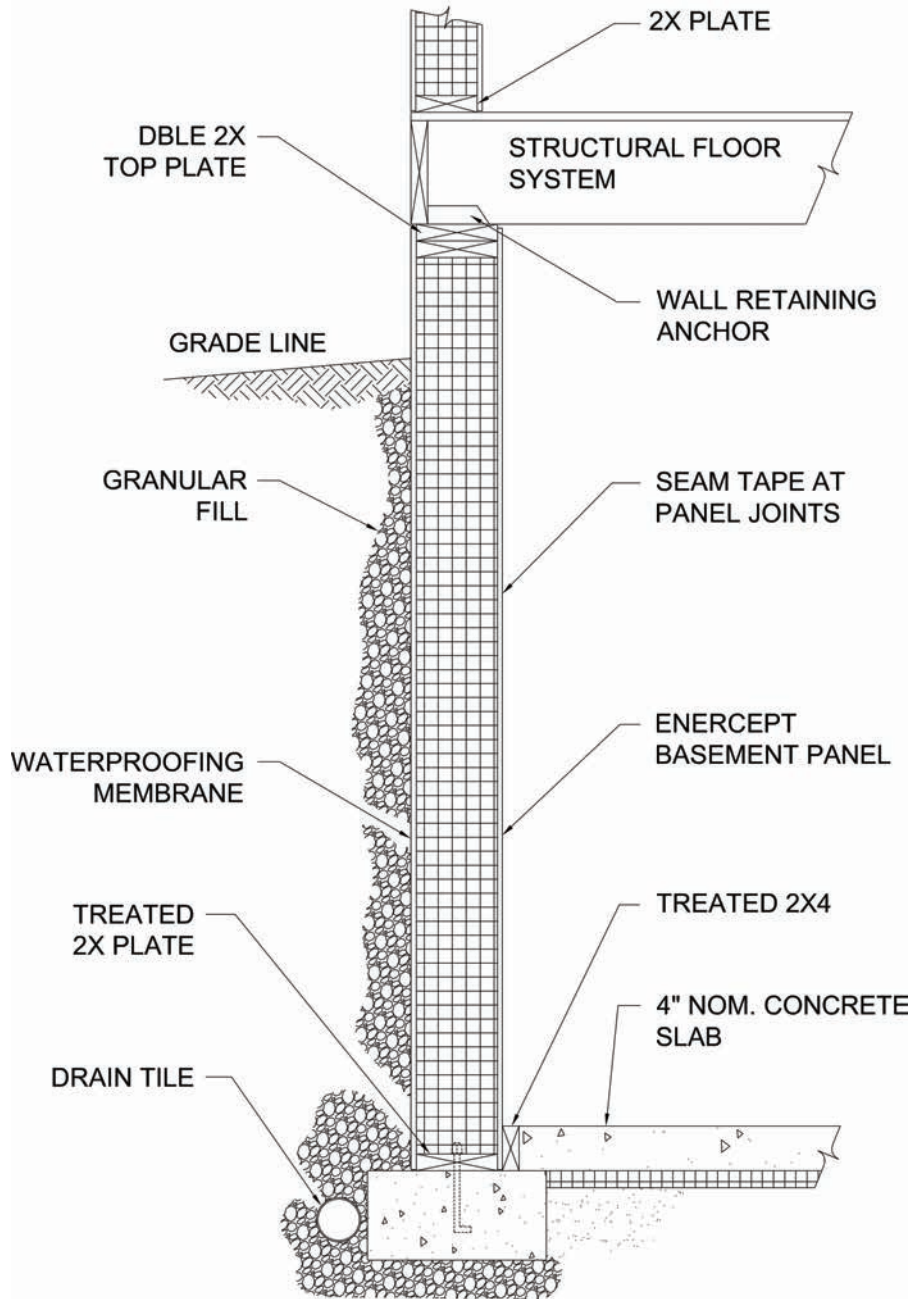
**DETAIL B**



**DETAIL A**



**FIGURE 1**



## **BASEMENT WALL, SLAB AND BACKFILL TREATMENT**

### **WALL TREATMENT**

- A. Cover all exterior joints with sealant.
- B. Apply a waterproofing membrane approved for below grade applications per code, from the footing to the top of the panel.
- C. **Floor deck, framing anchors, joist blocking concrete floor slab and shear walls (if required) must be installed before backfilling.**
- D. With drain tile in place, crushed rock is used for backfill as shown.
- E. To control drainage, backfill and landscaping must be sloped away from the basement walls.

### **SLAB TREATMENT**

- A. A moisture barrier is placed on a 3" porous substrata prior to placement of a minimum 1 ½" layer of EPS insulation.
- B. The concrete slab is then poured upon this base allowing the slab to act as a thermal mass.

### **BACKFILL TREATMENT**

- A. Panels are designed for 30 pcf hydraulic pressure. Contact your building officials regarding extreme soil conditions in your area.
- B. **Floor system, anchors, blocking & shear walls must be installed before backfilling. Concrete floor must be poured before backfilling.**
- C. Backfilling should be completed evenly in 1' lifts around the perimeter of the structure.
- D. See chart on page 4-12 for maximum backfill depth.
- E. To control drainage, backfill and landscaping must be sloped away from the foundation walls.

# BACKFILL SPECIFICATIONS

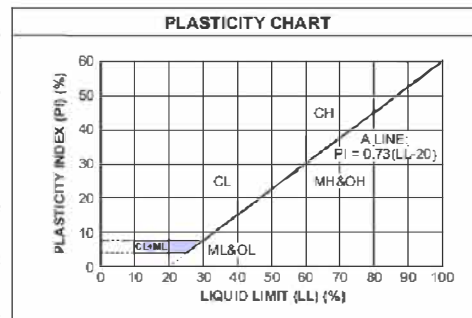
| Panel Thickness | Panel Height | Max. Backfill Hgt     |
|-----------------|--------------|-----------------------|
| 8" Panel        | 8'-0"        | 8'-0" (Full Backfill) |
| 8" Panel        | 9'-0"        | 7'-3"                 |
| 8" Panel        | 10'-0"       | 6'-9"                 |
| 10" Panel       | 8'-0"        | 8'-0" (Full Backfill) |
| 10" Panel       | 9'-0"        | 8'-6"                 |
| 10" Panel       | 10'-0"       | 8'-0"                 |

| UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART                                           |                                                                                                                       |
|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| COARSE-GRAINED SOILS<br>(more than 50% of material is larger than No. 200 sieve size.) |                                                                                                                       |
| GRAVELS<br>More than 50% of coarse fraction larger than No. 4 sieve size               | Clean Gravels (Less than 5% fines)                                                                                    |
|                                                                                        | GW Well-graded gravels, gravel-sand mixtures, little or no fines                                                      |
|                                                                                        | GP Poorly-graded gravels, gravel-sand mixtures, little or no fines                                                    |
|                                                                                        | Gravels with fines (More than 12% fines)                                                                              |
|                                                                                        | GM Silty gravels, gravel-sand-silt mixtures                                                                           |
|                                                                                        | GC Clayey gravels, gravel-sand-clay mixtures                                                                          |
| SANDS<br>50% or more of coarse fraction smaller than No. 4 sieve size                  | Clean Sands (Less than 5% fines)                                                                                      |
|                                                                                        | SW Well-graded sands, gravelly sands, little or no fines                                                              |
|                                                                                        | SP Poorly-graded sands, gravelly sands, little or no fines                                                            |
|                                                                                        | Sands with fines (More than 12% fines)                                                                                |
|                                                                                        | SM Silty sands, sand-silt mixtures                                                                                    |
|                                                                                        | SC Clayey sands, sand-clay mixtures                                                                                   |
| FINE-GRAINED SOILS<br>(50% or more of material is smaller than No. 200 sieve size.)    |                                                                                                                       |
| SILTS AND CLAYS<br>Liquid limit less than 50%                                          | ML Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity |
|                                                                                        | CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays                  |
|                                                                                        | OL Organic silts and organic silty clays of low plasticity                                                            |
| SILTS AND CLAYS<br>Liquid limit 50% or greater                                         | MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts                                |
|                                                                                        | CH Inorganic clays of high plasticity, fat clays                                                                      |
|                                                                                        | OH Organic clays of medium to high plasticity, organic silts                                                          |
| HIGHLY ORGANIC SOILS                                                                   | PT Peat and other highly organic soils                                                                                |

| LABORATORY CLASSIFICATION CRITERIA |                                                                                                           |
|------------------------------------|-----------------------------------------------------------------------------------------------------------|
| GW                                 | $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3 |
| GP                                 | Not meeting all gradation requirements for GW                                                             |
| GM                                 | Atterberg limits below "A" line or P.I. less than 4                                                       |
| GC                                 | Atterberg limits above "A" line with P.I. greater than 7                                                  |
| SW                                 | $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3 |
| SP                                 | Not meeting all gradation requirements for GW                                                             |
| SM                                 | Atterberg limits below "A" line or P.I. less than 4                                                       |
| SC                                 | Atterberg limits above "A" line with P.I. greater than 7                                                  |

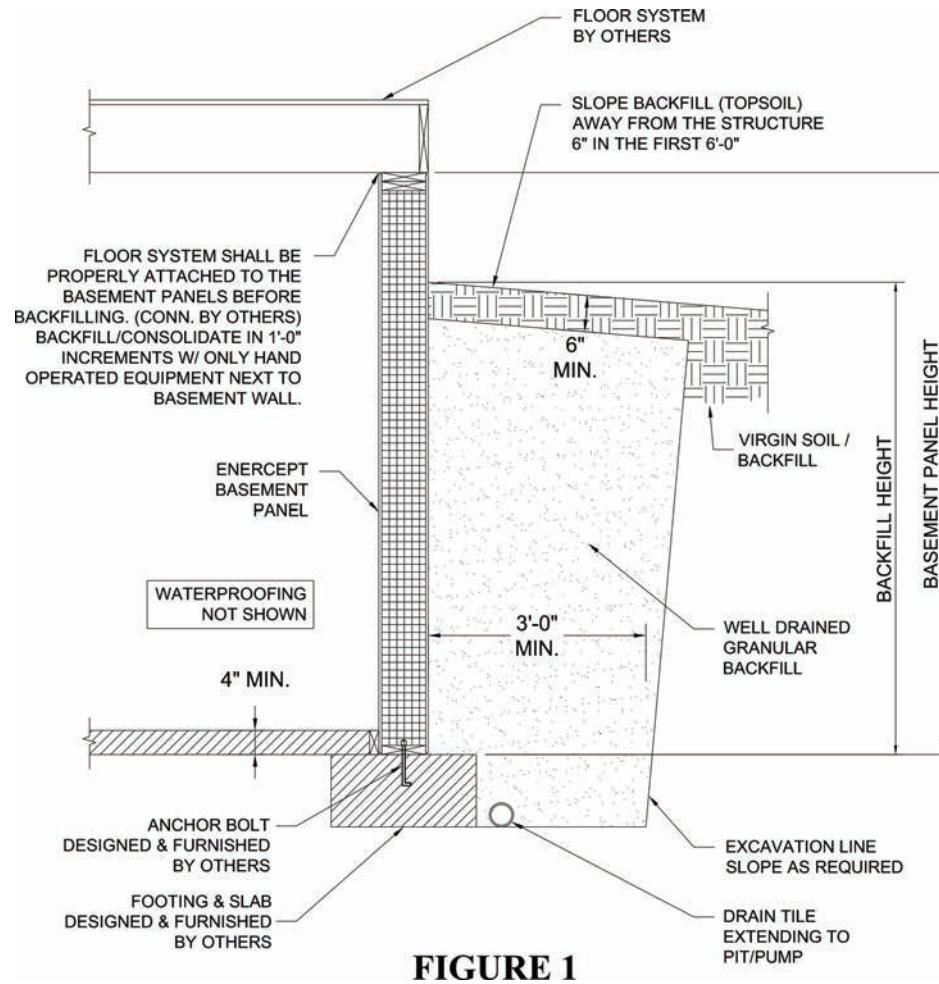
Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent ..... GW, GP, SW, SP  
 More than 12 percent ..... GM, GC, SM, SC  
 5 to 12 percent ..... Borderline cases requiring dual symbols

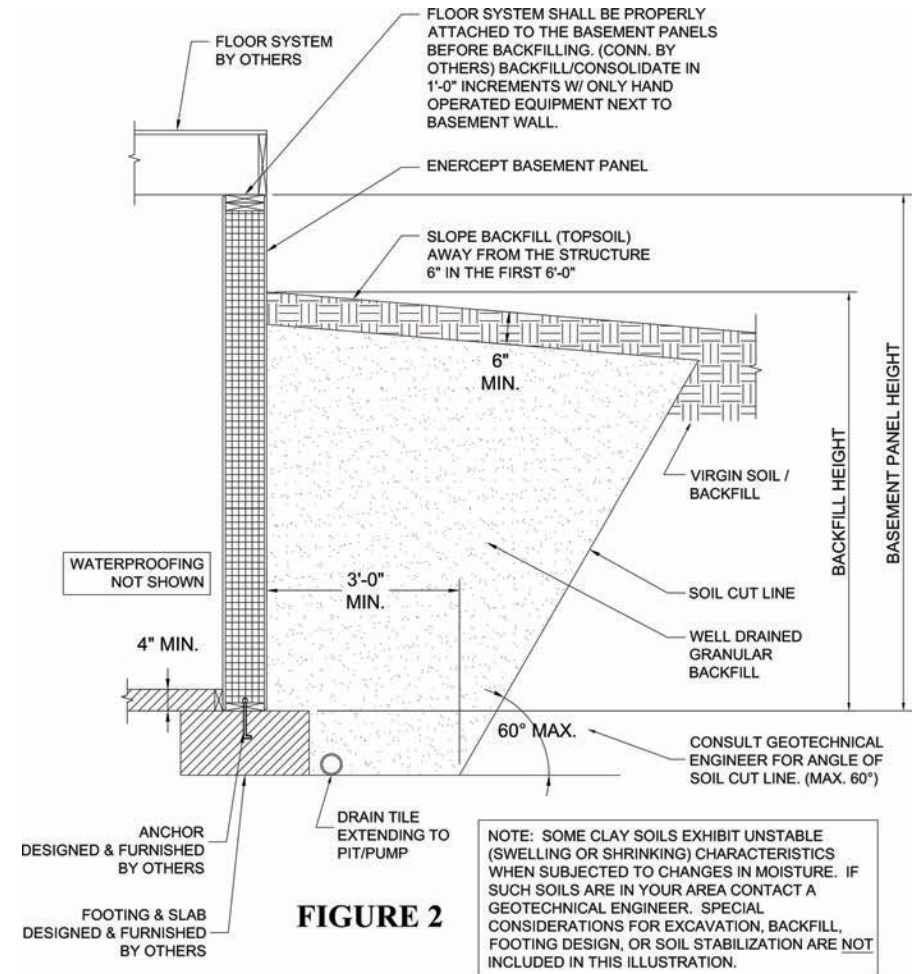


1. Enercept 8" (10") basement panels are constructed with 7 1/4" (9 1/4") EPS core, treated 2x8 (2x10) SYP#2 studs at 12" on center, 7/16" OSB interior skin, and 1/2" treated plywood exterior skin. Total panel thickness equals 8 3/16" (10 3/16").
2. A 30 pcf / ft active soil pressure was used for the 8'-0" tall Enercept basement panel & a 60 pcf / ft at-rest soil pressure was used for the 9'-0" and 10'-0" tall Enercept basement panels per IBC 2006.
3. A vertical axial load of 2,000 plf was used when determining the above values. If the actual vertical load exceeds this value the above backfill heights do not apply.
4. The floor system shall be properly attached to the basement panel before backfilling. Backfill / consolidate in 1'-0" increments with only hand operated equipment next to basement wall.
5. See Figure 1 & Figure 2 of the following page for backfill requirements. Consult a local geotechnical engineer for recommendations and to differentiate between expansive and non-expansive soils.
6. Drain tile at base extending to sump pit/pump.
7. Slope surface (topsoil) away from the structure 6" minimum in 6'-0".

# BACKFILL REQUIREMENT DETAILS



**FIGURE 1: NON- EXPANSIVE SOILS**



**FIGURE 2: EXPANSIVE SOILS**

# SECTION 5 WALL PANELS



If you have any questions  
or concerns call us at:

**605-882-2222**

**CALL BEFORE YOU CUT!**

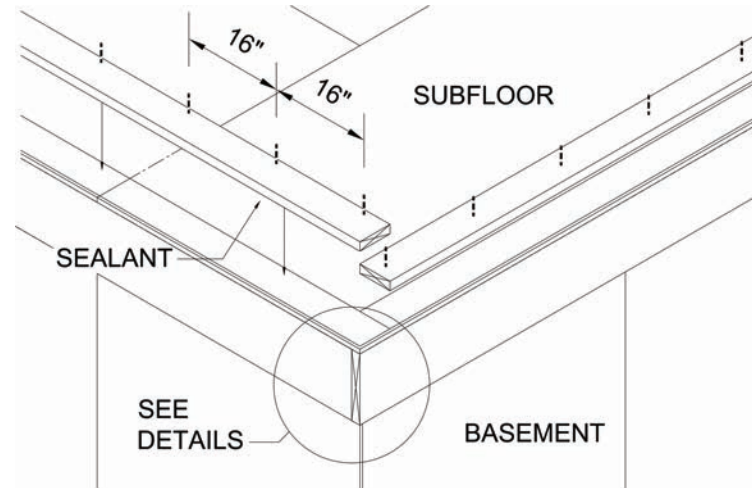


# FLOOR SYSTEM / SILL PLATE INSTALLATION & OPTIONS

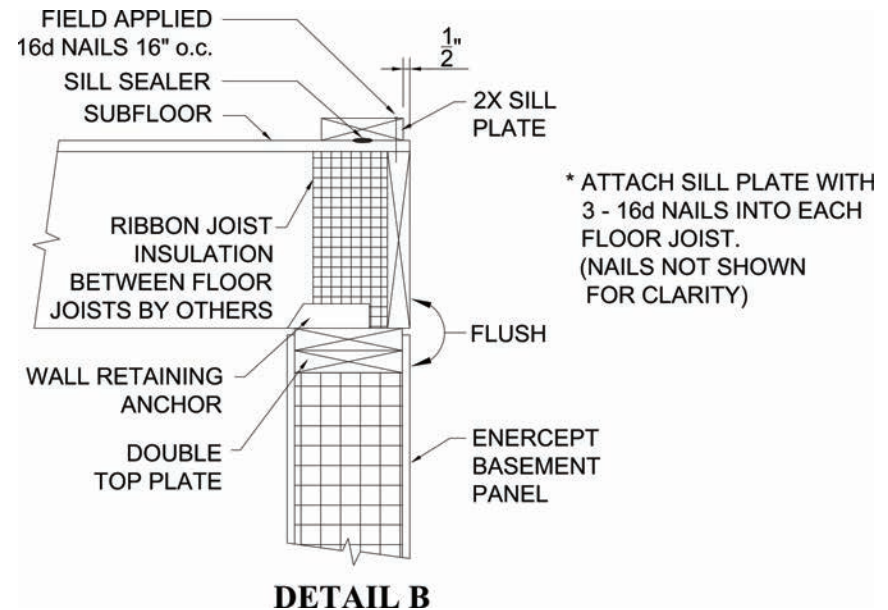
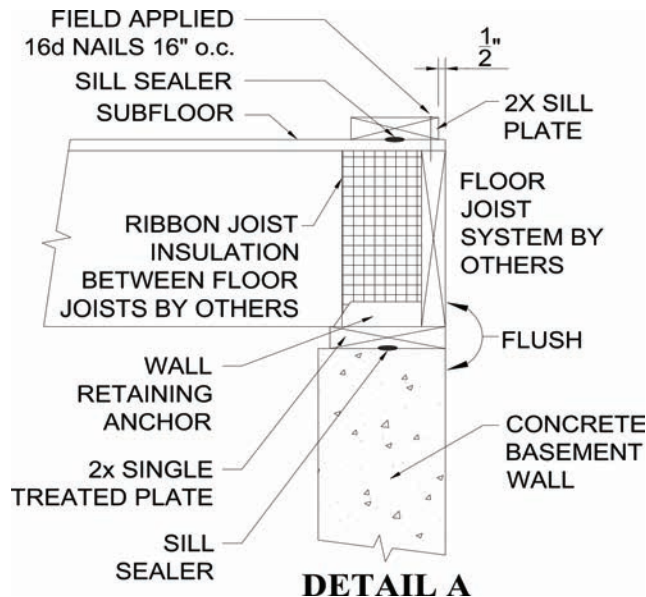
## SILL PLATE TO SUBFLOOR ATTACHMENT

1. The floor system must be LEVEL and SQUARE.
2. Sill plates are typically set inwards 1/2" to account for exterior sheathing to the wall panels. Therefore, the outside dimension of the sill plate normally must be 1" less than the overall exterior dimension of the structure. For example, a 26' x 40' floor system will have a sill plate dimension of 25'-11" x 39'-11".
3. Chalk lines for plate layout. Check squareness and overall dimensions.
4. Apply sealant or sill seal below sill plate.
5. Nail the sill plate to the sub-floor using 16d nails on 16" center or as specified on the shop drawings..
6. Repeat this procedure around the entire perimeter of the sub-floor.

**NOTE:** Levelness, squareness and alignment of the sill plates are critical parts of the Enercept system.



**FIGURE 1**



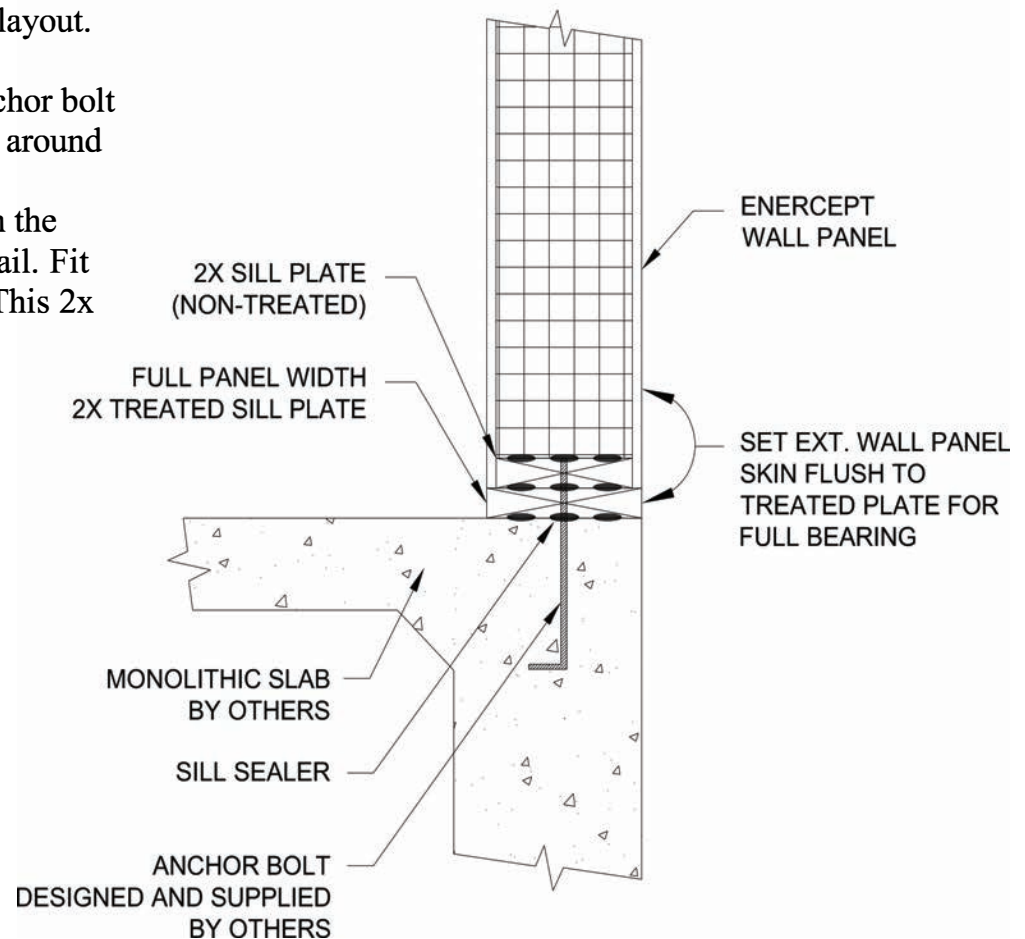
# SILL PLATE INSTALLATION ON CONCRETE

## SILL PLATE TO CONCRETE SLAB ATTACHMENT

1. The slab must be LEVEL and SQUARE.
2. The outside dimension of the treated sill plate must match the overall exterior dimension of the structure.
3. Check for squareness and overall dimension of treated plate layout.
4. Apply sealant (sill seal) below the treated sill plate.
5. Install the treated sill plate to the slab, fitting it over each anchor bolt (as designed and provided by others). Repeat this procedure around the entire perimeter of the slab.
6. Install the non-treated 2x bottom plate per the instructions on the previous page using 3 beads of sealant as shown in the detail. Fit and fasten the anchor bolts through the plate where needed. This 2x bottom plate will be buried within the panel.

**NOTE:** Levelness, squareness and alignment of the sill plate are critical parts of the Enercept system.

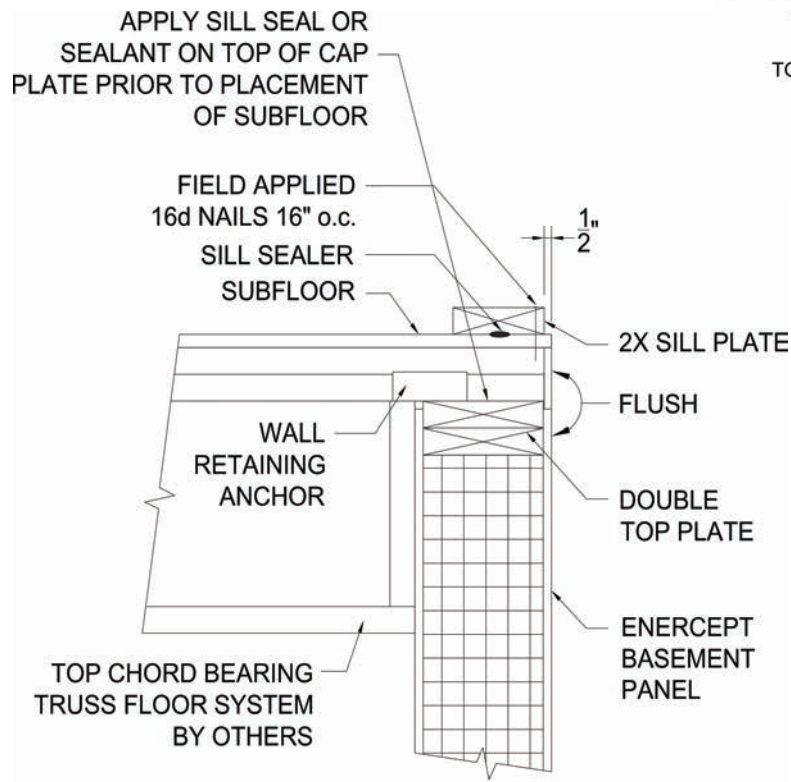
FIGURE 1



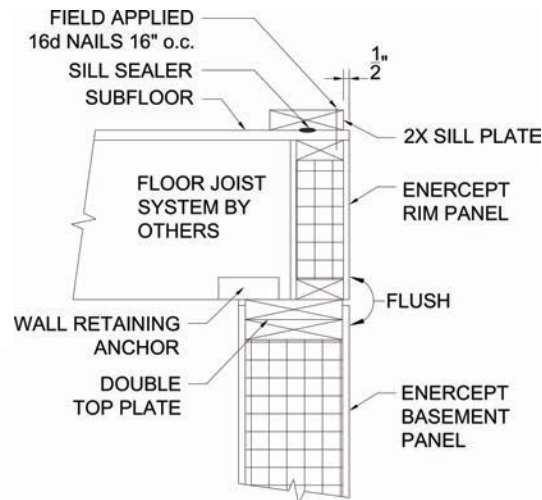
# RIM JOIST / SILL PLATE INSTALLATION & OPTIONS

Remember to drill holes in the sill plates at wire chase locations of upper level wall panels.

Drill holes at an angle where required to obtain access to wire chases for wire routing. Refer to Figure 2 on page 11-3.

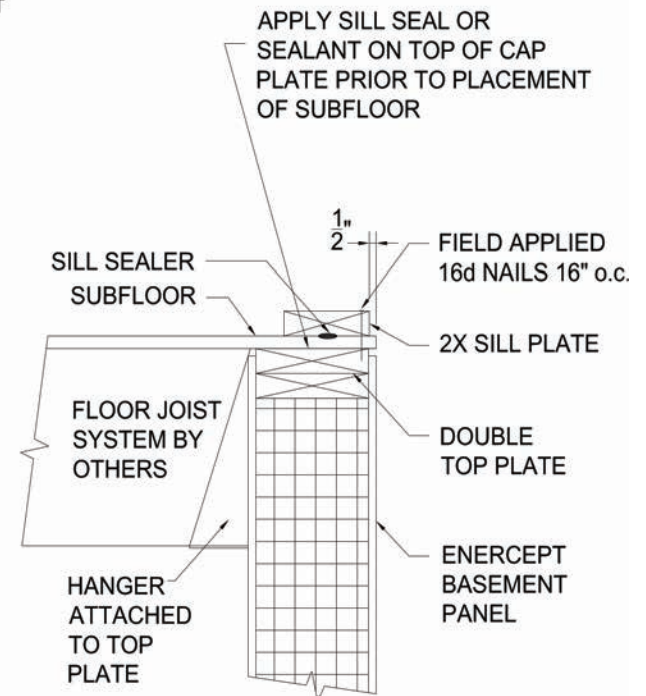


**TOP CHORD BEARING TRUSS**



**RIM PANEL DETAIL**

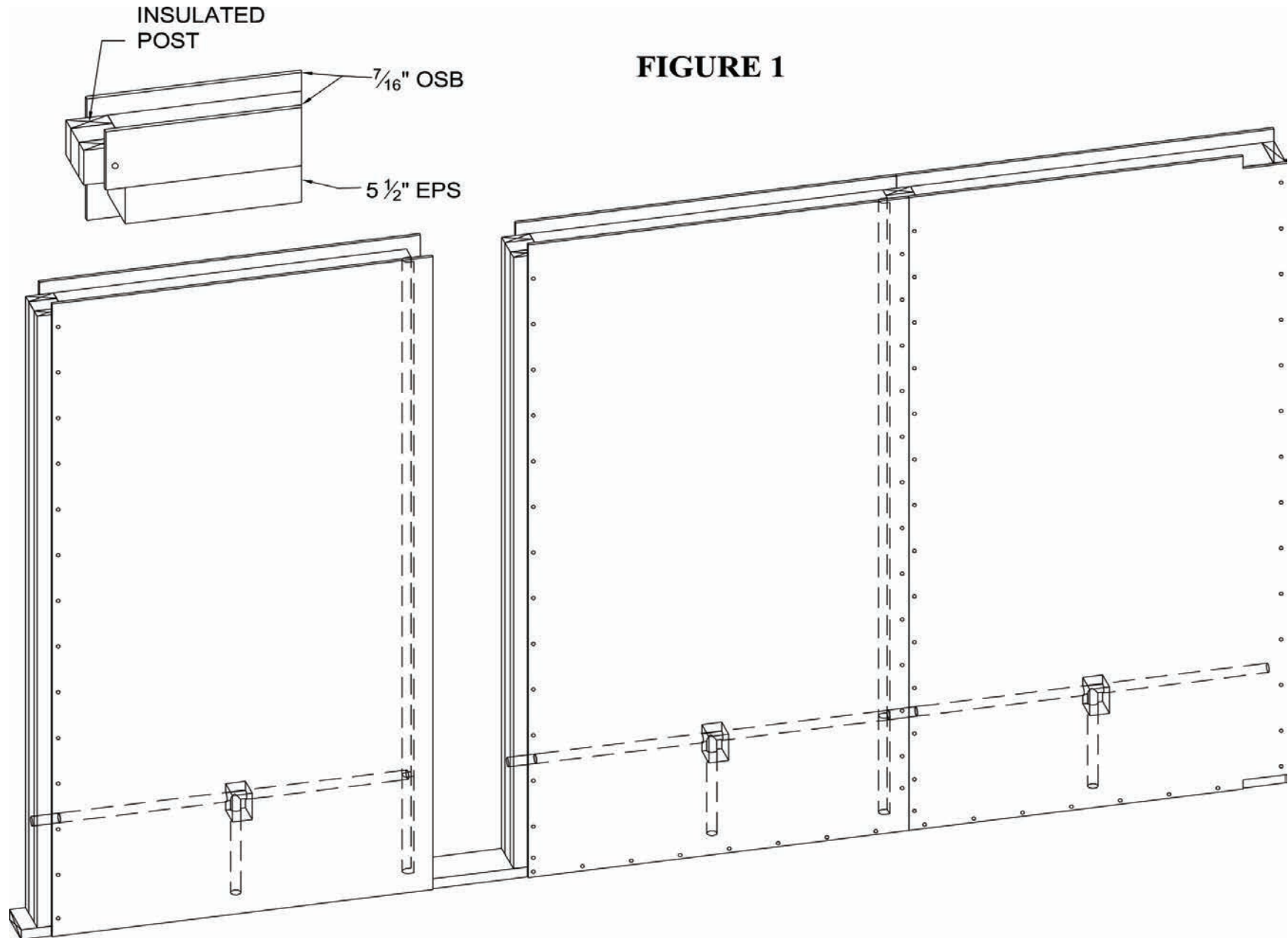
\* SEALANT NOT SHOWN FOR CLARITY. REFER TO DETAILS ON THE SHOP DRAWINGS FOR PROPER PLACEMENT OF SEALANT



**HANGING JOISTS INSIDE PANEL**



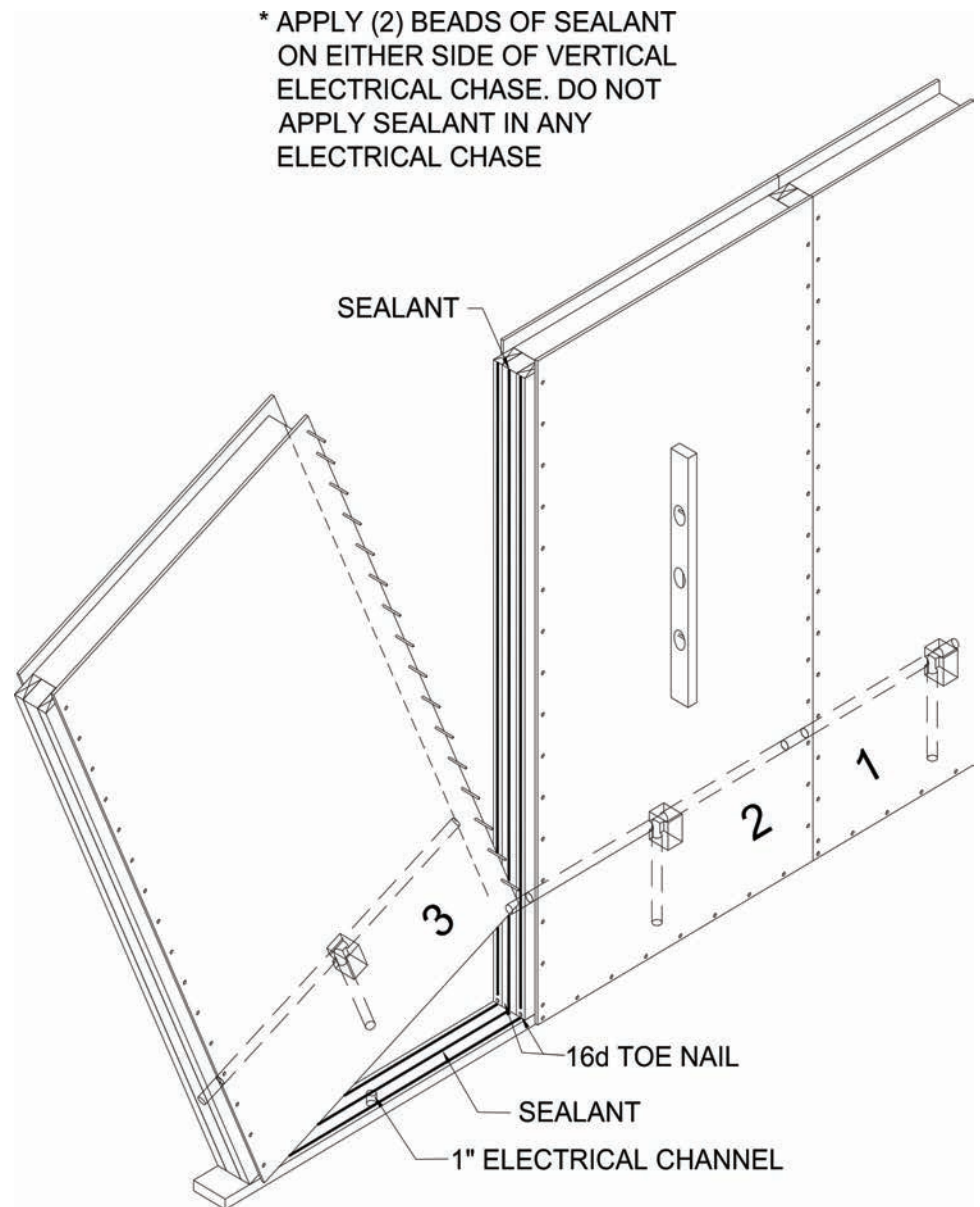
# TYPICAL WALL PANEL



## TYPICAL WALL PANEL INSTALLATION STEPS

**NOTE:** All Enercept panels are generally numbered in sequential order. The order does not necessarily represent the order of installation. Panel numbers shown in this guide are for illustration only.

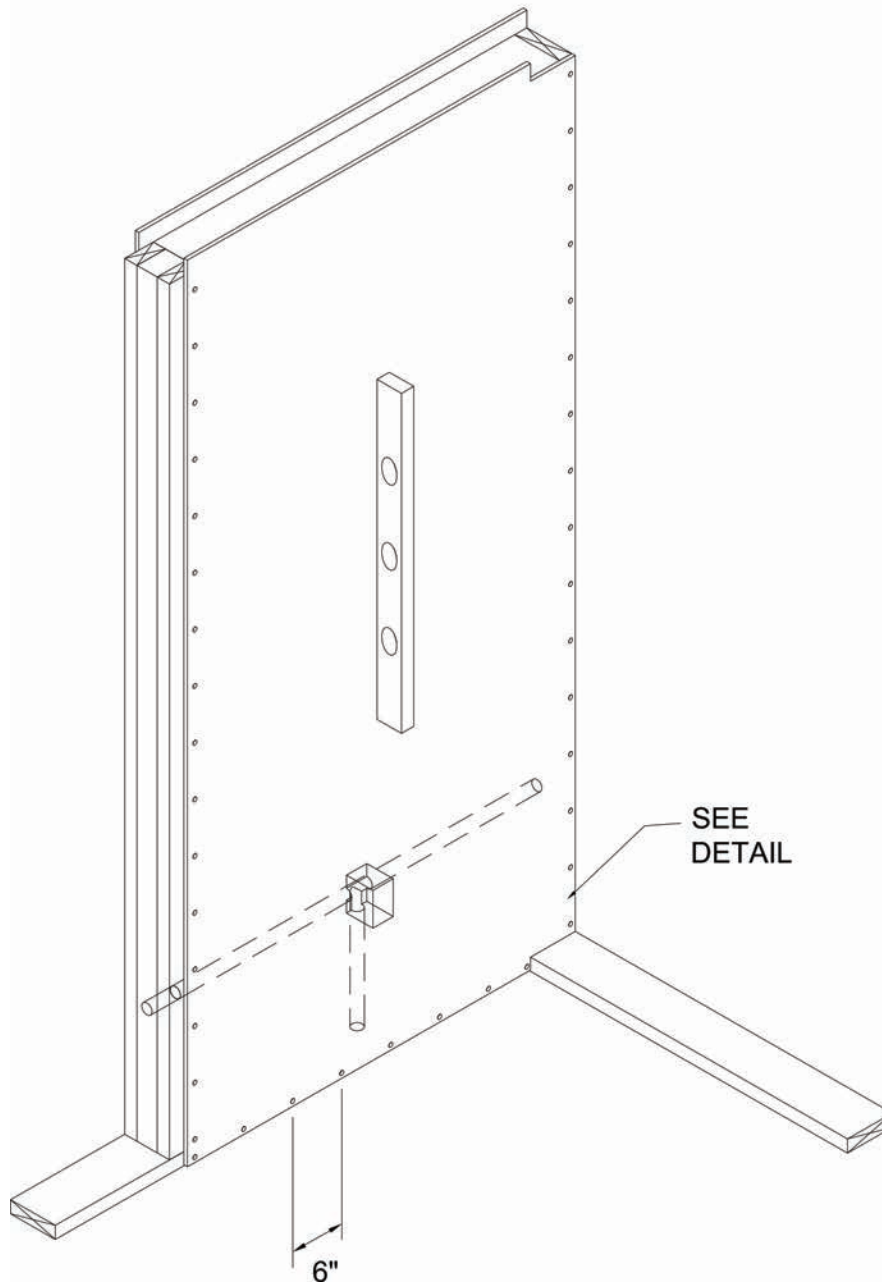
1. Before placing panels into position over the sill plate, check the bottom of the panel for vertical wiring chases. Where chases are found, drill a matching 1.5" diameter hole through the sill plate and the sub-floor. See Section 11: Electrical, for more information.
2. Before setting panels over sill plate, 3 unbroken  $\frac{1}{4}$ " diameter beads of approved sealant compatible with polystyrene must be applied to the plate as shown.
3. **NOTE:** The bead is symbolized by the solid line in Figure 1.
4. **IMPORTANT: DO NOT USE SOLVENT BASED SEALANT. SEALANT MUST BE EPS COMPATIBLE.**
5. Apply sealant to the recessed edges of the panel being installed before sitting the panel over the sill plate.
6. To avoid disturbing the sealant bead on the sill plate, tilt the panel back slightly on the connector stud and slide forward into position
7. **NOTE:** Use a come-a-long, ratchet straps, or other mechanical means to pull panels together.
8. When panels are properly positioned and the thermal post is in contact with EPS and plumbed, both the interior and exterior edges must be nailed using 8d nails on 6" centers (unless noted otherwise on panel layout drawings). Toenail the bottom of the laminated post to the sill plate using 16d box nails at the position shown.
9. **NOTE:** Top of panels must be evenly aligned before nailing.



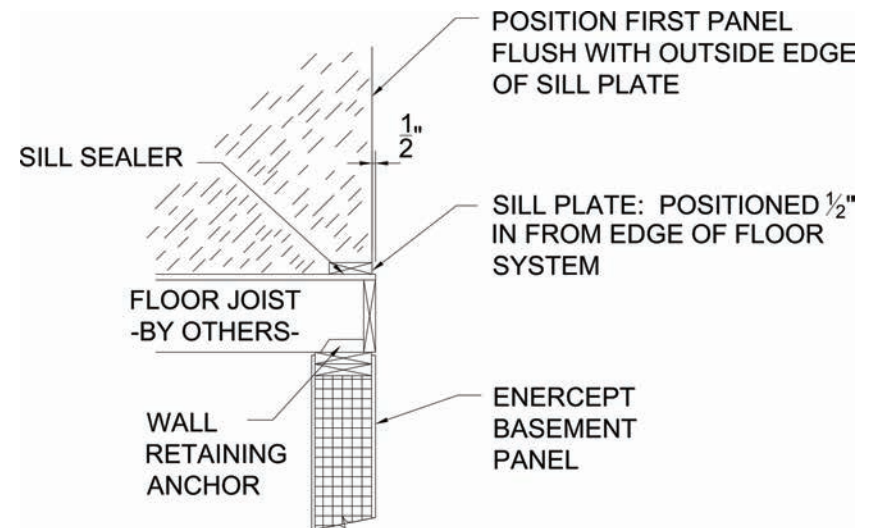
**FIGURE 1**

## SETTING THE FIRST PANEL

**FIGURE 1**



1. Check panel for vertical electrical chases. Drill sill plate hole to match location of vertical chase.
2. Apply sealant to the sill plate and set panel #1 into position.
3. Before nailing the panel into place, plumb the interior surface and the leading edge of the panel to be sure it is vertically plumb in both directions.
4. When the panel is in its proper position, nail to the sill plate using 8d nails spaced 6" o.c. on both the interior and exterior edges.
5. Set subsequent panels in numerical order, following the layout drawing furnished with the Enercept building system.
6. Follow the typical wall panel installation steps, described on the previous page.
7. Repeat the preceding steps when setting successive panels.
8. Add temporary diagonal bracing to ensure the panel remains plumb during the installation of subsequent panels.



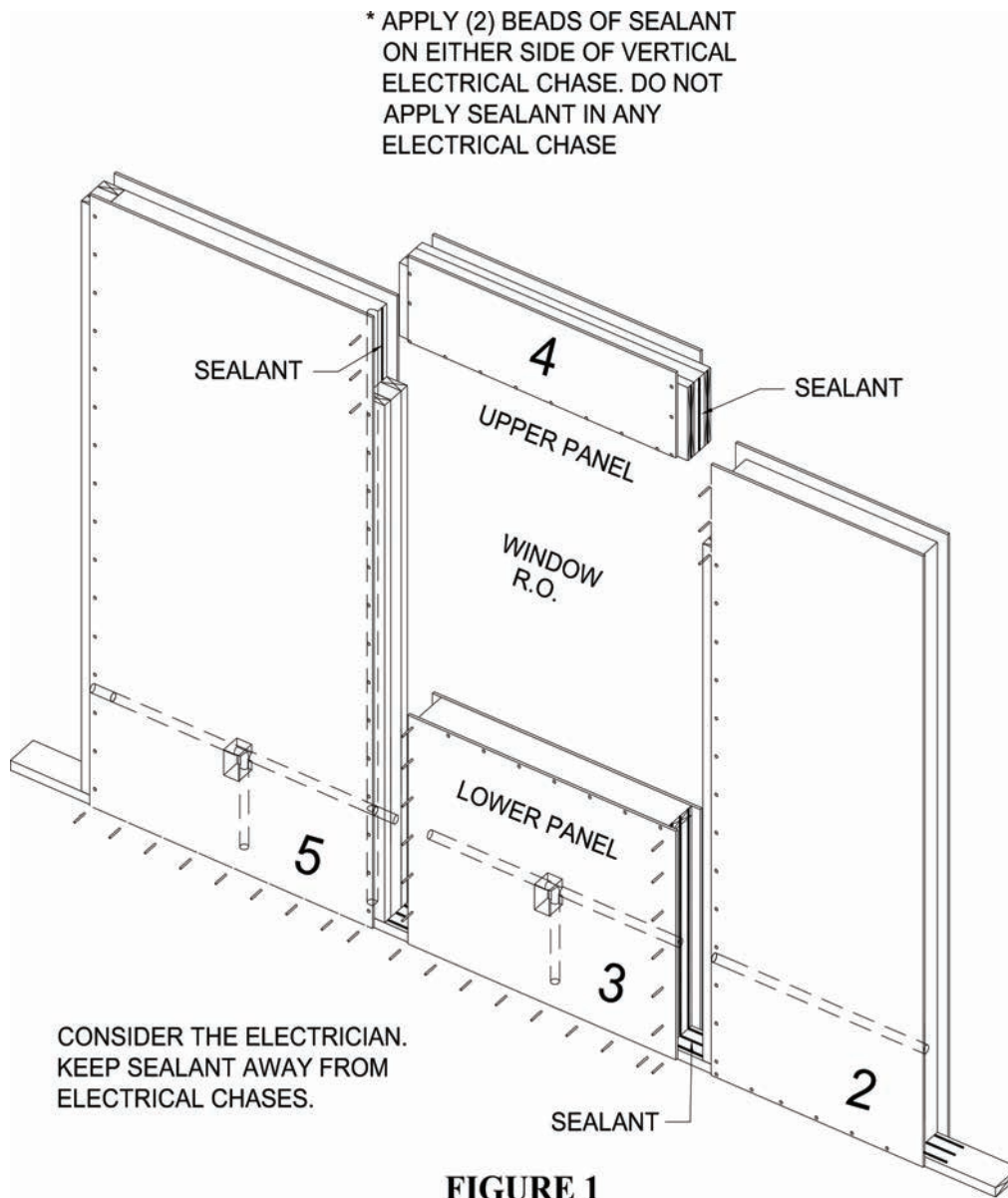
**FIGURE 2**

## WINDOW PANEL INSTALLATION

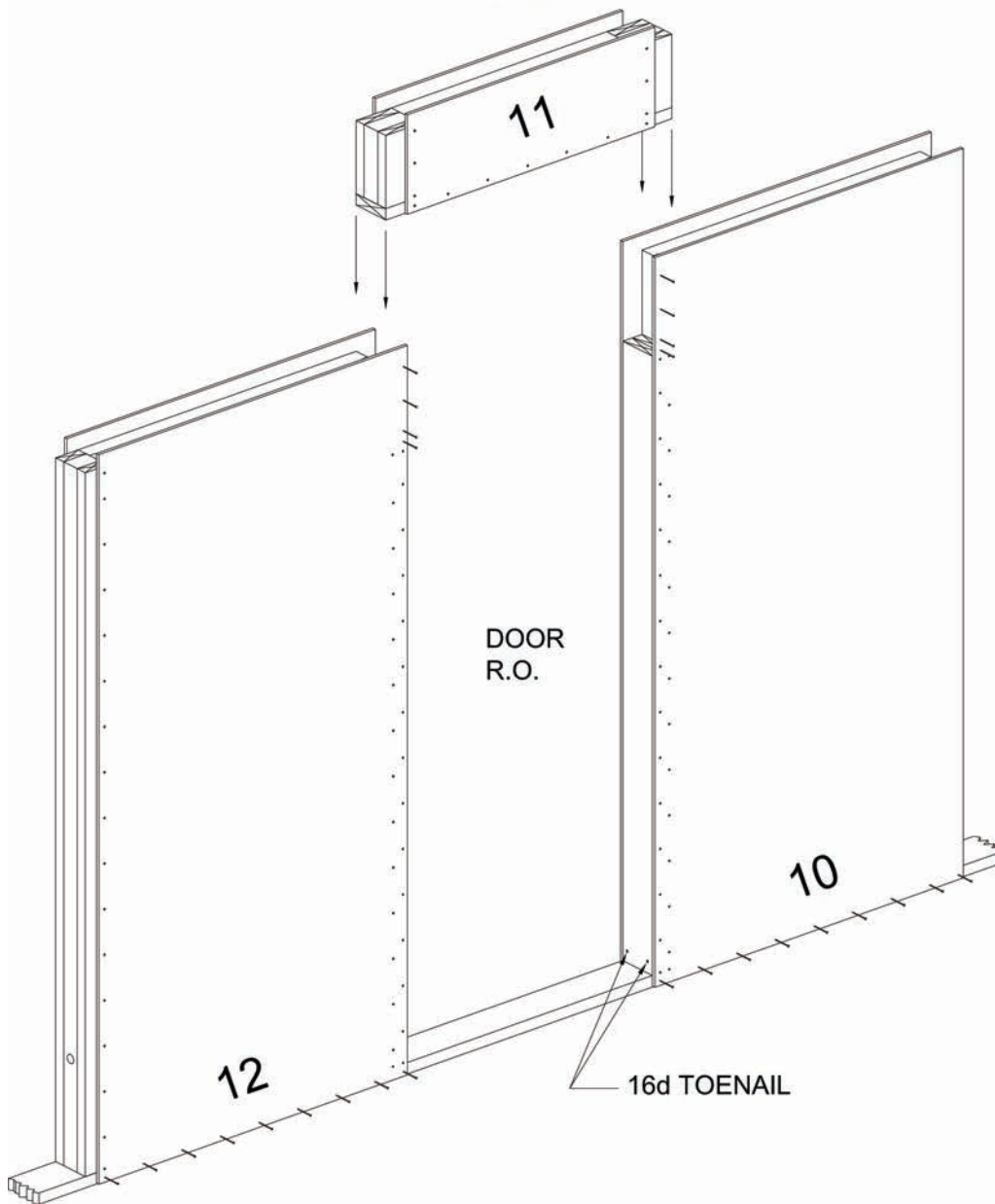
**NOTE:** Panel numbers shown are for illustration only.

**NOTE:** Window rough openings will typically consist of a lower panel and a header panel. In some cases, windows will be embedded within a single panel.

1. Check panel for vertical electrical chases. Drill sill plate hole to match location of vertical chase.
2. Apply sealant to the leading recessed area on lower panel # 3 as shown.
3. Apply sealant to the sill plate.
4. Tilt and slide panel #3 into position, plumb, level and nail with 8d nails on 6" centers through both the interior and exterior edges as shown.
5. Apply sealant to the remaining end of panel # 3.
6. Apply sealant to the sill plate and place panel #5 into position, leaving a space of approximately 1" between panels #5 and # 3.
7. Apply sealant to the upper portion of panels #2 and #5.
8. Slide upper panel #4 down into position, slide panel #5 over tightly against panel #3 and panel #4.
9. Plumb panel #5 and nail into position.
10. Nail upper #4 and lower panel #3 at this time. Nail all interior and exterior edges with 8d nails on 6" centers.



**FIGURE 1**



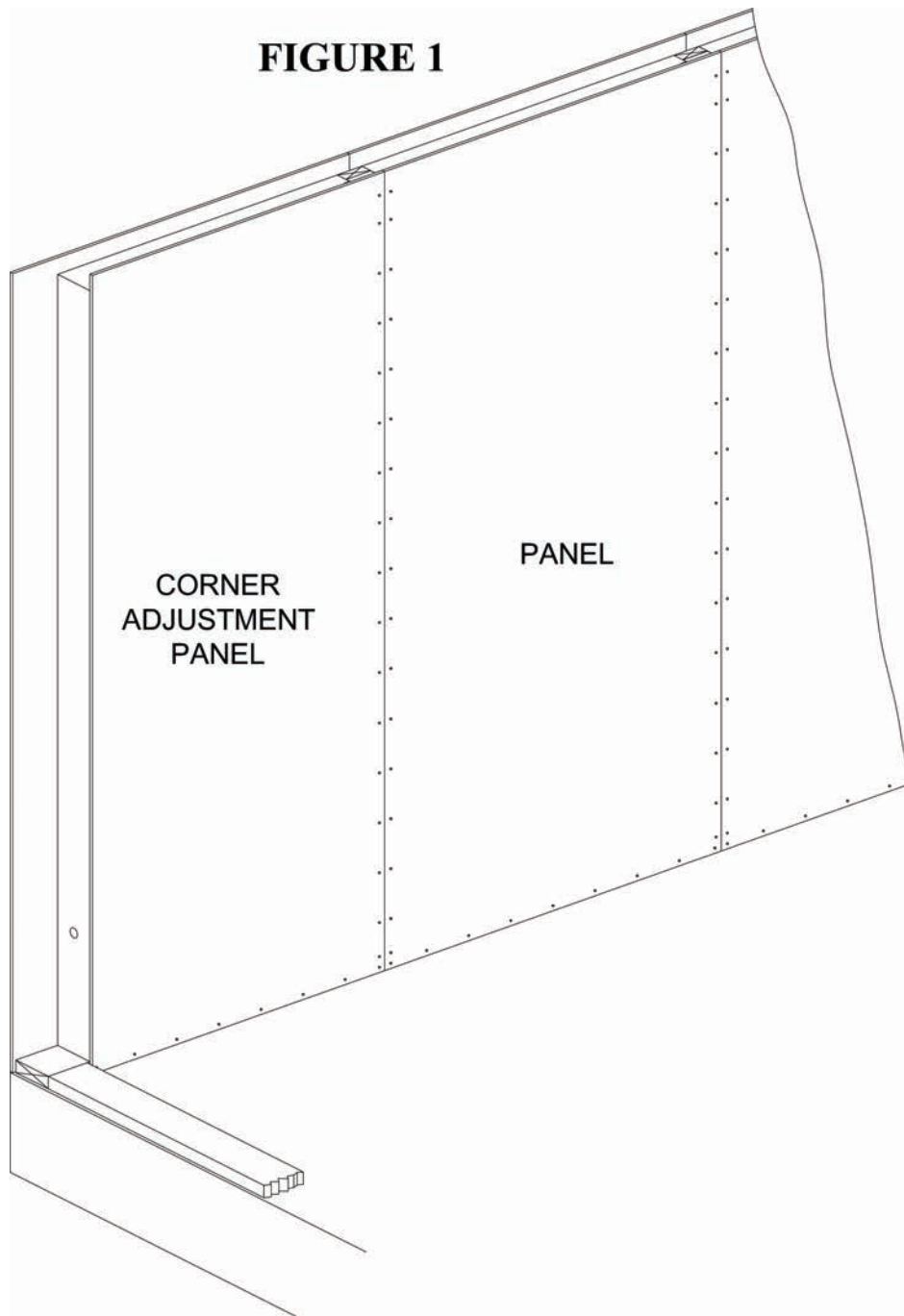
## DOOR PANEL INSTALLATION

**NOTE:** Installation of door panels is similar to windows except there is no lower panel at the opening.

1. Panel #10 is assumed to have been set in place.
2. Determine the approximate position for panel #12.
3. Check panel #12 for vertical electrical chases. Drill sill plate hole to match location of vertical chase.
4. Apply sealant to the sill plate below panel #12.
5. Tilt and slide panel #12 into position. **DO NOT NAIL THE PANEL AT THIS TIME**
6. Apply sealant to the upper portion of #10 and #12 and slide door lintel #11 into place.
7. Push panel #12 over firmly against header panel #11.
8. **NOTE:** Lower width of rough opening must equal upper width.
9. Plumb panel #12 and nail all panels with 8d nails on 6" centers, on all interior and exterior edges.



**FIGURE 1**



## **PANEL GROWTH**

### **WHAT AND WHY**

Panel growth refers to the increase in length of panel walls and roofs. Failure to obtain a tight fit between panels can cause growth. Thermal posts in wall panels must be in contact with the EPS core of the adjacent panel.

### **CORRECTION METHODS**

For standard 4'-wide panel applications, Enercept has designed each corner panel to allow the builder to easily shorten the panel by the amount of growth. For jumbo 8'-wide panel applications and panels using OSB splines, it may be necessary to correct panel growth before the end of the wall to ensure that rough openings remain in the proper locations.

Enercept recommends measuring periodically, checking opening centerline dimensions for growth as panels are set in place.

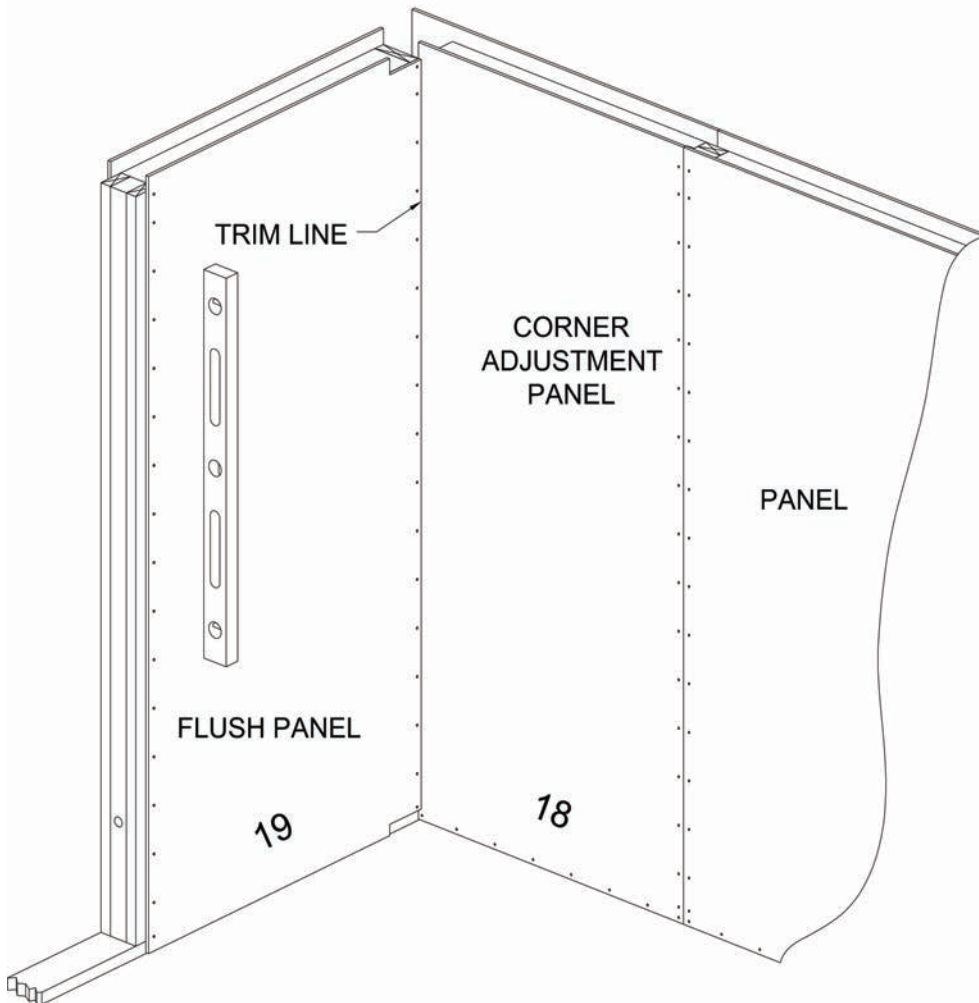
- An electric foam scoop can be obtained from Enercept to recess the foam by the amount of panel growth. (Enercept gives each builder the option to purchase a foam scoop.)
- Use a circular saw (Skilsaw) or reciprocating saw (Sawzall) to cut the sheathing back by the same amount.

### **CORNER ADJUSTMENT PANEL**

1. Temporarily set the corner adjustment panel into position.
2. **DO NOT NAIL OR APPLY SEALANT AT THIS TIME!**
3. Any growth that may have occurred during the erection of the previous panels will be compensated for by following the instruction on the next page.



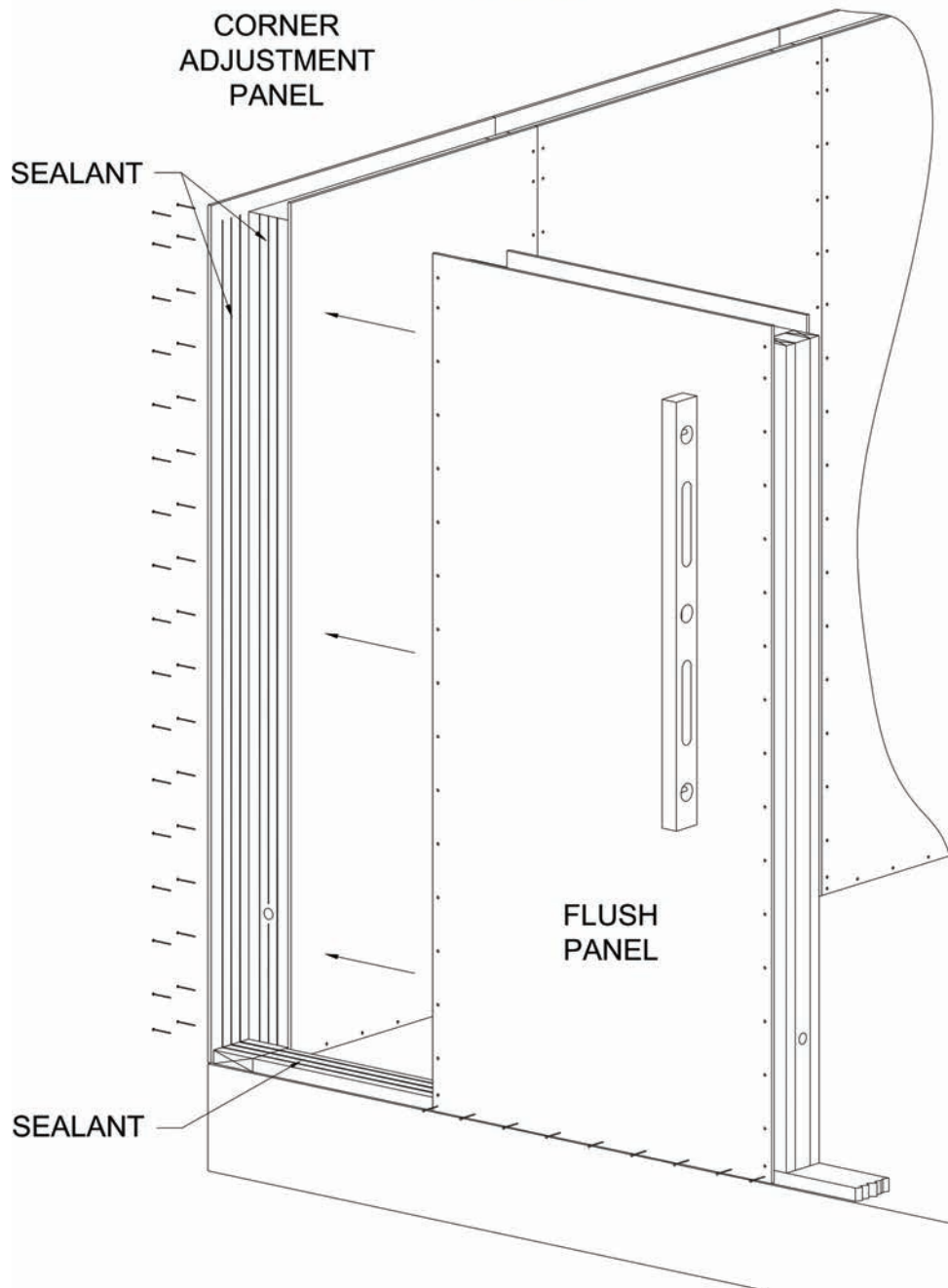
**FIGURE 1**



## **FITTING THE CORNER ADJUSTMENT PANEL**

1. Temporarily set the corner adjustment panel into position, panel #18 as indicated on the previous page.
2. Temporarily set the flush panel #19 into position over the sill plate and slide it against the inside surface of the corner adjustment panel #18.
3. If no growth has occurred in the wall with panel #18, flush panel #19 will slide completely into the corner.
  - a. If this is the case, remove flush panel #19 and permanently install panel #18, following the required steps.
  - b. Then go on to the next page.
4. If trimming of the panel is necessary, perform the follow steps.
5. Plumb the interior of the flush panel #19 as shown, tilting the panel in or out until the OSB surface is vertically plumb.
6. With the edge of panel #19 as a guide, mark and trim the adjustment panel #18.
7. Trim the OSB skin and recess the EPS core the corresponding dimension.
8. Install the corner panel #18 following the required steps
9. Install the flush panel #19 as described on the following page.

**FIGURE 1**

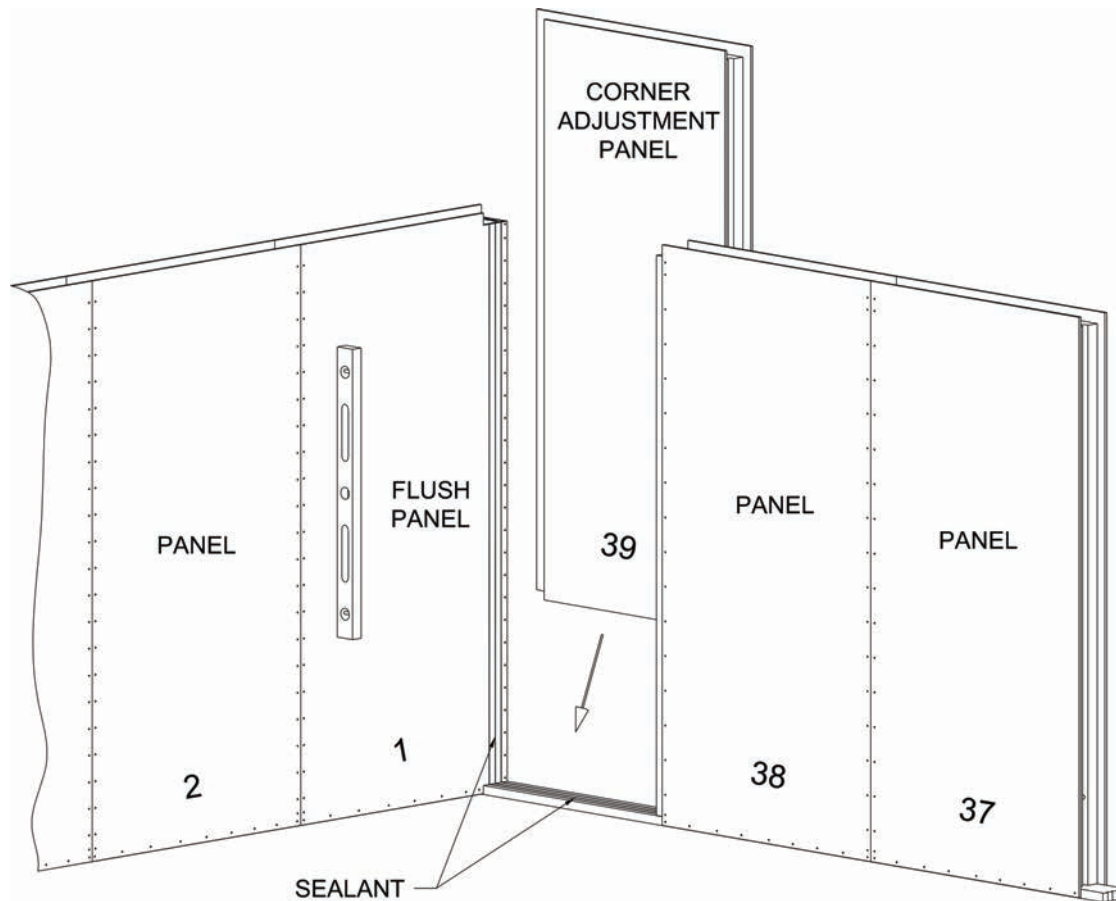


## **CORNER FLUSH PANEL INSTALLATION**

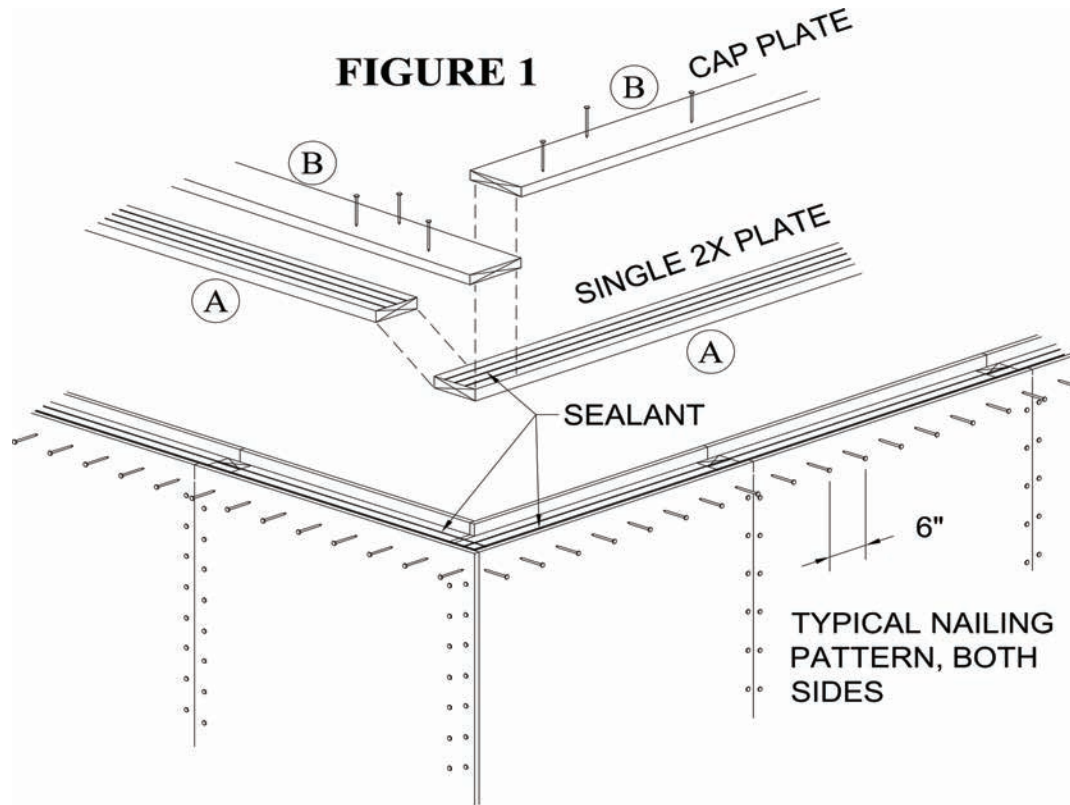
1. Check the bottom of the flush panel for vertical electrical channels and drill a matching hole through the sill plate.
2. Apply sealant to the required area as shown.
3. Tilt the corner flush panel backward and slide into position.
4. Plumb the panel.
5. Fasten the panel to the sill plate on interior and exterior edges with 8d nails on 6" centers.
6. Use 8d nails, spaced as shown, and fasten the exterior corner.

## FINAL ADJUSTMENT PANEL INSTALLATION

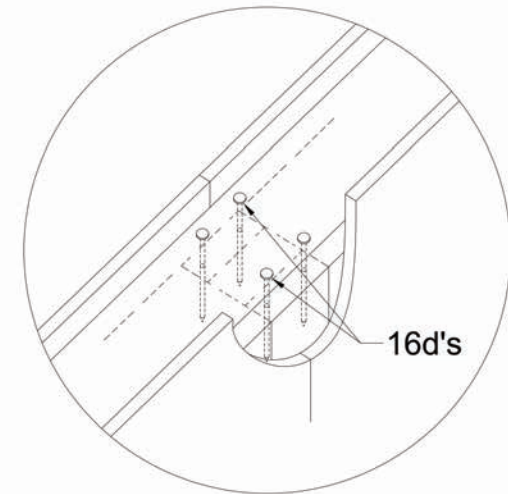
**NOTE:** Installation of the adjustment panel in the final corner is slightly different than the previous corners since one corner panel is already in position (the first panel erected.)



1. If temporary diagonal bracing was installed on panel #1, remove the temporary bracing.
2. Use a level and check panel #1 to assure that it has remained plumb.
3. Measure the distance between the inside face of panel #1 and the leading edge of the sheathing in panel #38 at both the top and bottom.
4. Trim the interior OSB and EPS core of panel #39, adjacent to panel #1, to correspond to these dimensions.
5. Trim the exterior sheathing of panel #39 so it is flush with the exterior surface of panel #1.
6. Drill matching electrical holes in sill as necessary.
7. Apply sealant and lift panel #39 above panel #1 and #38 and slide down, into place.
8. Using 8d nails on 6" centers, fasten all interior and exterior edges as shown on the preceding page.



\* APPLY (2) BEADS OF SEALANT ON EITHER SIDE OF VERTICAL ELECTRICAL CHASE. DO NOT APPLY SEALANT IN ANY ELECTRICAL CHASE



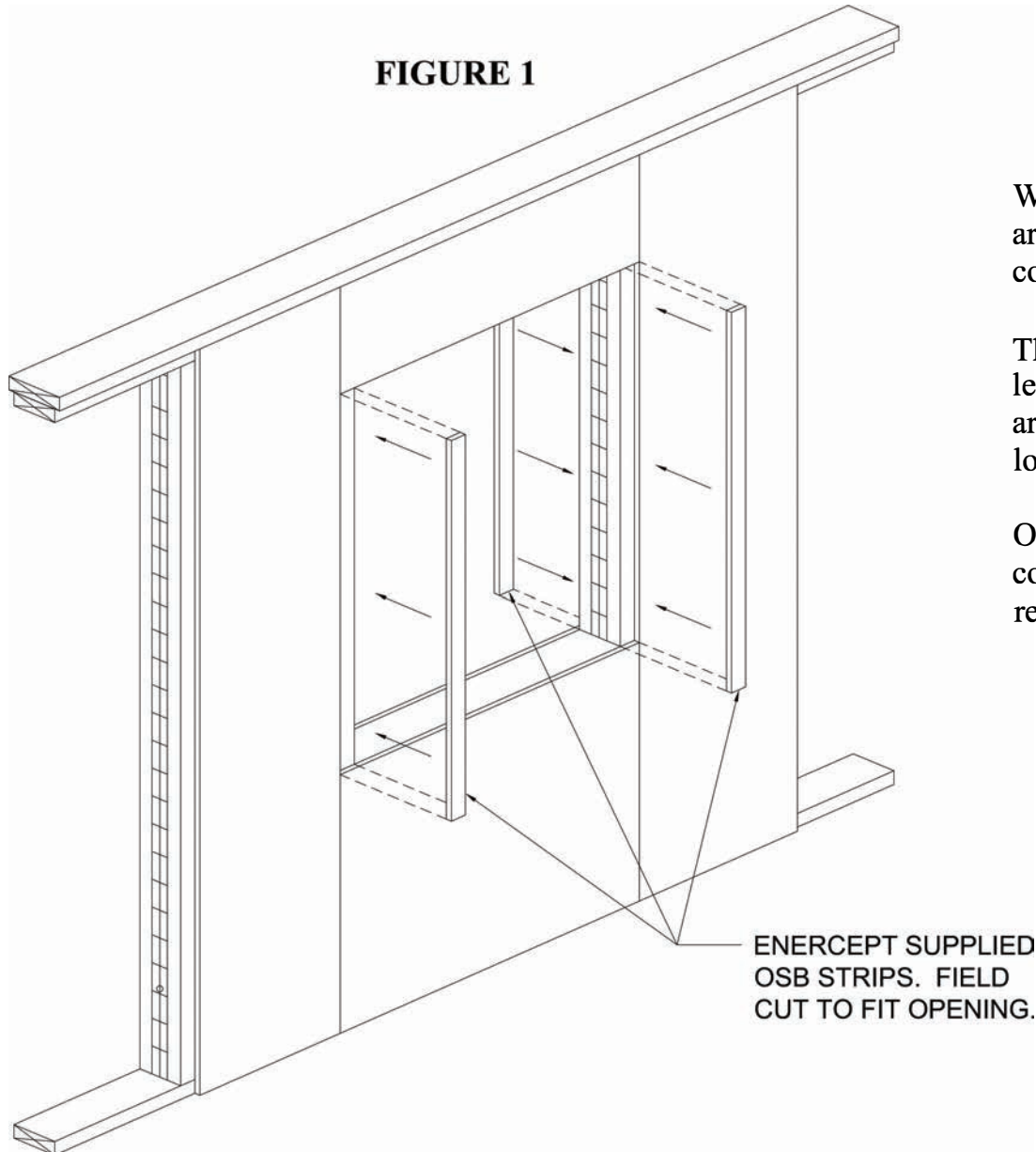
## TOP PLATE / CAP PLATE INSTALLATION

DETAIL A

1. Check the top surface of the panel cores for vertical wiring channels. Mark these positions on the interior sheathing for later drilling reference.
2. Place 3 continuous  $\frac{1}{4}$ " diameter beads of sealant on the core of the panels and place the first plate (A) into position.
3. **NOTE:** Allow a minimum joint offset of at least 4'. Do not splice over window or door openings.
4. Fasten first plate (A) to the studs of the thermal post using four 16d nails as shown in Detail.
5. Place 3 continuous  $\frac{1}{4}$ " beads of approved sealant on top of the first plate (A).
6. Install plate (B) using 16d nails on staggered 16" centers.
7. Firmly press plates (A) and (B) into position, nail with 8d nails on 6" staggered centers through interior and exterior sheathing.
8. Drill through both plates into the vertical electrical channels previously marked in Step 1.

# WINDOW FILLER STRIPS

**FIGURE 1**



Window strips are supplied to fill in the areas around openings in which the thermal post connection member is exposed.

These OSB strips are sent 1 ½" wide in 4'-0" lengths to be field cut to size and installed around openings that have an insulated post located on either side of the opening.

Openings using 2X posts at either side are constructed flush with the panels and will not require the use of window filler strips.

# SECTION 6

## BEAM / CENTER WALL



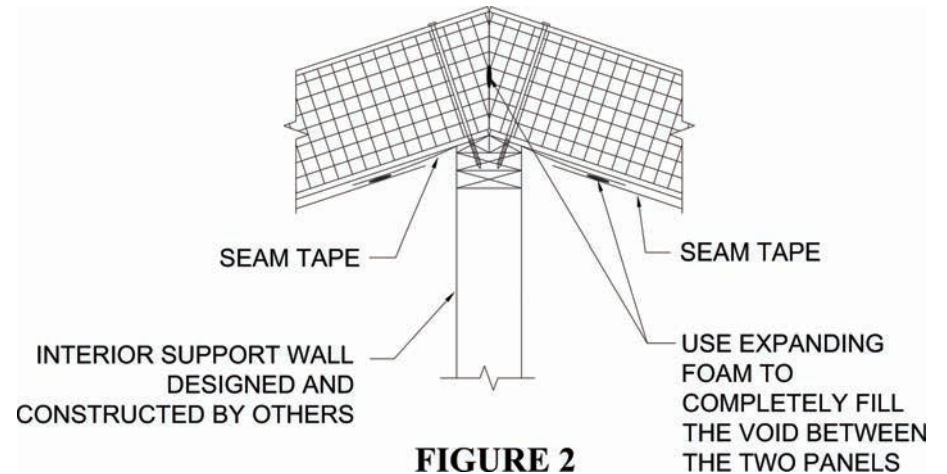
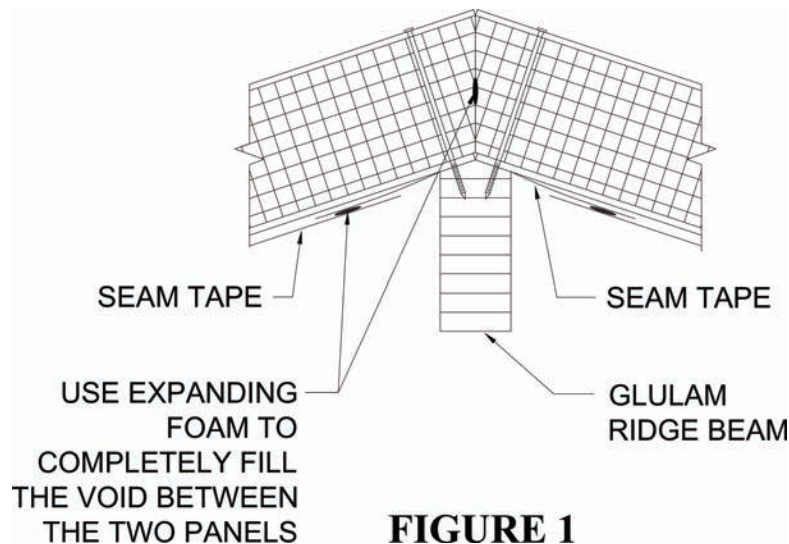
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# SEAM TAPE



## SEAM TAPE

Drape the seam tape (release paper side up) and tack with staples to the top side of the beam / center wall.

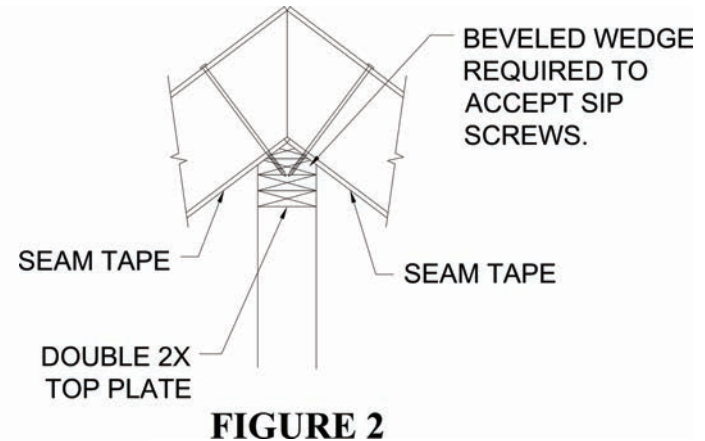
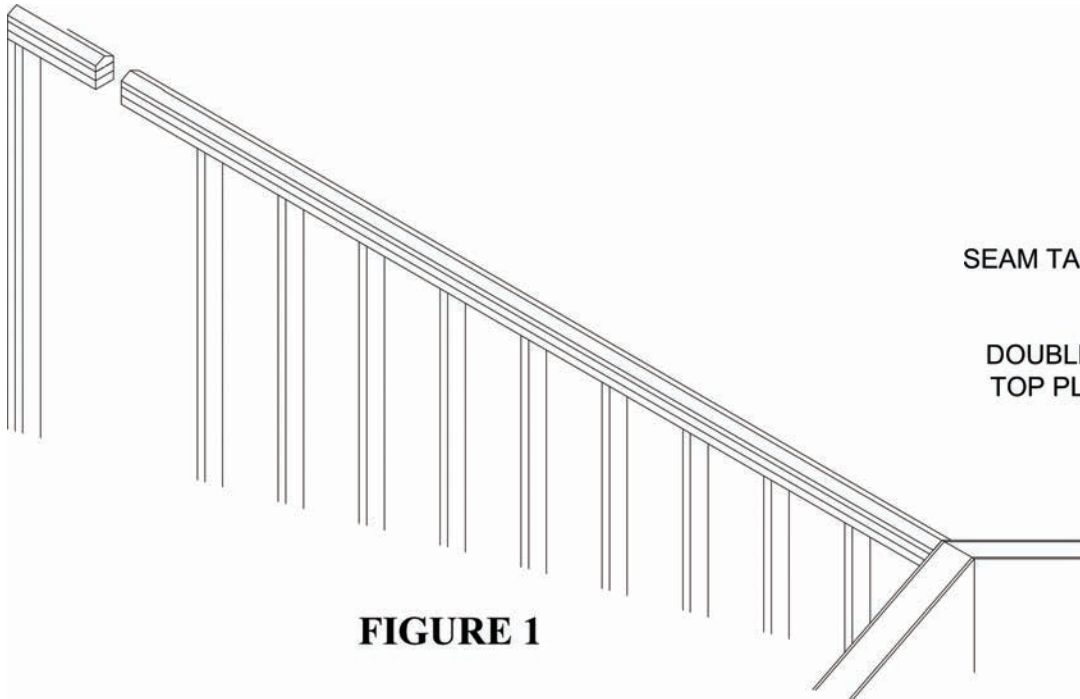
Do not remove paper backing until after the roof panels are installed.

## NOTE:

To ensure interior walls do not pull away from the panels, ALL INTERIOR WALLS MUST BE SCREWED TO ENERCEPT WALL AND ROOF PANELS WITH 3" SCREWS.

**DO NOT NAIL! DO NOT NAIL! DO NOT NAIL!**

# CENTER BEARING WALL

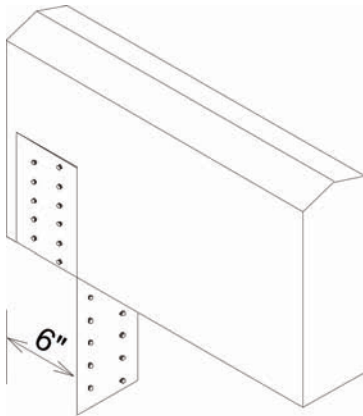


**NOTE:** Center bearing walls used to support roof panels shall be designed and supplied by others.

Enercept suggests using a minimum of 2x6 wall construction to accommodate bearing requirements for roof panels. Enercept does not, however, claim that the 2x6 framing is adequate for the project specific structural loads. Circumstances such as wall height or loading may dictate that other construction is required.

Construct the center support wall so its height will equal the height of the gable wall top plate at the peak.

# RIDGE BEAM INSTALLATION



**FIGURE 1**

1. Plumb and brace all walls.
2. Check beam measurements against site measurements.
3. Adjust beam length if needed.

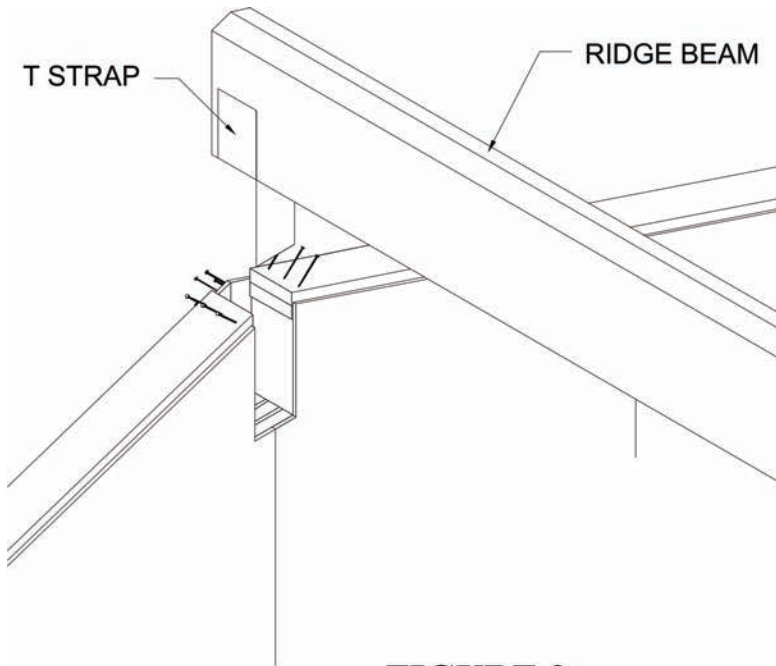
**NOTE:** Do not notch or drill holes into any beams without contacting Enercept or Beam Supplier.

4. Confirm beam pockets and beam depth is accurate.
5. If necessary, adjust the beam pocket size prior to installation.

**NOTE:** Beam pockets are often slightly wider and deeper than required for adjusting beam placement within pocket. Shim within beam pocket when necessary to attain proper bearing height.

6. Install T-connector(s) as illustrated in Figure 1 and nail to beam.
7. All intermediate beam supports must be installed prior to installing the beam.
8. All beam support points must be at the same height and level.
9. Lift beam into position. Insure that the beam is level.
10. Toenail with 16d nails spaced 2" apart as illustrated in Figure 2, also nail through the exterior wall sheathing into the end of the beam with 8d nails on 2" centers.
11. Fasten T-connector(s) to wall panel and supporting post with 8d nails.
12. Attach intermediate beam support points to beam.
13. Seal any gaps / voids with expanding foam sealant around the beam in the panel beam pockets.
14. Before and during setting of roof panels check for lateral movement (bowing).
15. Drape seam tape (paper side up) over the top of the beam and tack in place before setting any roof panels.

**NOTE:** Seam tape can be tacked to the beam prior to lifting beam into place.



**FIGURE 2**

# SECTION 7 GABLE WALLS



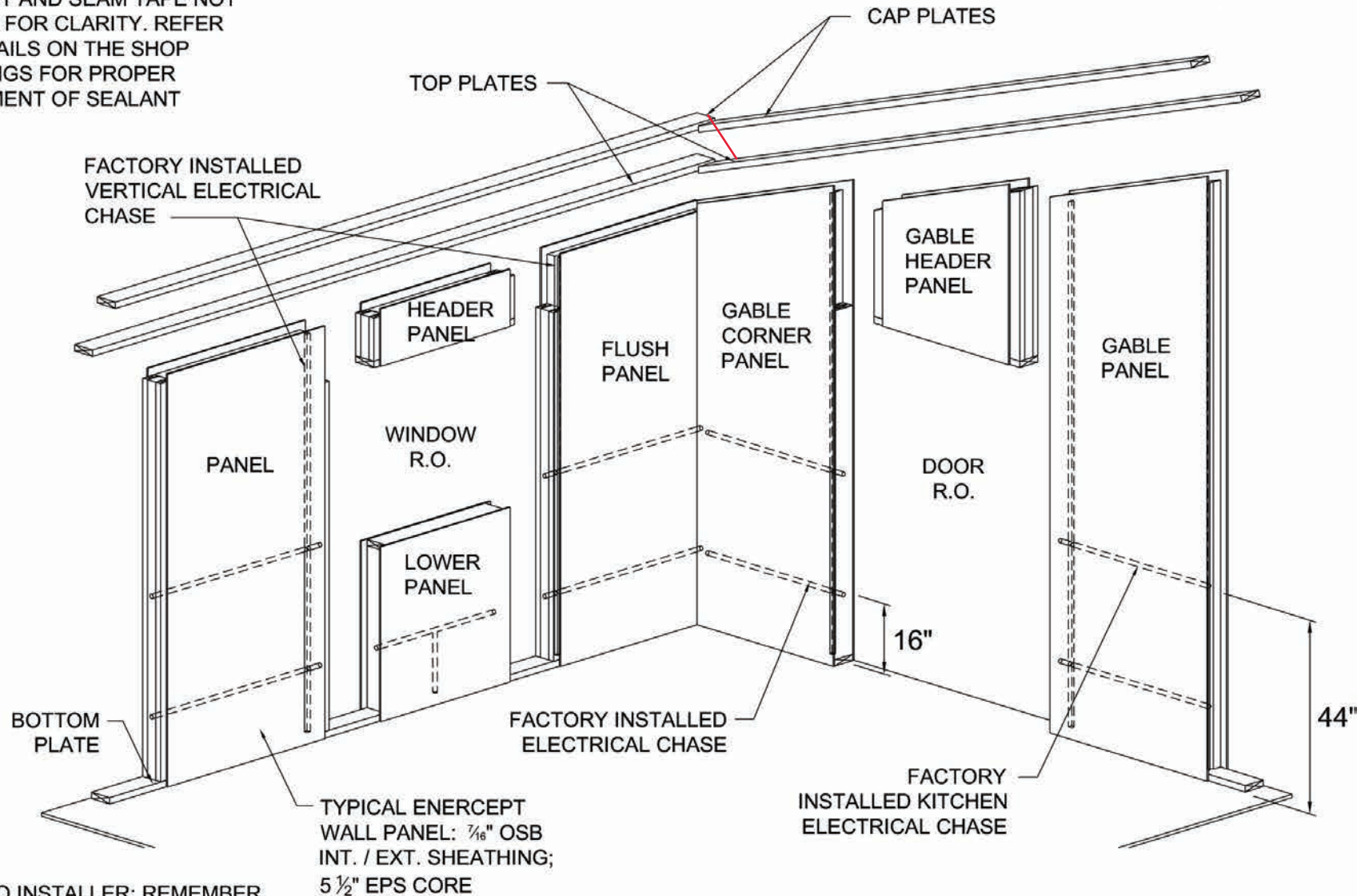
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# TYPICAL GABLE WALL LAYOUT

\* SEALANT AND SEAM TAPE NOT SHOWN FOR CLARITY. REFER TO DETAILS ON THE SHOP DRAWINGS FOR PROPER PLACEMENT OF SEALANT



\* NOTE TO INSTALLER: REMEMBER TO DRILL TOP PLATE/CAP PLATE AND SILL PLATE AT THE VERTICAL CHASE LOCATIONS FOR ELECTRICAL INSTALLATION.

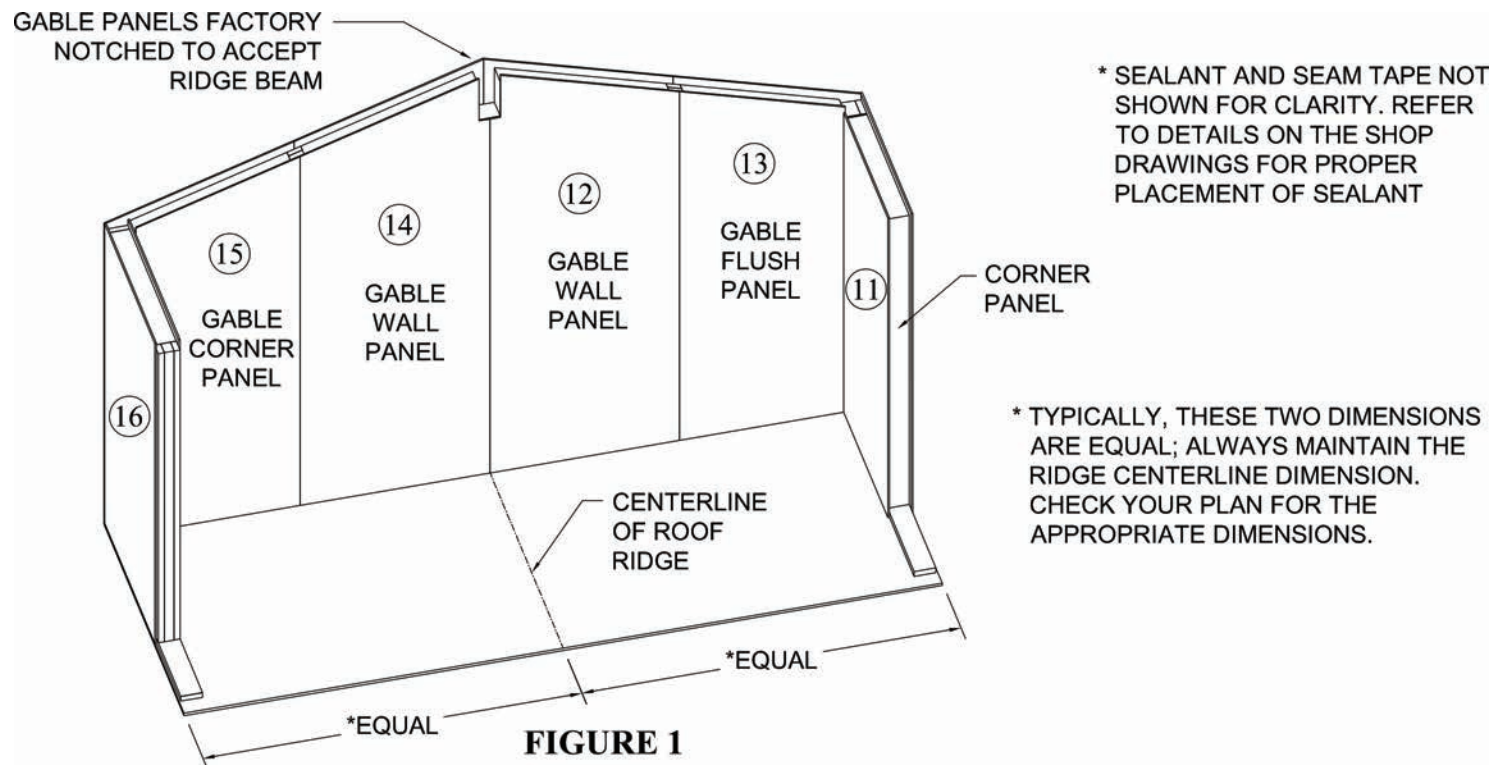
**FIGURE 1**



# TYPICAL GABLE WALL LAYOUT

**NOTE:** Centerline dimension and pitch must be maintained. Any panel growth must be addressed at the corners.

1. For easier installation do not set wall panel #11 until gable flush panel #13 is in place.
2. Mark centerline of beams and windows on sub-floor prior to installation for reference when setting the gable wall panels.
3. Start with gable wall panel #12 (as shown below), setting panels from the center to the outside.
4. Continue setting panels. Any growth must be addressed on the gable flush panel.
5. Set panel #14 and continue to the corner, address any panel growth on the gable corner panel.
6. Refer to page 5-6 Typical Wall Panel Installation Steps for wall panel installation.





# SECTION 8 STRUCTURAL ROOF



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# LIFTING PANELS ONTO THE ROOF

The easiest and safest way to pick up and set your roof panels into position is using a crane or a boom truck.

The 8” structural roof panel weighs approximately 3.75 pounds per square foot.

The 10” structural roof panel weighs approximately 4.5 pounds per square foot.

The 12” structural roof panel weighs approximately 4.8 pounds per square foot.

Listed below are suggested options for picking up panels:

1. Refer to page 8-4 for lifting rod detail.
2. See page 8-3 for lifting plate detail.

**\* Do not use the electrical wire in the roof panel as a guide rope.**

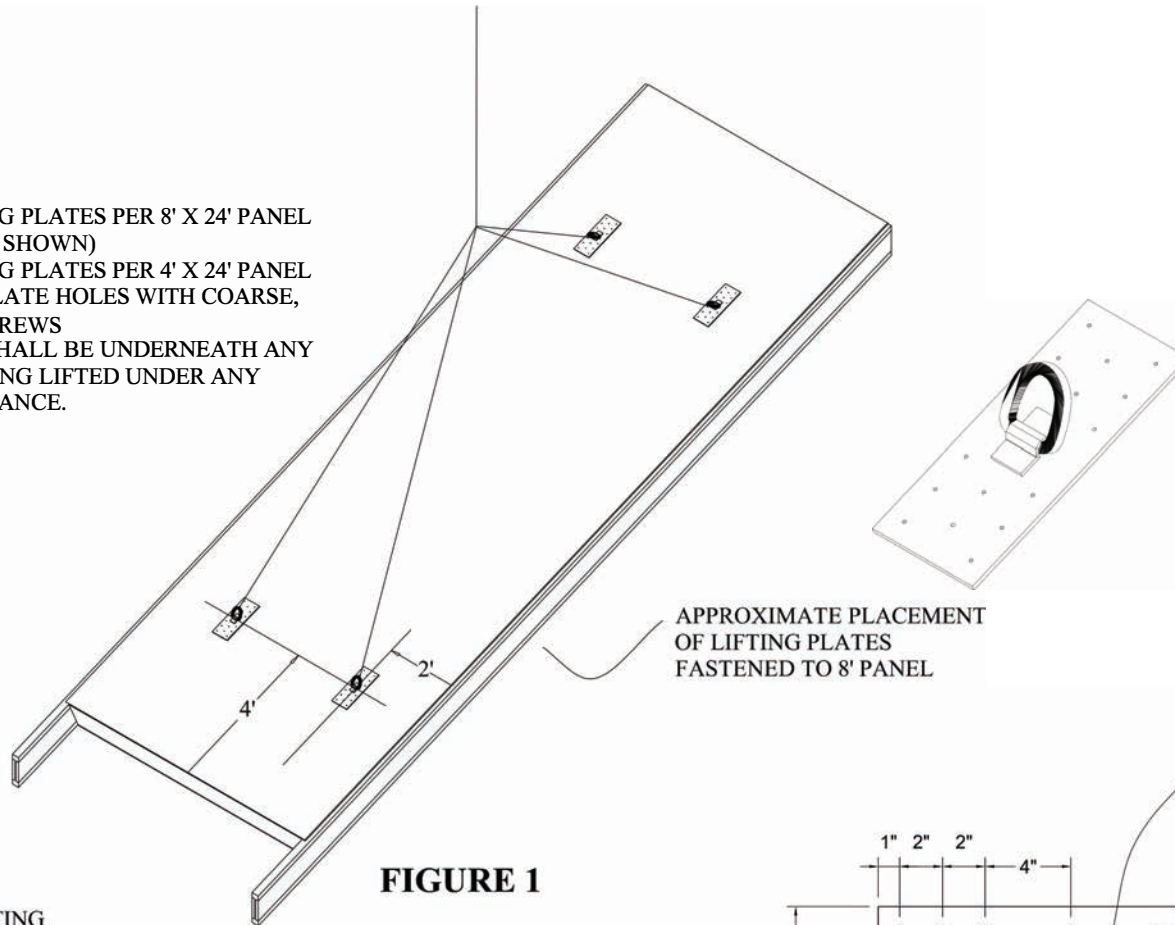
Whether you use one of the suggestions listed above or another method that you develop yourself, please make safety your first concern.

**NOTE: Place seam tape draped over beam / center wall before setting roof panels. (For more information, refer to page 6-2.**

# LIFTING PLATE DETAILS

## NOTES:

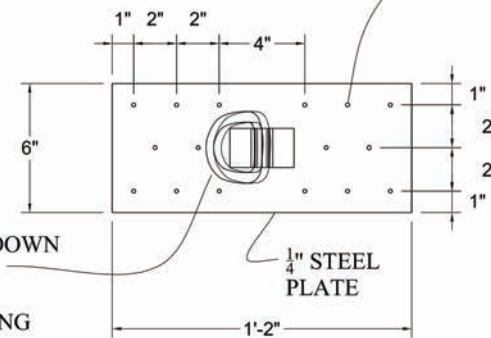
- USE (4) LIFTING PLATES PER 8' X 24' PANEL (EXAMPLE SHOWN)
- USE (2) LIFTING PLATES PER 4' X 24' PANEL
- FILL ALL 16 PLATE HOLES WITH COARSE, THREADED SCREWS
- NO PERSON SHALL BE UNDERNEATH ANY PANEL BEING LIFTED UNDER ANY CIRCUMSTANCE.



**FIGURE 1**

SPECS AND FASTING PATTERN APPLY ONLY TO LIFTING PLATES SUPPLIED BY ENERCEPT

2  $\frac{5}{16}$ " D-RING TIE DOWN WITH MOUNTING BRACKET #1200 MINIMUM WORKING LOAD. BRACKET FULLY WELDED TO PLATE BY CERTIFIED WELDER.



(16)  $\frac{3}{16}$ " HOLES PER PLATE. USE #6 X  $1\frac{1}{4}$ " COARSE THREAD WOOD SCREWS TO FASTEN PLATE TO PANEL. FILL ALL HOLES

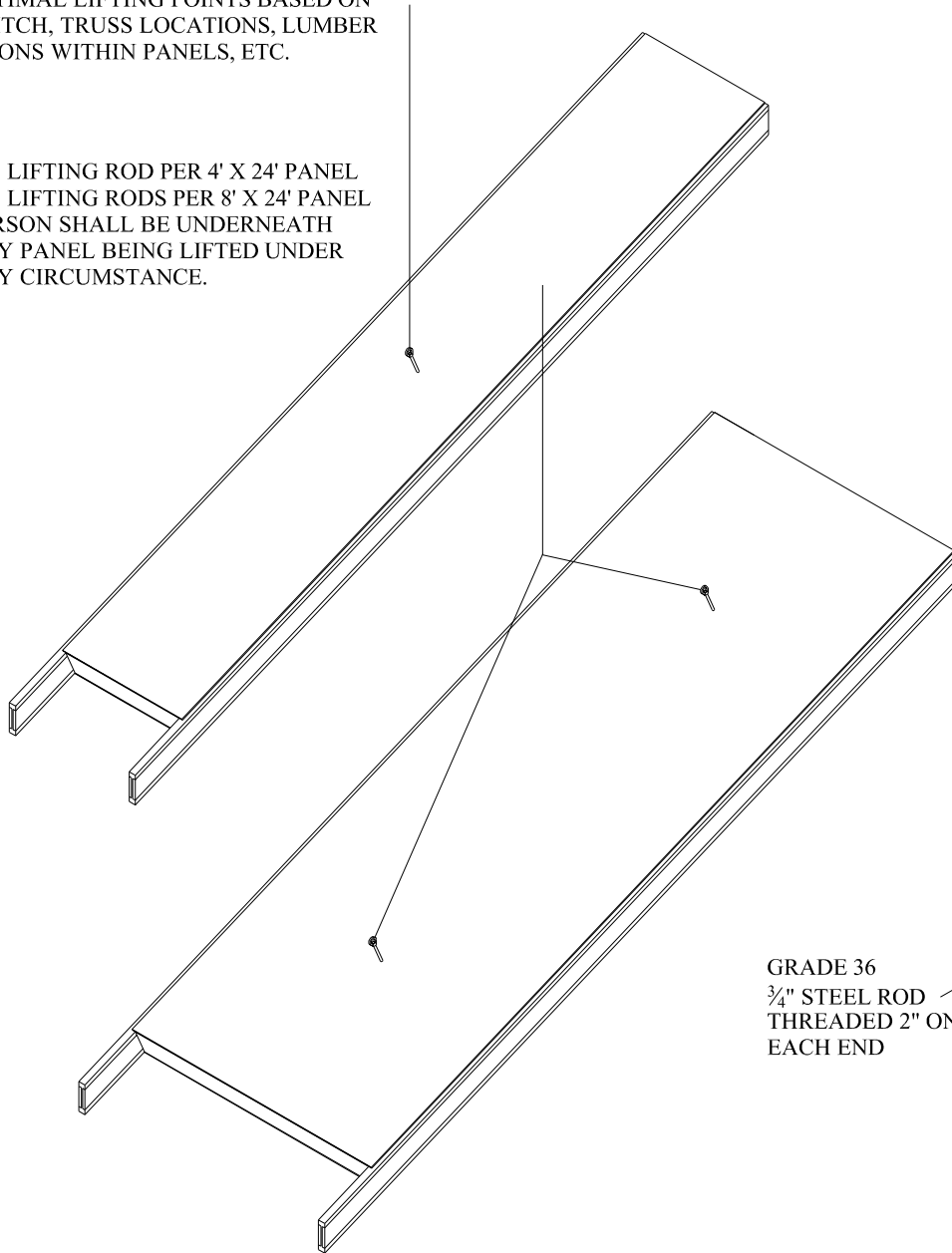
LIFTING PLATE CAPACITY:  
416lb MAXIMUM ALLOWABLE LIFTING CAPACITY PER PLATE. (ALL 16 HOLES MUST BE FILLED WITH SPECIFIED SCREWS)

# LIFTING ROD DETAILS

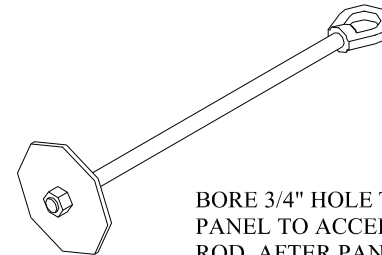
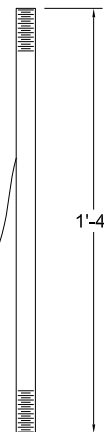
THE CONTRACTOR SHALL DETERMINE THE OPTIMAL LIFTING POINTS BASED ON ROOF PITCH, TRUSS LOCATIONS, LUMBER LOCATIONS WITHIN PANELS, ETC.

## NOTES:

- USE (1) LIFTING ROD PER 4' X 24' PANEL
- USE (2) LIFTING RODS PER 8' X 24' PANEL
- NO PERSON SHALL BE UNDERNEATH ANY PANEL BEING LIFTED UNDER ANY CIRCUMSTANCE.



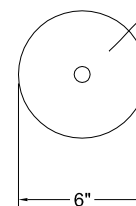
GRADE 36  
 $\frac{3}{4}$ " STEEL ROD  
THREADED 2" ON  
EACH END



BORE  $\frac{3}{4}$ " HOLE THROUGH  
PANEL TO ACCEPT LIFTING  
ROD. AFTER PANEL IS SET  
AND SECURELY FASTENED IN  
PLACE, UTILIZE SPRAY FOAM  
TO SEAL HOLE.



EYE NUT THREADED  
ONTO  $\frac{3}{4}$ " ROD AND  
WELDED INTO PLACE  
(A105)



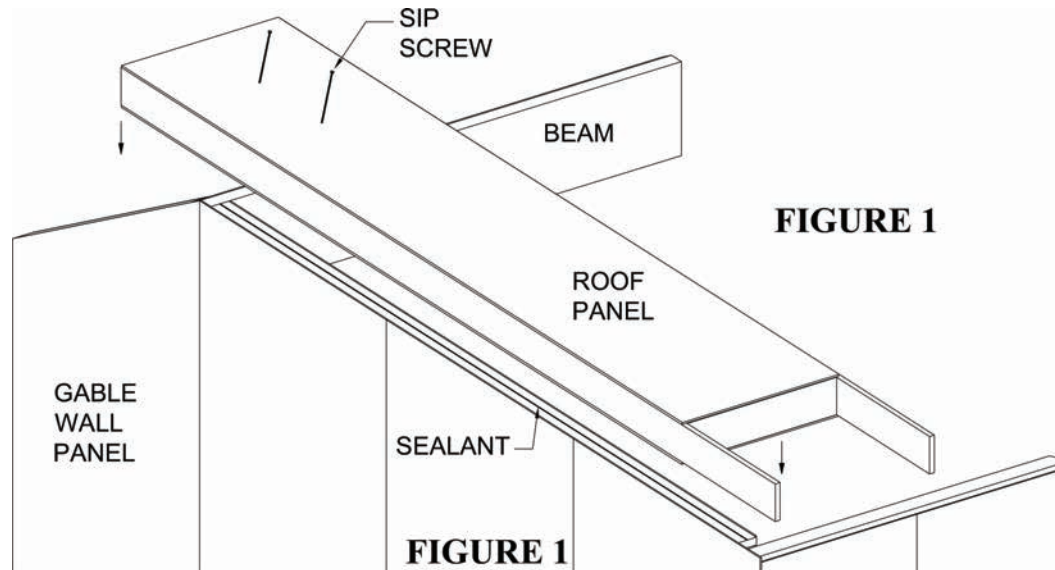
$\frac{1}{4}$ " X 6" DIAMETER STEEL  
PLATE. WELD  $\frac{3}{4}$ " HEX  
NUT TO BOTTOM OF  
PLATE.  
(A36 PLATE)



HEX NUT  
(A563)

LIFTING ROD CAPACITY:  
1200lb MAXIMUM  
ALLOWABLE LIFTING  
CAPACITY PER ROD.

# ROOF PANEL INSTALLATION



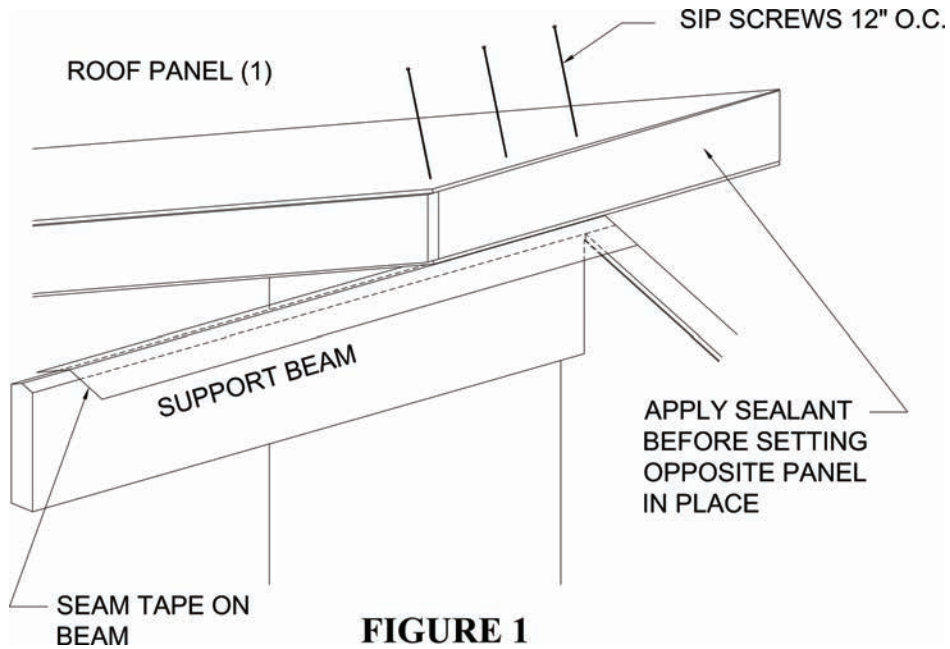
1. Before placement of any roof panels, make sure all wall / gable panels are plumb and braced against tipping inward / outward.
2. Drape seam tape over the center beam or center support wall. Seam tape should be tacked directly to the beam paper side up. Remove the paper backing after roof panels are installed.
3. Pre-start SIP screws in the roof panel. The gable screws will be on 16" centers typ. (or as recommended in the plan specifications). Measure from the finished gable edge of the panel to the desired overhang length PLUS half the thickness of the wall panels to pre-start gable screws (centering the screws with the top plates). Keeping the desired overhang in mind, set the long edge of the roof panel square with the wall panels. The plumb cut of the roof panel must be in line with the center of the ridge beam.

**NOTE:** It is important that the roof panel be installed at a 90 degree angle to the center of the beam / center wall.

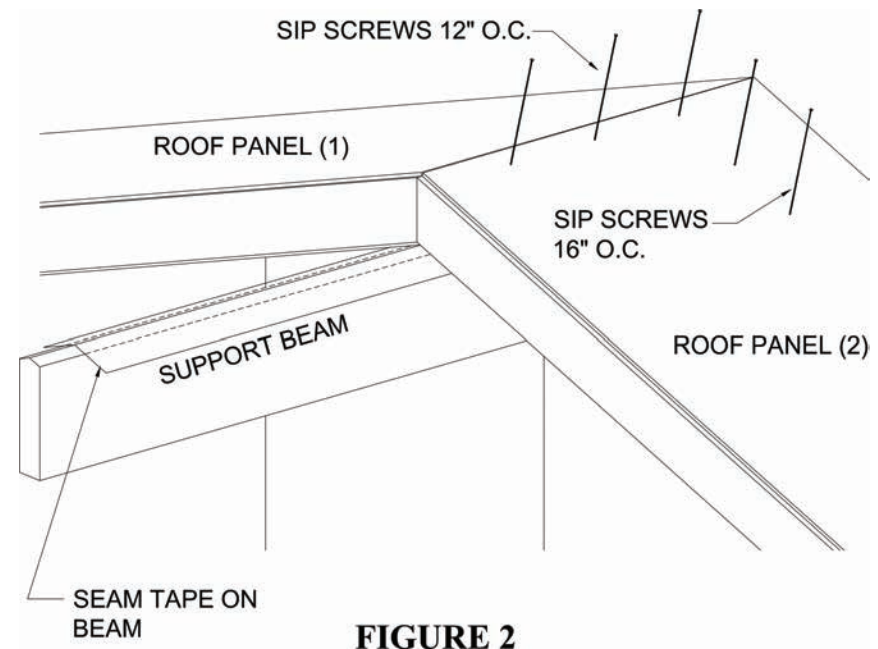
4. Re-check wall / gable panels for plumb.
5. Using SIP screws, fasten the roof panel to the ridge beam and eave wall on 12" centers.  
(Or as recommended in panel specifications.)  
\* Screws over 18" will have 3" washers.
6. **All overframed areas must be properly ventilated.**

**NOTE:** For panels that create overhang, pre-measure where gable wall centerline will fit under roof and pre-start screws in panels before raising into place.

# ROOF PANEL INSTALLATION



**FIGURE 1**



**FIGURE 2**

**NOTE:** The top end of the panel should set in middle of the beam / center wall.

1. Attach panel to the beam / center wall using the SIP screws provided on 12" centers.
2. Attach the eave end of the roof panel to the wall panel using SIP screws provided on 12" centers.
3. Set panel #2 into position on the opposite side of the roof, using the same methods as used for panel # 1.
4. Space the panels so a 3/8" gap is maintained between the panels. Make sure panel #2 maintains a 90 degree angle to the beam /center wall.
5. Install the provided screws in panel #2 on 16" centers to the gable panel or refer to project layout drawings for required screw spacing.



# ROOF PANEL INSTALLATION

## CONTINUED FROM PREVIOUS PAGE

6. Apply sealant to recess of the next panel before setting into place, slide panel over the 2x or TJI connecting member, making sure that the top of the roof panel is in the center of the Ridge beam and even with the adjoining panel. 2x or TJI should be in contact with the EPS.

**NOTE:** Connector must be in contact with EPS

7. Once the panel is in the proper position, nail the connecting edges with 8d nails on 6" centers on both the interior the exterior sheathing. Install SIP screws at the ridge beam and eave wall in accordance with the layout drawings.

8. Continue installation of roof panels in an alternating pattern from one side of the ridge beam to the other.

9. Periodically measure panel progress for growth. This is critical if any hip / valleys or offsets are involved in your roof design.

**NOTE:** Panel growth must be addressed before setting panels in the critical measurement areas (hip / valley, offsets). If panel growth occurs, recess the foam and trim the sheathing back accordingly to maintain the necessary dimensions.  
**Call Enercept before trimming.**

10. Install the final roof panels following the same steps as panels #1 and #2.

**11. USE EXPANDING FOAM SEALANT AT THE RIDGE TO SEAL ANY GAPS OR CRACKS BETWEEN ROOF PANELS.**

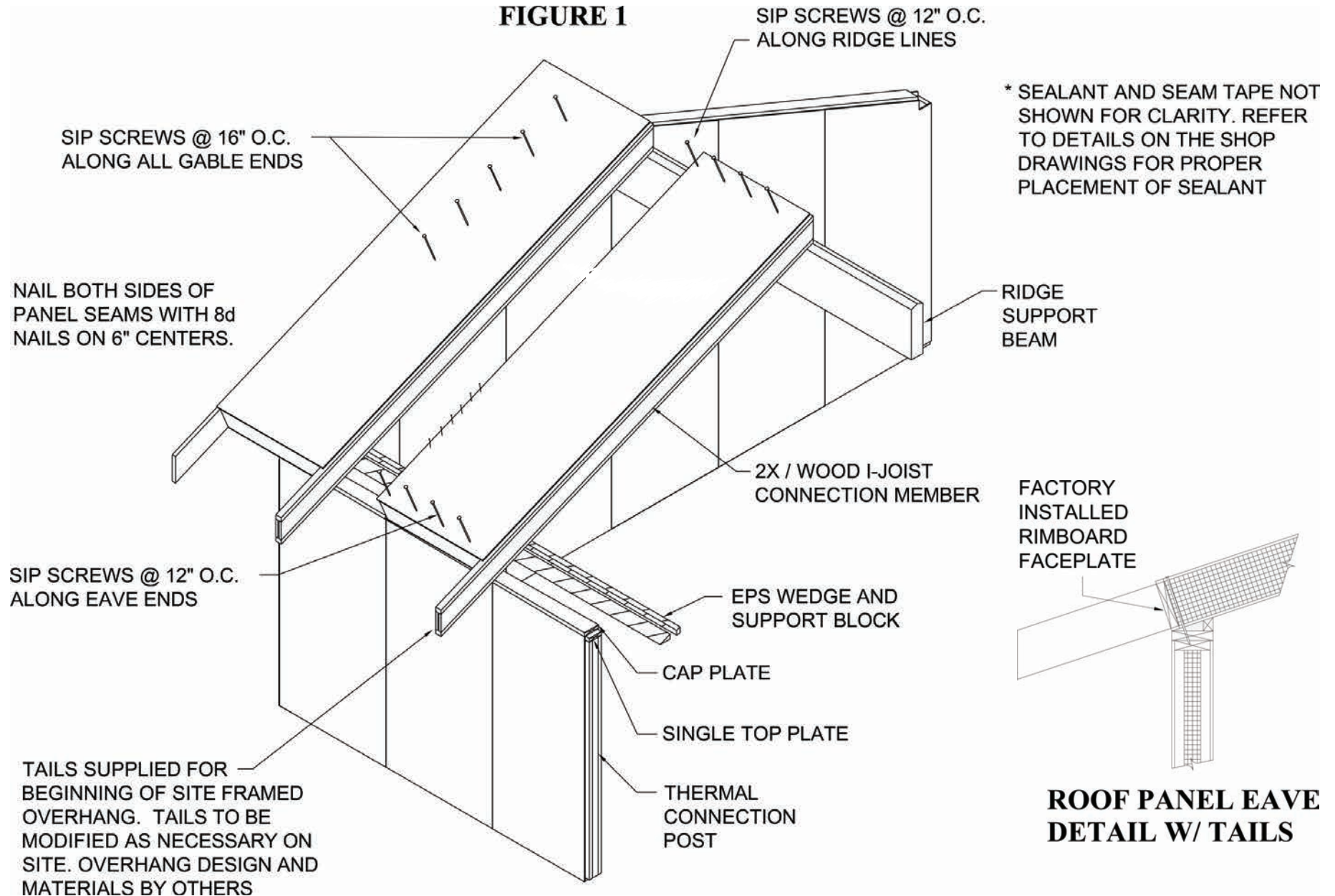
**NOTE:** Roof panels must be dry prior to application of roofing felt or any roofing product.

**NOTE:** Panels must be completely fastened down before electrical wiring is routed.

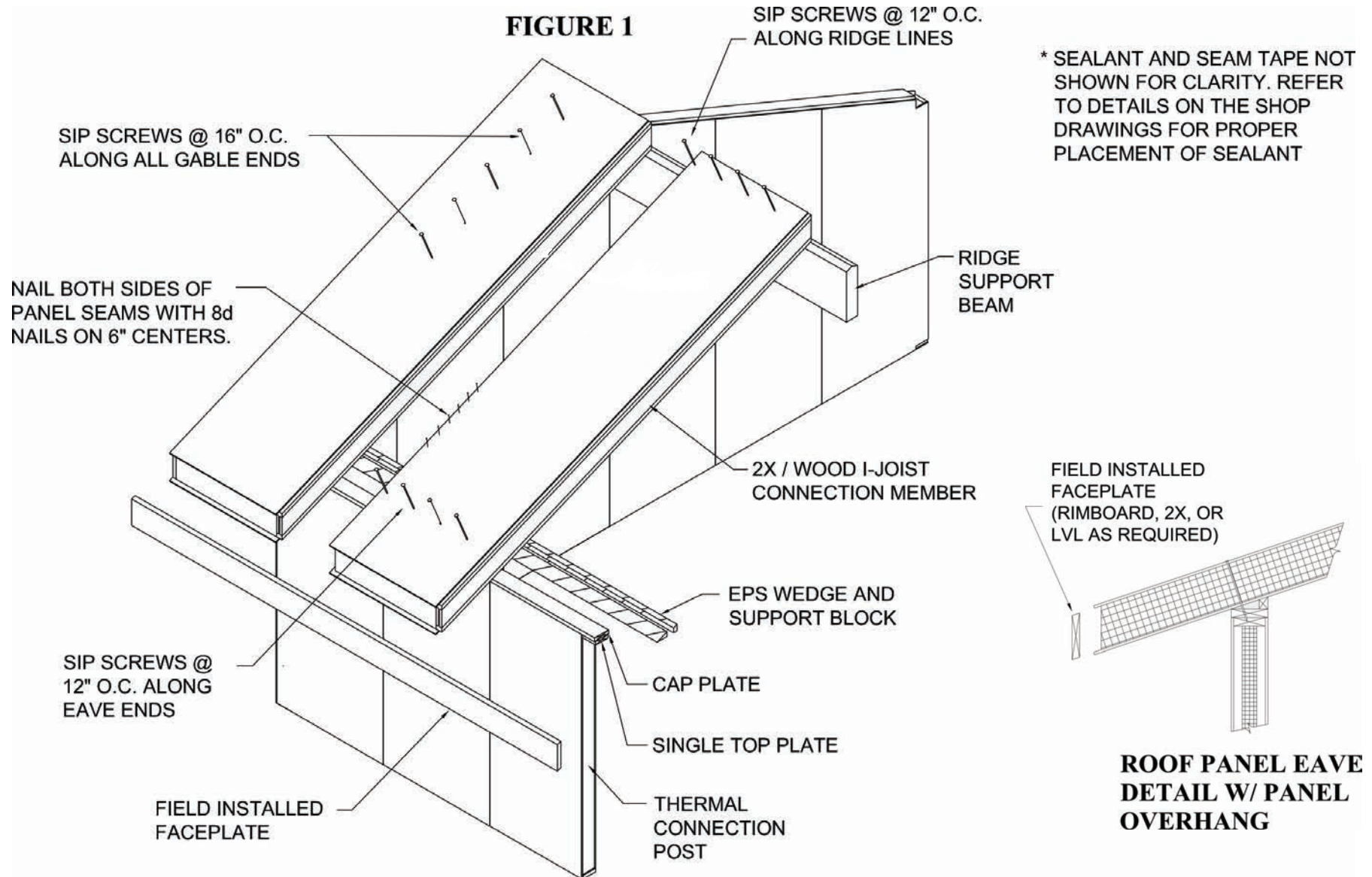
**NOTE:** All overframed areas must be vented properly. (Stick or panel.)

# STRUCTURAL ROOF PANELS WITH TAILS

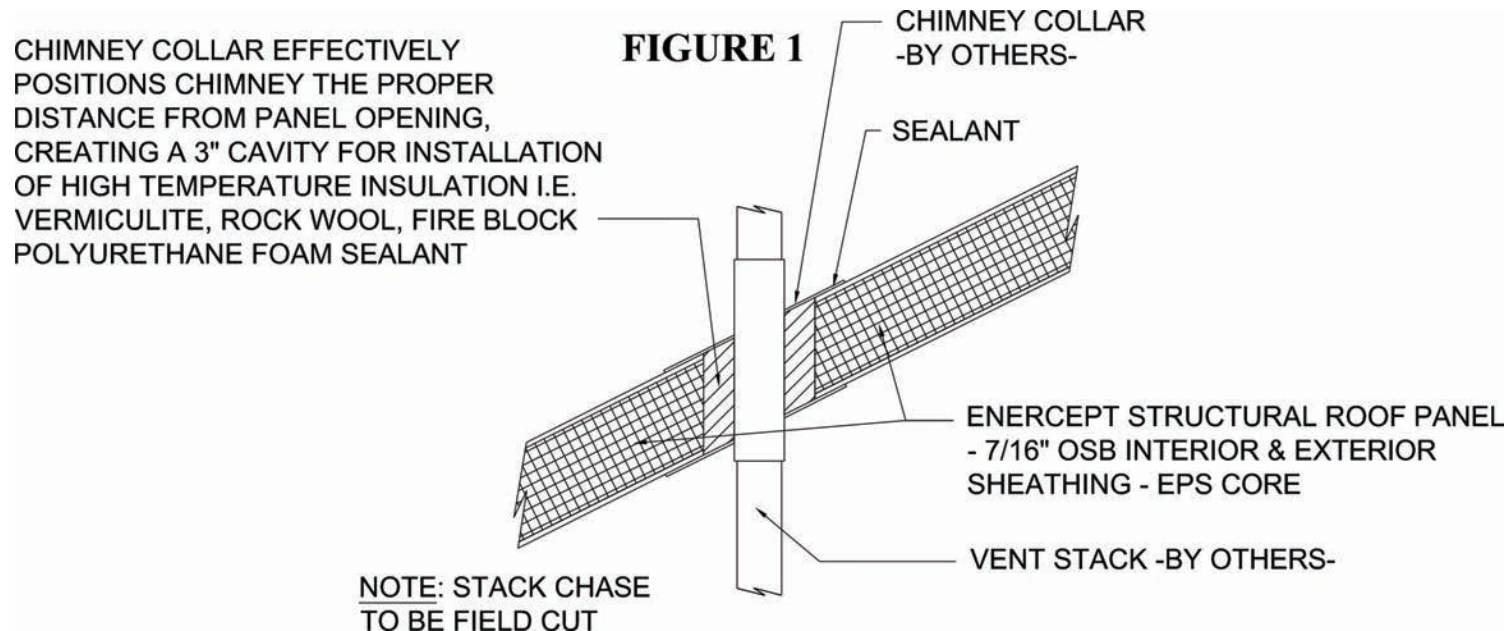
**FIGURE 1**



# STRUCTURAL ROOF PANELS WITH INSULATED OVERHANG



# STACK CHASE



## CHIMNEY / VENT STACK OPENINGS

1. Determine location on roof panel where the chimney or vent stack will be located.
2. Cut an opening to allow a minimum of 3" clearance from a chimney stack to the edge of the roof panel opening. Allow 1" clearance from a vent stack to the edge of the opening
3. Follow industry standards for installing chimney / vent stacks using chimney / donut / collars on the interior and exterior of the panel.
4. Before setting the last collar, fill the 3" cavity around the chimney stack with high temperature insulation, i.e. vermiculite, rock wool, fire block polyurethane foam sealant. Fill cavities around a vent stack with expanding foam sealant.
5. Apply sealant to collars to insure against leaking.

# SECTION 9 DORMER ROOF

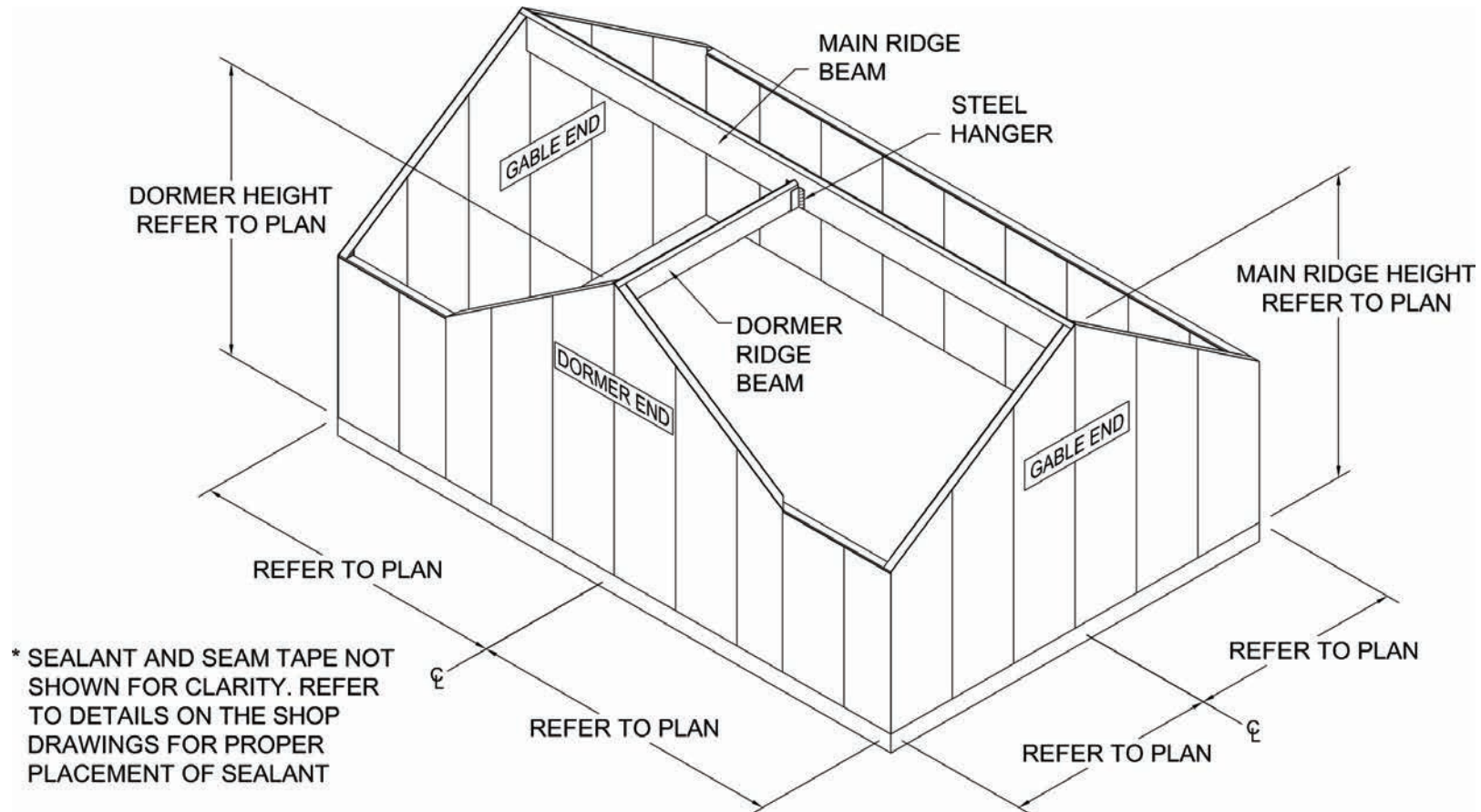


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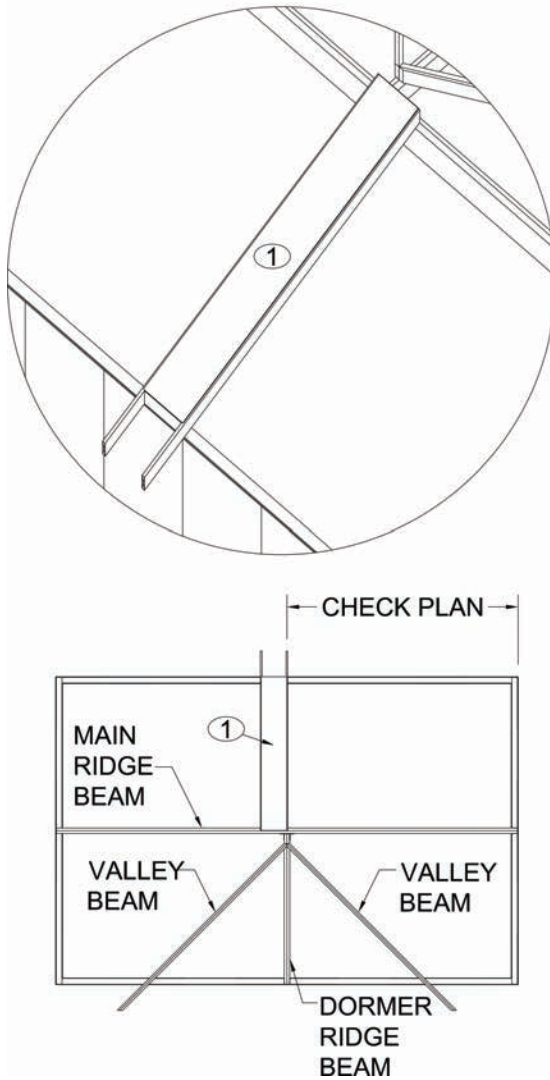


**FIGURE 1**

1. Field confirm measurements of the dormer and gable wall centers and heights. **THESE MUST MATCH THE MEASUREMENTS SHOWN ON YOUR PANEL LAYOUT.**
2. Set the main ridge beam in place - before final attachment to the gable ends and support points, check the main ridge height and level **PER THE LAYOUT.**
3. Dormer beam / beam hanger must be attached to the main ridge beam at the same height as the support point in the dormer wall panel.
4. Before final attachment of the dormer beam, check level and squareness of the connection with center beam.

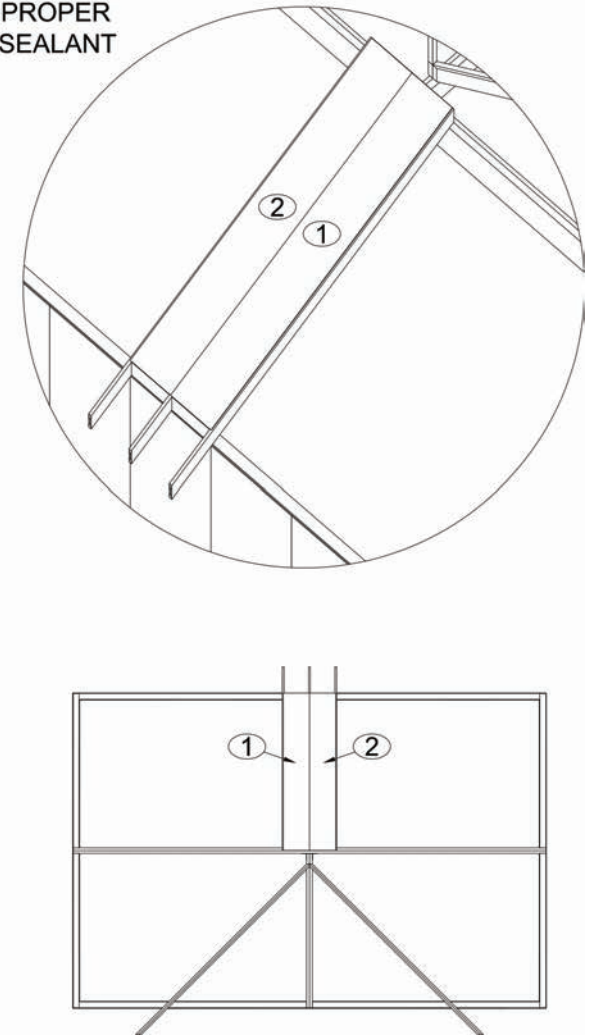


**FIGURE 1**



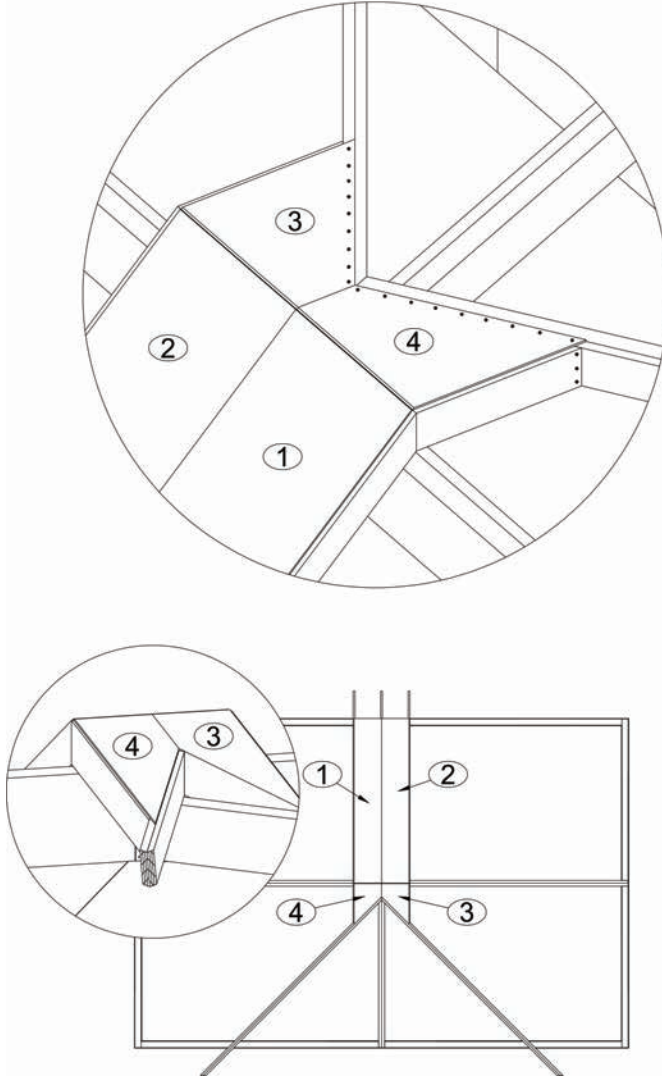
\* SEALANT AND SEAM TAPE NOT SHOWN FOR CLARITY. REFER TO DETAILS ON THE SHOP DRAWINGS FOR PROPER PLACEMENT OF SEALANT

**FIGURE 2**



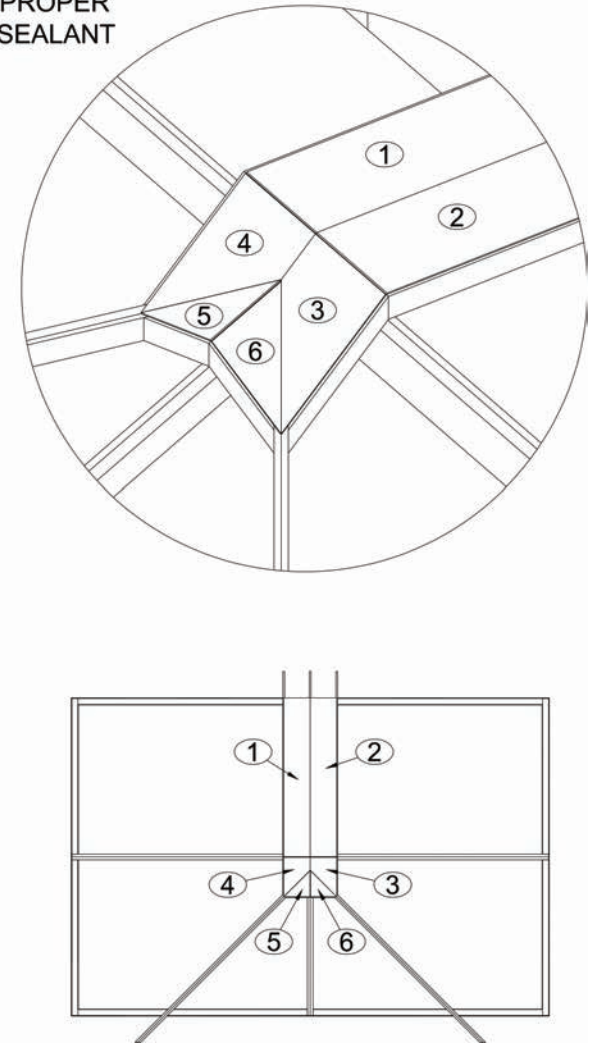
5. Set roof panels (#1 & #2) opposite of dormer side into position according to the panel layouts measurements, and fasten (this will give you a working platform and keep the ridge beam from moving).

**FIGURE 1**



\* SEALANT AND SEAM TAPE NOT SHOWN FOR CLARITY. REFER TO DETAILS ON THE SHOP DRAWINGS FOR PROPER PLACEMENT OF SEALANT

**FIGURE 2**

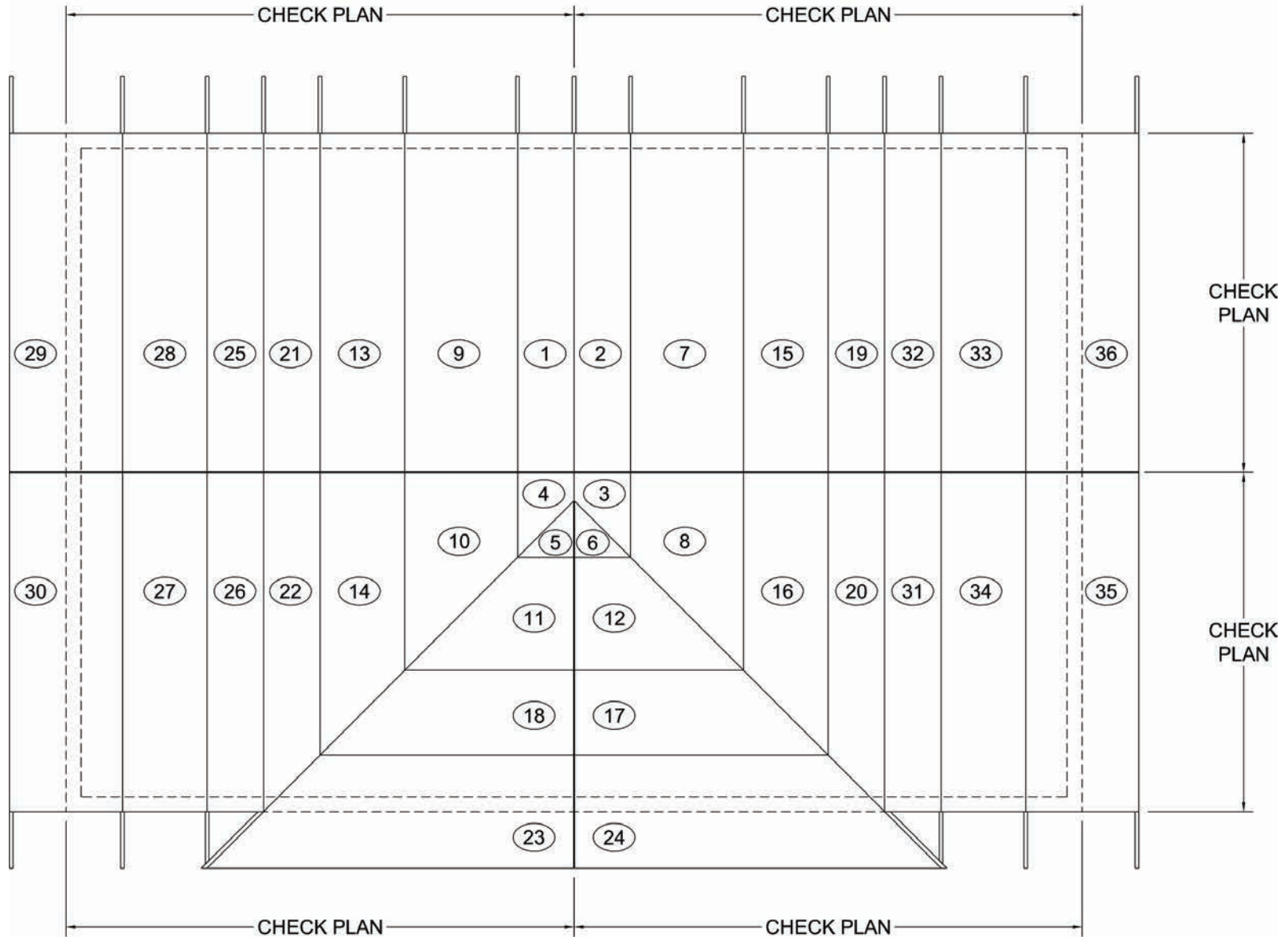


6. Set the valley beams into position and slide roof panels #3 & #4 over valley beam.

7. Fasten panels #3 & #4 to the ridge and valley beams.

8. Install panels #5 & #6 and fasten to the dormer and valley beam.

**FIGURE 1**



9. Continue setting remaining panels in numerical order as shown on the panel layouts and refer to the Enercept construction guide (structural roof) section for additional information.

# SECTION 10 SINGLE & DOUBLE SIDED ROOF



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# SINGLE SIDED & DOUBLE SIDED ROOF PANEL WITH OSB SPLINE

1. Set and square 1st panel into position (as shown on the panel layout), with the exterior edges of the roof panel set at the desired overhang.

**NOTE:** It is important that the roof panel is set square with the decking, support beams, trusses and / or purlins.

2. Fasten panel to support beams, trusses, purlins or decking with the SIP screws supplied, using the pattern and spacing shown on the roof layout. A minimum of 1" penetration into the support is required. Do not over drive fasteners - this will cause an irregular surface.

**NOTE:** Enercept bases fastener quantities on this pattern and spacing. If you wish to use more fasteners, they can be purchased from Enercept.

3. Carefully check spline chase for defects or foreign material. Apply ¼" bead of sealant to the panel, as shown in spline details. Carefully insert OSB spline into spline chase.

4. Position next panel and slide over spline. Fasten as in step 2.

5. Apply sealant to each spline splice.

6. Periodically measure panel progress for growth. This is critical if any beams, trusses, purlins, hips / valleys or offsets are involved in your roof design. Panel ends must maintain a minimum of 1½" bearing surface unless otherwise noted on the panel layouts.

**NOTE:** Panel growth must be addressed before setting panels in the critical measurement areas (hip / valley, offsets). If panel growth occurs, trim the panel accordingly to maintain the necessary dimensions and recess the foam.

**Call Enercept before trimming.**

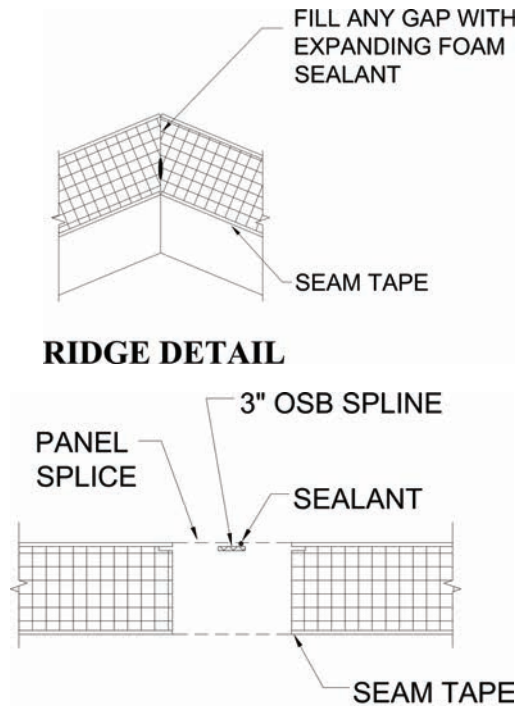
7. Continue setting the roof panels (following steps 2, 3, 4, 5 & 6) as specified on the panel layouts until finished.

8. Seal any gaps or voids in the peak or hip/valley areas with expanding foam sealant.

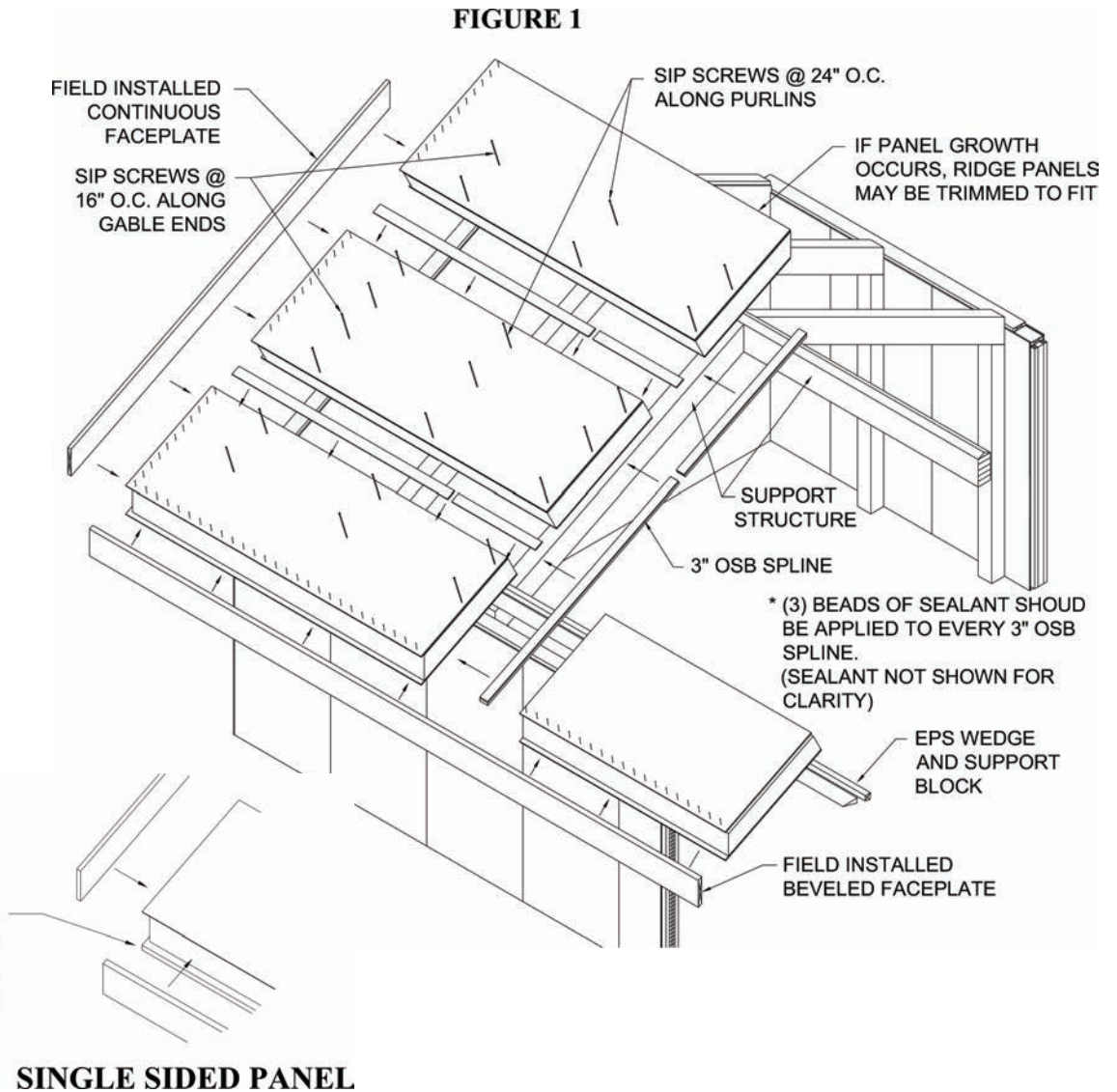
9. Field install faceplate material (rimboard, 2x, or LVL, as supplied) at eave & gable end recesses.

10. Roof panels must be dry prior to application of roofing felt or any other roofing products

# SINGLE & DOUBLE SIDED ROOF WITH OSB SPLINE PANEL INSTALLATION



NON-STRUCTURAL  
SINGLE SIDED PANELS  
TO SIT ON T&G DECK.  
DECK BY OTHERS.





# SECTION 11 ELECTRICAL



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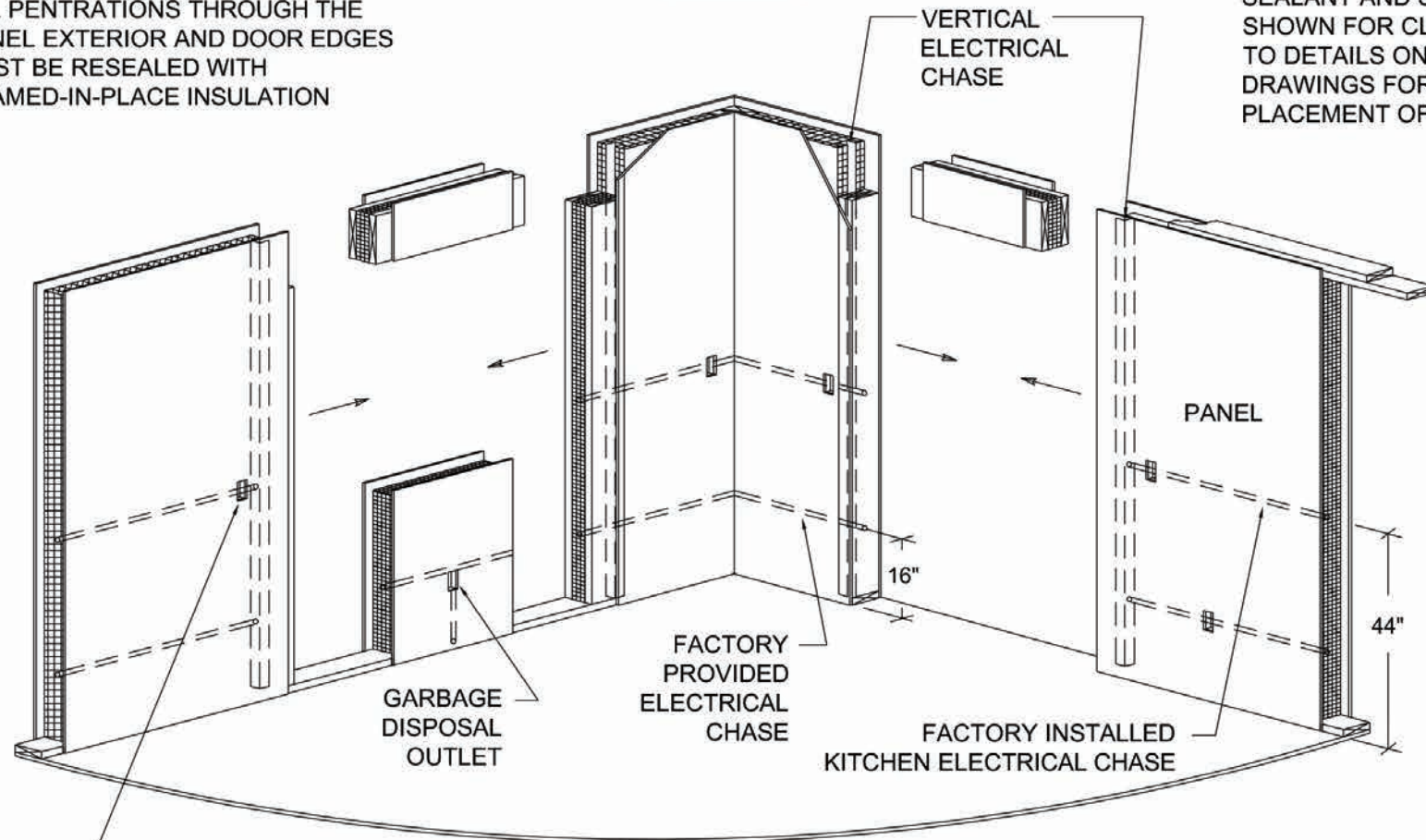
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# TYPICAL ELECTRICAL LAYOUT

**FIGURE 1**

ALL PENETRATIONS THROUGH THE PANEL EXTERIOR AND DOOR EDGES MUST BE RESEALED WITH FOAMED-IN-PLACE INSULATION

\* SEALANT AND SEAM TAPE NOT SHOWN FOR CLARITY. REFER TO DETAILS ON THE SHOP DRAWINGS FOR PROPER PLACEMENT OF SEALANT



CUTOUTS FOR LIGHT AND OUTLET SWITCHES ARE FIELD CUT AT THE DESIRED HEIGHT NEXT TO CHASE

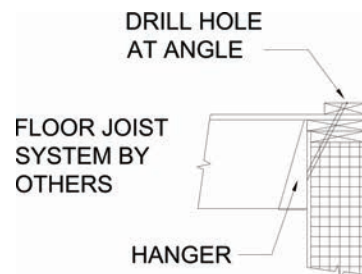
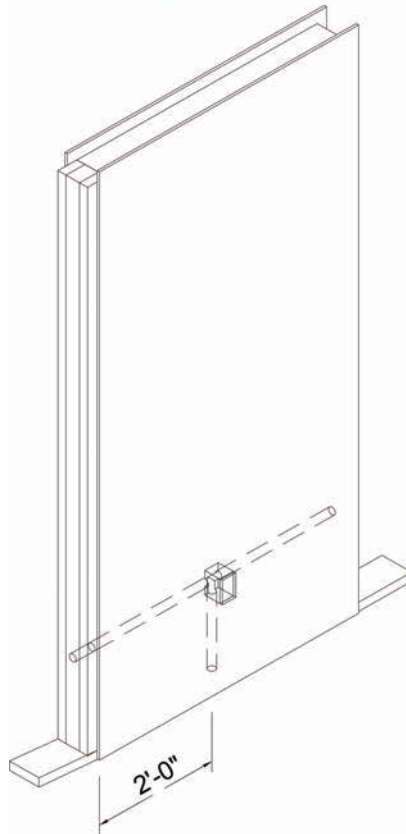
**OPTION:** THE ELECTRICAL WIRES CAN BE RUN ALONG THE TOP OF THE WALL PANELS. REFER TO THE STANDARD TOP OF WALL DETAILS.

WHERE PANELS ARE USED IN SLAB ON GRADE APPLICATIONS, IT IS SUGGESTED THAT CONDUIT IN SLAB BE UTILIZED TO ROUTE ELECTRICAL WIRING.

CUSTOM ELECTRICAL CHASE LOCATIONS PROVIDED UPON REQUEST.

# ELECTRICAL CHASES - GENERAL

**FIGURE 1**



**FIGURE 2**

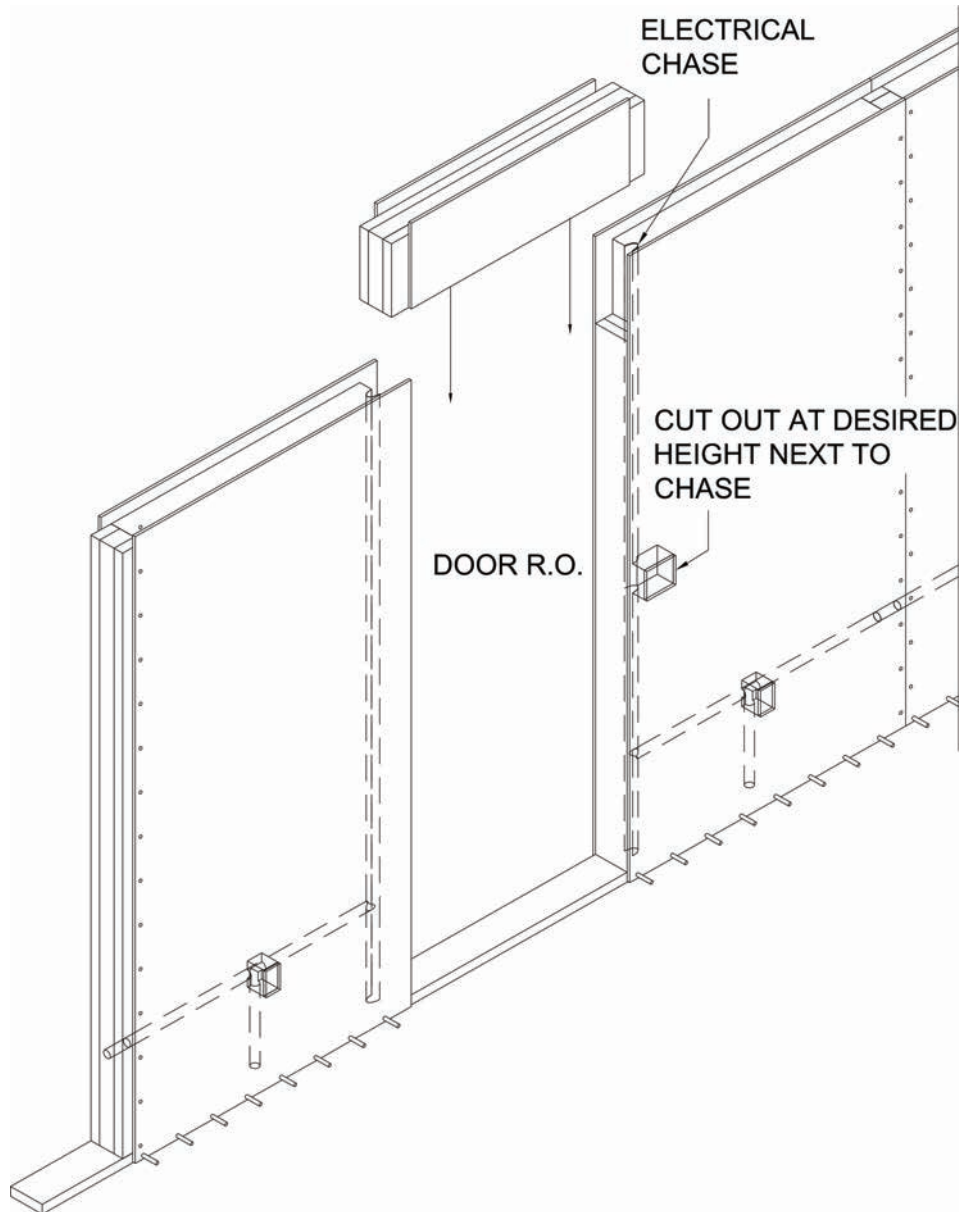
- A. All electrical wiring is run through the typically 1¼" diameter chases that are provided in the panels. Panels will have a horizontal chase located 16" from the bottom of the panel sheathing as shown. The insulated posts will also have this chase to allow the wiring to run continuously between panels. 4' wide panels, and lower window panels will have a vertical chase centered in the panel connecting to the 16" horizontal chase. Factory cutouts for outlet boxes are installed in 4' and lower window panels only (does not include basement panels), all others must be field cut. Chases will be marked in blue.
- B. As previously illustrated, a matching 1½" hole is drilled through the sill plate before the panels are set into position. Electrical wires are then run vertically up from the level below through the vertical chases.
- C. In situations that have the floor system hung inside the wall panel, be sure to drill the 1½" hole at an angle so that the wire chases can be accessed to run wire. Refer to figure 2.
- D. Cutouts for outlet boxes should be cut tangent to the horizontal chase. When cutting these openings, care should be taken not to remove any more of EPS insulation than is necessary.

**NOTE: DO NOT CUT PANEL SKINS** without contacting Enercept first. OSB skins are an important part of the structural integrity and load bearing capacity. Improper cutting of panel's OSB interior / exterior skin may damage the structural integrity of the panel / structure.

**NOTE:** Foundation panels do not include electrical chases. Basement panels include only a vertical electrical chase in each panel.

**NOTE:** Recessed light fixtures are not recommended in SIP panels.

# ELECTRICAL CHASES - DOORS

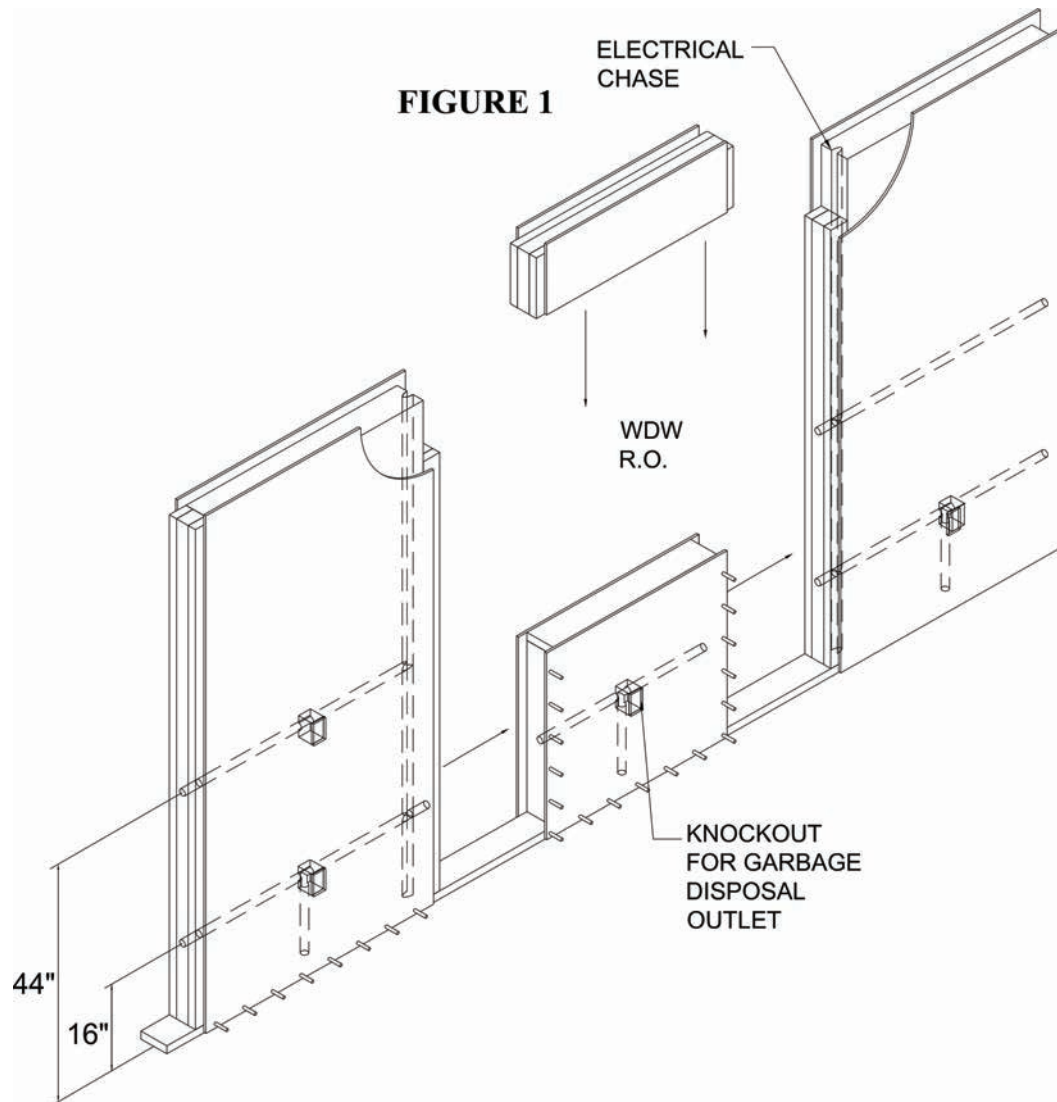


1. To allow for wiring of switches, doorbells, exterior lights, etc., vertical chases are provided in the edge of each panel adjacent to a door opening. See illustration to the left.
2. Cutouts for light switches can be cut at the desired height next to this chase.
3. For exterior lights, doorbells and exterior outlets, drill through the outside surface of the panel into the electrical chase at the desired height.

**NOTE:** Caution must be taken when cutting and drilling into the panel to remove no more insulation than necessary. Use approved expanding foam sealant to fill voids.

5. All penetrations through the panel exterior and door edges must be resealed with foam-in-place insulation.

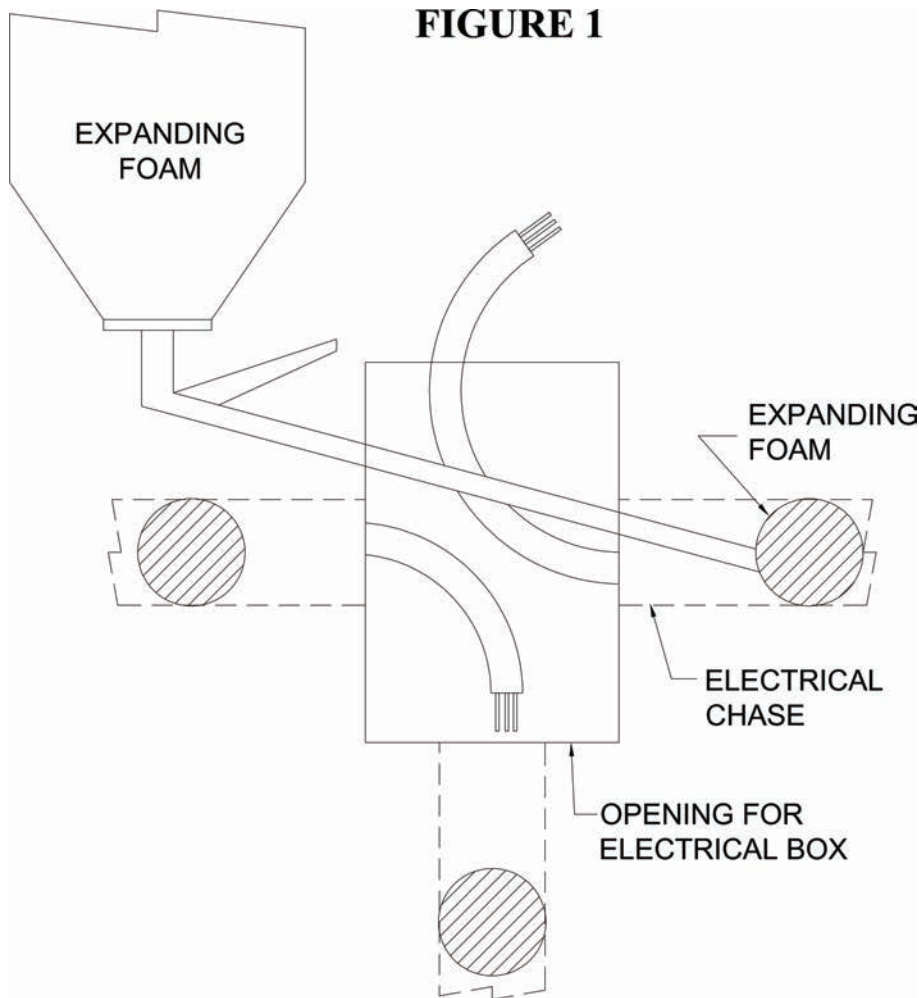
# ELECTRICAL CHASES - COUNTER HEIGHT



1. To allow for outlets above the counter top, an additional horizontal chase 44" above the floor is located in the panels the length of the counter.
2. To reach these horizontal chases with the wiring, a vertical chase is provided at the edge of the panels on either side of the window.
3. Cutouts for switches and outlet boxes can be cut into the panel at the desired locations.

**NOTE:** If a light is requested above the sink work area, a short vertical channel is located in the center of the lintel above the window opening. Wiring for this light would run up the vertical channel in the panel edge, above the double plate on the top of the panels, and down through the short vertical channel.

# SEALING ELECTRICAL CHASES



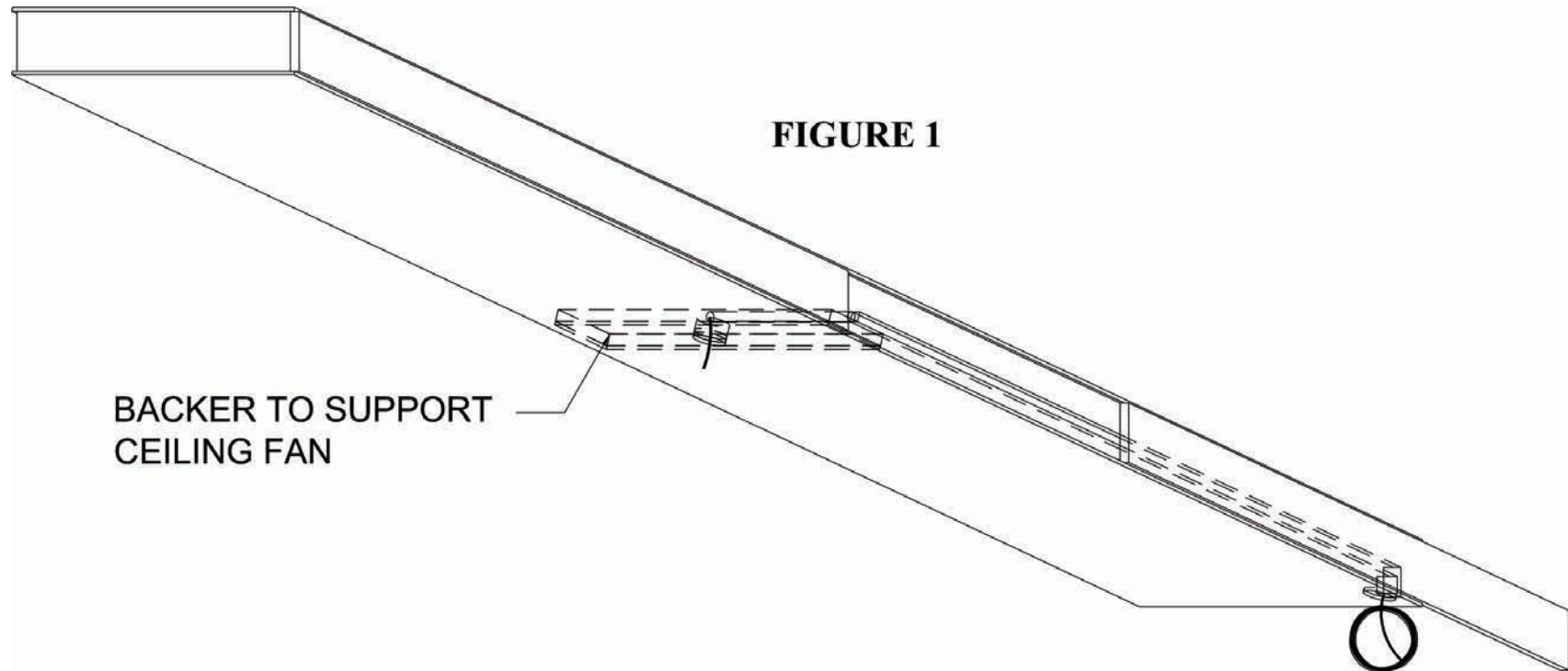
## ELECTRICAL CHANNELS - EXPANDING FOAM SEALANT INSULATION

After pulling all wires, but before receptacles and/or switches are installed, ensure the elimination of air infiltration by foaming in place each electrical chase as shown. Use only enough expanding foam to seal the case without expanding into the electrical box.

**NOTE:** Allow expanding foam to cure before installing fixtures and connecting wires.



# ELECTRICAL CHASES - ROOF PANELS



## ELECTRICAL CHASES - CEILING LIGHTS / FANS

**NOTE:** At locations in the ceiling panels where there will be ceiling lights or fans, a 12-3 with ground electrical wire will be factory installed, unless local codes indicate otherwise (notify Enercept in this case).

**NOTE:** A sufficient length of wire extending from an opening prepared for a  $3\frac{1}{2} \times 3\frac{1}{2}$  electrical box (electrical box by others) will be furnished at the location of the light.

1. At the lower end of the panel, eave end, a wire will be provided to reach either a controlling switch or a junction box.
2. Vertical chases will be provided in the wall panels for this purpose as required.

# SECTION 12 SEAM TAPE



If you have any questions  
or concerns call us at:

**605-882-2222**

**CALL BEFORE YOU CUT!**

# SEAM TAPE

Enercept highly recommends that seam tape be used on all wall panel seams. Enercept requires the use of seam tape at all wall panel to roof panel connections along with all roof panel seams, ridge, hip, valley beam areas.

***It is not the intent of Enercept or this guide to provide information on seam tape / vapor barrier installation or usage which may contradict local jurisdictions. The builder / homeowner doing this work is ultimately responsible for satisfying the authority having jurisdiction for appropriate codes.***

## Seam Tape Installation (Interior Panel Surface Only)

Seam tape should be installed (paper side up) over all beams or supporting walls before roof panels are set in place (do not remove the paper backing until roof panels are in place and fastened to the beam / center walls).

Seam tape should be installed in the temperature range from 0° F to 120° F. Panel surfaces are to be clean, free of dirt and debris, and have not absorbed water. Surfaces should be free of any damaged, unsupported areas, sharp protrusions or voids.

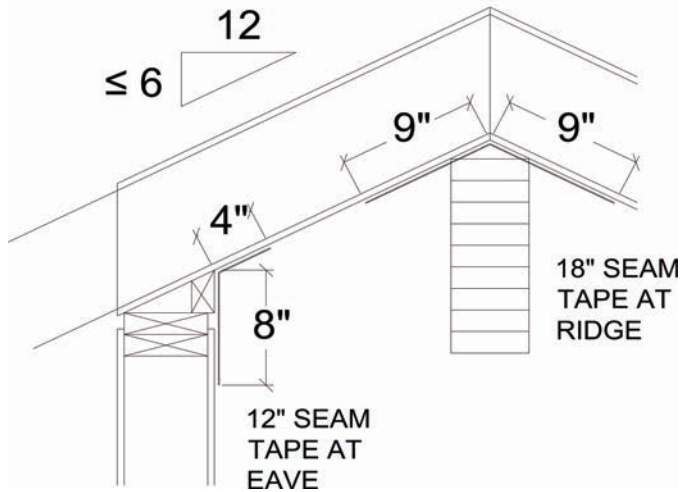
Position tape so that it is centered on the panel joint and peel back a few inches of one side of the split paper release liner. Remove the liner while applying firm pressure to the seam tape surface as it comes into contact with the panel surface. Repeat this procedure with the remaining side of the paper release liner and tape. Using a roller (rubber, wood or steel “J” roller) apply sufficient pressure along the entire tape surface to ensure a continuous seal and to eliminate trapping air beneath the tape. Overlap the tape at least 3” at tape joints and end of roll points.

***/t is not the intent of Enercept or this guide to provide information on seam tape / vapor barrier installation or usage which may contradict local jurisdictions. The builder / homeowner doing this work is ultimately responsible for satisfying the authority having jurisdiction for appropriate codes.***

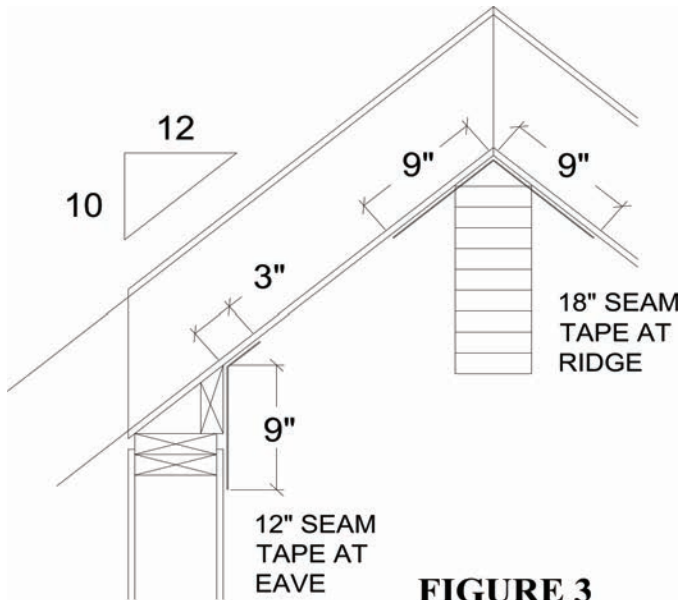
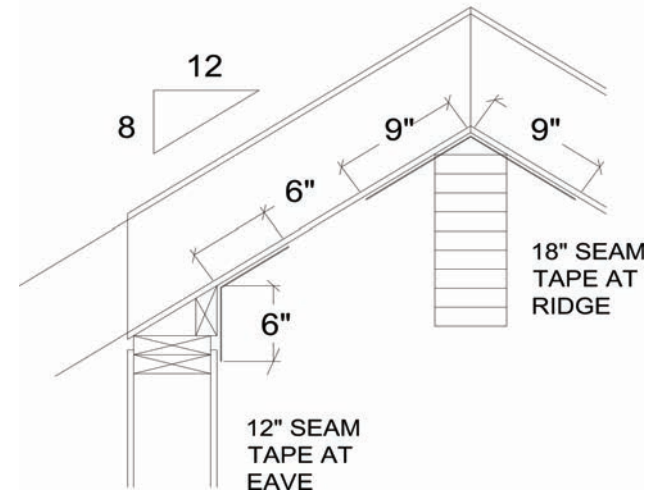
# SEAM TAPE DETAILS

NOTE: Seam tape shown in other sections of the Enercept Construction Guide is required.

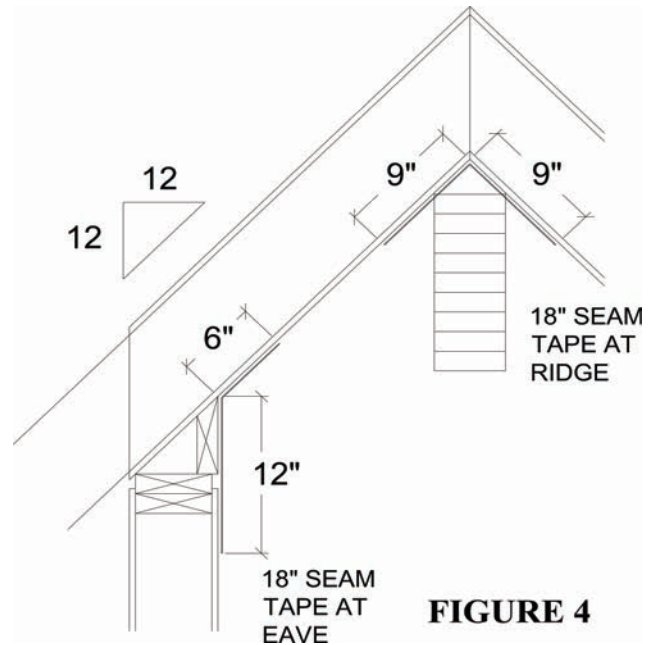
**FIGURE 1**



**FIGURE 2**



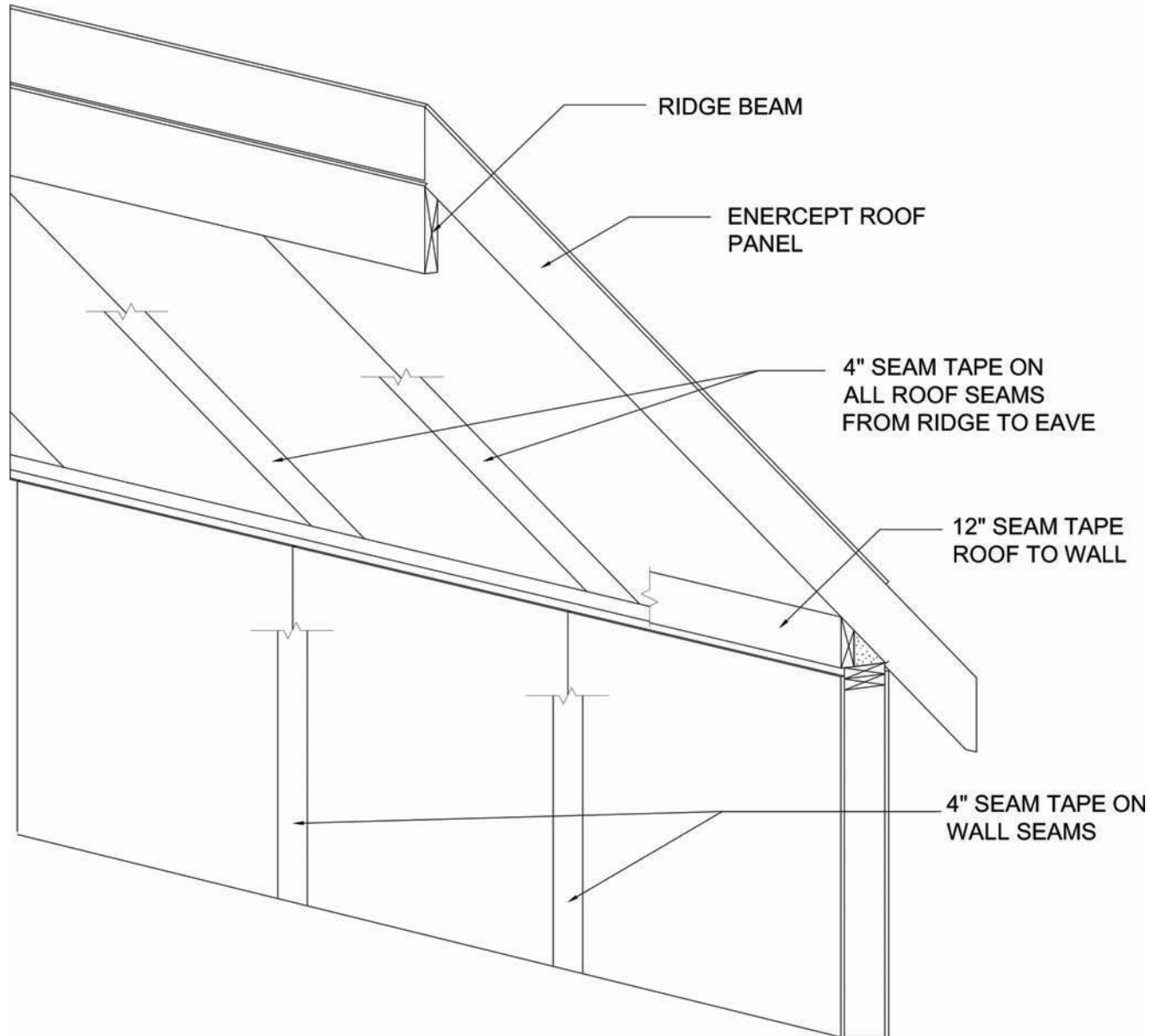
**FIGURE 3**



**FIGURE 4**

# SEAM TAPE DETAILS

FIGURE 1





# SECTION 13

## GLOSSARY OF TERMS



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# GLOSSARY

**Acoustical Sealant:** A tar-like substance compatible with polystyrene and OSB that retains flexibility for a long period of time used to minimize air leakage at panel seams and joints.

**Adhesive:** Any adhesive compatible with polystyrene. Do not use solvent based adhesive. Use only approved materials.

**Basement Panels:** Panels constructed with a treated plywood exterior and treated 2x dimensional lumber on 12” or 16” centers. Used in below grade applications.

**Beam Bracket:** A T-shaped steel strap which fastens center beam to king post.

**Beam Hanger:** A welded steel bracket typically used to attach beam to other beams.

**Block & String Alignment:** An accepted carpentry technique used to assure proper alignment. Spacer blocks hold taut string a given distance from the surface to be aligned. Serves as a reference point for measuring parallelism between line and surface.

**Center Support Beam:** A factory constructed beam that supports the upper end of the roof panels over long, open spans.

**Center Wall:** A site-built wall used to support the upper end of roof panels. One end of the center support beam may rest on this wall.

**Chimney Collar:** Doughnut-shaped metal flashings designed to fit the circumference of the chimney and provide for a minimum 3” clearance between chimney and combustible structural members. Noncombustible insulation, e.g. vermiculite or rock wool, must be used to totally fill the 3” void before applying the upper collar.

**Corner Adjustment Panel:** Panel which is designed to be more easily trimmed to compensate for any growth that may have occurred during erection of the wall panels.

**Electrical Chases:** Factory-located passageways at the edge of each panel, beside each opening, and 16” above the lower edge of wall panels used for electrical wiring. Electrical chases can be installed above countertop height in kitchens and bathrooms. Basement panels only contain vertical chases at the edge of each panel. Foundation panels do not contain electrical chases. For additional information, see Enercept Electrical Guide.

**EPS:** Expanded polystyrene, the insulating core of the Enercept components.

# GLOSSARY

**EPS Wedge:** Roof to wall angled EPS foam wedge placed on top of wall where the roof meets the top of the sidewall to insulate wedge shaped space.

**Foam Sealant Insulation:** Commercially available polyurethane foam packaged in aerosol cans. Used for filling voids around windows and door openings, exterior electrical passages, and roof-to-wall area.

**Growth:** Joint spacing can slightly effect the exact measurements of panels. Therefore, finished lengths of SIP walls or roofs can vary slightly. Installation crews must check centerline measurements. Unchecked growth can slightly change rough opening locations. Management of growth in gable walls is critical since beam pocket location is very important.

**Insulated Post:** A patented thermally insulated connecting spline (or post) made from (2) 2x members and EPS, which is used to easily join panels together.

**Left:** Direction as viewed from the interior of the home.

**Lintel:** A narrow panel positioned above a window or door opening.

**LVL (Laminated Veneer Lumber):** 2x type material manufactured similarly to plywood. Stronger than traditional 2Xs.

**OSB (Oriented Strand Board):** A composite wood-based panel made from new-growth timber. The strands are oriented or arranged so maximum strength is achieved in any given direction when combined with adhesives to produce greater tension and compression performance.

# GLOSSARY

**Overhang:** The part of the roof extending past the exterior wall.

**Plate:** Dimensional lumber, usually 2x6, installed in the top, bottom, and edges of the Enercept Panels.

**Plumb:** Perpendicular to the horizon. At a right angle to the level floor.

**Right:** Direction as viewed from the interior of the home.

**RO (Rough Opening):** A factory provided opening sized according to the window or door unit actual size.

**Sealant:** Unbroken, full length 1/4" bead of sealant compatible with expanded polystyrene.

The symbol  is used to designate areas that have sealant applied. Use only approved sealant. Do not use solvent based materials.

**SIP Seam Tape:** An adhesive tape designed to be applied to the interior seams of exterior wall and roof SIPs. The purpose is to minimize moist interior air from escaping through panel seams.

**Sill Plate:** Dimensional lumber, usually 2x6, which is nailed to the subfloor and deck.

**SIP:** Structural Insulated Panel.

# GLOSSARY

**Sub-Facia:** Dimensional lumber, usually 2X, LVL, LSL, rim board, or multi-layered OSB at the outer edge of the roof panels. In some instances, this may be factory installed, but in most cases it is field installed.

**Sub-Floor:** Boards or plywood panels laid directly on floor joists over which a finished floor will be installed.

**Tapered Support Block:** Long trapezoidal shaped piece of wood installed between the inside of the top plate on walls and underside of roof panels. This is installed after the connection of the wall and roof has sealant applied and the EPS wedge is installed.

**Enercept highly recommends that seam tape be used on all wall panel seams and require the use of seam tape at all wall panel to roof panel connections along with all roof panel seams, ridge, hip and valley beam seams.**