



## INSTALLATION MANUAL



## Tips for Successful Ownership of Your Epitome Foundation Wall

CONSULT YOUR EPITOME WALL SUPPLIER PRIOR TO PERFORMING ANY  
MODIFICATIONS ON YOUR EPITOME FOUNDATION WALLS

### General Principals

- DO run mechanicals vertically within the preformed stud cavity.
- DO safely use self-drilling fasteners to hang interior finishes and exterior cladding.
- DO maintain exterior where exposed to UV rays with protective covering such as house paint or exterior cladding.
- DO operate heavy machinery in accordance with best management practices as well as with state and local codes.
- DO apply sealant to all fasteners that penetrate the exterior of the panel.
- DON'T drill holes through wall panel or the preformed studs on the wall panel.
- DON'T drive nails or staples into the wall panel.
- DON'T cut any window or door openings in the wall panels.
- DON'T compromise any portion of interior or exterior skins of the wall panels.
- DON'T operate heavy machinery parallel to or in close proximity to the foundation. Heavy equipment should be operated at 45 degree angle to the building.



## Index

Excavation.....	1.
Special Excavation Issues.....	2.
Prescriptive Requirements for Footing.....	3.
Panel Placement and Anchorage.....	4.
Panel to Panel Connection.....	5.
Panel Connection at Outside Corners.....	6.
Panel Connection at Inside Corners.....	7.
Waterproofing.....	8.
Lateral Floor Joist Blocking, Joists Parallel to Wall.....	9.
Lateral Floor Joist Blocking, Joists Parallel to Wall (continued).....	10.
Lateral Floor Joist Blocking, Joists Perpendicular to Wall.....	11.
Connection to Floor System, Floor Joist to Sill Plate Table.....	12.
Connection of Wall to Plate / Wall to Footer Table.....	13.
Stairwell Header Procedure.....	14.
Stairwell opening reinforcement (30 PCF Soil Density).....	15.
Stairwell opening reinforcement (45 PCF Soil Density).....	16.
Stairwell opening reinforcement (60 PCF Soil Density).....	17.
Garage Slab to Foundation Wall Attachment .....	18.
Shear Walls.....	19.
Openings/ Window Wells.....	20.
Window opening Reinforcing for backfill height and Soil Density.....	21.
Basement Foundation.....	22.
Crawlspace Foundation.....	23.
Frost Walls.....	24.
Concrete Frost Walls Connection to Epitome Foundation Wall Panel .....	25.
Concrete Stoop.....	26.
Proper Backfilling.....	27.
Final Grade.....	28.
Installing Mechanical, Electrical and Plumbing / Additional Insulation.....	29.
Interior Coverings.....	30.
Exterior Coverings.....	31.
Exterior Coverings - Continued.....	32.
Structural Properties.....	33.
Structural Properties.....	34.
Conditions of Use.....	35.
Conditions of Use.....	36.
Builder Checklist.....	37.
Builder Checklist - Continued.....	38.



## Excavation

### **\*Stability of Excavations**

A. Slope sides of excavations to angle of repose of material excavated; otherwise, shore and brace where sloping is not possible either because of space restrictions or stability of material excavated. Comply with applicable codes and ordinances.

B. Maintain sides and slopes of excavation in a safe condition until completion of backfilling. Take precautions to prevent slides or cave-ins when excavations are made in locations adjacent to backfilled excavations, and when sides of excavations are subjected to vibrations from traffic, machinery, or any other source.

### **\*Dewatering**

A. Perform earthwork in a manner to prevent surface water and ground water from flowing into excavations. Promptly remove water from excavations using pumps, sumps, and dewatering system components necessary to convey water away from excavations.

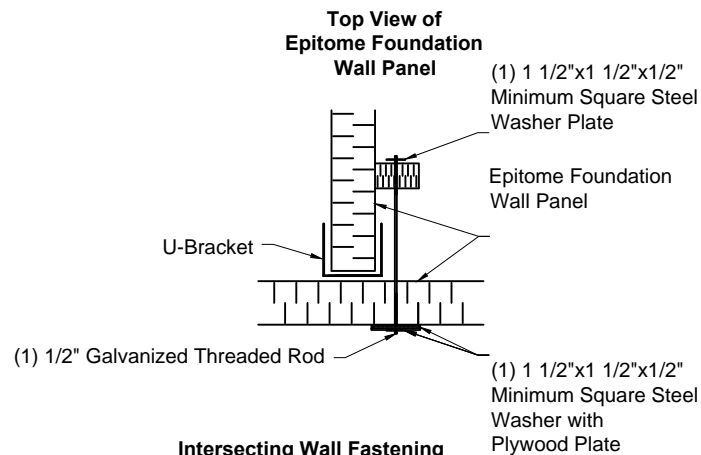
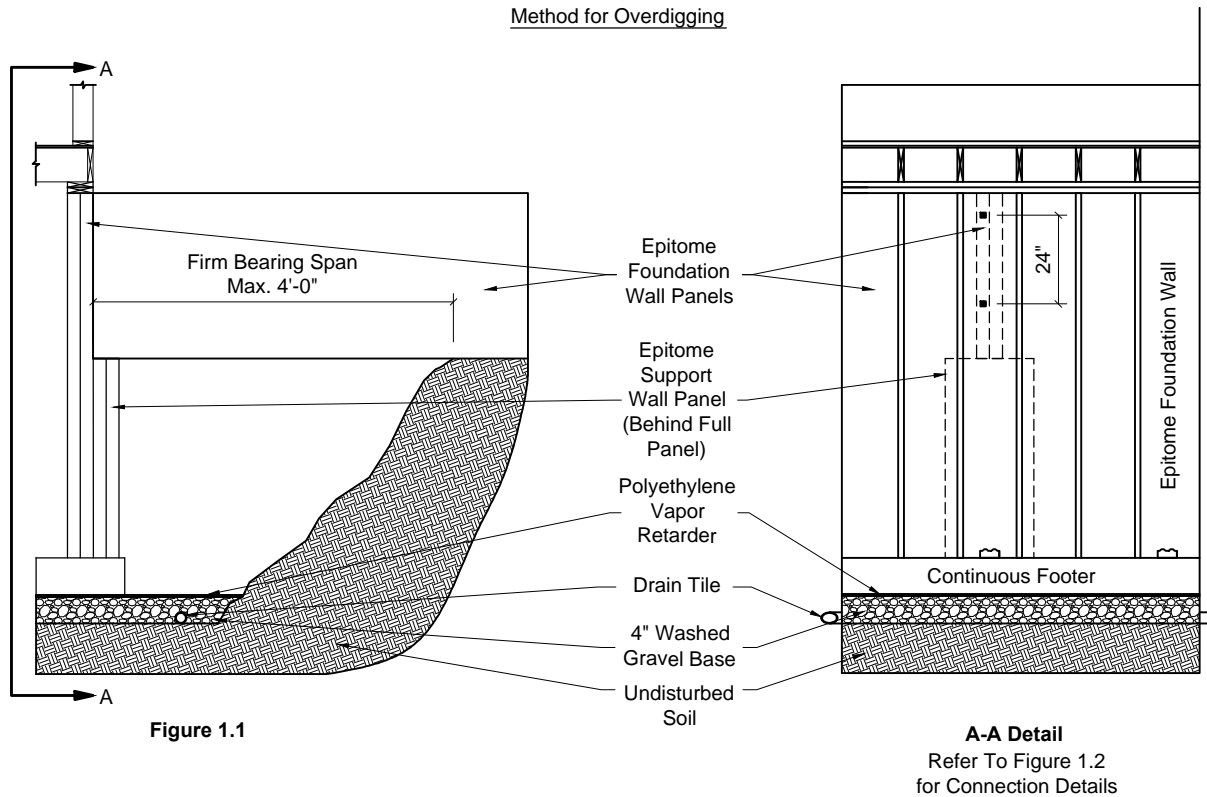
B. Convey water removed from excavations and rain water to collection or run-off areas. Provide and maintain temporary drainage ditches and other diversions outside excavation limits for each structure. Do not use foundation or utility trench excavations as temporary drainage ditches.

**\* Requirements are minimums based  
on the International Residential Code  
Check with state and local codes  
for design specific requirements.**

## Special Excavating Issues

### Intersecting Walls

Where foundation walls intersect with a crawl space or garage wall an Epitome support wall shall be employed on the exterior side. Spans shall not exceed 4'-0".



## \*Prescriptive Requirements for Footings

All exterior walls shall be supported on continuous solid or fully grouted masonry or concrete footings or other approved structural system of sufficient design to accommodate all loads and to transmit the resulting loads to the soil within the limitations as determined from the character of the soil. Footings shall be supported on undisturbed natural soils or engineered fill. Concrete footing shall be designed and constructed in accordance with state and local codes.

Concrete and masonry footings shall be engineered by a structural engineer or comply with prescriptive methods permitted within the applicable code for region and location. Minimum size of concrete and masonry footings shall be as set forth in Table 2 and Figure 2. The footing width,  $W$ , shall be based on the load bearing value of the soil in accordance with Table 2. Spread footings shall be at least 6 inches in thickness,  $T$ . Footing projections,  $P$ , shall be at least 2 inches and shall not exceed the thickness of the footing.

All exterior footings shall be placed at least 12 inches below the undisturbed ground surface. Except where otherwise protected from frost, the depth of footings shall also extend below the frost line in accordance with state and local codes.

### \*Reinforcement

Concrete footings shall have a minimum (2) #4 continuous bars. Reinforcement shall be located a minimum of 3 inches clear from the bottom of the footing.

CLASS OF MATERIAL	LOAD-BEARING PRESSURE (pounds per square foot)	a. When soil tests are required the allowable bearing capacities of the soil shall be part of the recommendations.  b. Where the building official determines that in-place soils with an allowable bearing capacity of less than 1,500 psf are likely to be present at the site, the allowable bearing capacity shall be determined by a soils investigation.
Crystalline Bedrock	12,000	
Sedimentary and Foliated Rock	4,000	
Sandy Gravel and/or Gravel (GW and GP)	3,000	
Sand, Silt Sand, Clayey Sand, Silty Gravel and Clayey Gravel (SW, SP, SM, SC, GM and GC)	2,000	
Clay, Sandy Clay, Silty Clay, Clayey Silt, Silt and Sandy Silt (CL, ML, MH and CH)	1,500 <sup>b</sup>	

**TABLE 1**  
**\*PRESUMPTIVE LOAD-BEARING VALUES**  
**OF FOUNDATION MATERIALS <sup>a</sup>**

**TABLE 2**

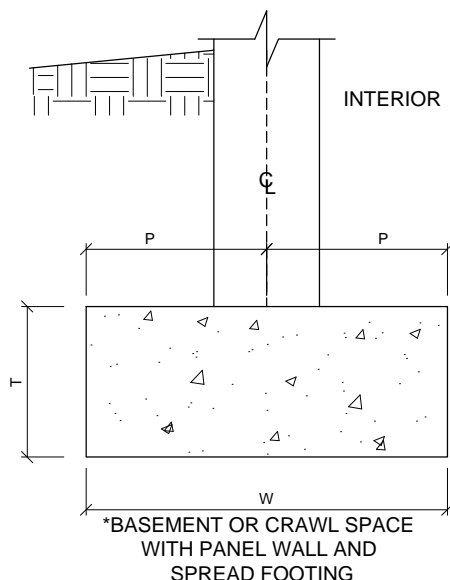
**\*MINIMUM WIDTH OF CONCRETE,  
PRECAST OR MASONRY UNITS (inches) <sup>a</sup>**

	LOAD-BEARING VALUE OF SOIL (psf)			
	1,500	2,000	3,000	≥ 4,000
Conventional Light-Frame Construction				
1-Story	12	12	12	12
2-Story	15	12	12	12
3-Story	23	17	12	12

a. Where minimum footing width is 12 inches, use of a single wythe of solid or fully grouted 12-inch nominal concrete masonry units is permitted.

**\* Requirements are minimums based  
on the International Residential Code  
Check with state and local codes  
for design specific requirements.**

Figure 2



## Panel Placement and Anchorage

After footings have cured, the exterior placement of the panels shall be marked with a chalk line. The chalk line will assist with the alignment of the panels during the assembly process. Using the chalk line as a guide, place the panel in its proper location. Attach the Epitome Foundation Wall to the continuous footer with (1) Simpson L70 bracket fastened at every 48" or within every third stud bay.

Epitome Foundation Walls are Pre-assembled with a Double Top Plate and a Connection from the Panel to Top Plates, Top Plates Omitted for Clarity.

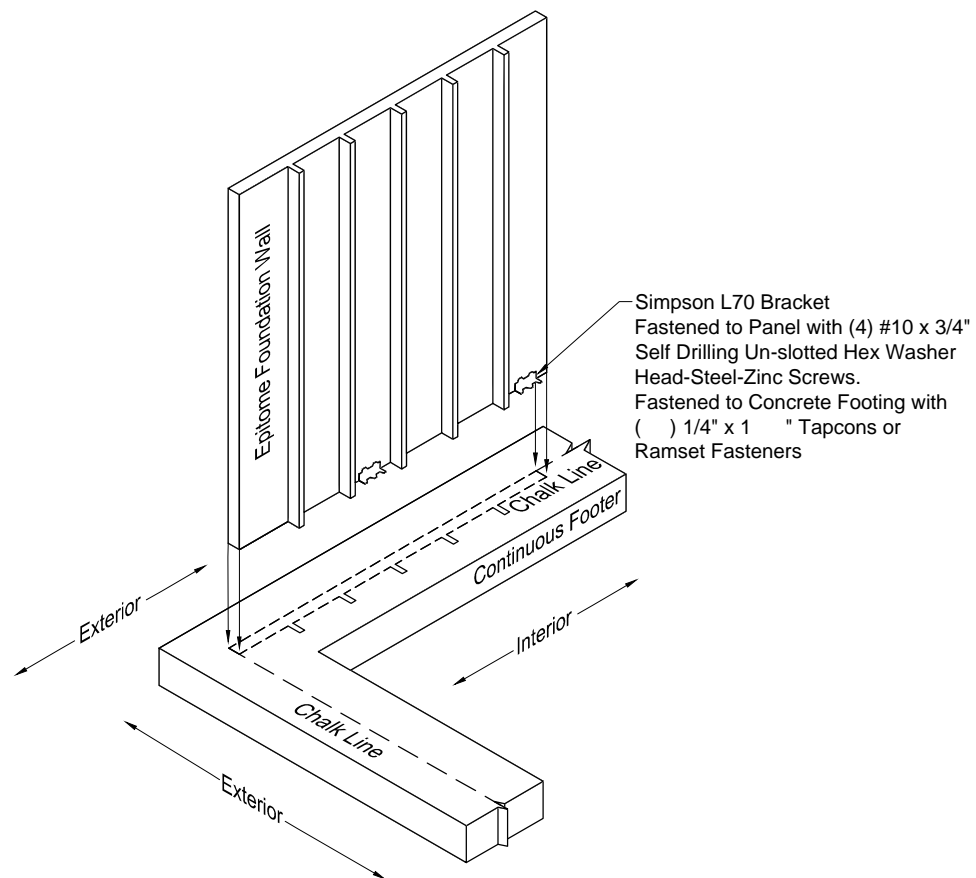
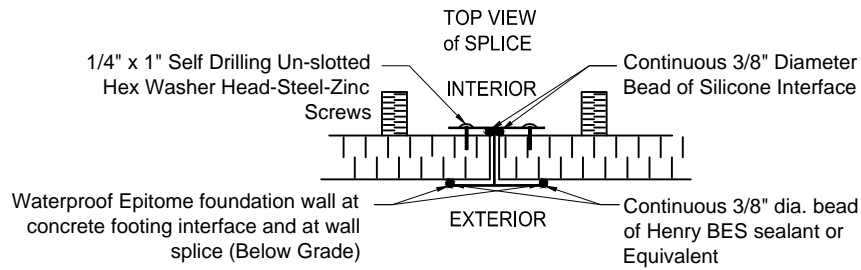


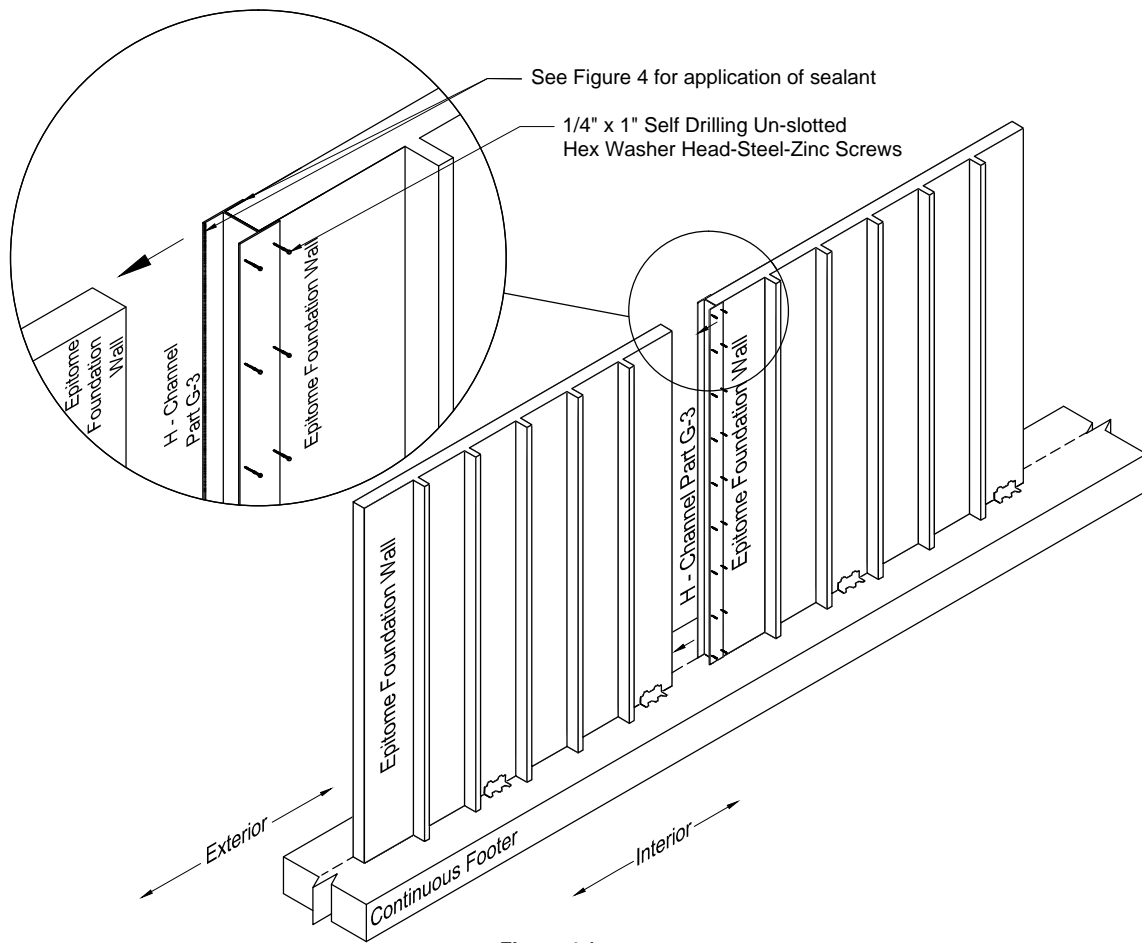
Figure 3

## Panel To Panel Connection

Epitome Foundation Walls are Pre-assembled with a Double Top Plate and a Connection from the Panel to Top Plates, Top Plates Omitted for Clarity.



**Figure 4**



**Figure 4.1**



## Panel Connection At Outside Corner

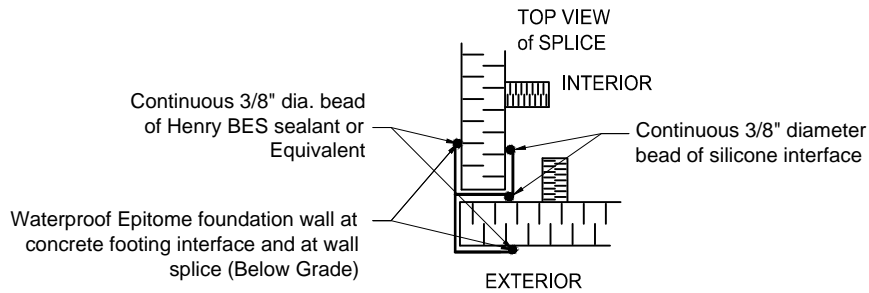


Figure 5

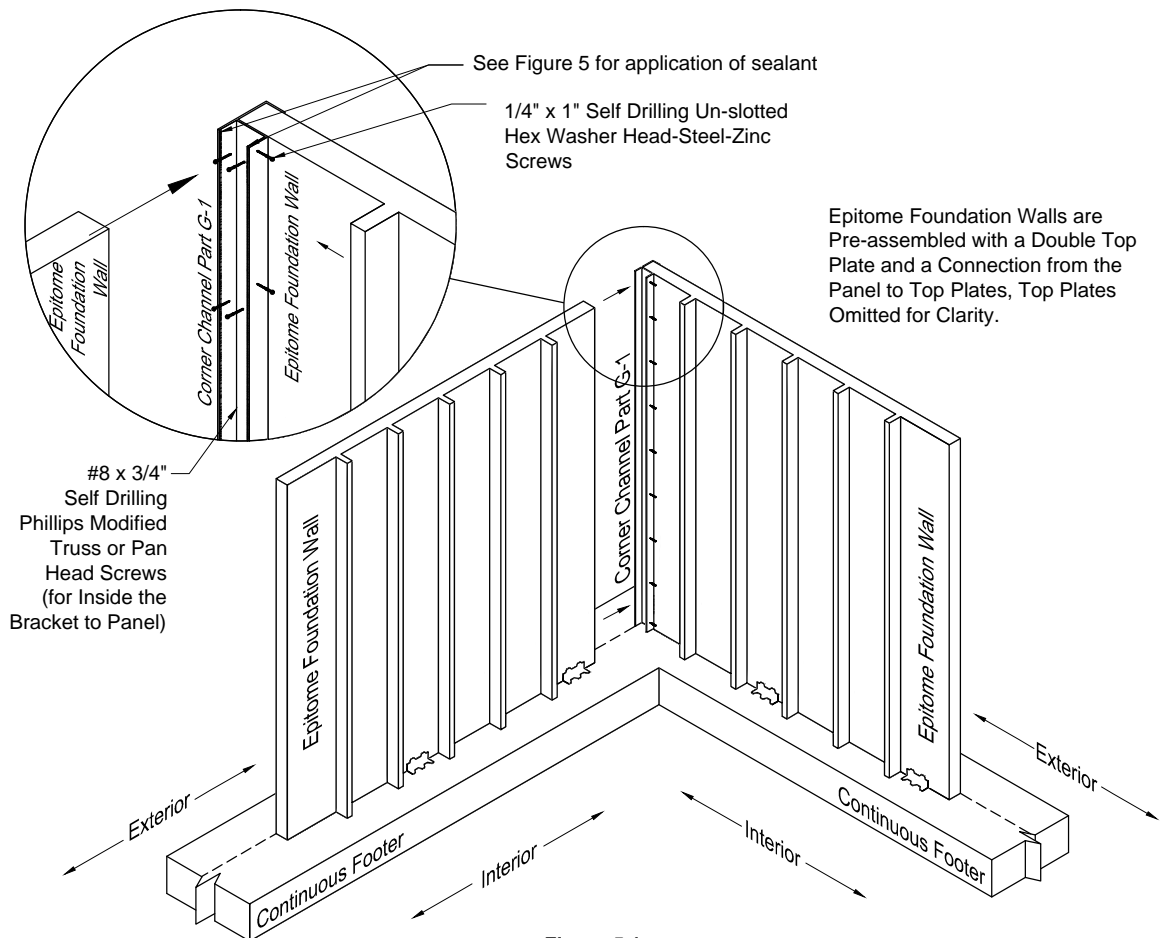


Figure 5.1

## Panel Connection At Inside Corner

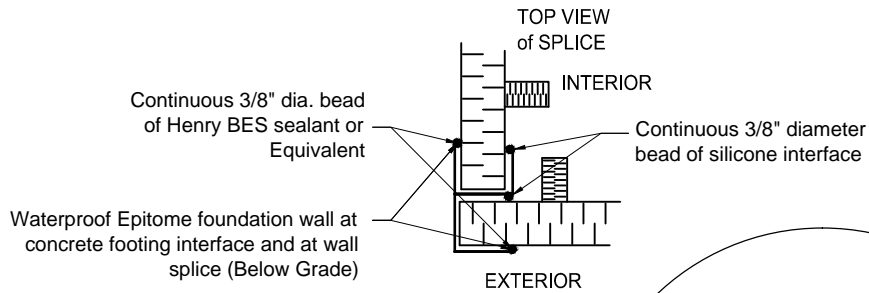


Figure 6

Epitome Foundation Walls are Pre-assembled with a Double Top Plate and a Connection from the Panel to Top Plates, Top Plates Omitted for Clarity.

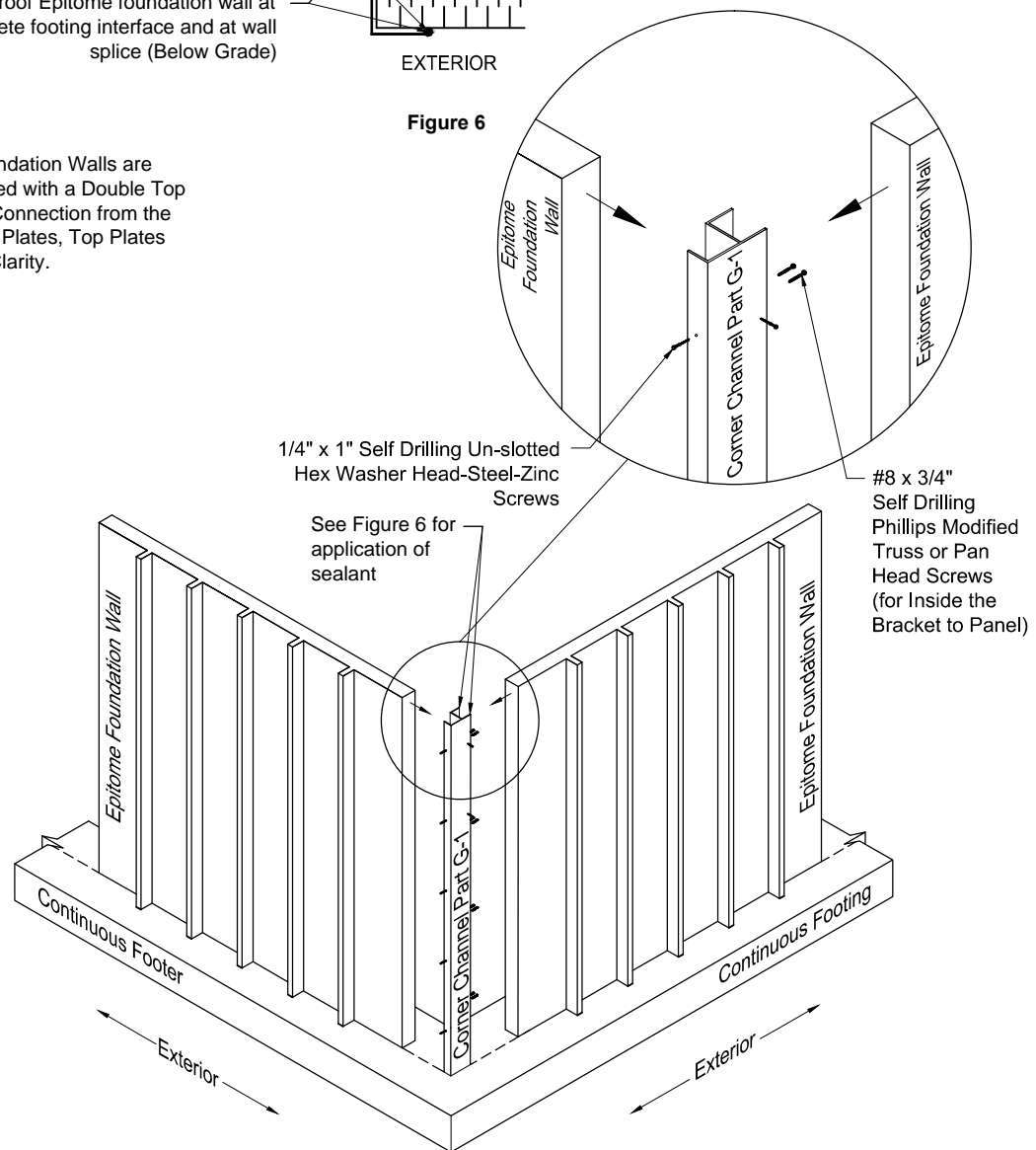


Figure 6

## Waterproofing

### **Panel to Footing / Panel to Panel Connections**

Where above grade: Seal panel connections with adhesive / sealant Henry HE 925 W204 or equivalent.

Where below grade: Step 1 - Seal panel to footing interface with adhesive / sealant Henry HE 925 W204 or equivalent.

Step 2 - Seal panel to footing interface and panel connections with one of the following options or equivalent.

Liquid membrane :

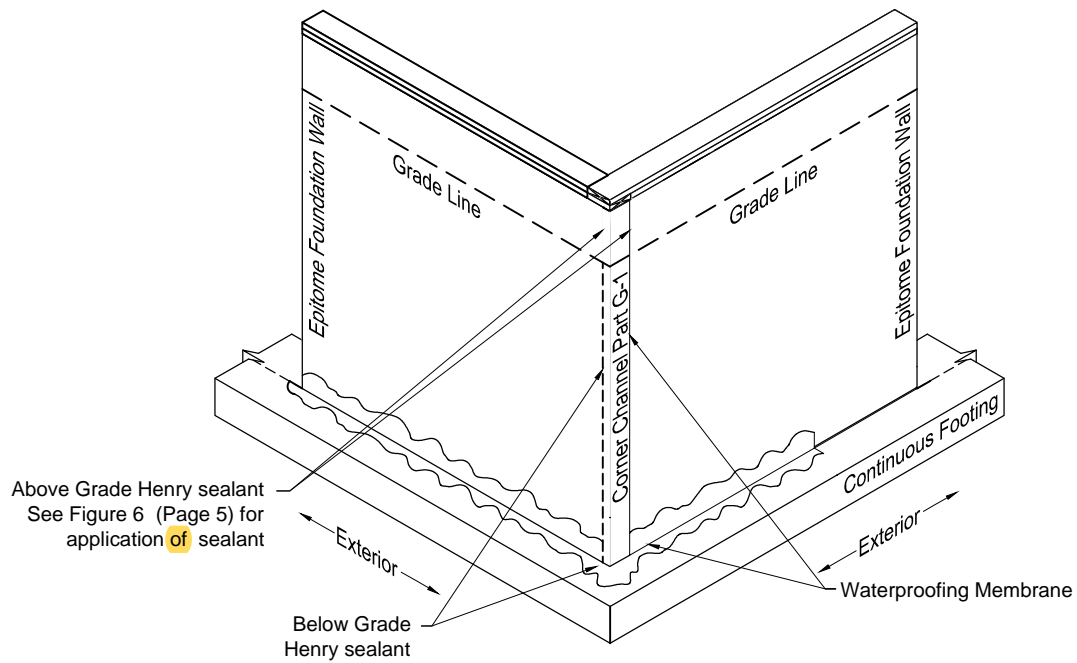
Henry HE 77006 Aqua-Bolc-SB (cold weather) or,  
Henry HE 787 Elastomulsion Waterproofing (warm weather).

Self Adhered Membrane:

Henry HEWP 200 Blueskin

And Primer for self adhered membrane:

HE545 Aquatac Primer (warm weather)  
HE571 BS Adhesive (cold weather).



**Figure 6**

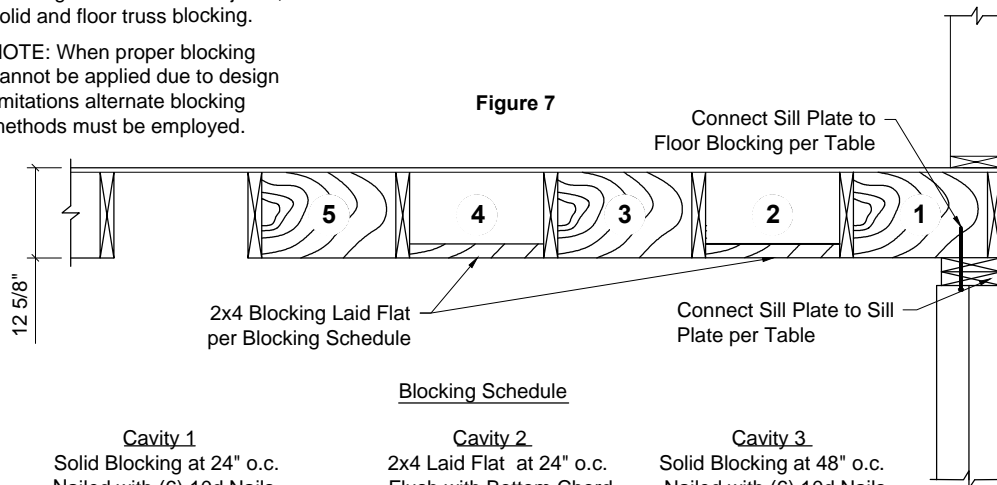
## Lateral Floor Joist Blocking Joists Parallel to Wall

Blocking can be used for I-joists, solid and floor truss blocking.

NOTE: When proper blocking cannot be applied due to design limitations alternate blocking methods must be employed.

**Important:**

When a panelized flooring system is utilized and a seam is within the 5th and/or 6th stud bays blocking must extend beyond the seam.



Blocking Schedule

Cavity 1

Solid Blocking at 24" o.c.  
Nailed with (6) 10d Nails  
through Subfloor into Blocking  
and Fastened to Floor Joist

Cavity 2

2x4 Laid Flat at 24" o.c.  
Flush with Bottom Chord  
of Truss or Bottom of Joist

Cavity 3

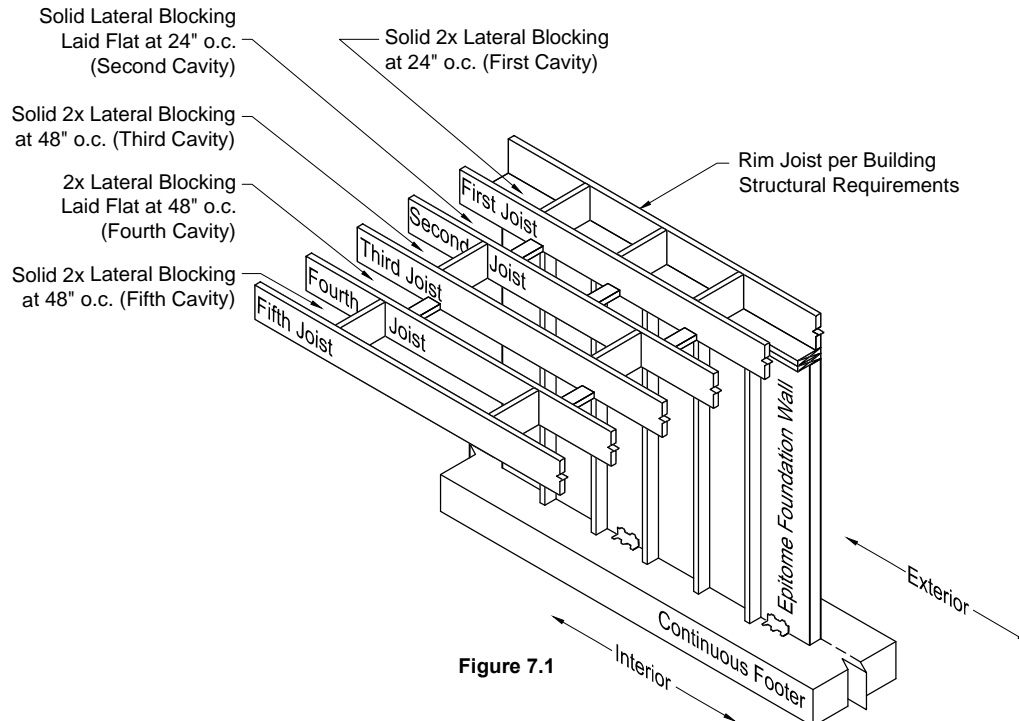
Solid Blocking at 48" o.c.  
Nailed with (6) 10d Nails  
through Subfloor into Blocking  
and Fastened to the Floor Joist

Cavity 4

2x4 Laid Flat at 48" o.c.  
Flush with Bottom Chord  
of Truss or Bottom of Joist

Cavity 5

Solid Blocking at 48" o.c.  
Nailed with (6) 10d Nails  
through Subfloor into Blocking  
and Fastened to the Floor Joist



**Figure 7.1**

## Lateral Floor Truss Blocking

**Note:**

If the lateral Load is Large enough and the vertical studs are long enough the Gable End Frame requires bracing to prevent it from rotating at the Gable End Frame/ end wall interface, along with Diagonal Bracing and/or web reinforcement to prevent the vertical Webs from bending.

The Diagonal Brace is required from the top of the end wall to the top chord of the Truss to impart a vertical force to the Truss Top Chord. This is in addition to any uplift forces the roof sheathing will impart to the Truss from wind. The load from this brace must be considered in the design and attachment of the supporting Truss.

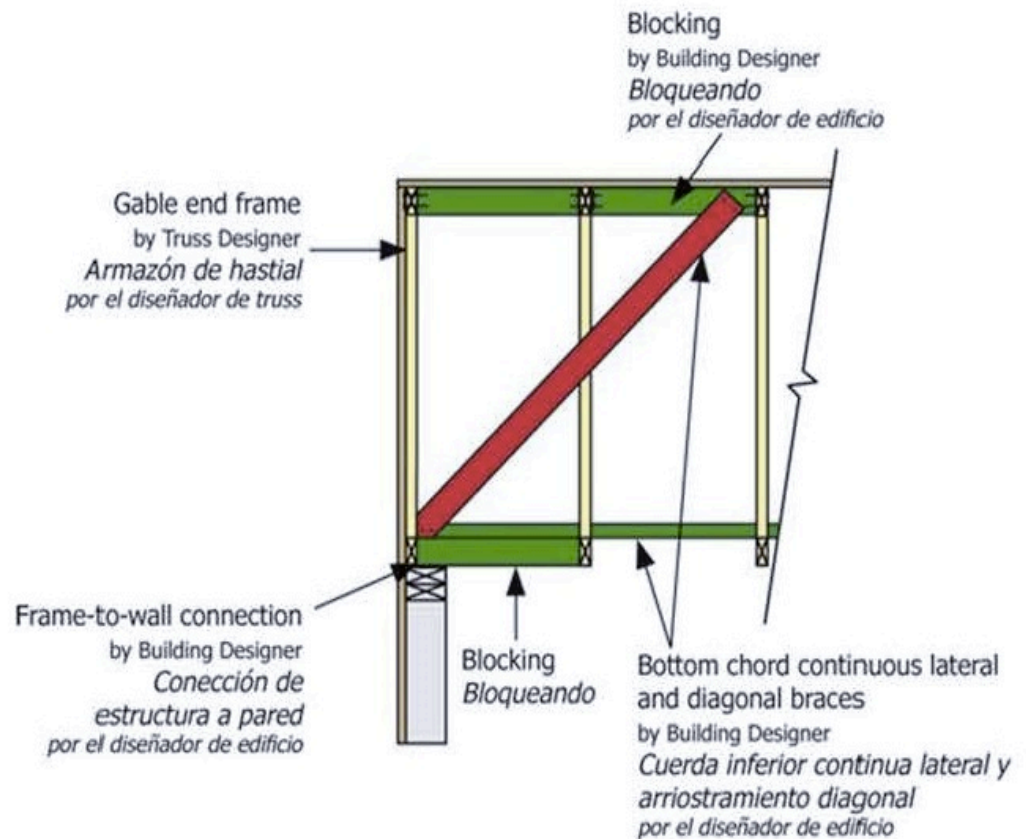


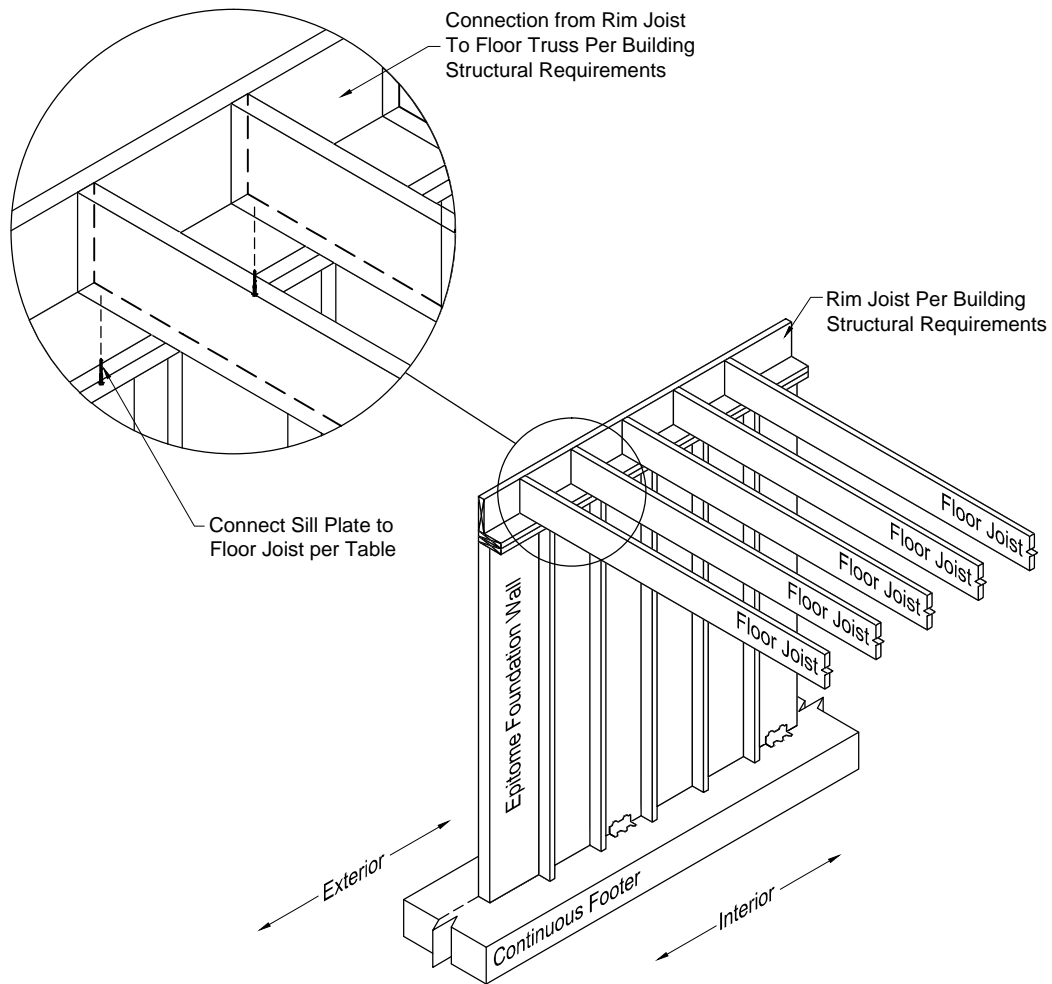
Figure 7.1a

## Lateral Floor Joist Connection Joists Perpendicular to Wall

Epitome Foundation Walls are pre-assembled with a top plate and a connection from the panel to top plate. Sill Plate can be connected to floor Joists through wall cavity.

**NOTE:**

1. When proper Blocking cannot be applied due to design limitations alternate Blocking methods must be employed.
2. If using I-joists, consult manufacturer's installation instructions for specific fastening from sill plate to joist.



**Figure 8**

## Connection to Floor System, Floor Joist to Sill Plate Table

Connections shall be equal to, or greater than the minimum requirements specified.

**TABLE 3**

**FLOOR JOIST TO SILL PLATE  
CONNECTIONS @ 24" OC OR LESS**

FOUNDATION COMPOSITE WALL HEIGHT  (Feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT  (Feet)	GW, GP, SM and SP (30 pcf) Soils Quantity & Spacing <sup>a</sup>		
		Joist Perpendicular to Rim Rail Using # 14 Screws <sup>c</sup> 1/4"x4-1/2"	Joist Parallel to Rim Rail Using # 14 Screws <sup>c</sup> 1/4"x4-1/2"	Sill Plate to Sill Plate Using 0.162" x 3 1/2" Nails <sup>b</sup>
5	4	1 per Joist	1 per Joist	2 @ 16" O.C.
5	5	1 per Joist	1 per Joist	2 @ 16" O.C.
6	4	1 per Joist	1 per Joist	2 @ 16" O.C.
6	5	1 per Joist	1 per Joist	2 @ 16" O.C.
6	6	1 per Joist	1 per Joist	2 @ 16" O.C.
7	4	1 per Joist	1 per Joist	2 @ 16" O.C.
7	5	1 per Joist	1 per Joist	2 @ 16" O.C.
7	6	1 per Joist	1 per Joist	2 @ 16" O.C.
7	7	1 per Joist	1 per Joist	2 @ 16" O.C.
8	4	1 per Joist	1 per Joist	2 @ 16" O.C.
8	5	1 per Joist	1 per Joist	2 @ 16" O.C.
8	6	1 per Joist	1 per Joist	2 @ 16" O.C.
8	7	1 per Joist	1 per Joist	2 @ 16" O.C.
8	8	1 per Joist	1 per Joist	2 @ 16" O.C.
9	4	1 per Joist	1 per Joist	2 @ 16" O.C.
9	5	1 per Joist	1 per Joist	2 @ 16" O.C.
9	6	1 per Joist	1 per Joist	2 @ 16" O.C.
9	7	1 per Joist	1 per Joist	2 @ 16" O.C.
9	8	1 per Joist	1 per Joist	2 @ 16" O.C.
9	9	1 per Joist	1 per Joist	2 @ 16" O.C.

Backfill must be composed of type GW, GP, SM or SP 30 pcf soils.

Composite Panel Systems recommended fastening is based on prescriptive requirements in the International Residential Code. Recommended fastening may be greater than prescriptive requirements. Alternate fastening must be approved by the local building official or verified by a professional engineer.

Screw requires 1 1/2" minimum penetration onto Joist.

#14 screw = 0.491 head and 0.242 shank diameter.

Apply sealant / adhesive between plates and between plate and top of the Epitome Foundation Walls.

## Connection to Floor System, Wall to Plate / Wall to Footer Table

Connections shall be equal to, or greater than the minimum requirements specified.

**TABLE 4**

**EPITOME FOUNDATION WALLS  
TOP AND BOTTOM  
CONNECTION  
(WALL-TO-PLATE)(WALL-TO-FOOTER)  
UNDER VARIOUS SOIL CONDITIONS  
QUANTITY AND SPACING**

FOUNDATION COMPOSITE WALL HEIGHT (Feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT (Feet)	GW, GP ,SM and SP (30 pcf) Soils Quantity & Spacing <sup>a</sup>		
		Top Connection (wall-to-plate) <sup>b</sup>		Bottom Connection (wall to footer) <sup>c</sup>
		Simpson L70	Simpson H2.5A	Simpson L70
5	4	1@ 48-in. oc	1@ 32-in. oc	1@ 48-in. oc
5	5	1@ 48-in. oc	1@ 16-in. oc	1@ 48-in. oc
6	4	1@ 48-in. oc	1@ 32-in. oc	1@ 48-in. oc
6	5	1@ 48-in. oc	1@ 16-in. oc	1@ 48-in. oc
6	6	1@ 32-in. oc	1@ 16-in. oc	1@ 48-in. oc
7	4	1@ 48-in. oc	1@ 32-in. oc	1@ 48-in. oc
7	5	1@ 48-in. oc	1@ 32-in. oc	1@ 48-in. oc
7	6	1@ 32-in. oc	1@ 16-in. oc	1@ 48-in. oc
7	7	1@ 16-in. oc	1@ 32-in. oc	1@ 48-in. oc
8	4	1@ 48-in. oc	1@ 32-in. oc	1@ 48-in. oc
8	5	1@ 48-in. oc	1@ 32-in. oc	1@ 48-in. oc
8	6	1@ 32-in. oc	1@ 32-in. oc	1@ 48-in. oc
8	7	1@ 16-in. oc	1@ 32-in. oc	1@ 48-in. oc
8	8	1@ 16-in. oc	1@ 16-in. oc	1@ 48-in. oc
9	4	1@ 48-in. oc	1@ 32-in. oc	1@ 48-in. oc
9	5	1@ 48-in. oc	1@ 32-in. oc	1@ 48-in. oc
9	6	1@ 48-in. oc	1@ 16-in. oc	1@ 48-in. oc
9	7	1@ 16-in. oc	1@ 32-in. oc	1@ 48-in. oc
9	8	1@ 16-in. oc	1@ 32-in. oc	1@ 48-in. oc
9	9	2@ 16-in. oc	1@ 32-in. oc	1@ 48-in. oc

a) Backfill must be composed of type GW, GP, SM or SP 30 pcf soils.

b) Top connection (wall-to-plate) requires both Simpson L70 and Simpson H2.5A, unless specified as not required.

**c) Bottom connection requires a 3 1/2" minimum slab poured prior to backfilling.**





## Stairwell Header Procedure

Stairwell openings adjacent to Epitome Foundation Walls require special consideration as the foundation wall often acts as a retaining wall without lateral Blocking.

For stairwell openings up to 9'-6" in length and within 8' of the foundation panels (Refer to the following 2 pages).

- Use construction adhesive between the sill plate and the top beam.
- Build a support beam (2x7" ripped sill plate and two 2x6), without splices, 2'-0" past each end of the stairwell opening.
- Bolt the support beam with 1/2" bolts, using washers, over the length of the support beam.

For alternate stairwell bracing see page 16 - Garage Slab to Foundation Wall Attachment (Alternative Reinforcement of Stairwell Opening)

## Stairwell Header Procedure, Parallel Joists

Date: Feb. 19, 2019

### Stairwell opening Reinforcing for backfill height & unbraced floor length for 30 PCF Soil Density

Assumes 9 ft. wall height

Assumes Double 2x8 sill plate is retained and timber reinforcing is located above sill plate.

#### Backfill Height 8ft.

Unbraced floor opening less 8'-0" in length do not require additional reinforcing.

Stairwell length - Ft.	Reinforcing	Additional Steel		PSL Alternative
		Plate 1	Plate 2	
8'-1" to 12'-6"	7" x 5 1/4" PSL	None	None	
12'-7" to 14'-4"	7 x 9 1/4 PSL	None	none	
14'-5" to 15'-0"	7 x 9 1/4 PSL	1/8" x 7"	none	7" x 11 1/4"

#### Backfill Height 7ft.

Unbraced floor opening less 8'-9" in length do not require additional reinforcing.

Stairwell length - Ft.	Reinforcing	Additional Steel	
		Plate 1	Plate 2
8'-10" to 12'-5"	7" x 3 1/2" PSL	None	None
12'-6" to 13'-7"	7 x 5 1/4 PSL	None	None
13'-8" to 15'-0"	7 x 9 1/4 PSL	None	None

#### Backfill Height 6ft.

Unbraced floor opening less 9'-9" length do not require additional reinforcing.

Stairwell length - Ft.	Reinforcing	Additional Steel	
		Plate 1	Plate 2
9'-10" to 13'-9"	7 x 3 1/4 PSL	None	None
13'-10" to 15'-0"	7 x 5 1/4 PSL	None	None

Steel Plate Locations:

Plate 1 - Between Top 2x8 and PSL timber

Plate 2 - Between bottom 2x8 and top 2x8

Date: Feb. 19, 2019

## Stairwell opening Reinforcing for backfill height & unbraced floor length for 45 PCF Soil Density

Assumes 9 ft. wall height

Assumes Double 2x8 sill plate is retained and reinforcing is located above sill plate.

### Backfill Height 8ft.

Unbraced floor opening 7 feet or less in length do not require additional reinforcing.

Stairwell length - Ft.	Reinforcing	Additional Steel		PSL Alternative
		Plate 1	Plate 2	
7'-1" to 12'-6"	7 x 9 1/4 PSL	None	None	
12'-7" to 13'-3"	7 x 9 1/4 PSL	1/8" x 7"	none	7" x 11 1/4"
13'-4" to 13'-10"	7 x 9 1/4 PSL	1/8" x 7"	1/8" x 7"	
13'-11" to 14'-6"	7 x 9 1/4 PSL	1/8" x 7"	1/4" x 7"	
14'-7" to 15'-0"	7 x 9 1/4 PSL	1/4" x 7"	1/4" x 7"	

### Backfill Height 7ft.

Unbraced floor opening 7' -9" or less in length do not require additional reinforcing.

Stairwell length - Ft.	Reinforcing	Additional Steel		
		Plate 1	Plate 2	
7'-10" to 13'-8"	7 x 9 1/4 PSL	None	None	
13'-9" to 14'-5"	7 x 9 1/4 PSL	1/8" x 7"	none	7" x 11 1/4"
14'-6" to 15'-0"	7 x 9 1/4 PSL	1/8" x 7"	1/16" x 7"	

### Backfill Height 6ft.

Stairwell length - Ft.	Reinforcing	Additional Steel		
		Plate 1	Plate 2	
8'-7" to 13'-0"	7 x 5 1/4 PSL	None	None	
13'-1" to 15'-0"	7 x 9 1/4 PSL	None	None	

Steel Plate Locations:

Plate 1 - Between Top 2x8 and PSL timber

Plate 2 - Between bottom 2x8 and top 2x8

Date: Feb. 19, 2019

## Stairwell opening Reinforcing for backfill height & unbraced floor length for 60 PCF Soil Density

Assumes 9 ft. wall height

Reinforcing is based on a deflection range of L/340 to L/3360.

Assumes Double 2x8 sill plate is retained and reinforcing is located above sill plate.

### Backfill Height 8ft.

Unbraced floor opening 6'-4" or less in length do not require additional reinforcing.

Stairwell length - Ft.	Reinforcing	Additional Steel		PSL Alternative
		Plate 1	Plate 2	
6'-5" to 11'-4"	7 x 9 1/4 PSL	None	None	
11'-5 to 12'-0"	7 x 9 1/4 PSL	1/8" x 7"	none	7" x 11 1/4"
12'-1" to 12'-6"	7 x 9 1/4 PSL	1/8" x 7"	1/8" x 7"	
12'-7" to 13'-8"	7 x 9 1/4 PSL	1/4" x 7"	1/4" x 7"	
13'-9 to 15'-0"	7 x 9 1/4 PSL	7/16" x 7"	1/4" x 7"	

### Backfill Height 7ft.

Unbraced floor opening 7'-0" or less in length do not require additional reinforcing.

Stairwell length - Ft.	Reinforcing	Additional Steel		
		Plate 1	Plate 2	
7'-1" to 12'-5"	7 x 9 1/4 PSL	None	None	
12'-6" to 13'-4"	7 x 9 1/4 PSL	1/8" x 7"	none	7" x 11 1/4"
13'-5" to 13'-9"	7 x 9 1/4 PSL	1/8" x 7"	1/4" x 7"	
13'-10" to 14'-5"	7 x 9 1/4 PSL	1/8" x 7"	1/4" x 7"	
14'-6" to 15'-0"	7 x 9 1/4 PSL	1/4" x 7"	1/4" x 7"	

### Backfill Height 6ft.

Unbraced floor opening 7'-9" or less in length do not require additional reinforcing.

Stairwell length - Ft.	Reinforcing	Additional Steel		
		Plate 1	Plate 2	
7'-10" to 13'-10"	7 x 9 1/4 PSL	None	None	
13'-11" to 14'-6"	7 x 9 1/4 PSL	1/8" x 7"	None	
14'-7" to 15'-0"	7 x 9 1/4 PSL	1/8" x 7"	1/8" x 7"	

Steel Plate Locations:

Plate 1 - Between Top 2x8 and PSL timber

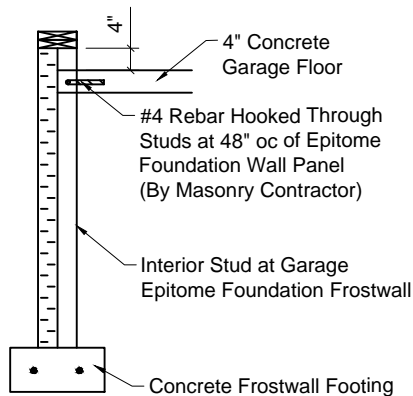
Plate 2 - Between bottom 2x8 and top 2x8

## Garage Slab to Foundation Wall Attachment

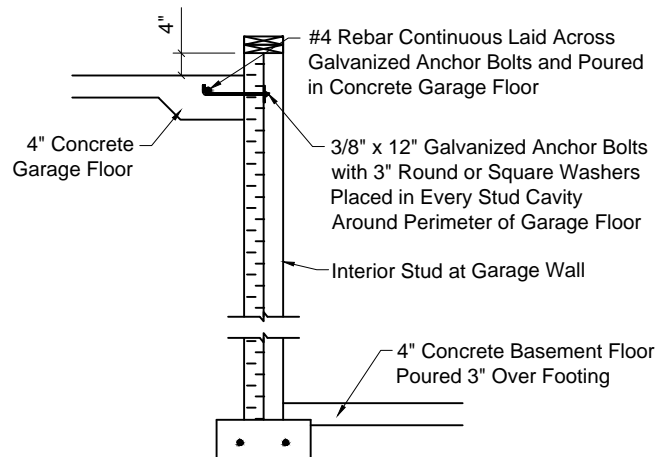
### And Alternative Reinforcement of Stairwell Opening with Temporary Bracing

Concrete garage shall be fastened to Epitome Foundations. Secure the Epitome Foundation Walls to the garage slab using 3/8" x 12" galvanized anchor bolts, 3" round or square washers in every stud cavity around perimeter of garage floor.

CONCRETE GARAGE FLOOR CONNECTION  
TO EPITOME FOUNDATION FROSTWALLS



CONCRETE GARAGE FLOOR CONNECTION  
TO EPITOME FOUNDATION WALLS



\*This procedure can also be used as an alternate stairwell reinforcement with temporary bracing of stairwell until concrete is cured.

\*For stairwells or floor openings adjacent to an exterior wall and larger than 9'-6" in length, or for an alternative stairwell reinforcement detail, consult an engineer or your Epitome Foundation Wall supplier.

## Shear Walls

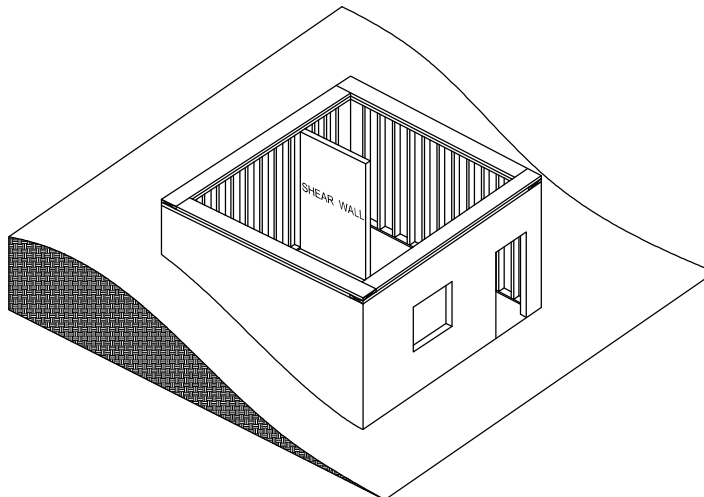
Designed for stabilizing structures, shear walls are often required for an open floor plan or uneven backfill conditions. Shear walls are constructed from wood, concrete, masonry (CMU) or steel materials. When an Architect or Engineer determines that a shear wall is necessary, the specifications are to be documented in the Architectural drawings. These specifications can consist of Location, Length and Top / Bottom of wall connection.

The following table assists in determining the necessity of a shear wall when uneven backfill conditions exist. If wall lengths exceed the maximum limit of this table due to uneven backfill or large floor openings, then a shear wall will need to be utilized. The project must be reviewed by an Engineer when a shear wall is employed. Some site conditions may also require the use of a shear wall even though the wall lengths do not surpass the dimensions specified in this table.

**TABLE 5**

**SHEAR WALL TABLE**

Wall Length Limits Without A Shear Wall		
Wall Height	Differential Backfill Height	Soil Types
		GW, GP, SM or SP 30 lbs soil
9'-0"	≥ 8'-4"	42'-0"
	≥ 7'-0"	72'-0"
	≥ 6'-0"	116'-0"



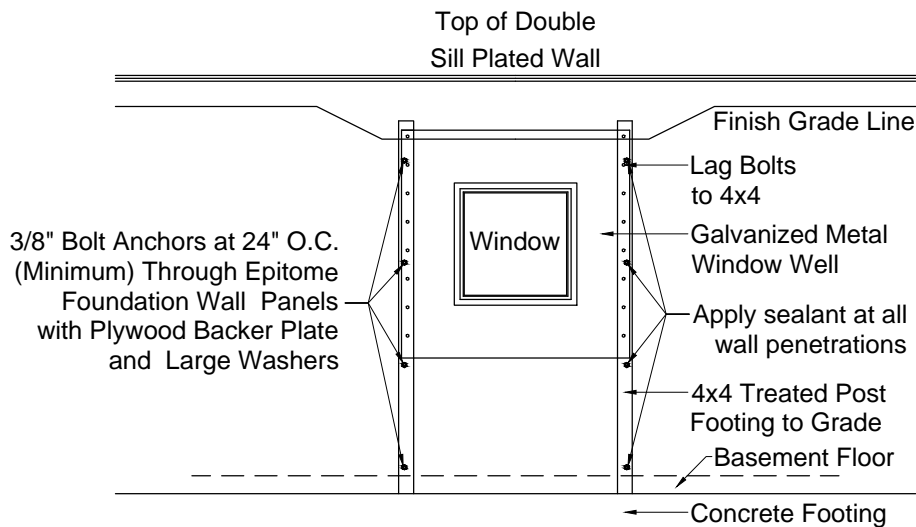
**Figure 11**

## Window Opening Reinforcement- See figure 12.2

Headers for openings shall be placed in the floor rim rails and shall be calculated, by a registered design professional or refer to prescriptive methods in the code, to distribute loads imposed on the Epitome Foundation Wall panels.

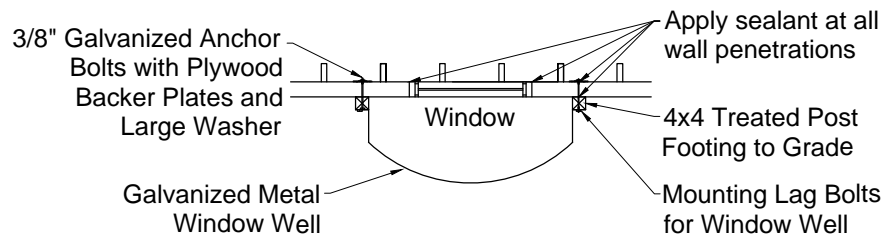
## Window Wells

Window wells can be installed directly to Epitome Foundation Wall panels in the field. Install a 4x4 post directly adjacent to the window well and connect to the Epitome Foundation Wall panel with 3/8" galvanised anchor bolts with backer plywood plates and a large washer. Add sealant to all Epitome Foundation Wall penetrations.



**ELEVATION**

**Figure 12**



**PLAN VIEW**

**Figure 12.1**

Date: Feb. 19, 2019

## Window opening Reinforcing for backfill height and Soil Density

Assumes 9 ft. wall height

Assumes Double 2x8 sill plate is retained

Reinforcing is located at bottom of window opening

### 30 PCF Soil Density

Backfill Height 5ft. or less	
Opening length - Ft.	Reinforcing
11'-1" to 15'-0"	7 x 3 1/2 PSL
Unbraced Window opening 11'-0" or less in length do not require additional reinforcing.	

### 45 PCF Soil Density

Backfill Height 5ft. or less	
Opening length - Ft.	Reinforcing
9'-10" to 13'-6"	7 x 3 1/2 PSL
13'-7" to 15'-0"	7 x 5 1/4 PSL
Unbraced Window opening 9'-9" or less in length do not require additional reinforcing.	
Backfill heights of 4 ft. and opening width less than 11'-4" do not require additional reinforcing. From 11'-5" to 15'-0" requires 7" x 3 1/2" PSL	
Backfill heights of 3 ft. and opening width less than 13'-6" do not require additional reinforcing. From 13'-7" to 15'-0" requires 7" x 3 1/2" PSL	

### 60 PCF Soil Density

Backfill Height 5ft. or less	
Opening length - Ft.	Reinforcing
8'-10" to 12'-5"	7" x 3 1/2" PSL
12'-6" to 13'-6"	7" x 5 1/4" PSL
13'-7" to 15'-0"	7" x 9 1/4" PSL
Unbraced Window opening 8'-9" or less in length do not require additional reinforcing.	
Backfill heights of 4 ft. and opening width less than 10'-0" do not require additional reinforcing. From 10'-1" to 14'-0" requires 7" x 3 1/2" PSL. From 14'-1" to 15'-0" requires 7" x 5	
Backfill heights of 3 ft. and opening width less than 12'-0" do not require additional reinforcing. From 12'-1" to 15'-0" requires 7" x 3 1/2" PSL	

Figure 12.2



## Basement Foundation

EPITOME FOUNDATION WALL SYSTEMS REQUIRE THE SLAB TO BE POURED AND FLOOR FRAMING ATTACHED BEFORE BACKFILLING. SEE PROPER BACKFILLING.

### \*Slab Base

A porous layer of gravel, crushed stone or coarse sand shall be placed to a minimum thickness of 4 inches under the basement floor. The footing should not be placed directly onto frozen soil.

### \*Vapor Retarder

A 6-mil-thick polyethylene vapor retarder shall be applied over the porous layer with the basement floor constructed over the polyethylene. Joints in polyethylene film shall be lapped 6 inches and sealed with adhesive.

### \*Drainage System

A sump shall be provided to drain the porous layer and footings. The sump shall be at least 24 inches in diameter or 20 inches square, shall extend at least 24 inches beyond the basement floor and shall be capable of positive gravity or mechanical drainage to remove any accumulated water. The drainage system shall discharge into an approved system or to daylight.

### \*Foundation Drainage

Foundation drainage shall be provided around all foundations that retain and enclose habitable or useable spaces located below grade. Drainage tiles, gravel or crushed stone drains, perforated pipe or other approved systems or materials shall be installed at or below the area to be protected and shall discharge by gravity or mechanical means into an approved drainage system. Gravel or crushed stone drains shall extend at least 1 foot beyond the outside edge of the footing and 6 inches above the top of the footing and be covered with an approved filter membrane material. The top of open joints of drain tiles shall be protected with strips of building paper. Perforated drains shall be surrounded with an approved filter membrane or the filter membrane shall cover the washed gravel or crushed rock covering the drain. Drainage tiles or perforated pipe shall be placed on a minimum of 2 inches of washed gravel or crushed rock at least one sieve size larger than the tile joint opening or perforation and covered with not less than 6 inches of the same material.

### \*Porous Fill

The space between the excavation and the foundation wall shall be backfilled with stone, sand or other porous fill up to one-half the total backfill height. Cap with Top Soil or Low Permeability Material Sloped 6" within the first 10' to divert ground water away from the foundation.

-SEE PROPER BACKFILLING

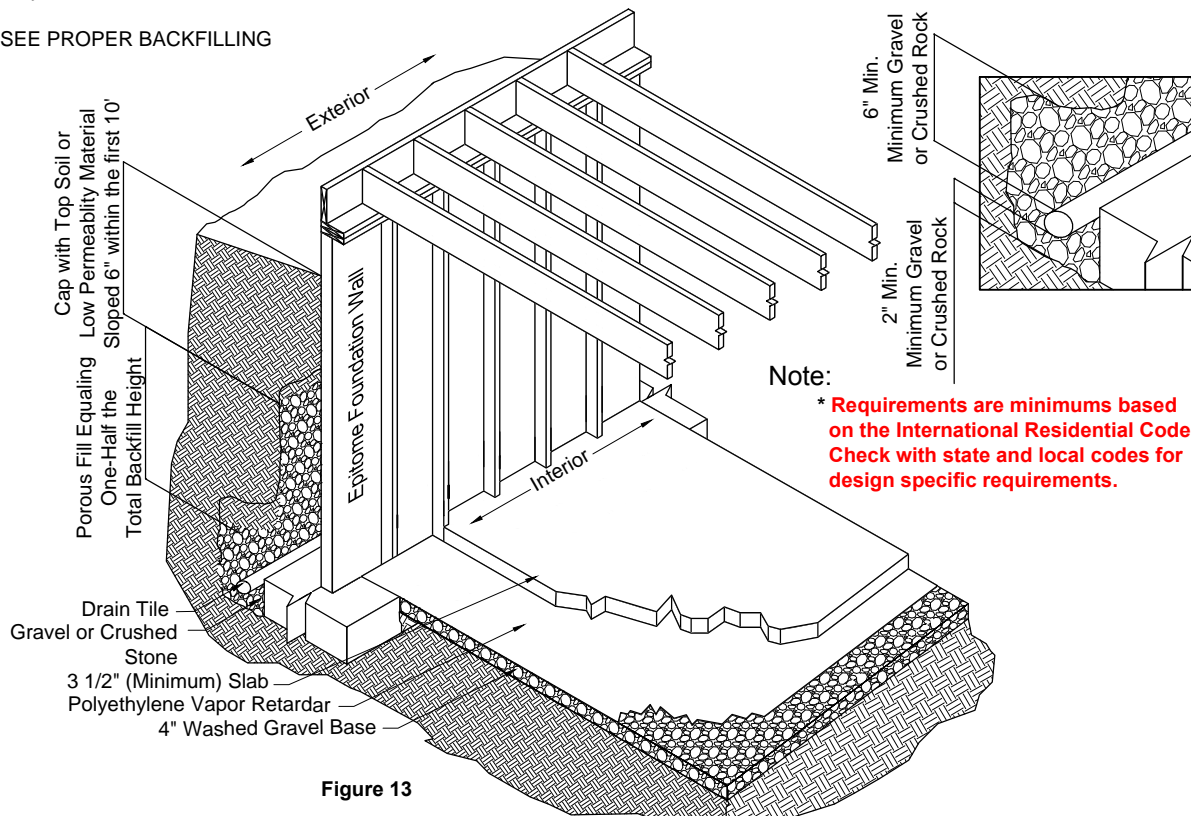


Figure 13

## Crawlspace Foundation

### **\*Removal of Debris**

The under-floor grade shall be cleaned of all vegetation and organic material.

### **\*Finished Grade**

The finished grade of the under-floor surface may be located at the bottom of the footings, however, where there is evidence that the ground water table can rise to within 6 inches of the finished floor at the building perimeter or where there is evidence that the surface water does not readily drain from the building site, the grade in the under-floor space shall be as high as the outside finished grade, unless an approved drainage system is provided.

-SEE PROPER BACKFILLING

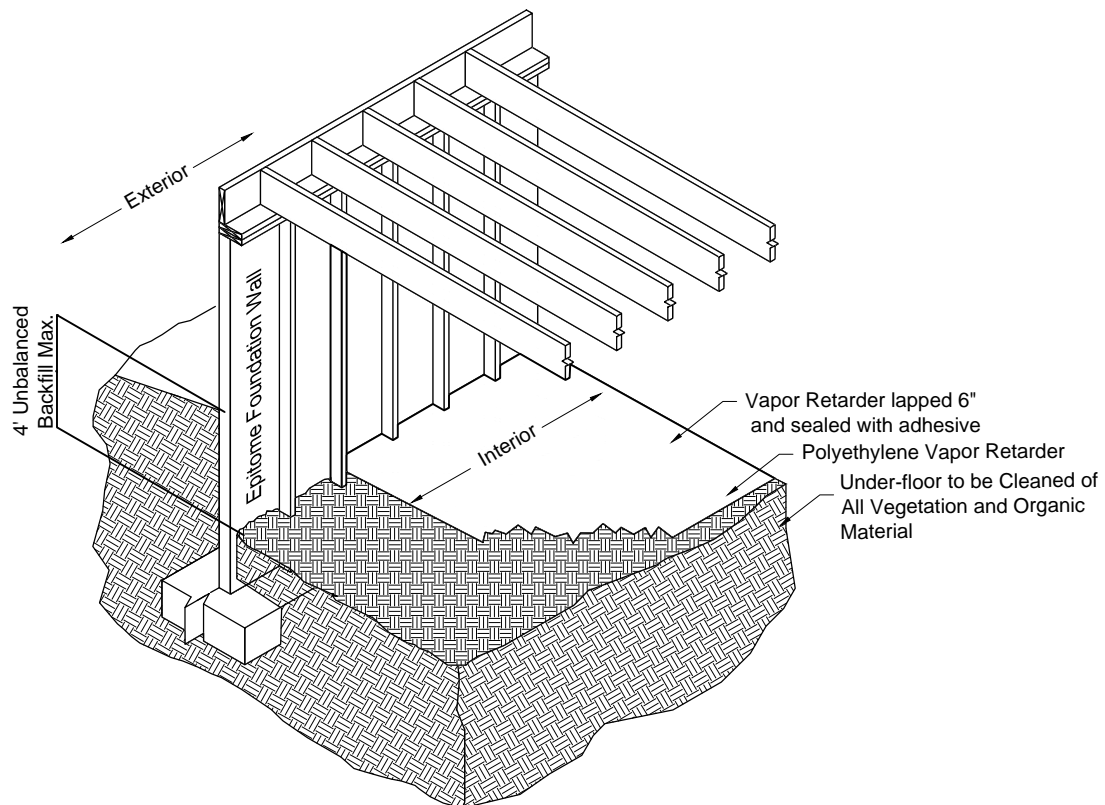


Figure 14

\* Requirements are minimums based on the International Residential Code  
Check with state and local codes for design specific requirements.

## Frost Walls

### \*Slab Base

A porous layer of gravel, crushed stone or coarse sand shall be placed to a minimum thickness of 4 inches under the slab floor.

### \*Vapor Retarder

A 6-mil-thick polyethylene vapor retarder shall be applied over the porous layer with the basement floor constructed over the polyethylene. Joints in polyethylene film shall be lapped 6 inches and sealed with adhesive.

Uniform backfilling is imperative for Frost Walls.

-SEE PROPER BACKFILLING

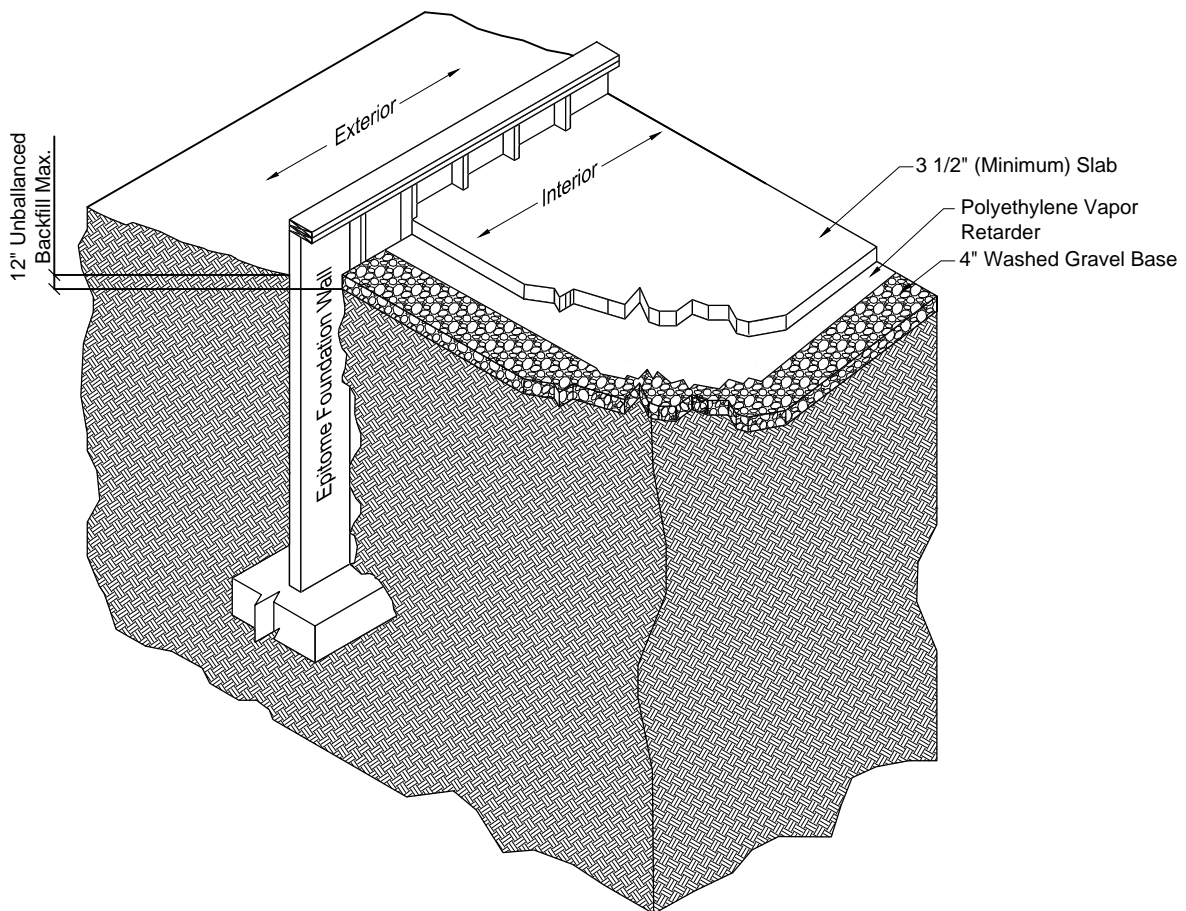


Figure 15

\* Requirements are minimums based  
on the International Residential Code  
Check with state and local codes  
for design specific requirements.



## Concrete Stoop

### Forming Materials

Use 2x materials to frame out the concrete stoop form, form is to be removed when concrete is completely set up. 2x bull nosing should be located between the front edge of the framing material and the Epitome Foundation Wall before concrete is poured.

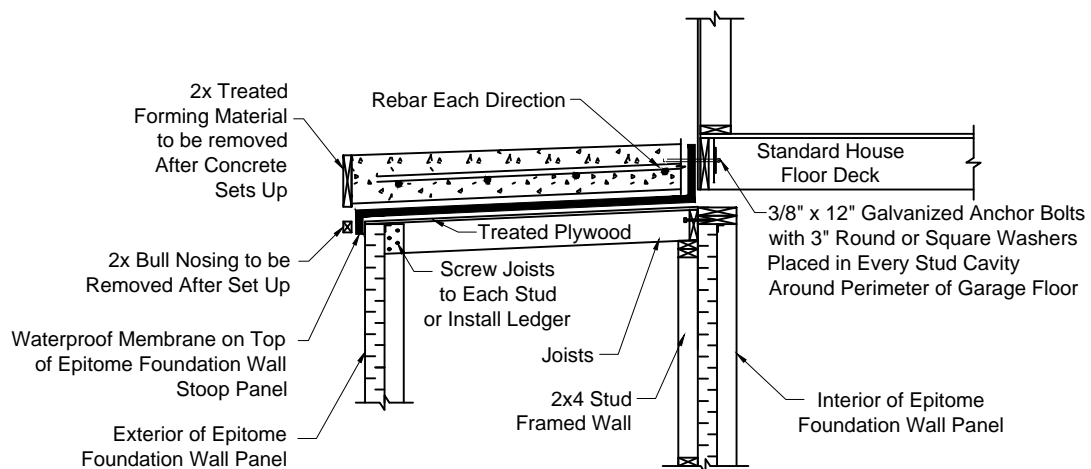
### Waterproof Membrane

A waterproof membrane is to be placed between the Epitome Foundation Wall and the 1/2" treated plywood before pouring concrete to aid in prevention of water infiltration.

### Fastening

Screw appropriately sized joists to each stud of the Epitome Foundation Wall.

SEE PROPER BACKFILLING



**CONCRETE STOOP  
ROOT CELLAR BELOW**

Figure 17



## Proper Backfilling

### **Before Backfilling Begins Install Floor System As Specified**

To be code compliant the framing and decking connection at the top of the Epitome Foundation Wall panel and the floor slab at the bottom of the Epitome Foundation Wall panel **MUST** be completed prior to backfilling.

Backfill shall not be placed against the wall until the wall has sufficient strength and has been anchored to the floor above, or has been sufficiently braced to prevent damage from the backfill.

### **Fill, General**

- A. It is the responsibility of the builder to ensure proper site conditions.
- B. Do not use expansive soil or topsoil for backfill. **example CLAY not acceptable**
- C. Do not place fill until required excavation and foundation preparation have been inspected and approved by local authorities, if inspection is required.
- D. Place fill or backfill in approximate horizontal layers; do not exceed the maximum lift thickness.
- E. Adjacent to structures, place fill or backfill to prevent damage and allow structures to assume loads gradually and uniformly, at approximately the same rate on all sides of structure.
- F. If there is water in an excavation, perform backfilling so that backfill displaces the water and does not trap it within.
- G. Perform backfilling to prevent wedging action against the structure. Step, terrace, or treat existing slopes as necessary to prevent slipping and wedging of the backfill. Conduct backfilling operations to avoid damage or deflecting any portion of the structure out of alignment. Gradually deposit the backfilling material transported in trucks or other vehicles instead of dumping the entire contents as one mass. Lower all clams, dippers, and similar backfill containers to within 5 feet of previously deposited backfill.
- H. Do not place backfill against any portion of any substructure unit until waterproofing is complete.
- I. Do not run heavy machinery parallel to or in close proximity to the foundation. Heavy equipment should be operated at 45 degree angle to the building.



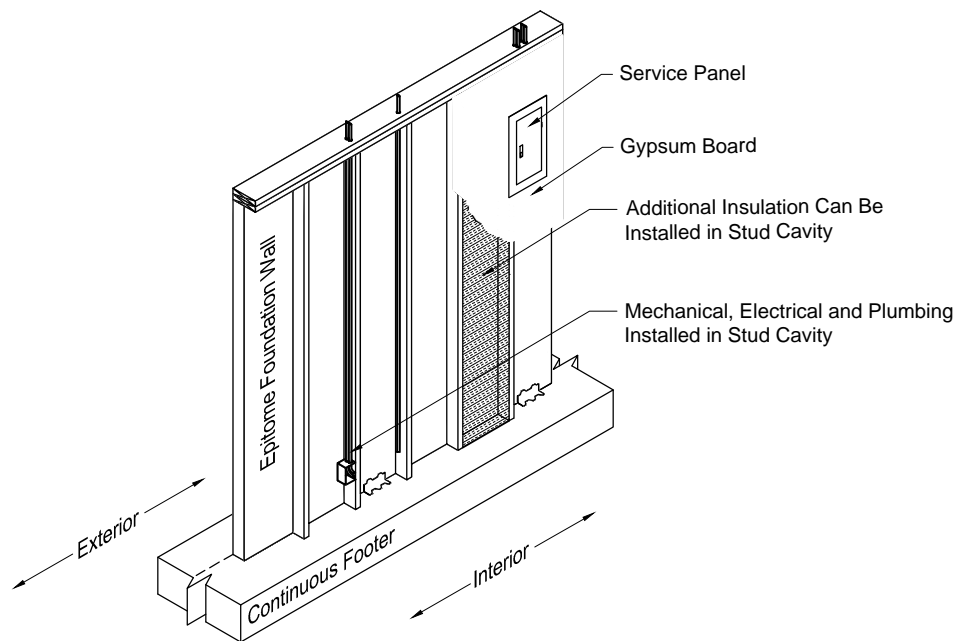
## \*Final Grade

Final grade shall be established using top soil or other low permeable material and shall be sloped to allow surface drainage. The grade shall fall a minimum of 6 inches within the first 10 feet. Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection that does not create a hazard. Where lot lines, walls, slopes or other physical barriers prohibit 6 inches of fall within the first 10 feet, drains or swales shall be constructed to insure drainage away from the structure. Paved surfaces within 10 feet of the building foundation shall be sloped a minimum of 2 percent away from the building.

**\* Requirements are minimums based  
on the International Residential Code  
Check with state and local codes  
for design specific requirements.**

## Mechanical, Electrical and Plumbing / Additional Insulation

Mechanical, electrical and plumbing can be installed vertically within the stud cavity. DO NOT drill holes through the panel or pre-formed studs in the Epitome Foundation Wall.



**Figure 18**

**\* Requirements are minimums based on the International Residential Code. Check with state and local codes for design specific requirements.**





## Interior Coverings

Epitome Foundation Walls can't be left uncovered. Further instructions are found in the ICC ESR-4667 report page 2 under Interior finishes.

### **\*Gypsum Board**

Gypsum Board can be applied direct to Epitome Foundation Wall pre-formed studs and fastened with self drilling screws.

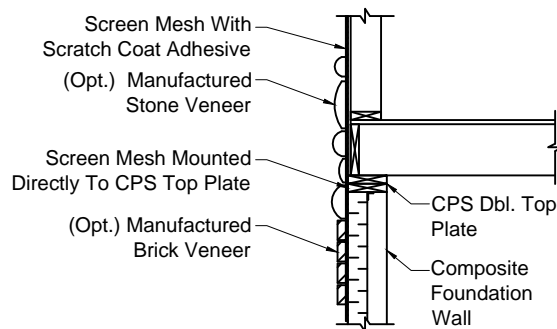
**\* Requirements are minimums based  
on the International Residential Code  
Check with state and local codes  
for design specific requirements.**

## \*Exterior Coverings

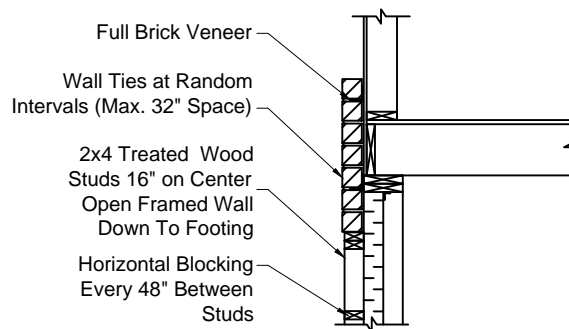
Epitome Foundation Walls can be covered with a wide range of exterior materials. Seal all exterior fasteners with silicone.

### **\*Stone and Masonry Veneer**

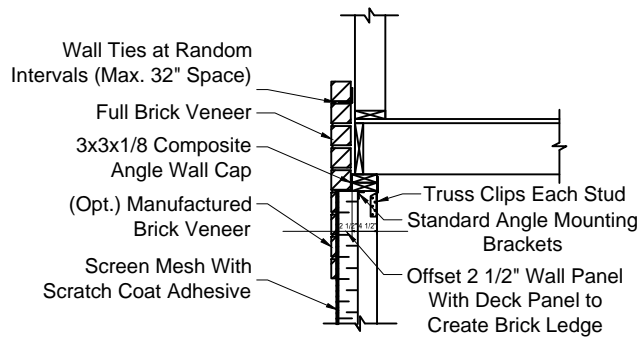
Stone and Masonry Veneer may be installed per conventional installation. Where Stone and Masonry Veneer supported by wood or cold formed steel construction adjoins Epitome Foundation Walls a moment joint shall be installed.



**Figure 19**  
MANUFACTURED STONE OR  
BRICK VENEER INSTALLATION  
DETAIL



**Figure 19.1**  
FULL BRICK VENEER W/  
TREATED WOOD WALL  
BRICK LEDGE



**Figure 19.2**  
WALL PANEL BRICK LEDGE  
FOR FULL BRICK VENEER

**\* Requirements are minimums based  
on the International Residential Code  
Check with state and local codes  
for design specific requirements.**



## **\*Exterior Coverings - Continued**

### **\*Wood Shakes and Shingles**

Wood shakes and shingles shall be installed in either single course or double course over the Epitome Foundation Walls. The spacing between adjacent shingles shall not exceed 1/4 inch, and between adjacent shakes shall not exceed 1/2 inch. The offset spacing between joints in adjacent courses shall be a minimum of 1 1/2 inch. Wood shakes and shingles shall be fastened with stainless steel fasteners and washers where required. Seal all fasteners with silicone.

### **Painted**

If no other exterior coverings are used, Epitome Foundation Walls shall be painted within the first few years of installation.

### **\*Vinyl Siding**

Vinyl Siding shall be installed in accordance with the manufacturers installation instructions and fastened with corrosion resistant fasteners and washers where required. Seal all fasteners with silicone.

### **\*Wood Hardboard and Wood Structural Panel Siding**

Panel siding can be installed over Epitome Foundation Walls. Vertical joints in Panel siding shall be shiplapped or covered with a batten. Horizontal joints shall be lapped a minimum of 1 inch or shall be shiplapped or flashed with Z Flashing. Panel siding shall be fastened with corrosion resistant fasteners and washers where required. Seal all fasteners with silicone.

Horizontal lap siding shall be installed in accordance with the manufacturers installation instructions. Horizontal lap siding shall be fastened with corrosion resistant fasteners and washers where required. Seal all fasteners with silicone.

**\* Requirements are minimums based  
on the International Residential Code  
Check with state and local codes  
for design specific requirements.**

## Structural Properties

**TABLE 6**

**Allowable Uniform Transverse Loads  
(Positive Pressure Loading) (psf)** <sup>1, 3, 4</sup>

Panel Length (ft)	7" Overall Thickness		
	Deflection Limit <sup>2</sup>		
	L/180	L/240	L/360
9	235	175	116

**TABLE 7**

**Allowable Uniform Transverse Loads  
(Negative Pressure Loading) (psf)** <sup>1, 3, 4</sup>

Panel Length (ft)	7" Overall Thickness		
	Deflection Limit <sup>2</sup>		
	L/180	L/240	L/360
9	200	192	130

1. Table values assume a simply supported panel with 2" of continuous bearing on facing at supports. Values do not include the dead weight of the panel.

2. Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and the requirements of adopted building code. Values are based on loads of short duration only and do not consider the effects of creep.

3. Tabulated values are based on the product's studs oriented parallel to the direction of panel bending

**TABLE 8**

**Allowable Axial Loads (plf)** <sup>1, 2, 3, 4, 5</sup>

Lateral Bracing Spacing (ft)	7" Overall Thickness
9	6246

1. Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load

2. All values are for normal duration and may not be increased for other durations.

3. Axial loads shall be applied concentrically to the top of the panel through repetitive members spaced not more than 24" on center.

4. The ends of both facings must bear on the supporting foundation or structure to achieve the tabulated axial loads.

5. Tabulated values are based on the product's studs oriented parallel to the direction of the applied load and facing the interior of the building.

## Structural Properties

**TABLE 9**

**Fastener Performance  
(Interior Facing)**

Fastener	Property	Value <sup>2</sup> (lbf)
#10-16 x 2-1/2" Self-Drilling Unslotted Hex Washer Head Screw	Lateral Capacity <sup>1</sup>	740
	Withdrawl Capacity	240
	Head Pull-Through Capacity	560

1. Fastener installed 1 3/8" from edge of board.

2. Characteristic test value (5<sup>th</sup> percentile with 75% confidence). It is the responsibility of the designer of record to use an appropriate factor of safety.

**TABLE 10**

**Fastener Performance  
(Exterior Facing)**

Fastener	Property	Value <sup>2</sup> (lbf)
#10-16 x 2-1/2" Self-Drilling Unslotted Hex Washer Head Screw	Lateral Capacity <sup>1</sup>	475
	Withdrawl Capacity	170

1. Fastener installed 1 3/8" from edge of board.

2. Characteristic test value (5<sup>th</sup> percentile with 75% confidence) It is the responsibility of the designer of record to use an appropriate factor of safety.

**TABLE 11**

**Characteristic Properties <sup>1</sup>**

Property	Interior Facing (psi)	Exterior Facing (psi)
Tensile Strength, $F_t$	9800	9000
Elastic Modulus, Min. (Tension.), $E_{tmin}$	290,000	285,000
Elastic Modulus (Tension.), $E_t$	445,000	370,000

1. All properties are based on a minimum panel width of 24' and direction of load parallel to the height of the wall panel.

2. Characteristic test value (5<sup>th</sup> percentile with 75% confidence) It is the responsibility of the designer of record to use an appropriate factor of safety.



## Conditions of Use

### Uses

**Fire Resistive Assemblies.** Epitome Foundation Wall Panels shall not be used as part of a fire-rated assembly unless suitable evidence and details are submitted and approved by the authority having jurisdiction.

### Design

**Design Approval.** Where required by the authority having jurisdiction, structures using Epitome Foundation Wall Panels shall be designed by a registered design professional. Construction documents, including engineering calculations and drawings providing floor plans, window details, door details and connector details, shall be submitted to the code official when application is made for permit. The individual preparing such documents shall possess the necessary qualifications as required by the applicable code and the professional registration laws of the state where the construction is undertaken. Approved construction documents shall be available at all times on the jobsite during installation.

**Design Loads.** Design loads to be resisted by the Epitome Foundation Wall Panels shall be as required under the applicable building code. Loads on the panels shall not exceed the loads noted on page 18.

**Allowable Loads.** Allowable transverse and axial loads are provided in Tables 6 through 8. Calculations demonstrating that the loads applied are less than the allowable loads shall be submitted to the code official for approval. For loading conditions not specifically addressed herein, structural members designed in accordance with accepted engineering practice shall be provided to meet applicable code requirements.

**Concentrated Loads.** Axial loads shall be applied to the SIP through continuous members such as a structural insulated roof or floor panels or repetitive members such as joists, trusses or rafters spaced at regular intervals of 24" on center or less. Such members shall be fastened to a rim board or similar member to distribute the load to the Epitome Foundation Wall Panels. For other loading conditions, reinforcement shall be provided. This reinforcement shall be designed in accordance with accepted engineering practice.

**Eccentric and Side Loads.** Axial loads shall be applied concentrically to the top of the Epitome Foundation Wall Panels. Loads shall not be applied eccentrically or through framing attached to one side of the panel (such as balloon framing) except where additional engineering documentation is provided.

### Installation

**Cutting and Notching.** No field cutting or routing of the panels shall be permitted except as shown on approved drawings.

**Below Grade Use.** Epitome Foundation Wall Panels are permitted to be used below grade provided the exterior facing is continuous and any joints or penetrations are protected, refer to this document and the manufacturer's installation instructions.

**Heat-Producing Fixtures.** Heat-producing fixtures shall not be installed in the panels unless protected by a method approved by the code official or documented in test reports. This limitation shall not be interpreted to prohibit heat-producing elements with suitable protection.

### Openings and Holes

**Openings in Core.** Openings in the core may be placed in the panels during fabrication at predetermined locations only. Openings in the core are only permitted when designed in accordance with the Openings section.

**Holes in Panels.** Holes may be placed in the panels during fabrication at predetermined locations only. Holes- are only permitted when designed in accordance with the Openings section.

### Openings

**General.** Openings in panels shall be reinforced with wood or steel designed in accordance with accepted engineering practice to resist all loads applied to the opening as required by the adopted code. Details for door and window openings shall be provided to clarify the manner of supporting transverse, axial and/or in-plane shear loads at openings. Such details shall be shown on approved design documents and subject to approval by the local authority having jurisdiction.

**Exterior Use.** When the product serves as the water-resistant exterior wall envelope, window openings are permitted when installed in accordance with the manufacturer's installation instructions or as determined by a design professional.

**Combined Loads.** Panels subjected to any combination of transverse, axial or in-plane shear loads shall be analyzed utilizing a straight line interaction.



## Conditions of Use

### **Panel Cladding**

**Exterior Wall Covering.** Epitome Foundation Wall Panels may serve as a water-resistive barrier, as required in IBC Section 1403.2, when installed in accordance with this document. The exterior facing shall be covered with weather protection as required by the adopted building code or other approved materials.

**Interior Finish.** Epitome Foundation Wall Panels are a class A finish exempt from the thermal barrier requirements of IBC Section 2603.4 and may be directly finished without the use of 1/2" gypsum over the interior facing.

### **Panel Installation Requirements**

**CPS Installation Certificate must be obtained in order to install Epitome Panels or a Certified Epitome contractor must be on-site during installation**



### **Installation, Connection, Framing and Backfilling Checklist**

Revised 12/17/14

An Epitome Foundation is set on a traditional footing and includes a traditional double top plate on which the floor system is fastened. The following outline provides information for proper wall installation, connection and Blocking prior to backfilling.

#### **See Installation Guide Details and Drawings**

#### **Tasks of Epitome Foundation Walls Supplier / Installer**

##### **● Install Epitome Foundation Walls**

- ☐ Snap chalk lines on footings for proper positioning
- ☐ Set Epitome Foundation Walls onto footings
- ☐ Fasten Epitome Foundation Walls temporarily to footings
- ☐ Connect Epitome Foundation Walls together
- ☐ Connect double lapping top plates
- ☐ Inspect for square and plumb
- ☐ Reinforce frost wall and root cellar wall connection with threaded rods, nuts and washers
- ☐ Ensure all connectors are completely fastened and sealed

##### **● Waterproof Epitome Foundation Walls**

- ☐ Apply waterproofing membrane to footer / wall interface
- ☐ Apply waterproofing membrane to exterior of wall connections where below grade
- ☐ Apply sealant to wall connections where above grade

##### **● Provide Installation Guide with Checklist to Builder**

- ☐ Ensure CPS responsibilities are completed and checked off
- ☐ Review and discuss Builder Tasks in detail, provide any required additional instructions
- ☐ Sign and date
- ☐ Keep one copy for file and provide one to Builder





**Tasks of General Contractor (See Installation Guide for Details and Drawings)**

Excavation and installation of level footings absent any significant humps or dips (+/- 1/8")

NOTE: The framing / decking connection at the top of the Epitome Foundation and the floor slab at the bottom of the Epitome Foundation MUST be completed prior to backfilling!

- ☐ Install proper drainage system
- ☐ Install floor diaphragm prior to pouring concrete slab
- ☐ Pour concrete slab to lock in bottom of Epitome Foundation
  - ☐ Blocking in floor diaphragm
    - ☐ Truss Parallel to Wall
      - ☐ Install solid blocking at 24" OC in first bay
      - ☐ Install flat blocking at 24" OC in second bay providing space for HVAC
      - ☐ Install solid blocking at 48" OC in third bay
      - ☐ Install flat blocking at 48" OC in fourth bay providing space for HVAC
      - ☐ Install solid blocking at 48" OC in fifth bay
      - \*must end with solid blocking
    - ☐ Truss Perpendicular to Wall
      - ☐ Connect every Floor Joist to Sill Plate
      - ☐ #14 torx screws from bottom up for dimension lumber and floor trusses
      - ☐ Attach I joist prescriptively
- ☐ Connection of Epitome Foundation Wall to garage slab and any concrete frost walls
  - ☐ Install threaded rod thru Epitome Foundation Wall into void where concrete will be poured to make connection. Secure with nuts and washers. Apply silicone for sealing out moisture.
- ☐ Brace Stairwells prior to backfilling
  - ☐ Follow stairwell header procedure or alternate tiedown procedure
  - ☐ Additional, removable bracing is also recommended until backfilling is complete
- ☐ Spread out any point loads
  - ☐ Apply additional LVL to SPF top plate to spread out any point loads, where required
- ☐ Headers
  - ☐ Install headers in floor system above fenestrations within Epitome Panels
- ☐ Backfilling and final grade
  - ☐ Do not run heavy machinery parallel to or in close proximity to the foundation.
  - ☐ Heavy equipment should be operated at 45 degree angle to the building. Slope the final soil grade a minimum of 6" fall within the first 10' to divert groundwater away from foundation.
  - ☐ In the case of frost wall, fill both sides simultaneously.

**NOTE: Drawings available upon request.**

CPS \_\_\_\_\_ DATE \_\_\_\_\_ Builder \_\_\_\_\_ Date \_\_\_\_\_