

Builder Guideline Booklet™



Superior Walls®
BUILD ON A SUPERIOR FOUNDATION™



For a copy of the Canadian Version of the Builder Guideline Booklet, click here:

<https://www.superiorwalls.com/api/getFile/18>

Introduction

We have written this Builder Guideline Booklet to assist you in successfully using Superior Walls products on your project. At Superior Walls we believe that our products and the structures they support need to last for generations. In order for that to happen you must give thoughtful consideration to the details of your wall system and utilize the guidelines provided in this booklet. Additional copies of this booklet are available for download at www.superiorwalls.com.

Proper site preparation and framing connection details are of particular importance. You will note that we have provided excerpts from the *2021 International Residential Code® for One- and Two- Family Dwellings* (often referred to as the “IRC”). These excerpts are included to aid in your understanding of the details or application being discussed in the various sections of this book. Please be aware that your municipality may have other requirements beyond those in the model code.

For additional information or for help with site-specific conditions and details, please consult your design professional or contact your local Superior Walls representative (find your Authorized Dealer on our website, www.superiorwalls.com). Additional technical information may be found in the Documents Center section of our website (www.superiorwalls.com), including the ICC-ES evaluation report on our Xi products, ESR-1662, which contains technical product specifications. CAD details may be downloaded by design professionals at www.superiorwalls.com. Suggestions for improvement may be submitted using our form located at: <https://www.superiorwalls.com/api/getFile/471>.

Be Safe!

Superior Walls of America urges you to maintain a safe working environment. The protection of the health and safety of everyone on your jobsite needs to be your primary concern.

Construction work can be particularly hazardous and involve many potential areas of concern. Personal protective equipment and other precautions are essential for a safe construction work environment.

We encourage you to:

- Work to *prevent* accidents and injuries
- Understand and obey requirements of environmental and occupational health and safety laws and regulations
- Increase safety awareness
- Establish safety responsibilities for your employees and subcontractors

PLEASE NOTE: Certain products may not be available in all market areas. Please contact your local Superior Walls representative to find out specifically which products and/or wall heights are available in your market area. **Projects with wall panels over 10 feet in height require additional consideration beyond what is described in this booklet and should be reviewed by a person competent in applying the structural design principles involved.**

WARRANTY NOTE: Superior Walls brand products are manufactured and installed by independently owned and operated factories licensed by Superior Walls of America, Ltd. Each of these independently operated factories (Licensees) provides a limited warranty on their Superior Walls products. The warranty covers defects in workmanship and materials as well as sidewall water penetration. Warranty terms may vary because of state and local regulations and the market strategies of individual licensees. Service under the warranty is solely the responsibility of the licensee. Ask for warranty details from your local Superior Walls representative or, if you already have Superior Walls products in your home, read your warranty for details specific to your locale.

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Builder / Owner Responsibilities

The builder / owner is responsible for the following items:

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1. Building Permits and Inspections | |
| 2. Soils Verification | Page 5, 6 |
| 3. Excavation | Page 7 |
| 4. Placement of Drain Pipe and Sump Pit | Page 8 |
| 5. Placement of Crushed Stone Footing | Page 9 |
| 6. Installation of Filter Membrane | Page 8 |
| 7. Cold Weather Practice | Page 9 |
| 8. Placement of Building Corner Pins and Establishing Grade | Page 10 |
| 9. Setback Requirements (Distance from road / property line) | Page 10 |
| 10. Site Accessibility for Trucks and Crane | Page 10 |
| 11. Installation of Sill Plate and Framing Attachments | Page 24 |
| 12. Shear Wall Determination | Page 36 |
| 13. Completion of the Framing / Decking connection at the top of the Superior Walls panel and the Floor Slab at the bottom of the Superior Walls panel prior to backfilling | Page 40 |
| 14. Grading of Soil and Installation of Functioning Gutters and Downspouts | Page 40 |

In order for your Superior Walls supplier to install a product that fully meets the design and performance requirements of your project, you must provide the following information:

- Soil type or bearing capacity
- All building floor plans and elevations
- Design load per linear foot on the foundation
- Beam and column locations, sizes and point loads
- Additional point loads and locations, if any
- Any uplift and/or hold-down requirements

- Location of Shear Wall(s), if required
- Window and door locations and rough opening sizes and opening style
- Egress requirements (Emergency Escape and Rescue Openings)
- Locations and sizes of support ledges (brickledge, slab supports, etc.)
- Interior stairway locations and opening sizes

- Inside fill conditions (as with garage, porch or crawlspace frost walls)
- Exterior basement entry system specifications
- Chimney details
- Backfill conditions (rough grading plans)
- Top-of-wall benchmark reference / Finished grade elevation

How the Crushed Stone Footing Works

The physics of the crushed stone footing:

1. The purpose of any wall footing is to distribute the wall's load over a sufficient area of soil so that the weight-bearing capacity of the soil is not exceeded.
2. The load of the building is carried by the Superior Walls panel and is transferred to the 1/2" clean crushed stone.
3. The load distribution path through the crushed stone is at an angle approximately 60 degrees from the horizontal.
4. As the depth of the crushed stone layer increases, the effective bearing width on the underlying soil also increases. (See [Figure 1](#).)
5. The tables in this booklet identify the required depth of the crushed stone footing for various wall loads and soil bearing capacities.

Code Reference:
2021 IRC Section: R403.4

R403.4 Footings for precast concrete foundations. Footings for precast concrete foundations shall comply with Section R403.4. (See Section R403.4.1 Crushed stone footings.)

Crushed Stone Footing / Effective Bearing Width Chart	
Crushed Stone Footing Depth (inches)	Effective Bearing Width (inches)
4	14-7/8
5	16
6	17-3/16
7	18-5/16
8	19-1/2
9	20-5/8
10	21-13/16
11	22-15/16
12	24-1/8
13	25-1/4
14	26-7/16
15	27-9/16
16	28-3/4
17	29-7/8
18	31-1/16
19	32-3/16
20	33-3/8
21	34-1/2
22	35-5/8

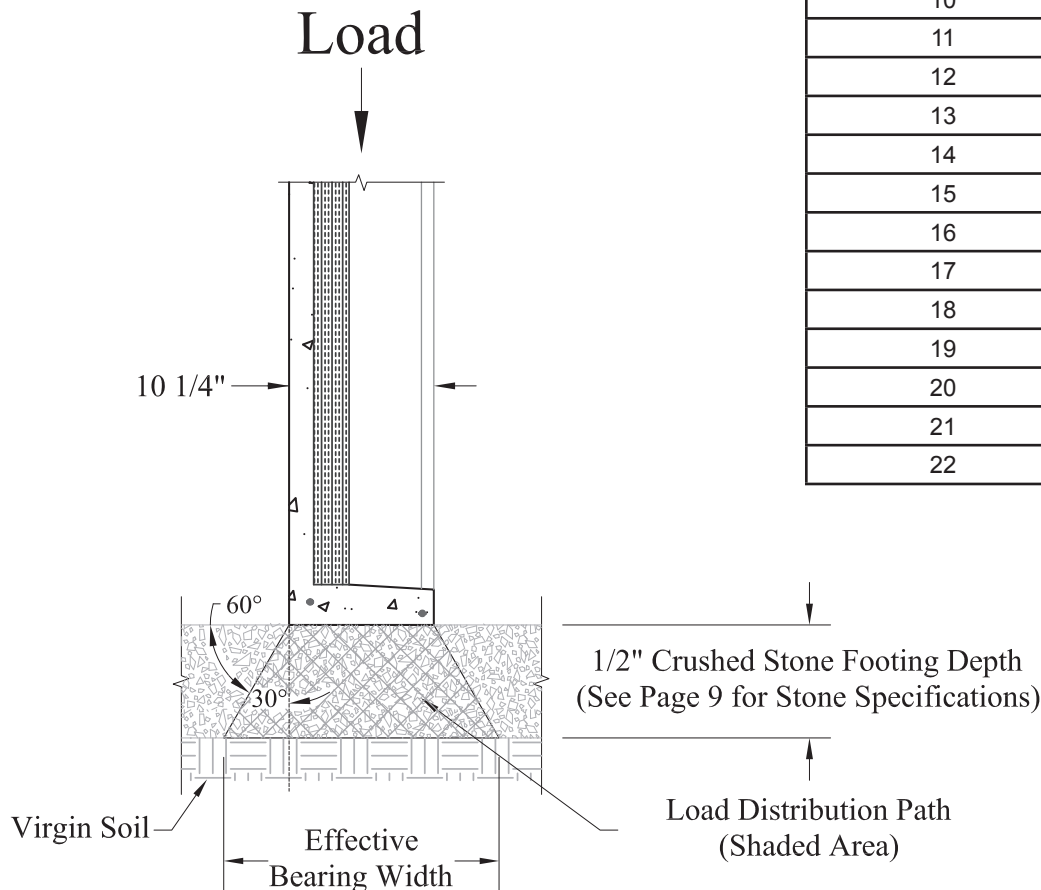


Figure 1

Site Preparation

Soils Verification

- Determine your soil type from Table 1 on this page and stone depth requirements from Table 2 on page 6. Superior Walls panels may be used on virtually any type of soil that has a bearing capacity of 1,500 PSF or better. For assistance identifying your soil type consult with:
 - Building Department
 - County Agricultural Extension Service
 - County Conservation District Officer
 - Soils Technician
 - Web Soil Survey website (<http://websoilsurvey.nrcs.usda.gov>)
 - Excavator
- Determine allowable Load-Bearing Pressure and Drainage Characteristics. (See Table 1.) This will affect the required depth of the 1/2" clean crushed stone footing.
- Establish combined footing load per linear foot. (Consider dead load, live load, snow and wind load.) Acquire loading information from building designer or engineer.
- Determine required depth of the 1/2" clean crushed stone footing. (From Table 2. Remember to allow for this depth when determining excavation depth.)

Table 1 Properties of Soils Classified According to the Unified Soil Classification System Table reference: 2021 IRC Table R405.1							
Soil Group	Unified Soil Classification System		Soil Description	Drainage Characteristics (a)	Frost Heave Potential	Volume Change Potential Expansion (b)	Presumptive Load-Bearing Pressure (PSF) (d)
	Soil Classes	Lateral Soil Load (PCF) (f)					
Group I Excellent	GW	30	Well graded gravel, gravel-sand mixtures, little or no fines	Good	Low	Low	3000
	GP	30	Poorly graded gravels or gravel sand mixtures, little or no fines	Good	Low	Low	3000
	SW	30	Well-graded sands, gravelly sands, little or no fines	Good	Low	Low	2000
	SP	30	Poorly graded sands or gravelly sands, little or no fines	Good	Low	Low	2000
	GM	45	Silty gravels, gravel-sand-silt mixtures	Good	Medium	Low	2000
	SM	45	Silty sand, sand-silt mixtures	Good	Medium	Low	2000
Group II Fair to Good	GC	45	Clayey gravels, gravel-sand-clay mixtures	Medium	Medium	Low	2000
	SC	60	Clayey sands, sand-clay mixture	Medium	Medium	Low	2000
	ML	45	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	Medium	High	Low	1500(c)
	CL	60	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	Medium	Medium	Medium to Low	1500(c)
Group III Poor (e)	CH	(e)	Inorganic clays of high plasticity, fat clays	Poor	Medium	High	1500(c)
	MH	(e)	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	Poor	High	High	1500(c)
Group IV Unsatisfactory (e)	OL	(e)	Organic silts and organic silty clays of low plasticity	Poor	Medium	Medium	By Test
	OH	(e)	Organic clays of medium to high plasticity, organic silts.	Unsatisfactory	Medium	High	By Test
	PT	(e)	Peat and other highly organic soils	Unsatisfactory	Medium	High	By Test

- (a) The percolation rate for good drainage is over 4 inches per hour, medium drainage is 2 inches to 4 inches per hour, and poor is less than 2 inches per hour.
- (b) Soils with a low potential expansion typically have a plasticity index (PI) of 0 to 15, soils with a medium potential expansion have a PI of 10 to 35 and soils with a high potential expansion have a PI greater than 20.
- (c) 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. 2021 IRC Table R401.4.1.
- (d) Presumptive Load-Bearing Values of Foundation Materials data from 2021 IRC Table R401.4.1.
- (e) CH, MH, OL, OH, and PT are unsuitable as backfill material.
- (f) Lateral soil load (PCF) from 2021 IRC tables in section R404.1.

Table 2
Minimum Depth of 1/2" Clean Crushed Stone Footing (Inches)

Construction Type		Soil Type & Load Bearing Capacity (PSF)					
Number of Stories	(Assumed Uniform Wall Load) ^(f)	1500	2000	2500	3000	3500	4000
		MH, CH, CL, ML	SC, GC, SM, GM, SP, SW		GP, GW		
Conventional light-frame construction							
1 – Story	(1100 pounds per linear foot) ^(e)	4"	4"	4"	4"	4"	4"
2 – Story	(1800 pounds per linear foot) ^(e)	7"	4"	4"	4"	4"	4"
3 – Story	(2900 pounds per linear foot) ^(e)	14" (a)	9" (a)	5"	4"	4"	4"
Masonry veneer over light-frame construction							
1 – Story	(1500 pounds per linear foot) ^(e)	5"	4"	4"	4"	4"	4"
2 – Story	(2700 pounds per linear foot) ^(e)	13" (a)	8"	4"	4"	4"	4"
3 – Story	(4000 pounds per linear foot) ^(e)	22" (a)	14" (a)	10" (a)	7"	5"	4"

(a) Crushed stone must be consolidated in 8" lifts with a plate vibrator.
 (b) Table allows for 378 pounds per linear foot for self weight of 10' Xi Plus foundation wall and 10-1/4 in. wall width.
 (c) See Page 9 for Stone Specifications.
 (d) Consult your Superior Walls drawing for the required depth of the crushed stone footing for your project.
 (e) Assumed Wall Loading (pounds per linear foot) per 2021 IRC Table R403.4.
 (f) The Assumed Uniform Wall Load shown in pounds per linear foot (plf) is the assumed load of the structure that is supported by the foundation wall and does not include the weight of foundation wall.

Typical Crushed Stone Footing Detail

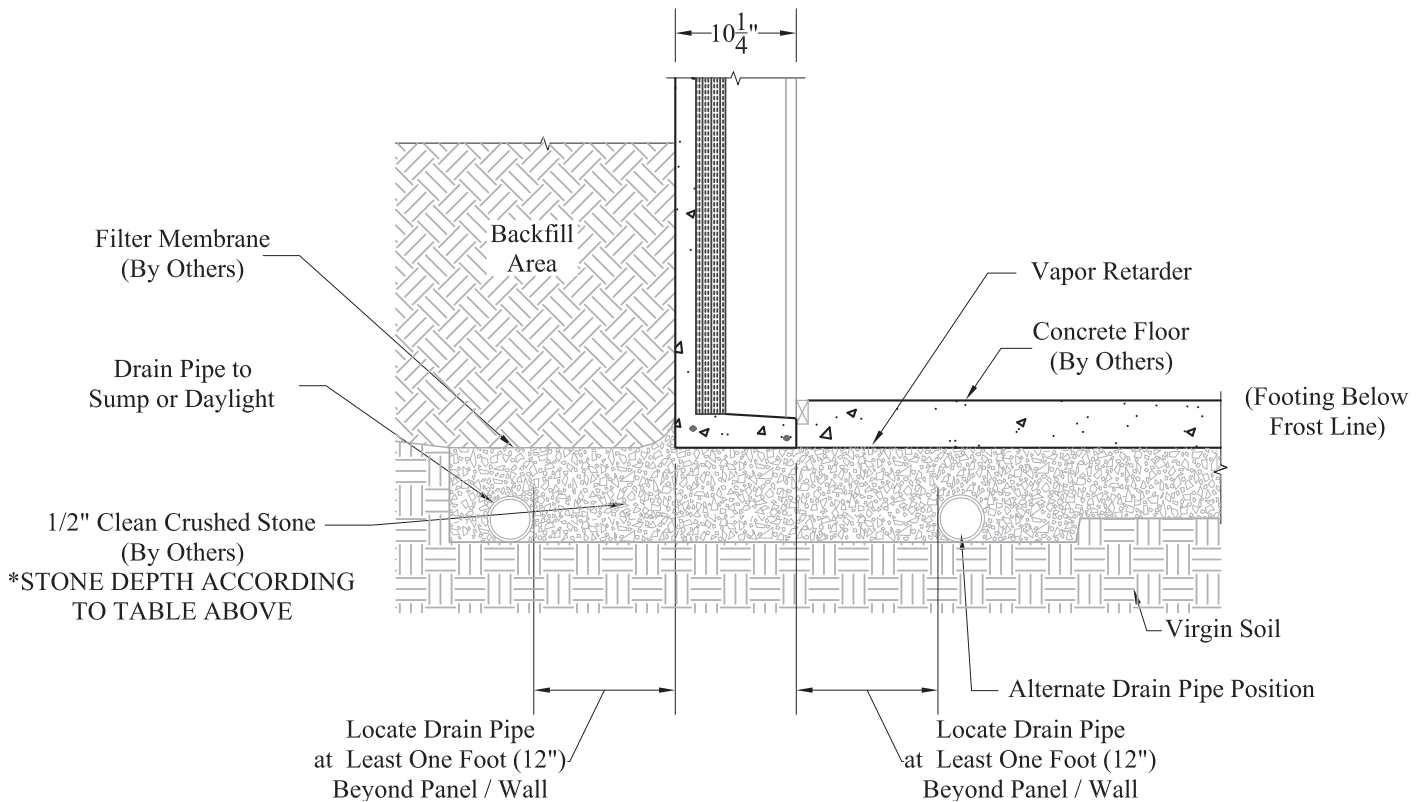


Figure 2

Excavation

- Confirm that you are working from the approved drawing prior to digging.
- See [Figure 3](#), below, for the typical basement excavation detail with full backfill.
- Allow a 2'-0" overdig at base of excavation.
- Ensure compliance with OSHA regulations.
- Slope grade away from foundation walls to fall a minimum of 6" within the first 10'-0" to divert ground water away from the foundation.
- Remember to dig hole(s) for sump pit(s) (if applicable).

NOTE: When using an Excavator who is not familiar with Superior Walls, provide them with a copy of the Builder Guideline Booklet or copies of the pages related to excavation including the Excavator's Checklist found in Appendix C.

Code Reference:
2021 IRC Section: R401.3

R401.3 Drainage. Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection so as to not create a hazard. Lots shall be graded so as to drain surface water away from foundation walls. The grade away from foundation walls shall fall a minimum of 6 inches (152 mm) within the first 10 feet (3048 mm).

Code Reference:
2021 IRC Section: R404.1.6

R404.1.6 Height above finished grade. Concrete and masonry foundation walls shall extend above the finished grade adjacent to the foundation at all points not less than 4 inches (102 mm) where masonry veneer is used and not less than 6 inches (152 mm) elsewhere.

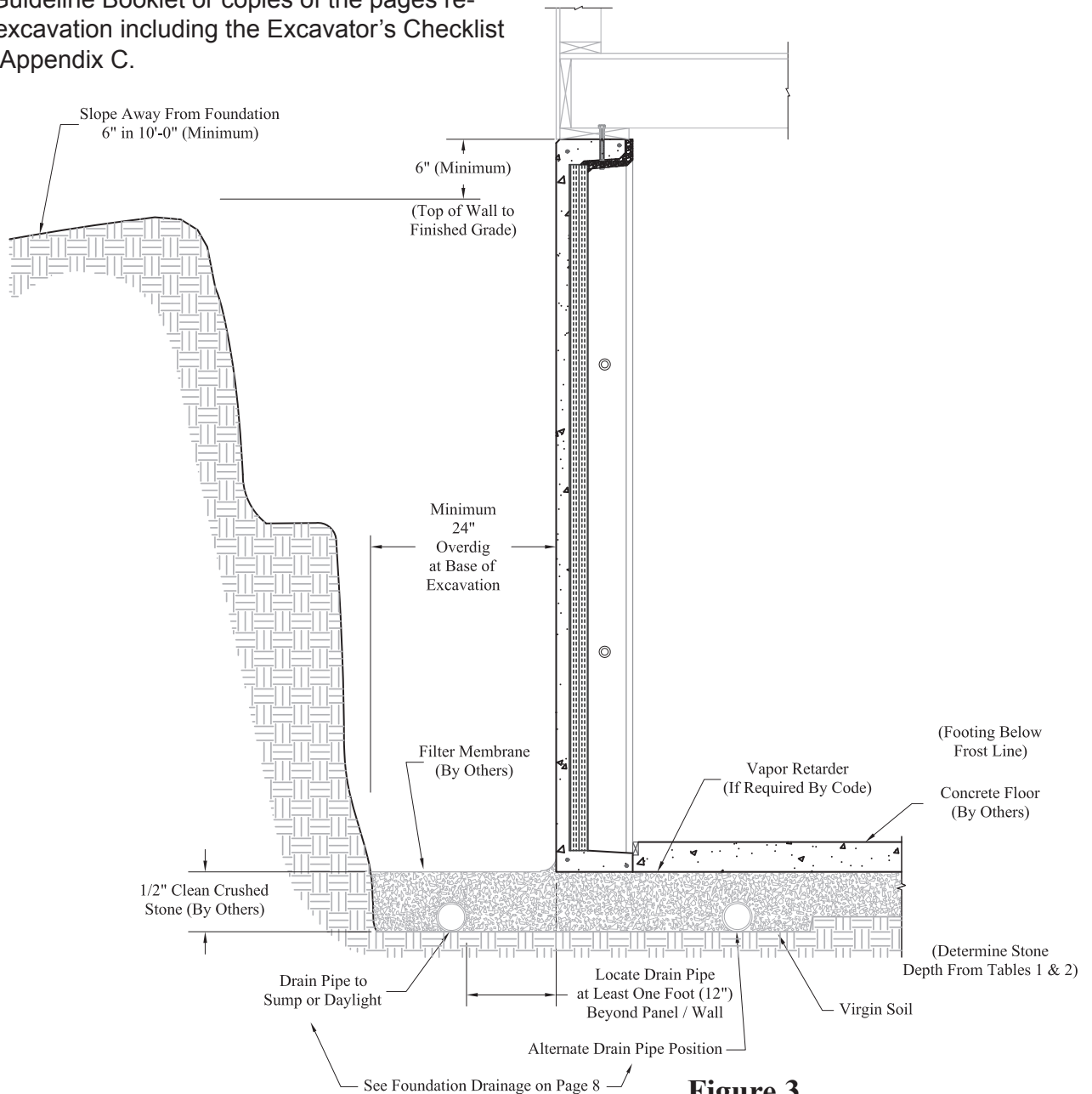


Figure 3

Foundation Drainage

Install perforated drain pipe.

- Use a 4" (min. dia.) perforated drainage pipe and locate on either the interior or exterior side of the panel / wall.
- Install pipe below the base of the panel / wall in the crushed stone.
- Locate pipe at least one foot (12") beyond the nearest edge of the panel / wall.
 - One foot (12") dimension applies to both interior or exterior pipe location. (See [Figure 2](#).)
 - When the Minimum Depth of the 1/2" Clean Crushed Stone Footing is greater than 20", the pipe must be located at a greater distance than one foot (12") to ensure that the pipe is not located within the Crushed Stone Footing "Load Distribution Path". (See [Figure 1](#).)

Install Sump Pit / Daylight Drain.

- Direct pipe to sump or daylight drain. (A second sump pit, a second drain pipe, and/or a second outlet to daylight should be considered for large foundations, for areas where you expect a high water table, or for a backup drainage option.)
 - Sump Pump, supplied by others, must be checked regularly to ensure proper working order.
 - When daylight drains are used, install a backwater valve to prevent the backflow of moist air into the stone footing area. This will reduce the likelihood of excessive interior humidity. (Backwater valves must be installed to ensure access for inspection or maintenance, according to manufacturer specifications/recommendations.)

Install filter membrane.

- Install an *approved* filter membrane over the crushed stone footing area on the exterior of the panel / wall prior to back-filling (even if pipe is located on the interior side of the panel / wall) to reduce the likelihood of the stone becoming clogged with the backfill material and not draining properly. In lieu of covering the crushed stone footing with an *approved* filter membrane, a perforated pipe with a filter sock may be used in areas where the soil type drains extremely well, such as gravelly sand type soils.
- "Approved" in this case is defined in the 2021 IRC as "acceptable to the building official."

NOTE: The above requirements are for precast concrete walls that retain earth and enclose habitable or usable space located below-grade that rest on crushed stone footings. Perimeter drain (perforated drain pipe) is not required on frost wall applications that are below the frost line.

Code Reference:
2021 IRC Section: R405.1.1

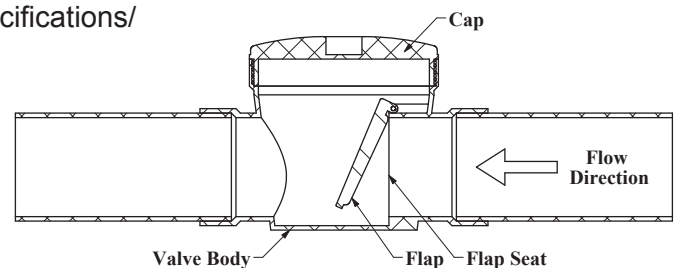
R405.1.1 Precast concrete foundation.
Precast concrete walls that retain earth and enclose habitable or usable space located below-grade that rest on crushed stone footings shall have a perforated drainage pipe installed below the base of the wall on either the interior or exterior side of the wall, at least one foot (305 mm) beyond the edge of the wall. If the exterior drainage pipe is used, an *approved* filter membrane material shall cover the pipe. The drainage system shall discharge into an *approved* sewer system or to daylight.

Superior Walls Interpretation:

If the filter membrane covers the crushed stone footing and if the perforated drain pipe is covered by the crushed stone footing, then the filter membrane has covered the pipe.

Gutter/Downspout Note:

Provide functioning rain gutters, downspouts, and run-outs. **Downspouts must NOT be run to the foundation drain.**



Example of a Backwater Valve

Crushed Stone Footings

Place the crushed stone footing.

- Depth of stone as determined on page 5 and Table 2 on page 6.
- Superior Walls panels are designed to be supported on clean crushed stone, or other properly designed footings. Clean crushed stone shall be free from organic, clayey or silty soils. Crushed stone shall be angular in nature and meet ASTM C33, with the maximum size stone not to exceed 1/2 inch. The crushed stone shall have a 1/2 inch nominal or smaller stone size.
- Place the crushed stone footing on virgin / undisturbed soil.
- If crushed stone footing is deeper than 8", place stone in 8" lifts and consolidate each lift with a plate vibrator.
- Evenly grade the stone to within +/- 1 inch of level.
- Be sure to have enough material on hand for use in final grading by the Superior Walls Certified Installation crew.
- See Figure 2 on page 6.

NOTE: Other materials may be used under the floor slab, adjacent to the clean crushed stone footing and the "Load Distribution Path" (Figure 1 on page 4). When using other code-approved stone sizes under the slab, the transition from the clean crushed 1/2" stone shall occur 24" from the interior edge of the panel / wall. The perforated drain pipe must be located in the clean crushed 1/2" stone footing.

Code Reference:
2021 IRC Section: R402.3

R402.3 Precast concrete. Precast concrete foundations shall be designed in accordance with Section R404.5 and shall be installed in accordance with the provisions of this code and the manufacturer's installation instructions.

Code Reference:
2021 IRC Section: R403.1

R403.1 General. All exterior walls shall be supported on continuous solid or fully grouted masonry or concrete footings, crushed stone footings, wood foundations, or other *approved* structural systems which shall be of sufficient design to accommodate all loads according to Section R301 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.

Code Reference:
2021 IRC Section: R403.4.1

R403.4.1 Crushed stone footings. Clean crushed stone shall be free from organic, clayey or silty soils. Crushed stone shall be angular in nature and meet ASTM C 33, with the maximum size stone not to exceed 1/2 inch (12.7 mm) and the minimum stone size not to be smaller than 1/16-inch (1.6 mm). Crushed stone footings for precast foundations shall be installed in accordance with Figure R403.4(1) and Table R403.4. Crushed stone footings shall be consolidated using a vibratory plate in a maximum of 8-inch lifts. Crushed stone footings shall be limited to Seismic Design Categories A, B and C.

Cold Weather Practice / Crushed Stone Frost Protection

- Do not excavate the site too far in advance of the scheduled set date. Do not place footing on frozen soil.
- After the site has been excavated, insulate the area where walls are to be set and protect this area with a waterproof covering.
- Mixing calcium chloride into the stone footing and then covering it will help prevent frost infiltration. (Do not forget to treat the "extra" stone pile – you may need it to fill-in low spaces in the crushed stone footing.)
- 6 inches of straw has approximately the same "R" value as 3 1/2" of fiberglass insulation (see chart below).

Insulating Values of Common Building Insulation Materials	
Insulation Material	Approximate "R" Values
1" of Straw	2.0
1/2" of Plywood	0.6
1" of Fiberglass Batt	3.3
1" of Extruded Polystyrene	5.0
Insulated Blankets or Tarps	Per Blanket Manufacturer

NOTE: These recommendations are compiled from a variety of industry sources.

Corner Pin and Benchmark Placement

1. Establish a benchmark to identify your required top-of-wall elevation. It is critical to properly establish the foundations' elevation to allow for adequate final grading to accommodate code regulations. (Clearly communicate the elevation requirements to your excavator and Superior Walls supplier.)
2. Set pins that define the building corners.
 - Pins should represent the exterior face of the Superior Walls panels.
 - Verify setback requirements.

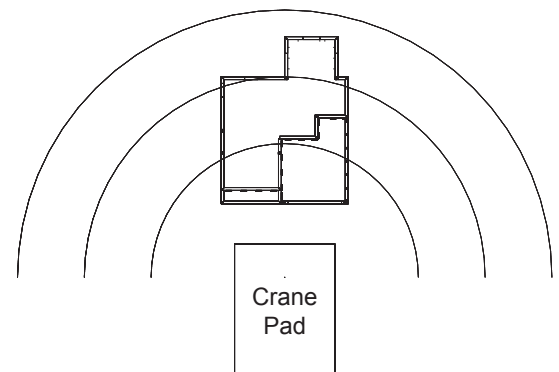
NOTE: Check with your Superior Walls supplier or sales representative for specific requirements. Verify that, at minimum, a 2 foot overdig, beyond the exterior face of where the wall panels will be installed, is provided.

Road Accessibility / Overhead Obstructions

- Consult with your Superior Walls supplier or sales representative concerning the specific details of your jobsite.
- The driveway must be wide enough to allow for trailer and crane access.
- The driveway surface and any culverts or bridges must be able to accommodate the weight of the vehicles.
- Walls are typically delivered on a drop deck trailer and have limited ground clearance.
- Verify that trees, wires and other overhead obstructions do not block site access.
- The Builder / Homeowner is responsible for any additional equipment or costs necessary to provide access to the work area.

Crane Accessibility

- Consult with your Superior Walls supplier or sales representative concerning the specific details of your jobsite.
- Access to the jobsite should be prepared so the crane can be positioned in a location that allows it to safely set each precast panel or as specified on the drawing.
- Prepare a level crane pad area with a solid base, free of overhead obstructions (trees, wires, etc.).
- A crane pad must be:
 - On virgin soil or compacted sufficiently to support the crane
 - Within 6 inches of level from corner to corner
- Provide a level area for the trailer to be parked near the crane.



Special Excavation Issues

Intersecting Walls

- When a wall such as a garage wall or crawl space wall intersects the basement wall and rests on a precast support ledge or knee wall, the overdig must not exceed 5'-0". (See [Figure 4.](#))
- See page 44 for support ledge details.

Overdig Procedure

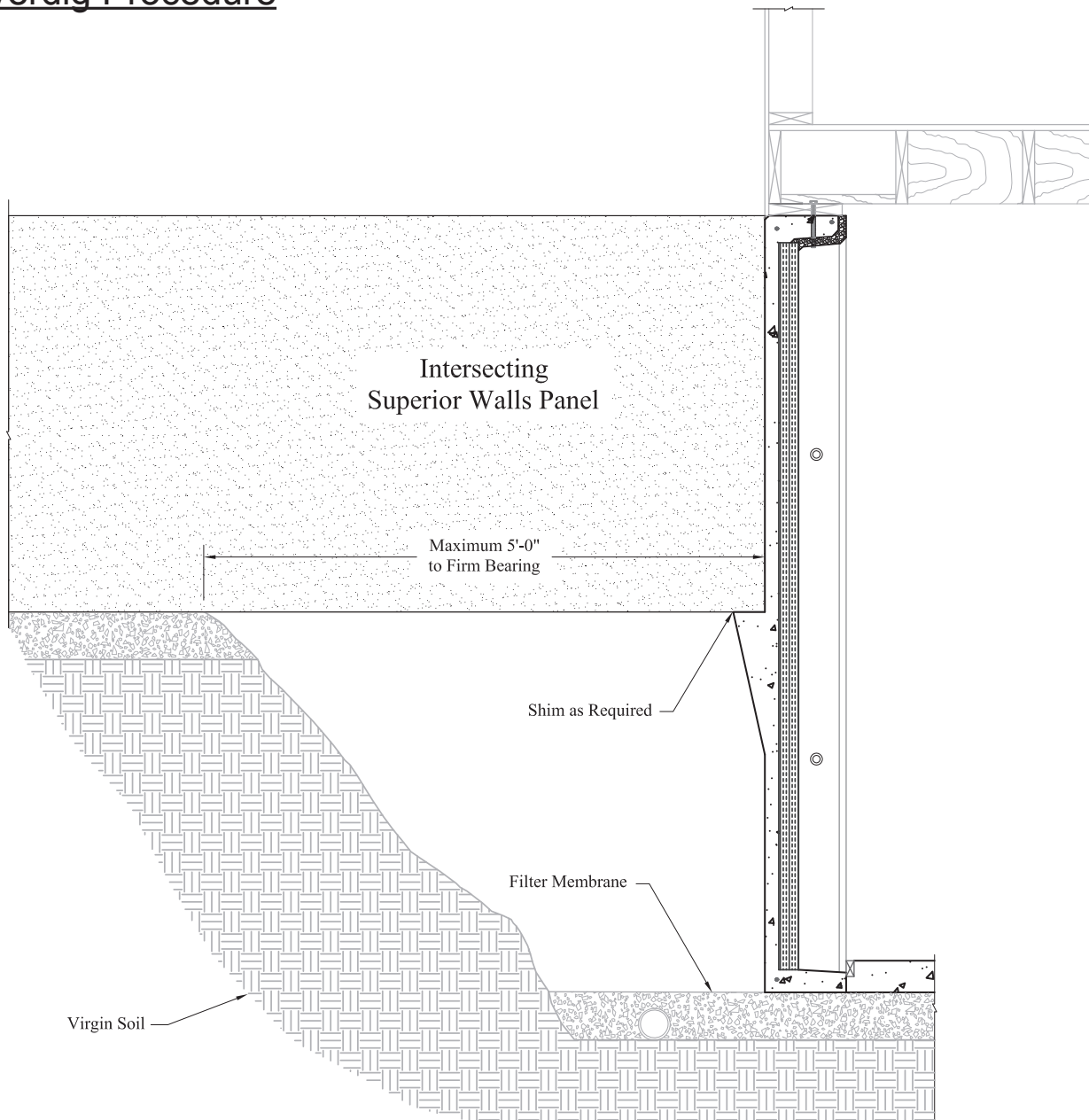


Figure 4

Intersecting Walls (cont.)

- When an overdig is more than 5'-0", an intermediate support column / wall is required unless project-specific engineering is provided. (See [Figure 5](#).)
- See page 44 for support ledge details.

Excessive Overdig Procedure

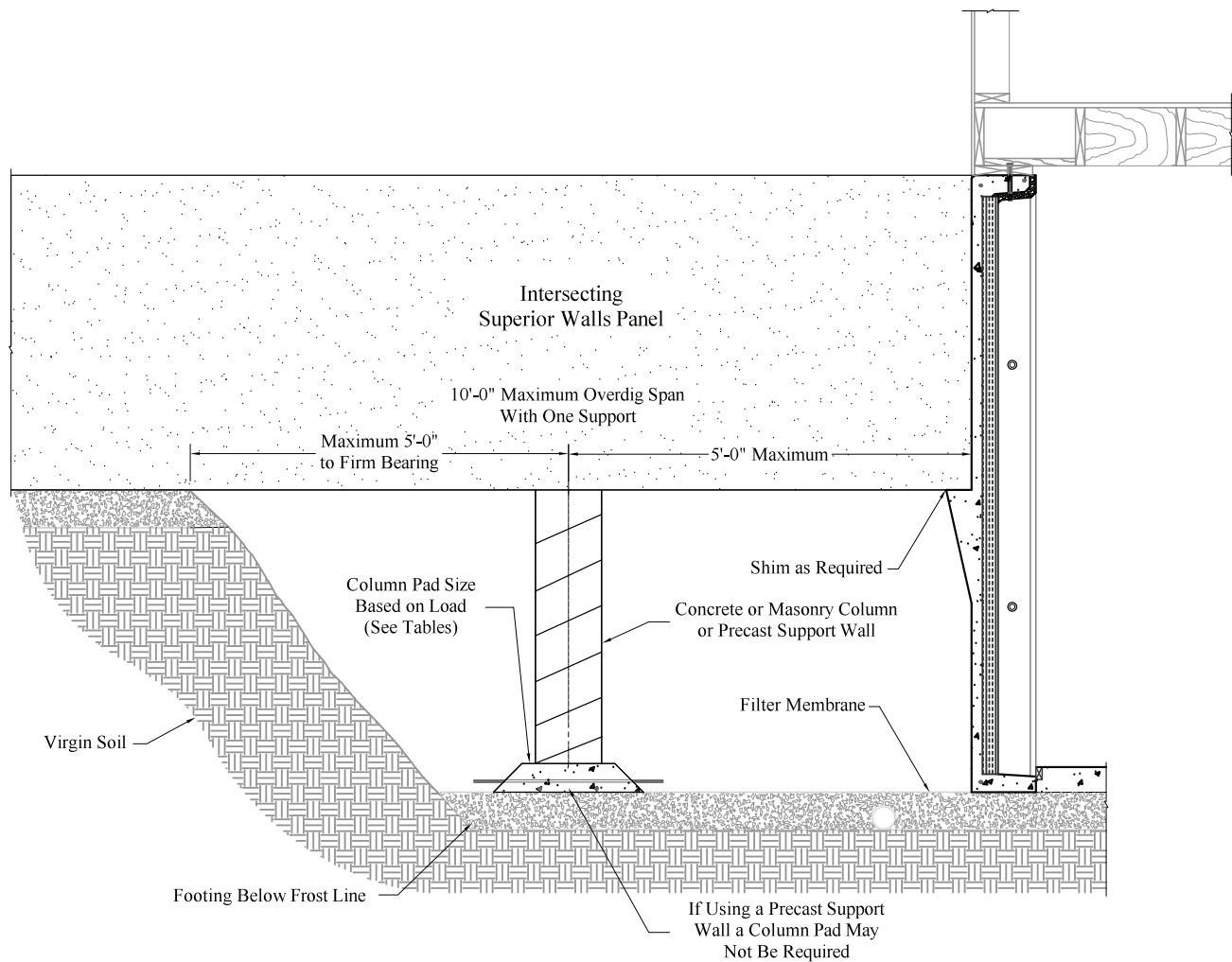


Figure 5

Trenching

- Trenches are typically used for Crawl Spaces, Frost Walls, Garages, and Porches.
- Dig trench to provide a width of 24" at base of excavation on both sides of wall. (When trench is 24" or less in depth, your local Superior Walls supplier may permit a narrower trench width. Contact your local Superior Walls representative for their requirements prior to excavation. When excavating, OSHA Standards always supersede any recommendations.)
- Trenches MUST be dug below frost line.
- Depth of crushed stone per [Table 2](#).
- Walls placed in trenches, as illustrated in [Figure 6](#), do not require a perforated drain pipe to be installed.

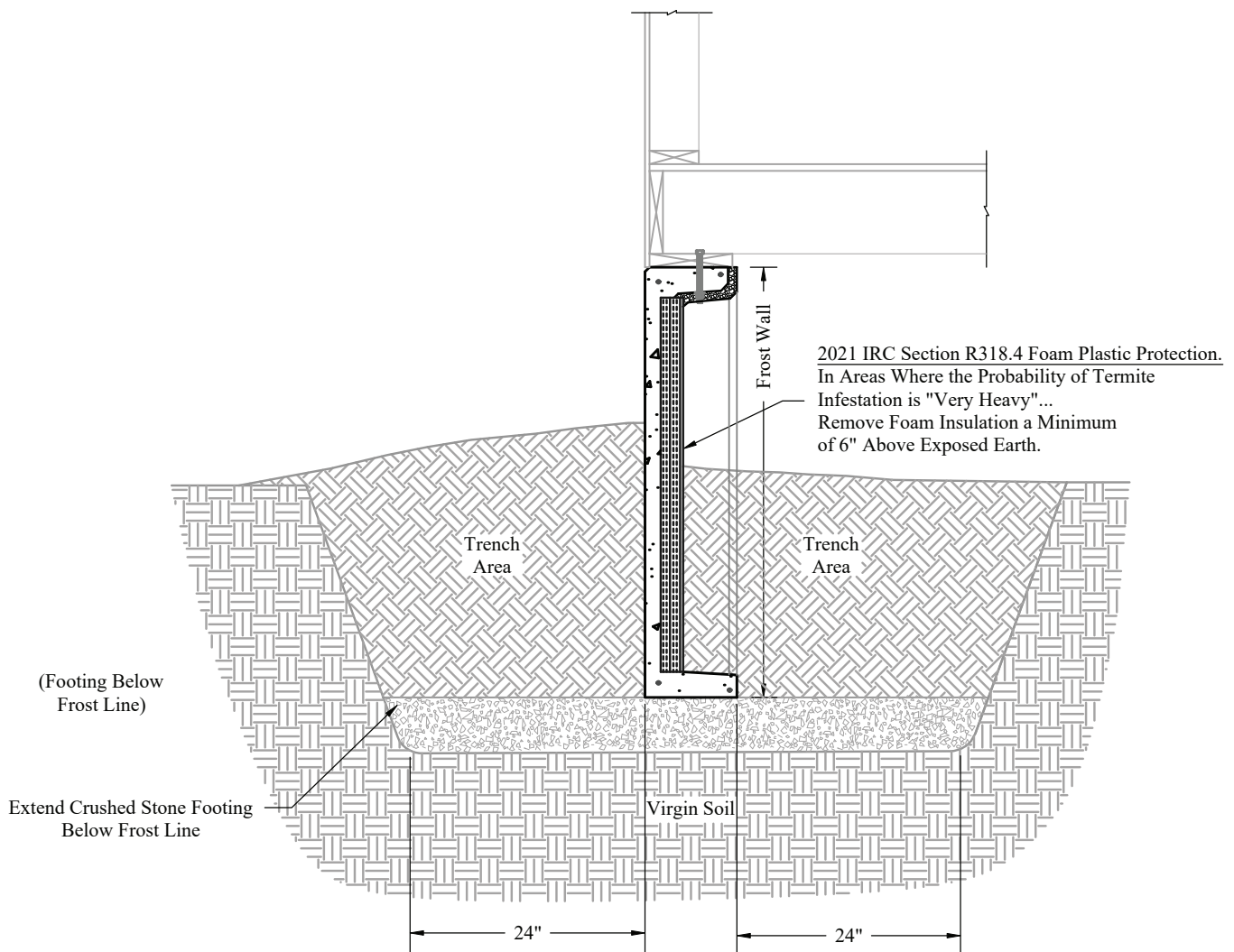


Figure 6

Daylight Basement / Above Grade Walls (Frost Areas)

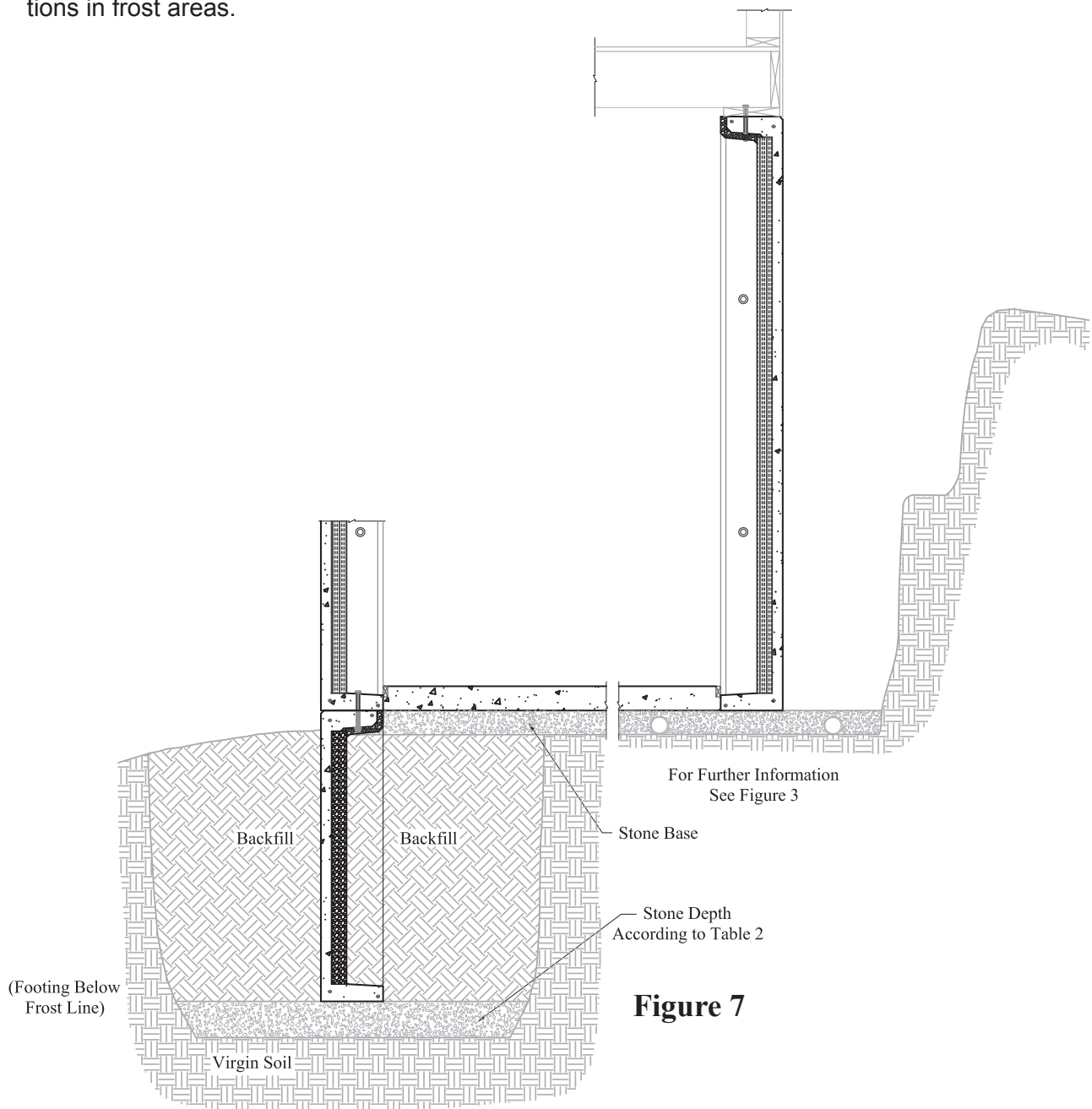
OPTION 1: Superior Walls Panels as Frost Walls

Projects using Superior Walls panels as frost walls should be detailed according to [Figure 7](#).

Additional requirements include:

- Place backfill carefully to avoid displacing frost walls.
- Bend slab connectors into concrete floor pour, if provided.
- Bolt upper and lower walls together with 1/2" x 7" bolts at a maximum of 48" on center.
- See trenching notes on page 13.
- A shear wall may be required in certain uneven backfill or open floor plan conditions. (See page 36.)

NOTE: Option 1 is the recommended method for Daylight Basement / Above Grade Wall applications in frost areas.



Daylight Basement / Above Grade Walls (Frost Areas)

OPTION 2: Crushed Stone Trench Footing

Projects using Crushed Stone Trench Footings should be detailed according to Figure 8.

NOTE: Option 1 is the recommended method for Daylight Basement / Above Grade Wall applications in frost areas.

Additional requirements include:

- Trench must be in virgin / undisturbed soil. (Bottom and both sides.)
- Width of trench is 36".
- Bottom of trench must extend below local frost depth.
- Provide an outlet (4" pipe) to daylight or to a sump pit with pump. (Do NOT place a continuous pipe in the trench due to the possibility of pipe crushing which could cause wall settlement.)
- Install a backwater valve on the outlet drain pipe to prevent the backflow of moist air into the stone footing area which will reduce the likelihood of excessive interior humidity. (See page 8.)
- Fill trench with 1/2" clean crushed stone, vibrating in 8" lifts with a plate vibrator.
- An "approved" filter membrane must be installed per code. (See page 8.)
- Bend slab connectors into concrete floor pour, if provided.
- Cover the exposed stones on the exterior of the wall with backfill or patio construction (to prevent air and water infiltration), properly sloped away from the wall.
- A shear wall may be required in certain uneven backfill or open floor plan conditions. (See page 36.)

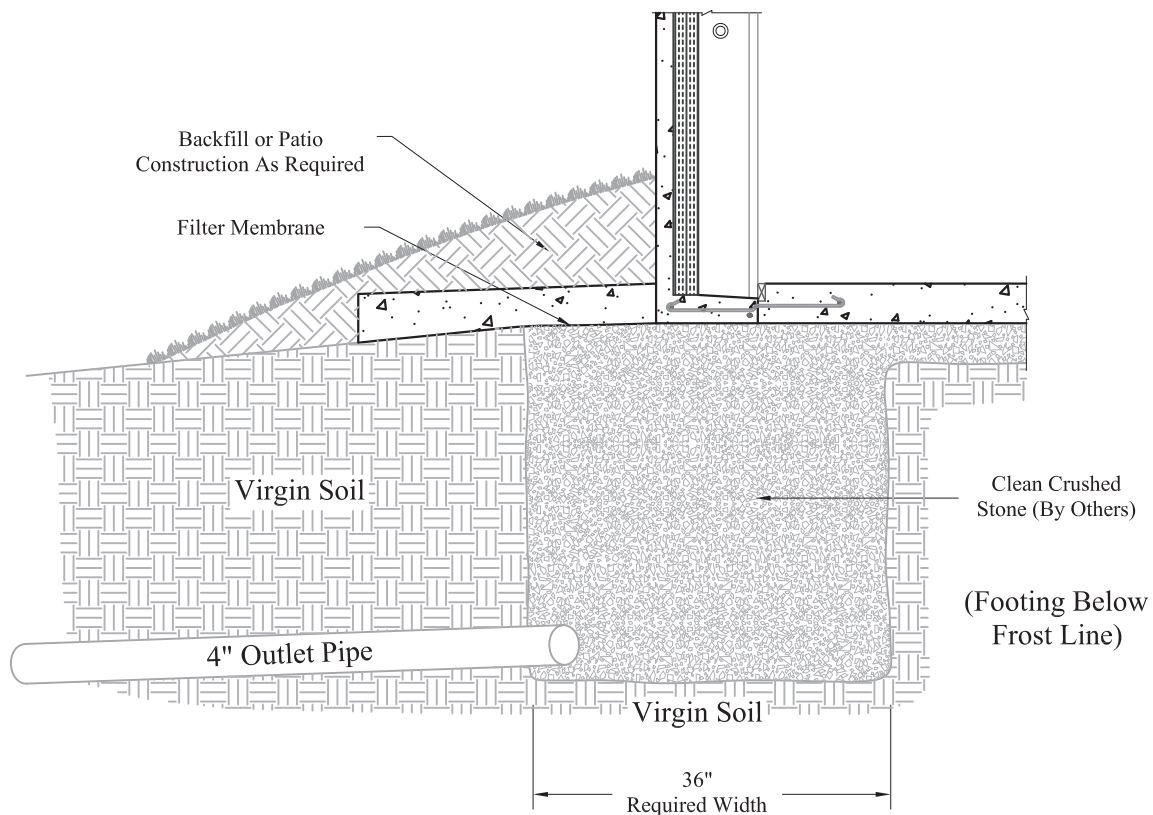


Figure 8

Daylight Basement / Above Grade Walls (Frost Areas)

OPTION 3: Fill-crete* Trench Footing

Projects using Fill-crete* Trench Footings should be detailed according to [Figure 9](#). Consult your code official for local acceptability prior to using this method.

NOTE: Option 1 is the recommended method for Daylight Basement / Above Grade Wall applications in frost areas.

Additional requirements include:

- Trench must be in virgin / undisturbed soil. (Bottom and both sides.)
- Minimum width of trench must comply with local building code requirements or Table R403.1.
- Bottom of trench must extend below local frost depth.
- Fill trench with Fill-crete (500 psi minimum compressive strength, air-entrained) to sub-grade elevation to allow for topping-off with the required depth of clean crushed stone.
- An “approved” filter membrane must be installed per code. (See page 8.)
- Bend slab connectors into concrete floor pour, if provided.
- Cover the exposed stones on the exterior of the wall with backfill or patio construction (to prevent air and water infiltration), properly sloped away from the wall.
- A shear wall may be required in certain uneven backfill or open floor plan conditions. (See page 36.)

* Note: Fill-crete is also known as:

- Flowable Mortar
- Flowable Fill
- Lean-mix backfill
- Controlled Low Strength Material (CLSM)
- Flow-crete

Consult your local concrete supplier for appropriate mix specifications.

Code Reference:
2021 IRC Table: R403.1 (1)-(3)

Tables R403.1 (1)-(3). See code for requirements.

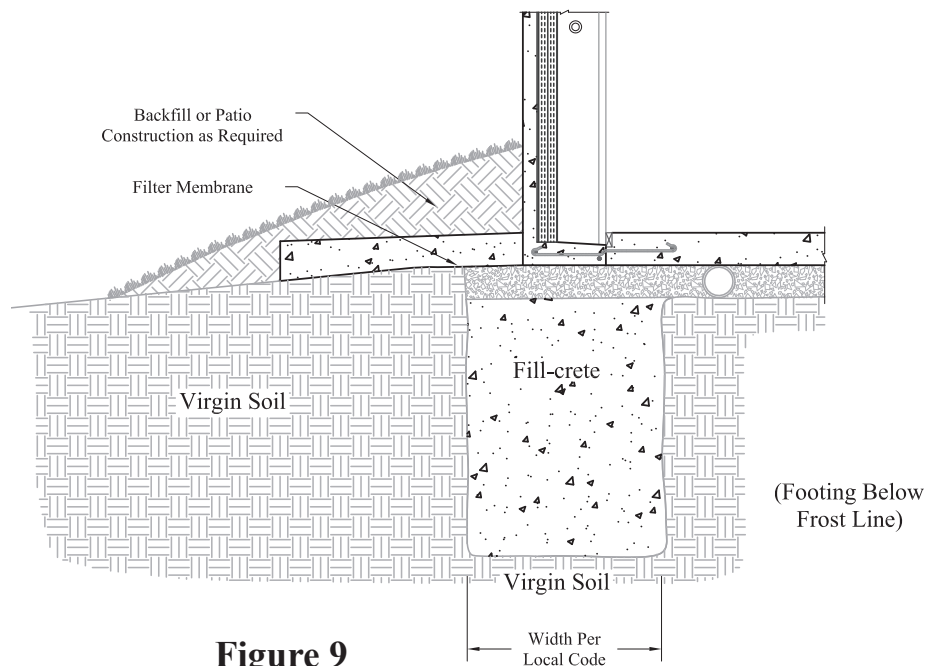


Figure 9

Daylight Basement (Non Frost / Shallow Frost Areas)

- Footing must be on virgin / undisturbed soil.
- Footing shall extend at least 12" below the undisturbed ground surface.
- Fill footing area with 1/2" clean crushed stone, vibrating in 8" lifts with a plate vibrator.
- Use a 4" (min. dia.) perforated drainage pipe and locate on either the interior or exterior side of the panel / wall. (See page 8.)
- Direct pipe to sump or daylight drain. (See page 8.)
- An "approved" filter membrane must be installed per code. (See page 8.)
- Bend slab connectors into concrete floor pour, if provided.
- Cover the exposed stones on the exterior of the wall with backfill or patio construction (to prevent air and water infiltration), properly sloped away from the wall.
- A shear wall may be required in certain uneven backfill or open floor plan conditions. (See page 36.)

Code Reference:
2021 IRC Section: R403.1.4

R403.1.4 Minimum Depth.

Exterior footings shall be placed not less than 12 inches (305 mm) below the undisturbed ground surface. Where applicable, the depth of footings shall also conform to Sections R403.1.4.1. Deck footings shall be in accordance with Section R507.3.

R403.1.4.1 Frost Protection. Except where otherwise protected from frost, foundation walls, piers and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods...(See 2021 IRC for more details)

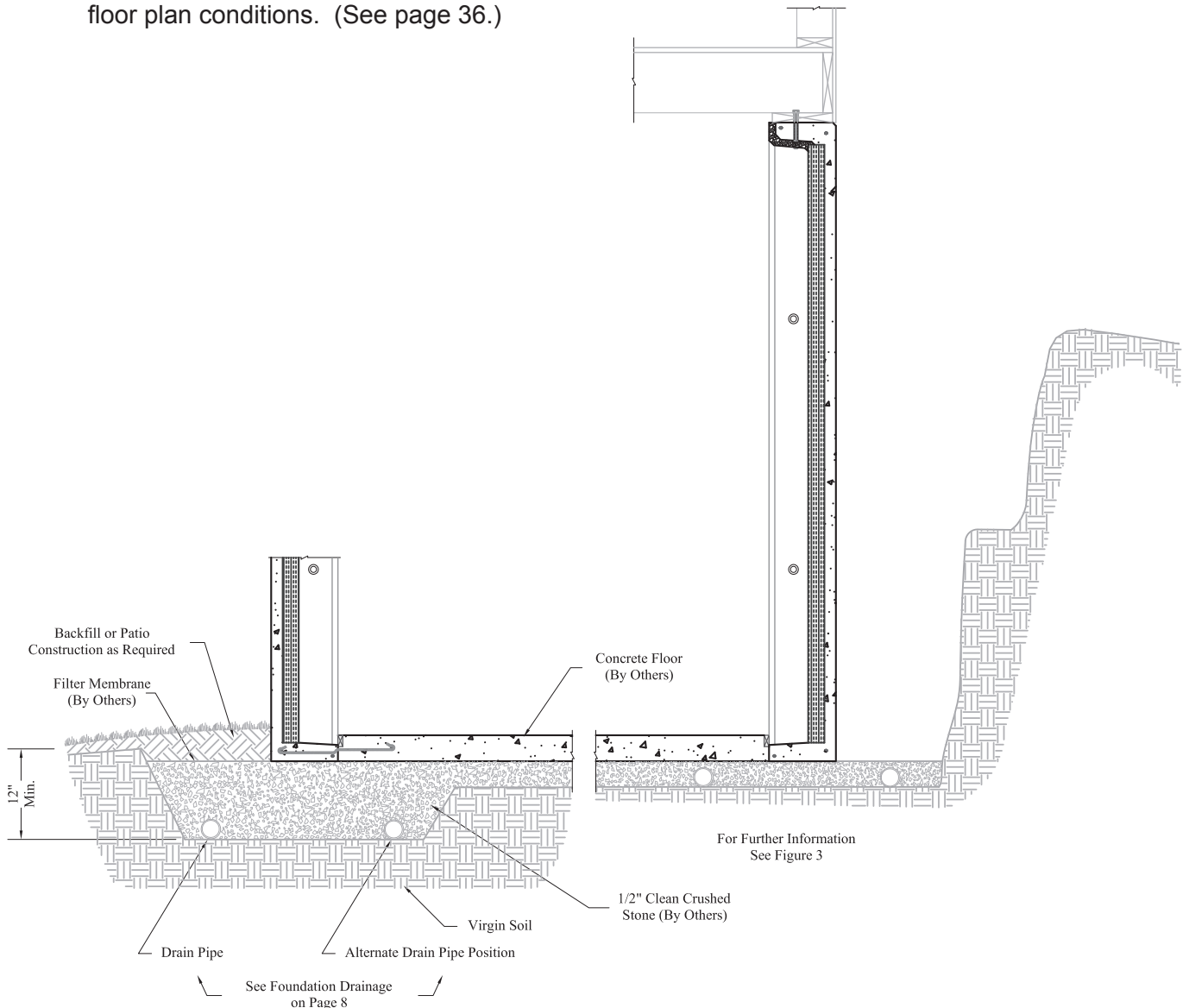


Figure 10

Procedures to Pour Concrete Floor

Typical Floor Pour Detail

- Bend slab connectors into concrete floor pour if provided.
- For the Xi Wall System, fasten a piece of lath (pressure treated is recommended) to the galvanized stud facing at the desired height of the concrete floor to form a screed board (see Figure 11 - Option 1), or omit the screed board and allow concrete floor pour to flow between the stud cavities on top of the Superior Walls footer beam (see Figure 11 - Option 2).
- For the Xi Plus Wall System, pour a 4" slab, using the upper edge of the insulated footer beam as a guide (see Figure 11 - Option 3).
- Install a vapor retarder per code.
- Typically allow a minimum of a 2" direct contact between wall footer beam and poured concrete floor. (See Figure 11 below.)
- For an insulated slab edge procedure, please contact your local Superior Walls representative.

Code Reference:
2021 IRC Section: R506.1

R506.1 General. Concrete slab-on-ground floors shall be designed and constructed in accordance with the provisions of this section or ACI 332. Floors shall be a minimum 3-1/2 inches (89 mm) thick (for expansive soils, see Section R403.1.8). The specified compressive strength of concrete shall be as set forth in Section R402.2.

Code Reference:
2021 IRC Section: R506.2.2

R506.2.2 Base. A 4-inch-thick (102 mm) base course consisting of clean graded sand, gravel, crushed stone, crushed concrete, or crushed blast-furnace slag passing a 2-inch (51 mm) sieve shall be placed on the prepared subgrade when the slab is below grade.

Exception: A base course is not required when the concrete slab is installed on well-drained or sand-gravel mixture soils classified as Group I according to the Unified Soil Classification System in accordance with Table R405.1.

Code Reference:
2021 IRC Section: R506.2.3

R506.2.3 Vapor retarder. A minimum 10-mil (0.010 inch; 0.254 mm) vapor retarder conforming to ASTM E1745 Class A requirements, with joints lapped not less than 6 inches (152mm) shall be placed between the concrete floor slab and the base course or the prepared sub-grade where no base course exists.

Exception: The vapor retarder is not required for the following:

1. Garages, utility buildings and other unheated *accessory structures*.
2. For unheated storage rooms having an area of less than 70 square feet (6.5 m²) and carports.
3. Driveways, walks, patios and other flatwork not likely to be enclosed and heated at a later date.
4. Where *approved by the building official*, based on local site conditions.

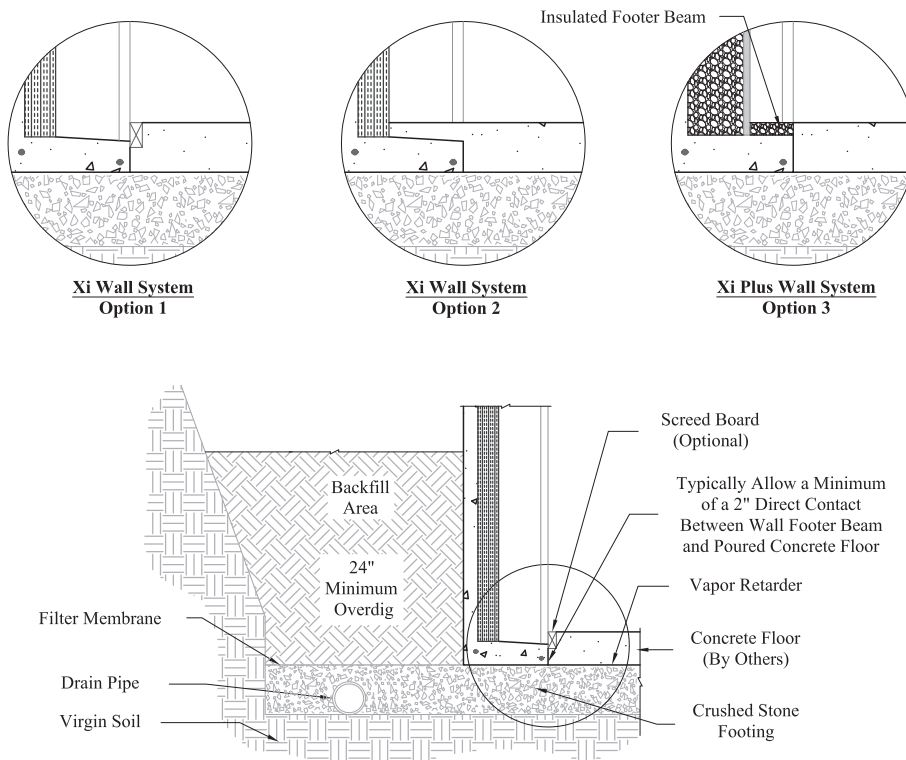


Figure 11

Raised Floor Pour Detail

See options below to pour the basement floor at an elevation higher than the typical elevation shown on page 18:

Option A (Figure 12):

- Cut and remove the foam insulation below the desired floor elevation.
- Cut and remove the interior stud facing below the desired floor elevation.
- Install a vapor retarder per code.

Option B (Figure 12):

- Leave foam insulation and interior stud facing on Superior Walls panel and pour concrete floor, allowing direct contact between the Superior Walls footer beam and the concrete floor pour.
- Install a vapor retarder per code.

Code Reference:
2021 IRC Section: R318.4

R318.4 Foam plastic protection.

In areas where the probability of termite infestation is "very heavy" as indicated in figure R318.4, extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundations walls or slab foundations located below *grade*. The clearance between foam plastics installed above *grade* and exposed earth shall be not less than 6 inches (152 mm)

Exceptions:

1. Buildings where the structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or pressure-preservative-treated wood.
2. Where in addition to the requirements of Section R318.1, an *approved* method of protecting the foam plastic and structure from subterranean termite damage is used.
3. On the interior side of basement walls.

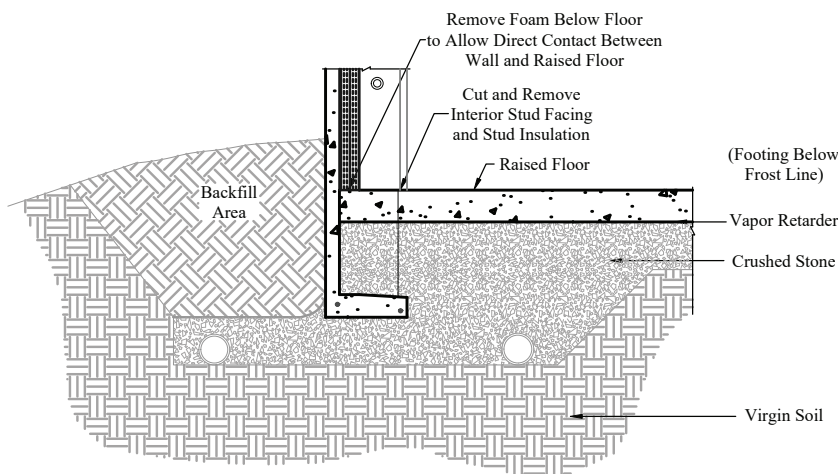


Figure 12 - Option A

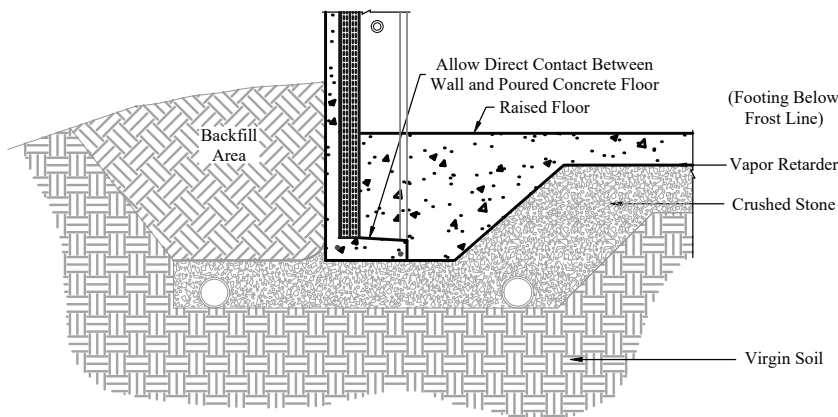


Figure 12 - Option B

Crawl Space Procedures

Crawl Space with Concrete Slab

- See the Framing Connection at the Top of the Wall section in this Booklet for Top of Wall requirements.
- Install a vapor retarder per code.
- Pour concrete floor against the bottom of the wall, at a minimum thickness of 2”.

Code Reference:
2021 IRC Section: R408

R408 UNDER-FLOOR SPACE. See code for requirements.

Note: A concrete floor is the recommended method for all crawl spaces and particularly for conditioned crawl space applications.

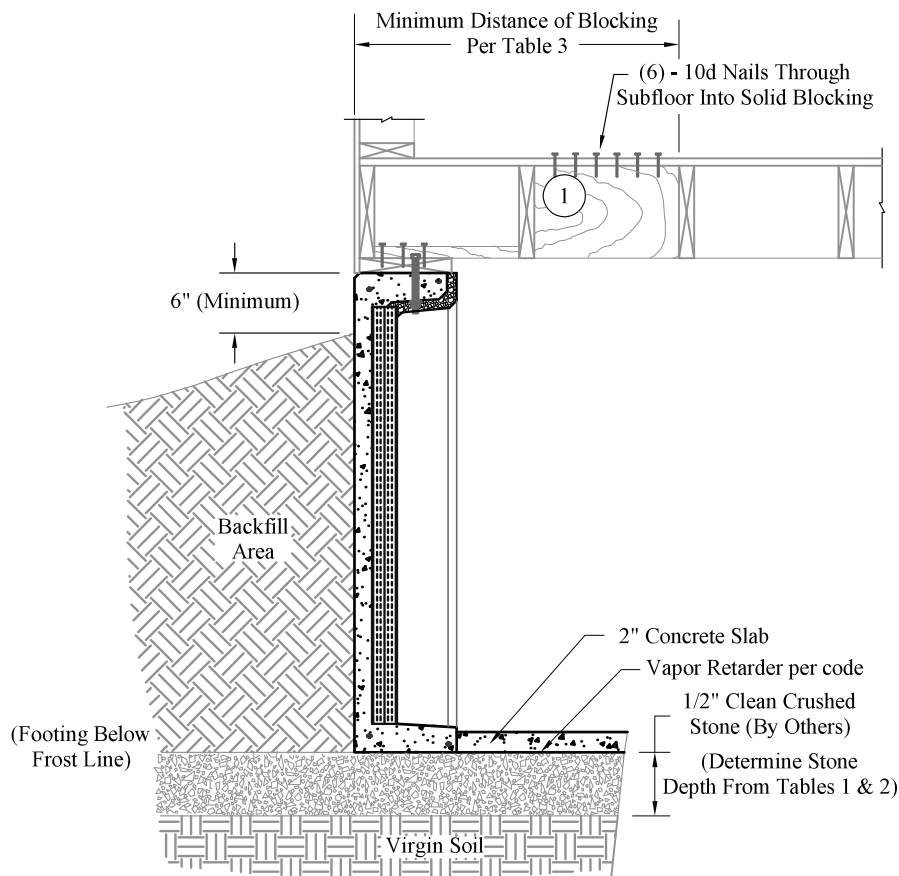


Figure 13

Crawl Space with Interior Fill

- See the Framing Connection at the Top of the Wall section in this Booklet for Top of Wall requirements.
- As an alternative to a concrete floor slab, a minimum of 12" of fill may be used to secure the bottom of the wall panels. The inside and outside of the wall panel should be filled simultaneously.
- Install a vapor retarder per code.

NOTE: A concrete floor is the recommended method for all crawl spaces and particularly for conditioned crawl space applications.

Code Reference:
2021 IRC Section: R408

R408 UNDER-FLOOR SPACE. See code for requirements.

Code Reference:
2021 IRC Section: R318.4

R318.4 Foam plastic protection.
In areas where the probability of termite infestation is "very heavy" as indicated in figure R318.4, extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundations walls or slab foundations located below *grade*. The clearance between foam plastics installed above *grade* and exposed earth shall be at least 6 inches (152 mm)...

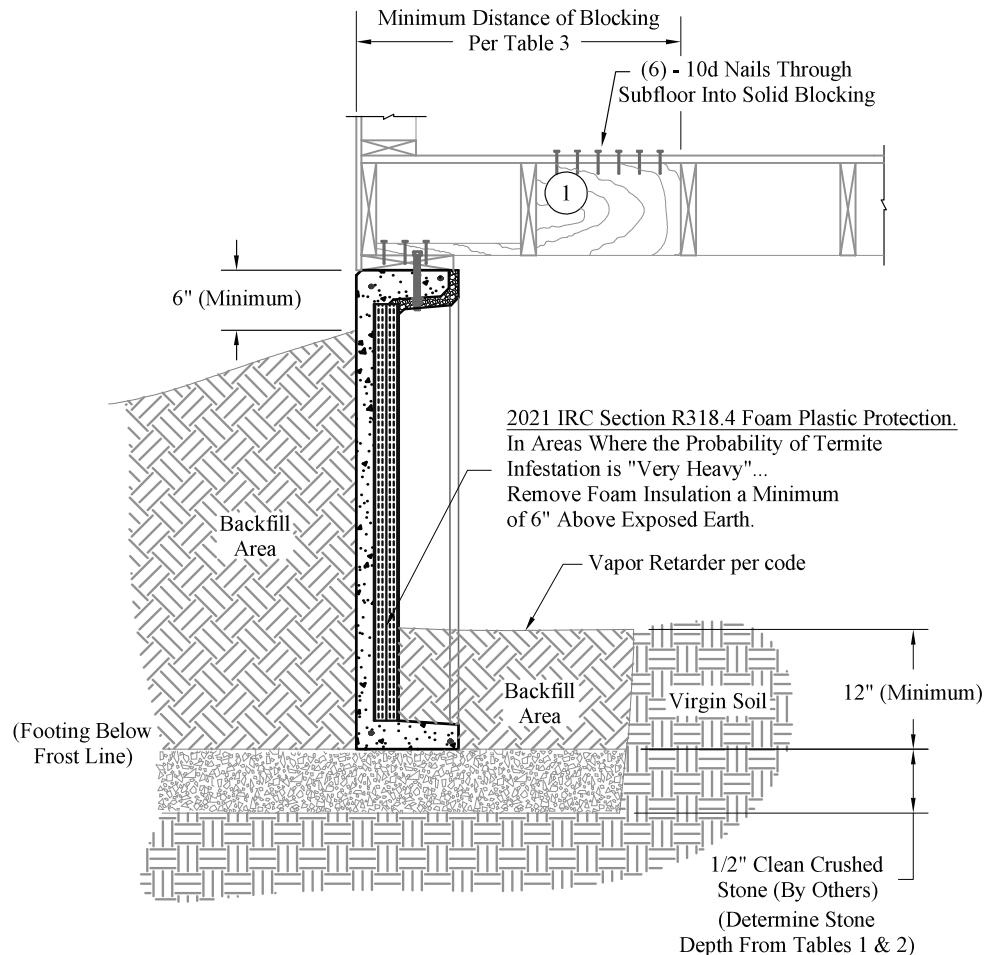


Figure 14

Porches, Garages and Other Inside Fill Conditions

For project details similar to the illustration below:

- Maximum backfill differential is 36". (Additional reinforcement can be added to most Superior Walls panels for project applications that require backfill differential greater than 36". Additional reinforcement must be discussed with your Superior Walls representative prior to panel manufacturing.)
- Use flat washers and nuts to fasten a 1/2 inch all-thread rod every 24 inches through precast holes in the bond beam.
- Bend the rod so that it is parallel to the floor pour and centered in the concrete.
- Rod length should extend at least 24 inches beyond the inside edge of the bond beam.
- Use temporary bracing on the exterior of the wall until concrete floor is poured and cured.
- Bottom of wall must be restrained to resist the lateral pressure of the infill material.

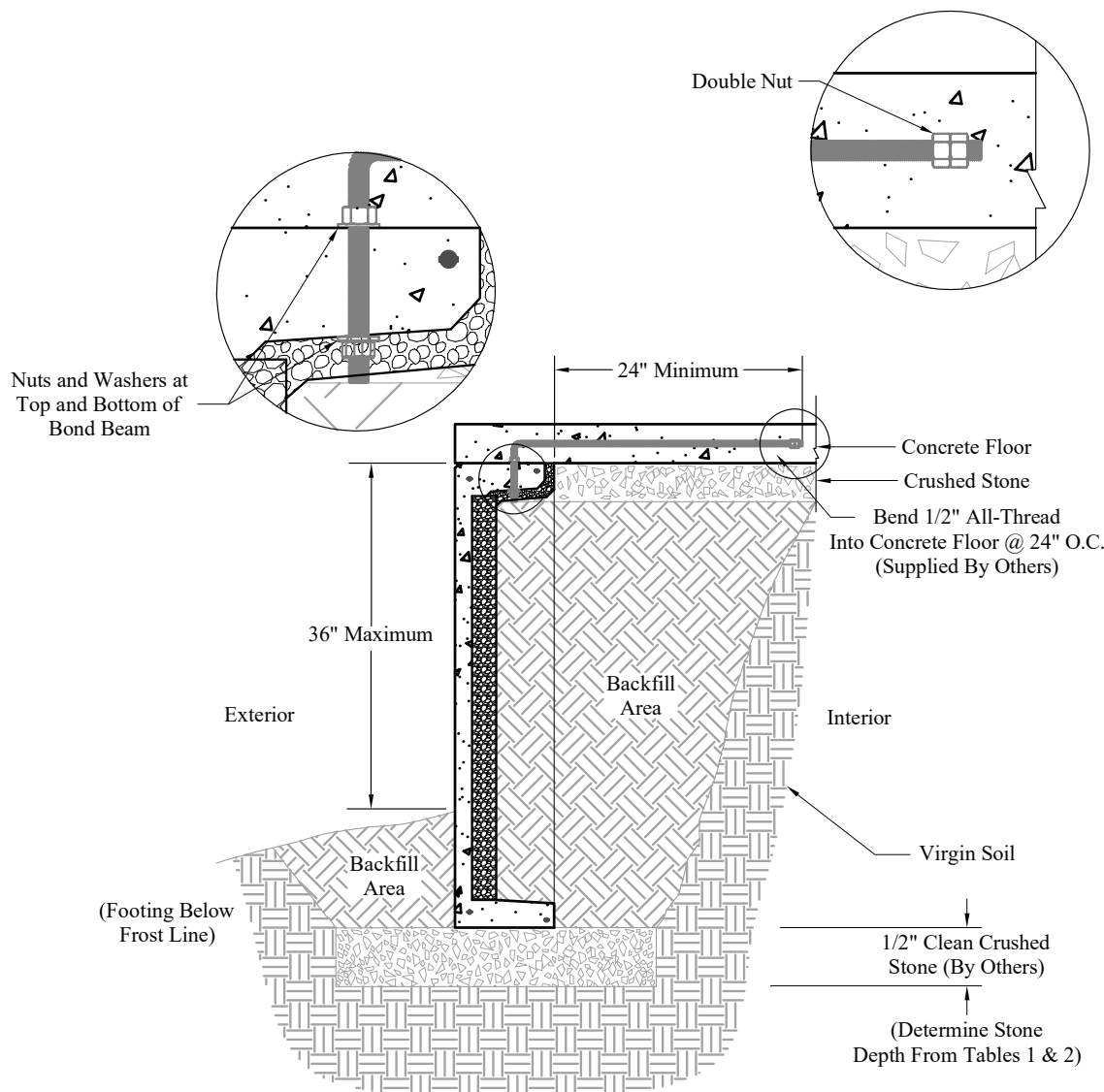


Figure 15

Garage Wall

- This wall type is used primarily for garage frost walls.
- For other inside fill conditions, reference page 22.
- Perimeter drain is not required on frost wall applications that are below the frost line.
- Contact your local Superior Walls representative for top of wall dimensions.
(Dimensions vary by market area.)

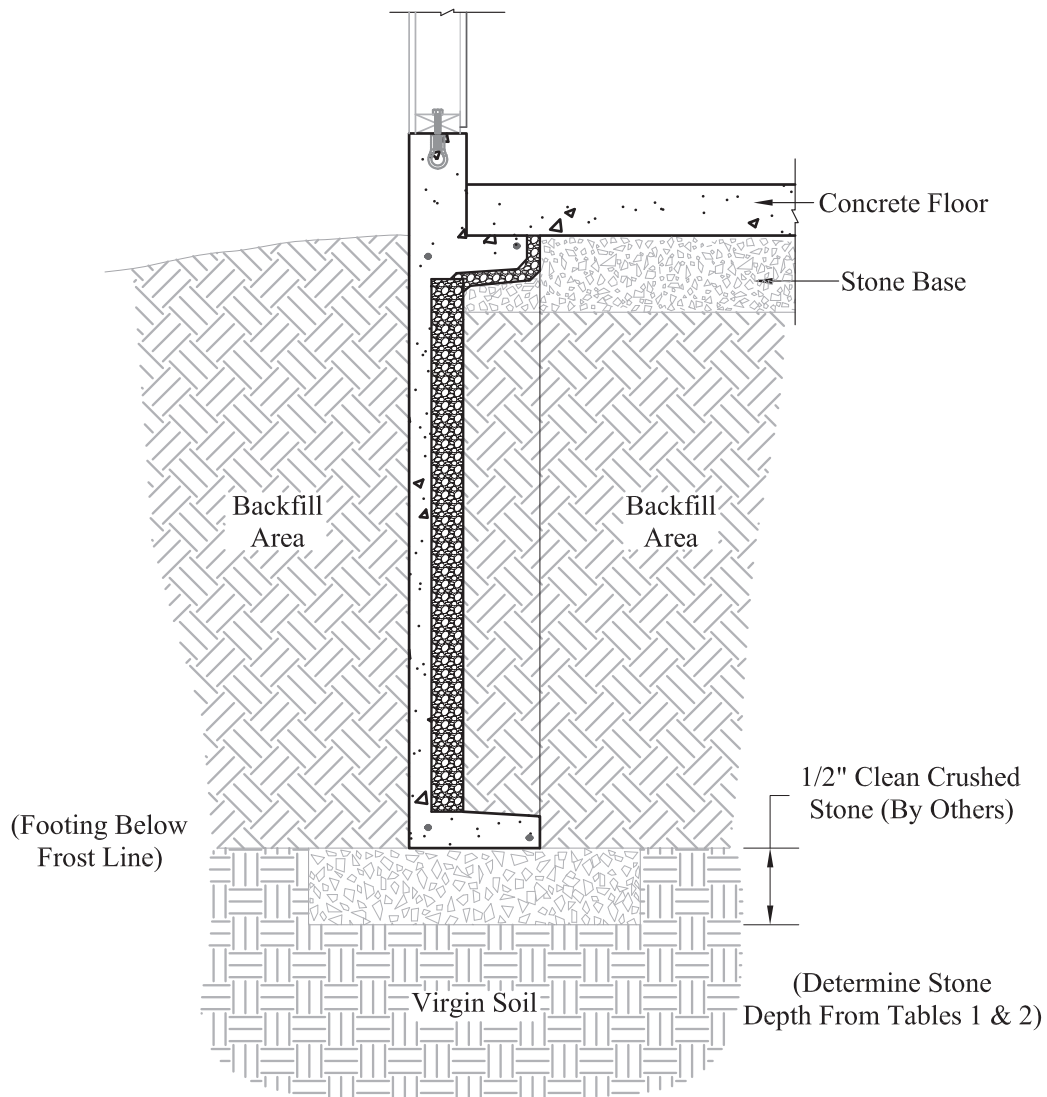


Figure 16

The Framing Connection at the Top of the Wall

To comply with building code requirements, the framing / decking connection at the top of the Superior Walls panel and the floor slab at the bottom of the Superior Walls panel **MUST** be completed prior to backfilling.

1. Sill Plate

- Two parallel beads of construction adhesive are recommended between the bond beam and the sill plate (at approximately 2" and 4" from the outside face of the wall panel).
- 2x10 treated sill plate is recommended.
- For through bolt applications: bolt the sill plate with minimum 1/2" x 5-1/2" bolts using two washers (one above the wood sill plate and one between the nut and the underside of the bond beam) through the precast holes provided in top bond beam.
- For threaded insert applications: use 1/2" threaded studs with a nut and washer or 1/2" bolts with a washer when inserts are provided in the top bond beam of the Superior Walls panels to attach the sill plate. (Threaded inserts are typically located above window / door headers, garage walls, Ui Walls, and/or the Xi Plus product.)

NOTE: Contact your local Superior Walls representative for threaded stud or bolt length and specification requirements for the threaded inserts supplied in the Superior Walls panels. Proper embedment and thread engagement is critical to achieve required capacities.

- Refer to fastening schedule in [Table 3](#) on page 27.
- Sill plate must be bolted within 12" of the end of all plate sections. See 2021 IRC – R403.1.6.
- Sill plate splices must be at least 4'-0" away from any foundation panel joint.
- Clamps may be used to temporarily secure sill plate in position prior to bolting. (Nails or other methods could result in cracking of the concrete.)

2. Floor Joists Perpendicular to the Foundation Wall

- Nail each joist securely to sill plate with two 16d common nails (3-1/2" x 0.162") or according to code. For modular home connections, see [Table 4](#) on page 34.

3. Floor Joists Parallel to the Foundation Wall

- Nail a 2 x 6 end wall brace securely to the sill plate with five 10d nails every 48" on center. (Braces must be within 12" from the interior of each corner.) See [Figure 19](#) on page 27 and [Figure 20](#) on page 28.
- Use 1 Solid block if backfill is 0' to 7'-6". Nail the block in line with the 2 x 6 end wall braces. (See page 27.)
- Use 2 Solid blocks if backfill is between 7'-6" and 9'-6" for joists less than 10" in height. (See page 27.)
- Use 3 Solid blocks when backfill is between 7'-6" and 9'-6" for joists that are greater than or equal to 10" in height. (See page 27.)
- See [Figure 22](#) on page 30 for plywood fabricated solid blocking details.

Code Reference:
2021 IRC Section: R404.1.7

R404.1.7 Backfill placement. 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 by backfill.

Code Reference:
2021 IRC Section: R403.1.6

R403.1.6 Foundation anchorage. ...wood sill plates shall be anchored to the foundation with minimum 1/2-inch-diameter (12.7 mm) anchor bolts spaced a maximum of 6 feet (1829 mm) on center or *approved* anchors or anchor straps spaced as required to provide equivalent anchorage to 1/2-inch-diameter (12.7 mm) anchor bolts... The bolts shall be located in the middle third of the width of the plate. A nut and washer shall be tightened on each anchor bolt. There shall be not fewer than two bolts per plate section with one bolt located not more than 12 inches (305 mm) or less than seven bolt diameters from each end of the plate section.

Exceptions:
See code for exceptions.

Code Reference:
2021 IRC Section: R317.3.1

R317.3.1 Fasteners for preservative-treated wood. Fasteners, including nuts and washers, for preservative-treated wood shall be of hot dipped, zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Staples shall be of stainless steel. Coating types and weights for connectors in contact with preservative-treated wood shall be in accordance with the connector manufacturer's recommendations...

Exceptions:
1. One-half-inch-diameter (12.7 mm) or greater steel bolts.

See code for other exceptions.

Framing Connection at the Top of Wall (cont.)

- NOTES:**
- 1) Framing connection details illustrated in this Booklet have not been evaluated for backfill exceeding 9'-6" in height. For projects with backfill exceeding 9'-6" in height, consult with a person competent in applying the structural design principles involved.
 - 2) See fastening schedule and details on pages 25-35.
 - 3) Warning: Pressure treated lumber requires special fastener considerations; see code references.

Floor Connection: Joists Perpendicular to Superior Walls Panels

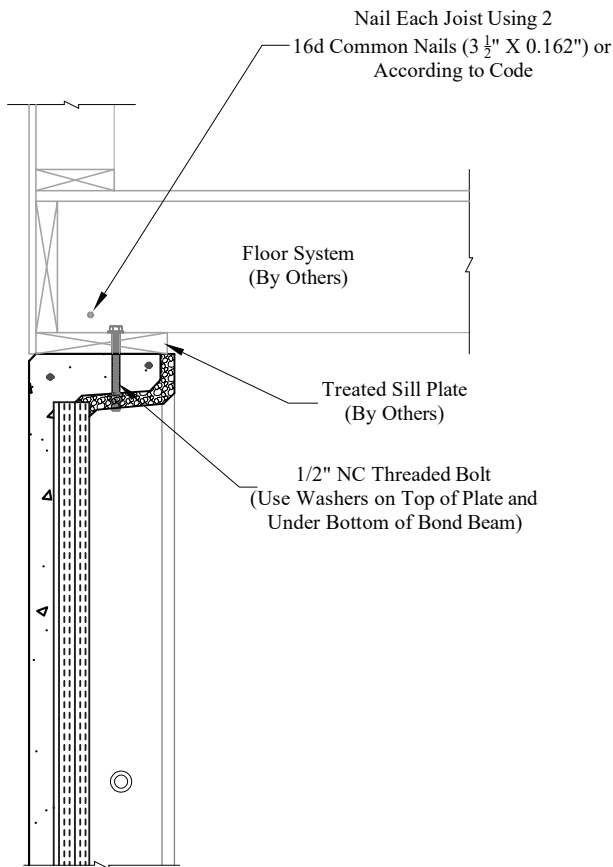


Figure 17 - Xi

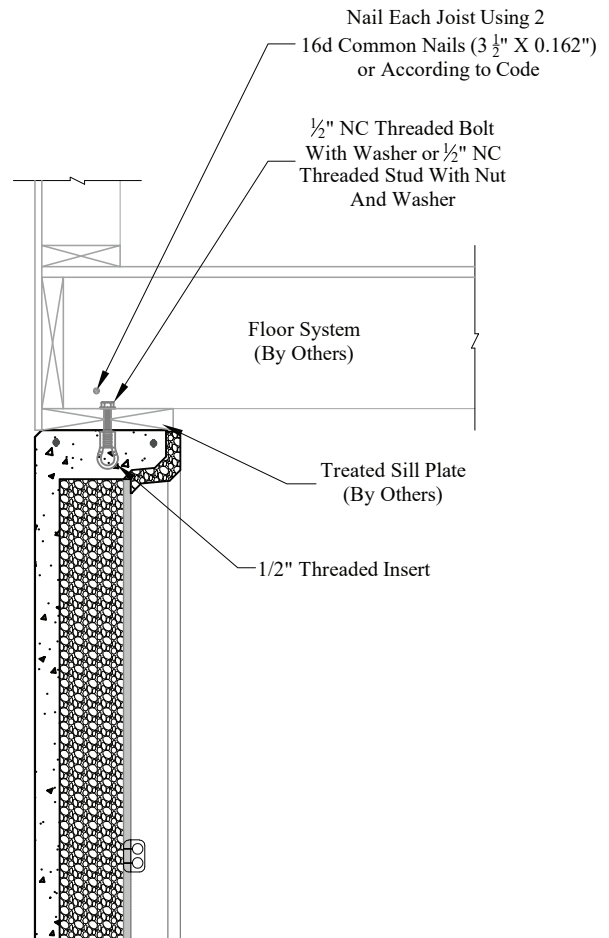


Figure 17 - Xi Plus

Floor Connection: Joists Perpendicular to Superior Walls Panels (cont.)

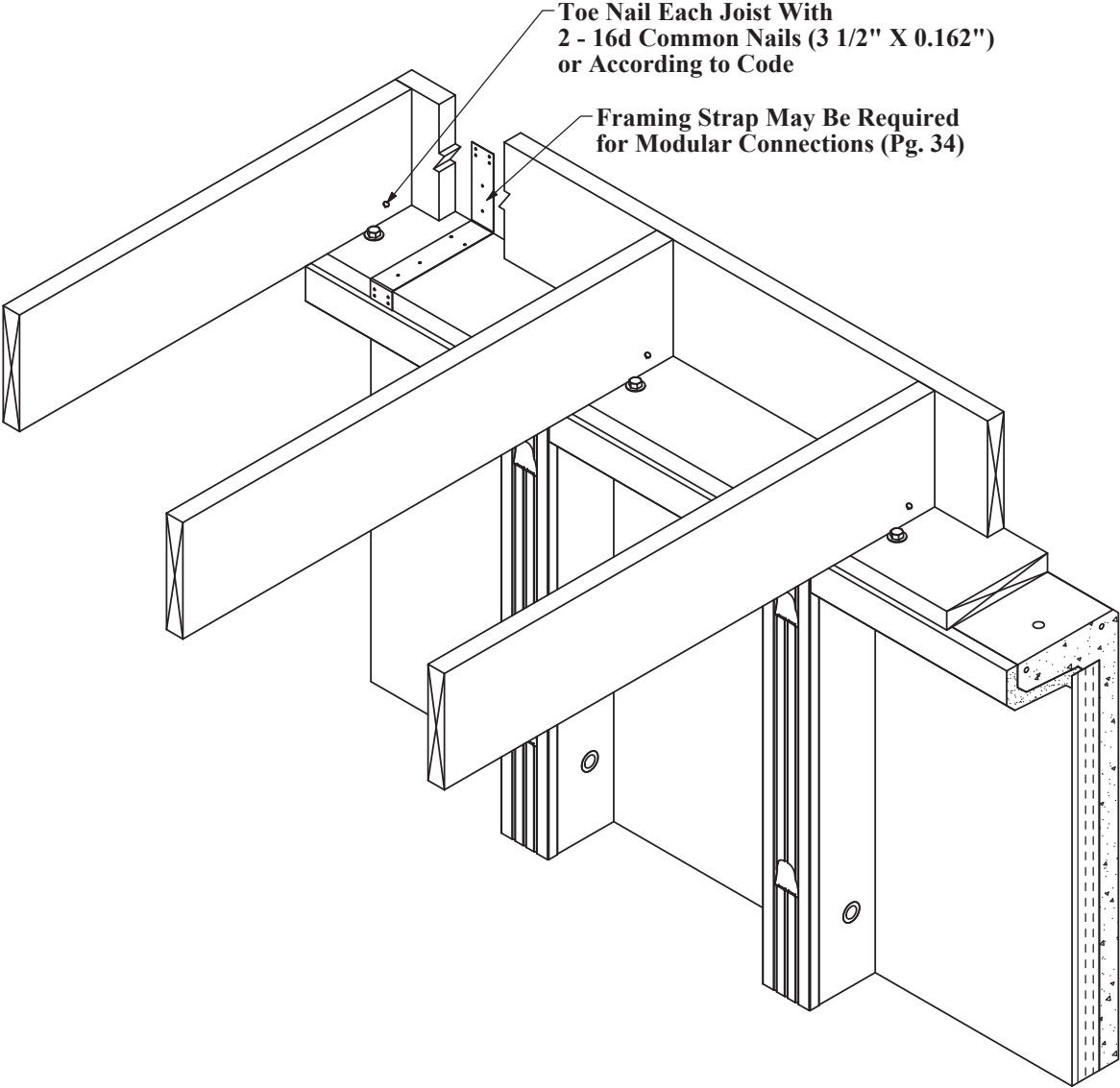


Figure 18

Table 3
Fastening Schedule

Backfill Height	Joist Height	Sill Plate Bolting	Brace & Block Spacing	Number of Solid Blocks Required	Minimum Distance of Blocking
7'-6" - 9'-6"	≥ 10"	One (1) 1/2" Bolt at 24" OC	48" OC / 12" from the interior of each corner	Three (3)	5'-0"
7'-6" - 9'-6"	< 10"	One (1) 1/2" Bolt at 24" OC		Two (2)	4'-0"
0' < 7'-6"	Any Height	One (1) 1/2" Bolt at 48" OC		One (1)	2'-0"

Floor Connection: Joists Parallel to Superior Walls Panels

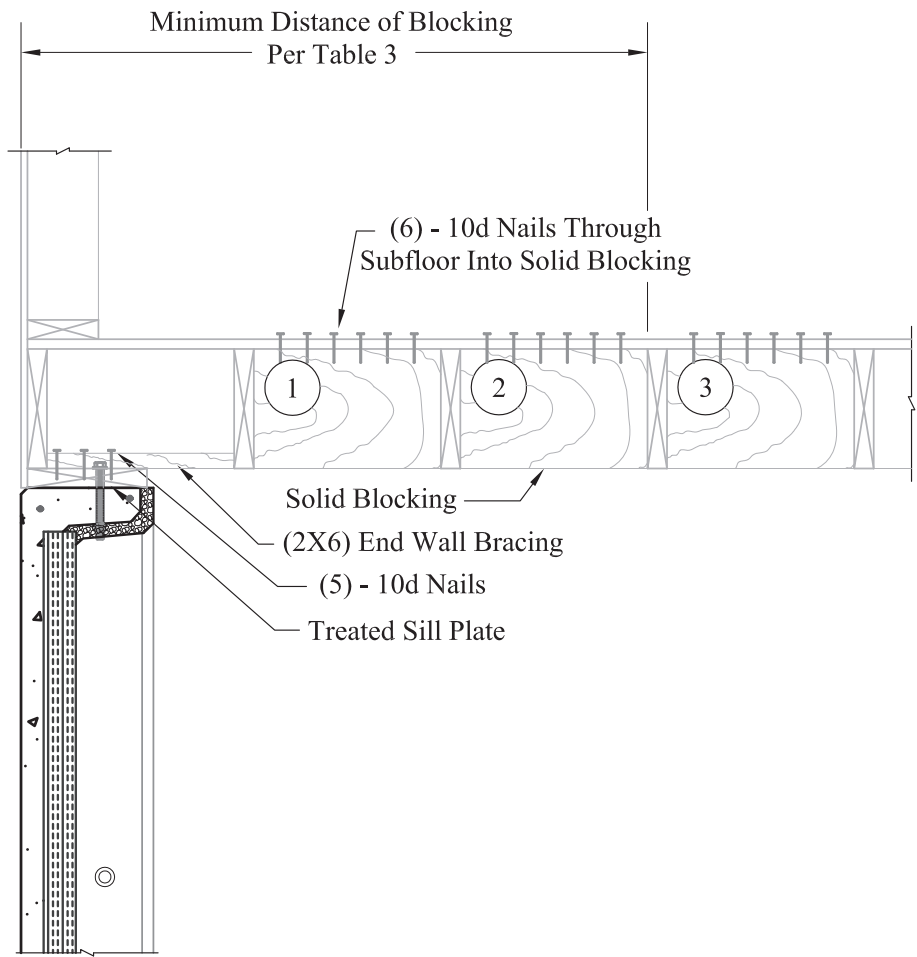


Figure 19

Floor Connection: Joists Parallel to Superior Walls Panels (cont.)

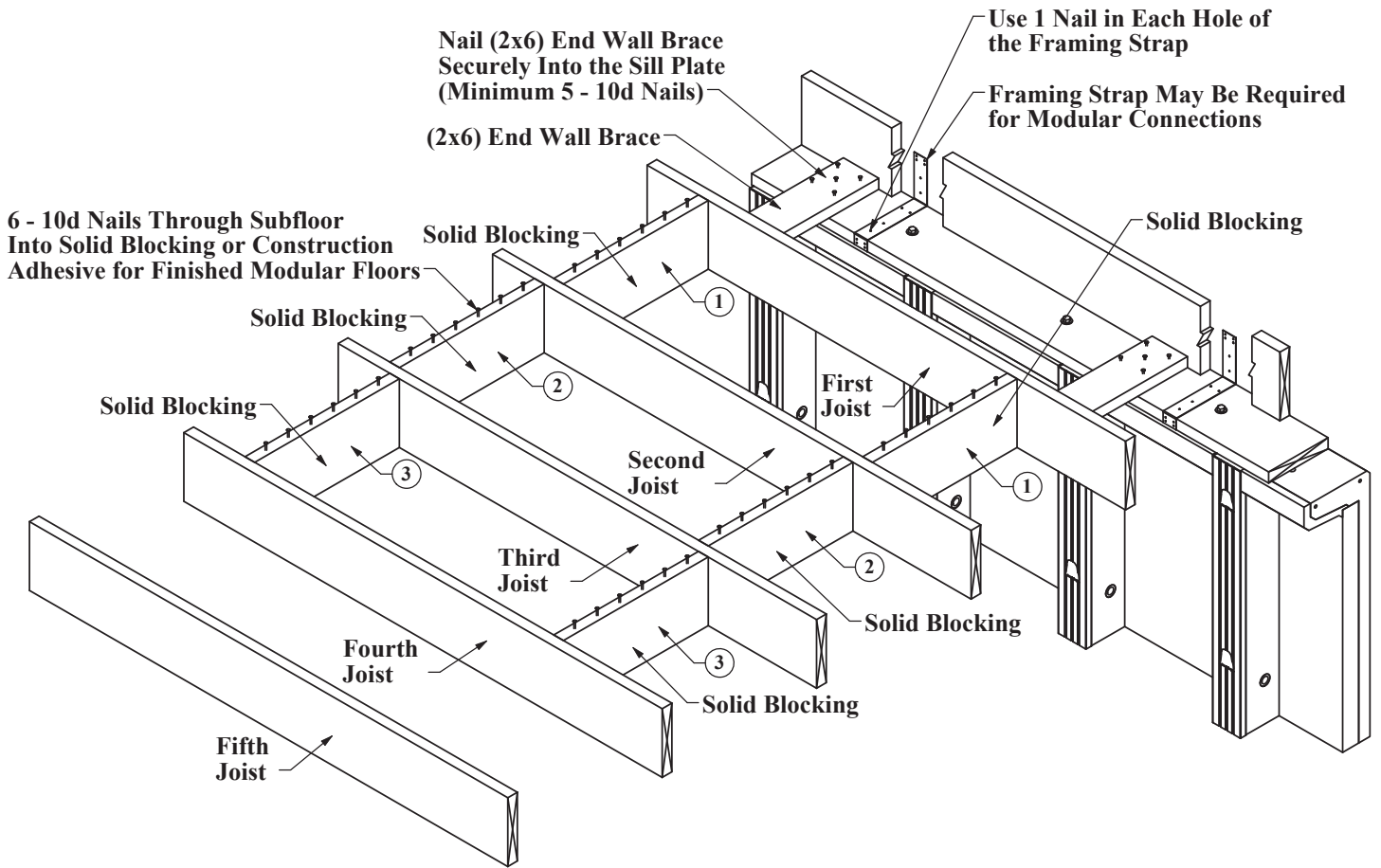


Figure 20

Floor Connection: Joists Parallel to Superior Walls Panels (cont.)

Alternate Blocking to Accommodate HVAC Equipment

To accommodate for HVAC ductwork that is located where Solid Blocking is shown in [Figure 19](#) on page 27 and [Figure 20](#) on page 28, additional blocking is required as shown in [Figure 21](#) (below).

- All requirements of [Table 3](#) remain. (See page 27.)
- Solid Blocking is replaced with 2x6 Flat Blocking. (Locate Flat Blocking between the joists and in line with the 2x6 End Wall Braces.) (See [Figure 21](#).)
- Add Solid Blocking to the next open joist bay to replace the Solid Blocking that was removed to accommodate for the HVAC duct work. (Number of Solid Blocks must comply with [Table 3](#).)

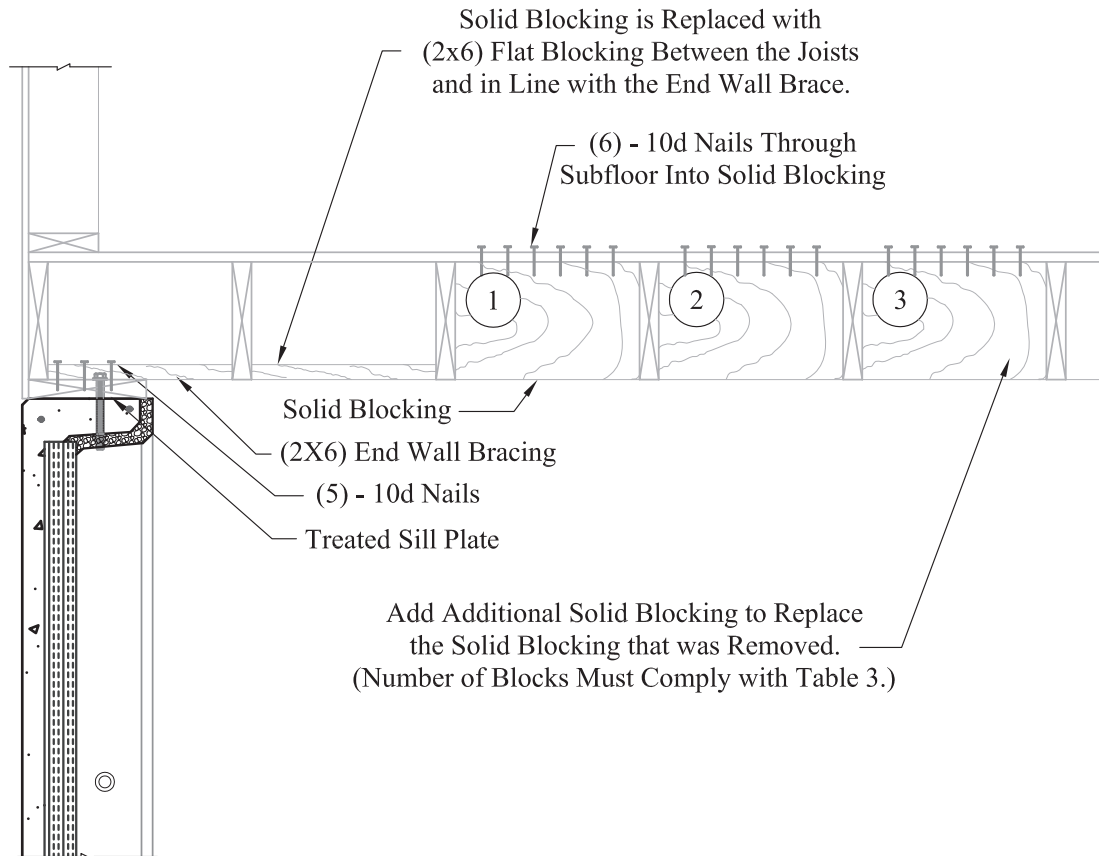


Figure 21

Floor Connection: "I" Joist Blocking

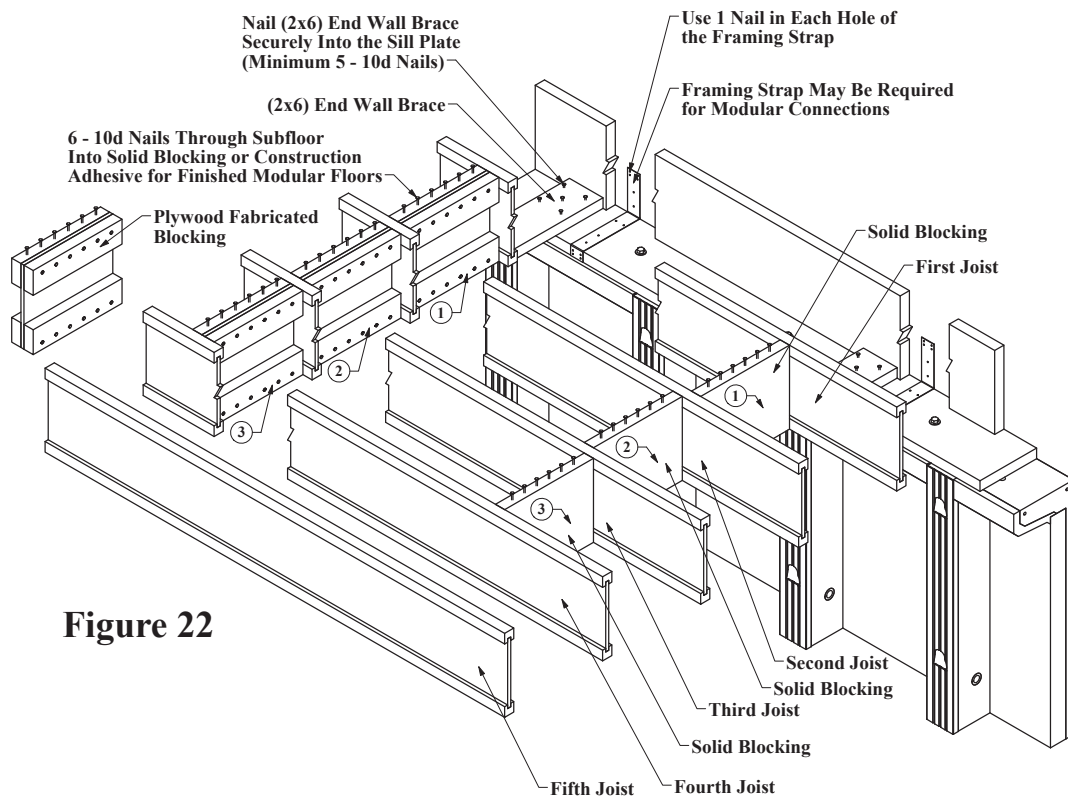
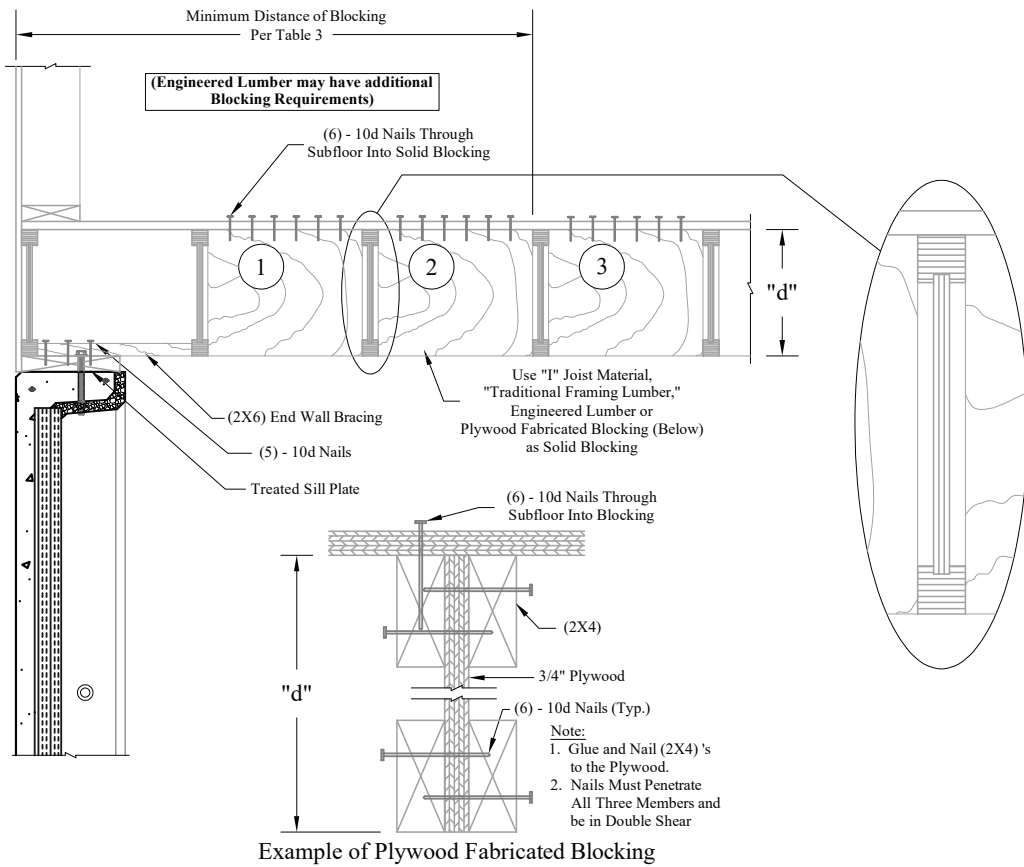


Figure 22

Floor Truss Connection: Top Chord Bearing Floor Truss

NOTE: Any additional requirements from the truss manufacturer must be followed.

Floor Truss Parallel to Superior Walls Panel

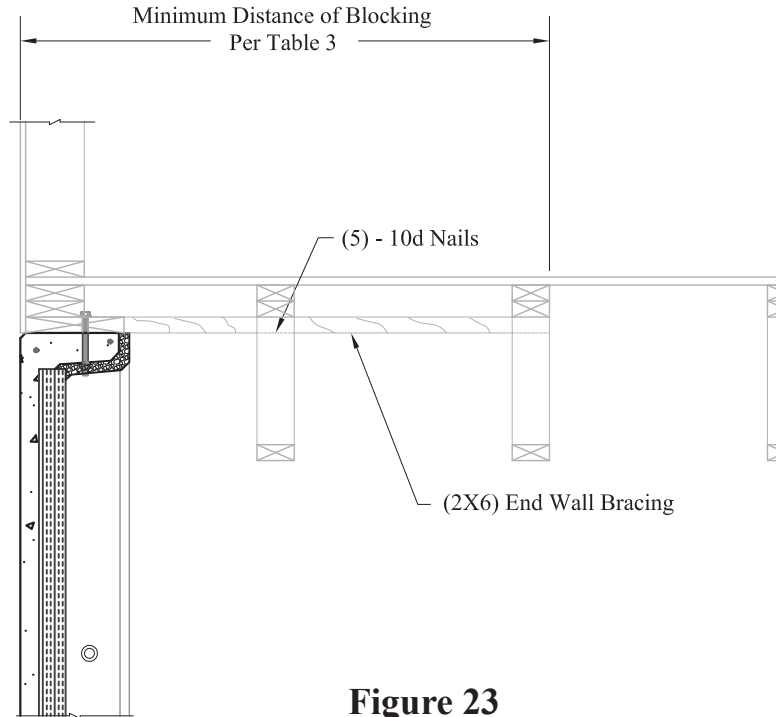


Figure 23

Floor Truss Perpendicular to Superior Walls Panel

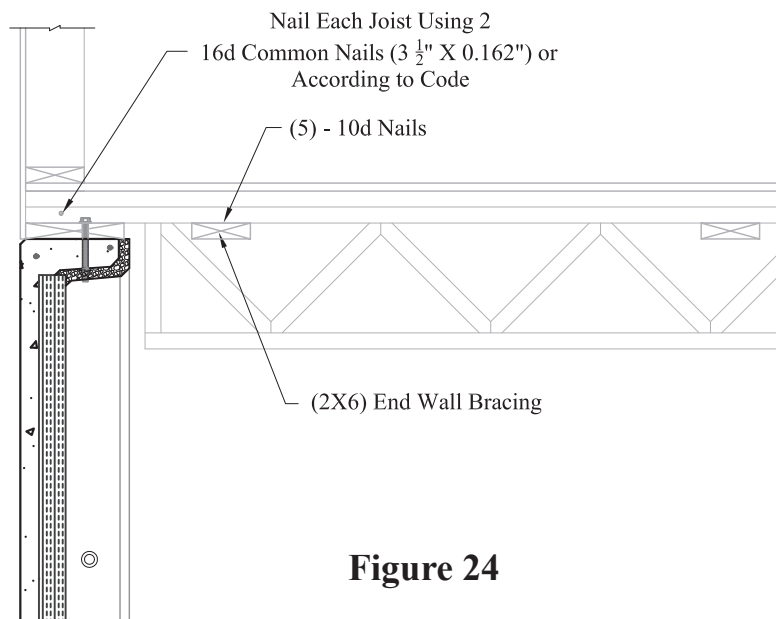


Figure 24

Floor Truss Connection: Mid Chord Bearing Floor Truss

NOTE: Any additional requirements from the truss manufacturer must be followed.

Floor Truss Parallel to Superior Walls Panel

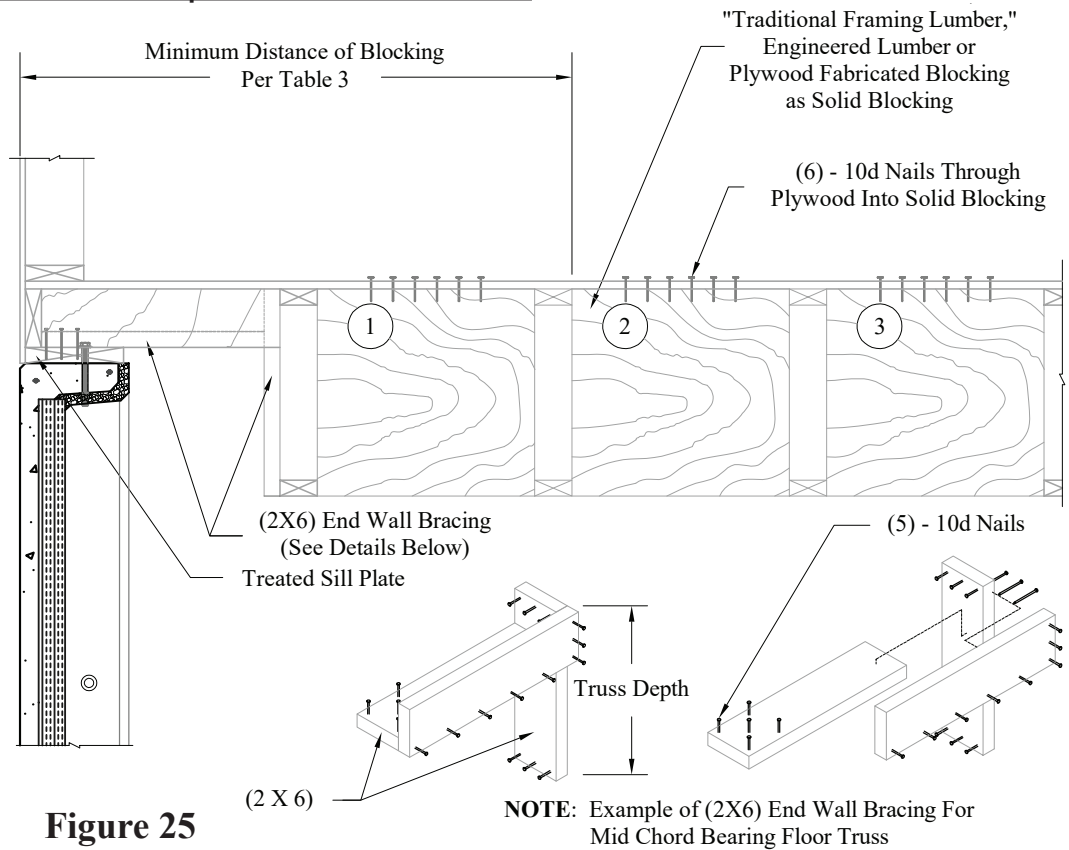


Figure 25

Floor Truss Perpendicular to Superior Walls Panel

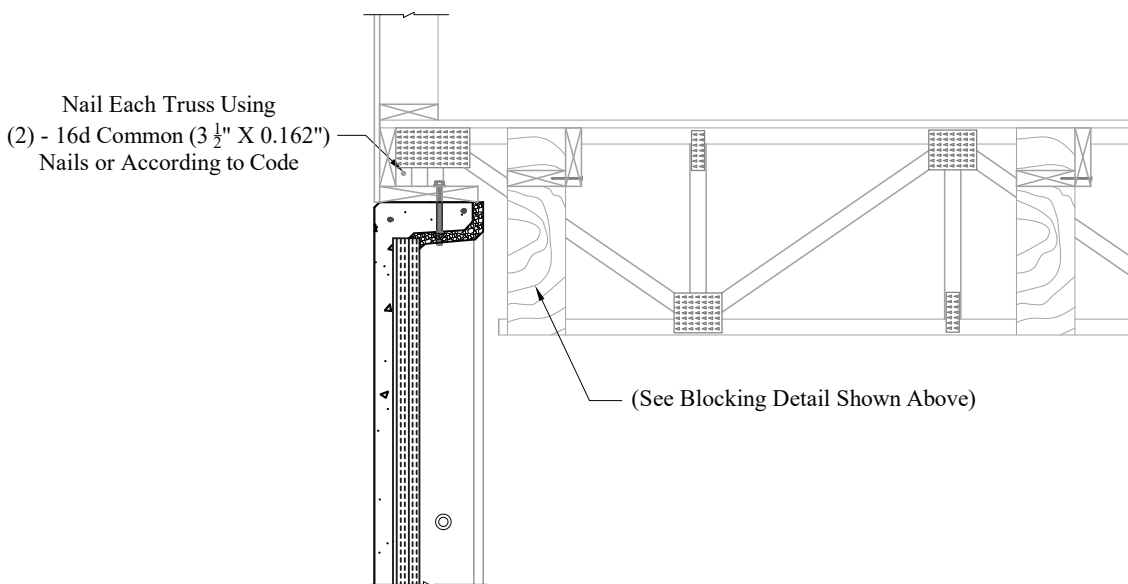
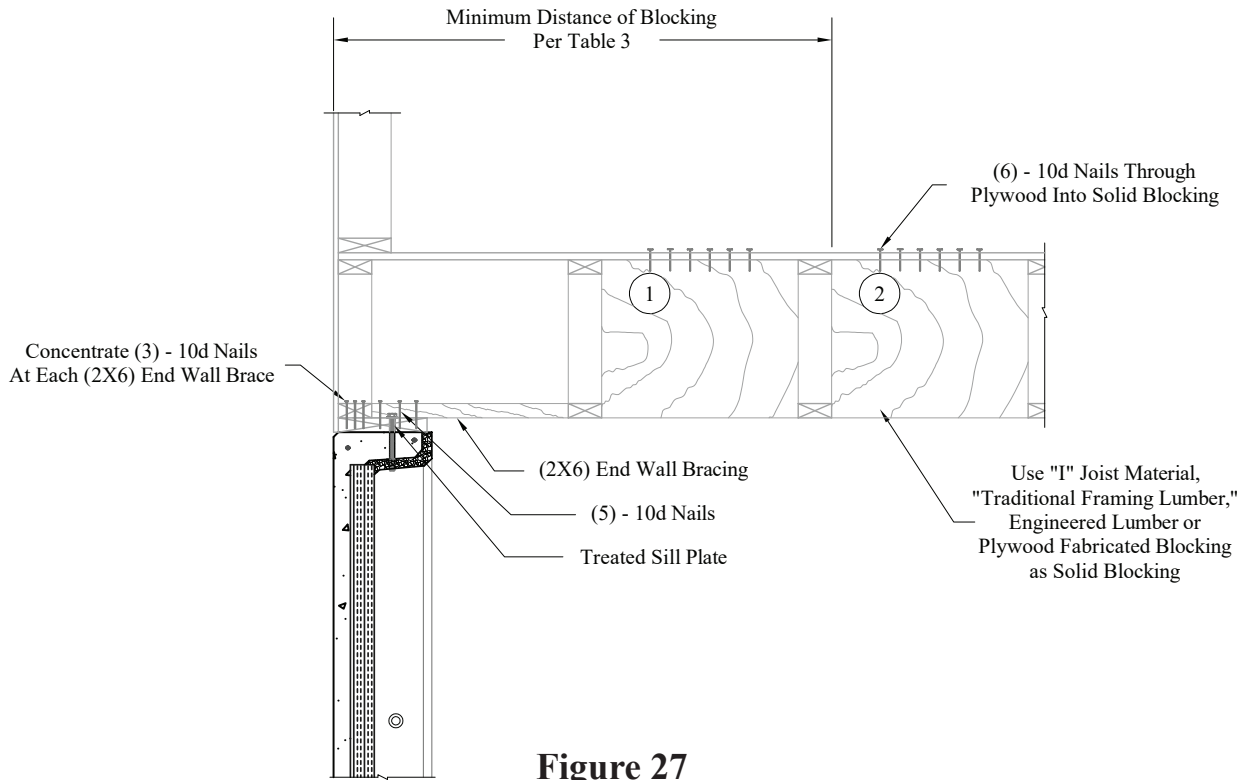


Figure 26

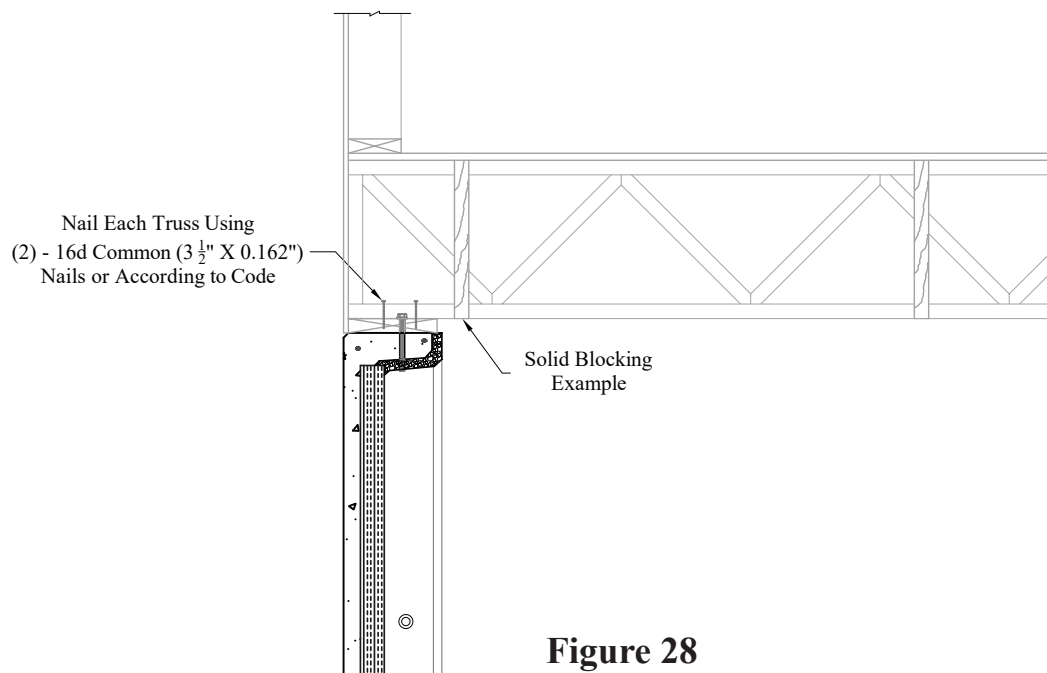
Floor Truss Connection: Bottom Chord Bearing Floor Truss

NOTE: Any additional requirements from the truss manufacturer must be followed.

Floor Truss Parallel to Superior Walls Panel



Floor Truss Perpendicular to Superior Walls Panel



Modular Connection

Sill Plate / Blocking

- Modular manufacturer may attach the sill plate in the factory during the modular construction, or the sill plate can be attached to the top of the Superior Walls panels prior to the modular placement.
- Construction adhesive is recommended between the Superior Walls bond beam and the sill plate.
- Bolt the sill plate to the top bond beam per the Sill Plate requirements on page 24 and the Fastening Schedule in [Table 3](#) on page 27.
- Joists Perpendicular to the Foundation Wall must be attached to the sill plate in one of two ways: (one or the other)
 1. Nail each joist securely to sill plate with two 16d common nails (3-1/2" x 0.162") or according to code.
 2. Use Framing Straps.
 - Nail the Framing Strap to sill plate before setting the structure. (See [Table 4](#).)
 - The Framing Strap lies between the band joist and the sill plate and is fastened with 1-1/2" (.148" x 1.500") nails provided.
 - Use 1 nail in every hole of the Framing Strap.
- Joists parallel to Superior Walls panels must have blocking per "Floor Joists Parallel to the Foundation Wall" requirements, on page 24, and the Fastening Schedule in [Table 3](#) on page 27.
 - Place 2x6 End Wall Bracing every 48" on center. (Braces must be within 12" from the interior of each corner.) See [Table 3](#) on page 27. For an alternative End Wall Bracing detail, contact your local Superior Walls representative.
 - When not using the Framing Strap: Nail 2x6 End Wall Bracing to the sill plate using five 10d nails. See [Figure 19](#) on page 27 and [Figure 20](#) on page 28.
 - When using the Framing Strap: Nail 2x6 End Wall Bracing securely between the joists using two 16d nails on each end, or to the sill plate using five 10d nails.
 - Add Solid Blocking per [Table 3](#) on page 27, as shown below in [Figure 29](#).
- A shear wall may be required in certain uneven backfill or open floor plan conditions. See page 36 for more information.

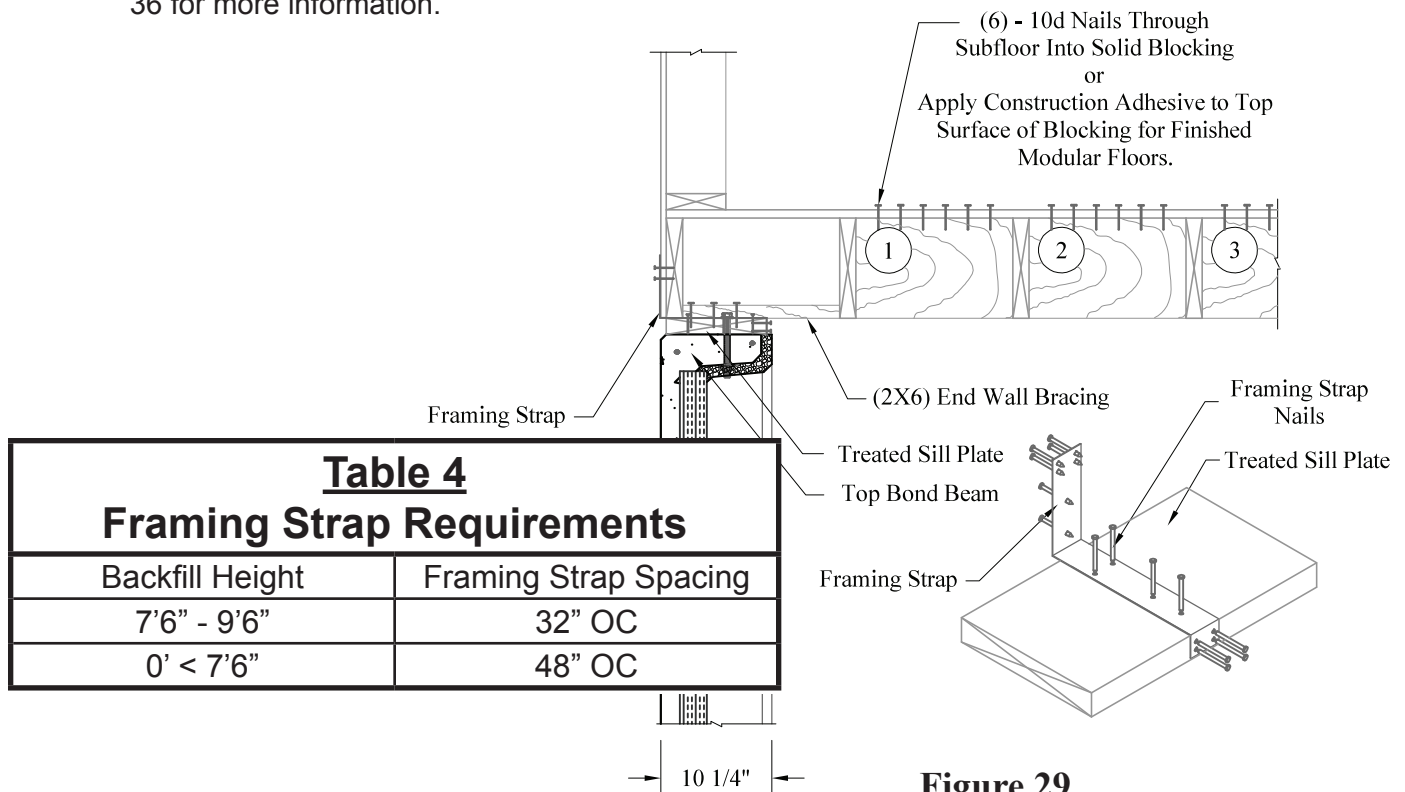


Figure 29

Typical Roof Truss Connection Detail

CAUTION: Depending on plan dimensions, site conditions, and design details, roof trusses may require structural cross bracing and / or uplift clips. Consult your design professional.

- When backfill is over 24" high, attach a layer of OSB (7/16" minimum) to the "bottom chord" (tie beam) of the trusses to create a framing diaphragm to resist the lateral pressures.

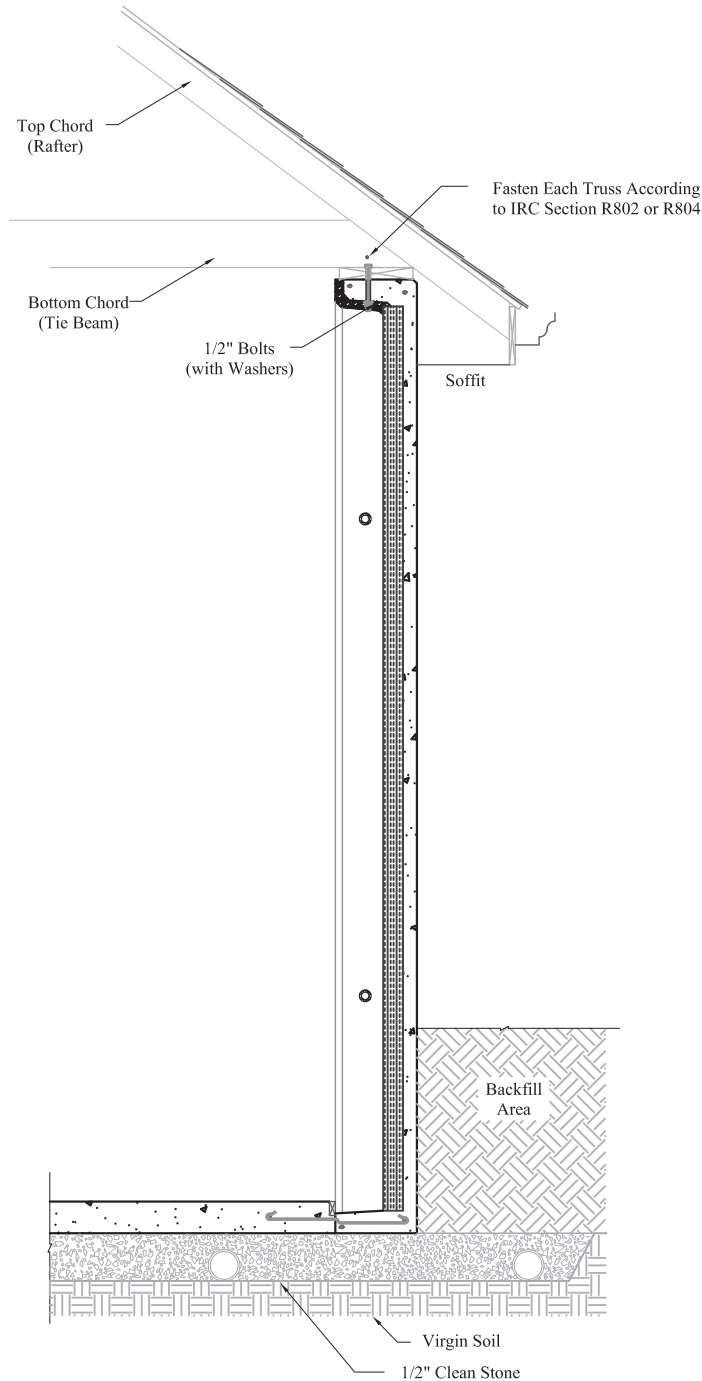


Figure 30

Shear Walls

A shear wall is a mechanism designed to provide lateral stability to a structure. A shear wall may be required in certain uneven backfill or open floor plan conditions (See [Figure 31](#)). It can be constructed by the builder from wood, concrete, masonry (CMU) or steel. If the Architect or Engineer has specified a shear wall for the project, these specifications should be documented in the Architectural drawings. The specifications required from the designer for shear walls consist of, but are not limited to: Location, Length, Bottom of wall connection and Top of wall connection.

The [Table 5: Shear Wall Table](#), below, provides a guideline to help determine when a shear wall may be needed. When the maximum wall lengths exceed the limits shown in [Table 5](#), a shear wall will likely be required and the project must be individually reviewed by a person competent in applying the structural design principles involved. Other site conditions such as adjacent driveways or other conditions may necessitate the need for a shear wall even when the wall lengths do not exceed the dimensions in [Table 5](#).

Table 5: Shear Wall Table				
Maximum Wall Length Without a Shear Wall				
Wall Height	Differential Backfill Height	Soil Type		
		SC, CL 60 lb/ft ² /ft	GM, SM, GC, ML 45 lb/ft ² /ft	GW, GP, SW, SP 30 lb/ft ² /ft
8'-2"	≤ 7'-6"	27'-0"	36'-0"	54'-0"
	≤ 7'-0"	32'-0"	44'-0"	66'-0"
	≤ 6'-0"	52'-0"	70'-0"	105'-0"
9'-0"	≤ 8'-4"	21'-6"	29'-0"	42'-0"
	≤ 7'-0"	36'-0"	48'-0"	72'-0"
	≤ 6'-0"	58'-0"	76'-0"	116'-0"
10'-0"	≤ 9'-4"	18'-0"	23'-0"	34'-0"
	≤ 8'-0"	27'-0"	36'-0"	54'-0"
	≤ 7'-0"	40'-0"	54'-0"	80'-0"
	≤ 6'-0"	64'-0"	86'-0"	128'-0"

- (1) CH, MH, OL, OH, and PT are unsuitable as backfill material.
- (2) See Table 1 on page 5 for definition of soil classes.
- (3) Assumed design lateral soil (psf per foot of depth) values are in accordance with Table R401.1.1(2) of the 2021 International Residential Code.
- (4) Soil Classes are in accordance with the Unified Soil Classification System.

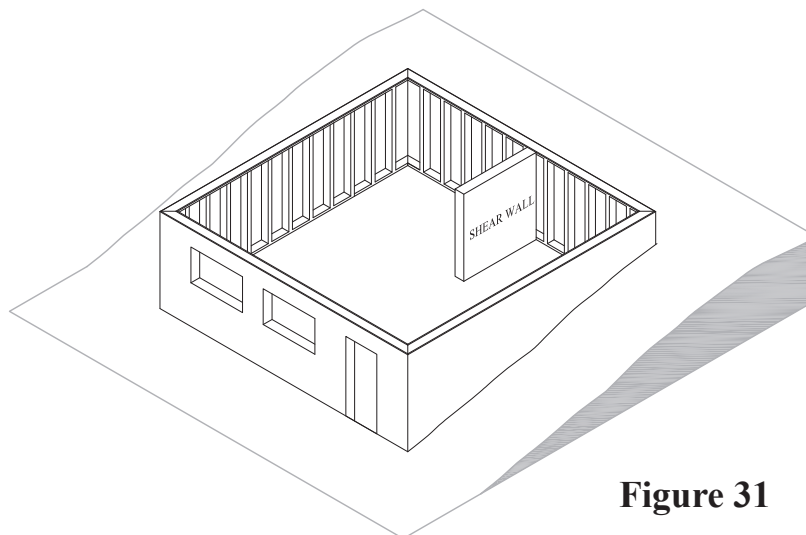


Figure 31

Stairwell Header Procedure

Stairwell openings adjacent to the foundation wall require special consideration because they often result in the foundation wall acting as a retaining wall with no top of wall restraint.

For stairwell openings up to 9'-6" in length and within 8' of the foundation panels (see [Figure 32](#) and [Figure 33](#)) (see table for Allowable Backfill material):

- Use construction adhesive between the sill plate and the top bond beam of the Superior Walls panel.
- Build a support beam (2x10 sill plate and two 2x8's), without splices, 2'-0" past each end of the stairwell opening.
- Bolt the support beam with 1/2" bolts, using washers, at every bolt or insert location provided in the Bond Beam over the length of the support beam.
- For stairwell openings larger than 9'6" in length, or for an alternative Stairwell Header Reinforcement Detail, consult an engineer or your Superior Walls supplier.

Table 6			
Allowable Backfill material for 9'-6" Stairwell Opening			
	Wall Height		
Soil Type	8'-2"	9'	10'
GW, GP, SW, SP 30 lb/ft ² /ft	OK	OK	OK
GM, SM, GC, ML 45 lb/ft ² /ft	OK	†	†
SC, CL 60 lb/ft ² /ft	†	†	†

† - Backfill with clean crushed stone.
 (1) Maximum height of backfill is 6" below the top of the wall.
 (2) See Table 1 on Page 5 for definition of Soil Classes.
 (3) CH, MH, OL, OH and PT Soil Classes are unsuitable as backfill material.

Stairwell Header Procedure: Parallel Joists

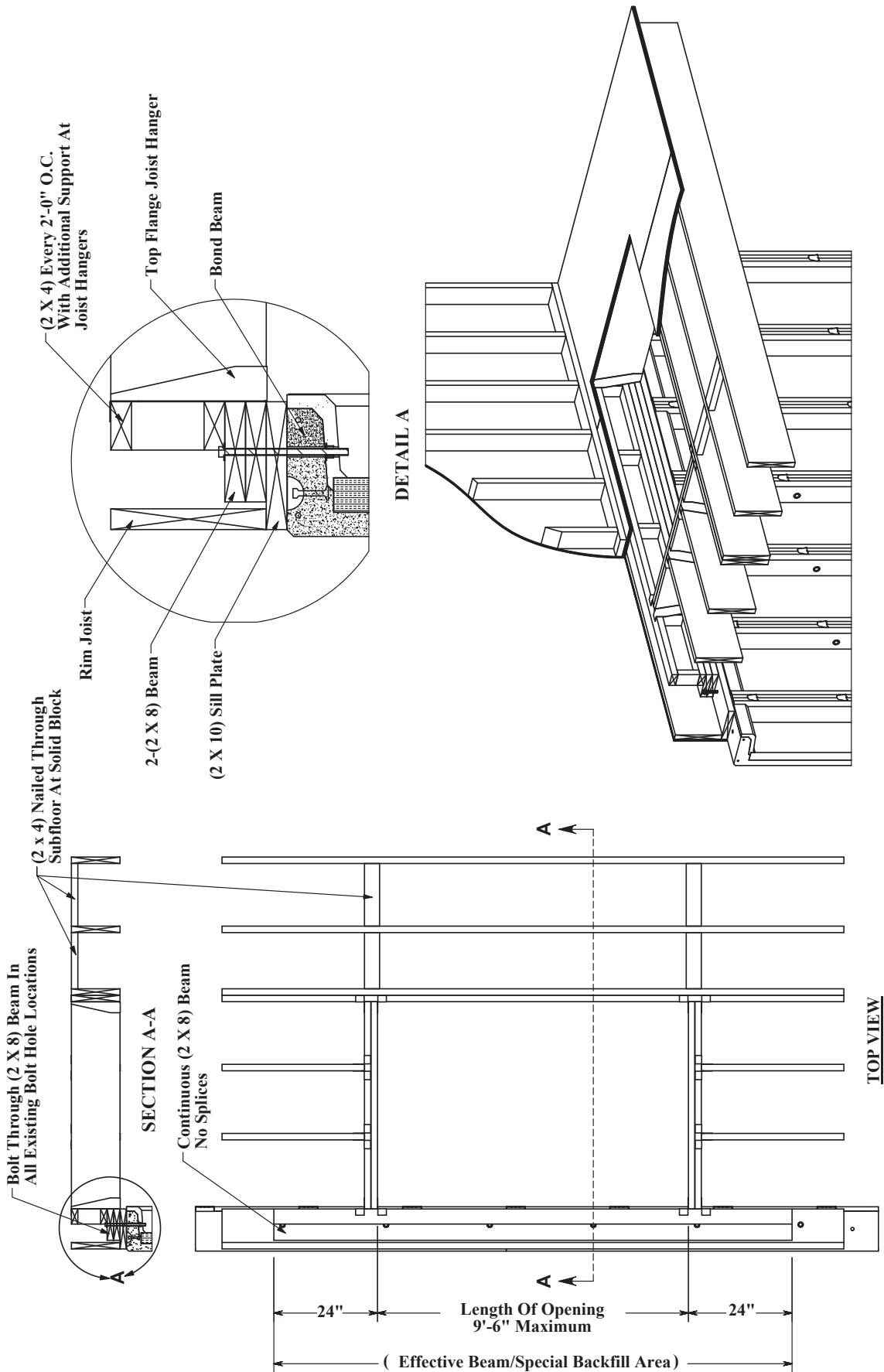


Figure 32

Stairwell Header Procedure: Perpendicular Joists

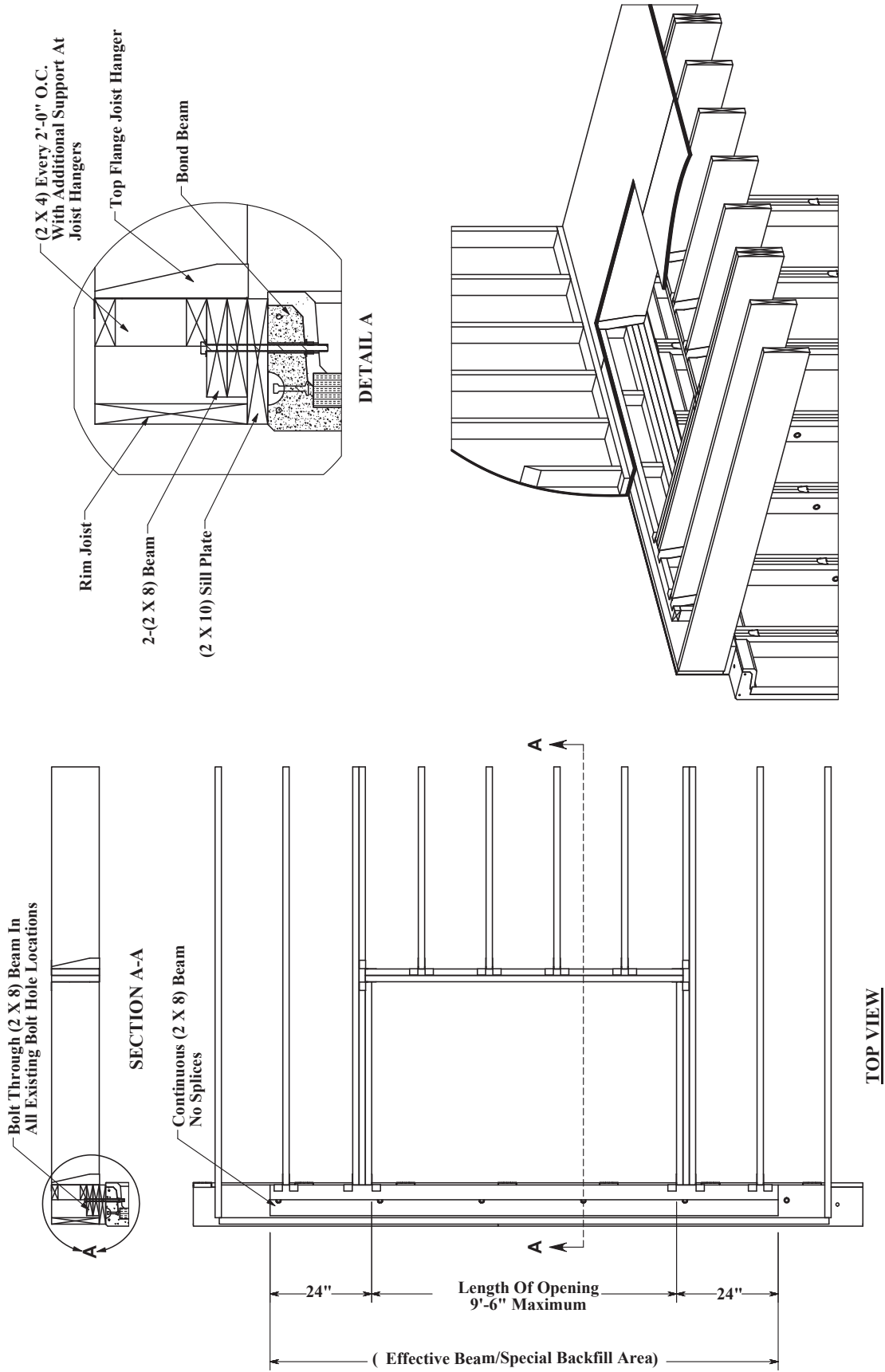


Figure 33

Backfilling

WARNING: To comply with building code requirements, the framing / decking connection at the top of the Superior Walls panel and the floor slab at the bottom of the Superior Walls panel **MUST** be completed prior to backfilling.

- It is the builder's responsibility to ensure proper site conditions.
- **Do not use expansive soil or topsoil for backfill.** For soil type, see [Table 1](#) on page 5.
- **Backfill should not exceed 60 pounds per cubic foot (PCF) equivalent fluid pressure (EFP) for any Superior Walls application.** [Note: While Xi wall panels are rated to handle up to 100 PCF, framing connection details illustrated in this booklet have not been evaluated for applications exceeding 60 PCF equivalent fluid pressure and/or for backfill exceeding 9'-6" in height.]
- When backfill exceeds 60 pounds per cubic foot (PCF) equivalent fluid pressure (EFP), and/or when wall panels exceed 10' in height, consult a design professional or other person competent in applying the structural design principles involved.
- Maximum allowed height of backfill is 6" below the top of the Superior Walls panel.
- Always slope ground away from the foundation according to local code or not less than 6" fall within the first 10 feet.
- Provide functioning rain gutters, downspouts, and run-outs. **Downspouts must NOT be run to the foundation drain.**
- Allowing heavy equipment to operate near backfilled walls may adversely affect the Superior Walls panels.
- In a condition where there is more backfill inside than outside, the maximum differential is 36". (Additional reinforcement can be added to most Superior Walls panels for product applications that require backfill differential greater than 36". Additional requirements must be discussed with your Superior Walls representative prior to panel manufacturing.)

Superior Walls does not permit the utilization of this exception.

Code Reference:
2021 IRC Section: R401.3

R401.3 Drainage. Surface drainage shall be diverted to a storm sewer conveyance or other *approved* point of collection that does not create a hazard. Lots shall be graded to drain surface water away from foundation walls. The *grade* shall fall not fewer than 6 inches (152 mm) within the first 10 feet (3048 mm).

Exception: See code for exception.

Code Reference:
2021 IRC Section: R404.1.6

R404.1.6 Height above finished grade. Concrete and masonry foundation walls shall extend above the finished *grade* adjacent to the foundation at all points not less than 4 inches (102 mm) where masonry veneer is used and not less than 6 inches (152 mm) elsewhere.

Code Reference:
2021 IRC Section: R404.1.7

R404.1.7 Backfill placement. 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 by backfill.

Exception: Such bracing is not required for walls supporting less than 4 feet (1219 mm) of unbalanced backfill.

Point Loading

It is important to identify any concentrated load that will rest directly on the sill plate or bond beam.

- When ordering, identify concentrated loads so that the factory can evaluate the load to provide the proper structural members to support it.
- Concentrated loads that must be considered include:
 - a) a load that exceeds the project's uniformly distributed load on the wall
 - b) any isolated load such as a column load.

Beam Pockets

Beam pockets are designed to support beams that will be located below floor joists. When ordering, **always specify the location, size (width and height), and design loading.**

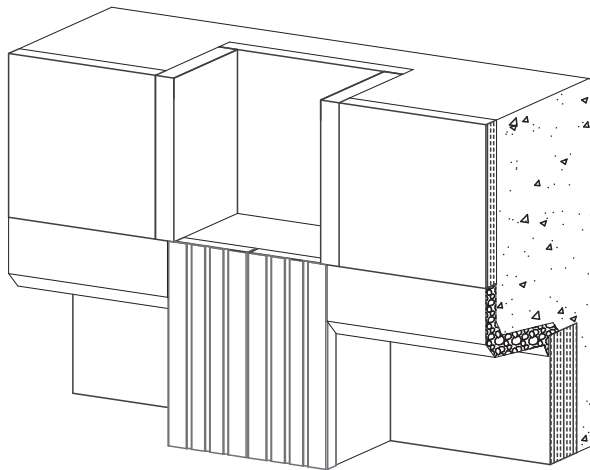


Figure 34

Code Reference:
2021 IRC Section: R606.6.3

R606.6.3 Beam supports. Beams, girders or other concentrated loads supported by a wall or column shall have a bearing of not less than 3 inches (76 mm) in length measured parallel to the beam upon *solid masonry* not less than 4 inches (102 mm) in thickness, or on a metal bearing plate of adequate design and dimensions to distribute the load safely, or on a continuous reinforced masonry member projecting not less than 4 inches (102 mm) from the face of the wall.

Precast Column Pads

- The following Precast Column Pad tables only apply to pads that conform to the Superior Walls specifications. For locally designed footing elements, follow the directions of the design professional involved.
- Precast column pads may be ordered for the support of columns designed for the loads indicated on the following charts.
- Crushed stone must be consolidated in 8" lifts with a plate vibrator.**
- "Depth of Stone" assumes 1/2" clean crushed stone, beneath pad, on virgin soil. Consider soil bearing capacity and stone depth requirements when selecting.
- Capacity values assume that the load is centered on the pad and that the column base is a minimum of 6" square.
- Interpolation for other soil bearing values is permitted.
- Capacity was analyzed in accordance with ACI 318-05.*

Table 7					
2' x 2' x 4-1/2" Precast Column Pad					
Depth of Stone	Excavation Width (Minimum)	Allowable Load (lbs.) (Based on soil bearing capacity)			
		1500 psf soil	2000 psf soil	3000 psf soil	4000 psf soil
2"	2'-3"	7,210	9,614	14,421	15,400*
4"	2'-5"	8,532	11,375	15,400*	15,400*
6"	2'-7"	9,964	13,285	15,400*	15,400*
8"	2'-10"	11,508	15,344	15,400*	15,400*
10" **	3'-0"	13,162	15,400*	15,400*	15,400*
12" **	3'-2"	14,928	15,400*	15,400*	15,400*
14" **	3'-5"	15,400*	15,400*	15,400*	15,400*

* Denotes pad limit
** Crushed stone must be consolidated in 8" lifts with a plate vibrator.

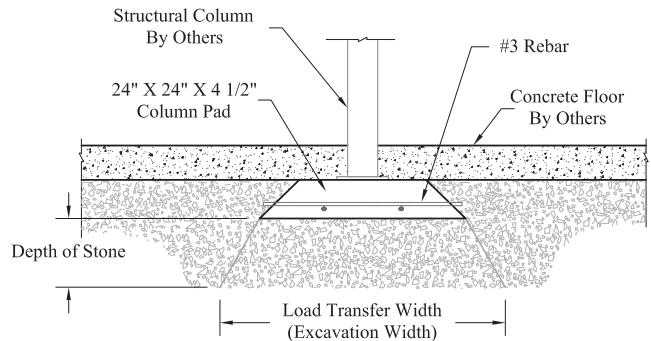


Figure 35

Table 8					
3' x 3' x 6" Precast Column Pad					
Depth of Stone	Excavation Width (Minimum)	Allowable Load (lbs.) (Based on soil bearing capacity)			
		1500 psf soil	2000 psf soil	3000 psf soil	4000 psf soil
0"	3'-0"	13,500	18,000	27,000	28,000*
2"	3'-3"	15,288	20,383	28,000*	28,000*
4"	3'-5"	17,186	22,915	28,000*	28,000*
6"	3'-7"	19,196	25,595	28,000*	28,000*
8"	3'-10"	21,317	28,000*	28,000*	28,000*
10" **	4'-0"	23,549	28,000*	28,000*	28,000*
12" **	4'-2"	25,892	28,000*	28,000*	28,000*
14" **	4'-5"	28,000*	28,000*	28,000*	28,000*

* Denotes pad limit
** Crushed stone must be consolidated in 8" lifts with a plate vibrator.

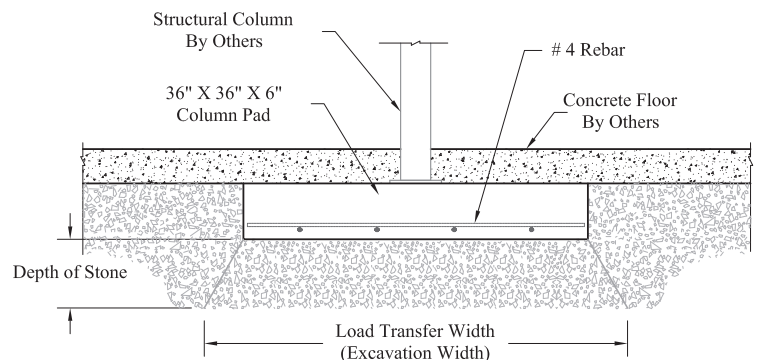


Figure 36

Precast Column Pads (cont.)

Table 9					
4' x 4' x 8" Precast Column Pad					
Depth of Stone	Excavation Width (Minimum)	Allowable Load (lbs.) (Based on soil bearing capacity)			
		1500 psf soil	2000 psf soil	3000 psf soil	4000 psf soil
0"	4'-0"	24,000	32,000	41,366*	41,366*
2"	4'-3"	26,365	35,153	41,366*	41,366*
4"	4'-5"	28,841	38,455	41,366*	41,366*
6"	4'-7"	31,428	41,366*	41,366*	41,366*
8"	4'-10"	34,126	41,366*	41,366*	41,366*
10" **	5'-0"	36,936	41,366*	41,366*	41,366*
12" **	5'-2"	39,856	41,366*	41,366*	41,366*
14" **	5'-5"	41,366*	41,366*	41,366*	41,366*

* Denotes pad limit
 ** Crushed stone must be consolidated in 8" lifts with a plate vibrator.

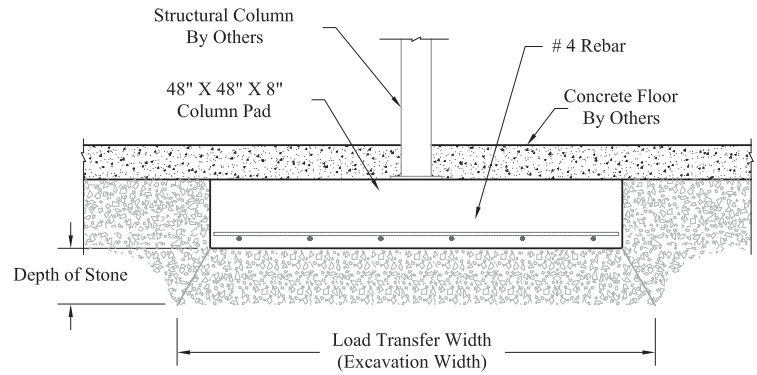


Figure 37

Support Ledges

- You may specify either a 4" or 5-1/2" projection for ledges to support:
 - Brick or stone veneers
 - Adjoining walls
 - Garage, porch or patio floor pours

Ledges may be either continuous or intermittent. Vertical and horizontal ledge location must be specified.

- Wall ties are needed when the ledge is intended to support masonry veneers and is 16" or more below the top of the Superior Walls panel.
- 4" and 5-1/2" support ledges are rated for 2,900 pounds per linear foot (for Ui Wall capacities, see page 45).
- See building code reference for flashing requirements.

Code Reference:
2021 IRC Section: R703.8

R703.8 Anchored Stone and masonry veneer, general. See code for requirements.

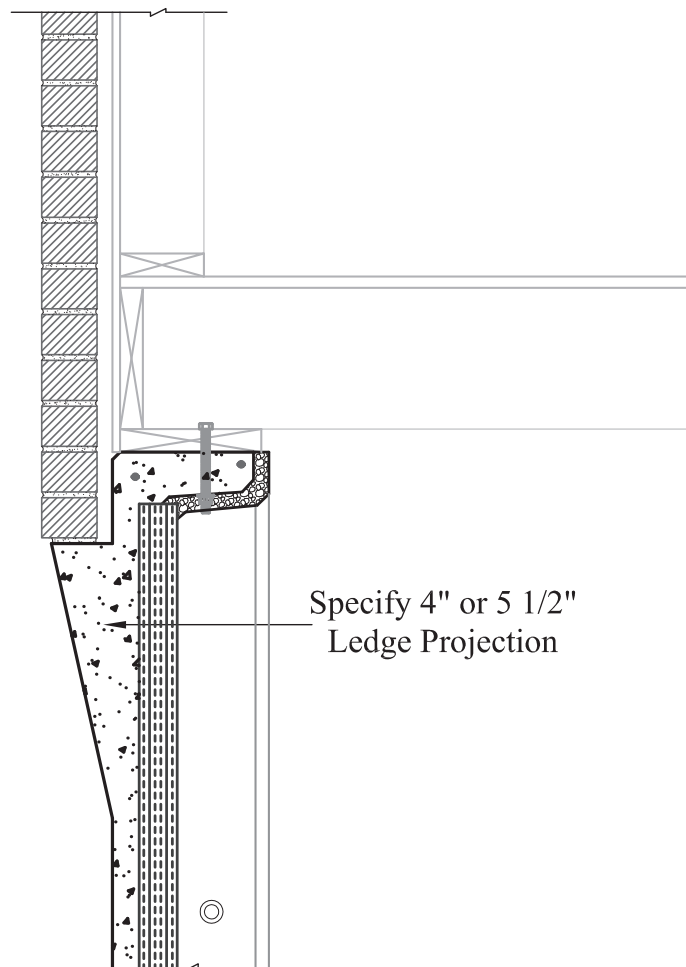


Figure 38

Ui Wall (Uninsulated Wall)

- This wall type is used primarily for garage frost walls.
- Perimeter drain is not required on frost wall applications that are below the frost line.
- Contact your local Superior Walls representative for available top of wall dimensions.

Ui Wall Guidelines:

Maximum Uniform Load Capacity on top of Ui Wall panels:

- 2700 pounds per linear foot (PLF) or,
- 1550 pounds per linear foot (PLF) with the addition of a Support Ledge (4" Projection only) with a maximum load capacity of 400 PLF on the Support Ledge

Garage Slab Requirements:

- Turned down slab (6" minimum width and 6" minimum depth at slab edge)
- 3/8" x 5" Garage Slab Restraint Bolts, spaced 1 per every 48" for entire length of wall

Backfill Requirements:

- 18" maximum unbalanced fill

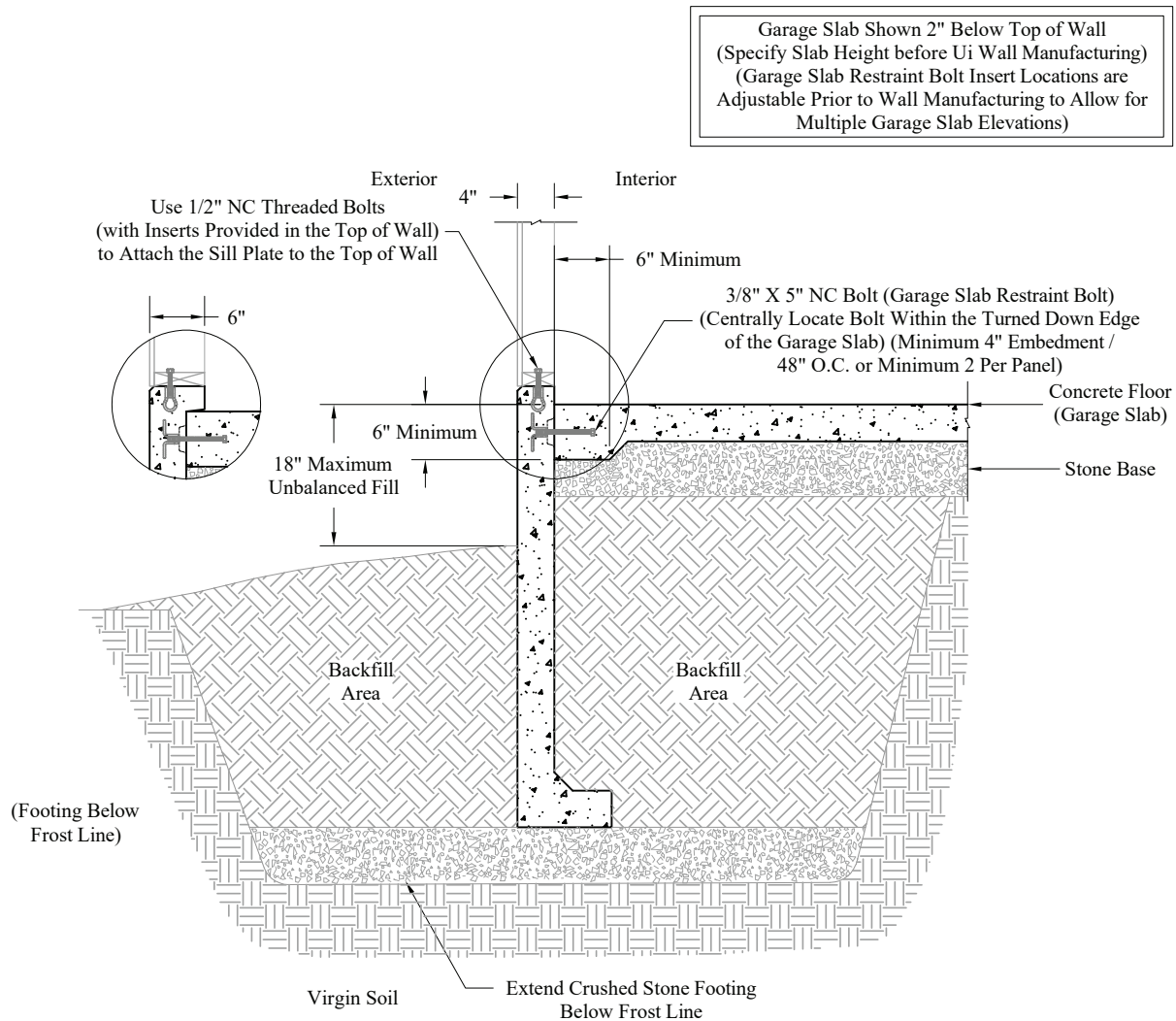


Figure 39

Egress

Emergency Escape and Rescue Openings

- Consult your Code Official regarding applicable egress requirements.
- Your design professional or Superior Walls representative can provide guidance concerning egress options specific to your jobsite.
- Egress product accessories (i.e. Window Wells, Grates, Covers, Bulkhead Enclosures, etc.) may be available from your local Superior Walls supplier to complement your Superior Walls panels.
- Consider having your Superior Walls panels built to accommodate the egress/emergency escape and rescue opening requirements for future construction plans.
- Window Wells shall be designed for proper drainage.

Code Reference:
2021 IRC Section: R310.1

R310.1 Emergency escape and rescue opening required. Basements, habitable attics and every sleeping room shall have not less than one operable emergency escape and rescue opening... See code for additional requirements and exceptions.

Code Reference:
2021 IRC Section: R310.2.1

R310.2.1 Minimum opening area. Emergency escape and rescue openings shall have a net clear opening of not less than 5.7 square feet (0.530 m²)... See code for additional requirements and exceptions.

Code Reference:
2021 IRC Section: R310.4

R310.4 Area Wells. An emergency escape and rescue opening where the bottom of the clear opening is below the adjacent grade shall be provided with an area well in accordance with Sections R310.4.1 through R310.4.4

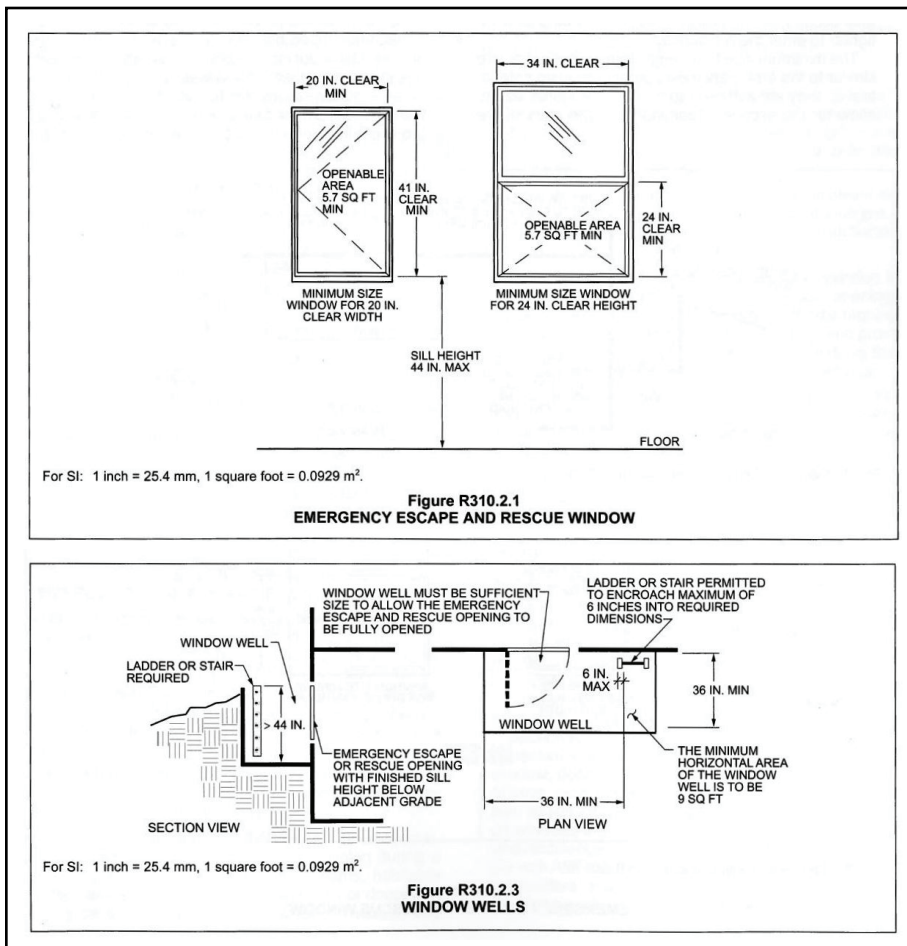
Code Reference:
2021 IRC Section: R310.4.3

R310.4.3 Drainage. Area wells shall be designed for proper drainage... See code for additional requirements and exceptions.

Code Reference:
2021 IRC Section: R311.1

R311.1 Means of egress. Dwellings shall be provided with a means of egress in accordance with this section.

See code for egress requirements for bulkhead enclosures and for windows and doors in a daylight basement.



(from the 2018 International Residential Code® 2nd Commentary)

Additional copies of this Homeowner Guide are available for download at www.superiorwalls.com. For additional technical resources, see <https://www.superiorwalls.com/resources/documents-center/>.

Controlling Humidity and Condensation

Modern construction methods have resulted in tighter, more energy-efficient homes that require planning for the control of humidity and condensation. Because a Superior Walls wall panel is constructed with a high-performance concrete mix and lined with closed-cell foam insulation, it prevents the free flow of moisture through the wall panel. Though this is a good thing when seeking to keep ground water out of your basement, it also acts to keep moisture vapor inside the house.

In certain conditions of high interior humidity and low exterior temperatures, it is possible that condensation may form on the interior surface of the Superior Walls panel. Condensation can occur anytime moist air contacts a surface that has a temperature less than the dew-point of the air.

Condensation may be controlled in a number of ways:

1. By reducing the amount of moisture in the air:
 - a. Limit moisture-producing sources or activities like non-vented clothes dryers or hot-tubs.
 - b. Use a dehumidifier.
2. By preventing the moisture from reaching the cold wall surface:
 - a. Remove the moist air with an exhaust fan or other ventilation.
3. By increasing the temperature of the room:
 - a. Add heat and the air will hold more moisture.
 - b. Increase the room temperature and you will also increase the temperature of the wall surface.

For additional technical information, please see the Technical Resources section of our website:

<https://www.superiorwalls.com/resources/documents-center/>

It is usually most effective to use more than one of these methods in order to effectively control condensation.

“Original Equipment” Foam Insulation

Most Superior Walls products are tested to comply with the requirements of the 2021 International Residential Code - Section R316 (Foam Plastic). No additional thermal barrier is required UNLESS the product is labeled as requiring a thermal barrier or additional foam insulation has been added after the panel was manufactured.

Exterior Maintenance

- **Grade** – Slope the ground away from the home a minimum of 6 inches within the first 10 feet from the wall (additional slope may be required by your local building code). Re-grade if soil settles over time.
- **Gutters and Downspouts** - Keep gutters and downspouts free of leaves and debris. Splash blocks or down spout extensions should be used to divert water away from the foundation.
- **Shrinkage Cracks** - Shrinkage cracks are fairly common in concrete products. Shrinkage cracks pose no threat of structural damage or potential for leakage. This type of crack typically occurs during the curing process, is generally less than 1/16” in width, and is limited to the surface of the wall. This type of crack does not need any type of repair. However, if desired, cosmetic treatments may be performed using a stucco type material or masonry paint.
- **Sealant** - Sealant below the ground level that is not exposed to UV light will not require maintenance. Sealant in panel joints exposed to UV light above the level of the ground may experience surface discoloration or cracking. If UV damage has occurred, joints can be resealed with a quality one-part polyurethane masonry sealant.

Still have questions? Contact your Superior Walls representative for answers to your questions. Find your local representative at www.superiorwalls.com using the “Find Your Authorized Dealer” link. For more technical information and details, see the Technical Resources section of our website at <https://www.superiorwalls.com/resources/documents-center/>.

Additional copies of this sheet are available for download at www.superiorwalls.com. For additional technical resources, see <https://www.superiorwalls.com/resources/documents-center/>.

Interior Finishing of Superior Walls Panels

- **Corner Studs and Blocking** – Always use preservative-treated lumber for corner studs and nailers placed against the concrete. For areas where there will be objects fastened to the finished walls between existing studs, install appropriate wood blocking. (i.e. For curtain rods, cabinets, doorstops, or electrical and plumbing fixture locations.)
- **Wiring and Plumbing** – Using the pre-cast holes in the studs, install all electrical wiring and small plumbing lines according to local codes. Holes may be drilled through the top bond beam for wiring and plumbing drops.
- **Drywall and Interior Finishes** – After the corner studs and all blocking are in place, the Superior Walls panels are ready for drywall. Regular ½” drywall is recommended to span the stud spacing. It is best to leave a ½” gap between the concrete floor and the bottom of the drywall to prevent moisture absorption into the drywall. This moisture can cause drywall deterioration and paint finish problems. Attach the drywall using 1” drywall screws (fine thread / sharp point). A solid bead of construction adhesive should be applied to the top bond beam and the face of the stud. The use of paneling or other similar products should still be backed with a layer of drywall.
- **Exterior Holes in Superior Wall Panels** – Any exterior holes that may be required for such things as sanitary soil lines, electrical service entrance cables, or chimney flues, should be made between the studs of the Superior Walls panels, following these simple procedures:
 1. Remove insulation from the interior of the wall panel and drill a pilot hole at the hole location, from the interior to the exterior.
 2. For small holes, use a core bit and hammer drill, always working from the exterior of the wall.
 3. For larger holes, first trace the circumference of the desired hole. Then drill a series of holes around the perimeter of the tracing from the exterior of the wall.
 4. Use a chisel, always working from the outside in, to remove the concrete.
 5. After the pipe is installed, apply a one-part polyurethane sealant around the pipe on the interior side.
 6. Finish by sealing the outside (pipe to concrete) with a one-part polyurethane sealant.

Adding Insulation to a Superior Walls Panel

There are two insulation methods that will consistently yield satisfactory results and prohibit condensation from forming within the wall cavity:

- Spray-on 2-part polyurethane foam. This is a closed cell material and completely closes off the cavity from moisture penetration. It can be obtained both professionally and as a DIY kit. Several DIY kits are available on the internet. Foam can be sprayed to the required thickness to achieve the desired R-value.
- Add extruded/expanded polystyrene foam board between the studs, and seal between the foam board and studs with a (“great stuff-type”) canned polyurethane. The polystyrene foam board is closed cell; moisture cannot pass through, and when used in conjunction with the canned foam, completely closes off the cavity from moisture penetration. Foam board is readily available for the DIY market, as is the canned polyurethane foam.

Generally speaking, after adding any type of exposed foam insulation to the interior of a wall assembly, the building code requires that you cover the insulation with a thermal barrier to protect the insulation from fire - see your local building code for details.

When adding other types of insulation to a Superior Walls wall panel, it is important to consider two factors to ensure that water vapor does not condense within the wall cavity:

1. Controlling the moisture content of the air trapped in the cavity while adding the insulation. (Use of a dehumidifier is recommended.)
2. Restricting moisture-laden air from entering the cavity from the living space or from the earth beneath the wall. (This may be accomplished through the use of paints, sealants, and spray foams. Daylight drains require a backwater valve on the drain line to prevent a back-flow of moist air.)

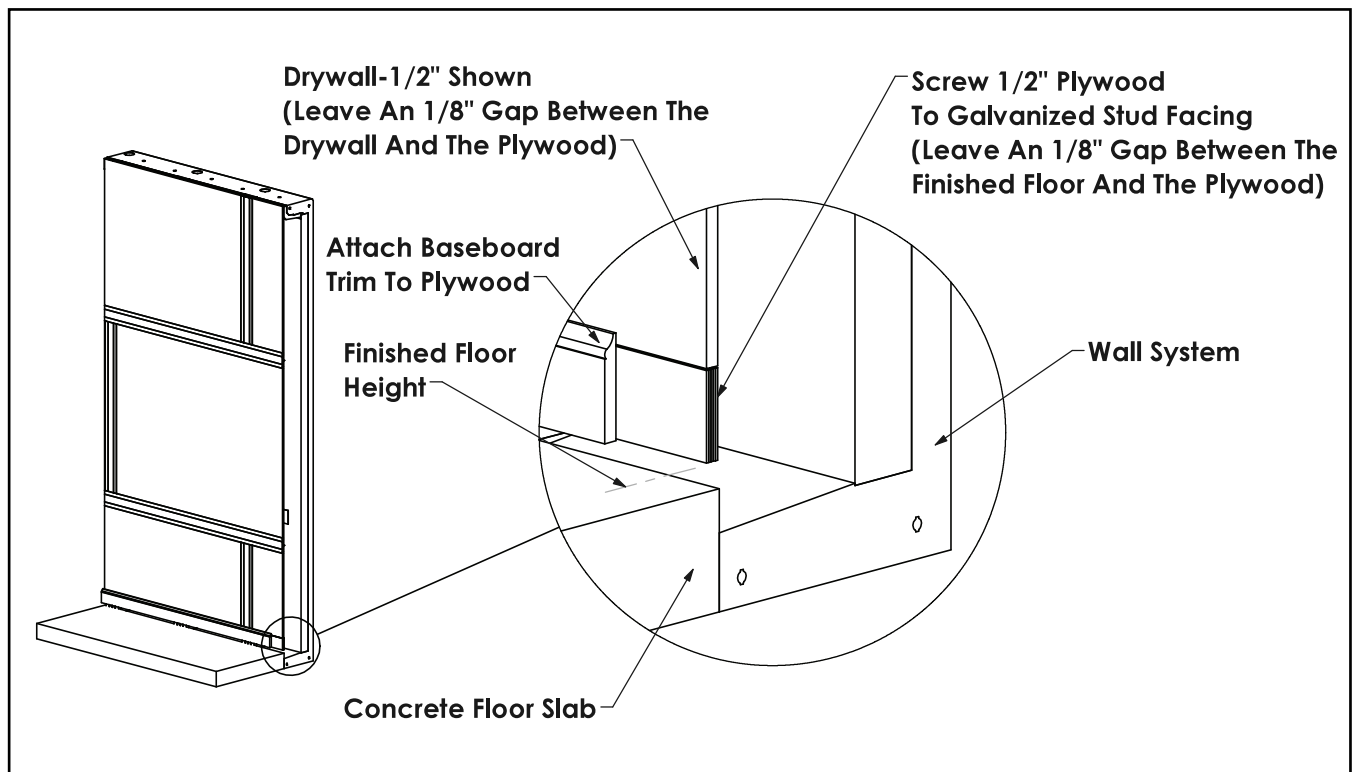
The essential issue is that you must stop moisture from entering the stud cavity.

- Fiberglass batt, cellulose, Icynene®, or other materials may perform satisfactorily if the considerations noted above are properly dealt with.

NOTE: This information is general in nature and may not be applicable in every situation. Your design professional (i.e. builder, architect, engineer, or supplier) can assist you in special conditions. When in doubt, please ask for guidance concerning your particular application.

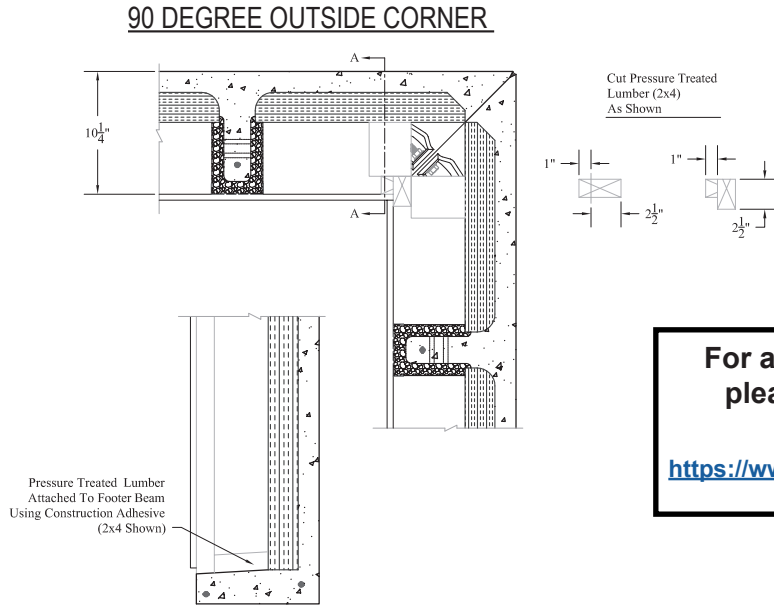
Attaching Drywall and Baseboards

The following is a possible method for installing baseboards to an Xi wall panel. Other methods may be acceptable.



Drywall Blocking Details

The following detail provides a possible method that may be used to frame up the corners of Superior Walls panels for attaching drywall. A similar method or the combination of bolted 2x6 pressure treated studs (to the sides of the Superior Walls studs using the precast chase holes) with horizontal blocking pieces can be used to create points of attachment for heavy items such as television mounts or shelving. Any required additional blocking or nailers should be installed prior to drywalling.

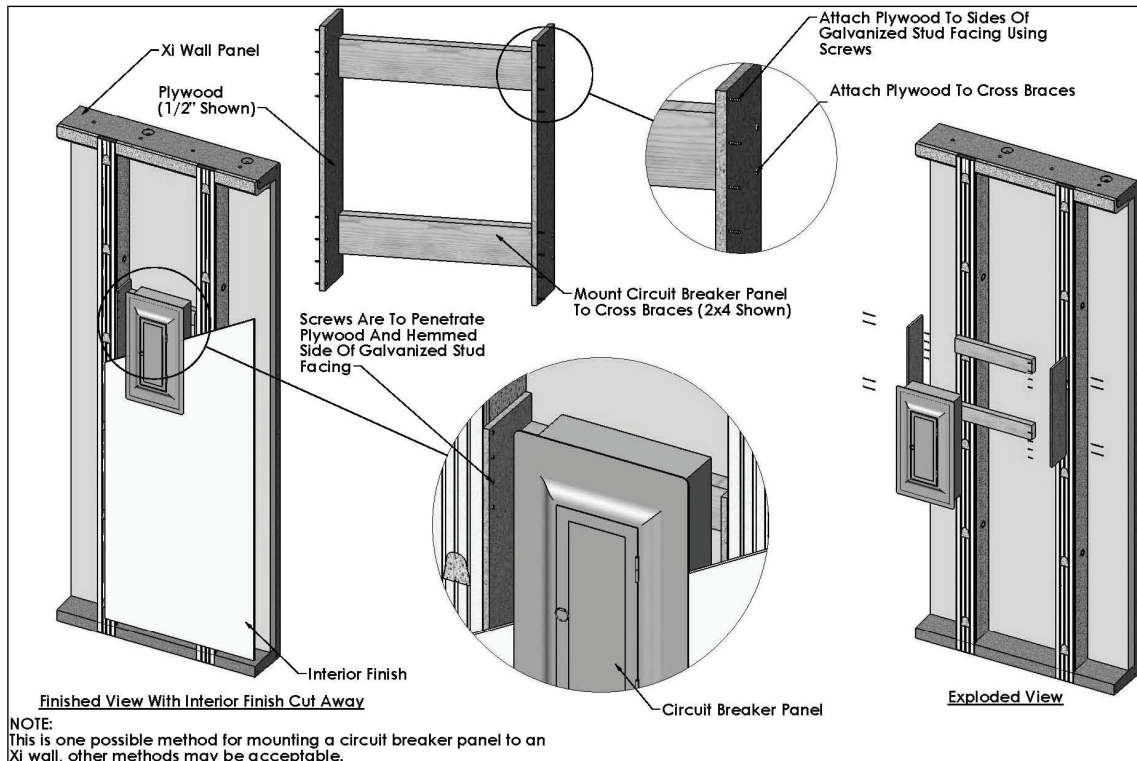


**For additional drywall blocking details,
please see the Technical Resources
section of our website:**

<https://www.superiorwalls.com/resources/documents-center/>

Attaching a Circuit Breaker Panel

The following is a possible method for mounting a circuit breaker panel to an Xi wall panel. Other methods may be acceptable.



Still have questions? Contact your Superior Walls representative for answers to your questions. Find your local representative at www.superiorwalls.com using the "Find Your Authorized Dealer" link. For more technical information and details, see the Technical Resources section of our website at www.superiorwalls.com/resources/documents-center/.

For use by builders and general contractors to ensure proper foundation design, construction, installation, and performance. All page references made below use the Superior Walls of America Builder Guideline Booklet (Revised JAN 2022) and the 2021 International Residential Code. Additional copies of this checklist are available for download at www.superiorwalls.com.

1. Provide your local Superior Walls representative with:

- Floor plans and elevations
- Design load (total pounds) per linear foot on the foundation
- Beam and column locations, sizes and point loads
- Additional point loads and locations
- Window and door locations, rough opening sizes, and opening style
- Egress (Emergency Escape and Rescue Openings) requirements
- Exterior finishes requiring support ledges
- Interior stairway locations, opening sizes (affects panel lengths)
- Inside fill conditions
- Exterior basement entry system specifications
- Chimney details

**For additional technical information,
please see the Technical Resources
section of our website:**

<https://www.superiorwalls.com/resources/documents-center/>

2. Prepare Site:

- Building Permits and Inspections
- Soils Verification
- Excavation
- Placement of Crushed Stone Footing
- Placement of Drain Pipe and Sump Pit or Daylight Drain
- Installation of Filter Membrane
- Cold Weather Practice
- Locate Building Corner Pins and Establish Grade
- Site Accessibility: Truck and Crane Access, Trailer Unload Area, Crane Pad(s)
- Installation of Sill Plate and Framing Attachments
- Backfill After Concrete Floor has been Poured and Framing / Decking Connection is complete

3. Provide checklist from Builder Guideline Booklet for:

- Excavation
- Concrete floor
- Framing
- Inspection

4. Provide approved drawings (Date: _____ Revision: _____) for:

- Excavation
- Concrete
- Framing

5. Soil characteristics

- Determine type (Soil Class) _____ and allowable Load-Bearing Pressure _____ (Table 1 on Pg. 5)
- Determine combined footing load per linear foot _____ (Uniform Wall Load) (Table 2 on Pg. 6)

6. Crushed stone footing (Pg. 6)

- Determine stone depth (Table #2 on Pg. 6) _____
- Communicate stone depth to excavator

7. Excavation (Pg. 7)

- Provide elevations
- Set corner pins
- Communicate to excavator: site accessibility needs (trucks and crane)

8. Drain system and daylight drain or sump (Pg. 6, 7 & 8)

- Communicate to excavator: placement of perforated drain pipe in reference to corner pin location (Figure 2 on Pg. 6, Foundation Drainage on Pg. 8)
- Communicate to excavator: location of daylight drain and backwater valve (Pg. 8) or location of sump accumulation tank(s)
- Install filter membrane (Pg. 8)

9. Shear walls (Pg. 36)

- Verify need for shear walls
- If required, verify that shear walls are attached to floor, outside wall and joist(s) above
- Choose shear wall construction: ___ Superior Walls panel or ___ Other construction
- If Other construction, communicate construction requirements

10. Concrete floor (Pg. 18)

NOTE: To comply with building code and Superior Walls of America, Ltd. requirements, the framing / decking connection at the top of the Superior Walls panel and the floor slab at the bottom of the Superior Walls panel MUST be completed prior to backfilling.

- Communicate need to embed Superior Walls Slab Connector (if included) into concrete floor pour
- Communicate slab specifications per Code and BGB requirements

11. Crawl space (Pg. 20 & 21): **Choose** one of the following:

- 2" minimum poured concrete floor
- 12" minimum inside fill

12. Framing / Modular connection (Pg. 24 to 35)

NOTE: To comply with building code and Superior Walls of America, Ltd. requirements, the framing / decking connection at the top of the Superior Walls panel and the floor slab at the bottom of the Superior Walls panel MUST be completed prior to backfilling.

- Determine fastening schedule (Table #3 on Pg 27) (_____" OC)
- Communicate fastening schedule to framers
- Bolted not more than 12" from the ends of each sill plate section (R403.1.6)
- Framing strap (if used) lies between band joist and sill plate (Figure #29 on Pg. 34), is fastened with 1-1/2" nails provided, 1 nail per hole, Verify strap spacing (Table #4 on Pg. 34)
- Bolted in center 1/3 of Plate

13. Electrical / Plumbing

- Communicate proper method to drill / cut holes through Superior Walls panels.

Exterior Holes in Superior Wall Panels – Any exterior holes that may be required for such things as sanitary soil lines, electrical service entrance cables, or chimney flues, should be made between the studs following these simple procedures:

1. Remove insulation from the interior of the wall panel and drill a pilot hole at the hole location, from the interior to the exterior.
2. For small holes, use a core bit and hammer drill, always working from the exterior of the wall.
3. For larger holes, first trace the circumference of the desired hole. Then drill a series of holes around the perimeter of the tracing from the exterior of the wall.
4. Use a chisel, always working from the outside in, to remove the concrete.
5. After the pipe is installed, apply a one-part polyurethane sealant around the pipe on the interior side.
6. Finish by sealing the outside (pipe to concrete) with a one-part polyurethane sealant.

For use by excavators to ensure accuracy of excavation, efficiency in foundation installation, and proper backfilling and grading. All page references made below use the Superior Walls of America Builder Guideline Booklet (Revised JAN 2022) and the 2021 International Residential Code. Additional copies of this checklist are available for download at www.superiorwalls.com.

1. Builder Guideline Booklet

- Obtain your personal copy of the Builder Guideline Booklet

2. Site drawings

- Confirm you are working from the approved drawing before you dig
- Drawing date: _____ Drawing Rev: _____

3. Building placement

- Obtain required benchmark elevations from builder
- Excavate per set pins from builder

**For additional technical information,
please see the Technical Resources
section of our website:**

<https://www.superiorwalls.com/resources/documents-center/>

4. Excavation (Pg. 7)

- Trench dug below frost line
- Verify with builder either: ___ sump pump or ___ daylight drain
- If sump pump, number of accumulation tanks _____
- Provide minimum 2'-0" over-dig at base of foundation (both sides of wall) (Pg. 7 & 13)
- Properly bench banks (for excavations more than 5'-0" deep, bench or slope in accordance with OSHA Standard 1926.652)
- If excavating for a Crushed Stone Trench Footing, dig trench 36" wide (Pg. 15)
- Provide ramp for access to hole if required
- Pile soil a safe distance from hole
- Excavate for column pads as required
- Prepare access driveway, trailer location pads, and crane pad(s)

5. Crushed stone footing (Pg. 9)

- Obtain required stone depth from builder (___ inches)
- Dig footing per required stone depth (Table #2 on Pg. 6)
- Use 4 inch (min. dia.) perforated pipe (Figure 2 on Pg. 6) and locate pipe (Foundation Drainage on Pg. 8)
- Place drain pipe (Figure 2 on Pg. 6 and Foundation Drainage on Pg. 8)
- Clean crushed stone (1/2" Max; Pg. 9)
- Consolidate stone in a maximum of 8" lifts with plate vibrator
- Direct drain pipe to accumulation tank(s) or daylight (Foundation Drainage on Pg. 8)
- Evenly grade the stone to within +/- 1 inch of level
- Leave enough stone behind for use in final grading by the wall installation crew
- Install filter membrane on top of stone footing prior to backfill (R405.1.1)

6. Concrete floor (Pg. 18)

- Provide clean 4" base (R506.2.2)

7. Backfilling (Pg. 40)

- Get approval to backfill from builder

NOTE: To comply with building code and Superior Walls of America, Ltd. requirements, the framing / decking connection at the top of the Superior Walls panel and the floor slab at the bottom of the Superior Walls panel MUST be completed prior to backfilling!

8. Final grading (Pg. 40)

- Slope the final soil grade a minimum of 6" fall within the first 10'-0" to divert ground water away from foundation (Pg. 40 and R401.3)
- Finished soil grade must be at least 6" below top of the Superior Walls panel (Pg. 40)

For use by concrete flatwork contractor in pouring the basement floor. All page references made below use the Superior Walls of America Builder Guideline Booklet (Revised JAN 2022) and the 2021 International Residential Code. Additional copies of this checklist are available for download at www.superiorwalls.com.

1. Builder Guideline Booklet
 - Obtain your personal copy of the Builder Guideline Booklet
2. Building drawings
 - Confirm you are working from the approved drawing
 - Drawing date: _____ Drawing Rev: _____
3. Crawl space (Pg. 20 & 21): Confirm, with builder, one of the following:
 - 2" minimum poured concrete floor
 - 12" minimum inside fill
4. Typical concrete floor pour (Pg. 18)
 - Clean 4" base (R506.2.2)
 - Install vapor retarder under floor pour as required by local code (R506.2.3)
 - 3-½" minimum concrete floor thickness (R506.1)
 - Fasten lath at the desired height of the concrete floor to form a screed board (optional)
 - Bend slab connectors (if present) down before pouring concrete floor
 - Provide 2" minimum concrete contact between base of wall and concrete floor
5. Raised concrete floor (at a level higher than the typical elevation) (Pg. 19)
 - Clean 4" base (R506.2.2)
 - Install vapor retarder under floor pour as required by local code (R506.2.3)
 - 3-½" thick minimum floor thickness (R506.1)
 - Cut and remove foam insulation at the desired floor elevation (as required)
 - Cut and remove the interior stud facing at the desired floor elevation (as required)

**For additional technical information,
please see the Technical Resources
section of our website:**

<https://www.superiorwalls.com/resources/documents-center/>

For use by framing contractors to ensure proper framing connection to top of Superior Walls panels. All page references made below use the Superior Walls of America Builder Guideline Booklet (Revised JAN 2022) and the 2021 International Residential Code. Additional copies of this checklist are available for download at www.superiorwalls.com.

1. Builder Guideline Booklet

- Obtain your personal copy of the Builder Guideline Booklet

2. Building drawings

- Confirm you are working from the approved drawing
- Drawing date: _____ Drawing Rev: _____

3. Crawl space (Pg. 20 & 21): Confirm, with builder, one of the following:

- 2" minimum poured concrete floor
- 12" minimum inside fill

4. Sill plate framing connection (Pg. 24 to 27)

- Obtain sill plate bolting frequency from builder (Table #3 on page 27) (___24" OC or ___ 48" OC)
- ½" bolts/studs with washers used to attach the sill plate to the top bond beam
- Fastened above window & door headers (Pg. 24)
- A minimum of 2 bolts/studs per sill plate section
- Bolted within 12" of the ends of each sill plate section (R403.1.6)
- Sill plate splices are at least 48" from any foundation panel joint
- Bolted in center 1/3 of Plate

5. Perpendicular floor joist connection (Pg. 24)

- Each joist nailed to sill plate with two 16d common nails (3-1/2" x 0.162") (or according to code)

6. Parallel floor joist connection (Pg. 24)

- 2 x 6 end-wall braces and joist blocking located every 48" and within 12" from the interior of each corner (Pgs. 24-34)
- 2 x 6 end-wall brace nailed to sill plate with five 10d nails
- Obtain number of solid blocks required from builder _____
- 1 solid block used if backfill is 0' to 7'-6"
- 2 solid blocks used if backfill is between 7'-6" and 9'-6" for joists less than 10" in height
- 3 solid blocks used if backfill is between 7'-6" and 9'-6" for joists that are greater than or equal to 10" in height (See fastening details on Pg. 27 to 34)
- Blocking requires six 10d nails through floor (conventional construction) or construction adhesive on top of blocking (modular construction) (Pg. 34)

7. Modular connection (Pg. 34)

- Obtain required spacing (32" or 48" OC) for framing straps from builder (Table #4 on Pg. 34)
- Install framing straps between band joist and sill plate (Figure 29 on Pg. 34)
- Nail framing strap with 1 ½" nails provided with straps
- 1 nail in every nail hole

8. Wooden Shear wall (Pg. 36)

- Determine from builder if a wooden shear wall is required (___ Yes ___ No)
- Shear wall attached to concrete floor, wall and floor joist(s) above (per design professional specifications)

9. Stairwell header (Pg. 37 to 39).

- Is the long side of the stairway opening within 8' of the parallel Superior Walls panel?
- If "YES":
 - Support beam (2 x 10 sill plate and two 2 x 8's) 2'-0" past each end of the opening without splices
 - Use 1/2" bolts/studs with washers in every precast hole through the bond beam or threaded insert location
 - Openings larger than 9'-6" must be reviewed by an engineer or be an alternative Superior Walls Stairwell Header reinforcement design

10. Roof truss connections (Pg. 35)

- Obtain sill plate bolting frequency from builder per table #3 on page 27 (___ 24" OC ___ or ___ 48" OC)
- Verify with builder what structural cross bracing (for wind loads or backfill) is required for the trusses (per manufacturer's specs)
- Verify with builder if uplift clips are required for the trusses

**For additional technical information,
please see the Technical Resources
section of our website:**

<https://www.superiorwalls.com/resources/documents-center/>

File # _____
Builder _____
Address _____

Job Name _____
Directions _____



CODE INSPECTOR'S CHECKLIST

Rev: 01/2022

For use by building code inspectors to simplify and expedite the inspection process with Superior Walls foundations. All page references made below use the Superior Walls of America Builder Guideline Booklet (Revised JAN 2022) and the 2021 International Residential Code. Additional copies of this checklist are available for download at www.superiorwalls.com.

1. Verify soil characteristics (Pg. 5)
 - Minimum 1,500 PSF capacity (Table R401.4.1)

2. Verify crushed stone footing (Pg. 6, 8, & 9)
 - Stone depth (Table #2 on Pg.6)
 - Clean crushed stone (1/2" Max)
 - Filter membrane by others prior to backfill (R405.1.1)

3. Verify excavation (Pg. 7)
 - Trenches / excavation dug below frost line

4. Verify drain system / sump pump (Pg. 6, 7 & 8)
 - Drainage pipe installed (Figure 2 on Pg. 6 & Foundation Drainage on Pg. 8)
 - Backwater Valve as required for daylight drain (Pg. 8)
 - Accumulation tank for sump if not draining to daylight

5. Verify concrete floor (Pg. 18 & 19)
 - 4" base provided (R506.2.2)
 - 3-1/2" thick minimum floor thickness (R506.1)
 - Vapor retarder provided under floor as required (R506.2.3)
 - 2" minimum concrete contact between base of wall and concrete floor, for typical floor pour
 - Raised floor pour options (Pg. 19)
 - Slab connectors (if present) bent into concrete floor pour

6. Verify crawl space construction if present (Pg. 20 & 21) and the presence of one of the following:
 - 2" minimum poured concrete floor thickness, or
 - 12" minimum inside fill, or

7. Verify sill plate framing connection (Pg. 24)
 - Bolted using minimum 1/2" bolts/studs with washers in top bond beam
 - Bolted using 1/2" bolts/studs above window / door headers
 - Attached per (Table #3 on page 27)
 - Minimum of 2 bolts per plate section
 - Sill plate splices must be at least 4'-0" away from any panel joint
 - Bolted not more than 12", nor less than 7 bolt diameters, from the end of each plate section (R403.1.6)
 - Bolted in center 1/3 of Plate

8. Verify perpendicular floor joist connections (Pg. 24)
 - Each joist nailed to sill plate with two 16d common nails (3-1/2" x 0.162") (or according to code) (Table R602.3(1))

9. Verify parallel floor joist connections (Pgs. 24-34)
- 2 x 6 end-wall braces located within 12" from the interior of each corner (Pgs. 24-34)
 - 2 x 6 end-wall braces nailed to sill plate with five 10d nails
 - 1 solid block used if backfill is 0' to 7'-6" (nailed in-line with the 2 x 6 end-wall brace)
 - 2 solid blocks used if backfill is between 7'-6" and 9'-6" for joists less than 10" in height
 - 3 solid blocks used if backfill is between 7'-6" and 9'-6" for joists that are greater than or equal to 10" in height (See fastening details on Pg. 27 to 34)
 - Blocking requires six 10d nails through floor (conventional construction) or construction adhesive on top of blocking (modular construction)
10. Verify modular connection (Pg. 34)
- Framing strap lies between band joist and sill plate (Figure 29 on Pg. 34)
 - Framing strap is fastened with 1-1/2" nails provided with straps
 - Verify 1 nail per hole
 - Verify strap spacing (Table #4 on Pg. 34)
11. Verify shear walls (Pg. 36)
- If present, verify that shear wall is attached to floor, outside wall and joist(s) above
 - Shear wall must be either a Superior Walls panel or other approved construction
12. Verify stairwell header (Pg. 37). Is the long side of the stairway opening within 8' of the parallel Superior Wall? If "YES":
- Support beam (2 x 10 sill plate and two 2 x 8's) 2'-0" past each end of the opening without splices
 - 1/2" bolts/studs with washers in every precast hole through the bond beam or threaded insert location
 - Openings larger than 9'-6" must be reviewed by an engineer or be an alternative Superior Walls Stairwell Header Reinforcement design
13. Verify backfilling (Pg. 40)
- Before backfilling, basement floor must be poured and first floor framing / decking properly attached (R404.1.7)
 - Height of finished soil grade must be at least 6" below top of Superior Walls Panel (R404.1.6)
14. Verify inside fill conditions (Pg. 22)
- Must not exceed 36" more inside fill than outside fill, unless the panel was specially manufactured for this application.
15. Verify final grade
- Slope the final soil grade a minimum of 6" fall within the first 10'-0" to divert ground water away from foundation (R401.3)
 - Height above finished soil grade must be at least 6" (R404.1.6)



Superior Walls®

www.superiorwalls.com

If you need further assistance, please contact your local Superior Walls Representative.

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