

## 2020 BAM Top of Foundation Wall Support Guide

### SCOPE OF WORK:

These drawings are an illustrative representation of an alternative option to the top of wall support information contained in the 2012 International Residential Code (IRC) section 404.1, as adopted by the 2015 Minnesota State Building Code. These drawings apply to the construction of top of full height cast-in-place concrete, insulated concrete form, and masonry basement foundation walls for typical residential cases. These drawings are not to scale and all conditions are to be verified by the contractor. Means and methods of construction for shoring, water-proofing, insulation, flashing, and all other non-structural requirements are to be by others in accordance with the Code and standard industry practice. These drawings are valid through December 31, 2020 or the adoption of the next state Code.

The drawings are to only be used by the Builder's Association of Minnesota (BAM) and its members. Refer to BAM's website for the most current version of these drawings. These drawings are to be provided to the building inspection department as part of the permit package.

### INDEX:

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- S2 - General Notes
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- S4 - Standard Non-Bearing Wall Joist Blocking Detail
- S5 - Bottom Chord Bearing Truss Non-Bearing Wall Detail
- S6 - Top Chord Bearing Truss Non-Bearing Wall Detail

### MATERIALS:

**Concrete:** Minimum 28 day compressive strength (F'c) of 3000 psi for walls  
Minimum 28 day compressive strength (F'c) of 5000 psi for footings  
Footings may be 3000 psi if an approved admixture is used to achieve a water and vapor resistance equivalent to 5000 psi

**Masonry:** Minimum 28 day prism strength (F'm) of 1500 psi

**Backfill Soil:** Sand - 30 psf/ft effective lateral pressure  
Sandy Clay - 45 psf/ft effective lateral pressure  
Clay - 60 psf/ft effective lateral pressure



### SITE ADDRESS:

Street: \_\_\_\_\_  
City: \_\_\_\_\_  
State:     MN     Zip: \_\_\_\_\_

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed professional engineer under the laws of the state of Minnesota.

Craig Oswell, PE (MN #42341)  
1/1/2020

### **Oswell Engineering and Consulting, L.L.C.**

Project Name: 2020 BAM Top of Foundation Support Guide  
Description: Scope of Work, Index, and Certification  
Project #: 19.101  
Client Name: Builder's Association of Minnesota (BAM)

1901 E Hennepin Ave, #201

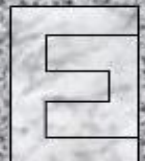
Minneapolis, MN 55413

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**GENERAL NOTES:**

1. Do not backfill until the concrete has reached at least 70 percent of the 28 day concrete strength. Use of adequate shoring by others is required until the final floor and slab systems are in place.
2. Slope grade 6" minimum downward away from foundations within first 10 feet or provide Code compliant swale.
3. Sill plate sections require at least two anchors with one within 4" to 12" of each end and at all corners and intersections. Walls less than 24" in length require only one anchor.
4. Use of multiple sill plates is not allowed unless specifically noted.
5. Anchor bolts 1/2" or larger in diameter do not require corrosion protection per IRC section R317.3.1, exception 1.
6. Anchor bolts may be substituted with 1/2" diameter threaded rod epoxy grouted at same spacing with 7" embed.
7. All premanufactured connectors and anchors are to be installed in accordance with their manufacturer's recommendations.
8. This packet applies to full height walls less than ten feet in clear height supporting unbalanced fill only. This packet does not apply to lookout and frost style walls. The details in this packet are not limited by wall length or plan dimensions.
9. This packet applies to traditional floor joists, I-joists, and trusses. All floor members are to bear at least 3.5" on the sill plate unless noted otherwise. Sill plates may over overhang the face of the wall provided the overhang is not loaded vertically and all anchor bolt/connection tolerances are met.
10. Sill plates may need to be larger than the minimum to meet Energy Code or other requirements. The exact size of the sill plate is the responsibility of the contractor.
11. Alternate anchors may be Simpson MAB, Simpson MASA, USP ST, USP FA3, Simpson FWAZ, or 1/2" diameter expansion anchors with 6" minimum embedment, or an equivalent manufactured anchor.

**TOP OF WALL ANCHOR SPACING TABLE**

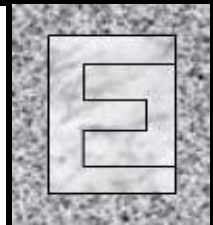
Alternative to MN Code Table R404.1(1)

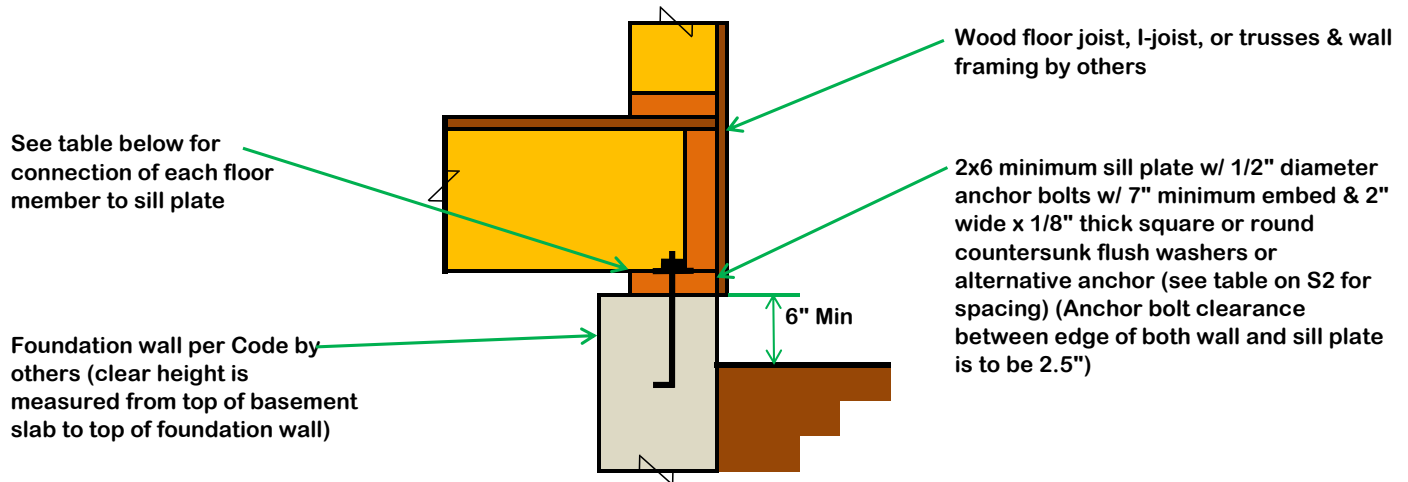
CLEAR HEIGHT (Top of Slab to Top of Wall)	BACKFILL HEIGHT ABOVE SLAB	SOIL TYPE					
		SAND		SANDY CLAY		CLAY	
		ANCHOR BOLT	ALTERNATE ANCHOR*	ANCHOR BOLT	ALTERNATE ANCHOR*	ANCHOR BOLT	ALTERNATE ANCHOR*
8'-0" or less	7'-6"	72"	48"	72"	24"	48"	16"
	6'-6"	72"	72"	72"	48"	72"	32"
	5'-6" or less	72"	72"	72"	72"	72"	72"
9'-0"	8'-6"	72"	36"	48"	16"	32"	8"
	7'-6"	72"	64"	72"	32"	56"	16"
	6'-6" or less	72"	72"	72"	64"	72"	32"
10'-0"	9'-6"	64"	24"	40"	16"	24"	8"
	8'-6"	72"	40"	56"	24"	40"	16"
	7'-6" or less	72"	72"	72"	32"	64"	24"

\* = see note 11 above for alternate anchor options

**Oswell Engineering and Consulting, L.L.C.**  
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 Description: General Notes  
 Project #: 19.101  
 Client Name: Builder's Association of Minnesota (BAM)

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## TYPICAL TOP OF FOUNDATION WALL DETAIL

### FLOOR MEMBER TO SILL PLATE CONNECTION TABLE

Alternate to MN Code Table R404.1(1)

CLEAR HEIGHT (Top of Slab to Top of Wall)	FLOOR MEMBER SPACING	BACKFILL TYPE		
		SAND	SANDY CLAY	CLAY
8'-0" or less	16"	A (note 5)	A (note 7)	C
	19.2"	A (note 6)	B	C
	24"	A (note 7)	C	C
9'-0"	16"	A (note 7)	C	C
	19.2"	A (note 7)	C	D
	24"	B	C	D
10'-0"	16"	B	C	D
	19.2"	B	D	D
	24"	C	D	D

### CONNECTION TYPE

CLASS (weakest to strongest)	DESCRIPTION
<b>A</b>	(3)0.131" diameter x 3" long toe/top nails
<b>B</b>	(3)0.148" diameter x 3" long toe/top nails
<b>C</b>	USP LJQ or USP MPA1/Simpson A35 (see note 4)
<b>D</b>	Simpson FWANZ, Simpson U2.1/4, Simpson U2.37/4, USP LJQ, or (2) USP MPA1/Simpson A35 (see notes 1 to 3)

#### **Notes:**

1. Simpson FWANZ requires 1.125" minimum OSB rim and must be located within 5" the floor member. For trusses, it must be in contact with the member or 2x4 minimum continuous bottom bracing must be provided.
2. USP LJQ must be sized appropriately for the actual floor member width.
3. Floor members must be at least 3" wide when two Simpson A35/USP MPA1's are used.
4. Connection C may be installed at every other floor member if the number of anchors is doubled.
5. As an alternative, connection C may be installed at every fourth floor member.
6. As an alternative, connection C may be installed at every third floor member.
7. As an alternative, connection C may be installed at every other floor member.

#### **Oswell Engineering and Consulting, L.L.C.**

Project Name: 2020 BAM Top of Foundation Support Guide  
 Description: Typical Bearing Wall Detail  
 Project #: 19.101  
 Client Name: Builder's Association of Minnesota (BAM)

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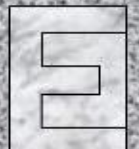
Minneapolis, MN 55413

Phone: 612-720-4639

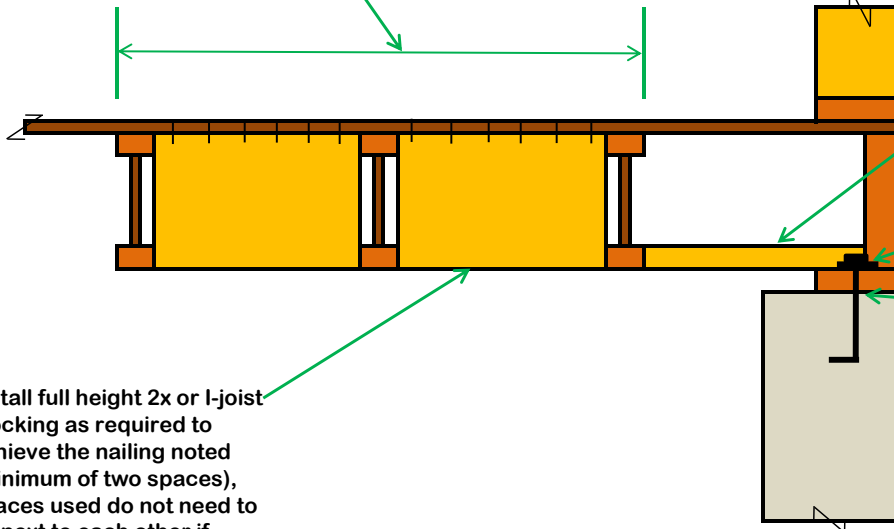
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Nail the floor sheathing to the blocking w/ at least (12) 0.131" diameter x 3" long nails evenly spaced



Wall framing, joists, & structural rim by others

See note 4 for spacers as required at mechanical only

Use Class D connection from S3 for blocking to sill

2x6 minimum sill plate w/ 1/2" diameter anchor bolts w/ 7" minimum embed & 2" wide x 1/8" thick square or round countersunk flush washers or alternative anchor (see table on S2 for spacing) (Anchor bolt clearance between edge of both wall and sill plate is to be 2.5"), **NOTE: Sill plate may have to be increased to 2x8 to fit Class D connectors**

Install full height 2x or I-joist blocking as required to achieve the nailing noted (minimum of two spaces), spaces used do not need to be next to each other if spaces between are blocked per note 4

### JOIST BLOCKING DETAIL

Blocking spacing to match anchor bolt spacing (see S2)

#### NOTES:

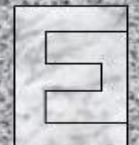
1. Floor sheathing is to be 3/4" minimum thick OSB/plywood installed in a staggered pattern. Nail to floor members with 0.131" diameter x 3" long nails at 6" o.c. at all panel edges/perimeter and 12" o.c. at all intermediate supports or an approved equivalent.
2. Blocking shown may be replaced with pre-manufactured blocking provided it can resist at least 1500 pounds of lateral compression.
3. Toe nail blocking members in place as required for stability.
4. Bays containing blocking do not need to be directly next to the wall or each other provided 2x4 spacer blocking is installed between them as shown. Toe nail spacers in place as required.
5. Full height blocking may contain 4" diameter maximum holes if required for electrical/plumbing. Provide at least 3" edge clearance for all holes.
6. All nails are to be spaced in members such that splitting does not occur.
7. Foundation wall is to be per Code by others.

Oswell Engineering and Consulting, L.L.C.

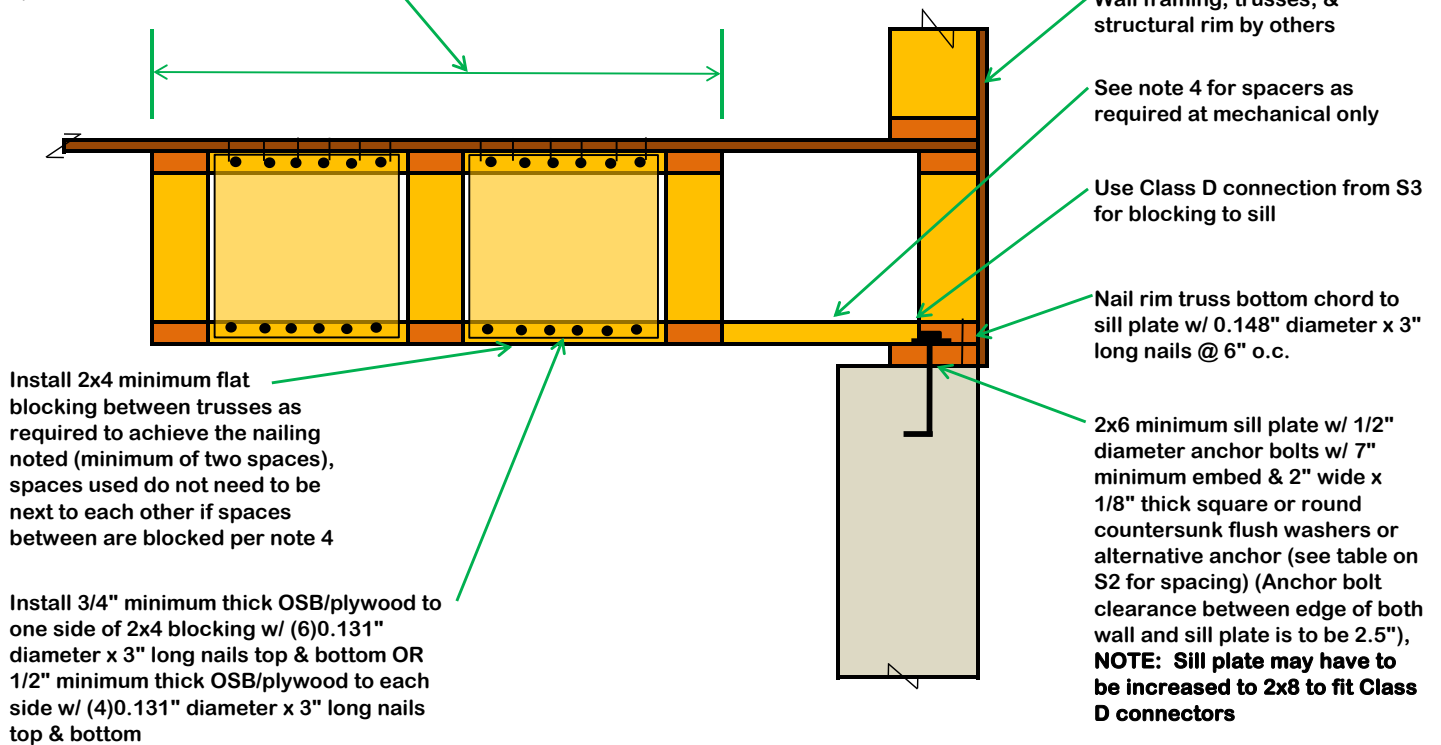
Project Name: 2020 BAM Top of Foundation Support Guide  
 Description: Standard Non-Bearing Wall Joist Blocking Detail (NOT TO SCALE)  
 Project #: 19.101  
 Client Name: Builder's Association of Minnesota (BAM)

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Nail the floor sheathing to the blocking w/ at least (12) 0.131" diameter x 3" long nails evenly spaced



### **BOTTOM CHORD BEARING TRUSS BLOCKING DETAIL** Blocking spacing to match anchor bolt spacing (see S2)

**NOTES:**

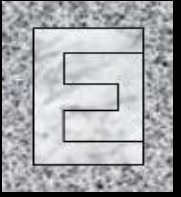
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2. Blocking shown may be replaced with pre-manufactured blocking provided it can resist at least 1500 pounds of lateral compression.
3. Toe nail blocking members in place as required for stability.
4. Bays containing blocking do not need to be directly next to the wall or each other provided 2x4 spacer blocking is installed between them as shown. Toe nail spacers in place as required.
5. OSB/plywood blocking may contain 4" diameter maximum holes if required for electrical/plumbing. Provide at least 3" edge clearance for all holes.
6. All nails are to be spaced in members such that splitting does not occur.
7. Foundation wall is to be per Code by others.
8. Do not cut rim truss bottom chord for any reason.

**Oswell Engineering and Consulting, L.L.C.**

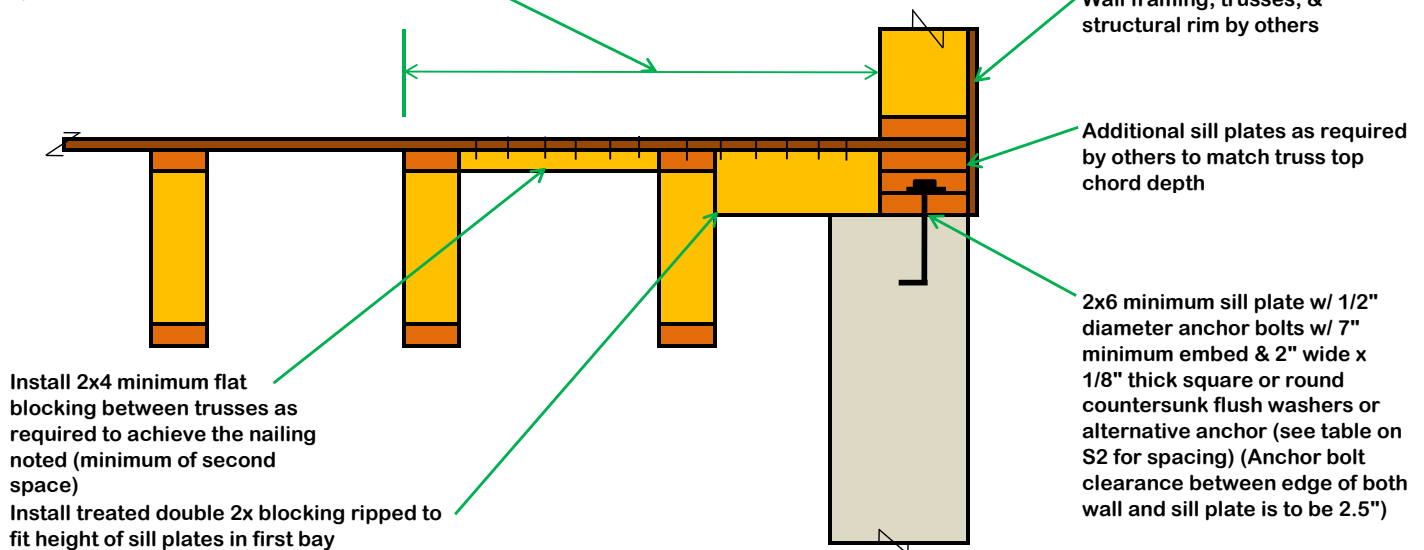
Project Name: 2020 BAM Top of Foundation Support Guide  
 Description: Non-Bearing Wall Bottom Chord Bearing Truss Blocking Detail (NOT TO SCALE)  
 Project #: 19.101  
 Client Name: Builder's Association of Minnesota (BAM)

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Nail the floor sheathing to the blocking w/ at least (12) 0.131" diameter x 3" long nails evenly spaced



**TOP CHORD BEARING TRUSS BLOCKING DETAIL**  
**Blocking spacing to match anchor bolt spacing (see S2)**

**NOTES:**

1. Floor sheathing is to be 3/4" minimum thick OSB/plywood installed in a staggered pattern. Nail to floor members with 0.131" diameter x 3" long nails at 6" o.c. at all panel edges/perimeter and 12" o.c. at all intermediate supports or an approved equivalent.
2. Toe nail blocking members in place as required for stability.
3. All nails are to be spaced in members such that splitting does not occur.
4. Foundation wall is to be per Code by others.

**Oswell Engineering and Consulting, L.L.C.**

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