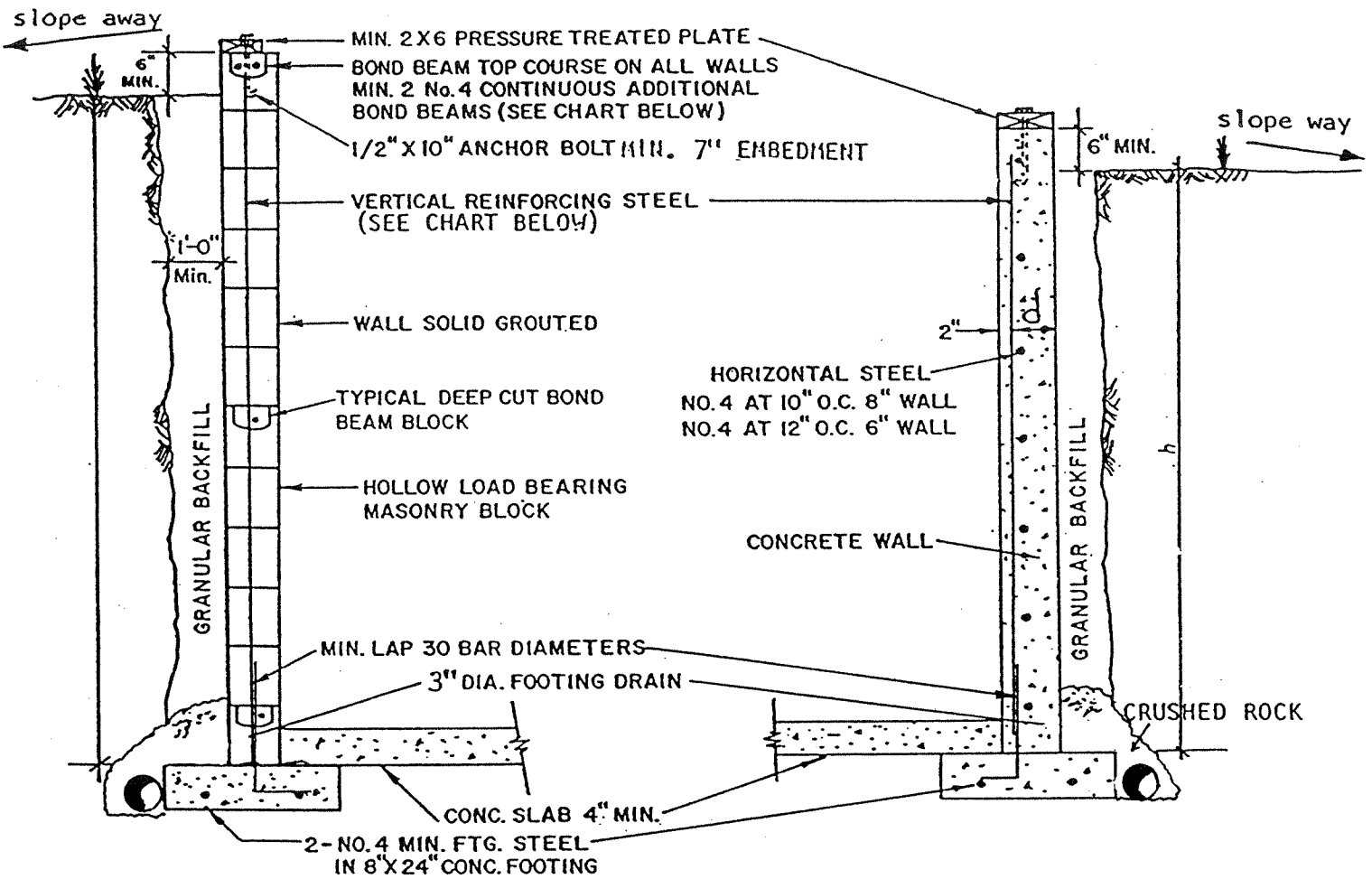


# FOUNDATION RETAINING WALLS



**Block Walls**

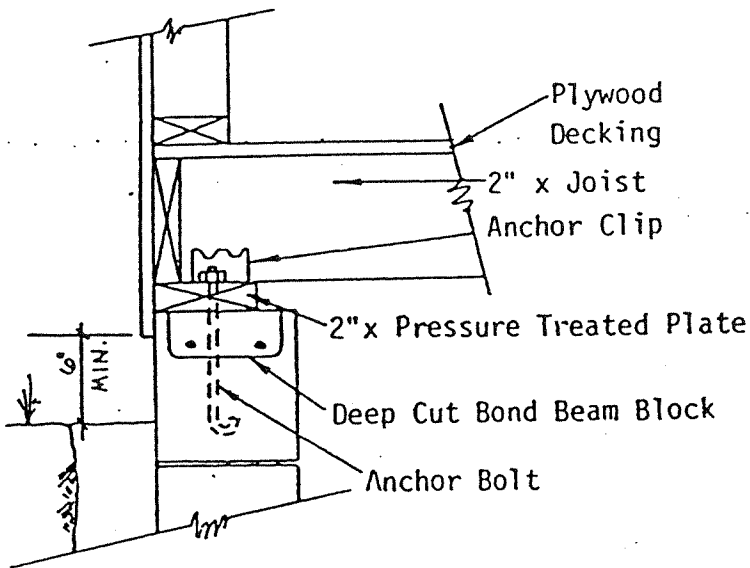
**Concrete Walls**

\* More Space may be required for waterproofing depending on the height of the wall.

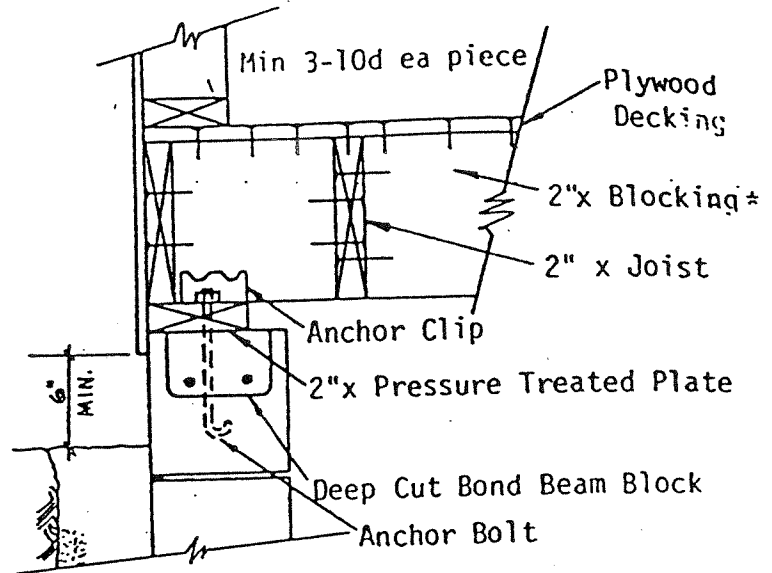
FIGURES NOT FOR CLAY SOIL-

WALL Ht. Ft h	MOM In Lbs Per Ft	SHEAR At Top Lbs/Ft	BOLTS Size & space	CONCRETE BLOCK WALLS						CONCRETE WALLS	
				6" Block		8" Block		12" Block		6" (d=4")	8" (d=6")
				Vert. St.	Horz. St.	Vert. St.	Horz. St.	Vert. St.	Horz. St.	Vert. St.	Vert. St.
3	623	45	1/2 @ 72	Not Allowed		1/2 @ 24		1/2 @ 24		1/2 @ 18	1/2 @ 24
4	1480	80	1/2 @ 48			1/2 @ 24		1-1/2 @ 24		1/2 @ 18	1/2 @ 24
5	2880	125	1/2 @ 36			1/2 @ 24		1-1/2 @ 16		1/2 @ 18	1/2 @ 18
6	4980	180	1/2 @ 24			1/2 @ 24		2-1/2 @ 16		1/2 @ 18	1/2 @ 18
7	7920	245	1/2 @ 18			1/2 @ 16		3-1/2 @ 16		1/2 @ 18	1/2 @ 18
8	11800	320	1/2 @ 16			3/4 @ 16		3-1/2 @ 16		1/2 @ 12	1/2 @ 18

## CONNECTION A



## CONNECTION B



**NOTE:**

The above connections are applicable to both concrete and masonry walls. Nails are commons. For other floor systems contact the Douglas County Building Department.

\* 2" x Solid Blocking  
 Wall Ht. 3'-4' - 1 row  
 " " 5'-7' - 2 rows  
 " " 8'-12' - 3 rows

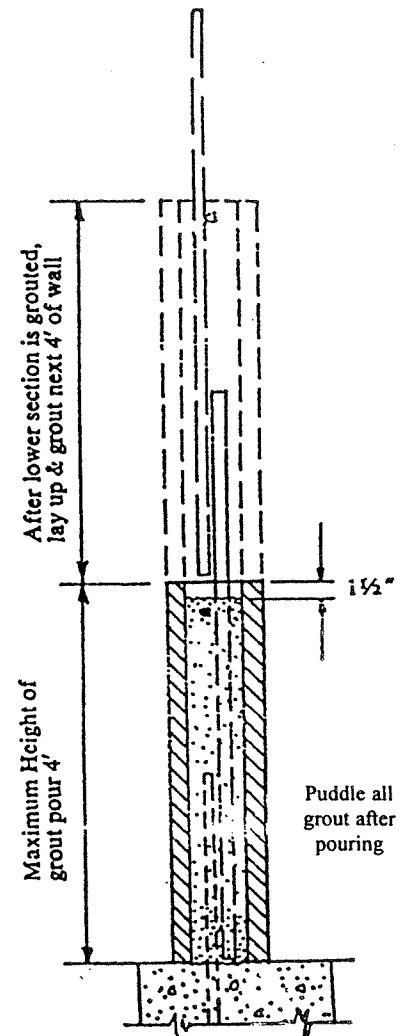
shear top lbs/ft	wall height ft.	joist spacing in.	CONNECTION "A"			CONNECTION "B"				
			anchor clips	* simpson	* silver	Toenail 3-8d	anchor clip	* simpson	* silver	blocking spacing ft/in
20	2	12				x				
		16				x				
		24				x				
45	3	12				x	1	A34N	A2	4-0
		16				x				
		24				x				
80	4	12				x	1	A34N	A2	4-0
		16				x				
		24				x				
125	5	12				x	1	A35N	A5A	3-6
		16				x				
		24	1	A34N	A2					
180	6	12					2	A34N	A2	3-6
		16	1	A34N	A2					
		24	1	A35N	A5A					
245	7	12	1	A34N	A2		2	A35N	A5A	3-6
		16	1	A35N	A5A					
		24	2	A34N	A2					
320	8	12	1	A35N	A5A		2	A35N	A5A	3-0
		16	1	A35N	A5A					
		24	2	A34N	A2					

\* Names used as reference only. Clips by other manufacturers may be used provided they have equivalent load carrying capacities.

# Low and High Lift Grouting Procedure Reinforced Hollow Unit Masonry

## Low Lift Grouting Procedure

1. All reinforced hollow unit masonry shall be built to preserve the unobstructed vertical continuity of the cells to be filled. Walls and cross webs forming such cells to be filled shall be fullbedded in mortar to prevent leakage of grout. All head (or end) joints shall be solidly filled with mortar for a distance in from the face of the wall or unit not less than the thickness of the longitudinal face shells. Bond shall be provided by lapping units in successive vertical courses or by equivalent mechanical anchorage.
2. Vertical cells to be filled shall have vertical alignment sufficient to maintain a clear, unobstructed continuous vertical cell measuring not less than 2 inches by 3 inches.
3. Units may be laid to a height not to exceed 8 feet. If the height exceeds 4 feet, cleanouts must be used.
4. Place vertical steel into cells with enough steel extending to provide proper lap splice 30 diameters minimum, 40 diameters recommended.
5. Grout cell, stopping grout 1/2" below top of unit or over horizontal steel which shall be fully imbedded in grout.
6. Expanded metal mesh or other material that will not interfere with bonding may be laid on top of unit to permit bond beams and horizontal members to be grouted in without fully grouting the wall is permitted.
7. When the grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the pour of grout not less than 1/2" below the top of the uppermost unit grouted. Horizontal steel shall be fully embedded by grout in an uninterrupted pour.



Low Lift Method of  
Grouting Hollow Unit  
Masonry

Information on Low and High Lift Grouting Procedures, Reinforced Hollow Unit Masonry taken from the following sources:

1. "Reinforced Masonry Engineering Handbook"  
Masonry Institute of America  
James E. Amrhein, P.E.
2. Uniform Building Code, Chapter 21.

# Basement Walls

## Masonry Walls:

1. Level backfill, no surcharge, soil well drained with granular material for backfill, equivalent fluid pressure of 30 pcf.
2. Grade N Hollow loadbearing units conforming to Astm C-90 fm = 1500 psi (solid grouted).
3. Wall solid grouted, fine or course consistency, minimum 7 sacks of portland cement per cubic yard of grout minimum compressive strength at 28 days of 2500 psi.
4. Type S or Type M mortar conforming to UBC Table 21-A.
5. Reinforcing steel shall be centered in the wall, and shall be held in place per UBC Section 2104.5.
6. Reinforcing steel shall be a minimum grade 40 deformed billet steel, rail steel or axle-steel bars.
7. Single family dwellings shall have a maximum of one story supported on the wall.
8. Anchor bolts shall be a minimum of 1/2" diameter.
9. Prior to grouting, the grout space shall be clean so that all spaces to be filled with grout do not contain mortar projections more than 1/2", mortar droppings or other foreign material.
10. Between grout pours, a horizontal construction joint shall be formed by stopping all wythes at the same elevation and with the grout stopping a minimum of 1 1/2" below a mortar joint, except at the top of the wall. Where bond beams occur, the grout pour shall be stopped a minimum of 1/2" below the top of the masonry.
11. All cells and spaces containing reinforcement shall be filled with grout.
12. Lap splices shall be a minimum of 30 bar diameters.
13. All grout shall be consolidated at time of pouring as per UBC Section 2104.6.2.
14. Masonry work in its entirety shall conform to UBC Chapter 21 and applicable standards, and specifically section 2104.