

**PLAN**

**GENERAL NOTES:**

1.  $f_c' = 4000$  PSI  $f_y = 60,000$  PSI
2. The weight of the manure with bedding and free stall manure was assumed as 45 and 60 pcf respectively.

**STEEL**

3. The 10 inch sidewall and 12 inch floor shall have two mats of steel.
4. All steel placed in the 10 inch sidewall and 12 inch floor shall have a minimum concrete cover over reinforcement of two inches, except when the concrete is placed on or against the earth, then the minimum concrete cover shall be 3 inches.
5. All #4 bars shall have a minimum lap splice length of 15 inches and all #5 bars shall have a minimum lap splice length of 19 inches, except as specifically shown on drawings.

**FLOOR SLAB**

6. The 5 inch floor slab shall be constructed by the following method: Place concrete on top of 3 inch layer on approved base course material. Use number 4 bars at 15 inch spacing each way. Concrete cover for steel placed in floor slab shall be 2 inch minimum.
7. Where ever the floor slab exceeds 30 feet in length or width, water tight expansion joints with dowel bars will be installed. Commercial water tight joint material will be installed as per manufacturers recommendation.
8. Approved base course material includes IDOT Grad No CA 7, 8, 11, 12, 13, 14, 15, 16 or FA 1, 2, 4.

**WALL**

9. The manure pit walls will withstand 60 pcf/ft. of fluid pressure.
10. The backfill loading was assumed to be 60 pcf/ft of equivalent pressure.
11. The wall will be built with expansion joints see (Expansion Joint Detail-Wall). No section of wall will be over 30 feet long between expansion joint.
12. A construction joint must be placed anywhere the concrete placement is not continuous. See Construction Joint Notes on page 3.

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Concrete (28 Days, 4000 PSI)	Cu. Yd.	
Reinforcing Steel #4 Rebars	Lbs.	
Reinforcing Steel #5 Rebars	Lbs.	
3/4" Dowel Bar	Lin. Ft.	
6" Nonmetallic Water Stop	Lin. Ft.	
1/2" Preformed Joint Filler	Lin. Ft.	
Base Course Material	Tons	
Perimeter Drain Fill	Tons	
4" Perforated CPT	Lin. Ft.	

STEEL SCHEDULE	
A	#4 @ 15"
B	#5 @ 8"
C	-----
D	#4 @ 12"
E	#5 @ 15"
F	#5 @ 8"
G	-----
H	#5 @ 15"
L	#4 @ 12"

**LEGEND**

- WALL: A - Outside Vertical Face  
 B - Inside Vertical Face  
 C - Not Required  
 D - Horizontal Inside & Outside Face
- FOOTING: E - Bottom Face, Perpendicular To Wall  
 F - Top Face, Perpendicular To Wall  
 G - Not Required  
 H - Parallel To Wall Top And Bottom
- CORNER: L - Corner Outside Horizontal Layer, Wall

- WS = 6" Nonmetallic Water Stop  
 CJ = Construction Joint  
 EJ = Expansion Joint

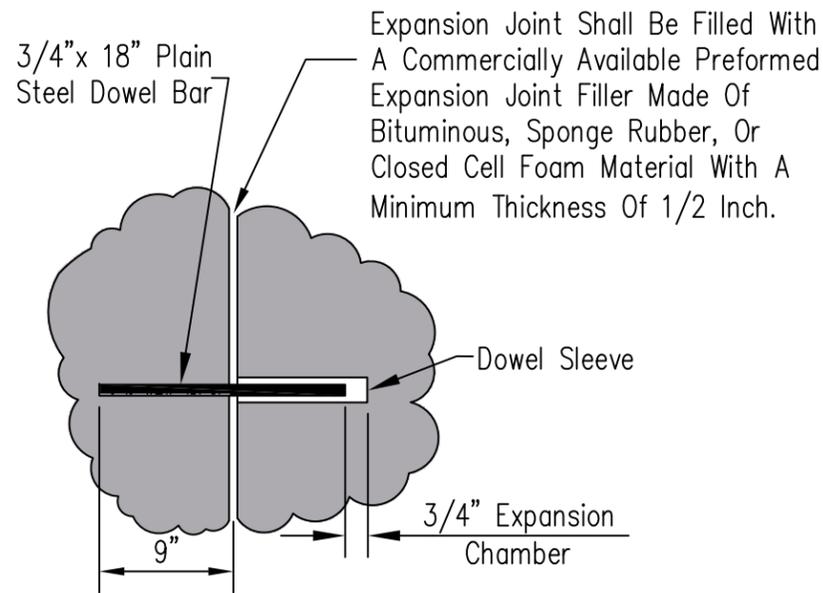
Date	5/1/14
Designed	
Drawn	M. QUINONES
Checked	
Approved	

**MANURE STORAGE FACILITY  
8' HIGH R/C WALL**

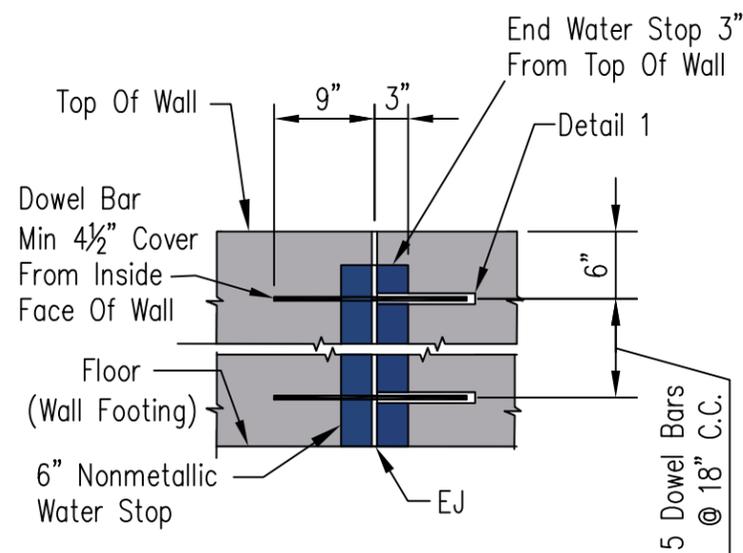


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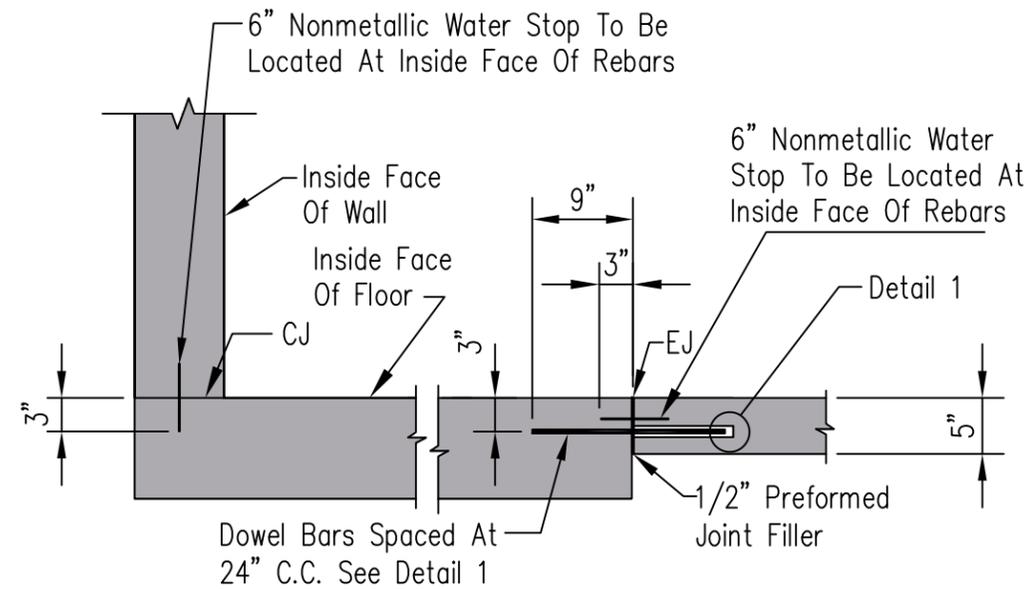
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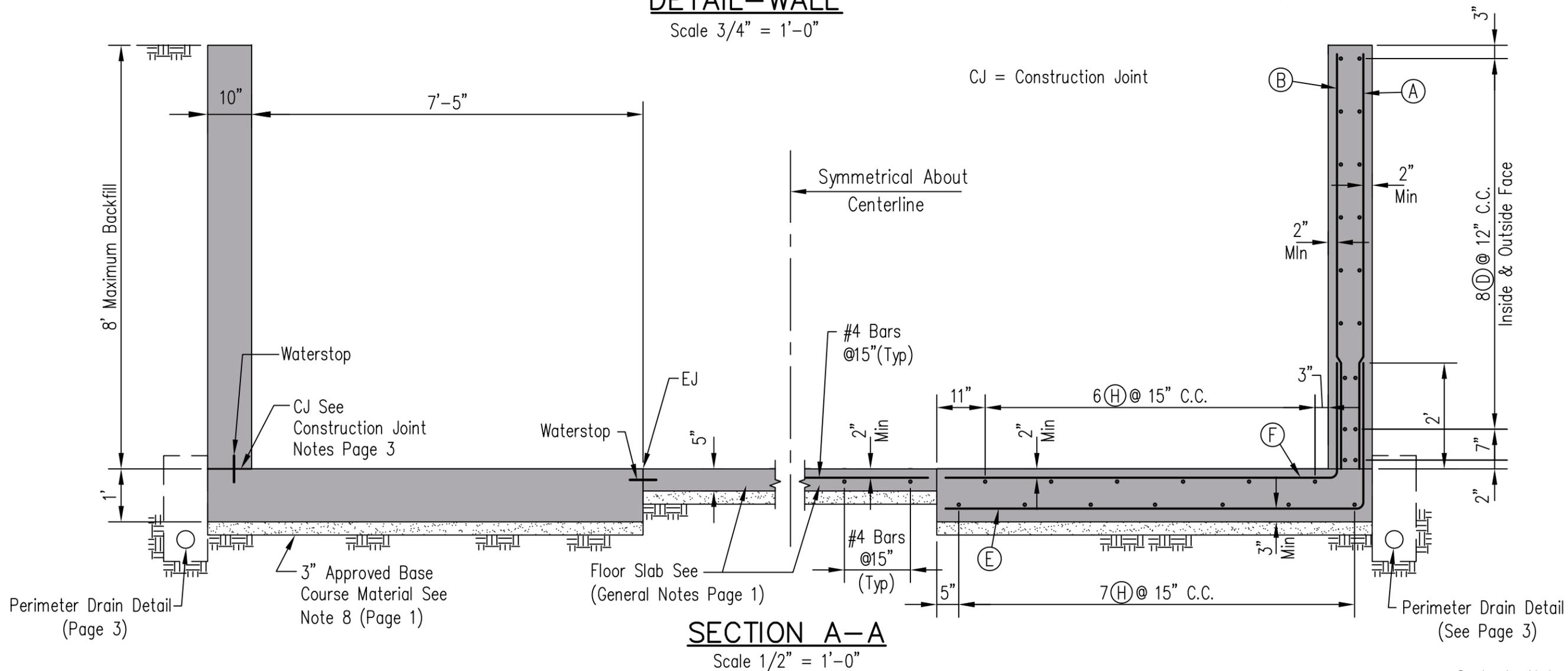
**DETAIL 1**  
Scale 1" = 1'-0"



Spacing Not Greater Than 30' C.C.  
**EXPANSION JOINT**  
**DETAIL-WALL**  
Scale 3/4" = 1'-0"



**EXPANSION JOINT DETAIL-FLOOR**  
Scale 3/4" = 1'-0"



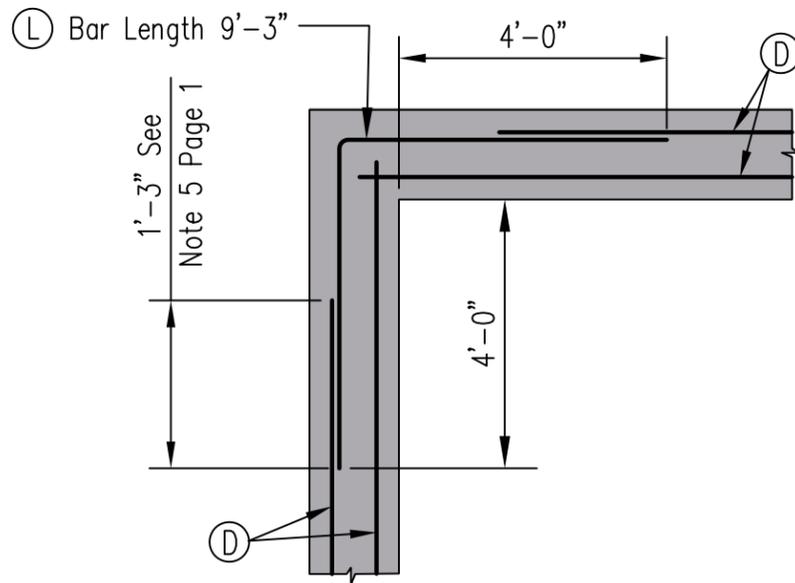
Scale As Noted

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**MANURE STORAGE FACILITY**  
**8' HIGH R/C WALL**

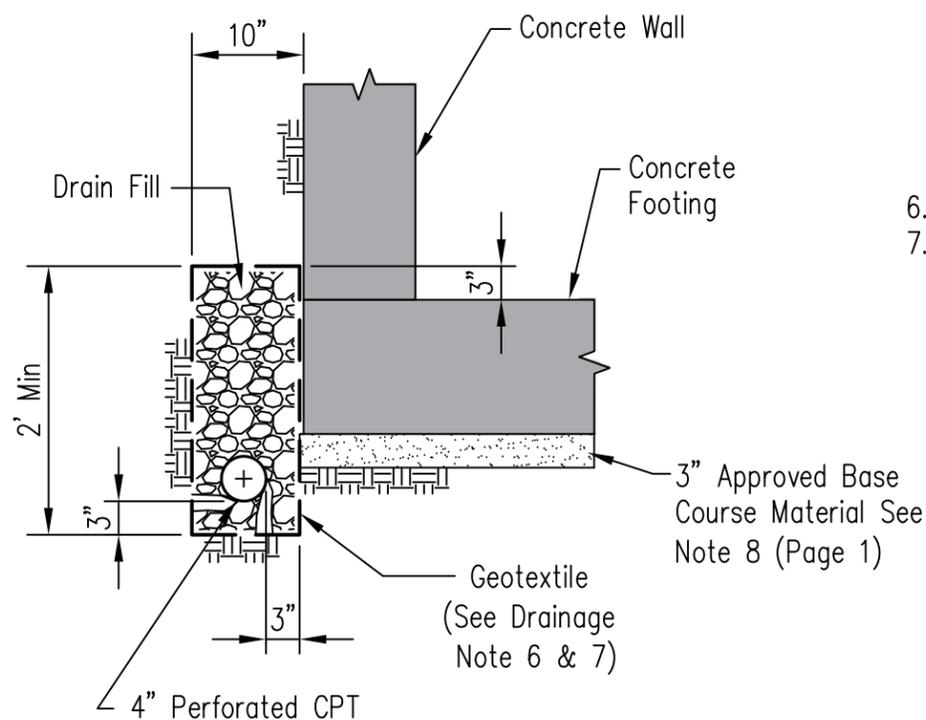
**NRCS**  
Natural Resources Conservation Service  
United States Department of Agriculture

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**CORNER DETAIL-PLAN VIEW**

Not To Scale



**PERIMETER DRAIN DETAIL**

Scale 3/4" = 1'-0"

**DRAINAGE NOTES:**

1. Provide perimeter drain to adequate outlet if water table can rise above floor level.
2. Perimeter drain pipe and gravel/geotextile filter is to be routed around all sides of the tank and drain freely to a surface water outlet or other subsurface drainage outlet.
3. Perimeter drain pipe and fittings be perforated corrugated polyethylene (CPT) meeting ASTM specifications listed below:

CPT	ASTM F405, F667
Dual Wall CPT	ASTM F2306, F2648, F405, F667

4. Drain fill shall consist of sand, gravel or concrete aggregate mixture with a maximum size of 3" and not more than 5% passing a #200 sieve. Qualifying IDOT gradations for drain fill include:  
CA-1, CA-3, CA-5, CA-7, CA-8, CA-11,  
CA-12, CA-13, CA-14, CA-15, CA-16, CA-18
5. Geotextile (non-woven, needle punched) minimum criteria:  
Grab tensile strength (lb) ASTM D 4632 \_\_\_\_\_ 202  
Elongation at failure (%) ASTM D 4632 \_\_\_\_\_ ≥50  
Trapezoidal tear strength (lb) ASTM D 4533 \_\_\_\_\_ 79  
Puncture strength (lb) ASTM D 6241 \_\_\_\_\_ 433  
Ultraviolet light (% retained strength) ASTM D 4355 \_\_\_\_\_ min 50  
Apparent opening size (AOS) ASTM D 4751 \_\_\_\_\_  
max 0.22 mm (US sieve size 70)  
Permittivity sec<sup>-1</sup> ASTM D 4491 \_\_\_\_\_ min 0.70
6. Any geotextile splices shall overlap a minimum of 18 inches.
7. Geotextile shall encase all drain fill.

**Construction Joint Notes**

1. A construction joint must be prepared when the concrete pour is not continuous, typically between the floor and wall.
2. Prepare all surfaces that will be in contact with new concrete as per note 5.
3. Let concrete cure at least 12 hours prior to steel tying and form construction for the next pour.
4. New concrete must not be placed until the hardened concrete has cured at least 12 hours.
5. Construction joints must be prepared using one of the following two methods:  
Method 1 – Water-Air or Sandblasting. Clean the joint surface of all unsatisfactory concrete, laitance, coating, stains, and debris by sandblasting or high-pressure air-water cutting, or both. Sandblasting can be used after the concrete has gained sufficient strength to resist excessive cutting, and high-pressure air-water cutting can be used as soon as the concrete has hardened sufficiently to prevent the jet from displacing the coarse aggregates. The surface of the concrete in place must be cut to expose clean, sound aggregate, but not so deep as to undercut the edges of larger particles of the aggregate. Cut the surface to at least 1/4" depth. Thoroughly wash the surface to remove all material after cutting.  
Method 2 – Mechanical. Clean the joint surface of all unsatisfactory concrete, laitance, coatings, stains, and debris by washing and scrubbing with a wire brush, wire broom, or other means approved by the engineer to expose coarse aggregate without displacing it. The surface must be roughened to at least 1/4" depth.
6. All construction joints must be wetted and standing water removed immediately before new concrete is placed.
7. New concrete must be sufficiently vibrated to ensure good contact into the prepared joint.
8. Keyways or steel plates cannot be substituted for the construction joint methods above.

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**8' HIGH R/C WALL**



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Scale As Noted