CALCULATIONS

METHODOLOGY:

γ = EQUIVALENT FLUID PRESSURE

CASE I

OTM = 1/6 γ H^3 WHERE γ = 60 pcf

NET MOM = OTM − RESISTING MOMENT

CASE II

OTM = 1/6 γ H^3 WHERE γ = 62.4 pcf

NET MOM = OTM + RESISTING MOMENT

$$fs = \frac{M(12\ in/ft)}{As\ j\ d} = \frac{Mt\ (12)}{As\ (0.887)\ d}$$

$$fc = \frac{M(2)\ 12\ in/ft}{j\ k\ b\ d^2}$$

$$= \frac{Mt\ (2)(12)}{(0.887)(0.339)(12)\ d^2} < 1125\ psi$$

$$vc = \frac{(1/2)\ \gamma\ H^2}{(12\ in/ft)\ j\ d}$$

$$= \frac{\gamma\ H^2}{(2)(12)(0.887)\ d} < 55\ psi$$

f'c = 2,500 psi

Fs = 20,000 psi

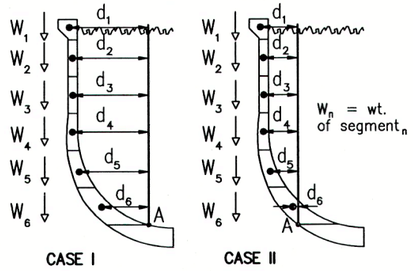
fc = 0.45 f'c = 1125 psi

$Vc = 1.1\sqrt{f'c}$ = 55 psi

RESISTING MOMENT:

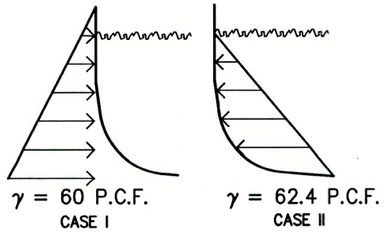
RESISTING MOMENT ABOUT POINT A

$RM = W_1 d_1 + W_2 d_2 + \ldots W_n d_n$



LOADING DIAGRAM:

THIS DETAIL IS DESIGNED FOR EACH OF THE LOAD CASES DEFINED BELOW.



CALCULATION RESULTS:

FREESTANDING WALL
EQUIVALENT FLUID PRESSURE = 60 P.C.F.
RESULTS FOR NO RAISED BOND BEAM

DEPTH 'D'	SOIL OTM ft-#	WATER OTM ft-#	SOIL RM ft-#	WATER RM ft-#	NET Mom	CASE I d1 SOIL	CASE II d2 WATER	VERTICAL STEEL	fs p.s.i.	fc p.s.i.	vc p.s.i.
3'-6"	429	446	106	-53	393	3"	3"	#3 @ 12"	15354	427	10.6
4'-0"	640	666	124	-55	611	3"	3"	#3 @ 6"	12275	508	13.9
5'-0"	1250	1300	230	-57	1020	3½"	4½"	"	17454	660	17.9
6'-0"	2160	2246	497	-2	1663	4"	5½"	add 3 #4	8283	580	22.5
7'-0"	3430	3567	1046	315	3882	4"	5½"	"	13807	832	30.6
8'-0"	5120	5325	2259	971	6296	4"	6½"	"	18781	998	40.0
8'-6"	6141	6387	4820	888	7275	4"	7½"	"	18671	889	45.2

RESULTS FOR 2'-6" MAX. RAISED BOND BEAM

HEIGHT 'H'	SOIL OTM ft-#	WATER OTM ft-#	SOIL RM ft-#	WATER RM ft-#	NET Mom	CASE I d1 SOIL	CASE II d2 WATER	VERTICAL STEEL	fs p.s.i.	fc p.s.i.	vc p.s.i.
3'-6"	429	10	106	-53	323	3"	3"	#3 @ 12"	12607	351	10.2
4'-0"	640	35	116	-63	524	3"	3"	#3 @ 6"	10537	436	13.3
5'-0"	1250	163	135	-99	1115	3½"	3"	"	19071	722	17.9
6'-0"	2160	446	163	-165	1997	4½"	3"	#3 @ 3"	13563	666	20.0
7'-0"	3430	948	251	-163	3179	5"	3"	"	19325	891	24.5
8'-0"	5120	1730	508	-82	4612	6"	3"	add 3 #4	14965	938	26.7
9'-0"	7290	2856	1031	195	6259	6½"	4"	"	18669	1064	31.2
10'-0"	10000	4388	2082	611	7918	8"	5½"	"	18993	1021	31.3
11'-0"	13310	6387	6678	291	6678	8½"	6½"	"	19921	1034	35.6

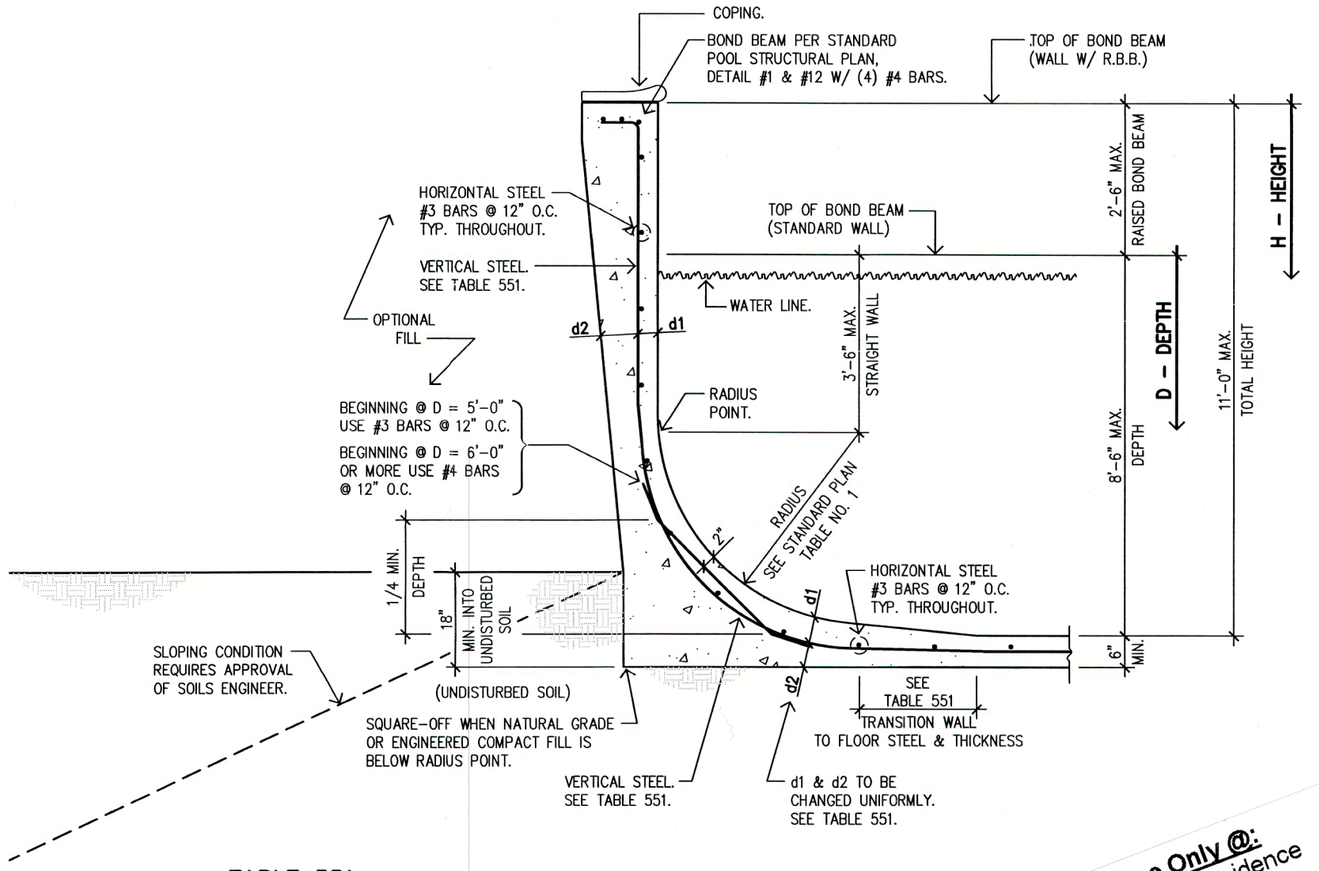


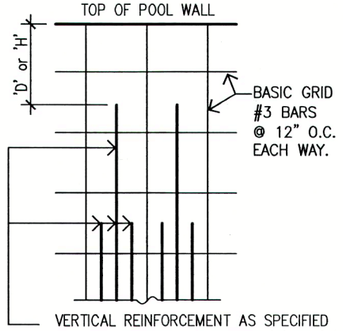
TABLE 551

'D' OR 'H' IS DISTANCE FROM TOP OF POOL WALL DOWNWARD.
BEGIN SPECIFIED STEEL & GUNITE THICKNESS AT INDICATED 'D' OR 'H' DEPTH.
(SEE STANDARD STRUCTURAL PLAN, DETAIL #2)

POOL DEPTH	NO RAISED BOND BEAM			REQ'D TRANS.
D	d1	d2	VERTICAL STEEL	
0 to 3'6"	3"	3"	#3 @ 12"	2'-0"
4'-0"	3"	3"	#3 @ 6"	2'-0"
4'-6"	3"	3½"	"	2'-0"
5'-0"	3½"	4½"	"	2'-0"
5'-6"	4"	5½"	"	2'-0"
6'-0"	4"	5½"	add 3 #4	2'-0"
6'-6"	4"	5½"	"	2'-0"
7'-0"	4"	5½"	"	2'-0"
7'-6"	4"	5½"	"	2'-0"
8'-0"	4"	6½"	"	2'-0"
8'-6"	4"	7½"	"	2'-0"

TOTAL HEIGHT	2'-6" MAX. RAISED BOND BEAM			REQ'D TRANS.
H	d1	d2	VERTICAL STEEL	
0 to 3'6"	3"	3"	#3 @ 12"	2'-0"
4'-0"	3"	3"	#3 @ 6"	2'-0"
4'-6"	3"	3"	"	2'-0"
5'-0"	3½"	3"	"	2'-0"
5'-6"	4½"	3"	"	2'-0"
6'-0"	4½"	3"	#3 @ 3"	2'-0"
6'-6"	4½"	3"	"	2'-0"
7'-0"	5"	3"	"	2'-8"
7'-6"	6"	3"	"	2'-8"
8'-0"	6"	3"	add 3 #4	2'-10"
8'-6"	6"	3½"	"	2'-11"
9'-0"	6½"	4"	"	3'-0"
9'-6"	7"	5"	"	3'-2"
10'-0"	8"	5½"	"	3'-2"
10'-6"	8½"	6½"	"	3'-2"
11'-0"	8½"	6½"	"	3'-2"

TYPICAL REBAR REINFORCING DIAGRAM



VERTICAL REINFORCEMENT AS SPECIFIED IN TABLE STARTS A DISTANCE 'D' OR 'H' DOWN FROM TOP OF POOL WALL. REINFORCEMENT OTHER THAN BASIC GRID NEED NOT EXTEND TO TOP OF POOL WALL. ADD BARS TO BE EQUALLY SPACED BETWEEN BASIC GRID.

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pool engineering inc.

For Use Only @:
Skitrail Ln Residence
2410 Skitrail Ln.
Steamboat CO

PLAN VALID ONLY WITH ENGINEER'S SIGNATURE IN RED INK ON PLAN.

THIS DETAIL TO BE USED IN CONJUNCTION WITH STANDARD POOL STRUCTURAL PLAN

DATE: 12/13/16

CALCS BY: T.L.L.

CHECKED BY: R.L.L.

FREESTANDING WALL
EQUIVALENT FLUID PRESSURE = 60 P.C.F.

DETAIL #551