

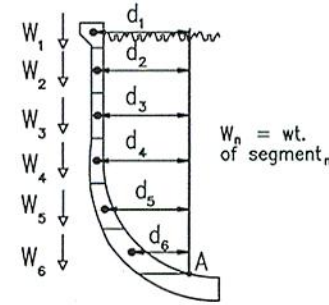
CALCULATIONS

METHODOLOGY:

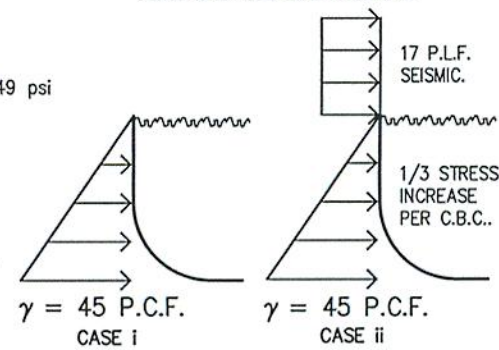
γ = EQUIVALENT FLUID PRESSURE
 $OTM = 1/6 \gamma H^3$
 WHERE $\gamma = 45$ pcf
 NET MOM = OTM - RESIST. MOMENT
 $f_s = \frac{M(12 \text{ in/ft})}{A_s j d} = \frac{M_t (12)}{A_s (0.887) d}$
 $f_c = \frac{M(2) 12 \text{ in/ft}}{j k b d^2} = \frac{M_t (2)(12)}{(0.887)(0.339)(12) d^2} < 900 \text{ psi}$
 $\nu_c = \frac{(1/2) \gamma H^2}{(12 \text{ in/ft}) j d} = \frac{\gamma H^2}{(2)(12)(0.887) d} < 49 \text{ psi}$
 $f'_c = 2,000 \text{ p.s.i.}$
 $F_s = 20,000 \text{ p.s.i.}$
 $f_c = 0.45 f'_c = 900 \text{ p.s.i.}$
 $V_c = 1.1 \sqrt{f'_c} = 49 \text{ p.s.i.}$

RESISTING MOMENT:

RESISTING MOMENT ABOUT POINT A
 $RM = W_1 d_1 + W_2 d_2 + \dots + W_n d_n$



LOADING DIAGRAM:



CALCULATION RESULTS:

6'-0" BLOCK WALL ON BOND BEAM
 EXPANSIVE SOIL
 EQUIVALENT FLUID PRESSURE = 45 P.C.F.
 RESULTS FOR NO RAISED BOND BEAM WITH SEISMIC

DEPTH 'D'	SOIL OTM ft-#	LOAD OTM ft-#	SOIL RM ft-#	NET Mom	t	VERTICAL STEEL	fs p.s.i.	fc p.s.i.	ν_c p.s.i.
2'-0"	60	510	74	496	5 1/2"	#3 @ 12"	25501	784	6.9
3'-0"	203	612	93	722	6 1/2"	"	25558	640	7.7
3'-6"	322	663	104	881	6 1/2"	#3 @ 6"	16035	598	9.5
4'-6"	683	765	163	1286	6 1/2"	"	23412	873	14.0
5'-6"	1248	867	330	1785	7 1/2"	"	24676	789	15.1
6'-6"	2060	969	687	2342	8 1/2"	"	26069	740	16.5
7'-6"	3164	1071	1422	2813	9 1/2"	"	26185	674	18.1
8'-6"	4606	1173	4493	1286	9 1/2"	"	11971	308	22.8

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

HEIGHT 'H'	SOIL OTM ft-#	LOAD OTM ft-#	SOIL RM ft-#	NET Mom	t	VERTICAL STEEL	fs p.s.i.	fc p.s.i.	ν_c p.s.i.
2'-0"	60	510	74	496	5 1/2"	#3 @ 12"	25501	784	6.9
3'-0"	203	612	93	722	6 1/2"	"	25558	640	7.7
3'-6"	322	663	104	881	6 1/2"	#3 @ 6"	16035	598	9.5
4'-6"	683	765	126	1323	6 1/2"	"	24081	898	14.0
5'-6"	1248	867	151	1964	7"	#3 @ 4"	20980	916	17.1
6'-6"	2060	969	191	2838	7 1/2"	#3 @ 3"	20267	977	20.3
7'-6"	3164	1071	349	3886	8"	"	24726	1115	23.7
8'-6"	4606	1173	710	5069	9"	add 2 #4	23646	1036	25.0
9'-6"	6430	1275	1419	6286	10"	"	24788	987	26.3
10'-6"	8682	1377	2948	7111	11"	"	24267	891	27.8
11'-0"	9983	1428	6057	5353	11"	"	18269	671	30.4

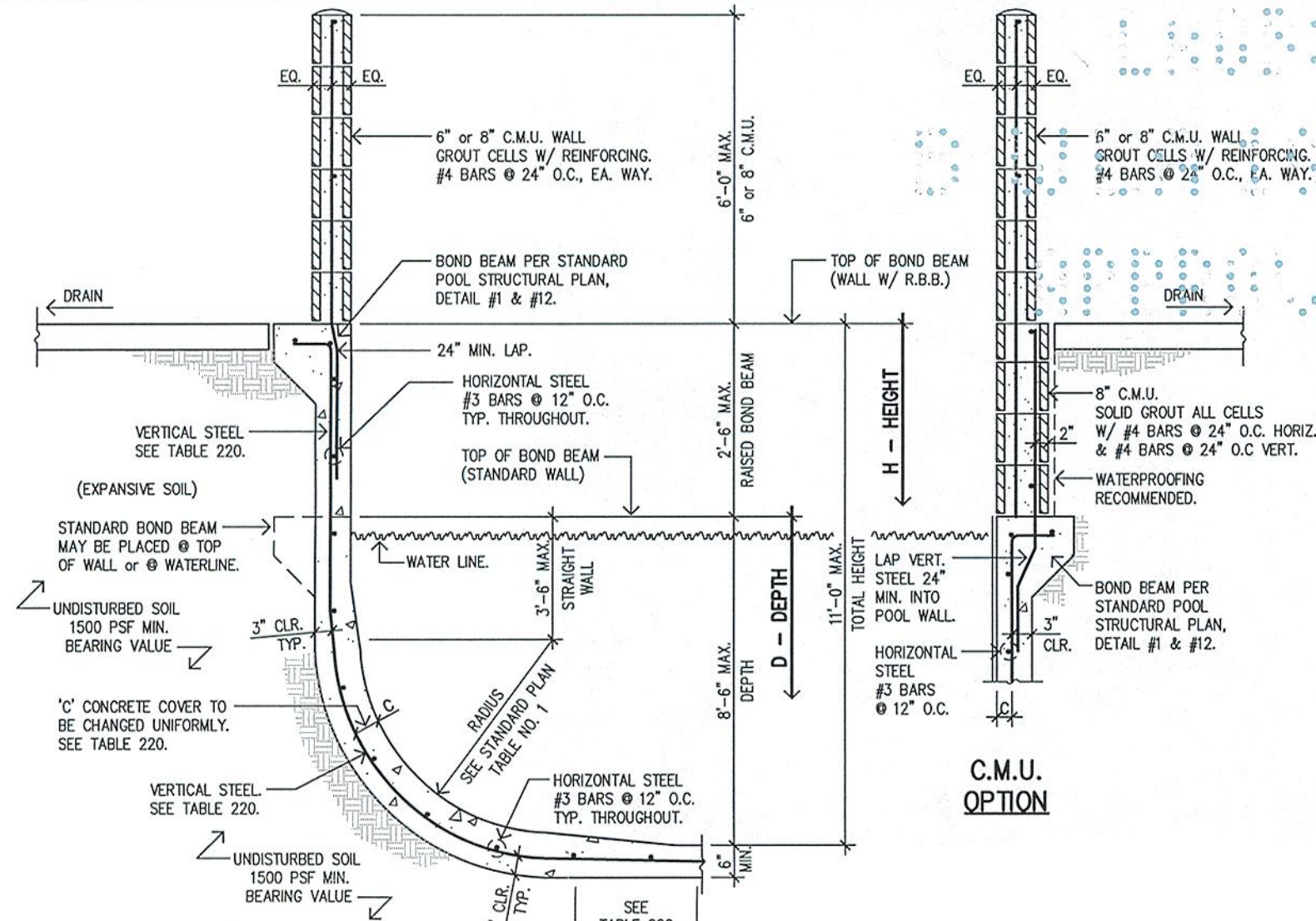
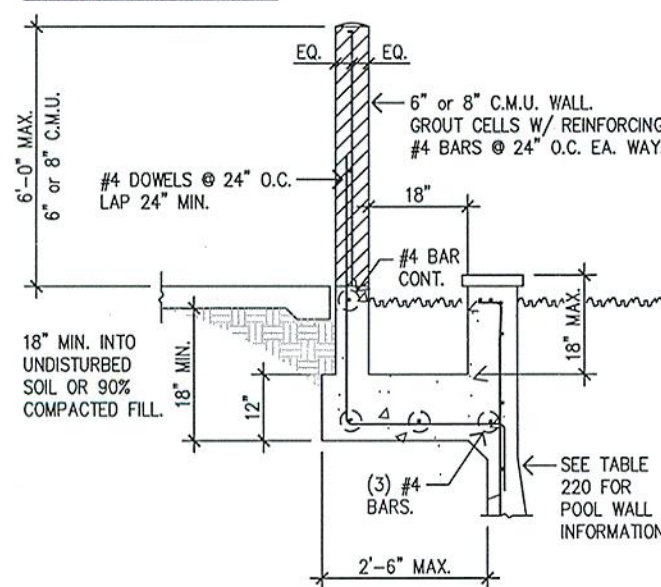


TABLE 220

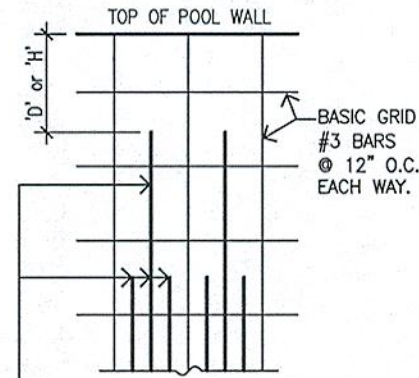
'D' or 'H' IS DISTANCE FROM TOP OF POOL WALL DOWNWARD. BEGIN SPECIFIED STEEL & GUNITE THICKNESS AT INDICATED 'D' OR 'H' DEPTH. (SEE STANDARD STRUCTURAL PLAN, DETAIL #2)

POOL DEPTH	NO RAISED BOND BEAM		REQ'D TRANS.	TOTAL HEIGHT	2'-6" MAX. R.B.B.		REQ'D TRANS.
	D	C			H	C	
0 to 2'0"	2 1/2"	#3 @ 12"	2'-0"	0 to 2'0"	2 1/2"	#3 @ 12"	2'-0"
2'-6"	3"	#3 @ 6"	2'-0"	2'-6"	3"	#3 @ 6"	2'-0"
3'-0"	3 1/2"	"	2'-0"	3'-0"	3 1/2"	"	2'-0"
4'-0"	3 1/2"	"	2'-0"	4'-0"	3 1/2"	"	2'-0"
4'-6"	3 1/2"	"	2'-0"	4'-6"	3 1/2"	#3 @ 4"	2'-0"
5'-6"	4 1/2"	"	2'-0"	5'-6"	4"	"	2'-0"
6'-6"	5 1/2"	"	2'-0"	5'-6"	4"	#3 @ 3"	2'-0"
7'-6"	6 1/2"	"	2'-0"	6'-6"	4"	"	2'-0"
7'-0"	4 1/2"	"	2'-10"	7'-0"	4 1/2"	"	2'-10"
7'-6"	5"	add 2 #4	2'-10"	7'-6"	5"	add 2 #4	2'-10"
8'-6"	5 1/2"	"	2'-10"	8'-6"	5 1/2"	"	2'-10"
9'-6"	6 1/2"	"	2'-10"	9'-6"	6 1/2"	"	2'-10"
10'-0"	7 1/2"	"	2'-10"	10'-0"	7 1/2"	"	2'-10"
11'-0"	7 1/2"	"	2'-11"	11'-0"	7 1/2"	"	2'-11"

FOUNTAIN DETAIL



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.

READY TO ISSUE
 BY V.L. DIMIR ARUTYUNYAN
 SEP 8, 2016
 Signature

REGISTERED PROFESSIONAL ENGINEER
 JEFFERY A. COLLINS
 C80733
 EXP. 6/31/2017
 CIVIL
 STATE OF CALIFORNIA

DATE: 12/27/10
 CALCS BY: A.C.
 CHECKED BY: R.L.L.

STANDARD WALL
 WITH 6'-0" BLOCK WALL ON BOND BEAM
 EXPANSIVE SOIL
 EQUIVALENT FLUID PRESSURE = 45 P.C.F.

DETAIL #220

Ron Lacher, R.C.E.
 1201 N. Tustin Ave.
 Anaheim, California 92807
 Fax: (714) 630-6114
 Phone: (714) 630-6100

pool engineering inc.

PLAN VALID ONLY WITH ENGINEER'S SIGNATURE IN RED INK ON PLAN.
 THIS DETAIL TO BE USED IN CONJUNCTION WITH STANDARD POOL STRUCTURAL PLAN