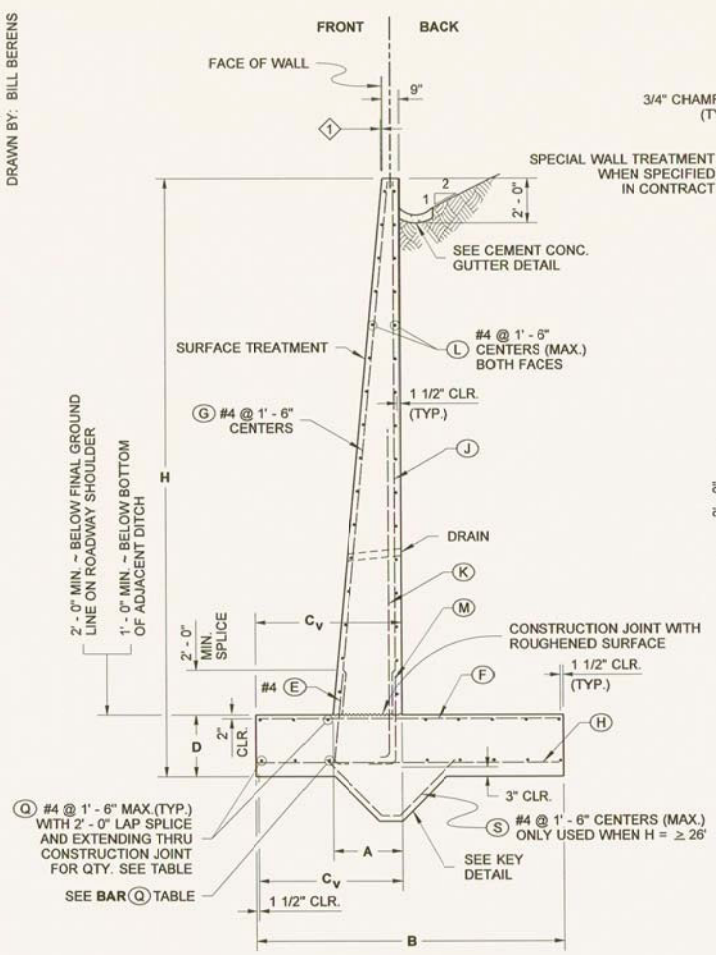
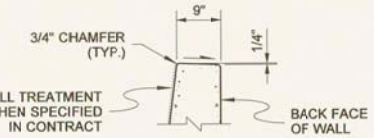
DRAWN BY: BILL BERENS



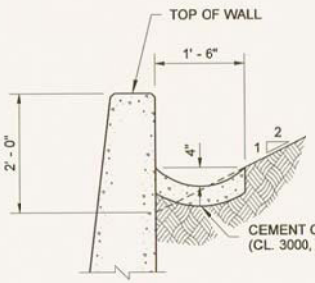
TYPICAL SECTION

BAR Q #4		
LOCATION	WALL HEIGHT (H)	QTY.
TOP OF FOOTING	≤ 14'	4
	15' ≤ 20'	6
	21' ≤ 24'	7
	25' ≤ 29'	9
	30' ≤ 35'	11
BOTTOM OF FOOTING	≤ 14'	4
	15' ≤ 20'	6
	21' ≤ 24'	7
	25' ≤ 29'	9
	30' ≤ 35'	11

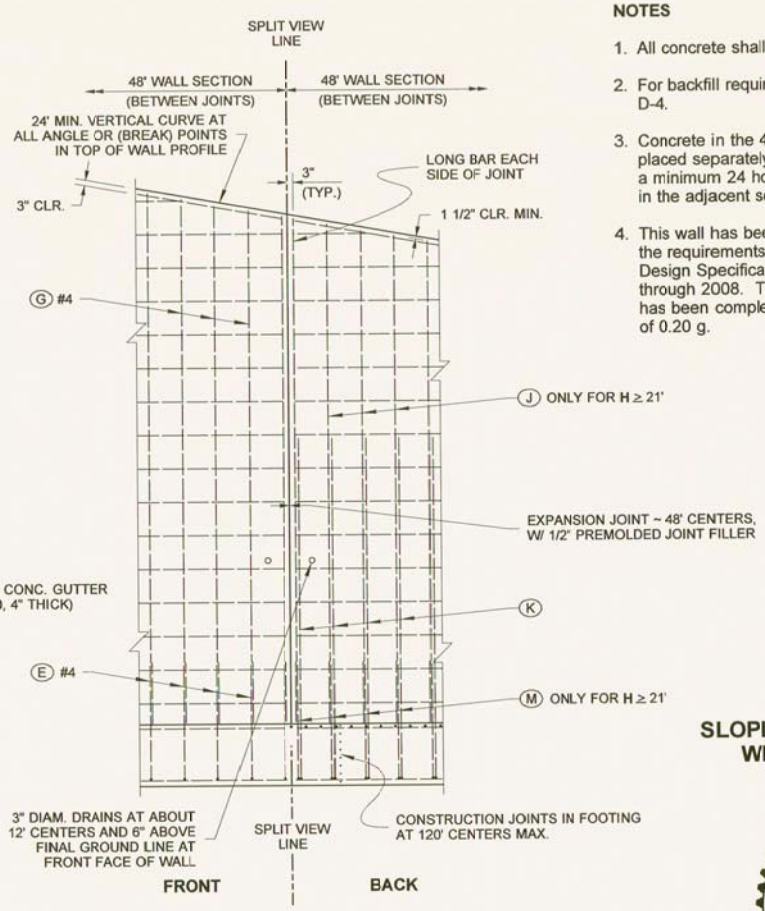
1 OFFSET ~ SET TOP OF WALL BACK:
H ≤ 20' ..... OFFSET = 1/2"
H ≥ 20' ..... OFFSET (inches) = $\frac{H(ft)}{8} - 2$



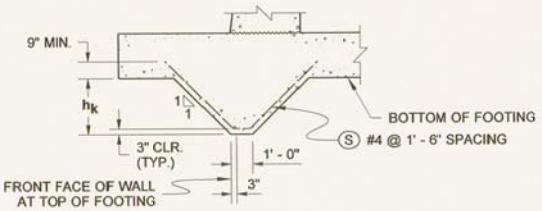
WALL TOP DETAIL



CEMENT CONC. GUTTER DETAIL



SPLIT ELEVATION VIEW
(SHOWING SEPARATE REBAR LAYERS)



KEY DETAIL
REQUIRED ON WALLS WHERE H ≥ 26'

NOTES

1. All concrete shall be Class 4000, except as noted.
2. For backfill requirements, see Standard Plan D-4.
3. Concrete in the 48 foot wall sections shall be placed separately between expansion joints with a minimum 24 hour period before placing concrete in the adjacent section.
4. This wall has been designed in accordance with the requirements of the AASHTO LRFD Bridge Design Specifications 4th Edition 2007 and interims through 2008. The seismic design of these walls has been completed using an effective PGA of 0.20 g.

SLOPING FACE WALL DESIGN WITH 2 :1 BACKSLOPE

BIJAN KHALEGHI
STATE OF WASHINGTON
21599
REGISTERED PROFESSIONAL ENGINEER

EXPIRES AUGUST 23, 2008

REINFORCED CONCRETE RETAINING WALL TYPE 6
STANDARD PLAN D-10.35-00

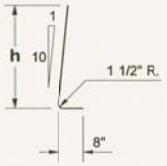
SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

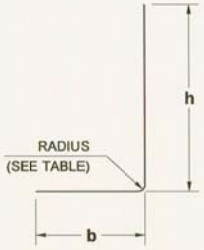
STATE DESIGN ENGINEER _____ DATE _____

Washington State Department of Transportation

WALL HT H	DIMENSIONS					FOOTING REINFORCEMENT																		STEM REINFORCEMENT				MATERIAL QUANTITY		MAXIMUM SOIL PRESSURE (PSF)		
						BAR (E) #4		BAR (F)			BAR (H)			BAR (K)					BAR (M)					BAR (J)			(G) #4					
	B	C_v	D	h_k	A	LENGTH	h	SIZE	SPA.	LENGTH	SIZE	SPA.	LENGTH	SIZE	SPA.	LENGTH	h	b	SIZE	SPA.	LENGTH	h	b	SIZE	SPA.	LENGTH	LENGTH	CONC. CY / LF	STEEL LBS / LF	SERVICE	STRENGTH	EXTREME EVENT 1
5'	4' - 3"	2' - 9"	1' - 0"	N/A	1' - 1 1/2"	3' - 4"	2' - 9"	#4	1' - 6"	4' - 0"	#4	1' - 6"	4' - 0"	#4	1' - 6"	5' - 1 1/2"	4' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3' - 9"	0.30	20.5	591	771	733
6'	4' - 3"	2' - 9"	1' - 0"	N/A	1' - 3"	3' - 4"	2' - 9"	#4	1' - 6"	4' - 0"	#4	1' - 6"	4' - 0"	#4	1' - 6"	6' - 1 1/2"	5' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4' - 9"	0.34	23.0	709	925	871
7'	4' - 3"	2' - 9"	1' - 0"	N/A	1' - 4"	3' - 4"	2' - 9"	#4	1' - 6"	4' - 0"	#4	1' - 6"	4' - 0"	#4	1' - 6"	7' - 1 1/2"	6' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5' - 9"	0.39	24.1	815	1061	992
8'	4' - 3"	3' - 0"	1' - 0"	N/A	1' - 5"	3' - 4"	2' - 9"	#4	1' - 6"	4' - 0"	#4	1' - 6"	4' - 0"	#4	1' - 6"	8' - 1 1/2"	7' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6' - 9"	0.44	26.6	887	1146	1066
9'	4' - 3"	3' - 0"	1' - 0"	N/A	1' - 6 1/2"	3' - 4"	2' - 9"	#4	1' - 6"	4' - 0"	#4	1' - 6"	4' - 0"	#4	1' - 6"	9' - 1 1/2"	8' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7' - 10 1/2"	0.50	27.7	998	1354	1236
10'	4' - 3"	3' - 3"	1' - 0"	N/A	1' - 7 1/2"	3' - 4"	2' - 9"	#4	1' - 6"	4' - 0"	#4	1' - 6"	4' - 0"	#4	1' - 6"	10' - 1 1/2"	9' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8' - 9 1/2"	0.56	31.5	1145	1580	1412
11'	4' - 9"	3' - 3"	1' - 3"	N/A	1' - 8 1/2"	3' - 7"	3' - 0"	#4	1' - 6"	4' - 6"	#4	1' - 6"	4' - 6"	#4	1' - 0"	11' - 1 1/2"	10' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9' - 6 1/2"	0.67	36.8	1368	1892	1686
12'	5' - 6"	3' - 3"	1' - 3"	N/A	1' - 10"	3' - 7"	3' - 0"	#4	1' - 6"	5' - 3"	#4	1' - 6"	5' - 3"	#4	1' - 0"	12' - 1 1/2"	11' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10' - 6 1/2"	0.77	38.8	1540	2125	1899
13'	6' - 0"	3' - 6"	1' - 3"	N/A	1' - 11"	3' - 7"	3' - 0"	#4	1' - 6"	5' - 9"	#4	1' - 6"	5' - 9"	#4	9"	13' - 1 1/2"	12' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11' - 6 1/2"	0.86	46.2	1664	2305	2049
14'	6' - 6"	3' - 6"	1' - 3"	N/A	2' - 0"	3' - 7"	3' - 0"	#4	1' - 0"	6' - 3"	#4	1' - 6"	6' - 3"	#4	7"	14' - 1 1/2"	13' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12' - 6 1/2"	0.96	54.5	1875	2604	2310
15'	7' - 3"	3' - 9"	1' - 6"	N/A	2' - 1"	3' - 10"	3' - 3"	#4	1' - 0"	7' - 0"	#4	1' - 6"	7' - 0"	#4	6"	15' - 1 1/2"	14' - 7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13' - 3 1/2"	1.12	62.7	1987	2754	2450
16'	7' - 9"	3' - 9"	1' - 6"	N/A	2' - 2"	3' - 10"	3' - 3"	#4	9"	7' - 6"	#4	1' - 6"	7' - 6"	#5	8"	16' - 2 1/2"	15' - 7"	9"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14' - 3 1/2"	1.22	72.1	2202	3058	2716
17'	8' - 3"	4' - 0"	1' - 9"	N/A	2' - 3"	4' - 1"	3' - 6"	#4	9"	8' - 0"	#4	1' - 6"	8' - 0"	#5	7"	17' - 2 1/2"	16' - 7"	9"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15' - 0 1/2"	1.39	80.1	2348	3265	2894
18'	9' - 0"	4' - 3"	1' - 9"	N/A	2' - 4 1/2"	4' - 1"	3' - 6"	#4	7"	8' - 9"	#4	1' - 6"	8' - 9"	#5	6"	18' - 2 1/2"	17' - 7"	9"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16' - 1"	1.52	93.9	2441	3391	3010
19'	9' - 9"	4' - 6"	2' - 0"	N/A	2' - 5"	4' - 4"	3' - 9"	#4	6"	9' - 6"	#4	1' - 6"	9' - 6"	#6	7"	19' - 4"	18' - 7"	11"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16' - 10"	1.73	110.7	2556	3545	3153
20'	10' - 3"	4' - 9"	2' - 3"	N/A	2' - 6"	4' - 7"	4' - 0"	#4	6"	10' - 0"	#4	1' - 6"	10' - 0"	#6	6"	20' - 4"	19' - 7"	11"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17' - 7"	1.93	123.5	2702	3752	3331
21'	11' - 0"	5' - 0"	2' - 3"	N/A	2' - 7 1/2"	4' - 7"	4' - 0"	#5	7"	10' - 9"	#4	1' - 6"	10' - 9"	#7	1' - 4"	10' - 3 1/2"	9' - 4 1/2"	1' - 1"	#7	1' - 4"	6' - 2"	5' - 2"	1' - 1"	#7	1' - 4"	18' - 6"	18' - 7"	2.09	125.5	2800	3886	3454
22'	12' - 0"	5' - 3"	2' - 3"	N/A	2' - 8 1/2"	4' - 7"	4' - 0"	#6	8"	11' - 9"	#4	1' - 6"	11' - 9"	#7	1' - 0"	9' - 3 1/2"	8' - 4 1/2"	1' - 1"	#7	1' - 0"	6' - 2"	5' - 2"	1' - 1"	#7	1' - 0"	19' - 6"	19' - 7"	2.27	153.1	2876	3983	3552
23'	12' - 3"	5' - 6"	2' - 6"	N/A	2' - 9 1/2"	4' - 10"	4' - 3"	#6	8"	12' - 0"	#4	1' - 6"	12' - 0"	#7	1' - 0"	10' - 5"	9' - 6"	1' - 1"	#7	1' - 0"	6' - 5"	5' - 5"	1' - 1"	#7	1' - 0"	20' - 3"	20' - 4"	2.48	160.1	3046	4229	3756
24'	13' - 0"	5' - 9"	2' - 6"	N/A	2' - 10 1/2"	4' - 10"	4' - 3"	#6	7"	12' - 9"	#4	1' - 6"	12' - 9"	#7	10"	10' - 0 1/2"	9' - 1 1/2"	1' - 1"	#7	10"	6' - 5"	5' - 5"	1' - 1"	#7	10"	21' - 3"	21' - 4"	2.66	184.9	3147	4368	3883
25'	13' - 9"	6' - 3"	2' - 9"	N/A	2' - 11 1/2"	5' - 1"	4' - 6"	#6	7"	13' - 6"	#4	1' - 6"	13' - 6"	#7	10"	11' - 1 1/2"	10' - 3"	1' - 1"	#7	10"	6' - 8"	5' - 8"	1' - 1"	#7	10"	22' - 0"	22' - 1"	2.94	197.0	3190	4424	3933
26'	13' - 9"	6' - 6"	2' - 9"	2' - 0"	3' - 1"	5' - 1"	4' - 6"	#6	7"	13' - 6"	#4	1' - 0"	13' - 6"	#8	1' - 4"	14' - 5 1/2"	13' - 5"	1' - 3"	#8	1' - 4"	7' - 9"	6' - 8"	1' - 3"	#8	1' - 4"	23' - 0"	23' - 1"	3.27	194.2	3248	4543	3997
27'	14' - 3"	7' - 0"	2' - 9"	2' - 0"	3' - 2"	5' - 1"	4' - 6"	#6	7"	14' - 0"	#4	1' - 0"	14' - 0"	#8	1' - 4"	15' - 5 1/2"	14' - 5 1/2"	1' - 3"	#8	1' - 4"	7' - 9"	6' - 8"	1' - 3"	#8	1' - 4"	24' - 0"	24' - 1 1/2"	3.44	201.9	3298	4620	4054
28'	14' - 9"	7' - 3"	3' - 0"	2' - 0"	3' - 3"	5' - 4"	4' - 9"	#6	7"	14' - 6"	#4	1' - 0"	14' - 6"	#8	1' - 2"	15' - 7"	14' - 6 1/2"	1' - 3"	#8	1' - 2"	8' - 0"	6' - 11"	1' - 3"	#8	1' - 2"	24' - 9"	24' - 10 1/2"	3.71	222.8	3450	4832	4238
29'	15' - 6"	7' - 6"	3' - 0"	2' - 0"	3' - 4"	5' - 4"	4' - 9"	#6	6"	15' - 3"	#4	11"	15' - 3"	#8	1' - 0"	15' - 4"	14' - 3 1/2"	1' - 3"	#8	1' - 0"	8' - 0"	6' - 11"	1' - 3"	#8	1' - 0"	25' - 9"	25' - 10 1/2"	3.92	255.3	3556	4976	4370
30'	16' - 6"	8' - 0"	3' - 3"	2' - 0"	3' - 5"	5' - 7"	5' - 0"	#7	7"	16' - 3"	#4	10'	16' - 3"	#9	10"	13' - 5 1/2"	12' - 3"	1' - 6"	#9	10"	9' - 7"	8' - 3"	1' - 6"	#9	10"	26' - 6"	26' - 7 1/2"	4.28	341.4	3591	5010	4414
31'	16' - 9"	8' - 3"	3' - 6"	2' - 0"	3' - 6"	5' - 10"	5' - 3"	#7	7"	16' - 6"	#4	10'	16' - 6"	#9	10"	14' - 6 1/2"	13' - 4"	1' - 6"	#9	10"	9' - 10"	8' - 6"	1' - 6"	#9	10"	27' - 3"	27' - 4 1/2"	4.56	353.0	3760	5254	4616
32'	17' - 3"	8' - 6"	3' - 9"	2' - 0"	3' - 7"	6' - 1"	5' - 6"	#7	7"	17' - 0"	#4	9"	17' - 0"	#10	1' - 0"	16' - 3"	14' - 10 1/2"	1' - 8"	#10	1' - 0"	11' - 5 1/2"	10' - 0"	1' - 8"	#10	1' - 0"	28' - 0"	28' - 1 1/2"	4.88	387.7	3910	5464	4799
33'	17' - 9"	8' - 9"	4' - 0"	2' - 0"	3' - 7 1/2"	6' - 4"	5' - 9"	#7	7"	17' - 6"	#4	9"	17' - 6"	#10	10"	15' - 5 1/2"	14' - 1"	1' - 8"	#10	10"	11' - 8 1/2"	10' - 3"	1' - 8"	#10	10"	28' - 9"	28' - 10 1/2"	5.21	442.0	4060	5675	4982
34'	18' - 9"	9' - 3"	4' - 0"	2' - 0"	3' - 9"	6' - 4"	5' - 9"	#7	6"	18' - 6"	#4	8"	18' - 6"	#10	10"	16' - 4"	15' - 1"	1' - 8"	#10	10"	11' - 8 1/2"	10' - 3"	1' - 8"	#10	10"	29' - 9"	29' - 10 1/2"	5.50	471.7	4072	5680	4997
35'	19' - 3"	9' - 6"	4' - 3"	2' - 0"	3' - 10"	6' - 7"	6' - 0"	#7	6"	19' - 0"	#4	7"	19' - 0"	#10	9"	16' - 2 1/2"	14' - 11 1/2"	1' - 8"	#10	9"	11' - 11 1/2"	10' - 6"	1' - 8"	#10	9"	30' - 6"	30' - 7 1/2"	5.86	516.0	4221	5889	5179



BAR (E)
@ 1' - 6" CENTERS



BAR	RADIUS
#4	1 1/2"
#5	1 7/8"
#6	2 1/4"
#7	2 5/8"
#8	3"
#9	4 3/4"
#10	5 3/8"
#11	6"

BARS (K) AND (M)

BAR	MIN. SPLICE
#4	2' - 0"
#5	2' - 0"
#6	2' - 0"
#7	2' - 6"
#8	3' - 3"
#9	4' - 2"
#10	5' - 3"

DRAWN BY: BILL BERENS

SLOPING FACE WALL DESIGN WITH 2 :1 BACKSLOPE

BIJAN KHALEGHI
STATE OF WASHINGTON
21695
REGISTERED
PROFESSIONAL ENGINEER
2/8/08

EXPIRES AUGUST 23, 2008

REINFORCED CONCRETE RETAINING WALL TYPE 6
STANDARD PLAN D-10.35-00

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

STATE DESIGN ENGINEER — DATE

Washington State Department of Transportation