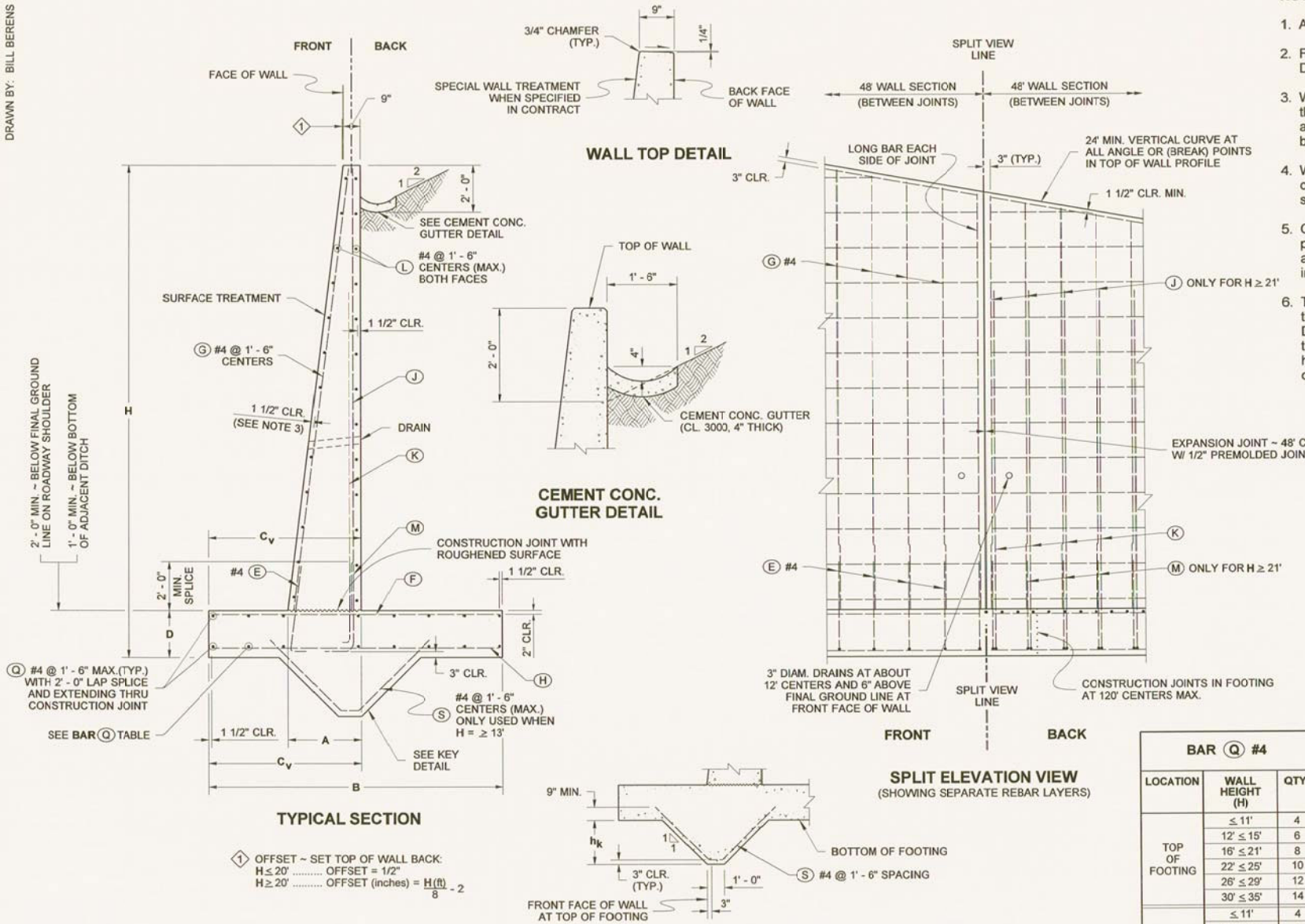


DRAWN BY: BILL BERENS



2'-0" MIN. - BELOW FINAL GROUND LINE ON ROADWAY SHOULDER
1'-0" MIN. - BELOW BOTTOM OF ADJACENT DITCH

ⓐ #4 @ 1'-6" MAX. (TYP.) WITH 2'-0" LAP SPLICE AND EXTENDING THRU CONSTRUCTION JOINT
SEE BAR ⓐ TABLE

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

KEY DETAIL
REQUIRED ON WALLS WHERE H ≥ 13'

- NOTES**
1. All concrete shall be Class 4000, except as noted.
 2. For backfill requirements, see Standard Plan D-4.
 3. When Wall Type 4SW (saltwater) is specified, the concrete cover over steel in the front face and the total wall thickness shall be increased by 1".
 4. When Wall Type 4SW (saltwater) is specified, concrete in the table column "Material Quantity" shall be increased by (0.003 x H) CY/LF.
 5. 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.
 6. 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 0.51 g.

SLOPING FACE WALL DESIGN WITH 2:1 BACKSLOPE



REINFORCED CONCRETE RETAINING WALL TYPE 4 AND 4SW STANDARD PLAN D-10.25-00

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

STATE DESIGN ENGINEER DATE
Washington State Department of Transportation

BAR ⓐ #4		
LOCATION	WALL HEIGHT (H)	QTY.
TOP OF FOOTING	≤ 11'	4
	12' ≤ 15'	6
	16' ≤ 21'	8
	22' ≤ 25'	10
	26' ≤ 29'	12
BOTTOM OF FOOTING	30' ≤ 35'	14
	≤ 11'	4
	12' ≤ 15'	6
	16' ≤ 21'	8
	22' ≤ 25'	10
26' ≤ 29'	12	
30' ≤ 35'	14	

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	CONC. CY / LF	STEEL LBS / LF	SERVICE	STRENGTH	EXTREME EVENT 1							
						LENGTH	h	SIZE	SPA.	LENGTH	SIZE	SPA.	LENGTH	SIZE	SPA.	LENGTH	h	b	SIZE	SPA.	LENGTH	h						b	LENGTH					
5'	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"	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	3'-10"	0.31	20.6	552	718	856
6'	4'-3"	3'-0"	1'-0"	N/A	1'-4 1/2"	3'-4"	2'-9"	#4	1'-6"	4'-0"	#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	4'-10"	0.35	23.0	666	864	1030
7'	4'-3"	3'-0"	1'-0"	N/A	1'-6"	3'-4"	2'-9"	#4	1'-6"	4'-0"	#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	5'-10"	0.41	25.5	771	998	1335
8'	4'-6"	3'-3"	1'-0"	N/A	1'-7 1/2"	3'-4"	2'-9"	#4	1'-6"	4'-3"	#4	1'-6"	4'-3"	#4	1'-6"	4'-3"	#4	1'-6"	8'-1 1/2"	7'-7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	6'-10 1/2"	0.47	28.2	862	1112	1612	
9'	5'-0"	3'-3"	1'-0"	N/A	1'-9"	3'-4"	2'-9"	#4	1'-6"	4'-9"	#4	1'-6"	4'-9"	#4	1'-6"	4'-9"	#4	1'-6"	9'-1 1/2"	8'-7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	7'-10 1/2"	0.56	31.1	969	1281	2056	
10'	5'-6"	3'-6"	1'-0"	N/A	1'-10 1/2"	3'-4"	2'-9"	#4	1'-6"	5'-3"	#4	1'-6"	5'-3"	#4	1'-6"	5'-3"	#4	1'-0"	10'-1 1/2"	9'-7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	8'-10 1/2"	0.64	36.2	1067	1440	2383	
11'	6'-0"	3'-9"	1'-0"	N/A	2'-0"	3'-4"	2'-9"	#4	1'-6"	5'-9"	#4	1'-6"	5'-9"	#4	1'-6"	5'-9"	#4	11"	11'-1 1/2"	10'-7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	9'-10 1/2"	0.73	40.0	1184	1605	2732	
12'	6'-9"	4'-0"	1'-0"	N/A	2'-1 1/2"	3'-4"	2'-9"	#4	1'-0"	6'-6"	#4	1'-0"	6'-6"	#4	1'-0"	6'-6"	#4	8"	12'-1 1/2"	11'-7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	10'-10 1/2"	0.84	51.0	1301	1767	2989	
13'	7'-0"	4'-6"	1'-0"	1'-0"	2'-3"	3'-4"	2'-9"	#4	1'-0"	6'-9"	#4	1'-0"	6'-9"	#4	1'-0"	6'-9"	#4	7"	13'-1 1/2"	12'-7"	8"	N/A	N/A	N/A	N/A	N/A	N/A	11'-10 1/2"	1.00	57.5	1388	1896	3229	
14'	7'-9"	4'-9"	1'-3"	1'-3"	2'-4"	3'-7"	3'-0"	#4	1'-0"	7'-6"	#4	11"	7'-6"	#5	8"	14'-3"	13'-7"	9"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12'-7 1/2"	1.19	66.8	1539	2104	3537		
15'	8'-3"	5'-0"	1'-3"	1'-3"	2'-5 1/2"	3'-7"	3'-0"	#4	11"	8'-0"	#4	9"	8'-0"	#5	7"	15'-3"	14'-7"	9"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13'-7 1/2"	1.31	77.7	1657	2271	3915		
16'	9'-0"	5'-3"	1'-6"	1'-6"	2'-6 1/2"	3'-10"	3'-3"	#4	9"	8'-9"	#4	7"	8'-9"	#5	6"	16'-3"	15'-7"	9"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14'-8"	1.53	92.5	1806	2480	4220		
17'	9'-9"	5'-6"	1'-6"	1'-6"	2'-8"	3'-10"	3'-3"	#4	6"	9'-6"	#4	6"	9'-6"	#5	7"	17'-4"	16'-7"	11"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15'-8"	1.67	113.0	1927	2642	4489		
18'	10'-6"	5'-6"	1'-6"	1'-6"	2'-9 1/2"	3'-10"	3'-3"	#5	8"	10'-3"	#4	6"	10'-3"	#7	8"	18'-6"	17'-7"	1'-1"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16'-5"	1.81	132.6	2121	2909	5006		
19'	11'-0"	6'-3"	1'-9"	1'-9"	2'-10 1/2"	4'-1"	3'-6"	#5	8"	10'-9"	#4	6"	10'-9"	#7	7"	19'-6"	18'-7"	1'-1"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17'-2"	2.06	146.5	2126	2921	4937		
20'	11'-9"	6'-6"	1'-9"	1'-9"	3'-0"	4'-1"	3'-6"	#5	8"	11'-6"	#5	8"	11'-6"	#7	6"	20'-6"	19'-7"	1'-1"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18'-2"	2.22	170.2	2245	3085	5207		
21'	12'-6"	6'-6"	2'-0"	2'-0"	3'-1 1/2"	4'-4"	3'-9"	#5	7"	12'-3"	#5	8"	12'-3"	#8	1'-2"	14'-2"	13'-1 1/2"	1'-3"	#8	1'-2"	7'-0"	5'-11"	1'-3"	#8	1'-2"	18'-10"	2.51	185.2	2472	3396	5756			
22'	13'-6"	6'-6"	2'-3"	2'-3"	3'-2 1/2"	4'-7"	4'-0"	#5	6"	13'-3"	#5	8"	13'-3"	#9	1'-0"	14'-5 1/2"	13'-4"	1'-6"	#9	1'-0"	8'-7"	7'-3"	1'-6"	#9	1'-0"	19'-7"	2.85	227.4	2698	3703	6200			
23'	13'-9"	7'-0"	2'-3"	2'-3"	3'-4"	4'-7"	4'-0"	#5	6"	13'-6"	#5	8"	13'-6"	#9	1'-2"	15'-10"	14'-8 1/2"	1'-6"	#9	1'-2"	8'-7"	7'-3"	1'-6"	#9	1'-2"	20'-7"	2.99	237.4	2746	3778	6450			
24'	14'-6"	7'-3"	2'-6"	2'-6"	3'-5"	4'-10"	4'-3"	#6	7"	14'-3"	#5	8"	14'-3"	#9	1'-0"	15'-10 1/2"	14'-9"	1'-6"	#9	1'-0"	8'-10"	7'-6"	1'-6"	#9	1'-0"	21'-4"	3.23	275.9	2899	3989	6759			
25'	15'-0"	7'-9"	2'-6"	2'-6"	3'-6 1/2"	4'-10"	4'-3"	#6	7"	14'-9"	#5	6"	14'-9"	#10	1'-2"	17'-7 1/2"	16'-4 1/2"	1'-8"	#10	1'-2"	10'-2 1/2"	8'-9"	1'-8"	#10	1'-2"	22'-4"	3.51	316.5	2944	4056	6897			
26'	15'-9"	7'-9"	2'-6"	2'-6"	3'-8"	4'-10"	4'-3"	#6	6"	15'-6"	#5	6"	15'-6"	#10	1'-0"	17'-7"	16'-4"	1'-8"	#10	1'-0"	10'-2 1/2"	8'-9"	1'-8"	#10	1'-0"	23'-4"	3.71	364.9	3141	4328	7416			
27'	16'-3"	8'-3"	2'-9"	2'-9"	3'-9"	5'-1"	4'-6"	#6	6"	16'-0"	#6	8"	16'-0"	#10	10"	17'-0 1/2"	15'-9 1/2"	1'-8"	#10	10"	10'-5 1/2"	9'-0"	1'-8"	#10	10"	24'-1"	4.07	418.8	3219	4439	7593			
28'	16'-9"	8'-9"	3'-0"	3'-0"	3'-10 1/2"	5'-4"	4'-9"	#6	6"	16'-6"	#6	7"	16'-6"	#10	10"	18'-5 1/2"	17'-2 1/2"	1'-8"	#10	10"	10'-8 1/2"	9'-3"	1'-8"	#10	10"	24'-10"	4.45	441.3	3298	4552	7773			
29'	17'-6"	9'-0"	3'-3"	3'-3"	3'-11 1/2"	5'-7"	5'-0"	#6	6"	17'-3"	#6	7"	17'-3"	#10	9"	18'-8 1/2"	17'-5 1/2"	1'-8"	#10	9"	10'-11 1/2"	9'-6"	1'-8"	#10	9"	25'-7"	4.87	485.7	3451	4763	8081			
30'	18'-0"	9'-3"	3'-6"	3'-6"	4'-0 1/2"	5'-10"	5'-3"	#6	6"	17'-9"	#6	7"	17'-9"	#10	9"	20'-1 1/2"	18'-10 1/2"	1'-8"	#10	9"	11'-2 1/2"	9'-9"	1'-8"	#10	9"	26'-4"	5.28	505.6	3606	4982	8510			
31'	18'-9"	9'-6"	4'-0"	4'-0"	4'-1 1/2"	6'-4"	5'-9"	#6	6"	18'-6"	#6	7"	18'-6"	#10	8"	20'-1 1/2"	18'-10 1/2"	1'-8"	#10	8"	11'-8 1/2"	10'-3"	1'-8"	#10	8"	26'-10"	5.96	559.9	3793	5241	8856			
32'	19'-6"	9'-9"	3'-9"	3'-9"	4'-3"	6'-1"	5'-6"	#7	7"	19'-3"	#6	6"	19'-3"	#10	7"	19'-10 1/2"	18'-7 1/2"	1'-8"	#10	7"	11'-5 1/2"	10'-0"	1'-8"	#10	7"	28'-1"	6.00	643.8	3879	5357	9087			
33'	20'-0"	10'-0"	4'-0"	4'-0"	4'-4 1/2"	6'-4"	5'-9"	#7	7"	19'-9"	#6	6"	19'-9"	#10	7"	21'-3 1/2"	20'-0 1/2"	1'-8"	#10	7"	11'-8 1/2"	10'-3"	1'-8"	#10	7"	28'-10"	6.46	688.3	4034	5577	9518			
34'	20'-9"	10'-3"	4'-1"	4'-1"	4'-5 1/2"	6'-6"	5'-11"	#7	6"	20'-8"	#6	6"	20'-8"	#10	6"	19'-10 1/2"	18'-7 1/2"	1'-8"	#10	6"	11'-2 1/2"	9'-9"	1'-8"	#10	6"	29'-9"	6.81	831.8	4324	5833	9880			
35'	21'-3"	10'-6"	4'-2"	4'-2"	4'-7"	6'-8"	6'-1"	#7	6"	21'-0"	#7	7"	21'-0"	#10	6"	20'-8"	19'-5"	1'-8"	#10	6"	10'-10"	9'-5"	1'-8"	#10	6"	30'-8"	7.13	969.0	4611	6094	10364			



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"

BAR (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"

VERTICAL FACE WALL DESIGN WITH 2:1 BACKSLOPE

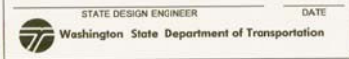


EXPIRES AUGUST 23, 2008

REINFORCED CONCRETE RETAINING WALL TYPE 4 AND 4SW STANDARD PLAN D-10.25-00

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION



DRAWN BY: BILL BERENS