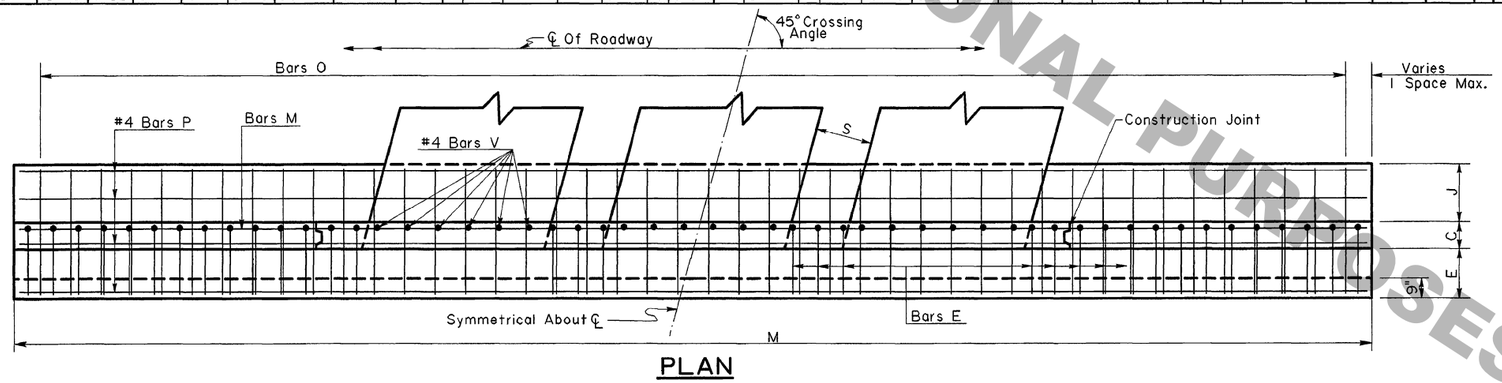
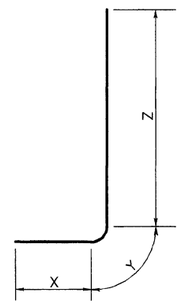
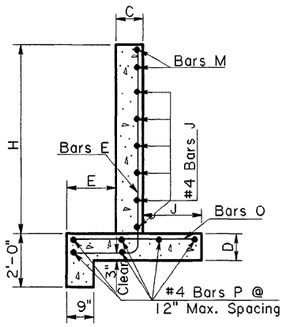
OPENING			H	E	C	J	D	L	M	S	BARS E							#4 BARS J		BARS O			#4 BARS P		#4BARS H		#4BARS V		BARS M		CONC.	STEEL	OPENING		
Dia. in.	No.	Area sq.ft.	Lgth. ft.in.	Lgth. ft.in.	Lgth. ft.in.	Lgth. ft.in.	Lgth. ft.in.	Lgth. ft.in.	Lgth. ft.in.	Lgth. ft.in.	Size	No.	Lgth. ft.in.	Spc. in.	X ft.in.	Y in.	Z ft.in.	No.	Lgth. ft.in.	Size	No.	Lgth. ft.in.	Spc. in.	No.	Lgth. ft.in.	No.	Lgth. ft.in.	Size	No.	Lgth. in.	Size	No.	Lgth. ft.in.	CU. YDS.	LBS.	Area sq.ft.	No.	Dia. in.
15	1	1.2	2- 3	0- 4	0- 6	2-11	0-10	6- 4	14- 5	1- 3	4	14	3- 1	12.0	0- 5	2	2- 6	2	6- 0	4	15	3- 5	12.0	7	14- 1	0	0- 0	1	8	4	2	14- 1	2.70	156	1.2	1	15
15	2	2.5	2- 3	0- 4	0- 6	2-11	0-10	6- 4	17-11	1- 3	4	17	3- 1	12.0	0- 5	2	2- 6	2	6- 0	4	19	3- 5	12.0	7	17- 7	2	1- 5	2	8	4	2	17- 7	3.34	194	2.5	2	15
15	3	3.7	2- 3	0- 4	0- 6	2-11	0-10	6- 4	21- 6	1- 3	4	20	3- 1	12.0	0- 5	2	2- 6	2	6- 0	4	22	3- 5	12.0	7	21- 2	3	1- 5	3	8	4	2	21- 2	3.98	230	3.7	3	15
15	4	4.9	2- 3	0- 4	0- 6	2-11	0-10	6- 4	25- 0	1- 3	4	23	3- 1	12.0	0- 5	2	2- 6	2	6- 0	4	26	3- 5	12.0	7	24- 8	3	1- 5	4	8	4	2	24- 8	4.62	268	4.9	4	15
15	5	6.1	2- 3	0- 4	0- 6	2-11	0-10	6- 4	28- 6	1- 3	4	26	3- 1	12.0	0- 5	2	2- 6	2	6- 0	4	29	3- 5	12.0	7	28- 2	4	1- 5	5	8	4	2	28- 2	5.25	303	6.1	5	15
15	6	7.4	2- 3	0- 4	0- 6	2-11	0-10	6- 4	32- 0	1- 3	4	29	3- 1	12.0	0- 5	2	2- 6	2	6- 0	4	33	3- 5	12.0	7	31- 8	5	1- 5	6	8	4	2	31- 8	5.88	341	7.4	6	15
18	1	1.6	2- 6	0- 4	0- 6	3- 1	0-10	7- 1	16- 3	1- 3	4	16	3- 4	12.0	0- 5	2	2- 9	2	6- 9	4	17	3- 7	12.0	7	15-11	0	0- 0	1	8	4	2	15-11	3.20	181	1.8	1	18
18	2	3.5	2- 6	0- 4	0- 6	3- 1	0-10	7- 1	20- 2	1- 3	4	19	3- 4	12.0	0- 5	2	2- 9	2	6- 9	4	21	3- 7	12.0	7	19-10	1	1- 5	2	8	4	2	19-10	3.93	223	3.5	2	18
18	3	5.3	2- 6	0- 4	0- 6	3- 1	0-10	7- 1	24- 9	1- 3	4	22	3- 4	12.0	0- 5	2	2- 9	2	6- 9	4	25	3- 7	12.0	7	23- 8	2	1- 5	3	8	4	2	23- 8	4.65	263	5.3	3	18
18	4	7.1	2- 6	0- 4	0- 6	3- 1	0-10	7- 1	27-11	1- 3	4	25	3- 4	12.0	0- 5	2	2- 9	2	6- 9	4	29	3- 7	12.0	7	27- 7	3	1- 5	4	8	4	2	27- 7	5.39	305	7.1	4	18
18	5	8.8	2- 6	0- 4	0- 6	3- 1	0-10	7- 1	31- 9	1- 3	4	28	3- 4	12.0	0- 5	2	2- 9	2	6- 9	4	32	3- 7	12.0	7	31- 5	4	1- 5	5	8	4	2	31- 5	6.10	343	8.8	5	18
18	6	10.6	2- 6	0- 4	0- 6	3- 1	0-10	7- 1	35- 8	1- 3	4	31	3- 4	12.0	0- 5	2	2- 9	2	6- 9	4	36	3- 7	12.0	7	35- 4	5	1- 5	6	8	4	2	35- 4	6.84	384	10.6	6	18
24	1	3.1	3- 0	0- 5	0- 6	3- 3	0-10	8- 6	19-10	1- 3	4	18	3-11	12.0	0- 6	2	3- 3	4	8- 2	4	21	3-10	12.0	7	19- 6	0	0- 0	2	8	4	2	19- 6	4.21	241	3.1	1	24
24	2	6.3	3- 0	0- 5	0- 6	3- 3	0-10	8- 6	24- 5	1- 3	4	21	3-11	12.0	0- 6	2	3- 3	4	8- 2	4	25	3-10	12.0	7	24- 1	2	1- 5	4	8	4	2	24- 1	5.12	289	6.3	2	24
24	3	9.4	3- 0	0- 5	0- 6	3- 3	0-10	8- 6	29- 0	1- 3	4	24	3-11	12.0	0- 6	2	3- 3	4	8- 2	4	30	3-10	12.0	7	28- 8	4	1- 5	6	8	4	2	28- 8	6.03	340	9.4	3	24
24	4	12.6	3- 0	0- 5	0- 6	3- 3	0-10	8- 6	33- 7	1- 3	4	27	3-11	12.0	0- 6	2	3- 3	4	8- 2	4	34	3-10	12.0	7	33- 3	6	1- 5	8	8	4	2	33- 3	6.94	389	12.6	4	24
24	5	15.7	3- 0	0- 5	0- 6	3- 3	0-10	8- 6	38- 2	1- 3	4	30	3-11	12.0	0- 6	2	3- 3	4	8- 2	4	39	3-10	12.0	7	37-10	8	1- 5	10	8	4	2	37-10	7.85	440	15.7	5	24
24	6	18.8	3- 0	0- 5	0- 6	3- 3	0-10	8- 6	42- 9	1- 3	4	33	3-11	12.0	0- 6	2	3- 3	4	8- 2	4	43	3-10	12.0	7	42- 5	10	1- 5	12	8	4	2	42- 5	8.76	488	18.8	6	24
30	1	4.9	3- 6	0- 6	0- 6	3- 6	0-10	9-11	23- 4	1- 3	4	22	4- 6	12.0	0- 7	2	3- 9	4	9- 7	4	24	4- 2	12.0	7	23- 0	0	0- 0	3	8	4	2	23- 0	5.38	298	4.9	1	30
30	2	9.8	3- 6	0- 6	0- 6	3- 6	0-10	9-11	28- 8	1- 3	4	25	4- 6	12.0	0- 7	2	3- 9	4	9- 7	4	29	4- 2	12.0	7	28- 4	2	1- 5	6	8	4	2	28- 4	6.51	356	9.8	2	30
30	3	14.7	3- 6	0- 6	0- 6	3- 6	0-10	9-11	33-11	1- 3	4	28	4- 6	12.0	0- 7	2	3- 9	4	9- 7	4	35	4- 2	12.0	7	33- 7	4	1- 5	8	8	4	2	33- 7	7.62	417	14.7	3	30
30	4	19.6	3- 6	0- 6	0- 6	3- 6	0-10	9-11	39- 3	1- 3	4	31	4- 6	12.0	0- 7	2	3- 9	4	9- 7	4	40	4- 2	12.0	7	38-11	6	1- 5	12	8	4	2	38-11	9.25	475	19.6	4	30
30	5	24.5	3- 6	0- 6	0- 6	3- 6	0-10	9-11	44- 6	1- 3	4	34	4- 6	12.0	0- 7	2	3- 9	4	9- 7	4	45	4- 2	12.0	7	44- 2	8	1- 5	15	8	4	2	44- 2	9.86	533	24.5	5	30
30	6	29.4	3- 6	0- 6	0- 6	3- 6	0-10	9-11	49-10	1- 3	4	37	4- 6	12.0	0- 7	2	3- 9	4	9- 7	4	51	4- 2	12.0	7	49- 6	10	1- 5	18	8	4	2	49- 6	10.99	594	29.4	6	30
36	1	7.1	4- 0	0- 7	0- 6	3- 9	0-10	11- 4	26-11	1- 3	4	26	5- 1	11.0	0- 8	2	4- 3	6	11- 0	4	28	4- 6	12.0	8	26- 7	0	0- 0	4	8	4	2	26- 7	6.70	396	7.1	1	36
36	2	14.1	4- 0	0- 7	0- 6	3- 9	0-10	11- 4	32-11	1- 3	4	29	5- 1	11.0	0- 8	2	4- 3	6	11- 0	4	34	4- 6	12.0	8	32- 7	3	1- 5	8	8	4	2	32- 7	8.04	469	14.1	2	36
36	3	21.2	4- 0	0- 7	0- 6	3- 9	0-10	11- 4	38-11	1- 3	4	32	5- 1	11.0	0- 8	2	4- 3	6	11- 0	4	40	4- 6	12.0	8	38- 7	6	1- 5	12	8	4	2	38- 7	9.39	542	21.2	3	36
36	4	28.3	4- 0	0- 7	0- 6	3- 9	0-10	11- 4	44-11	1- 3	4	35	5- 1	11.0	0- 8	2	4- 3	6	11- 0	4	46	4- 6	12.0	8	44- 7	9	1- 5	16	8	4	2	44- 7	10.74	615	28.3	4	36
36	5	35.3	4- 0	0- 7	0- 6	3- 9	0-10	11- 4	50-11	1- 3	4	38	5- 1	11.0	0- 8	2	4- 3	6	11- 0	4	52	4- 6	12.0	8	50- 7	12	1- 5	20	8	4	2	50- 7	12.09	687	35.3	5	36
36	6	42.4	4- 0	0- 7	0- 6	3- 9	0-10	11- 4	56-10	1- 3	4	41	5- 1	11.0	0- 8	2	4- 3	6	11- 0	4	58	4- 6	12.0	8	56- 6	15	1- 5	24	8	4	2	56- 6	13.42	760	42.4	6	36
42	1	9.6	4- 6	0- 8	0- 6	4- 0	0-10	12- 9	30- 5	1- 5	4	38	5- 8	8.5	0- 9	2	4- 9	6	12- 5	4	31	4-10	12.0	8	30- 1	0	0- 0	4	8	4	2	30- 1	8.12	496	9.6	1	42
42	2	19.2	4- 6	0- 8	0- 6	4- 0	0-10	12- 9	37- 5	1- 5	4	41	5- 8	8.5	0- 9	2	4- 9	6	12- 5	4	38	4-10	12.0	8	37- 1	3	1- 8	8	8	4	2	37- 1	9.79	582	19.2	2	42
42	3	28.8	4- 6	0- 8	0- 6	4- 0	0-10	12- 9	44- 4	1- 5	4	44	5- 8	8.5	0- 9	2	4- 9	6	12- 5	4	45	4-10	12.0	8	44- 0	6	1- 8	12	8	4	2	44- 0	11.44	667	28.8	3	42
42	4	38.5	4- 6	0- 8	0- 6	4- 0	0-10	12- 9	51- 4	1- 5	4	47	5- 8	8.5	0- 9	2	4- 9	6	12- 5	4	52	4-10	12.0	8	51- 0	9	1- 8	16	8	4	2	51- 0	13.12	753	38.5	4	42
42	5	48.1	4- 6	0- 8	0- 6	4- 0	0-10	12- 9	58- 3	1- 5	4	50	5- 8	8.5	0- 9	2	4- 9	6	12- 5	4	59	4-10	12.0	8	57-11	12	1- 8	20	8	4	2	57-11	14.77	839	48.1	5	42
42	6	57.7	4- 6	0- 8	0- 6	4- 0	0-10	12- 9	65- 2	1- 5	4	53	5- 8	8.5	0- 9	2	4- 9	6	12- 5	4	66	4-10	12.0	8	64-10	15	1- 8	24	8	4	2	64-10	16.42	924	57.7	6	42
48	1	12.6	5- 0	0- 9	0- 6	4- 2	0-10	14- 2	34- 0	1- 7	4	54	6- 3	6.5	0-10	2	5- 3	8	13-10	4	35	5- 1	12.0	8	33- 8	0	0- 0	5	8	4	2	33- 8	9.60	645	12.6	1	48
48	2	25.1	5- 0	0- 9	0- 6	4- 2	0-10	14- 2	41-11	1- 7	4	59	6- 3	6.5	0-10	2	5- 3	8	13-10	4	43	5- 1	12.0	8	41- 7	4	1-11	10	8	4	2	41- 7	11.59	753	25.1	2	48
48	3	37.7	5- 0	0- 9	0- 6	4- 2	0-10	14- 2	49-10	1- 7	4	64	6- 3	6.5	0-10	2	5- 3	8	13-10	4	51	5- 1	12.0	8	49- 6	8	1-11	15	8	4	2	49- 6	13.57	862	37.7	3	48
48	4	50.2	5- 0	0- 9	0- 6	4- 2	0-10	14- 2	57- 9	1- 7	4	69	6- 3	6.5	0-10	2	5- 3	8	13-10	4	58	5- 1	12.0	8	57- 5	12	1-11	20	8	4	2	57- 5	15.56	967	50.2	4	48
48	5	62.8	5- 0	0- 9	0- 6	4- 2	0-10	14- 2	65- 7	1- 7	4	74	6- 3	6.5	0-10	2	5- 3	8	13-10	4	66	5- 1	12.0	8	65- 3	16	1-11	25	8	4	2	65- 3	17.52	1074	62.8	5	48
48	6	75.4	5- 0	0- 9	0- 6	4- 2	0-10	14- 2	73- 6	1- 7	4	79	6- 3	6.5	0-10	2	5- 3	8	13-10	4	74	5- 1	12.0	8	73- 2	20	1-11	30	8	4	2	73- 2	19.50	1183	75.4	6	48
54	1	15.9	5- 6	0-10	0- 8	4- 4	1- 0	15- 7	37- 6	1- 9	4	46	7- 2	8.5	1- 1	2	5-11	8	15- 3	4	38	5- 6	12.0	9	37- 2	0	0- 0	6	8	4	2	37- 2	13.68	717	15.9	1	54
54	2	31.8	5- 6	0-10	0- 8	4- 4	1- 0	15- 7	46- 5	1- 9	4	50	7- 2	8.5	1- 1	2	5-11	8	15- 3	4	47	5- 6	12.0	9	46- 1	4	2- 2	12	8	4	2	46- 1	16.51	843	31.8	2	54
54	3	47.7	5- 6	0-10	0- 8	4- 4	1- 0	15- 7	55- 4	1- 9	4	54	7- 2	8.5	1- 1	2	5-11	8	15- 3	4	56	5- 6	12.0	9	54-11	8	2- 2	18	8	4	2	54-11	19.31	969	47.7	3	54
54	4	63.6	5- 6	0-10	0- 8	4- 4	1- 0	15- 7	64- 1	1- 9	4	58	7- 2	8.5	1- 1	2	5-11	8	15- 3	4	65	5- 6	12.0	9	63- 9	12	2- 2	24	8	4	2	63- 9	22.10	1094	63.6	4	54
54	5	79.5	5- 6	0-10	0- 8	4- 4	1- 0	15- 7	73- 0	1- 9	4	62	7- 2	8.5	1- 1	2	5-11	8	15- 3	4	74	5- 6	12.0	9	72- 8	16	2- 2	30	8	4	2	72- 8	24.93	1220	79.5	5	54
54	6	95.4	5- 6	0-10	0- 8	4- 4	1- 0	15- 7	81-10	1- 9	4	66	7- 2	8.5	1- 1	2	5-11	8	15- 3	4	83	5- 6	12.0	9	81- 6	20	2- 2	36	8	4	2	81- 6	27.73	1346	95.4	6	54

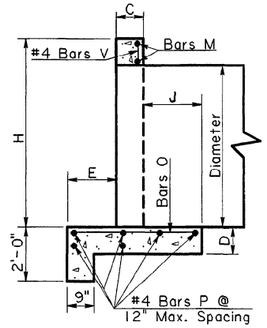




BARS E



SECTION A-A



SECTION B-B

STATE OF LOUISIANA
WILLIAM M. RAY
REG. No. 24936
REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING
6-28-01

GENERAL NOTES

DESIGN: Method- Headwalls are designed as retaining walls according to current AASHTO working stress procedures. Walls are designed for a lateral earth pressure of 40 psf with 2.0 feet of surcharge. Overturning- A minimum safety factor of 2.0 is provided against overturning. The resultant of loads is within the middle third of the footing. Sliding - A minimum safety factor of 1.5 is provided against sliding. The coefficient of friction between the footing and soil is 0.5. Foundation - The design soil bearing pressure is 1800 psf. When strength of the soil at the site is less than 1800 psf, bedding material shall be added under the footing as directed.

MATERIALS: Concrete- All concrete shall be class A. All exposed edges shall be ¾ inch chamfered. Reinforcing Steel - Reinforcement shall be Grade 60. Bar spacing dimensions are to bar centers. Steel required for lap splices not detailed shall not be measured for payment. Reinforcing steel shall have 2" cover unless otherwise specified. Steel and concrete quantities shown in table are for one headwall.

A 1'-6" square of geotextile fabric (see Section 1019 of the LA DOTD Standard Specifications) shall be placed in contact with concrete behind each weephole in addition to approximately 2 cu.ft. of concrete sand (see Section 1003.02 of the LA DOTD Standard Specifications).

CONSTRUCTION JOINTS: All construction joints shown are optional. For details of keyed construction joints see Standard Plan CM-49. For construction joints without key, the joint surface shall be roughened. Hardened surface shall be cleaned. Immediately before new concrete is placed, joint surface shall be saturated with water.

PRELIMINARY PLANS FOR PRELIMINARY PURPOSES ONLY

28-NOV-2007 10:30

R:\Standard Plans\Special Details\English\New Sheets\HW-45CMP1.dgn

SHEET NUMBER

PARISH | FEDERAL PROJECT | STATE PROJECT

DESIGNED PAA | DETAILED KAJ | DATE 3-22-93
CHECKED | CHECKED PAA | SHEET 1 OF 1

NO.	DATE	REVISION DESCRIPTION	BY
2	6-11-00	New Sheet Added, Minor Drafting Revisions	JCM
1	11-14-97	Revised General Notes And Added Name HW-45CMP1	JCM

STRAIGHT HEADWALL FOR CMP ON A 45° CROSSING 15" THRU 54"

SPECIAL DETAIL | HW-45CMP1

HYDRAULICS SECTION