Volume IV

APPENDIX L—Annex L-1

Detailed Construction Cost Estimates for Studied Alternatives

This page intentionally left blank.

Annex L-1 Detailed Construction Cost Estimates for Studied Alternatives

Summary Tables

Projected Cost Tables

Figures

TOC 1

Detailed Cost Estimate Tables

Table L-1-S1
Summary of Detailed Construction Cost Estimates
Elements Sized for Diversion Flow Rate

Item	Design Flow Rate, cfs												
	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	10,000	15,000	20,000
Romeville Diversion Structure													
Diversion Culvert (MR Stage Elev. 11)	9,153,737	10,128,425		11,693,241		12,800,722		13,453,364		15,427,856	21,898,619	25,746,959	33,346,343
Diversion Culvert (MR Stage Elev. 5)	10,975,299	13,166,220	15,261,434	17,592,978	21,015,384	22,726,745		27,498,278		32,137,682	56,418,986		
Diversion Siphon (MR Stage Elev. 17)	6,426,784	8,330,427		11,895,838		15,565,390		18,557,782		21,427,733			
Romevile Transmission Canal													
Transmission Canal - Earthen	9,436,344	12,101,285		17,876,998		25,025,053		29,054,443		34,799,096	61,933,496	90,012,347	117,774,453
Transmission Canal - Deep Earthen	10,355,370	12,013,931		16,553,530		22,556,705		27,096,304		32,442,126	55,140,120	79,683,714	103,187,931
Transmission Canal - Concrete-lined	19,545,274	21,955,741		28,468,673		35,003,421		41,508,201		48,042,838	80,660,115	113,468,551	146,091,164
Romeville Batture Crossing													
Siphon Pipe	2,397,690	3,071,811		4,339,551		5,652,093		6,715,317		7,759,510			
Inlet Canal	3,502,038	3,566,173		3,678,747		3,742,882		3,783,845		3,929,608	4,445,532	4,607,291	5,151,920
South Bridge Alignment													
Diversion Culvert	9,765,469	11,293,665		12,594,577		15,032,428		15,549,601		17,539,603	26,631,005	37,321,241	45,982,457
Transmission Canal - Earthen	13,012,974	16,134,543		23,422,852		29,806,801		36,195,720		43,579,382	76,305,682	109,462,806	142,858,168
North Distribution Canal			15,487,186		29,279,679								
Parish Ditch Widening			9,934,275										

Table L-1-S2
Summary of Detailed Construction Cost Estimates
Water Distribution and Water Management Elements

Item	Construction Cost, $
Control Gates (cost per structure)	
Control Structure No. 1-2	4,231,000
Control Structure No. 1-3	5,395,306
Control Structure No. 1-4	5,080,010
Control Structure No. 1-5	2,796,173
Control Structure No. 1-6E	4,477,824
Control Structure No. 1-6S	2,547,032
Control Structure No. 1-6N	2,547,779
Control Structure No. 1-7	2,667,155
Control Structure No. 3-1	7,387,468
Control Structure No. 3-2	4,039,939
Berm Gaps (cost per gap)	
20-foot wide gap	39,319
100-foot wide gap	58,238
250-foot wide gap	65,937
500-foot wide gap	123,039
Circulation Improvements at KCS RR/ Hwy 61 Corridor (cost per location)	
Small capacity culvert (1 - 4' x 4' box culvert)	2,122,182
Large capacity culvert (4 - 5' x 5' box culverts)	3,510,978
Bridge	2,972,254
Improve Existing Parish Drainage Channel	9,934,275
Diversions from Conway Canal	
Diversion Ditch to HU 200	673,049
Berm Gaps (cost per gap)	
20-foot wide gap	37,465
100-foot wide gap	63,328
250-foot wide gap	80,880
500-foot wide gap	110,780
Instrumentation	
Romeville - HU 100's	907,465
South Bridge - HU 100's and 200's	1,221,415
South Bridge - all HU's	1,288,690
Dual Diversion - HU 100's and 200's	1,445,665
Dual Diversion - all HU's	1,512,940

Table L-1-S3
Summary of Projected Construction Costs
Elements Sized for Diversion Flow Rate

Item	Design Flow Rate, cfs												
	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	10,000	15,000	20,000
Romeville Diversion Structure													
Diversion Culvert (MR Stage Elev. 11)	9,600,000	10,200,000	10,800,000	11,400,000	12,000,000	12,600,000	13,200,000	13,800,000	14,400,000	15,000,000	21,000,000	27,000,000	32,900,000
Diversion Culvert (MR Stage Elev. 5)	10,800,000	13,200,000	15,600,000	18,000,000	20,400,000	22,800,000	25,200,000	27,600,000	30,000,000	32,400,000	56,300,000	80,300,000	104,300,000
Diversion Siphon (MR Stage Elev. 17)	6,700,000	8,400,000	10,100,000	11,700,000	13,400,000	15,100,000	16,800,000	18,500,000	20,100,000	21,800,000			
Diversion Siphon (MR Stage Elev. 17)	7,500,000	10,000,000	12,500,000	15,000,000	17,600,000	20,100,000	22,600,000	25,100,000	27,600,000	30,100,000			
Romevile Transmission Canal													
Transmission Canal - Earthen	9,800,000	12,600,000	15,300,000	18,100,000	20,900,000	23,600,000	26,400,000	29,200,000	31,900,000	34,700,000	62,400,000	90,000,000	117,700,000
Transmission Canal - Deep Earthen	10,200,000	12,500,000	14,900,000	17,300,000	19,700,000	22,100,000	24,500,000	26,900,000	29,300,000	31,700,000	55,600,000	79,500,000	103,400,000
Transmission Canal - Concrete-lined	18,800,000	22,100,000	25,400,000	28,600,000	31,900,000	35,100,000	38,400,000	41,700,000	44,900,000	48,200,000	80,800,000	113,400,000	146,000,000
South Bridge Alignment													
Diversion Culvert	9,800,000	10,700,000	11,600,000	12,500,000	13,500,000	14,400,000	15,300,000	16,200,000	17,200,000	18,100,000	27,400,000	36,700,000	45,900,000
Transmission Canal - Earthen	13,100,000	13,100,000	13,100,000	13,100,000	13,100,000	13,100,000	13,100,000	13,100,000	13,100,000	13,100,000	13,100,000	13,100,000	13,100,000

Table L-1-P1
Romeville Diversion Culvert (MR Stage Elev. 11)
Projected Costs

Design Flow Rate, cfs	Detailed Estimates		Projected Costs		Difference (Projected-Estimated)	Costs To Use
	Cost, $	Unit Cost, $/cfs	Cost, $	Unit Costs $/cfs		
500	9,153,737	18,307	9,631,576	19,263	477,839	9,600,000
1,000	10,128,425	10,128	10,229,479	10,229	101,054	10,200,000
1,500			10,827,381	7,218		10,800,000
2,000	11,693,241	5,847	11,425,284	5,713	-267,957	11,400,000
2,500			12,023,186	4,809		12,000,000
3,000	12,800,722	4,267	12,621,089	4,207	-179,633	12,600,000
3,500			13,218,991	3,777		13,200,000
4,000	13,453,364	3,363	13,816,894	3,454	363,529	13,800,000
4,500			14,414,796	3,203		14,400,000
5,000	15,427,856	3,086	15,012,699	3,003	-415,157	15,000,000
10,000	21,898,619	2,190	20,991,724	2,099	-906,896	21,000,000
15,000	25,746,959	1,716	26,970,749	1,798	1,223,790	27,000,000
20,000	33,346,343	1,667	32,949,774	1,647	-396,569	32,900,000
Intercept	9,033,674					
Slope	1,196					

Table L-1-P2
Romeville Diversion Culvert (MR Stage Elev. 5)
Projected Costs

Design Flow Rate, cfs	Detailed Estimates		Projected Costs		Difference (Projected-Estimated)	Costs To Use
	Cost, $	Unit Cost, $/cfs	Cost, $	Unit Costs $/cfs		
500	10,975,299	21,951	10,760,740	21,521	-214,559	10,800,000
1,000	13,166,220	13,166	13,159,667	13,160	-6,553	13,200,000
1,500	15,261,434	10,174	15,558,594	10,372	297,160	15,600,000
2,000	17,592,978	8,796	17,957,521	8,979	364,543	18,000,000
2,500	21,015,384	8,406	20,356,447	8,143	-658,936	20,400,000
3,000	22,726,745	7,576	22,755,374	7,585	28,630	22,800,000
3,500			25,154,301	7,187		25,200,000
4,000	27,498,278	6,875	27,553,228	6,888	54,950	27,600,000
4,500			29,952,155	6,656		30,000,000
5,000	32,137,682	6,428	32,351,082	6,470	213,400	32,400,000
10,000	56,418,986	5,642	56,340,351	5,634	-78,634	56,300,000
15,000			80,329,621	5,355		80,300,000
20,000			104,318,890	5,216		104,300,000

Intercept	8,361,813
Slope	4,798

Table L-1-P3
Romeville Diversion Siphon (MR Stage Elev. 17)
Projected Costs

Design Flow Rate, cfs	Detailed Estimates		Projected Costs		Difference (Projected-Estimated)	Costs To Use
	Cost, $	Unit Cost, $/cfs	Cost, $	Unit Costs $/cfs		
500	6,426,784	12,854	6,708,708	13,417	281,924	6,700,000
1,000	8,330,427	8,330	8,386,776	8,387	56,349	8,400,000
1,500			10,064,844	6,710		10,100,000
2,000	11,895,838	5,948	11,742,913	5,871	-152,925	11,700,000
2,500			13,420,981	5,368		13,400,000
3,000	15,565,390	5,188	15,099,049	5,033	-466,341	15,100,000
3,500			16,777,117	4,793		16,800,000
4,000	18,557,782	4,639	18,455,186	4,614	-102,596	18,500,000
4,500			20,133,254	4,474		20,100,000
5,000	21,427,733	4,286	21,811,322	4,362	383,589	21,800,000
Intercept	5,030,639					
Slope	3,356					

Table L-1-P4
Romeville Diversion Siphon (MR Stage Elev. 11)
Projected Costs

Design Flow Rate, cfs	Detailed Estimates		Projected Costs		Difference (Projected-Estimated)	Costs To Use
	Cost, $	Unit Cost, $/cfs	Cost, $	Unit Costs $/cfs		
500			7,535,219	15,070		7,500,000
1,000			10,039,798	10,040		10,000,000
1,500			12,544,378	8,363		12,500,000
2,000			15,048,958	7,524		15,000,000
2,500			17,553,537	7,021		17,600,000
3,000			20,058,117	6,686		20,100,000
3,500			22,562,696	6,446		22,600,000
4,000			25,067,276	6,267		25,100,000
4,500			27,571,855	6,127		27,600,000
5,000			30,076,435	6,015		30,100,000

Intercept

Slope

Table L-1-P5
Romeville Earthen Transmission Canal
Projected Costs

Design Flow Rate, cfs	Detailed Estimates		Projected Costs		Difference (Projected-Estimated)	Costs To Use
	Cost, $	Unit Cost, $/cfs	Cost, $	Unit Costs $/cfs		
500	9,436,344	18,873	9,788,624	19,577	-9,416,767	9,800,000
1,000	12,101,285	12,101	12,555,730	12,556	-12,088,729	12,600,000
1,500			15,322,837	10,215		15,300,000
2,000	17,876,998	8,938	18,089,943	9,045	-17,867,953	18,100,000
2,500			20,857,049	8,343		20,900,000
3,000	25,025,053	8,342	23,624,155	7,875	-25,017,178	23,600,000
3,500			26,391,261	7,540		26,400,000
4,000	29,054,443	7,264	29,158,368	7,290	-29,047,153	29,200,000
4,500			31,925,474	7,095		31,900,000
5,000	34,799,096	6,960	34,692,580	6,939	-34,792,157	34,700,000
10,000	61,933,496	6,193	62,363,642	6,236	-61,927,260	62,400,000
15,000	90,012,347	6,001	90,034,704	6,002	-90,006,344	90,000,000
20,000	117,774,453	5,889	117,705,766	5,885	-117,768,567	117,700,000
Intercept	7,021,518					
Slope	5,534					

Table L-1-P6
Romeville Deep Earthen Transmission Canal
Projected Costs

Design Flow Rate, cfs	Detailed Estimates		Projected Costs		Difference (Projected-Estimated)	Costs To Use
	Cost, $	Unit Cost, $/cfs	Cost, $	Unit Costs $/cfs		
500	10,355,370	20,711	10,151,520	20,303	-203,850	10,200,000
1,000	12,013,931	12,014	12,541,395	12,541	527,464	12,500,000
1,500			14,931,271	9,954		14,900,000
2,000	16,553,530	8,277	17,321,146	8,661	767,616	17,300,000
2,500			19,711,022	7,884		19,700,000
3,000	22,556,705	7,519	22,100,897	7,367	-455,808	22,100,000
3,500			24,490,773	6,997		24,500,000
4,000	27,096,304	6,774	26,880,648	6,720	-215,656	26,900,000
4,500			29,270,524	6,505		29,300,000
5,000	32,442,126	6,488	31,660,399	6,332	-781,727	31,700,000
10,000	55,140,120	5,514	55,559,154	5,556	419,034	55,600,000
15,000	79,683,714	5,312	79,457,909	5,297	-225,805	79,500,000
20,000	103,187,931	5,159	103,356,664	5,168	168,732	103,400,000
Intercept	7,761,644					
Slope	4,780					

Table L-1-P7
Romeville Concrete-lined Transmission Canal
Projected Costs

Design Flow Rate, cfs	Detailed Estimates		Projected Costs		Difference (Projected-Estimated)	Costs To Use
	Cost, $	Unit Cost, $/cfs	Cost, $	Unit Costs $/cfs		
500	19,545,274	39,091	18,845,017	37,690	-700,258	18,800,000
1,000	21,955,741	21,956	22,105,185	22,105	149,444	22,100,000
1,500			25,365,353	16,910		25,400,000
2,000	28,468,673	14,234	28,625,521	14,313	156,848	28,600,000
2,500			31,885,689	12,754		31,900,000
3,000	35,003,421	11,668	35,145,857	11,715	142,436	35,100,000
3,500			38,406,025	10,973		38,400,000
4,000	41,508,201	10,377	41,666,193	10,417	157,992	41,700,000
4,500			44,926,362	9,984		44,900,000
5,000	48,042,838	9,609	48,186,530	9,637	143,692	48,200,000
10,000	80,660,115	8,066	80,788,211	8,079	128,096	80,800,000
15,000	113,468,551	7,565	113,389,892	7,559	-78,659	113,400,000
20,000	146,091,164	7,305	145,991,573	7,300	-99,591	146,000,000
Intercept	15,584,849					
Slope	6,520					

Table L-1-P8
South Bridge Diversion Culvert (MR Stage Elev. 11)
Projected Costs

Design Flow Rate, cfs	Detailed Estimates		Projected Costs		Difference (Projected-Estimated)	Costs To Use
	Cost, $	Unit Cost, $/cfs	Cost, $	Unit Costs $/cfs		
500	9,765,469	19,531	9,750,999	19,502	-14,469	9,800,000
1,000	11,293,665	11,294	10,679,134	10,679	-614,532	10,700,000
1,500			11,607,268	7,738		11,600,000
2,000	12,594,577	6,297	12,535,402	6,268	-59,174	12,500,000
2,500			13,463,537	5,385		13,500,000
3,000	15,032,428	5,011	14,391,671	4,797	-640,757	14,400,000
3,500			15,319,806	4,377		15,300,000
4,000	15,549,601	3,887	16,247,940	4,062	698,339	16,200,000
4,500			17,176,074	3,817		17,200,000
5,000	17,539,603	3,508	18,104,209	3,621	564,606	18,100,000
10,000	26,631,005	2,663	27,385,553	2,739	754,548	27,400,000
15,000	37,321,241	2,488	36,666,897	2,444	-654,344	36,700,000
20,000	45,982,457	2,299	45,948,241	2,297	-34,216	45,900,000
Intercept	8,822,865					
Slope	1,856					

Table L-1-P9
South Bridge Earthen Transmission Canal
Projected Costs

Design Flow Rate, cfs	Detailed Estimates		Projected Costs		Difference (Projected-Estimated)	Costs To Use
	Cost, $	Unit Cost, $/cfs	Cost, $	Unit Costs $/cfs		
500	13,012,974	26,026	13,145,223	26,290	132,249	13,100,000
1,000	16,134,543	16,135	16,470,865	16,471	336,323	16,500,000
1,500			19,796,508	13,198		19,800,000
2,000	23,422,852	11,711	23,122,150	11,561	-300,703	23,100,000
2,500			26,447,792	10,579		26,400,000
3,000	29,806,801	9,936	29,773,434	9,924	-33,367	29,800,000
3,500			33,099,076	9,457		33,100,000
4,000	36,195,720	9,049	36,424,718	9,106	228,999	36,400,000
4,500			39,750,360	8,833		39,800,000
5,000	43,579,382	8,716	43,076,003	8,615	-503,379	43,100,000
10,000	76,305,682	7,631	76,332,424	7,633	26,742	76,300,000
15,000	109,462,806	7,298	109,588,845	7,306	126,039	109,600,000
20,000	142,858,168	7,143	142,845,266	7,142	-12,902	142,800,000
Intercept	9,819,581					
Slope	6,651					

Figure L-1-1
Romeville Diversion Culvert (MR Stage Elev. 11)
Construction Costs

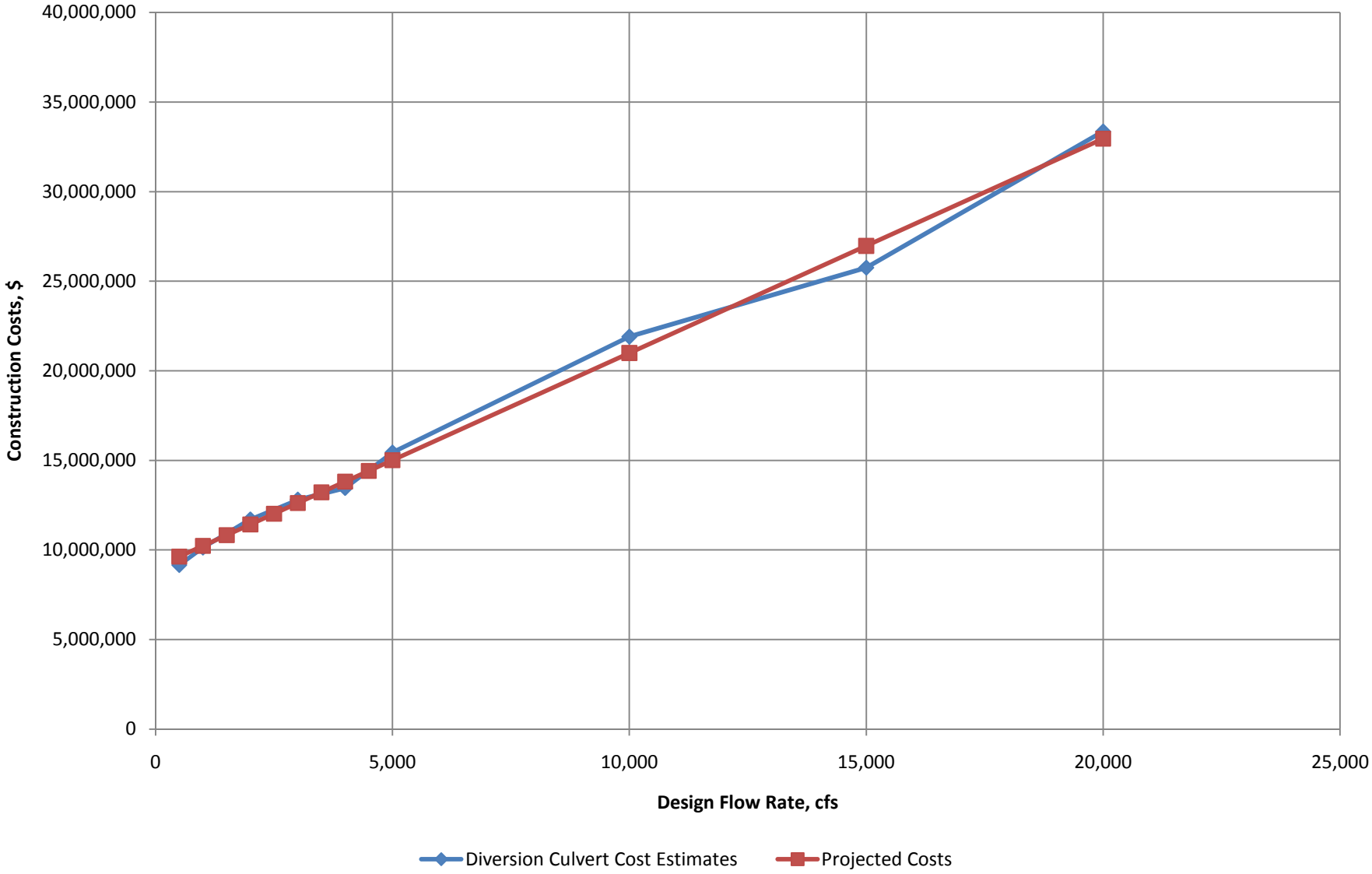


Figure L-1-2
Romeville Diversion Culvert (MR Stage Elev. 11)
Unit Construction Costs

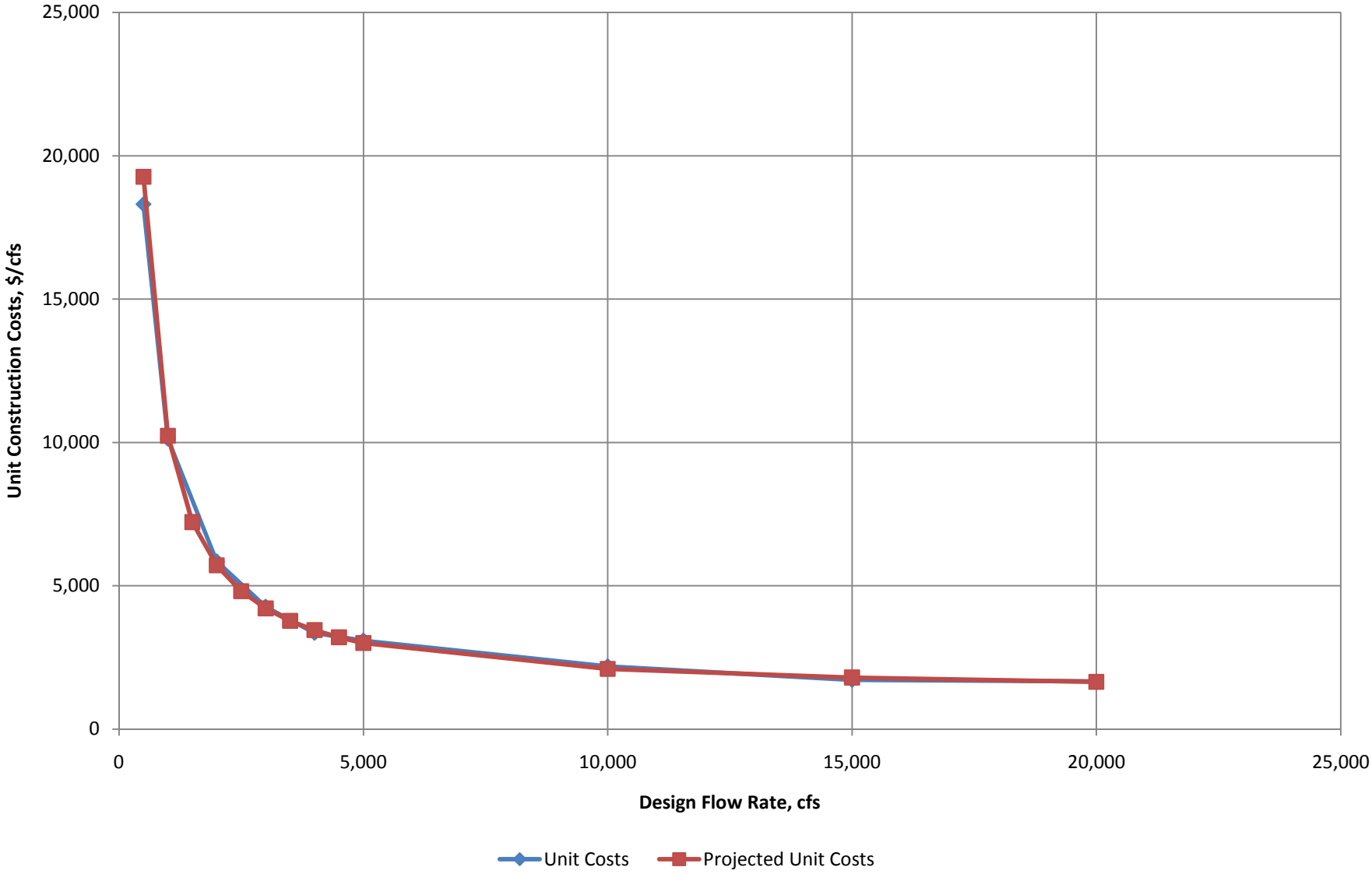


Figure L-1-3
Romeville Diversion Culvert (MR Stage Elev. 5)
Construction Costs

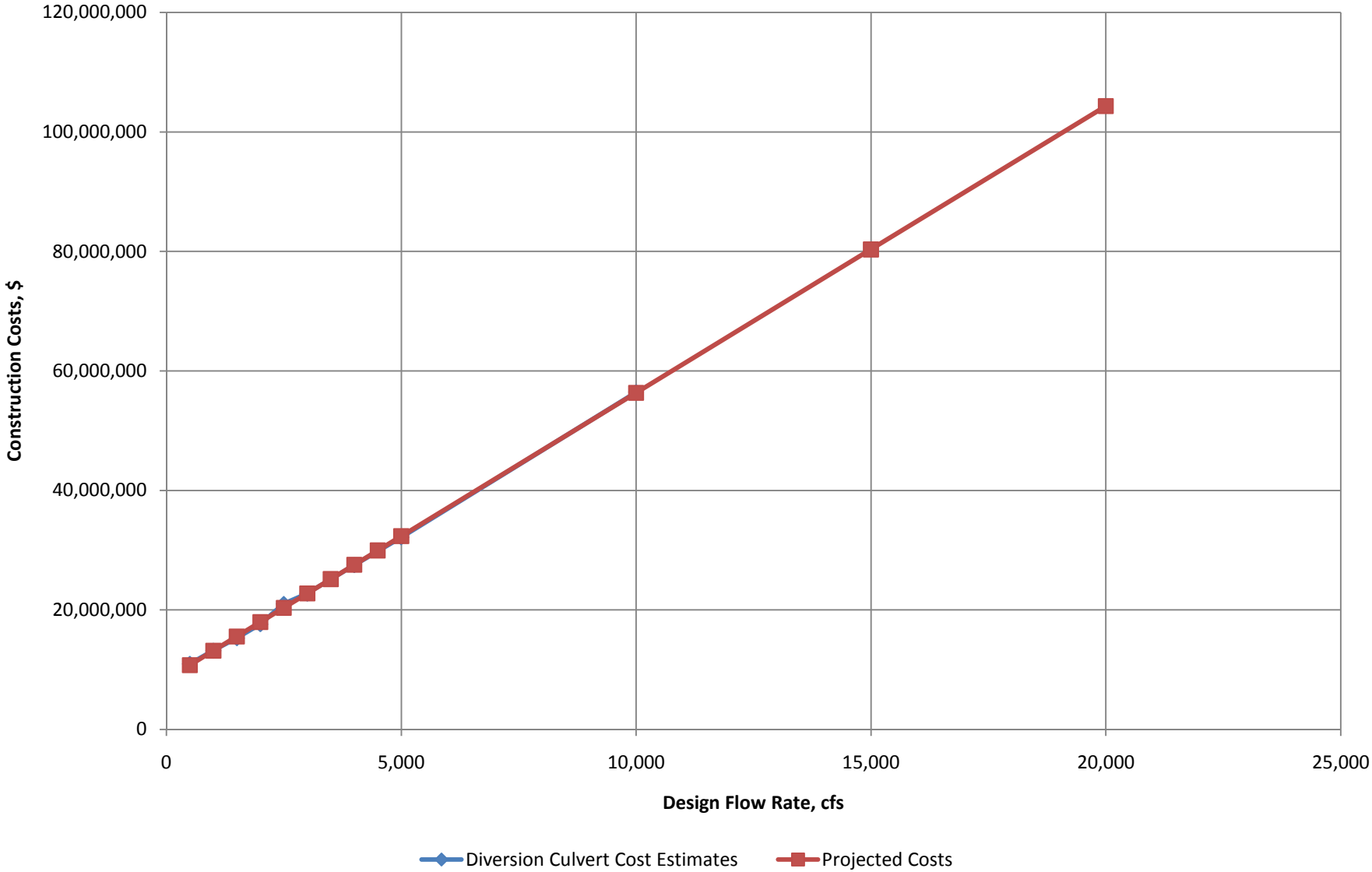


Figure L-1-4
Romeville Diversion Culvert (MR Stage Elev. 5)
Unit Construction Costs

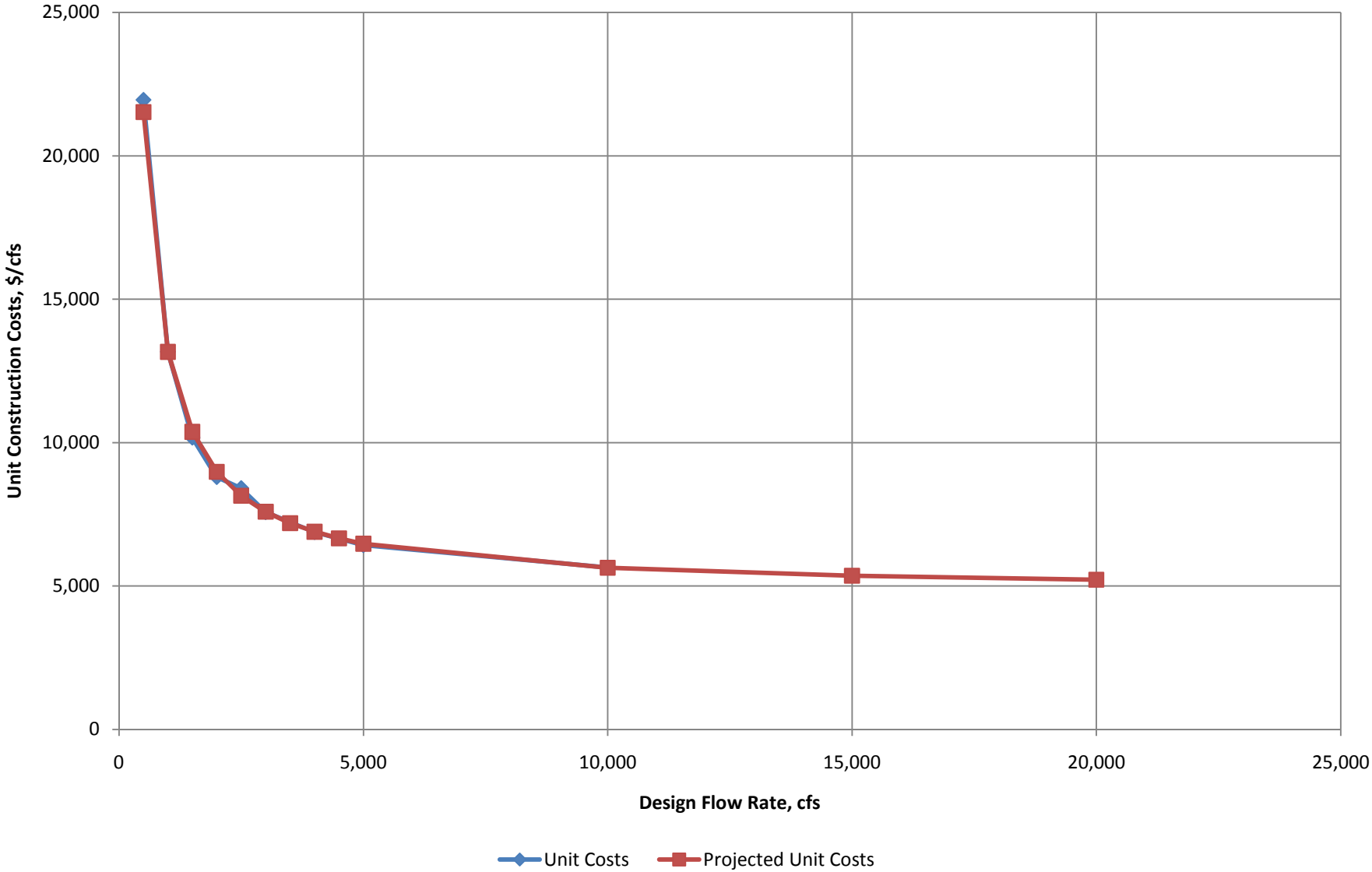


Figure L-1-5
Romeville Diversion Siphon
Construction Costs

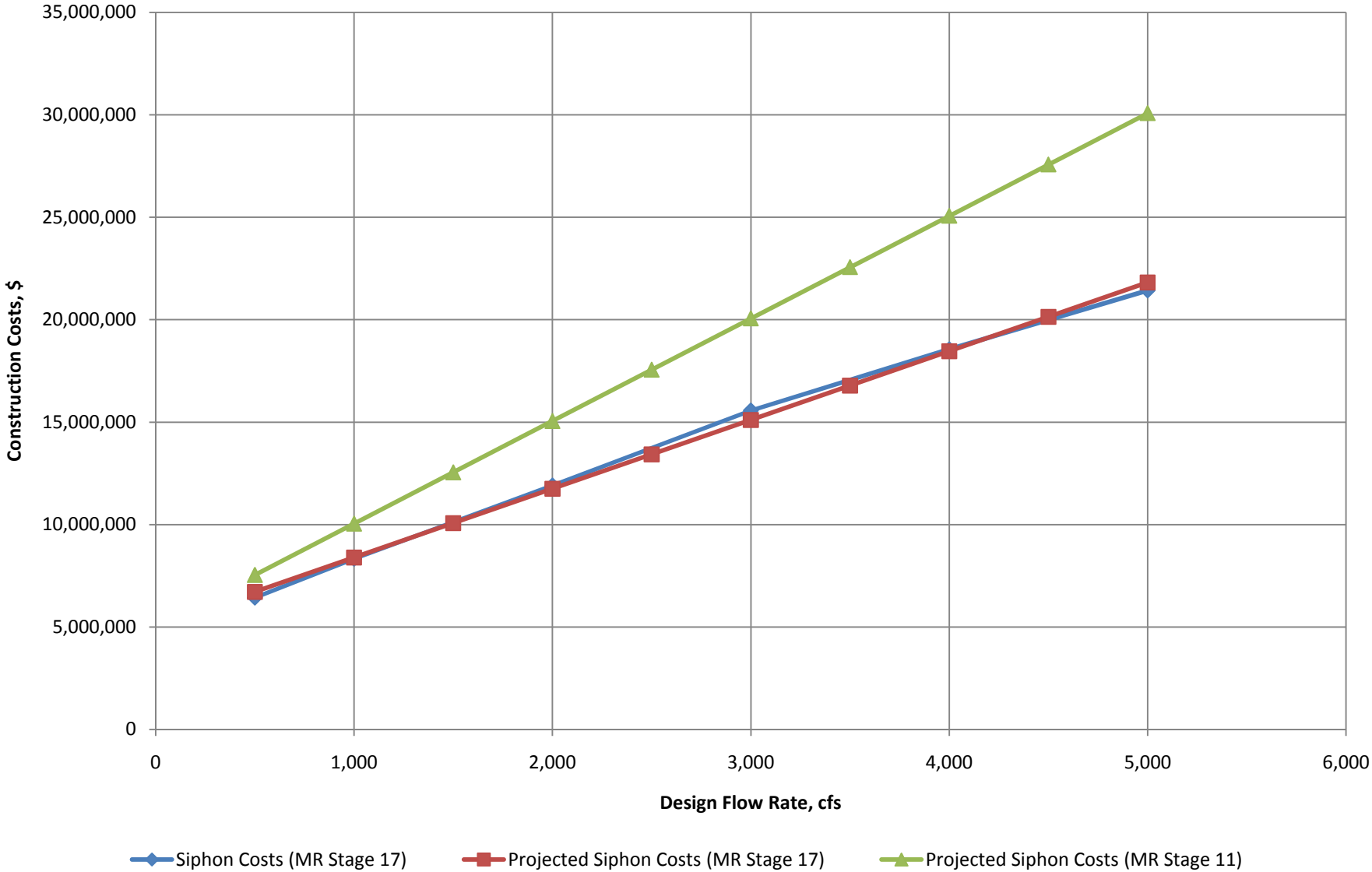


Figure L-1-6
Romeville Diversion Siphon
Unit Construction Costs

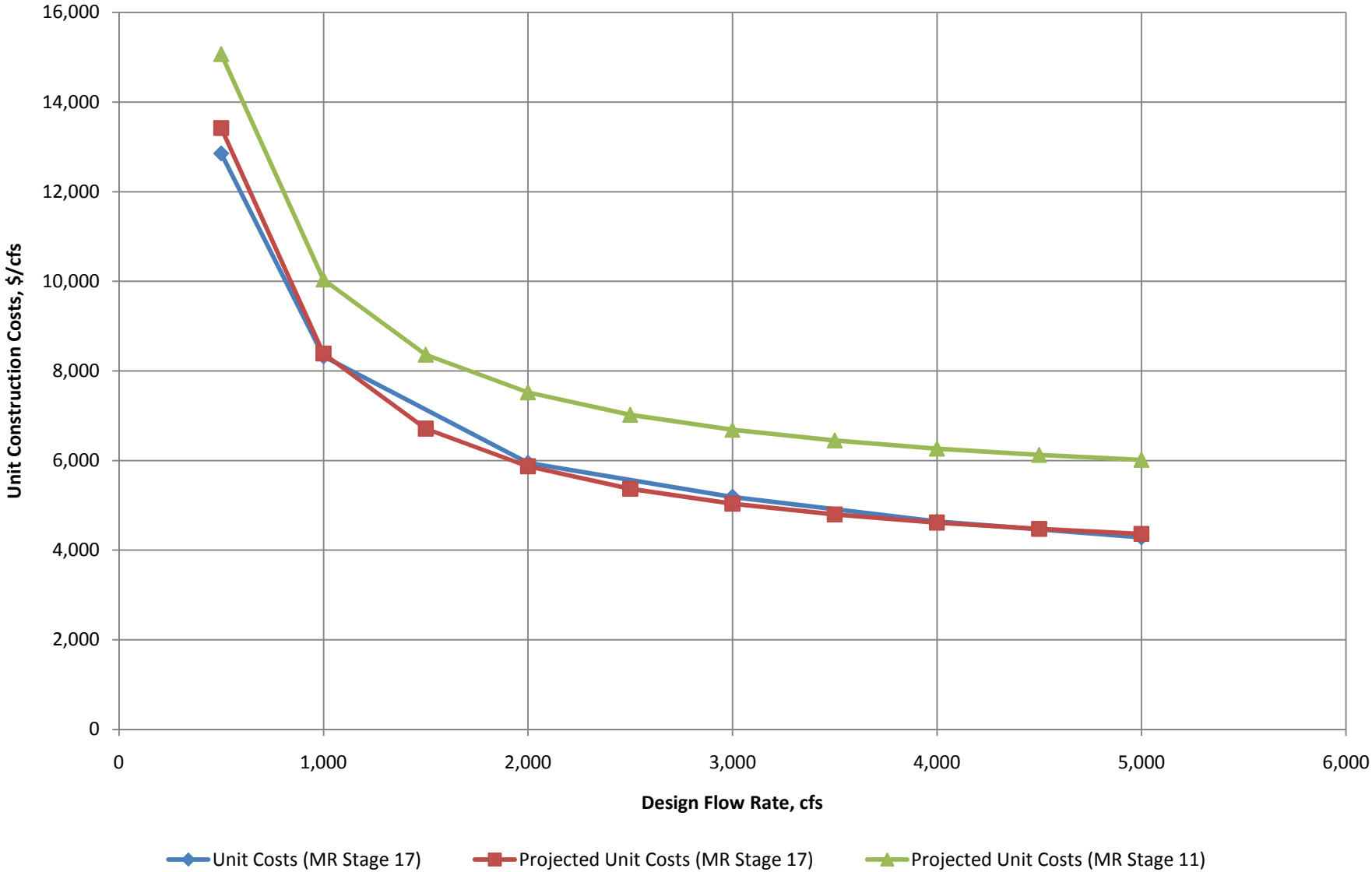


Figure L-1-7
Romeville Earthen Transmission Canal
Construction Costs

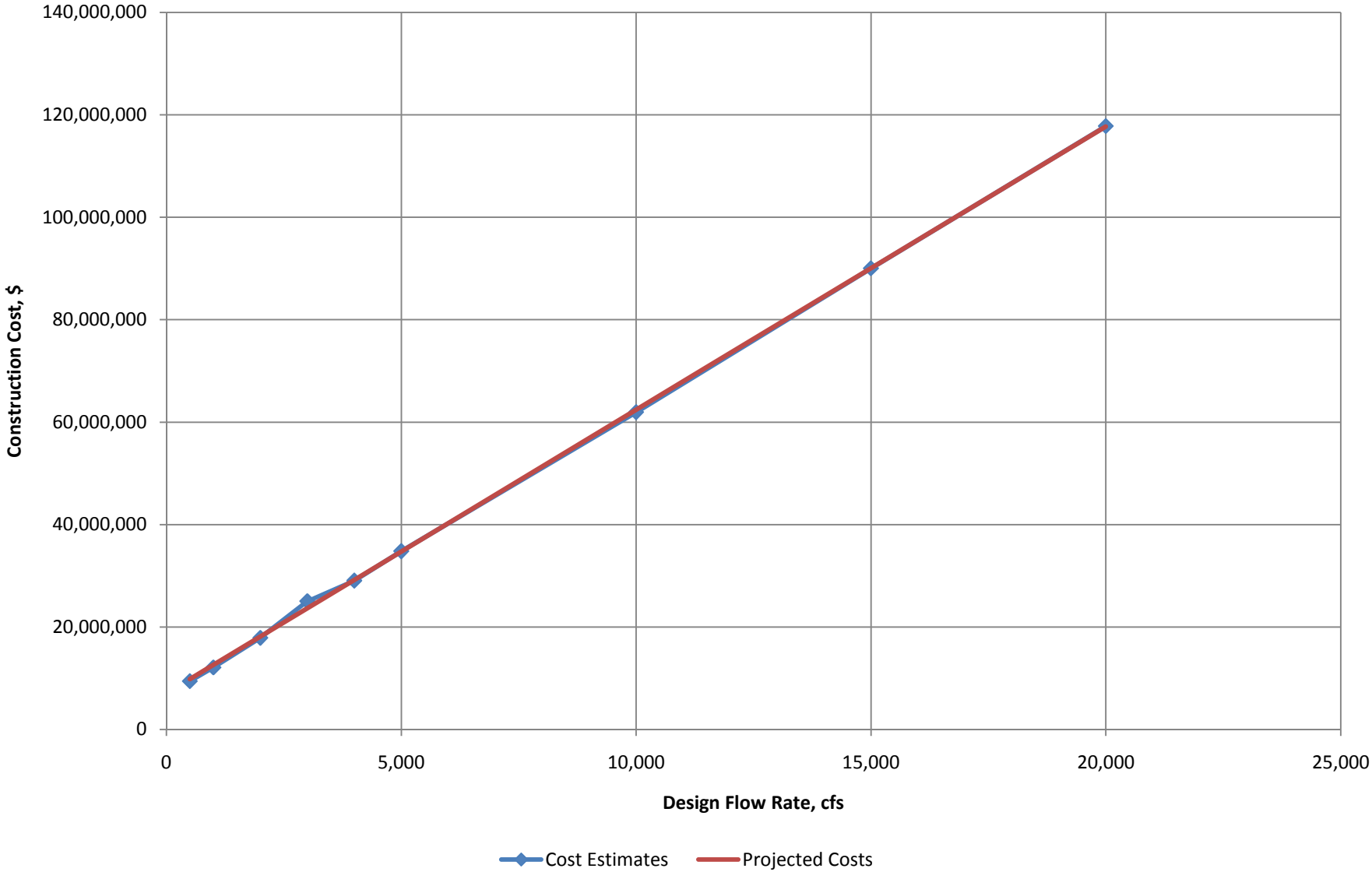


Figure L-1-8
Romeville Earthen Transmission Canal
Unit Construction Costs

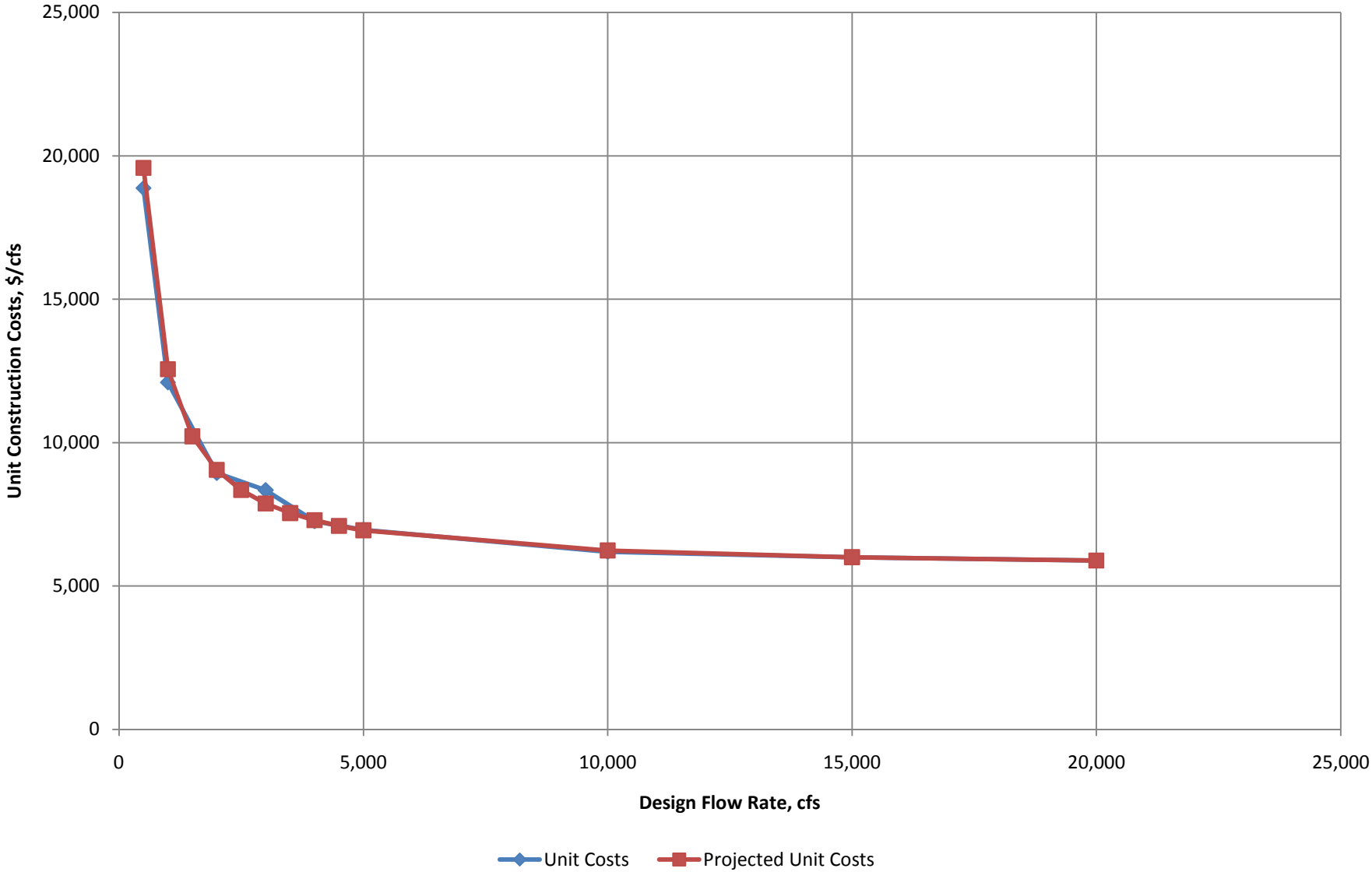


Figure L-1-9
Romeville Deep Earthen Transmission Canal
Construction Costs

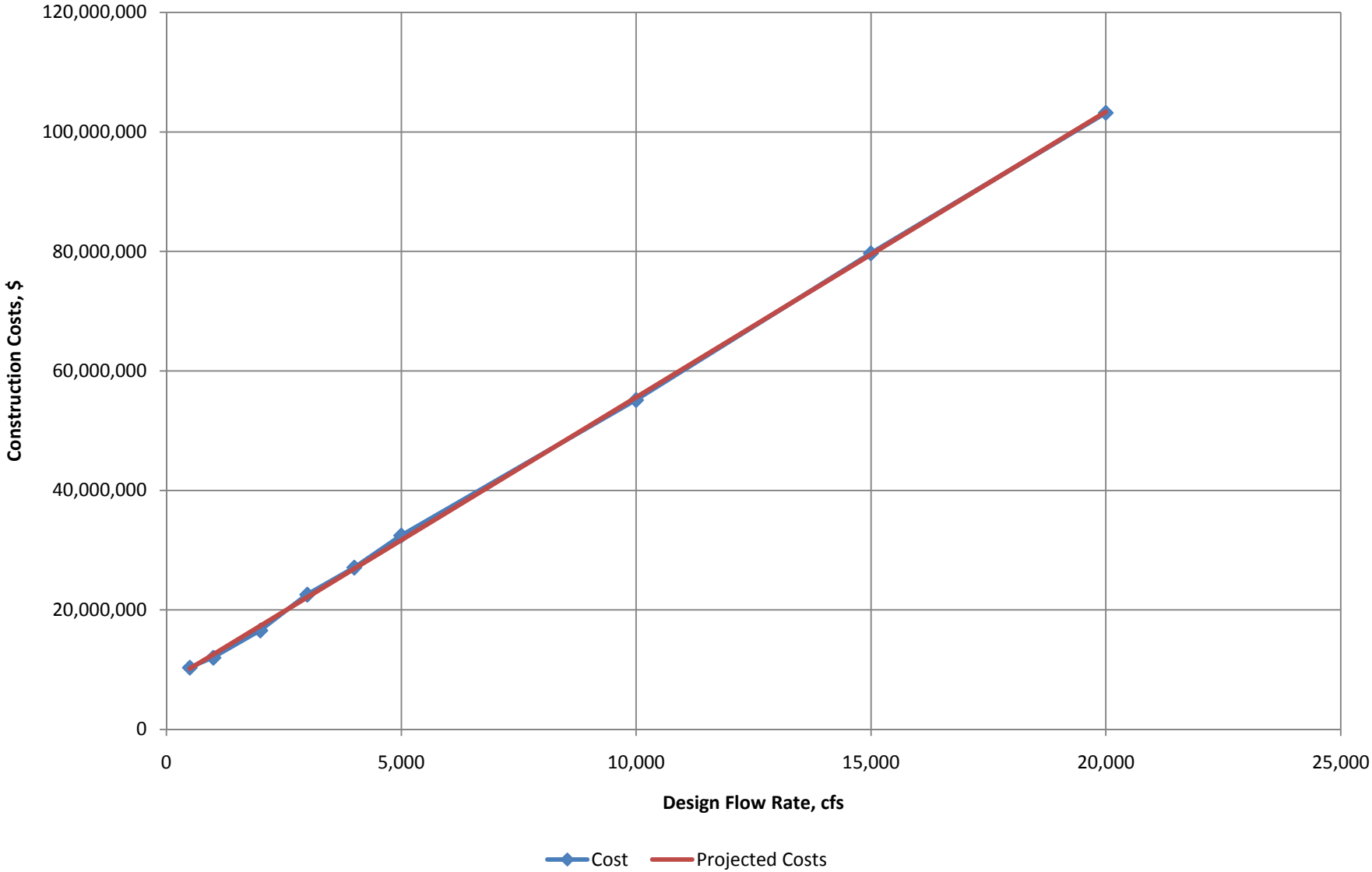


Figure L-1-10
Romeville Deep Earthen Transmission Canal
Unit Construction Costs

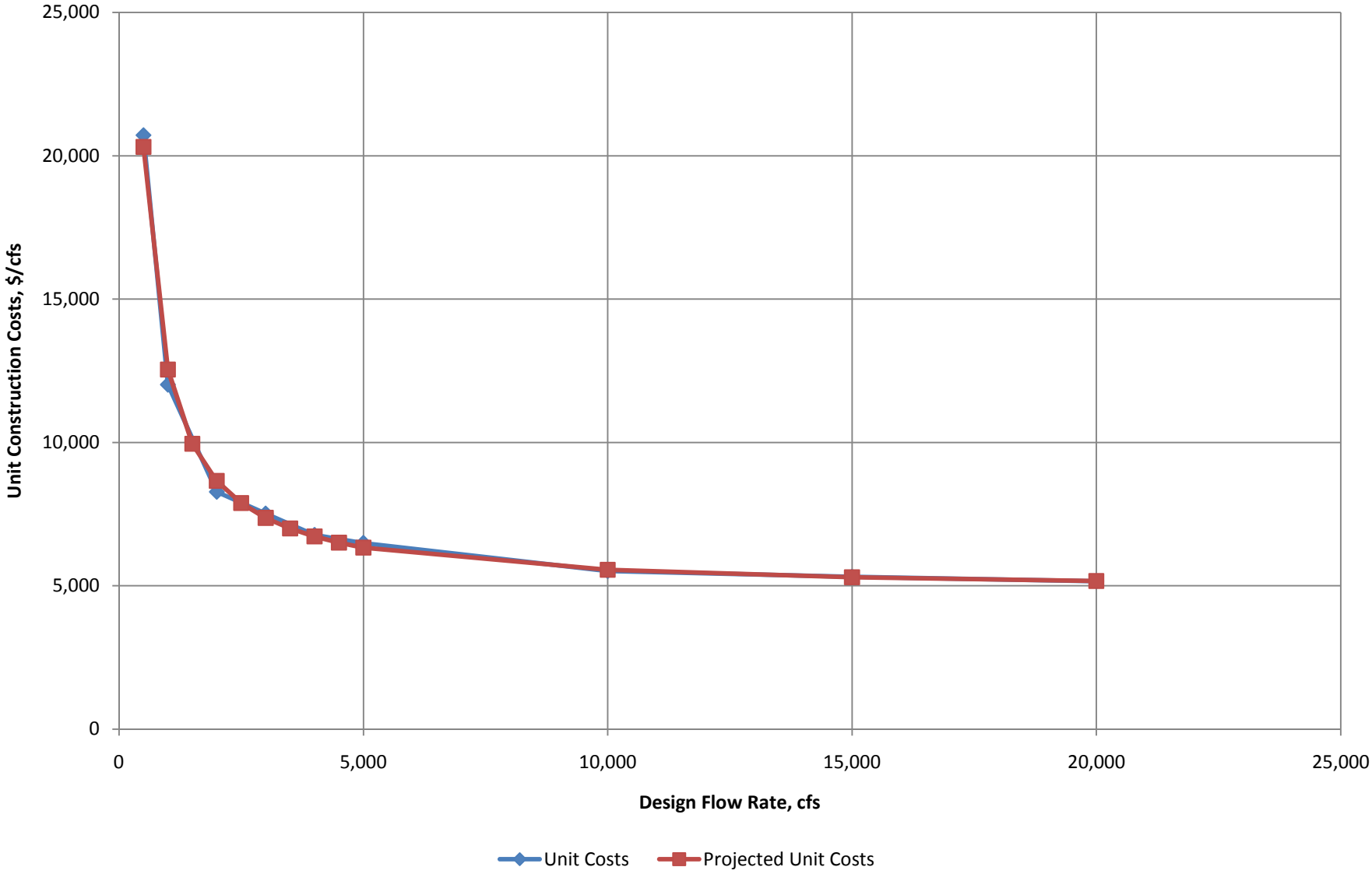


Figure L-1-11
Romeville Concrete-lined Transmission Canal
Construction Costs

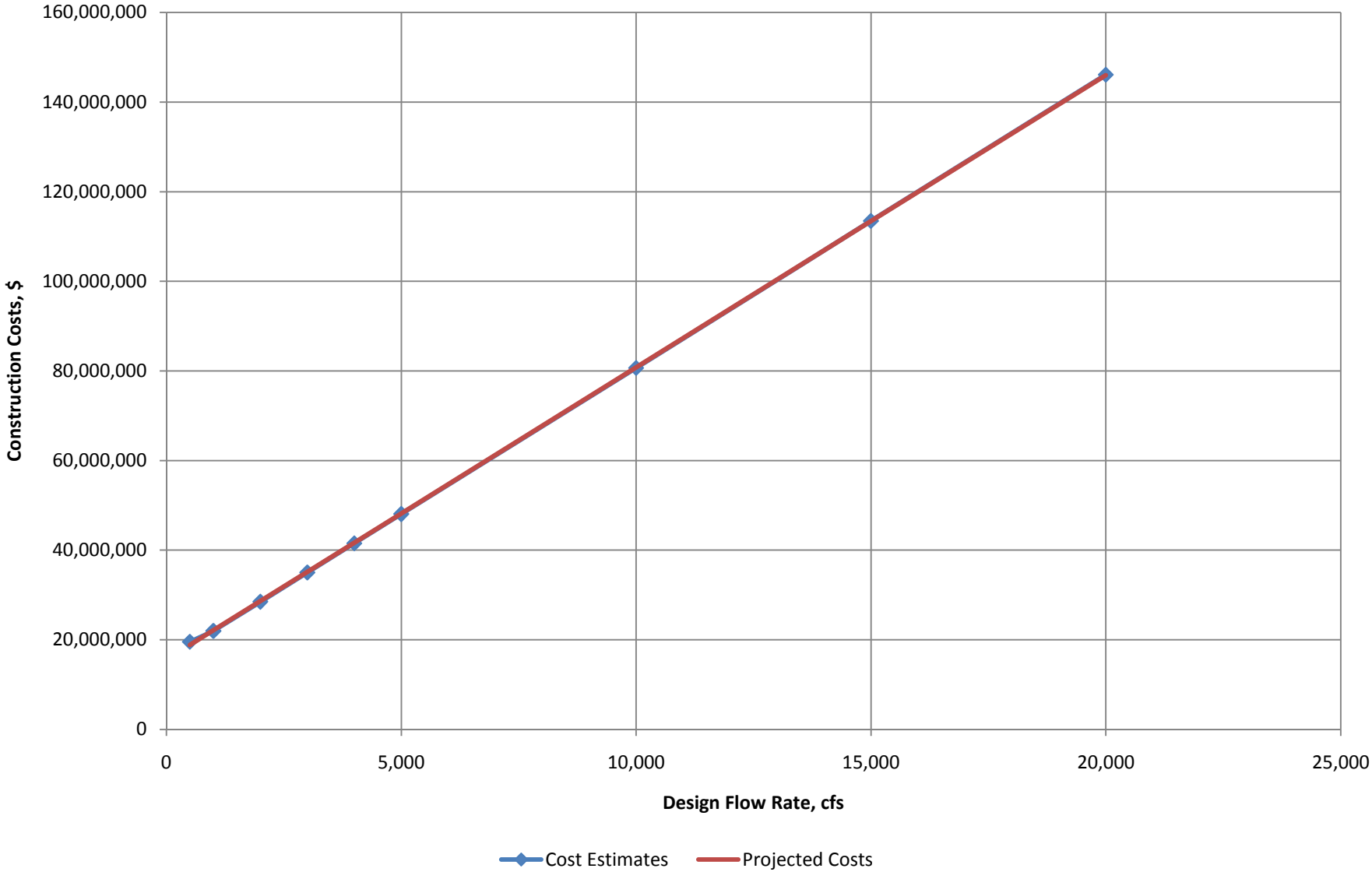


Figure L-1-12
Romeville Concrete-lined Transmission Canal
Unit Construction Costs

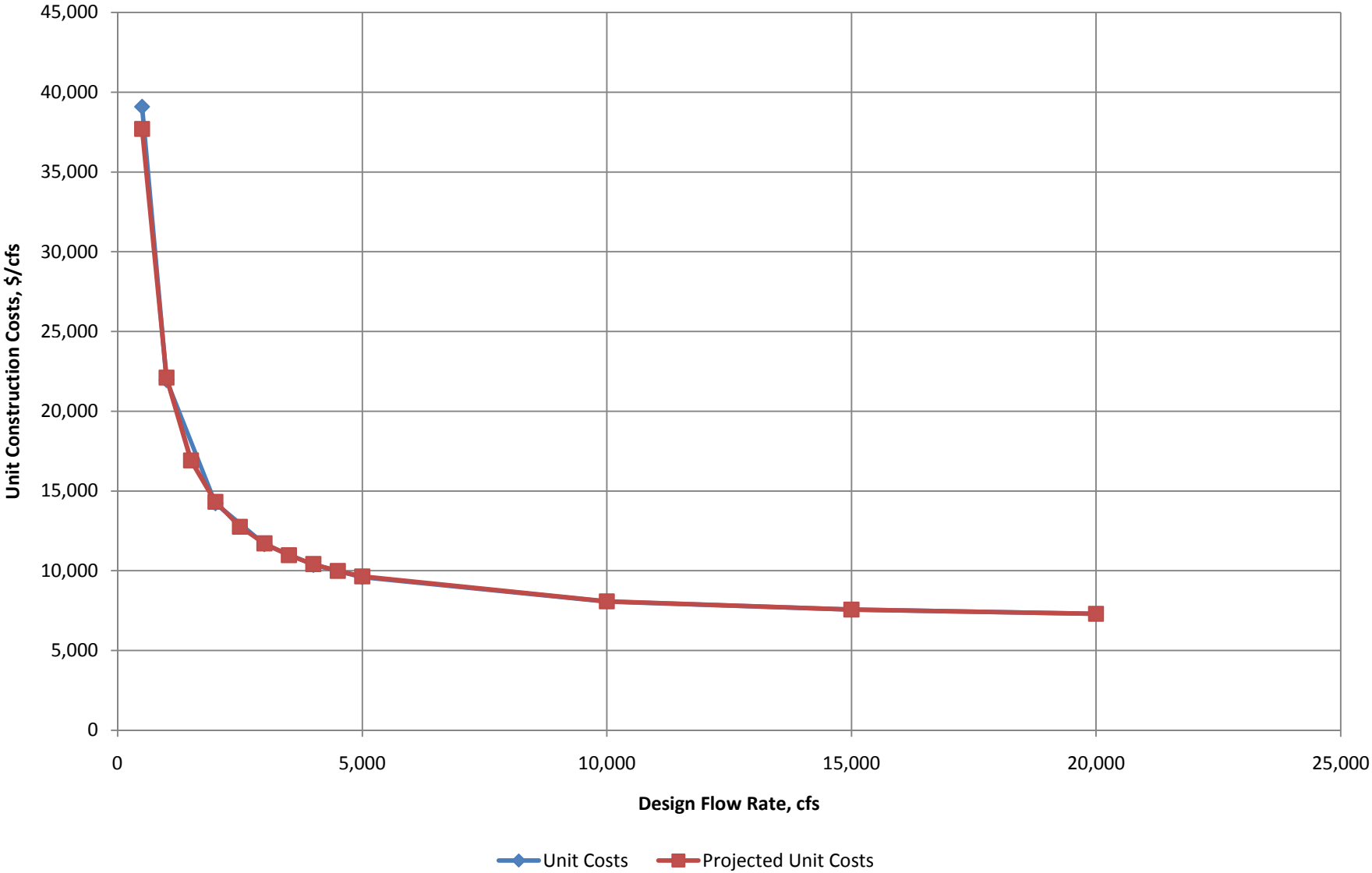


Figure L-1-13
Romeville Batture Crossing
Siphon Pipe vs. Inlet Canal

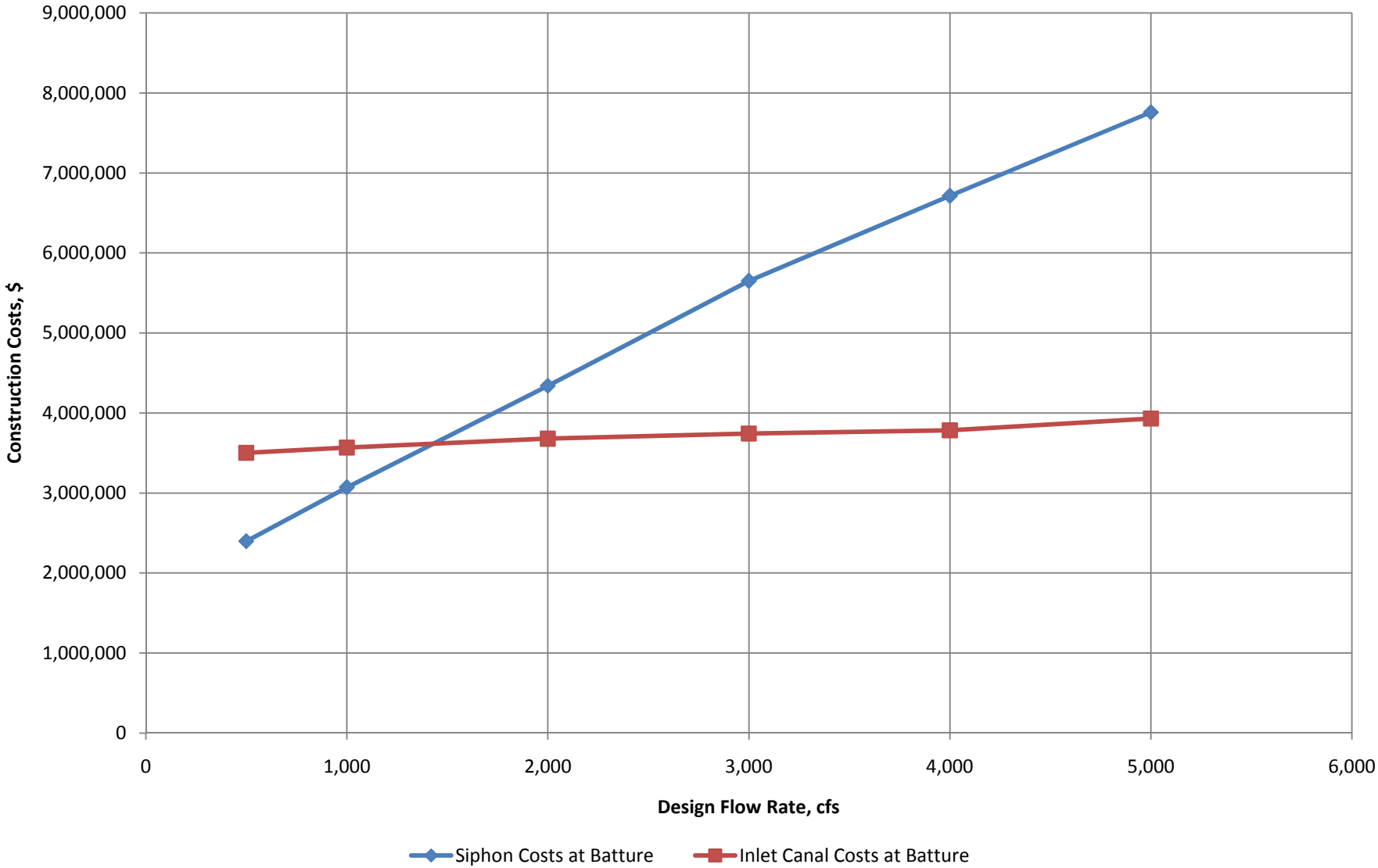


Figure L-1-14
South Bridge Diversion Culvert
Construction Costs

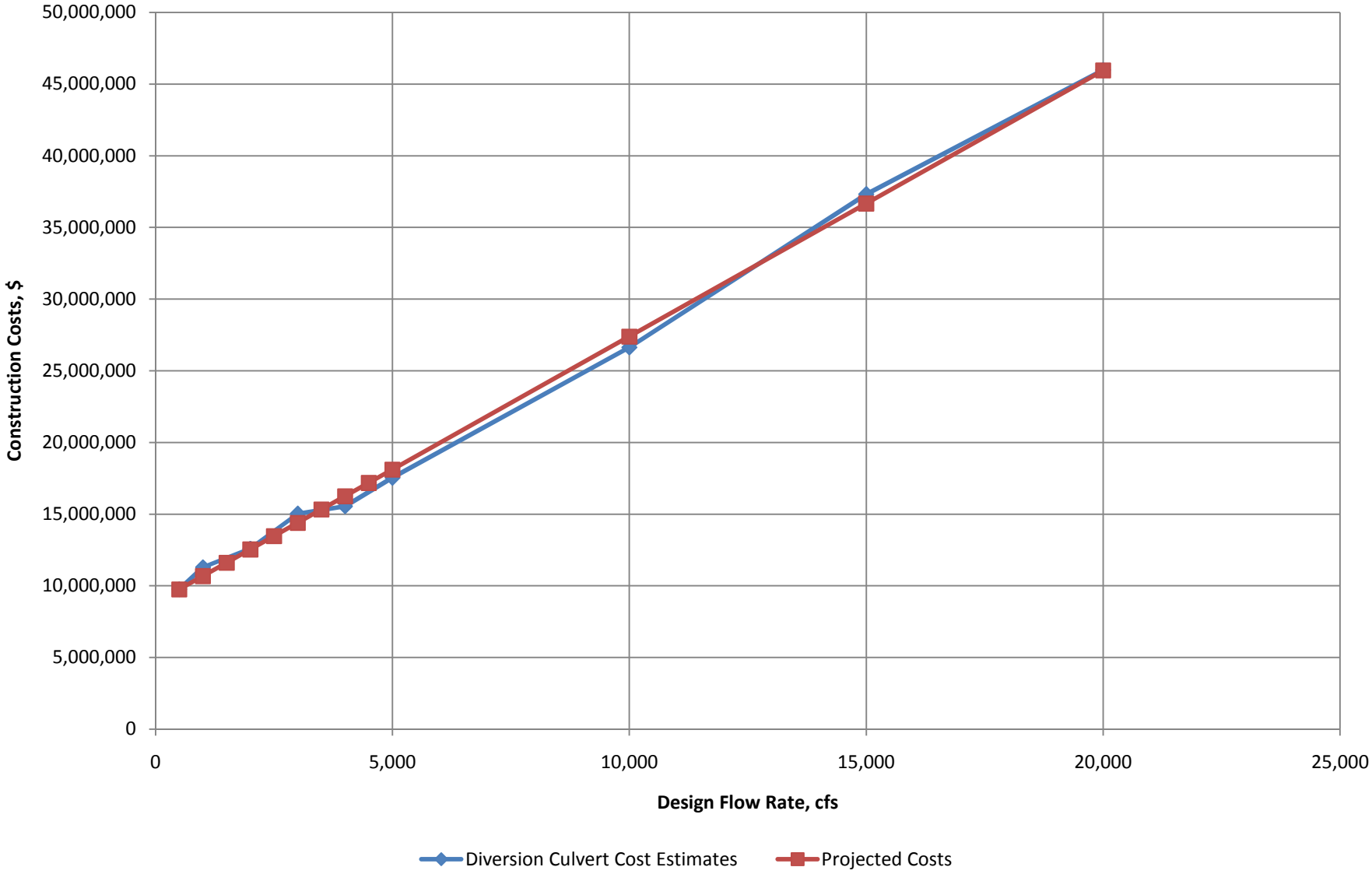


Figure L-1-15
Romeville Diversion Culvert
Unit Construction Costs

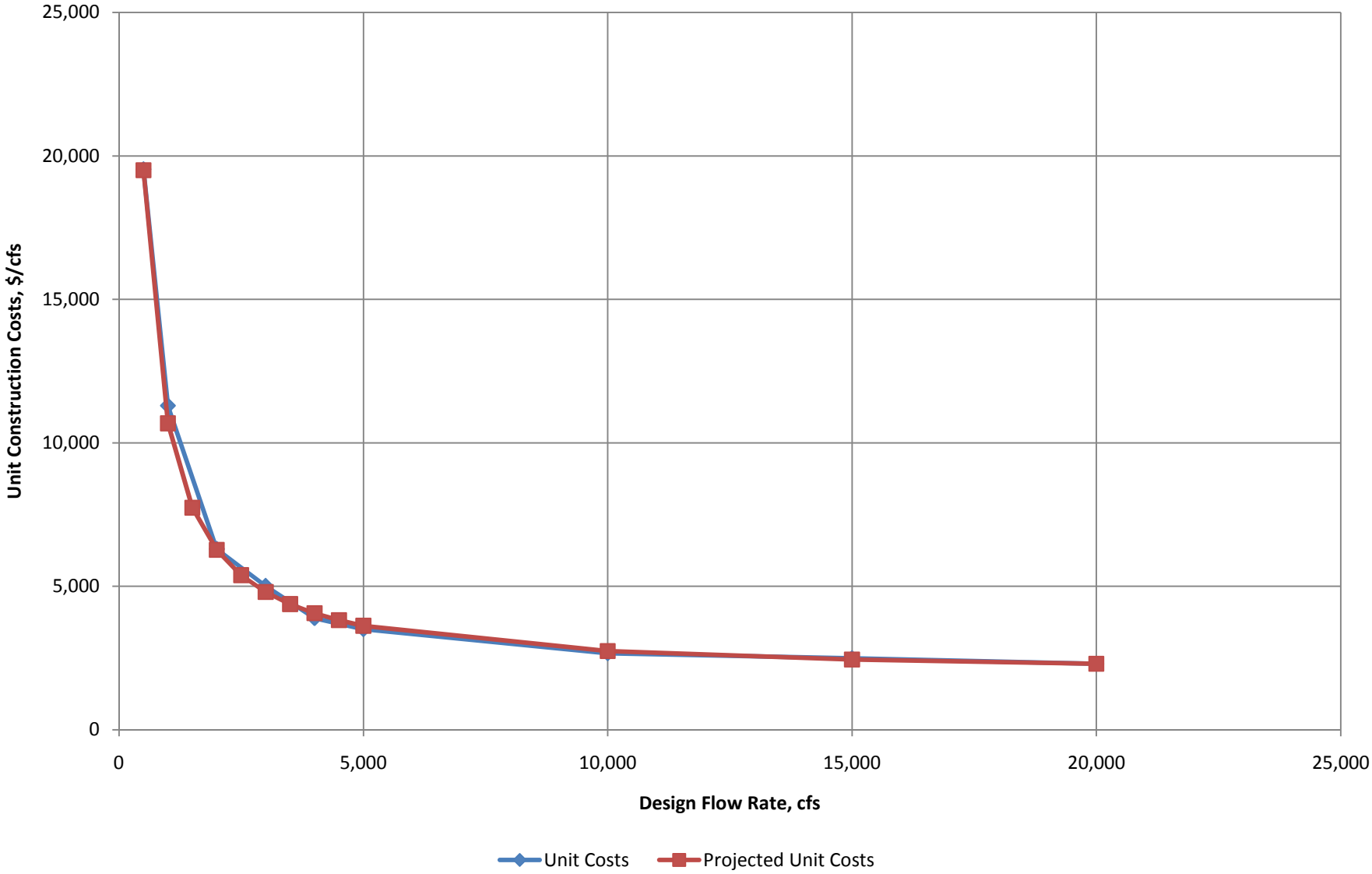


Figure L-1-16
South Bridge Earthen Transmission Canal
Construction Costs

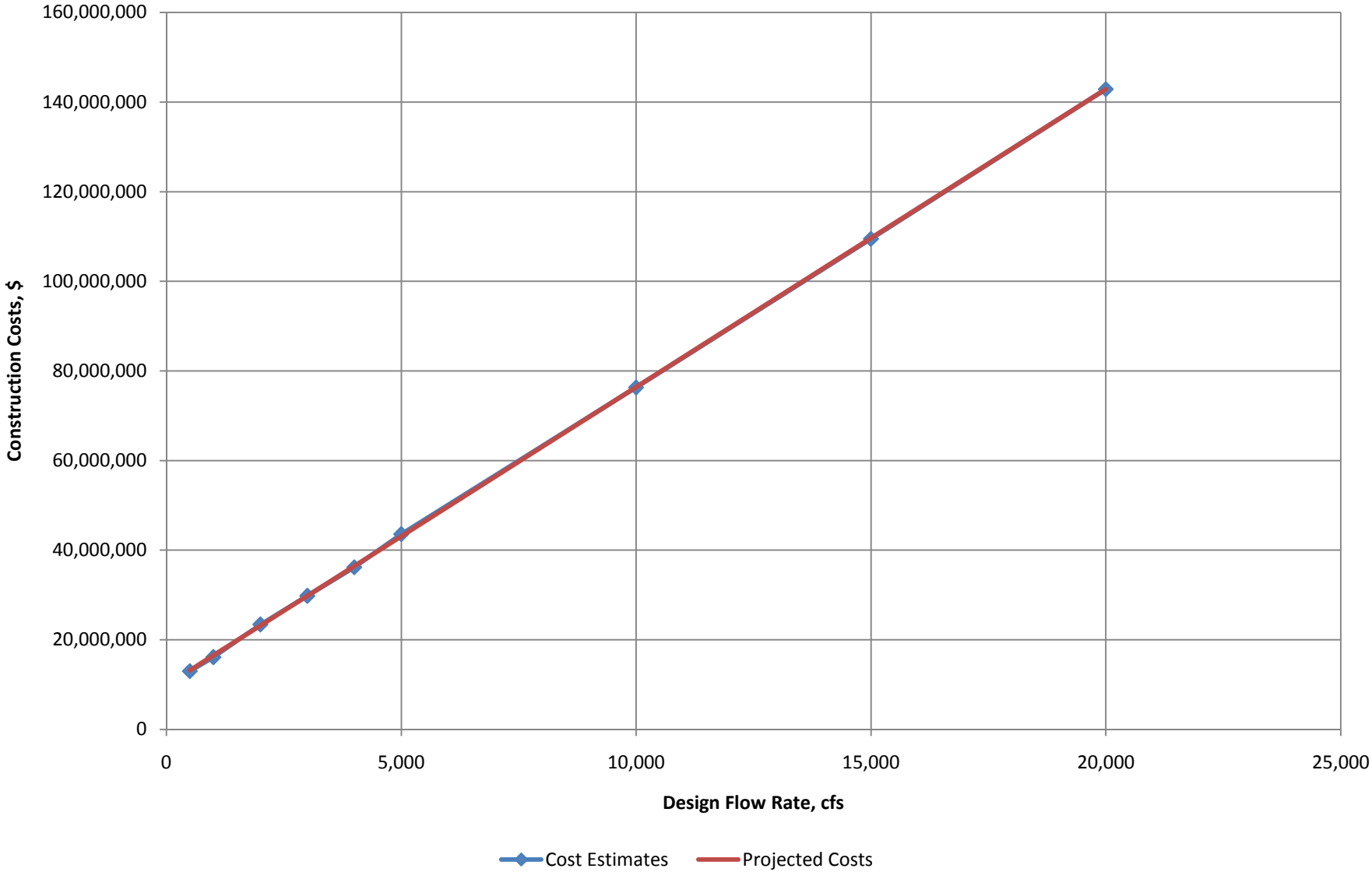


Figure L-1-17
South Bridge Earthen Transmission Canal
Unit Construction Costs

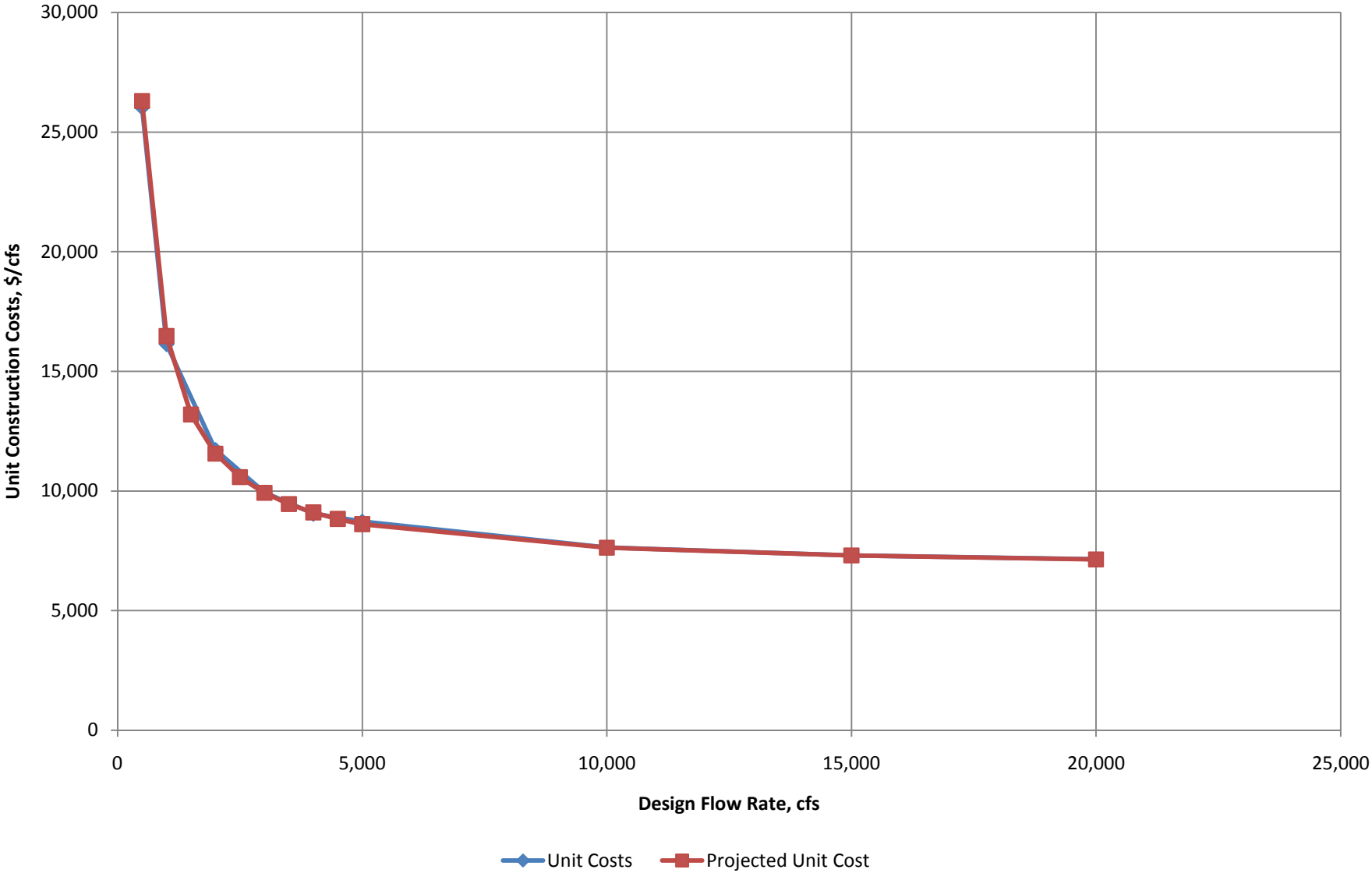


Figure L-1-18
Control Structures
Construction Cost vs. Gate Area

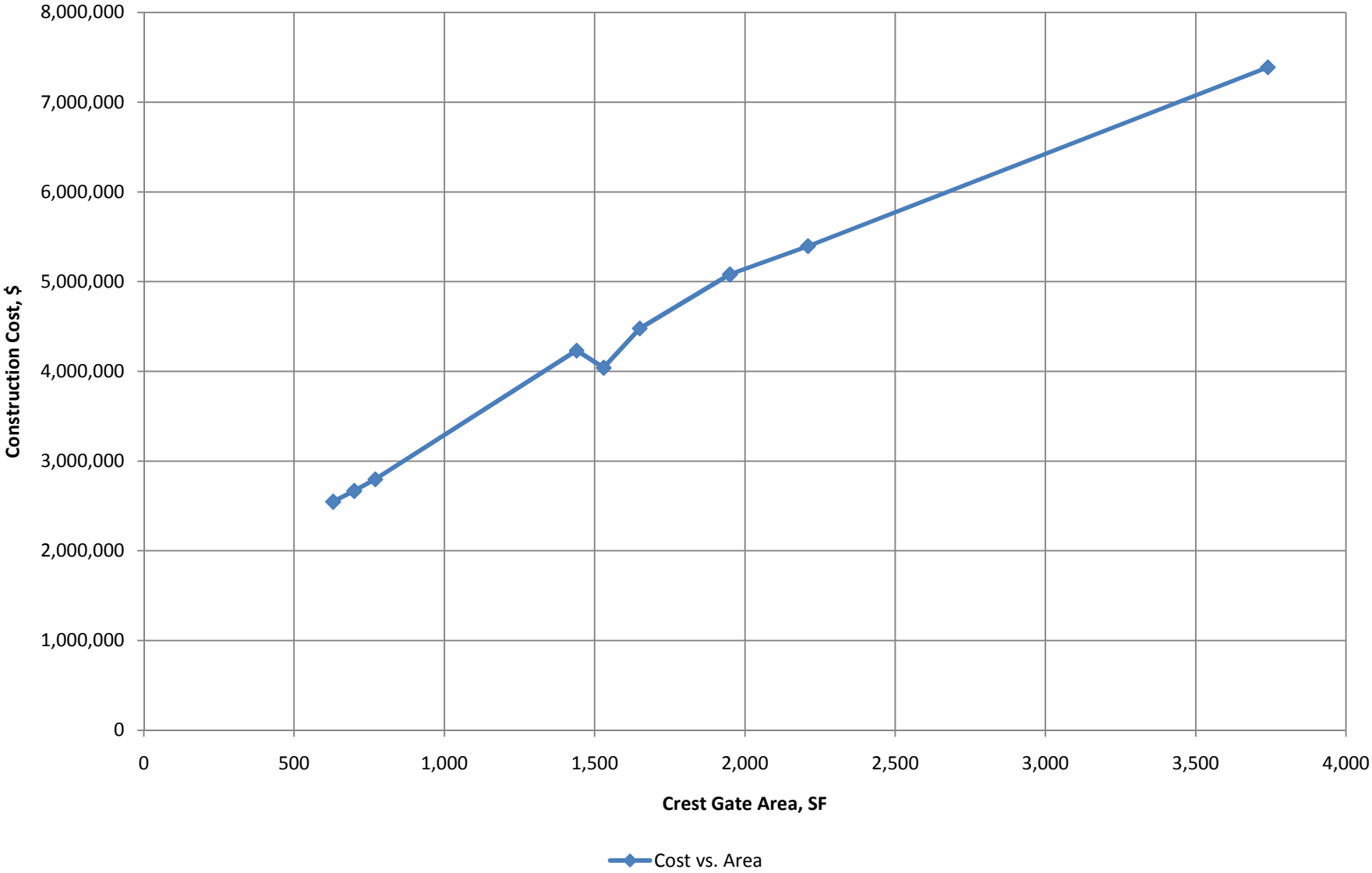


Figure L-1-19
Control Structures
Unit Construction Cost vs. Gate Area

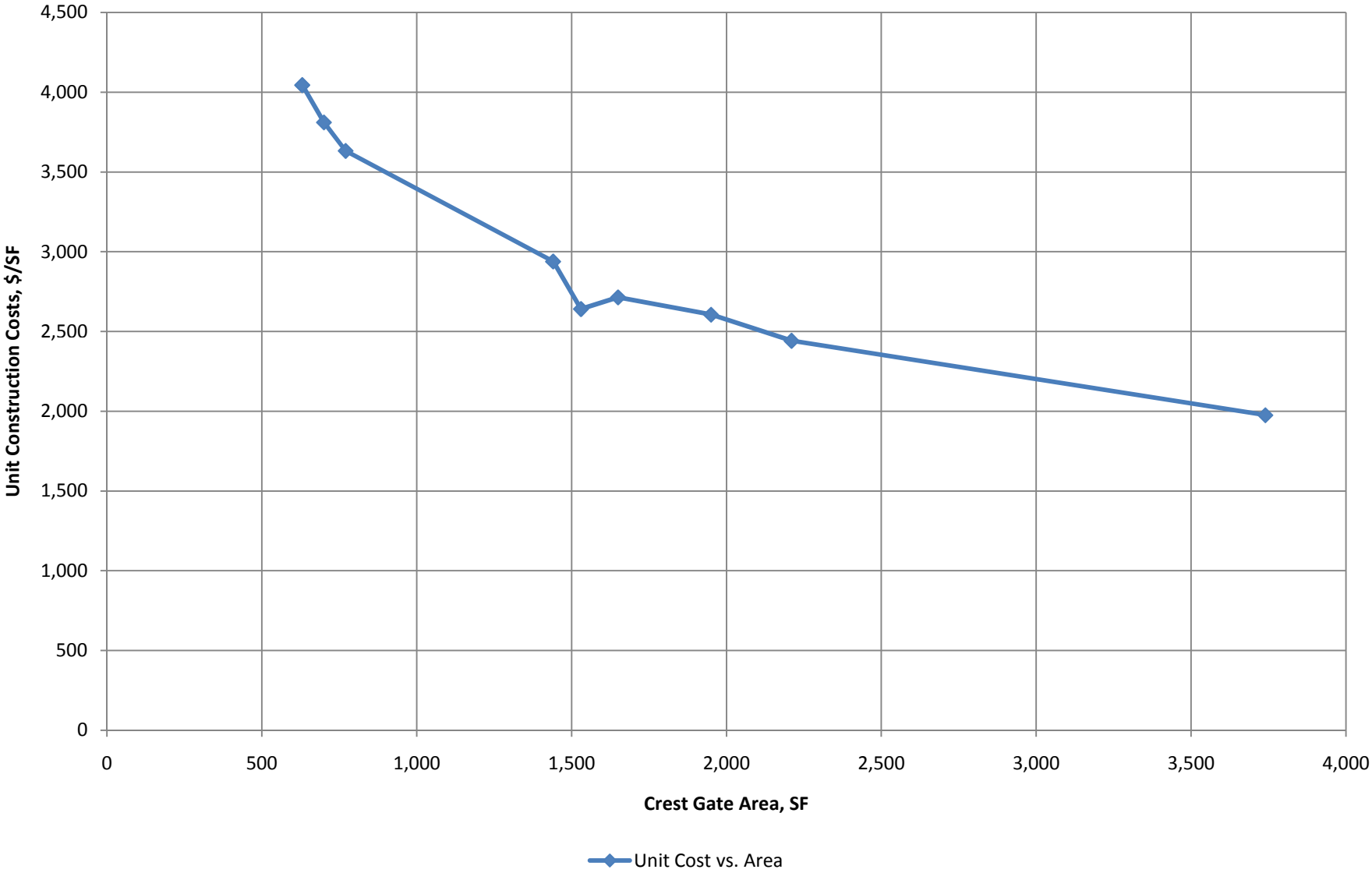


Figure L-1-20
Berm Gaps
Construction Costs

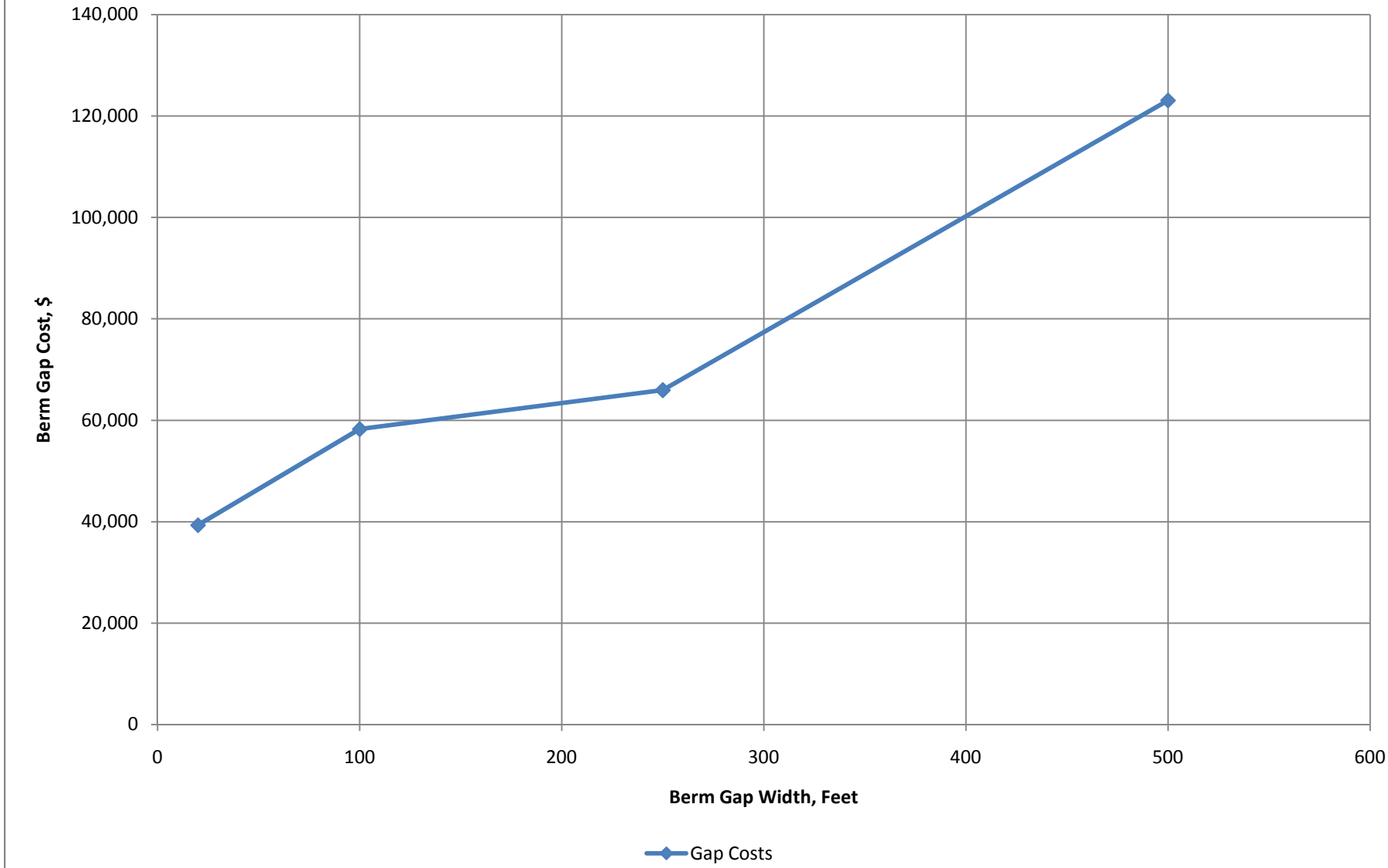


Table L-1-1
Romeville Diversion Culvert (MR Stage Elev. 11)
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Mobilization	LS	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
	Temporary Miss. Rvr. Levee Relocation																				
	Import Fill (use inlet canal excavation)	CY	15		0	0	0		0		0		0		0		0		0		0
	Place Fill (use inlet canal material)	CY	6	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200
	Excavate/remove temporary levee	CY	4	35,700	142,800	35,700	142,800	35,700	142,800	35,700	142,800	35,700	142,800	35,700	142,800	35,700	142,800	35,700	142,800	35,700	142,800
	Haul off excess spoils	CY	6	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200
	Permanent Levee removal and replacement																				
	Remove existing concrete slope paving																				
	Demolition	SY	9	1,770	15,930	1,810	16,290	1,870	16,830	1,910	17,190	1,930	17,370	2,000	18,000	2,290	20,610	2,380	21,420	2,680	24,120
	Disposal	CY	13	395	5,135	400	5,200	420	5,460	420	5,460	430	5,590	450	5,850	510	6,630	530	6,890	600	7,800
	Excavate existing levee (stockpile on site)	CY	4	28,100	112,400	27,700	110,800	28,400	113,600	27,400	109,600	26,800	107,200	28,400	113,600	35,500	142,000	31,100	124,400	36,000	144,000
	Fill existing levee	CY	6	28,100	168,600	27,700	166,200	28,400	170,400	27,400	164,400	26,800	160,800	28,400	170,400	35,500	213,000	31,100	186,600	36,000	216,000
	Replace concrete slope paving - 8"	SY	75	1,770	132,750	1,810	135,750	1,870	140,250	1,910	143,250	1,930	144,750	2,000	150,000	2,290	171,750	2,380	178,500	2,680	201,000
	Coffer Dam - Mississippi River																				
	Steel Sheet Pile - PZ-35	SF	62	17,000	1,054,000	17,200	1,066,400	17,600	1,091,200	17,800	1,103,600	18,000	1,116,000	18,500	1,147,000	20,300	1,258,600	20,900	1,295,800	22,800	1,413,600
	Inlet Canal																				
	Excavation	CY	4	60,000	240,000	61,400	245,600	63,700	254,800	65,100	260,400	65,800	263,200	68,900	275,600	79,700	318,800	83,000	332,000	94,300	377,200
	Haul off excess spoils	CY	6	24,300	145,800	25,700	154,200	28,000	168,000	29,400	176,400	30,100	180,600	33,200	199,200	44,000	264,000	47,300	283,800	58,600	351,600
	Riprap at Miss. Rvr. (54" deep)	SY	100	5,200	520,000	5,350	535,000	5,590	559,000	5,740	574,000	5,810	581,000	6,130	613,000	7,260	726,000	7,600	760,000	8,800	880,000
	Bollards/Dolphins in Miss. Rvr. (Groups of 3 pipes)																				
	5 groups - 12" Dia. Steel Pipe, 70' long	EA	8,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500
	Riprap at Culvert Inlet - (18" deep)	SY	50	580	29,000	600	30,000	640	32,000	660	33,000	670	33,500	710	35,500	860	43,000	910	45,500	1,070	53,500
	Concrete Channel Lining at Culvert	SY	50	390	19,500	400	20,000	430	21,500	440	22,000	450	22,500	480	24,000	580	29,000	610	30,500	720	36,000
	Diversion Culvert - CIP Boxes																				
	Excavation	CY	4	13,100	52,400	15,500	62,000	18,200	72,800	21,200	84,800	22,800	91,200	25,600	102,400	34,000	136,000	43,200	172,800	54,500	218,000
	Haul off excess spoils	CY	6	3,090	18,540	4,500	27,000	6,500	39,000	8,600	51,600	9,700	58,200	12,200	73,200	19,500	117,000	27,900	167,400	38,800	232,800
	Cement Stabilized Sand Backfill	CY	25	1,380	34,500	1,690	42,250	1,920	48,000	2,230	55,750	2,390	59,750	2,540	63,500	2,970	74,250	3,610	90,250	4,180	104,500
	Backfill	CY	10	10,010	100,100	11,000	110,000	11,700	117,000	12,600	126,000	13,100	131,000	13,400	134,000	14,500	145,000	15,300	153,000	15,700	157,000
	14" Concrete Piling	VLF	45	8,600	387,000	11,800	531,000	17,100	769,500	20,300	913,500	21,900	985,500	28,800	1,296,000	53,400	2,403,000	60,800	2,736,000	86,400	3,888,000
	Concrete Culvert - CIP																				
	Floor slab	CY	300	380	114,000	525	157,500	760	228,000	910	273,000	980	294,000	1,280	384,000	2,370	711,000	2,710	813,000	3,840	1,152,000
	Walls	CY	600	360	216,000	500	300,000	760	456,000	950	570,000	1,050	630,000	1,310	786,000	1,900	1,140,000	2,660	1,596,000	3,650	2,190,000
	Roof slab	CY	750	380	285,000	525	393,750	760	570,000	910	682,500	980	735,000	1,280	960,000	2,370	1,777,500	2,710	2,032,500	3,840	2,880,000
	Headwalls - 2																				
	Footing	CY	300	220	66,000	250	75,000	280	84,000	310	93,000	320	96,000	350	105,000	440	132,000	500	150,000	610	183,000
	Headwalls	CY	600	255	153,000	265	159,000	280	168,000	290	174,000	300	180,000	320	192,000	385	231,000	390	234,000	440	264,000
	Gate Tower - CIP																				
	Walls	CY	600	190	114,000	240	144,000	300	180,000	310	186,000	320	192,000	390	234,000	680	408,000	1,550	930,000	1,980	1,188,000
	Grating - Steel - Heavy Duty	SF	75	200	15,000	320	24,000	480	36,000	600	45,000	660	49,500	880	66,000	1,680	126,000	1,960	147,000	2,800	210,000
	Sluice gates with motor operators																				
	500 cfs (2 - 5' x 5' Boxes)	EA	53,000	2	106,000																
	1,000 cfs (2 - 8' x 7' Boxes)	EA	99,000			2	198,000														

Table L-1-1
Romeville Diversion Culvert (MR Stage Elev. 11)
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	2,000 cfs (3 - 8' x 8' Boxes)	EA	112,000					3	336,000												
	3,000 cfs (3 - 10 x 10 Boxes)	EA	165,000							3	495,000										
	4,000 cfs (3 - 11 x 11 Boxes)	EA	200,000									3	600,000								
	5,000 cfs (4 - 11 x 11 Boxes)	EA	200,000											4	800,000						
	10,000 cfs (7 - 12 x 10 Boxes)	EA	195,000													7	1,365,000				
	15,000 cfs (7 - 14 x 14 Boxes)	EA	239,000															7	1,673,000		
	20,000 cfs (10 - 14 x 14 Boxes)	EA	239,000																	10	2,390,000
	Stop Logs - 2 sets																				
	500 cfs (2 - 5' x 5' Boxes)	EA	13,000	4	52,000																
	1,000 cfs (2 - 8' x 7' Boxes)	EA	21,000			4	84,000														
	2,000 cfs (3 - 8' x 8' Boxes)	EA	23,000					6	138,000												
	3,000 cfs (3 - 10 x 10 Boxes)	EA	29,000							6	174,000										
	4,000 cfs (3 - 11 x 11 Boxes)	EA	37,000									6	222,000								
	5,000 cfs (4 - 11 x 11 Boxes)	EA	37,000											8	296,000						
	10,000 cfs (7 - 12 x 10 Boxes)	EA	36,000													14	504,000				
	15,000 cfs (7 - 14 x 14 Boxes)	EA	56,000															14	784,000		
	20,000 cfs (10 - 14 x 14 Boxes)	EA	56,000																	20	1,120,000
	Cutoff Wall - PZ-22	SF	64	6,420	410,880	6,540	418,560	6,740	431,360	6,860	439,040	6,920	442,880	7,180	459,520	8,100	518,400	8,380	536,320	9,340	597,760
	Trash Rack/Bar Screens	SF	100	80	8,000	160	16,000	275	27,500	425	42,500	520	52,000	685	68,500	1,190	119,000	1,940	194,000	2,780	278,000
	Site Work - 6 Acres																				
	Clearing & Grubbing	AC	2,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200
	Strip & Stockpile topsoil - 6"	CY	2	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000
	Site Drainage																				
	Drainage swales	LF	10	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000
	Drainage pipe - 18" RCP	LF	35	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000
	Fence - 6' Chain Link w/3-strand BW	LF	33	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000
	Site road excavation and grading	CY	6	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000
	Site road fill	CY	10	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000
	Site road - gravel - 12"	SY	9	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000
	Site road - asphalt driveway	SY	40	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000
	Site lighting	LS	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
	Place topsoil	CY	2	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000
	Seeding/turf establishment	AC	3,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000
	Building	LS	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000
	Electrical Allowance	LS	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000
	Instrumentation Allowance	LS	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000
	Utility relocations in LA 44 ROW																				
	Communication line	LS	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
	Communication line	LS	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
	Overhead power line	LS	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
	Dewatering																				
	Culvert	LF	100	320	32,000	320	32,000	320	32,000	320	32,000	320	32,000	320	32,000	320	32,000	320	32,000	320	32,000

Table L-1-1
Romeville Diversion Culvert (MR Stage Elev. 11)
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Inlet Canal	LF	50	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000
	Site - misc. items	LF	25	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000
	SWPPP	LS	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000
	LA 44 Detour - 2 lanes - 1,000 feet																				
	Clearing & Grubbing	AC	2,200	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600
	Excavation & Grading	CY	10	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000
	Structural fill	CY	14	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000
	Lime Stabilization 12" Deep, 5% Lime	SY	6	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000
	Stone Base	CY	15	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050
	Bituminous Base Course 4"	SY	12	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400
	Bituminous Binder Course 3"	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	Bituminous Top Course 1"	SY	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gravel shoulders	CY	10	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	LA 44 Pavement Demolition																				
	LA 44 Detour Pavement - 1,000 LF	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	LA 44 Pavement at Box Culvert - 300 LF	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Haul Demo'ed Pavement	CY	13	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	LA 44 Reconstruction - 2 lanes - 300 feet																				
	Excavation & Grading	CY	10	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890
	Structural fill	CY	14	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014
	Lime Stabilization 12" Deep, 5% Lime	SY	6	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802
	Stone Base	CY	15	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890
	Bituminous Base Course 4"	SY	12	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600
	Bituminous Binder Course 3"	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Bituminous Top Course 1"	SY	3	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400
	Gravel shoulders	CY	10	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
					0		0		0		0		0		0		0		0		0
	Subtotal - Direct Costs				6,122,901		6,774,866		7,821,566		8,562,356		8,998,906		10,319,636		14,647,906		17,222,046		22,305,246
	O/H and Profit Markup		30%		1,836,870		2,032,460		2,346,470		2,568,707		2,699,672		3,095,891		4,394,372		5,166,614		6,691,574
	Subtotal				7,959,771		8,807,326		10,168,036		11,131,063		11,698,578		13,415,527		19,042,278		22,388,660		28,996,820
	Contingency		15%		1,193,966		1,321,099		1,525,205		1,669,659		1,754,787		2,012,329		2,856,342		3,358,299		4,349,523

Table L-1-1
Romeville Diversion Culvert (MR Stage Elev. 11)
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Total Cost				**9,153,737**		**10,128,425**		**11,693,241**		**12,800,722**		**13,453,364**		**15,427,856**		**21,898,619**		**25,746,959**		**33,346,343**

Table L-1-2
Romeville Diversion Culvert (MR Stage Elev. 5)
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		1,500 cfs		2,000 cfs		2,500 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Mobilization	LS	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
	Temporary Miss. Rvr. Levee Relocation																				
	Import Fill (use inlet canal excavation)	CY	15		0	0	0		0		0		0		0		0		0		0
	Place Fill (use inlet canal material)	CY	6	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200
	Excavate/remove temporary levee	CY	4	35,700	142,800	35,700	142,800	35,700	142,800	35,700	142,800	35,700	142,800	35,700	142,800	35,700	142,800	35,700	142,800	35,700	142,800
	Haul off excess spoils	CY	6	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200	35,700	214,200
	Permanent Levee removal and replacement																				
	Remove existing concrete slope paving																				
	Demolition	SY	9	1,850	16,650	1,929	17,361	2,022	18,198	2,128	19,152	2,277	20,493	2,352	21,168	2,570	23,130	2,725	24,525	3,771	33,939
	Disposal	CY	13	411	5,343	429	5,577	449	5,837	473	6,149	506	6,578	523	6,799	571	7,423	606	7,878	838	10,894
	Excavate existing levee (stockpile on site)	CY	4	29,458	117,832	29,792	119,168	31,951	127,804	34,400	137,600	37,854	151,416	39,581	158,324	44,620	178,480	48,219	192,876	72,405	289,620
	Fill existing levee	CY	6	29,458	176,748	29,792	178,752	31,951	191,706	34,400	206,400	37,854	227,124	39,581	237,486	44,620	267,720	48,219	289,314	72,405	434,430
	Replace concrete slope paving - 8"	SY	75	1,850	138,750	1,929	144,675	2,022	151,650	2,128	159,600	2,277	170,775	2,352	176,400	2,570	192,750	2,725	204,375	3,771	282,825
	Coffer Dam - Mississippi River																				
	Steel Sheet Pile - PZ-35	SF	62	17,480	1,083,760	18,000	1,116,000	18,600	1,153,200	19,280	1,195,360	20,240	1,254,880	20,720	1,284,640	22,120	1,371,440	23,120	1,433,440	29,840	1,850,080
	Inlet Canal																				
	Excavation	CY	4	62,980	251,920	66,035	264,140	69,560	278,240	73,555	294,220	79,195	316,780	82,015	328,060	90,240	360,960	96,115	384,460	135,595	542,380
	Haul off excess spoils	CY	6	27,280	163,680	30,335	182,010	33,860	203,160	37,855	227,130	43,495	260,970	46,315	277,890	54,540	327,240	60,415	362,490	99,895	599,370
	Riprap at Miss. Rvr. (54" deep)	SY	100	5,516	551,600	5,833	583,300	6,200	620,000	6,616	661,600	7,202	720,200	7,496	749,600	8,351	835,100	8,962	896,200	13,069	1,306,900
	Bollards/Dolphins in Miss. Rvr. (Groups of 3 pipes)																				
	5 groups - 12" Dia. Steel Pipe, 70' long	EA	8,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500
	Riprap at Culvert Inlet - (18" deep)	SY	50	623	31,150	667	33,350	717	35,850	773	38,650	853	42,650	893	44,650	1,010	50,500	1,093	54,650	1,653	82,650
	Concrete Channel Lining at Culvert	SY	50	416	20,800	444	22,200	478	23,900	516	25,800	569	28,450	596	29,800	673	33,650	729	36,450	1,102	55,100
	Diversion Culvert - CIP Boxes																				
	Excavation	CY	4	16,037	64,148	20,089	80,356	22,992	91,968	26,281	105,124	30,924	123,696	33,246	132,984	40,018	160,072	44,855	179,420	77,360	309,440
	Haul off excess spoils	CY	6	5,085	30,510	8,011	48,066	10,323	61,938	12,942	77,652	16,640	99,840	18,489	110,934	23,881	143,286	27,733	166,398	53,618	321,708
	Cement Stabilized Sand Backfill	CY	25	1,647	41,175	2,039	50,975	2,216	55,400	2,418	60,450	2,702	67,550	2,844	71,100	3,259	81,475	3,556	88,900	5,547	138,675
	Backfill	CY	10	10,952	109,520	12,078	120,780	12,669	126,690	13,339	133,390	14,284	142,840	14,757	147,570	16,137	161,370	17,122	171,220	23,742	237,420
	14" Concrete Piling	VLF	45	15,467	696,015	22,400	1,008,000	30,400	1,368,000	39,467	1,776,015	52,267	2,352,015	58,667	2,640,015	77,333	3,479,985	90,667	4,080,015	180,267	8,112,015
	Concrete Culvert - CIP																				
	Floor slab	CY	300	687	206,100	996	298,800	1,351	405,300	1,754	526,200	2,323	696,900	2,607	782,100	3,437	1,031,100	4,030	1,209,000	8,012	2,403,600
	Walls	CY	600	569	341,400	948	568,800	1,138	682,800	1,327	796,200	1,707	1,024,200	1,896	1,137,600	2,276	1,365,600	2,465	1,479,000	4,741	2,844,600
	Roof slab	CY	750	687	515,250	996	747,000	1,351	1,013,250	1,754	1,315,500	2,323	1,742,250	2,607	1,955,250	3,437	2,577,750	4,030	3,022,500	8,012	6,009,000
	Headwalls - 2																				
	Footing	CY	300	256	76,800	298	89,400	331	99,300	369	110,700	422	126,600	449	134,700	527	158,100	582	174,600	956	286,800
	Headwalls	CY	600	275	165,000	297	178,200	322	193,200	350	210,000	391	234,600	412	247,200	470	282,000	510	306,000	793	475,800
	Gate Tower - CIP																				
	Walls	CY	600	263	157,800	357	214,200	453	271,800	563	337,800	717	430,200	795	477,000	1,020	612,000	2,702	1,621,200	4,713	2,827,800
	Grating - Steel - Heavy Duty	SF	75	420	31,500	640	48,000	900	67,500	1,200	90,000	1,600	120,000	1,800	135,000	2,420	181,500	2,880	216,000	5,760	432,000
	Sluice gates with motor operators																				
	500 cfs (3 - 7 x 6 Boxes)	EA	81,000	3	243,000																
	1,000 cfs (4 - 8 x 8 Boxes)	EA	117,000			4	468,000														

Table L-1-2
Romeville Diversion Culvert (MR Stage Elev. 5)
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		1,500 cfs		2,000 cfs		2,500 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	1,500 cfs (5 - 9 x 8 Boxes)	EA	129,000					5	645,000												
	2,000 cfs (6 - 10 x 8 Boxes)	EA	140,000							6	840,000										
	2,500 cfs (8 - 10 x 8 Boxes)	EA	140,000									8	1,120,000								
	3,000 cfs (9 - 10 x 8 Boxes)	EA	140,000											9	1,260,000						
	4,000 cfs (11 - 11 x 8 Boxes)	EA	151,000													11	1,661,000				
	5,000 cfs (12 - 12 x 8 Boxes)	EA	161,000															12	1,932,000		
	10,000 cfs (24 - 12 x 8 Boxes)	EA	161,000																	24	3,864,000
	Stop Logs - 2 sets																				
	500 cfs (3 - 7 x 6 Boxes)	EA	18,700	6	112,200																
	1,000 cfs (4 - 8 x 8 Boxes)	EA	24,000			8	192,000														
	1,500 cfs (5 - 9 x 8 Boxes)	EA	25,500					10	255,000												
	2,000 cfs (6 - 10 x 8 Boxes)	EA	26,400							12	316,800										
	2,500 cfs (8 - 10 x 8 Boxes)	EA	26,400									16	422,400								
	3,000 cfs (9 - 10 x 8 Boxes)	EA	26,400											18	475,200						
	4,000 cfs (11 - 11 x 8 Boxes)	EA	26,800													22	589,600				
	5,000 cfs (12 - 12 x 8 Boxes)	EA	26,900															24	645,600		
	10,000 cfs (24 - 12 x 8 Boxes)	EA	26,900																	48	1,291,200
	Cutoff Wall - PZ-22	SF	64	6,680	427,520	6,940	444,160	7,240	463,360	7,580	485,120	8,060	515,840	8,300	531,200	9,000	576,000	9,500	608,000	12,860	823,040
	Trash Rack/Bar Screens	SF	100	178	17,800	362	36,200	509	50,900	679	67,900	905	90,500	1,018	101,800	1,369	136,900	1,629	162,900	3,258	325,800
	Site Work - 6 Acres																				
	Clearing & Grubbing	AC	2,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200
	Strip & Stockpile topsoil - 6"	CY	2	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000
	Site Drainage																				
	Drainage swales	LF	10	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000
	Drainage pipe - 18" RCP	LF	35	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000
	Fence - 6' Chain Link w/3-strand BW	LF	33	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000
	Site road excavation and grading	CY	6	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000
	Site road fill	CY	10	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000
	Site road - gravel - 12"	SY	9	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000
	Site road - asphalt driveway	SY	40	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000
	Site lighting	LS	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
	Place topsoil	CY	2	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000
	Seeding/turf establishment	AC	3,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000
	Building	LS	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000
	Electrical Allowance	LS	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000
	Instrumentation Allowance	LS	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000
	Utility relocations in LA 44 ROW																				
	Communication line	LS	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
	Communication line	LS	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
	Overhead power line	LS	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
	Dewatering																				
	Culvert	LF	100	320	32,000	320	32,000	320	32,000	320	32,000	320	32,000	320	32,000	320	32,000	320	32,000	320	32,000

Table L-1-2
Romeville Diversion Culvert (MR Stage Elev. 5)
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		1,500 cfs		2,000 cfs		2,500 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Inlet Canal	LF	50	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000
	Site - misc. items	LF	25	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000
	SWPPP	LS	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000
	LA 44 Detour - 2 lanes - 1,000 feet																				
	Clearing & Grubbing	AC	2,200	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600
	Excavation & Grading	CY	10	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000
	Structural fill	CY	14	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000
	Lime Stabilization 12" Deep, 5% Lime	SY	6	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000
	Stone Base	CY	15	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050
	Bituminous Base Course 4"	SY	12	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400
	Bituminous Binder Course 3"	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	Bituminous Top Course 1"	SY	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gravel shoulders	CY	10	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	LA 44 Pavement Demolition																				
	LA 44 Detour Pavement - 1,000 LF	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	LA 44 Pavement at Box Culvert - 300 LF	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Haul Demo'ed Pavement	CY	13	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	LA 44 Reconstruction - 2 lanes - 300 feet																				
	Excavation & Grading	CY	10	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890
	Structural fill	CY	14	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014
	Lime Stabilization 12" Deep, 5% Lime	SY	6	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802
	Stone Base	CY	15	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890
	Bituminous Base Course 4"	SY	12	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600
	Bituminous Binder Course 3"	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Bituminous Top Course 1"	SY	3	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400
	Gravel shoulders	CY	10	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
					0		0		0		0		0		0		0		0		0
	Subtotal - Direct Costs				7,341,337		8,806,836		10,208,317		11,767,878		14,057,113		15,201,836		18,393,497		21,496,777		37,738,452
	O/H and Profit Markup		30%		2,202,401		2,642,051		3,062,495		3,530,363		4,217,134		4,560,551		5,518,049		6,449,033		11,321,536
	Subtotal				9,543,738		11,448,887		13,270,812		15,298,241		18,274,247		19,762,387		23,911,546		27,945,810		49,059,988
	Contingency		15%		1,431,561		1,717,333		1,990,622		2,294,736		2,741,137		2,964,358		3,586,732		4,191,872		7,358,998

Table L-1-2
Romeville Diversion Culvert (MR Stage Elev. 5)
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		1,500 cfs		2,000 cfs		2,500 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Total Cost				**10,975,299**		**13,166,220**		**15,261,434**		**17,592,978**		**21,015,384**		**22,726,745**		**27,498,278**		**32,137,682**		**56,418,986**

Table L-1-3
Romeville Diversion Siphon (500 cfs)
Construction Cost Estimate

Item No.	Description	Unit	500 cfs Qty	Unit Price	Cost, $
	Mobilization	LS	1	100,000	100,000
	Coffer Dam - Mississippi River (Temporary)				
	Steel Sheet Pile - PZ-35	SF	12,100	62	750,200
	Coffer Dam - Levee Crossing (Temporary)				
	Steel Sheet Pile - PZ-27	SF	12,900	35	451,500
	Cutoff Wall				
	Steel Sheet Piling - PZ-22	SF	2,300	64	147,200
	Concrete Wall - 12" Thick	CY	15	450	6,750
	Riprap at Miss. Rvr. (54" deep)	SY	1,500	100	150,000
	Bollards/Dolphins in Miss. Rvr. (Groups of 3 pipes)				
	5 groups - 12" Dia. Steel Pipe, 70' long	EA	15	8,500	127,500
	Siphon Piping - (3) 60" Dia. - 900 LF				
	A53 CW Standard Pipe PE, 60"	LF	2,700	350	945,000
	60" Butterfly Valve, Flg., w/Motor Op.	EA	3	81,200	243,600
	60" Knife Gate Valve, Flg., w/Motor Op.	EA	3	60,800	182,400
	Inlet screens, 60"	SF	60	100	6,000
	Excavate Pipe Trench	CY	8,185	4	32,740
	Cement Stabilized Sand - Pipe Zone	CY	2,160	25	54,000
	Bank Sand Bedding - Pipe Zone	CY	1,070	15	16,050
	Native Backfill	CY	5,000	10	50,000
	Haul Trench Spoils	CY	3,230	6	19,380
	Concrete Pipe Supports				
	Footings	CY	85	450	38,250
	Vertical	CY	40	1,000	40,000
	Access Walkways	SF	1,050	75	78,750
	Vacuum Start-up System				
	Vacuum Pumping Equipment	LS	1	30,000	30,000
	Vacuum Piping	LS	1	20,000	20,000
	Equipment Building	LS	1	50,000	50,000

Table L-1-3
Romeville Diversion Siphon (500 cfs)
Construction Cost Estimate

Item No.	Description	Unit	500 cfs Qty	Unit Price	Cost, $
	Electrical Allowance	LS	1	100,000	100,000
	Instrumentation Allowance	LS	1	100,000	100,000
	Site Work - 6 Acres				
	Clearing & Grubbing	AC	6	2,200	13,200
	Strip & Stockpile topsoil - 6"	CY	5,000	2	10,000
	Site Drainage				
	Drainage swales	LF	2,000	10	20,000
	Drainage pipe - 18" RCP	LF	200	35	7,000
	Fence - 6' Chain Link w/3-strand BW	LF	3,000	33	99,000
	Site road excavation and grading	CY	2,000	6	12,000
	Site road fill	CY	1,000	10	10,000
	Site road - gravel - 12"	SY	2,000	9	18,000
	Site road - asphalt driveway	SY	250	40	10,000
	Site lighting	LS	1	5,000	5,000
	Place topsoil	CY	5,000	2	10,000
	Seeding/turf establishment	AC	6	3,000	18,000
	Utility relocations in LA 44 ROW				
	Communication line	LS	1	5,000	5,000
	Communication line	LS	1	5,000	5,000
	Overhead power line	LS	1	5,000	5,000
	Dewatering				
	Culvert	LF	320	100	32,000
	Pipe Trenches	LF	400	50	20,000
	Site - misc. items	LF	1,000	25	25,000
	SWPPP	LS	1	10,000	10,000
	LA 44 Relocation - 2 lanes - 1,000 feet				
	Excavation & Grading	CY	2,963	10	29,630
	Structural fill	CY	1,670	14	23,380
	Lime Stabilization 12" Deep, 5% Lime	SY	4,889	6	29,334
	Stone Base	CY	1,086	15	16,290
	Bituminous Base Course 4"	SY	2,667	12	32,004
	Bituminous Binder Course 3"	SY	2,667	9	24,003
	Bituminous Top Course 1"	SY	2,667	3	8,001
	Gravel shoulders	CY	494	10	4,940

Table L-1-3
Romeville Diversion Siphon (500 cfs)
Construction Cost Estimate

Item No.	Description	Unit	500 cfs Qty	Unit Price	Cost, $
	Painted Lines 4" Wide	LF	3,000	0.20	600
	Signage	LS	1	1,500	1,500
	Drainage Pipe 18" RCP	LF	140	75	10,500
	Seeding/Turf Establishment	AC	2	3,000	6,000
	LA 44 Demolition				
	Demolish Existing Pavement	SY	2,700	9	24,300
	Haul Demo'ed Pavement	CY	450	13	5,850
	Seeding/Turf Establishment	AC	3	3,000	9,000
	Subtotal - Direct Costs				4,298,852
	O/H and Profit Markup			30%	1,289,656
	Subtotal				5,588,508
	Contingency			15%	838,276
	Total Cost				**6,426,784**

Table L-1-3
Romeville Diversion Siphon (1,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	1,000 cfs Qty	Unit Price	Cost, $
	Mobilization	LS	1	100,000	100,000
	Coffer Dam - Mississippi River (Temporary)				
	Steel Sheet Pile - PZ-35	SF	12,800	62	793,600
	Coffer Dam - Levee Crossing (Temporary)				
	Steel Sheet Pile - PZ-27	SF	13,500	35	472,500
	Cutoff Wall				
	Steel Sheet Piling - PZ-22	SF	2,700	64	172,800
	Concrete Wall - 12" Thick	CY	25	450	11,250
	Riprap at Miss. Rvr. (54" deep)	SY	1,800	100	180,000
	Bollards/Dolphins in Miss. Rvr. (Groups of 3 pipes)				
	5 groups - 12" Dia. Steel Pipe, 70' long	EA	15	8,500	127,500
	Siphon Piping - (4) 72" Dia. - 900 LF				
	A53 CW Standard Pipe PE, 72"	LF	3,600	445	1,602,000
	72" Butterfly Valve, Flg., w/Motor Op.	EA	4	96,500	386,000
	72" Knife Gate Valve, Flg., w/Motor Op.	EA	4	86,600	346,400
	Inlet screens, 72"	SF	115	100	11,500
	Excavate Pipe Trench	CY	12,200	4	48,800
	Cement Stabilized Sand - Pipe Zone	CY	3,820	25	95,500
	Bank Sand Bedding - Pipe Zone	CY	1,890	15	28,350
	Native Backfill	CY	6,470	10	64,700
	Haul Trench Spoils	CY	5,710	6	34,260
	Concrete Pipe Supports				
	Footings	CY	140	450	63,000
	Vertical	CY	70	1,000	70,000
	Access Walkways	SF	1,260	75	94,500
	Vacuum Start-up System				
	Vacuum Pumping Equipment	LS	1	40,000	40,000
	Vacuum Piping	LS	1	20,000	20,000
	Equipment Building	LS	1	50,000	50,000

Table L-1-3
Romeville Diversion Siphon (1,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	1,000 cfs Qty	Unit Price	Cost, $
	Electrical Allowance	LS	1	100,000	100,000
	Instrumentation Allowance	LS	1	100,000	100,000
	Site Work - 6 Acres				
	Clearing & Grubbing	AC	6	2,200	13,200
	Strip & Stockpile topsoil - 6"	CY	5,000	2	10,000
	Site Drainage				
	Drainage swales	LF	2,000	10	20,000
	Drainage pipe - 18" RCP	LF	200	35	7,000
	Fence - 6' Chain Link w/3-strand BW	LF	3,000	33	99,000
	Site road excavation and grading	CY	2,000	6	12,000
	Site road fill	CY	1,000	10	10,000
	Site road - gravel - 12"	SY	2,000	9	18,000
	Site road - asphalt driveway	SY	250	40	10,000
	Site lighting	LS	1	5,000	5,000
	Place topsoil	CY	5,000	2	10,000
	Seeding/turf establishment	AC	6	3,000	18,000
	Utility relocations in LA 44 ROW				
	Communication line	LS	1	5,000	5,000
	Communication line	LS	1	5,000	5,000
	Overhead power line	LS	1	5,000	5,000
	Dewatering				
	Culvert	LF	320	100	32,000
	Pipe Trenches	LF	400	50	20,000
	Site - misc. items	LF	1,000	25	25,000
	SWPPP	LS	1	10,000	10,000
	LA 44 Relocation - 2 lanes - 1,000 feet				
	Excavation & Grading	CY	2,963	10	29,630
	Structural fill	CY	1,670	14	23,380
	Lime Stabilization 12" Deep, 5% Lime	SY	4,889	6	29,334
	Stone Base	CY	1,086	15	16,290
	Bituminous Base Course 4"	SY	2,667	12	32,004
	Bituminous Binder Course 3"	SY	2,667	9	24,003
	Bituminous Top Course 1"	SY	2,667	3	8,001
	Gravel shoulders	CY	494	10	4,940

Table L-1-3
Romeville Diversion Siphon (1,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	1,000 cfs Qty	Unit Price	Cost, $
	Painted Lines 4" Wide	LF	3,000	0.20	600
	Signage	LS	1	1,500	1,500
	Drainage Pipe 18" RCP	LF	140	75	10,500
	Seeding/Turf Establishment	AC	2	3,000	6,000
	LA 44 Demolition				
	Demolish Existing Pavement	SY	2,700	9	24,300
	Haul Demo'ed Pavement	CY	450	13	5,850
	Seeding/Turf Establishment	AC	3	3,000	9,000
	Subtotal - Direct Costs				5,572,192
	O/H and Profit Markup			30%	1,671,658
	Subtotal				7,243,850
	Contingency			15%	1,086,577
	Total Cost				**8,330,427**

Table L-1-3
Romeville Diversion Siphon (2,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	2,000 cfs Qty	Unit Price	Cost, $
	Mobilization	LS	1	100,000	100,000
	Coffer Dam - Mississippi River (Temporary)				
	Steel Sheet Pile - PZ-35	SF	14,200	62	880,400
	Coffer Dam - Levee Crossing (Temporary)				
	Steel Sheet Pile - PZ-27	SF	15,000	35	525,000
	Cutoff Wall				
	Steel Sheet Piling - PZ-22	SF	3,400	64	217,600
	Concrete Wall - 12" Thick	CY	40	450	18,000
	Riprap at Miss. Rvr. (54" deep)	SY	2,500	100	250,000
	Bollards/Dolphins in Miss. Rvr. (Groups of 3 pipes)				
	5 groups - 12" Dia. Steel Pipe, 70' long	EA	15	8,500	127,500
	Siphon Piping - (7) 72" Dia. - 900 LF				
	A53 CW Standard Pipe PE, 72"	LF	6,300	445	2,803,500
	72" Butterfly Valve, Flg., w/Motor Op.	EA	7	96,500	675,500
	72" Knife Gate Valve, Flg., w/Motor Op.	EA	7	86,600	606,200
	Inlet screens, 72"	SF	200	100	20,000
	Excavate Pipe Trench	CY	20,300	4	81,200
	Cement Stabilized Sand - Pipe Zone	CY	6,870	25	171,750
	Bank Sand Bedding - Pipe Zone	CY	3,390	15	50,850
	Native Backfill	CY	10,100	10	101,000
	Haul Trench Spoils	CY	10,300	6	61,800
	Concrete Pipe Supports				
	Footings	CY	250	450	112,500
	Vertical	CY	130	1,000	130,000
	Access Walkways	SF	1,770	75	132,750
	Vacuum Start-up System				
	Vacuum Pumping Equipment	LS	1	62,000	62,000
	Vacuum Piping	LS	1	20,000	20,000
	Equipment Building	LS	1	50,000	50,000

Table L-1-3
Romeville Diversion Siphon (2,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	2,000 cfs Qty	Unit Price	Cost, $
	Electrical Allowance	LS	1	100,000	100,000
	Instrumentation Allowance	LS	1	100,000	100,000
	Site Work - 6 Acres				
	Clearing & Grubbing	AC	6	2,200	13,200
	Strip & Stockpile topsoil - 6"	CY	5,000	2	10,000
	Site Drainage				
	Drainage swales	LF	2,000	10	20,000
	Drainage pipe - 18" RCP	LF	200	35	7,000
	Fence - 6' Chain Link w/3-strand BW	LF	3,000	33	99,000
	Site road excavation and grading	CY	2,000	6	12,000
	Site road fill	CY	1,000	10	10,000
	Site road - gravel - 12"	SY	2,000	9	18,000
	Site road - asphalt driveway	SY	250	40	10,000
	Site lighting	LS	1	5,000	5,000
	Place topsoil	CY	5,000	2	10,000
	Seeding/turf establishment	AC	6	3,000	18,000
	Utility relocations in LA 44 ROW				
	Communication line	LS	1	5,000	5,000
	Communication line	LS	1	5,000	5,000
	Overhead power line	LS	1	5,000	5,000
	Dewatering				
	Culvert	LF	320	100	32,000
	Pipe Trenches	LF	400	50	20,000
	Site - misc. items	LF	1,000	25	25,000
	SWPPP	LS	1	10,000	10,000
	LA 44 Relocation - 2 lanes - 1,000 feet				
	Excavation & Grading	CY	2,963	10	29,630
	Structural fill	CY	1,670	14	23,380
	Lime Stabilization 12" Deep, 5% Lime	SY	4,889	6	29,334
	Stone Base	CY	1,086	15	16,290
	Bituminous Base Course 4"	SY	2,667	12	32,004
	Bituminous Binder Course 3"	SY	2,667	9	24,003
	Bituminous Top Course 1"	SY	2,667	3	8,001
	Gravel shoulders	CY	494	10	4,940

Table L-1-3
Romeville Diversion Siphon (2,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	2,000 cfs Qty	Unit Price	Cost, $
	Painted Lines 4" Wide	LF	3,000	0.20	600
	Signage	LS	1	1,500	1,500
	Drainage Pipe 18" RCP	LF	140	75	10,500
	Seeding/Turf Establishment	AC	2	3,000	6,000
	LA 44 Demolition				
	Demolish Existing Pavement	SY	2,700	9	24,300
	Haul Demo'ed Pavement	CY	450	13	5,850
	Seeding/Turf Establishment	AC	3	3,000	9,000
	Subtotal - Direct Costs				7,957,082
	O/H and Profit Markup			30%	2,387,125
	Subtotal				10,344,207
	Contingency			15%	1,551,631
	Total Cost				**11,895,838**

Table L-1-3
Romeville Diversion Siphon (3,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	3,000 cfs Qty	Unit Price	Cost, $
	Mobilization	LS	1	100,000	100,000
	Coffer Dam - Mississippi River (Temporary)				
	Steel Sheet Pile - PZ-35	SF	15,300	62	948,600
	Coffer Dam - Levee Crossing (Temporary)				
	Steel Sheet Pile - PZ-27	SF	16,100	35	563,500
	Cutoff Wall				
	Steel Sheet Piling - PZ-22	SF	4,000	64	256,000
	Concrete Wall - 12" Thick	CY	55	450	24,750
	Riprap at Miss. Rvr. (54" deep)	SY	3,000	100	300,000
	Bollards/Dolphins in Miss. Rvr. (Groups of 3 pipes)				
	5 groups - 12" Dia. Steel Pipe, 70' long	EA	15	8,500	127,500
	Siphon Piping - (8) 84" Dia. - 900 LF				
	A53 CW Standard Pipe PE, 84"	LF	7,200	575	4,140,000
	84" Butterfly Valve, Flg., w/Motor Op.	EA	8	119,100	952,800
	84" Knife Gate Valve, Flg., w/Motor Op.	EA	8	111,000	888,000
	Inlet screens, 84"	SF	310	100	31,000
	Excavate Pipe Trench	CY	27,500	4	110,000
	Cement Stabilized Sand - Pipe Zone	CY	10,100	25	252,500
	Bank Sand Bedding - Pipe Zone	CY	4,990	15	74,850
	Native Backfill	CY	12,400	10	124,000
	Haul Trench Spoils	CY	15,100	6	90,600
	Concrete Pipe Supports				
	Footings	CY	330	450	148,500
	Vertical	CY	195	1,000	195,000
	Access Walkways	SF	2,060	75	154,500
	Vacuum Start-up System				
	Vacuum Pumping Equipment	LS	1	100,000	100,000
	Vacuum Piping	LS	1	20,000	20,000
	Equipment Building	LS	1	50,000	50,000

Table L-1-3
Romeville Diversion Siphon (3,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	3,000 cfs Qty	Unit Price	Cost, $
	Electrical Allowance	LS	1	100,000	100,000
	Instrumentation Allowance	LS	1	100,000	100,000
	Site Work - 6 Acres				
	Clearing & Grubbing	AC	6	2,200	13,200
	Strip & Stockpile topsoil - 6"	CY	5,000	2	10,000
	Site Drainage				
	Drainage swales	LF	2,000	10	20,000
	Drainage pipe - 18" RCP	LF	200	35	7,000
	Fence - 6' Chain Link w/3-strand BW	LF	3,000	33	99,000
	Site road excavation and grading	CY	2,000	6	12,000
	Site road fill	CY	1,000	10	10,000
	Site road - gravel - 12"	SY	2,000	9	18,000
	Site road - asphalt driveway	SY	250	40	10,000
	Site lighting	LS	1	5,000	5,000
	Place topsoil	CY	5,000	2	10,000
	Seeding/turf establishment	AC	6	3,000	18,000
	Utility relocations in LA 44 ROW				
	Communication line	LS	1	5,000	5,000
	Communication line	LS	1	5,000	5,000
	Overhead power line	LS	1	5,000	5,000
	Dewatering				
	Culvert	LF	320	100	32,000
	Pipe Trenches	LF	400	50	20,000
	Site - misc. items	LF	1,000	25	25,000
	SWPPP	LS	1	10,000	10,000
	LA 44 Relocation - 2 lanes - 1,000 feet				
	Excavation & Grading	CY	2,963	10	29,630
	Structural fill	CY	1,670	14	23,380
	Lime Stabilization 12" Deep, 5% Lime	SY	4,889	6	29,334
	Stone Base	CY	1,086	15	16,290
	Bituminous Base Course 4"	SY	2,667	12	32,004
	Bituminous Binder Course 3"	SY	2,667	9	24,003
	Bituminous Top Course 1"	SY	2,667	3	8,001
	Gravel shoulders	CY	494	10	4,940

Table L-1-3
Romeville Diversion Siphon (3,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	3,000 cfs Qty	Unit Price	Cost, $
	Painted Lines 4" Wide	LF	3,000	0.20	600
	Signage	LS	1	1,500	1,500
	Drainage Pipe 18" RCP	LF	140	75	10,500
	Seeding/Turf Establishment	AC	2	3,000	6,000
	LA 44 Demolition				
	Demolish Existing Pavement	SY	2,700	9	24,300
	Haul Demo'ed Pavement	CY	450	13	5,850
	Seeding/Turf Establishment	AC	3	3,000	9,000
	Subtotal - Direct Costs				10,411,632
	O/H and Profit Markup			30%	3,123,490
	Subtotal				13,535,122
	Contingency			15%	2,030,268
	Total Cost				**15,565,390**

Table L-1-3
Romeville Diversion Siphon (4,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	4,000 cfs Qty	Unit Price	Cost, $
	Mobilization	LS	1	100,000	100,000
	Coffer Dam - Mississippi River (Temporary)				
	Steel Sheet Pile - PZ-35	SF	16,400	62	1,016,800
	Coffer Dam - Levee Crossing (Temporary)				
	Steel Sheet Pile - PZ-27	SF	17,200	35	602,000
	Cutoff Wall				
	Steel Sheet Piling - PZ-22	SF	4,600	64	294,400
	Concrete Wall - 12" Thick	CY	70	450	31,500
	Riprap at Miss. Rvr. (54" deep)	SY	3,500	100	350,000
	Bollards/Dolphins in Miss. Rvr. (Groups of 3 pipes)				
	5 groups - 12" Dia. Steel Pipe, 70' long	EA	15	8,500	127,500
	Siphon Piping - (10) 84" Dia. - 900 LF				
	A53 CW Standard Pipe PE, 84"	LF	9,000	575	5,175,000
	84" Butterfly Valve, Flg., w/Motor Op.	EA	10	119,100	1,191,000
	84" Knife Gate Valve, Flg., w/Motor Op.	EA	10	111,000	1,110,000
	Inlet screens, 84"	SF	390	100	39,000
	Excavate Pipe Trench	CY	34,200	4	136,800
	Cement Stabilized Sand - Pipe Zone	CY	12,700	25	317,500
	Bank Sand Bedding - Pipe Zone	CY	6,280	15	94,200
	Native Backfill	CY	15,200	10	152,000
	Haul Trench Spoils	CY	19,000	6	114,000
	Concrete Pipe Supports				
	Footings	CY	420	450	189,000
	Vertical	CY	250	1,000	250,000
	Access Walkways	SF	2,440	75	183,000
	Vacuum Start-up System				
	Vacuum Pumping Equipment	LS	1	110,000	110,000
	Vacuum Piping	LS	1	20,000	20,000
	Equipment Building	LS	1	50,000	50,000

Table L-1-3
Romeville Diversion Siphon (4,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	4,000 cfs Qty	Unit Price	Cost, $
	Electrical Allowance	LS	1	100,000	100,000
	Instrumentation Allowance	LS	1	100,000	100,000
	Site Work - 6 Acres				
	Clearing & Grubbing	AC	6	2,200	13,200
	Strip & Stockpile topsoil - 6"	CY	5,000	2	10,000
	Site Drainage				
	Drainage swales	LF	2,000	10	20,000
	Drainage pipe - 18" RCP	LF	200	35	7,000
	Fence - 6' Chain Link w/3-strand BW	LF	3,000	33	99,000
	Site road excavation and grading	CY	2,000	6	12,000
	Site road fill	CY	1,000	10	10,000
	Site road - gravel - 12"	SY	2,000	9	18,000
	Site road - asphalt driveway	SY	250	40	10,000
	Site lighting	LS	1	5,000	5,000
	Place topsoil	CY	5,000	2	10,000
	Seeding/turf establishment	AC	6	3,000	18,000
	Utility relocations in LA 44 ROW				
	Communication line	LS	1	5,000	5,000
	Communication line	LS	1	5,000	5,000
	Overhead power line	LS	1	5,000	5,000
	Dewatering				
	Culvert	LF	320	100	32,000
	Pipe Trenches	LF	400	50	20,000
	Site - misc. items	LF	1,000	25	25,000
	SWPPP	LS	1	10,000	10,000
	LA 44 Relocation - 2 lanes - 1,000 feet				
	Excavation & Grading	CY	2,963	10	29,630
	Structural fill	CY	1,670	14	23,380
	Lime Stabilization 12" Deep, 5% Lime	SY	4,889	6	29,334
	Stone Base	CY	1,086	15	16,290
	Bituminous Base Course 4"	SY	2,667	12	32,004
	Bituminous Binder Course 3"	SY	2,667	9	24,003
	Bituminous Top Course 1"	SY	2,667	3	8,001
	Gravel shoulders	CY	494	10	4,940

Table L-1-3
Romeville Diversion Siphon (4,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	4,000 cfs Qty	Unit Price	Cost, $
	Painted Lines 4" Wide	LF	3,000	0.20	600
	Signage	LS	1	1,500	1,500
	Drainage Pipe 18" RCP	LF	140	75	10,500
	Seeding/Turf Establishment	AC	2	3,000	6,000
	LA 44 Demolition				
	Demolish Existing Pavement	SY	2,700	9	24,300
	Haul Demo'ed Pavement	CY	450	13	5,850
	Seeding/Turf Establishment	AC	3	3,000	9,000
	Subtotal - Direct Costs				12,413,232
	O/H and Profit Markup			30%	3,723,970
	Subtotal				16,137,202
	Contingency			15%	2,420,580
	Total Cost				**18,557,782**

Table L-1-3
Romeville Diversion Siphon (5,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	5,000 cfs Qty	Unit Price	Cost, $
	Mobilization	LS	1	100,000	100,000
	Coffer Dam - Mississippi River (Temporary)				
	Steel Sheet Pile - PZ-35	SF	17,200	62	1,066,400
	Coffer Dam - Levee Crossing (Temporary)				
	Steel Sheet Pile - PZ-27	SF	17,900	35	626,500
	Cutoff Wall				
	Steel Sheet Piling - PZ-22	SF	5,000	64	320,000
	Concrete Wall - 12" Thick	CY	80	450	36,000
	Riprap at Miss. Rvr. (54" deep)	SY	3,900	100	390,000
	Bollards/Dolphins in Miss. Rvr. (Groups of 3 pipes)				
	5 groups - 12" Dia. Steel Pipe, 70' long	EA	15	8,500	127,500
	Siphon Piping - (10) 96" Dia. - 900 LF				
	A53 CW Standard Pipe PE, 96"	LF	9,000	690	6,210,000
	96" Butterfly Valve, Flg., w/Motor Op.	EA	10	145,500	1,455,000
	96" Knife Gate Valve, Flg., w/Motor Op.	EA	10	127,500	1,275,000
	Inlet screens, 96"	SF	510	100	51,000
	Excavate Pipe Trench	CY	40,400	4	161,600
	Cement Stabilized Sand - Pipe Zone	CY	15,900	25	397,500
	Bank Sand Bedding - Pipe Zone	CY	7,830	15	117,450
	Native Backfill	CY	16,700	10	167,000
	Haul Trench Spoils	CY	23,700	6	142,200
	Concrete Pipe Supports				
	Footings	CY	480	450	216,000
	Vertical	CY	310	1,000	310,000
	Access Walkways	SF	2,590	75	194,250
	Vacuum Start-up System				
	Vacuum Pumping Equipment	LS	1	140,000	140,000
	Vacuum Piping	LS	1	20,000	20,000
	Equipment Building	LS	1	50,000	50,000

Table L-1-3
Romeville Diversion Siphon (5,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	5,000 cfs Qty	Unit Price	Cost, $
	Electrical Allowance	LS	1	100,000	100,000
	Instrumentation Allowance	LS	1	100,000	100,000
	Site Work - 6 Acres				
	Clearing & Grubbing	AC	6	2,200	13,200
	Strip & Stockpile topsoil - 6"	CY	5,000	2	10,000
	Site Drainage				
	Drainage swales	LF	2,000	10	20,000
	Drainage pipe - 18" RCP	LF	200	35	7,000
	Fence - 6' Chain Link w/3-strand BW	LF	3,000	33	99,000
	Site road excavation and grading	CY	2,000	6	12,000
	Site road fill	CY	1,000	10	10,000
	Site road - gravel - 12"	SY	2,000	9	18,000
	Site road - asphalt driveway	SY	250	40	10,000
	Site lighting	LS	1	5,000	5,000
	Place topsoil	CY	5,000	2	10,000
	Seeding/turf establishment	AC	6	3,000	18,000
	Utility relocations in LA 44 ROW				
	Communication line	LS	1	5,000	5,000
	Communication line	LS	1	5,000	5,000
	Overhead power line	LS	1	5,000	5,000
	Dewatering				
	Culvert	LF	320	100	32,000
	Pipe Trenches	LF	400	50	20,000
	Site - misc. items	LF	1,000	25	25,000
	SWPPP	LS	1	10,000	10,000
	LA 44 Relocation - 2 lanes - 1,000 feet				
	Excavation & Grading	CY	2,963	10	29,630
	Structural fill	CY	1,670	14	23,380
	Lime Stabilization 12" Deep, 5% Lime	SY	4,889	6	29,334
	Stone Base	CY	1,086	15	16,290
	Bituminous Base Course 4"	SY	2,667	12	32,004
	Bituminous Binder Course 3"	SY	2,667	9	24,003
	Bituminous Top Course 1"	SY	2,667	3	8,001
	Gravel shoulders	CY	494	10	4,940

Table L-1-3
Romeville Diversion Siphon (5,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	5,000 cfs Qty	Unit Price	Cost, $
	Painted Lines 4" Wide	LF	3,000	0.20	600
	Signage	LS	1	1,500	1,500
	Drainage Pipe 18" RCP	LF	140	75	10,500
	Seeding/Turf Establishment	AC	2	3,000	6,000
	LA 44 Demolition				
	Demolish Existing Pavement	SY	2,700	9	24,300
	Haul Demo'ed Pavement	CY	450	13	5,850
	Seeding/Turf Establishment	AC	3	3,000	9,000
	Subtotal - Direct Costs				14,332,932
	O/H and Profit Markup			30%	4,299,880
	Subtotal				18,632,812
	Contingency			15%	2,794,922
	Total Cost				**21,427,733**

Table L-1-4
Romeville Earthen Transmission Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Mobilization	LS	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
	Earthen Channel																				
	Clearing & Grubbing	AC	2,200	57	125,400	65	143,000	87	191,400	106	233,200	126	277,200	144	316,800	238	523,600	336	739,200	430	946,000
	Strip Topsoil - 6''	CY	2	46,000	92,000	52,700	105,400	70,300	140,600	85,200	170,400	101,400	202,800	116,000	232,000	192,000	384,000	270,400	540,800	347,500	695,000
	Excavation	CY	4	169,000	676,000	305,000	1,220,000	559,000	2,236,000	792,000	3,168,000	1,046,000	4,184,000	1,300,000	5,200,000	2,470,000	9,880,000	3,692,000	14,768,000	4,899,000	19,596,000
	Fill (embankment)	CY	6	113,000	678,000	113,000	678,000	113,000	678,000	113,000	678,000	113,000	678,000	113,000	678,000	113,000	678,000	113,000	678,000	113,000	678,000
	Import fill material	CY	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Haul off spoils	CY	6	56,000	336,000	192,000	1,152,000	446,000	2,676,000	879,000	5,274,000	933,000	5,598,000	1,190,000	7,140,000	2,350,000	14,100,000	3,579,000	21,474,000	4,786,000	28,716,000
	Place topsoil	CY	2	46,000	92,000	52,700	105,400	70,300	140,600	85,200	170,400	101,400	202,800	116,000	232,000	192,000	384,000	270,400	540,800	347,500	695,000
	Seeding/Establish Turf	AC	3,000	55	165,000	52	156,000	54	162,000	54	162,000	54	162,000	52	156,000	54	162,000	54	162,000	54	162,000
	Drainage ditch at ROW	LF	10	30,050	300,500	30,200	302,000	30,500	305,000	30,800	308,000	31,100	311,000	31,400	314,000	32,800	328,000	34,200	342,000	35,700	357,000
	Drainage outfall pipes - 24" RCP	LF	50	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000
	Fence - 4-strand Barbed Wire	LF	15	30,050	450,750	30,200	453,000	30,500	457,500	30,800	462,000	31,100	466,500	31,400	471,000	32,800	492,000	34,200	513,000	35,700	535,500
	Stilling Basin at Culvert/Siphon Outfall																				
	Concrete channel lining - 100 LF	SY	50	890	44,500	1,250	62,500	1,920	96,000	2,600	130,000	3,200	160,000	3,860	193,000	6,910	345,500	10,200	510,000	13,300	665,000
	Riprap - 18" - 50 LF	SY	50	450	22,500	630	31,500	960	48,000	1,300	65,000	1,600	80,000	1,930	96,500	3,460	173,000	5,100	255,000	6,700	335,000
	Canadian National RR Crossing																				
	(12' x 8' CIP Box Culverts - 100 LF)																				
	Excavation	CY	6	5,270	31,620	6,100	36,600	8,610	51,660	11,110	66,660	13,620	81,720	16,120	96,720	28,640	171,840	41,160	246,960	53,690	322,140
	Culvert floor - CIP	CY	300	230	69,000	330	99,000	640	192,000	950	285,000	1,260	378,000	1,570	471,000	3,130	939,000	4,685	1,405,500	6,240	1,872,000
	Culvert walls - CIP	CY	600	180	108,000	240	144,000	420	252,000	595	357,000	770	462,000	950	570,000	1,840	1,104,000	2,730	1,638,000	3,615	2,169,000
	Culvert roof - CIP	CY	750	230	172,500	330	247,500	640	480,000	950	712,500	1,260	945,000	1,570	1,177,500	3,130	2,347,500	4,685	3,513,750	6,240	4,680,000
	Headwalls																				
	Footing	CY	300	220	66,000	250	75,000	345	103,500	440	132,000	530	159,000	625	187,500	1,090	327,000	1,560	468,000	2,025	607,500
	Wall	CY	600	125	75,000	140	84,000	170	102,000	210	126,000	240	144,000	275	165,000	440	264,000	610	366,000	780	468,000
	Cement Stabilized Sand Backfill	CY	25	595	14,875	645	16,125	800	20,000	960	24,000	1,120	28,000	1,270	31,750	2,045	51,125	2,820	70,500	3,600	90,000
	Backfill - excavated material	CY	10	3,340	33,400	3,500	35,000	3,985	39,850	4,465	44,650	4,950	49,500	5,430	54,300	7,840	78,400	10,250	102,500	12,670	126,700
	Haul off spoils	CY	6	1,930	11,580	2,600	15,600	4,625	27,750	6,645	39,870	8,670	52,020	10,690	64,140	20,800	124,800	30,910	185,460	41,020	246,120
	Concrete Channel Lining - 10 LF each end	SY	50	180	9,000	250	12,500	390	19,500	510	25,500	640	32,000	780	39,000	1,390	69,500	2,030	101,500	2,660	133,000
	Riprap - 10 LF each end	SY	50	180	9,000	250	12,500	390	19,500	510	25,500	640	32,000	780	39,000	1,390	69,500	2,030	101,500	2,660	133,000
	CN RR Relocation - 2,000 LF																				
	Clearing & Grubbing	AC	2,200	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600
	Embankment	LF	20	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000
	Ballast	LF	35	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000
	Railroad Track Work	LF	200	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000
	Turnout	EA	150,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000
	Remove temporary embankment & ballast	LF	15	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000
	Remove temporary rail	LF	15	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000
	Remove Turnout	EA	6,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000
	Seeding	AC	3,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000
	CN RR Reconstruction - 200 LF																				
	Embankment	LF	20	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000
	Ballast	LF	35	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000
	Railroad Track Work	LF	200	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000
	Seeding	AC	3,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000
	LA 3125 Crossing																				

Table L-1-4
Romeville Earthen Transmission Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	(12' x 8' CIP Box Culverts - 300 LF)																				
	Excavation	CY	6	8,400	50,400	9,975	59,850	14,700	88,200	19,400	116,400	24,200	145,200	28,900	173,400	52,500	315,000	76,200	457,200	99,800	598,800
	Culvert floor - CIP	CY	300	330	99,000	485	145,500	960	288,000	1,430	429,000	1,910	573,000	2,375	712,500	4,740	1,422,000	7,100	2,130,000	9,465	2,839,500
	Culvert walls - CIP	CY	600	290	174,000	385	231,000	675	405,000	965	579,000	1,255	753,000	1,545	927,000	2,985	1,791,000	4,430	2,658,000	5,875	3,525,000
	Culvert roof - CIP	CY	750	330	247,500	485	363,750	960	720,000	1,430	1,072,500	1,910	1,432,500	2,375	1,781,250	4,740	3,555,000	7,100	5,325,000	9,465	7,098,750
	Headwalls																				
	Footing	CY	300	185	55,500	210	63,000	300	90,000	385	115,500	475	142,500	560	168,000	995	298,500	1,435	430,500	1,870	561,000
	Wall	CY	600	65	39,000	70	42,000	80	48,000	90	54,000	100	60,000	115	69,000	165	99,000	220	132,000	270	162,000
	Cement Stabilized Sand Backfill	CY	25	1,545	38,625	1,690	42,250	2,125	53,125	2,565	64,125	3,000	75,000	3,440	86,000	5,620	140,500	7,795	194,875	9,975	249,375
	Backfill - excavated material	CY	10	3,775	37,750	3,730	37,300	3,580	35,800	3,435	34,350	3,290	32,900	3,145	31,450	2,420	24,200	1,690	16,900	970	9,700
	Haul off spoils	CY	6	4,625	27,750	6,245	37,470	11,120	66,720	15,965	95,790	20,910	125,460	25,755	154,530	50,080	300,480	74,510	447,060	98,830	592,980
	Concrete Channel Lining - 10 LF each end	SY	50	180	9,000	250	12,500	390	19,500	510	25,500	640	32,000	780	39,000	1,390	69,500	2,030	101,500	2,660	133,000
	Riprap - 10 LF each end	SY	50	180	9,000	250	12,500	390	19,500	510	25,500	640	32,000	780	39,000	1,390	69,500	2,030	101,500	2,660	133,000
	LA 3125 Detour - 2 Lanes - 1,000 feet																				
	Clearing & Grubbing	AC	2,200	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600
	Excavation & Grading	CY	10	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000
	Fill	CY	10	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000
	Lime Stabilization 12" Deep, 5% Lime	SY	6	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000
	Stone Base	CY	15	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050
	Bituminous Base Course 4"	SY	12	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400
	Bituminous Binder Course 3"	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	Bituminous Top Course 1"	SY	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gravel shoulders	CY	10	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	LA 3125 Reconstruction - 2 Lanes - 300 feet																				
	Excavation & Grading	CY	10	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890
	Fill	CY	10	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010
	Lime Stabilization 12" Deep, 5% Lime	SY	6	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802
	Stone Base	CY	15	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890
	Bituminous Base Course 4"	SY	12	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600
	Bituminous Binder Course 3"	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Bituminous Top Course 1"	SY	3	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400
	Gravel shoulders	CY	10	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000
	Pavement Demolition																				
	LA 3125 Detour Pavement - 1,000 LF	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	LA 3125 Pavement at Box Culvert - 300 LF	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Haul Demo'ed Pavement	CY	13	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	Dewatering and Water Management																				
	Earthen Canal																				
	Dewatering	LF	50	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000
	CN RR Crossing																				

Table L-1-4
Romeville Earthen Transmission Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Dewatering	LF	50	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000
	LA 3125																				
	Dewatering	LF	50	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000
	Utility Construction																				
	Dewatering	LF	25	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500
					0		0		0		0		0		0		0		0		0
	Subtotal - Direct Costs				6,598,842		8,462,437		12,501,397		17,500,037		20,317,792		24,335,032		43,310,137		62,945,697		82,359,757
	O/H and Profit Markup		30%		1,979,653		2,538,731		3,750,419		5,250,011		6,095,338		7,300,510		12,993,041		18,883,709		24,707,927
	Subtotal				8,578,495		11,001,168		16,251,816		22,750,048		26,413,130		31,635,542		56,303,178		81,829,406		107,067,684
	Contingency		10%		857,849		1,100,117		1,625,182		2,275,005		2,641,313		3,163,554		5,630,318		8,182,941		10,706,768
	Total Cost				**9,436,344**		**12,101,285**		**17,876,998**		**25,025,053**		**29,054,443**		**34,799,096**		**61,933,496**		**90,012,347**		**117,774,453**

Table L-1-5
Romeville Deep Earthen Transmission Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Mobilization	LS	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
	Earthen Channel																				
	Clearing & Grubbing	AC	2,200	64	140,101	70	154,848	84	184,343	101	221,212	114	250,707	131	287,576	198	435,051	268	589,899	339	744,747
	Strip Topsoil - 6''	CY	2	51,370	102,741	56,778	113,556	67,593	135,185	81,111	162,222	91,926	183,852	105,444	210,889	159,519	319,037	216,296	432,593	273,074	546,148
	Excavation	CY	4	254,173	1,016,694	317,963	1,271,850	530,593	2,122,372	796,381	3,185,525	1,009,012	4,036,047	1,274,800	5,099,200	2,337,953	9,351,810	3,480,842	13,923,366	4,597,152	18,388,607
	Fill (embankment)	CY	6	112,920	677,521	112,920	677,521	112,920	677,521	112,920	677,521	112,920	677,521	112,920	677,521	112,920	677,521	112,920	677,521	112,920	677,521
	Import fill material	CY	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Haul off spoils	CY	6	141,253	847,519	205,042	1,230,254	417,673	2,506,037	683,461	4,100,766	896,092	5,376,549	1,161,880	6,971,278	2,225,032	13,350,194	3,367,921	20,207,528	4,484,232	26,905,389
	Place topsoil	CY	2	51,370	102,741	56,778	113,556	67,593	135,185	81,111	162,222	91,926	183,852	105,444	210,889	159,519	319,037	216,296	432,593	273,074	546,148
	Seeding/Establish Turf	AC	3,000	61	183,003	64	191,047	64	191,047	64	191,047	64	191,047	64	191,047	64	191,047	62	186,019	62	186,019
	Drainage ditch at ROW	LF	10	30,150	301,500	30,250	302,500	30,450	304,500	30,700	307,000	30,900	309,000	31,150	311,500	32,150	321,500	33,200	332,000	34,250	342,500
	Drainage outfall pipes - 24" RCP	LF	50	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000
	Fence - 4-strand Barbed Wire	LF	15	30,150	452,250	30,250	453,750	30,450	456,750	30,700	460,500	30,900	463,500	31,150	467,250	32,150	482,250	33,200	498,000	34,250	513,750
	Stilling Basin at Culvert/Siphon Outfall																				
	Concrete channel lining - 100 LF	SY	50	889	44,444	1,022	51,111	1,467	73,333	2,022	101,111	2,467	123,333	3,022	151,111	5,244	262,222	7,633	381,667	9,967	498,333
	Riprap - 18" - 50 LF	SY	50	444	22,222	511	25,556	733	36,667	1,011	50,556	1,233	61,667	1,511	75,556	2,622	131,111	3,817	190,833	4,983	249,167
	Canadian National RR Crossing																				
	(12' x 10' CIP Box Culverts - 100 LF)																				
	Excavation	CY	6	5,905	35,431	6,897	41,381	8,880	53,280	11,855	71,129	13,838	83,029	15,821	94,928	25,738	154,425	36,645	219,872	46,561	279,368
	Culvert floor - CIP	CY	300	119	35,556	222	66,667	430	128,889	741	222,222	948	284,444	1,156	346,667	2,193	657,778	3,333	1,000,000	4,370	1,311,111
	Culvert walls - CIP	CY	600	148	88,889	222	133,333	370	222,222	593	355,556	741	444,444	889	533,333	1,630	977,778	2,444	1,466,667	3,185	1,911,111
	Culvert roof - CIP	CY	750	119	88,889	222	166,667	430	322,222	741	555,556	948	711,111	1,156	866,667	2,193	1,644,444	3,333	2,500,000	4,370	3,277,778
	Headwalls				0		0		0		0		0		0		0		0		
	Footing	CY	300	221	66,248	252	75,581	314	94,248	407	122,248	470	140,915	532	159,581	843	252,915	1,185	355,581	1,496	448,915
	Wall	CY	600	163	97,629	176	105,611	203	121,576	243	145,523	269	161,488	296	177,453	429	257,277	575	345,083	708	424,907
	Cement Stabilized Sand Backfill	CY	25	615	15,370	667	16,667	770	19,259	926	23,148	1,030	25,741	1,133	28,333	1,652	41,296	2,222	55,556	2,741	68,519
	Backfill - excavated material	CY	10	4,461	44,608	4,675	46,746	5,102	51,023	5,744	57,438	6,171	61,715	6,599	65,991	8,738	87,375	11,090	110,897	13,228	132,281
	Haul off spoils	CY	6	1,444	8,667	2,222	13,333	3,778	22,667	6,111	36,667	7,667	46,000	9,222	55,333	17,000	102,000	25,556	153,333	33,333	200,000
	Concrete Channel Lining - 10 LF each end	SY	50	178	8,889	204	10,222	293	14,667	404	20,222	493	24,667	604	30,222	1,049	52,444	1,527	76,333	1,993	99,667
	Riprap - 10 LF each end	SY	50	178	8,889	204	10,222	293	14,667	404	20,222	493	24,667	604	30,222	1,049	52,444	1,527	76,333	1,993	99,667
	CN RR Relocation - 2,000 LF																				
	Clearing & Grubbing	AC	2,200	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600
	Embankment	LF	20	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000
	Ballast	LF	35	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000
	Railroad Track Work	LF	200	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000
	Turnout	EA	150,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000
	Remove temporary embankment & ballast	LF	15	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000
	Remove temporary rail	LF	15	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000
	Remove Turnout	EA	6,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000
	Seeding	AC	3,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000
	CN RR Reconstruction - 200 LF																				
	Embankment	LF	20	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000
	Ballast	LF	35	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000
	Railroad Track Work	LF	200	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000
	Seeding	AC	3,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000
	LA 3125 Crossing																				

Table L-1-5
Romeville Deep Earthen Transmission Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	(12' x 10' CIP Box Culverts - 300 LF)																				
	Excavation	CY	6	9,151	54,903	11,044	66,263	14,830	88,981	20,510	123,059	24,296	145,777	28,083	168,496	47,015	282,088	67,840	407,040	86,772	520,632
	Culvert floor - CIP	CY	300	171	51,157	328	98,403	643	192,894	1,115	334,630	1,430	429,120	1,745	523,611	3,320	996,065	5,053	1,515,764	6,627	1,988,218
	Culvert walls - CIP	CY	600	241	144,444	361	216,667	602	361,111	963	577,778	1,204	722,222	1,444	866,667	2,648	1,588,889	3,972	2,383,333	5,176	3,105,556
	Culvert roof - CIP	CY	750	171	127,894	328	246,007	643	482,234	1,115	836,574	1,430	1,072,801	1,745	1,309,028	3,320	2,490,162	5,053	3,789,410	6,627	4,970,544
	Headwalls				0		0		0		0		0		0		0		0		
	Footing	CY	300	180	54,047	209	62,769	267	80,213	355	106,380	413	123,824	471	141,269	762	228,491	1,081	324,436	1,372	411,658
	Wall	CY	600	92	54,929	96	57,344	104	62,172	116	69,415	124	74,244	132	79,073	172	103,216	216	129,774	257	153,917
	Cement Stabilized Sand Backfill	CY	25	1,620	40,509	1,766	44,144	2,056	51,412	2,493	62,315	2,783	69,583	3,074	76,852	4,528	113,194	6,127	153,171	7,581	189,514
	Backfill - excavated material	CY	10	5,615	56,151	5,594	55,942	5,553	55,526	5,490	54,901	5,448	54,484	5,407	54,067	5,198	51,984	4,969	49,692	4,761	47,608
	Haul off spoils	CY	6	3,535	21,213	5,450	32,697	9,278	55,666	15,020	90,119	18,848	113,087	22,676	136,056	41,816	250,898	62,871	377,225	82,011	492,068
	Concrete Channel Lining - 10 LF each end	SY	50	178	8,889	204	10,222	293	14,667	404	20,222	493	24,667	604	30,222	1,049	52,444	1,527	76,333	1,993	99,667
	Riprap - 10 LF each end	SY	50	178	8,889	204	10,222	293	14,667	404	20,222	493	24,667	604	30,222	1,049	52,444	1,527	76,333	1,993	99,667
	LA 3125 Detour - 2 Lanes - 1,000 feet																				
	Clearing & Grubbing	AC	2,200	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600
	Excavation & Grading	CY	10	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000
	Fill	CY	10	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000
	Lime Stabilization 12" Deep, 5% Lime	SY	6	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000
	Stone Base	CY	15	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050
	Bituminous Base Course 4"	SY	12	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400
	Bituminous Binder Course 3"	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	Bituminous Top Course 1"	SY	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gravel shoulders	CY	10	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	LA 3125 Reconstruction - 2 Lanes - 300 feet																				
	Excavation & Grading	CY	10	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890
	Fill	CY	10	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010
	Lime Stabilization 12" Deep, 5% Lime	SY	6	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802
	Stone Base	CY	15	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890
	Bituminous Base Course 4"	SY	12	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600
	Bituminous Binder Course 3"	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Bituminous Top Course 1"	SY	3	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400
	Gravel shoulders	CY	10	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000
	Pavement Demolition																				
	LA 3125 Detour Pavement - 1,000 LF	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	LA 3125 Pavement at Box Culvert - 300 LF	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Haul Demo'ed Pavement	CY	13	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	Dewatering and Water Management																				
	Earthen Canal																				
	Dewatering	LF	50	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000
	CN RR Crossing																				

Table L-1-5
Romeville Deep Earthen Transmission Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Dewatering	LF	50	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000
	LA 3125																				
	Dewatering	LF	50	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000
	Utility Construction																				
	Dewatering	LF	25	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500
					0		0		0		0		0		0		0		0		0
	Subtotal - Direct Costs				7,241,518		8,401,351		11,575,895		15,773,920		18,948,464		22,686,801		38,559,525		55,722,877		72,159,393
	O/H and Profit Markup		30%		2,172,455		2,520,405		3,472,769		4,732,176		5,684,539		6,806,040		11,567,857		16,716,863		21,647,818
	Subtotal				9,413,973		10,921,756		15,048,664		20,506,095		24,633,003		29,492,842		50,127,382		72,439,740		93,807,210
	Contingency		10%		941,397		1,092,176		1,504,866		2,050,610		2,463,300		2,949,284		5,012,738		7,243,974		9,380,721
	Total Cost				**10,355,370**		**12,013,931**		**16,553,530**		**22,556,705**		**27,096,304**		**32,442,126**		**55,140,120**		**79,683,714**		**103,187,931**

Table L-1-6
Romeville Concrete-lined Transmission Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Mobilization	LS	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
	Concrete-Lined Channel																				
	Clearing & Grubbing	AC	2,200	57	125,400	60	132,000	67	147,400	77	169,400	84	184,800	94	206,800	137	301,400	181	398,200	225	495,000
	Strip Topsoil - 6''	CY	2	45,963	91,926	48,667	97,334	54,074	108,148	62,185	124,370	67,593	135,186	75,704	151,408	110,852	221,704	146,000	292,000	181,148	362,296
	Excavation	CY	4	152,215	608,860	194,558	778,232	304,649	1,218,596	414,741	1,658,964	524,832	2,099,328	634,923	2,539,692	1,185,380	4,741,520	1,740,071	6,960,284	2,290,528	9,162,112
	Fill (embankment)	CY	6	113,000	678,000	113,000	678,000	113,000	678,000	113,000	678,000	113,000	678,000	113,000	678,000	113,000	678,000	113,000	678,000	113,000	678,000
	Import fill material	CY	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Haul off spoils	CY	6	39,295	235,770	81,638	489,828	191,729	1,150,374	301,821	1,810,926	411,912	2,471,472	522,000	3,132,000	1,072,460	6,434,760	1,627,151	9,762,906	2,177,607	13,065,642
	Place topsoil	CY	2	45,963	91,926	48,667	97,334	54,074	108,148	62,185	124,370	67,593	135,186	75,704	151,408	110,852	221,704	146,000	292,000	181,148	362,296
	Seeding/Establish Turf	AC	3,000	54	162,000	54	162,000	54	162,000	54	162,000	52	156,000	53	159,000	53	159,000	53	159,000	53	159,000
	Drainage ditch at ROW	LF	10	30,050	300,500	30,100	301,000	30,200	302,000	30,350	303,500	30,450	304,500	30,600	306,000	31,250	312,500	31,900	319,000	32,550	325,500
	Drainage outfall pipes - 24" RCP	LF	50	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000
	Fence - 4-strand Barbed Wire	LF	15	30,050	450,750	30,100	451,500	30,200	453,000	30,350	455,250	30,450	456,750	30,600	459,000	31,250	468,750	31,900	478,500	32,550	488,250
	Concrete channel lining	SY	50	146,404	7,320,200	162,626	8,131,300	204,804	10,240,200	246,982	12,349,100	289,160	14,458,000	331,337	16,566,850	542,226	27,111,300	754,737	37,736,850	965,626	48,281,300
	Riprap - 18" - 50 LF	SY	50	450	22,500	630	31,500	960	48,000	1,300	65,000	1,600	80,000	1,930	96,500	3,460	173,000	5,100	255,000	6,700	335,000
	Canadian National RR Crossing																				
	(12' x 8' CIP Box Culverts - 100 LF)																				
	Excavation	CY	6	5,270	31,620	6,100	36,600	8,610	51,660	11,110	66,660	13,620	81,720	16,120	96,720	28,640	171,840	41,160	246,960	53,690	322,140
	Culvert floor - CIP	CY	300	230	69,000	330	99,000	640	192,000	950	285,000	1,260	378,000	1,570	471,000	3,130	939,000	4,685	1,405,500	6,240	1,872,000
	Culvert walls - CIP	CY	600	180	108,000	240	144,000	420	252,000	595	357,000	770	462,000	950	570,000	1,840	1,104,000	2,730	1,638,000	3,615	2,169,000
	Culvert roof - CIP	CY	750	230	172,500	330	247,500	640	480,000	950	712,500	1,260	945,000	1,570	1,177,500	3,130	2,347,500	4,685	3,513,750	6,240	4,680,000
	Headwalls																				
	Footing	CY	300	220	66,000	250	75,000	345	103,500	440	132,000	530	159,000	625	187,500	1,090	327,000	1,560	468,000	2,025	607,500
	Wall	CY	600	125	75,000	140	84,000	170	102,000	210	126,000	240	144,000	275	165,000	440	264,000	610	366,000	780	468,000
	Cement Stabilized Sand Backfill	CY	25	595	14,875	645	16,125	800	20,000	960	24,000	1,120	28,000	1,270	31,750	2,045	51,125	2,820	70,500	3,600	90,000
	Backfill - excavated material	CY	10	3,340	33,400	3,500	35,000	3,985	39,850	4,465	44,650	4,950	49,500	5,430	54,300	7,840	78,400	10,250	102,500	12,670	126,700
	Haul off spoils	CY	6	1,930	11,580	2,600	15,600	4,625	27,750	6,645	39,870	8,670	52,020	10,690	64,140	20,800	124,800	30,910	185,460	41,020	246,120
	CN RR Relocation - 2,000 LF																				
	Clearing & Grubbing	AC	2,200	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600
	Embankment	LF	20	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000
	Ballast	LF	35	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000
	Railroad Track Work	LF	200	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000
	Turnout	EA	150,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000
	Remove temporary embankment & ballast	LF	15	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000
	Remove temporary rail	LF	15	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000
	Remove Turnout	EA	6,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000
	Seeding	AC	3,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000
	CN RR Reconstruction - 200 LF																				
	Embankment	LF	20	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000
	Ballast	LF	35	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000
	Railroad Track Work	LF	200	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000
	Seeding	AC	3,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000
	LA 3125 Crossing																				
	(12' x 8' CIP Box Culverts - 300 LF)																				
	Excavation	CY	6	8,400	50,400	9,975	59,850	14,700	88,200	19,400	116,400	24,200	145,200	28,900	173,400	52,500	315,000	76,200	457,200	99,800	598,800
	Culvert floor - CIP	CY	300	330	99,000	485	145,500	960	288,000	1,430	429,000	1,910	573,000	2,375	712,500	4,740	1,422,000	7,100	2,130,000	9,465	2,839,500
	Culvert walls - CIP	CY	600	290	174,000	385	231,000	675	405,000	965	579,000	1,255	753,000	1,545	927,000	2,985	1,791,000	4,430	2,658,000	5,875	3,525,000

Table L-1-6
Romeville Concrete-lined Transmission Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Culvert roof - CIP	CY	750	330	247,500	485	363,750	960	720,000	1,430	1,072,500	1,910	1,432,500	2,375	1,781,250	4,740	3,555,000	7,100	5,325,000	9,465	7,098,750
	Headwalls																				
	Footing	CY	300	185	55,500	210	63,000	300	90,000	385	115,500	475	142,500	560	168,000	995	298,500	1,435	430,500	1,870	561,000
	Wall	CY	600	65	39,000	70	42,000	80	48,000	90	54,000	100	60,000	115	69,000	165	99,000	220	132,000	270	162,000
	Cement Stabilized Sand Backfill	CY	25	1,545	38,625	1,690	42,250	2,125	53,125	2,565	64,125	3,000	75,000	3,440	86,000	5,620	140,500	7,795	194,875	9,975	249,375
	Backfill - excavated material	CY	10	3,775	37,750	3,730	37,300	3,580	35,800	3,435	34,350	3,290	32,900	3,145	31,450	2,420	24,200	1,690	16,900	970	9,700
	Haul off spoils	CY	6	4,625	27,750	6,245	37,470	11,120	66,720	15,965	95,790	20,910	125,460	25,755	154,530	50,080	300,480	74,510	447,060	98,830	592,980
	LA 3125 Detour - 2 Lanes - 1,000 feet																				
	Clearing & Grubbing	AC	2,200	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600
	Excavation & Grading	CY	10	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000
	Fill	CY	10	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000
	Lime Stabilization 12" Deep, 5% Lime	SY	6	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000
	Stone Base	CY	15	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050
	Bituminous Base Course 4"	SY	12	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400
	Bituminous Binder Course 3"	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	Bituminous Top Course 1"	SY	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gravel shoulders	CY	10	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	LA 3125 Reconstruction - 2 Lanes - 300 feet																				
	Excavation & Grading	CY	10	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890
	Fill	CY	10	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010
	Lime Stabilization 12" Deep, 5% Lime	SY	6	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802
	Stone Base	CY	15	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890
	Bituminous Base Course 4"	SY	12	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600
	Bituminous Binder Course 3"	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Bituminous Top Course 1"	SY	3	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400
	Gravel shoulders	CY	10	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000
	Pavement Demolition																				
	LA 3125 Detour Pavement - 1,000 LF	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	LA 3125 Pavement at Box Culvert - 300 LF	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Haul Demo'ed Pavement	CY	13	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	Dewatering and Water Management																				
	Earthen Canal																				
	Dewatering	LF	50	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000
	CN RR Crossing																				
	Dewatering	LF	50	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000
	LA 3125																				
	Dewatering	LF	50	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000
	Utility Construction																				
	Dewatering	LF	25	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500
					0		0		0		0		0		0		0		0		0

Table L-1-6
Romeville Concrete-lined Transmission Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Subtotal - Direct Costs				13,668,024		15,353,665		19,908,163		24,477,917		29,026,714		33,596,390		56,405,675		79,348,637		102,161,653
	O/H and Profit Markup		30%		4,100,407		4,606,100		5,972,449		7,343,375		8,708,014		10,078,917		16,921,703		23,804,591		30,648,496
	Subtotal				17,768,431		19,959,765		25,880,612		31,821,292		37,734,728		43,675,307		73,327,378		103,153,228		132,810,149
	Contingency		10%		1,776,843		1,995,976		2,588,061		3,182,129		3,773,473		4,367,531		7,332,738		10,315,323		13,281,015
	Total Cost				**19,545,274**		**21,955,741**		**28,468,673**		**35,003,421**		**41,508,201**		**48,042,838**		**80,660,115**		**113,468,551**		**146,091,164**

Table L-1-7
Romeville Batture Crossing - Siphon Pipe (500 cfs)
Construction Cost Estimate

Item No.	Description	Unit	500 cfs Qty	Unit Price	Cost, $
	Mobilization	LS	1	100,000	100,000
	Coffer Dam - Mississippi River (Temporary)				
	Steel Sheet Pile - PZ-35	SF	12,100	62	750,200
	Riprap at Miss. Rvr. (54" deep)	SY	1,500	100	150,000
	Riprap at Siphon Inlet - (18" deep)	SY	580	50	29,000
	Concrete Channel Lining at Siphon Inlet	SY	390	50	19,500
	Siphon Piping - (3) 60" Dia. - 445 LF				
	A53 CW Standard Pipe PE, 60"	LF	1,335	350	467,250
	Inlet screens, 60"	SF	60	100	6,000
	Excavate Pipe Trench	CY	3,967	4	15,868
	Cement Stabilized Sand - Pipe Zone	CY	1,628	25	40,700
	Bank Sand Bedding - Pipe Zone	CY	0	15	0
	Native Backfill	CY	0	10	0
	Haul Trench Spoils	CY	1,673	6	10,038
	Dewatering				
	Siphon Pipe	LF	305	50	15,250
	Subtotal - Direct Costs				1,603,806
	O/H and Profit Markup			30%	481,142
	Subtotal				2,084,948
	Contingency			15%	312,742
	Total Cost				**2,397,690**

Table L-1-7
Romeville Batture Crossing - Siphon Pipe (1,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	1,000 cfs Qty	Unit Price	Cost, $
	Mobilization	LS	1	100,000	100,000
	Coffer Dam - Mississippi River (Temporary)				
	Steel Sheet Pile - PZ-35	SF	12,800	62	793,600
	Riprap at Miss. Rvr. (54" deep)	SY	1,800	100	180,000
	Riprap at Siphon Inlet - (18" deep)	SY	600	50	30,000
	Concrete Channel Lining at Siphon Inlet	SY	400	50	20,000
	Siphon Piping - (4) 72" Dia. - 445 LF				
	A53 CW Standard Pipe PE, 72"	LF	1,780	445	792,100
	Inlet screens, 72"	SF	115	100	11,500
	Excavate Pipe Trench	CY	6,524	4	26,096
	Cement Stabilized Sand - Pipe Zone	CY	2,879	25	71,975
	Bank Sand Bedding - Pipe Zone	CY	0	15	0
	Native Backfill	CY	0	10	0
	Haul Trench Spoils	CY	2,367	6	14,202
	Dewatering				
	Siphon Pipe	LF	305	50	15,250
	Subtotal - Direct Costs				2,054,723
	O/H and Profit Markup			30%	616,417
	Subtotal				2,671,140
	Contingency			15%	400,671
	Total Cost				**3,071,811**

Table L-1-7
Romeville Batture Crossing - Siphon Pipe (2,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	2,000 cfs Qty	Unit Price	Cost, $
	Mobilization	LS	1	100,000	100,000
	Coffer Dam - Mississippi River (Temporary)				
	Steel Sheet Pile - PZ-35	SF	14,200	62	880,400
	Riprap at Miss. Rvr. (54" deep)	SY	2,500	100	250,000
	Riprap at Siphon Inlet - (18" deep)	SY	640	50	32,000
	Concrete Channel Lining at Siphon Inlet	SY	430	50	21,500
	Siphon Piping - (7) 72" Dia. - 445 LF				
	A53 CW Standard Pipe PE, 72"	LF	3,115	445	1,386,175
	Inlet screens, 72"	SF	200	100	20,000
	Excavate Pipe Trench	CY	11,247	4	44,988
	Cement Stabilized Sand - Pipe Zone	CY	5,175	25	129,375
	Bank Sand Bedding - Pipe Zone	CY	0	15	0
	Native Backfill	CY	0	10	0
	Haul Trench Spoils	CY	3,837	6	23,022
	Dewatering				
	Siphon Pipe	LF	305	50	15,250
	Subtotal - Direct Costs				2,902,710
	O/H and Profit Markup			30%	870,813
	Subtotal				3,773,523
	Contingency			15%	566,028
	Total Cost				**4,339,551**

Table L-1-7
Romeville Batture Crossing - Siphon Pipe (3,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	3,000 cfs Qty	Unit Price	Cost, $
	Mobilization	LS	1	100,000	100,000
	Coffer Dam - Mississippi River (Temporary)				
	Steel Sheet Pile - PZ-35	SF	15,300	62	948,600
	Riprap at Miss. Rvr. (54" deep)	SY	3,000	100	300,000
	Riprap at Siphon Inlet - (18" deep)	SY	660	50	33,000
	Concrete Channel Lining at Siphon Inlet	SY	440	50	22,000
	Siphon Piping - (8) 84" Dia. - 445 LF				
	A53 CW Standard Pipe PE, 84"	LF	3,560	575	2,047,000
	Inlet screens, 84"	SF	310	100	31,000
	Excavate Pipe Trench	CY	16,020	4	64,080
	Cement Stabilized Sand - Pipe Zone	CY	7,604	25	190,100
	Bank Sand Bedding - Pipe Zone	CY	0	15	0
	Native Backfill	CY	0	10	0
	Haul Trench Spoils	CY	4,939	6	29,634
	Dewatering				
	Siphon Pipe	LF	305	50	15,250
	Subtotal - Direct Costs				3,780,664
	O/H and Profit Markup			30%	1,134,199
	Subtotal				4,914,863
	Contingency			15%	737,229
	Total Cost				**5,652,093**

Table L-1-7
Romeville Batture Crossing - Siphon Pipe (4,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	4,000 cfs Qty	Unit Price	Cost, $
	Mobilization	LS	1	100,000	100,000
	Coffer Dam - Mississippi River (Temporary)				
	Steel Sheet Pile - PZ-35	SF	16,400	62	1,016,800
	Riprap at Miss. Rvr. (54" deep)	SY	3,500	100	350,000
	Riprap at Siphon Inlet - (18" deep)	SY	670	50	33,500
	Concrete Channel Lining at Siphon Inlet	SY	450	50	22,500
	Siphon Piping - (10) 84" Dia. - 445 LF				
	A53 CW Standard Pipe PE, 84"	LF	4,450	575	2,558,750
	Inlet screens, 84"	SF	390	100	39,000
	Excavate Pipe Trench	CY	20,010	4	80,040
	Cement Stabilized Sand - Pipe Zone	CY	9,581	25	239,525
	Bank Sand Bedding - Pipe Zone	CY	0	15	0
	Native Backfill	CY	0	10	0
	Haul Trench Spoils	CY	6,081	6	36,486
	Dewatering				
	Siphon Pipe	LF	305	50	15,250
	Subtotal - Direct Costs				4,491,851
	O/H and Profit Markup			30%	1,347,555
	Subtotal				5,839,406
	Contingency			15%	875,911
	Total Cost				**6,715,317**

Table L-1-7
Romeville Batture Crossing - Siphon Pipe (5,000 cfs)
Construction Cost Estimate

Item No.	Description	Unit	5,000 cfs Qty	Unit Price	Cost, $
	Mobilization	LS	1	100,000	100,000
	Coffer Dam - Mississippi River (Temporary)				
	Steel Sheet Pile - PZ-35	SF	17,200	62	1,066,400
	Riprap at Miss. Rvr. (54" deep)	SY	3,900	100	390,000
	Riprap at Siphon Inlet - (18" deep)	SY	710	50	35,500
	Concrete Channel Lining at Siphon Inlet	SY	480	50	24,000
	Siphon Piping - (10) 96" Dia. - 445 LF				
	A53 CW Standard Pipe PE, 96"	LF	4,450	690	3,070,500
	Inlet screens, 96"	SF	510	100	51,000
	Excavate Pipe Trench	CY	24,479	4	97,916
	Cement Stabilized Sand - Pipe Zone	CY	11,944	25	298,600
	Bank Sand Bedding - Pipe Zone	CY	0	15	0
	Native Backfill	CY	0	10	0
	Haul Trench Spoils	CY	6,857	6	41,142
	Dewatering				
	Siphon Pipe	LF	305	50	15,250
	Subtotal - Direct Costs				5,190,308
	O/H and Profit Markup			30%	1,557,092
	Subtotal				6,747,400
	Contingency			15%	1,012,110
	Total Cost				**7,759,510**

Table L-1-8

Romeville Batture Crossing - Inlet Canal

Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Mobilization	LS	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
	Coffer Dam - Mississippi River																				
	Steel Sheet Pile - PZ-35	SF	62	17,000	1,054,000	17,200	1,066,400	17,600	1,091,200	17,800	1,103,600	18,000	1,116,000	18,500	1,147,000	20,300	1,258,600	20,900	1,295,800	22,800	1,413,600
	Inlet Canal																				
	Excavation	CY	4	60,000	240,000	61,400	245,600	63,700	254,800	65,100	260,400	65,800	263,200	68,900	275,600	79,700	318,800	83,000	332,000	94,300	377,200
	Haul off excess spoils	CY	6	60,000	360,000	61,400	368,400	63,700	382,200	65,100	390,600	65,800	394,800	68,900	413,400	79,700	478,200	83,000	498,000	94,300	565,800
	Riprap at Miss. Rvr. (54" deep)	SY	100	5,200	520,000	5,350	535,000	5,590	559,000	5,740	574,000	5,810	581,000	6,130	613,000	7,260	726,000	7,600	760,000	8,800	880,000
	Riprap at Culvert Inlet - (18" deep)	SY	50	580	29,000	600	30,000	640	32,000	660	33,000	670	33,500	710	35,500	860	43,000	910	45,500	1,070	53,500
	Concrete Channel Lining at Culvert	SY	50	390	19,500	400	20,000	430	21,500	440	22,000	450	22,500	480	24,000	580	29,000	610	30,500	720	36,000
	Dewatering																				
	Inlet Canal	LF	50	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000
					0		0		0		0		0		0		0		0		0
	Subtotal - Direct Costs				2,342,500		2,385,400		2,460,700		2,503,600		2,531,000		2,628,500		2,973,600		3,081,800		3,446,100
	O/H and Profit Markup		30%		702,750		715,620		738,210		751,080		759,300		788,550		892,080		924,540		1,033,830
	Subtotal				3,045,250		3,101,020		3,198,910		3,254,680		3,290,300		3,417,050		3,865,680		4,006,340		4,479,930
	Contingency		15%		456,788		465,153		479,837		488,202		493,545		512,558		579,852		600,951		671,990
	Total Cost				**3,502,038**		**3,566,173**		**3,678,747**		**3,742,882**		**3,783,845**		**3,929,608**		**4,445,532**		**4,607,291**		**5,151,920**

Table L-1-9
South Bridge Diversion Culvert
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Mobilization	LS	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
	Temporary Miss. Rvr. Levee Relocation																				
	Import Fill (use inlet canal excavation)	CY	15	16,700	250,500	15,460	231,900	14,770	221,550	12,570	188,550	12,600	189,000	11,100	166,500	4,000	60,000	0	0	0	0
	Place Fill (use inlet canal material)	CY	6	44,400	266,400	44,400	266,400	44,400	266,400	44,400	266,400	44,400	266,400	44,400	266,400	44,400	266,400	44,400	266,400	44,400	266,400
	Excavate/remove temporary levee	CY	4	44,400	177,600	44,400	177,600	44,400	177,600	44,400	177,600	44,400	177,600	44,400	177,600	44,400	177,600	44,400	177,600	44,400	177,600
	Haul off excess spoils	CY	6	44,400	266,400	44,400	266,400	44,400	266,400	44,400	266,400	44,400	266,400	44,400	266,400	44,400	266,400	44,400	266,400	44,400	266,400
	Permanent Levee removal and replacement																				
	Remove existing concrete slope paving																				
	Demolition	SY	9	585	5,265	655	5,895	810	7,290	880	7,920	960	8,640	1,040	9,360	1,420	12,780	1,860	16,740	2,210	19,890
	Disposal	CY	13	130	1,690	145	1,885	180	2,340	200	2,600	215	2,795	230	2,990	315	4,095	415	5,395	490	6,370
	Excavate existing levee (stockpile on site)	CY	4	29,000	116,000	30,800	123,200	29,400	117,600	33,100	132,400	31,100	124,400	32,900	131,600	41,300	165,200	50,900	203,600	58,700	234,800
	Fill existing levee	CY	6	29,000	174,000	30,800	184,800	29,400	176,400	33,100	198,600	31,100	186,600	32,900	197,400	41,300	247,800	50,900	305,400	58,700	352,200
	Replace concrete slope paving - 8"	SY	75	585	43,875	655	49,125	810	60,750	880	66,000	960	72,000	1,040	78,000	1,420	106,500	1,860	139,500	2,210	165,750
	Coffer Dam - Mississippi River																				
	Steel Sheet Pile - PZ-35	SF	62	16,600	1,029,200	17,000	1,054,000	17,200	1,066,400	18,000	1,116,000	18,000	1,116,000	18,500	1,147,000	21,000	1,302,000	23,800	1,475,600	26,000	1,612,000
	Inlet Canal																				
	Excavation	CY	4	27,700	110,800	28,940	115,760	29,630	118,520	31,830	127,320	31,800	127,200	33,300	133,200	40,400	161,600	48,500	194,000	55,000	220,000
	Haul off excess spoils	CY	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,100	24,600	10,600	63,600
	Riprap at Miss. Rvr. (54" deep)	SY	100	4,950	495,000	5,225	522,500	5,370	537,000	5,835	583,500	5,830	583,000	6,150	615,000	7,650	765,000	9,350	935,000	10,720	1,072,000
	Bollards/Dolphins in Miss. Rvr. (Groups of 3 pipes)																				
	5 groups - 12" Dia. Steel Pipe, 70' long	EA	8,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500	15	127,500
	Riprap at Culvert Inlet - (18" deep)	SY	50	550	27,500	585	29,250	605	30,250	670	33,500	670	33,500	710	35,500	910	45,500	1,150	57,500	1,330	66,500
	Concrete Channel Lining at Culvert	SY	50	365	18,250	390	19,500	405	20,250	445	22,250	445	22,250	475	23,750	610	30,500	765	38,250	890	44,500
	Diversion Culvert - CIP Boxes																				
	Excavation	CY	4	19,000	76,000	21,400	85,600	25,500	102,000	29,000	116,000	31,300	125,200	34,600	138,400	49,700	198,800	67,100	268,400	81,100	324,400
	Haul off excess spoils	CY	6	4,000	24,000	5,600	33,600	8,100	48,600	10,800	64,800	12,400	74,400	15,000	90,000	26,800	160,800	40,400	242,400	51,400	308,400
	Cement Stabilized Sand Backfill	CY	25	1,660	41,500	1,800	45,000	2,270	56,750	2,390	59,750	2,640	66,000	2,810	70,250	3,600	90,000	4,510	112,750	5,240	131,000
	Backfill	CY	10	15,000	150,000	15,800	158,000	17,400	174,000	18,200	182,000	18,900	189,000	19,600	196,000	22,900	229,000	26,700	267,000	29,700	297,000
	14" Concrete Piling	VLF	45	10,500	472,500	16,920	761,400	20,420	918,900	31,500	1,417,500	31,500	1,417,500	39,100	1,759,500	74,700	3,361,500	115,500	5,197,500	148,200	6,669,000
	Concrete Culvert - CIP																				
	Floor slab	CY	300	470	141,000	755	226,500	910	273,000	1,400	420,000	1,400	420,000	1,740	522,000	3,320	996,000	5,130	1,539,000	6,590	1,977,000
	Walls	CY	600	470	282,000	625	375,000	935	561,000	1,040	624,000	1,300	780,000	1,560	936,000	2,590	1,554,000	3,890	2,334,000	4,930	2,958,000
	Roof slab	CY	750	470	352,500	755	566,250	910	682,500	1,400	1,050,000	1,400	1,050,000	1,740	1,305,000	3,320	2,490,000	5,130	3,847,500	6,590	4,942,500
	Headwalls - 2																				
	Footing	CY	300	250	75,000	280	84,000	310	93,000	345	103,500	360	108,000	390	117,000	520	156,000	680	204,000	800	240,000
	Headwalls	CY	600	310	186,000	335	201,000	345	207,000	380	228,000	380	228,000	400	240,000	510	306,000	640	384,000	740	444,000
	Gate Tower - CIP																				
	Walls	CY	600	220	132,000	295	177,000	305	183,000	435	261,000	400	240,000	480	288,000	850	510,000	1,270	762,000	1,600	960,000
	Grating - Steel - Heavy Duty	SF	75	240	18,000	420	31,500	540	40,500	880	66,000	880	66,000	1,100	82,500	2,160	162,000	3,360	252,000	4,320	324,000
	Sluice gates with motor operators																				
	500 cfs (2 - 6 x 6 Boxes)	EA	70,000	2	140,000																
	1,000 cfs (3 - 7 x 6 Boxes)	EA	81,000			3	243,000														

Table L-1-9
South Bridge Diversion Culvert
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	2,000 cfs (3 - 9 x 9 Boxes)	EA	141,000					3	423,000												
	3,000 cfs (4 - 11 x 8 Boxes)	EA	150,000							4	600,000										
	4,000 cfs (4 - 11 x 10 Boxes)	EA	177,000									4	708,000								
	5,000 cfs (5 - 11 x 10 Boxes)	EA	177,000											5	885,000						
	10,000 cfs (9 - 12 x 10 Boxes)	EA	187,000													9	1,683,000				
	15,000 cfs (14 - 12 x 10 Boxes)	EA	187,000															14	2,618,000		
	20,000 cfs (18 - 12 x 10 Boxes)	EA	187,000																	18	3,366,000
	Stop Logs - 2 sets																				
	500 cfs (2 - 6 x 6 Boxes)	EA	17,000	4	68,000																
	1,000 cfs (3 - 7 x 6 Boxes)	EA	19,000			6	114,000														
	2,000 cfs (3 - 9 x 9 Boxes)	EA	27,000					6	162,000												
	3,000 cfs (4 - 11 x 8 Boxes)	EA	27,000							8	216,000										
	4,000 cfs (4 - 11 x 10 Boxes)	EA	33,000									8	264,000								
	5,000 cfs (5 - 11 x 10 Boxes)	EA	33,000											10	330,000						
	10,000 cfs (9 - 12 x 10 Boxes)	EA	35,000													18	630,000				
	15,000 cfs (14 - 12 x 10 Boxes)	EA	35,000															28	980,000		
	20,000 cfs (18 - 12 x 10 Boxes)	EA	35,000																	36	1,260,000
	Cutoff Wall - PZ-22	SF	64	6,460	413,440	6,540	418,560	6,700	428,800	6,920	442,880	7,180	459,520	7,440	476,160	8,660	554,240	10,060	643,840	11,180	715,520
	Trash Rack/Bar Screens	SF	100	100	10,000	180	18,000	340	34,000	470	47,000	620	62,000	780	78,000	1,530	153,000	2,380	238,000	3,050	305,000
	Site Work - 6 Acres																				
	Clearing & Grubbing	AC	2,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200	6	13,200
	Strip & Stockpile topsoil - 6"	CY	2	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000
	Site Drainage																				
	Drainage swales	LF	10	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000	2,000	20,000
	Drainage pipe - 18" RCP	LF	35	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000
	Fence - 6' Chain Link w/3-strand BW	LF	33	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000	3,000	99,000
	Site road excavation and grading	CY	6	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000	2,000	12,000
	Site road fill	CY	10	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000	1,000	10,000
	Site road - gravel - 12"	SY	9	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000	2,000	18,000
	Site road - asphalt driveway	SY	40	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000	250	10,000
	Site lighting	LS	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
	Place topsoil	CY	2	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000	5,000	10,000
	Seeding/turf establishment	AC	3,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000	6	18,000
	Building	LS	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000	1	30,000
	Electrical Allowance	LS	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000
	Instrumentation Allowance	LS	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000	1	50,000
	Utility relocations in LA 44 ROW																				
	Communication line	LS	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
	Communication line	LS	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
	Overhead power line	LS	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000	1	5,000
	Dewatering																				
	Culvert	LF	100	350	35,000	350	35,000	350	35,000	350	35,000	350	35,000	350	35,000	350	35,000	350	35,000	350	35,000

Table L-1-9
South Bridge Diversion Culvert
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Inlet Canal	LF	50	170	8,500	170	8,500	170	8,500	170	8,500	170	8,500	170	8,500	170	8,500	170	8,500	170	8,500
	Site - misc. items	LF	25	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000	1,000	25,000
	SWPPP	LS	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000
	LA 44 Detour - 2 lanes - 1,000 feet																				
	Clearing & Grubbing	AC	2,200	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600
	Excavation & Grading	CY	10	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000
	Structural fill	CY	14	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000	1,500	21,000
	Lime Stabilization 12" Deep, 5% Lime	SY	6	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000
	Stone Base	CY	15	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050
	Bituminous Base Course 4"	SY	12	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400
	Bituminous Binder Course 3"	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	Bituminous Top Course 1"	SY	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gravel shoulders	CY	10	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	LA 44 Pavement Demolition																				
	LA 44 Detour Pavement - 1,000 LF	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	LA 44 Pavement at Box Culvert - 300 LF	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Haul Demo'ed Pavement	CY	13	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540	580	7,540
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	LA 44 Reconstruction - 2 lanes - 300 feet																				
	Excavation & Grading	CY	10	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890
	Structural fill	CY	14	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014	501	7,014
	Lime Stabilization 12" Deep, 5% Lime	SY	6	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802
	Stone Base	CY	15	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890
	Bituminous Base Course 4"	SY	12	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600
	Bituminous Binder Course 3"	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Bituminous Top Course 1"	SY	3	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400
	Gravel shoulders	CY	10	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
					0		0		0		0		0		0		0		0		0
	Subtotal - Direct Costs				6,532,086		7,554,291		8,424,466		10,055,136		10,401,071		11,732,176		17,813,381		24,964,041		30,757,496
	O/H and Profit Markup		30%		1,959,626		2,266,287		2,527,340		3,016,541		3,120,321		3,519,653		5,344,014		7,489,212		9,227,249
	Subtotal				8,491,712		9,820,578		10,951,806		13,071,677		13,521,392		15,251,829		23,157,395		32,453,253		39,984,745
	Contingency		15%		1,273,757		1,473,087		1,642,771		1,960,752		2,028,209		2,287,774		3,473,609		4,867,988		5,997,712

Table L-1-9
South Bridge Diversion Culvert
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Total Cost				**9,765,469**		**11,293,665**		**12,594,577**		**15,032,428**		**15,549,601**		**17,539,603**		**26,631,005**		**37,321,241**		**45,982,457**

Table L-1-10
South Bridge Earthen Transmission Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Mobilization	LS	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
	Earthen Channel																				
	Clearing & Grubbing	AC	2,200	83	182,600	92	202,400	112	246,400	129	283,800	145	319,000	162	356,400	251	552,200	340	748,000	426	937,200
	Strip Topsoil - 6''	CY	2	66,500	133,000	74,500	149,000	90,500	181,000	104,000	208,000	117,000	234,000	131,000	262,000	202,000	404,000	274,000	548,000	343,000	686,000
	Excavation	CY	4	392,000	1,568,000	561,000	2,244,000	923,000	3,692,000	1,225,000	4,900,000	1,527,000	6,108,000	1,899,000	7,596,000	3,459,000	13,836,000	5,049,000	20,196,000	6,659,000	26,636,000
	Fill (embankment)	CY	6	55,400	332,400	55,400	332,400	55,400	332,400	55,400	332,400	55,400	332,400	55,400	332,400	55,400	332,400	55,400	332,400	55,400	332,400
	Import fill material	CY	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Haul off spoils	CY	6	336,600	2,019,600	505,600	3,033,600	867,600	5,205,600	1,169,600	7,017,600	1,471,600	8,829,600	1,843,600	11,061,600	3,403,600	20,421,600	4,993,600	29,961,600	6,603,600	39,621,600
	Place topsoil	CY	2	66,500	133,000	74,500	149,000	90,500	181,000	104,000	208,000	117,000	234,000	131,000	262,000	202,000	404,000	274,000	548,000	343,000	686,000
	Seeding/Establish Turf	AC	3,000	79	237,000	79	237,000	79	237,000	79	237,000	79	237,000	79	237,000	79	237,000	81	243,000	79	237,000
	Drainage ditch at ROW	LF	10	30,050	300,500	30,200	302,000	30,500	305,000	30,800	308,000	31,000	310,000	31,300	313,000	32,600	326,000	34,000	340,000	35,300	353,000
	Drainage outfall pipes - 24" RCP	LF	50	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000	300	15,000
	Fence - 4-strand Barbed Wire	LF	15	30,050	450,750	30,200	453,000	30,500	457,500	30,800	462,000	31,000	465,000	31,300	469,500	32,600	489,000	34,000	510,000	35,300	529,500
	Stilling Basin at Culvert/Siphon Outfall																				
	Concrete channel lining - 100 LF	SY	50	1,200	60,000	1,520	76,000	2,180	109,000	2,740	137,000	3,290	164,500	3,850	192,500	6,850	342,500	9,790	489,500	12,740	637,000
	Riprap - 18" - 50 LF	SY	50	600	30,000	760	38,000	1,090	54,500	1,370	68,500	1,650	82,500	1,930	96,500	3,430	171,500	4,900	245,000	6,370	318,500
	Canadian National RR Crossing																				
	(12' x 8' CIP Box Culverts - 100 LF)																				
	Excavation	CY	6	7,000	42,000	8,000	48,000	11,000	66,000	14,000	84,000	17,000	102,000	20,000	120,000	35,000	210,000	50,000	300,000	65,000	390,000
	Culvert floor - CIP	CY	300	250	75,000	330	99,000	640	192,000	950	285,000	1,260	378,000	1,570	471,000	3,130	939,000	4,685	1,405,500	6,240	1,872,000
	Culvert walls - CIP	CY	600	180	108,000	240	144,000	420	252,000	595	357,000	770	462,000	950	570,000	1,840	1,104,000	2,730	1,638,000	3,615	2,169,000
	Culvert roof - CIP	CY	750	250	187,500	330	247,500	640	480,000	950	712,500	1,260	945,000	1,570	1,177,500	3,130	2,347,500	4,685	3,513,750	6,240	4,680,000
	Headwalls																				
	Footing	CY	300	240	72,000	275	82,500	365	109,500	460	138,000	555	166,500	645	193,500	1,120	336,000	1,580	474,000	2,045	613,500
	Wall	CY	600	175	105,000	190	114,000	240	144,000	290	174,000	340	204,000	390	234,000	630	378,000	880	528,000	1,120	672,000
	Cement Stabilized Sand Backfill	CY	25	595	14,875	645	16,125	800	20,000	960	24,000	1,120	28,000	1,270	31,750	2,045	51,125	2,820	70,500	3,600	90,000
	Backfill - excavated material	CY	10	5,100	51,000	5,400	54,000	6,400	64,000	7,400	74,000	8,400	84,000	9,300	93,000	14,300	143,000	19,200	192,000	24,100	241,000
	Haul off spoils	CY	6	1,900	11,400	2,600	15,600	4,600	27,600	6,600	39,600	8,600	51,600	10,700	64,200	20,700	124,200	30,800	184,800	40,900	245,400
	Concrete Channel Lining - 10 LF each end	SY	50	240	12,000	310	15,500	440	22,000	550	27,500	660	33,000	770	38,500	1,370	68,500	1,960	98,000	2,550	127,500
	Riprap - 10 LF each end	SY	50	240	12,000	310	15,500	440	22,000	550	27,500	660	33,000	770	38,500	1,370	68,500	1,960	98,000	2,550	127,500
	CN RR Relocation - 2,000 LF																				
	Clearing & Grubbing	AC	2,200	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600
	Embankment	LF	20	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000	2,000	40,000
	Ballast	LF	35	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000	2,000	70,000
	Railroad Track Work	LF	200	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000	2,000	400,000
	Turnout	EA	150,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000	2	300,000
	Remove temporary embankment & ballast	LF	15	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000	8,600	129,000
	Remove temporary rail	LF	15	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000	2,000	30,000
	Remove Turnout	EA	6,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000	2	12,000
	Seeding	AC	3,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000
	CN RR Reconstruction - 200 LF																				
	Embankment	LF	20	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000	200	4,000
	Ballast	LF	35	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000	200	7,000
	Railroad Track Work	LF	200	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000	200	40,000
	Seeding	AC	3,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000
	LA 3125 Crossing																				

Table L-1-10
South Bridge Earthen Transmission Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	(12' x 8' CIP Box Culverts - 300 LF)																				
	Excavation	CY	6	5,820	34,920	7,040	42,240	10,700	64,200	14,400	86,400	18,000	108,000	21,700	130,200	40,000	240,000	58,200	349,200	76,500	459,000
	Culvert floor - CIP	CY	300	330	99,000	485	145,500	960	288,000	1,430	429,000	1,910	573,000	2,375	712,500	4,740	1,422,000	7,100	2,130,000	9,465	2,839,500
	Culvert walls - CIP	CY	600	290	174,000	385	231,000	675	405,000	965	579,000	1,255	753,000	1,545	927,000	2,985	1,791,000	4,430	2,658,000	5,875	3,525,000
	Culvert roof - CIP	CY	750	330	247,500	485	363,750	960	720,000	1,430	1,072,500	1,910	1,432,500	2,375	1,781,250	4,740	3,555,000	7,100	5,325,000	9,465	7,098,750
	Headwalls																				
	Footing	CY	300	165	49,500	195	58,500	285	85,500	370	111,000	460	138,000	550	165,000	980	294,000	1,420	426,000	1,860	558,000
	Wall	CY	600	44	26,400	44	26,400	44	26,400	44	26,400	44	26,400	44	26,400	44	26,400	44	26,400	44	26,400
	Cement Stabilized Sand Backfill	CY	25	1,545	38,625	1,690	42,250	2,125	53,125	2,565	64,125	3,000	75,000	3,440	86,000	5,620	140,500	7,795	194,875	9,975	249,375
	Backfill - excavated material	CY	10	1,200	12,000	800	8,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Haul off spoils	CY	6	4,620	27,720	6,240	37,440	10,700	64,200	14,400	86,400	18,000	108,000	21,700	130,200	40,000	240,000	58,200	349,200	76,500	459,000
	Concrete Channel Lining - 10 LF each end	SY	50	240	12,000	310	15,500	440	22,000	550	27,500	660	33,000	770	38,500	1,370	68,500	1,960	98,000	2,550	127,500
	Riprap - 10 LF each end	SY	50	240	12,000	310	15,500	440	22,000	550	27,500	660	33,000	770	38,500	1,370	68,500	1,960	98,000	2,550	127,500
	LA 3125 Detour - 2 Lanes - 1,000 feet																				
	Clearing & Grubbing	AC	2,200	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600	3	6,600
	Excavation & Grading	CY	10	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000	2,200	22,000
	Fill	CY	10	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000	1,500	15,000
	Lime Stabilization 12" Deep, 5% Lime	SY	6	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000	4,000	24,000
	Stone Base	CY	15	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050	670	10,050
	Bituminous Base Course 4"	SY	12	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400	2,700	32,400
	Bituminous Binder Course 3"	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	Bituminous Top Course 1"	SY	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Gravel shoulders	CY	10	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600	260	2,600
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	LA 3125 Reconstruction - 2 Lanes - 300 feet																				
	Excavation & Grading	CY	10	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890	889	8,890
	Fill	CY	10	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010	501	5,010
	Lime Stabilization 12" Deep, 5% Lime	SY	6	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802	1,467	8,802
	Stone Base	CY	15	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890	326	4,890
	Bituminous Base Course 4"	SY	12	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600	800	9,600
	Bituminous Binder Course 3"	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Bituminous Top Course 1"	SY	3	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400	800	2,400
	Gravel shoulders	CY	10	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480	148	1,480
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500	140	10,500
	Seeding/Turf Establishment	AC	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000
	Pavement Demolition																				
	LA 3125 Detour Pavement - 1,000 LF	SY	9	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300	2,700	24,300
	LA 3125 Pavement at Box Culvert - 300 LF	SY	9	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200	800	7,200
	Haul Demo'ed Pavement	CY	13	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670	590	7,670
	Seeding/Turf Establishment	AC	3,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000	3	9,000
	Dewatering and Water Management																				
	Earthen Canal																				
	Dewatering	LF	50	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000	15,000	750,000
	CN RR Crossing																				

Table L-1-10
South Bridge Earthen Transmission Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	500 cfs		1,000 cfs		2,000 cfs		3,000 cfs		4,000 cfs		5,000 cfs		10,000 cfs		15,000 cfs		20,000 cfs	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Dewatering	LF	50	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000	200	10,000
	LA 3125																				
	Dewatering	LF	50	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000	400	20,000
	Utility Construction																				
	Dewatering	LF	25	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500	500	12,500
					0		0		0		0		0		0		0		0		0
	Subtotal - Direct Costs				9,099,982		11,282,897		16,379,617		20,843,917		25,311,692		30,475,092		53,360,617		76,547,417		99,900,817
	O/H and Profit Markup		30%		2,729,995		3,384,869		4,913,885		6,253,175		7,593,508		9,142,528		16,008,185		22,964,225		29,970,245
	Subtotal				11,829,977		14,667,766		21,293,502		27,097,092		32,905,200		39,617,620		69,368,802		99,511,642		129,871,062
	Contingency		10%		1,182,998		1,466,777		2,129,350		2,709,709		3,290,520		3,961,762		6,936,880		9,951,164		12,987,106
	Total Cost				**13,012,974**		**16,134,543**		**23,422,852**		**29,806,801**		**36,195,720**		**43,579,382**		**76,305,682**		**109,462,806**		**142,858,168**

Table L-1-11
North Distribution Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	Area 200 Qty	Area 200 Cost, $	Area 200 & 300 Open Cut RR & Hwy Qty	Area 200 & 300 Open Cut RR & Hwy Cost, $	Area 200 & 300 Tunnel RR & Hwy Qty	Area 200 & 300 Tunnel RR & Hwy Cost, $
	Mobilization	LS	100,000	1	100,000	1	100,000	1	100,000
	Earthen Channel								
	Clearing & Grubbing	AC	2,200	141	310,200	241	530,200	241	530,200
	Strip Topsoil - 6''	CY	2	114,000	228,000	195,000	390,000	195,000	390,000
	Excavation	CY	4	729,000	2,916,000	1,225,000	4,900,000	1,225,000	4,900,000
	Fill (embankment)	CY	6	729,000	4,374,000	1,225,000	7,350,000	1,225,000	7,350,000
	Import fill material	CY	15	0	0	0	0	0	0
	Haul off spoils	CY	6	0	0	0	0	0	0
	Place topsoil	CY	2	114,000	228,000	195,000	390,000	195,000	390,000
	Seeding/Establish Turf	AC	3,000	94	282,000	132	396,000	132	396,000
	SWPPP	LS	25,000	1	25,000	1	25,000	1	25,000
	Cross-drainage								
	2 - 4' x 4' Box Culvert - Inverted Siphon	LF	300	1,750	525,000	2,700	810,000	2,700	810,000
	Headwalls	EA	5,000	14	70,000	18	90,000	18	90,000
	Release Structures to Swamp	LF	75	4,960	372,000	6,400	480,000	6,400	480,000
	Control gate	EA	5,000	124	620,000	160	800,000	160	800,000
	Transitions to Inverted Siphon								
	(U/S of KCS RR and D/S of Hwy 61)								
	Concrete Channel Lining	SY	50	0	0	1,600	80,000	1,600	80,000
	Riprap - 10 LF	SY	50	0	0	220	11,000	220	11,000
	Additional Erosion Protection - 2 locations								
	Concrete Channel Lining - 10 LF each end	SY	50	0	0	220	11,000	220	11,000
	Riprap - 10 LF each end	SY	50	0	0	220	11,000	220	11,000
	KCS RR Crossing - Tunneled								
	(3 - 10' x 6' Box Culverts - 100 LF)								
	3 - 10' x 6' Box Culverts - Tunneled - 50 LF	LF	4,000	0	0	0	0	150	600,000
	3 - 10' x 6' Box Culverts - Open Cut - 50 LF	LF	2,000	0	0	0	0	50	100,000
	Headwalls	EA	50,000	0	0	0	0	2	100,000
	KCS RR Crossing - Open-cut								
	(3 - 10' x 6' CIP Box Culverts - 100 LF)								
	Excavation	CY	6	0	0	9,200	55,200	0	0
	Culvert floor - CIP	CY	300	0	0	400	120,000	0	0

Table L-1-11
North Distribution Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	Area 200 Qty	Area 200 Cost, $	Area 200 & 300 Open Cut RR & Hwy Qty	Area 200 & 300 Open Cut RR & Hwy Cost, $	Area 200 & 300 Tunnel RR & Hwy Qty	Area 200 & 300 Tunnel RR & Hwy Cost, $
	Culvert walls - CIP	CY	600	0	0	296	177,600	0	0
	Culvert roof - CIP	CY	750	0	0	400	300,000	0	0
	Headwalls								
	Footing	CY	300	0	0	244	73,200	0	0
	Wall	CY	600	0	0	83	49,800	0	0
	Cement Stabilized Sand Backfill	CY	25	0	0	680	17,000	0	0
	Backfill - excavated material	CY	10	0	0	6,100	61,000	0	0
	Haul off spoils	CY	6	0	0	3,100	18,600	0	0
	KCS RR Relocation - 2,000 LF								
	Clearing & Grubbing	AC	2,200	0	0	3	6,600	0	0
	Embankment	LF	20	0	0	2,000	40,000	0	0
	Ballast	LF	35	0	0	2,000	70,000	0	0
	Railroad Track Work	LF	200	0	0	2,000	400,000	0	0
	Turnout	EA	150,000	0	0	2	300,000	0	0
	Remove temporary embankment & ballast	LF	15	0	0	8,600	129,000	0	0
	Remove temporary rail	LF	15	0	0	2,000	30,000	0	0
	Remove Turnout	EA	6,000	0	0	2	12,000	0	0
	Seeding	AC	3,000	0	0	2	6,000	0	0
	KCS RR Reconstruction - 200 LF								
	Embankment	LF	20	0	0	200	4,000	200	4,000
	Ballast	LF	35	0	0	200	7,000	200	7,000
	Railroad Track Work	LF	200	0	0	200	40,000	200	40,000
	Seeding	AC	3,000	0	0	2	6,000	2	6,000
	Hwy 61 Crossing - Tunneled Option								
	(3 - 10' x 6' Box Culverts - 200 LF)								
	3 - 10' x 6' Box Culverts - Tunneled - 100 LF	LF	4,000	0	0	0	0	300	1,200,000
	3 - 10' x 6' Box Culverts - Open Cut - 100 LF	LF	2,000	0	0	0	0	100	200,000
	Headwalls	EA	50,000	0	0	0	0	2	100,000
	Hwy 61 Crossing - Open Cut Option								
	(3 - 10' x 6' CIP Box Culverts - 200 LF)								
	Excavation	CY	6	0	0	15,100	90,600	0	0
	Culvert floor - CIP	CY	300	0	0	363	108,900	0	0
	Culvert walls - CIP	CY	600	0	0	296	177,600	0	0
	Culvert roof - CIP	CY	750	0	0	363	272,250	0	0
	Headwalls								
	Footing	CY	300	0	0	231	69,300	0	0

Table L-1-11
North Distribution Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	Area 200 Qty	Area 200 Cost, $	Area 200 & 300 Open Cut RR & Hwy Qty	Area 200 & 300 Open Cut RR & Hwy Cost, $	Area 200 & 300 Tunnel RR & Hwy Qty	Area 200 & 300 Tunnel RR & Hwy Cost, $
	Wall	CY	600	0	0	74	44,400	0	0
	Cement Stabilized Sand Backfill	CY	25	0	0	1,200	30,000	0	0
	Backfill - excavated material	CY	10	0	0	10,300	103,000	0	0
	Haul off spoils	CY	6	0	0	4,800	28,800	0	0
	Hwy 61 Detour - 2 Lanes - 500 feet								
	Detour Pavement - asphalt	SY	60	0	0	1,400	84,000	0	0
	Remove Detour	SY	9	0	0	1,400	12,600	0	0
	Dispose of demo'd material	CY	13	0	0	250	3,250	0	0
	Hwy 61 Reconstruction - 4 Lanes - 200 feet								
	Hwy 61 Pavement at Box Culvert - 200 LF	SY	9	0	0	1,800	16,200	1,800	16,200
	Haul Demo'ed Pavement	CY	13	0	0	300	3,900	300	3,900
	Excavation & Grading	CY	10	0	0	600	6,000	600	6,000
	Structural fill	CY	14	0	0	300	4,200	300	4,200
	Lime Stabilization 12" Deep, 5% Lime	SY	6	0	0	1,800	10,800	1,800	10,800
	Stone Base	CY	15	0	0	600	9,000	600	9,000
	Bituminous Base Course 4"	SY	12	0	0	1,800	21,600	1,800	21,600
	Bituminous Binder Course 3"	SY	9	0	0	1,800	16,200	1,800	16,200
	Bituminous Top Course 1"	SY	3	0	0	1,800	5,400	1,800	5,400
	Gravel shoulders	CY	10	0	0	0	0	0	0
	Painted Lines 4" Wide	LF	0.20	0	0	3,000	600	3,000	600
	Signage	LS	1,500	0	0	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	0	0	100	7,500	100	7,500
	Seeding/Turf Establishment	AC	3,000	0	0	1	3,000	1	3,000
	Utility Relocations								
	Pipe line between RR and Hwy	LS	500,000	0	0	0	0	0	0
	Communication lines - RR	EA	5,000	0	0	2	10,000	0	0
	Communication lines - Hwy	EA	5,000	0	0	2	10,000	0	0
	Dewatering and Water Management								
	Earthen Canal								
	Dewatering	LF	25	31,000	775,000	40,000	1,000,000	40,000	1,000,000
	KCS RR Crossing								
	Dewatering	LF	50	0	0	100	5,000	100	5,000
	Hwy 61								
	Dewatering	LF	50	0	0	200	10,000	200	10,000
	Utility Construction								
	Dewatering	LF	25	200	5,000	500	12,500	500	12,500

Table L-1-11
North Distribution Canal
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	Area 200 Qty	Area 200 Cost, $	Area 200 & 300 Open Cut RR & Hwy Qty	Area 200 & 300 Open Cut RR & Hwy Cost, $	Area 200 & 300 Tunnel RR & Hwy Qty	Area 200 & 300 Tunnel RR & Hwy Cost, $
					0		0		0
	Subtotal - Direct Costs				10,830,200		20,475,300		19,864,600
	O/H and Profit Markup		30%		3,249,060		6,142,590		5,959,380
	Subtotal				14,079,260		26,617,890		25,823,980
	Contingency		10%		1,407,926		2,661,789		2,582,398
	Total Cost				**15,487,186**		**29,279,679**		**28,406,378**

Table L-1-12
Parish Ditch Widening
Construction Cost Estimate

Item No.	Description	Unit	Quantity	Unit Price	Cost, $
	Mobilization	LS	1	100,000	10,000
	Barge for access, operations	MON	4	60,000	240,000
	Clearing & Grubbing	AC	190	2,200	418,000
	Strip & stockpile topsoil	CY	153,000	2	306,000
	Excavation	CY	760,000	4	3,040,000
	Cast spoil behind existing spoil banks	CY	760,000	2	1,520,000
	Place topsoil	CY	153,000	2	306,000
	Seeding/establish vegetation	AC	190	3,000	570,000
	SWPPP	LS	1	25,000	25,000
	Water Control - channel	LS	1	100,000	100,000
	Water Control - misc.	LS	1	10,000	10,000
	Pipe line adjustment or accommodations	LS	1	100,000	100,000
	Subtotal - Direct Costs				6,645,000
	O/H and Profit Markup			30%	1,993,500
	Subtotal				8,638,500
	Contingency			15%	1,295,775
	Total Cost				**9,934,275**

Notes:

1. Widen the existing Parish drainage channel for 1,500 cfs
2. From Lateral 3-D to South Bridge alignment
3. Use land-based excavation operations, but need a barge for supplemental access, operations
4. Access via S. Brodge alignment and existing drainage ROW's into the Swamp.

Table L-1-13
Control Structures
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	Struct No. 1-2		Struct No. 1-3		Struct No. 1-4		Struct No. 1-5		Struct No. 1-6E		Struct No. 1-6S		Struct No. 1-6N		Struct No. 1-7		Struct No. 3-1		Struct No. 3-2	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Mobilization	LS	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
	Access/Work Barges	MON	60,000	4	240,000	4	240,000	4	240,000	3	180,000	4	240,000	3	180,000	3	180,000	3	180,000	4	240,000	3	180,000
	Clear work site	AC	2,200	2	4,400	2	4,400	2	4,400	2	4,400	2	4,400	2	4,400	2	4,400	2	4,400	2	4,400	2	4,400
	Seeding/Establish Turf	AC	3,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000	2	6,000
	Coffer Dam																						
	Steel Sheet Piling - PZ-27	SF	35	19,500	682,500	26,000	910,000	25,100	878,500	13,600	476,000	20,500	717,500	11,400	399,000	11,400	399,000	12,500	437,500	39,900	1,396,500	23,000	805,000
	Dewatering interior	MON	5,000	4	20,000	4	20,000	4	20,000	4	20,000	4	20,000	4	20,000	4	20,000	4	20,000	4	20,000	4	20,000
	Channel Excavation	CY	10	1,700	17,000	2,300	23,000	2,200	22,000	1,100	11,000	1,630	16,300	670	6,700	720	7,200	820	8,200	3,690	36,900	1,900	19,000
	Gate Structure																						
	Concrete floor	CY	400	180	72,000	265	106,000	225	90,000	100	40,000	215	86,000	90	36,000	90	36,000	95	38,000	410	164,000	170	68,000
	Intermediate Pedestals																						
	Walls	CY	700	100	70,000	167	116,900	136	95,200	44	30,800	89	62,300	34	23,800	34	23,800	39	27,300	245	171,500	82	57,400
	Roof	CY	850	6	5,100	10	8,500	8	6,800	3	2,550	6	5,100	2	1,700	2	1,700	3	2,550	13	11,050	4	3,400
	Retaining Walls - gate structure																						
	Walls	CY	700	80	56,000	90	63,000	110	77,000	75	52,500	75	52,500	60	42,000	60	42,000	65	45,500	125	87,500	125	87,500
	Footings	CY	400	85	34,000	90	36,000	95	38,000	85	34,000	85	34,000	80	32,000	80	32,000	80	32,000	100	40,000	100	40,000
	Retaining Walls - channel transition sections																						
	Walls	CY	700	45	31,500	45	31,500	55	38,500	40	28,000	40	28,000	30	21,000	30	21,000	35	24,500	60	42,000	60	42,000
	Footings	CY	400	40	16,000	40	16,000	40	16,000	40	16,000	40	16,000	40	16,000	40	16,000	40	16,000	40	16,000	40	16,000
	Concrete Channel Lining	SY	50	1,600	80,000	2,270	113,500	1,740	87,000	940	47,000	2,000	100,000	940	47,000	940	47,000	940	47,000	2,940	147,000	1,200	60,000
	Riprap - 18" deep	SY	50	270	13,500	380	19,000	290	14,500	160	8,000	340	17,000	160	8,000	160	8,000	160	8,000	490	24,500	200	10,000
	Crest Gates - Gate and HPU																						
	Crest Gates	SF	450	1,200	540,000	1,820	819,000	1,650	742,500	660	297,000	1,430	643,500	540	243,000	540	243,000	600	270,000	3,230	1,453,500	1,360	612,000
	Hydraulic Power Unit (HPU)	EA	225,000	2	450,000	2	450,000	2	450,000	1	225,000	2	450,000	1	225,000	1	225,000	1	225,000	2	450,000	1	225,000
	Cylinders (operators)	EA	25,000	3	75,000	8	200,000	6	150,000	2	50,000	3	75,000	2	50,000	2	50,000	2	50,000	8	200,000	4	100,000
	Piping - HPU to Cylinders (multiple lines)	LF	25	1,300	32,500	1,500	37,500	1,400	35,000	1,100	27,500	1,400	35,000	1,100	27,500	1,100	27,500	1,100	27,500	1,600	40,000	1,200	30,000
	Safety System at crest gates	LS	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000	1	100,000
	Fence - Chain Link with 3-strand barbed wire	LF	33	200	6,600	200	6,600	200	6,600	200	6,600	200	6,600	200	6,600	200	6,600	200	6,600	200	6,600	200	6,600
	Equipment Building																						
	Pre-fab Concrete Building	EA	25,000	2	50,000	2	50,000	2	50,000	1	25,000	2	50,000	1	25,000	1	25,000	1	25,000	2	50,000	1	25,000
	12" Prestressed Concrete Piling	VLF	50	240	12,000	240	12,000	240	12,000	120	6,000	240	12,000	120	6,000	120	6,000	120	6,000	240	12,000	120	6,000
	Electrical																						
	Generator (one per HPU)	LS	20,000	2	40,000	2	40,000	2	40,000	1	20,000	2	40,000	1	20,000	1	20,000	1	20,000	2	40,000	1	20,000
	Conduit & Wiring to Pedestals	LF	20	1,300	26,000	1,500	30,000	1,400	28,000	1,100	22,000	1,400	28,000	1,100	22,000	1,100	22,000	1,100	22,000	1,600	32,000	1,200	24,000
	Misc electrical items	LS	20,000	1	20,000	1	20,000	1	20,000	1	20,000	1	20,000	1	20,000	1	20,000	1	20,000	1	20,000	1	20,000
	Instrumentation																						
	On-site instrumentation in equipment bldg	EA	15,000	2	30,000	2	30,000	2	30,000	1	15,000	2	30,000	1	15,000	1	15,000	1	15,000	2	30,000	1	15,000
	Subtotal - Direct Costs				2,830,100		3,608,900		3,398,000		1,870,350		2,995,200		1,703,700		1,704,200		1,784,050		4,941,450		2,702,300
	O/H and Profit Markup		30%		849,030		1,082,670		1,019,400		561,105		898,560		511,110		511,260		535,215		1,482,435		810,690
	Subtotal				3,679,130		4,691,570		4,417,400		2,431,455		3,893,760		2,214,810		2,215,460		2,319,265		6,423,885		3,512,990

Table L-1-13
Control Structures
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	Struct No. 1-2		Struct No. 1-3		Struct No. 1-4		Struct No. 1-5		Struct No. 1-6E		Struct No. 1-6S		Struct No. 1-6N		Struct No. 1-7		Struct No. 3-1		Struct No. 3-2	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Contingency		15%		551,870		703,736		662,610		364,718		584,064		332,222		332,319		347,890		963,583		526,949
	Total Cost				**4,231,000**		**5,395,306**		**5,080,010**		**2,796,173**		**4,477,824**		**2,547,032**		**2,547,779**		**2,667,155**		**7,387,468**		**4,039,939**

Table L-1-14
Berm Gap (20 feet wide)
Construction Cost Estimate

Item No.	Description	Unit	Quantity	Unit Price	Cost, $
	Mobilization	LS	1	5,000	5,000
	Barge for access ($60,000/Month)	Day	2	2,000	4,000
	Clearing & Grubbing	AC	0.50	5,600	2,800
	Strip & stockpile topsoil	CY	400	2	800
	Excavation	CY	200	4	800
	Disposal on site	CY	200	4	800
	Geotextile	SY	160	5	800
	Articulated Concrete Blocks	SY	160	50	8,000
	Place topsoil	CY	400	2	800
	Seeding/establish vegetation	AC	1	3,000	1,500
	SWPPP	LS	1	500	500
	Water Control	LS	1	500	500
	Subtotal - Direct Costs				26,300
	O/H and Profit Markup			30%	7,890
	Subtotal				34,190
	Contingency			15%	5,129
	Total Cost				**39,319**

Notes
1. Articulated Concrete Blocks - without cables
2. Multiple work sites and crews using the barges. Prorate costs, as if barges being used on this and other tasks full-time.
3. Barge time - 1 day each move-in, move-out and delivering materials. Use 2 days

Table L-1-15
Berm Gap (100 feet wide)
Construction Cost Estimate

Item No.	Description	Unit	Quantity	Unit Price	Cost, $
	Mobilization	LS	1	10,000	10,000
	Barge for access ($60,000/Month)	Day	2	2,000	4,000
	Clearing & Grubbing	AC	0.50	5,600	2,800
	Strip & stockpile topsoil	CY	420	2	840
	Excavation	CY	700	4	2,800
	Disposal on site	CY	700	4	2,800
	Geotextile	SY	225	5	1,125
	Articulated Concrete Blocks	SY	225	50	11,250
	Place topsoil	CY	420	2	840
	Seeding/establish vegetation	AC	0.50	3,000	1,500
	SWPPP	LS	1	500	500
	Water Control	LS	1	500	500
	Subtotal - Direct Costs				38,955
	O/H and Profit Markup			30%	11,687
	Subtotal				50,642
	Contingency			15%	7,596
	Total Cost				**58,238**

Notes:
1. Extend articulated concrete block 50 feet into gap
2. Articulated Concrete Blocks - without cables
3. Multiple work sites and crews using the barges. Prorate costs, as if barges being used on this and other tasks full-time.
4. Barge time - 1 day each move-in, move-out and delivering materials. Use 2 days

Table L-1-16
Berm Gap (250 feet wide)
Construction Cost Estimate

Item No.	Description	Unit	Quantity	Unit Price	Cost, $
	Mobilization	LS	1	10,000	10,000
	Barge for access ($60,000/Month)	Day	3	2,000	6,000
	Clearing & Grubbing	AC	0.75	5,600	4,200
	Strip & stockpile topsoil	CY	420	2	840
	Excavation	CY	700	4	2,800
	Disposal on site	CY	700	4	2,800
	Geotextile	SY	225	5	1,125
	Articulated Concrete Blocks	SY	225	50	11,250
	Place topsoil	CY	420	2	840
	Seeding/establish vegetation	AC	0.75	3,000	2,250
	SWPPP	LS	1	1,000	1,000
	Water Control	LS	1	1,000	1,000
	Subtotal - Direct Costs				44,105
	O/H and Profit Markup			30%	13,232
	Subtotal				57,337
	Contingency			15%	8,600
	Total Cost				**65,937**

Notes:
1. Extend articulated concrete block 50 feet into gap
2. Articulated Concrete Blocks - without cables
3. Multiple work sites and crews using the barges. Prorate costs, as if barges being used on this and other tasks full-time.
4. Barge time - 1 day each move-in, move-out. 1 day delivering materials. Use 4 days

Table L-1-17
Berm Gap (500 feet wide)
Construction Cost Estimate

Item No.	Description	Unit	Quantity	Unit Price	Cost, $
	Mobilization	LS	1	10,000	10,000
	Barge for access ($60,000/Month)	Day	4	2,000	8,000
	Clearing & Grubbing	AC	2.00	5,600	11,200
	Strip & stockpile topsoil	CY	1,300	2	2,600
	Excavation	CY	2,400	4	9,600
	Disposal on site	CY	2,400	4	9,600
	Geotextile	SY	340	5	1,700
	Articulated Concrete Blocks	SY	340	50	17,000
	Place topsoil	CY	1,300	2	2,600
	Seeding/establish vegetation	AC	2	3,000	6,000
	SWPPP	LS	1	2,000	2,000
	Water Control	LS	1	2,000	2,000
	Subtotal - Direct Costs				82,300
	O/H and Profit Markup			30%	24,690
	Subtotal				106,990
	Contingency			15%	16,049
	Total Cost				**123,039**

Notes:
1. Extend articulated concrete block 50 feet into gap
2. Articulated Concrete Blocks - without cables
3. Multiple work sites and crews using the barges. Prorate costs, as if barges being used on this and other tasks full-time.
4. Barge time - 1 day each move-in, move-out. 1 day delivering materials. Use 4 days

Table L-1-18

Circulation Improvements at KCS RR and Hwy 61 Corridor

Construction Cost Estimate

Item No.	Description	Unit	Unit Price	1 - 4x4 Box		2 - 10x5		Bridges	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Mobilization	LS	100,000	1	100,000	1	100,000	1	100,000
	Earthen Channel - 525 LF								
	Clearing & Grubbing	AC	2,200	2	4,400	2	4,400	2	4,400
	Strip Topsoil - 6''	CY	2	1,070	2,140	1,070	2,140	1,070	2,140
	Excavation	CY	4	3,300	13,200	3,300	13,200	3,300	13,200
	Fill (embankment)	CY	6	0	0	0	0	0	0
	Import fill material	CY	15	0	0	0	0	0	0
	Haul off spoils	CY	6	0	0	0	0	0	0
	Place topsoil	CY	2	1,070	2,140	1,070	2,140	1070	2,140
	Seeding/Establish Turf	AC	3,000	2	6,000	2	6,000	2	6,000
	Drainage ditch at ROW	LF	10	1,100	11,000	1,100	11,000	1100	11,000
	Drainage outfall pipes - 24" RCP	LF	25	100	2,500	100	2,500	100	2,500
	Fence - 4-strand Barbed Wire	LF	15	0	0	0	0	0	0
	KCS RR Crossing - 100 LF								
	Small Capacity Culvert								
	1 - 4' x 4' Box Culvert - tunneled - 50 LF	LF	4,000	50	200,000		0		0
	1 - 4' x 4' Box Culvert - open cut - 50 LF	LF	1,000	50	50,000		0		0
	Headwalls	EA	10,000	2	20,000		0		0
	KCS RR Moderate capacity culverts								
	4 - 5' x 5' Box Culverts - tunneled - 50 LF	LF	4,000	0	0	200	800,000	0	0
	4 - 5' x 5' Box Culverts - open cut - 50 LF	LF	2,000	0	0	100	200,000	0	0
	Headwalls	EA	20,000	0	0	2	40,000	0	0
	KCS RR Moderate capacity bridge								
	Bridge - 20' w x 50' l	LF	4,000		0		0	100	400,000
	Channel Excavation	CY	10		0		0	700	7,000
	KCS RR Channel erosion protection								
	Concrete Channel Lining - 10 LF each end	SY	50	120	6,000	120	6,000	520	26,000
	Riprap - 10 LF each end	SY	50	120	6,000	120	6,000	520	26,000
	KCS RR Reconstruction - 200 LF								
	Railroad Track Work	LF	200	200	40,000	200	40,000	200	40,000
	Subgrade	LF	20	200	4,000	200	4,000	200	4,000
	Ballast	LF	20	200	4,000	200	4,000	200	4,000

Table L-1-18

Circulation Improvements at KCS RR and Hwy 61 Corridor

Construction Cost Estimate

Item No.	Description	Unit	Unit Price	1 - 4x4 Box		2 - 10x5		Bridges	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Hwy 61 Crossing - 200 LF								
	Hwy 61 Box Culverts								
	Excavation	CY	6	4,120	24,720	5,300	31,800		0
	Culvert floor - CIP	CY	300	55	16,500	155	46,500		0
	Culvert walls - CIP	CY	600	45	27,000	105	63,000		0
	Culvert roof - CIP	CY	750	55	41,250	155	116,250		0
	Headwalls	EA	10,000	2	20,000	2	20,000		0
	Cement Stabilized Sand Backfill	CY	20	560	11,200	750	15,000		0
	Backfill - excavated material	CY	6	3,190	19,140	3,400	20,400		0
	Haul off spoils	CY	6	930	5,580	1,900	11,400		0
	Hwy 61 Bridge								
	Bridge - 100' w x 50' l	SF	100		0		0	5000	500,000
	Channel Excavation	CY	10		0		0	1300	13,000
	Hwy 61 erosion protection								
	Concrete Channel Lining - 10 LF each end	SY	50	120	6,000	120	6,000	560	28,000
	Riprap - 10 LF each end	SY	50	120	6,000	120	6,000	560	28,000
	Hwy 61 Detour - 2 Lanes - 500 feet								
	Detour Pavement - asphalt	SY	60	1,400	84,000	1,400	84,000	1,400	84,000
	Remove Detour	SY	9	1,400	12,600	1,400	12,600	1,400	12,600
	Dispose of demo'd material	CY	13	250	3,250	250	3,250	250	3,250
	Hwy 61 Reconstruction - 4 Lanes - 200 feet								
	Hwy 61 Pavement at Box Culvert - 200 LF	SY	9	1,800	16,200	1,800	16,200	1,800	16,200
	Haul Demo'ed Pavement	CY	13	300	3,900	300	3,900	300	3,900
	Excavation & Grading	CY	10	600	6,000	600	6,000	600	6,000
	Structural fill	CY	14	300	4,200	300	4,200	300	4,200
	Lime Stabilization 12" Deep, 5% Lime	SY	6	1,800	10,800	1,800	10,800	1,800	10,800
	Stone Base	CY	15	600	9,000	600	9,000	600	9,000
	Bituminous Base Course 4"	SY	12	1,800	21,600	1,800	21,600	1,800	21,600
	Bituminous Binder Course 3"	SY	9	1,800	16,200	1,800	16,200	1,800	16,200
	Bituminous Top Course 1"	SY	3	1,800	5,400	1,800	5,400	1,800	5,400
	Gravel shoulders	CY	10	0	0	0	0	0	0
	Painted Lines 4" Wide	LF	0.20	3,000	600	3,000	600	3,000	600
	Signage	LS	1,500	1	1,500	1	1,500	1	1,500
	Drainage Pipe 18" RCP	LF	75	100	7,500	100	7,500	100	7,500
	Seeding/Turf Establishment	AC	3,000	1	3,000	1	3,000	1	3,000

Table L-1-18
Circulation Improvements at KCS RR and Hwy 61 Corridor
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	1 - 4x4 Box		2 - 10x5		Bridges	
				Qty	Cost, $	Qty	Cost, $	Qty	Cost, $
	Utility Relocations								
	Pipe line between RR and Hwy	LS	500,000	1	500,000	1	500,000	1	500,000
	Communication lines - RR	EA	5,000	2	10,000	2	10,000	2	10,000
	Communication lines - Hwy	EA	5,000	2	10,000	2	10,000	2	10,000
	Dewatering and Water Management								
	Earthen Canal								
	Dewatering	LF	50	500	25,000	500	25,000	500	25,000
	CN RR Crossing								
	Dewatering	LF	50	100	5,000	100	5,000	100	5,000
	LA 3125								
	Dewatering	LF	50	200	10,000	200	10,000	200	10,000
	Utility Construction								
	Dewatering	LF	25	200	5,000	200	5,000	200	5,000
					0		0		0
	Subtotal - Direct Costs				1,419,520		2,348,480		1,988,130
	O/H and Profit Markup		30%		425,856		704,544		596,439
	Subtotal				1,845,376		3,053,024		2,584,569
	Contingency		15%		276,806		457,954		387,685
	Total Cost				**2,122,182**		**3,510,978**		**2,972,254**

Table L-1-19
Instrumentation/Communications
Construction Cost Estimate

Item No.	Description	Unit	Unit Price	HU 100's Romeville Qty	HU 100's Romeville Cost, $	HU 100's & 200's South of Motiva Qty	HU 100's & 200's South of Motiva Cost, $	All HU's South of Motiva Qty	All HU's South of Motiva Cost, $	HU 100's & 200's Dual Diversion Qty	HU 100's & 200's Dual Diversion Cost, $	All HU's Dual Diversion Qty	All HU's Dual Diversion Cost, $
	Mobilization	LS	10,000	1	10,000	1	10,000	1	10,000	1	10,000	1	10,000
	Radio Towers												
	Diversion Site												
	Romeville - 150' Tower	VLF	1,000	150	150,000		0		0	150	150,000	150	150,000
	Motiva - 150' Tower	VLF	1,000		0	150	150,000	150	150,000	150	150,000	150	150,000
	Hwy 61 Corridor - 150' Tower	VLF	1,000		0	150	150,000	150	150,000	150	150,000	150	150,000
	Control Structure 1 - 150' Tower	VLF	1,000	150	150,000	150	150,000	150	150,000	150	150,000	150	150,000
	Control Structure 2 - 150' Tower	VLF	1,000	150	150,000	150	150,000	150	150,000	150	150,000	150	150,000
					0		0		0		0		0
	Control Room - at Diversion Site	LS	12,000	1	12,000	1	12,000	1	12,000	1	12,000	1	12,000
					0		0		0		0		0
	Gage Stations (stream, weather)	EA	15,000	3	45,000	5	75,000	6	90,000	5	75,000	6	90,000
					0		0		0		0		0
	Environmental Monitoring Stations				0		0		0		0		0
	HU 100 Series	EA	15,000	6	90,000	6	90,000	6	90,000	6	90,000	6	90,000
	HU 200 Series	EA	15,000	0	0	2	30,000	2	30,000	2	30,000	2	30,000
	HU 300 Series	EA	15,000	0	0	0	0	2	30,000	0	0	2	30,000
					0		0		0		0		0
	Subtotal - Direct Costs				607,000		817,000		862,000		967,000		1,012,000
	O/H and Profit Markup		30%		182,100		245,100		258,600		290,100		303,600
	Subtotal				789,100		1,062,100		1,120,600		1,257,100		1,315,600
	Contingency		15%		118,365		159,315		168,090		188,565		197,340
	Total Cost				**907,465**		**1,221,415**		**1,288,690**		**1,445,665**		**1,512,940**

Notes:
1. Local instrumentation not included in this estimate. See the specific project element.

Table L-1-20
Conway Canal - Diversion Ditch to HU 200
Construction Cost Estimate

Item No.	Description	Unit	Quantity	Unit Price	Cost, $
	Mobilization	LS	1	10,000	10,000
	Barge for access ($60,000/Month)	Day	4	2,000	8,000
	Clearing & Grubbing	AC	10	5,600	56,000
	Strip & stockpile topsoil	CY	7,800	2	15,600
	Excavation	CY	20,000	4	80,000
	Fill (berm)	CY	20,000	6	120,000
	Place topsoil	CY	7,800	2	15,600
	Seeding/establish vegetation	AC	10	3,000	30,000
	SWPPP	LS	1	10,000	10,000
	Water Control	LS	1	5,000	5,000
	Pipe line adjustment or accommodations	LS	1	100,000	100,000
	Subtotal - Direct Costs				450,200
	O/H and Profit Markup			30%	135,060
	Subtotal				585,260
	Contingency			15%	87,789
	Total Cost				**673,049**

Notes:

1. Multiple work sites and crews using the barges. Prorate costs, as if barges being used on this and other tasks full-time.
2. Barge time - 1 day each move-in, move-out. 1 day delivering materials. Use 4 days

Table L-1-21
Conway Canal Berm Gap (20 feet wide)
Construction Cost Estimate

Item No.	Description	Unit	Quantity	Unit Price	Cost, $
	Mobilization	LS	1	5,000	5,000
	Barge for access ($60,000/Month)	Day	2	2,000	4,000
	Clearing & Grubbing	AC	0.50	5,600	2,800
	Strip & stockpile topsoil	CY	130	2	260
	Excavation	CY	180	4	720
	Disposal on site	CY	180	4	720
	Geotextile	SY	160	5	800
	Articulated Concrete Blocks	SY	160	50	8,000
	Place topsoil	CY	130	2	260
	Seeding/establish vegetation	AC	0.5	3,000	1,500
	SWPPP	LS	1	500	500
	Water Control	LS	1	500	500
	Subtotal - Direct Costs				25,060
	O/H and Profit Markup			30%	7,518
	Subtotal				32,578
	Contingency			15%	4,887
	Total Cost				**37,465**

Notes
1. Articulated Concrete Blocks - without cables
2. Multiple work sites and crews using the barges. Prorate costs, as if barges being used on this and other tasks full-time.
3. Barge time - 1 day each move-in, move-out and delivering materials. Use 2 days

Table L-1-22
Conway Canal Berm Gap (100 feet wide)
Construction Cost Estimate

Item No.	Description	Unit	Quantity	Unit Price	Cost, $
	Mobilization	LS	1	10,000	10,000
	Barge for access ($60,000/Month)	Day	2	2,000	4,000
	Clearing & Grubbing	AC	0.50	5,600	2,800
	Strip & stockpile topsoil	CY	250	2	500
	Excavation	CY	420	4	1,680
	Disposal on site	CY	420	4	1,680
	Geotextile	SY	340	5	1,700
	Articulated Concrete Blocks	SY	340	50	17,000
	Place topsoil	CY	250	2	500
	Seeding/establish vegetation	AC	0.50	3,000	1,500
	SWPPP	LS	1	500	500
	Water Control	LS	1	500	500
	Subtotal - Direct Costs				42,360
	O/H and Profit Markup			30%	12,708
	Subtotal				55,068
	Contingency			15%	8,260
	Total Cost				**63,328**

Notes:
1. Extend articulated concrete block 50 feet into gap
2. Articulated Concrete Blocks - without cables
3. Multiple work sites and crews using the barges. Prorate costs, as if barges being used on this and other tasks full-time.
4. Barge time - 1 day each move-in, move-out and delivering materials. Use 2 days

Table L-1-23
Conway Canal Berm Gap (250 feet wide)
Construction Cost Estimate

Item No.	Description	Unit	Quantity	Unit Price	Cost, $
	Mobilization	LS	1	10,000	10,000
	Barge for access ($60,000/Month)	Day	3	2,000	6,000
	Clearing & Grubbing	AC	1.00	5,600	5,600
	Strip & stockpile topsoil	CY	480	2	960
	Excavation	CY	860	4	3,440
	Disposal on site	CY	860	4	3,440
	Geotextile	SY	340	5	1,700
	Articulated Concrete Blocks	SY	340	50	17,000
	Place topsoil	CY	480	2	960
	Seeding/establish vegetation	AC	1	3,000	3,000
	SWPPP	LS	1	1,000	1,000
	Water Control	LS	1	1,000	1,000
	Subtotal - Direct Costs				54,100
	O/H and Profit Markup			30%	16,230
	Subtotal				70,330
	Contingency			15%	10,550
	Total Cost				**80,880**

Notes:
1. Extend articulated concrete block 25 feet into gap
2. Articulated Concrete Blocks - without cables
3. Multiple work sites and crews using the barges. Prorate costs, as if barges being used on this and other tasks full-time.
4. Barge time - 1 day each move-in, move-out. 1 day delivering materials. Use 3 days

Table L-1-24
Conway Canal Berm Gap (500 feet wide)
Construction Cost Estimate

Item No.	Description	Unit	Quantity	Unit Price	Cost, $
	Mobilization	LS	1	10,000	10,000
	Barge for access ($60,000/Month)	Day	4	2,000	8,000
	Clearing & Grubbing	AC	2.00	5,600	11,200
	Strip & stockpile topsoil	CY	850	2	1,700
	Excavation	CY	1,600	4	6,400
	Disposal on site	CY	1,600	4	6,400
	Geotextile	SY	340	5	1,700
	Articulated Concrete Blocks	SY	340	50	17,000
	Place topsoil	CY	850	2	1,700
	Seeding/establish vegetation	AC	2	3,000	6,000
	SWPPP	LS	1	2,000	2,000
	Water Control	LS	1	2,000	2,000
	Subtotal - Direct Costs				74,100
	O/H and Profit Markup			30%	22,230
	Subtotal				96,330
	Contingency			15%	14,450
	Total Cost				**110,780**

Notes:
1. Extend articulated concrete block 50 feet into gap
2. Articulated Concrete Blocks - without cables
3. Multiple work sites and crews using the barges. Prorate costs, as if barges being used on this and other tasks full-time.
4. Barge time - 1 day each move-in, move-out. 1 day delivering materials. Use 4 days

Volume IV

APPENDIX L—Annex L-2

This annex intentionally left blank

Detailed hydrologic and hydraulic results are presented in Main Appendix L, Section L2.

Volume IV

APPENDIX L—Annex L-3

Geotechnical Engineering Data for Design Facilities

This page intentionally left blank.

LOG OF BORING CDM-7

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°3'46.4"
COORDINATE LON: W90°50'25.1"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	SOIL	USCS GROUP SYMBOL	SAMPLES	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
		CL		**Firm, brown and gray lean CLAY w/ little silt, and ferrous staining** ▽		1.00					32.1				
		CH		**Firm, gray fat CLAY w/ ferrous staining**		0.75		0.58		81	42.1	73	21	52	
5		CH		**Firm, brown and gray fat CLAY w/ ferrous staining;** silty sand lenses, 4'-6'		2.25									
				- w/ some silt, 6'-7'		1.25		0.63		88	34.5				
10						1.25		0.66		89	30.6	85	25	60	
		CL		**Firm, gray lean CLAY w/ some silt, and ferrous staining**											
15						1.25		0.63		96	29.2				
				- w/ trace of shell fragments											
20						1.50									
				- w/ trace of calcareous nodules											
25						1.50		0.78		94	32.9				
30						2.50									
		ML		**Loose, brown SILT**											
35						0.50			0.55 @10.0	91	32.9	29	25	4	
		CL		**Very stiff, brown lean CLAY w/ ferrous staining**											
40						2.50									
		ML		**Very loose, brown SILT w/ some clay**											
45						<0.25									90.5
		CH		**Very stiff, gray fat CLAY w/ shell fragments**											
50						1.75		2.11		78	42.8	76	20	56	

DEPTH OF BORING: 100 FEET **DEPTH TO FREE GROUNDWATER: NOT ENCOUNTERED**
DATE DRILLED: January 18, 2010 **: 6 INCHES AFTER 24 HOURS**

LOG OF BORING CDM-7

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°3'46.4"
COORDINATE LON: W90°50'25.1"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	USCS GROUP SYMBOL	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
55	CL	**Very stiff becoming firm, brown and gray lean CLAY**		2.75									
60				1.50		0.82		96	31.3				
65	CL	**Very stiff, brown lean CLAY w/ ferrous staining**		3.25									
70	CL	**Very stiff, brown and gray lean CLAY w/ ferrous staining**		3.00		2.36		94	29.7				
75	CH	**Very stiff, gray fat CLAY** - w/ ferrous staining, 73'-80'		2.75									
80		- w/ silt, 78'-90', calcareous nodules at 78'		2.75		0.89		81	38.9				
85		- becoming stiff		2.00									
90				1.00		1.08		80	50.2	70	22	48	
95				1.75									
100		- becoming very stiff		2.50									

DEPTH OF BORING: 100 FEET **DEPTH TO FREE GROUNDWATER: NOT ENCOUNTERED**
DATE DRILLED: January 18, 2010 **: 6 INCHES AFTER 24 HOURS**

Geotechnical Consulting Services
Baton Rouge, Louisiana

LOG OF BORING CDM-8

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°3'57.23"
COORDINATE LON: W90°50'9.05"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	SOIL	USCS GROUP SYMBOL	SAMPLES	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
		CL		Firm, brown lean CLAY w/ some fine sand ▽				0.54		103	25.6				
		SM		Very loose, brown silty SAND w/ some clay		1.25									
		CH		Soft, brown fat CLAY		<0.25									
						0.75		0.35		79	35.9	101	26	75	99.1
5		CH		Firm, gray and brown fat CLAY; trace of fine sand @ top 4"											
				- w/ ferrous stains		0.50									
						0.75		0.68		82	40.7				
		CH		Stiff, gray fat CLAY w/ ferrous stains											
10						1.25					33.8	87	27	60	
		CL		Soft, gray lean CLAY w/ ferrous stains											
15						1.00		0.47		92	30.1				
				- becoming very stiff w/ shell fragments, and trace of black and white concretions											
20						2.25									
				- becoming soft and mottled w/ green, tan and white spots											
25						0.75		0.37		88	34.5				
				- becoming very stiff											
30						3.25									
		CL-ML		Firm, red and brown silty CLAY w/ fine sand, and ferrous stains											
35						0.50			0.78 @10.0	93	32.8	29	22	7	
		SP		Medium dense, red and brown fine SAND w/ some silt											
40					16										
				Boring terminated @ 40 feet											
45															
50															

DEPTH OF BORING: 40 FEET **DEPTH TO FREE GROUNDWATER: NOT ENCOUNTERED**

DATE DRILLED: January 19, 2010 **: 2 INCHES AFTER 24 HOURS**

Geotechnical Consulting Services
Baton Rouge, Louisiana

LOG OF BORING CDM-9

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°4'7.08"
COORDINATE LON: W90°49'54.51"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	USCS GROUP SYMBOL	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
	CH	**Firm, brown fat CLAY;** trace plant roots, 0'-2' ▽		0.50		0.64		84	38.1	66	23	43	
				0.25									
5	CH	**Firm becoming soft, gray and brown fat CLAY; ferrous stains, 4'-20'**		1.00		0.59		80	40.7	83	24	59	
				0.75									
10				0.50		0.30		86	36.0				
	CH	**Stiff, red-brown and gray fat CLAY w/ trace of fine sand**											
15				1.50									
	CH	**Stiff, light gray fat CLAY**											
20				3.00		1.48		103	24.8	52	16	36	
	CH	**Soft, gray and red-brown fat CLAY w/ black stains;** w/ trace of sand @ 25'											
25				1.75									
	SC	**Very loose, red-brown fine clayey SAND w/ some silt**											
30				0.25		0.28		95	27.0				25.2
35			8										
	CL	**Very stiff, light gray lean CLAY**											
40			7	2.25		2.29		97	27.8				
		Boring terminated @ 40 feet											
45													
50													

DEPTH OF BORING: 40 FEET **DEPTH TO FREE GROUNDWATER: NOT ENCOUNTERED**

DATE DRILLED: January 19, 2010 **: 4 INCHES AFTER 24 HOURS**

Geotechnical Consulting Services
Baton Rouge, Louisiana

LOG OF BORING CDM-10

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°4'17.28"
COORDINATE LON: W90°49'39.37"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	SOIL	USCS GROUP SYMBOL	SAMPLES	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
		CH		**Soft, brown fat CLAY;** trace plant roots, 0'-2' ▽											
						0.50									
				- w/ ferrous stains											
						1.00		0.42		68	58.5	107	28	79	
5		CH		**Very soft to soft, gray fat CLAY w/ ferrous stains**											
						0.25		0.23		65	59.2				
						0.25		0.34		66	59.1	100	30	70	
10						0.50									
		CH		**Firm becoming stiff, tan and gray fat CLAY**											
15				**w/ ferrous stains**		1.25		0.75		97	27.0				
20					8	2.00									
						2.00			1.2 @12.7	100	26.1				
		CL		**Firm becoming soft, red-brown lean CLAY**											
25						3.25		0.69		94	28.1	30	20	10	
30				- w/ trace of silt, and fine sand	7										
						0.50		0.25		90	32.3				
		ML		**Loose, red-brown SILT w/ sand and clay**											
35					8							25	23	2	41.8
40		CL		**Firm, light gray and tan lean CLAY**	9	2.00									
				Boring terminated @ 40 feet											
45															
50															

DEPTH OF BORING: 40 FEET **DEPTH TO FREE GROUNDWATER: NOT ENCOUNTERED**

DATE DRILLED: January 19, 2010 **: 4 INCHES AFTER 24 HOURS**

LOG OF BORING CDM-11

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°4'29.27"
COORDINATE LON: W90°49'26.44"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	USCS GROUP SYMBOL	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
	CL	**Firm, brown lean CLAY w/ fine sand and ferrous stains** ▽		1.25		0.59		90	25.1				
	CH	**Firm, brown-gray fat CLAY w/ roots and ferrous stains**		0.75		0.51		78	53.4	107	26	81	
5		- w/ interbedded layers of decayed wood		0.75									
	CH	**Very soft becoming stiff, gray fat CLAY**											
		- w/ ferrous stains, 6'-8'		0.25		0.20		60	64.6	113	26	87	
		- w/ roots											
10				0.75					63.3				
		- w/ silt and ferrous stains											
15				1.50									
	CL	**Stiff, light gray lean CLAY w/ silt and ferrous stains**											
20				1.75					22.9				
	CL	**Stiff, gray and red-brown lean CLAY w/ silt**											
25				1.75									
	CL	**Firm becoming stiff, brown lean CLAY w/ silt**											
30				0.75									
		- w/ ferrous staining											
35				2.00									
	CL	**Stiff, gray lean CLAY w/ ferrous staining**											
40				2.00									
		Boring terminated @ 40 feet											
45													
50													

DEPTH OF BORING: 40 FEET **DEPTH TO FREE GROUNDWATER: NOT ENCOUNTERED**

DATE DRILLED: January 21, 2010 **: 1.5 FEET AFTER 24 HOURS**

Geotechnical Consulting Services
Baton Rouge, Louisiana

LOG OF BORING CDM-12

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA PARISH

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°4'35.75"
COORDINATE LON: W90°49'18.11"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	SOIL	USCS GROUP SYMBOL	SAMPLES	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
		ML		Loose, brown SILT w/ fine sand, clay, and plant roots		0.50		0.40		89	29.8	28	25	3	
						0.25									
5		CH		Soft, gray fat CLAY w/ ferrous stains, and roots; slickensided, 4'-6'		0.50		0.41		70	53.6	107	31	76	
						1.25									
10						1.25		0.39		60	64.1				
15						0.75									
20						1.00									
25		CL		Stiff, light gray lean CLAY w/ silt, and ferrous stains		1.75					22.2				
30		CL		Very stiff, red-brown lean CLAY w/ trace silt, and ferrous stains		2.75									
35		CL		Very stiff, mottled red-tan-gray-black lean CLAY w/ concretions .		3.00									
40		CL		Very stiff, tan and gray lean CLAY w/ ferrous stains		2.75									
45						3.00									
50		CL		Very stiff, tan lean CLAY w/ some silt		2.25									

DEPTH OF BORING: 100 FEET **DEPTH TO FREE GROUNDWATER: NOT RECORDED**
DATE DRILLED: January 21, 2010

Geotechnical Consulting Services
Baton Rouge, Louisiana

LOG OF BORING CDM-12

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°4'35.75"
COORDINATE LON: W90°49'18.11"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	USCS GROUP SYMBOL	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
55		- becoming soft w/ some fine sand		0.75									
60		- becoming stiff w/ silt and sand		1.25									
65		- w/ interbeded silty sand layers											
70		- becoming very stiff to hard w/ silt and ferrous stains		4.00									
75	CL	**Very stiff, gray lean CLAY w/ trace silt, trace fine sand, shells, ferrous stains**		3.50									
80	CL	**Stiff, gray and dark brown lean CLAY w/ decayed wood**		1.25									
85	CL	**Very stiff, gray lean CLAY w/ calcareous lenses, and ferrous stains**		2.25									
90		- becoming stiff		1.75									
95	CL	**Very stiff, dark gray lean CLAY w/ decayed wood layers**		2.25									
100	CL	**Very stiff, green and gray lean CLAY w/ trace of fine sand**		2.75									

DEPTH OF BORING: 100 FEET **DEPTH TO FREE GROUNDWATER: NOT RECORDED**
DATE DRILLED: January 21, 2010

LOG OF BORING CDM-13

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: HOLLOW-STEM AUGER **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°4'40.38"
COORDINATE LON: W90°49'21.73"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	USCS GROUP SYMBOL	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
	ML	**Loose, brown SILT w/ some clay, sand and roots** ▽		0.50						28	26	2	
5	CL	**Stiff becoming soft, brown lean CLAY w/ silt**		1.50		1.18		99	26.6				
				0.75									
				0.75		0.33		93	25.7	35	22	13	
10	CH	**Soft, gray fat CLAY w/ ferrous stains and silt**		0.50		0.34		57	74.8				
15		**Firm becoming stiff, gray lean CLAY** -w/ ferrous stains and silt, 13'-20'		0.75									
20				2.00		1.15		107	23.1	34	22	12	
25		-w/ concretions		3.25									
		Boring terminated @ 25 feet											
30													
35													
40													
45													
50													

DEPTH OF BORING: 25 FEET **DEPTH TO FREE GROUNDWATER: NOT ENCOUNTERED**
DATE DRILLED: January 20, 2010 **: 1 FEET AFTER 24 HOURS**

Geotechnical Consulting Services
Baton Rouge, Louisiana

LOG OF BORING CDM-14

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: HOLLOW-STEM AUGER **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°4'31.20"
COORDINATE LON: W90°49'14.11"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	SOIL	USCS GROUP SYMBOL	SAMPLES	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
		CL		**Firm becoming soft, brown sandy lean CLAY w/ roots** ▽		0.50		0.50		97.7	23.4	30	22	8	
						0.25									
5		CH		**Soft, gray-brown fat CLAY w/ fine sand**											
						0.75		0.35		68.0	56.7				
		CH		**Very soft, gray fat CLAY;** w/ ferrous stains, 6'-8'											
						0.75									
				-w/ fine sand at 8'											
10				-w/ wood fragments, 8'-15'		0.75		0.23		61.1	59.6	86	32	54	
		CL		**Soft becoming stiff, gray lean CLAY w/ ferrous nodules**											
15						0.50		0.26		94.4	29.1				
20						1.25									
25						2.50		1.37		97.8	30.6				
				Boring terminated @ 25 feet											
30															
35															
40															
45															
50															

DEPTH OF BORING: 25 FEET **DEPTH TO FREE GROUNDWATER: NOT ENCOUNTERED**
DATE DRILLED: January 20, 2010 **: 3 FEET AFTER 24 HOURS**

Geotechnical Consulting Services
Baton Rouge, Louisiana

LOG OF BORING CDM-18

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°5'3.34"
COORDINATE LON: W90°48'21.49"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	USCS GROUP SYMBOL	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
	OH	**Very soft, dark gray and black ORGANIC CLAY**											
		-w/ calcareous nodules		0.05					145.9	139	55	84	
		*** 0.17@3 psi; 0.17@5 psi; 0.15@10 psi											
		* average unit weight of 53.6		0.05			***	*	143.7				
5		-wood fragments @ 4'											
			WOH										
	CH	**Very soft, gray fat CLAY**											
				0.50					44.8	52	14	38	
	CL	**Very soft, gray lean CLAY**; silt, 8'-10'											
10		*** 0.21@4 psi; 0.27@8 psi; 0.32@15 psi		0.25			***	*	29.7				
		* average unit weight of 85.0											
		-w/ calcareous nodules											
15				1.25		0.16			26.6	45	19	26	
	CH	**Soft to firm, gray fat CLAY w/ calcareous nodules**											
20		-wood fragements @ 20'		1.75					31.0				
25				0.75		0.25		83	33.7				
	CH	**Firm to soft, light gray fat CLAY w/ calcareous nodules**											
30				2.25					35.5				
35		* large (1") calcareous nodules present in sample		1.75		0.25		77	38.7				
40				0.75					46.7				
45													
	CL	**Firm to soft, tan lean CLAY**	25	2.25					38.2				
		-w/ silt and calcareous nodules											
50				2.00		0.89		98	25.9	38	22	16	

DEPTH OF BORING: 100 FEET **DEPTH TO MUDLINE: 3 FEET**
DATE DRILLED: January 28, 2010

LOG OF BORING CDM-18

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°5'3.34"
COORDINATE LON: W90°48'21.49"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	SOIL	USCS GROUP SYMBOL	SAMPLES	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
55				-w/ silt and ferrous stains		2.00					25.9				
60						2.50									
65				-w/ ferrous nodules and trace of shell fragments		0.75		0.37		94	25.3				
70		CH		**Firm, gray fat CLAY**		0.75					28.7				
75						1.25									
80				- slickensided		1.25		0.93		85	36.9	92	22	70	
85				-w/ decayed wood @ 85'		1.50					31.6				
90				-w/ decayed wood @ 88'		1.00									
95				-w/ decayed wood @ 93' and slickensided		2.25		0.96		87	34.4				
100		SC-SM		**Very dense, gray silty, clayey SAND**		4.50					26.5				59

DEPTH OF BORING: 100 FEET **DEPTH TO MUDLINE: 3 FEET**

DATE DRILLED: January 28, 2010

Geotechnical Consulting Services
Baton Rouge, Louisiana

LOG OF BORING CDM-19

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°4'44.76"
COORDINATE LON: W90°45'3.24"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	USCS GROUP SYMBOL	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
	OH	**Very soft, gray ORGANIC CLAY w/ root fragments and silt**	WOH						212.4				
			WOH										
5	CL	**Very soft, gray lean CLAY w/ root fragments and some silt**	WOH						26.9	46	18	28	
	CH	**Firm becoming stiff, gray fat CLAY;** root fragments 6'-8'		1.25		0.66		74	25.5	50	19	31	
10		-w/ silt and organics		2.00					25.4				
	CH	**Firm, tan and gray fat CLAY w/ silt lenses**											
15		*** 0.21@5psi; 0.29@10psi; 0.26@19psi * average unit weight of 82.0		0.75			***	*	34.9				
20		-becoming soft w/ calcareous nodules and little fine sand		0.25					33.5	58	18	40	
25													
	CL	**Stiff, tan and gray lean CLAY w/ silt lenses; fine sand @ bottom 6"**		1.25		1.85		98	26.4				
	SM	**Very dense, tan silty fine SAND**											
30			58						26.4				65
	CH	**Firm, tan fat CLAY w/ calcareous nodules**											
35				0.75					47.9				
	CH	**Stiff, gray fat CLAY w/ silt lenses**		1.50		1.51		85	34.2	62	27	35	
	CH	**Firm, tan fat CLAY w/ calcareous nodules**											
40				1.00					49.7				
	CL	**Stiff, gray lean CLAY;** large amount of shell, 43'-45'											
45				1.75					21.3				
50		-w/ calcareous nodules		1.25		1.80		101	25.2				

DEPTH OF BORING: 100 FEET **DEPTH TO MUDLINE: 8 FEET**
DATE DRILLED: January 30, 2010

LOG OF BORING CDM-19

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°4'44.76"
COORDINATE LON: W90°45'3.24"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	SOIL	USCS GROUP SYMBOL	SAMPLES	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
		CL		**Stiff, gray lean CLAY**											
				- becoming very stiff											
55						2.75									
60				-w/ silt, silt lenses and ferrous stains		2.50					25.3				
		CH		**Stiff, gray fat CLAY;** w/ sand pockets and ferrous nodules											
65						1.75		2.31		90	31.6	67	26	41	
70						3.25									
75				-w/ sand pockets		2.75					41.5				
80				-becoming firm w/ silt lenses, clay and fine sand @ top 8"		1.00		0.92		84	34.3	65	23	42	99
85				-becoming very stiff w/ wood fragements at 83'		2.50									
90				-w/ sand pockets		2.75					21.5				
95				-becoming very stiff and slickensided w/ silt lenses * failure at 2.1% stain		4.25		*1.84		100	24.1				
100				-becoming very stiff		3.50					28.2				

DEPTH OF BORING: 100 FEET **DEPTH TO MUDLINE: 8 FEET**
DATE DRILLED: January 31, 2010

LOG OF BORING CDM-21

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

COORDINATE LAT: N30°6'9.30"
COORDINATE LON: W90°44'19.60"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	SOIL	USCS GROUP SYMBOL	SAMPLES	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
		CH		**Stiff, dark brown fat CLAY w/ grass roots and peat pockets**		1.50					53.0				
				- becoming soft		0.50		0.40		50	86.8				
5		CH		**Soft, gray fat CLAY, slickensided**		0.50		0.27		59	67.2	123	39	84	
				- becoming very soft w/ small pieces of roots,6'-15' and large root (1" dia) running through sample,6'-10'		<0.25					78.0				
10				-organic fat clay		<0.25					193.0				
15				-w/ small pieces of roots		0.50		0.18		83	37.8	54	18	36	
				- becoming firm											
20						1.25					25.3				
		CL		**Stiff, gray lean CLAY w/ ferrous stains**											
25						1.25		0.66		91	32.3				
				w/ some fine sand											
30						2.00					30.0				
		CH		**Firm, light gray fat CLAY w/ some fine sand**											
35				-slickensided and jointed		0.75		0.32		83	34.0	58	23	35	
		SP		**Loose, red and brown fine SAND**											
40					5						27.8				
				- becoming medium dense w/ interbedded sandy clay layer											
45					11						36.9				
		CH		**Firm to stiff gray fat CLAY** w/ silt											
50					8						37.5				

DEPTH OF BORING: 100 FEET **DEPTH TO FREE GROUNDWATER: NOT ENCOUNTERED**
DATE DRILLED: February 8, 2010

LOG OF BORING CDM-21

MISSISSIPPI RIVER DIVERSION

ST. JAMES PARISH, LOUISIANA

TYPE OF BORING: WET ROTARY **PROJECT NUMBER: 0193124-01**

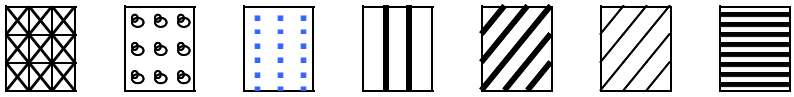
COORDINATE LAT: N30°6'9.30"
COORDINATE LON: W90°44'19.60"
SURFACE ELEVATION: NOT RECORDED
BORING LOCATION PLAN: APPENDIX SHEET NO. 2

DEPTH, FEET	SOIL	USCS GROUP SYMBOL	SAMPLES	SOIL DESCRIPTION	SPT-N (BLOWS/FOOT)	Hand Pen. (tsf)	Torvane tsf	UC (tsf) (D2166)	UU (tsf) (D2850) @ Confining Pressure (psi)	UNIT DRY WT. (lbs/ft^3)	MOISTURE CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	% PASSING NO. 200
				Stiff, dark brown fat CLAY w/ grass roots and peat											
				- becoming stiff											
55						1.50		1.00		84	35.7	65	23	42	
				- becoming very soft w/ little fine sand											
60						<0.25					43.8				87
				- becoming stiff											
65						1.25		1.33		75	45.7	56			
				- w/ little silt											
70						2.00					26.4				
		CH		**Soft, tan and gray fat CLAY w/ large silt pockets**											
75						1.25		0.34		86	34.0				
		CH		**Stiff, gray fat CLAY;** w/ 4" layer of shells (gravel size) @ 78'											
80						3.00					32.8				
85						2.25		1.08		85	34.0	51	20	31	
				- w/ shells (gravel size)											
90						1.50					53.5				
		CL		**Very stiff, green-gray lean CLAY, slickensided**											
95						3.25		2.63		99	25.7				
100						3.25					23.1				

DEPTH OF BORING: 100 FEET **DEPTH TO FREE GROUNDWATER: NOT ENCOUNTERED**
DATE DRILLED: February 8, 2010

KEY TO TERMS AND SYMBOLS USED ON LOGS

SOIL TYPE

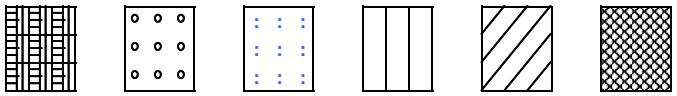


ROCK | GRAVEL | SAND | SILT | FAT CLAY | LEAN CLAY | PEAT

SAMPLER TYPE

NO SAMPLE | AUGER SAMPLE | SHELBY TUBE | SPLIT SPOON

MODIFIERS



STONE or CONCRETE | GRAVELY | SANDY | SILTY | CLAYEY | FILL

NO RECOVERY | ROCK CORE | 2" SHELBY TUBE | TXDOT CONE

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D 2487 (1980)

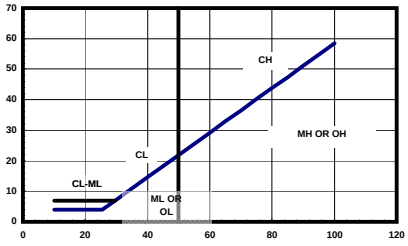
MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS LESS THAN 50% PASSING NO. 200 SIEVE	GRAVEL & GRAVELY SOILS LESS THAN 50% PASSING NO. 4 SIEVE	CLEAN GRAVEL (LITTLE OR NO FINES	GW	WELL GRADED GRAVEL, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			GP	POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		W/ APPRECIABLE FINES	GM	SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN 50% PASSING NO. 4 SIEVE	CLEAN SANDS LITTLE FINES	SW	WELL GRADED SAND, GRAVELY SAND (LITTLE FINES)
			SP	POORLY GRADED SANDS, GRAVELY SAND (L.FINES)
		SANDS WITH APPREA. FINES	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS,SAND-CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS & VERY FINE SANDS,ROCK FLOUR SILTY OR CLAYEY FINE SANDS OR CLAYEY SILT W/ LOW PI
			CL	INORGANIC CLAY OF LOW TO MEDIUM PI LEAN CLAY GRAVELY CLAYS, SANDY CLAYS, SILTY CLAYS
			OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PI
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY FAT CLAYS
			OH	ORGANIC CLAYS OF MED TO HIGH PI, ORGANIC SILT
HIGHLY ORGANIC SOIL			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS
UNCLASSIFIED FILL MATERIALS			ARTIFICIALLY DEPOSITED AND OTHER UNCLASSIFIED SOILS AND MAN-MADE SOIL MIXTURES	

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	UNCONFINED COMPRESSIVE STRENGTH IN TONS/FT^2
VERY SOFT	0.0 TO 0.25
SOFT	0.25 TO 0.50
MEDIUM STIFF	0.50 TO 1.0
STIFF	1.0 TO 2.0
VERY STIFF	2.0 TO 4.0
HARD	> 4.0 OR 4.0+

RELATIVE DENSITY - GRANULAR SOILS

CONSISTENCY	N-VALUE (BLOWS/FOOT)
VERY LOOSE	0-4
LOOSE	4-9
MEDIUM DENSE	10-29
DENSE	30-49
VERY DENSE	> 50 OR 50+



ABBREVIATIONS

HP - HAND PENETROMETER
TV - TORVANE
MV - MINIATURE VANE
UC - UNCONFINED COMPRESSION TEST
UU - UNCONSOLIDATED UNDRAINED TRAIXIAL
CU - CONSOLIDATED UNDRAINED

GROUNDWATER FIRST ENCOUNTERED

24-HOUR GROUNDWATER READING

CLASSIFICATION OF GRANULAR SOILS

U.S. STANDARD SIEVE SIZE(S)

6" 3" 3/4" 4 10 40 200

BOULDERS	COBBLES	GRAVEL		SAND			SILT OR CLAY	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		

152 76.2 19.1 4.76 2.0 0.42 0.074 0.002

GRAIN SIZE IN MM

This page intentionally left blank.

CDM

Memorandum

To: *Jamie Bartel, P.G.*

From: *Mohammad Tavassoli, Ph.D., P.E.*
Albert Ayenu-Prah, Ph.D., E.I.

Date: *March 10, 2010*

Subject: *Blind River Freshwater Diversion*
St. James Parish, Louisiana
- Geotechnical Field Investigations

Introduction

The State of Louisiana, together with the Louisiana Coastal Authority (LCA) and the United States Army Corps of Engineers (USACE) New Orleans District, is conducting a feasibility study to restore part of the Maurepas Swamp in St. James Parish, Louisiana. CDM was retained to conduct the feasibility study for the proposed project.

Project Description

The Maurepas Swamp (Swamp) is one of the largest coastal fresh water swamps in the State of Louisiana, covering an area of approximately 233,000 acres. Since the construction of the Mississippi River flood control levees in the region, the swamp has been cut off from freshwater infusion, as well as sediments and nutrients hitherto provided by the Mississippi River. As a result, the swamp has undergone considerable degradation of its ecosystem, together with continual local subsidence.

The proposed project involves designing and constructing a small freshwater diversion canal from the Mississippi River to the Swamp. The proposed flow rate in the diversion canal would be less than 5000 cubic feet per second, discharging into the Blind River, which is located within the Swamp.

Purpose and Scope

This report presents geotechnical field investigations being undertaken at the project location.

The investigations consist of drilling and sampling 21 test borings, and installing seven (7) piezometers within the project area. **Figures 1A** and **1B** show the boring location plan.

Results of laboratory testing of the soil samples, and water level readings from the piezometers will furnish information pertinent to the geotechnical design of the diversion canal.

Existing Site Conditions

Terrain

The project area is relatively flat, with elevations within the Swamp ranging from 1 to 3 feet, gradually increasing to about 10 feet near the Mississippi River levees south of the Swamp. The Swamp is wooded with cypress trees and other vegetation. The Blind River runs through the Swamp along with connected canals. The Interstate 10 corridor and Airline Highway also cross the Swamp.

Existing soil survey information from the United States Department of Agriculture (USDA) indicates that soils in the area are predominantly clay with occasional layers of silt; the top six inches is mostly peat. Soil information was only available to approximately 6.5 feet below ground surface.

Geology

St James Parish lies on Alluvium and Natural Levees. Sediments underlying this region are of the Holocene Epoch, overlying Pleistocene formations. The Alluvium consists of gray to brownish gray clay and silty clay, reddish brown in the Red River Valley, with some sand and gravel. Natural Levees are gray and brown silt, and silty clay, with some very fine sand, reddish brown along the Red River. The natural levees lie near the Mississippi River, with point bars and backswamps further inland. In general, on the concave sides of the river are fine-grained natural levee deposits, undifferentiated deltaic plain swamp, and marsh materials. On the convex sides of the river bends are accretionary and point bar deposits. The alluvial deposits are fluvial sediments deposited by a rise in sea level in this region between 4000 and 6000 years ago.

Subsurface Investigations

Field Exploration

As mentioned earlier, the geotechnical field investigation consisted of drilling a total of 21 test borings and installing seven (7) piezometers. The test borings consisted of sixteen 3-inch diameter, and five 5-inch diameter borings. **Table 1** presents some information for the test borings.

Borings B-7 through B-14 and B-18 through B-21 have been completed, with the samples at the laboratory testing stage. Borings B-1 through B-6, which are close to the Mississippi River levee, will be drilled once the Pontchartrain Levee District approves the drilling permit application. Borings B-15 through B-17 will be drilled upon permit approval by the Louisiana

Office of Coastal Restoration and Management. The completed borings were drilled and sampled between January 18 and March 5, 2010.

Before drilling, the borings were located and staked in the field using a handheld GPS device. The boring locations are shown on **Figures 1A** and **1B**.

Table 1.

Boring	Boring Depth (ft)	Boring Diameter (in.)	GPS Coordinates		Groundwater Depth (ft)
			Easting	Northing	
B1	100	5	-90.84506	30.05966	
B2	130	5	-90.84457	30.06000	
B3	100	5	-90.84423	30.06023	
B4	25	3	-90.84461	30.06070	
B5	25	3	-90.84380	30.05975	
B6	40	3	-90.84380	30.05975	
B7	100	3	-90.84021	30.06295	0.5
B8	40	3	-90.83585	30.06590	0.2
B9	40	3	-90.83181	30.06863	0.3
B10	40	3	-90.82760	30.07147	0.3
B11	40	3	-90.82401	30.07492	1.5
B12	100	3	-90.82170	30.07660	Not Recorded
B13	25	3	-90.82270	30.07788	1.0
B14	25	3	-90.82059	30.07533	3.0
B15	40	3	-90.81817	30.07917	
B16	40	3	-90.81438	30.08193	
B17	40	3	-90.81071	30.08463	
B18*	100	5	-90.80545	30.08434	3**
B19*	100	5	-90.75086	30.07906	8**
B20	100	3	-90.71677	30.08507	
B21	100	3	-90.73893	30.10262	

*Drilled in Blind River
**Depth to mudline

The borings were drilled using a track-mounted drilling rig, except borings B-18 and B-19 in the Blind River, which were drilled with a pontoon-mounted drilling rig. Each boring was sampled with the solid stem auger technique until groundwater was first encountered and recorded; the wet rotary sampling technique was used thereafter.

Split spoon samples, typically taken in cohesionless soils, and Shelby tube samples, typically taken in cohesive soils, were collected continuously to a depth of 10 feet below existing ground surface, and then at 5-foot intervals thereafter until boring termination. Shelby tube sampling was conducted in general accordance with ASTM D 1587, *Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes*. The Shelby tubes were extruded on-site for visual classification and storage. Split-spoon sampling was conducted in general accordance with ASTM D 1586, *Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils*. For the 24-inch split-spoon sampler used, the sampler was driven 18 inches into the ground at 6-inch increments. The number of blows required to drive the sampler each 6-inch increment was recorded, and the Standard Penetration Resistance (N-value) was determined as the sum of the blows over the 2nd and 3rd increments. Representative soil samples were taken from each split-spoon or Shelby tube sample, stored in moisture proof containers, and securely transported to the laboratory for later review and geotechnical laboratory testing. The borings were backfilled with cement-bentonite slurry after final groundwater readings were recorded. Borings drilled in the Blind River were backfilled immediately after drilling.

Field logs were prepared by a CDM geotechnical engineer, who also observed the test borings in the field. Final boring logs will be prepared upon receiving test results back from the laboratory. Drilling and laboratory testing are being performed by Professional Service Industries, Inc. (PSI). Completed boring logs are provided in the **Appendix**.

Laboratory Testing Program

The laboratory testing program for undisturbed and disturbed samples obtained from the borings consisted of the following:

- Moisture Content
- Atterberg Limits
- Unit Weight
- Sieve Analysis (percent passing #200)
- Unconfined Compression Test
- Triaxial Test (UU test- 3 point)

The preceding laboratory tests, conducted according to ASTM standards, will provide the necessary geotechnical parameters for design and construction purposes. Available laboratory test results are shown on the completed boring logs in the **Appendix**.

Subsurface Conditions

Final boring logs from completed sample testing indicate that subsurface soils are mostly brown and gray stiff clay with occasional loose silt and fine sand lenses and layers. The silt and sand layers were usually encountered between 30 and 50 feet below ground surface.

Some soft clay was encountered in some of the borings, usually between 0 and 25 feet below ground surface. In boring B-18, the soft clay extended to 65 feet, and in B-21 soft clay was encountered at 73 to 78 feet.

In most of the borings, soil color changed to red-brown between 25 and 50 feet.

Groundwater

Final groundwater levels were usually measured 24 hours after drilling. Groundwater generally varied between 0.2 and 3 feet below ground surface.

Variation in Subsurface Conditions

The interpretation of general soil conditions is based on soil and groundwater conditions observed at the test boring locations. However, subsurface conditions may vary at locations other than the subsurface exploration locations.

Groundwater levels are expected to fluctuate with season, temperature, river stage, and other factors.

Closure

This geotechnical field investigation report has been prepared for the proposed Blind River Freshwater Diversion canal in St. James Parish, Louisiana. This report presented geotechnical field investigations, including available results of laboratory testing on selected soil samples. The methods and procedures used in this report are in accordance with generally accepted engineering practices. No other warranty, expressed or implied, is made.

A final geotechnical report including recommendations for slope stability, foundation support for various diversion structures and other relevant design requirements for the proposed diversion project will be issued once the final alignment, depth, hydraulic modeling and other design features have been completed.

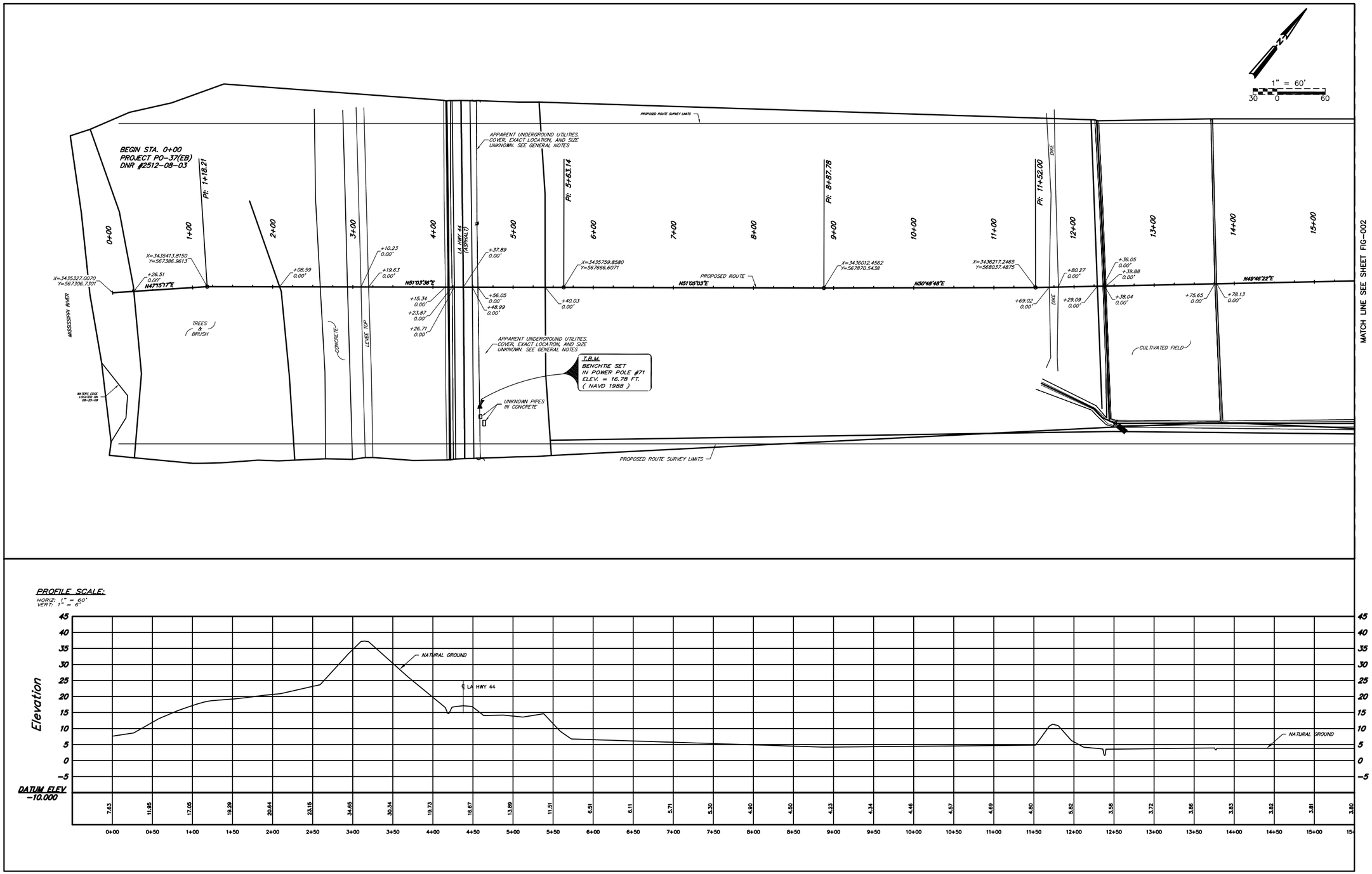
This page intentionally left blank.

Volume IV

APPENDIX L—Annex L-4 through L-6

Survey Data, Engineering Plates, Control Structure Memorandum

This page intentionally left blank.



US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.
-	-	01/05/2010	-

DESIGNED BY:
DWN BY: J ALCINA
CKD BY:
SUBMITTED BY: Bob A. Submitter
PLOT SCALE: 1" = 200'
PLOT DATE: 01/06/2010
SIZE: ANSI D
DATE: JANUARY, 2010
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
FILE NAME: ANSI_D_rootFW.dgn

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

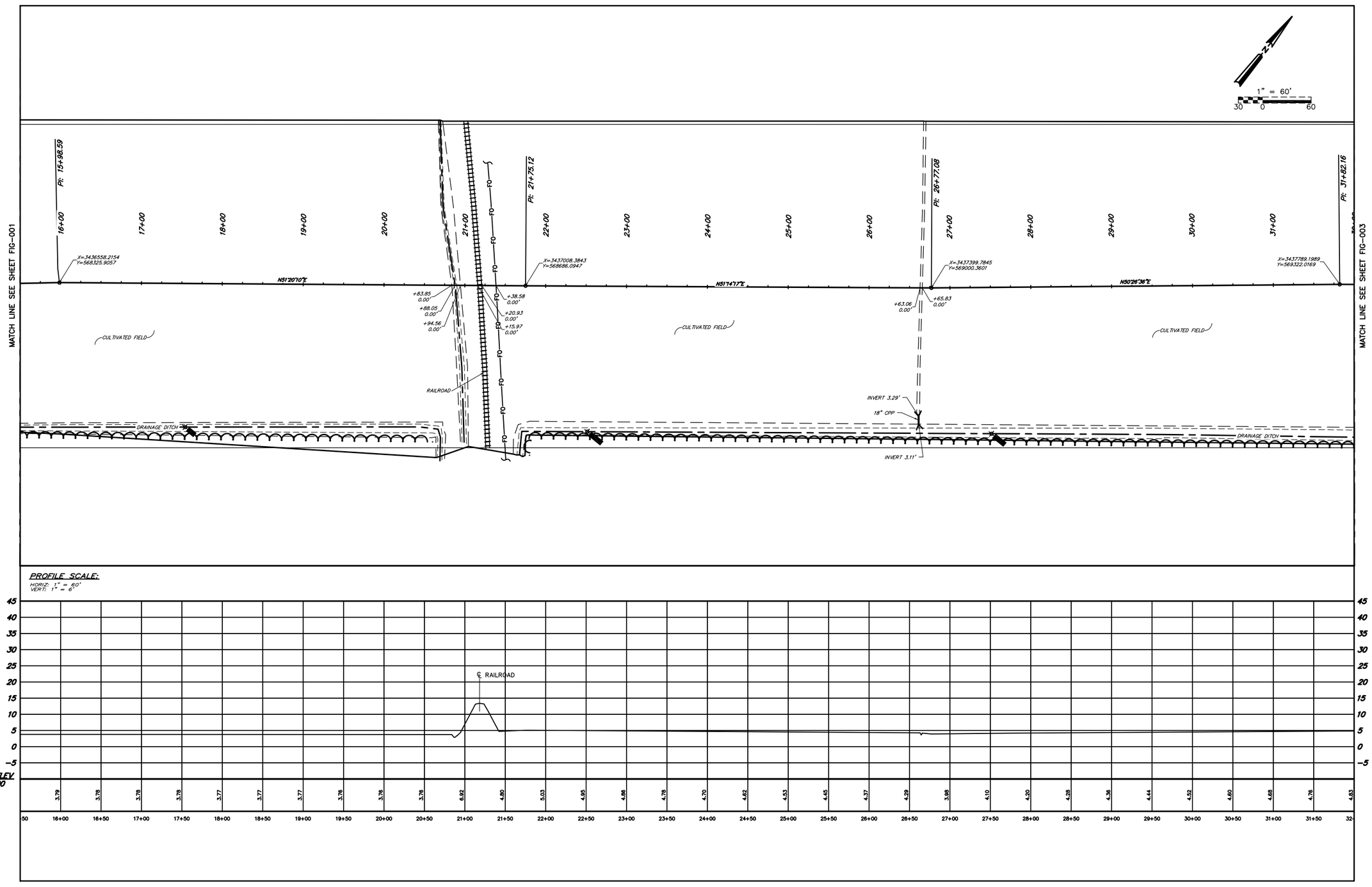
CDM
1515 POYDRAS ST. SUITE 1350
NEW ORLEANS, LA 70112 ZIP

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA TITLE 3

BLIND RIVER DIVERSION CANAL
PLAN AND PROFILE
STA. 00+00 TO STA. 15+50

SHEET IDENTIFICATION
FIG-001
SHEET X OF Y

DATE: Jan 06, 2010 3:06pm XREFS:



US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.
-	-	01/05/2010	-

DESIGNED BY: -
DWN BY: J ALCINA
CKD BY: -
SUBMITTED BY: Bob A. Submitter
DATE: JANUARY, 2010
SOLICITATION NO.: -
CONTRACT NO.: -
PLOT DATE: 01/07/2010
PLOT SCALE: 1 = 20'
FILE NUMBER: -
SIZE: ANSI D
FILE NAME: ANSI_D_civilPW.dgn

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

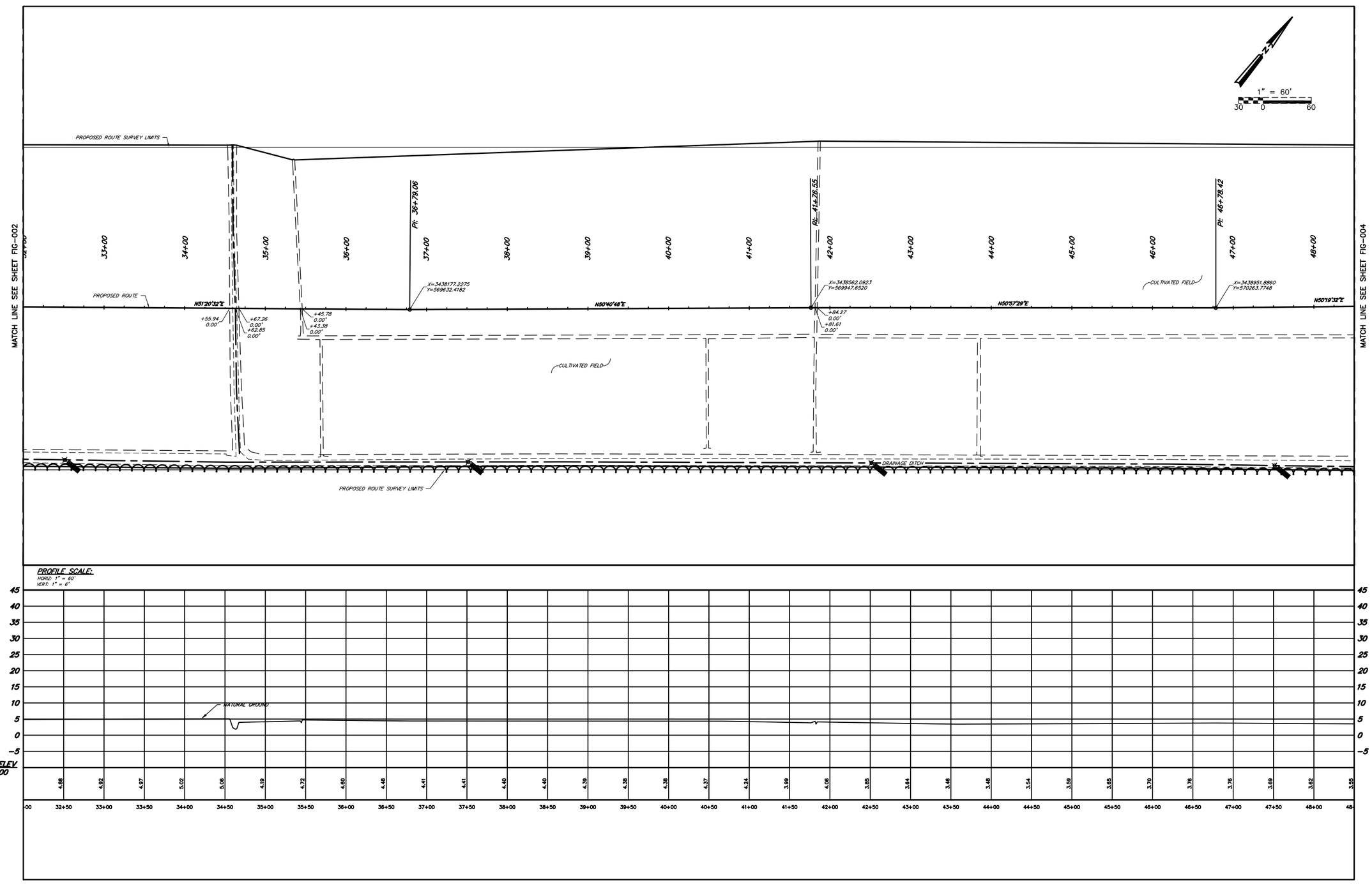
CDM
1515 POYDRAS ST., SUITE 1350
NEW ORLEANS, LA 70112 ZIP

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA TITLE 3

BLIND RIVER DIVERSION CANAL
PLAN AND PROFILE
STA. 15+50 TO STA. 32+00

SHEET IDENTIFICATION
FIG-002
SHEET X OF Y

DATE: Jan 06, 2010 3:06pm XREFS:



US Army Corps of Engineers

MARK	DESCRIPTION	DATE	APPR.
-	-	01/05/2010	-

DESIGNED BY:
DRAWN BY: J ALCINA
CKD BY: -
SUBMITTED BY: Bob A. Submitter
DATE: JANUARY, 2010
SOLICITATION NO.: -
CONTRACT NO.:
FILE NUMBER:
PLOT SCALE: 1" = 60'
PLOT DATE: 01/06/2010
SIZE: ANSI D
FILE NAME: ANSI_D_nosPW.dgn

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST. SUITE 1350
NEW ORLEANS, LA 70112 ZIP

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA TITLE 3

BLIND RIVER DIVERSION CANAL
PLAN AND PROFILE
STA. 32+00 TO STA. 48+50

SHEET IDENTIFICATION
FIG-003
SHEET X OF Y

DATE: Jan 06, 2010 3:06pm XREFS:

MATCH LINE SEE SHEET FIG-003

MATCH LINE SEE SHEET FIG-005

1" = 60'
30 0 60

PROPOSED ROUTE SURVEY LIMITS

49+00 50+00 51+00 52+00 53+00 54+00 55+00 56+00 57+00 58+00 59+00 60+00 61+00 62+00 63+00 64+00

Pi: 50+27.72

Pi: 62+08.93

CULTIVATED FIELD

PROPOSED ROUTE

N51°10'45"E

N50°34'03"E

X=3439220.7408
Y=570486.7796

X=3440141.0335
Y=571227.2637

+82.10 0.00'
+56.25 0.00'
+78.80 0.00'
18" IRON
INVERT 1.49'
+51.14 0.00'
+46.70 0.00'
INVERT 1.28'
+97.55 0.00'
+00.31 0.00'
INVERT 1.08'
INVERT 0.56'
15" IRON
+41.63 0.00'
+44.52 0.00'
+33.82 0.00'
+41.94 0.00'
+37.84 0.00'
15" IRON
INVERT 0.93'
INVERT 1.40'
INVERT 0.41'
24" RCP
INVERT -0.05'
24" RCP
INVERT 0.31'
INVERT -0.02'

APPARENT PIPELINE, COVER, EXACT LOCATION, AND SIZE UNKNOWN, SEE GENERAL NOTES

APPARENT PIPELINE, COVER, EXACT LOCATION, AND SIZE UNKNOWN, SEE GENERAL NOTES

WILLIAMS PIPELINE MARKER 1-800-440-8475

GULF SOUTH PIPELINE 1-800-850-0051

PROFILE VIEW

PROFILE SCALE:
HORIZ: 1" = 60'
VERT: 1" = 6'

Elevation

45 40 35 30 25 20 15 10 5 0 -5

DATUM ELEV -10.000

NATURAL GROUND

3.48 3.40 3.56 1.28 3.68 3.41 3.24 3.06 2.89 2.72 2.54 2.56 2.60 2.83 2.60 2.43 2.20 2.45 2.52 2.80 2.64 2.65 2.65 2.55 2.40 2.99 3.04 3.01 2.97 2.93 2.89 2.84 2.80

-50 49+00 49+50 50+00 50+50 51+00 51+50 52+00 52+50 53+00 53+50 54+00 54+50 55+00 55+50 56+00 56+50 57+00 57+50 58+00 58+50 59+00 59+50 60+00 60+50 61+00 61+50 62+00 62+50 63+00 63+50 64+00 64+50 65-

US Army Corps of Engineers

MARK	DESCRIPTION	DATE	APPR.
		01/05/2010	-

DESIGNED BY:
DWN BY: J ALCINA
CKD BY:
SUBMITTED BY: Bob A. Submitter
PLOT SCALE: 1" = 200'
PLOT DATE: 01/06/2010
SIZE: ANSI D
DATE: JANUARY, 2010
SOLICITATION NO.:
CONTRACT NO.:
FILE NUMBER:
FILE NAME: ANSI_D_rootFW.dgn

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

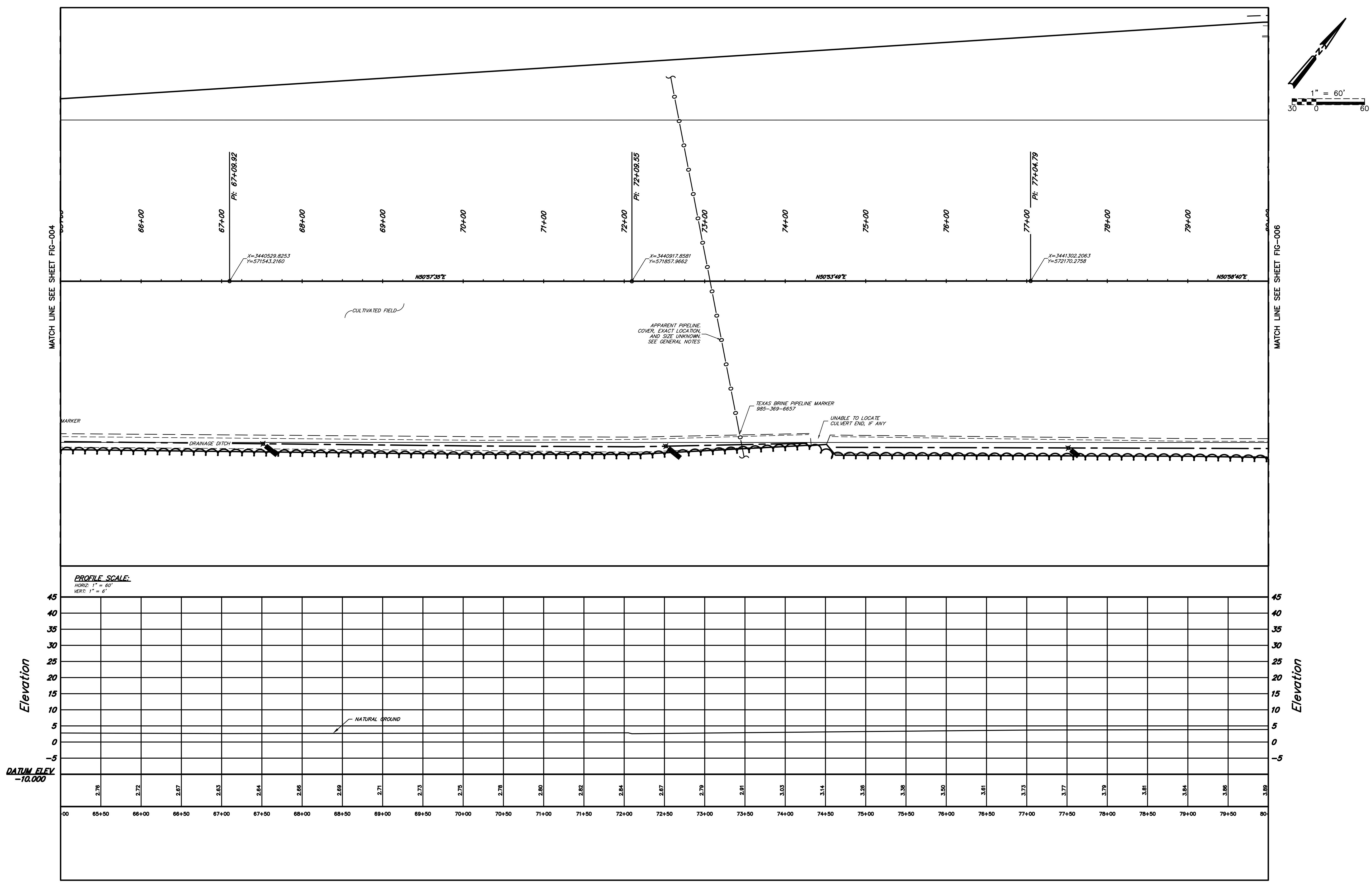
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LA 70112 ZIP

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA TITLE 3

BLIND RIVER DIVERSION CANAL
PLAN AND PROFILE
STA. 48+50 TO STA. 65+00

SHEET IDENTIFICATION
FIG-004
SHEET X OF Y

DATE: Jan 06, 2010 3:06pm XREFS:



US Army Corps of Engineers

MARK	DESCRIPTION	DATE	APPR.
		01/05/2010	

DESIGNED BY: | DATE: JANUARY, 2010 | SOLICITATION NO.: | CONTRACT NO.: | FILE NUMBER:

DWN BY: J'ALCINA | CKD BY:

SUBMITTED BY: Bob A. Schmitter

PLOT SCALE: 1" = 120' | PLOT DATE: 01/05/2010

SIZE: ANSI D | FILE NAME: ANSI_D_mstPW.dgn

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

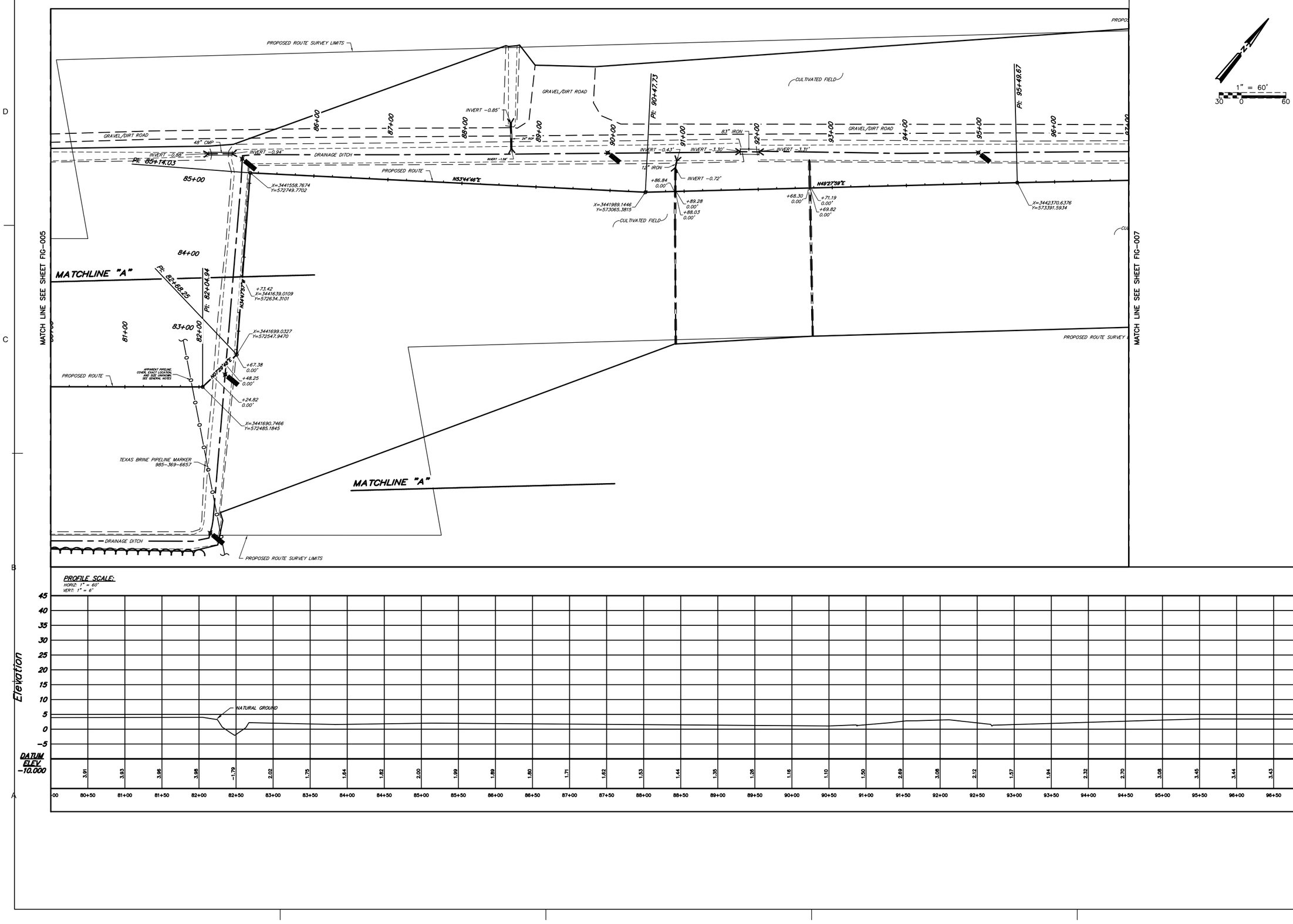
CDM
1515 POYDRAS ST. SUITE 1350
NEW ORLEANS, LA 70112 ZIP

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA TITLE 3

BLIND RIVER DIVERSION CANAL
PLAN AND PROFILE
STA. 65+00 TO STA. 80+00

SHEET IDENTIFICATION
FIG-005
SHEET X OF Y

DATE: Jan 06, 2010 3:06pm XREFS:



US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.
		01/05/2010	-

DESIGNED BY: -
DWN BY: J ALCINA
CKD BY:
SUBMITTED BY: Bob A. Submitter
DATE: JANUARY, 2010
SOLICITATION NO.: -
CONTRACT NO.: -
PLOT DATE: 1/6/2010
PLOT SCALE: 1" = 20'
FILE NUMBER: -
SIZE: ANSI D
FILE NAME: ANSI_D_notPW.dgn

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST. SUITE 1350
NEW ORLEANS, LA 70112 ZIP

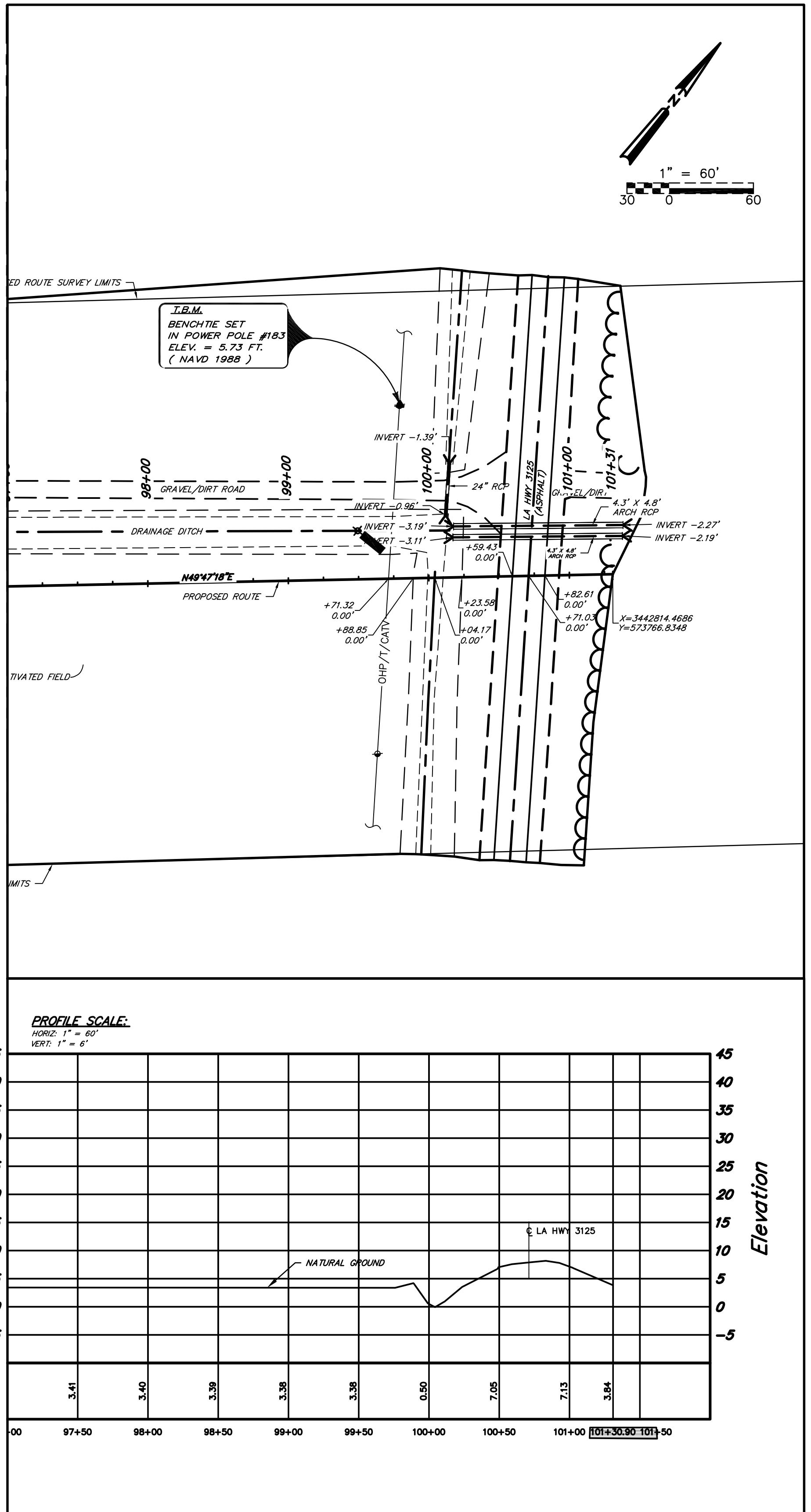
BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA TITLE 3

BLIND RIVER DIVERSION CANAL
PLAN AND PROFILE
STA. 80+00 TO STA. 97+00

SHEET IDENTIFICATION
FIG-006
SHEET X OF Y

DATE: Jan 06, 2010 3:06pm XREFS:

DATE: Jan 06, 2010 3:06pm XREFS:



US Army Corps of Engineers®

MARK	DESCRIPTION	DATE	APPR.
		01/05/2010	.

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: .
DWN BY: J ALCINA
CKD BY: .
SUBMITTED BY: Bob A. Submitter
PLOT SCALE: 1" = 120'
PLOT DATE: 01/05/2010
SIZE: ANSI D
FILE NAME: ANSI_D_nonPW.dgn
DATE: JANUARY, 2010
SOLICITATION NO.: .
CONTRACT NO.: .
FILE NUMBER: .

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST. SUITE 1350
NEW ORLEANS, LA 70112 ZIP

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA TITLE 3

BLIND RIVER DIVERSION CANAL
PLAN AND PROFILE
STA. 97+00 TO STA. 101+30.90

SHEET IDENTIFICATION
FIG-007
SHEET X OF Y

US Army Corps
of Engineers®
New Orleans District

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA

MARCH 2010

THIS PROJECT WAS DESIGNED BY THE MISSISSIPPI VALLEY DISTRICT CORPS OF ENGINEERS. THE INITIALS OR SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER 1110-1-8152. SIGNATURES INDICATE OFFICIAL RECOMMENDATION OF ALL DRAWINGS IN THIS SET.

APPROVED BY:

DISTRICT ENGINEER

APPROVAL RECOMMENDED BY:

CHIEF EC-D BRANCH

CHIEF EC-H BRANCH

CHIEF ENGR & CONST DIVISION

PROJECT MANAGER

CHIEF COST/SPEC/CIVIL&A SECTION

CHIEF MECH/ELEC/STRU/ARCH SECTION

CHIEF GEOTECH/GEOLOGY/SURV SECTION

CHIEF HYDRAULICS & HYDROLOGY SECT.

US Army Corps
of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

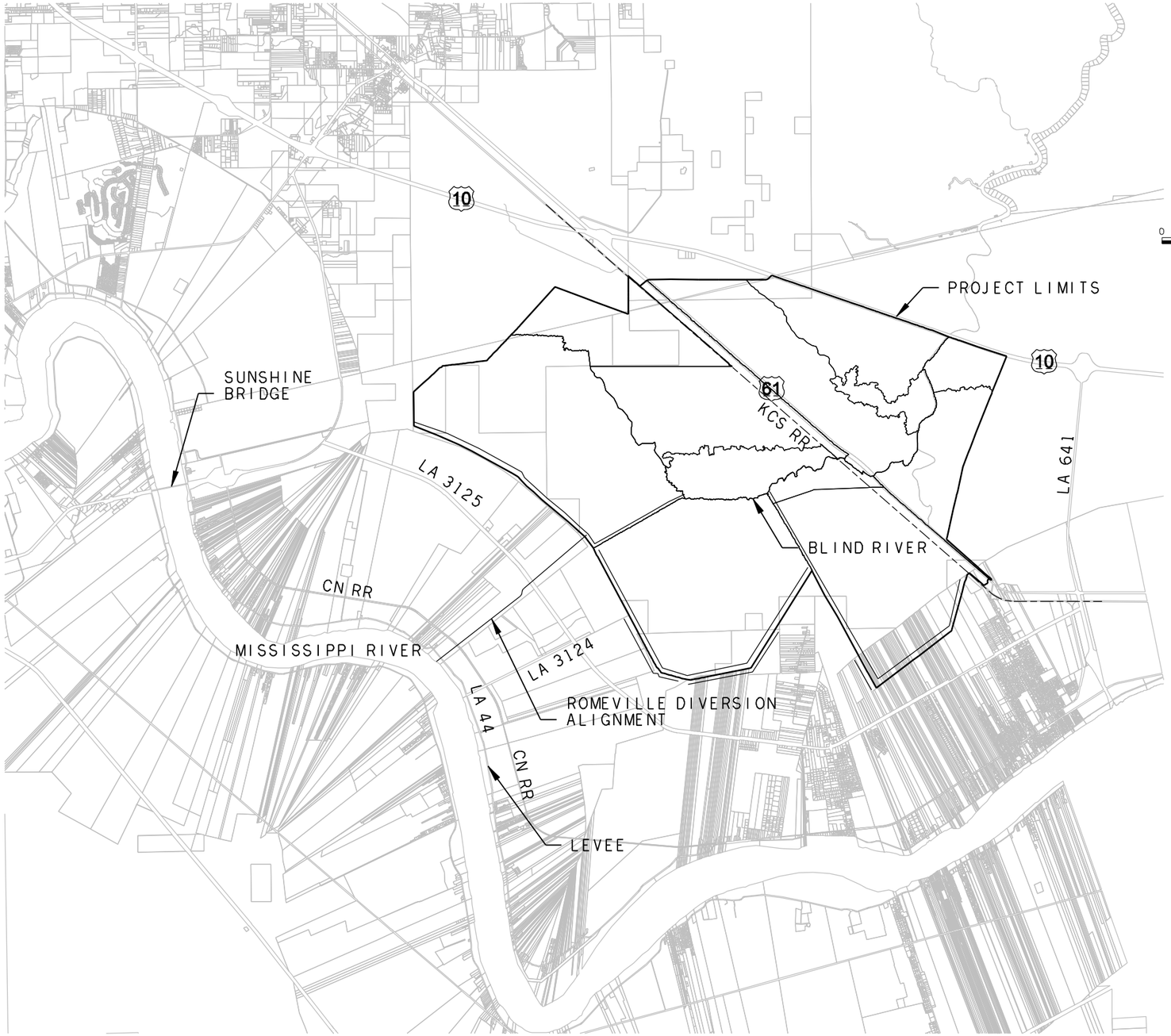
BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
COVER SHEET

SHEET IDENTIFICATION
G-001

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA
-
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: STOLZB	DATE: 2009/12
DWN BY: ROMEROC	CKD BY: LLEWELLYNR
SUBMITTED BY: CDM	
PLOT SCALE: 1:1	PLOT DATE: 3/29/2010
SIZE: ANSI D	FILE NAME: I:\247247_01\G01---G-001---.dgn
	FILE NUMBER:

5:04:49 PM



VICINITY MAP

N

0 10000' 20000'
SCALE: 1"=10000'

INDEX

US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: STOKJR		DATE: 2009/12	
DWN BY: ROMEROC	CKD BY: LLEWELLYNK		
SUBMITTED BY: CDM			
SIZE: ANSI D	FILE NAME: H247247_01G02—G-002—dgn	PLOT SCALE: 1:1	PLOT DATE: 2009/12

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST. SUITE 1350
NEW ORLEANS, LOUISIANA 70112

FILE NUMBER:

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
INDEX AND VICINITY MAP SHEET

SHEET IDENTIFICATION
G-002

5:00:36 PM

CONWAY CANAL

BLIND RIVER

U.S. HIGHWAY 61

U.S. HIGHWAY 61 CULVERT

PROJECT BOUNDARY

I-10

KCS RR

KCS RR CULVERT

3-2

LA641

LA3125

CN RR

I-6A

I-6B

TRANSMISSION CANAL

LA3125 CULVERT

I-8A

I-8B

I-7

LA3124

CN RR CULVERT

ROMEVILLE CULVERT

ST. JAMES PARRISH CANAL

MISSISSIPPI RIVER

LA44 (RIVER ROAD)

MISSISSIPPI RIVER

0 2500' 5000'

SCALE: 1" = 2500'

Structure Summary Table

Control Structure	Est. Channel Width (ft)	Est. Channel Depth (from TOB) (ft)	Location Description
1-6 East	147	6.7	St. James Parish Canal, At Romeville transmission connection
1-6 South	66	4.9	St. James Parish Canal, At Romeville transmission connection
1-7	65	5.6	St. James Parish Canal near Hwy 61
1-8 Southeast	130	10.5	St. James Parish Canal
1-8 Northwest	130	10.5	St. James Parish Canal
3-2	82	13	Adjacent to Hwy. 61

Control Structures to be used on diversion scenarios.
Control Structure 1-6 and 1-8 will be a 2-way structure controlling flow in 2 directions.

US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

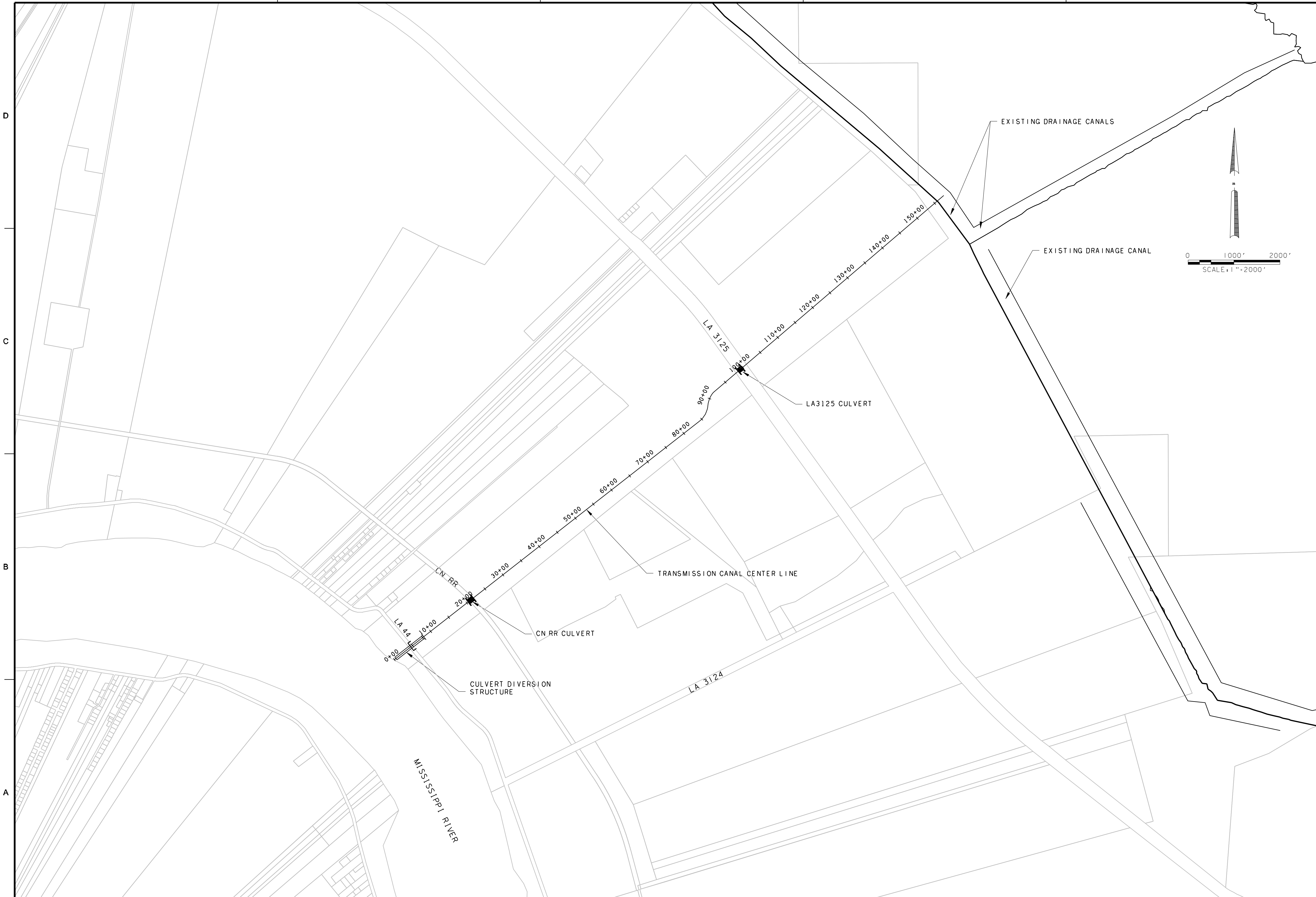
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: STOLZB
DRWN BY: ROMERGC
SUBMITTED BY: CDM
CKD BY: LLEWELLYNR
PLOT SCALE: 1:1
PLOT DATE: 3/2/2010
SIZE: ANSI D
FILE NAME: H247247_01G003—G-003—dgn
FILE NUMBER:
DATE: 2009/12

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
ROMEVILLE DIVERSION ALTERNATIVE

SHEET IDENTIFICATION
G-003

3:40:10 PM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

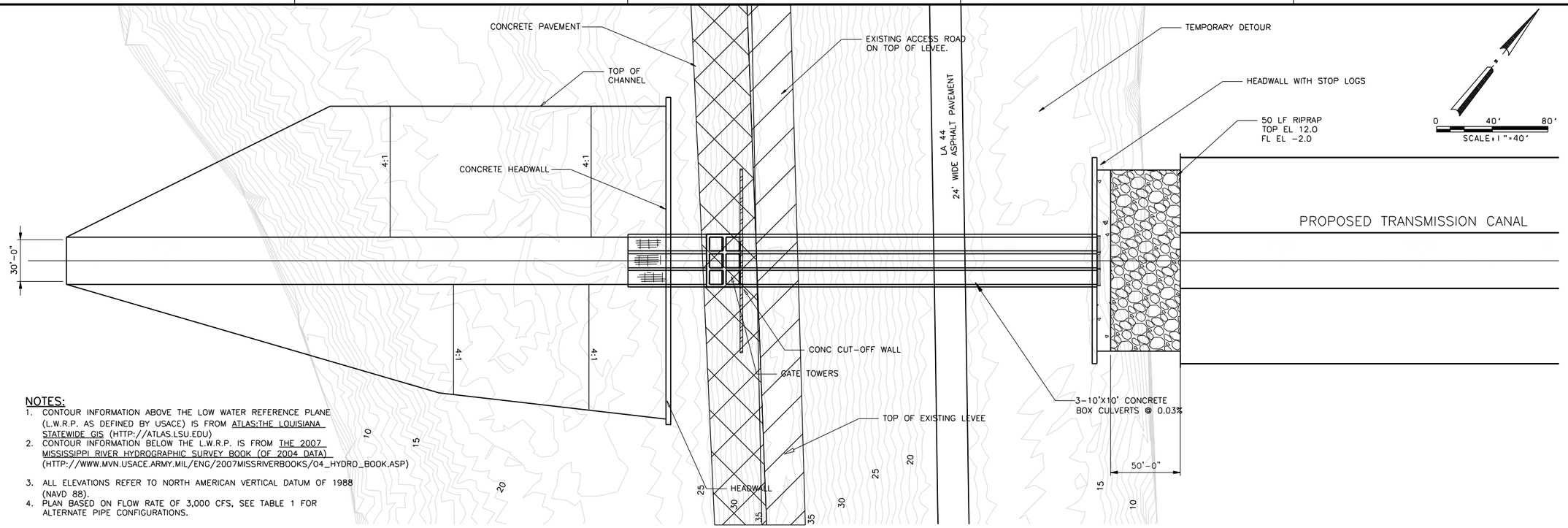
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: STOLZB		DATE: 2009/12
DWN BY: ROMEROC	CKD BY: LLEWELLYNR	
SUBMITTED BY: CDM		
PLOT SCALE: 2000:1	PLOT DATE: 2/17/2010	FILE NUMBER:
SIZE: ANSI D	FILE NAME: H247247_05C01---C-001---.dgn	

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
ROMEVILLE DIVERSION ALIGNMENT

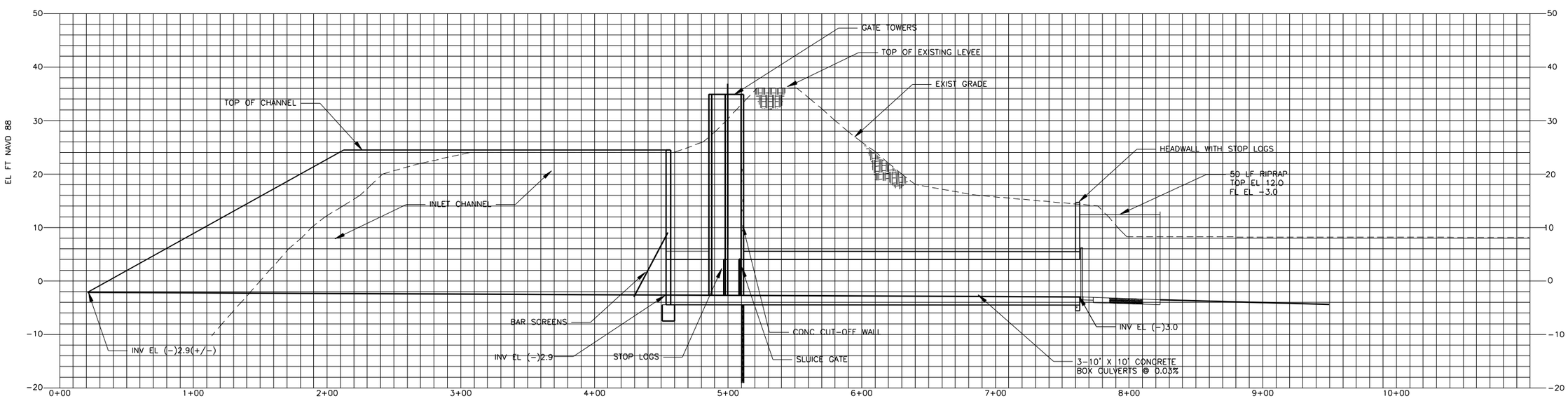
SHEET IDENTIFICATION
C-001

3:28:27 PM



NOTES:

1. CONTOUR INFORMATION ABOVE THE LOW WATER REFERENCE PLANE (L.W.R.P. AS DEFINED BY USACE) IS FROM ATLAS:THE LOUISIANA STATEWIDE GIS (HTTP://ATLAS.LSU.EDU)
2. CONTOUR INFORMATION BELOW THE L.W.R.P. IS FROM THE 2007 MISSISSIPPI RIVER HYDROGRAPHIC SURVEY BOOK (OF 2004 DATA) (HTTP://WWW.MVN.USACE.ARMY.MIL/ENG/2007MISSRIVERBOOKS/04_HYDRO_BOOK.ASP)
3. ALL ELEVATIONS REFER TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
4. PLAN BASED ON FLOW RATE OF 3,000 CFS, SEE TABLE 1 FOR ALTERNATE PIPE CONFIGURATIONS.



US Army Corps of Engineers
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

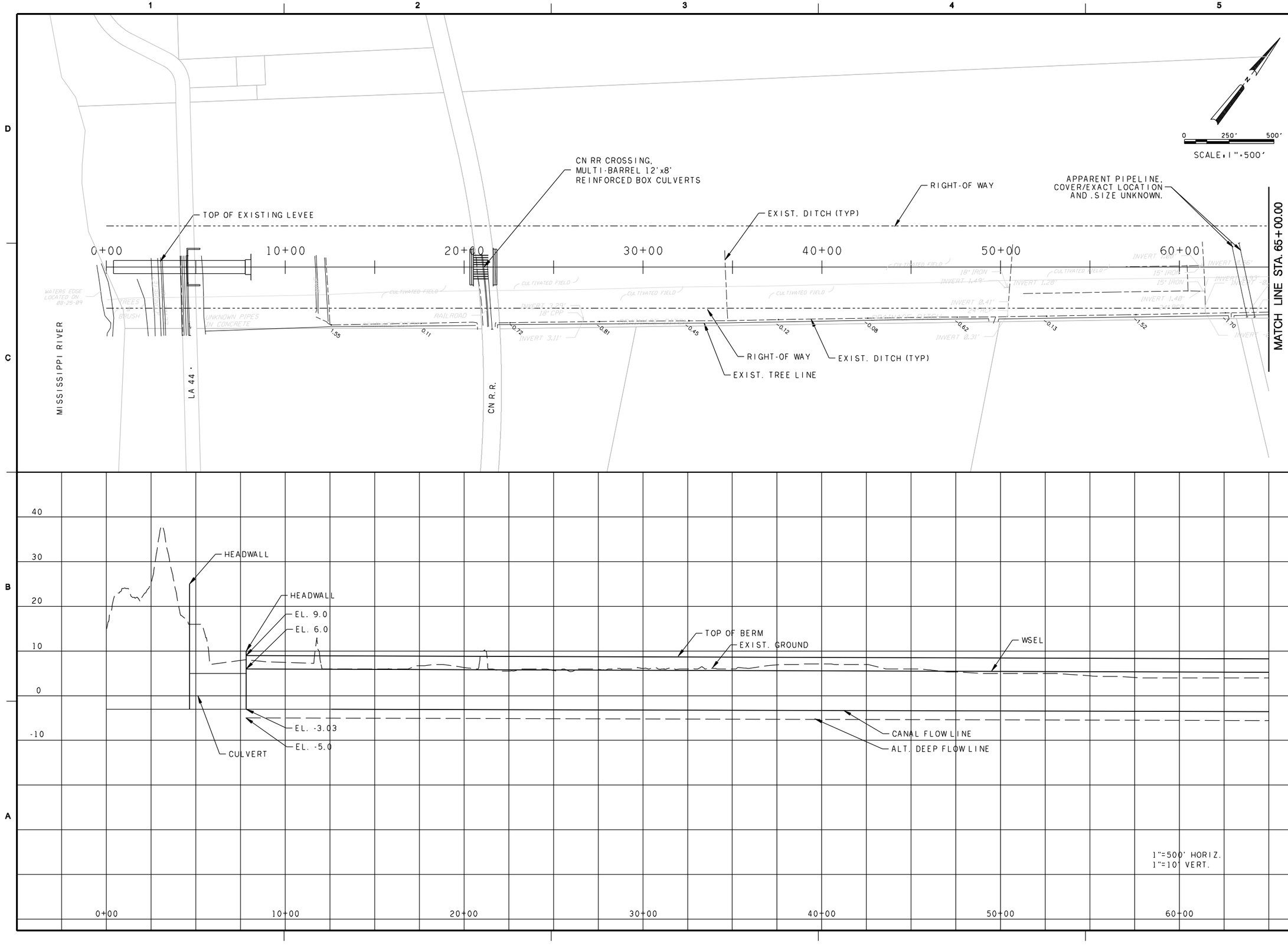
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: WILLIAMSB
DWN BY: BLOCKWOOD
SUBMITTED BY: CDM
PLOT SCALE:
SIZE: ANSI D
DATE: 2009/12
CKD BY: WILLIAMSB
PLOT DATE: 2/17/2010
FILE NAME: 1247247_09003--C-003--DGN
FILE NUMBER:

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
ROMEVILLE CULVERT
PLAN AND PROFILE

SHEET IDENTIFICATION
C-002

5:10:39 PM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: LLEWELLYNR
DRAWN BY: ROMEROC
SUBMITTED BY: CDM
DATE: 2009/12
CKD BY: LLEWELLYNR
PLOT SCALE: 1:1
PLOT DATE: 2010/03/03
FILE NUMBER:
SIZE: ANSI D
FILE NAME: H247247_05C03—C-003—dgn

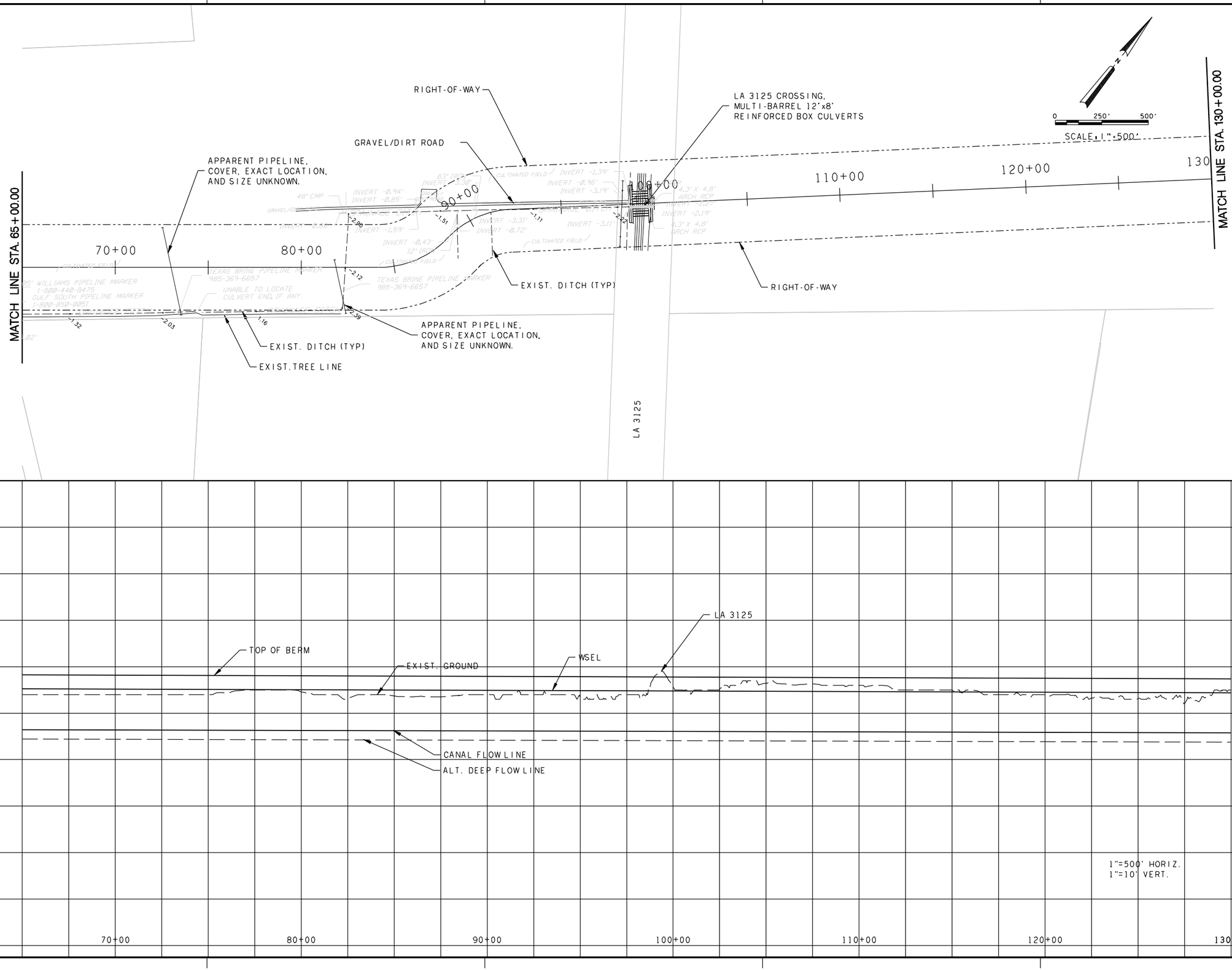
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
ROMEVILLE TRANSMISSION CANAL
PLAN AND PROFILE

SHEET
IDENTIFICATION
C-003

4:23:23 PM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: LLEWELLYNR		DATE: 2009/12	
DWN BY: ROMEROC	CKD BY: LLEWELLYNR		
SUBMITTED BY: CDM			
PLOT SCALE: 1=1	PLOT DATE: 2/7/2010	FILE NUMBER:	
SIZE: ANSI D	FILE NAME: H247247_09CH4—C-004—dgn		

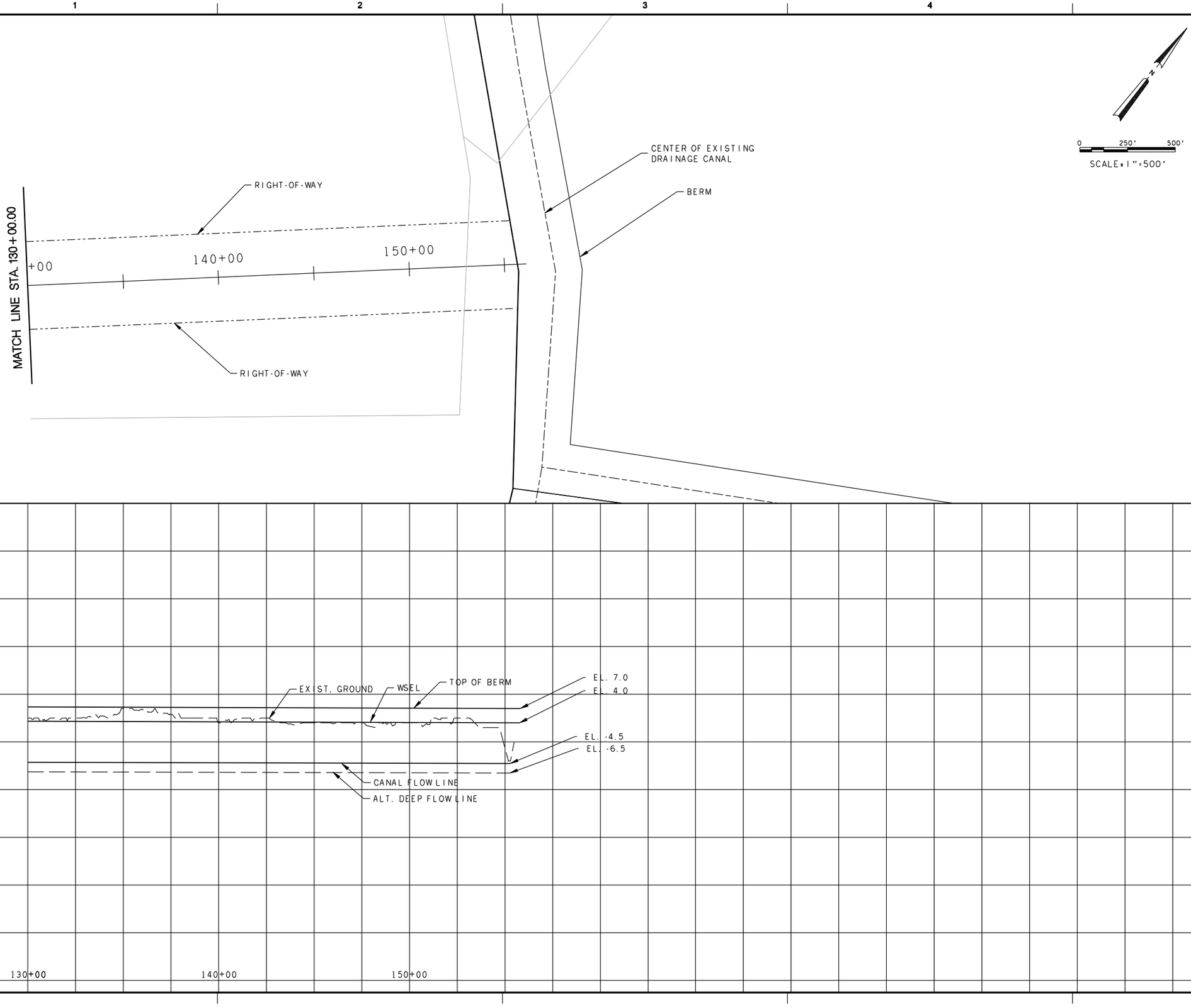
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
ROMEVILLE TRANSMISSION CANAL
PLAN AND PROFILE

SHEET
IDENTIFICATION
C-004

4:23:46 PM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

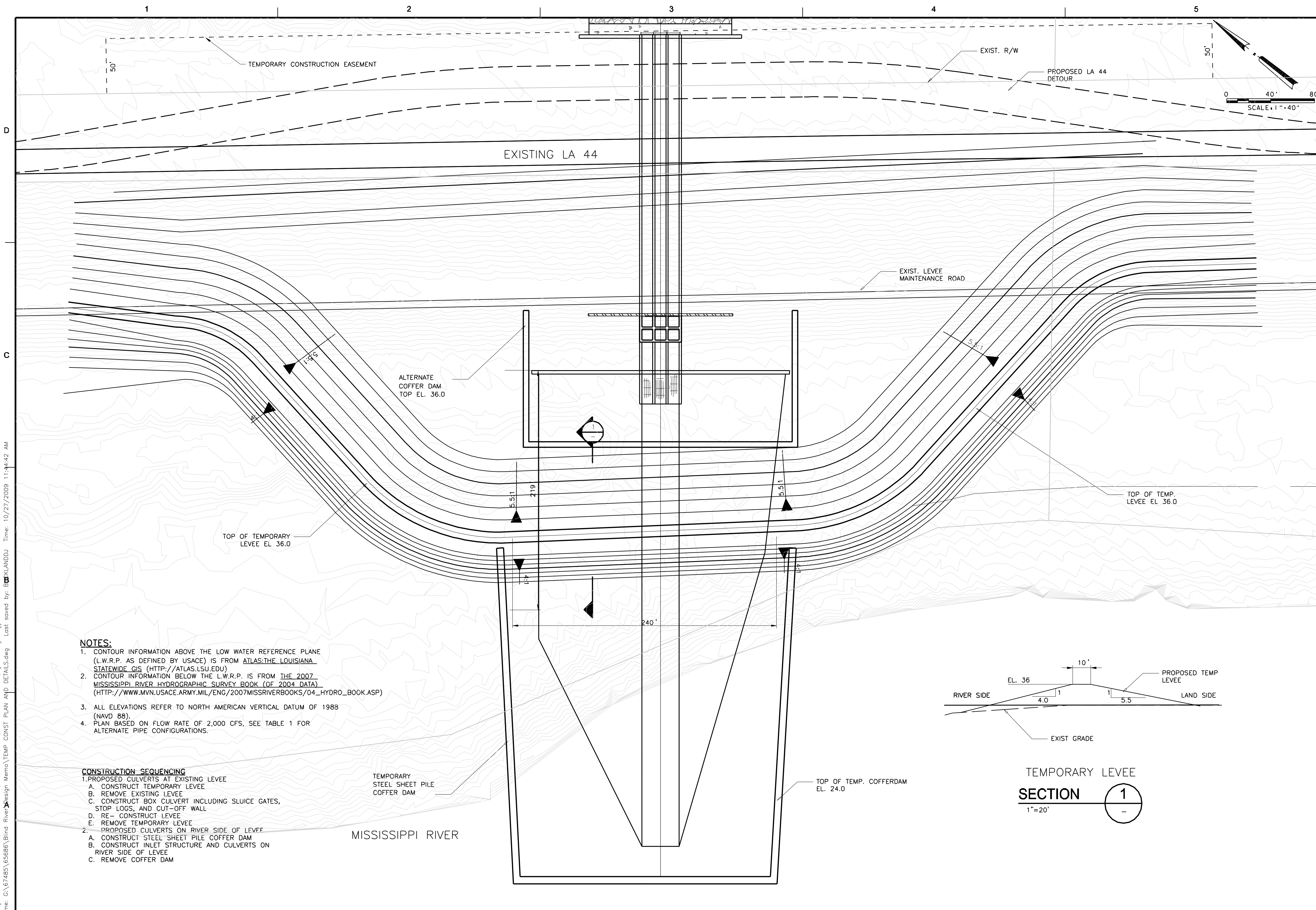
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: LLEWELLYNR
DWN BY: ROMEROC
SUBMITTED BY: CDM
CKD BY: LLEWELLYNR
PLOT SCALE: 1:1
PLOT DATE: 2/7/2020
SIZE: ANSI D
DATE: 2/2020
FILE NUMBER:
FILE NAME: h247247_05C05—C-005—dgn

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
ROMEVILLE TRANSMISSION CANAL
PLAN AND PROFILE

SHEET IDENTIFICATION
C-005

4:31:20 PM



NOTES:

1. CONTOUR INFORMATION ABOVE THE LOW WATER REFERENCE PLANE (L.W.R.P. AS DEFINED BY USACE) IS FROM ATLAS:THE LOUISIANA STATEWIDE GIS (HTTP://ATLAS.LSU.EDU)
2. CONTOUR INFORMATION BELOW THE L.W.R.P. IS FROM THE 2007 MISSISSIPPI RIVER HYDROGRAPHIC SURVEY BOOK (OF 2004 DATA) (HTTP://WWW.MVN.USACE.ARMY.MIL/ENG/2007MISSRIVERBOOKS/04_HYDRO_BOOK.ASP)
3. ALL ELEVATIONS REFER TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
4. PLAN BASED ON FLOW RATE OF 2,000 CFS, SEE TABLE 1 FOR ALTERNATE PIPE CONFIGURATIONS.

CONSTRUCTION SEQUENCING

1. PROPOSED CULVERTS AT EXISTING LEVEE
   - A. CONSTRUCT TEMPORARY LEVEE
   - B. REMOVE EXISTING LEVEE
   - C. CONSTRUCT BOX CULVERT INCLUDING SLUICE GATES, STOP LOGS, AND CUT-OFF WALL
   - D. RE- CONSTRUCT LEVEE
   - E. REMOVE TEMPORARY LEVEE
2. PROPOSED CULVERTS ON RIVER SIDE OF LEVEE
   - A. CONSTRUCT STEEL SHEET PILE COFFER DAM
   - B. CONSTRUCT INLET STRUCTURE AND CULVERTS ON RIVER SIDE OF LEVEE
   - C. REMOVE COFFER DAM

US Army Corps of Engineers® New Orleans District

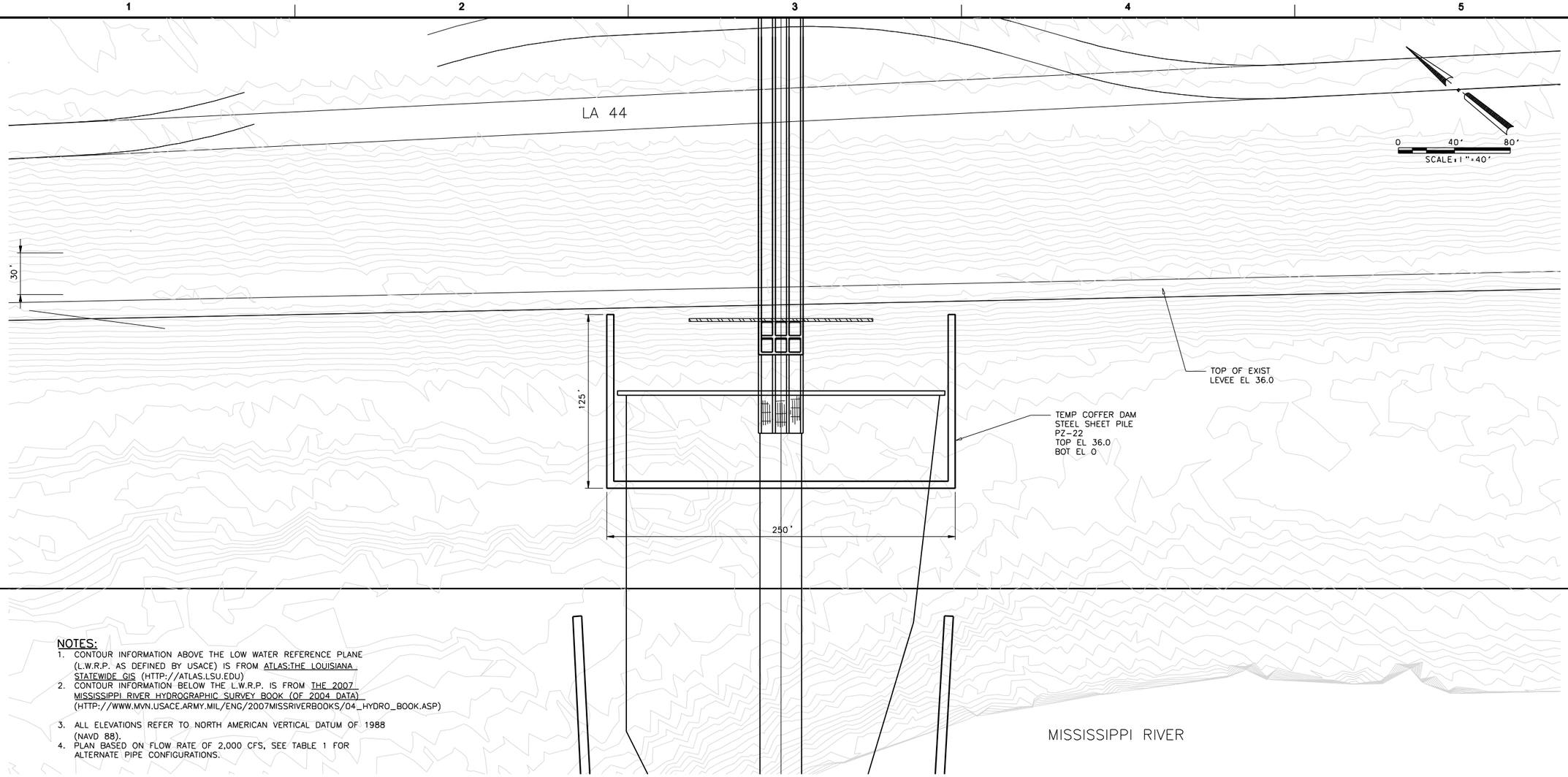
DESIGNED BY: | DATE: 200912 | DWN BY: | CKD BY: | SUBMITTED BY: CDM | PLOT SCALE: | PLOT DATE: 3/1/2010 | FILE NUMBER: | SIZE: ANSI D | FILE NAME:

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
CULVERT DETAILS LEVEE RELOCATION
AND LA44 DETOUR SHEET

SHEET IDENTIFICATION
C-007



NOTES:
1. CONTOUR INFORMATION ABOVE THE LOW WATER REFERENCE PLANE (L.W.R.P. AS DEFINED BY USACE) IS FROM ATLAS:THE LOUISIANA STATEWIDE GIS (HTTP://ATLAS.LSU.EDU)
2. CONTOUR INFORMATION BELOW THE L.W.R.P. IS FROM THE 2007 MISSISSIPPI RIVER HYDROGRAPHIC SURVEY BOOK (OF 2004 DATA) (HTTP://WWW.MVN.USACE.ARMY.MIL/ENG/2007MISSRIVERBOOKS/04_HYDRO_BOOK.ASP)
3. ALL ELEVATIONS REFER TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
4. PLAN BASED ON FLOW RATE OF 2,000 CFS, SEE TABLE 1 FOR ALTERNATE PIPE CONFIGURATIONS.

TEMPORARY COFFER DAM

PLAN

1" = 40'

CONSTRUCTION SEQUENCING

1. PROPOSED CULVERTS AT EXISTING LEVEE
   - A. CONSTRUCT TEMPORARY LEVEE
   - B. REMOVE EXISTING LEVEE
   - C. CONSTRUCT BOX CULVERT INCLUDING SLUICE GATES, STOP LOGS, AND CUT-OFF WALL
   - D. RE- CONSTRUCT LEVEE
   - E. REMOVE TEMPORARY LEVEE
2. PROPOSED CULVERTS ON RIVER SIDE OF LEVEE
   - A. CONSTRUCT STEEL SHEET PILE COFFER DAM
   - B. CONSTRUCT INLET STRUCTURE AND CULVERTS ON RIVER SIDE OF LEVEE
   - C. REMOVE COFFER DAM

US Army Corps of Engineers
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

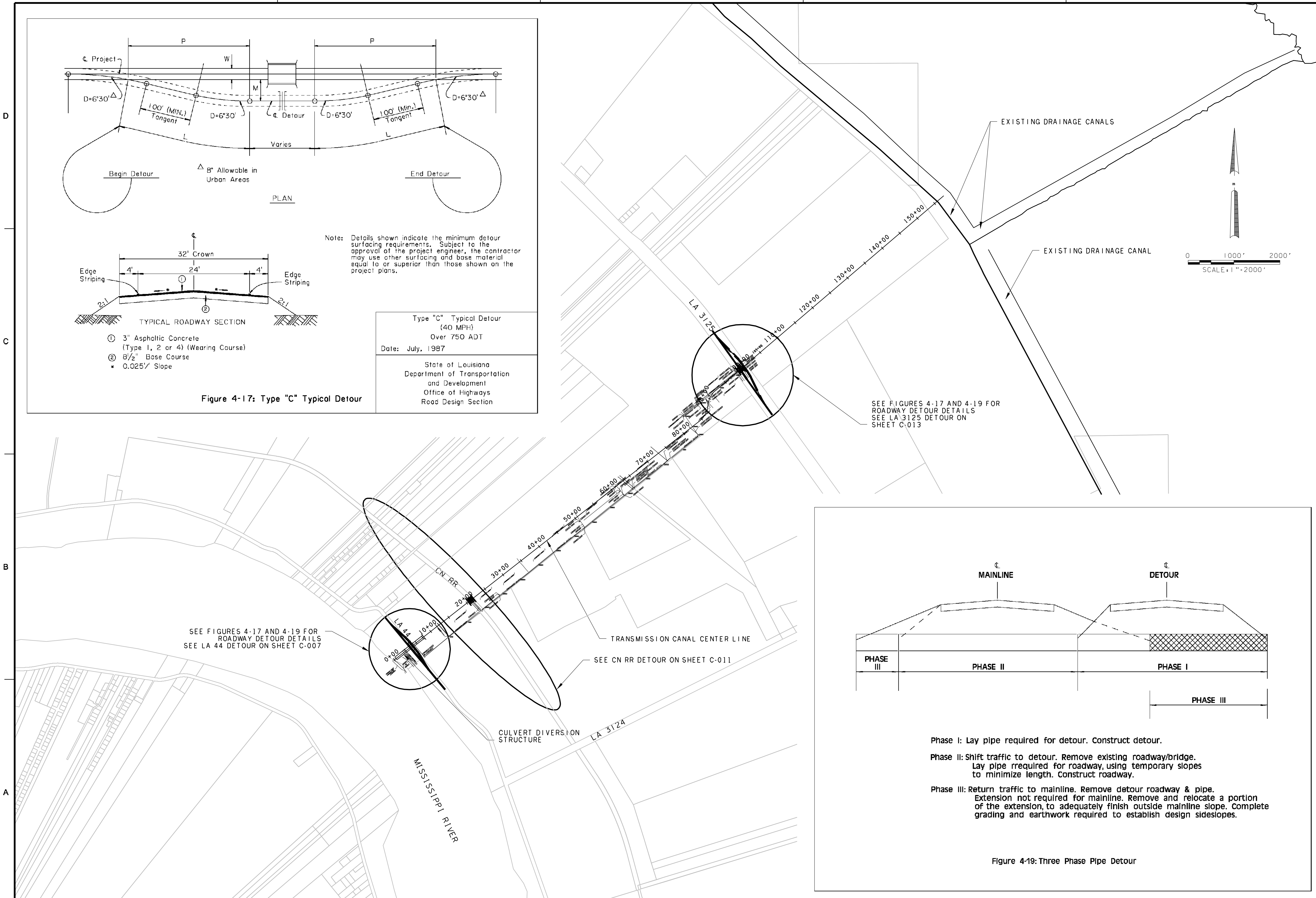
DESIGNED BY: CDM | DRWN BY: | CKD BY: | SUBMITTED BY: CDM | DATE: 2009/12 | PLOT SCALE: | PLOT DATE: 1/13/2010 | FILE NUMBER: | FILE NAME: | SIZE: ANSI D

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1360
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
CULVERT DETAILS - TEMPORARY COFFER DAMS

SHEET IDENTIFICATION
C-008



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

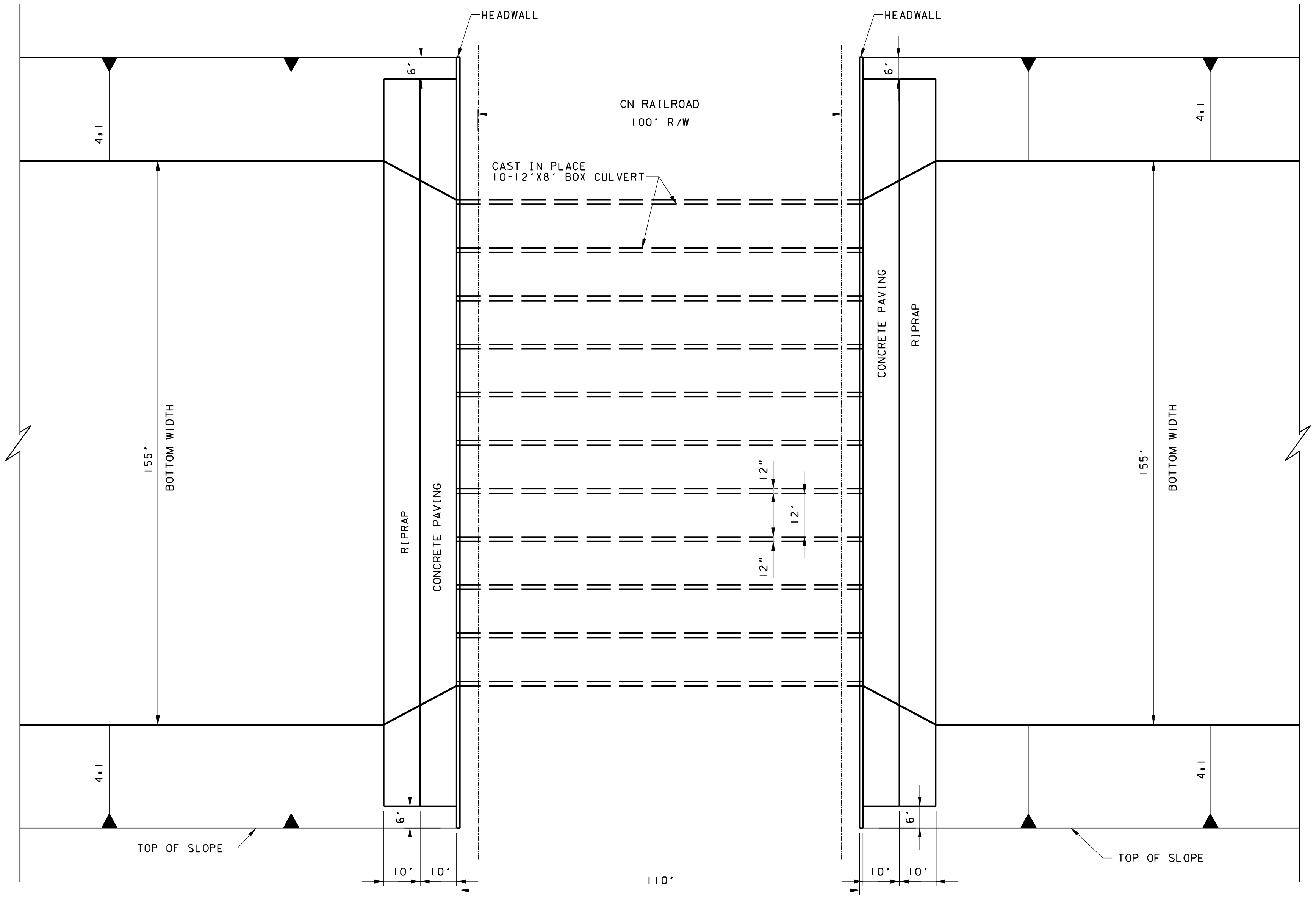
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: STOLZB
DATE: 2009/12
DWN BY: ROMEROC
CKD BY: LLEWELLYNR
SUBMITTED BY: CDM
PLOT SCALE: 2000:1
PLOT DATE: 3/1/2010
FILE NUMBER:
SIZE: ANSI D
FILE NAME: H247247_05C09---C-009---.dgn

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
DETOUR LOCATION LAYOUT

SHEET IDENTIFICATION
C-009

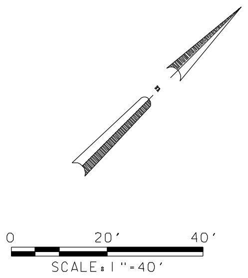
11:30:23 AM

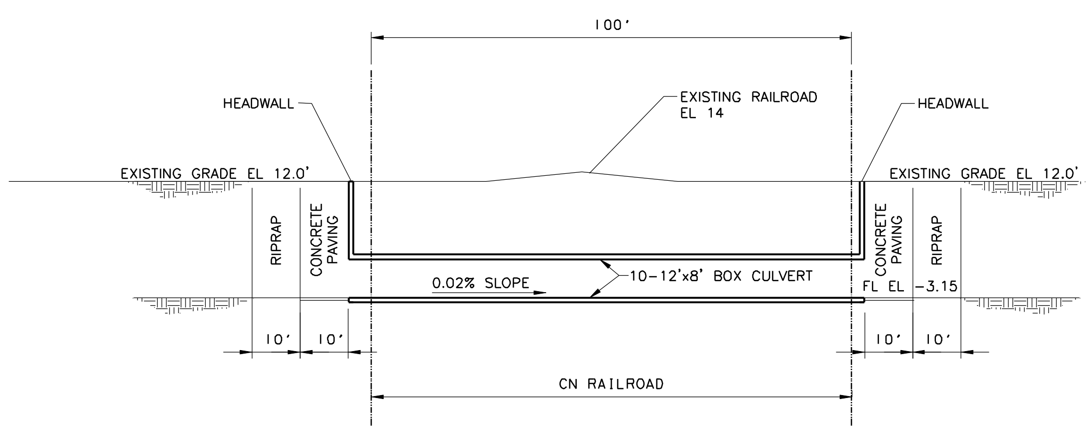


TRANSMISSION CANAL CULVERTS UNDER CN RAILROAD

PLAN

1" = 40'





TRANSMISSION CANAL CULVERTS UNDER CN RAILROAD

PROFILE

1" = 40'

NOTES:
1. OPEN-CUT CONSTRUCTION.

US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

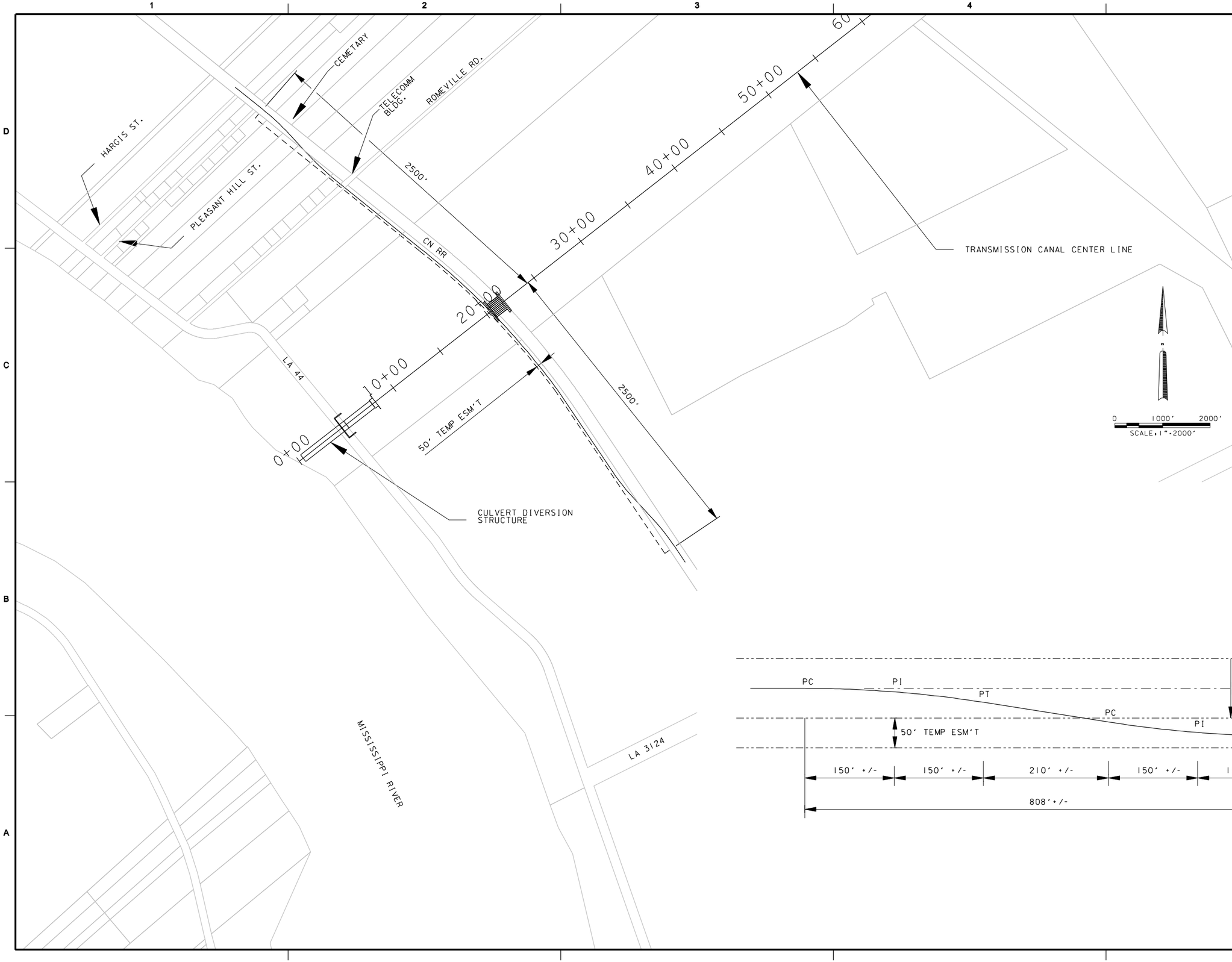
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: STOLZB		DATE: 2009/12
DWN BY: ROMEROC	CKD BY: LLEWELLYNR	
SUBMITTED BY: CDM		
PLOT SCALE: 1:1	PLOT DATE: 3/1/2010	FILE NUMBER:
SIZE: ANSI D	FILE NAME: H247247_05C510---C-010---.dgn	

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
CN R.R. CROSSING

SHEET IDENTIFICATION
C-010

11:31:54 AM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: STOLZE
DRN BY: ROMEROC
CKD BY: LLEWELLYNR
SUBMITTED BY: CDM
PLOT SCALE: As noted
SIZE: ANSI D
DATE: 2009/12
PLOT DATE: 2009/12
FILE NUMBER:
FILE NAME: 12x12x7_05c11--C-011---dgn

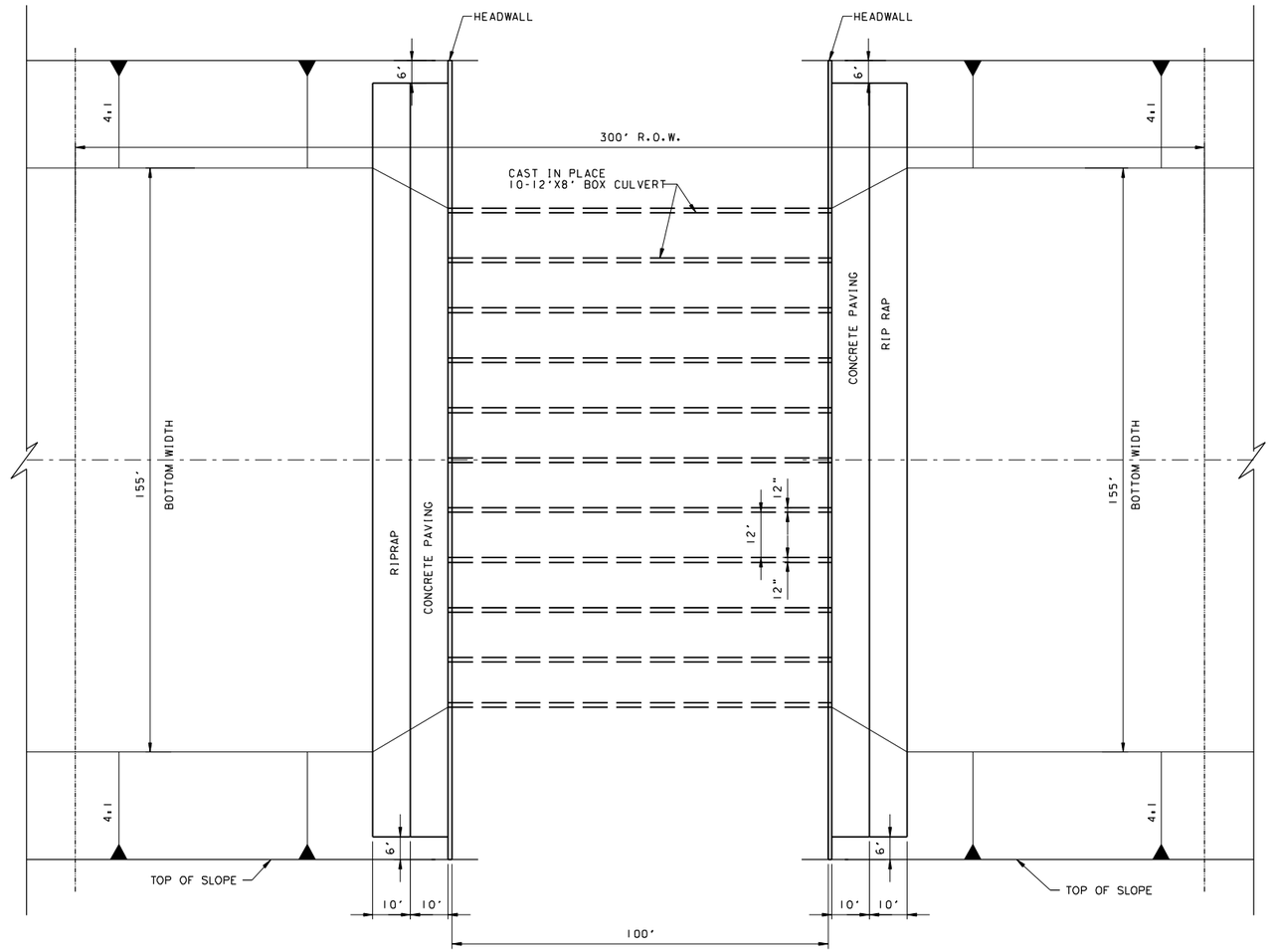
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
CN RR DETOUR SHEET

SHEET IDENTIFICATION
C-011

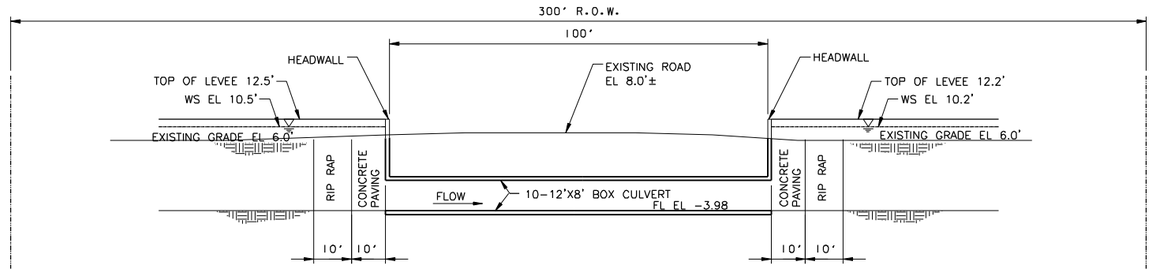
11:34:03 AM



TRANSMISSION CANAL CULVERTS UNDER LA3125

PLAN

1" = 40'



TRANSMISSION CANAL CULVERTS UNDER LA3125

PROFILE

1" = 40'

0 20' 40'

SCALE: 1"=40'

NOTES:
1. OPEN-CUT CONSTRUCTION.

US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

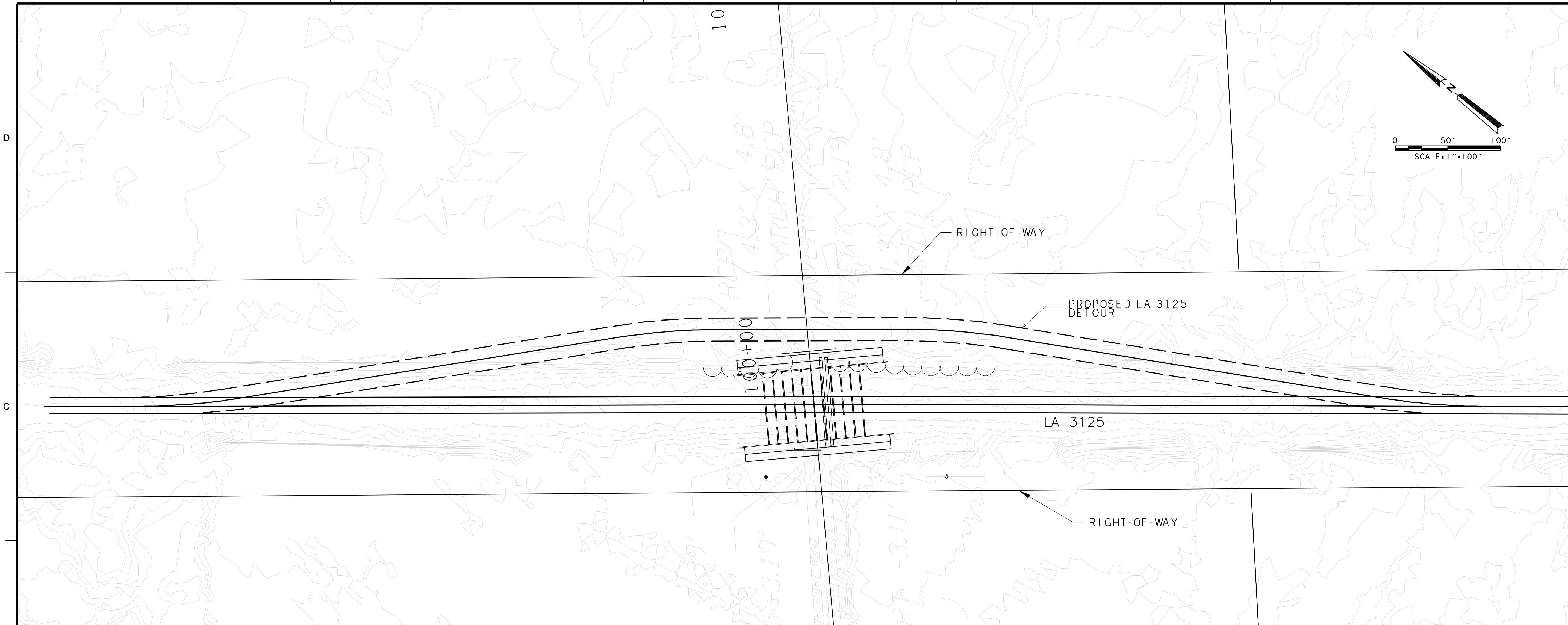
U.S. ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT NEW ORLEANS, LOUISIANA	DESIGNED BY: BTOLZB	DATE: 2008/12	
	DWN BY: ROMEROC	CKD BY: LLEWELLYNR	
	SUBMITTED BY: CDM		
	PLOT SCALE: 1:1	PLOT DATE: AUG/05	FILE NUMBER:
	SIZE: ANSI D	FILE NAME: H247247_050512--C-012--.dgn	

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
LA3125 CROSSING

SHEET IDENTIFICATION
C-012

11:35:52 AM



NOTES:

1. CONTOUR INFORMATION ABOVE THE LOW WATER REFERENCE PLANE (L.W.R.P. AS DEFINED BY USACE) IS FROM ATLAS:THE LOUISIANA STATEWIDE GIS (HTTP://ATLAS.LSU.EDU)
2. CONTOUR INFORMATION BELOW THE L.W.R.P. IS FROM THE 2007 MISSISSIPPI RIVER HYDROGRAPHIC SURVEY BOOK (OF 2004 DATA) (HTTP://WWW.MVN.USACE.ARMY.MIL/ENG/2007MISSRIVERBOOKS/04_HYDRO_BOOK.ASP)
3. ALL ELEVATIONS REFER TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
4. PLAN BASED ON FLOW RATE OF 2,000 CFS, SEE TABLE 1 FOR ALTERNATE PIPE CONFIGURATIONS.

CONSTRUCTION SEQUENCING

1. PROPOSED CULVERTS AT EXISTING LEVEE
   - A. CONSTRUCT TEMPORARY LEVEE
   - B. REMOVE EXISTING LEVEE
   - C. CONSTRUCT BOX CULVERT INCLUDING SLUICE GATES, STOP LOGS, AND CUT-OFF WALL
   - D. RE- CONSTRUCT LEVEE
   - E. REMOVE TEMPORARY LEVEE
2. PROPOSED CULVERTS ON RIVER SIDE OF LEVEE
   - A. CONSTRUCT STEEL SHEET PILE COFFER DAM
   - B. CONSTRUCT INLET STRUCTURE AND CULVERTS ON RIVER SIDE OF LEVEE
   - C. REMOVE COFFER DAM

US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: STOLZB		DATE: 2009/12
DWN BY: ROMEROC	CKD BY: LLEWELLYNR	
SUBMITTED BY: CDM		
PLOT SCALE: 2000:1	PLOT DATE: 3/1/2010	FILE NUMBER:
SIZE: ANSI D	FILE NAME: H247247_05C13---C-013---.dgn	

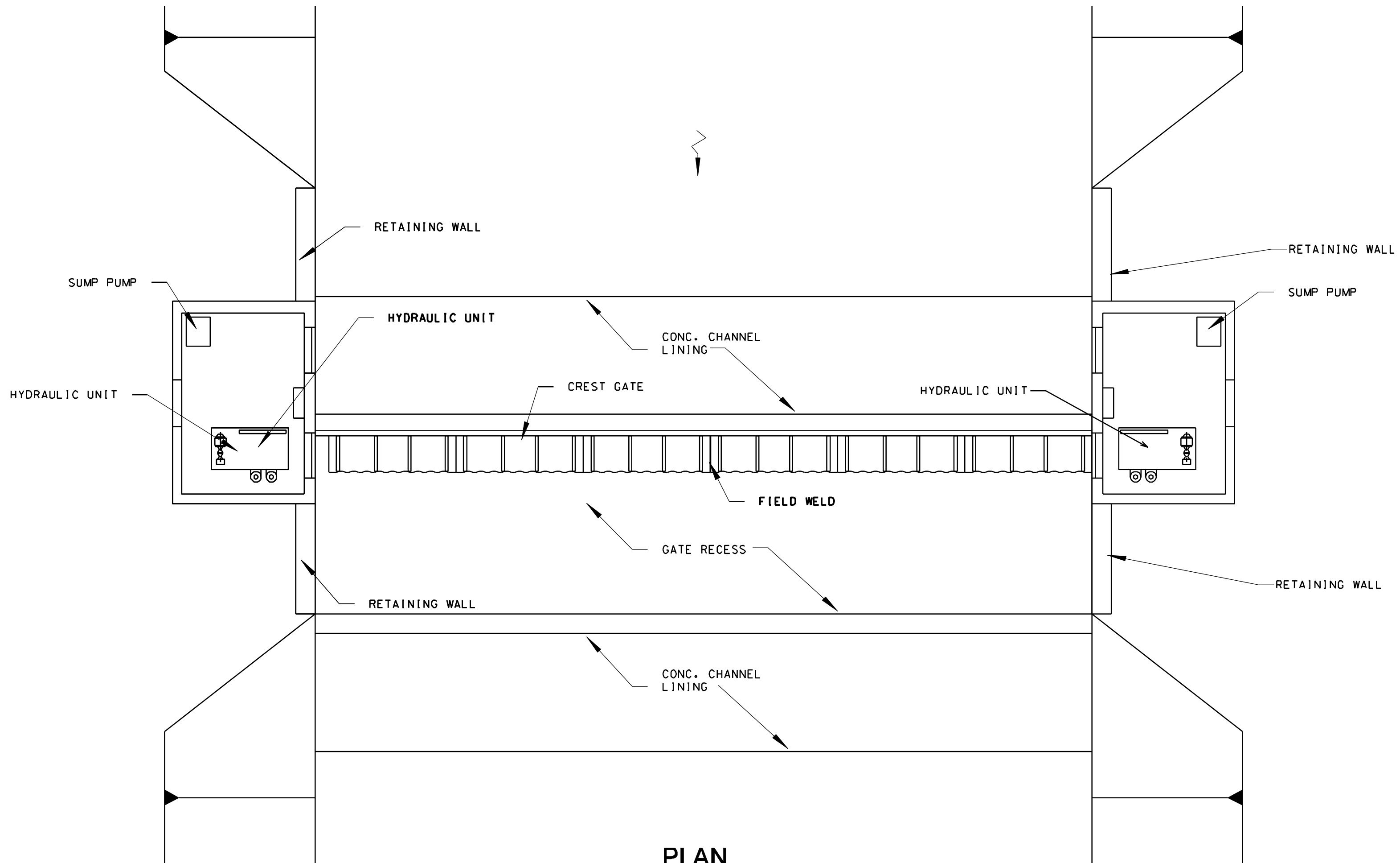
BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
LA3125 DETOUR SHEET

SHEET IDENTIFICATION
C-013

US Army Corps of Engineers®
New Orleans District

NOTES:

1. PILING SIZING, SPACING AND DEPTH SHALL BE DETERMINED FROM GEOTECHNICAL DATA.
2. CONTROL BUILDING, (NOT SHOWN) PRE-FAB CONCRETE STRUCTURE 10'X20' (PLAN) ELEVATED ON CONCRETE PILINGS PILING-4-12" SQUARE, EACH 30' LONG

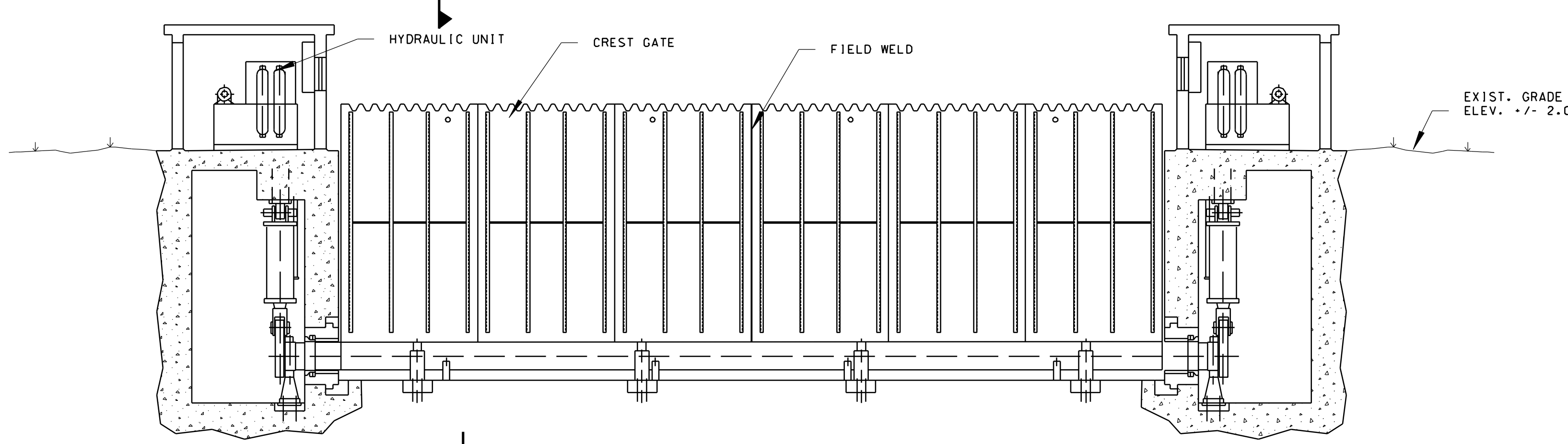


PLAN
N.T.S.

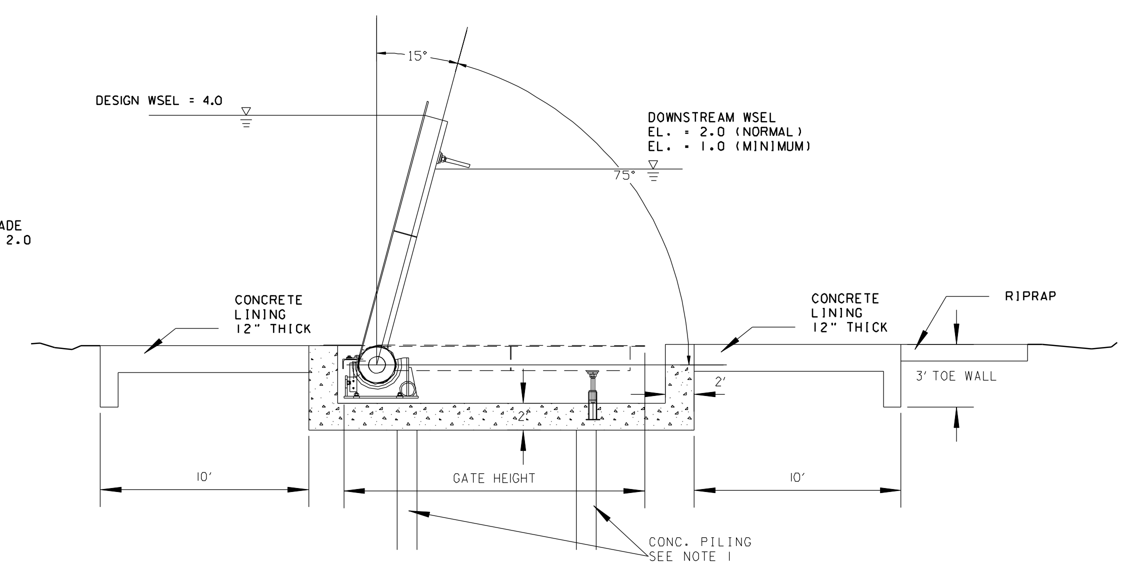
Structure Summary Table

Control Structure	Est. Channel Width (ft)	Est. Channel Depth (from TOB) (ft)	Location Description
1-3	164	8.4	St. James Parish Canal
1-6 East	147	6.7	St. James Parish Canal, At Romeville transmission connection
1-6 South	66	4.9	St. James Parish Canal, At Romeville transmission connection
1-6 North	66	4.7	St. James Parish Canal, At Romeville transmission connection
1-7	65	5.6	St. James Parish Canal near Hwy 61
1-8 Southwest	130	8.1	St. James Parish Canal
1-8 Southeast	130	10.5	St. James Parish Canal
1-8 Northwest	130	10.5	St. James Parish Canal
2-4	65	0	Adjacent to Hwy. 61
3-1	213	12.3	Conway Canal

Control Structures to be used on diversion scenarios.
Control Structure 1-6 and 1-8 will be a 3-way structure controlling flow in 3 directions.



SECTION
N.T.S.



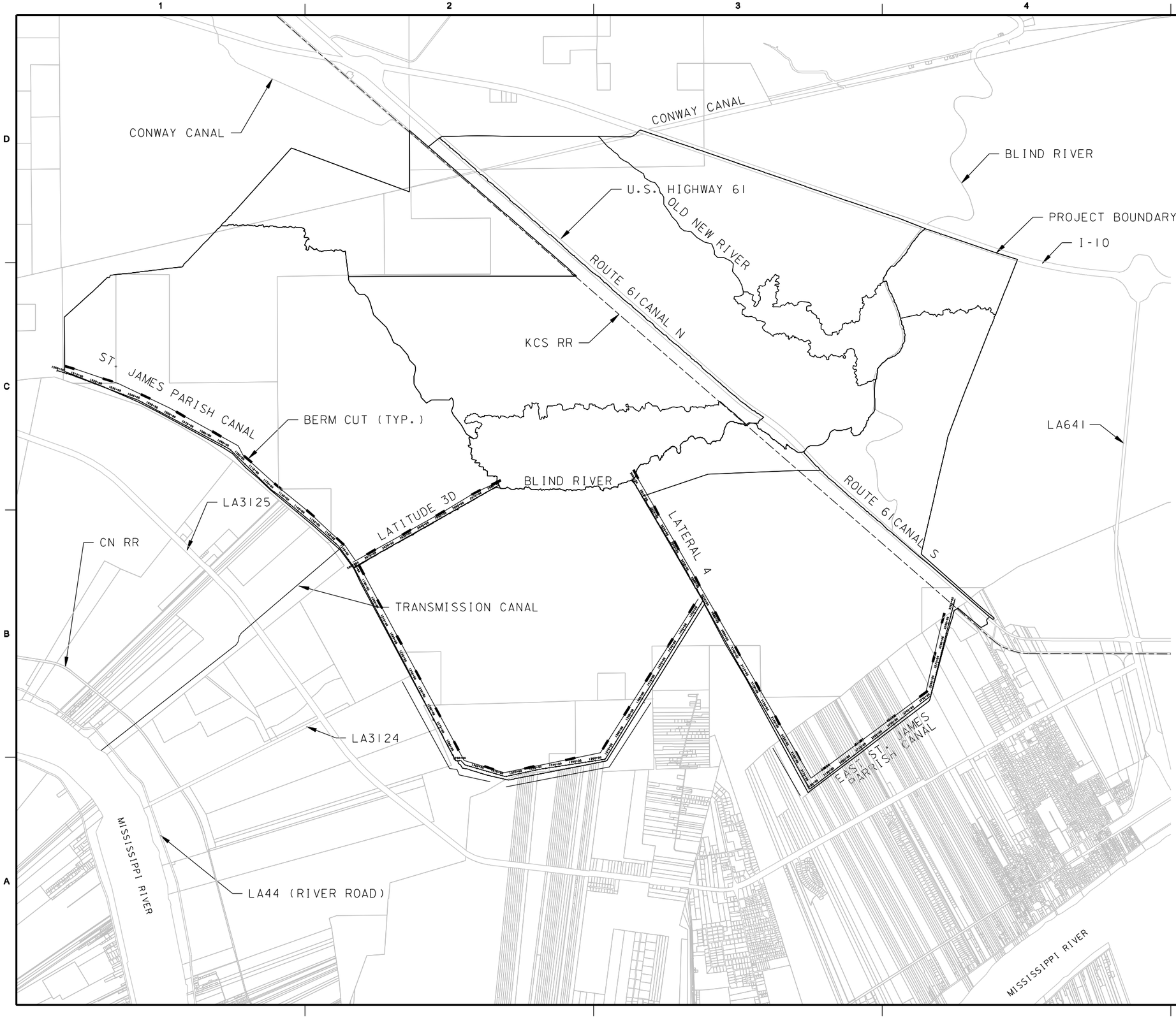
SECTION 1/-
N.T.S.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST. SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
CONTROL STRUCTURE PLAN & DETAILS

SHEET IDENTIFICATION
C-014



1 2 3 4 5

D C B A

11:39:12 AM

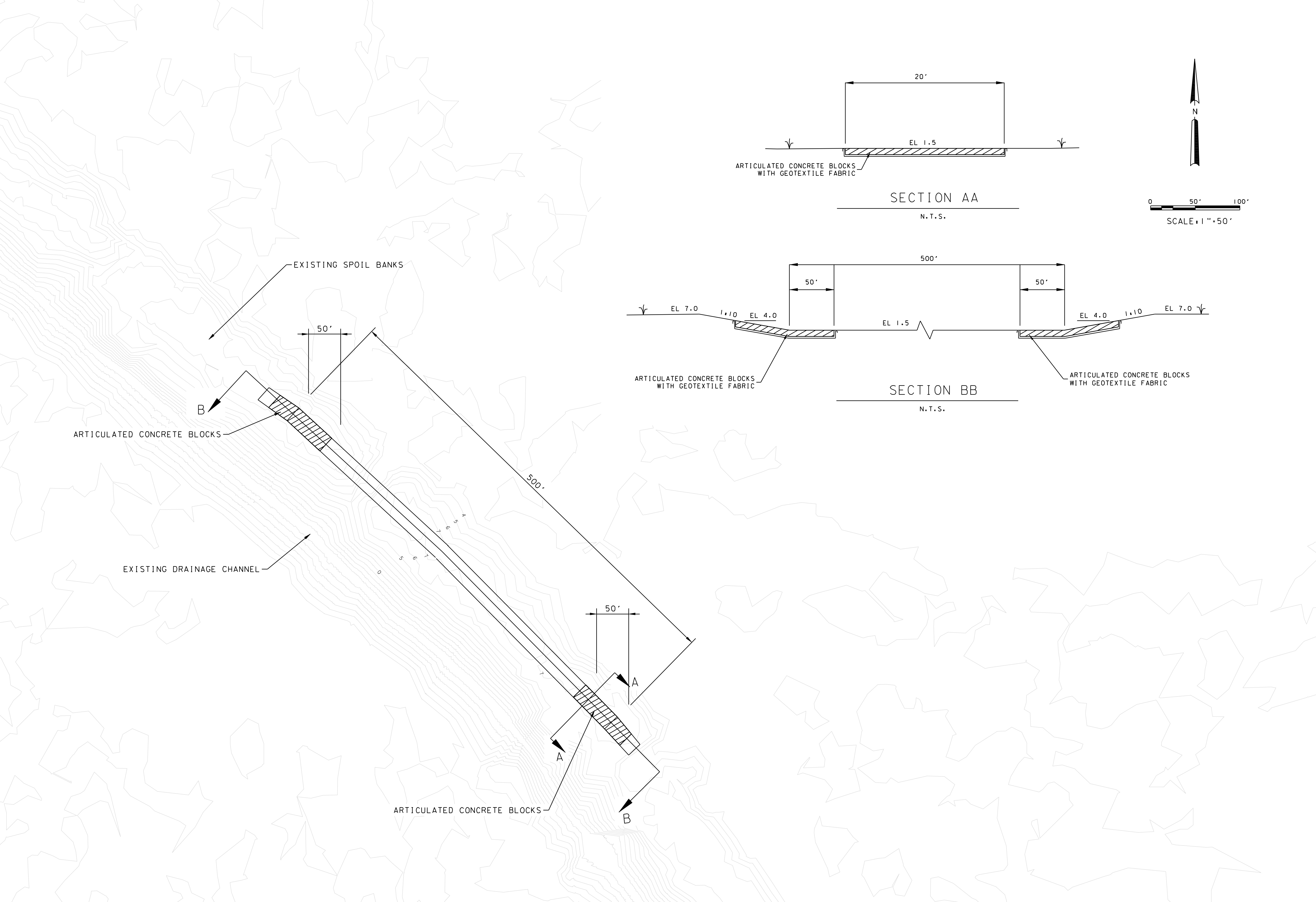
US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS NEW ORLEANS DISTRICT NEW ORLEANS, LOUISIANA	DESIGNED BY: CHEVAUER/B	DRWN BY: ROMERO/C	CKD BY: LEWELLYNR
	SUBMITTED BY: CDM	PLOT SCALE: 1:1	PLOT DATE: 3/9/2012
CDM 1515 POYDRAS ST, SUITE 1350 NEW ORLEANS, LOUISIANA 70112	SIZE: ANSI D	FILE NAME: H247247_05115—C015—dgn	FILE NUMBER:
	DATE: 2009/12		

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS LAYOUT

SHEET IDENTIFICATION
C-015



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

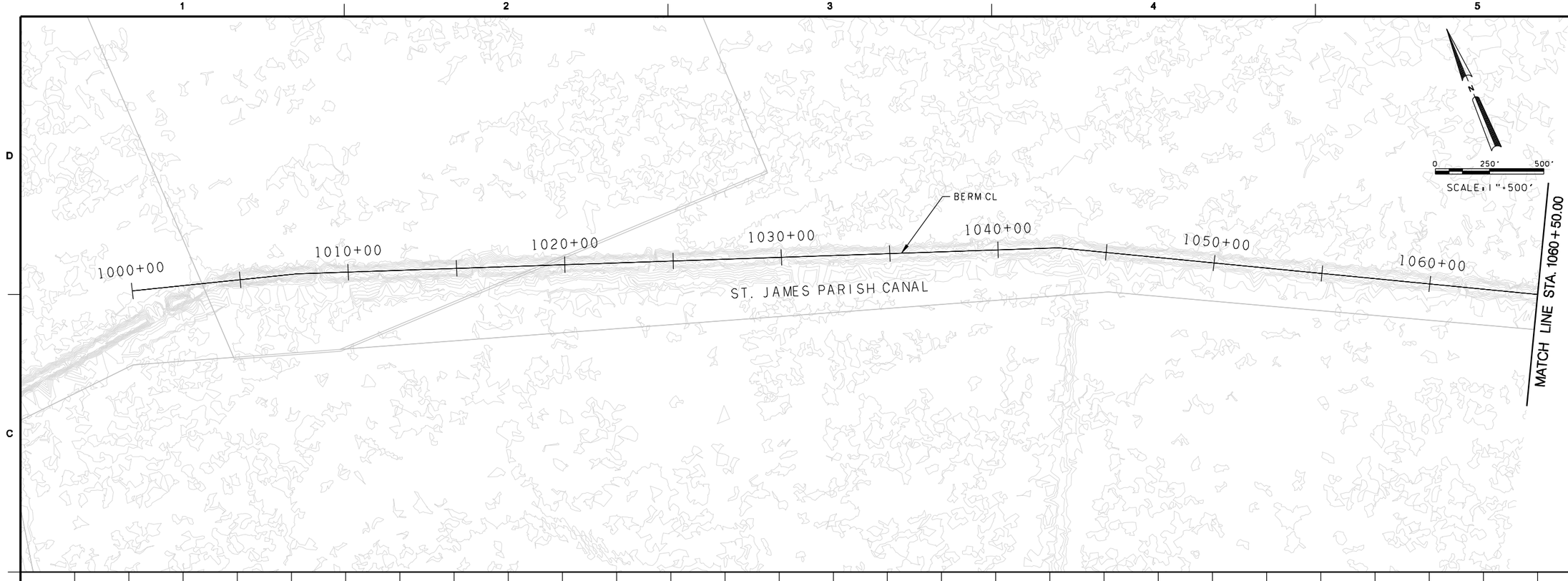
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

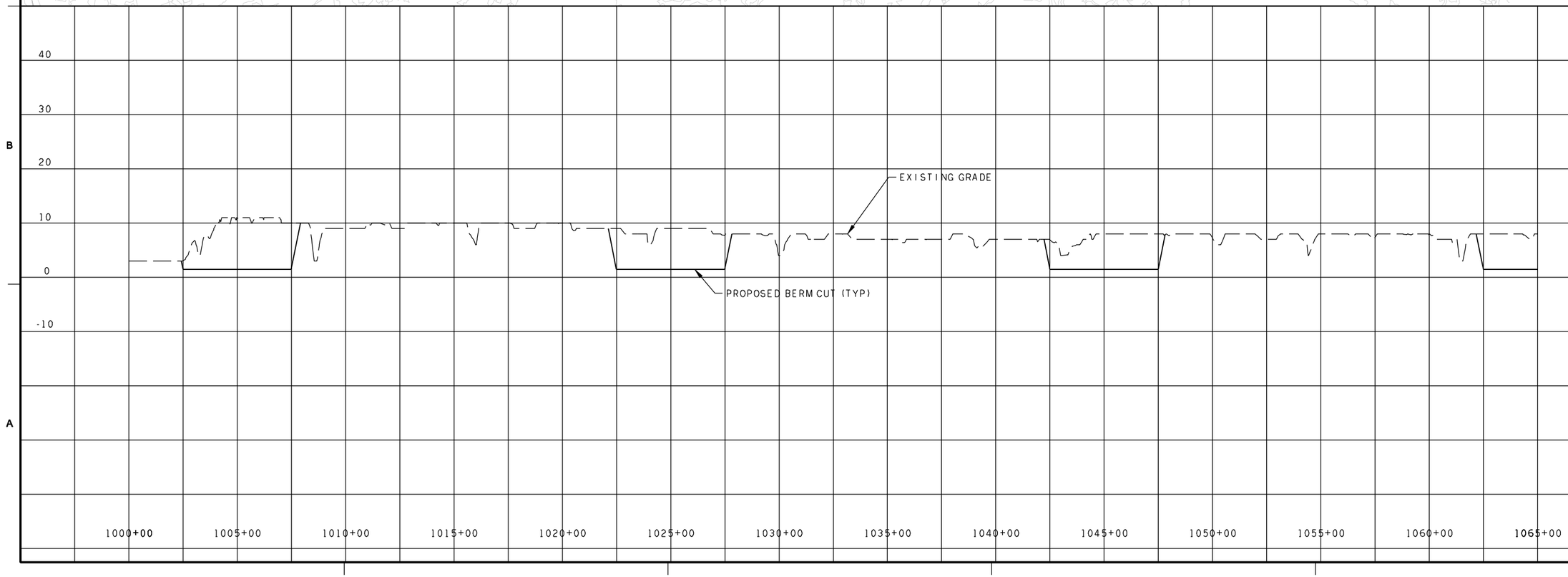
DESIGNED BY: CHEVALIERB		DATE: 2009/12
DWN BY: CHEVALIERB	CKD BY: LLEWELLYNR	
SUBMITTED BY: CDM		
PLOT SCALE: 50:1	PLOT DATE: 3/1/2010	FILE NUMBER:
SIZE: ANSI D	FILE NAME: H247247_01C116---C-016---.dgn	

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM GAP DETAIL

SHEET IDENTIFICATION
C-016

1:33:05 PM





US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: CHEVAUSRB
DRWN BY: ROMEROC
SUBMITTED BY: CDM
CKD BY: LLEWELLYNR
DATE: 2009/12
PLOT SCALE: 1:1
PLOT DATE: 3/4/2010
SIZE: ANSI D
FILE NUMBER:
FILE NAME: h247247_05C117--C-017--dgn

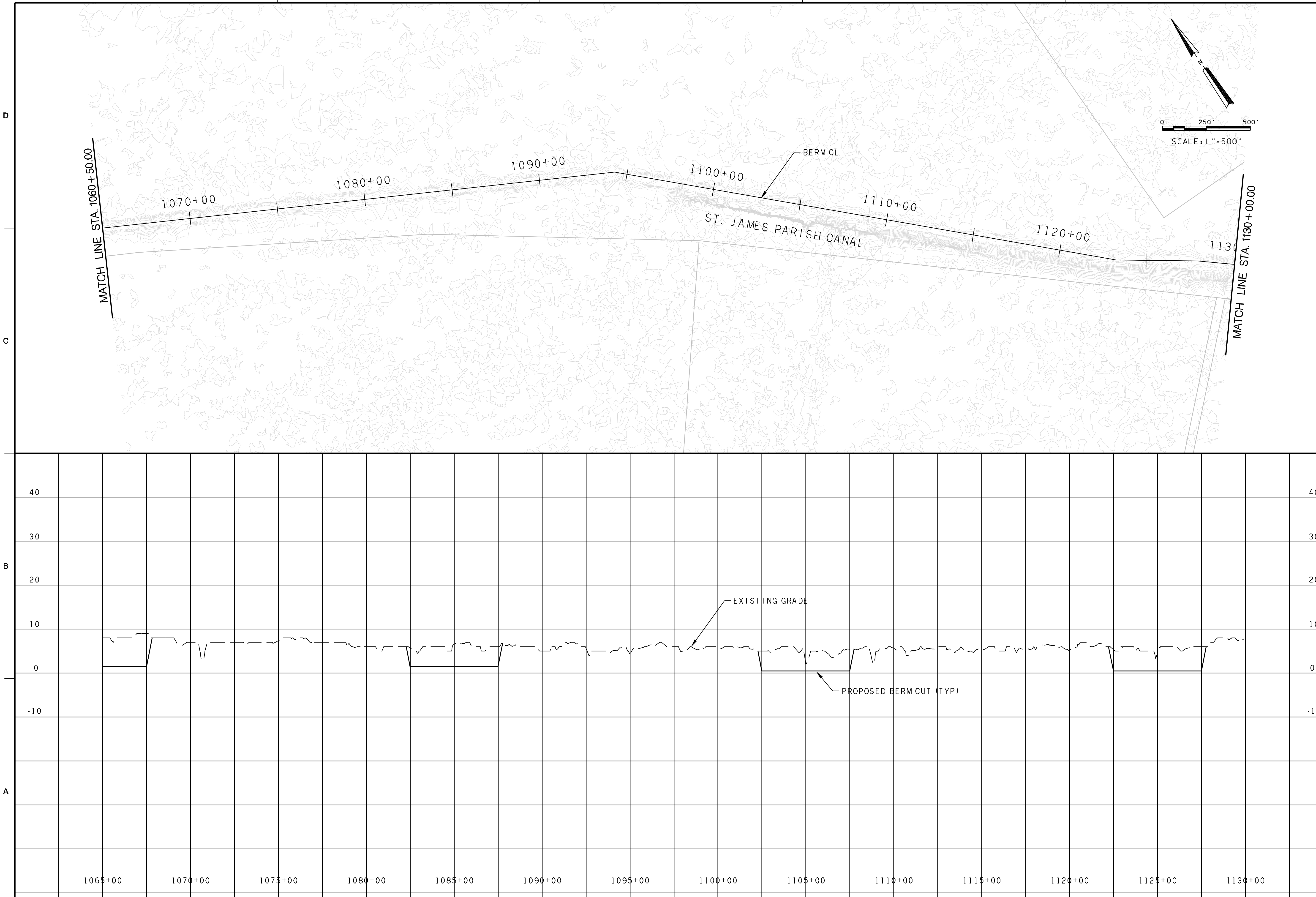
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-017

1:34:04 PM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

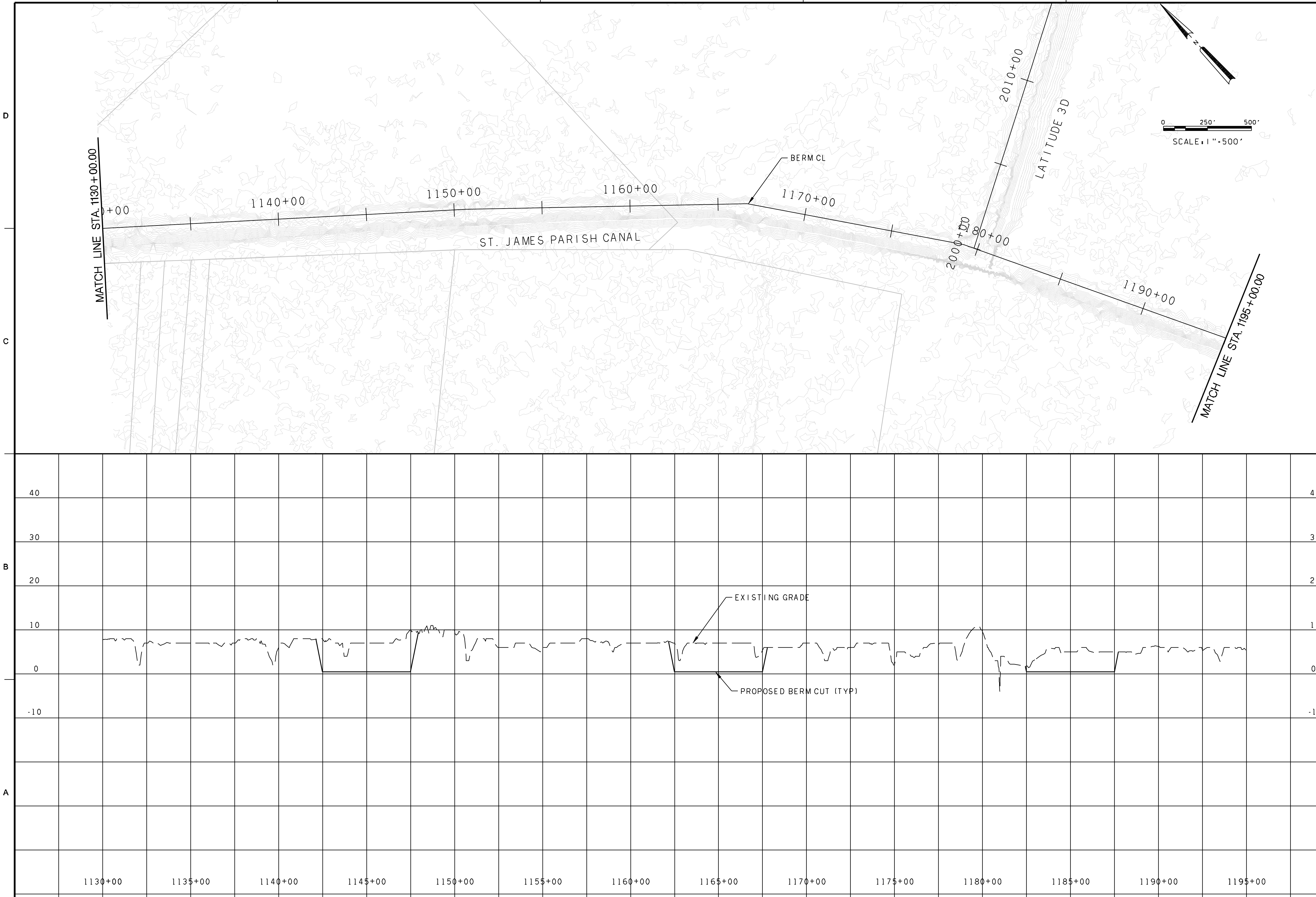
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: CHEVALIERB		DATE: 2009/12
DWN BY: ROMEROC	CKD BY: LLEWELLYNR	
SUBMITTED BY: CDM		
PLOT SCALE: 1:1	PLOT DATE: 3/1/2010	FILE NUMBER:
SIZE: ANSI D	FILE NAME: H247247_05C118---C-018---.dgn	

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-018



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

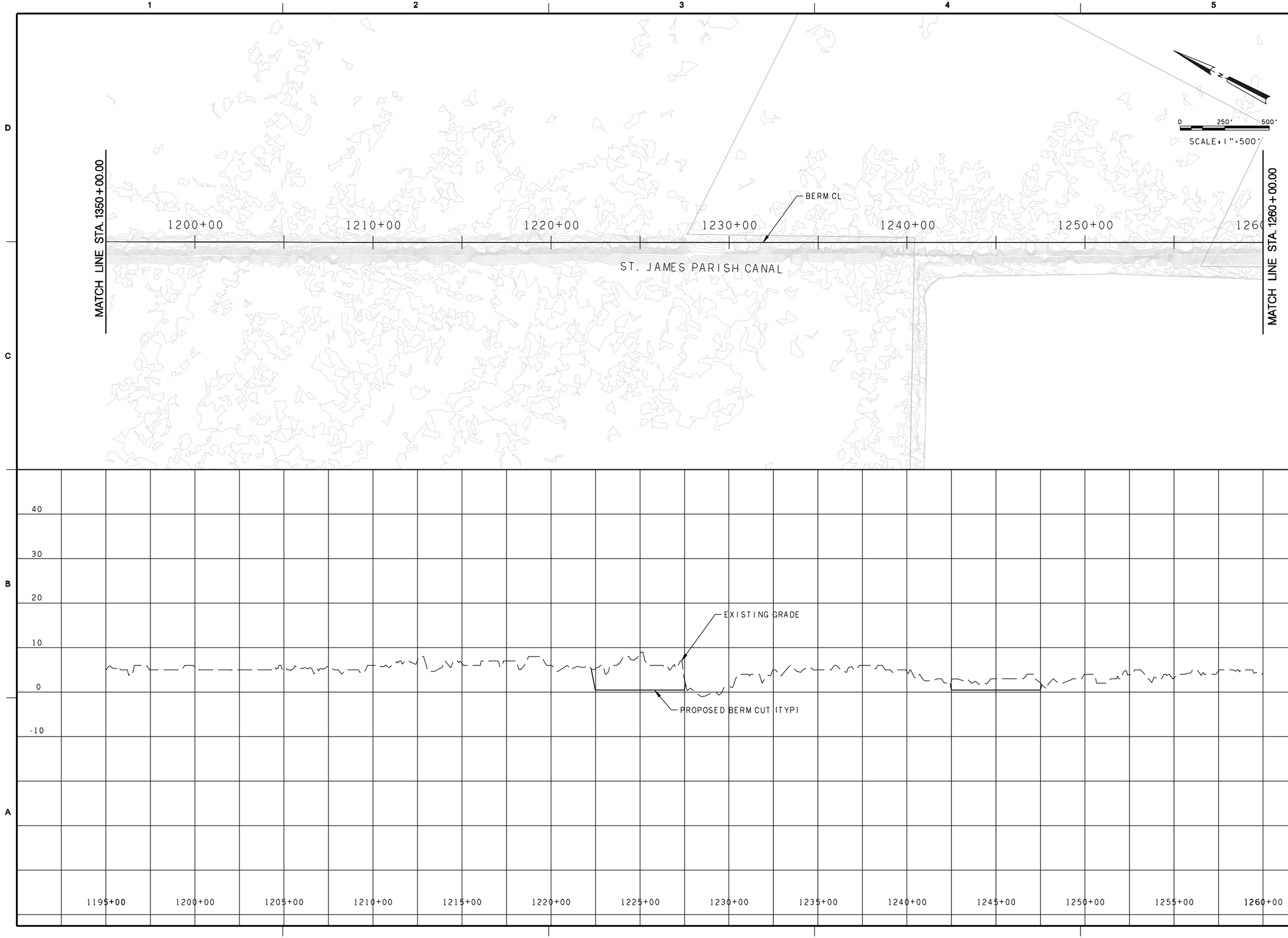
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: CHEVALIERB
DATE: 2009/12
DWN BY: ROMEROC
CKD BY: LLEWELLYNR
SUBMITTED BY: CDM
PLOT SCALE: 1:1
PLOT DATE: 3/1/2010
FILE NUMBER:
SIZE: ANSI D
FILE NAME: H247247_05C119---C-019---.dgn

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-019



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: CHEVAUSB | DRAWN BY: ROMEROC | SUBMITTED BY: CDM | CKD BY: LLEWELLYNR | DATE: 2009/12 | PLOT SCALE: 1:1 | PLOT DATE: AUTO | FILE NUMBER: | SIZE: ANSI D | FILE NAME: h247247_05C120—C-020—dgn

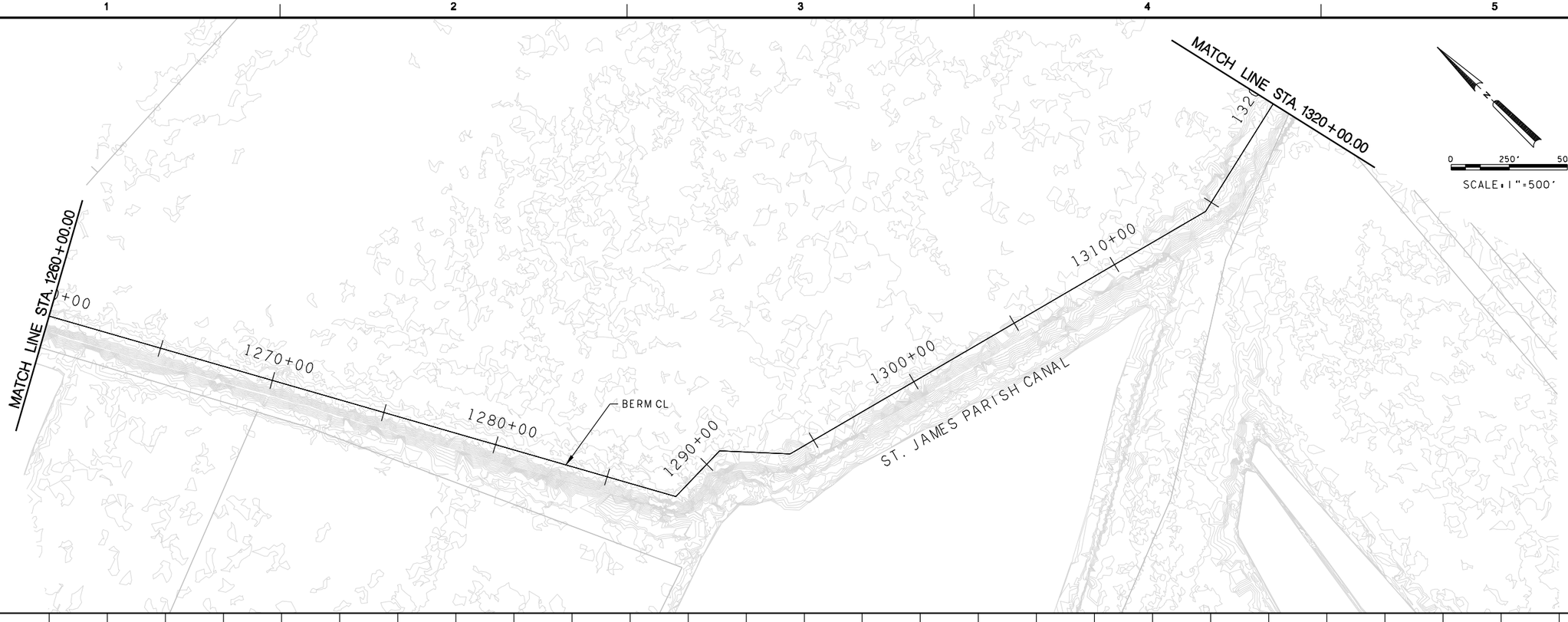
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

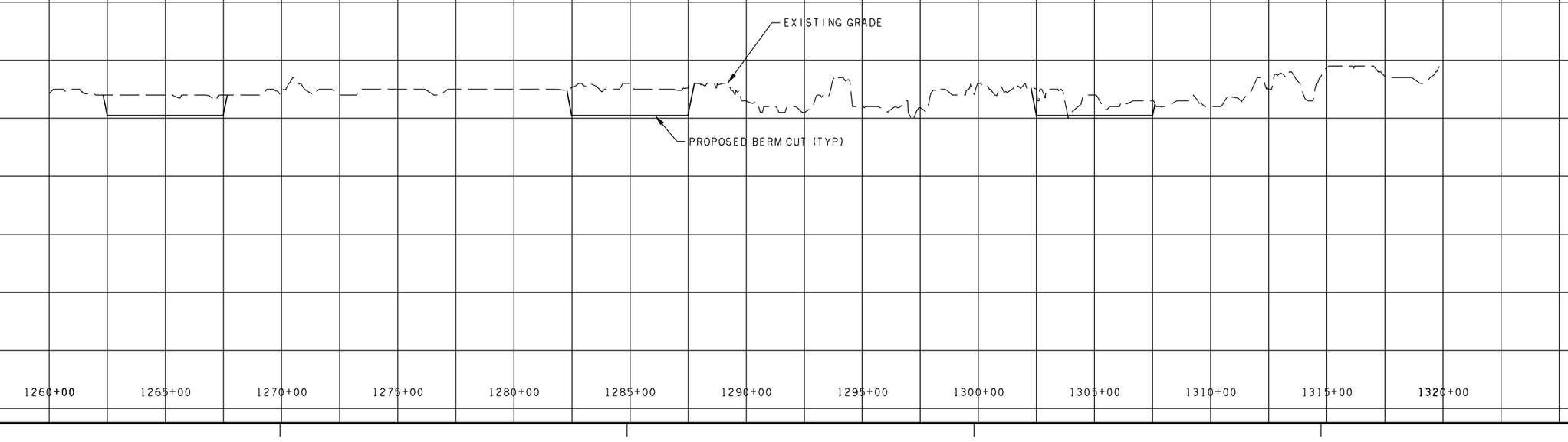
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-020

1:36:35 PM





US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: CHEVAUSRB	DRAWN BY: ROMEROC	SUBMITTED BY: CDM	DATE: 2009FY2
		CKD BY: LLEWELLYNR	
PLOT SCALE: 1:1	PLOT DATE: 1/31/2024		FILE NUMBER:
SIZE: ANSI D	FILE NAME: h247247_05C121—C-021—dgn		

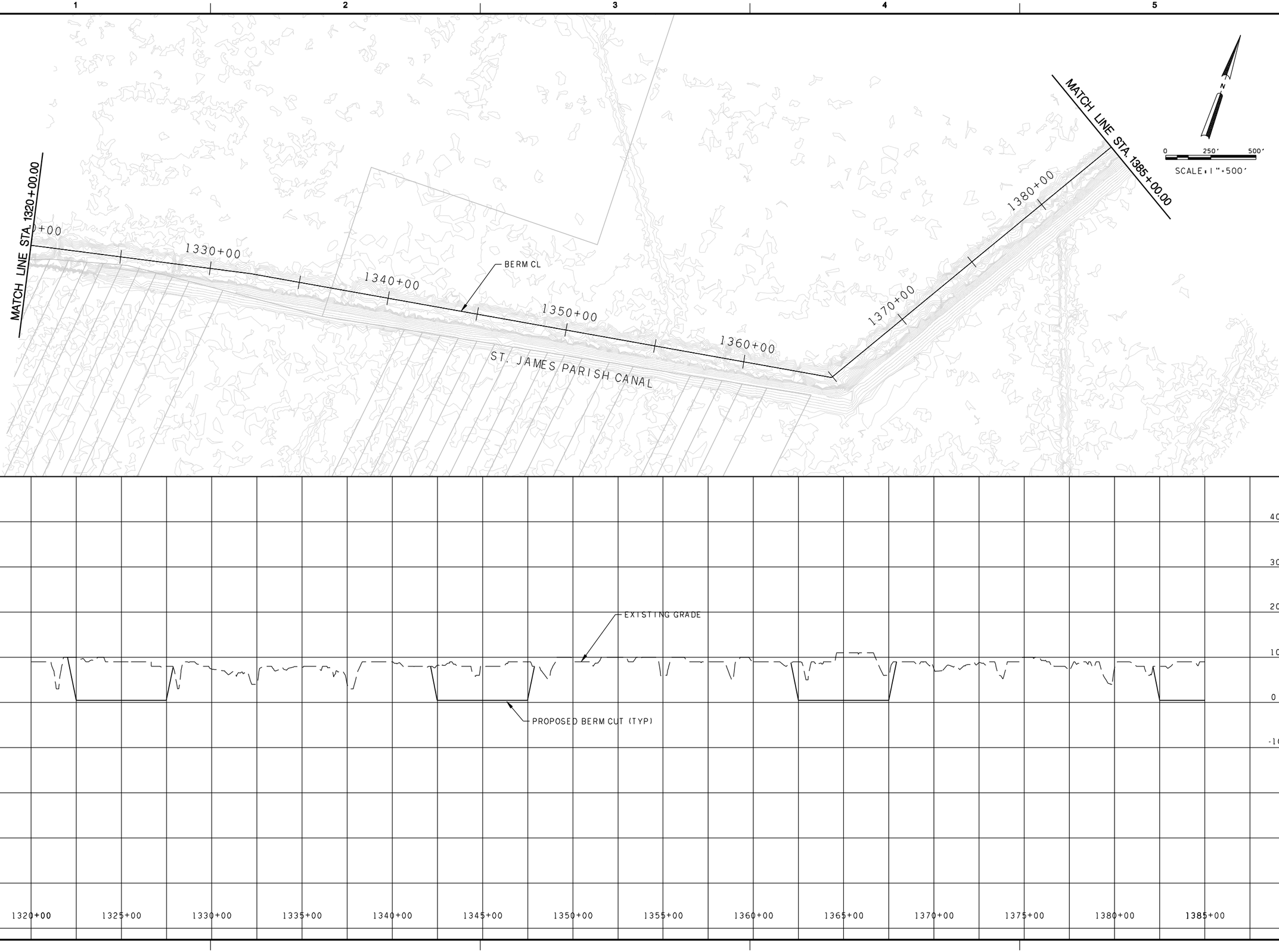
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-021

1:37:24 PM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

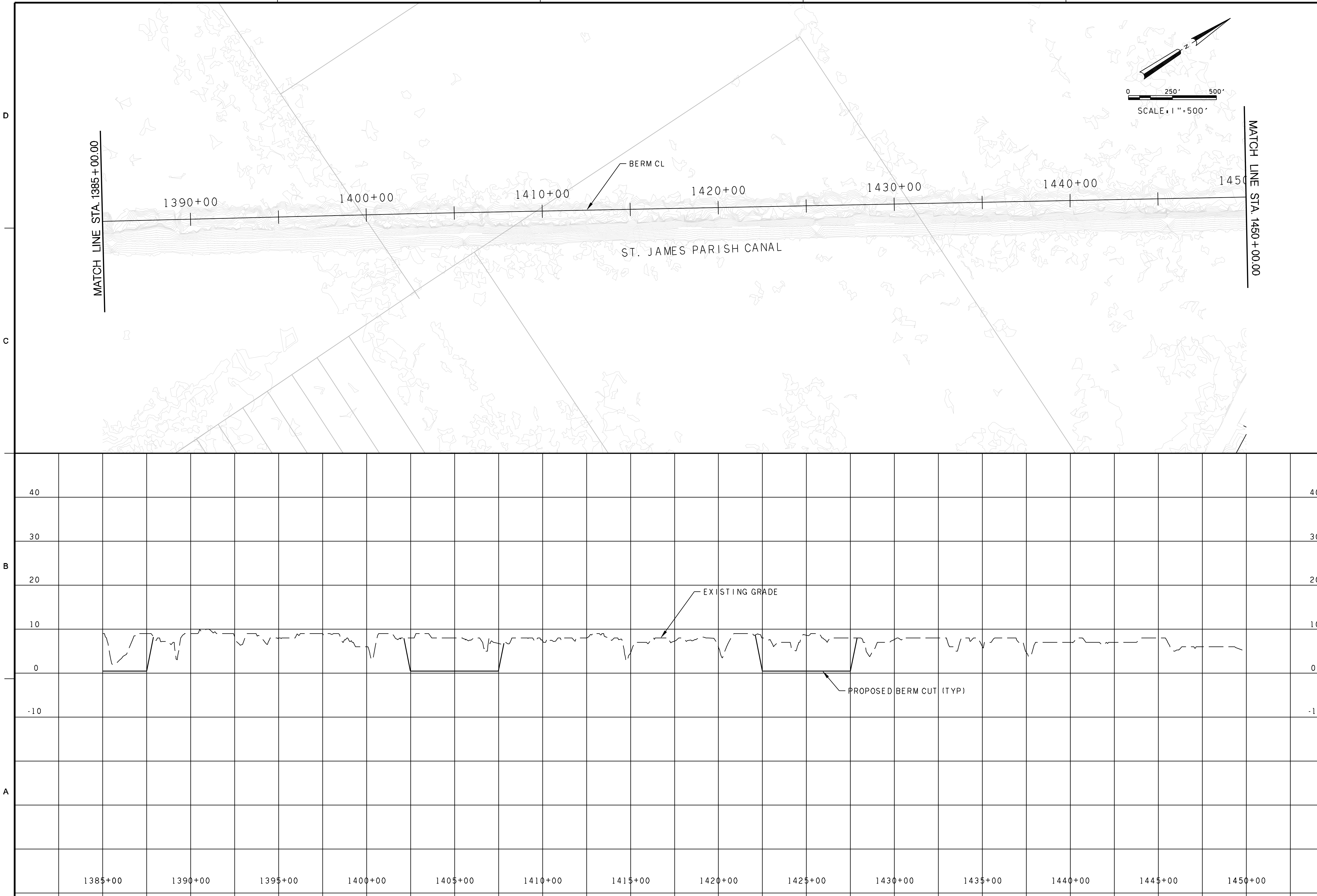
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: CHEVAUXRB
DRAWN BY: ROMEROC
SUBMITTED BY: CDM
CKD BY: LLEWELLYNR
PLOT SCALE: 1:1
PLOT DATE: 3/9/2012
SIZE: ANSI D
FILE NAME: H247247_DSC122--C-022--.dgn
FILE NUMBER:
DATE: 2009/12

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-022

1:38:14 PM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

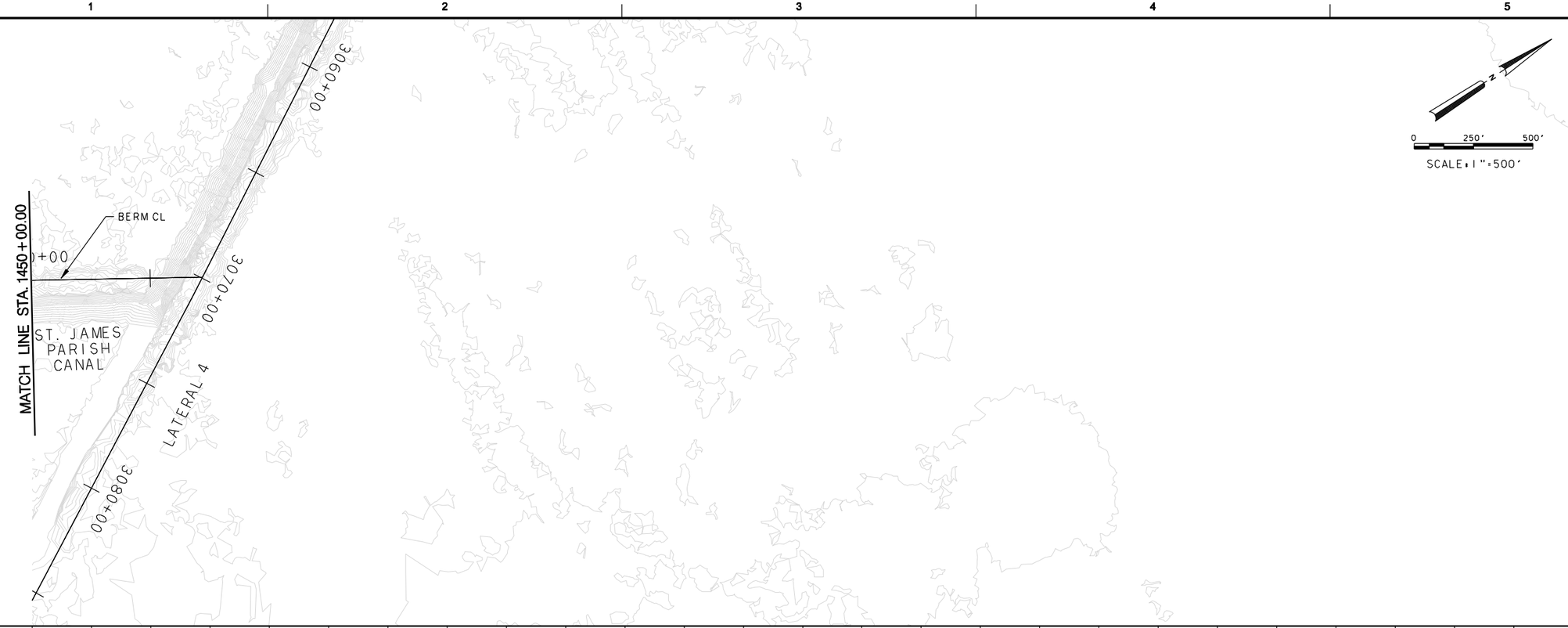
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: CHEVALIERB		DATE: 2009/12
DWN BY: ROMEROC	CKD BY: LLEWELLYNR	
SUBMITTED BY: CDM		
PLOT SCALE: 1:1	PLOT DATE: 3/1/2010	FILE NUMBER:
SIZE: ANSI D	FILE NAME: H247247_05C123---C-023---.dgn	

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-023

1:39:09 PM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

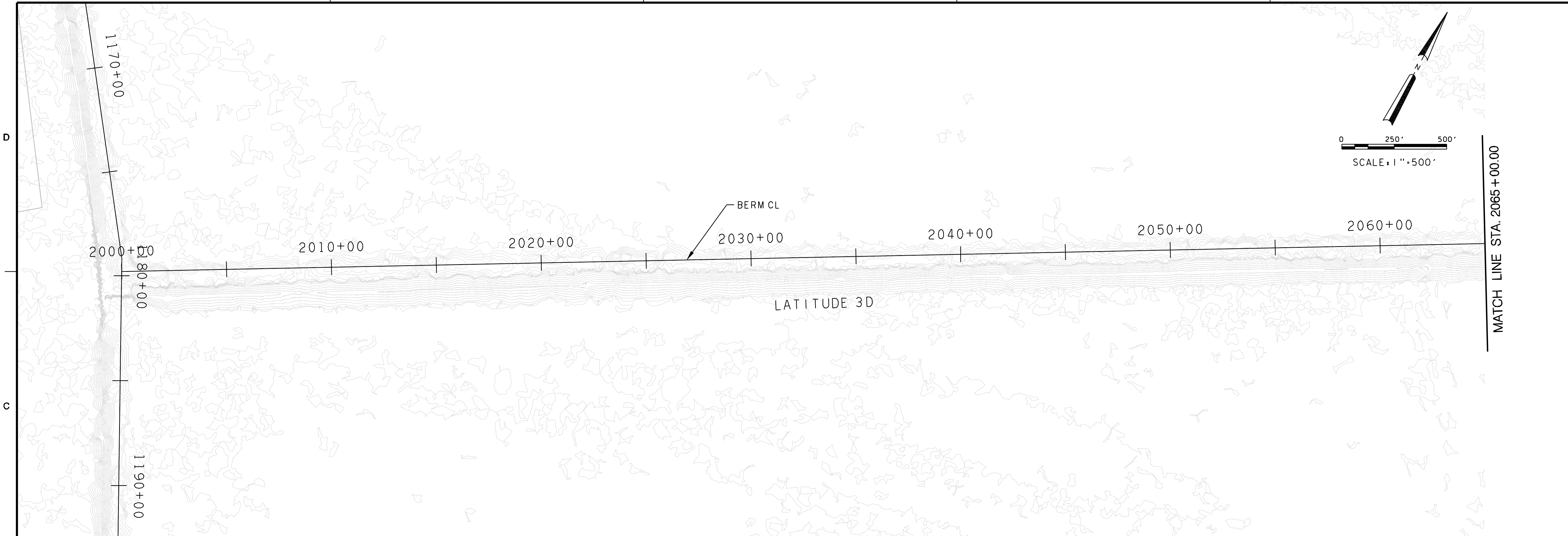
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

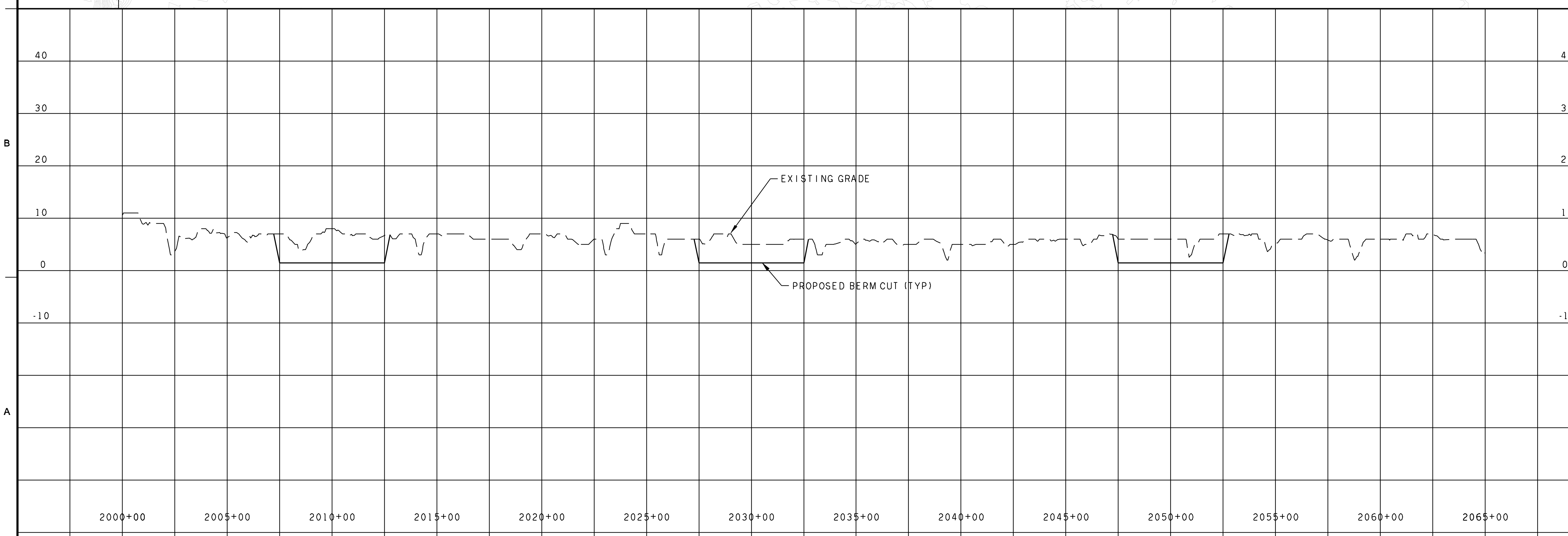
DESIGNED BY: CHEVAUSB
DRWN BY: ROMEROC
SUBMITTED BY: CDM
PLOT SCALE: 1:1
SIZE: ANSI D
DATE: 2009/12
CKD BY: LLEWELLYNR
PLOT DATE: AUTO
FILE NAME: H247247_05C124—C-024—dgn
FILE NUMBER:

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-024

1:39:59 PM





US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

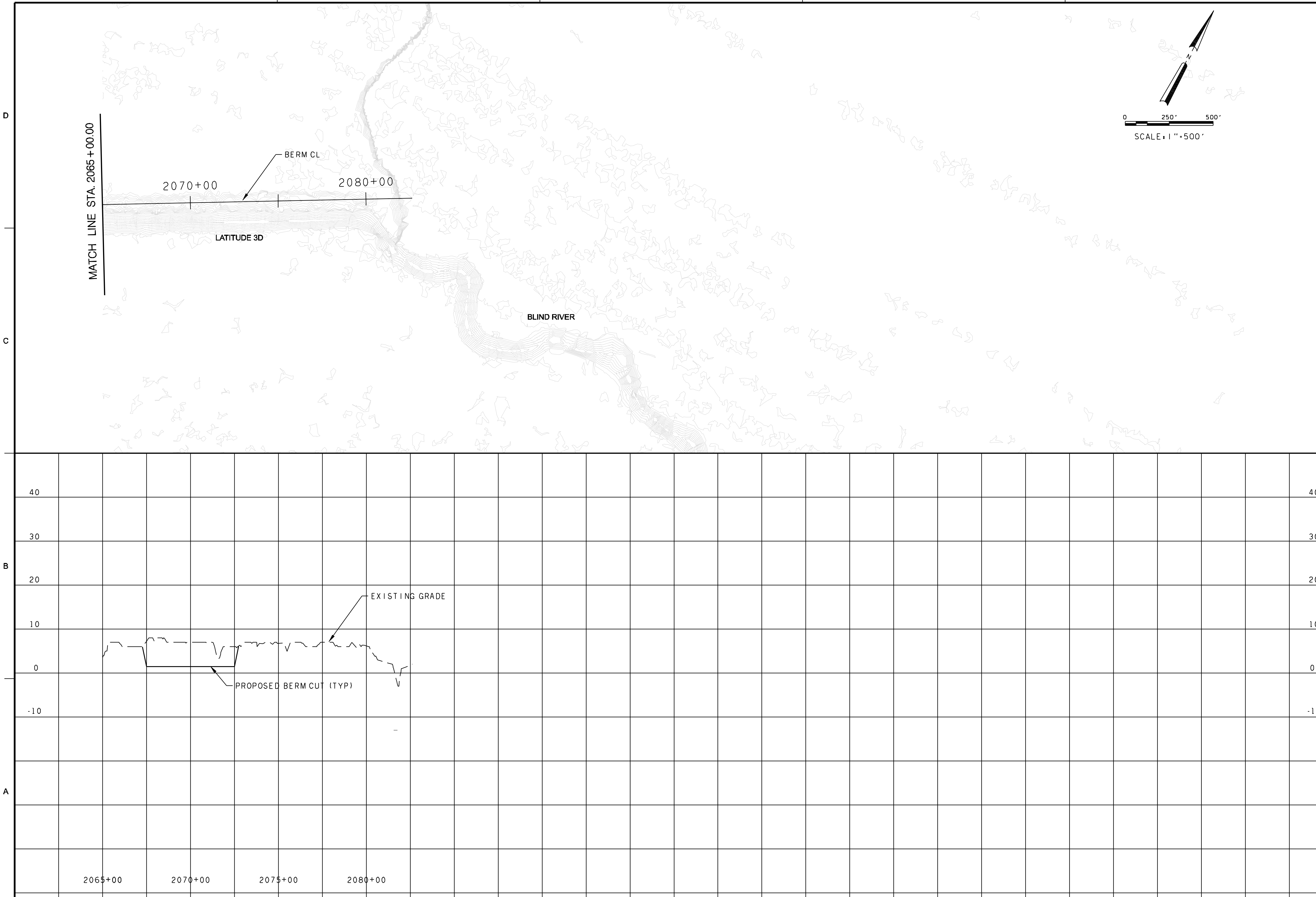
DESIGNED BY: CHEVALIERB | DATE: 2009/12
DWN BY: ROMEROC | CKD BY: LLEWELLYNR
SUBMITTED BY: CDM
PLOT SCALE: 1:1 | PLOT DATE: 3/1/2010 | FILE NUMBER:
SIZE: ANSI D | FILE NAME: H247247_05C125—C-025—.dgn

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-025



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

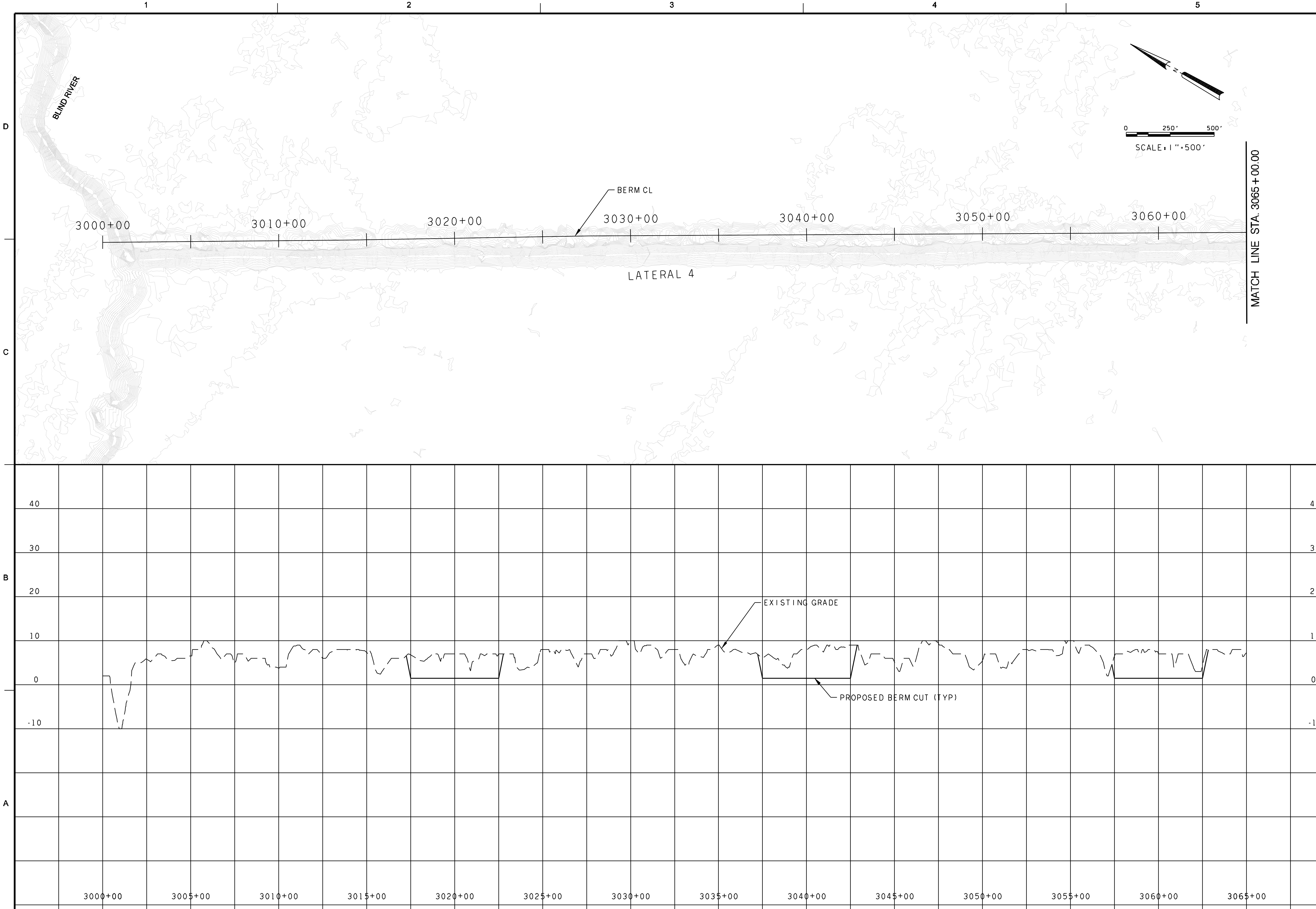
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: CHEVALIERB		DATE: 2009/12
DWN BY: ROMEROC	CKD BY: LLEWELLYNR	
SUBMITTED BY: CDM		
PLOT SCALE: 1:1	PLOT DATE: 3/1/2010	FILE NUMBER:
SIZE: ANSI D	FILE NAME: H247247_05C126---C-026---.dgn	

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-026



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

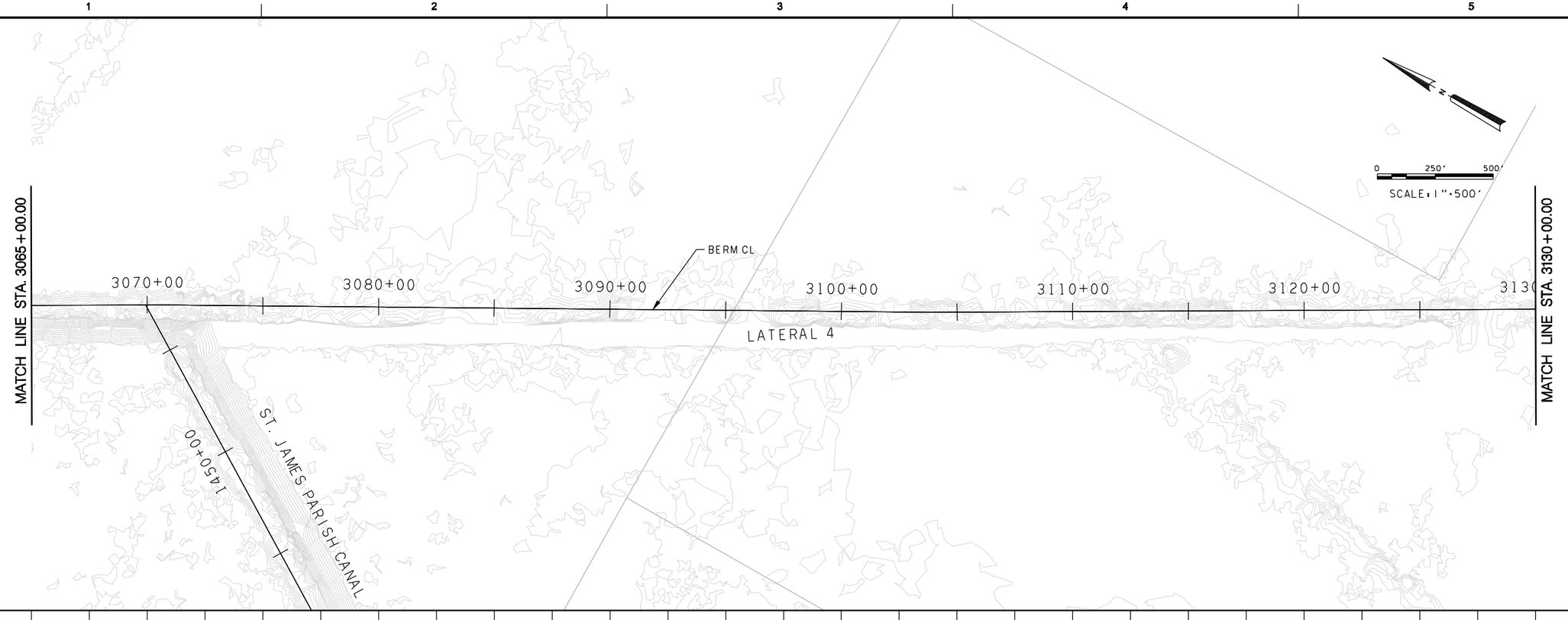
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

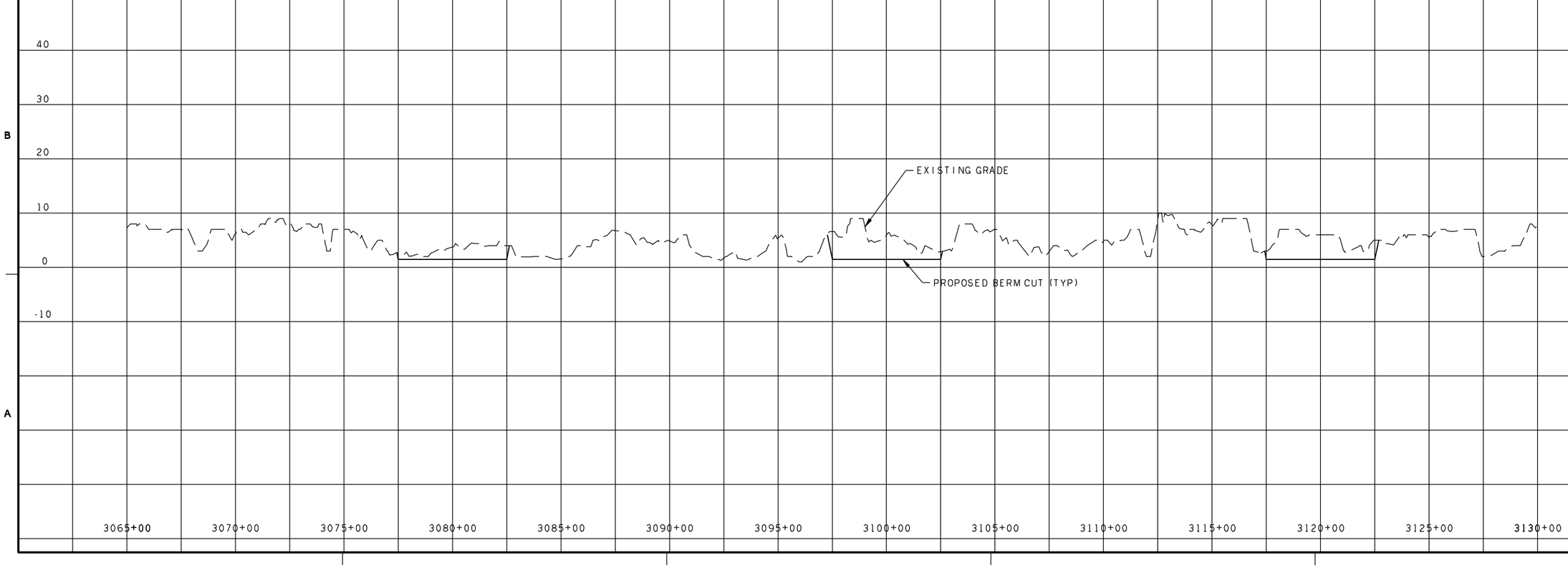
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: CHEVALIERB		DATE: 2009/12
DWN BY: ROMEROC	CKD BY: LLEWELLYNR	
SUBMITTED BY: CDM		
PLOT SCALE: 1:1	PLOT DATE: 3/1/2010	FILE NUMBER:
SIZE: ANSI D	FILE NAME: H247247_05C127---C-027---.dgn	

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-027





US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: CHEVAUSRB	DRAWN BY: ROMEROC	SUBMITTED BY: CDM	PLOT SCALE: 1:1
CKD BY: LLEWELLYNR			PLOT DATE: 8/1/2023
DATE: 2009FY2			FILE NUMBER:
SIZE: ANSI D	FILE NAME: H247247_05C128—C-028—dgn		

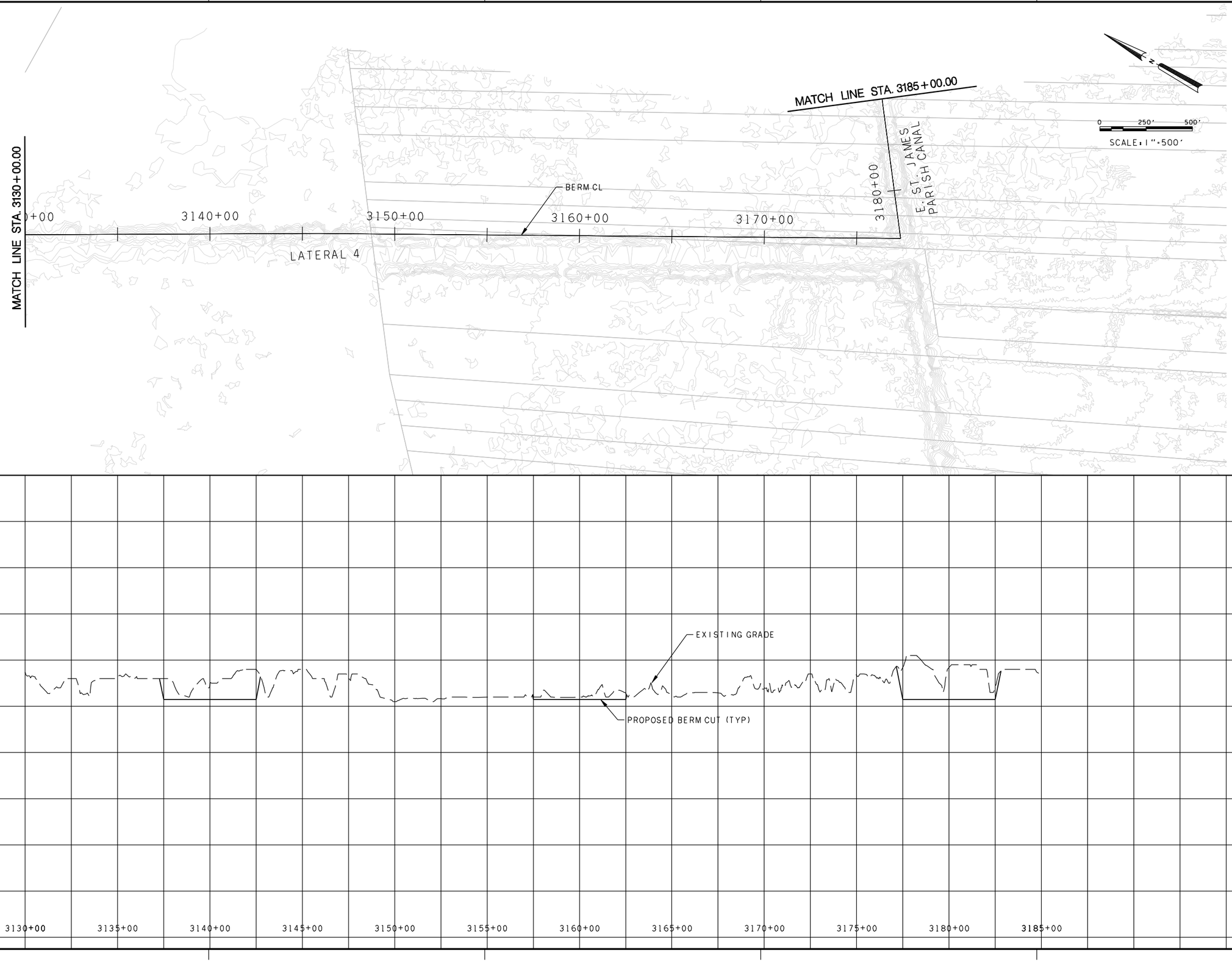
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-028

1:59:23 PM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

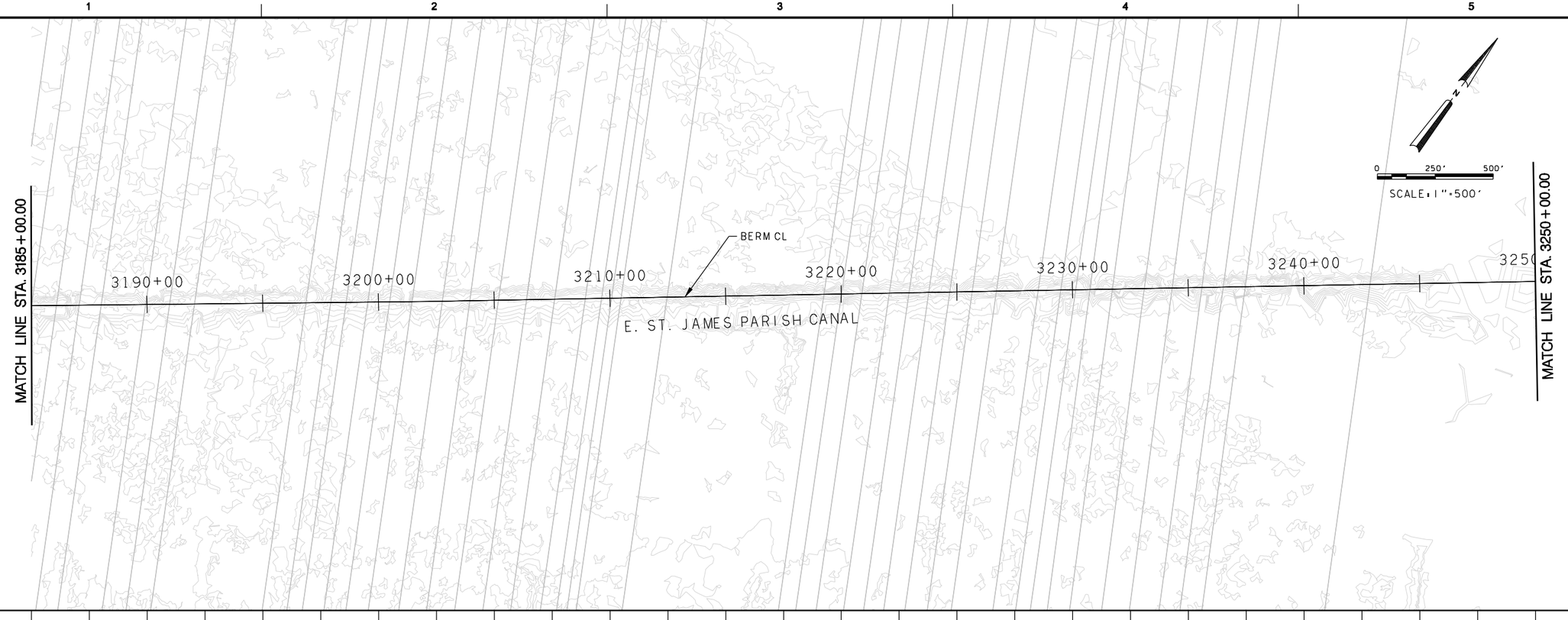
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

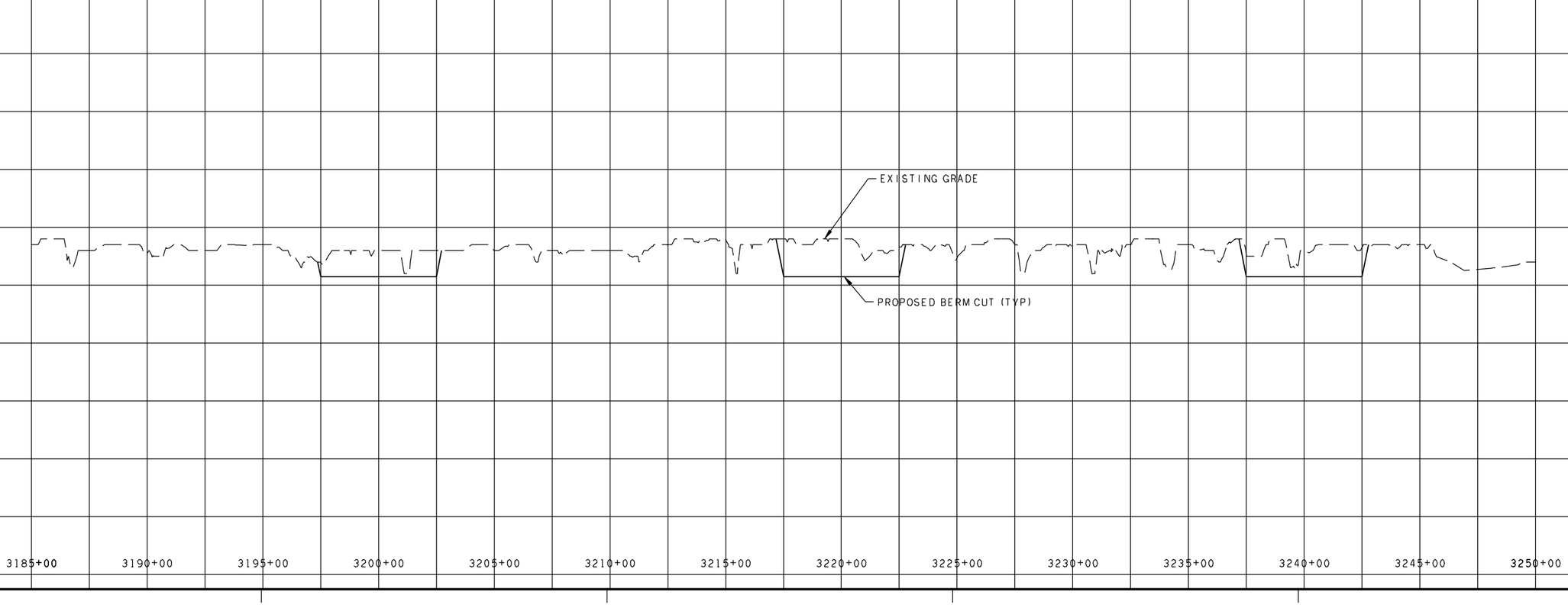
DESIGNED BY: CHEVALIERB
DRWN BY: ROMEROC
SUBMITTED BY: CDM
CKD BY: LLEWELLYNR
SIZE: ANSI D
DATE: 2009/12
PLOT SCALE: 1:1
PLOT DATE: 3/9/2010
FILE NAME: H247247_D5C129—C-029—dgn
FILE NUMBER:

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-029

2:00:50 PM





US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.
MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: CREVAUXRB	DRWN BY: ROMEROC	SUBMITTED BY: CDM	DATE: 2008/12
CKD BY: LLEWELLYNR	PLOT SCALE: 1:1	PLOT DATE: 2008/12	FILE NUMBER:
SIZE: ANSI D	FILE NAME: H247247_05C130--C-030--.dgn		

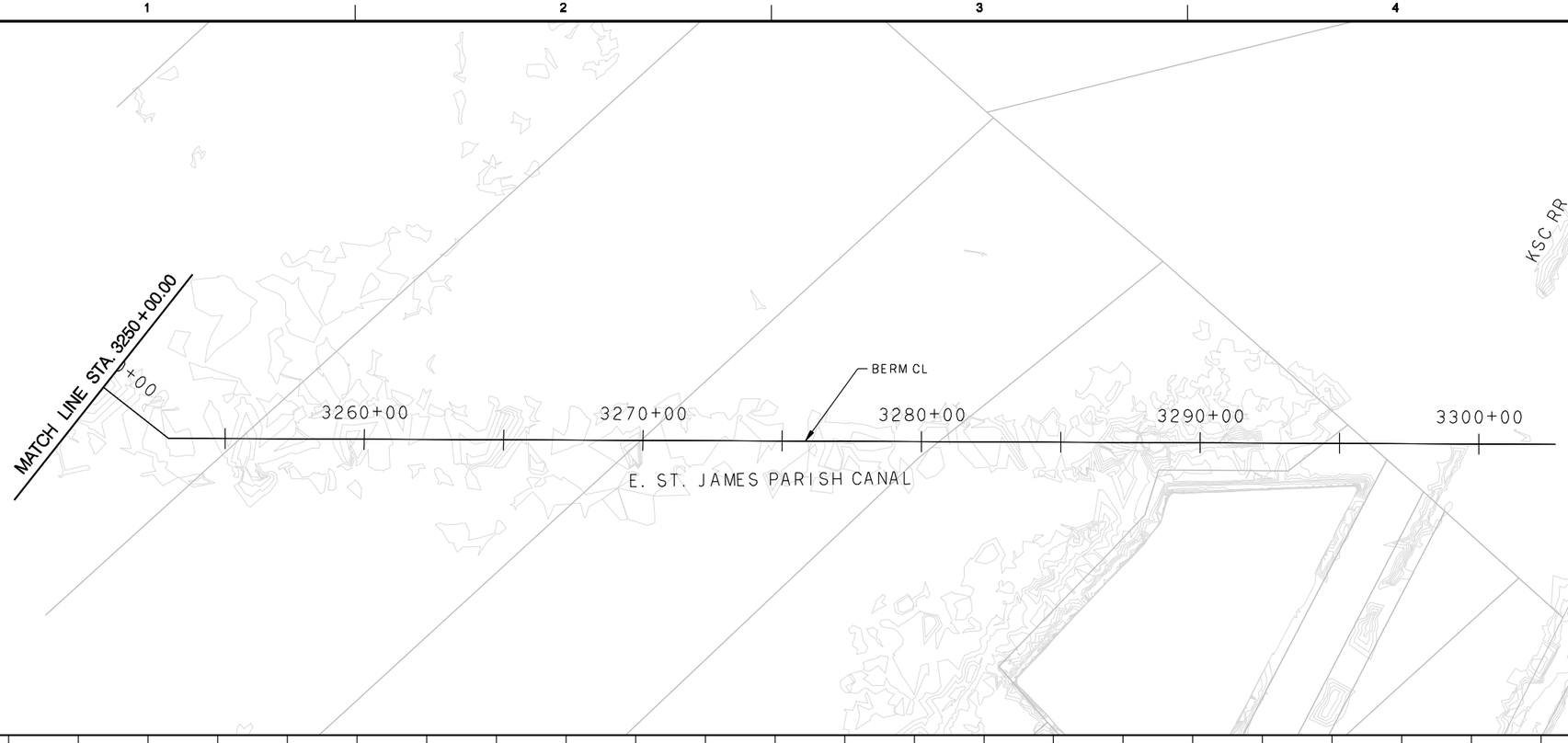
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

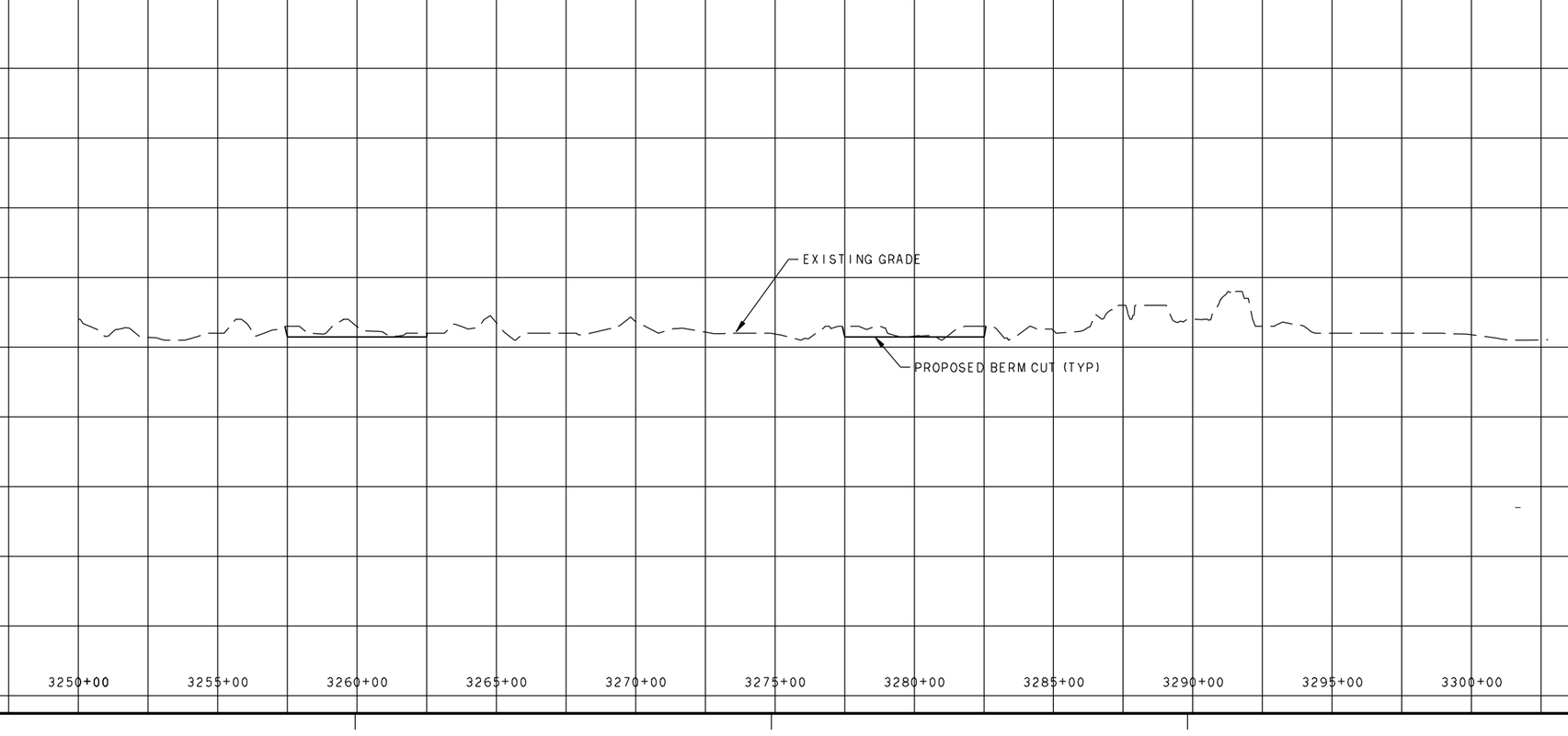
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-030

10:28:46 AM





US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

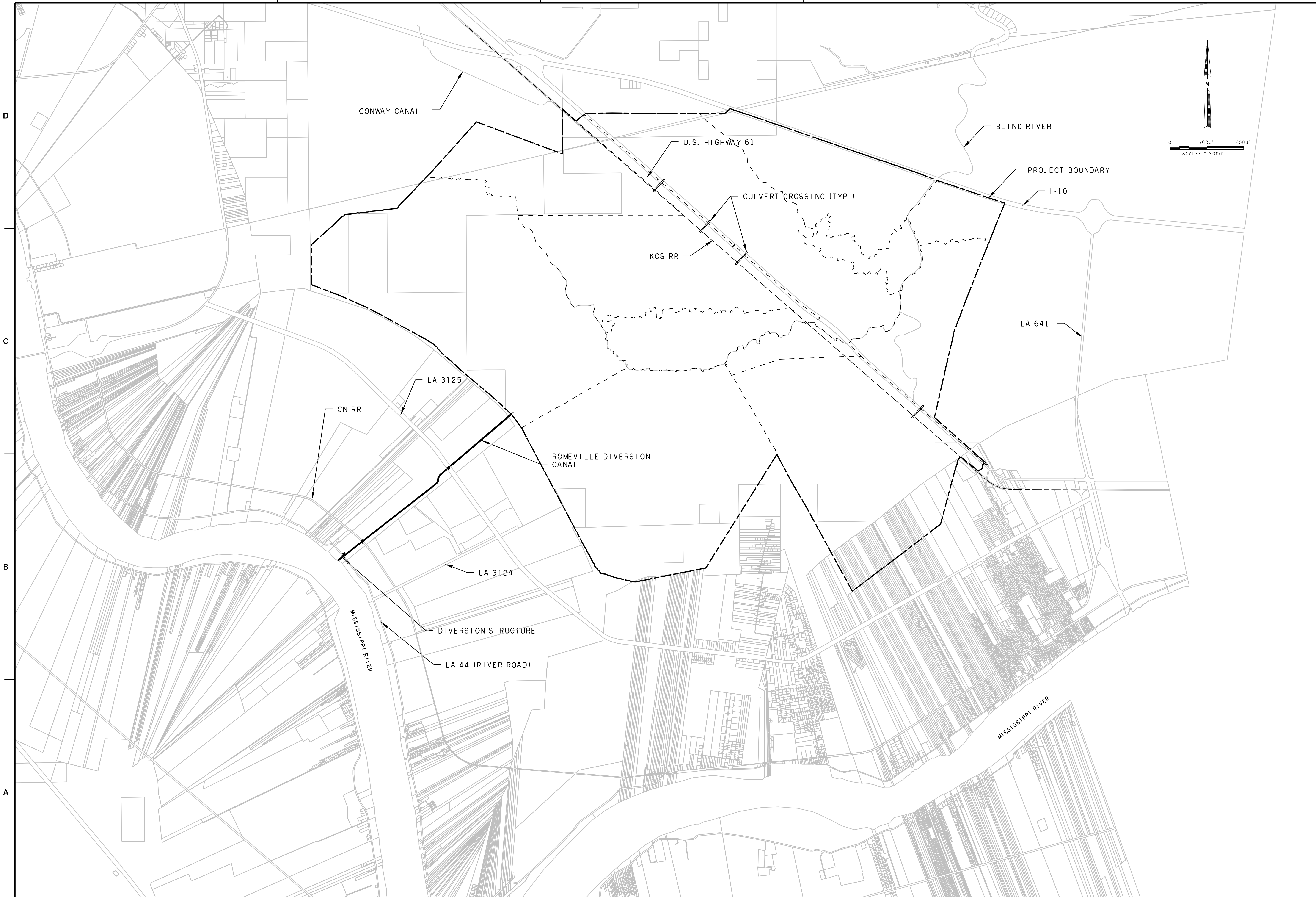
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: CHEVALIERB
DRAWN BY: ROMEROC
SUBMITTED BY: CDM
CKD BY: LLEWELLYNR
DATE: 2009/12
PLOT SCALE: 1:1
PLOT DATE: 2009/12/14
FILE NUMBER:
SIZE: ANSI D
FILE NAME: H247247_DSC131--C-031--.dgn

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
BERM CUTS
PLAN AND PROFILE

SHEET IDENTIFICATION
C-031

10:52:14 AM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

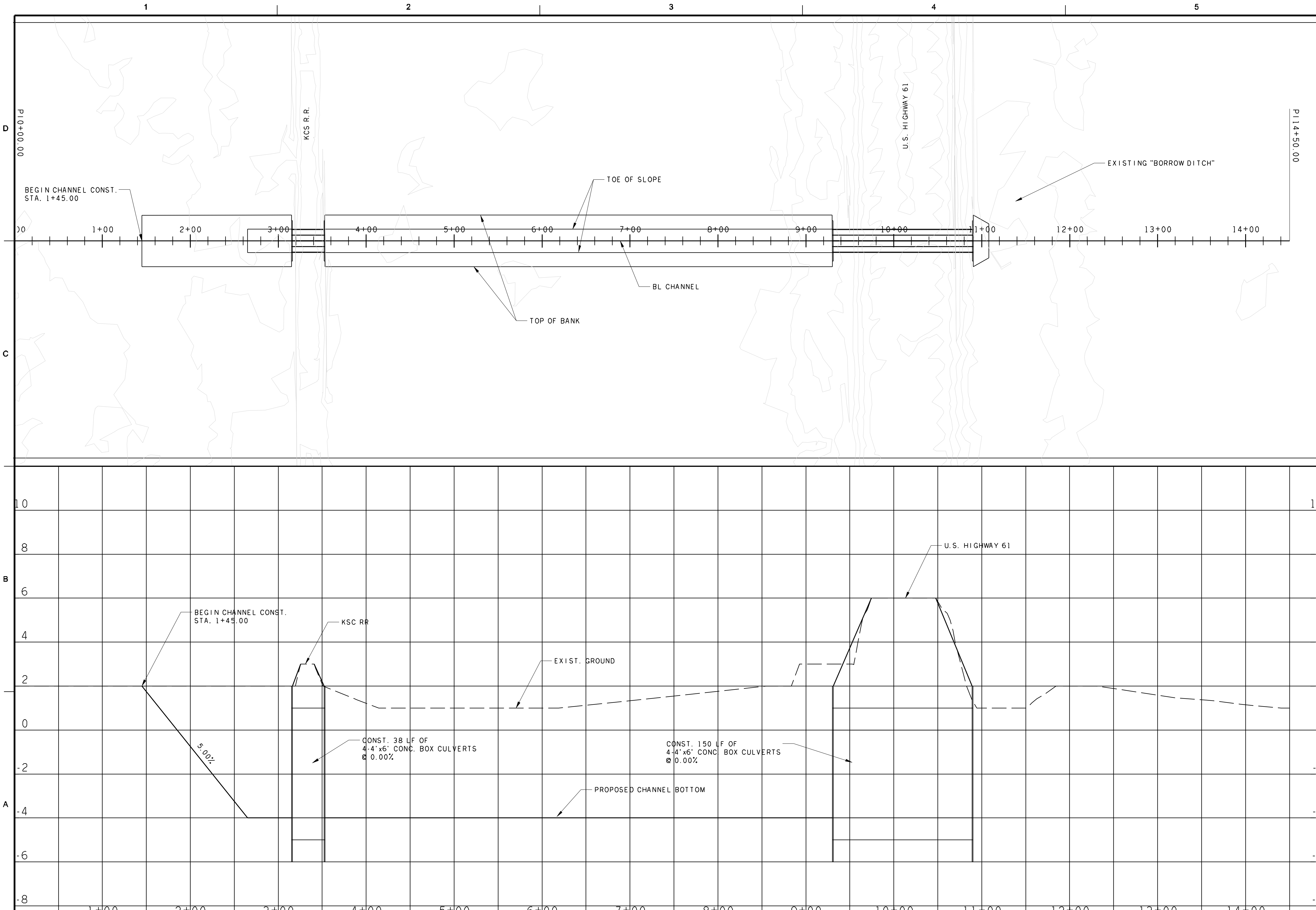
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: STOLZB		DATE: 2009/12
DWN BY: ROMEROC	CKD BY: LLEWELLYNR	
SUBMITTED BY: CDM		
PLOT SCALE: 1:1	PLOT DATE: 3/2/2010	FILE NUMBER:
SIZE: ANSI D	FILE NAME: H247247_05C32---C-032---.dgn	

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
CULVERT CROSSING LOCATION

SHEET IDENTIFICATION
C-032

3:52:19 PM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: CHEVALIER
DWN BY: CHEVALIER
CKD BY: LLEWELLYNR
DATE: 2009/12
SUBMITTED BY: CDM
PLOT SCALE: 1:1
PLOT DATE: 3/2/2010
FILE NUMBER:
SIZE: ANSI D
FILE NAME: H247247_05C130---C-030---.dgn

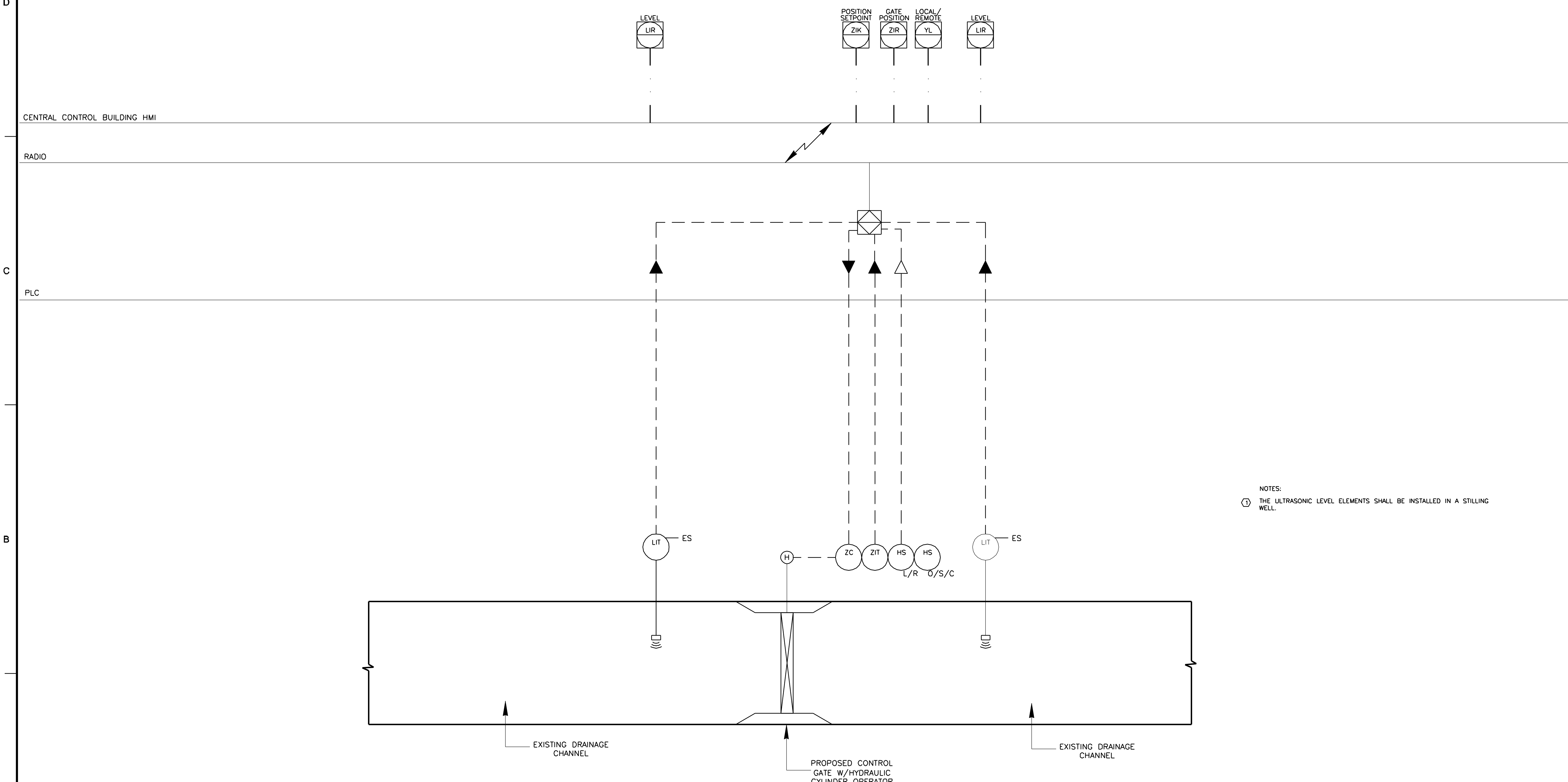
U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
KCS R.R. & HIGHWAY 61 CROSSING

SHEET IDENTIFICATION
C-030

3:54:35 PM



NOTES:

1. THE ULTRASONIC LEVEL ELEMENTS SHALL BE INSTALLED IN A STILLING WELL.

US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

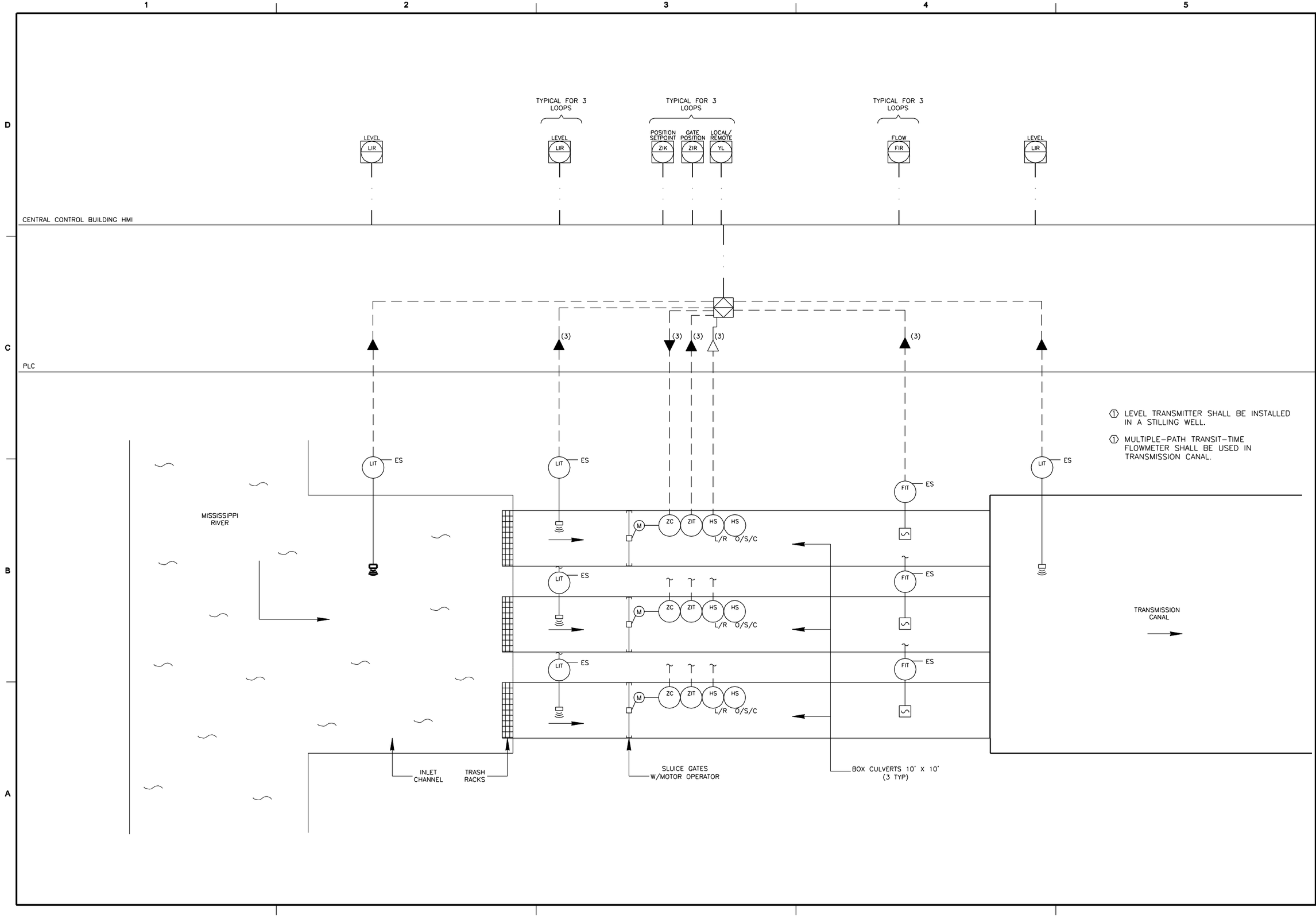
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: STOLTZB
DATE: 2009/12
DWN BY: ROMEROC
CKD BY: LLEWELLYNR
SUBMITTED BY: CDM
PLOT SCALE: 1:1
PLOT DATE: 3/2/2010
FILE NUMBER:
SIZE: ANSI D
FILE NAME: H247247_15E134---E-034---.dgn

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
PROCESS & INSTRUMENTATION DIAGRAM
SWAMP CONTROL STRUCTURE

SHEET IDENTIFICATION
I-034

4:35:36 PM



US Army Corps of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

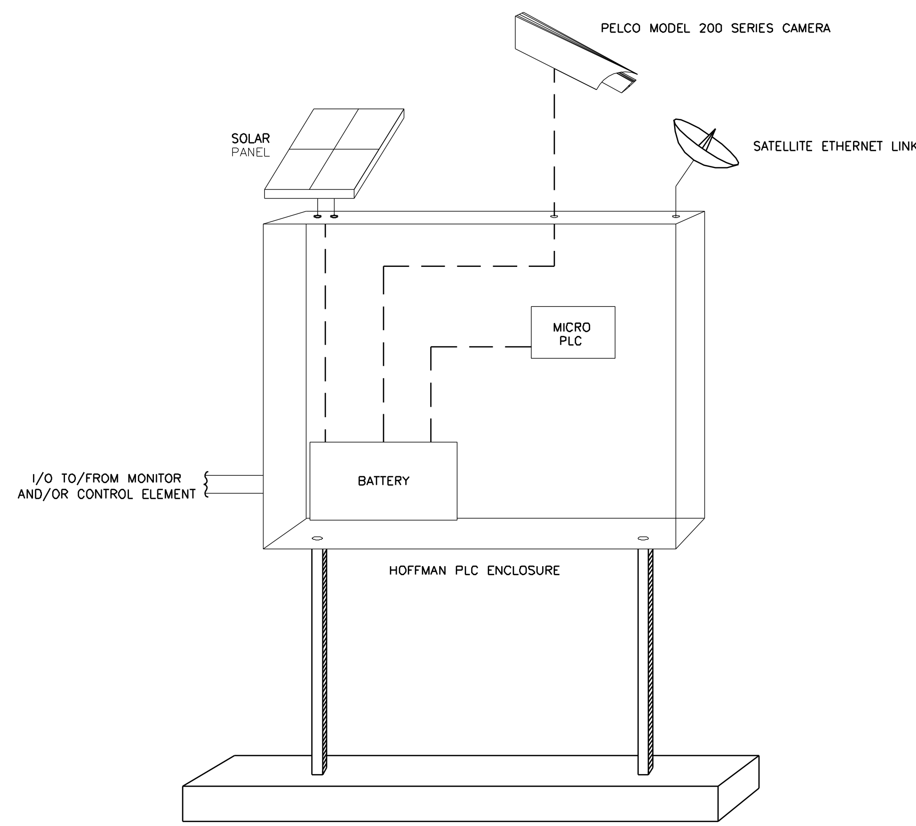
CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: STOLTZB
DRWN BY: ROMEROC
SUBMITTED BY: CDM
CKD BY: LLEWELLYNR
DATE: 2009/12
PLOT SCALE: 1:1
PLOT DATE: 2009/12/15
SIZE: ANSI D
FILE NAME: H347247_156135—E-035—dgn
FILE NUMBER:

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
PROCESS & INSTRUMENTATION DIAGRAM
ROMEVILLE DIVERSION CULVERT

SHEET IDENTIFICATION
I-035

4:52:48 PM



US Army Corps
of Engineers®
New Orleans District

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

U.S. ARMY CORPS OF ENGINEERS
NEW ORLEANS DISTRICT
NEW ORLEANS, LOUISIANA

CDM
1515 POYDRAS ST, SUITE 1350
NEW ORLEANS, LOUISIANA 70112

DESIGNED BY: STOLTZB
DATE: 2009/12
DWN BY: ROMEROC
CKD BY: LLEWELLYNR
SUBMITTED BY: CDM
PLOT SCALE: 1:1
PLOT DATE: 3/2/2010
FILE NUMBER:
SIZE: ANSI D
FILE NAME: H247247_15E136---E-036---.dgn

BLIND RIVER FRESHWATER DIVERSION
FEASIBILITY STUDY
ST. JAMES PARISH, LOUISIANA
-
PANEL DETAILS

SHEET
IDENTIFICATION
I-035

4:54:02 PM

This page intentionally left blank.

Volume IV

APPENDIX L—Annex L-7

Project Costs and Schedule Risk Analysis

This page intentionally left blank.

**** TOTAL PROJECT COST SUMMARY ****

PROJECT: Convent/Blind River Diversion Project
LOCATION: St. James Parish, Louisiana

DISTRICT: MVN
POC: CHIEF, COST ENGINEERING

PREPARED: 3/24/2010

This Estimate reflects the scope and schedule in report; Blind River Diversion Project, March 2010

Program Year (Budget EC): 2012
Effective Price Level Date: 1 OCT 11

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	FULLY FUNDED PROJECT ESTIMATE Spent Thru: 22-Mar-10 ($K)		COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
02	RELOCATIONS	10,611	6,431	60.6%	17,042	2.6%	10890.2	6599.4	17489.6			11192.8	6782.8	17975.6
06	FISH & WILDLIFE FACILITIES	6,620			6,620		6620.0		6620.0			6620.0		6620.0
15	FLOODWAY CONTROL & DIVERSION STR	56,980	16,068	28.2%	73,048	2.6%	58476.3	16490.3	74966.6			60536.2	17071.2	77607.4
	CONSTRUCTION ESTIMATE TOTALS:	74,212	22,499		**96,710**	2.4%	75,986	23,090	99,076			78,349	23,854	102,203
01	LANDS AND DAMAGES	2,070	1,850	89.4%	3,920	2.6%	2,124	1,899	4,023			2,133	1,907	4,041
30	PLANNING, ENGINEERING & DESIGN	6,759	777	11.5%	7,536	2.6%	6,937	798	7,734			6,953	800	7,753
31	CONSTRUCTION MANAGEMENT	7,435	1,190	16.0%	8,625	2.6%	7,630	1,221	8,851			7,890	1,262	9,153
	PROJECT COST TOTALS:	90,476	26,316	29.1%	**116,792**	2.5%	92,678	27,007	119,685			95,326	27,823	123,140

CHIEF, COST ENGINEERING

PROJECT MANAGER

ESTIMATED FEDERAL COST:	65%	**80,041**
ESTIMATED NON-FEDERAL COST:	35%	**43,099**
ESTIMATED TOTAL PROJECT COST:		**123,140**

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Convent/Blind River Diversion Project
LOCATION: St. James Parish, Louisiana
CONTRACT: Diversion Culvert
This Estimate reflects the scope and schedule in report; Blind River Diversion Project, March 2010

DISTRICT: MVN
POC: CHIEF, COST ENGINEERING
PREPARED: 3/24/2010

Estimate Prepared: 22-Mar-10
Effective Price Level: 1 OCT 10

Program Year (Budget EC): 2012
Effective Price Level Date: 1 OCT 11

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	FULLY FUNDED PROJECT ESTIMATE: Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
02	RELOCATIONS	$ 2,668	$ 1,617	60.6%	$ 4,284	2.6%	2737.8	1659.1	4396.9	2014Q1	3.6%	2836.2	1718.7	4554.9
06	FISH & WILDLIFE FACILITIES	$ -	$ -		$ -									
15	FLOODWAY CONTROL & DIVERSION STR	$ 11,118	$ 3,135	28.2%	$ 14,254	2.6%	11410.5	3217.8	14628.2	2014Q1	3.6%	11820.5	3333.4	15153.9
	CONSTRUCTION ESTIMATE TOTALS:	13,786	4,752	34.5%	**18,538**		13786.2	4876.9	18663.1			14656.6	5052.1	19708.7
01	LANDS AND DAMAGES	$ -	$ -	89.4%	$ -									
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management	28	$ 3	11.5%	31	2.6%	28.3	3.3	31.6	2012Q1		28.3	3.3	31.6
0.5%	Planning & Environmental Compliance	69	$ 8	11.5%	77	2.6%	70.7	8.1	78.9	2012Q1		70.7	8.1	78.9
8.0%	Engineering & Design	1,103	$ 127	11.5%	1,230	2.6%	1131.9	130.2	1262.0	2012Q1		1131.9	130.2	1262.0
0.2%	Engineering Tech Review ITR & VE	28	$ 3	11.5%	31	2.6%	28.3	3.3	31.6	2012Q1		28.3	3.3	31.6
0.2%	Contracting & Reprographics	28	$ 3	11.5%	31	2.6%	28.3	3.3	31.6	2012Q1		28.3	3.3	31.6
0.5%	Engineering During Construction	69	$ 8	11.5%	77	2.6%	70.7	8.1	78.9	2014Q1	3.6%	73.3	8.4	81.7
0.2%	Planning During Construction	28	$ 3	11.5%	31	2.6%	28.3	3.3	31.6	2014Q1	3.6%	29.3	3.4	32.7
0.2%	Project Operations	28	$ 3	11.5%	31	2.6%	28.3	3.3	31.6	2012Q1		28.3	3.3	31.6
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	1,379	$ 221	16.0%	1,599	2.6%	1414.8	226.4	1641.2	2014Q1	3.6%	1465.7	234.5	1700.2
	Project Operation:		$ -	16.0%										
1.0%	Project Management	138	$ 22	16.0%	160	2.6%	141.5	22.6	164.1	2014Q1	3.6%	146.6	23.5	170.0
	CONTRACT COST TOTALS:	16,681	5,153		**21,835**		16757.4	5288.6	22045.9			17687.3	5473.2	**23160.4**

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Convent/Blind River Diversion Project
LOCATION: St. James Parish, Louisiana
CONTRACT: Transmission Canal
This Estimate reflects the scope and schedule in report; Blind River Diversion Project, March 2010

DISTRICT: MVN
POC: CHIEF, COST ENGINEERING
PREPARED: 3/24/2010

Estimate Prepared: 22-Mar-10
Effective Price Level: 1 OCT 10

Program Year (Budget EC): 2012
Effective Price Level Date: 1 OCT 11

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	FULLY FUNDED PROJECT ESTIMATE: Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
02	RELOCATIONS	$ 411	$ 249	60.6%	$ 660	2.6%	421.5	255.4	676.9	2014Q2	4.1%	438.6	265.8	704.4
06	FISH & WILDLIFE FACILITIES	$ -	$ -		$ -									
15	FLOODWAY CONTROL & DIVERSION STR	$ 17,718	$ 4,996	28.2%	$ 22,714	2.6%	18183.1	5127.6	23310.7	2014Q2	4.1%	18921.8	5335.9	24257.7
	CONSTRUCTION ESTIMATE TOTALS:	18,128	5,245	28.9%	**23,374**		18604.5	5383.0	23987.6			19360.4	5601.7	24962.1
01	LANDS AND DAMAGES	$ -	$ -	89.4%	$ -									
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management	36	$ 4	11.5%	40	2.6%	37.2	4.3	41.5	2012Q1		37.2	4.3	41.5
0.5%	Planning & Environmental Compliance	91	$ 10	11.5%	101	2.6%	93.0	10.7	103.7	2012Q1		93.0	10.7	103.7
8.0%	Engineering & Design	1,450	$ 167	11.5%	1,617	2.6%	1488.4	171.2	1659.5	2012Q1		1488.4	171.2	1659.5
0.2%	Engineering Tech Review ITR & VE	36	$ 4	11.5%	40	2.6%	37.2	4.3	41.5	2012Q1		37.2	4.3	41.5
0.2%	Contracting & Reprographics	36	$ 4	11.5%	40	2.6%	37.2	4.3	41.5	2012Q1		37.2	4.3	41.5
0.5%	Engineering During Construction	91	$ 10	11.5%	101	2.6%	93.0	10.7	103.7	2014Q2	4.1%	96.8	11.1	107.9
0.2%	Planning During Construction	36	$ 4	11.5%	40	2.6%	37.2	4.3	41.5	2014Q2	4.1%	38.7	4.5	43.2
0.2%	Project Operations	36	$ 4	11.5%	40	2.6%	37.2	4.3	41.5	2012Q1		37.2	4.3	41.5
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	1,813	$ 290	16.0%	2,103	2.6%	1860.5	297.7	2158.1	2014Q2	4.1%	1936.0	309.8	2245.8
	Project Operation:		$ -	16.0%										
1.0%	Project Management	181	$ 29	16.0%	210	2.6%	186.0	29.8	215.8	2014Q2	4.1%	193.6	31.0	224.6
	CONTRACT COST TOTALS:	21,935	5,773		**27,708**		22511.5	5924.4	28435.9			23355.8	6157.0	**29512.8**

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Convent/Blind River Diversion Project
LOCATION: St. James Parish, Louisiana
CONTRACT: Canadian National Railroad Relocation and Reconstruction
This Estimate reflects the scope and schedule in report; Blind River Diversion Project, March 2010

DISTRICT: MVN
POC: CHIEF, COST ENGINEERING
PREPARED: 3/24/2010

Estimate Prepared: 22-Mar-10
Effective Price Level: 1 OCT 10

Program Year (Budget EC): 2012
Effective Price Level Date: 1 OCT 11

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	FULLY FUNDED PROJECT ESTIMATE Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
02	RELOCATIONS	$ 1,232	$ 747	60.6%	$ 1,979	2.6%	1264.6	766.3	2030.9	2013Q4	3.1%	1304.4	790.4	2094.8
06	FISH & WILDLIFE FACILITIES	$ -	$ -		$ -									
15	FLOODWAY CONTROL & DIVERSION STR	$ -	$ -	28.2%	$ -									
	CONSTRUCTION ESTIMATE TOTALS:	1,232	747	60.6%	**1,979**		1264.6	766.3	2030.9			1304.4	790.4	2094.8
01	LANDS AND DAMAGES	$ -	$ -	89.4%	$ -									
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management	2	$ 0	11.5%	3	2.6%	2.5	0.3	2.8	2012Q1		2.5	0.3	2.8
0.5%	Planning & Environmental Compliance	6	$ 1	11.5%	7	2.6%	6.3	0.7	7.1	2012Q1		6.3	0.7	7.1
8.0%	Engineering & Design	99	$ 11	11.5%	110	2.6%	101.2	11.6	112.8	2012Q1		101.2	11.6	112.8
0.2%	Engineering Tech Review ITR & VE	2	$ 0	11.5%	3	2.6%	2.5	0.3	2.8	2012Q1		2.5	0.3	2.8
0.2%	Contracting & Reprographics	2	$ 0	11.5%	3	2.6%	2.5	0.3	2.8	2012Q1		2.5	0.3	2.8
0.5%	Engineering During Construction	6	$ 1	11.5%	7	2.6%	6.3	0.7	7.1	2013Q4	3.1%	6.5	0.8	7.3
0.2%	Planning During Construction	2	$ 0	11.5%	3	2.6%	2.5	0.3	2.8	2013Q4	3.1%	2.6	0.3	2.9
0.2%	Project Operations	2	$ 0	11.5%	3	2.6%	2.5	0.3	2.8	2012Q1		2.5	0.3	2.8
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	123	$ 20	16.0%	143	2.6%	126.5	20.2	146.7	2013Q4	3.1%	130.4	20.9	151.3
	Project Operation:		$ -	16.0%										
1.0%	Project Management	12	$ 2	16.0%	14	2.6%	12.6	2.0	14.7	2013Q4	3.1%	13.0	2.1	15.1
	CONTRACT COST TOTALS:	1,491	783		**2,274**		1530.2	803.1	2333.3			1574.6	828.0	**2402.5**

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Convent/Blind River Diversion Project
LOCATION: St. James Parish, Louisiana
CONTRACT: Control Structures and Berm Gaps
This Estimate reflects the scope and schedule in report; Blind River Diversion Project, March 2010

DISTRICT: MVN
POC: CHIEF, COST ENGINEERING
PREPARED: 3/24/2010

Estimate Prepared: 2-Feb-10
Effective Price Level: 1 OCT 10

Program Year (Budget EC): 2012
Effective Price Level Date: 1 OCT 11

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	FULLY FUNDED PROJECT ESTIMATE: Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
02	RELOCATIONS	$ -	$ -	60.6%	$ -									
06	FISH & WILDLIFE FACILITIES	$ -	$ -		$ -									
15	FLOODWAY CONTROL & DIVERSION STR	$ 27,526	$ 7,762	28.2%	$ 35,288	2.6%	28248.4	7966.1	36214.5	2013Q4	3.1%	29136.8	8216.6	37353.3
	CONSTRUCTION ESTIMATE TOTALS:	27,526	7,762	28.2%	**35,288**		28248.4	7966.1	36214.5			29136.8	8216.6	37353.3
01	LANDS AND DAMAGES	$ -	$ -	89.4%	$ -									
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management	55	$ 6	11.5%	61	2.6%	56.5	6.5	63.0	2012Q1		56.5	6.5	63.0
0.5%	Planning & Environmental Compliance	138	$ 16	11.5%	153	2.6%	141.2	16.2	157.5	2012Q1		141.2	16.2	157.5
8.0%	Engineering & Design	2,202	$ 253	11.5%	2,455	2.6%	2259.9	259.9	2519.8	2012Q1		2259.9	259.9	2519.8
0.2%	Engineering Tech Review ITR & VE	55	$ 6	11.5%	61	2.6%	56.5	6.5	63.0	2012Q1		56.5	6.5	63.0
0.2%	Contracting & Reprographics	55	$ 6	11.5%	61	2.6%	56.5	6.5	63.0	2012Q1		56.5	6.5	63.0
0.5%	Engineering During Construction	138	$ 16	11.5%	153	2.6%	141.2	16.2	157.5	2013Q4	3.1%	145.7	16.8	162.4
0.2%	Planning During Construction	55	$ 6	11.5%	61	2.6%	56.5	6.5	63.0	2013Q4	3.1%	58.3	6.7	65.0
0.2%	Project Operations	55	$ 6	11.5%	61	2.6%	56.5	6.5	63.0	2012Q1		56.5	6.5	63.0
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	2,753	$ 440	16.0%	3,193	2.6%	2824.8	452.0	3276.8	2013Q4	3.1%	2913.7	466.2	3379.9
	Project Operation:		$ -	16.0%										
1.0%	Project Management	275	$ 44	16.0%	319	2.6%	282.5	45.2	327.7	2013Q4	3.1%	291.4	46.6	338.0
	CONTRACT COST TOTALS:	33,306	8,563		**41,869**		34180.6	8788.1	42968.7			35172.9	9054.9	**44227.8**

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Convent/Blind River Diversion Project
LOCATION: St. James Parish, Louisiana
CONTRACT: Highway 61 Crossing Culverts
This Estimate reflects the scope and schedule in report; Blind River Diversion Project, March 2010

DISTRICT: MVN
POC: CHIEF, COST ENGINEERING
PREPARED: 3/24/2010

Estimate Prepared: 2-Feb-10
Effective Price Level: 1 OCT 10

Program Year (Budget EC): 2012
Effective Price Level Date: 1 OCT 11

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	FULLY FUNDED PROJECT ESTIMATE Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
02	RELOCATIONS	$ 258	$ 156	60.6%	$ 414	2.6%	264.3	160.2	424.5	2014Q1	3.6%	273.8	165.9	439.7
06	FISH & WILDLIFE FACILITIES	$ -	$ -		$ -									
15	FLOODWAY CONTROL & DIVERSION STR	$ 618	$ 174	28.2%	$ 792	2.6%	634.4	178.9	813.2	2014Q1	3.6%	657.2	185.3	842.5
	CONSTRUCTION ESTIMATE TOTALS:	876	330	37.7%	**1,206**		898.7	339.1	1237.7			930.9	351.2	1282.2
01	LANDS AND DAMAGES	$ -	$ -	89.4%	$ -									
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management	2	$ 0	11.5%	2	2.6%	1.8	0.2	2.0	2012Q1		1.8	0.2	2.0
0.5%	Planning & Environmental Compliance	4	$ 1	11.5%	5	2.6%	4.5	0.5	5.0	2012Q1		4.5	0.5	5.0
8.0%	Engineering & Design	70	$ 8	11.5%	78	2.6%	71.9	8.3	80.2	2012Q1		71.9	8.3	80.2
0.2%	Engineering Tech Review ITR & VE	2	$ 0	11.5%	2	2.6%	1.8	0.2	2.0	2012Q1		1.8	0.2	2.0
0.2%	Contracting & Reprographics	2	$ 0	11.5%	2	2.6%	1.8	0.2	2.0	2012Q1		1.8	0.2	2.0
0.5%	Engineering During Construction	4	$ 1	11.5%	5	2.6%	4.5	0.5	5.0	2014Q1	3.6%	4.7	0.5	5.2
0.2%	Planning During Construction	2	$ 0	11.5%	2	2.6%	1.8	0.2	2.0	2014Q1	3.6%	1.9	0.2	2.1
0.2%	Project Operations	2	$ 0	11.5%	2	2.6%	1.8	0.2	2.0	2012Q1		1.8	0.2	2.0
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	88	$ 14	16.0%	102	2.6%	89.9	14.4	104.2	2014Q1	3.6%	93.1	14.9	108.0
	Project Operation:		$ -	16.0%										
1.0%	Project Management	9	$ 1	16.0%	10	2.6%	9.0	1.4	10.4	2014Q1	3.6%	9.3	1.5	10.8
	CONTRACT COST TOTALS:	1,060	356		**1,415**		1087.4	365.2	1452.6			1123.4	378.0	**1501.4**

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Convent/Blind River Diversion Project
LOCATION: St. James Parish, Louisiana
CONTRACT: Pipeline Relocation
This Estimate reflects the scope and schedule in report; Blind River Diversion Project, March 2010

DISTRICT: MVN
POC: CHIEF, COST ENGINEERING
PREPARED: 3/24/2010

Estimate Prepared: 2-Feb-10
Effective Price Level: 1 OCT 10

Program Year (Budget EC): 2012
Effective Price Level Date: 1 OCT 11

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	FULLY FUNDED PROJECT ESTIMATE: Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
02	RELOCATIONS	$ 6,043	$ 3,662	60.6%	$ 9,706	2.6%	6202.0	3758.4	9960.4	2013Q2	2.2%	6339.8	3841.9	10181.8
06	FISH & WILDLIFE FACILITIES	$ -	$ -		$ -									
15	FLOODWAY CONTROL & DIVERSION STR	$ -	$ -	28.2%	$ -									
	CONSTRUCTION ESTIMATE TOTALS:	6,043	3,662	60.6%	**9,706**		6202.0	3758.4	9960.4			6339.8	3841.9	10181.8
01	LANDS AND DAMAGES	$ -	$ -	89.4%	$ -									
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management	12	$ 1	11.5%	13	2.6%	12.4	1.4	13.8	2012Q1		12.4	1.4	13.8
0.5%	Planning & Environmental Compliance	30	$ 3	11.5%	34	2.6%	31.0	3.6	34.6	2012Q1		31.0	3.6	34.6
8.0%	Engineering & Design	483	$ 56	11.5%	539	2.6%	496.2	57.1	553.2	2012Q1		496.2	57.1	553.2
0.2%	Engineering Tech Review ITR & VE	12	$ 1	11.5%	13	2.6%	12.4	1.4	13.8	2012Q1		12.4	1.4	13.8
0.2%	Contracting & Reprographics	12	$ 1	11.5%	13	2.6%	12.4	1.4	13.8	2012Q1		12.4	1.4	13.8
0.5%	Engineering During Construction	30	$ 3	11.5%	34	2.6%	31.0	3.6	34.6	2013Q2	2.2%	31.7	3.6	35.3
0.2%	Planning During Construction	12	$ 1	11.5%	13	2.6%	12.4	1.4	13.8	2013Q2	2.2%	12.7	1.5	14.1
0.2%	Project Operations	12	$ 1	11.5%	13	2.6%	12.4	1.4	13.8	2012Q1		12.4	1.4	13.8
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management	604	$ 97	16.0%	701	2.6%	620.2	99.2	719.4	2013Q2	2.2%	634.0	101.4	735.4
	Project Operation:		$ -	16.0%										
1.0%	Project Management	60	$ 10	16.0%	70	2.6%	62.0	9.9	71.9	2013Q2	2.2%	63.4	10.1	73.5
	CONTRACT COST TOTALS:	7,312	3,838		**11,150**		7504.4	3938.9	11443.3			7658.4	4025.0	**11683.4**

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Convent/Blind River Diversion Project
LOCATION: St. James Parish, Louisiana
CONTRACT: Adaptive Management
This Estimate reflects the scope and schedule in report; Blind River Diversion Project, March 2010

DISTRICT: MVN
POC: CHIEF, COST ENGINEERING
PREPARED: 3/24/2010

Estimate Prepared: 2-Feb-10
Effective Price Level: 1 OCT 10

Program Year (Budget EC): 2012
Effective Price Level Date: 1 OCT 11

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	FULLY FUNDED PROJECT ESTIMATE: Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
02	RELOCATIONS		$ -	60.6%	$ -									
06	FISH & WILDLIFE FACILITIES	$ 6,620	$ -		$ 6,620		6620.0		6620.0	2015Q1		6620.0		6620.0
15	FLOODWAY CONTROL & DIVERSION STRUCTURE		$ -	28.2%	$ -									
	CONSTRUCTION ESTIMATE TOTALS:	6,620			**6,620**		6620.0		6620.0			6620.0		6620.0
01	LANDS AND DAMAGES		$ -	89.4%	$ -									
30	PLANNING, ENGINEERING & DESIGN													
	Project Management		$ -	11.5%										
	Planning & Environmental Compliance		$ -	11.5%										
	Engineering & Design		$ -	11.5%										
	Engineering Tech Review ITR & VE		$ -	11.5%										
	Contracting & Reprographics		$ -	11.5%										
	Engineering During Construction		$ -	11.5%										
	Planning During Construction		$ -	11.5%										
	Project Operations		$ -	11.5%										
31	CONSTRUCTION MANAGEMENT													
	Construction Management		$ -	16.0%										
	Project Operation:		$ -	16.0%										
	Project Management		$ -	16.0%										
	CONTRACT COST TOTALS:	6,620			**6,620**		6620.0		6620.0			6620.0		**6620.0**

**** TOTAL PROJECT COST SUMMARY ****

**** CONTRACT COST SUMMARY ****

PROJECT: Convent/Blind River Diversion Project
LOCATION: St. James Parish, Louisiana
CONTRACT: Real Estate Acquisition
This Estimate reflects the scope and schedule in report; Blind River Diversion Project, March 2010

DISTRICT: MVN
POC: CHIEF, COST ENGINEERING
PREPARED: 3/24/2010

Estimate Prepared: 2-Feb-10
Effective Price Level: 1 OCT 10

Program Year (Budget EC): 2012
Effective Price Level Date: 1 OCT 11

WBS NUMBER	Civil Works Feature & Sub-Feature Description	COST ($K)	CNTG ($K)	CNTG (%)	TOTAL ($K)	ESC (%)	COST ($K)	CNTG ($K)	TOTAL ($K)	FULLY FUNDED PROJECT ESTIMATE: Mid-Point Date	ESC (%)	COST ($K)	CNTG ($K)	FULL ($K)
A	B	C	D	E	F	G	H	I	J	P	L	M	N	O
02	RELOCATIONS		$ -	60.6%	$ -									
06	FISH & WILDLIFE FACILITIES	$ -	$ -		$ -									
15	FLOODWAY CONTROL & DIVERSION STRUCTURE		$ -	28.2%	$ -									
	CONSTRUCTION ESTIMATE TOTALS:													
01	LANDS AND DAMAGES	$ 2,070	$ 1,850	89.4%	$ 3,920	2.6%	2124.3	1899.1	4023.3	2012Q2	0.4%	2133.3	1907.2	4040.5
30	PLANNING, ENGINEERING & DESIGN													
0.2%	Project Management		$ -	11.5%										
0.5%	Planning & Environmental Compliance		$ -	11.5%										
8.0%	Engineering & Design		$ -	11.5%										
0.2%	Engineering Tech Review ITR & VE		$ -	11.5%										
0.2%	Contracting & Reprographics		$ -	11.5%										
0.5%	Engineering During Construction		$ -	11.5%										
0.2%	Planning During Construction		$ -	11.5%										
0.2%	Project Operations		$ -	11.5%										
31	CONSTRUCTION MANAGEMENT													
10.0%	Construction Management		$ -	16.0%										
	Project Operation:		$ -	16.0%										
1.0%	Project Management		$ -	16.0%										
	CONTRACT COST TOTALS:	2,070	1,850		**3,920**		2124.3	1899.1	4023.3			2133.3	1907.2	**4040.5**

This page intentionally left blank.

Convent/Blind River Diversion Project
Louisiana Coastal Area Ecosystem Restoration
St. James Parish, Louisiana

Estimated by	CDM
Designed by	CDM
Prepared by	M. Schlebusch
Preparation Date	3/23/2010
Effective Date of Pricing	3/23/2010
Estimated Construction Time	1,095 Days

Table of Contents

Designed by
CDM
Estimated by
CDM
Prepared by
M. Schlebusch

Design Document	Blind River Diversion Project
Document Date	1/29/2010
District	New Orleans District
Contact	CDM - 816-444-8270
Budget Year	2010
UOM System	Original

Direct Costs
LaborCost
EQCost
MatlCost
SubBidCost
Supply/Allowan

Timeline/Currency

Preparation Date	3/23/2010
Escalation Date	9/30/2009
Eff. Pricing Date	3/23/2010
Estimated Duration	1095 Day(s)
Currency	US dollars
Exchange Rate	1.000000

Costbook CB06EB: MII English Cost Book 2006

Labor LB10NatFD: Labor National 2010

Labor Rates
LaborCost1
LaborCost2
LaborCost3
LaborCost4

Equipment EP10R03: MII Equipment Region 3r 2010
Note: Fuel and electrical costs updated as of February 2010.

03 SOUTHEAST

Sales Tax	8.75
Working Hours per Year	1,530
Labor Adjustment Factor	0.83
Cost of Money	3.25
Cost of Money Discount	25.00
Tire Recap Cost Factor	1.50
Tire Recap Wear Factor	1.80
Tire Repair Factor	0.15
Equipment Cost Factor	1.00
Standby Depreciation Factor	0.50

Fuel

Electricity	0.103
Gas	2.810
Diesel Off-Road	2.799
Diesel On-Road	2.564

Shipping Rates

Over 0 CWT	10.26
Over 240 CWT	9.59
Over 300 CWT	8.41
Over 400 CWT	7.64
Over 500 CWT	4.49
Over 700 CWT	4.36
Over 800 CWT	4.99

Labor ID: LB10NatFD EQ ID: EP10R03 Currency in US dollars TRACES MII Version 3.0

Date	Author	Note

3/11/2010

LOUISIANA COASTAL AREA ECOSYSTEM RESTORATION
CONVENT/BLIND RIVER DIVERSION PROJECT
ST. JAMES PARISH, LOUISIANA

1.0 PROJECT DESCRIPTION
The study area for this project is located in the Mississippi River Deltaic Plain within coastal southeast Louisiana in the Lake Pontchartrain Basin. The study area for this project is within the Upper Lake Pontchartrain Sub-basin; the Upper Lake Pontchartrain Sub-basin includes Lake Maurepas, Maurepas Swamp, Blind River, and portions of the Amite River

The Maurepas Swamp is one of the largest remaining tracts of coastal freshwater swamp in Louisiana. The Blind River flows from St. James Parish, through Ascension Parish and St John the Baptist Parish, and then discharges into Lake Maurepas.

The Maurepas Swamp serves as a buffer between the open water areas of Lakes Maurepas and Pontchartrain and developed areas along the IH-10/Airline Highway corridor. Development along the IH-10/Airline Highway corridor in this area includes residential, commercial, and industrial land use. The Maurepas Swamp is used for fishing, hunting, and other recreational activities, and as a large contiguous tract of bald cypress-tupelo swamp near the New Orleans metropolitan area, has considerable cultural significance.

The Small Diversion at Convent/Blind River restoration project was proposed to reverse the current decline of a portion of the southwestern portion of the Maurepas Swamp and to prevent the transition of the Swamp into marsh and open water. Reversing this decline would help to develop more sustainable wetland ecosystem which can serve to protect the local environment, economy, and culture. In light of Louisiana's extreme vulnerability to intense storms this project may also provide some measure of flood damage protection.

The specific restoration project objectives for the diversion at Convent/Blind River would be to:
- Promote water distribution in the southeastern portion of Maurepas Swamp to move stagnant water out of the system
- Facilitate swamp building, at a rate greater than swamp loss due to subsidence and sea level rise, by increasing sediment input and swamp production to maintain or increase elevation in the swamp
- Increase the durations of dry periods in the swamp to improve bald cypress and tupelo productivity and to increase seed germination and survival of these key species
- Improve fish and wildlife habitat in the swamp and in Blind River

The study of the Diversion at Convent / Blind River restoration project is evaluating a small hydraulic diversion (less than 3,000 cubic feet per second [cfs]) from the Mississippi River into Maurepas Swamp. Alternative locations for the proposed control structure in the vicinity of Convent, Louisiana, located at Mississippi River mile 159 are being investigated. The purpose of this study is to identify reasonable alternatives and to screen the alternatives down to a recommended plan. The Blind River headwaters are located in St. James Parish approximately 2 to 3 miles north of the east bank of the Mississippi River at Convent. The Blind River flows north then east through Ascension and St. John the Baptist Parishes before it empties into Lake Maurepas. The objective of this project is to introduce freshwater, sediment, and nutrients into the southwestern portion of the Maurepas Swamp to improve biological productivity that would facilitate accretion in the Swamp, and prevent further Swamp deterioration.

2.0 CONSTRUCTION ELEMENTS
The Romeville diversion alignment, with a 3,000 cfs capacity, would have six major components: a diversion culvert facility, a transmission canal, control structures of various sizes, berm gaps, cross culverts along the Highway 61 corridor, and instrumentation. Following is a general summary of the components.

2.1 DIVERSION CULVERT FACILITY
The diversion culvert facility would divert fresh water from the Mississippi River, transfer it under the east levee through a box culvert, and discharge it into the transmission canal. The primary hydraulic elements of the diversion culvert facility would be as follows:
- Three 10-feet x 10-feet multi-cell cast-in-place reinforced concrete box culverts under the east levee and LA 44

Labor ID: LB10NatFD EQ ID: EP10R03 Currency in US dollars TRACES MII Version 3.0

Date	Author	Note

3/11/2010

- Three 10-feet x 10-feet cast iron sluice gates with motor operators on the culvert inlets
- Trash racks near the culvert inlet
- Inlet canal across the batture from the Mississippi River to the culvert inlet

LA 44 (River Road) is adjacent to the levee and the box culvert would extend under the road and discharge into the transmission canal 100 feet east of the road. Erosion protection would be provided at locations with higher flow velocities and turbulence, such as at the Mississippi River bank, in the inlet canal entrance, at the box culvert entrance, and at the culvert outlet.

Ancillary elements at the diversion culvert facility would include a gate tower to raise the sluice gate operators and operator access above the Mississippi River flood stage, a steel sheet pile cut-off wall in the levee to reduce the potential for seepage and piping (loss of fines), and stop logs both upstream and downstream of the sluice gates to isolate them for maintenance. The diversion site would include an access driveway, a site road for access to the top of the levee, fence, drainage, lighting, a security system, and a control building.

2.2 TRANSMISSION CANAL

The transmission canal would transfer the diverted water approximately three miles from the diversion culvert facility to an existing drainage channel at the perimeter of the Swamp. The transmission canal would be constructed with a 25% factor of safety for the flow rate to avoid overtopping the berms. This is in anticipation that as the Mississippi River stage varies, the diversion control system, though automated for flow regulation, may not control the flow rate to the precise design value. For the 3,000 cfs diversion, the transmission canal would be designed for 3,750 cfs.

The canal would be an earthen trapezoidal channel section, with a 155-foot wide bottom, 4:1 (H:V) side slopes, and a depth of approximately 12 feet, including a 2-foot freeboard. The top width would be approximately 250 feet. The hydraulic grade line would be above natural ground for most of the route. Therefore, embankments or berms with 34-foot wide tops would be constructed on both sides of the canal. The material excavated to form the channel would be used to construct the embankments.

The transmission canal alignment crosses the Canadian National Railroad (CN RR) and LA 3125, a local highway. Both crossings would consist of eight 12-feet x 8-feet reinforced concrete box culverts across the full right-of-way.

2.3 CONTROL STRUCTURES

The project would use the existing drainage channels at the perimeter of the Swamp to distribute the diverted flow throughout and into the Swamp. The hydraulic grade line, or water surface elevation would need to be raised and controlled slightly (0.5 feet to 1.0 feet) above the existing levels and controlled to force the diverted water out of the drainage channels into the Swamp. Control structures with downward opening crest gates would be installed at key locations in the existing Parish Drainage System channels to perform this function.

The crest gate is a specialty gate that rotates on a shaft at the bottom of the channel and is operated by large hydraulic cylinders. The gate would be rotated up to the vertical position to increase the water surface elevation during the flow diversion. The gate would be rotated down to the channel bottom into the open position when there is no diversion, to allow for normal drainage, and to allow the passage of boats and barges. The crest gates would be installed in large concrete structures constructed in the existing drainage channel. Instrumentation, controls, a hydraulic power unit, and a generator would be located in a precast concrete building at each control structure site.

2.4 BERM GAPS

When the existing drainage channels were excavated in the Swamp, the excavated material was cast to one side of the channel forming spoil banks. The size of the spoil banks vary, with the top elevations ranging from Elev. 4 to Elev. 12. From field observations and the hydro-dynamic modeling, it has been determined that the spoil banks currently block flow circulation into and out of the swamp, resulting in stagnant areas and poor circulation of water through the hydrologic units. In the current configuration, the spoil banks prevent the diverted water from easily entering and flowing through the Swamp. Therefore, new 500-foot wide berm gaps would be excavated in the spoil banks at an approximate spacing of 2,500 feet on center. The gaps would be excavated to the elevation of the adjacent Swamp natural ground elevations and the spoil would be disposed behind the existing spoil banks. The spoil would be piled up to Elev. 6 to provide additional refuge areas for wildlife during

Labor ID: LB10NatFD EQ ID: EP10R03 Currency in US dollars TRACES MII Version 3.0

Date	Author	Note

3/11/2010

flood events in the Swamp.

2.5 CROSS CULVERTS AT THE HIGHWAY 61 CORRIDOR

The hydrodynamic modeling of the Swamp project area indicated that the Kansas City Southern Railroad (KCS RR) and the Highway 61 embankments disrupted the natural flow and circulation of water through the Swamp. This resulted in hydrologic units east and west of the KCS RR/Highway 61 corridor having stagnant water, poor drainage, and lack of sources of fresh water input. New culvert crossings would be added under Highway 61 at four locations. Each installation would consist of three 3-feet x 4-feet reinforced concrete box culverts. It is assumed that there are sufficient cross drainage openings at the KCS RR and additional culverts are not be required. Earthen channels (large ditches) would be excavated across the 500-foot space between the KCS RR and Highway 61 to interconnect the drainage capacity at the railroad with the new culverts at Highway 61.

2.6 INSTRUMENTATION

Instrumentation would be required to monitor and control the diversion flow rate and the water surface elevations in the diversion, transmission, and distribution system in the Swamp. Typically, flow rates and water levels would be measured and the feedback data would be used to adjust gate positions to control the desired parameters at the diversion culvert and the control structures. The monitoring and control data would be collected, analyzed, and transmitted to and from a control building on the diversion culvert site. Following are the main instrumentation for data collection and control that would be installed for each component:

- Diversion Culvert – The flow control at the diversion culvert would establish the flow rate for the project. The diversion flow rate would be set manually by an operator, with adjustments as necessary. The diversion culvert would have instrumentation for water levels at the culvert entrance and exit, for flow measurement, and for sluice gate positions. The control system at the diversion structure would be designed to automatically adjust the sluice gate openings as the Mississippi River stage varies to maintain a constant flow rate.
- Control Structures – The crest gates at the control structures would require water level measurement on both sides of the gates, and gate position measurement, to control gate position, water levels, and flow rates over the gates. The control gates would have manually set positions, with occasional adjustments based on feedback from system monitoring.

There would be no flow or water level control at the following components:
- Transmission Canal – There would be no instrumentation in the transmission canal to control flow rates or water surface elevations. However, the transmission canal would have level monitors at several locations to ensure that the berms are not overtopped.
- Berm Gaps – there would be no flow measurement, level measurement, or controls at the individual berm gaps. All water level control would be at the control structures.
- Cross Culverts at the Highway 61 Corridor – there would be no flow measurement, level measurement, or controls at the four cross culvert locations.

Water level monitors would be required in the Blind River at Highway 61, at IH-10, and possibly additional locations on Blind River and the existing drainage channel network within the Swamp. These monitors would provide feedback for the flow rate control and control gate settings.

The environmental monitoring and hydrological monitoring and data collection within the Swamp would be monitored and transmitted to the control building at the levee for recording and observation.

The data collected from the project would be used as input for adaptive management.

Real-time data would be required from the system components to allow the operator to control and adjust the system flow rates. Radio towers would be provided at each control structure in the Highway 61 corridor to communicate to the control building via a radio tower at the diversion facility. The towers would be 150 to 200 feet tall to have clear line-of-sight communications above the mature Bald Cypress trees.

3.0 ESTIMATED CONSTRUCTION DURATION

The project (for bond calculation purposes) is assumed to have a duration of approximately 3 years or 780 working days (working day is defined as an 8-hour day Monday

Labor ID: LB10NatFD EQ ID: EP10R03 Currency in US dollars TRACES MII Version 3.0

Date	Author	Note

3/11/2010

through Friday excluding major holidays). It is assumed that actual project duration is approximately 36 months from notice to proceed (NTP). The NTP date and field mobilization date are unknown at this phase of the conceptual planning; however, for planning purposes a design completion date in June 2012 was assumed. Procurement and contract award were assumed to occur from July to September 2012 with construction activities starting January 2013.

4.0 ESTIMATE PREPARATION
This cost estimate was prepared based on the guidance provided in U.S. Army Corps of Engineers (USACE) engineer regulation ER 1110-2-1302 and engineer technical letter ETL 1110-2-573 and using the Micro Computer Aided Cost Engineering System (MCACES) Second Generation (MII) software version 3.0, build 4.

This cost estimate assumes that all the necessary equipment, labor, and material would be available for the project because it is located near New Orleans, Louisiana which is a major metropolitan area.

The quantities used in the estimate preparation were determined from the conceptual plans for the work and assumptions made by the cost estimators.

The structure of the estimate is organized according to the Civil Works Work Breakdown Structure (ETL 1110-2-573). The costs presented in this estimate are considered Class 4 with an accuracy range of +50%/-30% of actual cost according to the American Society for Testing and Materials (ASTM) Standard Classification for Cost Estimate Classification System (Designation E 2516-06).

4.1 LABOR RATES
This estimate is based on the latest available/supported MCACES MII labor rate database, which has been updated using the most recent Davis Bacon Wage Determinations for St. James Parish, Louisiana for the base and fringe rates. A labor premium was applied to the Davis Bacon wage determinations to account for a tight construction labor market in the New Orleans area. Subsistence was applied at the rate of $1 per hour.

A worker productivity of 95% was assumed due to the heat and humidity common to southern Louisiana.

Overtime was assumed for this cost estimate to address local concerns on accessibility and ability for hurricane evacuation routes to be available, and to anticipate potential contractor competitiveness with other projects in the area.

In addition, payroll taxes and insurance have been updated for each laborer using the following 2010 factors:

Federal/State Unemployment Taxes: 5.03% (0.8% Federal/4.23% State)
Social Security Taxes: 7.65%
Workmen's Compensation: Varies by trade. Ranges from 22.47% to 26.56%

4.2 EQUIPMENT RATES
This estimate is based on the latest available/supported MCACES MII equipment rate database (EP07R03), which has been updated using the latest Region 3 (LA) Area Factors, as provided in Appendix B of Engineering Pamphlet EP 1110-1-8, dated 10 September 2007. The Area Factors were further adjusted to account for LA state sales tax and current fuel costs (gasoline and diesel) at the time of estimate preparation, and therefore the equipment rates used in the estimate more accurately represent current 2010 energy prices.

4.3 CONTRACTORS/SUBCONTRACTORS
It is assumed that the work will be divided into more than one contract. The following provides an initial breakdown in contracts for this project:

- Diversion Culvert
  LA 44 detour and reconstruction
  Temporary Mississippi river levee

Labor ID: LB10NatFD EQ ID: EP10R03 Currency in US dollars TRACES MII Version 3.0

Date	Author	Note

3/11/2010

Permanent levee removal and replacement
Diversion culverts construction

- Transmission Canal
  LA 3125 detour and reconstruction
  LA 3125 crossing
  CN RR crossing culverts construction
  Construction of earthen channel

- CN RR Relocation
  CN RR temporary relocation and reconstruction

- Control Structures and Berm Gaps
  Construction of control structures
  Formation of berm gaps
  Installation of instrumentation

- Highway 61 Crossing
  Highway 61 detour and reconstruction
  Construction of earthen channels between the KCS RR and Highway 61
  Highway 61 crossing culverts construction

- Pipeline Relocation
  Temporary or permanent relocation of utilities and pipelines in the LA 44 right-of-way

Although the cost estimate assigns different prime contractors based on the work division above, it is not separated into the different contracts. However, the Total Project Cost Summary tables in Appendix A are broken out by the potential contracts listed above.

The estimate assumes the work would be performed by a Prime Contractor or one of the following Subcontractors to the Prime Contractor:

SUBCONTRACTORS
Piling Subcontractor
Concrete Subcontractor
Mechanical Subcontractor
Building Subcontractor
Electrical/Instrumentation Subcontractor
Asphalt Paving Subcontractor
Fence Subcontractor
Revegetation Subcontractor

A Class B surety bond rate was assumed for the both the Prime Contractor and its subcontractors for civil works projects (Construction Cost Estimating Guide For Civil Works, ETL 1110-2-573).The bond rate is calculated by the MCACES MII software.

The following Prime Contractor overhead, profit, and bond markups are assumed:

Labor ID: LB10NatFD EQ ID: EP10R03 Currency in US dollars TRACES MII Version 3.0

Date	Author	Note

3/11/2010

Job Office Overhead (JOOH) = 10%
Home Office Overhead (HOOH) = 10%
Profit = 8%
Bond = Class B – computed by the MCACES MII software

For most of the subcontractors, the following Subcontractor overhead, profit, and bond markups are assumed:

Job Office Overhead (JOOH) = 2%
Home Office Overhead (HOOH) = 10%
Profit = 10%

For the Piling Subcontractor, the following overhead, profit, and bond markups are assumed:

Job Office Overhead (JOOH) = 5%
Home Office Overhead (HOOH) = 10%
Profit = 10%

The Prime Contractor also applies their markups on work done by the subcontractor. The following Prime Contractor markups on Subcontractors are assumed:

Job Office Overhead (JOOH) = 2%
Home Office Overhead (HOOH) = 3%
Profit = 3%
Bond = Computed by the MCACES MII software

4.4 PROJECT OWNER MARKUPS

The owner also has markups on the project level that are applied after contractor markups. These markups are included below. Project owner markups (escalation and contingency) were not applied in the MCACES MII estimate but rather in a separate Total Project Cost Summary Tables in Attachment A. Escalation was determined by the Preliminary Project Schedule in Attachment B.

An 8.75% state sales tax is applied for St. James Parish, Louisiana (4% state sales tax and 4.75% Parish sales tax); it is assumed that the Contractor has an in-state address for purposes of ordering/purchasing materials that incur sales tax.

For the base estimate contingency was applied to lands and damages property acquisition and owner relocations and all construction features. Total project contingency was quantified using the August 2007 USACE Cost and Schedule Risk Analysis Process guidance and is based on Monte Carlo simulation of the cost estimate using Crystal Ball software. The cost risk analysis served to quantify contingency based on an 80% level of confidence and corresponds directly to the risk register prepared by the project delivery team. Total project contingency was quantitatively allocated to individual project features based on dollar-weighted relative risk as measured by the standard deviation of the feature-specific Crystal Ball forecast.

4.5 DETAIL COST SOURCES

The MCACES MII supporting databases (labor, equipment, materials) were used whenever vendor quotes could not be obtained for this cost estimate. Direct detail costs were derived using several sources of cost information. The following are the reference codes used in the detail section to identify sources and are listed in order of usage within the estimate:

1) MCACES MII English Cost Book 2008 (as listed by database ID) Note: Labor, equipment and crew databases have been updated to 2010 using current cost data. Material costs were updated with current vendor quotes or from RS Means CostWorks 2010.

Labor ID: LB10NatFD EQ ID: EP10R03 Currency in US dollars TRACES MII Version 3.0

Date	Author	Note

3/11/2010

2) Vendor Quotes or costs based on Previous Work by CDM (no code listed)
3) CostWorks 2010 from RS MEANS “00 00 0000 0000”

5.0 RISK ANALYSIS

The overall risk management process for the project involves (1) identifying risk factors, (2) analyzing and quantifying the properties of those risk factors, (3) mitigating the impact of the factors on planned project performance, and (4) developing and implementing a risk management plan. While the risk management process is just one part of the overall project planning process, it is incorporated in a concurrent and iterative manner with the other planning processes so as to refine project plans with a goal of increasing performance certainty. The first two elements of the risk management process (identifying risk factors; analyzing and quantifying the properties of those risk factors) have been performed in accordance with the Cost and Schedule Risk Analysis Process described in the August 2007 guidance developed by the USACE Walla Walla District.

6.0 ATTACHMENTS

Attachment A - Total Project Cost Summary Tables
Attachment B - Preliminary Project Schedule
Attachment C - Calculations
Attachment D - Wage Determinations
Attachment E - Vendor Quotes
Attachment F - MCACES MII Input Backup

Currency in US dollars

Direct Cost Markups	Category	Method
Productivity	Productivity	Productivity
Overtime	Overtime	Overtime

	Days/Week	Hours/Shift	Shifts/Day	1st Shift	2nd Shift	3rd Shift
Standard	*5.00*	*8.00*	*1.00*	*8.00*	*0.00*	*0.00*
Actual	*6.00*	*8.00*	*1.00*	*10.00*	*0.00*	*0.00*

Day	OT Factor	Working	OT Percent	FCCM Percent
Monday	*1.00*	*Yes*	*18.33*	*(33.33)*
Tuesday	*1.00*	*Yes*		
Wednesday	*1.00*	*Yes*		
Thursday	*1.00*	*Yes*		
Friday	*1.50*	*Yes*		
Saturday	*2.00*	*Yes*		
Sunday	*2.00*	*No*		

Sales Tax	TaxAdj	Running % on Selected Costs
MatlCost		
Supply/Allowan		

Contractor Markups	Category	Method
JOOH	JOOH	Direct %
JOOH Subcontrator	JOOH	Direct %
JOOH Specialized Sub	Allowance	Running %
HOOH	HOOH	Direct %
HOOH Subcontractor	HOOH	Direct %
HOOH Specialized Sub	Allowance	Running %
Profit	Profit	Direct %
Profit Subcontractor	Profit	Direct %
Profit - Specialized Sub	Allowance	Running %
Bond	Bond	Bond Table

Class B, Tiered, 24 months, 1.00% Surcharge

Contract Price	Bond Rate
500,000	*15.84*
2,000,000	*9.57*
2,500,000	*7.59*
2,500,000	*6.93*
100,000,000,000	*6.34*

Labor ID: LB10NatFD EQ ID: EP10R03 Currency in US dollars TRACES MII Version 3.0

Description	Quantity	UOM	LaborCost	EQCost	MatlCost	SubBidCost	CostToPrime	ContractCost
Project Cost Summary Report			**8,837,494**	**8,023,928**	**19,372,127**	**30,423,190**	**57,878,880**	**90,475,627**
01 Lands and Damages	**1.00**	**LS**	**0**	**0**	**0**	**2,069,900**	**0**	**2,069,900**
01 10 Real Estate Acquisition	**1.00**	**LS**	**0**	**0**	**0**	**2,069,900**	**0**	**2,069,900**
02 Relocations	**1.00**	**LS**	**930,425**	**1,056,002**	**898,823**	**4,680,000**	**8,286,175**	**10,611,495**
02 01 Roads	**1.00**	**LS**	**127,083**	**138,430**	**445,326**	**0**	**879,728**	**1,076,508**
02 02 Railroads	**1.00**	**LS**	**242,481**	**161,011**	**373,106**	**0**	**949,758**	**1,232,231**
02 03 Cemeteries, Utilities, and Structures	**1.00**	**LS**	**560,861**	**756,561**	**80,391**	**4,680,000**	**6,456,690**	**8,302,756**
06 Fish and Wildlife Facilities	**1.00**	**LS**	**0**	**0**	**0**	**6,620,000**	**0**	**6,620,000**
06 03 Wildlife Facilities and Sanctuaries	**1.00**	**LS**	**0**	**0**	**0**	**6,620,000**	**0**	**6,620,000**
15 Floodway Control-Diversion Structures	**1.00**	**LS**	**7,907,069**	**6,967,926**	**18,473,304**	**2,859,072**	**49,592,704**	**56,980,014**
15 00 Floodway Control-Diversion Structures	**1.00**	**LS**	**7,907,069**	**6,967,926**	**18,473,304**	**2,859,072**	**49,592,704**	**56,980,014**
30 Planning, Engineering, and Design	**1.00**	**LS**	**0**	**0**	**0**	**6,759,152**	**0**	**6,759,152**
31 Construction Management	**1.00**	**LS**	**0**	**0**	**0**	**7,435,066**	**0**	**7,435,066**

Currency in US dollars

US Army Corps
of Engineers®

State of Louisiana

LCA SMALL DIVERSION AT CONVENT/BLIND RIVER

COST AND SCHEDULE RISK ANALYSIS

Prepared for:

CDM

CAMP DRESSER & MCKEE INC.
Baton Rouge, Louisiana

Prepared by:

Risk Strategics
The Risk & Decision Analysis Company

RISK STRATEGICS, LLC
Bellingham, Washington

March 23, 2010

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

This page intentionally left blank.

EXECUTIVE SUMMARY

The purpose of this report is to document the results of the Cost and Schedule Risk Analysis (CSRA) performed for the Louisiana Coastal Area (LCA) Small Diversion at Convent/Blind River (Blind River Diversion Project) located in St. James Parish, Louisiana. The CSRA results reflect both cost and schedule risks and are intended to define contingency for the remaining base cost estimate on the Tentatively Selected Plan for the project.

The CSRA was prepared in accordance with US Army Corps of Engineers (USACE) Engineer Regulation (ER) 1110-2-1150, Engineering and Design for Civil Works, ER 1110-2-1302, Civil Works Cost Engineering, and Engineer Technical Letter 1110-2-573, Construction Cost Estimating Guide for Civil Works. The report presents the contingency results for both cost and schedule risks for all project features. The resulting study provides a Tentatively Selected Plan cost estimate summary indicating the estimated remaining base costs and contingencies required for various levels of statistical confidence.

The Blind River Diversion Project technical scope, cost estimates, and schedules were developed by the USACE New Orleans District and the State of Louisiana. These work projects serve as the basis for the risk analysis. For CSRA purposes, the project scope consists of the following features:

- Lands and Damages
- Relocations
- Floodway Control - Diversion Structures
- Planning, Engineering and Design
- Construction Management

Fish and Wildlife Facilities (Adaptive Management) costs estimated at $6,620,000 are assumed to include appropriate contingency and have been excluded from the project scope for CSRA purposes.

Summary of Findings

Table ES-1 was developed as part of the CSRA and provides total Tentatively Selected Plan cost contingencies for the Blind River Diversion Project calculated at various confidence level intervals and rounded to the nearest thousand dollars. Contingency values are rounded to the nearest percent. The total Tentatively Selected Plan cost contingency was quantified as approximately $26.3 million at the eighty-percent confidence level (P80) or about 31% of the remaining base cost estimate of $83,855,627.

To combine cost and schedule contingency results into the total cost contingency presented in Table ES-1, schedule contingency was used to calculate the additional hotel costs and escalation risk impact of project delays. These calculated costs were then added to the cost contingency amount to reflect the USACE standard for presenting the estimated cost for the fully funded project amount.

The P80 level is the contingency value most commonly reported for programming and management purposes within USACE. These results reflect contingencies based on both the cost and schedule risk analyses. It should be noted that use of P80 as a decision criteria is a risk adverse approach (whereas the use of P50 would be a risk neutral approach, and use of levels less than 50 percent would be risk seeking). Thus, a P80 confidence level results in greater contingency as compared to a P50 confidence level.

Table ES-1. Tentatively Selected Plan Contingency Summary

Confidence Level	Remaining Base Cost + Contingency	Contingency ($)	Contingency (%)
P0	$86,627,000.00	$2,771,000.00	3.0%
P10	$98,384,000.00	$14,528,000.00	17.0%
P20	$100,786,000.00	$16,930,000.00	20.0%
P30	$102,481,000.00	$18,625,000.00	22.0%
P40	$103,931,000.00	$20,075,000.00	24.0%
P50	$105,272,000.00	$21,416,000.00	26.0%
P60	$106,654,000.00	$22,798,000.00	27.0%
P70	$108,179,000.00	$24,323,000.00	29.0%
P80	**$110,193,000.00**	**$26,337,000.00**	**31.0%**
P90	$112,994,000.00	$29,138,000.00	35.0%
P100	$141,358,000.00	$57,502,000.00	69.0%

The key cost risk drivers identified through sensitivity analysis are *Railroad Involvement* and *Relocation of Unknown Utilities* which respectively contribute about 19.0 and 12.4 percent of statistical cost variance during *Monte Carlo* simulation. *Construction Productivity Assumptions*, *Geotechnical Uncertainty*, *Lack of Surveys*, *Timing of Project Funding*, and *Market Condition and Bidding Environment* are also important cost risk drivers which together contribute about 42.7 percent of statistical cost variance.

The key schedule risk driver identified through sensitivity analysis is *Timely Design* which contributes about 66.4 percent of statistical schedule duration variance during *Monte Carlo* simulation. *Timing of Project Funding*, *Railroad Involvement*, and *Project*

Priority are also important schedule risk drivers which together contribute about 32.7 percent of statistical schedule variance.

Table ES-2 provides a breakdown of Blind River Diversion Project Tentatively Selected Plan contingency by WBS feature at P80. Values in Table ES-2 are rounded to the nearest dollar or one tenth of one percent.

Table ES-2. Feature Level Contingency at P80

Feature	Remaining Base Cost	Contingency ($)	Contingency (%)	Remaining Base Cost + Contingency
Lands and Damages	$2,069,900	$1,849,471	89.4%	$3,919,371
Relocations	$10,611,495	$6,428,476	60.6%	$17,039,971
Floodway Control - Diversion Structure	$56,980,014	$16,092,218	28.2%	$73,072,232
Planning, Engineering and Design	$6,759,152	$774,178	11.5%	$7,533,330
Construction Management	$7,435,066	$1,192,658	16.0%	$8,627,724

Summary of Recommendations

Several recommendations are provided in the CSRA, as follows:

1. Periodically update the CSRA. Risk events are dynamic and should be evaluated regularly through all phases of design, construction and O&M. To fully recognize its benefits, CSRA should be considered as an ongoing process conducted concurrent to, and iteratively with, other important project processes such as scope and execution plan development, resource planning, procurement planning, cost estimating, budgeting and scheduling.

2. Consider the entire risk analysis curve for budgeting and scheduling purposes. The amount of contingency included in project control plans usually depends, at least in part, on the project leadership's willingness to accept risk of project overruns. The less risk that project leadership is willing to accept the more contingency should be applied in the project control plans.

3. Develop a standalone Risk Management Plan or substantially incorporate the key elements of risk management into the Project Management Plan. The key elements of project risk management include risk management planning, risk identification, risk analysis, risk responses, and risk monitoring/control. The CSRA focuses on risk identification and risk analysis but is not intended to address the other key elements of risk management.

4. Use the risk register routinely as a tool for tracking risk mitigation effectiveness and include the risk mitigation actions identified in the risk register for high-level risks on the project schedule. Updating the risk register as risks are realized or eliminated during project execution may simplify periodic CSRA updates and maintain PDT focus on key risk drivers.

MAIN REPORT

1.0 PURPOSE

The purpose of this report is to document the results of the Cost and Schedule Risk Analysis (CSRA) performed for the Louisiana Coastal Area (LCA) Small Diversion at Convent/Blind River (Blind River Diversion Project) located in St. James Parish, Louisiana. The CSRA results reflect both cost and schedule risks and are intended to define contingency for the remaining base cost estimate on the Tentatively Selected Plan for the project.

2.0 BACKGROUND

The study area for the Blind River Diversion Project is within the Upper Lake Pontchartrain Sub-basin; the Upper Lake Pontchartrain Sub-basin includes Lake Maurepas, Maurepas Swamp, Blind River, and portions of the Amite River.

The Maurepas Swamp is one of the largest remaining tracts of coastal freshwater swamp in Louisiana. The Blind River flows from St. James Parish, through Ascension Parish and St John the Baptist Parish, and then discharges into Lake Maurepas.

The Maurepas Swamp serves as a buffer between the open water areas of Lakes Maurepas and Pontchartrain and developed areas along the I-10/Airline Highway corridor. Development along the I-10/Airline Highway corridor in this area includes residential, commercial, and industrial land use. The Maurepas Swamp is used for fishing, hunting, and other recreational activities, and as a large contiguous tract of bald cypress-tupelo swamp near the New Orleans metropolitan area, has considerable cultural significance.

The Small Diversion at Convent/Blind River restoration project was proposed to reverse the current decline of a portion of the southwestern portion of the Maurepas Swamp and to prevent the transition of the Swamp into marsh and open water. Reversing this decline would help to develop a more sustainable wetland ecosystem which can serve to protect the local environment, economy, and culture. In light of Louisiana's extreme vulnerability to intense storms this project may also provide some measure of flood damage protection.

The specific restoration project objectives for the diversion at Convent/Blind River would be to:

- Promote water distribution in the southeastern portion of Maurepas Swamp to move stagnant water out of the system.
- Facilitate swamp building, at a rate greater than swamp loss due to subsidence and sea level rise, by increasing sediment input and swamp production to

maintain or increase elevation in the swamp.

- Increase the durations of dry periods in the swamp to improve bald cypress and tupelo productivity and to increase seed germination and survival of these key species.
- Improve fish and wildlife habitat in the swamp and in Blind River.

3.0 REPORT SCOPE

The CSRA was prepared in accordance with US Army Corps of Engineers (USACE) Engineer Regulation (ER) 1110-2-1150, Engineering and Design for Civil Works, ER 1110-2-1302, Civil Works Cost Engineering, and Engineer Technical Letter 1110-2-573, Construction Cost Estimating Guide for Civil Works. The report presents the contingency results for both cost and schedule risks for all project features. The resulting study provides a Tentatively Selected Plan cost estimate summary indicating the estimated remaining base costs and contingencies required for various levels of statistical confidence.

3.1 Project Scope

The Blind River Diversion Project technical scope, cost estimates, and schedules were developed by the USACE New Orleans District and the State of Louisiana. These work projects serve as the basis for the risk analysis. For CSRA purposes, the project scope consists of the following features:

- Lands and Damages
- Relocations
- Floodway Control - Diversion Structures
- Planning, Engineering and Design
- Construction Management

Fish and Wildlife Facilities (Adaptive Management) costs estimated at $6,620,000 are assumed to include appropriate contingency and have been excluded from the project scope for CSRA purposes.

3.2 USACE Risk Analysis Process

The risk analysis process for this study generally follows the USACE Headquarters requirements as well as the guidance provided by the Cost Engineering Directory of Expertise for Civil Works (Cost Engineering DX). The risk analysis process reflected within this report uses probabilistic cost and schedule risk analysis methods within the framework of the Oracle Crystal Ball software application. The risk analysis results are intended to serve several functions, one being the establishment of reasonable

contingencies reflective of various levels of confidence to successfully accomplish the project work within that established contingency amount. Furthermore, the scope of the report includes the identification and communication of important steps, logic, key assumptions, limitations, and decisions to help ensure that risk analysis results can be appropriately interpreted.

Risk analysis results are also intended to support decision making and risk management as the project progresses through planning and implementation. To fully recognize its benefits, cost and schedule risk analysis should be considered as an ongoing process conducted concurrent to, and iteratively with, other important project processes such as scope and execution plan development, resource planning, procurement planning, cost estimating, budgeting and scheduling.

In addition to broadly defined risk analysis standards and recommended practices, this risk analysis was performed to substantially meet the requirements and recommendations of the following documents and sources:

- Cost and Schedule Risk Analysis Process guidance prepared by the USACE Cost Engineering DX.
- Memorandum from Major General Don T. Riley (US Army Director of Civil Works), dated July 3, 2007.
- Engineering and Construction Bulletin issued by James C. Dalton, P.E. (Chief, Engineering and Construction, Directorate of Civil Works), dated September 10, 2007.
- Engineering Regulation ER 1110-2-1150 dated August 31, 1999.
- Engineering Regulation ER 1110-2-1302 dated September 15, 2008.
- Engineering Technical Letter ETL 1110-2-573 dated September 30, 2008.

4.0 METHODOLOGY / PROCESS

The risk analysis process used for this study is intended to determine the probability of various cost outcomes and quantify the required contingency needed in the Tentatively Selected Plan cost estimate to achieve any desired level of cost confidence. A parallel process was also used to determine the probability of various project schedule duration outcomes and quantify the required schedule contingency (float) needed in the schedule to achieve any desired level of schedule confidence.

In simple terms, contingency is an amount added to an estimate (cost or schedule) to allow for items, conditions or events for which the occurrence or impact is uncertain and that experience suggests will likely result in additional costs being incurred or additional time being required. The amount of contingency included in project control plans depends, at least in part, on the project leadership's willingness to accept risk of project overruns. The less risk that project leadership is willing to accept the more contingency

should be applied in the project control plans. The risk of overrun is expressed, in a probabilistic context, using confidence levels.

The Cost Engineering DX guidance for cost and schedule risk analysis generally focuses on the eighty-percent level of confidence (P80) for cost contingency calculation. It should be noted that use of P80 as a decision criteria is a risk adverse approach (whereas the use of P50 would be a risk neutral approach, and use of levels less than 50 percent would be risk seeking). Thus, a P80 confidence level results in greater contingency as compared to a P50 confidence level.

The risk analysis process uses *Monte Carlo* techniques to determine probabilities and contingency. Consistent with Cost Engineering DX guidance, the *Monte Carlo* techniques are facilitated computationally by a commercially available risk analysis software application (Oracle Crystal Ball) that is an add-in to Microsoft Excel.

The Blind River Diversion Project Tentatively Selected Plan cost estimate was prepared by the State of Louisiana and USACE New Orleans District in MII, the second generation of the Micro-Computer Aided Cost Estimating System (MCACES). The Tentatively Selected Plan schedule was prepared by the State of Louisiana and USACE New Orleans District using the Microsoft Project scheduling software application. Because Crystal Ball is an Excel add-in, the cost estimate and schedule were recreated in Excel format from their native MII and Microsoft Project formats, respectively. The level of detail recreated in the Excel-format cost estimate and schedule is sufficient for risk analysis purposes, but generally less than that of the native format.

The primary steps, in functional terms, of the risk analysis process are described in the following subsections. Risk analysis results are provided in Section 6.

4.1 Identify and Assess Risk Factors

Checklists or historical databases of common risk factors are sometimes used to facilitate risk factor identification. However, key risk factors are often unique to a project and not readily derivable from historical information. Therefore, input from the entire PDT should be obtained using creative processes such as brainstorming or other facilitated risk assessment meetings. In practice, a combination of professional judgment from the PDT and empirical data from similar projects is desirable and was considered.

A formal risk identification and analysis teleconference was conducted for the Blind River Diversion Project Tentatively Selected Plan on February 24, 2010. The teleconference included capable and qualified representatives from multiple project team disciplines and functions, including:

- Project Management
- Design Engineering

- Economics
- Biological Assessment
- Environmental
- Hydraulics and Hydrology
- Cost Engineering

Additionally, numerous informal discussions were conducted with the project team throughout the risk analysis process on an as-needed basis to further facilitate risk factor identification, market analysis and risk assessment.

4.2 Quantify Risk Factor Impacts

The quantitative impacts of risk factors on project plans were analyzed using a combination of professional judgment, empirical data and analytical techniques. Risk factor impacts were represented by probabilistic distribution functions (density functions) for inputs into the Crystal Ball software application. The probabilistic distribution functions are used to describe the characteristic population (tendencies) of the risk factor inputs. The following elements of each risk factor were addressed in the risk factor quantification process:

- Maximum possible value for the risk factor.
- Minimum possible value for the risk factor.
- Most likely value (the statistical mode), if applicable.
- Nature of the probability density function used to approximate risk factor uncertainty.
- Mathematical correlations between risk factors.
- Affected cost estimate and schedule elements.

Risk factor quantification focused on the various project features as presented in the Tentatively Selected Plan cost estimate and listed in Section 3.1 (Project Scope). This was done because it was recognized that the various features carry differing degrees of risk as related to cost, schedule, design complexity and design progress.

The resulting product from risk factor identification, assessment and quantification was captured within a risk register for both cost and schedule risk concerns. The risk register is presented in Appendix A.

4.3 Analyze Cost Estimate and Schedule Contingency

Contingency was analyzed using the Crystal Ball software application. *Monte Carlo* analysis was performed by applying the risk factors (quantified as probability density functions) to the appropriate estimated cost and schedule elements identified in the risk register. Contingencies were calculated by applying only the moderate and high level

risks identified for the Tentatively Selected Plan (*i.e.*, low-level risks were not considered, but remain within the risk register to serve historical purposes as well as support follow-on risk studies).

For the cost estimate, contingency was calculated as the difference between the cost forecast at various confidence level intervals and the remaining base cost estimate. The remaining base cost estimate is the most likely cost estimate less any assumed contingency.

For the schedule, contingency was calculated as the difference between the duration forecast at various confidence level intervals and the base schedule duration. The duration contingency was then used to estimate *hotel* costs (see next paragraph) and calculate the additional time value of money impact of project delays that are included in the presentation of total cost contingency in Section 6. The resulting time value of money, or added escalation risk, and hotel costs are added into the cost contingency amount to reflect the USACE standard for presenting the estimated cost for the fully funded project amount.

Hotel costs are fixed costs that are inherently incurred as a result of schedule delays. These fixed costs may include general site conditions, rents, project management, supervision and administration, and elements of home office or field office overhead. In practice, sufficiently detailed cost estimates and resource-loaded schedules are often not available to support detailed *hotel* cost estimates for risk analysis and only rough order of magnitude estimates can be developed.

Total contingency (reflecting cost and schedule impacts) was allocated on a WBS feature level based on the dollar-weighted relative risk of each feature as quantified by *Monte Carlo* simulation. Standard deviation was used as the feature-specific measure of risk for contingency allocation purposes. This approach results in a relatively larger portion of total project contingency being allocated to features with relatively higher estimated cost uncertainty.

5.0 KEY ASSUMPTIONS AND LIMITATIONS

Key assumptions and limitations are those that are most likely to significantly affect the determinations of contingency presented in the CSRA. The key assumptions and limitations are important to help ensure that project leadership and other decision makers understand the steps, logic, and decisions made in the risk analysis, as well as any resultant implications on the use of outcomes and results.

The following list identifies the key risk analysis assumptions and limitations within the context of the Blind River Diversion Project CSRA. For each item, the context is first provided and then followed by the key assumption or limitation.

1. Unknown Decisions or Decision Makers: The CSRA was prepared using a framework to generate contingency information that is appropriate for use by State of Louisiana and USACE decision makers for scheduling, budgeting, and project

control purposes. The framework may generate results that are appropriate for use by a wide variety of decision makers or stakeholders; however, the assumed use of CSRA results is limited to scheduling, budgeting, and project control. Other uses by unknown decision makers may not be appropriate.

2. Dynamic Risks: Risk events are dynamic, not static, and should be evaluated regularly through all phases of design, construction and O&M (if required). The CSRA is based on the identification and assessment of risks as of the date of this document. Reduced utility of current CSRA results should be assumed if the likelihood and impact of risks change over time.

3. Causal Relationships: With the exception of risk events identified as correlated in the risk register, it is assumed that the impacts of risks are independent and that the realization of one risk does not cause the realization of another. Significant variance of the risk model results from actual project costs and schedules may be experienced if significant causal relationships exist between risks assumed to be independent.

4. Conservation of Market Pricing Risk: The CSRA assumes that market pricing risks are not created or destroyed but can only be transferred or shared *at a price* as a result of various contract acquisition strategies. As an example, it is assumed that a contractor will add a level of contingency to a fixed price bid, relative to a cost reimbursable bid, that is reflective of the risk transferred contractually from the Government to the contractor. Other aspects of contract acquisition strategies not related to market pricing, such as the management cost of modifications or claims, are not included in this assumption. Any contract acquisition strategy that actually transfers market pricing risk to a contractor *at no cost* to the Government is not reflected in the CSRA.

5. *Unknown Unknown* and *Unknowable Risks*: The Cynefin Framework describes decision-making contexts, in part, by characteristic types of uncertainty. Simple, complicated, complex and chaotic contexts within the framework are respectively associated with *known known*, *known unknown*, *unknown unknown* and *unknowable* uncertainties. The CSRA process focuses on *known known* and *known unknown* risks and is not intended to quantify the impacts of *unknown unknown* or *unknowable* risks. Significant variance of the risk model results from actual project costs and schedules may be experienced if *unknown unknown* or *unknowable* risks, as defined in the Cynefin Framework, are realized.

6.0 RESULTS

The results of the Blind River Diversion Project CSRA are provided in the following sections. In addition to contingency calculation results, sensitivity analyses are

presented to provide decision makers with an understanding of variability and the key contributors to the cause of this variability.

6.1 Risk Register

A risk register is a tool commonly used in project planning and risk analysis. The risk register for the Blind River Diversion Project is presented as Appendix A. The risk register reflects the results of risk factor identification and assessment, risk factor quantification, and contingency analysis.

The Blind River Diversion Project risk register identifies 35 risks that are organized into the following categories:

- Project Management and Organizational Risks
- Contract Acquisition Risks
- Technical Risks
- Lands and Damages Risks
- Regulatory and Environmental Risks
- Construction Risks
- Estimate and Schedule Risks
- External Risks

In regard to project cost, 21 risks are rated as either moderate level or high level based on the risk level matrix identified in Cost Engineering DX guidance. Eighteen risks are identified as either moderate level or high level in regard to project schedule. Contingencies were calculated by applying only the moderate and high level risks identified for the Tentatively Selected Plan (*i.e.*, low-level risks were not considered, but remain within the risk register to serve historical purposes as well as support follow-on risk studies).

It is important to note that a risk register can be an effective tool for managing identified risks throughout the project lifecycle. As such, it is generally recommended that risk registers be updated as the designs, cost estimates and schedule are further refined, especially on large projects with extended schedules. Recommended uses of the risk register going forward include:

- Documenting risk mitigation strategies being pursued in response to the identified risks and their assessment in terms of probability and impact.
- Providing project sponsors, stakeholders and leadership/management with a documented framework from which risk status can be monitored.
- Communicating risk management issues.
- Providing a mechanism for eliciting risk analysis feedback and project control input.

- Identifying risk transfer, elimination or mitigation actions required for implementation of risk management plans.

6.1 Cost Risk Analysis - Cost Contingency Results

Table 1 provides the cost contingencies for the Blind River Diversion Project calculated at various confidence level intervals and rounded to the nearest thousand dollars. Contingency values are rounded to the nearest one-tenth of one percent. Cost contingency was quantified as approximately $22.3 million at P80 (about 26.6% of the remaining base cost estimate of $83,855,627).

Table 1. Cost Contingency Summary

Confidence Level	Remaining Base Cost + Contingency	Contingency ($)	Contingency (%)
P0	$86,380,000	$2,525,000	3.0%
P10	$96,898,000	$13,043,000	15.6%
P20	$98,725,000	$14,870,000	17.7%
P30	$100,072,000	$16,216,000	19.3%
P40	$101,273,000	$17,417,000	20.8%
P50	$102,379,000	$18,523,000	22.1%
P60	$103,511,000	$19,655,000	23.4%
P70	$104,736,000	$20,880,000	24.9%
P80	**$106,157,000**	**$22,302,000**	**26.6%**
P90	$108,163,000	$24,308,000	29.0%
P100	$132,817,000	$48,962,000	58.4%

Sensitivity analysis generally ranks the relative importance of each risk. The Crystal Ball software uses a statistical measure (contribution to variance) that approximates the importance of each risk contributing to variability of cost outcomes during *Monte Carlo* simulation. In variance-based sensitivity analysis, expectation values have to be evaluated to generate a global sensitivity measure. Because expectation values are means (probability-weighted averages), using the importance measures to calculate the contingency associated with a risk at any given confidence level would generally not be meaningful. Furthermore, variance-based sensitivity analysis may provide misleading results for correlated risks.

Key cost drivers identified in the sensitivity analysis can be used to support development of a risk management plan that will facilitate control of risk factors and their potential impacts throughout the project lifecycle. Together with the risk register,

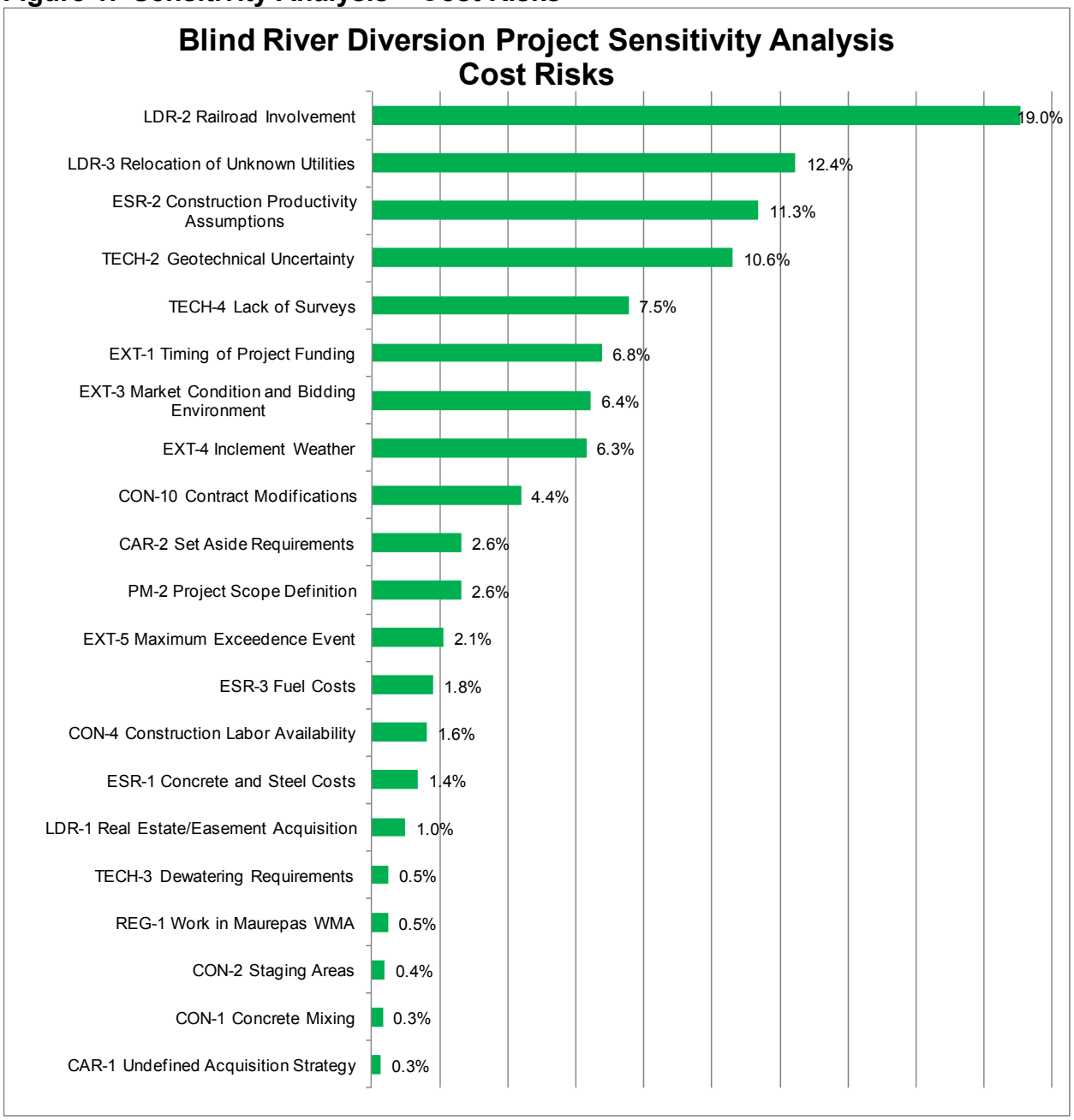
sensitivity analysis results can also be used to support development of strategies to eliminate, mitigate, accept or transfer key risks.

The risks considered as key or primary cost drivers are ranked in order of importance in contribution to variance bar charts. Opportunities that have a potential to reduce project cost and are shown with a negative sign; risks are shown with a positive sign to reflect the potential to increase project cost. A longer bar in the sensitivity analysis chart represents a greater potential impact to total project cost.

Figure 1 presents a sensitivity analysis that includes the moderate and high level cost risks identified in the risk register for the Blind River Diversion Project. Risks that contribute less than 0.1% of statistical cost variance during *Monte Carlo* simulation are omitted from the figure.

The key cost risk drivers identified through sensitivity analysis are *Railroad Involvement* and *Relocation of Unknown Utilities* which respectively contribute about 19.0 and 12.4 percent of statistical cost variance during *Monte Carlo* simulation. *Construction Productivity Assumptions*, *Geotechnical Uncertainty*, *Lack of Surveys*, *Timing of Project Funding*, and *Market Condition and Bidding Environment* are also important cost risk drivers which together contribute about 42.7 percent of statistical cost variance.

Figure 1. Sensitivity Analysis – Cost Risks



Note: Variance-based sensitivity analysis provides quantitative information about the importance of the risks; however, extrapolations or ancillary uses of the information are not recommended. Rather than evaluation of contingency, the primary intended use of sensitivity analysis is evaluation of the risk model. Risks preceded by an asterisk are correlated with one or more other risks as indicated in the risk register. Variance-based sensitivity analysis may provide misleading results for correlated risks.

6.3 Schedule Risk Analysis – Schedule Contingency Results

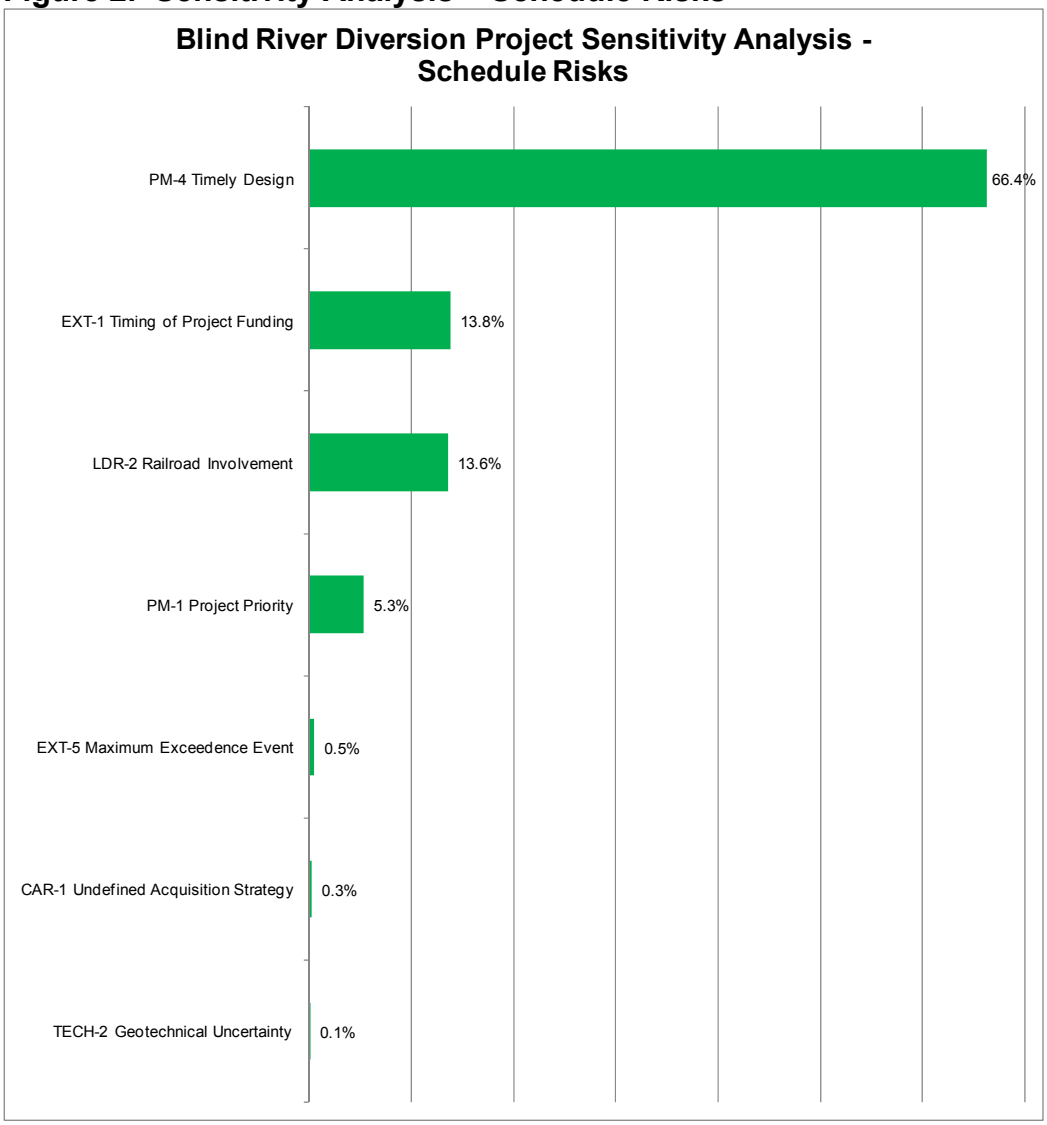
Table 2 provides the schedule duration contingencies for the Blind River Diversion Project calculated at various confidence level intervals and rounded to the nearest day. Contingency values are rounded to the nearest one-tenth of one percent. Schedule duration contingency was quantified as 568 days at P80 (about 30.4% of the remaining base schedule duration of approximately 1,866 calendar days). It is important to note that these results reflect only those contingencies established from the schedule risk analysis and do not reflect the influences of schedule float.

Table 2. Schedule Contingency Summary

Confidence Level	Base Duration + Contingency (calendar days)	Contingency (calendar days)	Contingency (%)
P0	1,901	35	1.9%
P10	2,076	210	11.3%
P20	2,157	291	15.6%
P30	2,206	340	18.2%
P40	2,241	375	20.1%
P50	2,274	408	21.9%
P60	2,309	443	23.7%
P70	2,351	485	26.0%
P80	**2,434**	**568**	**30.4%**
P90	2,545	679	36.4%
P100	3,059	1,193	63.9%

Figure 2 presents a sensitivity analysis that includes the moderate and high level schedule duration risks identified in the risk register for the Blind River Diversion Project. Risks that contribute less than 0.1% of statistical schedule variance during *Monte Carlo* simulation are omitted from the figure.

Figure 2. Sensitivity Analysis – Schedule Risks



Note: Variance-based sensitivity analysis provides quantitative information about the importance of the risks; however, extrapolations or ancillary uses of the information are not recommended. Rather than evaluation of contingency, the primary intended use of sensitivity analysis is evaluation of the risk model. Risks preceded by an asterisk are correlated with one or more other risks as indicated in the risk register. Variance-based sensitivity analysis may provide misleading results for correlated risks.

The key schedule risk driver identified through sensitivity analysis is *Timely Design* which contributes about 66.4 percent of statistical schedule duration variance during *Monte Carlo* simulation. *Timing of Project Funding*, *Railroad Involvement*, and *Project Priority* are also important schedule risk drivers which together contribute about 32.7 percent of statistical schedule variance.

6.4 Combined Cost and Schedule Contingency Results

Table 3 provides total Tentatively Selected Plan cost contingencies for the Blind River Diversion Project calculated at various confidence level intervals and rounded to the nearest thousand dollars. Contingency values are rounded to the nearest percent. To combine cost and schedule contingency results into a total cost contingency, schedule contingency was used to calculate the additional hotel costs and escalation risk impact of project delays. These calculated costs were then added to the cost contingency amount to reflect the USACE standard for presenting the estimated cost for the fully funded project amount.

The total Tentatively Selected Plan cost contingency was quantified as approximately $26.3 million at the eighty-percent confidence level (P80) or about 31% of the remaining base cost estimate of $83,855,627. About 14 percent of the total cost contingency is associated with schedule risk (*i.e.*, about 4.4 out of the 31 total percentage points). It is important to note that these results reflect contingencies based on both the cost and schedule risk analyses.

Table 3. Tentatively Selected Plan Contingency Summary

Confidence Level	Remaining Base Cost + Contingency	Contingency ($)	Contingency (%)
P0	$86,627,000.00	$2,771,000.00	3.0%
P10	$98,384,000.00	$14,528,000.00	17.0%
P20	$100,786,000.00	$16,930,000.00	20.0%
P30	$102,481,000.00	$18,625,000.00	22.0%
P40	$103,931,000.00	$20,075,000.00	24.0%
P50	$105,272,000.00	$21,416,000.00	26.0%
P60	$106,654,000.00	$22,798,000.00	27.0%
P70	$108,179,000.00	$24,323,000.00	29.0%
P80	**$110,193,000.00**	**$26,337,000.00**	**31.0%**
P90	$112,994,000.00	$29,138,000.00	35.0%
P100	$141,358,000.00	$57,502,000.00	69.0%

Figure 3 provides a summary graph of the Blind River Diversion Project Tentatively Selected Plan risk analysis.

Figure 3. Remaining Cost Risk Analysis

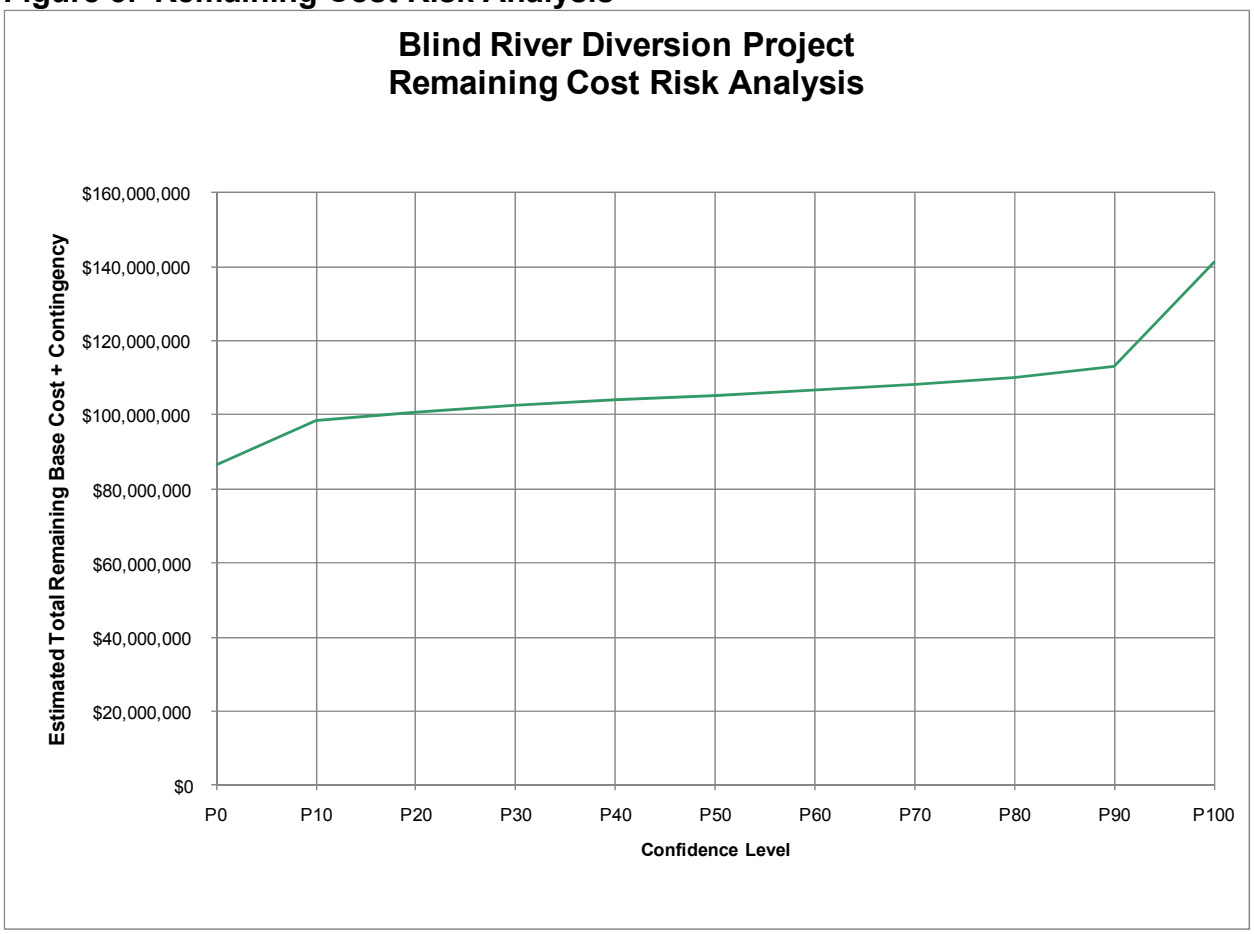


Table 4 provides a breakdown of Tentatively Selected Plan contingency by WBS feature at P80.

Table 4. Feature Level Contingency at P80

Feature	Remaining Base Cost	Contingency ($)	Contingency (%)	Remaining Base Cost + Contingency
Lands and Damages	$2,069,900	$1,849,471	89.4%	$3,919,371
Relocations	$10,611,495	$6,428,476	60.6%	$17,039,971
Floodway Control - Diversion Structure	$56,980,014	$16,092,218	28.2%	$73,072,232
Planning, Engineering and Design	$6,759,152	$774,178	11.5%	$7,533,330
Construction Management	$7,435,066	$1,192,658	16.0%	$8,627,724

7.0 MAJOR FINDINGS/OBSERVATIONS

This section provides a summary of significant risk analysis results that are identified in the preceding sections of the report. Risk analysis results are intended to provide project leadership with contingency information for scheduling, budgeting, and project control purposes. Results also provide tools to support decision making and risk management as projects progress through planning and implementation.

Major findings and observations of the risk analysis are listed below.

1. The total Tentatively Selected Plan cost contingency was quantified as approximately $26.3 million at the eighty-percent confidence level (P80) or about 31% of the remaining base cost estimate of $83,855,627. About 14 percent of the total cost contingency is associated with schedule risk (*i.e.*, about 4.4 out of the 31 total percentage points). It is important to note that these results reflect contingencies based on both the cost and schedule risk analyses.

2. The key cost risk drivers identified through sensitivity analysis are *Railroad Involvement* and *Relocation of Unknown Utilities* which respectively contribute about 19.0 and 12.4 percent of statistical cost variance during *Monte Carlo* simulation. *Construction Productivity Assumptions*, *Geotechnical Uncertainty*, *Lack of Surveys*, *Timing of Project Funding*, and *Market Condition and Bidding*

Environment are also important cost risk drivers which together contribute about 42.7 percent of statistical cost variance.

3. The key schedule risk driver identified through sensitivity analysis is *Timely Design* which contributes about 66.4 percent of statistical schedule duration variance during *Monte Carlo* simulation. *Timing of Project Funding*, *Railroad Involvement*, and *Project Priority* are also important schedule risk drivers which together contribute about 32.7 percent of statistical schedule variance.

8.0 RECOMMENDATIONS

This section provides several general recommendations based on the major CSRA findings and observations. CSRA does not address all key elements of project risk management and, accordingly, the list of recommendations should not be considered comprehensive. The recommendations are as follows:

1. Periodically update the CSRA. Risk events are dynamic and should be evaluated regularly through all phases of design, construction and O&M. To fully recognize its benefits, CSRA should be considered as an ongoing process conducted concurrent to, and iteratively with, other important project processes such as scope and execution plan development, resource planning, procurement planning, cost estimating, budgeting and scheduling.

2. Consider the entire risk analysis curve for budgeting and scheduling purposes. The amount of contingency included in project control plans usually depends, at least in part, on the project leadership's willingness to accept risk of project overruns. The less risk that project leadership is willing to accept the more contingency should be applied in the project control plans.

3. Develop a standalone Risk Management Plan or substantially incorporate the key elements of risk management into the Project Management Plan. The key elements of project risk management include risk management planning, risk identification, risk analysis, risk responses, and risk monitoring/control. The CSRA focuses on risk identification and risk analysis but is not intended to address the other key elements of risk management.

4. Use the risk register routinely as a tool for tracking risk mitigation effectiveness and include the risk mitigation actions identified in the risk register for high-level risks on the project schedule. Updating the risk register as risks are realized or eliminated during project execution may simplify periodic CSRA updates and maintain PDT focus on key risk drivers.

APPENDIX A

RISK REGISTER

Blind River Diversion Project
Tentatively Selected Plan

The diversion alignment, with a 3,000 cfs capacity, has six major components: a diversion culvert facility, a transmission canal, approximately six control structures of various sizes, approximately 30 berm gaps, cross culverts at four locations along the Highway 61 corridor, and instrumentation. The study area for this project is located in the Mississippi River Deltaic Plain within coastal southeast Louisiana in the Lake Pontchartrain Basin. This restoration project was proposed to reverse the current decline of a portion of the southwestern portion of the Maurepas Swamp and to prevent the transition of the Swamp into marsh and open water.

Revised:
8-Mar-10

Impact or Consequence of Occurrence

	Negligible	*Marginal*	*Significant*	*Critical*	*Crisis*
Very Likely	Low	Moderate	High	High	High
Likely	Low	Moderate	High	High	High
Unlikely	Low	Low	Moderate	Moderate	High
Very Unlikely	Low	Low	Low	Low	High

Risk No.	PDT-developed Risk/Opportunity Event	PDT Concerns	PDT Discussions	Responsibility/POC	Project Cost			Project Schedule			Mitigation Actions
					Likelihood*	Impact*	Risk Level*	Likelihood*	Impact*	Risk Level*	
PROJECT MANAGEMENT AND ORGANIZATIONAL RISKS											
PM-1	Project Priority	The project will be competing with other projects for resources.	The project has relatively high priority for the State and New Orleans District. It also enjoys strong local support. However, it may receive lower priority from USACE HQ as a restoration project (as compared to hurricane and storm damage protection).	Project Management State of Louisiana	UNLIKELY	MARGINAL	**LOW**	UNLIKELY	CRITICAL	**MODERATE**	1. Ensure that the strong local support for the project is effectively communicated. 2. State may also mitigate by maintaining project visibility with USACE.
PM-2	Project Scope Definition	The level of project definition is approximately 15%.	The level of project definition is not unusual for a project at this stage of design. The current estimate and schedule may not fully reflect the final design.	Project Management	LIKELY	CRITICAL	**HIGH**	LIKELY	SIGNIFICANT	**HIGH**	1. Proceed with a robust design process. 2. Update the cost estimate and schedule to reflect design progress and communicate any significant changes in funding needs early.
PM-3	Approval or Decision Delays	Both design and construction will require numerous document reviews and key decisions by both the State and USACE.	Communication and the timing of reviews and decisions by the State and USACE has been good to date. Significant delays related to approval times or key decisions are not anticipated.	Project Management	UNLIKELY	NEGLIGIBLE	**LOW**	UNLIKELY	MARGINAL	**LOW**	1. Periodically monitor and reassess this risk to determine if changes in risk probability or impact have occurred.
PM-4	Timely Design	The project involves significant permitting and coordination with outside agencies. Untimely or rushed design may result in permitting delays.	Permitting agencies and the Canadian National Railroad (CN RR) will require substantial design information before significant decisions can be made and requirements identified.	Project Management	UNLIKELY	MARGINAL	**LOW**	UNLIKELY	CRITICAL	**MODERATE**	1. Schedule detailed design early and include sufficient float in the schedule so that unanticipated design delays do not impact the permitting schedule. 2. Early and frequent consultation with permitting agencies and CN RR as the design progresses.
CONTRACT ACQUISITION RISKS											
CAR-1	Undefined Acquisition Strategy	An acquisition plan has not yet been developed.	Four construction contracts are currently anticipated for planning purposes. It is not clear if the State; USACE; or the State and USACE will issue and manage the construction contracts. The State prefers handling all of the contracting but no decisions have been made. Railroad work may be contracted directly by CN RR.	Contract Acquisition	VERY LIKELY	MARGINAL	**MODERATE**	VERY LIKELY	MARGINAL	**MODERATE**	1. Early consultation with contract acquisition specialist to validate planning assumptions regarding contracting. 2. Make a key decision regarding acquisition strategy early in the design process and reach agreement between the State, USACE and CN RR.
CAR-2	Set Aside Requirements	The use of SDB and 8(a) contracts may be required.	The cost estimate may not reflect the tiering of subcontractors and potential for increased costs if set aside requirements are imposed on the project. The pool of qualified SDB and 8(a) firms is likely limited in comparison to an unrestricted procurement. This could result in a less competitive bidding process.	Contract Acquisition	LIKELY	SIGNIFICANT	**HIGH**	LIKELY	MARGINAL	**MODERATE**	1. Early consultation with contract acquisition specialist to validate planning assumptions regarding set aside requirements. 2. Make a key decision regarding set aside requirements.
TECHNICAL RISKS											
TECH-1	Level of Technical Complexity	Innovative, complex or first-of-a-kind designs may result in unanticipated schedule delays and cost impacts.	The project involves relatively standard heavy civil construction. Features are not technically complex. Design and construction contractors have extensive regional experience with similar projects.	Engineering	VERY UNLIKELY	SIGNIFICANT	**LOW**	VERY UNLIKELY	SIGNIFICANT	**LOW**	1. Periodically monitor and reassess this risk to determine if changes in risk probability or impact have occurred.
TECH-2	Geotechnical Uncertainty	Cost estimate and schedule rely on significant assumptions regarding geotechnical conditions.	Cut-and-fill balance calculations are based on the assumption that dirt excavated during transmission canal construction will be suitable for temporary levee construction. Geotechnical conditions also impact structural support design (e.g., concrete piles).	Engineering	LIKELY	SIGNIFICANT	**HIGH**	LIKELY	MARGINAL	**MODERATE**	1. Conduct geotechnical investigations early in the design process. 2. Update the cost estimate and schedule to reflect geotechnical data and communicate any significant changes in funding needs early.
TECH-3	Dewatering Requirements	Estimated transmission canal dewatering costs may be low.	Actual dewatering needs are uncertain because subsurface conditions are not well known at this stage of the project. Cost in estimate may be low.	Engineering	LIKELY	MARGINAL	**MODERATE**	LIKELY	NEGLIGIBLE	**LOW**	1. Conduct dewatering-related studies and investigations early in the design process. 2. Update the cost estimate and schedule to reflect dewatering studies and communicate any significant changes in funding needs early.
TECH-4	Lack of Surveys	Detailed surveys have not yet been performed.	No surveys are available for the control structures, except for channel depth. Current design and cost estimate assumptions may not be valid after detailed survey data is received.	Engineering	LIKELY	SIGNIFICANT	**HIGH**	LIKELY	NEGLIGIBLE	**LOW**	1. Conduct detailed surveys early in the design process. 2. Update the cost estimate and schedule to reflect survey data and communicate any significant changes in funding needs early.
LANDS AND DAMAGES RISKS											
LDR-1	Real Estate/Easement Acquisition	Real estate acquisition has not yet begun.	The State will handle real estate acquisition and can use eminent domain to compel acquisition if necessary. Significant uncertainty exists in the timing and cost of acquisitions. Development of adjacent or nearby parcels may result in significantly increased costs.	Real Estate	LIKELY	CRITICAL	**HIGH**	LIKELY	MARGINAL	**MODERATE**	1. Refine real estate needs early in the design. 2. Acquire real estate early to minimize risk of adjacent and nearby land use changes that cause land values to increase.
LDR-2	Railroad Involvement	Project requires relocation and reconstruction of CN RR crossing.	Input from CN RR regarding their requirements has been requested but not received. Design, cost and schedule assumptions may not be accurate. State and USACE will have no control if CN RR issues and manages relocation contracts for design and construction.	Real Estate	LIKELY	SIGNIFICANT	**HIGH**	LIKELY	CRITICAL	**HIGH**	1. Proactively manage interface with CN RR through frequent consultation. 2. Substantially complete all planning/design elements that CN RR will require to make decisions regarding their requirements and contracting. 3. Build float into the schedule if the State and/or USACE will not be in control of relocation and reconstruction contracts.

Blind River Diversion Project
Tentatively Selected Plan

The diversion alignment, with a 3,000 cfs capacity, has six major components: a diversion culvert facility, a transmission canal, approximately six control structures of various sizes, approximately 30 berm gaps, cross culverts at four locations along the Highway 61 corridor, and instrumentation. The study area for this project is located in the Mississippi River Deltaic Plain within coastal southeast Louisiana in the Lake Pontchartrain Basin. This restoration project was proposed to reverse the current decline of a portion of the southwestern portion of the Maurepas Swamp and to prevent the transition of the Swamp into marsh and open water.

Revised:
8-Mar-10

Impact or Consequence of Occurrence

	Negligible	*Marginal*	*Significant*	*Critical*	*Crisis*
Very Likely	Low	Moderate	High	High	High
Likely	Low	Moderate	High	High	High
Unlikely	Low	Low	Moderate	Moderate	High
Very Unlikely	Low	Low	Low	Low	High

Risk No.	PDT-developed Risk/Opportunity Event	PDT Concerns	PDT Discussions	Responsibility/POC	Project Cost			Project Schedule			Mitigation Actions
					Likelihood*	Impact*	Risk Level*	Likelihood*	Impact*	Risk Level*	
LDR-3	Relocation of Unknown Utilities	Cost and time required for relocating unknown utilities are not reflected in the estimate or schedule.	Pipeline location work is only partially complete and some larger petroleum and gas pipelines are likely to be identified in the future. Project will need to coordinate with pipeline owner and pay for relocation if necessary. Major fiber optic or other communication lines are not expected to be impacted.	Real Estate	LIKELY	SIGNIFICANT	**HIGH**	LIKELY	MARGINAL	**MODERATE**	1. Conduct thorough utility locating surveys early in the design process. 2. Consult early with owners of any significant, currently unknown utilities to determine requirements and schedule for relocations. 3. Update the cost estimate and schedule to reflect necessary relocations and communicate any significant changes in funding needs early.
REGULATORY AND ENVIRONMENTAL RISKS											
REG-1	Work in Maurepas WMA	Special requirements related to work within the Maurepas Swamp Wildlife Management Area (WMA) are not reflected in the cost estimate or schedule.	Work within the WMA will require environmental permits which may have significant special requirements. There are limitations on construction during eagle nesting season. The WMA is culturally significant and historic, cultural resource and endangered surveys are not yet complete.	Environmental	LIKELY	MARGINAL	**MODERATE**	LIKELY	MARGINAL	**MODERATE**	1. Complete historic, cultural resource and endangered species surveys early and consult with permitting agencies proactively. 2. Substantially complete all planning/design elements required for environmental permitting early in the design process. 3. Incorporate any special requirements into the design and reflect in the cost estimate and schedule.
CONSTRUCTION RISKS											
CON-1	Concrete Mixing	Uncertainty regarding where concrete for cast-in-place structures will be mixed may result in estimated unit costs being too low.	The project requires significant cast-in-place concrete work using ready mix concrete that will be brought in by barge. Mixing may occur at a staging area before loading onto barges or occur at the construction locations. The cost estimate may not reflect the true unit cost of concrete delivered by barge.	Cost Engineering	LIKELY	MARGINAL	**MODERATE**	LIKELY	NEGLIGIBLE	**LOW**	1. Conduct survey to determine how cast-in-place concrete has been handled for similar projects within the region. 2. Assess validity of unit costs in estimate and revise as appropriate.
CON-2	Staging Areas	Locations and requirements for staging areas have not yet been identified.	Staging areas are not likely to be allowed within the WMA. It is anticipated that the staging area(s) for control structures will be required to be located in upland areas and be self-contained. Cost and time required for locating and constructing staging areas may not be reflected in the cost estimate and schedule.	Engineering	LIKELY	MARGINAL	**MODERATE**	LIKELY	MARGINAL	**MODERATE**	1. Determine staging area requirements and locations during detailed design. 2. Consult with Real Estate early if any acquisition action is necessary.
CON-3	Site Access	Site access for work within the swamp will be by barge.	Contractors in the region have extensive experience doing work in the wet using barges. Availability of barges not anticipated to be an issue because of the timing of construction relative to other projects. Boat launch for barges is available.	Engineering	VERY UNLIKELY	MARGINAL	**LOW**	VERY UNLIKELY	MARGINAL	**LOW**	1. Periodically monitor and reassess this risk to determine if changes in risk probability or impact have occurred.
CON-4	Construction Labor Availability	A limited supply of construction labor could result in schedule delays or increased cost. Attracting labor in a tight market may require incentives (e.g., overtime).	Specialty labor not required for the project. Availability of labor not anticipated to be an issue because of the timing of construction relative to other projects.	Cost Engineering	UNLIKELY	SIGNIFICANT	**MODERATE**	UNLIKELY	MARGINAL	**LOW**	1. Monitor labor availability and market conditions.. 2. Update the cost estimate to reflect labor costs and communicate any significant changes in funding needs early.
CON-5	Long Lead Fabrication	Construction may be delayed if design and procurement of long lead items is not timely. Added costs may be required if fabrication shop space is scare.	The project does not involve significant long lead procurement. The 10' x 10' sluice gates and motors will require the longest lead time.	Cost Engineering	UNLIKELY	MARGINAL	**LOW**	UNLIKELY	SIGNIFICANT	**MODERATE**	1. Determine lead time required for sluice gates and reflect in schedule. 2. Complete design of gates early enough to support procurement schedule. 3. Monitor market conditions and fabrication space to identify needs to accelerate schedule.
CON-6	Highway Permit	A permit will be required from the Louisiana Department of Transportation.	Untimely receipt of the permit from Louisiana Department of Transportation (DOT), or unanticipated permit requirements, may result in schedule delays or costs not reflected in the estimate. DOT permitting for the project is anticipated to be routine in nature.	Permitting	UNLIKELY	MARGINAL	**LOW**	UNLIKELY	MARGINAL	**LOW**	1. Periodically monitor and reassess this risk to determine if changes in risk probability or impact have occurred.
CON-7	Compatibility with Hunting Season	The State generally restricts work in the swamp during hunting season due to the risk of a hunting accident.	The project area is used widely for hunting, fishing and recreation. A hunting accident involving contractors may result in a work stoppage and safety reviews. Coordination and public outreach will be required. Hunting season runs from November through January.	Project Management State of Louisiana	UNLIKELY	MARGINAL	**LOW**	UNLIKELY	MARGINAL	**LOW**	1. Periodically monitor and reassess this risk to determine if changes in risk probability or impact have occurred.
CON-8	Mississippi River Permit	Uncertainty regarding the need to obtain a permit to withdraw water from the Mississippi River.	Because the 3,000 cfs diversion capacity is a small fraction of Mississippi River flows, permitting is not anticipated to be problematic (if a permit is needed). Permitting agencies would likely be USACE and the Coast Guard.	Permitting	LIKELY	NEGLIGIBLE	**LOW**	LIKELY	MARGINAL	**MODERATE**	1. Identify permitting needs through early. 2. If permitting is required, substantially complete all planning/design elements required for permitting early in the design process. 3. Incorporate any special requirements into the design and reflect in the cost estimate and schedule.
CON-9	HTW or CR Impacts	Potential to encounter unanticipated hazardous or toxic waste (HTW) or cultural resources (CR) during construction.	Subsurface CR (e.g. artifacts) or HTW (e.g. petroleum from old or abandoned pipelines) may be encountered during excavation activities resulting in schedule delays and added costs for study and disposal of contaminated soil.	Engineering	UNLIKELY	MARGINAL	**LOW**	UNLIKELY	SIGNIFICANT	**MODERATE**	1. Perform a thorough survey of known CR and HTW sites during detailed design. 2. Design around any known CR and HTW to the maximum extent possible. 3. Build sufficient float into the schedule if known CR or HTW sites are adjacent to or nearby construction locations.

Revised:
8-Mar-10

Blind River Diversion Project
Tentatively Selected Plan

The diversion alignment, with a 3,000 cfs capacity, has six major components: a diversion culvert facility, a transmission canal, approximately six control structures of various sizes, approximately 30 berm gaps, cross culverts at four locations along the Highway 61 corridor, and instrumentation. The study area for this project is located in the Mississippi River Deltaic Plain within coastal southeast Louisiana in the Lake Pontchartrain Basin. This restoration project was proposed to reverse the current decline of a portion of the southwestern portion of the Maurepas Swamp and to prevent the transition of the Swamp into marsh and open water.

Impact or Consequence of Occurrence

	Negligible	*Marginal*	*Significant*	*Critical*	*Crisis*
Very Likely	Low	Moderate	High	High	High
Likely	Low	Moderate	High	High	High
Unlikely	Low	Low	Moderate	Moderate	High
Very Unlikely	Low	Low	Low	Low	High

Risk No.	PDT-developed Risk/Opportunity Event	PDT Concerns	PDT Discussions	Responsibility/POC	Project Cost			Project Schedule			Mitigation Actions
					Likelihood*	Impact*	Risk Level*	Likelihood*	Impact*	Risk Level*	
CON-10	Contract Modifications	Risk that unforeseen conditions will result in construction contract modifications after contract award.	There is a residual risk after construction contracts are awarded that legitimate contract modifications may be required. This is a risk common to all heavy civil projects. Because the contract acquisition strategy includes four construction contracts, it is considered likely that at least one will require a modification.	Engineering	LIKELY	SIGNIFICANT	**HIGH**	LIKELY	NEGLIGIBLE	**LOW**	1. Perform thorough surveys and investigations as part of a robust design process. 2. Perform constructability reviews at key stages of the design process.
ESTIMATE AND SCHEDULE RISKS											
ESR-1	Concrete and Steel Costs	The cost estimate may not reflect the future prices of concrete and steel.	The project requires significant concrete and steel. Concrete and steel prices have been historically volatile and may increase if economic conditions improve. Concrete and steel prices are likely to be volatile and could increase or decrease from cost estimate assumptions. Increased prices may be more likely than decreases.	Cost Engineering	LIKELY	MARGINAL	**MODERATE**	LIKELY	NEGLIGIBLE	**LOW**	1. Monitor concrete and steel prices, as well as regional economic conditions. 2. Update the cost estimate to reflect concrete and steel prices and communicate any significant changes in funding needs early.
ESR-2	Construction Productivity Assumptions	Productivity assumptions in the cost estimate and schedule may not be valid.	The project requires significant wet work in the Mississippi River and in the swamp. Productivity for barge work can be significantly impacted by local conditions and the use of productivity assumptions based on historical data may not be accurate. Lower than anticipated productivity may result in schedule delays and increased indirect costs (hotel load).	Cost Engineering	LIKELY	SIGNIFICANT	**HIGH**	LIKELY	SIGNIFICANT	**HIGH**	1. Conduct survey to identify productivities for similar projects near the project location. 2. Conduct constructability review a key stages of the design process. 2. Assess validity of productivity assumptions in estimate and schedule and revise as appropriate.
ESR-3	Fuel Costs	Fuel cost assumptions in the cost estimate may not be valid.	The project requires significant heavy equipment use and associated fuel consumption. Fuel prices have been historically volatile and may increase if economic conditions improve. Fuel prices are likely to be volatile and could increase or decrease from cost estimate assumptions. Increased prices may be more likely than decreases.	Cost Engineering	LIKELY	MARGINAL	**MODERATE**	LIKELY	NEGLIGIBLE	**LOW**	1. Monitor fuel prices, as well as regional economic conditions. 2. Update the cost estimate to reflect fuel prices and communicate any significant changes in funding needs early.
EXTERNAL RISKS											
EXT-1	Timing of Project Funding	Funding delays, or lower than anticipated annual funding, could result in an extended construction schedule.	Annual funding over three fiscal years considered likely. Funding decisions will be made by the State and USACE.	Project Management	LIKELY	SIGNIFICANT	**HIGH**	LIKELY	CRITICAL	**HIGH**	1. Reach agreement between the State and USACE and make a key decision regarding incremental funding early in the design process. 2. Monitor changes in funding expectations and reflect any changes in the cost estimate and schedule.
EXT-2	Local Community Acceptance	Local community could object to the project and cause schedule delays or design changes.	The project has enjoyed strong support by the local community. Future issues are not anticipated.	Project Management	LIKELY	NEGLIGIBLE	**LOW**	LIKELY	NEGLIGIBLE	**LOW**	1. Periodically monitor and reassess this risk to determine if changes in risk probability or impact have occurred.
EXT-3	Market Condition and Bidding Environment	Cost estimate and schedule assumptions regarding future market conditions and bidding environment may not be valid.	The bidding environment is anticipated to be competitive, but prices may rise if market conditions improve significantly. Bidding is anticipated to occur in mid-2012 as many regional projects are being completed.	Cost Engineering	UNLIKELY	SIGNIFICANT	**MODERATE**	UNLIKELY	MARGINAL	**LOW**	1. Monitor market conditions and bidding environment. 2. Update the cost estimate to reflect conditions and communicate any significant changes in funding needs early.
EXT-4	Inclement Weather	Storm surge caused by hurricanes and tropical storms may damage partially completed construction.	Inclement weather may result in schedule delays related to pumping water from channels, excavating sediments, etc. Control buildings may experience water damage.	Cost Engineering	VERY LIKELY	SIGNIFICANT	**HIGH**	VERY LIKELY	MARGINAL	**MODERATE**	1. Schedule vulnerable construction around hurricane season to the extent possible.
EXT-5	Maximum Exceedence Event	An unusual storm could cause significant spill-over into the project area and destroy the project or make it unconstructable.	A 500-year event would likely be catastrophic for the project.	Project Management	VERY UNLIKELY	CRISIS	**HIGH**	VERY UNLIKELY	CRISIS	**HIGH**	1. Accept risk.

*Likelihood, Impact, and Risk Level to be verified through market research and analysis (conducted by cost engineer).
1. Risk/Opportunity identified with reference to the Risk Identification Checklist and through deliberation and study of the PDT.
2. Concerns and Discussions elaborate on Risk/Opportunity Events and includes any assumptions or findings (discussion to support the event rating).
3. The responsibility or POC is the entity responsible as the Subject Matter Expert (SME) for action, monitoring, or information on the PDT for the identified risk or opportunity.
4. Likelihood is measured as likelihood of impacting cost or schedule.
5. Impact is a measure of the event's effect on project objectives with relation to scope, cost, and/or schedule -- **Negligible**, **Marginal**, **Significant**, **Critical**, or **Crisis.** Impacts on Project Cost may vary in severity from impacts on Project Schedule.
6. Risk Level is the resultant of Likelihood and Impact Low, Moderate, or High. Refer to the matrix located at top of page.
7. Variance Distribution refers to the behavior of the individual risk item with respect to its potential effects on Project Cost and Schedule. For example, an item with clearly defined parameters and a solid most likely scenario would probably follow a triangular distribution. Complete unknowns related to "it could be anywhere" would fall into the category of uniform.
8. Correlation recognizes those risk events that may be related to one another. Care should be given to ensure the risks are handled correctly without a "double counting."
9. Affected Project Component identifies the specific item of the project to which the risk directly or strongly correlates.
10. Project Implications identifies whether or not the risk item affects project cost, project schedule, or both. The PDT is responsible for conducting studies for both Project Cost and for Project Schedule.
11. Results of the risk identification process are studied and further developed by the Cost Engineer, then analyzed through the Monte Carlo Analysis Method for Cost (Contingency) and Schedule (Escalation) Growth.
11. Results of the risk identification process are studied and further developed by the Cost Engineer, then analyzed through the Monte Carlo Analysis Method for Cost (Contingency) and Schedule (Escalation) Growth.