

Appendix F: Relative Cost Assessment

		5B-3.9 MG	6-3.9 MG	7-3.9 MG	5B-16.2 MG
Cost Elements		2 (E) culvert intercepts + 1 Hydraulic control + 1 debris screening cell @ Westlake Park + SW detention cells beneath the Westlake Park softball field + 1 pump system incl. SCADA + 1 forced main return to (E) box culvert + 1 drop structure + 1 debris screening cell + 900' box culvert + 1 tunnel inlet + 13' dia. x 5,200' tunnel + rehab'd outfall structure 8,389 dump truck loads (12 CY)	2 (E) culvert intercepts + 1 Hydraulic control + 1 debris screening cell @ Westlake Park + SW detention cells beneath the Westlake Park softball field + 1 pump system incl. SCADA + 1 forced main return to (E) box culvert + 1 drop structure + 1 debris screening cell + 2,100' box culvert + 1 tunnel inlet + 13' dia. x 4,200' tunnel + rehab'd outfall structure 7,680 dump truck loads (12 CY)	2 (E) culvert intercepts + 1 Hydraulic control + 1 debris screening cell @ Westlake Park + SW detention cells beneath the Westlake Park softball field + 1 pump system incl. SCADA + 1 forced main return to (E) box culvert + 1 drop structure + 1 debris screening cell + 1 tunnel inlet + 3,500' box culvert + 13' dia. x 3,200' tunnel + rehab'd outfall structure 6,971 dump truck loads (12 CY)	2 (E) culvert intercepts + 1 Hydraulic control + 1 debris screening cell @ Westlake Park + SW detention cells beneath the Westlake Park softball field + 1 pump system incl. SCADA + 1 forced main return to (E) box culvert + 1 drop structure + 1 debris screening cell + 900' box culvert + 1 tunnel inlet + 8' dia. (12' exc) x 5,200' tunnel + rehab'd outfall structure 18,405 dump truck loads (12 CY)
No. of Intercepts, < 36" dia.	EA	1	1	1	1
No. of Intercepts, > 36" dia.	EA	1	1	1	1
New 60" dia. Culvert	LF				-
Detention Structure	MG	3.9	3.9	3.9	16.2
Pump system & forced main	Units	1	1	1	2
No. of Drop Structures	EA	1	1	1	1
Debris Screen Cells	LF	500	500	500	500
Debris Screen @ (E) Tunnel Inlet	EA				
Canal Impr. Length	LF	900	2,100	3,500	900
Tunnel Dia.	FT	15	15	15	15
Tunnel Length	LF	5,200	4,200	3,200	5,200
Outfall Structure	EA	Rehab	Rehab	Rehab	Rehab
Intercepts, < 36" dia, \$/ EA	50,000 \$/ EA	50,000	50,000	50,000	50,000
Intercepts, > 36" dia, \$/ EA	100,000 \$/ EA	100,000	100,000	100,000	100,000
New Culvert, \$/ LF	100 \$/ LF	-	-	-	-
Detention Capacity, \$/Gal	2.0 \$/ Gal	7,800,000	7,800,000	7,800,000	32,400,000
Pump system & forced main, \$/ EA	1,500,000 \$/ EA	1,500,000	1,500,000	1,500,000	3,000,000
Drop Structures, \$/ EA	200,000 \$/ EA	200,000	200,000	200,000	200,000
Debris Screens, \$/ LF	3,000 \$/ LF	1,500,000	1,500,000	1,500,000	1,500,000
Debris Screen @ (E) Tunnel Inlet, \$/EA	200,000 \$/ EA	-	-	-	-
Canal Impr., \$/ LF	5,000 \$/ LF	4,500,000	10,500,000	17,500,000	4,500,000
Tunnel, 7' ID, \$/ LF	5,000 \$/ LF				
Tunnel, 8' ID, \$/ LF	5,000 \$/ LF				26,000,000
Tunnel, 10' ID, \$/ LF	5,500 \$/ LF				
Tunnel, 13' ID, \$/ LF	7,000 \$/ LF	36,400,000	29,400,000	22,400,000	
Tunnel, 15' ID, \$/ LF	8,000 \$/ LF				
New Outfall Structure, \$/ EA	5,000,000 \$/ EA	-	-	-	-
Rehabilitated Outfall Structure, \$/ EA	5,000,000 \$/ EA	5,000,000	5,000,000	5,000,000	5,000,000
Relative Direct Construction Cost		\$ 57,050,000	\$ 56,050,000	\$ 56,050,000	\$ 72,750,000
Mobilization/ Demobilization	10%	5,705,000	5,605,000	5,605,000	7,275,000
Contractor's Overhead & Profit	40%	22,820,000	22,420,000	22,420,000	29,100,000
Design & Permitting Allowance	10%	5,705,000	5,605,000	5,605,000	7,275,000
Construction Mgmt & QA/QC Allowance	10%	5,705,000	5,605,000	5,605,000	7,275,000
Mitigation Allowance	2%	1,141,000	1,121,000	1,121,000	1,455,000
Subtotal		\$ 98,126,000	\$ 96,406,000	\$ 96,406,000	\$ 125,130,000
Recommended Contingency	50%	49,063,000	48,203,000	48,203,000	62,565,000
Relative Cost		\$ 147,189,000	\$ 144,609,000	\$ 144,609,000	\$ 187,695,000
Rank (Least Relative Cost = 1)		3	1	1	5

		6-16.2 MG	7-16.2 MG	30.8 MG
Cost Elements		2 (E) culvert intercepts + 1 Hydraulic control + 1 debris screening cell @ Westlake Park + SW detention cells beneath the Westlake Park softball field + 1 pump system incl. SCADA + 1 forced main return to (E) box culvert + 1 debris screening cell + 2,100' box culvert + 1 tunnel inlet + 8' dia. (12' exc) x 4,200' tunnel + rehab'd outfall structure 17,951 dump truck loads (12 CY)	2 (E) culvert intercepts + 1 Hydraulic control + 1 debris screening cell @ Westlake Park + SW detention cells beneath the Westlake Park softball field + 1 pump system incl. SCADA + 1 forced main return to (E) box culvert + 1 debris screening cell + 3,500' box culvert + 1 tunnel inlet + 8' dia. (12' exc) x 3,200' tunnel + rehab'd outfall structure 17,497 dump truck loads (12 CY)	3 (E) culvert intercepts + 5' dia. x 550 culvert + 1 Hydraulic control + 1 debris screening system + SW detention cells beneath the Westlake Park softball field + 1 pump system incl. SCADA + 1 forced main return to (E) box culvert + No modifications to existing canal and tunnel 23,508 dump truck loads (12 CY)
No. of Intercepts, < 36" dia.	EA	1	1	1
No. of Intercepts, > 36" dia.	EA	1	1	2
New 60" dia. Culvert	LF	-	-	550
Detention Structure	MG	16.2	16.2	30.8
Pump system & forced main	Units	2	2	3
No. of Drop Structures	EA	1	1	
Debris Screen Cells	LF	500	500	500
Debris Screen @ (E) Tunnel Inlet	EA			1
Canal Impr. Length	LF	2,100	3,500	
Tunnel Dia.	FT	15	15	
Tunnel Length	LF	4,200	3,200	
Outfall Structure	EA	Rehab	Rehab	
Intercepts, < 36" dia. \$/ EA	50,000 \$/ EA	50,000	50,000	50,000
Intercepts, > 36" dia. \$/ EA	100,000 \$/ EA	100,000	100,000	200,000
New Culvert, \$/ LF	100 \$/ LF	-	-	55,000
Detention Capacity, \$/Gal	2.0 \$/ Gal	32,400,000	32,400,000	61,600,000
Pump system & forced main, \$/ EA	1,500,000 \$/ EA	3,000,000	3,000,000	4,500,000
Drop Structures, \$/ EA	200,000 \$/ EA	200,000	200,000	-
Debris Screens, \$/ LF	3,000 \$/ LF	1,500,000	1,500,000	1,500,000
Debris Screen @ (E) Tunnel Inlet, \$/EA	200,000 \$/ EA	-	-	200,000
Canal Impr., \$/ LF	5,000 \$/ LF	10,500,000	17,500,000	-
Tunnel, 7' ID, \$/ LF	5,000 \$/ LF			
Tunnel, 8' ID, \$/ LF	5,000 \$/ LF	21,000,000	16,000,000	
Tunnel, 10' ID, \$/ LF	5,500 \$/ LF			
Tunnel, 13' ID, \$/ LF	7,000 \$/ LF			
Tunnel, 15' ID, \$/ LF	8,000 \$/ LF			
New Outfall Structure, \$/ EA	5,000,000 \$/ EA	-	-	-
Rehabilitated Outfall Structure, \$/ EA	5,000,000 \$/ EA	5,000,000	5,000,000	-
Relative Direct Construction Cost		\$ 73,750,000	\$ 75,750,000	\$ 68,105,000
Mobilization/ Demobilization	10%	7,375,000	7,575,000	6,810,500
Contractor's Overhead & Profit	40%	29,500,000	30,300,000	27,242,000
Design & Permitting Allowance	10%	7,375,000	7,575,000	6,810,500
Construction Mgmt & QA/QC Allowance	10%	7,375,000	7,575,000	6,810,500
Mitigation Allowance	2%	1,475,000	1,515,000	1,362,100
Subtotal		\$ 126,850,000	\$ 130,290,000	\$ 117,140,600
Recommended Contingency	50%	63,425,000	65,145,000	58,570,300
Relative Cost		\$ 190,275,000	\$ 195,435,000	\$ 175,710,900
Rank (Least Relative Cost = 1)		6	7	4

Minimum	Average	Maximum
\$ 50,000	\$ 50,000	\$ 50,000
\$ 100,000	\$ 125,000	\$ 200,000
\$ -	\$ 13,750	\$ 55,000
\$ 7,800,000	\$ 33,525,000	\$ 86,000,000
\$ 1,500,000	\$ 3,000,000	\$ 6,000,000
\$ -	\$ 150,000	\$ 200,000
\$ 1,500,000	\$ 1,500,000	\$ 1,500,000
\$ -	\$ 50,000	\$ 200,000
\$ -	\$ 8,125,000	\$ 17,500,000
\$ -	\$ -	\$ -
\$ 16,000,000	\$ 21,000,000	\$ 26,000,000
\$ -	\$ -	\$ -
\$ 22,400,000	\$ 29,400,000	\$ 36,400,000
\$ -	\$ -	\$ -
\$ -	\$ -	\$ -
\$ -	\$ 3,750,000	\$ 5,000,000
\$ 56,050,000	\$ 69,188,750	\$ 94,005,000
\$ 5,605,000	\$ 6,918,875	\$ 9,400,500
\$ 3,760,200	\$ 23,445,275	\$ 30,300,000
\$ 96,406,000	\$ 112,189,288	\$ 130,290,000
\$ 48,203,000	\$ 56,094,644	\$ 65,145,000
\$ 144,609,000	\$ 168,283,931	\$ 195,435,000



JACOBS ASSOCIATES