

Appendix B Cost Estimate

Comparative Cost of Alternatives for Construction of Totem Lake Connector

5/30/2017

KADI/ARPE

Base Steel	\$ 1.00
Basic Fabrication	\$ 2.00
Complicated Fabrication	\$ 3.00

Item	Description	UM	U.C.	Option A: The Gates		Option B: Skipping Stone		Option C: Half Arches		Option D: Suspended Ring	
				Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
A DIRECT COSTS											
SUBSTRUCTURE											
1	Structure Exc Class A Incl. Haul	CY	\$40	561	\$22,423	409	\$16,352	707	\$28,278	403	\$16,139
2	Shoring Extra Excavation Class A	SF	\$12	721	\$8,655	220	\$2,639	509	\$6,108	377	\$4,524
3	Conc. Class 4000 for Columns	CY	\$725	442	\$320,653	342	\$248,096	643	\$466,097	341	\$247,167
4	Steel Reinforcing for Columns	LBS	\$1	117,066	\$117,066	85,094	\$85,094	171,137	\$171,137	84,343	\$84,343
5	Wall Area for Piers and Abutments	SF	\$50	2,022	\$101,099	2,209	\$110,442	3,063	\$153,128	1,970	\$98,492
6	Furnish & Place Temp Casing for Shafts	LF	\$200	-	\$0	-	\$0	-	\$0	-	\$0
7	Furnish Permanent Casing	LF	\$500	970	\$485,000	1,020	\$510,000	1,240	\$620,000	740	\$370,000
8	Placing Permanent Casing	EA	\$2,500	15	\$37,500	16	\$40,000	20	\$50,000	12	\$30,000
9	Soil Exc for Shaft Incl Haul	CY	\$450	816	\$367,305	876	\$394,139	877	\$394,532	947	\$425,948
10	Conc. Class 5000 for Shaft	CY	\$400	816	\$326,493	876	\$350,346	877	\$350,695	947	\$378,620
11	Stl. Reinforcing for Shafts	LBS	\$1	261,194	\$261,194	280,277	\$280,277	280,556	\$280,556	302,896	\$302,896
12	CSL Access Tube	LF	\$10	4,560	\$45,600	4,950	\$49,500	5,780	\$57,800	4,400	\$44,000
13	Removal of Shaft Obstructions		10%	1	\$152,309	1	\$162,426	1	\$175,358	1	\$155,146
14	PT Bar	LBS	\$8	99	\$790	1,410	\$11,280	14,986	\$119,891	83	\$664
15	Structural Steel Plate	LBS	\$3	109,342	\$328,027	8,387	\$25,161	10,846	\$32,539	1,891	\$5,674
16	Rolled Sections	LBS	\$2	26,834	\$53,669	21,106	\$42,213	180,593	\$361,186	27,277	\$54,553
17	Pot Bearings	EA	\$8,000	-	\$0	-	\$0	-	\$0	1	\$8,000
18	Painting Steel	SF	\$3	3,291	\$9,872	874	\$2,622	4,043	\$12,128	1,178	\$3,534
SUPERSTRUCTURE											
1	Concrete Class 4000 (CIP on PC)	CY	\$725	265	\$192,192	305	\$221,125	244	\$176,602	-	\$0
2	Concrete Class 4000 (Concrete Formwork)	CY	\$1,200	-	\$0	-	\$0	689	\$826,379	-	\$0
3	Epoxy-Coated Steel Reinf Bar for Deck	LBS	\$1	77,809	\$77,809	91,500	\$91,500	279,672	\$279,672	-	\$0
4	Painting Steel	SF	\$3	21,154	\$63,463	24,275	\$72,824	-	\$0	44,893	\$134,678
5	Structural Steel Plate	LBS	\$3	2,977	\$8,931	6,097	\$18,290	-	\$0	973,054	\$2,919,162
6	Rolled Sections	LBS	\$2	389,450	\$778,900	159,933	\$319,866	-	\$0	-	\$0
7	Pipe	LBS	\$2	-	\$0	414,666	\$829,333	-	\$0	36,051	\$72,102
8	Rods	LF	\$1	-	\$0	-	\$0	-	\$0	616	\$616
9	Eleastomeric Bearing Pad	EA	\$250	2	\$500	6	\$1,500	8	\$2,000	14	\$3,500
10	Stay Cables	LBS	\$10	7,311	\$73,114	-	\$0	44,903	\$449,031	-	\$0
11	Cables	LF	\$420	-	\$0	-	\$0	-	\$0	591	\$248,267
12	Epoxy Wearing Surface	SF	\$18	-	\$0	-	\$0	-	\$0	13,712	\$251,743
13	Expansion Joint System (Compression Seal)	LF	\$100	30	\$3,000	32	\$3,200	54	\$5,400	33	\$3,300
14	Bridge Railing	LF	\$300	1,636	\$490,800	1,620	\$486,000	1,624	\$487,200	1,662	\$498,600
15	Dampers	EA	\$50,000	1	\$50,000	-	\$0	1	\$50,000	1	\$50,000
16	Special Crane Mobilize/Demobilize	EA	\$25,000	4	\$100,000	4	\$100,000	2	\$50,000	5	\$125,000
APPROACH RAMP											
1	Approach Walls	SF	\$60	5,980	\$358,772	5,980	\$358,772	5,980	\$358,772	5,980	\$358,772
2	Approach Fill	CY	\$35	1,627	\$56,959	1,627	\$56,959	1,627	\$56,959	1,627	\$56,959
3	Approach Pavement (Asphalt)	SF	\$4	8,513	\$34,051	8,513	\$34,051	8,513	\$34,051	8,513	\$34,051
4	Railing	LF	\$300	1,116	\$334,827	1,116	\$334,827	1,116	\$334,827	1,116	\$334,827
5	Bridge Approach Slab (6' Long x 8")	CY	\$500	4	\$2,074	4	\$2,074	4	\$2,074	4	\$2,074
6	Access / Trestle (for Wetlands)	LF	\$1,000	140	\$140,000	140	\$140,000	280	\$280,000	-	\$0
OTHER											
1	Maintenance of Traffic	EA	\$200,000	1	\$200,000	1	\$200,000	2	\$400,000	1	\$200,000
2	Handrail Lighting (one side)	LF	\$400	1,376	\$550,418	1,368	\$547,218	1,370	\$548,018	1,389	\$555,618
3	Utility Conflicts	LS	\$20,000	1	\$20,000	5	\$100,000	5	\$100,000	3	\$60,000
4	Clearing and Grubbing	LS	\$15,650	1	\$15,650	1	\$15,650	1	\$15,650	1	\$15,650
5	Landscaping, Hardscaping & Seating	EA	\$150,000	1	\$150,000	1	\$150,000	1	\$150,000	1	\$150,000
6	Stormwater	LF	\$275	300	\$82,500	300	\$82,500	300	\$82,500	300	\$82,500
7	Misc Allowance (wetlands, trees, etc.)	EA	\$75,000	2	\$150,000	2	\$150,000	2	\$150,000	1	\$75,000
ADDITIONAL ALLOWANCES											
B	1 Contingency (% of A)	EA	20%	6,571,615	\$1,314,323	6,646,276	\$1,329,255	8,118,568	\$1,623,714	8,462,120	\$1,692,424
C	2 Mobilization (% of A+B)	EA	10%	7,885,938	\$788,594	7,975,531	\$797,553	9,742,282	\$974,228	10,154,543	\$1,015,454
D	3 Art Allowance (% of A+B+C)	EA	1%	8,674,532	\$86,745	8,773,084	\$87,731	10,716,510	\$107,165	11,169,998	\$111,700
E	4 Tax (% of A+B+C+D)	EA	10.1%	8,761,277	\$884,889	8,860,815	\$894,942	10,823,675	\$1,093,191	11,281,698	\$1,139,451
F	5 Owner's Reserve (% of A+B+C+D)	EA	7.5%	8,761,277	\$657,096	8,860,815	\$664,561	10,823,675	\$811,776	11,281,698	\$846,127
G	6 Construction Management (% of A+B+C+D)	EA	13%	8,761,277	\$1,138,966	8,860,815	\$1,151,906	10,823,675	\$1,407,078	11,281,698	\$1,466,621
H	7 City Permits	EA	\$75,000	1	\$75,000	1	\$75,000	1	\$75,000	1	\$75,000
I	8 City Staff Costs	EA	\$583,000	1	\$583,000	1	\$583,000	1	\$583,000	1	\$583,000
TOTAL VALUE FOR COMPARITIVE ESTIMATE											
J	1 Subtotal (A+B+C+D+E+F+G+H+I)				\$12,100,000		\$12,200,000		\$14,800,000		\$15,400,000
K	2 Cost with Inflation - 2019 (% of J)		5%		\$13,300,000		\$13,500,000		\$16,300,000		\$17,000,000
	3 Relative Cost Comparison (Cost/Min Cost)				100%		102%		123%		128%

Comparative Cost of Alternatives for Construction of Totem Lake Connector

5/30/2017

KADI/ARPE

Base Steel	\$ 2.00
Basic Fabrication	\$ 3.00
Complicated Fabrication	\$ 4.00

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3	Conc. Class 4000 for Columns	CY	\$725	442	\$320,653	342	\$248,096	643	\$466,097	341	\$247,167
4	Steel Reinforcing for Columns	LBS	\$2	117,066	\$234,132	85,094	\$170,187	171,137	\$342,275	84,343	\$168,687
5	Wall Area for Piers and Abutments	SF	\$50	2,022	\$101,099	2,209	\$110,442	3,063	\$153,128	1,970	\$98,492
6	Furnish & Place Temp Casing for Shafts	LF	\$200	-	\$0	-	\$0	-	\$0	-	\$0
7	Furnish Permanent Casing	LF	\$500	970	\$485,000	1,020	\$510,000	1,240	\$620,000	740	\$370,000
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12	CSL Access Tube	LF	\$10	4,560	\$45,600	4,950	\$49,500	5,780	\$57,800	4,400	\$44,000
13	Removal of Shaft Obstructions		10%	1	\$178,429	1	\$190,454	1	\$203,414	1	\$185,436
14	PT Bar	LBS	\$8	99	\$790	1,410	\$11,280	14,986	\$119,891	83	\$664
15	Structural Steel Plate	LBS	\$4	109,342	\$437,369	8,387	\$33,548	10,846	\$43,386	1,891	\$7,565
16	Rolled Sections	LBS	\$3	26,834	\$80,503	21,106	\$63,319	180,593	\$541,779	27,277	\$81,830
17	Pot Bearings	EA	\$8,000	-	\$0	-	\$0	-	\$0	1	\$8,000
18	Painting Steel	SF	\$3	3,291	\$9,872	874	\$2,622	4,043	\$12,128	1,178	\$3,534
SUPERSTRUCTURE											
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3	Epoxy-Coated Steel Reinf Bar for Deck	LBS	\$2	77,809	\$155,619	91,500	\$183,000	279,672	\$559,343	-	\$0
4	Painting Steel	SF	\$3	21,154	\$63,463	24,275	\$72,824	-	\$0	44,893	\$134,678
5	Structural Steel Plate	LBS	\$4	2,977	\$11,908	6,097	\$24,387	-	\$0	973,054	\$3,892,216
6	Rolled Sections	LBS	\$3	389,450	\$1,168,349	159,933	\$479,798	-	\$0	-	\$0
7	Pipe	LBS	\$3	-	\$0	414,666	\$1,243,999	-	\$0	36,051	\$108,153
8	Rods	LF	\$2	-	\$0	-	\$0	-	\$0	616	\$1,231
9	Eleastomeric Bearing Pad	EA	\$250	2	\$500	6	\$1,500	8	\$2,000	14	\$3,500
10	Stay Cables	LBS	\$10	7,311	\$73,114	-	\$0	44,903	\$449,031	-	\$0
11	Cables	LF	\$420	-	\$0	-	\$0	-	\$0	591	\$248,267
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13	Expansion Joint System (Compression Seal)	LF	\$100	30	\$3,000	32	\$3,200	54	\$5,400	33	\$3,300
14	Bridge Railing	LF	\$300	1,636	\$490,800	1,620	\$486,000	1,624	\$487,200	1,662	\$498,600
15	Dampers	EA	\$50,000	1	\$50,000	-	\$0	1	\$50,000	1	\$50,000
16	Special Crane Mobilize/Demobilize	EA	\$25,000	4	\$100,000	4	\$100,000	2	\$50,000	5	\$125,000
APPROACH RAMP											
1	Approach Walls	SF	\$60	5,980	\$358,772	5,980	\$358,772	5,980	\$358,772	5,980	\$358,772
2	Approach Fill	CY	\$35	1,627	\$56,959	1,627	\$56,959	1,627	\$56,959	1,627	\$56,959
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4	Railing	LF	\$300	1,116	\$334,827	1,116	\$334,827	1,116	\$334,827	1,116	\$334,827
5	Bridge Approach Slab (6' Long x 8")	CY	\$500	4	\$2,074	4	\$2,074	4	\$2,074	4	\$2,074
6	Access / Trestle (for Wetlands)	LF	\$1,000	140	\$140,000	140	\$140,000	280	\$280,000	-	\$0
OTHER											
1	Maintenance of Traffic	EA	\$200,000	1	\$200,000	1	\$200,000	2	\$400,000	1	\$200,000
2	Handrail Lighting (one side)	LF	\$400	1,376	\$550,418	1,368	\$547,218	1,370	\$548,018	1,389	\$555,618
3	Utility Conflicts	LS	\$20,000	1	\$20,000	5	\$100,000	5	\$100,000	3	\$60,000
4	Clearing and Grubbing	LS	\$15,650	1	\$15,650	1	\$15,650	1	\$15,650	1	\$15,650
5	Landscaping, Hardscaping & Seating	EA	\$150,000	1	\$150,000	1	\$150,000	1	\$150,000	1	\$150,000
6	Stormwater	LF	\$275	300	\$82,500	300	\$82,500	300	\$82,500	300	\$82,500
7	Misc Allowance (wetlands, trees, etc.)	EA	\$75,000	2	\$150,000	2	\$150,000	2	\$150,000	1	\$75,000
ADDITIONAL ALLOWANCES											
B	1 Contingency (% of A)	EA	20%	7,582,407	\$1,516,481	7,741,363	\$1,548,273	9,069,428	\$1,813,886	9,918,537	\$1,983,707
C	2 Mobilization (% of A+B)	EA	10%	9,098,889	\$909,889	9,289,636	\$928,964	10,883,313	\$1,088,331	11,902,245	\$1,190,224
D	3 Art Allowance (% of A+B+C)	EA	1%	10,008,778	\$100,088	10,218,599	\$102,186	11,971,645	\$119,716	13,092,469	\$130,925
E	4 Tax (% of A+B+C+D)	EA	10.1%	10,108,866	\$1,020,995	10,320,785	\$1,042,399	12,091,361	\$1,221,227	13,223,394	\$1,335,563
F	5 Owner's Reserve (% of A+B+C+D)	EA	7.5%	10,108,866	\$758,165	10,320,785	\$774,059	12,091,361	\$906,852	13,223,394	\$991,755
G	6 Construction Management (% of A+B+C+D)	EA	13%	10,108,866	\$1,314,153	10,320,785	\$1,341,702	12,091,361	\$1,571,877	13,223,394	\$1,719,041
H	7 City Permits	EA	\$75,000	1	\$75,000	1	\$75,000	1	\$75,000	1	\$75,000
I	8 City Staff Costs	EA	\$583,000	1	\$583,000	1	\$583,000	1	\$583,000	1	\$583,000
TOTAL VALUE FOR COMPARITIVE ESTIMATE											
J	1 Subtotal (A+B+C+D+E+F+G+H+I)				\$13,900,000		\$14,100,000		\$16,400,000		\$17,900,000
K	2 Cost with Inflation - 2019 (% of J)		5%		\$15,300,000		\$15,500,000		\$18,100,000		\$19,700,000
	3 Relative Cost Comparison (Cost/Min Cost)				100%		101%		118%		129%

