

APPENDIX F

RCC DAM PRELIMINARY OPINION OF COST FOR ALTERNATIVE ASSESSMENT

**Ragged Mountain Dam
Roller Compacted Concrete Dam Alternative
Alternatives Assessment Opinion of Cost
(Prices in 2010 Dollars)**

Schnabel Engineering 2010

Dam Construction

Item Number		Units	Quantity	Unit Price	Extended Price
1	Mobilization & Demobilization				
	a. General	LS	1	\$2,523,413	\$2,523,413
	b. Bonds and Insurance	LS	1	\$1,081,463	\$1,081,463
2	Reservoir Road Maintenance and Traffic Control	LS	1	\$275,000	\$275,000
3	Construct /Maintain/Restore Temporary Onsite Roads	LS	1	\$75,000	\$75,000
4	Care and Diversion of Water				
	a. Erosion and Sediment Control	LS	1	\$300,000	\$300,000
	b. Cofferdam(s) and Divert Water	LS	1	\$150,000	\$150,000
	c. Foundation Dewatering	MO	10	\$35,000	\$350,000
5	Clearing and Grubbing	AC	N/A	N/A	N/A
6	Reservoir Clearing	AC	140	\$5,650	\$791,000
7	Demolition and Removal of Structures				
	a. Miscellaneous Structures	LS	1	\$10,000	\$10,000
	b. Demolition of Lower Dam	LS	1	\$250,000	\$250,000
	c. Removal of Upper Dam	LS	1	\$450,000	\$450,000
8	Foundation Preparation				
	a. Foundation Clean-Up Secondary	SY	5,500	\$10	\$55,000
	b. Foundation Clean-UP Final	SY	5,500	\$12	\$66,000
	c. Rock Trimming	CY	4,000	\$75	\$300,000
	d. Rock Fracture Treatment	LF	200	\$20	\$4,000
9	Foundation Drilling and Grouting	SF	137,110	\$25	\$3,427,750
10	Fill				
	a. Select Fill	CY	N/A	\$6	N/A
	b. Random Fill	CY	85,500	\$5.50	\$470,250
	c. Rock Fill	CY	105,000	\$9	\$945,000
	d. Fine Drain Fill	CY	2,500	\$55	\$137,500
11	Slope Protection				
	a. Rip Rap	CY	500	\$100	\$50,000
	b. Slush Grouted Rip Rap	CY	N/A		N/A
	c. Bedding Material (Coarse Aggregate)	CY	200	\$55	\$11,000
12	Conventional Concrete (Includes Waterstop)				
	a. Structural Concrete	CY	2,600	\$750	\$1,950,000
	b. Gallery/Adit Concrete	CY	777	\$750	\$582,750
	b. Outlet Works Encasement Concrete	CY	280	\$500	\$140,000
	c. Corewall Concrete	CY	N/A	N/A	N/A
	d. Downstream Facing Concrete	CY	4,422	\$350	\$1,547,700
	e. Paving Concrete	CY	450	\$400	\$180,000
	f. Dental Concrete	CY	5,000	\$250	\$1,250,000
	g. Backfill Concrete	CY	1,500	\$250	\$375,000
13	Steel Reinforcing Bars	Lbs	621,690	\$0.80	\$497,352
14	Roller Compacted Concrete	CY	126,410	\$95	\$12,008,950
15	Bedding Mix	LS	1	\$450,000	\$450,000
16	Dam Construction Joints	LS	1	\$100,000	\$100,000
17	Trial RCC Placement and Testing	LS	1	\$150,000	\$150,000
18	Precast Concrete Panels with Geomembrane Liner	SF	77,000	\$32	\$2,464,000
19	External Geomembrane Liner	SF	17,000	\$30	\$510,000
20	Precast Parapet Walls	LF	1,600	\$60	\$96,000
21	Drilled and Grouted Anchor Bars	EA	80	\$500	\$40,000
22	Drilled Foundation Drains	LF	2,700	\$45	\$121,500
23	Outlet Works				
	a. Ductile Iron Pipe and Fittings - 42 inch Dia	LF	540	\$500	\$270,000
	b. Ductile Iron Pipe and Fittings - 24 inch Dia	LF	800	\$300	\$240,000
	c. 6 inch Minimum Release Pipe	LS	1	\$12,000	\$12,000
	d. Sluice Gates and Accessories - 42 inch	EA	5	\$60,000	\$300,000
	e. 42 inch Blowoff Valve	EA	1	\$30,000	\$30,000
	f. Water Intake Trash Racks	EA	5	\$15,000	\$75,000
	g. Valve Vault Accessories	LS	1	\$150,000	\$150,000

24	1600-Feet of 36-inch Pipe, Open Cut, 10-foot Depth, Class 53 Ductile Iron Pipe (Outside of Dam)
	a. Furnish and Install Pipe
	b. Clearing and Grubbing
	c. Site Restoration
	d. Rock Removal (50% Rock, 6-foot Wide Trench)
25	Chain-Link Fence
26	Instrumentation
27	Electrical
28	Mechanical
29	Rock-Lined Swale
30	Select Material Surfacing - Access Road
31	Guide Rail
32	Security Gates
33	Landscaping and Site Restoration
	a. Topsoil, Permanent Seeding and Mulching
34	Staging Area
	a. Land Rental
	b. Restoration
35	Safety Buoy System
36	Unlisted Items

LF	1,600	\$689.00	\$1,102,400
LF	1,600	\$22.00	\$35,200
LF	1,600	\$16.00	\$25,600
CY	1,784	\$200.00	\$356,800
LF	120	\$45	\$5,400
LS	1	\$200,000	\$200,000
LS	1	\$200,000	\$200,000
LS	1	\$85,000	\$85,000
LF	1,500	\$60	\$90,000
SY	2,500	\$12	\$30,000
LF	780	\$50	\$39,000
EA	2	\$5,000	\$10,000
AC	5	\$10,000	\$50,000
LS	1	\$200,000	\$200,000
LS	1	\$225,000	\$225,000
LS	1	\$20,000	\$20,000
LS	1	\$1,716,608	\$1,716,608

Dam Construction Subtotal: **\$39,653,636**
Contingency (%): **20%**
Subtotal Estimated Dam Construction Costs Plus Contingency: **\$47,584,363**

Foundation Excavation

Item Number	Description
1	Mobilization & Demobilization
	a. General
	b. Bonds & Insurance
2	Care & Diversion of Water
	a. Erosion and Sediment Control
	b. Cofferdam(s) and Divert Water
	c. Foundation Dewatering
3	Clearing and Grubbing
4	Demolition and Removal of Structures
5	Excavation
	a. Unclassified Excavation and Stripping
	b. Rock Excavation
	c. Soil Excavation
6	Foundation Preparation
	a. Preliminary Foundation Clean-up
7	Water Supply Temporary Bypass Piping
8	Overhead Electrical Relocation
9	Reservoir Road Modifications and Traffic Control
10	Construct & Maintain Temporary Onsite Roads
11	Unlisted Items

Units	Quantity	Unit Price	Extended Price
LS	1	\$150,131	\$150,131
LS	1	\$75,065	\$75,065
LS	1	\$200,000	\$200,000
LS	1	\$200,000	\$200,000
LS	1	\$350,000	\$350,000
AC	7.5	\$6,000	\$45,000
LS	1	\$20,000	\$20,000
CY	N/A	N/A	N/A
CY	16,090	\$25	\$402,250
CY	116,380	\$6.00	\$698,280
SY	11,000	\$15	\$165,000
LS	1	\$150,000	\$150,000
LS	1	\$10,000	\$10,000
LS	1	\$112,500	\$112,500
LS	1	\$30,000	\$30,000
LS	1	\$119,152	\$119,152

Foundation Excavation Subtotal: **\$2,727,378**
Contingency (%): **20%**
Subtotal Estimated Foundation Excavation Costs Plus Contingency: **\$3,272,853**

Construction Cost Subtotal: **\$42,381,013**
Subtotal Estimated Construction Costs Plus Contingency: **\$50,857,216**

Engineering Services

1	Engineering Services
	a. Engineering Design
	b. Construction Observation and Testing

Unit	Quantity	Unit Price	Extended Price
LS	1	\$890,298	\$890,298
LS	1	\$3,200,000	\$3,200,000

Engineering Services Subtotal: **\$4,090,298**
Contingency (%): **10%**
Subtotal Estimated Engineering Costs Plus Contingency: **\$4,499,328**

Construction and Engineering Costs Total: **\$46,471,311**
Estimated Total Construction and Engineering Costs Plus Contingency: **\$55,356,544**