

BASED ON 35% DESIGN DATED 14 JULY 1997

PROJECT HOWARD HANSON DAM FISH PASSAGE  
 LOCATION HOWARD HANSON DAM, WASHINGTON


DISTRICT SEATTLE  
 POC: OLTON SWANSON, CHIEF, COST ENGINEERING

ACCOUNT NUMBER	FEATURE DESCRIPTION	CURRENT MCA CES ESTIMATE PREPARED: EFFECTIVE PRICING LEVEL				AUTHORIZED/BUDGET YEAR EFFECTIVE PRICING LEVEL				FULLY FUNDED ESTIMATE		
		COST (\$K)	CNTG (\$K)	CNTG (%)	TOTAL (\$K)	COST (\$K)	CNTG (\$K)	TOTAL (\$K)	COST (\$K)	CNTG (\$K)	FULL (\$K)	
04	DAMS	37,810	7,562	20.0%	45,372				42,990	8,598	51,588	
06	FISH AND WILDLIFE FACILITIES	5,581	1,117	20.0%	6,698				6,346	1,270	7,616	
	<b>TOTAL CONSTRUCTION COST</b>	<b>\$43,391</b>	<b>\$8,679</b>	<b>20.0%</b>	<b>\$52,070</b>				<b>\$49,336</b>	<b>\$9,868</b>	<b>\$59,204</b>	
01	LANDS AND DAMAGES	3,290	658	20.0%	3,948				3,815	763	4,578	
30	PLANNING, ENGINEERING AND DESIGN	6,950	1,390	20.0%	8,340				7,450	1,490	8,940	
31	CONSTRUCTION MANAGEMENT	3,471	694	20.0%	4,165				4,245	849	5,094	
	<b>TOTAL PROJECT COSTS</b>	<b>\$57,102</b>	<b>\$11,421</b>	<b>20.0%</b>	<b>\$68,523</b>				<b>\$64,846</b>	<b>\$12,970</b>	<b>\$77,816</b>	
	MONITORING	5,153	1,031	20.0%	6,184							
	<b>TOTAL PROJECT COSTS PLUS MONITORING</b>	<b>62,255</b>	<b>12,452</b>	<b>20.0%</b>	<b>74,707</b>							

TOTAL FEDERAL COSTS \_\_\_\_\_  
 TOTAL NON-FEDERAL COSTS \_\_\_\_\_  
 THE MAXIMUM PROJECT COST IS \_\_\_\_\_

THIS TPCS REFLECTS A PROJECT COST CHANGE OF \_\_\_\_\_

DISTRICT APPROVED:

 CHIEF, COST ENGINEERING  
 \_\_\_\_\_ CHIEF, REAL ESTATE  
 \_\_\_\_\_ CHIEF, PLANNING  
 \_\_\_\_\_ CHIEF, ENGINEERING  
 \_\_\_\_\_ CHIEF, CONSTRUCTION  
 \_\_\_\_\_ CHIEF, OPERATIONS  
 \_\_\_\_\_ CHIEF, PROGRAMS MANAGEMENT  
 \_\_\_\_\_ PROJECT MANAGER  
 \_\_\_\_\_ DDE (PM)

DIVISION APPROVED

\_\_\_\_\_ CHIEF, COST ENGINEERING  
 \_\_\_\_\_ DIRECTOR, REAL ESTATE  
 \_\_\_\_\_ CHIEF, PROGRAMS MANAGEMENT  
 \_\_\_\_\_ DIRECTOR OF PPMD

APPROVED DATE: \_\_\_\_\_

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BASED ON 35% DESIGN DATED 14 JULY 1997

PROJECT HOWARD HANSON DAM FISH PASSAGE  
 LOCATION: HOWARD HANSON DAM, WASHINGTON

DISTRICT: SEATTLE  
 POC: OLTON SWANSON, CHIEF, COST ENGINEERING

ACCOUNT NUMBER	FEATURE DESCRIPTION	CURRENT MCACES ESTIMATE PREPARED: EFFECTIVE PRICING LEVEL:				TOTAL (\$K)	AUTHORIZED/BUDGET YEAR: EFFECTIVE PRICING LEVEL:			FULLY FUNDED ESTIMATE				
		COST (\$K)	CNTG (\$K)	CNTG (%)	26 Jan 98 Oct 1997		COST (\$K)	CNTG (\$K)	TOTAL (\$K)	FEATURE MIDPT	OMB (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)
04	DAMS													
04 03	OUTLET WORKS	37,810	7,562	20.0%	45,372					OCT 02	13.7%	42,990	8,598	51,588
06	FISH AND WILDLIFE FACILITIES													
06.03	WILDLIFE FACILITIES AND SANCTUARY	5,581	1,117	20.0%	8,898					OCT 02	13.7%	8,346	1,270	7,616
<b>TOTAL CONSTRUCTION COST</b>		<b>\$43,391</b>	<b>\$8,679</b>	<b>20.0%</b>	<b>\$52,070</b>							<b>\$49,336</b>	<b>\$9,868</b>	<b>\$59,204</b>
01	LANDS AND DAMAGES													
	PHASE I	1,381	276	20.0%	1,657					APR 99	7.2%	1,480	296	1,776
	PHASE II	1,909	382	20.0%	2,291					OCT 02	22.3%	2,335	467	2,802
30	PLANNING, ENGINEERING AND DESIGN	6,950	1,390	20.0%	8,340					APR 99	7.2%	7,450	1,490	8,940
31	CONSTRUCTION MANAGEMENT	3,471	694	20.0%	4,165					OCT 02	22.3%	4,245	649	5,094
<b>TOTAL PROJECT COSTS</b>		<b>\$57,102</b>	<b>\$11,421</b>	<b>20.0%</b>	<b>\$68,523</b>							<b>\$64,846</b>	<b>\$12,970</b>	<b>\$77,816</b>
	MONITORING	5,153	1,031	20.0%	6,184									
<b>TOTAL PROJECT COSTS PLUS MONITORING</b>		<b>\$62,255</b>	<b>\$12,452</b>	<b>0</b>	<b>74,707</b>									

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BASED ON 35% DESIGN DATED 14 JULY 1997

PROJECT: HOWARD HANSON DAM FISH PASSAGE  
 LOCATION: HOWARD HANSON DAM, WASHINGTON

DISTRICT: SEATTLE  
 POC: OLTON SWANSON, CHIEF, COST ENGINEERING

ACCOUNT NUMBER	FEATURE DESCRIPTION	CURRENT MCACES ESTIMATE PREPARED: 26 Jan 98				AUTHORIZED/BUDGET YEAR: Oct 1997			FULLY FUNDED ESTIMATE					
		EFFECTIVE PRICING LEVEL:		CNTG (%)	TOTAL (\$K)	EFFECTIVE PRICING LEVEL:			FEATURE MIDPT	OMB (%)	COST (\$K)	CNTG (\$K)	FULL (\$K)	
COST (\$K)		COST (\$K)	CNTG (\$K)			TOTAL (\$K)								
04	DAMS													
04.03	OUTLET WORKS													
04.03.01	MOB, DEMOB & PREPARATORY WORK	820		164	20.0%	984								
04.03.03	CARE AND DIVERSION OF WATER													
04.03.01.02	COFFER DAM	3,503		701	20.0%	4,204								
04.03.03	PERMANENT ACCESS ROADS AND PARKING	2,002		400	20.0%	2,402								
04.03.05	BRIDGE	220		44	20.0%	264								
04.03.09	BUILDINGS	1,856		371	20.0%	2,227								
04.03.10	EARTHWORK FOR STRUCTURES	2,866		533	20.0%	3,199								
04.03.11	FOUNDATION WORK	2,010		402	20.0%	2,412								
04.03.12	SEEPAGE CONTROL													
04.03.12.1	CONSOLIDATION GROUTING	3,035		607	20.0%	3,642								
04.03.12.2	ADIT EXTENSION	724		145	20.0%	869								
04.03.12.3	FEEDER WELLS	249		50	20.1%	-								
04.03.12.4	HORIZONTAL DRAINS	375		75	20.0%	450								
04.03.12.5	PRESSURE GAGE	2		0	0.0%	2								
04.03.12.6	RE-PERFORATE FEEDER WELLS	21		4	19.0%	25								
04.03.12.7	ROCK BLANKET	2,500		500	20.0%	3,000								
04.03.29	APPROACH AND OUTLET CHANNELS	1,413		283	20.0%	1,696								
04.03.54	OUTLET PORTAL AND STILLING BASIN	75		15	20.0%	90								
04.03.55	TUNNEL AND CONDUIT	1,518		304	20.0%	1,822								
04.03.56	INTAKE STRUCTURE	6,846		1,369	20.0%	8,215								
04.03.57	INTAKE GATES AND EQUIPMENT	3,400		680	20.0%	4,080								
04.03.99	ELECTRICAL	1,314		263	20.0%	1,577								
04.03.99	CRANE	3,261		652	20.0%	3,913								
		<u>37,810</u>		<u>7,562</u>		<u>45,372</u>								
06	FISH AND WILDLIFE FACILITIES													
06.03	WILDLIFE FACILITIES AND SANCTUARY													
06.03.99	WILDLIFE HABITAT MITIGATION													
	PHASE 1	1,154		231	20.0%	1,385								
	PHASE 2	828		166	20.0%	994								
06.03.99	FISH HABITAT MITIGATION													
	PHASE 1	779		156	20.0%	935								
	PHASE 2	1,603		321	20.0%	1,924								
	FISH HABITAT RESTORATION PHASE 1	1,217		243	20.0%	1,460								
		<u>5,581</u>		<u>1,117</u>		<u>6,698</u>								
	<b>TOTAL CONSTRUCTION COST</b>	<b>\$43,391</b>		<b>\$8,679</b>	<b>20.0%</b>	<b>\$52,070</b>								

HOWARD HANSON DAM  
ADDITIONAL WATER STORAGE FEASIBILITY STUDY  
NARRATIVE

1. To accommodate a future increase in reservoir level at Howard Hanson Dam several safety and environmental measures must be implemented. A fish passage facility will be built next to the existing intake tower with a new tunnel constructed to tie into the existing tunnel. This structure will facilitate smolt travel downstream through a larger, less navigable reservoir. A consolidation grouting program will be initiated at the right bank to address potential reservoir seepage problems associated with the pool raise. Habitat loss will be mitigated by the enhancement of existing upland areas. Environmental restoration measures will be implemented as well. The need for additional right bank seepage repairs will be determined after construction is completed and the pool is raised.

2. The basis of the estimate is the feasibility level designs dated July 1997 and December 1996.

3a. The general construction schedule is attached.

3b. The need for overtime for any construction activities has not yet been determined.

3c. The fish window for the working in the reservoir for environmental restoration and mitigation is late July through the end of October. The construction window for working on the cofferdam is October through February when the pool is drawn down.

4. Subcontractors identified at this time for the fish collector tower include those for cofferdam, mining, reinforcing steel, structural steel, mechanical, electrical and service crane. Consolidation grouting will be a separate contract with no potential subcontractors foreseen at this time. The environmental work will consist of several contracts with no potential subcontractors identified at this time.

5a. Entrance to the Howard Hanson Dam Project site is controlled by the city of Tacoma. The site access roads will be established before cofferdam or intake tower is started. Access will be from crest of dam to existing upper left bank road or new lower left bank road (Fish Collector Bypass Road.) Access to dewatered reservoir area via the Forebay Access Road will be limited to track vehicle due to extreme grade. Access to tower area is also possible by using the existing tower access road or access bridge.

5b. The nearest borrow areas are located 10 miles away in Enumclaw, WA.

5c. Rock excavation for the access roads, collector foundation and discharge conduit will be accomplished by drilling and blasting. Off road trucks will haul away excavated materials.

7/21/97

HOWARD HANSON DAM  
ADDITIONAL WATER STORAGE FEASIBILITY STUDY  
NARRATIVE

Consolidation grouting is the only necessary reservoir seepage repair at this time. The need for additional measures will be determined after the pool is raised.

The fish collector will be constructed of normal weight reinforced concrete placed in lifts. Then structural, mechanical and electrical equipment will be installed. After the service crane is set up then the reservoir will be dewatered and the cofferdam removed.

Construction of the administration and support buildings will begin with time to allow for completion by the time the fish collector is fully functional.

5d. Unusual conditions encountered will involve soils and weather. All excavated rock will be limited in use as it will deteriorate rapidly after being mined. Work in the existing tunnel during the months of October through January may be interrupted by flood water releases.

5e. There are no unique techniques of construction currently being considered at this time. All methods are estimated as conventional practices at this level of design.

5f. Availability of labor and equipment is not foreseen as a problem. The project site is located within one hour from urban areas. There are two concrete plants located in Enumclaw, but an on-site concrete batch plant would likely be utilized instead.

6. There are no environmental concerns with construction of the fish collector, consolidation grouting, or environmental mitigation and restoration projects

7. Contingencies are set at 20% for all features including construction and in-house labor. Inflation factors used in full funded summary according to EC 1-2-169 dated March 31, 1996.

8. Labor rates are based on October 1997 King County union wages. Equipment rates and material prices are effective October 1995.

7/21/97

ID	Task Name	Duration	2001					2002				2003			
			Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
1	PROJECT START	0d	◆ 11/1												
2	PHASE I	175d	[Bar chart showing Phase I tasks from Q4 2001 to Q2 2002]												
3	Project Office	25d	[Bar chart]												
4	Mobilization	1w	[Bar chart]												
5	Construction	4w	[Bar chart]												
6	Access Road	74d	[Bar chart]												
15	Consolidation Grouting	20w	[Bar chart]												
16	ADD'L RIGHT BANK SEEPAGE REPAIRS (OPTIONA	50d	[Bar chart]												
17	Pressure Gage	1w	[Bar chart]												
18	Adit Extension	10w	[Bar chart]												
19	Seepage Adit Feeder Wells	6w	[Bar chart]												
20	Horizontal Drains	5w	[Bar chart]												
21	Re-perforate Feeder Wells	2w	[Bar chart]												
22	Rock Blanket	8w	[Bar chart]												
23	Cofferdam	75d	[Bar chart]												
24	Mobilization of Floating Plant	1w	[Bar chart]												
25	Rock Excavation	4w	[Bar chart]												
26	Concrete Walls	6w	[Bar chart]												
27	Steel Wall	4w	[Bar chart]												
28	Habitat Restoration, 1169' Pool	131d	[Bar chart]												
29	End Phase I	0d	◆ 6/19												
30	PHASE II	413d	[Bar chart showing Phase II tasks from Q2 2002 to Q3 2003]												
31	Fish Collector	413d	[Bar chart]												
32	Mobilization	2w	[Bar chart]												
33	Foundation Excavation	125d	[Bar chart]												
36	Foundation Prep	25d	[Bar chart]												
41	TUNNELS	60d	[Bar chart]												
49	Foundation Construction	2w	[Bar chart]												
50	Dewater Cofferdam	45d	[Bar chart]												

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ID	Task Name	Duration	2001				2002				2003					
			Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		
51	Channel Excavation	100d														
55	Fish Collector Structural	120d														
56	Existing Tower Mods	10d														
59	Concrete, in Place	110d														
60	Portal & Gate Room	4w														
61	Fish Lock	6w														
62	Fish Lock Regulation Well	2w														
63	Wet Well Structure	10w														
64	Mechanical Equipment	160d														
65	Gate Guides	5w														
66	Radial Gates	5w														
67	Trash Rack	1w														
68	Intake Horn	1w														
69	Stoplogs	2w														
70	Emergency Gates	5w														
71	Gate Operating Machinery (hydraulics)	5w														
72	COFFERDAM REMOVAL	35d														
76	Access Deck	2w														
77	Access/Ventilation Tower	70d														
84	Access Bridge	45d														
90	Sitework Electrical	9w														
91	Tower Electrical	6w														
92	Remote Controls	3w														
93	Maintenance Building	10w														
94	Administration Building	30w														
95	Habitat Restoration, 1169' Pool	131d														
96	Habitat Restoration	131d														
97	PROJECT COMPLETION	0d														

Howard Hanson Dam Additional Water Storage  
Feasibility Report

Feature Description	Reconnaissance Report Oct 89	Feasibility Report Jan 98	Difference (Feasibility-Recon.)	Comments
Reservoir Clearing	\$4,674	\$0	-4,674	The current design specifies that this work is to be done by City of Tacoma at no cost to the project.
04 Dams	8,273	42,706	34,433	The fish passage structure is now a separate tower with a tunnel that ties into the existing tunnel. The structure selected in the reconnaissance report was for a fish collection structure attached to the existing tower.
08 Roads, Railroads and Bridges	2,073	2,666	593	The current design provides for a fish collector bypass road and a tower access road. The previous design was similar. Feature 08 is considered incidental in the Dam.
06 Fish & Wildlife Facilities	4,199	6,698	2,499	The new design includes multiple sites for restoration and mitigation.
31 Planning, Engineering & Design	1,811	8,340	6,529	Feature 30 is supported by estimates of labor. Also included is exploration, modeling and surveying.
30 Construction Management	905	4,165	3,260	Construction supervision and inspection is estimated at 16% of the total construction cost for the current design.
Monitoring	0	6,184		
01 Lands and Damages	0	3,948	3,948	A detailed cost breakdown has been calculated for the current design, while the previous design did not address this issue.
<b>TOTAL PROJECT COSTS</b>	<b>\$21,935</b>	<b>\$74,707</b>	<b>\$46,588</b>	

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Sun 25 Jan 1998  
Eff Date 10/01/97

U.S. Army Corps of Engineers  
PROJECT HHDHSS: Fish Tower/Seepage Cntrl/Environ - Howard Hanson Dam Additional  
FEASIBILITY LEVEL ESTIMATE

TIME 23:59.07  
TITLE PAGE 1

Fish Tower/Seepage Cntrl, Environ  
Howard Hanson Dam Additional  
Water Storage Feasibility Study  
Green River, Washington

Designed By: U.S. Army Corps of Engineers  
Estimated By: Seattle District

Prepared By: Cost Engineering Branch  
William B. Garrott/Pierce

Preparation Date: 01/26/98  
Effective Date of Pricing: 10/01/97  
Est Construction Time: 1100 Days

Sales Tax: 8.50%

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Release 5.30

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57	INTAKE GATES AND EQUIPMENT	25
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99	CRANE	30
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08	FEEDER WELLS	33
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Sun 29 Jan 1998  
Est Date 10/01/97  
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U S Army Corps of Engineers  
PROJECT HHDWBS. Fish Tower/Seepage Cntrl/Environ - Howard Hanson Dam Additional  
FEASIBILITY LEVEL ESTIMATE

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No Backup Reports

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U.S. Army Corps of Engineers  
 PROJECT HHDWBS. Fish Tower/Seepage Cntrl/Environ - Howard Hanson Dam Additional  
 FEASIBILITY LEVEL ESTIMATE  
 \*\* PROJECT INDIRECT SUMMARY - Detail \*\*

	QUANTITY	UOM	DIRECT	OVERHEAD	HOME OFC	PROFIT	INS/BOND	B&O TAX	TOTAL COST	UNIT COST		
04 DAMS												
04.03 OUTLET WORKS (FISH COLLECTOR)												
04.03.01	MOB, DEMOP	F	PREPARATORY WORK	666,823	62,313	29,165	45,498	12,057	4,079	819,936		
TOTAL MOB, DEMOP F PREPARATORY WORK				666,823	62,313	29,165	45,498	12,057	4,079	819,936		
04.03.03 CARE AND DIVERSION OF WATER												
04.03.03.01	Site Work			2,621,039	244,929	114,639	178,836	47,392	16,034	3,222,869		
04.03.03.15	Mechanical			226,935	21,206	9,926	15,484	4,103	1,388	279,043		
04.03.03.16	Power for Unwatering Pumps			733	69	32	50	13	4	901		
TOTAL CARE AND DIVERSION OF WATER				2,848,707	266,204	124,596	194,370	51,508	17,427	3,502,814		
04.03.04 PERMANENT ACCESS ROADS & PARKING												
04.03.04.02	Site Work			1,628,185	152,150	71,213	111,093	29,440	9,960	2,002,041		
TOTAL PERMANENT ACCESS ROADS & PARKING				1,628,185	152,150	71,213	111,093	29,440	9,960	2,002,041		
04.03.05 BRIDGE												
04.03.05.05	BRIDGES, FOUNDATIONS			11,477	1,072	502	783	208	70	14,112		
04.03.05.06	BRIDGES, ABUTMENTS AND PIERS			14,235	1,330	623	971	257	87	17,504		
04.03.05.07	BRIDGES, SUPERSTRUCTURE AND DECK			117,307	10,962	5,131	8,004	2,121	718	144,243		
04.03.05.08	BRIDGES, ASSOCIATED GENERAL ITEM			35,731	3,339	1,563	2,438	646	219	43,935		
TOTAL BRIDGE				125.00 LF	178,750	16,704	7,818	12,196	3,232	1,094	219,794	1758.35
04.03.09 BUILDINGS												
04.03.09.10	Site Prep			29,479	2,755	1,289	2,011	533	180	36,247		
04.03.09.20	Utilities			70,749	6,611	3,094	4,827	1,279	433	86,994		
04.03.09.25	Generator Building	900.00 SF		103,419	9,664	4,523	7,056	1,870	633	127,166	141.30	
04.03.09.55	Fish Evaluation Facility	2500.00 SF		324,736	30,346	14,203	22,157	5,872	1,987	399,301	159.72	
04.03.09.65	Resident Engineer Bldg	1.00 JOB		117,393	10,970	5,135	8,010	2,123	718	144,348	144348.48	
04.03.09.95	Demolition			10,259	959	449	700	185	63	12,614		
TOTAL BUILDINGS				656,035	61,305	28,694	44,762	11,862	4,013	806,670		
04.03.10 EARTHWORK FOR STRUCTURES												

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U S Army Corps of Engineers  
 PROJECT BHDWBS Fish Tower/Seepage Cntrl/Environ - Howard Hanson Dam Additional  
 FEASIBILITY LEVEL ESTIMATE  
 \*\* PROJECT INSPECT SUMMARY Detail \*\*

	QUANTITY	UOM	DIRECT	OVERHEAD	HOME OFC	PROFIT	INS/BOND	B&O TAX	TOTAL COST	UNIT COST
04 03 1 00 Site Work			2,168,262	202,620	94,836	147,944	39,205	13,264	2,666,153	
TOTAL EARTHWORK STRUCTURES	16,540.00	CY	2,168,262	202,620	94,836	147,944	39,205	13,264	2,666,153	69.70
04 03 11 FOUNDATION WORK										
04 03 11 00 Drainage Impediments	9510.00	LF	158,354	14,774	6,913	10,764	2,856	907	194,546	20.46
04 03 11 01 Foundation Preparation	5778.00	SY	107,033	10,002	4,681	7,303	1,935	655	141,509	22.78
04 03 11 02 Rock Anchors	1500.00	LF	34,955	3,266	1,529	2,385	632	214	42,981	28.65
04 03 11 03 Concrete	200.00	CY	186,631	17,440	8,163	12,734	3,375	1,142	229,484	1147.42
04 03 11 04 Welding, construction safety	1.00	LF	6,388	557	279	436	116	39	7,855	15.71
04 03 11 10 Dewatering	1.00	MO	457,740	42,775	20,021	31,232	6,277	4,800	562,844	187614.68
04 03 11 11 Foundation Backfill	16000.00	CY	681,729	63,893	29,905	46,652	12,363	4,183	840,723	52.55
TOTAL FOUNDATION WORK	20000.00	SF	1,634,529	152,743	71,491	111,526	29,554	9,999	2,009,842	100.49
04 03 29 APPROACH AND OUTLET CHANNEL										
04 03 29 02 Site Work			1,149,290	107,398	50,268	78,417	20,761	7,031	1,413,184	
TOTAL APPROACH AND OUTLET CHANNEL	36000.00	CY	1,149,290	107,398	50,268	78,417	20,761	7,031	1,413,184	39.26
04 03 54 OUTLET PORTAL AND STILLING BASIN										
04 03 54 03 Metals			16,191	1,513	708	1,105	293	99	19,909	
04 03 54 20 Fish Monitoring Facilities			44,984	4,204	1,968	3,059	813	275	55,313	
TOTAL OUTLET PORTAL AND STILLING BASIN			61,176	5,717	2,676	4,174	1,106	374	75,223	
04 03 55 TUNNEL AND CONDUIT										
04 03 55 02 Site Work for All New Tunnels			312,484	25,201	13,667	21,321	6,650	1,911	384,238	
04 03 55 90 Tunnel Construction, 7' H X 8' W	150.00	LF	161,060	28,134	13,168	20,542	5,444	1,642	370,198	2467.98
04 03 55 91 Tunnel Extension, new Tower Site	25.00	LF	50,000	4,672	2,187	3,412	904	306	61,481	2459.23
04 03 55 97 24" Dia Fish Pipe (from Tower	50.00	LF	12,185	1,138	533	831	220	75	14,980	299.61
04 03 55 98 48" Bypass (from Tower to Exist	210.00	LF	129,734	12,123	5,674	8,852	2,346	794	159,523	759.63
04 03 55 99 Existing Tunnel Work	900.00	LF	429,324	40,119	18,776	29,293	7,763	2,626	527,904	586.56
TOTAL TUNNEL AND CONDUIT			1,234,795	115,388	54,067	84,251	22,327	7,554	1,518,323	
04 03 56 INTAKE STRUCTURE										
04 03 56 03 Concrete	12750.00	CY	4,951,353	462,691	216,562	337,836	89,527	1,290	6,088,259	477.51
04 03 56 05 Metals			537,145	50,195	23,494	36,650	9,712	1,286	660,482	
04 03 56 15 Mechanical (from MMD)			79,003	7,383	3,455	5,390	1,428	483	97,143	

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	QUANTITY	UOM	DIRECT	OVERHEAD	HOME OFC	PROFIT	INS/BOND	B&O TAX	TOTAL COST	UNIT COST
TOTAL INTAKE STRUCTURE	210.00	VLF	5,567,501	520,269	243,511	379,877	100,667	34,059	6,845,884	31259.74
04 03 57 INTAKE GATES AND EQUIPMENT										
04 03 57 05 Metals			2,169,192	202,705	94,876	148,006	39,222	13,270	2,667,272	
04 03 57 15 Mechanical			55,834	55,679	26,061	40,654	10,772	3,645	712,647	
TOTAL INTAKE GATES AND EQUIPMENT			2,765,027	258,385	120,936	188,661	49,995	16,915	3,399,919	
04 03 98 ELECTRICAL										
04 03 98 1 Demolition			28,423	2,656	1,243	1,935	514	174	34,950	
04 03 98 2 Lighting			74,501	6,962	3,259	5,083	1,347	456	91,607	
04 03 98 3 Electric Power and Lighting			269,424	25,177	11,784	18,383	4,872	1,648	331,287	
04 03 98 4 Standby Power Equipment			332,143	31,038	14,527	22,662	6,006	2,032	408,408	
04 03 98 5 Controls & Instrumentation			346,138	32,346	15,139	23,617	6,259	2,117	425,616	
04 03 98 6 Telephone			17,687	1,653	774	1,207	320	108	21,748	
TOTAL ELECTRICAL			1,068,315	99,831	46,726	72,892	19,316	6,535	1,313,617	
04 03 99 CRANE										
04 03 99 14 Permanent Operating Equipment			2,652,144	247,836	115,999	180,959	47,954	16,224	3,261,117	
TOTAL CRANE			2,652,144	247,836	115,999	180,959	47,954	16,224	3,261,117	
TOTAL OUTLET WORKS (FISH COLLECTOR)	219.00	VLF	24,279,560	2,268,862	1,061,937	1,656,622	439,005	148,930	29,854,515	136321.99
04 12 SEEPAGE CONTROL										
04 12 04 CONSOLIDATION GROUTING										
04 12 04 02 Site Work			2,498,724	199,898	107,945	168,394	44,624	15,098	3,034,683	
TOTAL CONSOLIDATION GROUTING	25510.00	LF	2,498,724	199,898	107,945	168,394	44,624	15,098	3,034,683	118.96
04 12 06 ADIT EXTENSION										
04 12 06 02 Site Work			595,862	47,671	25,741	40,156	10,641	3,600	723,673	
TOTAL ADIT EXTENSION	200.00	LF	595,862	47,671	25,741	40,156	10,641	3,600	723,673	3618.36
04 12 08 FEEDER WELLS										

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	QUANTITY	UOM	DIRECT	OVERHEAD	HOME OFC	PROFIT	INS. BOND	B&O TAX	TOTAL COST	UNIT COST
04 12 02 Site Work			205,465	16,437	8,876	13,847	3,669	1,241	249,535	
TOTAL FEEDER WELLS	5.00	EA	205,465	16,437	8,876	13,847	3,669	1,241	249,535	49907.10
04 12 10 HORIZONTAL DRAINS FOR EXISTING										
04 12 10 02 Site Work			308,539	24,683	13,329	20,793	5,510	1,864	374,719	
TOTAL HORIZONTAL DRAINS FOR EXISTING	4500.00	LF	308,539	24,683	13,329	20,793	5,510	1,864	374,719	83.27
04 12 12 PRESSURE GAGE										
04 12 12 02 Site Work			1,624	130	70	109	29	10	1,972	
TOTAL PRESSURE GAGE	1.00	EA	1,624	130	70	109	29	10	1,972	1972.16
04 12 14 RE-PERFORATE FEEDER WELLS										
04 12 14 02 Site Work			17,129	1,370	740	1,154	306	103	20,803	
TOTAL RE-PERFORATE FEEDER WELLS	10.00	EA	17,129	1,370	740	1,154	306	103	20,803	2080.31
04 12 16 ROCK BLANKET										
04 12 16 02 Site Work			2,059,013	164,721	88,949	138,761	36,772	12,441	2,500,657	
TOTAL ROCK BLANKET	69000.00	CY	2,059,013	164,721	88,949	138,761	36,772	12,441	2,500,657	36.24
TOTAL SEEPAGE CONTROL			5,686,356	454,911	245,651	383,215	101,552	34,358	6,906,043	
TOTAL DAMS			29,965,916	2,723,773	1,307,588	2,039,837	540,557	182,888	36,760,557	
06 FISH AND WILDLIFE FACILITIES										
06 03 Wildlife Facilities & Sanctuary										
06 03 9A Wildlife Habitat										
06 03 9A 01 Wildlife Habitat Mitigation Ph 1			961,462	79,417	31,226	58,966	16,966	5,740	1,153,777	
06 03 9A 05 Wildlife Habitat Mitigation Ph 2			690,501	57,035	22,426	42,348	12,185	4,122	828,618	
TOTAL Wildlife Habitat			1,651,963	136,452	53,652	101,314	29,151	9,863	1,982,395	
06 03 9B Fish Habitat										

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		QUANTITY	UOM	DIRECT	OVERHEAD	HOME OFC	PROFIT	INS/BOND	B&O TAX	TOTAL COST	UNIT COST
06 03 98 01	Fish Habitat Mitigation Ph 1			649,170	53,621	21,084	39,813	11,455	3,876	779,019	
06 03 98 02	Fish Habitat Mitigation Ph 2			1,214,002	83,757	32,933	62,188	17,893	6,054	1,216,826	
06 03 98 05	Fish Habitat Mitigation Ph 2			1,336,016	110,355	43,391	81,937	23,575	7,976	1,603,251	
TOTAL Fish Habitat				2,999,188	247,733	97,408	183,938	52,924	17,906	3,599,097	
TOTAL Wildlife Facilities & Sanctuary				4,657,151	384,185	151,060	285,252	82,075	27,769	5,581,491	
TOTAL FISH AND WILDLIFE FACILITIES				4,657,151	384,185	151,060	285,252	82,075	27,769	5,581,491	
19 BUILDINGS, GROUNDS, & UTILITIES											
19.00 Maintenance Shop											
19 00 01	Substructure	2400.00	SF	73,957	6,109	2,402	4,536	1,305	442	80,750	36.98
19 00 02	Structural Frame	2400.00	SF	40,690	3,261	1,322	2,495	718	243	48,829	20.35
19 00 03	Roofing	2400.00	SF	15,295	1,263	497	938	270	91	18,354	7.65
19 00 04	Exterior Closure	2400.00	SF	58,728	4,851	1,907	3,602	1,036	351	70,475	29.36
19 00 05	Interior Construction	2400.00	SF	12,466	1,030	405	765	220	74	14,960	6.23
19 00 06	Interior Finishes	2400.00	SF	3,856	319	125	237	68	23	4,628	1.93
19 00 07	Specialties	2400.00	SF	33,250	2,746	1,080	2,039	587	199	39,901	16.63
19 00 08	Plumbing	2400.00	SF	12,547	1,036	408	770	221	75	15,057	6.27
19 00 09	Heating,Ventils n & Air Condit	2400.00	SF	15,851	1,309	515	972	280	95	19,022	7.93
19 00 10	Special Mechanical Systems	2400.00	SF	1,722	142	56	106	30	10	2,067	0.86
19 00 11	Interior Electrical	2400.00	SF	24,996	2,065	812	1,533	441	149	29,996	12.50
19 00 12	Special Interior Electrical Syst	2400.00	SF	867	72	28	53	15	5	1,041	0.43
TOTAL Maintenance Shop		2400.00	SF	294,227	24,303	9,556	18,045	5,192	1,757	353,080	147.12
19.10 Administration Building, Single											
19 10 01	Substructure	3500.00	SF	43,293	3,576	1,406	2,655	764	258	51,952	14.84
19 10 02	Structural Frame	3500.00	SF	33,164	2,739	1,077	2,034	585	198	39,798	11.37
19 10 03	Roofing	3500.00	SF	24,000	1,982	779	1,472	424	143	28,800	8.23
19 10 04	Exterior Closure	3500.00	SF	85,415	7,055	2,774	5,238	1,507	510	102,501	29.29
19 10 05	Interior Construction	3500.00	SF	41,259	3,408	1,340	2,530	728	246	49,511	14.15
19 10 06	Interior Finishes	3500.00	SF	29,728	2,456	965	1,823	525	177	35,674	10.19
19 10 07	Specialties	3500.00	SF	2,616	216	85	160	46	16	3,140	0.90
19 10 08	Plumbing	3500.00	SF	25,799	2,131	838	1,582	455	154	30,959	8.85
19 10 09	Heating,Ventilation & Air Condit	3500.00	SF	111,625	9,220	3,625	6,846	1,970	666	133,952	38.27
19 10 11	Interior Electrical	3500.00	SF	24,781	2,047	805	1,520	437	148	29,738	8.50
19 10 12	Special Interior Electrical Syst	3500.00	SF	1,674	138	54	103	30	10	2,008	0.57
TOTAL Administration Building, Single		3500.00	SF	423,353	34,969	13,750	25,964	7,471	2,528	508,033	145.15
19.98 Maint Bldg. Support Facilities											
19.98.18 Utility Lines & Service											

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	QUANTITY UOM	DIRECT	OVERHEAD	HOME OFC	PROFIT	INS/BOND	B&O TAX	TOTAL COST	UNIT COST
19 98 16 1 Utilities		39,745	3,283	1,291	2,438	761	237	47,695	
TOTAL Utility Lines & Service		39,745	3,283	1,291	2,438	761	237	47,695	
19 98 21 Parking Lots and Service Roads									
19 98 21.01 Site Work		15,189	1,255	491	932	268	91	18,227	
TOTAL Parking Lots and Service Roads		15,189	1,255	491	932	268	91	18,227	
TOTAL Mr. Bldg Support Facilities		54,934	4,538	1,784	3,369	969	328	65,922	
19 99 Admin Bldg Support Facilities									
19 99 18 Utility Lines & Service									
19 99 18.01 Utilities		73,812	6,097	2,397	4,527	1,303	441	88,577	
TOTAL Utility Lines & Service		73,812	6,097	2,397	4,527	1,303	441	88,577	
19 99 22 Parking Lots and Service Roads									
19 99 22.02 Site Work		28,591	2,362	929	1,753	505	171	34,310	
TOTAL Parking Lots and Service Roads		28,591	2,362	929	1,753	505	171	34,310	
TOTAL Admin Bldg Support Facilities		102,404	8,455	3,326	6,200	1,807	611	122,867	
TOTAL BUILINGS, GROUNDS, & UTILITIES	2.00 EA	874,916	72,268	28,416	53,658	15,439	5,223	1,049,922	524961 02
TOTAL Fish Tower/Seepage Cntrl/Environ	1.00 EA	35,491,984	3,180,226	1,487,063	2,378,766	638,070	215,880	43,391,971	43391971

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