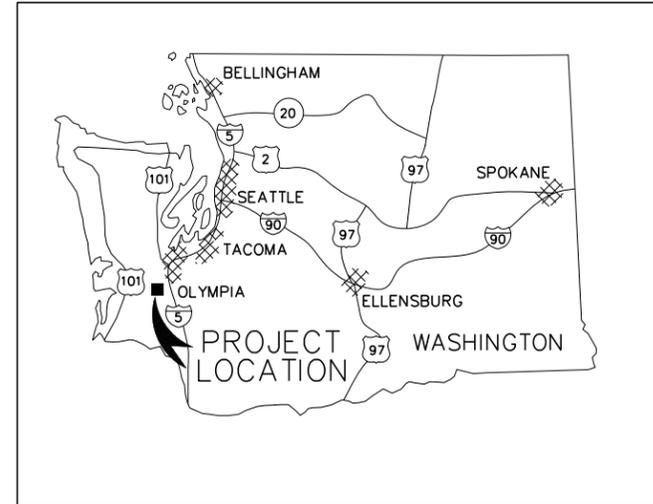
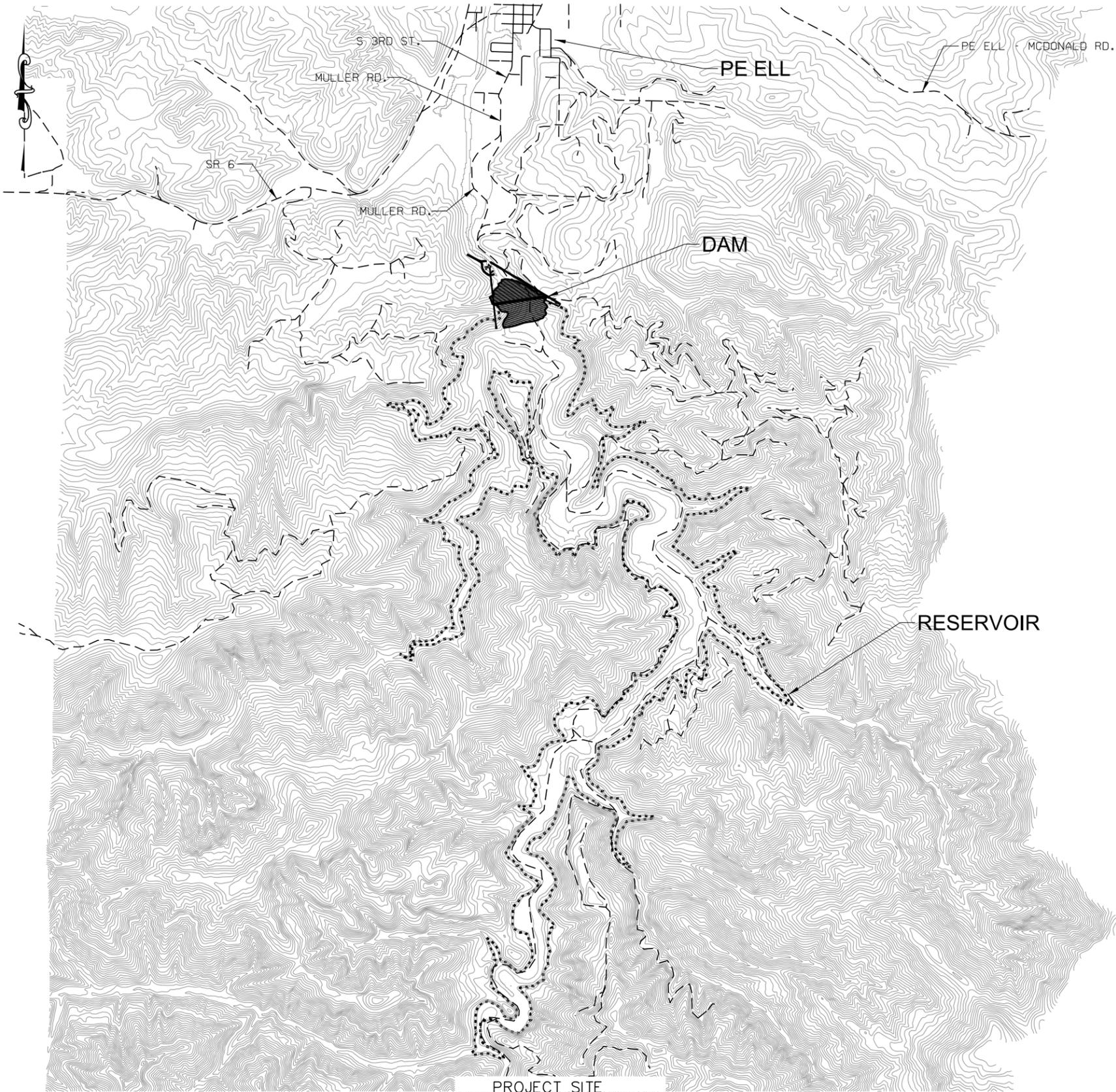
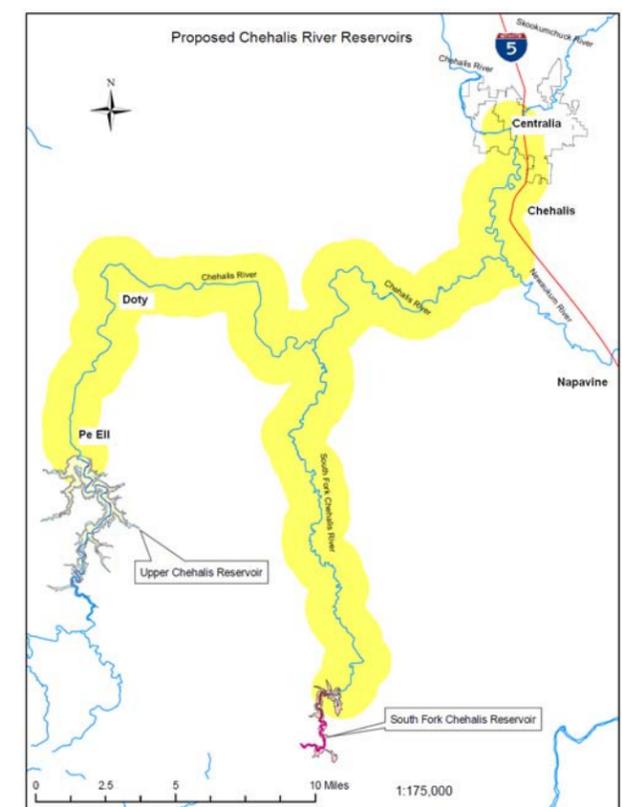


**Appendix B**  
**Upper Chehalis Structure Preliminary Drawings**

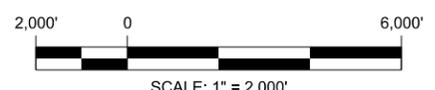
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LOCATION MAP



VICINITY MAP



**PRELIMINARY**

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**LEWIS COUNTY**  
**PUBLIC UTILITY DISTRICT NO.1**  
**321 NW PACIFIC AVENUE**  
**CHEHALIS, WA 98532**

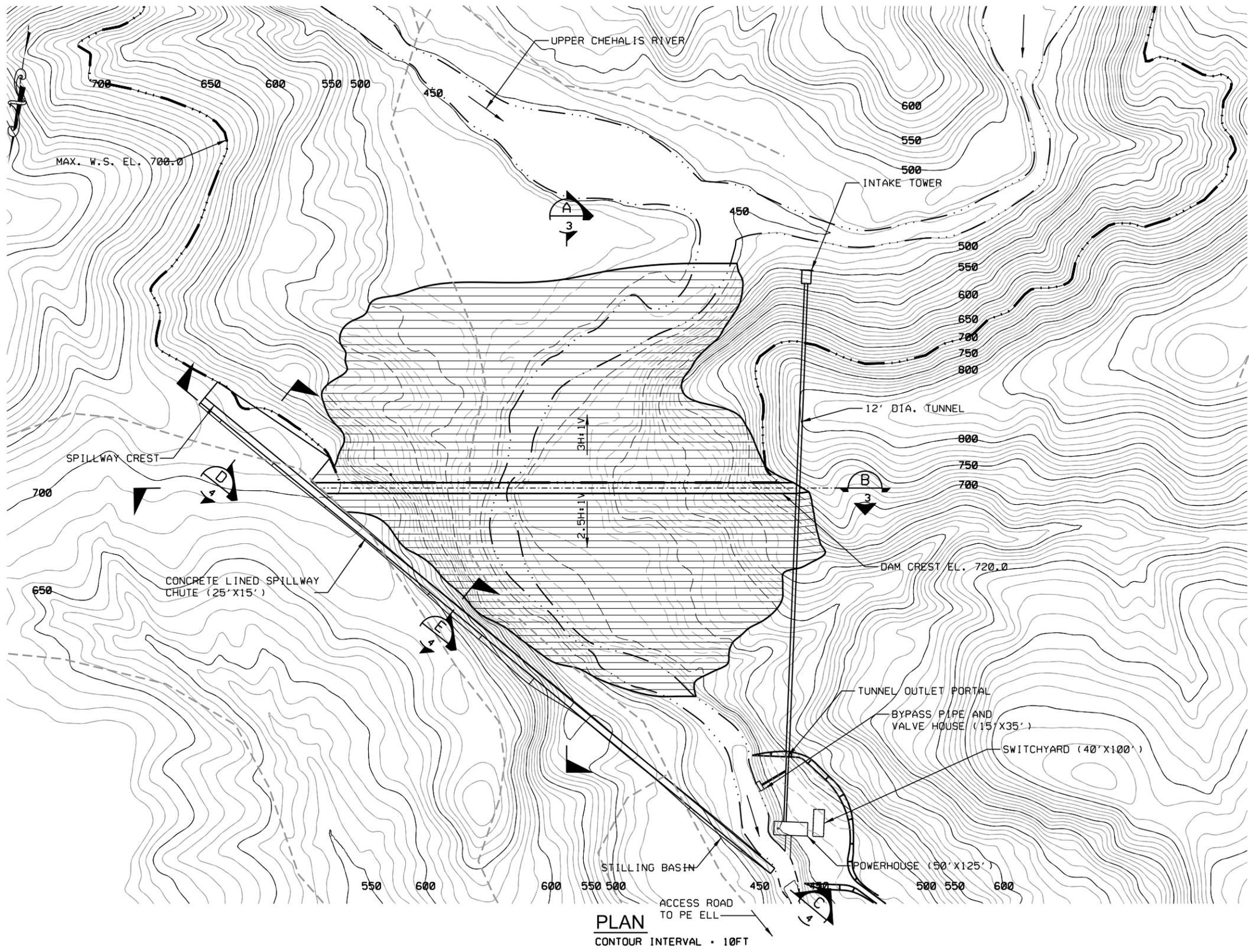


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 PH. 425.889.2700

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DESIGNED BY: S. HANSEN		UPPER CHEHALIS DAM	
CHECKED BY:		LOCATION, VICINITY, & PROJECT LOCATION MAP	
APPROVED BY:			
DATE: 06-25-10		SCALE: AS NOTED	DRAWING NO. 1
ORIGINAL INSPECTION		PROJECT NO.	SHEET NO. OF 1
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**PLAN**  
CONTOUR INTERVAL - 10FT



**PRELIMINARY**

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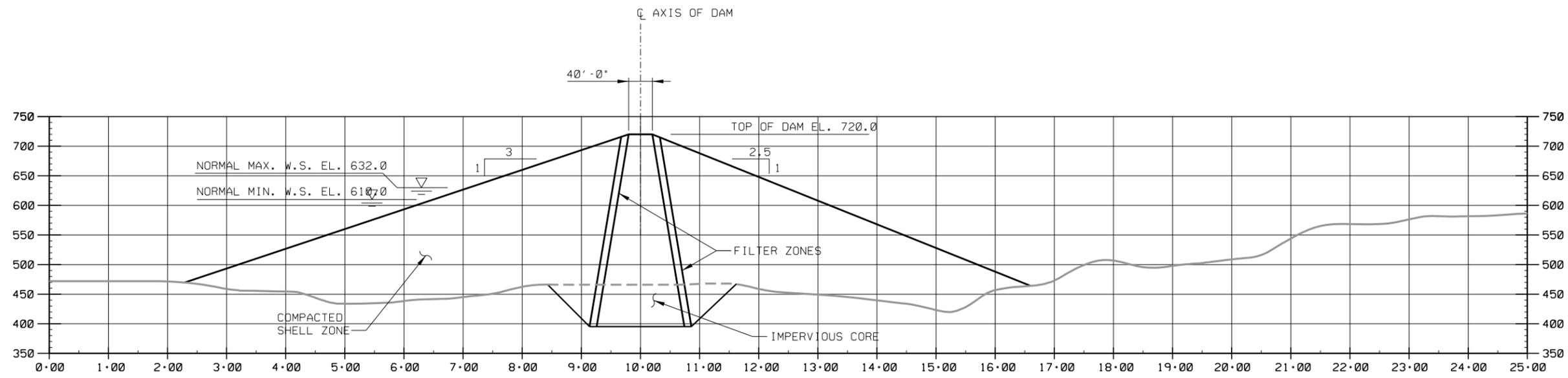
**LEWIS COUNTY**  
**PUBLIC UTILITY DISTRICT NO.1**  
**321 NW PACIFIC AVENUE**  
**CHEHALIS, WA 98532**


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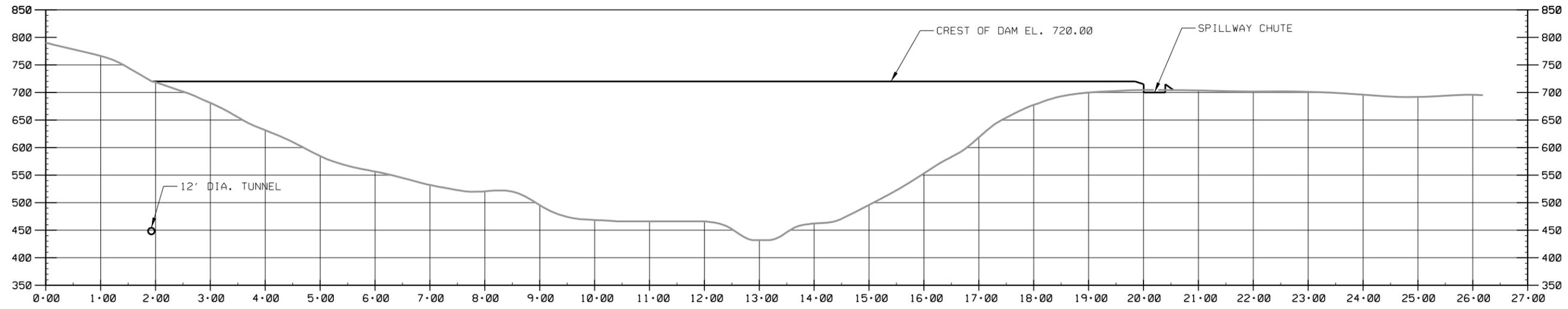
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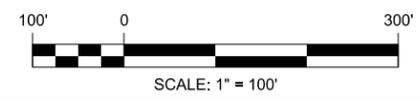
**CHEHALIS RIVER BASIN FLOOD AUTHORITY**  
**UPPER CHEHALIS DAM**  
**GENERAL ARRANGEMENT PLAN**



**SECTION A**  
SCALE: 1" = 100' - 0" 2



**ELEVATION B**  
SCALE: 1" = 100' - 0" 2



**PRELIMINARY**

**LEWIS COUNTY  
PUBLIC UTILITY DISTRICT NO.1  
321 NW PACIFIC AVENUE  
CHEHALIS, WA 98532**

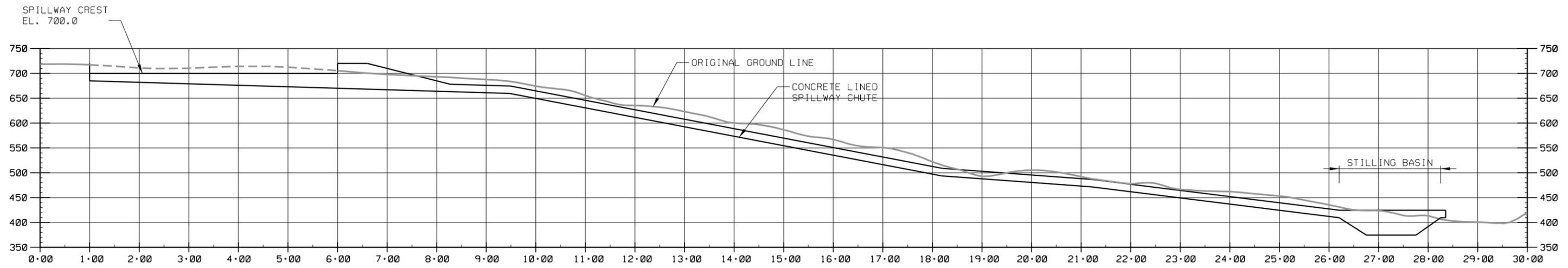
**EES Consulting**  
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PH. 425.889.2700

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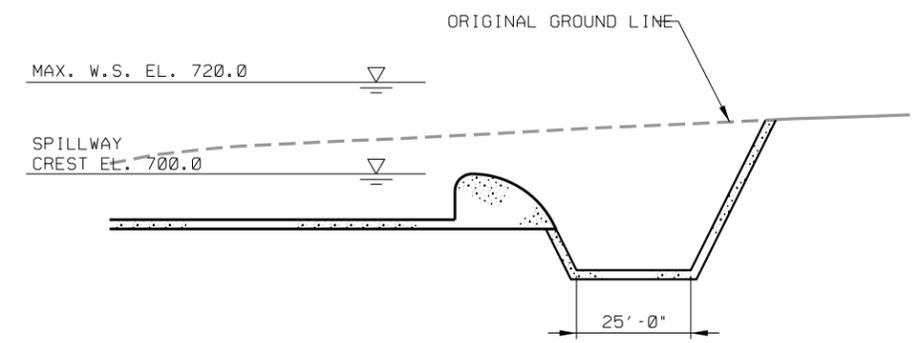
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A	05-10-10	ISSUED FOR S & W REVIEW						

**CHEHALIS RIVER BASIN FLOOD AUTHORITY**  
**UPPER CHEHALIS DAM  
SECTION AND ELEVATION**

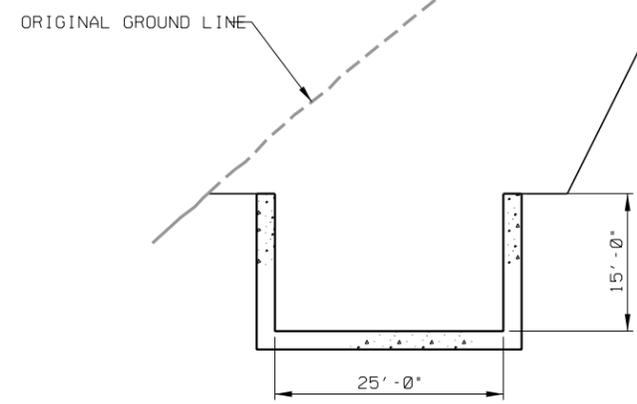
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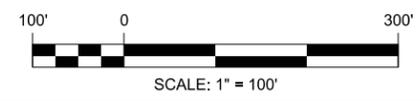
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**SECTION D**  
SCALE: 1" = 20' - 0" 2



**SECTION E**  
SCALE: 1" = 10' - 0" 2



**PRELIMINARY**

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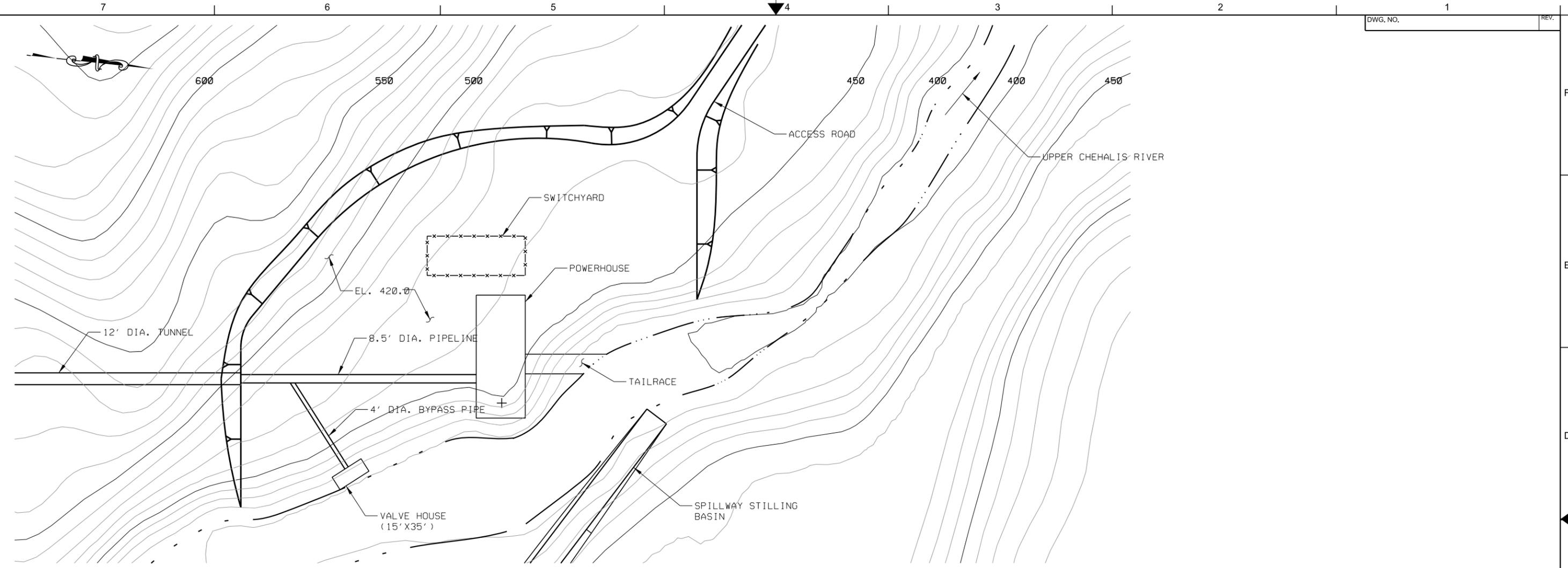
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DESIGNED BY:  
**S. MANNEN**  
CHECKED BY:  
**E. WILSON**  
APPROVED BY:  
DATE:

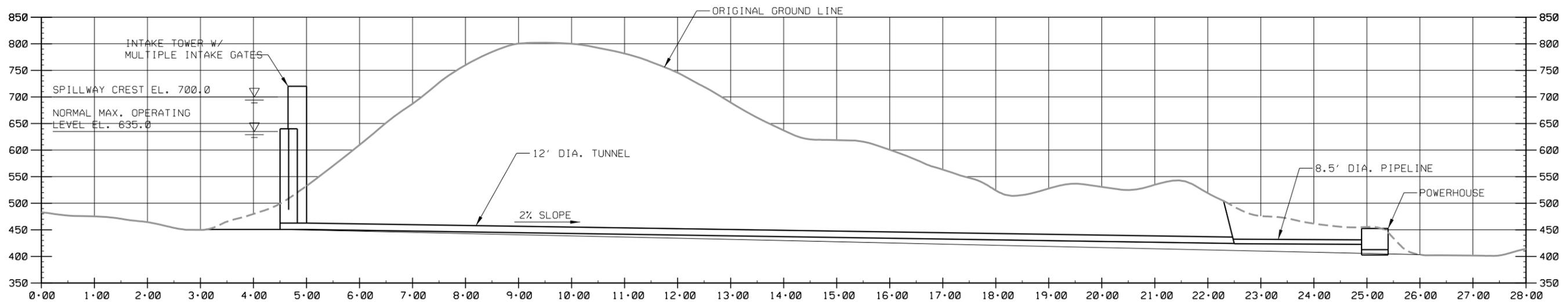
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**UPPER CHEHALIS DAM  
SECTION AND ELEVATION**  
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REV. **A**

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**POWERHOUSE PLAN**  
SCALE: 1" = 50'-0"



**DIVERSION TUNNEL PROFILE**  
SCALE: 1" = 100'-0"

**PRELIMINARY**

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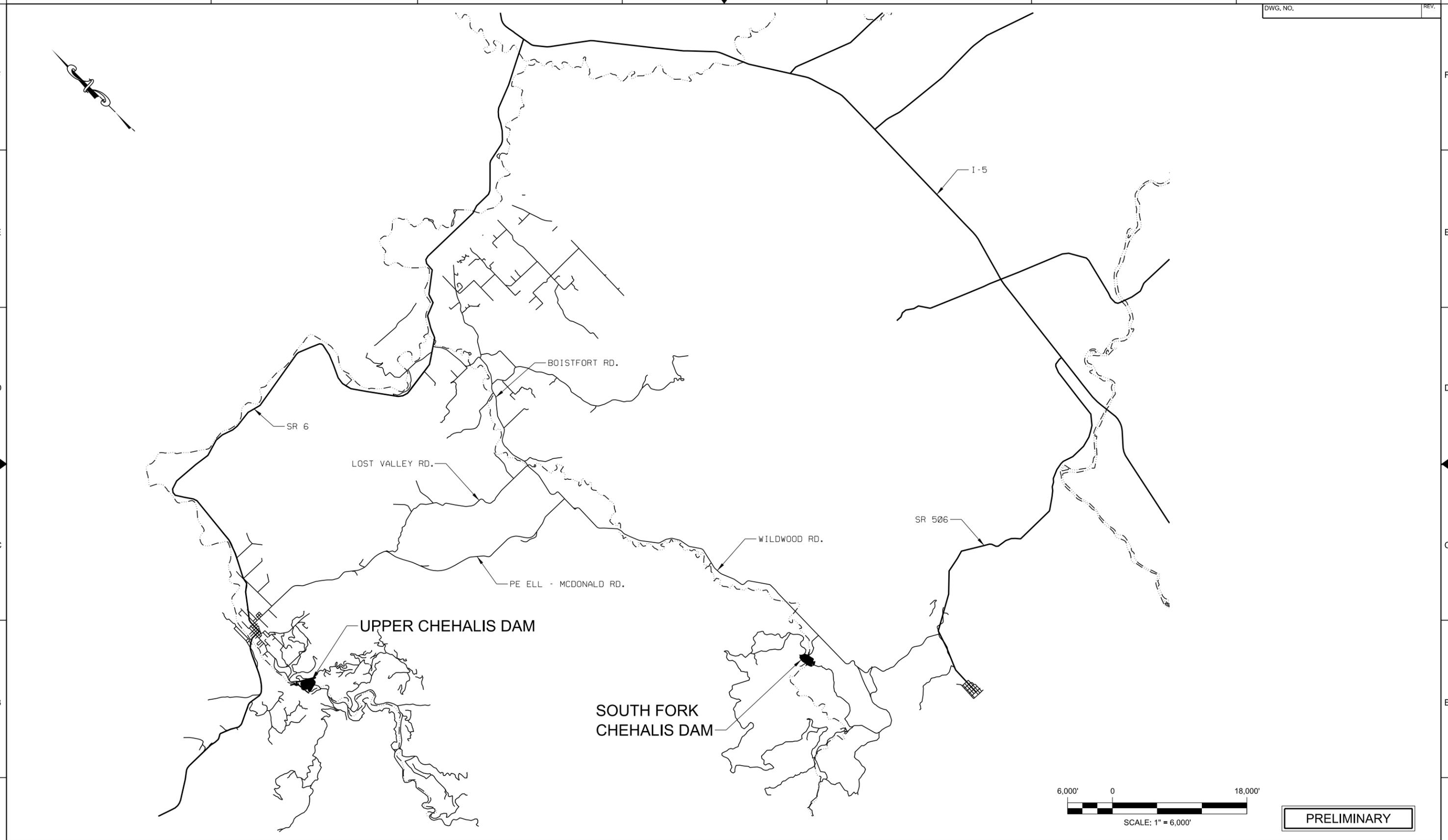
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DRAWN BY:  
**R. JACKSON**  
 DESIGNED BY:  
**S. MANNEN**  
 CHECKED BY:  
**E. WILSON**  
 APPROVED BY:

**CHEHALIS RIVER BASIN FLOOD AUTHORITY**  
**UPPER CHEHALIS DAM**  
**PENSTOCK AND TUNNEL PROFILES**

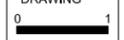
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**R. JACKSON**  
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**S. MANNEN**  
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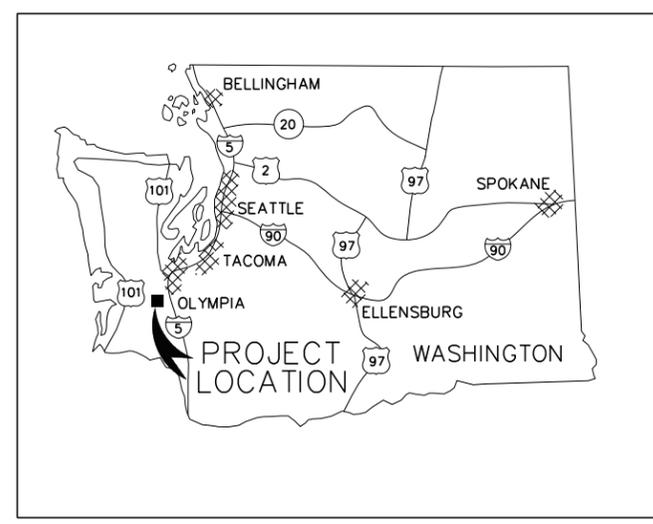
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**UPPER CHEHALIS DAM**  
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**Appendix C**  
**South Fork Structure Preliminary Drawings**

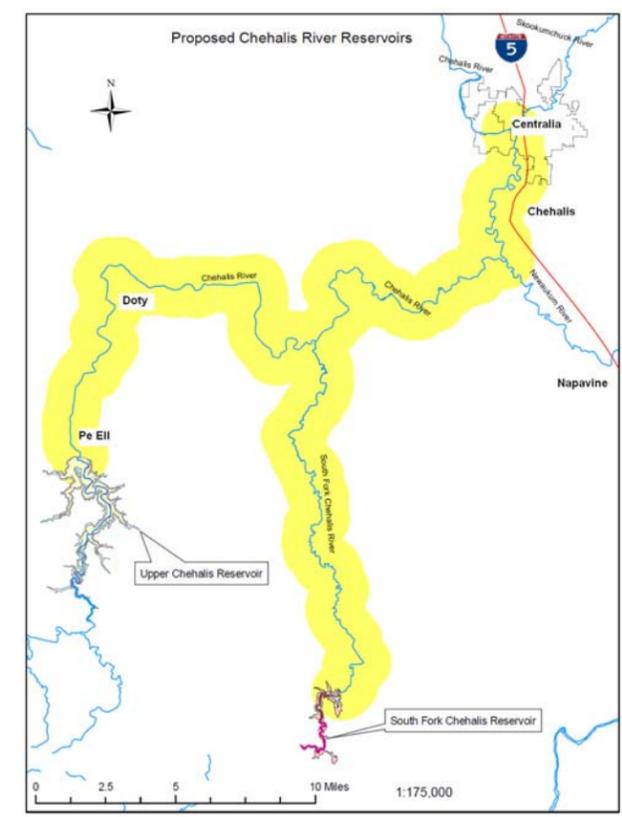
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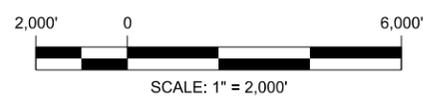
PROJECT SITE



LOCATION MAP



VICINITY MAP



**PRELIMINARY**

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**LEWIS COUNTY**  
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**321 NW PACIFIC AVENUE**  
**CHEHALIS, WA 98532**



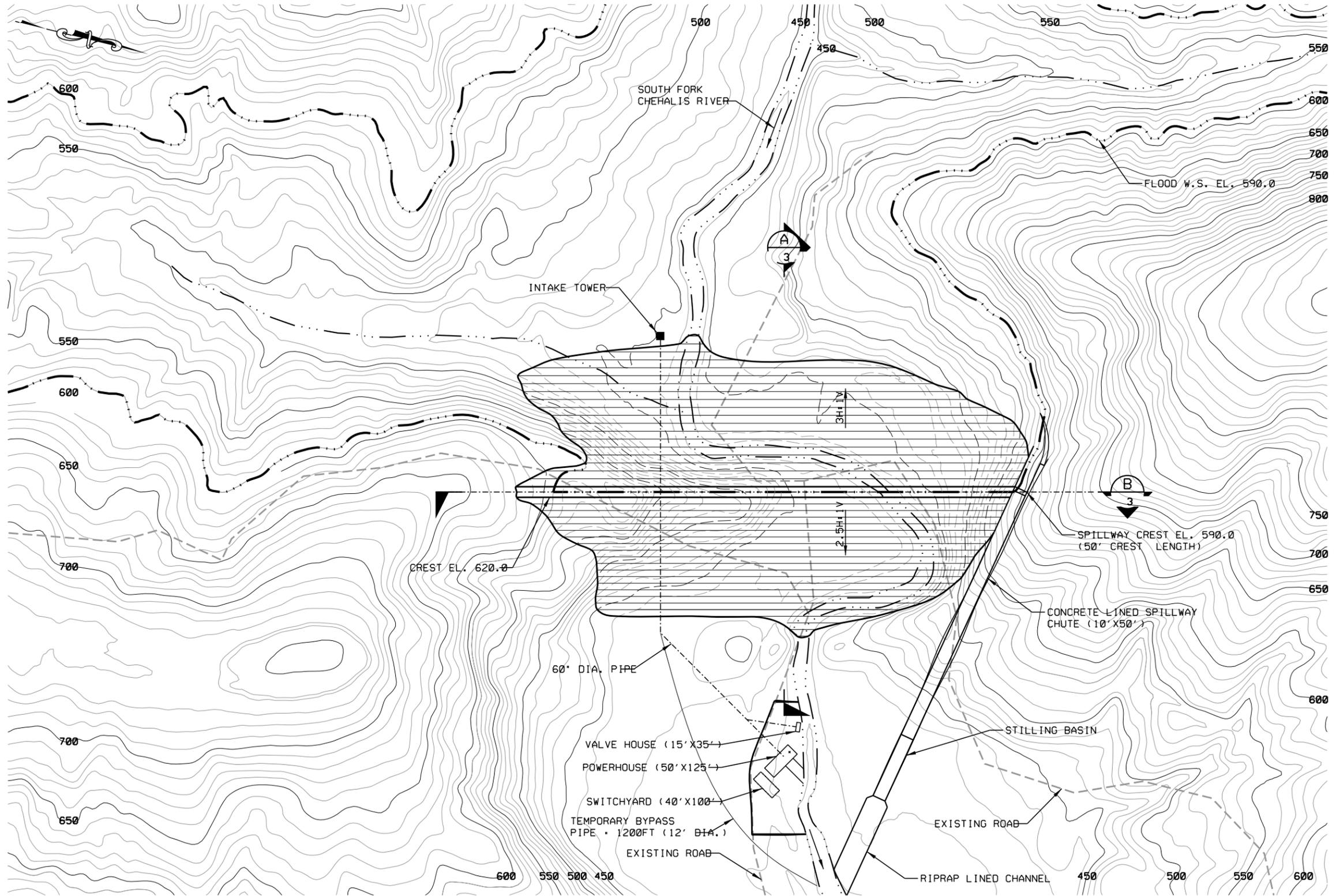
570 KIRKLAND WAY, SUITE 200 KIRKLAND, WA 98033  
 PH. 425.889.2700

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DESIGNED BY: S. MANNEN		SOUTH FORK CHEHALIS DAM LOCATION, VICINITY, & PROJECT LOCATION MAPS	
CHECKED BY:		SCALE: AS NOTED	
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**PLAN**  
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**PRELIMINARY**

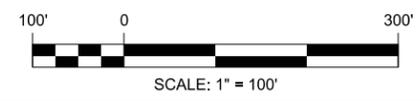
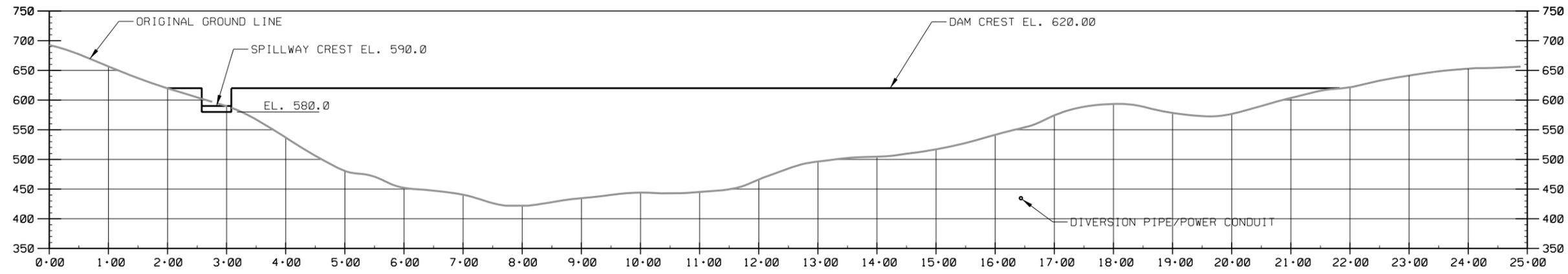
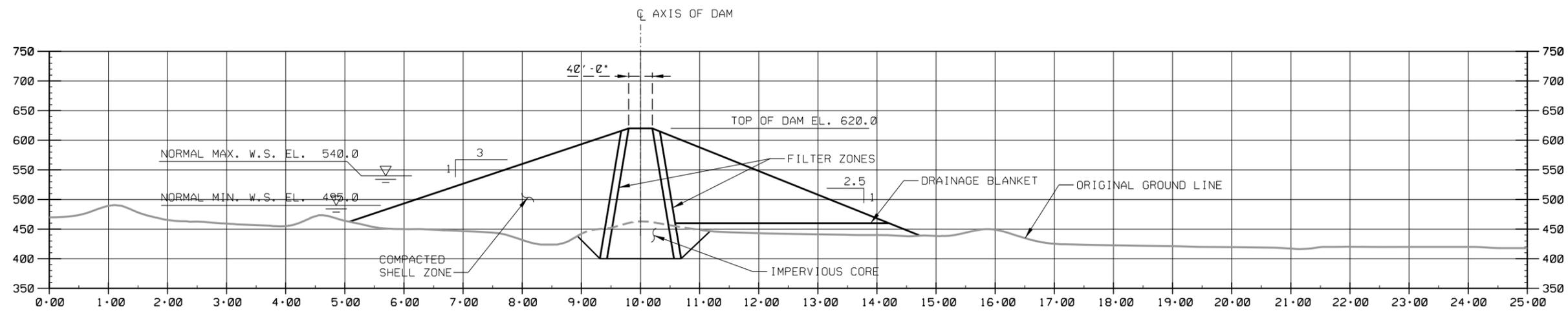
**LEWIS COUNTY**  
**PUBLIC UTILITY DISTRICT NO.1**  
 321 NW PACIFIC AVENUE  
 CHEHALIS, WA 98532

**EES Consulting**  
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							ELEC MECH
							INSPECTION

**CHEHALIS RIVER BASIN FLOOD AUTHORITY**  
**SOUTH FORK CHEHALIS DAM**  
**GENERAL ARRANGEMENT PLAN**  
 SCALE: AS NOTED  
 DRAWING NO. 2  
 SHEET NO. OF  
 SF-ALT 3 - SHEET 2 - SOUTH FORK DAM PLAN - ALT



PRELIMINARY

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CHEHALIS RIVER BASIN FLOOD AUTHORITY

SOUTH FORK CHEHALIS DAM SECTION AND ELEVATION

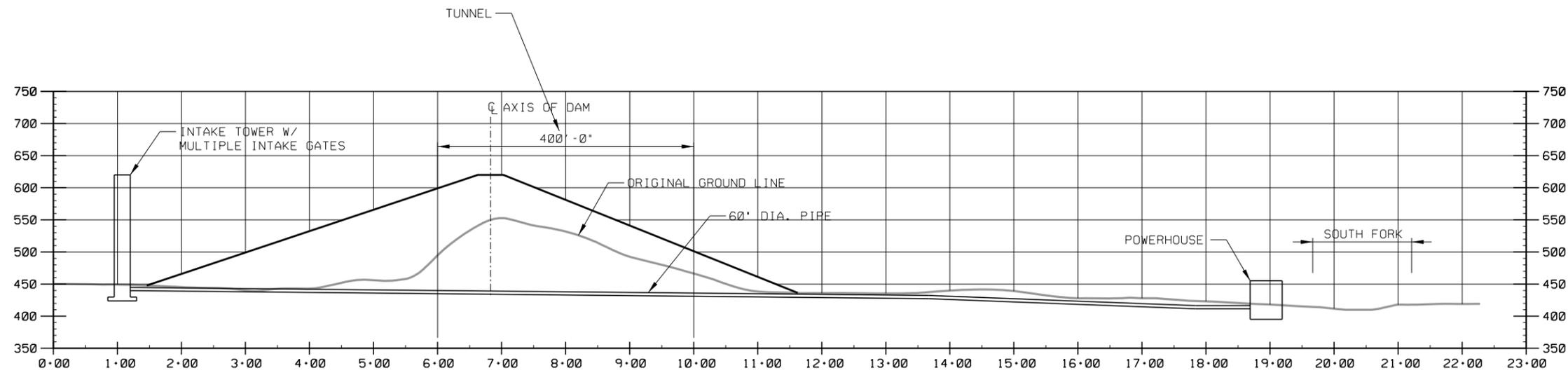
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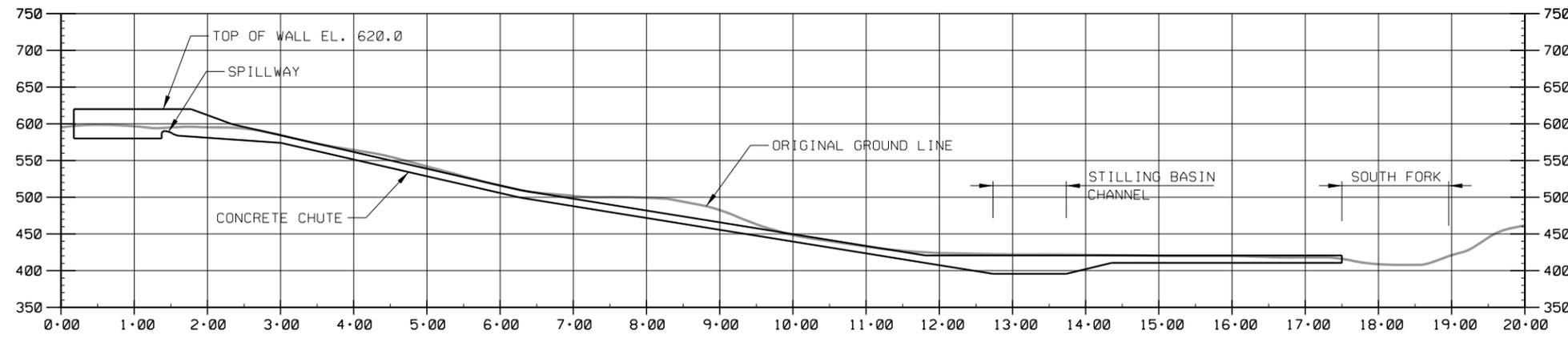
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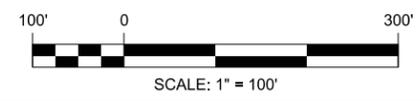
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**PIPELINE PROFILE**  
SCALE: 1" = 100'-0"



**SPILLWAY PROFILE**  
SCALE: 1" = 100'-0"



**PRELIMINARY**

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321 NW PACIFIC AVENUE  
CHEHALIS, WA 98532**



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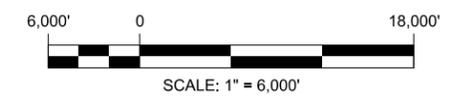
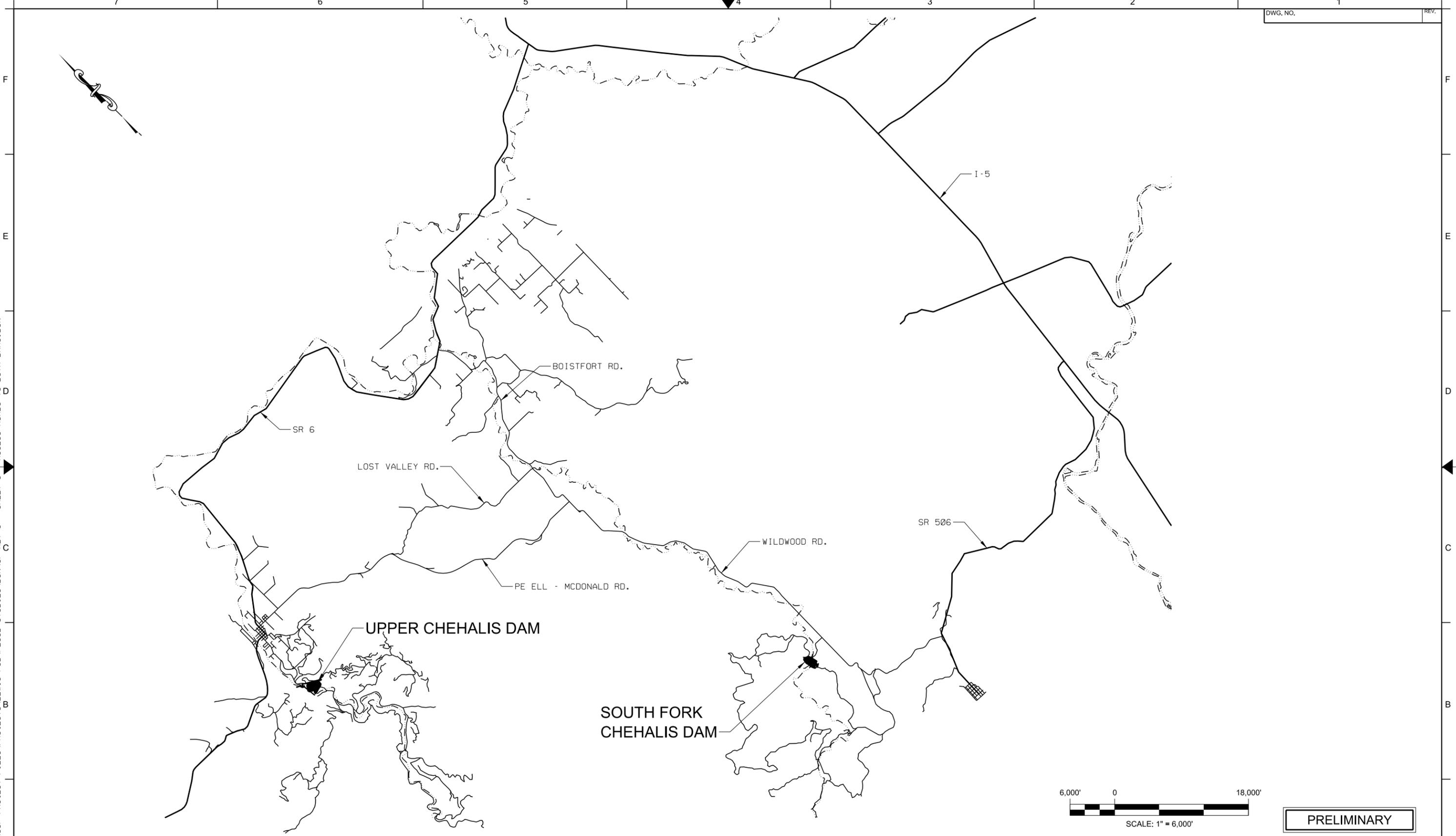
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B	09-10-10	ISSUED FOR S.A.W. REVIEW						

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DESIGNED BY: S. JOHNSON		SOUTH FORK CHEHALIS DAM PENSTOCK AND TUNNEL PROFILES	
CHECKED BY:		SCALE: AS NOTED	
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PRELIMINARY

**LEWIS COUNTY**  
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**CHEHALIS, WA 98532**



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**R. JACKSON**  
 DESIGNED BY:  
**S. MANNEN**  
 CHECKED BY:  
 APPROVED BY:  
 DATE: **06-25-10**  
 ORIGINAL  
 INSPECTION

**CHEHALIS RIVER BASIN FLOOD AUTHORITY**  
**SOUTH FORK CHEHALIS DAM**  
**SITE ACCESS ROADS**  
 SCALE: **AS NOTED**  
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**Appendix D**  
**Upper Chehalis and South Fork**  
**Structure Preliminary Cost Estimates**

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**Upper Chehalis Project (Flood Only)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

**Summary Sheet**

Updated October 6, 2010

Acct No	Description	Amount (\$)
330	Land and Land Rights. Permits, Owner Costs	24,150,000
331	Structures and Improvements	0
	Penstock Supply	0
332	All Other Reservoirs, Dams, and Waterways	86,602,000
333	Turbine and Generator Water To Wire Package	0
334	Accessory Electrical Equipment incl install	0
335	Misc. Mechanical Equipment incl install	0
336	Roads	375,000
353	Substation Equipment	0
355	Transmission Lines	0
	ESTIMATED COSTS SUBTOTAL	111,127,000
	WSST @ 7.9%	8,779,033
	SUBTOTAL	119,906,033
	Contingency Allowance (30%)	35,971,800
	TOTAL ESTIMATED DIRECT COST (rounded)	\$155,878,000
	Engineering and Construction Management Assistance (6%)	9,352,700
	TOTAL DIRECT PROJECT COST 2010 (rounded)	165,230,000

**Upper Chehalis Project (Flood Only)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

Acct No	Description	Quantity	Unit	Unit Price	Amount (\$)
<b>330</b>	<b>LAND AND LAND RIGHTS</b>				
<b>330 .1</b>	<b>Mobilization/Logistics/Permits</b>				
.11	Mobilize & Demob	1	LS	\$5,000,000	\$5,000,000
.12	Land acquisition	1,500	ACRE	\$10,000	\$15,000,000
.13	FERC Licensing	0	LS	\$0	\$0
.14	State and Local Permitting	1	LS	\$4,000,000	\$4,000,000
.15	BPA Coordination/costs	1	LS	\$50,000	\$50,000
.16	District internal costs, legal, etc	1	LS	\$100,000	\$100,000
<i>Subtotal - Acc No. 330 - Land and Land Rights</i>					\$24,150,000
<b>331</b>	<b>STRUCTURES AND IMPROVEMENTS</b>				
<b>331 .1</b>	<b>Powerhouse</b>				
<i>Subtotal - Powerhouse</i>					\$0
<b>331 .2</b>	<b>Powerhouse Site/Switchyard</b>				
<i>Subtotal - Powerhouse Site/Switchyard</i>					\$0
<i>Subtotal - Acc No. 331 - Structures and Improvements</i>					\$0
<b>332</b>	<b>RESERVOIRS, DAMS, AND WATERWAYS</b>				
<b>332 .1</b>	<b>Dam and Control Gates</b>				
.11	Clearing	1,300	ACRE	\$2,000	\$2,600,000
.12	Dewatering/care of water/cofferdam	1	LS	\$1,000,000	\$1,000,000
.13	Grout Curtain	1	LS	\$14,000,000	\$14,000,000
.14	Stripping-Dam Foundation	775,000	CY	\$16	\$12,400,000
.15	Dam Embankment	4,683,000	CY	\$5.5	\$25,756,500
.16	Trashracks	1	LS	\$30,000	\$30,000
.17	Up and Downstream Gates w/ operators	2	LS	\$100,000	\$200,000
.18	Dam Instrumentation	1	LS	\$10,000	\$10,000
.19	Fish Passage (allowance for u/s trap and haul)	1	LS	\$10,000,000	\$10,000,000
<i>Subtotal - Dam and Intake</i>					\$65,996,500
<b>332 .2</b>	<b>Spillway</b>				
.21	Clearing	7	ACRE	\$2,000	\$14,000
.22	Excavation	75,000	CY	\$20	\$1,500,000
.23	Concrete Overflow Crest	3,000	CY	\$500	\$1,500,000
.25	Chute Concrete	8,055	CY	\$600	\$4,833,000
.26	Stilling Basin Concrete	1,700	CY	\$600	\$1,020,000
<i>Subtotal - Spillway</i>					\$8,867,000
<b>332 .3</b>	<b>Tunnel- 12' diameter</b>				
.31	Tunnel Excavation	1,400	LF	\$4,000	\$5,600,000
.32	12 ft Diameter Steel Liner (Installation Included)	1,400	LF	\$1,200	\$1,680,000
.33	Upstream Portal Excavation	1,900	CY	\$65	\$123,500
.34	Upstream Portal Inlet Structure Concrete	200	CY	\$800	\$160,000
.35	Downstream Portal Excavation	63,000	CY	\$65	\$4,095,000
.36	Downstream Portal Outlet Structure Concrete	100	CY	\$800	\$80,000
<i>Subtotal - Tunnel- 12' diameter</i>					\$11,738,500

**Upper Chehalis Project (Flood Only)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

<b>332</b>	<b>.4</b>	<b>Penstock</b>				
<i>Subtotal - Penstock Supply and Install</i>						\$0
<i>Subtotal - Acc No. 332 - Reservoirs, Dams and Waterways</i>						\$86,602,000
<b>333</b>	<b>.1</b>	<b>TURBINES AND GENERATORS- Water To Wire Package</b>				
<i>Subtotal - Acc No. 333 - Turbines and Generators- Water To Wire Contract</i>						\$0
<b>334</b>	<b>.1</b>	<b>ACCESSORY ELECTRICAL EQUIPMENT</b>				
<i>Subtotal - Acc No. 334 - Accessory Electrical Equipment</i>						\$0
<b>335</b>	<b>.1</b>	<b>MISCELLANEOUS MECHANICAL EQUIPMENT - POWERPLANT</b>				
<i>Subtotal - Acc No. 335 - Miscellaneous Mechanical Equipment</i>						\$0
<b>336</b>	<b>.1</b>	<b>ROADS</b>				
	.11	Permanent Roads (Allowance)	1	LS	\$150,000	\$150,000
	.12	Permanent Bridge (Allowance)	1	LS	\$100,000	\$100,000
	.13	Temporary Roads	1	LS	\$75,000	\$75,000
	.14	Temporary Bridges	1	LS	\$50,000	\$50,000
<i>Subtotal - Acc No. 336 - Roads</i>						\$375,000
<b>353</b>		<b>SUBSTATION EQUIPMENT AND STRUCTURES</b>				
<b>353</b>	<b>.1</b>	<b>Plant Switchyard</b>				
<i>Subtotal - Acc. No. 353 Plant Switchyard</i>						\$0
<b>355</b>		<b>TRANSMISSION LINES</b>				
<b>355</b>	<b>.1</b>	<b>Powerhouse to Puget Switchyard</b>				
<i>Subtotal - Acc No. 355 - Transmission Lines</i>						\$0

**South Fork Project (Flood Only)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

**Summary Sheet**

Updated October 6, 2010

Acct No.	Description	Amount (\$)
330	Land and Land Rights. Permits, Owner Costs	15,150,000
331	Structures and Improvements	0
	Penstock Supply Contract	0
332	All Other Reservoirs, Dams, and Waterways	47,063,500
333	Turbine and Generator Water To Wire Package	0
334	Accessory Electrical Equipment incl install	0
335	Misc. Mechanical Equipment incl install	0
336	Roads	375,000
353	Substation Equipment	0
355	Transmission Lines	0
	ESTIMATED COSTS SUBTOTAL	62,588,500
	WSST @ 7.9%	4,944,492
	SUBTOTAL	67,532,992
	Contingency Allowance (30%)	20,259,900
	TOTAL ESTIMATED DIRECT COST (rounded)	\$87,793,000
	Engineering and Construction Management Assistance (6%)	5,267,600
	TOTAL DIRECT PROJECT COST 2010 (rounded)	93,060,000

**South Fork Project (Flood Only)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

Acct No	Description	Quantity	Unit	Unit Price	Amount (\$)
<b>330</b>	<b>LAND AND LAND RIGHTS</b>				
<b>330 .1</b>	<b>Mobilization/Logistics/Permits</b>				
.11	Mobilize & Demob	1	LS	\$5,000,000	\$5,000,000
.12	Land acquisition	600	ACRE	\$10,000	\$6,000,000
.13	FERC Licensing	0	LS	\$0	\$0
.14	Other State and Local Permitting	1	LS	\$4,000,000	\$4,000,000
.15	BPA coordination/costs	1	LS	\$50,000	\$50,000
.16	District internal costs, legal, etc	1	LS	\$100,000	\$100,000
<i>Subtotal - Acc No. 330 - Land and Land Rights</i>					\$15,150,000
<b>331</b>	<b>STRUCTURES AND IMPROVEMENTS</b>				
<b>331 .1</b>	<b>Powerhouse</b>				
<i>Subtotal - Powerhouse</i>					\$0
<b>331 .2</b>	<b>Powerhouse Site/Switchyard</b>				
<i>Subtotal - Powerhouse Site/Switchyard</i>					\$0
<i>Subtotal - Acc No. 331 - Structures and Improvements</i>					\$0
<b>332</b>	<b>RESERVOIRS, DAMS, AND WATERWAYS</b>				
<b>332 .1</b>	<b>Dam and Control Gates</b>				
.11	Clearing	400	ACRE	\$2,000	\$800,000
.12	Dewatering/care of Water/cofferdam	1	LS	\$1,000,000	\$1,000,000
.13	Grout Curtain	1	LS	\$1,400,000	\$1,400,000
.14	Stripping-Dam Foundation	667,000	CY	\$16	\$10,672,000
.15	Dam Embankment	2,679,000	CY	\$5.5	\$14,734,500
.16	Trashracks	1	LS	\$30,000	\$30,000
.17	Up and Downstream Gates w/ Operators	2	LS	\$100,000	\$200,000
.18	Dam Instrumentation	1	LS	\$10,000	\$10,000
.19	Fish Passage (allowance for u/s trap and haul)	1	LS	\$10,000,000	\$10,000,000
<i>Subtotal - Dam and Intake</i>					\$38,846,500
<b>332 .2</b>	<b>Spillway</b>				
.21	Clearing	3	ACRE	\$2,000	\$6,000
.22	Excavation	59,250	CY	\$20	\$1,185,000
.23	Concrete Overflow Crest (Included in Chute)	0	CY	\$500	\$0
.25	Chute Concrete	4,900	CY	\$600	\$2,940,000
.26	Stilling Basin Concrete	1,500	CY	\$600	\$900,000
<i>Subtotal - Spillway</i>					\$5,031,000
<b>332 .3</b>	<b>Tunnel- 12' diameter</b>				
.31	Tunnel Excavation	400	LF	\$4,000	\$1,600,000
.32	12ft Diameter Steel Liner (Installation Included)	1,100	FT	\$1,200	\$1,320,000
.33	Upstream Portal Excavation	200	CY	\$65	\$13,000
.34	Upstream Portal Inlet Structure Concrete	200	CY	\$800	\$160,000
.35	Downstream Portal Excavation	200	CY	\$65	\$13,000
.36	Downstream Portal Outlet Structure Concrete	100	CY	\$800	\$80,000
<i>Subtotal - Tunnel- 12' diameter</i>					\$3,186,000

**South Fork Project (Flood Only)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

<b>332</b>	<b>.4</b>	<b>Penstock</b>				
<hr/>						
<i>Subtotal - Penstock Supply and Install</i>						\$0
<hr/>						
<i>Subtotal - Acc No. 332 - Reservoirs, Dams and Waterways</i>						\$47,063,500
<b>333</b>	<b>.1</b>	<b>TURBINES AND GENERATORS- Water To Wire Package</b>				
<hr/>						
<i>Subtotal - Acc No. 333 - Turbines and Generators- Water To Wire Contract</i>						\$0
<b>334</b>	<b>.1</b>	<b>ACCESSORY ELECTRICAL EQUIPMENT</b>				
<hr/>						
<i>Subtotal - Acc No. 334 - Accessory Electrical Equipment</i>						\$0
<b>335</b>	<b>.1</b>	<b>MISCELLANEOUS MECHANICAL EQUIPMENT - POWERPLANT</b>				
<hr/>						
<i>Subtotal - Acc No. 335 - Miscellaneous Mechanical Equipment</i>						\$0
<b>336</b>	<b>.1</b>	<b>ROADS</b>				
	.11	<i>Permanent Roads (Allowance)</i>	1	LS	\$150,000	\$150,000
	.12	<i>Permanent Bridge (Allowance)</i>	1	LS	\$100,000	\$100,000
	.13	<i>Temporary Roads</i>	1	LS	\$75,000	\$75,000
	.14	<i>Temporary Bridges</i>	1	LS	\$50,000	\$50,000
<hr/>						
<i>Subtotal - Acc No. 336 - Roads</i>						\$375,000
<b>353</b>		<b>SUBSTATION EQUIPMENT AND STRUCTURES</b>				
<b>353</b>	<b>.1</b>	<b>Plant Switchyard</b>				
<hr/>						
<i>Subtotal - Acc. No. 353 Plant Switchyard</i>						\$0
<b>355</b>		<b>TRANSMISSION LINES</b>				
<b>355</b>	<b>.1</b>	<b>Powerhouse to Puget Switchyard</b>				
<hr/>						
<i>Subtotal - Acc No. 355 - Transmission Lines</i>						\$0

**Upper Chehalis Project (Multi-Purpose)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

**Summary Sheet**

Updated September 2, 2010

Acct No	Description	Amount (\$)
330	Land and Land Rights. Permits, Owner Costs	28,650,000
331	Structures and Improvements	4,588,700
	Penstock Supply	257,000
332	All Other Reservoirs, Dams, and Waterways	121,145,290
333	Turbine and Generator Water To Wire Package	7,774,750
334	Accessory Electrical Equipment incl install	452,850
335	Misc. Mechanical Equipment incl install	1,050,000
336	Roads	375,000
353	Substation Equipment	250,000
355	Transmission Lines	275,000
	ESTIMATED COSTS SUBTOTAL	164,818,600
	WSST @ 7.9%	13,020,669
	SUBTOTAL	177,839,269
	Contingency Allowance (30%)	53,351,800
	TOTAL ESTIMATED DIRECT COST (rounded)	\$231,191,000
	Engineering and Construction Management Assistance (6%)	13,871,500
	TOTAL DIRECT PROJECT COST 2010 (rounded)	245,060,000

**Upper Chehalis Project (Multi-Purpose)  
Preliminary Direct Construction Cost Estimate (2010 Dollars)**

Acct No	Description	Quantity	Unit	Unit Price	Amount (\$)
<b>330</b>	<b>LAND AND LAND RIGHTS</b>				
<b>330 .1</b>	<b>Mobilization/Logistics/Permits</b>				
.11	Mobilize & Demob	1	LS	\$5,000,000	\$5,000,000
.12	Land acquisition	1,500	ACRE	\$10,000	\$15,000,000
.13	FERC Licensing	1	LS	\$8,000,000	\$8,000,000
.14	State and Local Permitting	1	LS	\$500,000	\$500,000
.15	BPA Coordination/costs	1	LS	\$50,000	\$50,000
.16	District internal costs, legal, etc	1	LS	\$100,000	\$100,000
<i>Subtotal - Acc No. 330 - Land and Land Rights</i>					\$28,650,000
<b>331</b>	<b>STRUCTURES AND IMPROVEMENTS</b>				
<b>331 .1</b>	<b>Powerhouse</b>				
.11	Clearing (P.H. & Switchyard)	3.5	ACRE	\$5,000	\$17,500
.12	Excavation and Grading (Downstream Tunnel Portal Included)	208,825	CY	\$16	\$3,341,200
.13	Tailrace Cofferdam/Dewatering	1	LS	\$50,000	\$50,000
.14	Concrete Foundations	480	CY	\$600	\$288,000
.15	Concrete Block Building (50'x125'x30' High)	6,250	SQ FT	\$25	\$156,250
.16	Roof System w/Steel Joist Supports	6,250	SQ FT	\$35	\$218,750
.17	Concrete Thrust Block	252	CY	\$500	\$126,000
.18	Valve House (15x35)	525	SQ FT	\$40	\$21,000
.19	Draft Tube Gates	2	EA	\$75,000	\$150,000
.110	Howell Bunger Valve	1	EA	\$100,000	\$100,000
<i>Subtotal - Powerhouse</i>					\$4,468,700
<b>331 .2</b>	<b>Powerhouse Site/Switchyard</b>				
.21	Switchyard Concrete Foundations	100	CY	\$800	\$80,000
.23	Fencing, Lighting and Misc	1	LS	\$10,000	\$10,000
.24	Grounding Grid	1	LS	\$10,000	\$10,000
.25	Oil Spill Containment	1	LS	\$20,000	\$20,000
<i>Subtotal - Powerhouse Site/Switchyard</i>					\$120,000
<i>Subtotal - Acc No. 331 - Structures and Improvements</i>					\$4,588,700
<b>332</b>	<b>RESERVOIRS, DAMS, AND WATERWAYS</b>				
<b>332 .1</b>	<b>Dam and Intake Tower</b>				
.11	Clearing	1,500	ACRE	\$2,000	\$3,000,000
.12	Dewatering/care of water/cofferdam	1	LS	\$1,000,000	\$1,000,000
.13	Grout Curtain	1	LS	\$14,000,000	\$14,000,000
.14	Stripping-Dam Foundation	1,107,000	CY	\$16	\$17,712,000
.15	Dam Embankment	7,815,000	CY	\$5.5	\$42,982,500
.16	Reinforced Concrete For Intake Tower	7,020	CY	\$800	\$5,616,000
.17	Trashracks	1	LS	\$30,000	\$30,000
.18	Gates w/ operators	2	LS	\$100,000	\$200,000
.19	Dam Instrumentation	1	LS	\$10,000	\$10,000
.110	Miscellaneous Metals (grating, handrail, decking, etc.)	15,000	LB	\$5	\$75,000
.111	Electrical Conduit and Wiring, Grounding	1	LS	\$20,000	\$20,000
.112	Heating, Lighting and Ventilation	1	LS	\$5,000	\$5,000
.113	Intake Control Building	384	SQ FT	\$110	\$42,240
.114	Intake Control Panel and HMI/PLC	1	LS	\$20,000	\$20,000
.115	Fish Passage (allowance for u/s and d/s trap and haul)	1	LS	\$18,000,000	\$18,000,000
<i>Subtotal - Dam and Intake</i>					\$102,712,740

**Upper Chehalis Project (Multi-Purpose)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

<b>332</b>	<b>.2</b>	<b>Spillway</b>				
	.21	Clearing	7	ACRE	\$2,000	\$14,000
	.22	Excavation	75,000	CY	\$20	\$1,500,000
	.23	Concrete Overflow Crest	3,000	CY	\$500	\$1,500,000
	.25	Chute Concrete	8,055	CY	\$600	\$4,833,000
	.26	Stilling Basin Concrete	1,700	CY	\$600	\$1,020,000
		Subtotal - Spillway				\$8,867,000
<b>332</b>	<b>.3</b>	<b>Tunnel- 12' diameter</b>				
	.31	Tunnel Excavation	1,800	LF	\$4,000	\$7,200,000
	.32	Portal Excavation (Upstream Only, Downstream see P.H.)	6,950	CY	\$65	\$451,750
	.33	12 ft Diameter Steel Liner (Installation Included)	1,800	FT	\$1,200	\$2,160,000
	.34	Concrete Plug at Downstream Portal	18	CY	\$600	\$10,800
		Subtotal - Tunnel- 12' diameter				\$9,822,550
<b>332</b>	<b>.4</b>	<b>Penstock</b>				
	.41	Supply and Install Steel Pipe (102" Diameter)	250	FT	\$700	\$175,000
	.42	Supply and Install Steel Pipe (48" Diameter)	100	FT	\$520	\$52,000
	.43	Pipe Fittings and Appurtenances	1	LS	\$30,000	\$30,000
		Subtotal - Penstock Supply and Install				\$257,000
		Subtotal - Acc No. 332 - Reservoirs, Dams and Waterways				\$121,402,290
<b>333</b>	<b>.1</b>	<b>TURBINES AND GENERATORS- Water To Wire Package</b>				
	.11	Hydraulic Turbines (based on recent bids) w HPU/LPU	10,000	KW	\$300	\$3,000,000
	.12	Generator and Accessories (6.9 kV)	10,000	KW	\$300	\$3,000,000
	.13	Generator Switchgear and Bus (15 KV metal clad switchgear)	2	EA	\$256,000	\$512,000
	.14	Powerhouse Station Service System	1	EA	\$75,000	\$75,000
	.15	Protection and Controls	1	LS	\$400,000	\$400,000
	.16	Turbine Shutoff Valve	2	EA	\$150,000	\$300,000
	.17	Engine Gen Sets, Propane w tanks (1-dam, 1-PH)	2	EA	\$50,000	\$100,000
	.18	Main Power Transformer (6.9 kV to 12.5 kV)	11,110	kVA	\$25	\$277,750
	.19	PTs, CTs and Protective Gear	2	LS	\$30,000	\$60,000
	.110	Line Circuit Breaker and Switches (15 kV)	1	LS	\$50,000	\$50,000
		Subtotal - Acc No. 333 - Turbines and Generators- Water To Wire Contract				\$7,774,750
<b>334</b>	<b>.1</b>	<b>ACCESSORY ELECTRICAL EQUIPMENT</b>				
	.11	Generator Switchgear and Bus (15 KV metal clad switchgear)	1	EA	\$0	above
	.12	Station Service System	1	EA	\$0	above
	.13	Protection and Controls	1	LS	\$0	above
	.14	Grounding	1	LS	\$10,000	\$10,000
	.15	Powerhouse Interior Lighting	1	LS	\$10,000	\$10,000
	.16	Powerline to Dam- material and install in conduit incl vaults	1,300	FT	\$23	\$29,900
	.17	Communications Line to Dam- mat'l & install in conduit/vaults	1,300	FT	\$15	\$19,500
	.18	Wire, Cables, Ducts, and Cable Trays	1	LS	\$50,000	\$50,000
	.19	Valve House power feed	150	FT	\$23	\$3,450
	.110	Electrical Equipment Installation & all wiring-powerhouse	1	LS	\$180,000	\$180,000
	.111	Electrical Equipment Installation and all wiring- intake/valve hou	1	LS	\$100,000	\$100,000
	.112	Powerhouse Video Surveillance and security Systems	1	LS	\$50,000	\$50,000
		Subtotal - Acc No. 334 - Accessory Electrical Equipment				\$452,850

**Upper Chehalis Project (Multi-Purpose)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

<b>335</b>	<b>.1</b>	<b>MISCELLANEOUS MECHANICAL EQUIPMENT - POWERPLANT</b>				
	.11	Heating and Ventilating	1	LS	\$50,000	\$50,000
	.12	Dewatering, Drainage and Plumbing	1	LS	\$100,000	\$100,000
	.13	Bridge Crane - 30 ton	1	LS	\$200,000	\$200,000
	.14	Fire Alarm System	1	LS	\$10,000	\$10,000
	.15	Misc Metals, gates, handrails	15,000	LB	\$5	\$75,000
	.16	Bathroom, septic system	1	LS	\$15,000	\$15,000
	.17	Installation of Misc Mechanical Equip- intake tower	1	LS	\$50,000	\$50,000
	.18	Installation of Misc Mechanical Equip.- powerhouse	1	LS	\$50,000	\$50,000
	.19	Installation Turbine and Generator	2	LS	\$250,000	\$500,000
<i>Subtotal - Acc No. 335 - Miscellaneous Mechanical Equipment</i>						\$1,050,000
<b>336</b>	<b>.1</b>	<b>ROADS</b>				
	.11	Permanent Roads (Allowance)	1	LS	\$150,000	\$150,000
	.12	Permanent Bridge (Allowance)	1	LS	\$100,000	\$100,000
	.13	Temporary Roads	1	LS	\$75,000	\$75,000
	.14	Temporary Bridges	1	LS	\$50,000	\$50,000
<i>Subtotal - Acc No. 336 - Roads</i>						\$375,000
<b>353</b>		<b>SUBSTATION EQUIPMENT AND STRUCTURES</b>				
<b>353</b>	<b>.1</b>	<b>Plant Switchyard</b>				
	.11	Installation of Switchyard Equipment	1	LS	\$200,000	\$200,000
	.12	Steel Structures	1	LS	\$50,000	\$50,000
<i>Subtotal - Acc. No. 353 Plant Switchyard</i>						\$250,000
<b>355</b>		<b>TRANSMISSION LINES</b>				
<b>355</b>	<b>.1</b>	<b>Powerhouse to Puget Switchyard</b>				
	.11	12.5 kV line to POI (1 mile new /2 mile upgrade)	3.00	miles		\$200,000
	.12	Conductors- buried, 3 phase (2.5 miles) - #4/0 MV cable	0	FT	\$0	included
	.13	Fiberoptic Cable for Communications	0	FT	\$0	included
	.14	Tie-In disconnect sw and accessories	1	LS	\$25,000	\$25,000
	.15	Electrical Vaults	0	FT	\$0	included
	.16	Fiber Vaults	0	FT	\$0	included
	.17	PUD Metering Cabinet at POI	1	LS	\$50,000	\$50,000
<i>Subtotal - Acc No. 355 - Transmission Lines</i>						\$275,000

**South Fork Project (Multi-Purpose)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

**Summary Sheet**

Updated September 2, 2010

Acct No.	Description	Amount (\$)
330	Land and Land Rights. Permits, Owner Costs	19,650,000
331	Structures and Improvements	1,671,600
	Penstock Supply Contract	594,300
332	All Other Reservoirs, Dams, and Waterways	72,409,690
333	Turbine and Generator Water To Wire Package	2,752,000
334	Accessory Electrical Equipment incl install	471,850
335	Misc. Mechanical Equipment incl install	1,050,000
336	Roads	375,000
353	Substation Equipment	250,000
355	Transmission Lines	675,000
	ESTIMATED COSTS SUBTOTAL	99,899,400
	WSST @ 7.9%	7,892,053
	SUBTOTAL	107,791,453
	Contingency Allowance (30%)	32,337,400
	TOTAL ESTIMATED DIRECT COST (rounded)	\$140,129,000
	Engineering and Construction Management Assistance (6%)	8,407,700
	TOTAL DIRECT PROJECT COST 2010 (rounded)	148,540,000

**South Fork Project (Multi-Purpose)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

Acct No	Description	Quantity	Unit	Unit Price	Amount (\$)
<b>330</b>	<b>LAND AND LAND RIGHTS</b>				
<b>330 .1</b>	<b>Mobilization/Logistics/Permits</b>				
.11	Mobilize & Demob	1	LS	\$5,000,000	\$5,000,000
.12	Land acquisition	600	ACRE	\$10,000	\$6,000,000
.13	FERC Licensing	1	LS	\$8,000,000	\$8,000,000
.14	Other State and Local Permitting	1	LS	\$500,000	\$500,000
.15	BPA coordination/costs	1	LS	\$50,000	\$50,000
.16	District internal costs, legal, etc	1	LS	\$100,000	\$100,000
<i>Subtotal - Acc No. 330 - Land and Land Rights</i>					\$19,650,000
<b>331</b>	<b>STRUCTURES AND IMPROVEMENTS</b>				
<b>331 .1</b>	<b>Powerhouse</b>				
.11	Clearing (P.H. & Switchyard)	2	ACRE	\$5,000	\$10,000
.12	Excavation and Grading (Downstream Portal Included)	33,600	CY	\$16	\$537,600
.13	Concrete Foundations	480	CY	\$600	\$288,000
.14	Concrete Block Building (50'x125'x30' High)	6,250	SQ FT	\$25	\$156,250
.15	Roof System w/Steel Joist Supports	6,250	SQ FT	\$35	\$218,750
.16	Concrete Thrust Block	140	CY	\$500	\$70,000
.17	Valve House (15x35)	525	SQ FT	\$40	\$21,000
.18	Draft Tube Gates	2	EA	\$75,000	\$150,000
.19	Howell Bungler Valve	1	EA	\$100,000	\$100,000
<i>Subtotal - Powerhouse</i>					\$1,551,600
<b>331 .2</b>	<b>Powerhouse Site/Switchyard</b>				
.21	Switchyard Concrete Foundations	100	CY	\$800	\$80,000
.23	Fencing, Lighting and Misc	1	LS	\$10,000	\$10,000
.24	Grounding Grid	1	LS	\$10,000	\$10,000
.25	Oil Spill Containment	1	LS	\$20,000	\$20,000
<i>Subtotal - Powerhouse Site/Switchyard</i>					\$120,000
<i>Subtotal - Acc No. 331 - Structures and Improvements</i>					\$1,671,600
<b>332</b>	<b>RESERVOIRS, DAMS, AND WATERWAYS</b>				
<b>332 .1</b>	<b>Dam and Intake Tower</b>				
.11	Clearing	600	ACRE	\$2,000	\$1,200,000
.12	Dewatering/care of Water/cofferdam	1	LS	\$1,000,000	\$1,000,000
.13	Temporary 12 ft Bypass Pipe (Installation Included)	1,200	FT	\$1,200	\$1,440,000
.14	Grout Curtain	1	LS	\$1,400,000	\$1,400,000
.15	Stripping-Dam Foundation	880,600	CY	\$16	\$14,089,600
.16	Dam Embankment	4,250,000	CY	\$5.5	\$23,375,000
.17	Reinforced Concrete For Intake Tower	4,600	CY	\$800	\$3,680,000
.18	Trashracks	1	LS	\$30,000	\$30,000
.19	Gates w/ operators	2	LS	\$100,000	\$200,000
.110	Dam Instrumentation	1	LS	\$10,000	\$10,000
.111	Miscellaneous Metals (grating, handrail, decking, etc.)	15,000	LB	\$5	\$75,000
.112	Electrical Conduit and Wiring, Grounding	1	LS	\$20,000	\$20,000
.113	Heating, Lighting and Ventilation	1	LS	\$5,000	\$5,000
.114	Intake Control Building	384	SQ FT	\$110	\$42,240
.115	Intake Control Panel and HMI/PLC	1	LS	\$20,000	\$20,000
.116	Fish Passage (allowance for u/s and d/s trap and haul)	1	LS	\$18,000,000	\$18,000,000
<i>Subtotal - Dam and Intake</i>					\$64,586,840

**South Fork Project (Multi-Purpose)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

<b>332</b>	<b>.2</b>	<b>Spillway</b>				
	.21	Clearing	3	ACRE	\$2,000	\$6,000
	.22	Excavation	59,250	CY	\$20	\$1,185,000
	.23	Concrete Overflow Crest (Included in Chute)	0	CY	\$500	\$0
	.25	Chute Concrete	4,900	CY	\$600	\$2,940,000
	.26	Stilling Basin Concrete	1,500	CY	\$600	\$900,000
		<i>Subtotal - Spillway</i>				\$5,031,000
<b>332</b>	<b>.3</b>	<b>Tunnel- 12' diameter</b>				
	.31	Tunnel Excavation	400	LF	\$4,000	\$1,600,000
	.32	Portal Excavation (Upstream Only, Downstream see P.H.)	6,950	CY	\$65	\$451,750
	.33	12ft Diameter Steel Liner (Installation Included)	1,100	FT	\$1,200	\$1,320,000
	.34	Concrete Plug at Downstream Portal	24	CY	\$600	\$14,400
		<i>Subtotal - Tunnel- 12' diameter</i>				\$3,386,150
<b>332</b>	<b>.4</b>	<b>Penstock</b>				
	.41	Supply and Install Steel Pipe ( 60" Diameter)	665	FT	\$700	\$465,500
	.42	Supply and Install Steel Pipe ( 48" Diameter)	190	FT	\$520	\$98,800
	.43	Pipe Fittings and Appurtenances	1	LS	\$30,000	\$30,000
		<i>Subtotal - Penstock Supply and Install</i>				\$594,300
		<i>Subtotal - Acc No. 332 - Reservoirs, Dams and Waterways</i>				\$73,003,990
<b>333</b>	<b>.1</b>	<b>TURBINES AND GENERATORS- Water To Wire Package</b>				
	.11	Hydraulic Turbines (based on recent bids) w HPU/LPU	2,000	kW	\$300	\$600,000
	.12	Generator and Accessories (6.9 kV)	2,000	kW	\$300	\$600,000
	.13	Generator Switchgear and Bus (15 KV metal clad switchgear)	2	EA	\$256,000	\$512,000
	.14	Powerhouse Station Service System	1	EA	\$75,000	\$75,000
	.15	Protection and Controls	1	LS	\$400,000	\$400,000
	.16	Turbine Shutoff Valve	2	EA	\$150,000	\$300,000
	.17	Engine Gen Sets, Propane w tanks (1-intake, 1-PH)	2	EA	\$50,000	\$100,000
	.18	Main Power Transformer (6.9 kV to 34.5 kV)	2,200	kVA	\$25	\$55,000
	.19	PTs, CTs and Protective Gear	2	LS	\$30,000	\$60,000
	.110	Line Circuit Breakers and Switches	1	LS	\$50,000	\$50,000
		<i>Subtotal - Acc No. 333 - Turbines and Generators- Water To Wire Contract</i>				\$2,752,000
<b>334</b>	<b>.1</b>	<b>ACCESSORY ELECTRICAL EQUIPMENT</b>				
	.11	Generator Switchgear and Bus (15 KV metal clad switchgear)	1	EA	\$0	above
	.12	Station Service System	1	EA	\$0	above
	.13	Protection and Controls	1	LS	\$0	above
	.14	Grounding	1	LS	\$10,000	\$10,000
	.15	Powerhouse Interior Lighting	1	LS	\$10,000	\$10,000
	.16	Powerline to Dam- material and install in conduit incl vaults	1,800	FT	\$23	\$41,400
	.17	Communications Line to Dam- mat'l & install in conduit/vaults	1,800	FT	\$15	\$27,000
	.18	Wire, Cables, Ducts, and Cable Trays	1	LS	\$50,000	\$50,000
	.19	Valve House power feed	150	FT	\$23	\$3,450
	.110	Electrical Equipment Installation & all wiring-powerhouse	1	LS	\$180,000	\$180,000
	.111	Electrical Equipment Installation and all wiring- intake	1	LS	\$100,000	\$100,000
	.112	Powerhouse Video Surveillance and security Systems	1	LS	\$50,000	\$50,000
		<i>Subtotal - Acc No. 334 - Accessory Electrical Equipment</i>				\$471,850

**South Fork Project (Multi-Purpose)**  
**Preliminary Direct Construction Cost Estimate (2010 Dollars)**

<b>335</b>	<b>.1</b>	<b>MISCELLANEOUS MECHANICAL EQUIPMENT - POWERPLANT</b>				
	.11	Heating and Ventilating	1	LS	\$50,000	\$50,000
	.12	Dewatering, Drainage and Plumbing	1	LS	\$100,000	\$100,000
	.13	Bridge Crane - 30 ton	1	LS	\$200,000	\$200,000
	.14	Fire Alarm System	1	LS	\$10,000	\$10,000
	.15	Misc Metals, gates, handrails	15,000	LB	\$5	\$75,000
	.16	Bathroom, septic system	1	LS	\$15,000	\$15,000
	.17	Installation of Misc Mechanical Equip- intake	1	LS	\$50,000	\$50,000
	.18	Installation of Misc Mechanical Equip.- powerhouse	1	LS	\$50,000	\$50,000
	.19	Installation Turbine and Generator	2	LS	\$250,000	\$500,000
<i>Subtotal - Acc No. 335 - Miscellaneous Mechanical Equipment</i>						\$1,050,000
<b>336</b>	<b>.1</b>	<b>ROADS</b>				
	.11	Permanent Roads (Allowance)	1	LS	\$150,000	\$150,000
	.12	Permanent Bridge (Allowance)	1	LS	\$100,000	\$100,000
	.13	Temporary Roads	1	LS	\$75,000	\$75,000
	.14	Temporary Bridges	1	LS	\$50,000	\$50,000
<i>Subtotal - Acc No. 336 - Roads</i>						\$375,000
<b>353</b>		<b>SUBSTATION EQUIPMENT AND STRUCTURES</b>				
<b>353</b>	<b>.1</b>	<b>Plant Switchyard</b>				
	.11	Installation of Switchyard Equipment	1	LS	\$200,000	\$200,000
	.12	Steel Structures	1	LS	\$50,000	\$50,000
<i>Subtotal - Acc. No. 353 Plant Switchyard</i>						\$250,000
<b>355</b>		<b>TRANSMISSION LINES</b>				
<b>355</b>	<b>.1</b>	<b>Powerhouse to Puget Switchyard</b>				
	.11	12.5 kV line to POI (2 mile new /2 mile upgrade)	4.00	miles		\$600,000
	.12	Conductors- buried, 3 phase (2.5 miles) - #4/0 MV cable	0	FT	\$0	included
	.13	Fiber optic Cable for Communications	0	FT	\$0	included
	.14	Tie-In disconnect sw and accessories	1	LS	\$25,000	\$25,000
	.15	Electrical Vaults	0	FT	\$0	included
	.16	Fiber Vaults	0	FT	\$0	included
	.17	PUD Metering Cabinet at POI	1	LS	\$50,000	\$50,000
<i>Subtotal - Acc No. 355 - Transmission Lines</i>						\$675,000