

Memo

To: Upper White Pine Project File
From: Jennifer Hadersberger, CCNRD
Date: 6/9/2015
Re: Line Item Construction Cost Evaluation



Alan Schmidt, Colin Forsythe, and Jennifer met to evaluate line item construction costs from several contractor bids. We compared 29 contractor line item bids from five projects (Tyee, Dillwater, Harrison, Lower White Pine, Harrison, and Lower Nason RM 4.6) constructed in Chelan County from 2012 – 2014. Cost per unit was recorded for the following tasks: mobilization, clearing and grubbing, excavation, fabric encapsulated soil lifts, cofferdam, ELJ's, de-watering, and installation of a temporary bridge. Engineer cost estimate was also included when available. The attached spreadsheet provides the cost per unit and range of bids per project. Some overall trends were observed to explain the large range in cost for some line items. For example, in general, the cost per cubic yard of excavation is higher when there are fewer yards to excavate; ie. there is economy of scale. Also, the cost of excavation depends upon whether or not the material is being hauled off-site or re-used on site. The cost range for log placement in ELJ's varies depending upon the complexity of installation, but there is also a range amongst contractors depending upon how they set up their line item bid. In other words, some contractors may put in higher cost estimates for cofferdam or de-watering and lower costs to install the large wood because these are related tasks. Some comparisons are apples to oranges because you have to look at the task description in the project specifications. In other words, some projects include most of the work in the cofferdam line item whereas others may be set up to include the work in the de-watering task. Costs per line item were compared to the line item costs in the 60% design engineer cost estimate for the Upper White Pine project.

Task	Unit	UWP 60% eng cost estimate	Range
Mobilization	Lump sum % of total cost	8%	5% - 21%
Clear and grub	Per acre	\$4,000/acre	\$1,000 - \$25,000
Cofferdam	Lump sum/dam	\$25,000/cofferdam and de-watering	\$1,500 – 75,000
Excavation	Cubic yard	\$6	\$5 - 100
ELJ	Per log installation cost	\$100 - 200	\$133 - 535
FESL	Per linear foot	\$40	\$21 - 170
Temporary bridge	Lump sum	\$50,000	\$30,000 – 70,000

Line item unit costs/unit for mobilization, clearing and grubbing, and excavation are near the lower range. This makes sense because this is a large project with a large volume of excavation that is stockpiled on site and reused in the project area and clearing which typically reduces the cost/unit. The cost/log for placement in ELJ's is also near the low range which makes sense because these are relatively "simple" structures compared to those installed at Harrison and Dillwater. However, vertical piles will be installed with a vibrasonic driver which adds cost. Cost estimates for cofferdam and de-watering are difficult to compare because every site is unique – factors include: surface water flow and elevation differences, height of cofferdam required, flow energy/velocity outboard of cofferdam, ground water inflow rate, ability to seal the cofferdam, rate of pumping, disposal location, ease/ability to treat discharge to comply with permits, etc. Most estimates for de-watering and cofferdam were less than \$20,000, however, bids for LWP started at that upper limit and went up to \$75,000. We anticipate cofferdam installation in the mainstem of Nason Creek will be more challenging than most of these projects evaluated and rate of groundwater inflow encountered along the new meander is unknown – thus, UWP may be more similar to the cost estimates of LWP.

Harrison Side Channel 2014														
Work or Material	Est. Quantity	Unit	Pipkin	Rayfield	Strider	Jansen	Belsaas Smith	Hurst	Range	Notes				
Mobilization	1.00	LS	8%	10%	10%	10%	21%	17.4%	8-21%					
Clearing and Grubbing (per acre)	1.39	AC	8,000	8,000	5,000	7,772	25,000	4,500	5k - 25k					
Dewatering	1.00	LS	35,000	50,000	95,000	105,721	25,000	55,000	25K - 105K	cost includes importing clean river rock in bulk bags and cofferdams				
Temporary Bridge	1.00	LS	50,500	30,000	70,000	42,748	35,000	37,400	30K - 70K					
Habitat Structure (includes wood)	1.00	EA	188,100	205,000	165,000	133,000	159,000	161,000	133K - 205K	Hurst paid 600/log for 192 logs so cost/ log placed ranges \$133,000 - 205,000				
Side Channel Excavation	95.00	CY	70	50	28	23	50	16	16-70	Note high cost/cy but low volume excavated				
Berm Excavation	430.00	CY	18	100	17	20	30	17	17-100					
TYEE 2012														
Work or Material	Est. Quantity	Unit	Hurst	Strider	Thayer	Pipkin	BCI Contracting	ERRG	Rayfield	Jansen	Range			
Mobilization	1.00	LS	11%	13%	11%	16%	11%	11%	8%	11%	8-15%			
Clearing and Grubbing	1.10	AC	\$6,100	\$7,000	\$1,227	\$4,000	\$9,000	\$7,317	\$5,000	\$11,700	5000-11,700			
Excavation	5750.00	CY	\$6.0	\$10.5	\$4.9	\$7.5	\$20.0	\$10.5	\$10.0	\$5.0	5--20			
Fabric Encapsulated Soil Lift	460.00	LF	\$50	\$43	\$170	\$80	\$80	\$125	\$21	\$21	21-100			
DILLWATER 2012														
Work or Material	Est. Quantity	Unit	COLUMBIA VALLEY	EVANS	HURST	MORGAN	Pipkin	Rayfield	Strider	Thayer	Range	Notes		
Mobilization	1.00	LS	7.70%	15%	11.50%	12.60%	8.60%	9.80%	12.60%	12%	7.7 - 15			
Cofferdam	3.00	EA	\$4,300	\$18,500	\$7,550	\$7,555	\$9,200	\$2,500	\$1,500	\$3,666	1000 - 18,500			
Excavation	1192.00	CY	\$10.00	\$5.00	5	\$2.75	\$12.00	\$5.00	\$15.00	9.3	5 --12			
Engineered Log Jam (does not include wood)	1.00	AVE	53,025	41,800	68,610	59,209	24,500	112,500	65,500	51,000	24,500 - 112,500	210 logs, so		
LOWER NASON N-1														
Work or Material	Est. Quantity	Unit	ENGINEER EST	ECO-GRIND	OLIN EXCAV.	RAYFIELD	HURST	Range	Notes					
Mobilization	1.00	LS	9%	8%	5%	21%	14%	5 -- 21						
Clearing and Grubbing	1.32	AC	\$3,750	\$1,500	\$1,515	\$1,000	\$3,000	1500 - 3000						
Cofferdam/De-watering	1.00	LS	\$3,070	\$10,000	\$3,500	\$12,000	\$15,800	3070 - 15800						
Abutment Excavation (does not include haul)	1220.00	CY	\$10.0	\$7.0	\$5.5	\$12.0	\$18.0	5.5 - 18						
Floodplain Excavation (includes haul)		CY	\$16.3	\$6.0	\$14.4	\$12.0	\$21.0	6 -- 21						
Lower White Pine														
Work or Material	Unit	Hurst	Pipkin	Strider	Range	Notes								
Mobilization	LS	8%	7%	10%	7-10%									
Clearing-grub	AC	\$11,600	\$25,000	\$15,000	11,600 - 25000	Had to work from access rd. fill = increased cost								
De-watering	LS	\$5,700	\$21,500	\$15,000	5,700 - 21,500									
Cofferdam	LS	\$18,700	\$50,000	\$75,000	18,700 - 75000									
Channel excavation - no haul	CY	\$41.00	\$31.00	\$15.00	15 - 41									