

COST ESTIMATE WORKSHEET

Client: Shawsheen Partners

Project Title: Shawsheen River Restoration Feasibility



Assuming *no* special handling of contaminated sediment

	Balmoral	Marland Place	Ballardvale Removal	Ballardvale Ramp	Ballardvale Fish Ladder
Construction	\$ 132,445	\$ 229,431	\$ 320,100	\$ 408,742	\$ 806,168
Final Design Eng.	\$ 50,000	\$ 100,000	\$ 100,000	\$ 115,000	\$ 155,000
Permitting	\$ 35,000	\$ 45,000	\$ 40,000	\$ 35,000	\$ 25,000
Total	\$ 217,445	\$ 374,431	\$ 460,100	\$ 558,742	\$ 986,168

All estimates assume the following:

No major infrastructure redesign or construction

Nearby sediment disposal opportunities

Costs will vary depending on the amount of excavation required

Construction assumes some excavation of legacy sediment but low-cost habitat work

Actual costs may vary considerably (>50%) from those shown

Shawsheen River Restoration
Draft Opinion of Probable Cost

Balmoral Dam Removal (Includes downstream remnant)

MHD Provision	Item	MHD Item #	Quantity	Unit	Unit cost	Total Cost	Notes
Mobilization	Mobilization	748	1	LS	\$ 14,396.17	\$ 14,396.17	
Traffic Control	Traffic Control	7.11	1	LS	\$ 10,000.00	\$ 10,000.00	All traffic control required
Erosion control	Matting for Erosion Control	767.9	1,133	SY	\$ 9.00	\$ 10,200.00	Disturbed areas
Erosion control	Sedimentation Fence	697	1,000	LF	\$ 5.00	\$ 5,000.00	Assume 500 ft
Erosion control	Refertilization	766	-	ton	\$ 600.00	\$ -	NA
Erosion control	Mulch	767.3	-	MSF	\$ 62.00	\$ -	NA
Dewatering	Dewatering	NA	1	LS	\$ 16,000.00	\$ 16,000.00	Includes temporary access, culverts, gravel pad as needed
Wetland Restoration	Removal of concrete and structure	NA	1	LS	\$ 10,000.00	\$ 10,000.00	Mostly hand labor, winch if needed
Wetland Restoration	Dam Demolition	NA	61	CY	\$ 177,777.00	\$ 10,694.44	Hydraulic jack mounted backhoe. Long arm excavator working from shore. Work in partial wet conditions, assumes pumping
Wetland Restoration	Concrete wall stabilization/reconstruction		300	SF	\$ 40.00	\$ 12,000.00	Includes demolition and replacement of fencing and concrete walls to gain access
Wetland Restoration	Impoundment sediment removal and subgrade excavation	170.2	200	CY	\$ 20.00	\$ 4,000.00	Assumes active excavation of sediment only to facilitate structure removal (200 out of the total)
Wetland Restoration	contaminated sediment removal and disposal	170.2	-	CY	\$ 150.00	\$ -	
Channel Restoration	Riffle construction	120	200	CY	\$ 65.00	\$ 13,000.00	Assumes cobble and small boulders
Planting and Seeding	Seeding - NE Conservation Mix	765.1	15	LB	\$ 30.00	\$ 450.00	labor and materials - repair of disturbed areas
Planting and Seeding	Wetland plugs	NA	-	EA	\$ 5.00	\$ -	NA
Planting and Seeding	Tree planting	NA	5	EA	\$ 250.00	\$ 1,250.00	Materials, labor including protection
Planting and Seeding	Shrub planting	707.5	5	EA	\$ 100.00	\$ 500.00	Materials, labor including protection
	Miscellaneous excavation		24	HR	\$ 120.00	\$ 2,880.00	Unit cost (time and materials) for work as directed by the engineer

Subtotal \$ 110,371
Contingency (20%) 22,074.12
Total \$ 132,445

Provision	Item	Quantity	Unit	Unit cost	Total Cost	Notes
Final Design	Plans and specification, final structural design	1	LS	\$ 30,000.00	\$ 30,000.00	
Final Design	Construction management and oversight	1	LS	\$ 20,000.00	\$ 20,000.00	
<i>Final Design and Oversight</i>					\$ 50,000.00	

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Marland Place Dam Removal (Includes upstream Red Rocks remnant)

Provision	Item	MHD Item #	Quantity	Unit	Unit cost	Total Cost	Notes
Mobilization	Mobilization	748	1	LS	\$ 24,938.16	\$ 24,938.16	
Traffic Control	Traffic Control	7.11	1	LS	\$ 10,000.00	\$ 10,000.00	All traffic control required
Erosion control	Matting for Erosion Control	767.9	2,000	SY	\$ 5.00	\$ 10,000.00	Disturbed areas
Erosion control	Sedimentation Fence	697	700	LF	\$ 5.00	\$ 3,500.00	Assume 1000 ft
Erosion control	Refertilization	766	-	ton	\$ 600.00	\$ -	NA
Erosion control	Mulch	767.3	5	MSF	\$ 62.00	\$ 310.00	NA
Dewatering	Dewatering	NA	1	LS	\$ 16,000.00	\$ 16,000.00	Assumes staged draw down, no pumping required
Wetland Restoration	Hydraulic jack mounted backhoe. Work in partial wet conditions, assumes pumping around for dewatering	NA	1	LS	\$ 16,000.00	\$ 16,000.00	
Wetland Restoration	Hydraulic jack mounted backhoe. Work in partial wet conditions, assumes pumping around for dewatering	NA	1	LS	\$ 16,000.00	\$ 16,000.00	
Wetland Restoration	Hydraulic jack mounted backhoe. Work in partial wet conditions, assumes pumping around for dewatering	NA	1	LS	\$ 16,000.00	\$ 16,000.00	
Wetland Restoration	Hydraulic jack mounted backhoe. Work in partial wet conditions, assumes pumping around for dewatering	NA	1	LS	\$ 16,000.00	\$ 16,000.00	
Wetland Restoration	Contaminated sediment removal and disposal	170.2	-	CY	\$ 150.00	\$ -	NA - assumes no contamination
Wetland Restoration	Rain garden grading/drain construction		444	CY	\$ 15.00	\$ 6,666.67	Common excavation, pipe placement, preparation for planting
Channel Restoration	Riffle construction	120	296	CY	\$ 80.00	\$ 23,703.70	Assumes 50 ft length, minor bank work
Channel Restoration	Simple bank grading/shaping upstream of Stevens	120	912	SF	\$ 12.00	\$ 10,944.00	Includes blanket installation, no toe stabilization
Channel Restoration	Fabric encapsulated lifts / new bank construction	120	900	LF	\$ 15.00	\$ 13,500.00	Assumes 3 lifts x 300 total feet = 900 LF
Channel Restoration	Infrastructure stabilization		250	SF	\$ 50.00	\$ 12,500.00	Concrete wall replacement, shoring
Planting and Seeding	Seeding - NE Conservation Mix	765.1	25	LB	\$ 30.00	\$ 750.00	labor and materials
Planting and Seeding	Wetland plugs	NA	500	EA	\$ 5.00	\$ 2,500.00	Materials and labor including growing and planting
Planting and Seeding	Tree planting	NA	50	EA	\$ 180.00	\$ 9,000.00	Materials, labor including protection
Planting and Seeding	Shrub planting	707.5	50	EA	\$ 60.00	\$ 3,000.00	Materials, labor including protection
	Miscellaneous excavation		24	HR	\$ 120.00	\$ 2,880.00	Unit cost (time and materials) for work as directed by the engineer

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Subtotal \$ 191,193
 Contingency (20%) 38,239
Total \$ 229,431
 Additional cost of removal all sediment \$ 20,000

This assumes partial sediment removal with no special handling requirements.

Provision	Item	Quantity	Unit	Unit cost	Total Cost	Notes
Final Design	Plans and specification, final structural design	1	LS	\$ 60,000.00	\$ 60,000.00	
Final Design	Construction management and oversight	1	LS	\$ 40,000.00	\$ 40,000.00	
<i>Final Design and Oversight</i>					\$ 100,000.00	

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Ballardvale Dam Removal

Provision	Item	MHD Item #	Quantity	Unit	Unit cost	Total Cost	Notes
Mobilization	Mobilization	748	1	LS	\$ 34,793.50	\$ 34,793.50	
Traffic Control	Traffic Control	7.11	1	LS	\$ 15,000.00	\$ 15,000.00	All traffic control required
Erosion control	Matting for Erosion Control	767.9	2,000	SY	\$ 5.00	\$ 10,000.00	Disturbed areas
Erosion control	Sedimentation Fence	697	700	LF	\$ 5.00	\$ 3,500.00	Assume 1000 ft
Erosion control	Refertilization	766	0.50	ton	\$ 600.00	\$ 300.00	NA
Erosion control	Mulch	767.3	30	MSF	\$ 62.00	\$ 1,860.00	NA
Dewatering	Dewatering	NA	1	LS	\$ 32,000.00	\$ 32,000.00	Assumes staged draw down, no pumping required
Wetland Restoration	Dam demolition and remnant stabilization	NA	200	CY	\$ 200.00	\$ 40,000.00	Hydraulic jack mounted backhoe. Work in partial wet conditions, assumes pumping around for dewatering
Wetland Restoration	Impoundment sediment removal	170.2	-	CY	\$ 25.00	\$ -	Assumes no removal of sediment
Wetland Restoration	Contaminated sediment removal and disposal	170.2	-	CY	\$ 80.00	\$ -	NA - assumes no contamination
Wetland Restoration	Rain garden grading/drain construction		200	CY	\$ 15.00	\$ 3,000.00	
Channel Restoration	Off channel construction		50	SF	\$ 30.00	\$ 1,500.00	Assumes stabilization in place, minor bank work
Channel Restoration	Simple bank grading/shaping Upstream of Andover St	120	885	SF	\$ 15.00	\$ 13,275.00	Includes blanket installation, toe stabilization
Channel Restoration	Fabric encapsulated lifts / new bank construction	120	1,800	LF	\$ 25.00	\$ 45,000.00	Assumes 3 lifts x 300 total feet = 900 LF
Channel Restoration	Infrastructure stabilization		250	SF	\$ 50.00	\$ 12,500.00	Concrete wall replacement, shoring
Planting and Seeding	Seeding - NE Conservation Mix	765.1	25	LB	\$ 30.00	\$ 750.00	labor and materials
Planting and Seeding	Wetland plugs	NA	500	EA	\$ 5.00	\$ 2,500.00	Materials and labor including growing and planting
Planting and Seeding	Tree planting	NA	50	EA	\$ 180.00	\$ 9,000.00	Materials, labor including protection
Planting and Seeding	Shrub planting	707.5	50	EA	\$ 60.00	\$ 3,000.00	Materials, labor including protection
	Miscellaneous excavation		24	HR	\$ 120.00	\$ 2,880.00	Unit cost (time and materials) for work as directed by the engineer

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Subtotal \$ 266,750
Contingency (20%) 53,350
Total \$ 320,100

This assumes partial sediment removal with no special handling requirements.

Provision	Item	Quantity	Unit	Unit cost	Total Cost	Notes
Final Design	Plans and specification, final structural design	1	LS	\$ 60,000.00	\$ 60,000.00	
Final Design	Construction management and oversight	1	LS	\$ 40,000.00	\$ 40,000.00	
					<i>Final Design and Oversight</i>	\$ 100,000.00

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Ballardvale Dam Channel Reconstruction for Grade Control

Provision	Item	MHD Item #	Quantity	Unit	Unit cost	Total Cost	Notes
Mobilization	Mobilization	748	1	LS	\$ 44,428.50	\$ 44,428.50	
Traffic Control	Traffic Control	7.11	1	LS	\$ 10,000.00	\$ 10,000.00	All traffic control required
Erosion control	Matting for Erosion Control	767.9	2,000	SY	\$ 5.00	\$ 10,000.00	Disturbed areas
Erosion control	Sedimentation Fence	697	700	LF	\$ 5.00	\$ 3,500.00	Assume 1000 ft
Erosion control	Refertilization	766	-	ton	\$ 600.00	\$ -	NA
Erosion control	Mulch	767.3	30	MSF	\$ 62.00	\$ 1,860.00	NA
Dewatering	Dewatering	NA	1	LS	\$ 35,000.00	\$ 35,000.00	Assumes damming and pumping from Andover Street crossing
Wetland Restoration	Hydraulic jack mounted backhoe. Work in partial wet conditions, assumes pumping around for dewatering	NA	1	LS	\$ 11,000.00	\$ 11,000.00	
Wetland Restoration	Assumes active removal of some sediment between dam and road	NA	1	LS	\$ 45,000.00	\$ 45,000.00	
Wetland Restoration	Contaminated sediment removal and disposal	170.2	-	CY	\$ 150.00	\$ -	NA - assumes no contamination
Wetland Restoration	Channel grade control base		600	CY	\$ 80.00	\$ 48,000.00	Placed and compacted fill
Channel Restoration	Riffle construction	120	600	CY	\$ 120.00	\$ 72,000.00	Assumes stabilization in place, minor bank work
Channel Restoration	Fabric encapsulated lifts / new bank construction	120	1,500	LF	\$ 15.00	\$ 22,500.00	Assumes 3 lifts x 300 total feet = 900 LF
Channel Restoration	Infrastructure stabilization		250	SF	\$ 50.00	\$ 12,500.00	Concrete wall replacement, shoring
Planting and Seeding	Seeding - NE Conservation Mix	765.1	15	LB	\$ 30.00	\$ 450.00	labor and materials
Planting and Seeding	Wetland plugs	NA	-	EA	\$ 5.00	\$ -	Materials and labor including growing and planting
Planting and Seeding	Tree planting	NA	150	EA	\$ 180.00	\$ 27,000.00	Materials, labor including protection
Planting and Seeding	Shrub planting	707.5	75	EA	\$ 60.00	\$ 4,500.00	Materials, labor including protection
	Miscellaneous excavation		24	HR	\$ 120.00	\$ 2,880.00	Unit cost (time and materials) for work as directed by the engineer

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Subtotal \$ 340,619
Contingency (20%) 68,124
Total \$ 408,742

Provision	Item	Quantity	Unit	Unit cost	Total Cost	Notes
Final Design	Plans and specification, final structural design	1	LS	\$ 70,000.00	\$ 70,000.00	
Final Design	Construction management and oversight	1	LS	\$ 45,000.00	\$ 45,000.00	
					<i>Final Design and Oversight</i>	\$ 115,000.00

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Ballardvale Dam Fish Ladder

Provision	Item	MHD Item #	Quantity	Unit	Unit cost	Total Cost	Notes
Mobilization	Mobilization	748	1	LS	\$ 87,627.00	\$ 87,627.00	
Traffic Control	Traffic Control	7.11	1	LS	\$ 3,000.00	\$ 3,000.00	All traffic control required
Erosion control	Matting for Erosion Control	767.9	200	SY	\$ 9.00	\$ 1,800.00	Disturbed areas
Erosion control	Sedimentation Fence	667	150	LS	\$ 5.00	\$ 750.00	
Erosion control	Refer to	767.9	-	MSP	\$ 62.00	\$ -	N/A
Erosion control	Mulch	707.3	-	MSP	\$ 62.00	\$ -	N/A
Dewatering	Dewatering	NA	1	LS	\$ 15,000.00	\$ 15,000.00	Isolation of the work area, in-situ dewatering as needed
Wetland Restoration	Fish ladder (Denil or weir and pool)	NA	10	Ft rise	\$ 27,000.00	\$ 270,000.00	Assumes integration into right bank abutment
Channel Restoration	Infrastructure stabilization		1	LS	\$ 50,000.00	\$ 50,000.00	Repair and stabilization of right abutment
Planting and Seeding	Seeding - NE Conservation Mix	765.1	1	LB	\$ 30.00	\$ 30.00	labor and materials
Planting and Seeding	Wetland plugs	NA	-	EA	\$ 5.00	\$ -	Materials and labor including growing and planting
Planting and Seeding	Tree planting	NA	3	EA	\$ 180.00	\$ 540.00	Materials, labor including protection
Planting and Seeding	Shrub planting	707.5	3	EA	\$ 60.00	\$ 180.00	Materials, labor including protection
	Miscellaneous excavation		24	HR	\$ 120.00	\$ 2,880.00	Unit cost (time and materials) for work as directed by the engineer
	Dam repair*		1	LS	\$ 240,000.00	\$ 240,000.00	Includes spillway renovation, structural repairs

* GZA 2007 Report

Subtotal \$ 671,807
Contingency (20%) 134,361
Total \$ 806,168

Provision	Item	Quantity	Unit	Unit cost	Total Cost	Notes
Final Design	Structural and fish passage engineering	1	LS	\$ 120,000.00	\$ 120,000.00	
Final Design	Construction management and oversight	1	LS	\$ 35,000.00	\$ 35,000.00	
					<i>Final Design and Oversight</i>	\$ 155,000.00