

MCS D Intake Spring - Project

Description	Estimated quantity	Units	Unit price, installed	
CONSTRUCTION				
Mobilization and Site Work				
Mobilization, Bonds & Insurance	1	LS	\$	60,000
Site Grading & Paving	1	LS	\$	10,000
Demobilization & Clean-up	1	LS	\$	10,000
Excavation	60	CY	\$	12
Backfill	10	CY	\$	15
Foundation Preparation	1	LS	\$	25,000
				Subtotal
Pipe, Valves, and Fittings				
4" Air Relief Valve	1	EA	\$	400
Connection to existing system	1	LS	\$	2,000
12" Fittings & Couplings (high pressure)	2	EA	\$	2,500
12" Fusion Bonded Epoxy Coated Pipe	10	LF	\$	200
16" Fusion Bonded Epoxy Coated Pipe	4,500	LF	\$	172
16" Magnetic Flow Meter	1	EA	\$	16,000
16" Butterfly Valves	1	EA	\$	7,000
16" Fittings & Couplings	2	EA	\$	2,400
Misc. adaptors, gauges, minor piping	1	LS	\$	20,000
				Subtotal
Turbine / Generator System				
Canyon Hydro Pelton				

Canyon Hydro Pelton 444 kW w/ Switchgear, shipping (incl 7% tax)	1	EA	\$	440,164
Installation, Commissioning and Training	1	LS	\$	47,000
				Subtotal
Electrical & Interconnection				
Electrical controls and SCADA	1	LS	\$	150,000
Site electrical	1	LS	\$	50,000
Utility Interconnection	1	LS	\$	250,000
				Subtotal
Powerhouse Building and Misc. Structural				
Pre-fab tilt up 18x18x10 w/ rollup dr + 1 man dr	1	LS	\$	73,000
Foundation Concrete	70	CY	\$	600
Floor Drains and Piping	1	LS	\$	2,000
Concrete Equipment Pad	2	CY	\$	530
Flow Control Structure	10	CY	\$	750
Misc Structural	1	LS	\$	30,000
Misc Concrete	5	CY	\$	380
Environmental Controls	1	LS	\$	30,000
				Subtotal

Construction contingency costs	Materials and installation Subtotal
	15%
	Construction Costs TOTAL

NON-CONSTRUCTION		NON-CONSTRUCTION
Pre-Design		
Land Acquisition		EA
Geotechnical (estimate)		EA
	Subtotal	Subtotal
Engineering		
		7.2%
Mechanical, Electrical, Civil Design		
		1.6%
GC Bid Package / Bid		
		2.4%
Construction management		
		8.0%
Project management		
	Subtotal	Subtotal
Interconnection		
		EA
Interconnection application and analysis		
		EA
Pacific Power interconnection fees (estimate)		

Project Cost Estimates (Detailed View)

Estimated amount			
(Construction)	Request Grant Funding	Cost Share	Total
\$ 60,000	\$ 60,000	\$ -	\$ 60,000
\$ 10,000	\$ 10,000	\$ -	\$ 10,000
\$ 10,000	\$ 10,000	\$ -	\$ 10,000
\$ 720	\$ 720	\$ -	\$ 720
\$ 150	\$ 150	\$ -	\$ 150
\$ 25,000	\$ 25,000	\$ -	\$ 25,000
\$ 105,870	\$ 105,870	\$ -	\$ 105,870
\$ 400	\$ 400	\$ -	\$ 400
\$ 2,000	\$ 2,000	\$ -	\$ 2,000
\$ 5,000	\$ 5,000	\$ -	\$ 5,000
\$ 2,000	\$ 2,000	\$ -	\$ 2,000
\$ 774,000	\$ 774,000	\$ -	\$ 774,000
\$ 16,000	\$ 16,000	\$ -	\$ 16,000
\$ 7,000	\$ 7,000	\$ -	\$ 7,000
\$ 4,800	\$ 4,800	\$ -	\$ 4,800
\$ 20,000	\$ 20,000	\$ -	\$ 20,000
\$ 831,200	\$ 831,200	\$ -	\$ 831,200

\$	440,160	\$	440,160	\$	-	\$	440,160
\$	47,000	\$	47,000	\$	-	\$	47,000
\$	487,160	\$	487,160	\$	-	\$	487,160
\$	150,000	\$	150,000	\$	-	\$	150,000
\$	50,000	\$	50,000	\$	-	\$	50,000
\$	250,000	\$	250,000	\$	-	\$	250,000
\$	450,000	\$	450,000	\$	-	\$	450,000
\$	73,000	\$	73,000	\$	-	\$	73,000
\$	42,000	\$	42,000	\$	-	\$	42,000
\$	2,000	\$	2,000	\$	-	\$	2,000
\$	1,060	\$	1,060	\$	-	\$	1,060
\$	7,500	\$	7,500	\$	-	\$	7,500
\$	30,000	\$	30,000	\$	-	\$	30,000
\$	1,900	\$	1,900	\$	-	\$	1,900
\$	30,000	\$	30,000	\$	-	\$	30,000
\$	187,460	\$	187,460	\$	-	\$	187,460

\$	2,061,700	\$	2,061,700		
\$	309,300	\$	-	\$	309,300
\$	2,371,000	\$	2,061,700	\$	309,300
\$		\$		\$	2,371,000

DN	Request Grant Funding	Cost Share	Total				
\$	5,000	\$	5,000	\$	-	\$	5,000
\$	15,000	\$	15,000	\$	-	\$	15,000
\$	20,000	\$	20,000	\$	-	\$	20,000
\$	170,140	\$	-	\$	170,140	\$	170,140
\$	37,810	\$	37,810	\$	-	\$	37,810
\$	56,710	\$	56,710	\$	-	\$	56,710
\$	189,040	\$	189,040	\$	-	\$	189,040
\$	453,700	\$	283,560	\$	170,140	\$	453,700
\$	50,000	\$	50,000	\$	-	\$	50,000
\$	35,000	\$	35,000	\$	-	\$	35,000

\$	85,000	\$	85,000	\$	-	\$	85,000
\$	45,000	\$	45,000			\$	45,000
\$	5,000	\$	-	\$	5,000	\$	5,000
\$	5,000	\$	-	\$	5,000	\$	5,000
\$	55,000	\$	45,000	\$	10,000	\$	55,000
\$	10,000	\$	-	\$	10,000	\$	10,000
\$	10,000	\$	-	\$	10,000	\$	10,000
\$	15,000	\$	-	\$	15,000	\$	15,000
\$	35,000	\$	-	\$	35,000	\$	35,000
\$	648,700	\$	433,600	\$	215,100	\$	648,700
\$	3,020,000	\$	2,495,000	\$	524,000	\$	3,020,000

Notes

For simplicity, Bonds, Insurance and Mobilization have been lumped together. It was estimated at about 3% of total construction costs which is consistent with other similar sized projects.

This item includes grading, compaction, sub-base and paving. Typically this cost can range between \$30 per square yard and \$50 per square yard depending on the thickness of asphalt, sub-base, etc.

This item includes cost estimate to demobilize and clean up site, post construction

This price is for bulk excavation without rock. The excavated area was calculated based on the size of the powerhouse and depth of the excavation.

This price was calculated based on the size of the powerhouse and depth of excavation.

This price is for finish grading and compaction of the sub-base under the foundation of the powerhouse. This cost will vary depending on the results of the geotechnical investigation. The excavated area was calculated based on the footprint size of the powerhouse.

This is the projected cost of one 4" Air Relief Valve

This is the projected for the connection to the existing system.

This is the projected cost for two 12" fittings & couplings. (high pressure)

This is the projected cost for 10 linear feet of 12" Fusion Bonded Epoxy Coated Pipe

This is the projected cost for 4,500 linear feet of 16" Fusion Bonded Epoxy Coated Pipe - Note that this is the additional pipe necessary to replace the existing wooden pipe. (This pipe is the component that will specifically reduce leakage in the system)

This is the projected cost for one 16" Magnetic Flow Meter

This is the projected cost for one 16" Butterfly Valves

This is the projected cost for two 16" Fittings and Couplings

This is the projected cost for all other miscellaneous equipment associated with the pipes, valves and fittings. (Adaptors, gauges, minor piping, etc...) This estimate is based on costs for similar sized projects.

This cost is the price of the Turbine, Generator, Controls and Switchgear package for the project. A quote from the turbine vendor, Canyon Hydro, was used. This quote is included on the second tab of this worksheet. Note that this cost includes the turbine package cost (\$404k), shipping costs (\$5k) and 7% tax (\$31k)

This is the cost associated with the installation, commissioning and initial training for the turbine, generator and switchgear. These costs are estimated based on startup and commissioning costs from similar projects.

These cost are associated with the programming necessary to operate the new turbine and switchgear as well as integrate into the current SCADA system. The cost estimate was based on recent engineers estimates and/or bid results from similar projects.

These are the costs associated with running programming instrumentation wiring, medium voltage wiring in the powerhouse and high voltage conduit to the interconnection point

Costs associated with the Utility Interconnection are the most difficult to estimate. These costs are not known until after the Interconnection Study is completed by the utility. Note that a full interconnection study cannot be completed until after the 50-percent design of the project is completed. A pre-interconnection application was completed for this project. The results don't provide any dollar estimate associated with the project but they do show that the line has capacity for interconnecting this size project. This means that there should not be any usual expenses associated with interconnection. Therefore we used estimates from other similar recent small hydro projects.

This is the projected cost for one pre fab tilt up 18x18x10 rollup building. This is the powerhouse structure that the turbine package and equipment will reside in.

This is the projected cost of 70 cubic yards of concrete for the foundation of the powerhouse. This cost was estimated based on the size of the anticipated powerhouse.

These costs are associated with the floor drains and piping within the powerhouse

This item is for equipment pad, or pads within the powerhouse.

The flow control structure is a separate structure from the powerhouse and is for receiving the water after the turbine. The quantity of concrete is based on the assumed size of the structure. The projected cost is based on 10 cubic yards of concrete.

This item is a catch-all for miscellaneous structural elements within and outside of the structure. For instance concrete stoops and walkways, stairways, special access hatches, etc. The cost is lump sum and is a placeholder for this additional work

This item is a catch all for misc concrete used in various areas of the structure.

This item is for heating and air conditioning for inside the powerhouse to protect sensitive electronic equipment and provide an environment suitable for the operations staff. There are two rooms in the powerhouse and we typically use \$15,000 per room.

These are the contingency costs of the project. At this point, (pre-design) 15% is a fair estimate for these costs.

MCSD intends to obtain fee simple ownership of the site. Discussions with MCSD staff indicate one acre could be procured at a cost of \$5,000.

This is the estimated cost of a geotechnical study for the proposed site.

This is the estimated costs for design and engineering associated with the Mechanical, Electrical and Civil Design. (Ex Tasks: 50% Design, Civil & Electrical Drawings & Specs, 100% Design, etc...) At this stage in the project a high level estimate was used based on 7.2% of total construction costs. This percentage was used determined based on other similar sized hydroelectric projects.

This is the estimated costs for the General Contractor Bid Package. At this stage in the project a high level estimate was used based on 1.6% of total construction costs. This percentage was used determined based on other similar sized hydroelectric projects.

This is the estimated costs for Construction Management activities associated with the project. At this stage in the project a high level estimate was used based on 2.4% of total construction costs. This percentage was used determined based on other similar sized hydroelectric projects.

This is the estimated costs for Project Management activities associated with the project. At this stage in the project a high level estimate was used based on 8% of total construction costs. This percentage was used determined based on other similar sized hydroelectric projects.

This task is to navigate the interconnection process with the Utility. There have been significant changes to the Rule 21 Interconnection process in the past years. New information, milestones, and review procedures have been instituted in order to efficiently process interconnection applications. The project will follow a four to five-step process: Submission of interconnection application; Review of initial package; Fast Track analysis; Supplemental Review; and Detailed Review. Note that the Detailed Review process may not be required pending the results of the Supplemental Review period. Under the new process, milestone deadlines for submissions and responses are required by both MCSD and the Utility. Failure to respond by the required timeline with the required information will result in a rejection of the application and a complete re-start to the interconnection process. For these reasons, the Interconnection task is considered a critical path of the project

This is the estimated cost of the interconnection fees paid to the Utility. The Utility will charge fees to analyze and interconnect the project.

These are the estimated fees to go through the CEQA process.

These are the estimated fees paid for local permits.

These are the fees related to registration WREGIS. These fees are necessary so the hydro project is eligible for Renewable Energy Credits as required by the California Energy Commission.

These are optional fees estimated for obtaining a financing package.

These are optional fees if MCSD elects to pursue additional grants or subsidies.

This is the fee paid to the Utility for the Power Purchase Agreement.