Shiawassee River Restoration at Corunna, Michigan

Cost Estimates from Ellen River Partners, Grand Rapids, Minnesota December 1, 20006

Ellen River Costs for surveying, consultation, analysis and design, and construction supervision of a contractor

Variety of Grade Control, Channel & Bank Work

Consultation & Surveying: (2007)

People	Daily Rate	days	Total	
1 prof.	1020	6	6120	
1 tech.[1]	500	6	3000	
[1]includes overtime hours				
Travel		6	1460	
Travel		6	1460	
			12040	
First billing (when done)				$12,040

B. Analysis & Design (2007)

People	Daily Rate	days	Total
1 prof.	1020	20	20400

C. Plan Presentations (2007)

1 prof.	1020	3	3060	
Travel		3	1310	
Second billing (total on return)				$24,770

People	Daily Rate	days	Total	
D. Construction Supervision (2007)				
1 prof.	1020	12	12240	
1 tech.[1]	500	12	6000	
[1]includes overtime hours				
Travel		12	2800	
Travel		12	2800	
includes travel days			23840	
Third billing (when done)				$23,840
Total:Surveying, Design, & Supervision				$60,650

People	Daily Rate	days	Total	
E. Monitoring, (2008)				
People	**Daily Rate**	**days**	**Total**	
1 prof.	1070	4	4280	
1 tech.[1]	525	4	2100	
[1]includes overtime hours				
Travel		4	1370	
Travel		4	1370	
two of the days are travel days			9120	
Monitoring Report				
1 prof.	1070	3	3210	
Fourth billing (when done)				$12,330
Ellen River Partners Total				$72,980

218-326-6120

A. Consultation & Surveying.

We would meet with Corunna City officials, Landowners, Conservation District and DNR during the survey visit to obtain an update on a consensus direction.

This time would also be used for pictures and assessment of bankfull elevations, utility concerns, and evaluation of sites for a rock rapids (going upstream, going downstream, or at the dam site). The survey would ential several cross sections of the river to ascertain bankfull flow conditions at each site. a longitudinal profile down the middle of the river to determine channel slopes before and after a rock rapids construction, and wide cast of survey points on the river bank and floodplain needed for preparation of a local topographic map. The site would also be evaluated for any additional structures needed to possibble protect downstream banks and bridge abutments.

If the city has known survey controls points with a X, Y, and Z values that would greatly speed the topographic survey. If they are not avialable we would have to "run in" from a known location or use GPS survey equipment to establish them. This would take an extra day or two.

I see several purposes for the the project:
1) Removal of the dam to allow fish passage.
2) Construction of a rock ramp to provide fish spawining, and to provide grade control for existing sediment above the dam
3) for retention of water levels upstream of the dam and
4) very attractive rapids

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A. Consultation & Surveying: cont.

Note that travel and surveying days average about 10-hr days because we can take advantage of daylight and keep the work going without increasing equipment setup and local travel time. Similarly, construction time is usually for 10-hr days to take advantage of daylight. I charge a single daily rate for professional time whether it is an 8-hr day or a 10-hr day. The technician time is charged at the 10-hr day time and includes additional overtime pay and unemployment taxes and insurance as required by the State of Minnesota. I (E. S. Verry) will do the stadia rod work and Arthur E. Elling will do the total station work.

B. Presentation of Conceptual Design:

I will return to Corunna to present conceptual designs to The City of Corunna, Landowner, Conservation District, and Michigan DNR staff. There are two days for working up some of the survey data and presentations. Three days are for plane travel and presentations.

C. Analysis & Design includes:

Sediment characterization (Wolman pebble count data).
Bankfull velocity, discharge, and shear stress modeling for bankfull, 25-, 50-, and 100-year flows
All design cross sections and longitudinal sections for about 5,000 feet of channel
Graphical displays on Tabloid size paper
Analyses will use FMSM Engineering's RiverMorph. (We will use the survey point data in the RiverMorph software, but the raw data can be exported in a variety of civil engineering formats including CivilSoft, CivilComp and a variety of DXF (Auto Cad) formats if the City wishes to use the topographic data for other purposes). I will also be using Manifold System GIS for plan view presentations.

D. Construction Supervision:

I (E. S. Verry) and my seasoned survey technician (Arthur E. Elling) will be on site much of the time to first train the construction crew in how the various structures are made and how channel shaping is done. The first day is the most intense as we get into doing one of the structures. After that, we will oversee and suggest refinements as the crew goes along. With two of us, we can be working more than one site at a time to make the most efficient use of crew equipment and personnel. It is possible we can reduce these costs if we have other projects going on at the same time and one of us will be at each of them for some of the days.

Additionally, we will make an "as built" survey of all structures and channel dimensions during the construction phase. This provides "proof of concept" for the design with an "as built" survey and provides a benchmark for monitoring survey data collected later after a bankfull or larger flood has passed.

E. Monitoring and Evaluation:

The monitoring survey is a physical elevation survey of all structures, a visual assessment of condition and assessment of proper function with respect to the channel. The field data is summarized and documented versus the comparable as built surveys, done during the construction phase. This assures the system is operating correctly and provides for timely adjustments if and where needed.

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Additional Expenses for work we can provide

Sediment Sampling	**$3,000**
HEC RAS Cross Sections and Model Runs	**$10,000 - $12,000**
Michigan PE review and stamp	**$3,000 - $5,000**
Michigan Permit Preparation and Submission	**$10,000 - $18,000**

Cost of rock is by far the largest expense.

	$/ton	
For 11,000 tons of rock the price range is:	**100**	**$1,100,000**
with fuel and operator	**75**	**$825,000**
	50	**$550,000**
	40	**$440,000**

Contractor, equipment and operators **$125,000 - $175,000**

Survey, Design, Permiting, Constr, Monitoring			With Rock Included		
Low	High	$/ton		Low	High
224,000	286,000	**100**	**$1,100,000**	$1,324,000	$1,386,000
224,000	286,000	**75**	**$825,000**	$1,049,000	$1,111,000
224,000	286,000	**50**	**$550,000**	$774,000	$836,000
224,000	286,000	**40**	**$440,000**	$664,000	$726,000

Bottom Line the project would run between $700,000 and$1,400,000

Most of the difference ($660,000 of the difference) is in the price range for rock.

There are other costs involved. One being the cost of grant writing, another might be utility costs if something like a water line, sewer line, power lines, etc. might need relocating.
Sediment disposal might be another if contaminants are found.