



Memorandum**Date:** 2015.07.13

To: Ron Grall, CPRP
City of Waukesha
Parks, Recreation and Forestry Department

From: Kurt Feuerstein, P.E. *K.F.*

RE: Woodfield Park Dam
Reconstruction Needs and Costs

INTRODUCTION

Woodfield Park is a neighborhood park and a natural resource area located in the west central portion of the City of Waukesha and encompasses approximately 60 acres. The park was acquired in the early 1980's with the aid of state and federal grant money. The ponds located within the park are designated as urban fishing waters by the DNR and are part of an urban fishing program that stocks rainbow trout annually.

The poor condition of the dam spillway structure in conjunction with past overtopping events of the embankment has caused concerns. The City of Waukesha Parks, Recreation & Forestry Department is currently reviewing options to address concerns with the park and the dam. Options include removal of the dam or reconstruction of the dam to current safety and WDNR standards. This memorandum will discuss the work associated with and the costs to reconstruct the dam.

DAM RECONSTRUCTION

There are two components to the reconstruction of the dam. First engineering services are required to study and properly design the dam reconstruction. After plans and specifications are prepared the work would be publically bid and a contractor will perform the dam reconstruction work, normally as part of the construction phase an engineering firm is retained to manage the construction and assure that the work is performed according the bid documents and DNR requirements.

Engineering Phase

During the engineering phase several items of work need to be accomplished in order to analyze, study, design and coordinate with the DNR to reach a satisfactory solution. Items necessary are listed as follows:

- Site survey
- Embankment stability investigation
- Soils investigations
- Hydrologic and hydraulic studies

- Spillway design
- Drawdown provisions
- WDNR coordination
- Plan production
- Construction estimates
- Bid documents
- Control structure design
- Fishery impacts
- Environmental analysis
- Specifications
- Coordination
- Bidding assistance

Construction Phase

This phase will include the actual cost to construct the proposed work as well as engineering support and construction inspection to assure quality work is being performed by the low bidder.

ESTIMATE OF PROBABLE COST TO RECONSTRUCT THE DAM

It is our opinion that the cost to reconstruct the dam will be on the order of \$350,000, see exhibit 1 for cost breakdowns. A cost estimate at this early stage of design should only be considered to be on a rough order of magnitude basis. There are several unknowns that could greatly affect the projects costs as detailed below:

1. Actual limits and scope of work in the existing pond. Re-grading and restoration work is unknown at this time and **was not** included in the cost estimate. One item to note is that if the dam reconstruction work is performed first there could be the opportunity to perform the pond work 'in the dry'. With drawdown provisions incorporated into the new spillway structure, the impoundment could be drawn down and conventional means of excavation and grading could be utilized.
2. Embankment work is not well defined. Once surveys and hydraulic studies are performed the actual needs to prevent overtopping will be determined. Once soil studies are performed the actual needs for embankment stability will be determined. The cost estimate presented in this memorandum was developed using an assumed 2 foot increase in the embankment elevation and 4:1 side slopes.
3. Sediment composition is unknown at this time. Once laboratory tests are performed on the sediment in the pond the need for any hazardous soil remediation can be determined. The cost estimate presented in this memorandum **did not** include provisions for handling contaminated soils.
4. General site layout and new structure siting. During the design phase it may be determined due to construction staging, hydraulic and fishery concerns that the location of the spillway structure could be moved to a more advantageous position, with the outlet stream being realigned. The cost estimate presented in this memorandum was developed assuming the new structure would be placed in the same location as the existing structure.

EXHIBITS

1. Estimate of Probable Costs

EXHIBIT 1

Opinion of Probable Costs for Woodfield Dam Reconstruction

Engineering Phase

Description	Quantity	Unit	Unit Cost	Total Cost
Site and Hydrographic Surveys	1	LS	\$10,000.00	\$10,000.00
Soils Borings and Laboratory Tests	1	LS	\$7,800.00	\$7,800.00
Preliminary Design	1	LS	\$20,000.00	\$20,000.00
Final Design	1	LS	\$18,000.00	\$18,000.00
Bid Documents and Bidding Assistance	1	LS	\$5,000.00	\$5,000.00
Total Engineering Design				\$61,000.00

Construction Phase

Description	Quantity	Unit	Unit Cost	Total Cost
Clearing	150	ID	\$35.00	\$5,250.00
Grubbing	150	ID	\$35.00	\$5,250.00
Removing Old Structure	1	LS	\$3,500.00	\$3,500.00
Excavation for Structures	1	LS	\$5,000.00	\$5,000.00
Coffer Dam	1	LS	\$7,500.00	\$7,500.00
Concrete Spillway Structure	22	LF	\$650.00	\$14,300.00
Inlet Control and Drawdown Structure	1	LS	\$7,500.00	\$7,500.00
Sheet Pile Cutoff and Anti-Seepage Walls	800	SF	\$45.00	\$36,000.00
Mobilization	1	LS	\$25,000.00	\$25,000.00
Restoration	1500	SY	\$7.00	\$10,500.00
Water Diversion	1	LS	\$5,000.00	\$5,000.00
Survey	1	LS	\$3,500.00	\$3,500.00
Grading and Shaping	1	LS	\$20,000.00	\$20,000.00
Fill Type SM	1700	CY	\$40.00	\$68,000.00
Riprap Heavy	20	CY	\$70.00	\$1,400.00
Major Item Total				\$218,000.00
Contingency for Non-Major Items (20%)				\$44,000.00
Total Construction Costs				\$262,000.00

Construction Management Services	1	LS	\$26,000.00	\$26,000.00
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Total Engineering and Construction \$349,000.00