CITY of NOVI CITY COUNCIL

www.cityofnovi.org

Agenda Item C
September 10, 2007

SUBJECT: Approval to award a contract for design and construction engineering services for the Meadowbrook Lake Dam Modifications project to URS Corporation for a not-to-exceed design fee of $39,885 and a construction engineering fee equal to a fixed 6.0% of the estimated construction cost (estimated to be $17,100) for a total of $56,985.

SUBMITTING DEPARTMENT: Engineering

CITY MANAGER APPROVAL:

EXPENDITURE REQUIRED	**$56,985**
AMOUNT BUDGETED	**$217,500**
APPROPRIATION REQUIRED	**N/A**
LINE ITEM NUMBER	**210-211.00-805.685 (Drain Revenue Fund)**

BACKGROUND INFORMATION:

Anderson, Eckstein & Westrick (AEW) was retained in 2004 to provide design and construction engineering services for two dredging projects: Meadowbrook Lake (completed in 2005) and Village Oaks Lake (completed in 2006). Because of ongoing streambank erosion issues upstream and downstream of Meadowbrook Lake, AEW was awarded an additional scope of work in late February 2005 to provide limited design and construction phase engineering services for streambank stabilization at discrete locations along the Middle Branch of the Rouge River. AEW provided recommendations in its June 2005 "Streambank Stabilization Report", which is attached. The first set of recommendations was implemented when streambank stabilization work was completed up- and downstream of Meadowbrook Lake earlier this summer.

The report's second set of recommendations involves work at the City-owned Meadowbrook Lake Dam to address storm storage issues, improve downstream habitat and mitigate erosion, as follows:

- **Recommendation 1-1:** Modify the dam spillway to provide better detention of smaller storm events and reduce the flashiness of the Middle Rouge River downstream of the dam.
- **Recommendation 1-2:** Provide additional capacity in the dam overflow spillway for large storm events.
- **Recommendation 1-3:** Install a cold water release in the dam to replace the existing flap gates and improve habitat by allowing cold water to mix with the warmer water being passed over the dam.

Each of these recommendations is explained in further detail in the attached report, and once implemented, all recommendations in the report will have been completed except for some tasks that MDEQ would not permit as part of the streambank stabilization project (e.g., removal of concrete apron from streambed at Nine Mile Road and installation of a sediment trap north of the Lake at Chattman Drive).

Because the approximate 250-foot long concrete channel downstream of the dam's spillway limits the river's capability to support wildlife habitat and creates high flow velocities, we recommend removal of the channel and replacement with rip rap and vegetation (see attached photograph depicting the channel).

The modifications to Meadowbrook Lake Dam will provide storm storage that will decrease the flow impacts of storm events (flashiness) downstream, and will thus assist with mitigating bank erosion and sedimentation. The installation of the cold water release will increase the oxygen levels of the water downstream of the dam to improve water quality and habitat in the river. The removal and replacement of the concrete channel downstream with a naturalized channel will decrease the velocity of the river to reduce erosion and sedimentation and provide additional habitat improvements to the river.

The City has a 100-foot wide drainage easement in which to complete this work. The easement extends from the dam to the end of the concrete channel to be removed.

The attached Request for Proposals for design and construction engineering services was sent to the six firms that City Council pre-qualified for utility-related projects. Five proposals were received and each was evaluated using Qualifications Based Selection, with a greater emphasis on the each firm's understanding of and approach to completing the relatively complex project scope. The following table summarizes the results of the proposal review process:

Firm	Not-to-Exceed Design Fee	Fixed % of Const	Estimated Construction Cost	Construction Engineering Fee (% Multiplied by Construction Cost Estimate)	Total Estimated Fee	Staff Review Score	Proposal Rank
Anderson Eckstein & Westrick	$ 30,400.00	12.80%	$285,000.00	$ 36,480.00	$66,880.00	409	2
Orchard Hiltz & McCliment	$ 44,000.00	10.00%	$285,000.00	$ 28,500.00	$72,500.00	291	5
Stantec	$ 53,500.00	10.00%	$285,000.00	$ 28,500.00	$82,000.00	394	3
Spalding DeDecker	$ 26,000.00	10.00%	$285,000.00	$ 28,500.00	$54,500.00	328	4
URS Corporation	$ 39,885.00	6.00%	$285,000.00	$17,100.00	$56,985.00	453	1

Of the five firms that submitted proposals, URS had the highest staff review score, the second lowest overall fee, the lowest construction engineering fee, and met all requirements listed in the request for proposals (see attached URS proposal dated August 1, 2007). Engineering staff's scoring summary is attached for reference.

URS has completed previous projects for the City including engineering for Beck Road Repaving, 2007 Neighborhood Roads, and Nine Mile Water Main, among others. It is important to note that, unlike the other responding firms, URS has recent experience with dam projects very similar to the Meadowbrook Lake Dam.

The design and permitting phase of this project will be completed by Spring 2008, and the construction phase will be completed by October 2008.

RECOMMENDED ACTION: Approval to award a contract for design and construction engineering services for the Meadowbrook Lake Dam Modifications project to URS Corporation for a not-to-exceed design fee of $39,885 and a construction engineering fee equal to a fixed 6.0% of the estimated construction cost (estimated to be $17,100) for a total of $56,985.

	1	2	Y	N
Mayor Landry				
Mayor Pro Tem Capello				
Council Member Gatt				
Council Member Margolis				

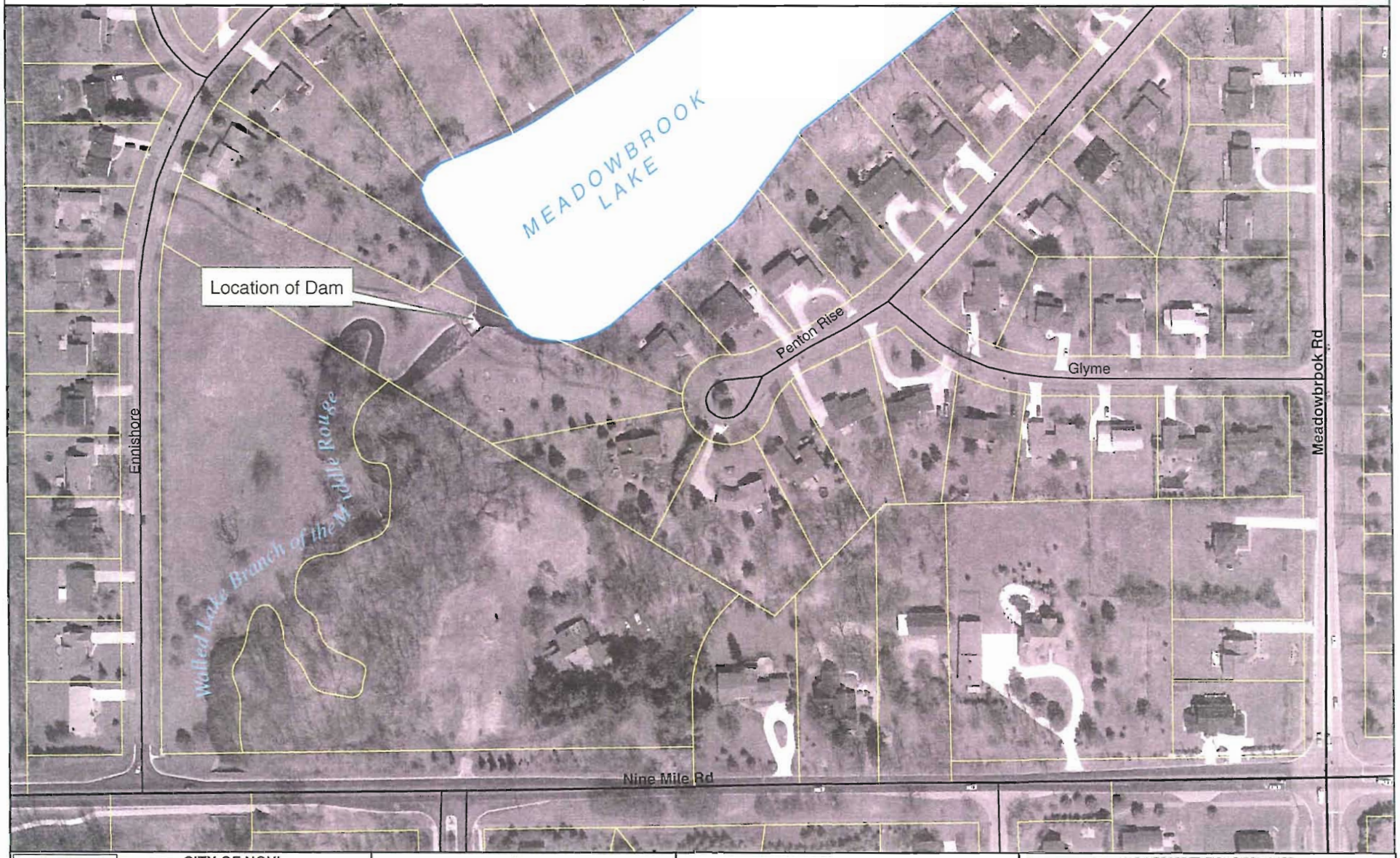
	1	2	Y	N
Council Member Mutch				
Council Member Nagy				
Council Member Paul				

Concrete channel to be removed *(background)* and stabilized area around sanitary manhole *(foreground)*.

Location Map

Meadowbrook Lake Dam

Map Publication Date: 07/06/07



CITY OF NOVI
ENGINEERING DEPARTMENT

NOVI CITY HALL
45175 W. TEN MILE ROAD
NOVI, MI 48375-3024
(248) 347-0454
WWW.CITYOFNOVI.ORG

MAP AUTHOR: Brian T. Coburn, P.E.

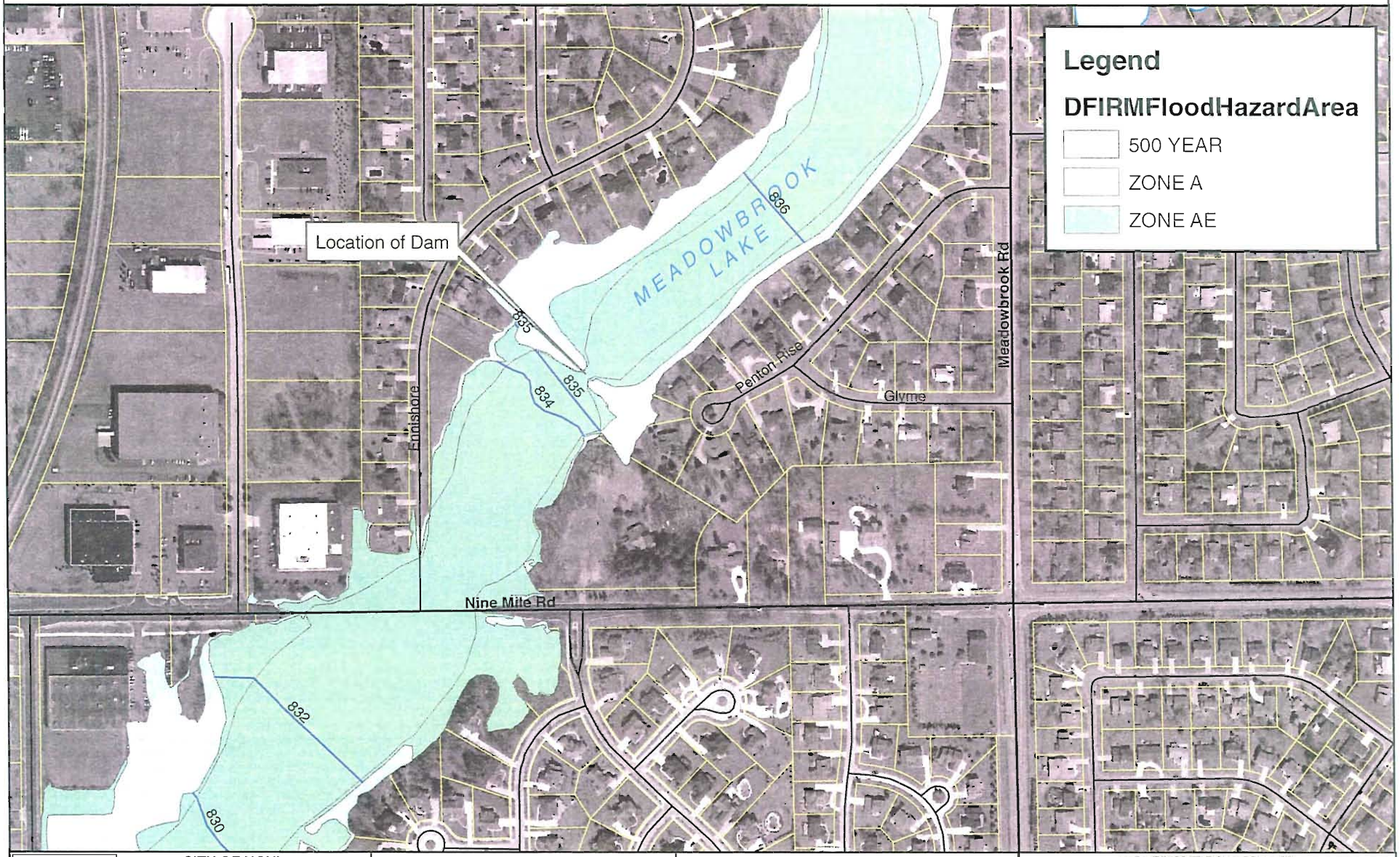
N
W E
S

0 65 130 260 390
FEET

1 INCH EQUALS 200 FEET

Floodplain Map
Meadowbrook Lake

Map Publication Date: 07/06/07



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MAP AUTHOR: Brian T. Coburn, P.E.

N W E S

0 130 260 520 780

FEET

1 INCH EQUALS 400 FEET

SCORING SUMMARY

Project Description: Meadowbrook Lake Dam

RANK 1= LOW, x= BEST (x = number of firms reponding)

Item weight:	*5*	*4*	*10*	*3*	*3*		
TOTAL SCORES	1	2	3	4	5	Totals	*Rank*
Anderson Eckstein & Westrick	15	17	17	17	15	409	2
Fishbeck Thompson Carr & Huber	0	0	0	0	0	0	6
Orchard Hiltz & McCliment	10	15	10	10	17	291	5
Stantec	5	12	21	19	18	394	3
Spalding DeDecker	25	15	8	11	10	328	4
URS Corporation	20	16	19	18	15	453	1
TOTALS	75	75	75	75	75		

SCORING CRITERIA

1. Engineering Fee
2. Evaluation of Schedule
3. Evaluation of Approach, Statement of Understanding of Project, and proposed staff
4. Analysis of subjective statements applicable to the project as required on the RFP (Value added items)
5. Evaluation of past performance on City projects

COBURN

STREAMBANK STABILIZATION REPORT

for

the Walled Lake Branch of the Rouge River
and Ingersol Creek

in the Vicinity of Meadowbrook Lake

City of Novi, Michigan

Prepared for

City of Novi
45175 West 10 Mile Road
Novi, MI 48375

June 2005

AEW Project No.
822-005

Prepared by
Anderson, Eckstein and Westrick, Inc.

Main Office
51301 Schoenherr Road
Shelby Township, MI 48315
586-726-1234

Kensington Office
53445 Grand River Avenue
New Hudson, MI 48165
248-446-0480

Executive Summary

Based on input from homeowners in the Meadowbrook Lake area, the City of Novi asked Anderson, Eckstein, and Westrick, Inc. to investigate streambank stabilization issues in the vicinity of Meadowbrook Lake. Specifically, we were asked to evaluate conditions in three areas:

Area 1: Walled Lake Branch Downstream of Meadowbrook Lake to 9 Mile Road.
Area 2: Walled Lake Branch from the CSX Railroad to Meadowbrook Lake.
Area 3: Ingersol Creek from Meadowbrook Road to Meadowbrook Lake.

The attached exhibit A shows the locations of each evaluation area and recommended improvement. Many of the areas we found to be in need of repair are supported by observations cited in the City of Novi Storm Water Master Plan Update prepared for the City in February 2005.

Our investigation revealed several areas which can be addressed through streambank stabilization and sedimentation and erosion control measures. The most eroded area of the stream is clearly the Walled Lake Branch downstream of Meadowbrook Lake to 9 Mile Road (see photos 1, 2, 7, 12 and 13). If larger scale streambank stabilization is to be conducted, we recommend taking action in this area.

Photo 1: Streambank erosion downstream of Meadowbrook Lake Dam

Photo 2: Erosion at outlet of the concrete channel

Erosion issues which are damaging or threatening City property and infrastructure are recommended to be implemented first. These items are:

- Hard armor the outlet of the concrete channel downstream of the Meadowbrook Lake Dam to protect it from further undermining. This will also protect the sanitary manhole structure adjacent to the channel which has been partially exposed by erosion. This issue is addressed in greater detail in section 1-4 of the report and in photos 2 (above), 7 and 8.
- Stabilize the area within the City right of way north of Chattman Road upstream of Meadowbrook Lake. Bank erosion is occurring in this area and has formed a pool. If further erosion continues it may threaten private property. This issue is detailed in Section 2-1 and in photos 16-19 of the report.

The remainder of this report details action items and provides preliminary cost estimates for all recommendations to improve and restore the stability of Meadowbrook Lake and its immediate tributaries.

Area 1: Walled Lake Branch Downstream of Meadowbrook Lake

This entire reach is highly eroded and requires immediate action to prevent continued streambank erosion. This issue is discussed in the Feb. 2005 Storm Water Master Plan Update on page 14.

Erosion is being caused by several factors. The first is the flashiness of the Walled Lake Branch immediately downstream of the dam. The term flashiness reflects the frequency and rapidity of short term changes in streamflow, especially in response to rainfall events. A variety of land use and land management changes may lead to increased or decreased flashiness, often to the detriment of stream stability and aquatic life. The configuration of the dam spillway does not allow for storage and attenuation of smaller rainstorms in Meadowbrook Lake. This design allows flow from all storm events to pass over its 28 foot weir. This sudden, uncontrolled increase in flow causes the flashiness of the stream.

Erosion in this area is also caused by maintaining mowed grass right up to the edge of the bank of the stream. Mowed grass has a very shallow root system and is easily undermined. Adding to the erosion problem, many of the trees along the bank of the creek are dead, diseased, or dying. Dead root systems are introducing water into the soil under the bank (and under the grass) after rainstorms due to the flashiness of the creek.

Bank stabilization in this area would help prevent sediment deposition downstream. To address problems in this area, we recommend the following tasks be considered.

1-1. Modify the dam spillway on the Meadowbrook Lake Dam to provide better detention of smaller storm events and reduce the flashiness of the stream. The Walled Lake Branch immediately downstream of the dam is highly degraded and unstable. This is due to the apparent flashiness caused by too large an outlet from the lake during low flow events. This problem is also discussed in the Feb. 2005 Storm Water Master Plan Update, pages 19-20. We recommend installing a v-notch weir spillway as shown in Photo 4 will allow for better detention of smaller storm events and reduce the flashiness of the river. Probable cost range: $15,000-$25,000.

Photo 3: Existing Meadowbrook Lake Dam spillway

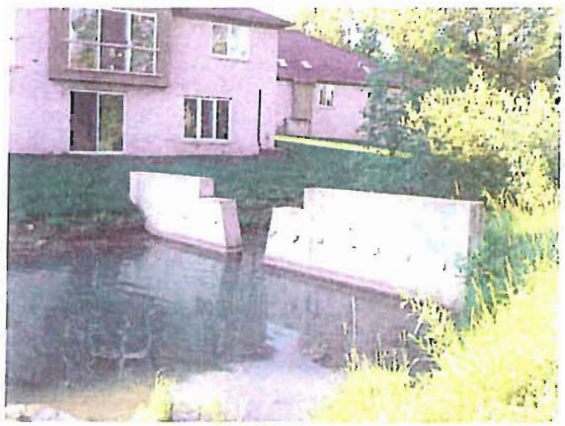


Photo 4: Example of alternate spillway configuration (Macomb Township, MI)

1-2. Provide additional capacity in the dam overflow spillway for large storm events. This reduces the potential for flooding upstream and the possibility of the earthen dam failing. The flooding issue is discussed in the Feb. 2005 Storm Water Master Plan Update, pg. 13. According to the current City of Novi Flood Insurance Study (FIS), the dam will be overtopped during the 100-year storm. If this occurs, the dam could break and release a flood wave downstream.

The Michigan Department of Environmental Quality projects the 100-year flood flow rate to be 2,150 cfs. Based on the weir equation below, the lake would need to be at an elevation of 842.50 to pass 2,150 cfs through the existing dam spillway. Since the top of the dam is at an elevation of

approximately 838-840, the 100-year flood would overtop the dam and increase flood hazards for residents upstream of the dam.

$$Q = c \times L \times h^{\frac{3}{2}}$$
$$c = 3.1$$
$$L = 28\,ft$$
$$h = 842.50 - 834 = 8.5\,ft$$
$$Q = 3.1 \times 28 \times 8.5^{\frac{3}{2}}$$
$$Q \cong 2{,}150\,cfs$$

We recommend allowing the flow to pass through an auxiliary spillway to lower the flood elevation upstream of the dam and reduce the possibility of failure. Photos 5 and 6 below show the existing berm on the Meadowbrook Lake Dam and an example of a newly installed pyramat spillway. Once vegetation is established, the pyramat spillway will be a grassy park area. Probable cost range: $75,000-$100,000.

Photo 5: Existing berm on dam

Photo 6: Installed Pyramat spillway (Quarton Lake Dam)

1-3. Install a cold water release in the dam. This will help improve the habitat downstream by allowing the cold water to mix with the warmer water being passed over the dam. The cooler water may contain more dissolved oxygen which is important for fish and wildlife habitats. It is our understanding that the City is investigating the possibility of replacing the flap gates on the dam with

sluice or slide gates. These gates would allow for cold water release. Probable cost range: $10,000-20,000.

1-4. Hard armor the outlet of the concrete channel with rip rap to protect it from further undermining. This will also protect the manhole structure adjacent to the channel. Photos 7 and 8 show the erosion at the end of the concrete channel and an example of the type of proposed rip rap protection. Probable cost range: $10,000-$15,000.

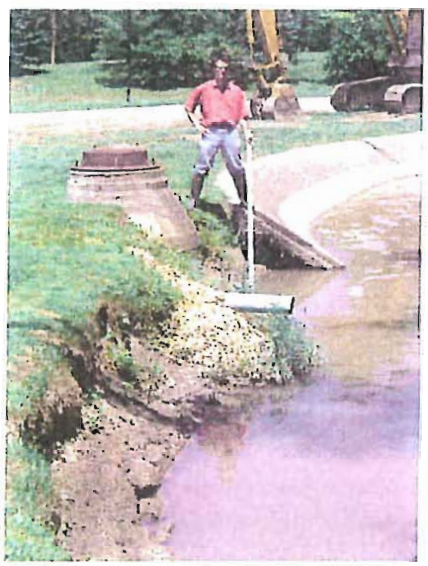


Photo 7: Erosion at end of concrete channel

Photo 8: Example of riprap protection (Quarton Lake, Bimingham, MI)

1-5. Modify the concrete apron which serves as the inlet to the culverts at 9 Mile Road. The existing concrete apron is wider than the natural stream width and is one to two feet higher than the natural stream bed. This configuration is causing a backwater along the stream near 9 Mile Road. The backwater saturates the soil above the natural toe of the bank, contributing to the bank failure. Photos 9 and 10 show the difference in elevation between the concrete apron and the streambed. We recommend sawcutting channels into the apron to allow the stream to flow without backwater. Probable cost range: $5,000-10,000.

Photo 9: Concrete apron at 9 Mile Road

Photo 10: Streambed is 1-2 feet below apron

1-6. Place riprap in the creek at channel bends to help stabilize the banks and create riffles in the creek to improve in stream habitat. Riffles are areas of shallow water and high velocity. The rough stream bottom creates small rapids providing aeration in these sections (see photo 11 below). Riffles are an important habitat for fish and usually precede a pool where fish will congregate and wait for food to be washed down to them. Probable cost range: $3,000-8,000.

Photo 11: Example of riffle (Gibson Drain in Sterling Heights, MI)

1-7. Remove all dead and dying trees along the banks of the stream, cut back all undercut banks, and realign the stream as necessary. Some stream bends are so severely eroded that they have to be realigned to be stabilized. As seen in photo 12, the west bank is nearly vertical with approximately 3 feet of erosion. Photo 13 (upstream of photo 12) shows trees which have died and fallen into the stream as a result of the undermined banks. Probable cost range: $55,000-$75,000.

Photo 12: Streambank erosion

Photo 13: Dead trees and debris

1-8. After completion of task 1-7, the streambank should be restored by planting trees and other vegetation along the reshaped banks of the stream. This will stabilize the stream, create a shaded habitat for more diverse wildlife, and provide a more aesthetically pleasing stream in the open space park. Photos 14 and 15 below are examples of vegetative streambank stabilization projects. Probable cost range: $75,000-$100,000.

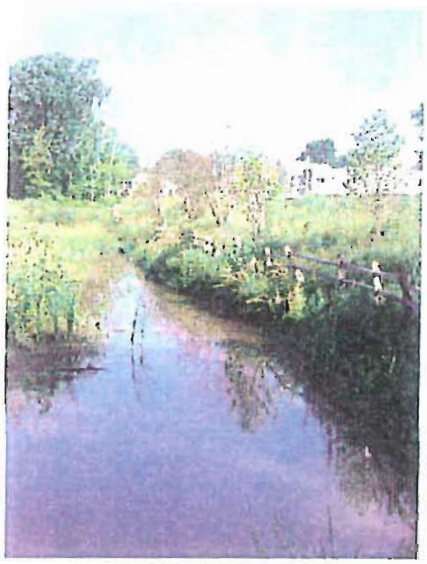


Photo 14: Plumbrook Drain streambank stabilization (Sterling Heights, MI)

Photo 15: Gibson Drain streambank stabilization (Sterling Heights, MI)

Area 2: Walled Lake Branch from the CSX Railroad to Meadowbrook Lake

The majority of this reach is in a heavily wooded wetland area. Our investigation of this area in April showed that there were areas of sediment deposition as well as some erosion. This process creates both natural deltas and shallow pools. While it is evident that the stream in this area is reacting to changed hydraulic conditions, likely due to urbanization, it would be difficult to bring construction equipment into this area without creating a fairly large disturbance. Based upon our field investigation, we recommend the following.

2-1. Just upstream of the Chatman Drive culvert, a pool has formed in the east bank, threatening to erode adjacent property into this pooled area. Based upon conversations with the adjacent property owner, the erosion may have begun after Ash trees were removed in this area. We recommend streambank stabilization in this area to prevent further erosion. Stabilization will require hard armoring with riprap along the toe of the stream bank and utilization of vegetative stabilization to the top of bank. Photos 16 and 17 show the pool area and the eroded banks just north of Chattman Road. Photos 18 and 19 show examples of rip rap protection for the toe of the stream bank as well as vegetative plantings that can be established in the rip rap. Probable cost range: $10,000-15,000.

Photo 16: Eroded pool in ROW north of Chattman

Photo 17: Pool depth is 2-3 feet

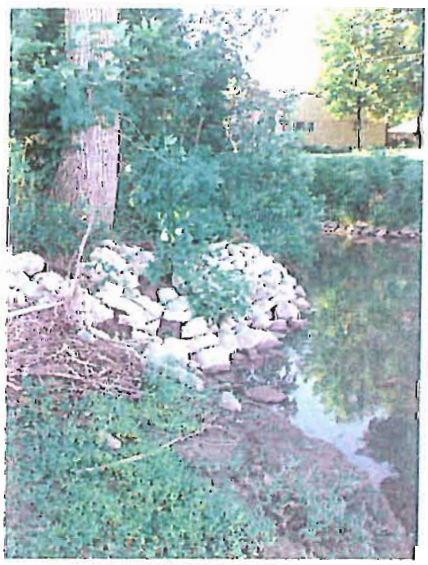


Photo 18: Example of riprap protection (Plumbrook Drain, Sterling Heights, MI)

Photo 19: Example of riprap (Rouge River, Birmingham, MI)

2-2. Construct and maintain a sediment trap in the vicinity of Chatman Drive. This will both reduce the amount of sedimentation into Meadowbrook Lake and allow better monitoring of the degree of erosion occurring in this area. This could also be accomplished by over excavation within the lake, although construction of traps just upstream of the lake may be easier to monitor and maintain (i.e. you can visually inspect and clean out from the bank). Photo 20 shows the accessibility for maintaining the sediment trap. Probable cost range: $3,000-$5,000.

Photo 20: Cleanout of a sediment trap (Duluth, MN)

2-3. Depending on the amount of sediment trapped, we recommend the City conduct a hydrologic, geomorphologic, and hydraulic study to better understand the characteristics of the Walled Lake Branch of the Rouge River from the CSX railroad to Meadowbrook Lake. Attempting to stabilize marginally degraded areas without this type of study would serve as a band-aid approach and only temporarily fix existing problems. It could also cause erosion in other areas that are currently stable.

Area 3: Ingersol Creek from Meadowbrook Road to Meadowbrook Lake

We continue to recommend that no stabilization measures are necessary in this reach, however, we do recommend that the degree of sediment coming from this branch be monitored. This could be accomplished by over excavation within the lake, although construction of traps just upstream of the lake may be easier to monitor and maintain (i.e. you can visually inspect and clean out from the bank). Photo 21 shows a possible location for constructing a sediment trap in the Ingersol Creek between Meadowbrook Road and Meadowbrook Lake.

Photo 21: Possible location for sediment trap

CONCLUSION

Anderson, Eckstein, and Westrick, Inc. has investigated streambank stabilization issues in the vicinity of Meadowbrook Lake. We evaluated conditions in the Walled Lake Branch Downstream of Meadowbrook Lake to 9 Mile Road, the Walled Lake Branch from the CSX Railroad to Meadowbrook Lake, and the Ingersol Creek from Meadowbrook Road to Meadowbrook Lake.

Our investigation revealed several areas which can be improved through streambank stabilization and sedimentation and erosion control measures. We have provided preliminary cost estimates for the implementation of each action item.

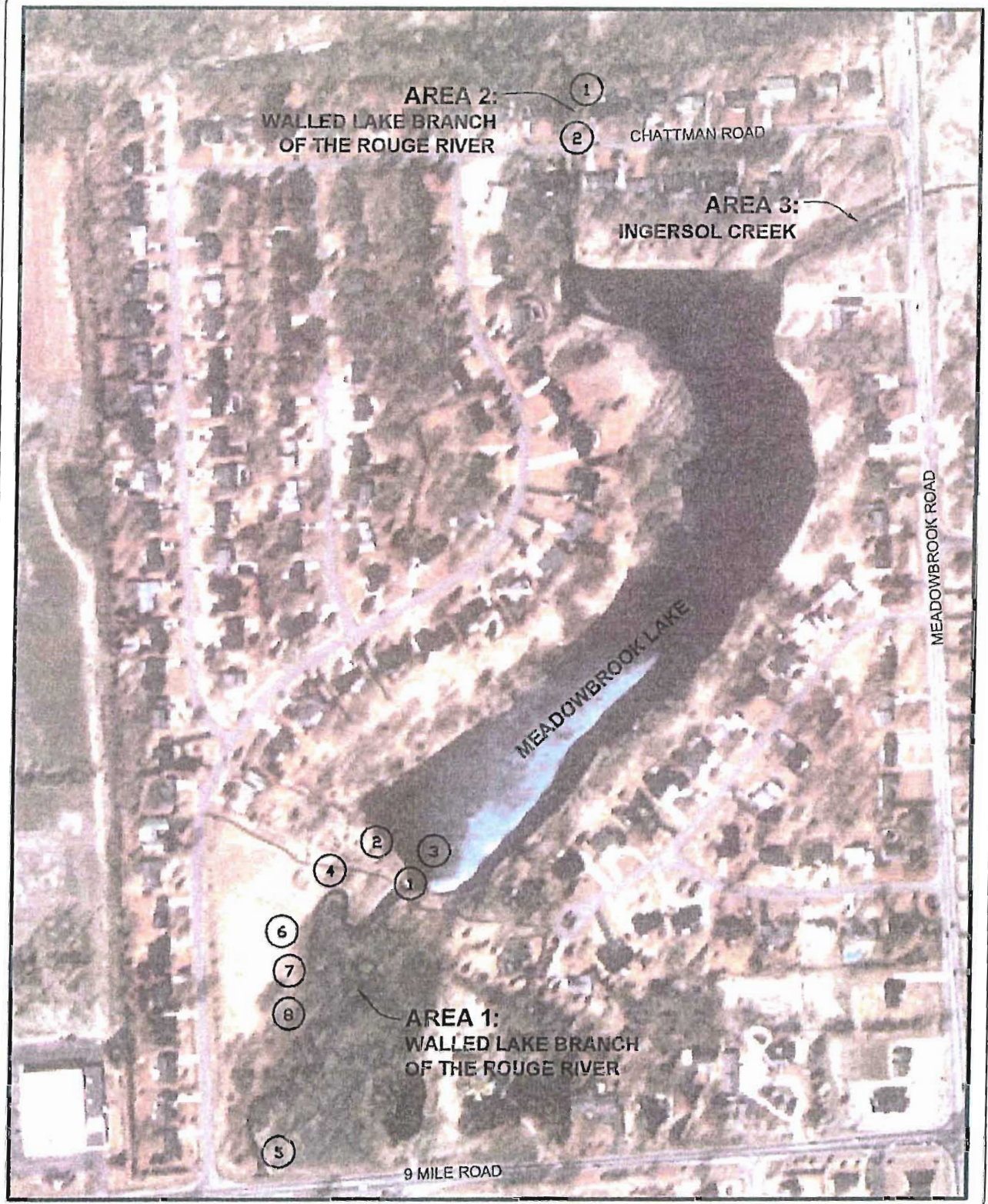
The most eroded area of the stream is downstream of Meadowbrook Lake to 9 Mile Road. If larger scale streambank stabilization is to be conducted, we recommend taking action in this area. This recommendation is supported by the City of Novi Storm Water Master Plan Update prepared for the City in February 2005.

Erosion issues which are damaging or threatening City property and infrastructure are recommended to be stabilized first. Two areas where this is occurring are at the outlet of the concrete channel downstream of the Meadowbrook Lake Dam and in the City right of way north of Chattman Road upstream of Meadowbrook Lake.

Other issues the City should consider addressing are:

- Monitoring the accumulation of sediment in the Walled Lake Branch and the Ingersol Creek upstream of Meadowbrook Lake.

- Modifying the existing dam to promote storage in Meadowbrook Lake and reduce flooding upstream of the lake. This is also recommended in the Feb. 2005 Storm Water Master Plan Update.
- Lower portions of the inlet apron at 9 Mile road so it does not create a backwater on the creek.



ANDERSON, ECKSTEIN
AND WESTRICK, INC.
Civil Engineers • Surveyors • Architects
51301 Schoenherr Road, Shelby Township, Michigan 48315
Phone 586•726•1234 Fax 586•726•0780

PROJECT	DATE	PROJECT NO.
Exhibit A Streambank Stabilization Report	JUN 2005	822–005
	DRAWN BY: JHB	SHEET No.
	CHECKED BY: MAM	1

REQUEST FOR PROPOSALS
CITY OF NOVI

ENGINEERING SERVICES FOR MEADOWBROOK LAKE DAM MODIFICATIONS

July 12, 2007

This Request for Proposals (RFP) for Meadowbrook Lake Dam Modifications is being sent to the firms selected in the Utility Qualification Process completed on March 19, 2007.

Project Description

The City and its consultant, Anderson Eckstein and Westrick, completed a study to investigate streambank stabilization issues in the vicinity of Meadowbrook Lake in June 2005. The report (which is included in Exhibit B) made several recommendations regarding modification of the existing dam at Meadowbrook Lake. This project includes the design and construction engineering services for implementing the following recommendations:

1-1 Modify the dam spillway to provide better detention of smaller storm events and reduce the flashiness of the Middle Rouge River downstream of the dam.
1-2 Provide additional capacity in the dam overflow spillway for large storm events.
1-3 Install a cold water release in the dam to replace the existing flap gates and to improve habitat by allowing cold water to mix with the warmer water being passed over the dam.

(These recommendations are explained in further detail in the report contained in Exhibit B.)

This project will also include the removal of the existing concrete channel downstream and replacement with rip rap and vegetation to decrease velocities and improve water quality.

SCOPE OF SERVICES

The selected consultant shall conduct the following activities:

1.) Upon authorization by the City Council and the City Engineer, the Consultant shall complete design tasks that include but are not limited to:

- Attend scope verification meeting with City staff.
- Provide complete topographic survey of the project area.
- Meet with DEQ officials to determine and understand permitting requirements.
- Perform hydraulic analysis to determine design of dam modification and impact on elevation of the lake.
- Attend public information meeting to discuss property owner impact of altering the existing dam.
- Provide preliminary design and project cost estimate at 30% complete for review and comment.
- Submit the DEQ permit application for the proposed work as the City's agent. Provide all required information to the DEQ for review and approval of the permit application.
- Provide exhibits for temporary construction easement and access to dam site. Additionally provide access and restoration plan for the access route.
- Provide final plans and contract documents for the project at the time of 90% review. The front-end documents will be provided by the City of Novi, the specifications shall be prepared by the

Consultant, and contract documents shall be prepared, printed, assembled, and distributed by the Consultant.

- Provide a revised construction cost estimate at the time of 90% review.
- Prepare the plans in accordance with the City of Novi Design and Construction Standards, Chapter 11, Novi Code of Ordinances and RCOC requirements as applicable.
- Specify protection of existing survey monumentation and coordinating with the County surveyor as required.

2.) The City will provide information as needed in the form of record drawings of existing utilities (as available), standard details, specifications, benchmarks, etc. to assist Consultant in completing the work. The city will make available construction plans for the existing structure as included in Exhibit B (record drawings are not available).

3.) The Consultant shall complete a soil erosion and sedimentation control plan for the project in compliance with Part 91 of P.A. 451 of 1994, Chapter 29 of the Novi Code of Ordinances and the City of Novi SESC Program Manual.

4.) As required, the Consultant shall attend Novi City Council meetings and public informational meetings, and prepare exhibits and other display material that may be needed to present the project(s). Assume one City Council meeting and two public information meetings for the purpose of this proposal.

5.) The Consultant shall submit five (5) sets of plans and cost estimates for review to the City Engineer at 30% complete. The Consultant shall submit five (5) sets of plans and two (2) sets of specifications at 90% complete for review and comment. The Consultant shall submit five (5) sets of as-bid drawings and specifications to the City at the time of construction bidding (of which one set to be sent directly to City Clerk, one set sent directly to Purchasing Official and the remaining three sets sent directly to Engineering), as well as a CD of the digital file converted to AutoCAD format. The Consultant shall also provide all plan sets required for permit application submittal to any agencies as required. All bidding activities shall be coordinated through the Engineering Division and Purchasing Department.

6.) As a part of the Design Phase, the Consultant shall prepare bid documents and provide assistance to the City Engineering and Purchasing Departments with the bidding of the project, including coordinating and facilitating the pre-bid meeting, preparation of contract addenda, plan revisions, responding to bidder inquiries, review of bids, and recommendation of award to City Engineering.

7.) Contract administration services shall include, but not be limited to: reviewing shop drawings furnished by the contractor at the pre-construction meeting, coordinating and running the pre-construction meeting, ensuring compliance with contract documents, regular consultation with City Engineering, interpretation of plans and specifications, preparation and certification of pay estimates, staking, full-time construction inspection during active construction, and materials testing along with final testing and project review. The Consultant must also promptly attend to resident concerns and complaints as they become known.

8.) Construction phase services shall also include submittal to City Engineering of all project reports and documents, and written recommendation regarding final acceptance of the project. The Consultant, within this phase, shall also prepare record drawings and transmit one (1) digital copy of as-built plan in .tif format (400 dpi minimum), two (2) plan copies, and a CD containing the digital file of the record drawings in the City standard format (AutoCAD), and provide such information to the Engineering Division within three (3) months following substantial completion of the project.

9.) During the construction phase the Consultant shall be responsible for administering and enforcing the soil erosion and sedimentation control plan as an agent for the City under the Authorized Public Agency (APA) program in compliance with the City of Novi *Authorized Public Agency Soil Erosion and Sedimentation Control Program Manual.* The Consultant shall also be responsible for soil erosion and sedimentation control inspections of the project for compliance with the approved soil erosion and sedimentation control plan. The inspections must be completed by an individual who has current certification through the Michigan Department of Environmental Quality under Part 91. The

inspections must occur at regular intervals and soil erosion and sedimentation control inspection logs must be maintained and provided to City staff as required. The Consultant shall also be responsible for instituting corrective measures in the field to prevent soil erosion and sedimentation as required, and for overseeing the Contractor's Storm Water Operator.

DOCUMENT AND FILE FORMAT

All documents shall be submitted to the City of Novi in an electronic format as specified by the Engineering Division.

Documents: MS Word

Digital copies of files, maps, or drawings:
files: ArcView Shape file, AutoCAD,
maps/drawings: ArcView layouts print file or AutoCAD format (.dxf)

All digital data should correspond to:
Project – State Plane Coordinate System
Michigan, South Zone – 6401
Datum – NAD83, NAVD 88
Spheroid – GRS1980
Units – International Feet

CONSULTANT QUALIFICATIONS

The Consultant has been pre-qualified to provide engineering consulting services for 2007-2008 Utility Projects.

CONSULTANT SELECTION

As a pre-qualified consultant, the selection for this utility project will be based on an evaluation of the fee proposal, which is labeled as Exhibit A, in addition to the Consultant's project understanding, approach, schedule, staffing plan, past performance on City engineering projects, and value-added concepts that would improve the overall project (i.e., cost savings, time savings, innovation, etc.).

By submitting a proposal, the Consultant agrees that neither the firm, sub-contractors, nor suppliers will discriminate against any person with respect to hiring or employment on the basis of religion, race, color, national origin, age, sex, height, weight, marital status, or a handicap that is unrelated to the individual's ability to perform tasks particular to a job or position.

The selected consultant will enter into an agreement with the City of Novi to perform the services listed in this Request for Proposals. The City's standard Consulting Engineering Agreement is included as Exhibit C.

PROPOSAL SUBMITTALS

To be considered, sealed fee proposals (an UNBOUND original and five copies) must arrive at the Purchasing Department, 45175 W. Ten Mile Road, Novi, Michigan 48375 on or before **3:00 P.M.** Prevailing Eastern Time, **Wednesday, August 1, 2007** addressed to **Carol J. Kalinovik, Purchasing Director**, and clearly labeled **MEADOWBROOK LAKE DAM MODIFICATIONS**. There will be no exceptions to this requirement and the City of Novi shall not be held responsible for late, lost, or misdirected proposals. Submitted proposals shall include:

- The proposed approach to the project, in detail (including any value-added concepts that would improve the overall project (i.e., cost savings, time savings, innovation, etc.).
- The completed fee proposal (Exhibit A)
- A proposed schedule for the project including design and construction phase
- A rate sheet or fee schedule depicting the Consultant's hourly rates that could be applied to additional work as may be necessary, for each category of staff that would work on the project.

All proposals must remain valid for one hundred twenty (120) days from due date and cannot be withdrawn during this period.

Questions regarding this Request for Proposals may be directed to:

City Engineer, Rob Hayes, P.E. (248) 735-5606
-or-
Civil Engineer, Brian Coburn, P.E. (248) 735-5632

The City of Novi reserves the right to accept any or all alternative proposals and to award the project to other than the firm with the lowest fee proposal, waive any irregularities or informalities, or both, to reject any or all proposals, and in general, to make award in any manner deemed by the City, in its sole discretion, to be in the best interests of the City of Novi.

Exhibits

A - Fee Proposal Form
B- Background Information
C - Engineering Consultant Agreement

EXHIBIT A
FEE PROPOSAL
CITY OF NOVI

ENGINEERING SERVICES FOR
MEADOWBROOK LAKE DAM MODIFICATIONS

We the undersigned propose to furnish to the City of Novi services consistent with the Request for Qualifications dated January 11, 2007 and Request for Proposals dated July 12, 2007, respectively. Design fees will be paid on an hourly basis for actual work performed to a maximum as proposed. A separate fee schedule is being provided should the City request additional work on an hourly basis.

Project	Phase	Total Fee
Meadowbrook Lake Dam Modifications	Design Phase	$
	Construction Cost Estimate: $_____	
	Construction Phase: _____% of Construction Cost	$
	TOTAL ESTIMATED FEE*	$

*Total Estimated Fee consists of a not-to-exceed design phase fee (which includes geotechnical costs if applicable) and a fixed percentage construction phase fee which is used to estimate an approximate fee amount based on the cost estimate above. The actual construction phase fee will be established when the project is awarded to a contractor by multiplying the fixed percentage provided and the bid price of the successful bidder.

PLEASE TYPE:

Company Name: _____

Address: _____

Agent's Name: _____

Agent's Title: _____

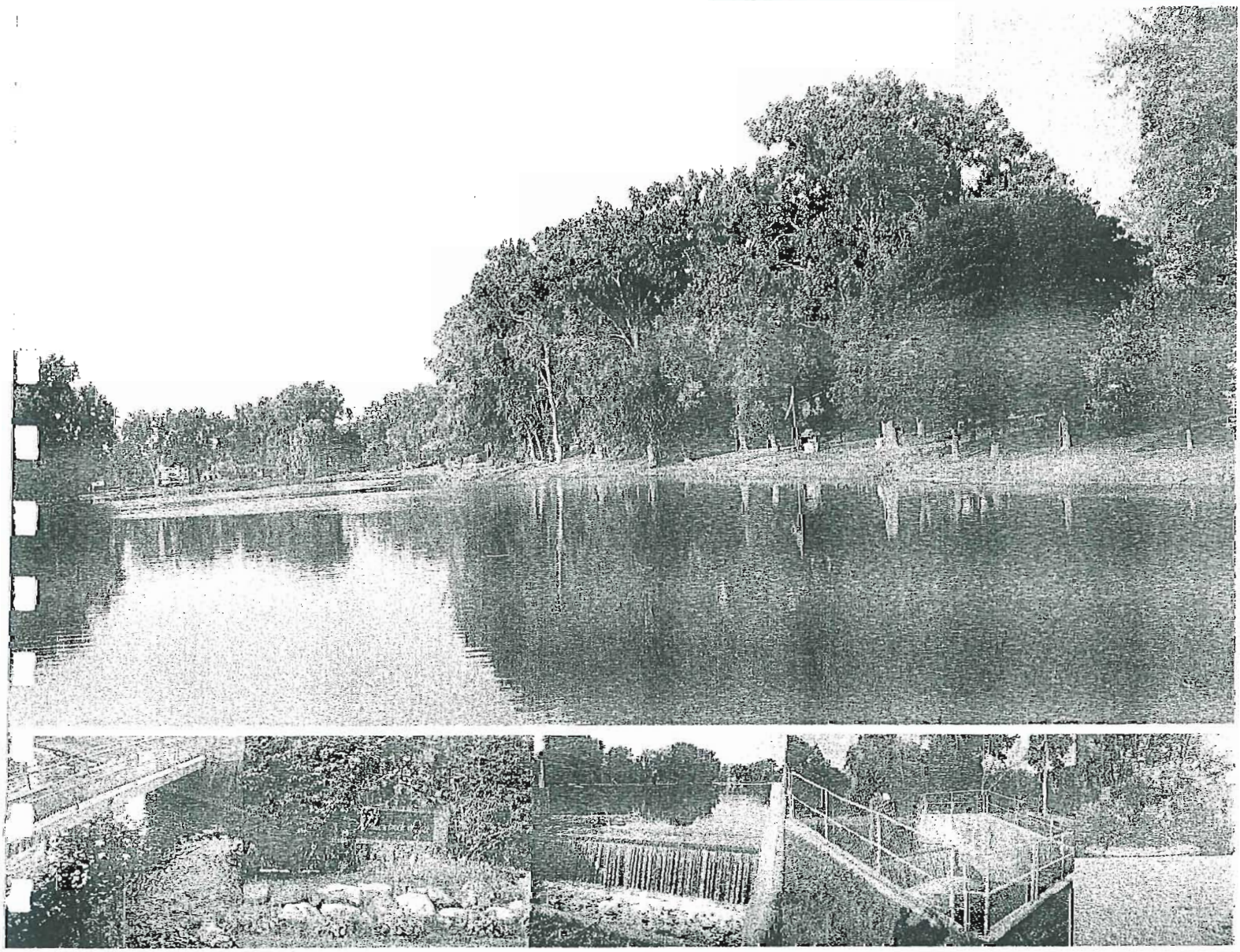
Agent's Signature: _____

Telephone Number: _____ Fax Number: _____

E-mail Address: _____Date: _____

CITY OF NOVI

PROPOSAL FOR ENGINEERING SERVICES
MEADOWBROOK LAKE DAM MODIFICATIONS



URS

August | 1 | 2007

URS

August 1, 2007

Ms. Carol J. Kalinovik
Purchasing Director
City of Novi
45175 W. Ten Mile Road
Novi, MI 48375-3024

Reference: Request for Proposal
Engineering Services for Meadowbrook Lake Dam Modifications

Dear Ms. Kalinovik:

Please find enclosed an original and five copies of our proposal for the above referenced project. Also enclosed is a sealed envelope with the fee proposal information requested in the RFP.

Our proposal and the prices quoted shall remain valid for 120 days.

URS has a deserved reputation for designing and inspecting large scale, complex municipal projects. However, we have also provided quality services for hundreds of projects of all types and scales to Cities, Villages and Counties throughout the State of Michigan.

We provided design, construction engineering, layout, and inspection services for the City of Novi on the Westmont Village Subdivision Phase I Project in 2003 and the Nine Mile Water Main Extension Project in 2005. We believe these projects to be a success and look forward to providing quality services to you on this project.

If you have any questions, please feel free to contact me at (248) 553-7438. We appreciate your consideration of our proposal and look forward to working with you again.

Sincerely,

URS Corporation – Great Lakes, Inc.

Jan Hauser, PE
Water Resources Department Director

Attachments:

URS Corporation
34555 West 12 Mile Road
Farmington Hills, MI 48331
Tel: 248.553.9449
Fax: 248.553.9571

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URS

Understanding and Approach

Introduction

After reading the Request for Proposal, Engineering Services for Meadowbrook Lake Dam Modification, visiting Meadowbrook Lake, reviewing DEQ's dam inspection report, AEW's Streambank Stabilization Report dated June 2005, and the City's Stormwater Master Plan update dated February 2007, URS understands the project requirements. Meadowbrook Lake needs dam modifications that will provide the following functionality:

- Detain smaller storm events in order to reduce peak flows and velocities in the Middle Rouge River downstream of the dam;
- Provide adequate capacity to pass the 100-yr flood as required by Michigan's dam safety regulations (Michigan Natural Resources and Environmental Protection Act, Act 451 of 1994); and
- Design and install a cold water release for the dam to improve fishery habitat.

Our experience with these types of projects also has demonstrated that lake front property owners usually desire minimal fluctuations of the normal lake level.

The functionality described in the RFP and other documents is qualitative. Therefore, as part of this study quantitative design criteria need to be identified. For example, URS (in conjunction with the City and DEQ) will develop quantitative criteria for answering the following questions::

- What constitutes a "small" event?
- What lake elevation constitutes "flooding"?
- What is an "erosive velocity" downstream of the dam?

Quantifying these design goals is necessary for evaluating feasible alternatives. URS will work with project stakeholders to develop design guidelines.

AEW's Stream Stabilization Report recommends a V-notch weir and an auxiliary spillway to meet the qualitative project goals described above. While this may be a suitable solution, URS feels it is presumptuous to make design decision without first completing a hydrologic and hydraulic

Briar Hill Lake Dam Design

URS recently prepared a conceptual design and estimated cost comparisons for the Briar Hill Lake Dam in the City of Solon, Ohio to meet similar objectives. URS' design saved approximately $250,000 over traditional designs. This was accomplished using an innovative design that included a fixed rectangular weir sized to detain and reduce peak flows from small storms, and a variable height Obermeyer gate to safely pass the design storm. An Obermeyer gate is a steel bottom-hinged spillway gate that is raised and lowered by an air-filled rubber bladder. The gate is automatically raised and lowered depending on inflow and lake stage. When the lake stage exceeds a pre-determined level (as expected during the design flood) it causes the gate to open and the floodwater to be safely passed. When the gate opens, the full hydraulic height of the spillway is available to pass large flows, allowing a smaller spillway to serve in place of a longer fixed-elevation weir. This design reduced the estimated construction costs by reducing the amount of structural concrete required for the spillway, and by maximizing the use of the existing dam structure. A similar design may be suitable for the Meadowbrook Lake Dam.

(H&H) study of the area. Other designs may be optimal for this site and reduce construction costs, use less space, better limit upstream flooding, and better reduce downstream velocities. To better answer these questions, and others, URS recommends performing a feasibility analysis on several alternatives.

Approach

URS will follow a seven step approach to completing the design and modification of Meadowbrook Lake dam. The seven steps are:

1. Investigate existing conditions
2. Perform a detailed analysis of the existing structure (H&H, structural, and geotechnical)
3. Perform a feasibility analysis of several alternative options (if needed)
4. Prepare design drawings and technical specification
5. Permitting
6. Construction
7. Certification

1. Investigate Existing Conditions:

- Review existing DEQ inspection reports, drawings, instrument readings, and other data as available.
- Review other reports relevant to the system (Stormwater Master Plan, Streambank Stabilization Report, etc)
- Attend a scope verification meeting and meet with DEQ to plan the permitting process.
- Identify deficiencies cited in MDEQ inspection report, such as inadequate spillway capacity.
- Perform visual dam inspection, including interview of key owner personnel and other stakeholders.
- Hold a stakeholder meeting to get input and provide dam, lake front, and downstream property owners with project information.
- Review MDEQ hydrologic and hydraulic (H & H) analyses if insufficient spillway capacity is cited in MDEQ report. For example, URS will verify and/ or re-calculate the 100-year storm event.
- Re-evaluate the 100-year event if appropriate.

Reviewing existing information on the dam condition, the channel downstream of the dam, and meeting with stakeholders will allow URS to gain a complete understanding of the factors driving dam modification. This review will help define design conditions such as allowable peak flows and velocities below the dam, acceptable lake level fluctuations, and any deficiencies in the current dam design. This task includes reviewing available information related to dam design, hydrology and hydraulics of the dam and watershed, meetings with the City to define design criteria.

Understanding and Approach

Our experience with similar projects has demonstrated that public involvement is critical. Understanding the concerns of those most impacted by the stream bank erosion and flooding is the key to a successful project. Facilitation and communication with the public will be geared toward understanding and addressing issues, concerns, and ideas raised by stakeholders. The meetings will initially focus on gathering information on the scope of problems and desired solutions. As the project progresses, proposed designs for the lake level control structure and downstream channel will be presented and discussed.

Since this project is expected to have public support, the meetings are designed primarily to provide progress updates. However, they will also provide an opportunity for concerned citizens to ask questions, voice opinions, and provide input on the process.

2. Detailed Analyses:

- Perform detailed H & H analyses to determine project design flood. Include further analysis of Critical Flood if warranted.
- Perform required surveying to prepare a complete topographic map of the project area.
- Perform structural analysis to determine structural stability of dam.
- Perform subsurface investigation and geotechnical analysis if needed.
- Prepare and submit H & H and Critical Flood report to MDEQ.
- Respond to MDEQ comments to secure approval of design flood.

Our detailed H&H analysis of the existing dam and drainage basin will focus on determining the inflow hydrographs for small storm events (2-year, 5-year, and 25-year events) and the 100-year flood event. The smaller events, 2 through 25-year, will be used during the design phase to assess peak flows and potential impacts on the channel below the dam. Design goals for these events will be to reduce their flashiness by better utilizing the storage capacity in Meadowbrook Lake. The 100-year event will be the critical design flow because Meadowbrook dam is designated a low hazard dam by DEQ. The DEQ 100-year peak flow of 2,150 CFS cited in AEW's report will be re-evaluated using the hydrologic model developed for this project. Design goal for passing the 100-year event will be to safely pass the flow without causing upstream flooding.

Our structural and geotechnical analysis will be used to determine the feasibility of different dam modifications, such as adding gates, modifying the weir, and adding an emergency overflow. The detailed analyses will be used insure that our proposed alternatives are constructable within the overall project budget and that the concrete spillway and earthen dam are structurally capable of being modified.

URS will conduct surveying of the project area. This will include elevations of important dam components (weir elevation, top of earthen dam, spillway elevation, etc.), and topography of

area around lake to assess how changes in lake stage will impact property owners and verify 100-year flood plain.

3. Feasibility and Alternatives Analysis (based on approved design flood)
- Analyze feasibility of a V-notch weir and auxiliary channel configuration as described in AEW's Stream Stabilization Report dated June 2005. If this configuration is not feasible URS will report this finding to the City.
- An optional scope to asses the feasibility of alternate designs will include:
  - Develop several conceptual designs to correct dam deficiencies.
  - Prepare conceptual sketches and construction cost estimates.
  - Prepare preliminary structural and hydraulic analyses for the conceptual designs to ensure they are feasible.
  - Prepare and submit to Owner an alternatives and feasibility report that compares and ranks the conceptual designs.
  - Owner selects one conceptual design for dam modifications.

Our approach to designing the dam modification will integrate the modeling and design tasks to allow effective use of computer models during the design process. Specifically, the dam will be designed to reduce the peak flow from the lake during small events while allowing for sufficient capacity to pass large events. Excess flows will be routed through the proposed emergency spillway overflow structure and channel. Reducing the peak flow of smaller more frequent events will reduce velocities and be compatible with softening the channel immediately downstream of the dam. Increased lake storage will result in short periods of increased lake levels, which will be controlled by the emergency spillway. Lake level changes will be minimized and limited to design criteria established by URS, the City and other stakeholders. In addition, modifications related to safely passing the design storm will be incorporated into the process and be related to reducing upstream flooding.

URS will develop a hydrologic model of the Meadow Lake watershed using HEC-HMS. The model will be used to estimate runoff volumes and peak flows for small events and the 100-year storm events from the watershed. The model will also be used to represent the lake using a stage-storage discharge relationship. State regulations for this structure require that the 100- year event is passed safely; however, expected freeboard and lake storage can be incorporated into the design process. Thus, the linked computer model will aid in the design of the dam and downstream channel by predicting peak flows and lake levels from storm events at the lake outlet. Our design will reduce peak flows and velocities of smaller events and limit upstream flooding during the 100 year event.

Event based simulations using the SCS method will be used within HEC-HMS. The computer framework will allow for quick model set-up and simulation and integration with a stage-storage discharge relationship that incorporates lake storage and outlet structure designs. This framework will allow the outlet structure to be optimized for the 100-year storm. The

design goals will be to reduce peak flows of smaller storms while insuring adequate capacity for the 100-yr event.

Our initial investigation will focus on evaluating and designing a V-notch weir and auxiliary spillway as described by AEW's Streambank Stabilization Report dated June 2005. URS will assess the feasibility of this configuration for small events and the 100-year event. For this configuration velocities and lake stage will be calculated and the design impact on flooding and erosion will be evaluated. If this design is shown to be practical and is constructable at a reasonable cost URS will proceed to the next step. If it does not meet project goals URS will report this to the City. Alternative designs will be evaluated if authorized by the City.

Alternative conceptual designs will focus on utilizing the existing dam structure to the fullest extent possible to minimize construction costs. By using innovative design, such as incorporating a stepped spillway or an Obermeyer gate, it may be possible to meet the design requirements by modifying the existing structure and adding a smaller weir for frequent small events.

4. Prepare Design Drawings and Technical Specifications

- Develop plans, sections and details for structural modifications to the existing spillway, including the proposed V-notch weir or other flow control features.
- Develop plans, sections and details for the proposed emergency spillway overflow section and outlet channel.
- Perform structural calculations, geotechnical analyses, seepage analyses, and stability analyses for sliding and overturning for the proposed modifications.
- Prepare technical specifications for all the required work.

URS will provide the required design drawings and technical specifications as required by the City of Novi. This will include exhibits for temporary construction easements and access to the dam site. Plans and design documents will be provided at 30% and 90% complete and a soil erosion and sedimentation control plan will be developed for the project. All plans will be submitted in accordance with the City's technical requirements as described in the RFP.

5. Permitting

- Prepare dam construction permit application for submittal to MDEQ and MDEQ review.
- Respond to and resolve MDEQ comments.
- Finalize dam construction permit.
- Obtain MDEQ approval.

Permitting dam modifications for the Meadow Lake Dam will require an DEQ dam construction permit; soil erosion and sedimentation control permit; and a Joint Permit Application (JPA). URS will work on the City's behalf to prepare and submit all required

permits and gain approval from all required agencies. Based on the cumulative experience of the URS Team, we will provide the following:

- Coordination among the County, City, design team and DEQ throughout the entire process;
- Prepare and submit all required permits and plans as required;
  - Prepare and submit to DEQ a dam construction permit;
  - Prepare a soil erosion and sediment control plan for the project and associated permits;
  - Completion and submittal of all calculations and typical illustrations for the JPA;
- Documentation of Feasible and Prudent Alternatives in sufficient detail to facilitate DEQ review and acceptance, and;
- Coordination and attendance at public meetings and hearings.

6. Construction

- **Prepare bid drawings, technical specifications, commercial terms and conditions and quantity estimate for bidding.**
- **Conduct or assist Owner with bidding process.**
- **Construct project (by others).**
- **Inspect construction. Submit field changes for MDEQ approval prior to construction, as necessary.**
- **Prepare as-built drawings.**

URS will work with the City during the bidding and construction process to insure that dam modifications are consistent with the design and specifications indicated in the DEQ permit and as required by the City Engineering department. Furthermore, URS will:

- Prepare all plans in accordance with City of Novi specifications;
- Prepare design drawings and construction cost estimates at 30% and 90% complete;
- Prepare SESC plan for project;
- Prepare as-bid drawings;
- Assist with bidding of project by working with City staff and attending pre-bid meetings as required; and
- Administer and enforce the SESC control plan for the city.

7. Certification/ Inspection

- **Prepare and submit to MDEQ an Engineer's Certification Report including as-built drawings, materials test reports, inspection reports and other construction documentation.**
- **MDEQ review of certification report and initial dam inspection.**
- **Respond to and resolve MDEQ's comments.**
- **MDEQ approval**

Understanding and Approach

URS will work with the DEQ to insure that the modified Meadowbrook Lake dam meets permit requirements and passes initial inspections by DEQ staff. To facilitate this process URS will compile drawings and other reports as required by DEQ.

Summary

URS' ongoing experience with a similar dam modification and design projects throughout the United States provides familiarity with design options that meet project goals; the relative construction costs of the options; and recent consideration of innovative solutions. URS believes that this recent experience in Ohio will transfer directly to the Meadowbrook Lake Dam modification project.

Value Added Concepts

1. Concept Design Feasibility Study

URS is concerned that the City may be proceeding to final design of the V-notch spillway and emergency overflow spillway before their efficacy has been proven by calculations. The use of a V-notch weir in place of the existing fixed-elevation overflow section may actually exacerbate lake level fluctuations and the tendency to overtop the dam. Preliminary calculations indicate that the proposed V-notch weir may make it necessary to provide a larger emergency spillway than might otherwise be necessary, and that the emergency spillway may actively flow more frequently. URS recommends that the City consider performing a limited feasibility study to explore a range of conceptual designs before proceeding to final design, permitting and construction. The study will evaluate several alternatives for their effect on the following:

- Lake level fluctuations,
- Flow rates in the primary and emergency spillways,
- Ability to safely pass the design flood,
- Control of erosion in the channel below the dam, and
- Estimated construction cost.

Alternatives to be considered might include:

- Use of Bottom Hinged Gate

  It may be possible to save significantly on construction costs if the existing dam can be utilized to pass the design flow and a smaller weir structure constructed to pass smaller, more frequent flows. This may be possible by incorporating into the existing spillway a bottom hinged gate, such as the Obermeyer Gate, that is raised during normal operating conditions and lowered when lake stage rises. This passive system can be effectively engineered to minimize construction costs while meeting design criteria. This concept

has been applied previously and saved 25 to 30 percent in construction costs over more traditional designs.

- Use of Stepped Spillway Weir
  It may be possible to modify the existing overflow section by elevating segments of it in small increments, say 0.1 foot. Two to three such steps would restrict flow of the smaller floods, reducing erosion in the channel downstream, but would not result in a large loss of overall spillway capacity. An emergency spillway control section and rock-lined channel would be constructed at the low area near the right abutment to augment flow through the principal spillway. The stepped spillway approach would need to be proven by hydrologic and hydraulic calculations in order to make it effective.

- Use of a Rubber Dam
  A pneumatic rubber dam would block flow from a deepened principal spillway overflow section, similar to the bottom-hinged gate concept. Normal flows would pass through a smaller, fixed-elevation concrete weir, but the rubber dam would deflate during large floods. Similar to the bottom-hinged gate, this approach may prove to be economically attractive.

2. Assessment of Cold Water Release

A cold water release is suggested for Meadowbrook Lake by AEW. The AEW report suggests that a cold water release may improve fishery habitat downstream of the dam. Because inclusion of a cold water release will add to the design and construction costs and assessment of this option is relatively inexpensive URS recommends the collection of water temperature data during the summer of 2008. Collecting water temperature data at several depths and/ or reviewing existing temperature data will determine whether cold water exists near the bottom of the lake and therefore, whether a cold water release would be effective. Temperature stratification does not occur on all lakes and is dependent on depth, mixing and other factors. Meadowbrook Lake is a run of the river impoundment and likely undergoes significant mixing and may not exhibit temperature stratification. Assessing the lakes vertical water temperature profile during summer months is relatively inexpensive compared to the cost of designing and constructing a cold water release. Furthermore, cold water fishery's are relatively rare in southeastern Michigan and the value of adding coldwater to the outlet may have limited ecological value. Thus, URS suggests that the City of Novi measure temperature at several depths and locations during the summer of 2008.

3. Stream Channel Assessment and Improvement

URS will utilize the HEC-RAS model for the channel downstream of the lake level control structure. This model will be used to design stream channel improvements that will effectively pass smaller events and the design flow. We will develop our model to:

- Assess stream stage for a 2-year, 5-year, 25-year, and 100-year peak flow for the existing channel. The stream stage and related flooding for these events will determine what types of channel improvements are required.
- Design a channel that safely and effectively routes the 100-year event, but that also passes smaller events while maintaining velocity and depth adequate for aquatic life. This will result in a channel cross section with a main channel for smaller events and flood plain for larger events.
- Utilize channel storage to the maximum extent possible to limit the need for channel improvements.

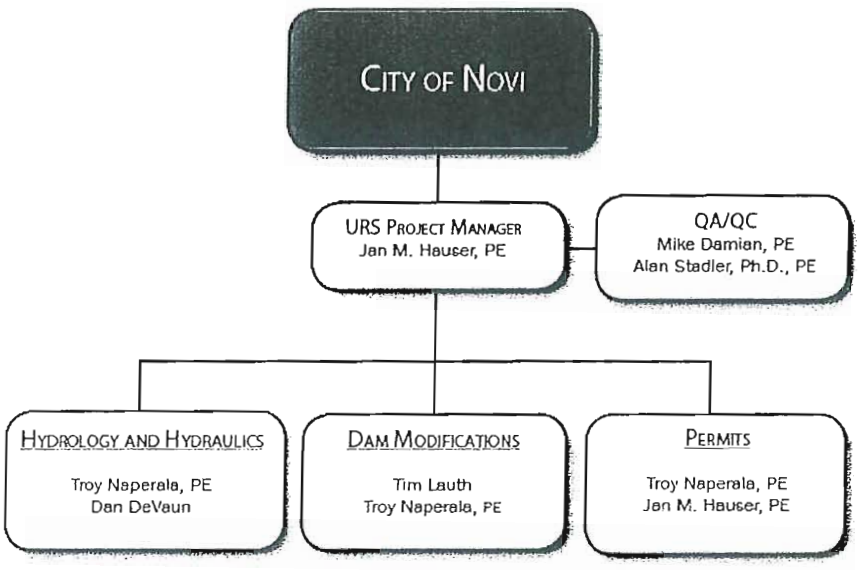
URS has extensive experience in stream channel improvement and restoration projects. Engineers on our team have successfully completed numerous restoration projects. They will provide quality assurance and quality control for the analysis, design, and permitting aspects of this project. The following tasks are anticipated to be required for the channel improvement task.

- Surveying work includes all of the survey data required to complete the design and permitting tasks for the restoration of the stream, including determination of the deepest part of the existing channel and cross sections needed for earthwork computations for the channel improvements. URS will use existing survey data if it is available.
- Assessing whether a road will experience over-topping during large storm events and whether it was designed to withstand this occurrence.
- Preparation of the required Joint Permit Application.
- Preparation of plans, specifications and estimates for the stream channel improvements downstream of the control structure.

Project Staffing

This section provides an overview of how this project will be managed. It includes an organizational chart and resumes of project staff that were not included in our pre-qualifications submittal.

Organizational Chart



Key Staff

Key staff are listed below. Resumes and/ or paragraph descriptions of each are also included at the end of this section. The resumes demonstrate staff experience with the required technical skills and similar project experience.

Jan Hauser, PE ..... Project Manager
Troy Naperala, PE ..... Hydrology & Hydraulics
Tim Lauth .....Dam Design and Modifications
Bill Weihbrecht .....Channel Improvements
Michael Damian, PE.....QAQC
Alan Stadler,PhD, PE.....QAQC

Jan Hauser

Mr. Hauser leads the URS Water/Wastewater Business line in Michigan responsible for overall business development, strategic planning, staff development, project performance and client management.

Project Staffing

Jan is experienced managing, planning, operating, and engineering water and wastewater utilities from both the public and private sectors through his work as Director of Utilities for Adrian, Michigan and managing offices of private consulting engineering firms. Mr. Hauser is a specialist in business development, project development, client management, project management and operations.

Troy Naperala

Mr. Naperala has over nine years experience working on and managing projects related to civil and environmental engineering problems. He has participated in and managed numerous projects dealing with hydrology and hydraulics. Projects have included dam related studies, storm water management, watershed management, regulatory compliance, contaminated sites, wetlands and water quality issues for a variety of clients. In addition he has designed and prepared permit applications for retention basins, engineered wetlands and Great Lakes Conveyances. His experience includes the management of projects for municipalities, states, industries, regional planning organizations and regulatory agencies.

Resumes for Tim Lauth, Michael Damian and Alan Stadler are included in this section because they were not part of URS' pre-qualification package.

URS

Timothy Lauth, P.E.

Structural Engineer

Overview

Mr. Lauth is experienced in all phases of structural design and project management for various facilities. His specific experience includes supervision of multidiscipline design/drafting staff, project coordination with clients, data processing management of computer-aided design and structural construction administration, entailing both domestic and international projects.

Areas of Expertise

Structural Design
Project Management
Project Coordination
Construction Administration

Years of Experience

With URS: 21 Years
With Other Firms: 9 Years

Education

Bachelor of Architectural Engineering / 1976/ The Pennsylvania State University

Registration/Certification

1981/ Registered Professional Engineer /Ohio
1998 / Registered Professional Engineer / Pennsylvania

Project Specific Experience

Senior Structural Engineer, Garrett A. Morgan Water Treatment Plant Reservoir, Cleveland, Ohio: The East Reservoir project encompasses the detailed design work required for the construction of a new, $50 million, large capacity (15 million gallon), underground finished water storage reservoir. The design included accommodating phased construction for the first chamber of the two chambered reservoir. The existing yard piping, within the reservoir footprint, was required to remain in operation until the first chamber was completed.

Structural Engineer, SWACO – Transfer Station Renovations, Columbus, Ohio: The projects consisted of the renovation of three existing Solid Waste Transfer stations. The existing stations had originally been designed as shredding stations for an energy generating waste burning facility. The facilities were converted to be simply Transfer Stations. The renovations included floor restoration, rehabilitating damaged structural framing and upgrading to meet current codes.

Newark Waterworks Dam Rehabilitation, City of Newark, Newark, Ohio: Responsible for the structural analysis and design of the Newark Dam rehabilitation improvements. The project consisted of designing the only slurry wall dam rehabilitation project in Ohio approved by ODNR. Project included designing an in-stream work pad, a slurry wall and cap, jet grout columns, installing piezometers, and designing bank protection. Used LandDesk to layout the design and develop permit and construction drawings.

McKelvey Lake Dam Improvements Plan, Youngstown, Ohio: Responsible for structural evaluation and engineering of remedial work for the existing overflow spillway. The rehabilitation work included partial demolition and reconstruction of an increased capacity spillway. The project included the safety analysis of a low head, water supply dam on the North Fork Licking River. Work included the analyzed failure of the Newark Dam during several storm events. Analyzed flooding conditions due to several dam failure scenarios using DAMBRK to determine a critical flood. Responsible for the hydrology/hydraulic calculations for a critical dam study and emergency action plan. Developed a floodplain map of a 5-mile reach downstream of the dam

URS

Michael T. Damian, P.G.

Geotechnical Engineer / Senior Project Manager

Overview

Mr. Damian has over 25 years of experience in geologic/ geotechnical subsurface explorations, dam inspection and repair, slope stability evaluations and remediation, rock blast design and implementation and associated budgeting, project and construction management functions.

Areas of Expertise

Geotechnical Projects

Years of Experience

With URS: 7 Years
With Other Firms: 24 Years

Education

BA/Geology/1973/University of Rhode Island
Continuing Education/ Construction Management/The Ohio State University/1984-1987
Continuing Education/ Geological Engineering/ University of Idaho 1987-1996

Registration/Certification

1990/Professional Geologist/ VA/2801 000891
1982/Blasting Certificate of Competency, MA/BL 3189

Project Specific Experience

Bloomington Lake Dam (now Jennings Randolph Lake Dam), Maryland: Project Geologist on contractor quality control team for major US Army Corps of Engineers flood control dam construction project on the Potomac River in western Maryland. Activities included:

- Supervised and inspected rock excavation using systematic drill and blast methods. Designed blasts and directed blasting operations.
- Inspected rock foundations for compliance with specifications prior to placement of concrete and earth fill.
- Inspected dam foundation drilling and grouting.
- Produced geologic maps of all structural excavations
- Assisted soils engineer with quality control testing of embankment fill, and maintained fill quantity records.
- Performed geologic investigation and designed solution to stabilize sliding rock mass in dam abutment.
- Administered site safety program for approximately 65 employees.

City of Newark, Ohio, Water Supply Dam Evaluation: Managed the in-depth safety evaluation of a concrete water supply dam in the central Ohio City of Newark, in response to regulatory requirements. Project included:

- Detailed inspection of dam structure.
- Drilling of exploratory borings, soils testing and the installation of remotely read piezometers.
- Hydraulic and hydrologic analyses to determine limits of flood inundation areas due to design storm.
- Preparation of Emergency Action Plan and Operations, Maintenance and Inspection Manual.
- Managed permitting, engineering and design of modifications to stabilize dam. Developed bid drawings and documents, conducted prebid meeting with client and contractors, evaluated bids and made recommendations to client for contract award.

inspection and monitoring data to consultant in preparation for its visits.

- Responsible for production of quantity and cost estimates for required remediation work and conveyed them to management. On larger remediation projects, administered procurement of maintenance or capital improvement funding.
- Directed the design of numerous dam remediation projects, produced drawings, bid documents and technical specifications, conducted bid meetings and post-bid evaluation. Administered construction contracts including cost control, scheduling and change orders as required.
- Provided company contact with dam safety officials from five states. Administered the periodic inspection reporting required by the various states.
- Initiated the procurement of DamSmart software package to be implemented on all hydro dams and earthen ash retention dams on the AEP System.

Senior Project Geologist, Waterford Energy LLC, Corps of Engineers Permitting, Washington County, Ohio: Senior project geologist for the submission of Corps of Engineers Permit Applications for Intake and Discharge Structures at the proposed Muskingum Combined Cycle Facility in Washington County, Ohio. The proposed facility will provide 850 MW of capacity and will connect to the existing transmission system located near the proposed site. In order to construct an intake structure and a discharge structure for the proposed PSEG Waterford Energy LLC natural gas fired electric power generating facility, a U.S. Army Corps of Engineers (USACE) permit is required. Section 404 of the Clean Water Act gives the USACE the authority to require permitting for activities along and in waters of the United States. The Muskingum River site falls under the authority of the USACE, Huntington District.

Muskingum River Plant Slurry Trench Cutoff Wall, Beverly, Ohio: This project involved remediation of heavy seepage from a 90' high bottom ash retention dam in southeastern Ohio. Project activities included:

- Conducted a thorough assessment of existing conditions through field inspections, review of instrumentation data, design reports and existing drawings and by conducting slope stability analyses.
- Analyzed several potential remediation designs with respect to effectiveness, cost and constructability. Selected slurry trench cutoff wall as best candidate to solve problems at dam.
- Researcher slurry trench construction techniques.
- Communicated and met with slurry trench contractors, and evaluated their capability to perform the required work.
- Directed the activities of technical consultants, including the recommendation that they utilize fly ash in the slurry design mix

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Alan T. Stadler, Ph.D., P.E.

Principal Geotechnical Engineer

Areas of Expertise

Geotechnical Engineering
Geo-Environmental Engineering
Project Management

Years of Experience

21 Years

Education

PhD/1996/The University of Colorado
MS/1989/Ohio State University
BS/1984/Civil Engineering/Ohio State University

Registration/Certification

1991/Registered Professional Engineer/South Carolina

1997/Registered Professional Engineer/North Carolina

Overview

Dr. Stadler joined the Cleveland office of URS in September 2004 as a member of the Environmental Group. His primary areas of expertise are geotechnical and geoenvironmental engineering. Dr. Stadler has worked in a wide variety of environments including private consulting, academic institutions, and the federal government. Immediately prior to joining URS, he was the director of the Geocentrifuge Research Laboratory in the Geosciences Research Department at the Idaho National Engineering and Environmental Laboratory (INEEL). He is a registered professional engineer in North and South Carolina.

Project Specific Experience

Deputy Project Manager, Morgan East Reservoir, Cleveland Division of Water, Cleveland, Ohio: Responsible for all project management and client contact issues, including budgeting, invoicing, subcontractor management and technical staff management. The East Reservoir includes the detailed design of a new, 15 million gallon underground finished water storage reservoir at the Cleveland Division of Water's Garrett A. Morgan Water Works Plant. In addition to new design work, the project includes the engineering design activities required to complete the demolition of the existing finished water pump station, boiler house, ancillary structures, yard piping and utilities. Engineering services also include construction work package bidding and award, construction administration, resident engineering and project closeout. Construction costs for these activities are estimated to approach 50 million dollars.

Project Manager, Senior Geotechnical Engineer, ODOT Slope Stabilization Projects, Ashtabula, Portage, and Trumbull Counties: Responsible for all technical and project management issues associated with the analysis of slope failures and the design of appropriate repairs for failed slopes along State Routes 5 and 531. Project scopes included design, specification and execution of subsurface investigations, laboratory testing, engineering analysis and slope repair design. Final products included the drawings and specifications required to complete the repairs.

Director of the Geocentrifuge Research Facility, Idaho National Engineering and Environmental Laboratory (INEEL), Geosciences Research Department, Idaho Falls, Idaho: The INEEL is a U.S. Department of Energy National Laboratory. Included in the INEEL's mission is geosciences research and development to address long-term stewardship of the environment. While at the INEEL, Dr. Stadler was charged with developing the physical infrastructure and training the staff to perform geocentrifuge research. Once the facility was rendered functional, his further responsibilities included initiating, facilitating, and

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Professional Societies/Affiliates

American Society of Civil Engineers
ASCE Geo-Institute
International Society of Soil Mechanics and Foundation Engineering

Specialized Experience

Member of the ASCE Geo-Institute's Earth Retaining Structures Committee (a national committee).

Member of the National Concrete Mansonry Association's (NCMA) retaining wall design guideline committee (a national committee)

Continuing Education: taught a one-day, 8-hour course, *Designing with Geosynthetics*, December 1999 and 2000 to satisfy continuing education requirements of registered Professional Engineers.

Post-secondary teaching at UNC Charlotte:

CEGR 5272 Designing with Geosynthetics (graduate/undergraduate)
CEGR 5252 Soil Dynamics and Earthquake Engineering (graduate)
CEGR 3278 Geotechnical Engineering (undergraduate)
CEGR 3090 Soil Behavior (undergraduate)
CEGR 3212 Computer Applications in Civil Engineering.
CEGR 6278 Advanced Soil Mechanics (graduate)

Awards

Graduated Summa Cum Laude (BSCE, 1984, The Ohio State University)

Named "New Century Scholar" and selected to attend an NSF-sponsored workshop titled, "Teaching, Learning, and Your Academic Career" at Stanford University, August 1999.

Security Clearance

None

Publications

Stadler, A.T. and Ko, H.Y., **"Physical and numerical modeling of cantilever retaining walls",** Physical Modeling in Geotechnics: ICPMG '02, Phillips, Guo & Popescu (eds.), St. John's, Newfoundland, Canada, July 2002.

Stadler, Alan T., **"Performance of Geogrid-Reinforced Retaining Walls at the South Carolina State Ports Authority's Wando Terminal"**, Amherst 2k: Performance Confirmation of Constructed Geotechnical Facilities, Amherst, Massachusetts, April 2000.

Stadler, Alan T., **"Assessment Tools for ABET Engineering Criteria 2000"**, Forming Civil Engineering's Future, proceedings of the 1999National Civil Engineering Education Congress, edited by Jerry R. Rogers and Brian R. Brenner, American Society of Civil Engineers

Implementation Schedule

A detailed schedule is attached for the Meadowbrook Lake Dam Modifications Project. The schedule shows key dates, tasks, and submittals for the Design and Construction phases of the project.

The schedule shows completion of construction in 12 months.

Implementation Schedule
Meadowbrook Lake Dam Modifications
City of Novi

ID	Task Name	Duration	Start	Finish
1	**Investigate Existing Conditions**	**41 days?**	**Mon 09/03/07**	**Mon 10/29/07**
2	Scope Verification Meeting	0 days	Mon 09/03/07	Mon 09/03/07
3	DEQ Meeting	0 days	Mon 09/03/07	Mon 09/03/07
4	Public Meeting 1	0 days	Tue 10/09/07	Tue 10/09/07
5	Review existing reports	41 days?	Mon 09/03/07	Mon 10/29/07
6	**Detailed anaysis**	**30 days**	**Tue 10/30/07**	**Mon 12/10/07**
7	Develop H&H model	30 days	Tue 10/30/07	Mon 12/10/07
8	Assess structural integrity of dam	30 days	Tue 10/30/07	Mon 12/10/07
9	Conducte geotechnical investigation (if needed)	30 days	Tue 10/30/07	Mon 12/10/07
10	**Feasibility and Alternatives analysis**	**30 days**	**Tue 12/11/07**	**Mon 01/21/08**
11	Prepare conceptual sketchs	30 days	Tue 12/11/07	Mon 01/21/08
12	Prepare H&H analysis of alternatives	30 days	Tue 12/11/07	Mon 01/21/08
13	Select final design with owner	0 days	Mon 01/21/08	Mon 01/21/08
14	**Permitting**	**150 days**	**Tue 09/18/07**	**Mon 04/14/08**
15	DEQ Dam Construction Permit (Step 1)	60 days	Tue 09/18/07	Mon 12/10/07
16	DEQ Dam Construction Permit (Step 2)	60 days	Tue 01/22/08	Mon 04/14/08
17	**Construction**	**107 days**	**Mon 04/07/08**	**Tue 09/02/08**
18	Prepare documents and assist with bidding	14 days	Mon 04/07/08	Thu 04/24/08
19	Construct Project	60 days	Mon 06/02/08	Fri 08/22/08
20	Inspect Project	7 days	Mon 08/25/08	Tue 09/02/08
21	Certification/ Inspection	18 days	Wed 09/03/08	Fri 09/26/08