# CITY OF NOVI CITY COUNCIL
# APRIL 12, 2021

**SUBJECT:** Consideration of approval to award engineering design services to OHM Advisors for streambank stabilization of the Middle Rouge River north of Meadowbrook Lake, dredging of the Meadowbrook Lake tributaries, and streambank and bankfull shelf construction south of Meadowbrook Lake in the amount of $172,747.00.

**SUBMITTING DEPARTMENT:** Department of Public Works, Engineering Division

| | |
|---|---|
| **EXPENDITURE REQUIRED** | **$ 172,747.00** |
| **AMOUNT BUDGETED** | **$ 239,047.00** |
| **APPROPRIATION REQUIRED** | **$ 0** |
| **LINE ITEM NUMBER** | **210-211.00-865.146** |

**BACKGROUND INFORMATION:** Meadowbrook Lake is part of the Rouge River watershed, receiving nearly half of the City's runoff via tributaries from the Walled Lake Branch of the Middle Rouge River and Ingersol Creek. OHM Advisors completed a stream restoration study of the Middle Rouge River upstream and downstream of Meadowbrook Lake in 2020, which provided a basis of design to address streambank deficiencies along the studied reach. The proposed project will build upon the basis of design from the study to develop plans detailing streambank stabilization methods and bankfull shelf construction. Additionally, City staff and residents of the Meadowbrook Lake subdivision noted the accumulation of sediments at both tributaries to Meadowbrook Lake, so this project will also include sediment dredging at the tributaries.

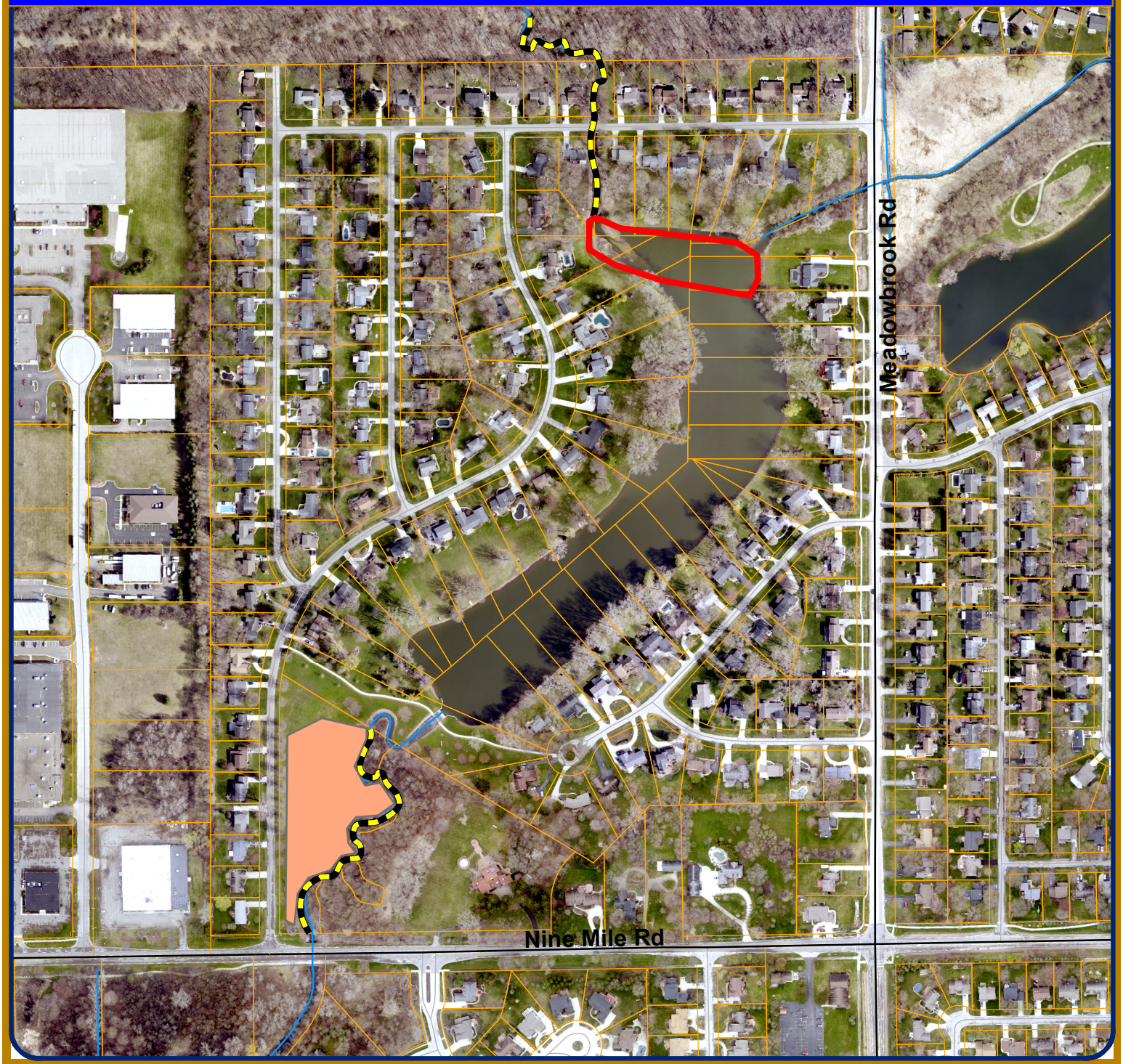
The attached design engineering services proposal outlines the detailed scope of services. The design fee for this project will be $172,747 (7.75% of the estimated construction cost of $2,229,000). OHM Advisor's engineering fees are based on the fixed fee schedule established in the Agreement for Professional Engineering Services for Public Projects. Design of this project would begin following award with construction

expected to start in spring 2022. The project will span three phases and take two construction seasons to complete.

**RECOMMENDED ACTION:** Approval to award engineering design services to OHM Advisors for streambank stabilization of the Middle Rouge River north of Meadowbrook Lake, dredging of the Meadowbrook Lake tributaries, and streambank and bankfull shelf construction south of Meadowbrook Lake in the amount of $172,747.00.

# Middle Rouge River at Meadowbrook Lake Streambank Stabilization, Inlet Dredging, and Bankfull Shelf Construction

## Location Map




Map Author: Rebecca Runkel
Date: 3/31/2021
Project: Middle Rouge @ Meadowbrook Lake
Version #: 1.0

MAP INTERPRETATION NOTICE

Map information depicted is not intended to replace or substitute for any official or primary source. This map was intended to meet National Map Accuracy Standards and use the most recent, accurate sources available to the people of the City of Novi. Boundary measurements and area calculations are approximate and should not be construed as survey measurements performed by a licensed Michigan Surveyor as defined in Michigan Public Act 132 of 1970 as amended. Please contact the City GIS Manager to confirm source and accuracy information related to this map.

Legend

- Inlet Dredging
- Streambank Stabilization
- Proposed Bankfull Shelf


City of Novi
Engineering Division
Department of Public Works
26300 Lee BeGole Drive
Novi, MI 48375
cityofnovi.org


Feet
0 85 170 340 510

1 inch = 414 feet

March 29, 2021

Ms. Rebecca Runkel
Project Engineer
City of Novi, Department of Public Works
26300 Lee Begole Drive
Novi, MI 48375

RE: Scope of Design Services
Middle Rouge Streambank Restoration & Stabilization at Meadowbrook Lake

Dear Ms. Runkel:

We are submitting this scope of services as a follow up to our prior discussions and the City's desire to prepare design documents for construction of the Middle Rouge streambank restoration project with the anticipated start of construction in the upcoming fall/winter. The following outlines our Project Understanding, Scope of Work, Schedule, and Fee for the construction phase of this project.

**Project Understanding**

We understand this project to include the engineering design of streambank and flow stabilization, along with floodplain creation, for an approximately 1,300-feet stretch between Meadowbrook Lake and the Nine Mile Road Crossing. The project will also include an additional 900-feet stretch beginning at the upstream end of Meadowbrook Lake and dredging of sediments from the inlet tributaries to the lake. The project is intended to be separated into three (3) primary construction phases. The objectives are based on the findings of preliminary design concepts and technical memorandum previously developed in August 2020 for the proposed streambank stabilization measures.

We understand the City desires for OHM Advisors to provide professional services through consistent with our on-going Agreement for Civil Engineering Services. We have attached a conceptual construction cost opinion for this project that was based on an initial review and follow up discussion with City engineering staff. The current opinion of construction cost for all three phases of work is $2,229,000.

**Scope of Services**

The scope of work for this project will be consistent with our Agreement for Civil Engineering Consulting Services between the City and OHM Advisors. This includes items related to the permitting and streambank design phase of work as outlined below:

- Data Gathering (Site Inventory, Assessment and Stream Survey)
- Hydrology and Hydraulics
- Design Basis Report
- Construction Plan and Specification Development
- Bidding and Award

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The following outlines our work plan to accomplish the scope of services for this project related to streambank restoration and dredging activities as noted above:

**Task 1 – Data Gathering (Site Inventory, Assessment and Stream Survey)**
As the first major task, we will build upon the previous site inventory and concept design. OHM Advisors will walk the river again to carefully identify other bank problem areas, and obstructions; photographing and obtaining GPS coordinates of each as needed. We will also perform additional sediment depth checks of the Lake tributaries to establish dredging location and quantities. This effort will build on the work already performed and provide better documentation of existing conditions and more detailed investigation of problem areas that will need to be addressed during construction. Specific work efforts include:

1. Attend an initial kick-off meeting with City Staff to discuss the project scope and schedule.
2. Prepare am EGLE Pre-application Meeting Request and meet with EGLE on site to determine permitting requirements and obtain EGLE input. We have assumed that the City will pay the pre-application fee as a reimbursable expense.
3. Obtain up to two additional stream cross sections, as needed, of the areas of proposed stream bank rehabilitation.
4. Contact utility companies to be assured that conflicts do not exist.
5. Perform a field inventory of the site, collecting data related to current channel conditions (degree of incision, bankfull depth, bank slope, percent of vegetative cover, existence of obstructions, man-made features, access potential, hydraulic controls, riffle/pool locations, substrate, etc.) and confirm initial recommended treatment. GPS coordinates and photos will be obtained at each identified location.
6. Perform sediment depth checks of lake tributaries for dredging quantification.
7. Coordinate with Geotechnical Engineer to obtain sediment samples for disposal of dredging material.
8. Obtain additional stream cross sections. Cross sections will include the top of bank on both sides of the stream, toe of slopes on both sides, thalweg point within stream and intermediate points across the stream channel. We estimate that an additional 2 cross sections will be obtained.
9. Refine the previously collected GPS into specific survey information for the proposed realignment of the stream
10. One-foot ground elevation contours, if needed.
11. Process topographic survey for development of base drawings. The surveyed data will be collected and presented on 24" x 36" drawings, with appropriate scales, using AutoCAD software. Survey plans will include plan (1"=100'), profile (1"=5' vertical) and cross sections (1"-10' vertical).
12. Create an access plan depicting area that can be used by contractor for access to the site and for storing of materials and equipment.
13. Tree survey work may be needed to supplement topographical survey data.

*Deliverable:*
- EGLE Pre-application Meeting Request
- Minutes of stakeholder meetings will be on file and available upon request
- Inventory portion of Design Basis (to be submitted as part of Task 4)
- Base plans

**Task 2 – Hydrology and Hydraulics**
OHM Advisors will update the existing and proposed conditions HEC-RAS models based on any observed changes in existing conditions. The revised hydraulic model along with physical stream measurements, will be used to confirm the size of a stable channel and protection measures developed during the concept design phase. Specific work efforts are as follows:

1. Prepare an updated backwater analysis using HEC-RAS for the existing and proposed conditions to

obtain final open channel hydraulic parameters. The revised data will be tabulated in an open channel summary that identifies, in locations of significance, the channel cross section location, cross section area, channel grade along with hydraulic parameters at each cross section.

2. Perform bankfull dimensionless shear stress computations in HEC-RAS and check with hand computations using core sample and cross section data. These computations will aid in determination of the stable channel/bank condition. It should be noted that to maintain stability, a stream must be able to transport the largest size of sediment and have the capacity to transport the load on an annual basis. These computations will be performed as per methods outlined in the NRCS NEH Part 64 Stream Restoration Guide.
3. Perform scour computations to determine bury depth of proposed toe/in-stream stabilization measures.
4. Prepare the hydraulic portion of the design basis outlining hydraulic findings.

*Deliverable:*

- Hydraulic portion of Design Basis (to be submitted as part of Task 4)

**Task 3 – Design Basis Report**

Under this task, OHM Advisors will compile data from the previous tasks and develop conceptual alternatives and preliminary cost estimates into a design basis report. Specific work efforts include:

1. Based on the updated proposed condition hydraulic results, prepare final conceptual sketches for restoration measures at the site. Conceptual plan views will be developed with GIS aerial backgrounds to provide a preliminary indication of access area and associated impacts.
2. Quantify sedimentation prevention benefit (load). Bank Erosion Hazard ratings and Near Bank Stress ratings will be used to estimate streambank erosion load in tons per year for both the existing and proposed (stable) conditions. The difference between the existing and proposed condition sediment loads will be used to quantify the sediment prevention benefit.
3. Compile stream data into EGLE's stream quantification tool.
4. Compile information into a design basis report and submit to the City of Novi for review and modify the Design Basis based on City comments.
5. Assist with 1 public meeting.
6. Meet with the City of Novi and modify the Design Basis based on feedback received during the public meeting. This report will be used for the EGLE Joint Permit Application submittal. Once the recommendations in the report are agreed upon, we will initiate detailed design.

*Deliverable:*

- Design Basis
- Public meeting presentation materials

**Task 4 – Construction Plan and Specification Development and Permitting**

Under this task, OHM Advisors will prepare EGLE Joint Permit Application (JPA) and construction plans/contract documents. Specific work efforts include:

1. Prepare full size 50-percent design plans including an access plan, existing conditions plan, tree clearing limits, site grading/restoration plan, and a soil erosion and sedimentation control plan. The plans will also include stream restoration, dredging locations and quantities, and SESC details.
2. Compute volumes of cut and fill for EGLE permitting purposes.
3. Provide the City with the anticipated impacts to local properties for ROW / easement acquisition. It is assumed that the City will acquire any temporary or permanent easements needed for construction.
4. Prepare preliminary schedule for proposed work including construction start, substantial completion, and final completion dates.

5. Review the geotechnical investigation by others. Incorporate the recommendations in the report into the plans and specifications as confirmed by the City.
6. Based on agreed upon conceptual treatment measures, submit 50-percent plans and specifications including compiled construction quantities, technical specifications, bid documents and advertisement.
7. Prepare SESC plan sheets for Soil Erosion review by the City.
8. Complete and submit an Inland Lakes and Streams and Floodplain permit application to EGLE. It should be noted that the City will be responsible for EGLE permit fees.
9. Prepare an EGLE JPA for NREPA Part 301 (Inland Lakes and Streams) and Part 31 (Floodplain Regulatory Authority) impacts and submit to EGLE to obtain a permit to construct the project.
10. Submit 50-percent design plans to be reviewed by the City of Novi and EGLE.
11. Based on input on 50-perecent plans, prepare plans to 100 percent for bidding purposes and/or phased construction by other means. This will include development of a final engineering cost estimate.
12. Prepare final technical specifications and method of payment entailing materials, equipment, and labor necessary to perform the work.

*Deliverables:*

- 50-, and 100-percent complete construction plans and specifications
- An engineer's opinion of probable cost

**Task 5 – Bidding and Award**

1. Attend one meeting with the City to review the plans and specifications and address any requested revisions.
2. Prepare final bid set documents for the project.
3. Assist the City with advertising and soliciting bids, printing and distributing bidding documents to interested bidders, tabulate and review the bids, check contractor references and provide a recommendation of the award of the project construction to a qualified contractor.
4. Check references for the three lowest bidding contractors.
5. Provide a recommendation of award to the City.

**Schedule**

Based on past communication with the City, the following is the anticipated schedule for this project:

- 50% plans – August 2021
- 100% plans – December 2021
- Prepare Bid Recommendation for Council Award – January 2022
- Phase 1 & 2 Tentative Construction Start – March 2022
- Phase 3 Tentative Construction Start – July 2022
- Tentative Construction Completion – December 2023

This schedule is based upon an authorization to proceed given by April 26, 2021.

**Assumptions**

The following services are not anticipated to be required for this project and have not been included at this time:

1. Permit or application fees that are necessary – to be paid by the City or as an additional reimbursable expense to OHM Advisors.
2. Coordination or design for private utility relocations or repairs.
3. Right-of-way and/or easement acquisitions – to be acquired by the City.
4. Remediation or removal of contaminated or hazardous soils or materials.
5. Existing culvert assessment and sizing, Pavement Evaluation, or Geotechnical Analysis/Report.
6. Sediment transport analysis is not included.

In the event any of these services are required by OHM Advisors, an addendum to the supplemental engineering agreement will be submitted for your approval prior to performing said services.

**Fee**

Based on the fee schedule in the Civil Engineering Consulting Services Agreement between the City and OHM Advisors, the proposed fee for this project is established as follows:

- Design Fee at 7.75% of construction cost ($2,229,000) = $172,747

A breakdown of the fee schedule by phase is as follows:

| Segment | Design Fee & Construction Cost (% of construction) | | Design Fee |
|---|---|---|---|
| **Phase 1 – Streambank Stabilization above Meadowbrook Lake** | 7.75% | $195,000 | $15,112 |
| **Phase 2 - Dredging of Lake Tributaries** | 7.75% | $1,334,000 | $103,385 |
| **Phase 3 – Streambank & Bankfull Shelf Construction** | 7.75% | $700,000 | $54,250 |
| **Total Design Fee** | | **$2,229,000** | **$172,747** |

Thank you for the opportunity to be of service. If you have any questions or require additional information, please contact me at 248-751-3111. We look forward to working with you on this project.

Sincerely,
OHM Advisors

Steve Siklich, P.E.
Project Manager

Authorization to Proceed

Signature Date

Printed Name Title

Encl: Cost Estimate

cc: Ben Croy, P.E., City Engineer
Tim Juidici, PE, OHM Advisors
Valerie Novaes, P.E., OHM Advisors

# CITY OF NOVI
## Middle Rouge Streambank Restoration
## Probable Estimate of Cost
## 3/4/2021
## Stabilization of Streambank above Meadowbrook Lake

| Item No. | Item Description | Unit | Quantity | Unit Price ($) | Cost ($) |
|---|---|---|---|---|---|
| 1 | Mobilization, Max 5% | Lsum | 1 | $ 10,000.00 | $ 10,000.00 |
| 2 | Erosion Control Allowance | Lsum | 1 | $ 7,000.00 | $ 7,000.00 |
| 3 | Clearing | Acre | 0.645 | $ 10,000.00 | $ 6,450.00 |
| 4 | Streambank Earthwork | Cyd | 6240 | $ 10.00 | $ 62,400.00 |
| 5 | Channel Pool | Ea | 5.241 | $ 500.00 | $ 2,620.50 |
| 6 | Whole Tree | Ea | 6 | $ 600.00 | $ 3,600.00 |
| 7 | Tree, Shrubs, and Live Stakes | Lsum | 1 | $ 61,000.00 | $ 61,000.00 |
| 8 | Riprap | Syd | 300 | $ 65.00 | $ 19,500.00 |
| 9 | Restoration | Syd | 7185 | $ 3.00 | $ 21,555.00 |
| | | | | | |
| | Construction Subtotal | | | | $ 195,000.00 |
| | | | | | |
| | Contingency | % | 15 | | |
| | | | | | |
| | **Construction Total** | | | | **$ 224,250.00** |
| | | | | | |
| | Design Engineering* | % Fee | 15 | | $29,250.00 |
| | Geotechnical Investigation | Lsum | 1 | $ 5,000.00 | $5,000.00 |
| | Inspection (Crew Days) | CD | 10 | $700.00 | $7,000.00 |
| | Contract Administration* | % Fee | 7 | | $13,650.00 |
| | Materials Testing | Lsum | 1 | $ 20,000.00 | $20,000.00 |
| | R.O.W. Acquisition | Lsum | 1 | $ 10,000.00 | $10,000.00 |
| | Permitting Allowance | Lsum | 1 | $ 10,000.00 | $10,000.00 |
| | Services Contingency | % | 15 | | $14,235.00 |
| | **Total Estimated Cost** | | | | **$ 333,385.00** |

* Per 'Attachment A' of the 2017-2022 Engineering Fee Table

**Assumptions**

| | Upper Segment |
|---|---|
| Proposed Length | 500 |
| Proposed Slope | 0.50% |
| Riprap | Included |
| Live Stakes | Included |
| Bankfull Shelf | Not Included |

# CITY OF NOVI
## Middle Rouge Streambank Restoration
## Probable Estimate of Cost
## 2/19/2021
## Dredging of 7,000 cyd at lake tributaries

| Item No. | Item Description | Unit | Quantity | Unit Price ($) | Cost ($) |
|---|---|---|---|---|---|
| 1 | Mobilization, Max 5% | Lsum | 1 | $ 64,000.00 | $ 64,000.00 |
| 2 | Erosion Control Allowance | Lsum | 1 | $ 5,000.00 | $ 5,000.00 |
| 3 | Dredge, Silt | Cyd | 7000 | $ 80.00 | $ 560,000.00 |
| 4 | Non-Hazardous Material Handling and Disposal | Cyd | 7000 | $ 100.00 | $ 700,000.00 |
| 5 | Restoration | Lsum | 1 | $ 5,000.00 | $ 5,000.00 |
| | | | | | |
| | Construction Subtotal | | | | $ 1,334,000.00 |
| | | | | | |
| | Contingency | % | 15 | | |
| | | | | | |
| | **Construction Total** | | | | **$ 1,534,100.00** |
| | | | | | |
| | Design Engineering* | % Fee | 8 | | $106,720.00 |
| | Geotechnical Investigation | Lsum | 1 | $ 5,000.00 | $5,000.00 |
| | Inspection (Crew Days) | CD | 20 | $700.00 | $14,000.00 |
| | Contract Administration* | % Fee | 5 | | $66,700.00 |
| | Materials Testing | Lsum | 1 | $ 5,000.00 | $5,000.00 |
| | R.O.W. Acquisition | Lsum | 1 | $ 40,000.00 | $40,000.00 |
| | Permitting Allowance | Lsum | 1 | $ 5,000.00 | $5,000.00 |
| | Services Contingency | % | 15 | | $36,363.00 |
| | **Total Estimated Cost** | | | | **$ 1,812,883.00** |

* Per 'Attachment A' of the 2017-2022 Engineering Fee Table

**Assumptions**

Based on a target average depth of 6 feet. Includes only the areas where most of the sediments are deposited and does not include dredging of the full lake bottom.

# CITY OF NOVI
# Middle Rouge Streambank Restoration
# Probable Estimate of Cost
# 3/4/2021

## Stabilization and Bankfull Shelf Construction of 1247 Feet of Streambank

| Item No. | Item Description | Unit | Quantity | Unit Price ($) | Cost ($) |
|---|---|---|---|---|---|
| 1 | Mobilization, Max 5% | Lsum | 1 | $ 34,000.00 | $ 34,000.00 |
| 2 | Erosion Control Allowance | Lsum | 1 | $ 7,000.00 | $ 7,000.00 |
| 3 | Clearing | Acre | 4 | $ 10,000.00 | $ 36,550.00 |
| 4 | Streambank Earthwork | Cyd | 35360 | $ 10.00 | $ 353,600.00 |
| 5 | Channel Pool | Ea | 30 | $ 500.00 | $ 14,849.50 |
| 6 | Whole Tree | Ea | 34 | $ 600.00 | $ 20,400.00 |
| 7 | Tree, Shrubs, and Live Stakes | Lsum | 0 | $ 61,000.00 | $ - |
| 8 | Riprap | Syd | 1700 | $ 65.00 | $ 110,500.00 |
| 9 | Restoration | Syd | 40715 | $ 3.00 | $ 122,145.00 |
| | | | | | |
| | Construction Subtotal | | | | $ 700,000.00 |
| | | | | | |
| | Contingency | % | 15 | | |
| | | | | | |
| | **Construction Total** | | | | **$ 805,000.00** |
| | | | | | |
| | Design Engineering* | % Fee | 15 | | $105,000.00 |
| | Geotechnical Investigation | Lsum | 1 | $ 5,000.00 | $5,000.00 |
| | Inspection (Crew Days) | CD | 30 | $700.00 | $21,000.00 |
| | Contract Administration* | % Fee | 6 | | $42,000.00 |
| | Materials Testing | Lsum | 1 | $ 20,000.00 | $20,000.00 |
| | R.O.W. Acquisition | Lsum | 1 | $ 10,000.00 | $10,000.00 |
| | Permitting Allowance | Lsum | 1 | $ 10,000.00 | $10,000.00 |
| | Services Contingency | % | 15 | | $31,950.00 |
| | **Total Estimated Cost** | | | | **$ 1,049,950.00** |

* Per 'Attachment A' of the 2017-2022 Engineering Fee Table

**Assumptions**

| | Upper Segment | Lower Segment |
|---|---|---|
| Proposed Length | 500 | 1247 |
| Proposed Slope | 0.50% | 0.50% |
| Riprap | Included | Included |
| Live Stakes | Included | Included |
| Bankfull Shelf | Not Included | 200' W Bank/100' E Bank |