

West Park Alternative 1 – Full Replacement of Treatment System Scope of Work

The project will consist of completing the design and preparing the necessary contract documents for removing the eight (8) AS-12 AquaSwirl Concentrator (ASC) units that were installed at West Park and replacing them with another manufacturer's units. The alternative systems will be evaluated and a recommendation will be given to the City for their approval. The work will also include modifying the existing storm sewer piping system to accommodate the new units, as well as performing necessary improvements to the diversion structures and the treatment system. As part of the design process, Orchard, Hiltz & McCliment, Inc. (OHM) will prepare a Basis of Design, which will outline the recommended treatment units, the system configuration that is to be constructed, and the results of our hydraulic modeling and analysis that will form the basis for the design. OHM will also prepare applications to the State Historic Preservation Office (SHPO) and the Michigan Department of Environmental Quality (MDEQ) for their approval and permit, respectively.

Key Project Objectives

A number of key design objectives will need to be met for the project. They include:

1. The design must allow for the treatment of first flush storm events without adverse surcharging upstream.
2. The construction must limit disruption, as much as possible, to the Park property and minimize inconvenience to the public.
3. The construction influence area, including staging limits, must be well defined in order to help maintain public safety and limit impact to the Park.
4. The proposed storm sewer treatment system, including the placement of treatment units, manholes and diversion structures, must be designed with the goal of limiting its impact on the Park and, hopefully, not expanding on the influence areas of the systems that were previously constructed.
5. The design must allow for truck access so that treatment units and adjoining structures can be maintained. This includes access by Vactor trucks for the removal of accumulated sediment and debris.
6. The design must include provisions for adjustable/removable weirs in the diversion structures.
7. The design must include provisions for the controlled venting/releasing of excess stormwater during large rain events when surcharging of the storm sewer system may occur. It would be preferable to have this water detained temporarily in the Park rather than cause potential problems elsewhere.

Work Plan

Task 1 - Conceptual Design and Evaluation

Task 1.1 - Project Kickoff Meeting

Following the notice to proceed, OHM will attend a kickoff meeting with City staff to review the project information and schedule. This meeting will identify the critical elements of the design schedule and establish the responsibilities of each team member. OHM will chair the meeting and distribute a meeting summary to those in attendance.

Task 1.2 - Data Research

The background information that was obtained during the forensic review will be reviewed to facilitate the design and prepare the contract documents. It will be important to gather any existing information in regard to project correspondence with SHPO that may have occurred during the design and construction of the West Park Renovations Project. It is assumed that this information is available and will be provided either by the City or by the County for OHM's review and use. Given the extent of the necessary modifications to the stormwater treatment systems, it is unclear whether the Park will be affected in such a way as to necessitate SHPO involvement. It is assumed that the treatment systems, including diversion

structures, treatment units and connecting pipe will need to be contained, as much as possible within the existing “footprints” of the treatment systems that were constructed at each branch of the West Park Drain. However, depending on the proposed treatment system(s), it may be necessary to excavate land areas that were not affected by the work of the previous project. This may, unfortunately, require additional review by SHPO.

All locations and conditions of existing infrastructure will be reviewed, including but not limited to, existing sanitary sewers, storm sewers, pathways and previously completed site improvements that may be affected by the construction. This information will be used to complete the design and limit disturbance, as much as possible, to the Park. In addition, the information will also be used to implement a utility layout and grading scheme that will allow for Vector truck access to the treatment units for future maintenance.

Exploratory excavations are not included as part of OHM’s proposal and are not expected to be needed. However, they could be added if desired by the City. OHM has working relationships with companies that specialize in locating underground utilities and this service can be provided to the City at an additional fee, if desired.

Task 1.3 - Evaluate Stormwater Treatment Units

OHM will evaluate possible treatment units with the understanding that the stated project goals must be met. Based on the project funding it is assumed that performance specifications will be provided as part of the contract documents, which may include a stated brand of acceptable treatment unit(s) that are deemed acceptable for construction/installation, with the inclusion of an “or equal” clause as required by SRF program. OHM will make a recommendation of an acceptable treatment unit(s) to the City.

Task 1.4 - Prepare Conceptual Layout Plan

OHM will prepare a conceptual layout plan that details the type of treatment unit(s) and system configuration that will be recommended for each branch of the West Park Drain. This information will show the relative sizes of the treatment units and planned improvements and their impact on the Park and its surface features. This information, along with a preliminary Engineer’s Opinion of Probable Construction Cost, will be provided to the City for review.

Deliverables

- Three (3) copies of Conceptual Layout Plan

Task 1.5 - Project Meeting to Discuss Conceptual Plan

OHM will attend a project meeting with the City to review and discuss comments that the City may have regarding the conceptual plan. OHM will chair the meeting and distribute a meeting summary to those in attendance.

Once the general alignment is approved by the City, the design will be further developed and a Basis of Design Report will be prepared for the City’s review and approval.

Task 1.6 - Public Open House

At the conclusion of the preparation of the conceptual layout plan, OHM attend and participate in one (1) “open house” style public meeting to present the project. Preparation of visual aids is anticipated and will be prepared. It is assumed that the City will provide a location for the meeting.

Task 1.7 - Soil Survey

OHM will review the Geotechnical Evaluation Report, dated June 11, 2009, that was prepared by Soils and Materials, Inc. (SME). It is assumed that this report will provide the necessary soil logs and information to facilitate the design and will be available for inclusion in the contract documents. No other soil investigation is anticipated at this time. However, our Work Plan does include some effort of CTI and Associates, Inc. (CTI) to assist in evaluating the site conditions, as depicted in the previously completed soil borings, to determine how they may affect the selection of new treatment units and system configuration. In addition, if the system configuration requires a change in location or extends beyond the

limits of the previous investigation, it may be necessary to obtain additional information through supplemental soil borings. If additional soil investigation is needed, OHM proposes to use CTI. We have included this work as Optional Task 5 – Geotechnical Investigation.

Task 1.8 - Topographic Survey

The exact limits of the project will be determined by the type of treatment units and system configuration approved by the City. It is assumed that the existing West Park grading plans, as prepared by Beckett and Raeder, Inc., will be used to evaluate the treatment units and alignment options for determining the preferred alternatives for each branch of the drain. Once this has occurred, it will be necessary to perform a survey at both locations, including access routes from Seventh Street, to locate critical surface features and elevations that may be affected by the construction. This information will be needed to complete the final design and prepare the required contract documents.

This survey will include gathering topographic information as necessary to verify and/or augment the site information that is already available.

OHM will collect base topographic survey for the preparation of base sheets. In addition, survey will be required to verify Park limits. This information will be obtained using a survey crew with Total Station and GPS equipment. Base sheets will be prepared in AutoCAD Civil 3D 2011 to a 1" = 20' (horizontal) and 1" = 2' (vertical) scale.

MISS DIG may be requested to physically flag the utilities in the field prior to any survey work.

The survey shall include the following:

1. Location of trees that are ornamental or with diameters greater than six (6) inches
2. Location of all above-ground features within the construction influence area
3. Adequate grade shots to generate a digital terrain model (DTM) with one-foot contours
4. Detailed existing spot elevations on all pathways and at other critical site features
5. Parcel lines will be established using a combination of existing plans and found monumentation
6. Location of existing utility structures and full structure inventories if not previously obtained during the forensic review or modeling effort performed by OHM

All survey procedures will conform to Michigan Law relative to land surveying and will be performed under the direct supervision of a Professional Surveyor licensed to practice in the State of Michigan.

Control

OHM will recover and/or reestablish the horizontal and vertical control if possible. It is anticipated that the coordinate system will be based on the City of Ann Arbor Geodetic Control Network (Horizontal: North American Datum of 1983, 1997 Adjustment (NAD83/97) and Vertical: North American Vertical Datum of 1988 (NAVD88)).

Topography

OHM will develop the survey work order and assign appropriate personnel to collect/annotate topography, investigate and describe underground utilities, locate and identify ornamental trees and trees with six-inch diameters and larger, per City requirements, establish existing alignments, and compile field notes, government corner witnesses and project reports.

Boundary Information

It is assumed that the City will provide OHM with boundary information for the Park and the "affected" parcels adjacent to the Park. It is also assumed that additional property interests, including grading permits and easements, will not be required as part of the project.

Task 1.8 - State Historic Preservation Office Application

OHM will complete the SHPO application if required, including assembling of the required information and documentation of the property that will be directly affected by the project. The extent of this application, and the required effort, will depend largely on what has been previously discussed with SHPO. It is assumed that all related correspondence and documentation will be provided by the City for OHM use. As previously stated, it is unclear as to what effect the new improvements will have on the Park property and any concerns that SHPO may have, including those that have been previously documented. It has been intimated that there may be some areas of archeological significance in the Park near the previous construction. Our proposal includes effort for submitting a project application to SHPO for their review and approval. However, it does not include the effort for performing an archeological investigation of the site.

Deliverables

- Two (2) copies of the SHPO Application

Task 2 - Preliminary Design and Document Preparation

Task 2.1 - Hydraulic Modeling

In evaluating the proposed structures, including the diversion structures and weirs, two critical components need to be assessed:

1. Setting of the weir height, which is predominantly governed by the water quality requirements, i.e. how much first flush flow needs to be diverted to the swirl concentrators
2. Setting of the weir length, which is predominantly governed by the total amount of flow the system needs to pass with the smallest amount of upstream surcharging

Although much work has already been accomplished to determine these parameters, based on the final configuration of the system and its components, fine tuning will most likely be needed to help ensure proper system performance. Effort will be included to assist the City in updating their SWMM model.

Task 2.2 - Micro Modeling

OHM will also perform a micro-level modeling as it relates to the proposed stormwater treatment units, diversion structures and interconnecting pipes. These appurtenances could introduce hydraulic losses critical to the amount of backwater generated in the system, and therefore require adjustments in the configuration of the weirs (both in height and length). While this was done for the existing system, a new iteration will be needed for the purposed system components.

Task 2.3 - Basis of Design Report

OHM will prepare a report that outlines the engineering basis that was used in the design. Narratives will be provided that outline how key design elements were selected, the rationale for sizing piping and structures, and the methodology used in sizing the diversion structures and weirs. Supporting calculations and model run data will be provided where possible. The objective will be to provide a report which outlines the methodology used in the design, with supporting documentation justifying how the treatment units were evaluated and selected. The document will also include supporting calculations, where possible.

Deliverables

- Three (3) copies of the Basis of Design Report
- Hydraulic grade line and sewer capacity based on modeling for pre-construction and post-construction simulations

Task 2.4 - Project Meeting to Discuss Basis of Design Report

OHM will attend a project meeting with the City to review and discuss comments that the City may have regarding the Basis of Design Report. OHM will chair the meeting and distribute a meeting summary to those in attendance.

Task 2.5 - Construction Plans and Specifications (70% Set)

OHM will prepare a 70% set of plans, draft contract documents and revised Engineer's Opinion of Probable Construction Cost for the City's review. The stormwater treatment system layout will be detailed, grading limits will be shown and all required work will be identified, including weir design, soil erosion and sedimentation control, and site restoration.

OHM will further develop the plans and contract documents to provide details relating to all planned improvements, including the stormwater treatment system, and sidewalk and bituminous pathway work. OHM will prepare the application for the appropriate MDEQ construction permit, as much of the work will occur in the designated 100-year flood plain.

Plans will be prepared to show required grading and restoration requirements. These plans shall be prepared by closely reviewing existing site features, minimizing impacts as much as possible, and following the requirements and recommendations of the City.

OHM will also develop construction plans and contract documents for repair, replacement and construction of stormwater treatment systems and site modification/repairs that are necessary to complete the work.

Deliverables

- Three (3) sets of 70% plans and specifications, plus electronic submittals
- Updated Engineer's Opinion of Probable Construction Cost
- MDEQ Permit Application

Task 2.6 - Project Meeting to Discuss 70% Plan Set

OHM will attend a project meeting with the City to review and discuss comments that the City may have regarding the 70% plans and specifications. OHM will chair the meeting and distribute a meeting summary to those in attendance.

Once the plan set is approved by the City, the design will be further developed for submission of the 90% set.

Task 2.7 – Construction Plans and Specifications (90% Set)

Based on the comments received from the City, OHM will prepare a 90% set of plans, draft contract documents and revised Engineer's Opinion of Probable Construction Cost for the City's review. The stormwater treatment system layout will be detailed, grading limits will be shown and all required work will be identified, including weir design and details, soil erosion and sedimentation control, and site restoration.

OHM will further develop the plans and contract documents to provide details relating to all planned improvements, including the stormwater treatment system, and sidewalk and bituminous pathway work. OHM will also prepare visual aids or handouts for presentation at one (1) Parks Advisory Commission Meeting and one (1) City Council Meeting.

Deliverables

- Three (3) sets of 90% plans and specifications
- Updated Engineer's Opinion of Probable Construction Cost

Task 2.8 - Project Meeting to Discuss 90% Plan Set

OHM will attend a project meeting with the City to review and discuss comments that the City may have regarding the conceptual plan. OHM will chair the meeting and distribute a meeting summary to those in attendance.

Once the 90% set is approved by the City, the contract documents will be further developed for final submission to the City.

Task 2.9 - Incorporate Final Comments, Print & Prepare Contract Documents and Assistance during the Project Advertisement

Upon receipt of final review comments from the City, OHM will complete any required final modifications to the contract documents and then submit the Bid set of contract documents and plan sets to the City for advertisement of the project. OHM will also submit to the City a final Engineer's Opinion of Probable Construction Costs.

OHM will assist the City during the project advertisement, including responding to plan holder questions if they should arise, preparation of addenda, and attend a pre-bid meeting.

Deliverables

- Bid quality contract documents in electronic format
- Engineer's Opinion of Probable Construction Cost

Task 3 - Construction Services

Task 3.1 - Construction Layout

OHM will provide construction survey layout services for the project. Staking will be provided for the storm sewer improvements and hard surfaces which may require relocation and/or replacement. This may include sidewalks and bituminous pathways. This will include the initial placement of the stakes and if removed by residents and/or contractor one (1) additional staking. Additional staking will be at the Contractor's expense.

Task 3.2 - Construction Inspection

OHM will provide full time on-site construction inspection services for the project. This will include, but not be limited to, the installation of treatment units, diversion and drainage structures, and storm sewer piping. It will also include full time on-site inspection for the site work that may be required as part of the project, including the removal and replacement of sidewalks and bituminous pathways, and surface restoration.

The assigned technician will monitor the installation of the specific work elements to assure substantial compliance with the plans and specifications by recording the alignment and elevation of the various work elements such as pavement removal, clearing, storm sewer and treatment unit installation, aggregate base & concrete placement, intermediate and final asphalt lifts, and restoration measurements and computations. All of these work elements require that the Contractor comply with the various City or specific project specifications or tolerances for each of the items placed. Through on the job verification, measurement and documentation of these various work elements installed, the project will be recorded for substantiation and proper payment for work completed by the Contractor. MDOT FieldBook software will be used to document the pay items completed, the materials used, and a general overview of daily progress.

For the purposes of our proposal, it is assumed that five (5) weeks of full-time inspection services at 50 hours per week will be provided.

Task 3.2 - Construction Engineering

OHM will provide construction engineering services as necessary to assist the City. Construction engineering services will include, but are not necessarily limited to, reviewing shop drawings and materials certifications provided by the contractor, attending pre-construction and progress meetings, as well as answering requests for information (RFIs) from the Contractor, resolving construction conflicts (i.e., mismarked utilities, utility conflicts, interpretation of the contract documents, etc.) Record drawings will also be provided.

Coordinating materials testing services and preparation of Daily Reports is also included under construction observation.

Exclusions

Items not included in the scope of this project are listed below:

1. Archeological Investigation
2. Construction Administration
3. Construction Testing

Optional Services

Task 4 - Additional Public Meeting

Upon the direction of the City, the following additional meeting could be added. It is assumed that this meeting will be 2 hours in length and require an equal amount of preparation time.

- Public Open House - At the conclusion of the final design phase, one (1) "open house" style public meeting may be needed to present the project. Preparation of visual aids is anticipated and will be prepared. It is assumed that the City will provide a location for the meeting.

The base proposal includes the following eight (8) meetings:

1. Project Kickoff Meeting
2. Conceptual Plan Meeting
3. Public Open House
4. Basis of Design Meeting
5. 70% Plan Set Meeting
6. 90% Plan Set Meeting
7. Pre-bid Meeting
8. Pre-con meeting

Task 5 – Geotechnical Investigation

This investigation will include performing up to four (4) fifteen-foot deep soil borings at locations to be determined by OHM.

CTI understands that the boring locations will be marked by the project surveyor. It is understood that the following conditions will need to be met.

1. CTI will be responsible for classifying all soils using the Uniform Field Soil Classification System. All field notes and soil samples shall be maintained for 60 days after submitting reports. After 60 days all soil samples shall be disposed of by the consultant.
2. OHM will check with the City Project Manager for land ownership and right of entry, if necessary.
3. CTI will conduct a field investigation, perform on-site and/or laboratory tests, record data and collect information.
4. CTI will analyze the data and the borings to develop design recommendations and report of the findings in a geotechnical investigation report.

City of Ann Arbor – Project Schedule of Key Dates

November 10, 2011.....City Council approval of PSA Amendment
November 18, 2011.....PSA Amendment Execution & Notice to Proceed
November 18, 2011.....Project Kickoff Meeting (#1)
November 29, 2011.....Conceptual Plan Meeting (#2)
December 1, 2011.....Public Open House (#3)
December 22, 2012.....Basis of Design Meeting (#4)
January 13, 2012Detailed Construction Plans and Specifications (70%)
January 20, 201270% Plan Set Meeting (#5)
January 27, 2012Detailed Construction Plans and Specifications (90%)
February1, 2012.....90% Plan Set Meeting (#6)
February 10, 2012.....100% Plan Set and Advertisement
February 29, 2012Pre-bid meeting (#7)
March 9, 2012Bids Due
April 16, 2012.....City Council Approval of Construction Contract

May 1, 2012Construction Start

June 1, 2012Construction Completion
July 29, 2012.....Submission of Record Drawings to City