

Scope of Work

This scope of work describes additional study and design activities requested by the City of Madison as regards the 'Hawks Landing Hydrology Study' Project. Specifically, the work will include final design activities for Pond D Alternative 3 as described in MSA's June 2017 study report. Additionally, MSA will provide some minor additional study work for the project to address landowner questions and collect some additional topography survey for a nearby site for the City's use for a separate project.

Task 1 – Topographic Survey.

MSA will conduct a topographic survey of the following locations (see attached map; numbered items below correspond to numbered areas on map):

1. Pond D Alternative 3. Survey will collect topographic data for an area approximately 7.5 acres in size located north and east of the northern bay of Pond C. Survey of this area will locate boundaries/edges of golf course features (tee boxes, greens, sand traps, etc.) as well as trees larger than approximately 4 inches in diameter. Survey will include topographic survey; building, lot, and pavement corners; utilities marked by Diggers Hotline, landscaping edges and permanent features for the property at 30 Turnwood Circle.
2. Pond C. Survey will expand previously collected data to the north and along the west perimeter of Pond C. This is anticipated to include collection of topographic data in the rear yards of:
 - a. 1809, 1805, 1801, and 1729 Hidden Hill Drive.
 - b. 9806, 9810, and 9814 Shadow Lane

Survey will include topographic survey; building, lot, and pavement corners; utilities marked by Diggers Hotline, landscaping edges and permanent features.

3. Hill Creek Storm Sewer Outfall. Survey will include the storm sewer system beginning at the inlets at the sag point in Hill Creek Drive and extending to the outfall at Pond D as well as topographic data for the lots to either side of the storm sewer system including the following lots:
 - a. 9609 Hill Creek Drive - The west half of the yard, both front and rear,
 - b. 9613 Hill Creek Drive - The east half of the front yard and entire rear yard
 - c. 9701 Hill Creek Drive – entire rear yard

Topographic data will also be collected on the golf course following the overland flow path between the south property lines of the previously described residential lots to the north water's edge of Pond C. The width of this survey data collection will be approximately 100-feet to either side of the low spot of this channel. Survey will include topographic survey; building, lot, and pavement corners; utilities marked by Diggers Hotline, landscaping edges and permanent features.

4. Shady Point and Hidden Hill Drive Lot Survey. Survey will include lot corners, building corners and surface topographic data for the following lots:
 - a. 1810 and 1814 Hidden Hill Drive and
 - b. 1829, 1830, 1833, and 1834 Shady Point Drive.

Additionally, topographic data will be collected for the undeveloped farm field at the northwest corner of Midtown Road and Hidden Hill Drive. Roadway cross sections will be taken within the limits defined by the residential lots to be surveyed on Hidden Hill Drive and Shady Point Drive at 25' intervals consistent with the City of Madison street survey standards.

5. Lots north of Hill Creek Drive. Survey will include lot corners, building corners and surface topographic data for the following lots as described
 - a. 9702 Hill Creek Drive – entire rear lot, east half of front lot
 - b. 9614 Hill Creek Drive – entire lot
 - c. 9610 Hill Creek Drive – entire rear lot, west half of front lot
 - d. 9606 Hill Creek Drive – entire rear lot
 - e. 9602 Hill Creek Drive – entire rear lot
 - f. Roadway cross sections will be taken at 25' intervals consistent with the City of Madison street survey standards.

Survey will also include collection of topographic data on the rear 1/3 of all lots between Sugar Maple Lane and Grassy Hollow Drive for areas not described above. Furthermore, the storm sewer running between the houses at 9702 and 9614 Hill Creek Drive will be surveyed (rim, invert, size, material, length) will be surveyed as will storm sewer in the street, complementary to storm data collected under area 3, above.

General Survey Data. MSA will call in a Diggers Locate for the survey to have public utilities marked. Survey will consist of collection of pavement surfaces, utilities, and trees over 6-inches in diameter. Existing inverts of storm structures will be obtained. The topography will include all break lines to create a map of 1-foot contours of the site. MSA will identify the property lines adjacent to the survey area (note that this may not be all parcel lines for private properties. All survey and design digital data will be provided on Wisconsin Coordinate Reference Systems – Dane Zone, U.S. Survey foot, NAD83 (201107) datum and NAVD 88 2012, feet, for vertical datum. All digital data will be provided in a form compatible with the City's hardware and software, which is currently MicroStation V8i (SELECT Series 2) on a Windows XP operating system.

Task 2 – Conduct Additional Hydrologic Analysis and Engineering Design.

Pursuant to the discussions held at a conference call between City of Madison Engineering Staff and MSA Professional Services on August 24, 2017 the level of analysis and detailed design for each study area (numbering corresponding to survey may) is as follows:

1. Area 1 - Hydrologic/Hydraulic Analysis and Design; Construction Plans, quantity estimates, and specifications or plan notes as sufficient for the golf-course owner to hire a contractor of their choice to complete construction work.

It is anticipated that design plans for Area 1 will be approximately 10 pages in total length and will include the following sheets; title sheet (1), project overview sheet (1), existing conditions (1), grading plans (3), removals & erosion control plans (2), details (2).

Per the City of Madison, it is expected that grading/earthwork may be required on the private lot at 30 Turnwood Circle.

2. Area 2 - Hydrologic/Hydraulic Analysis and Design of pond outlet (low flow and high flow) as well as overflow channel including assessment of the impact of constructed retaining walls. Construction Plans, quantities, construction estimate, and specifications sufficient for bidding out construction for work on pond outlet.

Per the City of Madison no grading/earthwork is to be conducted on lots off Hidden Hill Drive, adjacent to Pond C.

If directed by City, construction plans, quantities, cost estimate, and specification sufficient to bid construction work associated with overflow channel and retaining walls – as detailed under Task 3, below.

3. Area 3 – Hydrologic/Hydraulic Analysis including subdivision of major watersheds for up to 6 subwatersheds as directed by City. MSA to provide peak runoff rates at each subwatersheds for events up to and including the 100-yr 24-hr rainfall event.
4. Area 4 - Hydrologic/Hydraulic Analysis and Design of surface overflow structure from intersection of Hidden Hill Drive and Shadow Wood Drive to Midtown Road drainage ditch. Development of plans, quantities, and cost estimate (no specifications).
5. Area 5 - Hydrologic/Hydraulic Analysis and Design of surface collection system to pass flows to Hill Creek ROW. Development of plans, quantities, and cost estimate (no specifications).
6. Area 6 (not shown on map) - Hydrologic/Hydraulic Analysis and Conceptual Design (One (1) 11x17 plan sheet) of conceptual pond located on east drainage way immediately upstream from Pond C.

Exclusions

The scope of work includes only those elements identified above. Specifically not included in this scope of work are the following activities:

- Preparation of Landscaping Plans
- Preparation of Construction Specifications
- Preparation of Bidding Documents
- Preparation of any permit applications or payment of permit fees
- Preparation of easement documents for work outside the Hawk's Landing Golf Course property
- Attendance at any meetings

Project Schedule

MSA will complete the above listed scope of work within 90 days of notice to proceed.

Deliverables

One (1) electronic copy in PDF format of construction plans, quantities, and cost estimates as described above. One (1) electronic copy in PDF format of technical memorandum describing hydrologic and hydraulic analyses and designs as described above.

Engineering Fee

MSA will complete all activities described above for an estimated fee of \$34,100.

OPTIONAL Task3 - Retaining Wall Structural Design

MSA will design and prepare plans for up to two (2) cast-in-place concrete retaining walls – one to either side of the Pond C overflow channel. It is noted that the City's intent is to construct only one wall to the

north side of the channel; however, depending on the findings of Task 4, above, it may be in the City's interest to construct walls to either side of the channel.

It is anticipated that design plans will be approximately 5 pages per wall and will include the following sheets; general plan sheet (1), typical section and notes (1), section through wall showing reinforcement (1), railing details (1), aesthetic details (1). The plans will include a list of quantities necessary for the construction project. The anticipated aesthetic treatment includes standard form liner and concrete staining on one or both sides of the wall. If a railing is required, a standard WisDOT pedestrian railing is anticipated.

MSA will perform bidding services for this project. MSA will prepare contract documents for use in the construction contract bidding process including standard City contract requirements, bid forms, quantity estimates, and bid bond forms. MSA will prepare an advertisement for public bid and will answer contractor questions with regard to plans and specifications. MSA will review for all bids for bid completeness and adherence to contract document requirements and will tabulate bid results. MSA will also review the low-bidder's ability to perform the work based on criteria provided by City. Based on this review, MSA will write a letter making recommendations to the on the most appropriate bid(s) to be selected.

Note that it is anticipated that the retaining walls will be bid by the linear foot, including all concrete and steel reinforcement. A detailed bill of bars will not be included. The plans and bid items will reference the WisDOT Standard Specifications for Highway and Structure Construction where applicable.

Upon completion of the design, MSA will provide a total estimated cost for construction.

Exclusions

The scope of work includes only those elements identified above. Specifically not included in this scope of work are the following activities:

- Design of retaining walls greater than 75 feet in length
- Subsurface investigation. Soil borings and geotechnical report will be provided by the City of Madison.
- Design or drafting of a custom pedestrian railing that is not included in the WisDOT Bridge Manual Standard Drawings.
- Land Owner coordination of any kind, whether for survey, design, or construction access.

Project Schedule

MSA will complete the above listed scope of work within 60 days of receiving the geotechnical report.

Deliverables

One (1) electronic copy in PDF format of construction plans for the retaining walls. One (1) electronic copy in PDF format of construction specifications for the retaining walls.

Engineering Fee ESTIMATE

Additional \$24,800.

SURVEY LIMITS

