

Attachment A - Scope of Work, Fee, and Schedule



Professional Engineering Services Park Hills Drainageway

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Scope of Work

NTM, with support from our subconsultants, will provide the services outlined in the Request for Proposals (RFP) and as outlined below. Our Scope of Work is based on assumptions as identified in individual task descriptions below.

Task 1. Existing Conditions Mapping

This task involves providing an existing conditions boundary and topographic survey of the project areas. Pennoni Associates, Inc. (PAI) will provide survey services on this project. Numerous methods of gathering the required survey data were evaluated including conventional survey, laser scanning, and aerial mapping using fixed wing aircraft and/or unmanned aerial systems (drones). Due to the requirement to locate individual trees 4" DBH or greater and the drainageway detail required for stream restoration design, the entire project will be surveyed using conventional techniques.

1.1 Boundary Survey

- a. Conduct a boundary survey of the lands owned by the Township. These lands are identified in a plan recorded in Centre County in Plat Book 22, Page 3. For the purposes of this project, parcels 1, 2 and 6 as identified on this plan will be surveyed.
- b. Research existing adjoining deeds and plans, if applicable.

The boundary survey plan will be prepared in AutoCAD Civil 3D format.

1.2 Topographic Survey

Conduct a topographic survey of the project area as defined in Item 1 below. The following services will be performed and will be shown on the plan:

- a. Conventional survey practices will be utilized to locate physical features on the subject premises including buildings, roads and driveways, signs, fences, walls, utility poles, fire hydrants, limits of wooded areas, inlets and drainage structures, visible utility structures, and other visible and accessible improvements and natural features.
- b. Place a PA One-Call for the proposed site to obtain a list of utilities that have existing facilities within and adjacent to the project site. A utility contact table that lists the utility name, address, phone and fax number, and contact person for each respective utility.
- c. Show spot elevations expressed to the nearest hundredth of a foot (0.01') on hard surfaces and nearest tenth of a foot (0.1') on soft surfaces, where appropriate. Contours will be shown at 1' intervals.
- d. Horizontal control will be tied to the Pennsylvania State Plane Coordinate System (NAD83), North Zone.
- e. Elevations will be tied to the North American Vertical Datum of 1988 (NAVD88).
- f. Identify the location, size, depth, and direction of flow of sanitary sewers, combination sewers, storm drains, and culverts serving or on the property, including catch basins and manholes, and inverts of pipe at each end as visible, available, and accessible at time of survey.
- g. Identify the location of water and gas mains, and other utilities serving or on the property as visible, available, and accessible at time of survey.

- h. Identify the location of electric, cable television, telephone, communication, street lighting, and traffic control facilities serving or on the property as visible, available, and accessible at time of survey.
- i. Show on the plan the graphic location of the flood plain as determined by the current FEMA Flood Insurance Rate Map.
- j. Trees over 4" DBH will be located and tagged with a discreet aluminum tree tag denoting a specific identification number which will be recorded and shown on the plan.
- k. The plan will be prepared in AutoCAD Civil 3D format.
- l. Topographic Survey Areas: The topographic survey will extend from Devonshire Drive and follow the existing drainageway to a point where Park Hills Park opens into a grass field, approximately 2,500 linear feet. The topographic survey area will include lands owned by the Township plus additional lands defined by a swath 100-foot wide centered on the existing drainage channel. Between the drainageway and Devonshire Drive, the topographic survey will include the area between 654 and 660 Devonshire Drive, including the inlet structures on Devonshire Drive.

1.3 Monuments

- a. At corners of Township owned land where no property corner marker is found, Pennoni will set a rebar corner marker. It is estimated that up to 10 corners may need to be set, but this number could vary greatly based on what is found during the survey.

Task 2. Hydrologic and Hydraulic Analysis / Conceptual Plan

This task will include the following activities:

2.1 Project Kick-off Meeting:

- a. Key project team members will meet with Township staff to review project objectives, goals, construction cost expectations, and other pertinent project information. Although a project kick-off meeting is not explicitly identified in the RFP, this meeting is included for the consultant team and Township to share ideas, and for all members of the consultant design team to gain a clear understanding of the Township's vision and expectations.

2.2 Student Design Reports Review

- a. Review the Penn State Department of Agricultural and Biological Engineering student concept design reports.
- b. The end-product from this activity will be an opinion memo outlining the merits of incorporating any student suggested design elements into the project.

2.3 Watershed Analysis – Existing Conditions

- a. *Residents Meeting:* The residents living immediately adjacent to the drainageway will be key stakeholders in the project and have first-hand understanding of drainage and flooding characteristics in the drainageway. For these reasons we have included a residents meeting as part of the scope of work. The goal of the meeting will be to gain a greater understanding of flood impacts to adjacent properties. Residents will be invited to share information and photographs of how the channel has changed over time including during flooding events. Information from this first meeting will be used to validate the hydrologic and hydraulic

models and to inform the design. Our effort assumes that the Township will be responsible for contacting residents and setting up the meeting.

- b. *Field View:* Key H&H and stream restoration staff will conduct a detailed field view to collect information necessary for analysis and design including, but not limited to (1) high water mark identification, (2) unique drainage characteristics (direct connections to channels, head-cut and cut bank locations, etc.), (3) Manning Roughness for the channel and overbank areas, (4) bed and bank material characterization, etc. The field view will also be used to assess restoration opportunities and limitations.
- c. *Existing Conditions Hydrologic and Hydraulic (H&H) analysis:* NTM's quantitative analysis will include applying the NRCS hydrologic model to compute flow from the 1-, 2-, 10-, and 100-year storms. Peak discharges will be computed to four (4) points of interest (POIs): Devonshire Drive, Princeton Drive, Park Hills Avenue, and the Township Park. To provide a more realistic model, we have included effort to directly connected impervious area separately from overland and non-directly connected areas.

HEC-RAS will be used for drainageway Hydraulic analysis. Channel steepness coupled with the needs imposed by anticipated channel restoration techniques dictate that a detailed geometric model be developed. This model will be developed based on the results of the field survey and observations made during the field view. An existing conditions model will be developed and will be used to characterize existing flood levels, channel shear stress, velocities, and stream bed stability.

Effort is included in the scope of work to validate the H&H models. Information provided by residents and the Township will be used as a key resource for model validation.

The results of the existing conditions H&H analysis and model validation will be documented in the Conceptual Design Summary Report.

The effort proposed for the H&H analysis assumes that the Township will provide information defining the existing storm drain conveyance system in the tributary watershed. This information will be critical to assessing accurate input parameters for the hydrologic model. Our proposed effort also assumes modeling four (4) points of interest defined by the area upstream of Devonshire Drive, Princeton Drive, Park Hills Avenue, and Park Hills Park.

2.4 Restoration Concept Development

Biohabitats (BIO) will be the lead for restoration concept development.

- a. *Site Reconnaissance:* A site reconnaissance will be performed to assess and document existing site conditions. The field reconnaissance will include a qualitative survey of the project area to identify key site characteristics and features (trees, etc.) to be avoided/preserved during construction. Any invasive species will be identified and flagged for treatment prior to construction. We will also identify locations for construction access and staging.
- b. *Conceptual Design:* Multiple stabilization practices will be considered during the conceptual design process. The end result will be development of a single recommended conceptual design for the drainageway. We will use information gained from our field view and the residents meeting to inform the design. The drainageway alignment will be established to minimize utility impacts and keep the drainageway within Township lands to the extent possible.

- c. *Conceptual Restoration Plan H&H Analysis:* Our proposed effort assumes hydraulic analysis of one (1) concept design. An iterative approach to the H&H analysis may be required to inform the design and different steps in the design process. Design objectives will be to achieve a stable channel without creating unacceptable flood impacts to adjacent properties.

It is recognized that the desire to relocate the channel to be completely within lands of the Township may have impacts on the extend of flooding on adjacent properties. Our goal will be to minimize any such impacts and the associated requirement for flowage easements.

- d. *Conceptual Plans, Typical Sections, and Cost Estimates:* Conceptual plans, typical sections, and cost estimates will be prepared for each design alternative.
- e. *Conceptual Design Summary Report and Graphics:* A conceptual design summary report will be prepared. The summary report will include the results of the existing conditions H&H analysis along with presentation of proposed concept restoration plan.
- f. *Conceptual Design Presentation to Township:* We will meet with the Township to present the recommended concept. This meeting will also be used to plan the PA DEP Pre-application meeting and public plans display meeting.

2.5 Outside Presentations

- a. *PA DEP Pre-application Meeting:* Key staff members from the consultant team will attend a pre-application meeting with PA DEP to discuss the recommended drainageway restoration concept, permitting or permit waiver requirements, and MS4 pollutant load reduction considerations.
- b. *Public Plans Display Meeting:* Key staff from the consultant team will attend one (1) public plans display meeting at the Township Building. We anticipate preparing the following graphics for the meeting: (1) Role plan illustrating the proposed drainageway plan overlain on an aerial of the project area; and (2) Color rendered cross sections and perspectives of typical restoration elements. If the Township desires, we can also have concept level cost information available.

Task 3. Final Design / Construction Plans / Permitting

3.1 Final Analysis and Design

This task involves establishing final waterway geometry and grading, and completing the final H&H and channel stability analysis.

3.2 Final Construction Plan Development

- a. Complete construction drawings will be developed for each section of the drainageway. Drawings will include a cover sheet, index, location map, notes, typical sections, plans with contours at 1-foot intervals, details, and other information necessary to properly construct the project. Plans will be prepared using AutoCAD Civil 3D, release 2018 or most current. We anticipate the drawing set for each section to consist of approximately 10 sheets.
- b. A single phased Sedimentation and Erosion Control Plan (E&S) - drawings and narrative - will be prepared for the project area. We anticipate the overall E&S drawing set to consist of approximately eleven (11) sheets.
- c. Channel cross sections at 50' intervals will be prepared as supplemental drawings for each section.

- d. PennDOT 408 specifications will be used when appropriate. Special provisions will be provided for any modified or special pay items. Special provisions will be prepared in Microsoft Word format.
- e. A detailed engineer's estimate of construction costs will be prepared using PADOT pay items. Pay items will be included for select tree removal by a certified arborist and for installation of chain link fence along the entire project boundary as requested in the RFP. The pay item tabulation will be provided in Microsoft Excel format.
- f. As part of final design, we will prepare an estimated construction schedule.

3.3 Permitting

- a. *Chapter 105 Permitting:* It is our understanding that either an individual Chapter 105 (Waterway Obstruction) permit or waiver-of-permit letter (Waiver 16) will be required for this project. It is anticipated that a final determination relative to the Chapter 105 permitting approach will be determined at or shortly following the project pre-application meeting with PA DEP. We also understand that although the project may be constructed in three (3) phases, it will be treated as a "single and complete project" by PA DEP. Therefore, the project will not qualify as a "small project."

NTM will coordinate with the PA DEP and prepare all documentation necessary to secure a Waiver 16 or an individual joint permit for the entire reach. This includes preparation of the permit application, Cumulative Impact Screening Form (PASPGP-4), Pennsylvania Natural Diversity Inventory (PNDI) clearance, cultural resource notification to the Pennsylvania Historic and Museum Commission (PHMC), secure floodplain management and stormwater management analysis with consistency letters (if required), Act 14 notification, project descriptive narrative, project site color photographs with key map, environmental assessment form, H&H analysis, erosion and sediment control plan, environmental assessment, alternatives analysis, and risk assessment for submission with permit documentation.

Effort will also include preparation of a wetland absence-presence determination. Based on our preliminary field view we do not anticipate any wetland impacts in the project area.

- b. *Chapter 106 Permitting:*

A Chapter 106 permit will be required for work in the floodplain. Effort in addition to that required for the 105 permit/permit waiver includes completing the permit application, completing a parcel impact tabulation and plan, and repackaging information developed under other tasks.

- c. *Permit Assumptions:*

- i. Permitting related to relocation of utilities to be by others and is not included.
- ii. Earth disturbance outside the 100-year floodplain assumed to be less than 1 acre and an NPDES permit will not be required.
- iii. The project will not create wetland impacts.

3.4 Utility Coordination

- a. Distribute design plans to all impacted utility companies.
- b. Attend one (1) utility coordination meeting

3.5 Easement/ROW Exhibits

Easement and right-of way (ROW) exhibits suitable for recording at the Centre County Courthouse will be prepared. We will create a signed and sealed exhibit for each property impacted by easements or ROW takings. Our proposed effort assumes that 10 easement/ROW exhibits will be required.

3.6 Public Plans Display Meeting

Key staff from the consultant team will attend one (1) public plans display meeting at the Township Building during final plans development. We anticipate preparing the following graphics for the meeting: (1) Role plan illustrating the proposed restoration plan and any necessary ROW takings and/or easements; (2) Color rendered cross sections and perspectives of restoration elements. If the Township desires, we can also have project cost information available.

Professional Fee

NTM's estimated professional service fee for the Township's defined Scope of Work is **\$242,830**. This fee is based on the Scope of Work outlined above. Estimated hours and direct labor costs by task are summarized in Table 1 below. Tables 2 through 5 provide hourly rates by labor category for design team staff. Rate tables reflect current hourly rates. Staff rates are subject to change annually.

Table 1. Estimated Effort and Professional Fees

Task	Hours	Fee
Task 1. Existing Conditions Mapping ⁽¹⁾	295	\$30,900
Task 2. Hydrologic and Hydraulic Analysis / Concept Plan	565	\$74,310
Task 3. Final Design / Construction / Permitting ⁽²⁾	1,130	\$134,300
Total Direct Labor	1,990	\$239,510
Total Expense		\$3,320
Total Fee		\$242,830

⁽¹⁾ Includes setting up to 10 rebar monuments

⁽²⁾ Includes preparation of up to 10 easement/ROW exhibits

Table 2. NTM Hourly Rates

Classification	Hourly Rate
Principal	\$200
Senior Project Mgr.	\$172
Project Manager	\$146
Senior Engineer	\$125
Engineer	\$108
Design Engineer	\$102
Designer	\$81
Admin	\$55

Table 3. Biohabitats Hourly Rates

Classification	Hourly Rate
Senior Engineer	\$170
Engineer	\$135
Landscape Architect	\$115
Sr. Env. Scientist	\$115
GIS/CADD Tech	\$95

Table 4. ARRC Hourly Rates

Classification	Hourly Rate
Principal	\$135
Project Manager	\$81
Technician I	\$54

Table 5. Pennoni Hourly Rates

Classification	Hourly Rate
Senior Professional	\$155
Project Professional	\$130
Technician II	\$100
2-Person Survey Crew	\$180

Schedule

Our proposed schedule is illustrated graphically on the next page. The schedule reflects the time the design team will need to complete design tasks. The schedule also provides for Township concept and construction plan review, and PA DEP permit review. Approximate meeting times are also identified. Target milestone dates are identified below:

Contract Award: November 20, 2018

Kick off Meeting: November 21, 2018

Residents Meeting: January 3, 2019

Survey Mapping Complete: January 11, 2018

Conceptual Plan Presentation to Township: Week of April 1, 2019

Public Conceptual Plan Presentation Meeting: Week of April 22, 2019

Hydrology and Hydraulic Analysis/Conceptual Plans Complete: May 3, 2019

DEP Pre-application Meeting: week of May 6, 2019

ROW Plans Complete: Week of September 2, 2019

DEP Permit Submission: September 6, 2019

Plans Display Meeting: Week of September 16, 2019

Plans, Details and Specifications Complete: Late September 2019

Easement/ROW Exhibits Complete: Late October 2019

Waterway Permit Approval: End February 2020

Proposed Schedule

Task	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
<i>Notice to Proceed</i>	X																
<i>Kick-off Meeting</i>	X																
<i>Boundary and Topographic Survey</i>																	
<i>H&H Analysis and Concept Plans</i>																	
<i>Residents Meeting</i>			X														
<i>Concept Design Presentation to Township</i>						X											
<i>Consultant Team Response to Comments</i>																	
<i>Public Meeting</i>							X										
<i>PADEP Pre-application Meeting</i>							X										
<i>Final Design/Construction Plans/Permitting</i>																	
<i>Final Analysis</i>																	
<i>Plans, Details, Specifications</i>																	
<i>ROW Map</i>																	
<i>Township Review</i>																	
<i>Easement/ROW Exhibits</i>																	
<i>Permit Document Preparation</i>																	
<i>Submit Permit Documents</i>																	
<i>PADEP Review</i>																	
<i>Permit Comment Response</i>																	
<i>Receive Permit</i>																	
<i>Plans Display Meeting</i>																	

NTM Client Commitment

NTM Engineering carefully and continuously monitors our workloads and capacities to ensure that we meet our clients' schedules and to provide quality deliverables. NTM's principals believe that quality is paramount to success – a philosophy that resonates throughout our firm.

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