MCPB
Item No. 4B
Date: 01-21-16

Muncaster Mill Road Sidewalk, Preliminary/Final Water Quality Plan, MR2016012

Joshua Penn, Planner Coordinator, Joshua.Penn@montgomeryplanning.org, 301-495-4546
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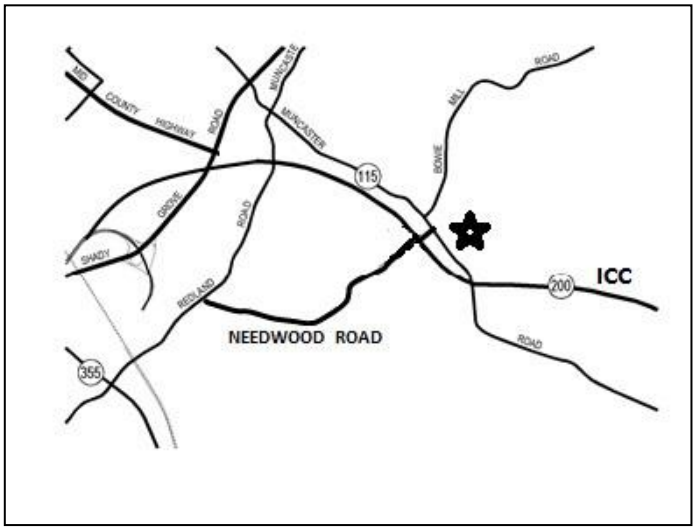
Kipling Reynolds AICP, Chief Area 3, Kipling.Reynolds@montgomeryplanning.org, 301-495-4645

Completed: 1/8/16

Description

*4B. **Preliminary/Final Water Quality Plan MR2016012: Upper Rock Creek Special Protection Area**
Construction of approximately 800 feet of six-foot-wide sidewalk along the north side of Muncaster Mill Road from Needwood Road to Colonel Zadok Magruder High School in Derwood. Master Plan: 2004 Upper Rock Creek

- Applicant: Montgomery County Department of Transportation
- Filing Date: November 23, 2015



Summary

- The review of this Mandatory Referral is in two parts:
  Item 4A - Mandatory Referral MR2016012 discussed as a separate staff report, and
  Item 4B – Preliminary/Final Water Quality Plan MR2016012.
- Staff recommends approval of the Preliminary/Final Water Quality Plan with conditions (Item 4B).
- This project is located within the Upper Rock Creek Special Protection Area (SPA) and on publicly owned property. Approval of a water quality plan is required under Section 19-62 of the Montgomery County Code. The Planning Board must take separate action on the Preliminary/Final Water Quality Plan (Item 4B) prior to taking action on the Mandatory Referral.
- This sidewalk will provide a connection between the Needwood Road Bikepath and Colonel Zadok Magruder High School where no current or proposed access exists.

RECOMMENDATION

Approval of the Preliminary/Final Water Quality Plan. Subject to the following condition:

1. The impervious surfaces are limited to the area as shown on the Impervious Surface Plan Portion of the Preliminary/Final Water Quality Plan. Impervious surfaces should be limited to no more than 29%.

SITE DESCRIPTION

The project study area includes approximately 1,000 linear feet along the north side of Muncaster Mill Road from Needwood Road to Colonel Zadok Magruder High School in Derwood. Muncaster Mill is classified in the 2004 Upper Rock Creek Master Plan as an arterial road. The road is posted at 40 miles per hour. The majority of the road remains as a two lane road except where development projects have been required to widen the road and at intersections where turn lanes have been provided.

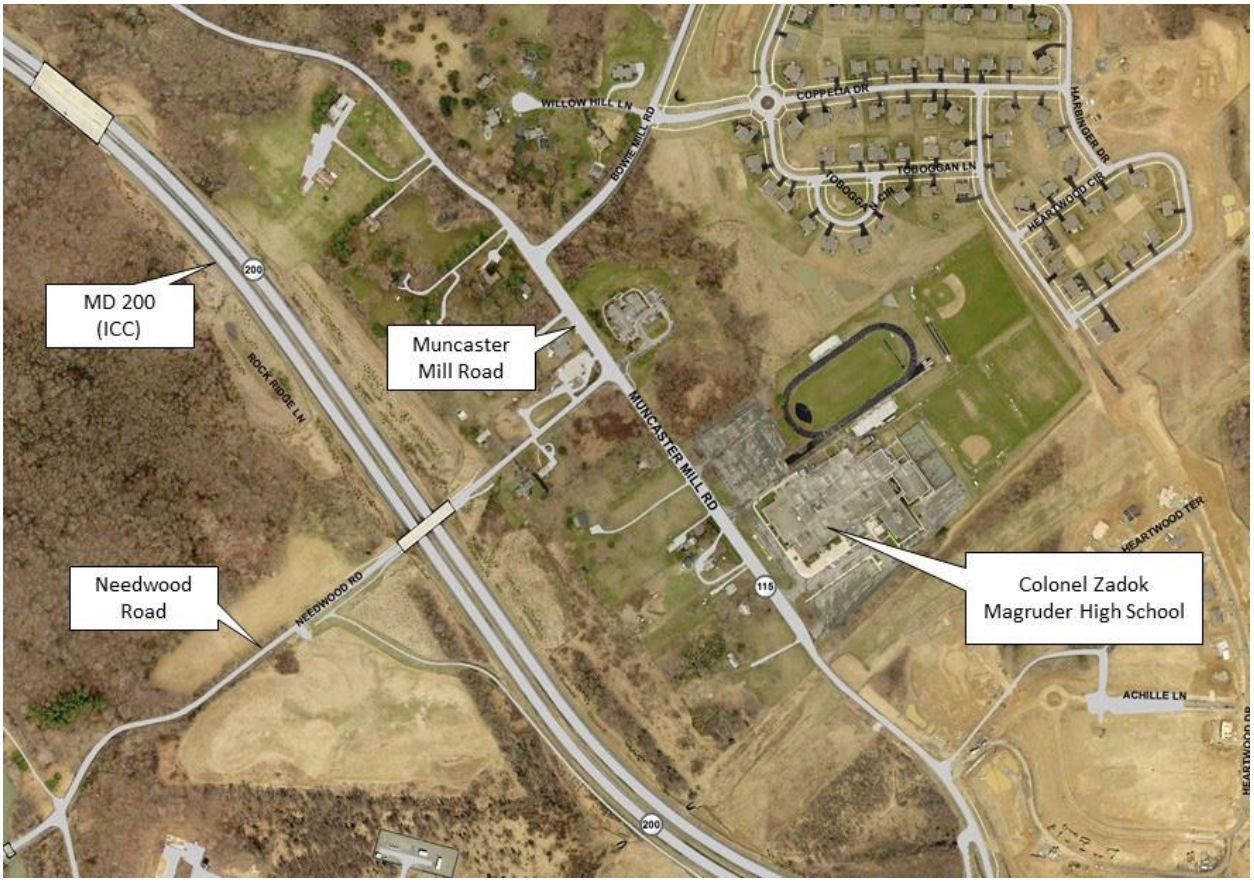


Figure 1. Project Location and Surrounding Area

Figure 2. Project Location

PROJECT DESCRIPTION
Construction of a six-foot-wide sidewalk along the north side of Muncaster Mill Road from Needwood Road to Colonel Zadok Magruder High School will connect the partially constructed and future proposed Needwood Road Bikepath (Class I shared use) with a safe and convenient pedestrian and bicycle route to the high school.

The Planning Board's action on the Preliminary/Final Water Quality Plan is regulatory and binding. The Planning Board must act on the Preliminary/Final Water Quality Plan before it finalizes its recommendations on the Mandatory Referral.

A. FOREST CONSERVATION PLAN ANALYSIS AND FINDINGS

The Application meets the requirements of Chapter 22A of the Montgomery County Forest Conservation Law.

Review for Conformance to the Forest Conservation Law

The Application meets the requirements of Chapter 22A of the Montgomery County Forest Conservation Law. The Application is exempt from submission of a forest conservation plan. A forest conservation exemption (#42015194E) was granted under the provisions of Section 22A-5(e) as "a State or County highway construction activity…" M-NCPPC Staff confirmed the exemption in a letter dated May 4, 2015 (Attachment A).

While the project is exempt, the applicant is still required under section 22A-9 of the County code to:

a) Minimize forest cutting, clearing, and loss of specimen trees to the extent possible while balancing other design, construction, and environmental standards. The constructing agency

must make a reasonable effort to minimize the cutting or clearing of trees and other woody plants.

b) If the forest to be cut or cleared for a County highway project equals or exceeds 20,000 square feet, the constructing agency must reforest a suitable area at the rate of one acre of reforestation for each acre of forest cleared.

c) Mitigation for loss of specimen or champion trees. Mitigation amounts are based on the size and character of the tree.

The sidewalk along Muncaster Mill Road has no forest clearing and minimal impacts to large and specimen trees. The applicant has minimized the limits of disturbance, minimizing the amount impacts to large and specimen trees. However to project still has impacts to two specimen trees and three large trees, so a tree save plan has been provided to highlight tree protection measures (ex. root pruning, tree protection fencing, and trenchless silt fencing) to be used during construction.

Environmental Guidelines

The project area does not contain any environmental buffers, streams, and other sensitive features. The project is within the Upper Rock Creek watershed, a USE III designation. The Countywide Stream Protection Strategy (CSPS) rates the water quality in this watershed as in good condition.

The project proposes no forest removal, no impacts to the Stream Valley Buffer (SVB), and no impacts to the 100-Year-Floodplain. There are no environmental impacts associated with the Muncaster Mill Road Sidewalk project.

B. SPA WATER QUALITY PLAN ANALYSIS AND FINDINGS

The Application meets the Water Quality Plan requirements of Chapter 19 of the Montgomery County Code and the impervious requirements of the Upper Rock Creek Environmental Overlay Zone.

<u>Review for Conformance to the Special Protection Area Requirements</u>

This project is located within the Upper Rock Creek SPA and on publicly owned property. It is required to obtain approval of a water quality plan under Section 19-62(c) of the Montgomery County Code. This section of the code states:

Publicly owned property. Before engaging in any land-disturbing activity on publicly owned property in an area designated as a special protection area, the applying agency or department should prepare a combined preliminary and final water quality plan.

As part of the requirements of the Special Protection Area law, a SPA Water Quality Plan should be reviewed in conjunction with a Mandatory Referral. Under Section 19-65, the provision of the law, the Montgomery County Department of Permitting Services (MCDPS) and the Planning Board have different

responsibilities in the review of a Water Quality Plan. MCDPS has reviewed and conditionally approved the elements of the water quality plan under its purview. The Planning Board's responsibility is to determine if environmental buffer protection, SPA forest conservation and planting requirements, and limits on impervious surfaces have been satisfied.

County DPS Special Protection Area Review Elements

In a letter dated November 2, 2015, MCDPS has conditionally approved the elements of the SPA Preliminary/Final Water Quality Plan under its purview with a synopsis provided below (Attachment B).

Site Performance Goals

As part of the Preliminary/Final Water Quality Plan, the following performance goals were established for the Property:

1. Storm flow runoff increases are to be minimized.
2. Sediment loading is to be minimized during construction; redundant erosion control treatments may be required.
3. Stormwater management will be provided in the form of Environmental Site Design to the Maximum Extent Practicable (ESD to the MEP).

Stormwater Management

Stormwater management for the Project will be provided by non-rooftop disconnection, a bio-swale, and a rain garden.

Sediment Control

An engineered sediment control plan must be submitted for this project prior to permitting.

BMP Monitoring

Required BMP monitoring will be performed by the Montgomery County Department of Environmental Protection (DEP) with the Applicant(s) required to pay a fee for this monitoring.

Planning Board Special Protection Area Review Elements

Staff recommends Planning Board approval of the elements of the SPA Water Quality Plan under its purview.

Environmental Buffer Protection

A Natural Resources Inventory and Forest Stand Delineation (NRI/FSD) was included as part of the Forest Conservation Exemption Request #42015194E, which was approved by Staff on May 4, 2015. There are no streams, floodplains, wetlands, or environmental buffers affected by the Project.

Impervious Surfaces

A main goal for development in all SPAs is to reduce the amount of impervious surfaces. The Environmental Overlay Zone for the Upper Rock Creek SPA imposes an eight percent imperviousness limit for new projects within the SPA that are serviced by public water and sewer. However, in the applicability section there is a clause for public projects that excludes public facilities from complying with the eight percent impervious cap. More specifically, section 59-C-18.242 of the Montgomery Zoning Ordinance states:

> All public projects are subject to the provisions of this overlay zone, however, these provisions are not intended to preclude the development of public facilities. Such facilities must conform to the water quality plan submission and review requirements established in the Montgomery County Code, Chapter 19, Article V, and keep imperviousness to the minimum needed to accomplish the public purpose intended.

This section identifies that public projects are not subject to the 8% imperviousness cap, but the project must minimize impervious surfaces to the amount needed to achieve the public purpose intended.

The area of the project within the SPA is approximately 0.45 acres and currently has .03 acres of imperviousness or 7%. The proposed sidewalk and roadway improvements will add an additional .10 acres of imperviousness for a total of 0.13 acres of the 0.45 acre area or 29%. The imperviousness percentage is inflated based upon using only the project area as the total area. The Sidewalk is being built to current standards and no unnecessary impervious surfaces have been used.

Planning staff believes that the applicant has minimized the total amount of impervious surface while maintaining the public purpose.

CONCLUSION

Staff recommends the Planning Board approve the Preliminary/Final Water Quality Plan with conditions specified above.

ATTACHMENTS

A. Forest Conservation Exemption
B. Department of Permitting Services (MCDPS) Preliminary/Final Water Quality Plan approval letter
C. Water Quality Report and Appendices

ATTACHMENT A

MONTGOMERY COUNTY PLANNING DEPARTMENT
THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

May 4, 2015

Mr. Bruce Johnston, Chief
Montgomery County Dept. of Transportation
100 Edison Park Dr., 4th Floor
Gaithersburg, MD 20878

Re: Forest Conservation Exemption 42015194E
Needwood Road Bike Path/Trail; Muncaster Mill Road Sidewalk

Dear Mr. Johnston:

Based on the review by staff of the Montgomery County Planning Department, the Forest Conservation Exemption submitted on April 22, 2015 for the plan identified above, is confirmed. The project site is exempt from Article II of the Montgomery County Code, Chapter 22A (Forest Conservation Law), Section 22A-5(e) because the site is a State or County highway construction activity that is subject to Section 5-103 of the Natural Resources Article of the Maryland Code or Section 22A-9 of the Forest Conservation Law. Sec. 22A-9 General. (1) applies to construction of a highway by the County as part of an approved Capital Improvements Program project. (2) The construction should minimize forest cutting or clearing and loss of specimen or champion trees to the extent possible while balancing design, construction, and environmental standards. The agency must make a reasonable effort to minimize the cutting or clearing of trees. (b) If the forest to be cut or cleared for a County highway project equals or exceeds 20,000 square feet, the agency must reforest a suitable area at the rate of one acre of reforestation for each acre of forest cleared. (c) Reforestation for County highway project must meet the standards in subsections 22A-12(e), (g), and (h). (d) Any mitigation requirement for loss of specimen or champion trees must be based on the size and character of the tree.

A pre-construction meeting is required after the limits of disturbance have been staked prior to clearing and grading. The following persons should attend this meeting; project manager, private arborist, construction superintendent, forest conservation inspector, and the Montgomery County sediment control inspector. If you have any questions regarding these actions, please feel free to contact me at david.wigglesworth@montgomeryplanning.org or at 301-495-4581 .

Sincerely,
David Wigglesworth
Sr. Planner
Development Application and Regulatory Coordination Division

Cc: 42015194E
Rebecca Park (MC-DOT)
Stacey Thompson Gill. (JMT)

ATTACHMENT B

DEPARTMENT OF PERMITTING SERVICES

Isiah Leggett
County Executive

Diane R. Schwartz Jones
Director

November 2, 2015

Mr. David Adams
Johnson, Mirmiran & Thompson
72 Loveton Circle
Sparks, Maryland 21152

Re: Preliminary/Final Water Quality Plan Request for
Needwood Road Bike Path/Trail
SM File #: 279955
Tract Size/Zone: 0.447 acres/Right-of-Way
Total Concept Area: 0.447
Watershed: Upper Rock Creek

Dear Mr. Adams:

Based on a review by the Department of Permitting Services Review Staff, the Preliminary/Final Water Quality Plan for the above mentioned site is **acceptable**. The Water Quality Plan proposes to meet required stormwater management and water quality goals via a combination of non-rooftop disconnection, a bio swale, and a rain garden.

The following **conditions** will need to be addressed **during** the detailed sediment control/stormwater management plan stage:

1. A detailed review of the stormwater management computations will occur at the time of detailed plan review.

2. An engineered sediment control plan must be submitted for this development.

This list may not be all-inclusive and may change based on available information at the time.

Payment of a stormwater management contribution in accordance with Section 2 of the Stormwater Management Regulation 4-90 **is not required**.

This letter must appear on the sediment control/stormwater management plan at its initial submittal. The concept approval is based on all stormwater management structures being located outside of the Public Utility Easement, the Public Improvement Easement, and the Public Right of Way unless specifically approved on the concept plan. Any divergence from the information provided to this office; or additional information received during the development process; or a change in an applicable Executive Regulation may constitute grounds to rescind or amend any approval actions taken, and to reevaluate the site for additional or amended stormwater management requirements. If there are subsequent additions or modifications to the development, a separate concept request shall be required.

ATTACHMENT C

NEEDWOOD ROAD BIKE PATH/TRAIL
Special Protection Area Design Report

Montgomery County, MD

PREPARED FOR:

Department of Transportation,
101 Monroe Street, 10th Floor
Rockville, Maryland 20850

PREPARED BY:

JOHNSON, MIRMIRAN & THOMPSON
Engineering A Brighter Future®
72 Loveton Circle, Sparks, MD 21152
Telephone: (410) 329-3100; Fax: (410) 472-2200; WEB: WWW.JMT.COM

JMT Job No. 13-0605-001
CIP No. 501304

September 14, 2015

Department of Permitting Services
255 Rockville Pike, 2nd Floor
Rockville, MD 20850-4166
Phone: 311 in Montgomery County or (240)-777-0311
http://www.montgomerycountymd.gov/permittingservices/

DPS

Application for Stormwater Management Concept

Stormwater Concept Application # 269036

A. Project Information

Project Name/Subdivision: Needwood Road Bike Path/Trail Property Size/Area: 0.447 Acres

Property Address/Location: 5900 Muncaster Mill Road (Address) Derwood/MD (City/State) 20855 (Zip)

B. *Owner/Applicant Information*

Name Department of Transportation - Division of Transportation Engineering (Property Owner's name) Bruce Johnston

Mailing Address 100 Edison Park Drive, 4th Floor (City) Gaithersburg, MD (State) 20878 (Zip Code)

Cell Telephone N/A Work Telephone 240-777-7236 Email Bruce.Johnston@MontgomeryCountyMD.gov

C. Engineer Information

Name Johnson, Mirmiran & Thompson (Firm Name and/or Contact Person) David Adams

Mailing Address 72 Loveton Circle (City) Sparks, MD (State) 21152 (Zip Code)

Cell Telephone N/A Work Telephone 410-329-3100 Email dadams@jmt.com

D. Type of Application (Check One)

See "Stormwater Management Concept Application Categories" on the reverse of this application for explanation.

☐ Stormwater Concept ☐ Site Development Stormwater Management Plan

☐ Combination Concept/Site Development Stormwater Management Plan

☐ SPA Preliminary Water Quality Plan (PWQP) ☐ SPA Final Water Quality Plan (FWQP)

☐ SPA Combination PWQP/FWQP ☒ SPA Water Quality Inventory

E. Type of Submittal (Check One)

☒ ***New*** ☐ ***Resubmittal**** ☐ ***Revision**** ☐ ***Reconfirmation****

* For Resubmittal, Revision and Reconfirmation provide original Stormwater Concept #: _____

Preliminary Plan # (if applicable): N/A Watershed Name/Class (I-IV): Washington Metro Area

Lot(s): Various Block(s): N/A Parcel(s): Various

Subdivision: N/A Municipality: N/A

I declare and affirm, under penalty of perjury, that to the best of my knowledge, information and belief all matters and facts in this application are correct. I declare that I am the owner of the property or duly authorized to make this application on behalf of the owner.

Signature: _____ (Signature Property Owner or Authorized Agent) Scott A. Miller (Printed Name) 9/15/2015 (Date)

E. Conditions of Approval

At a Minimum, All Stormwater Management Concept applications must include:

1. Completed application with original signature.
2. Description of application fee category and determination of fee amount submitted separately and attached to the application.
3. Check made payable to Montgomery County, MD.
4. One (1) cover letter with justification for the proposed Stormwater Management Concept.
5. One (1) copy of grading or site plan which include:
   - A. Vicinity map.
   - B. Existing and proposed grading.
   - C. Impervious areas and improvements.
   - D. Existing and proposed drainage areas. Location of study points used for calculations. If flows beyond study points converge off-site, give distance to convergence.
   - E. Off-site drainage and outfalls.
   - F. Downstream conditions.
   - G. If the site drains to an existing storm drain system, provide a schematic drawing of the storm drain layout on 200' scale topography detailing the system from the point of inflow to the existing outfall.
   - H. The proposed development showing streets; parking lots; topography; 100-year floodplain (cite study approval authority) and flow paths; existing or proposed easements for storm drains, sewers, and other utilities; building locations; locations of springs, seeps and wetlands; and major soils groups.
   - I. In Special Protection Areas (SPA) One copy of the plans, computations and a sediment control concept must be submitted to the following agencies: DPS, DEP Watershed Management and MNCPPC (Environmental).
6. One (1) copy of notifications to downstream property owners, with receipts, per Executive Regulation 7-02AM.
7. One (1) copy of **approved** Natural Resources Inventory and Forest Stand Delineation for developments that are required to go through preliminary or site plan review.
8. The location, type, and hazard class of all proposed on-site stormwater management facilities, including preliminary design. Topography, profiles, and cross sections as necessary to show that the design is feasible and that the correct design assumptions are used.
9. Results of in-place soil testing. Refer to Montgomery County "Soil Testing Guidelines for Stormwater Management Practices".
10. One (1) copy of computations showing the adequacy of existing public or private drainage systems.

GENERAL NOTES:

1. Incomplete or improperly prepared submissions will be returned without review.
2. The application package must be submitted in sets and all plans must be folded **no larger than 8-1/2" x 14"**.
3. **If the project is located in a designated "Special Protection Area" contact MCDPS for additional requirements.**
4. Applications are not considered received until they are accepted for review.
5. DPS may require additional information as deemed necessary during the review process.

STORMWATER MANAGEMENT CONCEPT APPLICATION CATEGORIES*:*

Stormwater Concept – The first stage of review for projects that will be going to Site Plan. Followed by Site development Concept prior to Site Plan approval.

Site Development Stormwater Concept – The final conceptual review stage for projects that will be going to Site Plan.

Combination Concept/Site Development – For all projects that are not going to Site Plan, or for projects that are going through a combined Preliminary/Site Plan process.

SPA PWQP - The first stage of review for Special Protection Area projects that will be going to Site Plan. Followed by FWQP prior to Site Plan approval.

SPA FWQP - The final conceptual review stage for Special protection Area projects that will be going to Site Plan.

Combination SPA PWQP/FWQP - For all projects that are not going to Site Plan, or for projects that are going through a combined Preliminary/Site Plan process or are going to Mandatory Referral.

SPA Water Quality Inventory – A conceptual stormwater and sediment control review for Special Protection Area projects exempt from PWQP/FWQP requirements.

Section 8 – Water Quality Inventory

A. Elements of Water Quality Inventory – The applicant's water quality inventory submission must include the following:

1. Stormwater Management Concept Plan – All stormwater management concepts must be designed in accordance with Chapter 19, Article II, Montgomery County Code, Maryland Law, and all associate regulations.

JMT: Please see attached Special Protection Area planset and SPA Design Report. We believe the design to be in accordance with the County Code regulations.

2. Sediment Control Concept Plans.

i) All sediment control concept plans must be designed in accordance with Chapter 19, Article I, Montgomery County Code, Maryland Law, and associate regulations.

ii) Sediment control plans must include phased land disturbance and provisions for prompt stabilization.

iii) Land disturbing activities must be kept to a minimum through staging and phasing of all construction activities.

JMT: Please see attached Special Protection Area planset. We believe the design to be in accordance with the County Code regulations.

3. Documentation of Impervious Areas – A plan describing the proposed development which minimizes impervious areas and, if applicable, meets imperviousness limits for the project as are required in a land use plan, watershed plan, comprehensive water and sewerage system plan, or specified in a County Council resolution designating a SPA.

JMT: Please see attached SPA Design Report.

4. Additional Documentation – Documentation showing avoidance, minimization, or proposed mitigation for impacts on environmentally sensitive areas, and on priority forest conservation areas as specified in the Planning Board's Environmental Guidelines. Documentation must also include:

i) Rationale in narrative form that any proposed encroachment is both necessary and unavoidable in that location; and

ii) Description as to how flexibility in Chapter 59 of the County Code ("Zone Ordinance") and other County regulations has been utilized (e.g. percent housing mix, minimum lot size, reduced width street right-of-way, "environmental" primary cross section) to avoid and minimize impacts.

JMT: The proposed work within the SPA limits of disturbance does not impact environmentally sensitive areas or priority forest conservation areas. Please see attached Special Protection Area Design Report for full description of work within the SPA limits of

disturbance.

5. **Other –** Any other information required in the Technical Manual.

   JMT: Please see attached Special Protection Area Design Report for full description of work within the SPA limits of disturbance.

Section 9 – Water Quality Plan Submissions

A. **Elements of the Preliminary Water Quality Plan –** Preliminary Water Quality Plans must include:

1. **Water Quality Inventory.**

   *JMT: Please see JMT explanations for **Section 8 – Water Quality Inventory** above.*

2. **Description of the proposed development project –** This must be in tabular or note form and include:
   i) All information as required on the Department's current stormwater management concept plan application form;

   ii) Zoning, with appropriate standards;

   iii) Type and number of dwelling units allowed and proposed;

   iv) Overall impervious area and impervious area outside of sensitive areas, with density and related impervious area assumptions specified ("typical" or average lot may be used); and

   v) Amount (acreage) and percentage of environmental sensitive areas disturbed, preserved, and in total.

   JMT: Please see attached Special Protection Area planset and SPA Design Report.

3. **Documentation of applications to State and Federal agencies for wetland permits –** When applicable, this documentation shall be in the form of written acknowledgement by the receiving agency, that all applications have been accepted for review. Documentation of proposed wetland mitigation measures should also be submitted.

   JMT: There are no wetlands within the SPA limits of disturbance.

4. **Description of other mitigation techniques –** Environmental protection techniques and plans, including those not otherwise required by law, regulation, or guideline, which are included in the preliminary water quality plan must be described in writing. This description should indicate how the following sediment and erosion control, stormwater management, and other water quality protective measures, are incorporated within the water quality plan or, if not included, provide justification acceptable to the Department:

   i) Linked BMP systems – BMP application will be linked in series to progressively minimize sediment and stormwater impacts wherever possible.

ii) Stabilization Requirements – Vegetative stabilization of perimeter controls and areas specified must occur within three days of installation of temporary sediment and erosion control structures.

iii) Phased Grading – Phased grading to minimize land disturbance during the development and construction process.

iv) Roads –

a. The requirement for open section roads shall not be waived except as provided in Chapter 49 of the County Code.

b. If open section roads cannot be implemented where they would normally apply, options for reducing road width or other means to reduce impacts of impervious surfaces on the stream hydrology, water quality, and aquatic life must be considered.

v) Stream Buffers – All county stream buffers will be shown on all water quality plan maps showing sediment and erosion control plans or stormwater management control plans. Stormwater and sediment control structures are not to be placed within the stream valley buffer except as approved by the Department and the Planning Board.

vi) Ground Water Recharge – Opportunities to provide recharge of clean stormwater into the ground water supply will be maximized. Stormwater requiring treatment will be conveyed to a water quality treatment best management practice.

JMT: Please see attached Special Protection Area planset and SPA Design Report.

5. Documentation of anticipated performance – Each proposed BMP or group of BMPs must be documented to show how it will achieve the performance goals selected for the site.

JMT: Please see attached SPA Design Report.

6. BMP monitoring plan – Monitoring plans must meet the requirements specified in the pre-application meeting and identify:

i) Performance goals established for the site and for any specific best management practices.

ii) A description and characterization of the BMPs chosen for the monitoring plan. The characterization of and description of the BMP will meet the minimum required in the pre-application meeting.

iii) A description and characterization of the monitoring protocol, as established by the Department, that will include:

a. Methods

b. Frequency of data recording.

c. Length and season of monitoring.

d. Data analysis (including statistical and graphical analysis).

e. Report milestones.

iv) The protocols to use for specific BMP monitoring are those supplied during the pre-application meeting. The monitoring protocols are designed to provide biologically meaningful information about the BMP performance and changes in stream water quality.

v) The final BMP's monitoring program and monitoring timeline approved by the Department will be submitted along with the applicant's final water quality plan. Upon approval, the monitoring program will be implemented according to the approved timeline.

JMT: Montgomery County Department of Transportation is still working through final ownership of these facilities. If the facilities are to be owned by State Highway Administration the facilities will be inspected on a three (3) year cycle per Chapter 3 of the SHA NPDES program, Standard Procedures Manual. If the facilities are to be owned by Montgomery County Department of Environmental Protection they will be inspected on a tri-annual basis.

B. Elements of Final Water Quality Plans – The plan must include:

1. **Final stormwater management concept plan** approved by the Department.

   JMT: Please see attached Special Protection Area planset and SPA Design Report.

2. **Final sediment control concept plan** approved by the Department.

   JMT: Please see attached Special Protection Area planset.

3. **Final BMP monitoring plan** approved by the Department. The final BMP monitoring plan must contain:

   i) Final narrative and numeric performance goals to use to monitor the effectiveness of the BMPs.

   ii) Documentation and basis for the numeric goals.

   iii) Final selection of BMPs chosen for the monitoring plans, including best management practice design characterization.

   iv) Final BMP monitoring protocol.

   v) Final methods for data collection, handling, analysis, and reports including monitoring frequencies, monitoring duration and season.

   vi) Schedule for implementing BMP monitoring and reporting requirements.

JMT: Please see attached SPA Design Report and JMT explanation of ***Section 9.A.6.***

4. **Water quality certification and wetlands disturbance permits** as required by state and federal agencies, or if not yet issued, progress reports acknowledged by state and federal agencies.

   JMT: Permit coverage under the Maryland General Permit NOI was applied for on 2/27/2015. The water quality certification will be received after the project receives DPS SWM and ESC approval.

5. **Other –** Terms, conditions, and requirements as established in the approved preliminary water quality plan or in case of a preliminary water quality plan in conjunction with a development approval before the District Council; the terms, conditions, and requirements as required to be revised by the Planning Board or the Department to conform to the District Council action on the development plan, schematic plan, or diagrammatic plan.

   JMT: Please see attached Special Protection Area planset and SPA Design Report.

Table of Contents

1. Introduction

On behalf of the Montgomery County Department of Transportation, Johnson, Mirmiran & Thompson (JMT) has completed this Design Report submittal for the Special Protection Area of the Needwood Road Bike Path/Trail project site located in Montgomery County under CIP No. 501304.

This report identifies all Environmental Site Design (ESD) opportunities, evaluates options and alternatives, and proposes best management practices to the Maximum Extent Practicable (MEP) to provide stormwater management for the Special Protection Area of the project site. The stormwater management approach for the project is to provide stormwater management (SWM) using Environmental Site Design (ESD) to the MEP for all impervious surfaces within the Needwood Road Bike Path project Special Protection Area limits of disturbance. The intent of this design is that proposed facilities used to achieve the project objective are nonstructural and micro-scale practices as described in the Maryland Stormwater Design Manual, Chapter 5 and/or the standards, specifications and details as developed and approved by Montgomery County DPS. The use of proprietary practices, alternative surfaces and/or methods other than nonstructural and micro-scale practices, such as Structural BMP's as identified in Chapter 3 of the Maryland Stormwater Design Manual, is considered on a case by case basis as approved by the DPW Project Manager and DPS.

The project is linear in nature as it is the widening and extension of existing sidewalk. The project is bounded by roadway and natural features throughout its entire length. All non-structural ESD and ESD micro-scale practices were considered for implementation on the project. It was determined that the following practices were most suitable for the SPA portion of this project: bio-swale, rain garden, and non-rooftop runoff disconnection. There are currently no existing stormwater management facilities within the project area.

2. Scope of the Report

The scope of this report is as follows:

- Determine the extent of the project area, which is defined as areas within the proposed Limits of Disturbance (LOD)
- Determine hydrologic soil groups from the Natural Resources Conservation Service (NRCS) Web Soil Survey and Soil Boring Classifications
- Determine the existing and proposed conditions within the project area
- Determine SWM quality control requirements using the Montgomery County Department of Permitting Services, Water Resources Technical Policy #5 'Computation of Required ESD Volume'
- Identify locations where ESD BMP placement is practicable
- Design ESD BMPs to the MEP

3. Sources of Information

- Site Investigation - September 17, 2014
- Site Topographic Survey Information, performed by JMT, August 2014
- Google Earth
- ADC Maps
- Montgomery County GIS Data
- FEMA FIRMette Maps, Panel 215
- Maryland Watershed Maps
- Natural Resources Conservation Service (NRCS) Web Soil Survey
- Soil Boring Classification, June 2015, and July 2015
- Montgomery County DPS Water Resource Documents
- 2000 Maryland Stormwater Design Manual, Volumes I & II and Supplement No. 1
- Environmental Site Design (ESD) Process & Computations, MDE, July 2010
- Report of Subsurface Exploration and Associated Geotechnical Evaluation (KIM Engineering)

4. Site/Project Description

The full project scope includes the design elements; a widening/extension of an eight (8) foot wide shared-use path along the south side of Needwood Road for a distance of over 9,000 linear feet starting at the western most intersection the Deer Lake Road and Needwood Road to the connection with the ICC trail terminus near the ICC crossing (this includes extensive roadway work where Needwood Road crosses Needwood Lake), an extension of an eight (8) foot wide shared-use path along the south side of Needwood Road for a distance of less than 250 linear feet starting at the eastern terminus of the ICC trail terminus to the proposed connection to the Alfred House-Needwood Road project sidewalk (Preliminary Plan Number 120120300), and the widening/extension of an eight (8) foot wide sidewalk along the eastern side of Muncaster Mill Road from the intersection of Needwood Road and Muncaster Mill Road to Colonel Zadok Magruder High School.

The portion of the project along Muncaster Mill Road lies within the Upper Rock Creek Special Protection Area. The analysis and design for the SPA portion of the project are the focus of the remainder of this report and the attached appendices and planset.

Proposed work along Muncaster Mill Road includes the following items: signal modification, curb replacement, sidewalk widening and extension, and construction of stormwater management facilities.

The Needwood Road Bike Path project is located in Rockville, Maryland. The entire project area is located within the Rock Creek watershed (02-14-02-06) of the Washington Metropolitan Area. The project does not fall within the Chesapeake Bay Critical Area designation and is not located in the 100-year or 500-year FEMA floodplain. The SPA portion of the project area consists of open space, roadway, and sidewalk. The SPA project area is approximately 0.447 acres of which approximately 6.94-percent or 0.031 acres is impervious surface in existing conditions. For proposed conditions, the SPA project area is unchanged, 0.447 acres, of which approximately 28.40-percent or 0.127 acres is impervious. Based on the existing and proposed conditions the required ESDv is 671 cf with an overall target P_E of 1.35". The impervious distribution for the project site is summarized in **Table 1** and the impervious responsibility is summarized in **Table 2**. Please see Appendix VI for ESD requirement computations.

Table 1: SPA Impervious Cover Summary Table

	Site Area (ac.)	Imp. Area (ac.)	% Imp.	% Pervious	Imp. Driveway (ac.)	Imp. Roadway (ac.)	Imp. Sidewalk (ac.)
Existing	0.447	0.031	6.94	93.06	0.000	0.014	0.017
Proposed	0.447	0.127	28.40	71.60	0.000	0.007	0.120

Table 2: SPA Impervious Area Responsibility

	Imp. Area (ac.)	% County Owned		% SHA Owned		% Park Owned	
Existing	0.031	0.00%	0.000 ac	100.00%	0.031 ac	0.00%	0.000 ac
Proposed	0.127	0.00%	0.000 ac	100.00%	0.127 ac	0.00%	0.000 ac

The drainage pattern within the Special Protection Area limits of disturbance is generally sheetflow and shallow concentrated flow over open space and impervious area. There are very few designed channels that convey flow throughout the site.

5. Soils Classification and Mapping

NRCS mapping of the project area shows hydrologic soil groups B and D. The B soils have moderate infiltration rates when thoroughly wet and the D soils typically have very low infiltration rates (higher runoff potential) when thoroughly wet. Additional information on the NRCS mapping for the project area can be found in Appendix II.

Based on the NRCS soil mapping the project area is 0.00% A soils, 38.51% B soils, 0.00% C soils, and 61.49% D soils. The ESD computations and BMP practices are based on the soil mapping.

6. Geotechnical Testing Results for BMPs within SPA

Soil borings and infiltration testing for SWM BMPs was performed by KIM Engineering in March 2015 and analysis of the borings was performed by KIM Engineering in April and July of 2015. See Appendix III for SPA portion of Geotechnical Report.

Table 3: SPA SWM Geotechnical Testing Results

BMP Facility	Boring Number	USDA Classification	Hydrologic Soil Group	Bottom Elev. of BMP Media	Bottom Elev. of Boring	Groundwater Elevation	Infiltration Rate
RG #1	SWM-23	Sandy Loam	A	429.25	423.00	No GW Found	2.4 in/hr

7. Existing SWM Facility Descriptions

There are currently no existing stormwater management facilities within the project area.

8. Existing Conditions

The Needwood Road Bike Path project is located along the east side of Muncaster Mill Road between the intersection of Muncaster Mill Road and Needwood Road and Colonel Zadok Magruder High School. Since the project area consists of less than 40% impervious area, the project is considered new development for the purpose of computing impervious area treatment requirements. All impervious area within the site limits, whether existing or proposed, will require 100% water quality treatment. This includes impervious area from sidewalk and roadway for the practices within the SPA. In existing conditions, these impervious surfaces drain to open space areas, some of which are suitable for LID practices. The following sections of the report discuss methodology and details each of the proposed treatment opportunities for the site.

9. Erosion and Sediment Control

The erosion and sediment control measures proposed for this project were designed to meet the Montgomery County and MD SHA E&S requirements. The drainage patterns within the SPA are curbed storm drain and overland flow. For disturbed areas along curblines curb inlet protection is proposed to treat any sediment laden runoff caused by the curb replacement and drainage installation. For areas beyond the curbline the runoff flows away from the roadway at all locations within the SPA super silt fence is proposed as a perimeter control to treat any sediment laden water before it leaves the project site.

10. Proposed ESD BMPs

For the Special Protection Area of the Needwood Road Bike Path project, three (3) stormwater management practices are proposed within the 0.447 acre limits of disturbance treating 0.127 acres of impervious. A rain garden, bio-swale, and non-rooftop runoff disconnection are being proposed within the SPA limits of disturbance. The table below provides a general breakdown of the ESD BMPs proposed for the SPA portion of the project. The table also defines which areas were not feasible for ESD practices and the reasons why. The paragraphs following the table provide summaries of the individual proposed ESD practices. Summary tables of all available data can be found in Appendices V-VII. ESD volume computations have been performed using the Montgomery County DPS Water Resources Technical Policy #5 as well as Maryland Stormwater Design Manual Chapter 5 methodology for each BMP.

Table 4: ESD Applicability and Constraints

Station Range		Proposed ESD Practice	Constraints limiting ESD BMPs
From	To		
400+50	403+60	Bio-Swale	Limited R/W, Curbed Roadway
403+60	405+75	Rain Garden	Limited R/W, Curbed Roadway
405+75	407+25	Non-Rooftop Runoff Disconnection	Limited R/W, Utilities, Curbed Roadway
407+25	408+50	None	Llimited R/W, Large Tree, Curbed Roadway

Sta. 400+50 to Sta. 407+50:

Facility **BS #1**: Bio-Swale

Proposed facility BS #1 is located along the east side of Muncaster Mill Road, ranging between stations 401+25 to 403+50. A three foot flat bottom swale with 3:1 side slopes will outfall to a proposed yard inlet which ties into the existing storm drain, the underdrain will be tied into this inlet. The drainage area will be limited to sidewalk and swale. The delineated drainage area to this facility is 0.10 acres, with 0.04 acres being impervious area from sidewalk. This facility treats an ESDv of 381 cf.

Facility **RG #1**: Rain Garden

Proposed facility RG #1 is located along the east side of Muncaster Mill Road, ranging between stations 403+60 to 404+30. The delineated drainage area to this facility is 0.20 acres, with 0.12 acres being impervious area from adjacent roadway and sidewalks. Existing runoff reaches this location thru a curb cut, in proposed conditions a backless inlet will maintain the existing drainage pattern. The landscaping for this facility is an aesthetic amenity in a highly visible area. The surface area of the proposed facility is 799 sf. This facility treats an ESDv of 559 cf.

Facility **RD #1**: Non-Rooftop Runoff Disconnect

Proposed facility RD #1 is located along the east side of Muncaster Mill Road, ranging between stations 405+75 to 407+25. The proposed sidewalk runoff will sheetflow to managed turfgrass. The turfgrass area has an electronic sign and is enclosed with curbed parking lot therefore an at-grade, non-channelized BMP, is the ideal facility type. This facility treats an ESDv of 75 cf.

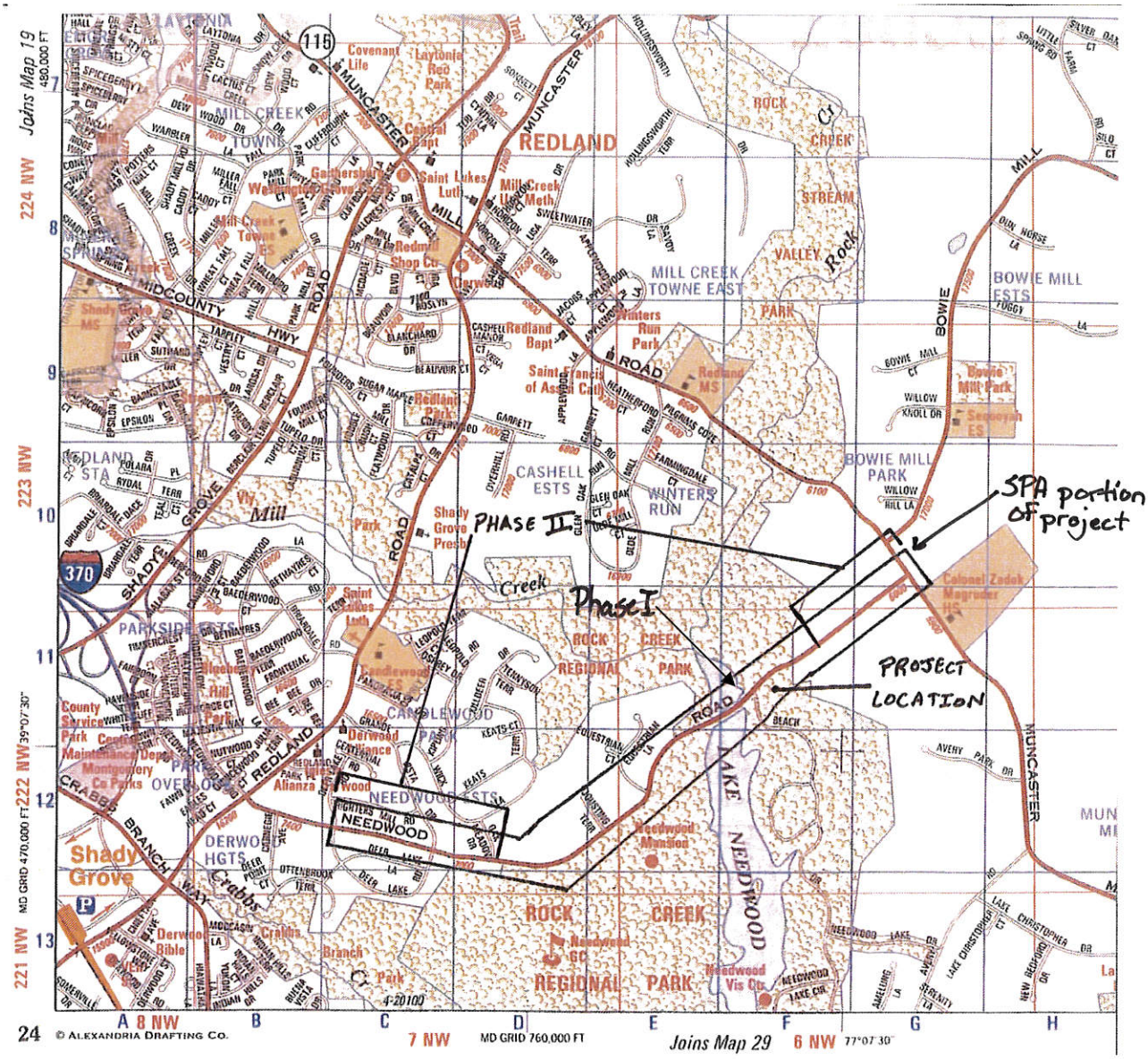
Table 5: Stormwater Management Treatment for Water Quality Utilizing ESD

BMP	Impervious Area (sf)	Treated ESDv (cf)
BS #1	1,707	381
RG #1	5,371	559
RD #1	941	75
	Total (cf)	1,015
	Required (cf)	671
	Net ESDv Treated (cf)	344

11. Conclusion

The proposed facilities detailed in this report offer a practicable and minimally impactful design approach toward meeting Montgomery County's Department of Permitting Services (DPS) requirement to treat impervious surface areas within the Needwood Road Bike Path project Special Protection Area limits of disturbance.

In total, 3 SWM facilities have been proposed for the Special Protection Area of the Needwood Road Bike Path project. The facilities consist of a bio-swale, rain garden, and non-rooftop runoff disconnection. The proposed facilities offer 1,015 cf of ESDv treatment to the MEP. These proposed stormwater management best management practices meet the stormwater management requirements for this project.



NEEDWOOD ROAD BIKE PATH
PROJECT LOCATION MAP
SCALE: 1"=2000'

APPENDIX I

Photo Documentation

Photo 1: RG #1, Looking South

Photo 2: RD #1, Looking South

APPENDIX II

Soils Information (NRCS)

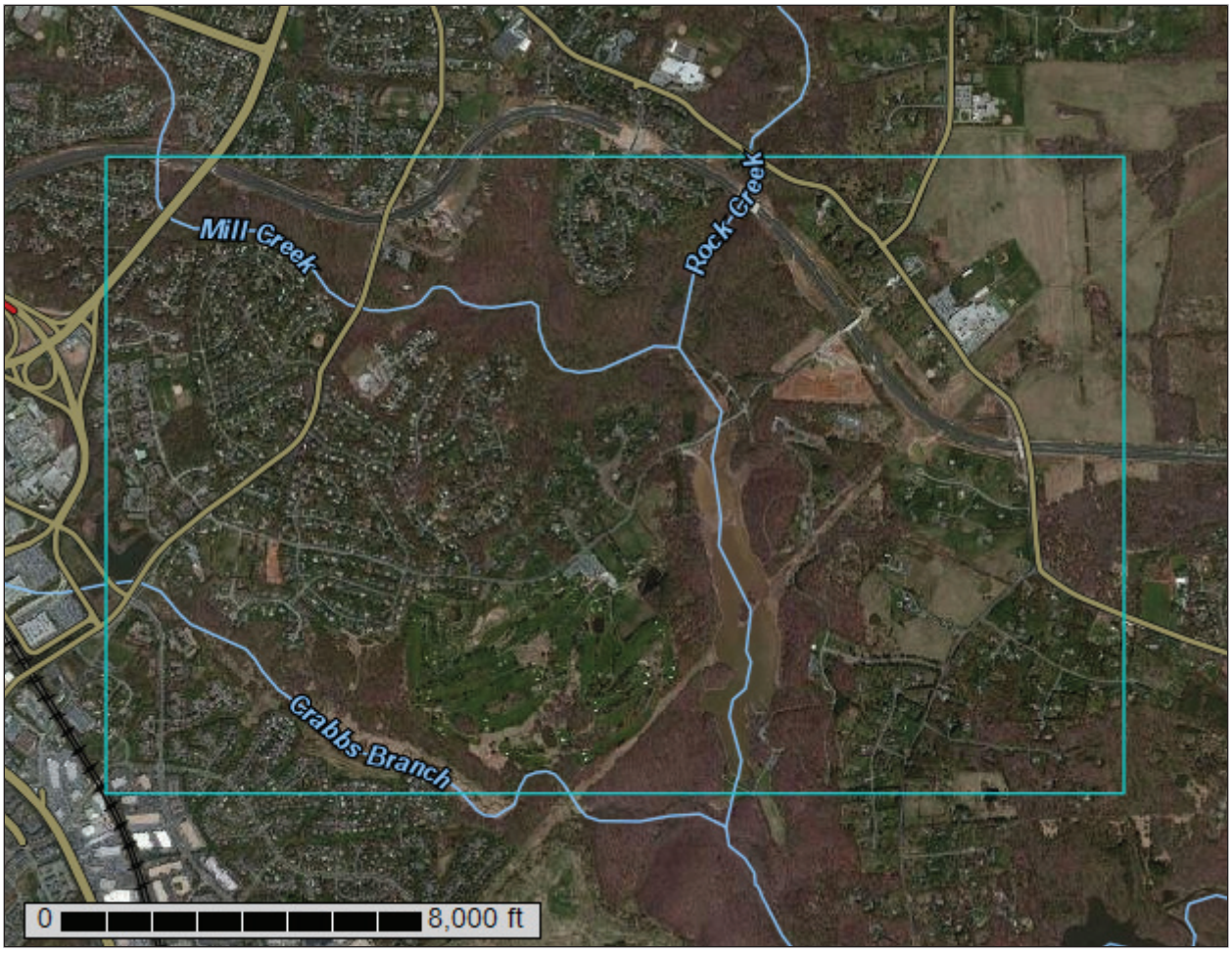
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Montgomery County, Maryland



August 6, 2014

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

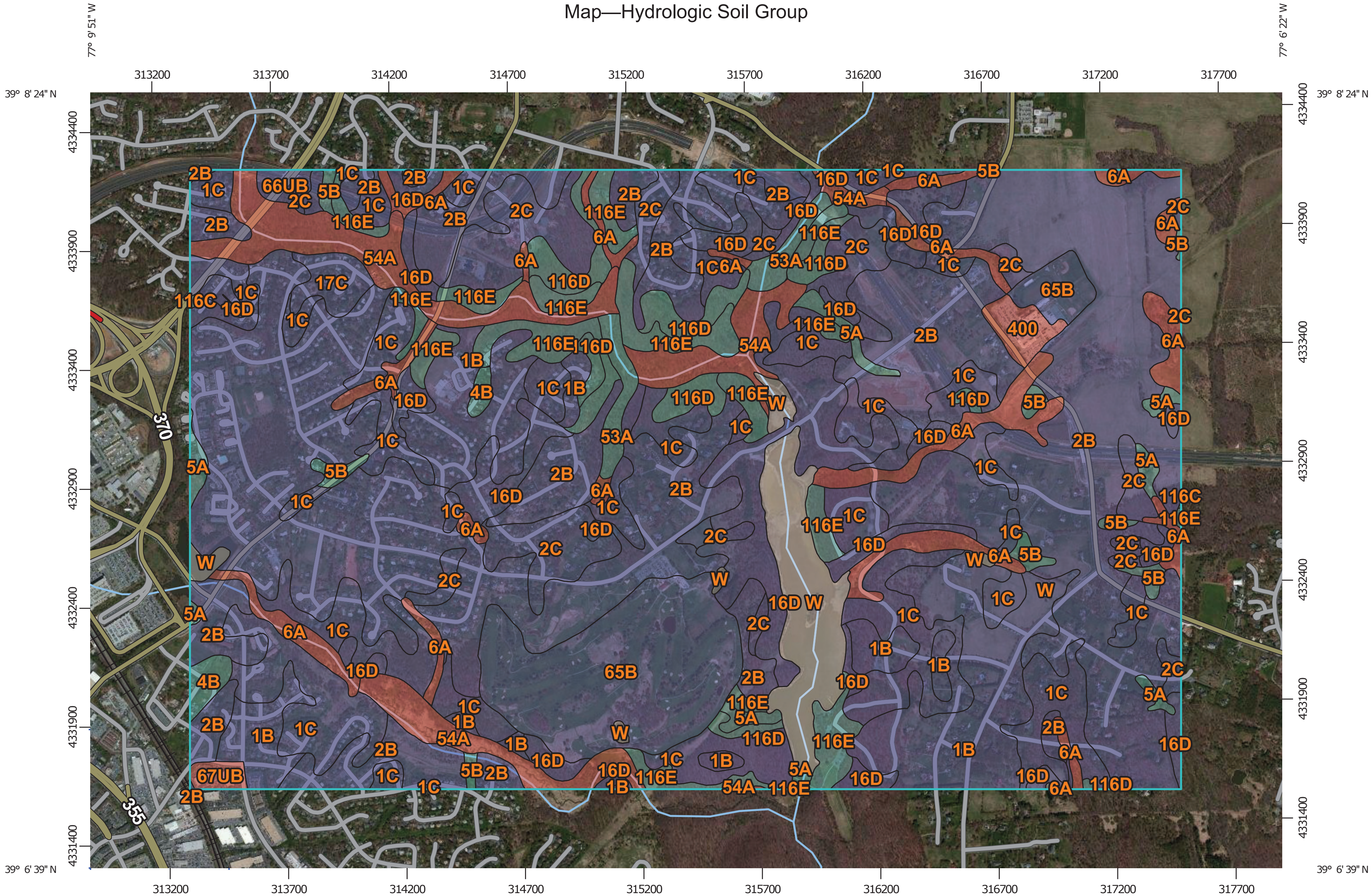
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group



Map Scale: 1:23,000 if printed on A landscape (11" x 8.5") sheet.

Meters: 0 300 600 1200 1800

Feet: 0 1000 2000 4000 6000

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Montgomery County, Maryland
Survey Area Data: Version 8, Dec 13, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 26, 2011—Mar 2, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Montgomery County, Maryland (MD031)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1B	Gaila silt loam, 3 to 8 percent slopes	B	219.7	8.1%
1C	Gaila silt loam, 8 to 15 percent slopes	B	384.9	14.2%
2B	Glenelg silt loam, 3 to 8 percent slopes	B	991.6	36.7%
2C	Glenelg silt loam, 8 to 15 percent slopes	B	138.9	5.1%
4B	Elioak silt loam, 3 to 8 percent slopes	C	11.3	0.4%
5A	Glenville silt loam, 0 to 3 percent slopes	C	25.1	0.9%
5B	Glenville silt loam, 3 to 8 percent slopes	C	19.2	0.7%
6A	Baile silt loam, 0 to 3 percent slopes	D	111.8	4.1%
16D	Brinklow-Blocktown channery silt loams, 15 to 25 percent slopes	B	195.0	7.2%
17C	Occoquan loam, 8 to 15 percent slopes	B	15.6	0.6%
53A	Codorus silt loam, 0 to 3 percent slopes, occasionally flooded	C	22.8	0.8%
54A	Hatboro silt loam, 0 to 3 percent slopes, frequently flooded	D	128.4	4.8%
65B	Wheaton silt loam, 0 to 8 percent slopes	B	162.2	6.0%
66UB	Wheaton-Urban land complex, 0 to 8 percent slopes	B	7.0	0.3%
67UB	Urban land-Wheaton complex, 0 to 8 percent slopes	D	6.5	0.2%
116C	Blocktown channery silt loam, 8 to 15 percent slopes, very rocky	C	0.6	0.0%
116D	Blocktown channery silt loam, 15 to 25 percent slopes, very rocky	C	52.9	2.0%
116E	Blocktown channery silt loam, 25 to 45 percent slopes, very rocky	C	112.8	4.2%
400	Urban land	D	13.5	0.5%

Hydrologic Soil Group— Summary by Map Unit — Montgomery County, Maryland (MD031)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
W	Census water		83.0	3.1%
Totals for Area of Interest			**2,702.8**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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APPENDIX III

Geotechnical Reports

Report of Subsurface Exploration and Associated Geotechnical Evaluations Stormwater Management Facilities Needwood Road Bike Path Montgomery County, Maryland

(KEI Project No.: G14212BC)

KIM ENGINEERING

1500 Caton Center Drive, Suite C, Baltimore, Maryland 21227 (410) 501-3669

KIM ENGINEERING, INC.
Engineering Consultants

April 20, 2015

Ms. Jennifer Ray
Johnson, Mirmiran & Thompson, Inc.
72 Loveton Circle
Sparks, Maryland 21152-0949

Subject: Report of Subsurface Exploration and Associated Geotechnical Services
Stormwater Management Facilities
Proposed Needwood Road Bike Path
Montgomery County, Maryland
KEI Project No.: G14212BC

Dear Ms. Ray:

The following report will present the results of the subsurface exploration program and the associated geotechnical evaluations for the stormwater management facilities proposed to accommodate the Needwood Road Bike Path.

The attached report presents our understanding of the project; reviews our exploration procedures; describes existing site and general subsurface conditions encountered; and presents our evaluations, conclusions, and recommendations.

We have enjoyed working with you on this project, and we are prepared to assist you with the construction quality assurance monitoring and testing services recommended herein. Please do not hesitate to contact us if you have questions on this report or if we may be of further assistance.

Respectfully,
Kim Engineering, Inc.

Ronald L. Pyles, P.E.
Principal Engineer

1500 Caton Center Drive, Suite C, Baltimore, Maryland 21227
Tel: (410) 501-3669 Fax: (410) 501-3671

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS
PROPOSED NEEDWOOD ROAD BIKE PATH
MONTGOMERY COUNTY, MARYLAND
KEI PROJECT NO.: G14212BC

The following is a summary of our conclusions and recommendations:

a. Subsurface conditions in the proposed stormwater management areas generally indicates naturally occurring residual soil materials consisting of Sandy SILT and Silty SAND materials.

b. Infiltration testing was conducted in some of the test borings subsequent to the presoak operation. The last three readings for the testing ranged from 0.3 to 2.0 inches per hour.

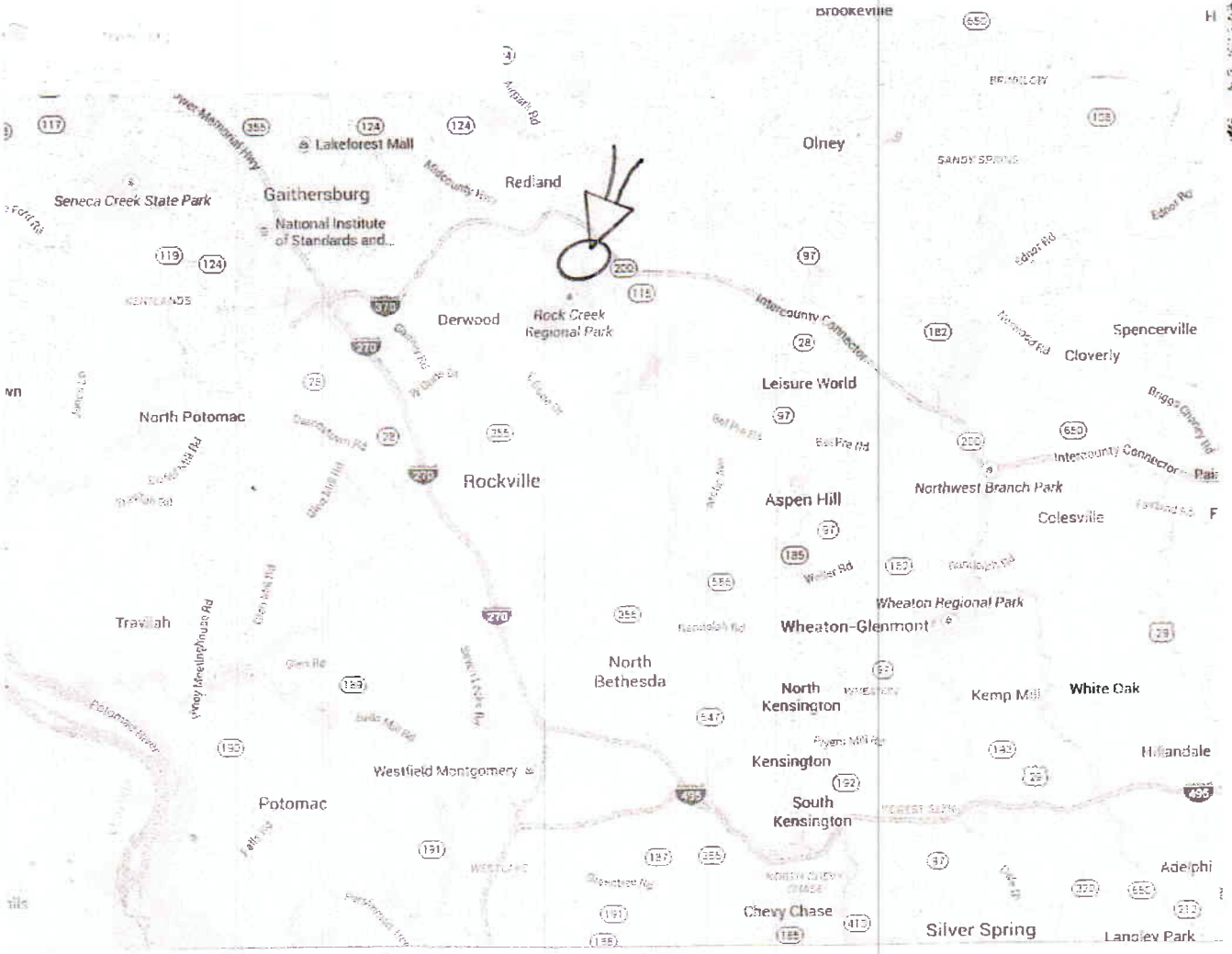
c. Groundwater was not apparent in any of the test borings at the time and depth of the study. Considering the proposed construction, groundwater is not expected to be an issue for the construction activities.

d. Additionally rock was not encountered in the stormwater management locations in the areas of and to the depths of the test borings.

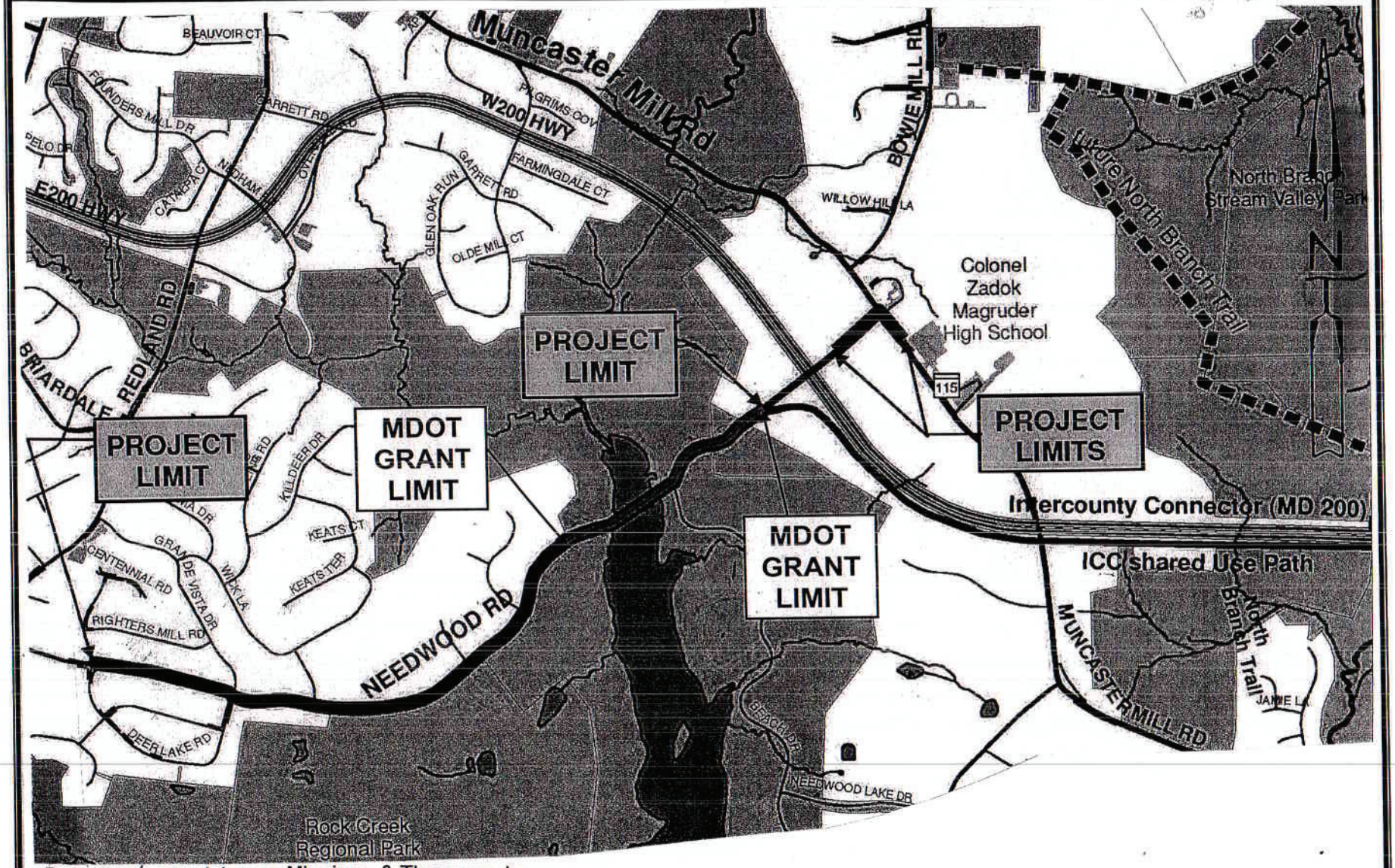
e. Variations in soil conditions may be encountered during construction. Determination of such variations will permit correlation between the subsurface exploration data of this report and actual conditions encountered during construction and verification of conformance with the plans and specifications. We recommend that Kim Engineering, Inc. be retained to perform professional observations of all construction activities.

APPENDIX A

SITE LOCATION INFORMATION



KIM ENGINEERING, INC. GEOTECHNICAL ENVIRONMENTAL & MATERIALS ENGINEERS	Project No.: G15212BC
	SCALE: NTS
	DATE: April 20, 2015
Project Vicinity Plan **Needwood Road Bike Path** **Montgomery County, Maryland**	**DRAWING NO.** 1



Base drawing by Johnson, Mirmiran, & Thompson, Inc.

Kim Engineering, Inc.
GEOTECHNICAL & MATERIALS ENGINEERS

Project No.: G15212BC
SCALE: NTS
DATE: April 20, 2015

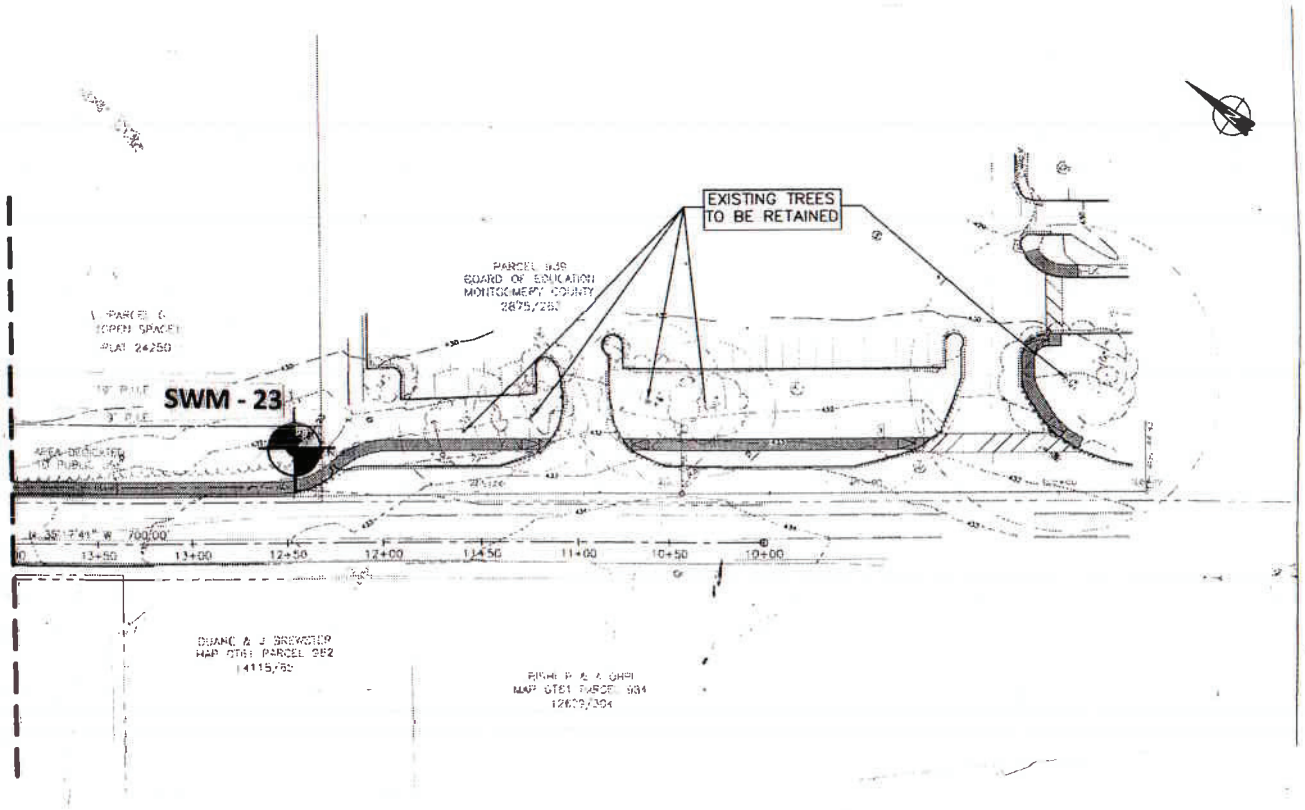
Project Location Plan, Needwood Road Bike Path, Montgomery County, Maryland

DRAWING NO.
2

APPENDIX B

SOIL TEST BORING

LOCATION PLANS AND LOGS



Base drawing by Johnson, Mirmiran, & Thompson, Inc.

Kim Engineering, Inc.
GEOTECHNICAL & MATERIALS ENGINEERS

Project No.: G15212BC
SCALE: NTS
DATE: April 20, 2015

Test Boring Location Plan, Needwood Road Bike Path, Montgomery County, Maryland

DRAWING NO.
3I

KIM ENGINEERING

RECORD OF SOIL EXPLORATION

Project Name	Needwood Road Bike Path	Ref. #	SWM-23
Location	Montgomery County, Maryland	Job #	G14212BC

		SAMPLER					
Datum	MSL	Hammer Wt.	140 Lbs.	Hole Diameter	2.25" I.D.	Foreman	Michael Ayers
Surf. Elev.		Hammer Drop	30 Inches	Rock Core Dia.	N.A.	Inspector	
Date Started	April 2015	Pipe Size	2 Inches OD	Boring Method	HSA	Date Complete	April 2015

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC. in.	BORING & SAMPLING NOTES
	SURFACE		0.0					
				D/I	3 4 7	1	7	Topsoil to 2.0 "
	Brown moist SILT with little clay and trace fine sand (MLc)		2.5					
				D/I	4 4 7	2	10	
			5					
				D/I	3 8 11	3	14	
	Bottom of test boring at 6.5 feet.		7.5					* Water not apparent during drilling. Cave-in at 4.5 feet.
			10					

SAMPLER TYPE
DRIVEN SPLIT SPOON UNLES
OTHERWISE NOTED.
PT-PRESSED SHELBY TUBE
CA-CONTINUOUS FLIGHT AU
RC-ROCK CORE

SAMPLE CONDITIONS
D-DISINTEGRATED
I-INTACT
U-UNDISTURBED
L-LOST

GROUND WATER DEPTH
AT Completion * FT.
AFTER _____ FT.

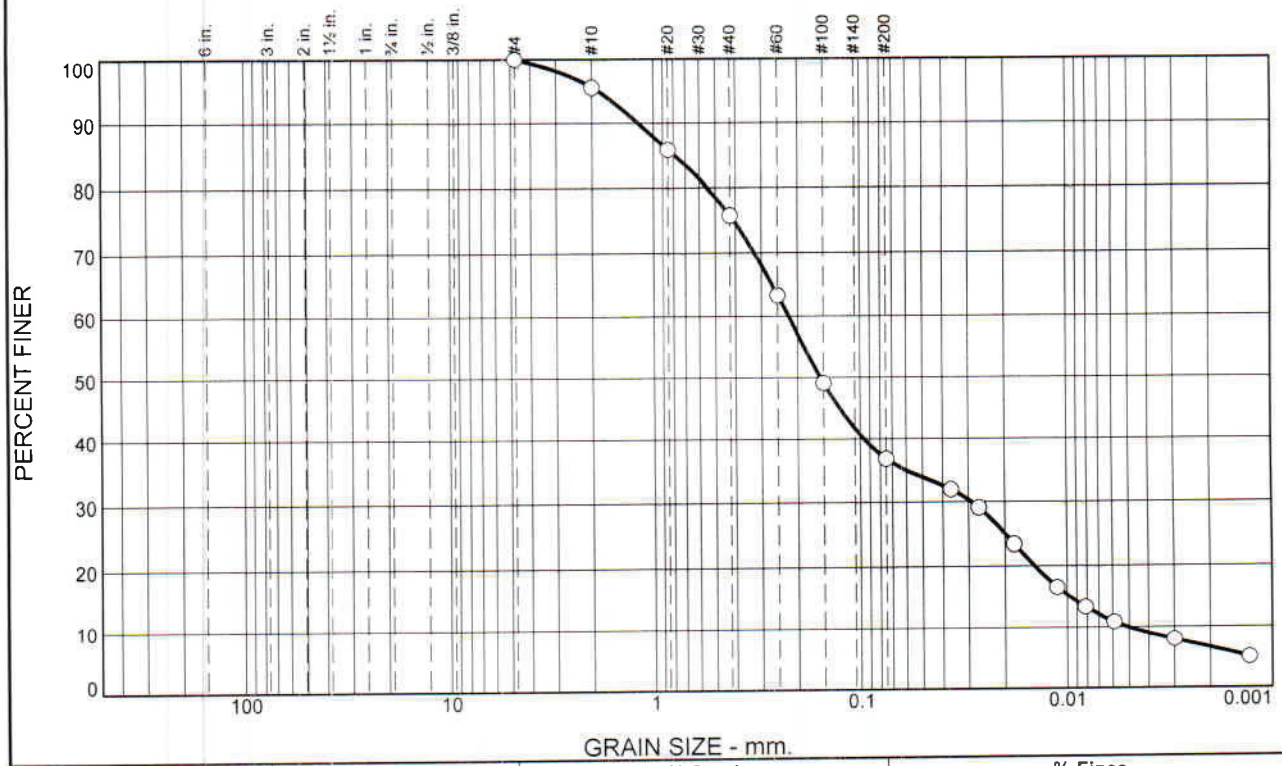
BORING METHOD
HSA-HOLLOW STEM AUGERS
CFA-CONT. FLIGHT AUGERS
DC-DRIVING CASING
MD-MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30":COUNT MADE AT 6" INTERVALS

APPENDIX C

LABORATORY TEST RESULTS

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	4.5	19.8	38.9	26.9	9.9

Test Results (ASTM D 422 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	95.5		
#20	85.7		
#40	75.7		
#60	63.3		
#100	49.1		
#200	36.8		
0.0364 mm.	32.0		
0.0267 mm.	29.1		
0.0181 mm.	23.4		
0.0112 mm.	16.6		
0.0082 mm.	13.4		
0.0059 mm.	10.9		
0.0030 mm.	7.9		
0.0013 mm.	5.0		

* (no specification provided)

Material Description

silty sand (SM)

Atterberg Limits (ASTM D 4318)

PL= NP LL= NV PI= NP

Classification

USCS (D 2487)= SM AASHTO (M 145)= A-4(0)

Coefficients

D_{90}= 1.1926 D_{85}= 0.8014 D_{60}= 0.2220
D_{50}= 0.1555 D_{30}= 0.0289 D_{15}= 0.0097
D_{10}= 0.0051 C_u= 43.66 C_c= 0.74

Remarks

Date Received: **Date Tested:** 7/13/15

Tested By: MH

Checked By: TR

Title: PM

Source of Sample: SWM-23 **Depth:** 4.5 **Date Sampled:**

Sample Number: 3

KIM ENGINEERING, INC.

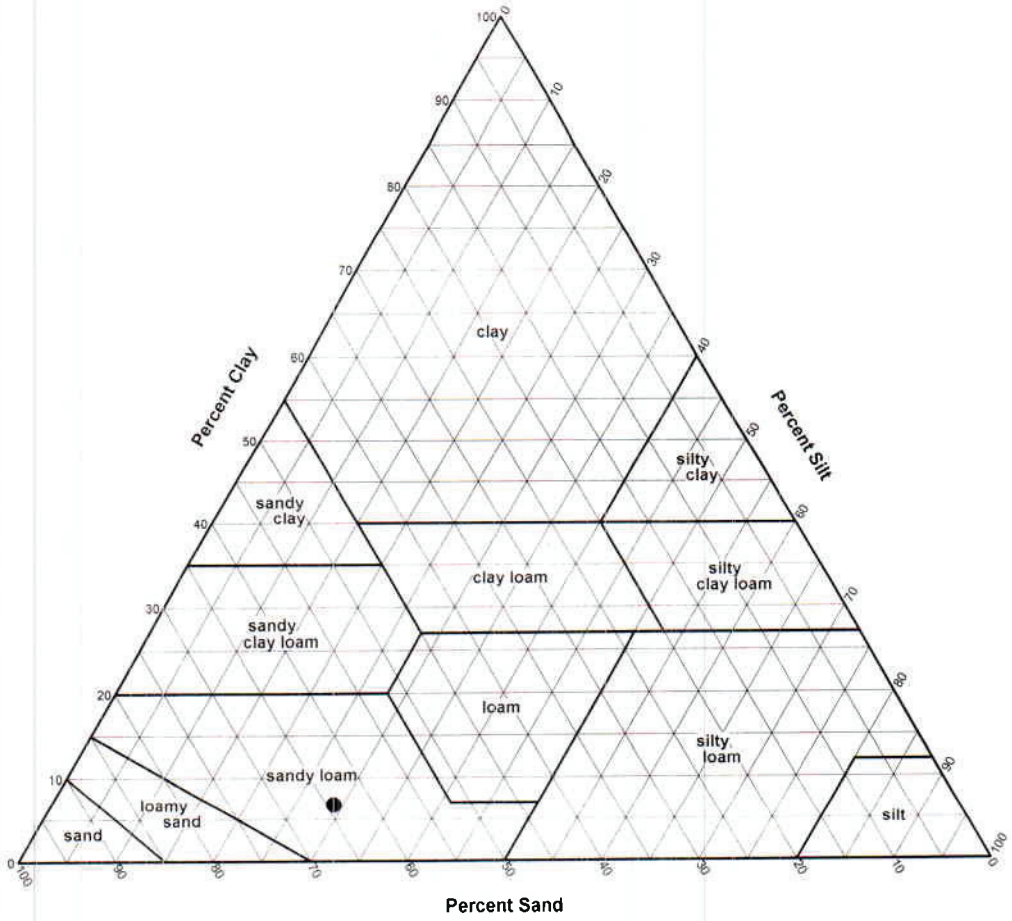
Silver Spring, Maryland

Client: Johnson, Mirmiran & Thompson, Inc.

Project: Needwood Road Bike Path

Project No: G14212BC **Figure**

USDA Soil Classification



SOIL DATA							
	Source	Sample No.	Depth	Percentages From Material Passing a #10 Sieve			Classification
				Sand	Silt	Clay	
●	SWM-23	3	4.5	64.2	29.0	6.8	Sandy loam

KIM ENGINEERING, INC.

Silver Spring, Maryland

Client: Johnson, Mirmiran & Thompson, Inc.

Project: Needwood Road Bike Path

Project No.: G14212BC

Figure

Needwood Bike Path
G14212BC

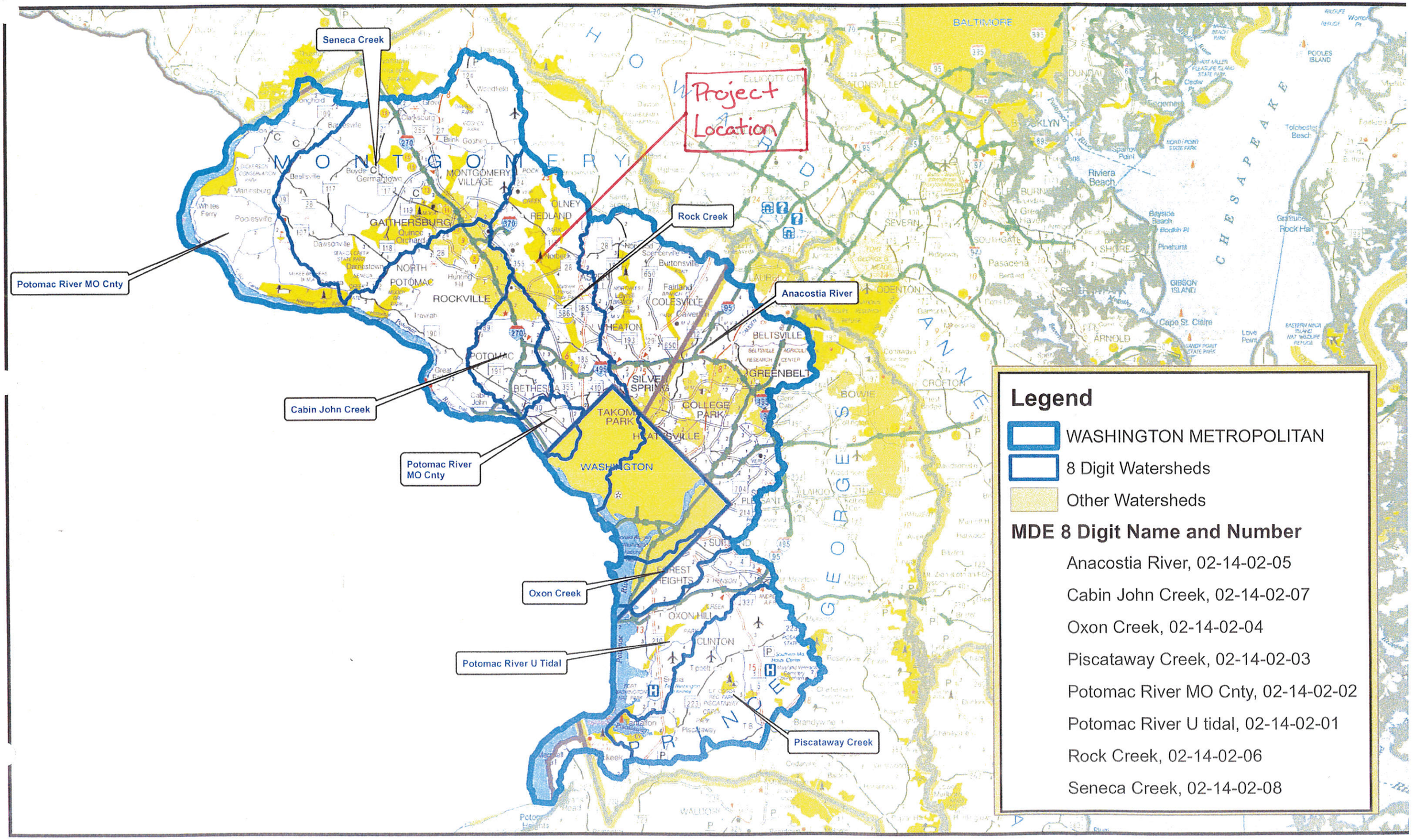
Time Interval= 0:30

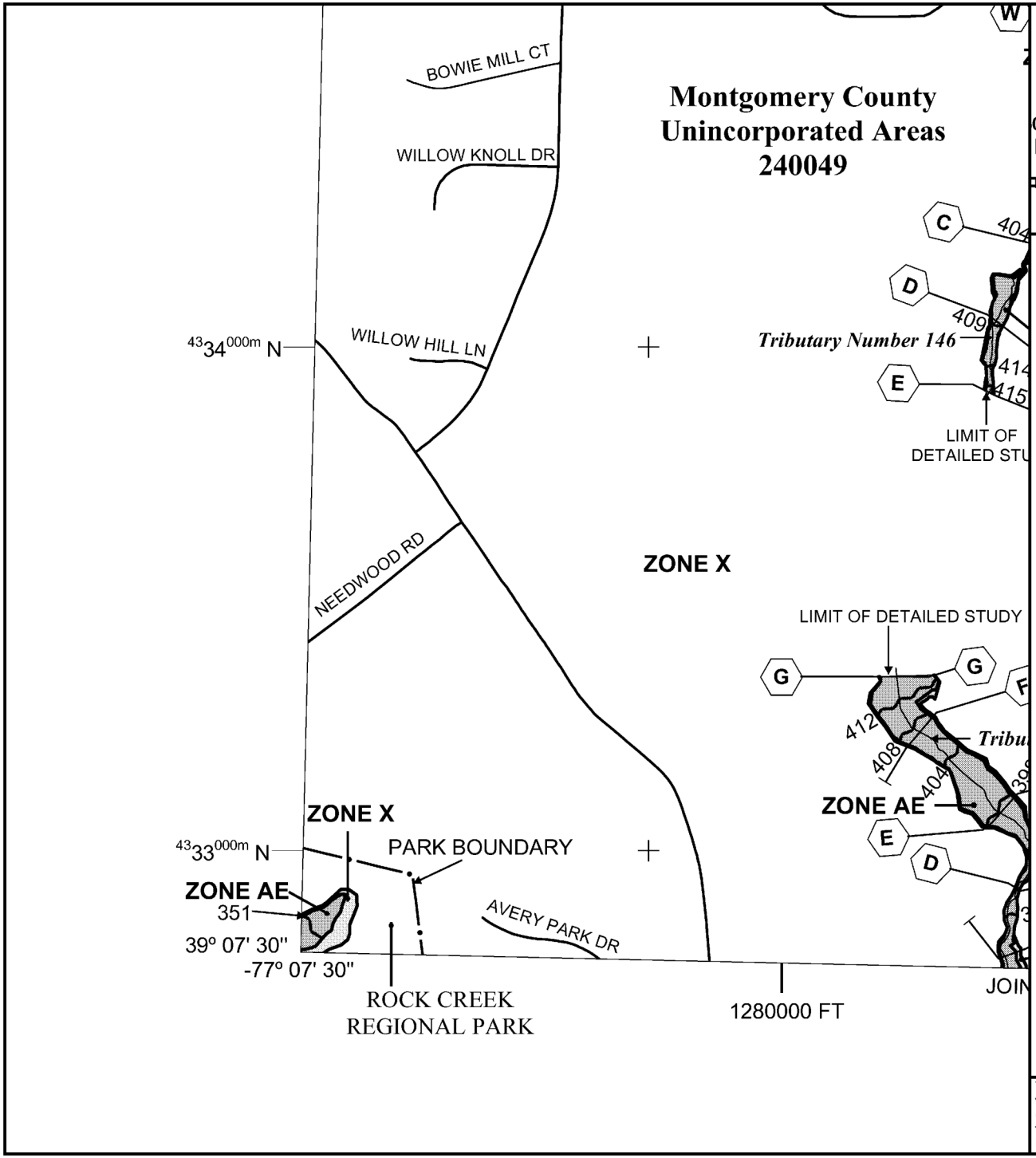
		Depth (inches)		
Time	Hr	SWM-22	SWM-23	
Test Depth (feet)		4	4	
0:00	0.00	3.5	0.0	
0:30	0.50	4.0	0.0	
1:00	1.00	5.0	2.0	
1:30	1.50	5.5	4.0	
2:00	2.00	5.5	5.5	
2:30	2.50	7.0	7.0	
3:00	3.00	7.0	9.0	
3:30	3.50	7.5	9.5	
4:00	4.00	8.0	9.5	
		Rate (inch/hr)		
Time	Hr	SWM-22	SWM-23	0
Test Depth		4	4	0
0:00	0.00	-	-	-
0:30	0.50	1.0	0.0	0.0
1:00	1.00	2.0	4.0	0.0
1:30	1.50	1.0	4.0	0.0
2:00	2.00	0.0	3.0	0.0
2:30	2.50	3.0	3.0	0.0
3:00	3.00	0.0	4.0	0.0
3:30	3.50	1.0	1.0	0.0
4:00	4.00	1.0	0.0	0.0
Average of final 3		0.7	1.7	0.0
Average ALL		1.1	2.4	0.0

APPENDIX IV

Watershed Maps and FEMA Flood Maps

WASHINGTON METROPOLITAN AREA 02-14-02





MAP SCALE 1" = 1000'

00 0 1000 2000

FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0215D

FIRM

FLOOD INSURANCE RATE MAP

MONTGOMERY COUNTY, MARYLAND

AND INCORPORATED AREAS

PANEL 215 OF 480

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
MONTGOMERY COUNTY	240049	0215	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
24031C0215D

EFFECTIVE DATE
SEPTEMBER 29, 2006

Federal Emergency Management Agency

APPENDIX V

Site Information & Constraints Summary Table

Site Information and Constraints Summary Table

Station Range		Applicable ESD Practice	Site Constraints									
From	To		Utility	Steep Longitudinal Slope	Steep Side Slope	D Soils	Limited R/W	Wooded Areas / Trees	Major Waterway	Golf Course Features	Outside Project Limits	Comments
400+50	403+60	Bio-Swale					X					Limited R/W and flat slope eliminates linear BMPs with deep underdrain systems, flat slopes encourage disconnection BMPs
403+60	405+75	Rain Garden				X	X					Limited R/W and flat slope eliminates linear BMPs with deep underdrain systems, existing point source from Muncaster Mill Rd encourages some form of treatment
405+75	407+25	Non-Rooftop Runoff Disconnection	X			X	X					School parking lot (curbed) eliminates BMPs with channelized outfalls, existing electronic sign encourages at-grade facilities
407+25	408+50	None				X	X	X				Large tree (roots) eliminates any BMP requiring grading, disconnection at this location would require grading

APPENDIX VI

Stormwater Management Computations and Summary Table

Site Data:

Project: Needwood Road Bike Path Project - SPA

County: Montgomery

By: DLA Date: 9/9/2015

Checked: SAM Date: 9/9/2015

	Existing		Proposed	
	Sq.Ft.	Acres	Sq.Ft.	Acres
Site Area:	19489	0.447	19489	0.447
Imp Area:	1352	0.031	5535	0.127
Imp %:	6.94		28.40	

Note: Pervious sidewalk area is excluded from impervious area.

Design Methodology:

- 2000 Maryland Stormwater Design Manual Volumes I & II
  Chapter 5.0 - Environmental Site Design
- Environmental Site Design (ESD) Process & Computations, July 2010

Determine Pre-Developed Conditions:

Soil Conditions

HSG	RCN	Area (sf)	Area (ac)	Percent
A	38	0	0.000	0.00
B	55	7506	0.172	38.51
C	70	0	0.000	0.00
D	77	11983	0.275	61.49

Composite RCN for "Woods in Good Condition":

$$RCN_{WOODS} = \frac{(\ 38 * 0.000 \ + \ 55 * 0.172 \ + \ 70 * 0.000 \ + \ 77 * 0.275\ )}{0.447}$$

RCN_{WOODS} = 68.53

Say **69**

Determine Target P_E:

Proposed Imp% = 28.40

Note: Round up proposed impervious percentage when determining P_E values.

P_E (inches)=

A:	1.6
B:	1.6
C:	1.6
D:	1.2

Values taken from Table 5.3 of MDE Manual

$$\text{Composite } P_E = \frac{(\ 1.6 * 0.000 \ + \ 1.6 * 0.172 \ + \ 1.6 * 0.000 \ + \ 1.2 * 0.275\ )}{0.447}$$

Composite P_E = 1.354 inches

Say **1.35** inches

Compute Q_E: (Run-off Depth to size ESD Practices)

Q_E = P_E x Rv **I =** 28.40 %

P_E = 1.35 inches

Rv = 0.05 + (0.009)(I) = 0.3056

Say **0.306**

Q_E = **0.413 inches**

Compute Required ESDv:

$$ESDv = \frac{P_E \times Rv \times A}{12}$$

$$ESDv = \frac{1.35\text{ in} * 0.306 * 19489\text{ sf}}{12}$$

ESDv = **671 cf**

Determine Stormwater Management Requirement After Using ESDv:

ESD Treatment Provided: **1015** cf

P_E Treated:

$$ESDv = \frac{P_E \times Rv \times A}{12}$$

$$P_E = \frac{ESDv \times 12}{Rv \times A}$$

$$P_E = \frac{1015\text{ cf} \times 12}{0.306 \times 19489\text{ sf}}$$

P_E = 2.042 inches

Say **2.04** inches

Calculate Reduced RCN:

Reduced RCN for treated P_E

HSG	RCN*	Area (sf)	Area (ac)	Percent
A		0	0.000	0.00
B		7506	0.172	38.51
C		0	0.000	0.00
D		11983	0.275	61.49

Notes: Computed P_E should be rounded down when selecting RCN*. If the treated P_E is less than 1" use the RCN* value for 1".

RCN* = $\frac{(0 * 0.000 + 0 * 0.172 + 0 * 0.000 + 0 * 0.275)}{0.447}$

RCN* = 0.00

Say **0**

Stormwater Management Computations Summary Table

Facility #	Facility Type	Road	Drainage Area (sf)	Impervious Area (sf)	% County Owned	% MNCPPC Owned	% SHA Owned	Water Quality Treatment Provided (cf)	Property Ownership
BS #1	Bio-Swale	Muncaster Mill Road	4413	1707	0%	0%	100%	381	SHA
RG #1	Rain Garden	Muncaster Mill Road	8819	5371	0%	0%	100%	559	SHA
RD #1	Non-Rooftop Runoff Disconnection	Muncaster Mill Road	N/A	941	0%	0%	100%	75	SHA

APPENDIX VII

Stormwater Computations

Bio-Swale #1

Drainage Area = 4413 sf
Imp. Area = 1707 sf
Imp % 38.68%

$$ESDv(max) = \frac{(P_E)(Rv)(A)}{12}$$

Rv = 0.05 + 0.009 x I
Rv = 0.398

$$ESDv(max) = \frac{(2.6")(0.398)(4413\ sf)}{12}$$

ESDv(max) = 381 cf

$$ESDv(min) = \frac{(P_E)(Rv)(A)}{12}$$

$$ESDv(min) = \frac{(1.0")(0.398)(4413\ sf)}{12}$$

ESDv(min) = 146 cf

ESDv = 0.4 x (L x W x 3.5)
ESDv = 0.4 x (3 x 110 x 3.5)
ESDv = 381 cf

Rain Garden #1

Drainage Area = 8819 sf
Imp. Area = 5371 sf
Imp % 60.90%

$$ESDv(max) = \frac{(P_E)(Rv)(A)}{12}$$

Rv = 0.05 + 0.009 x I
Rv = 0.598

$$ESDv(max) = \frac{(2.6")(0.598)(8819\ sf)}{12}$$

ESDv(max) = 1143 cf

$$ESDv(min) = \frac{(P_E)(Rv)(A)}{12}$$

$$ESDv(min) = \frac{(1.0")(0.598)(8819\ sf)}{12}$$

ESDv(min) = 440 cf

ESDv = (S.A. x Depth) + 0.4 x (S.A. x 1)
ESDv = (799 x 0.5) + 0.4 x (799 x 1)
ESDv = 559 cf

Design Firm:	Maryland Environmental Site Design Calculations	Project#	13-0605-001
	Non-Rooftop Disconnect	Date	10/6/2014
JMT Engineering		Designer:	KMO
	Project: Needwood Road Bike Path	Checked	DLA
		Practice #	RD #2

Drainage Area Data

(Rooftop) Impervious Area: 941 sf

HSG Rating: B

Overall Site Target P_E: 1.00 inches

1. Determine Surface Area of Practice:

A. Proposed Surface Area:

Proposed Surface Area (A_F): 941 sq ft

2. Compute Volume Requirements for Proposed Surface Area

A. Compute P_E Value (Equation 5.2)

P_E = 1.00 inches Pe based on flow path rati

B. Compute Q_E Value

$Q_E = P_E \times R_v$; where: P_E = 1.00 in $R_v = 0.05 + (0.009)(I)$ R_v = 0.950

Q_E Provided= 0.95 inches

Q_E Required= 0.95 inches

C. Compute Required ESD_V:

ESD_v = Required ESD Volume Based on DA and A_F of This Practice

$ESD_v = \frac{(Q_E)(A)}{12 \text{ in/ft}}$ where A is the drainage area (in acres)

ESD_v Provided=	**0.0017**	**ac/ft**	**74.5**	**cu ft**
ESD_v Required=	**0.0017**	**ac/ft**	**74.5**	**cu ft**
WQ_v Provided=	**0.0017**	**ac/ft**	**74.5**	**cu ft**
WQ_v Required=	**0.0017**	**ac/ft**	**74.5**	**cu ft**

APPENDIX VIII

SPA Plans & Profiles

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION

NEEDWOOD ROAD
BIKE PATH/TRAIL

SPECIAL PROTECTION AREA
MUNCASTER MILL ROAD

C. I. P. PROJECT NO. 501304

SPA DESIGN

INDEX OF SHEETS

MONTGOMERY COUNTY DEPARTMENT OF TRANSPORTATION MAINTENANCE CERTIFICATION

I HEREBY CERTIFY THAT THE DEPARTMENT OF TRANSPORTATION WILL ASSUME MAINTENANCE RESPONSIBILITIES FOR ALL STORMWATER MANAGEMENT FACILITIES AS LISTED AND SHOWN, HEREON, IN ACCORDANCE WITH THE MEMORANDUM OF UNDERSTANDING BETWEEN THIS DEPARTMENT AND THE DEPARTMENT OF ENVIRONMENTAL PROTECTION DATED SEPTEMBER 1, 1986. IF, FOR ANY REASON, FUTURE IMPROVEMENTS TO THE ROADWAY ARE PLANNED THAT WOULD IMPACT ANY OF THE STORMWATER MANAGEMENT FACILITIES INCLUDED HEREIN, THIS DEPARTMENT WILL NOTIFY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION DURING THE PLANNING OR EARLY DESIGN STAGE FOR SUCH IMPROVEMENTS.

DATE

BRUCE E. JOHNSTON, P.E.
CHIEF, DIVISION OF
TRANSPORTATION ENGINEERING

OWNER'S CERTIFICATION

I HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF NATURAL RESOURCES APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT.

DATE

BRUCE E. JOHNSTON, P.E.
CHIEF, DIVISION OF
TRANSPORTATION ENGINEERING

DESIGN CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE "2011 MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL," MONTGOMERY COUNTY DEPARTMENT OF PERMITTING SERVICES EXECUTIVE REGULATIONS 5-90, 7-02AM AND 36-90, AND MONTGOMERY COUNTY DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION "STORM DRAIN CRITERIA" DATED AUGUST, 1988.

DATE

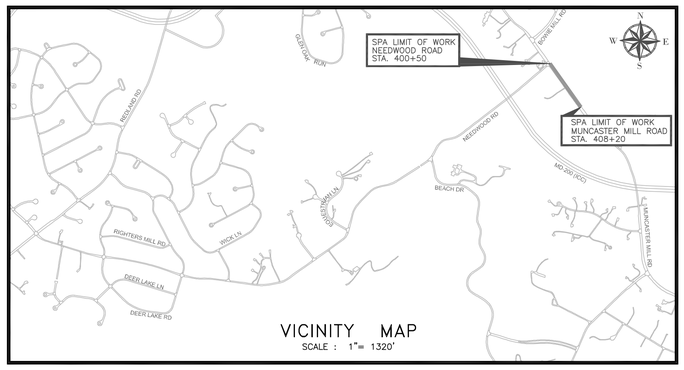
MICHAEL ROTHENHEBER, P.E.
MD. REGISTRATION NO. 18589

CERTIFICATION OF THE QUANTITIES

I HEREBY CERTIFY THAT THE ESTIMATED TOTAL AMOUNT OF EXCAVATION AND FILL AS SHOWN ON THESE PLANS HAS BEEN COMPUTED TO 607 CUBIC YARDS OF EXCAVATION, 40 CUBIC YARDS OF FILL AND THE TOTAL AREA TO BE DISTURBED AS SHOWN ON THESE PLANS HAS BEEN DETERMINED TO BE 137,400 SQUARE FEET OR 3.2 ACRES.

DATE

MICHAEL ROTHENHEBER, P.E.
MD. REGISTRATION NO. 18589



VICINITY MAP
SCALE : 1"= 1320'

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. _____ EXPIRATION DATE _____

RELATED REQUIRED PERMITS
To be completed by the consultant and placed on the first sheet of the Sediment Control / Stormwater Management plan set for **all** projects.

IT IS THE RESPONSIBILITY OF PERMITTEE/OWNER OF THIS SITE TO OBTAIN ALL REQUIRED PERMITS PRIOR TO ISSUANCE OF THE APPROVED SEDIMENT CONTROL PERMIT

TYPE OF PERMIT	REQD	NOT REQD	PERMIT #	EXPIRATION DATE	WORK RESTRICTION DATES
MCDPS Floodplain District		X			
WATERWAYS/WETLAND(S):		X			
a. Corps of Engineers		X			
b. MDE		X			
c. MDE Water Quality Certification		X			
MDE Dam Safety		X			
DNR Roadside Tree Care Permit	X			Approval Date	
DPS Roadside Tree Protection Plan	X			Approval Date	
N.P.D.E.S. NOTICE OF INTENT	X				DATE FILED 2/27/15
OTHERS (Please List):		X			

JUNE 2014

THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION, DEPARTMENT OF PARK AND PLANNING

M-NCPPC PERMIT NO. _____

M-NCPPC PARK FACILITY CODE _____

REVIEWED BY _____

APPROVED BY _____
CHIEF, CONSTRUCTION SECTION

DATE APPROVED _____

M-NCPPC PERMIT SHEET # ____ OF ____

THIS IS NOT A PERMIT TO BEGIN CONSTRUCTION

This approval is for technical review only. For permit information, contact Jay Childs, Construction Supervisor at (301)495-2574.

JOHNSON, MIRMIRAN & THOMPSON
Engineering A Brighter Future®
72 Loveton Circle, Sparks, MD 21152
Telephone: (410) 329-3100; Fax: (410) 472-2200; WEB: WWW.JMT.COM

OWNER/ADDRESS:
MONTGOMERY COUNTY DEPARTMENT
OF TRANSPORTATION
100 EDISON PARK DRIVE, 4TH FLOOR
GAITHERSBURG, MD 20878

CONTACT:
REBECCA PARK, P.E.
PROJECT MANAGER
DESIGN SECTION
DIVISION OF TRANSPORTATION ENGINEERING
240-777-7263

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Transportation Planning and Design Section — Date

APPROVED

Chief, Division of Transportation Engineering — Date

Designed by : DLA Drawn by : DLA Checked by : SAM

GN-01 TITLE SHEET

NEEDWOOD ROAD
BIKE PATH/TRAIL
DEER LAKE ROAD TO EQUESTRIAN LANE
I.C.C. TRAIL, MUNCASTER MILL ROAD

DATE: SEPTEMBER 2015

Project No. : 501304 SHEET 1 of 6

EROSION AND SEDIMENT CONTROL — GENERAL NOTES

STANDARD EROSION AND SEDIMENT CONTROL NOTES

1. The permittee shall notify the Department of Permitting Services (DPS) forty–eight (48) hours before commencing any land disturbing activity and, unless waived by the Department, shall be required to hold a pre–construction meeting between them or their representative, their engineer and an authorized representative of the Department.

2. The permittee must obtain inspection and approval by DPS at the following points:

   A. At the required pre–construction meeting.

   B. Following installation of sediment control measures and prior to any other land disturbing activity.

   C. During the installation of a sediment basin or stormwater management structure at the required inspection points (see Inspection Checklist on plan). Notification prior to commencing construction is mandatory.

   D. Prior to removal or modification of any sediment control structure(s).

   E. Prior to final acceptance.

3. The permittee shall construct all erosion and sediment control measures per the approved plan and construction sequence, shall have them inspected and approved by the Department prior to beginning any other land disturbances, shall ensure that all runoff from disturbed areas is directed to the sediment control devices, and shall not remove any erosion or sediment control measure without prior permission from the Department.

4. The permittee shall protect all points of construction ingress and egress to prevent the deposition of materials onto traversed public thoroughfare(s). All materials deposited onto public thoroughfare(s) shall be removed immediately.

5. The permittee shall inspect periodically and maintain continuously in effective operating condition, all erosion and sediment control measures until such time as they are removed with prior permission from the Department. The permittee is responsible for immediately repairing or replacing any sediment control measures which have been damaged or removed by the permittee or any other person.

6. Following initial soil disturbance or re–disturbance, permanent or temporary stabilization must be completed within:

   a) Three (3) calendar days as to the surface of all perimeter dikes, swales, ditches, perimeter slopes and all slopes steeper than 3 horizontal to 1 vertical (3:1); and

   b) Seven (7) calendar days as to all other disturbed or graded areas on the project site not under active grading.

   All areas disturbed outside of the perimeter sediment control system must be minimized and stabilized immediately. Maintenance must be performed as necessary to ensure continued stabilization.

7. The permittee shall apply sod, seed, and anchored straw mulch, or other approved stabilization measures to all disturbed areas within seven (7) calendar days after stripping and grading activities have ceased on that area. Maintenance shall be performed as necessary to ensure continued stabilization. Active construction areas such as borrow or stockpile areas, roadway improvements, and areas within fifty (50) feet of a building under construction may be exempt from this requirement, provided that erosion and sediment control measures are installed and maintained to protect those areas.

8. Prior to removal of sediment control measures, the permittee shall stabilize all contributory disturbed areas with required soil amendments and topsoil, using sod or an approved permanent seed mixture and an approved anchored mulch. Wood fiber mulch may only be used in seeding season when the slope does not exceed 10% and grading has been done to promote sheet flow drainage. Areas brought to finished grade during the seeding season shall be permanently stabilized within seven (7) calendar days of establishment. When property is brought to finished grade during the months of November through February, and permanent stabilization is found to be impractical, an approved temporary seed and straw anchored mulch shall be applied to disturbed areas. The final permanent stabilization of such property shall be completed prior to the following April 15.

9. The site permit, work, materials, approved SC/SM plans, and test reports shall be available at the site for inspection by duly authorized officials of Montgomery County.

10. Surface drainage flows over unstabilized cut and fill slopes shall be controlled by either preventing drainage flows from traversing the slopes or by installing mechanical devices to lower the water down slope without causing erosion. Dikes shall be installed and maintained at the top of cut or fill slopes until the slope and drainage area to it are fully stabilized, at which time they must be removed and final grading done to promote sheet flow drainage. Mechanical devices must be provided at points of concentrated flow where erosion is likely to occur.

11. Permanent swales or other points of concentrated water flow shall be stabilized within 3 calendar days of establishment with sod or seed with an approved erosion control matting or by other approved stabilization measures.

12. Sediment control devices shall be removed, with permission of the Department, within thirty (30) calendar days following establishment of permanent stabilization in all contributory drainage areas. Stormwater management structures used temporarily for sediment control shall be converted to the permanent configuration within this time period as well.

13. No permanent cut or fill slope with a gradient steeper than 3:1 will be permitted in lawn maintenance areas or on residential lots. A slope gradient of up to 2:1 will be permitted in non– maintenance areas provided that those areas are indicated on the erosion and sediment control plan with a low–maintenance ground cover specified for permanent stabilization. Slope gradient steeper than 2:1 will not be permitted with vegetative stabilization.

14. The permittee shall install a splashblock at the bottom of each downspout unless the downspout is connected by a drain line to an acceptable outlet.

15. For finished grading, the permittee shall provide adequate gradients so as to prevent water from standing on the surface of lawns more than twenty–four (24) hours after the end of a rainfall, except in designated drainage courses and swale flow areas, which may drain as long as forty–eight (48) hours after the end of a rainfall.

16. Sediment traps or basins are not permitted within 20 feet of a building which is existing or under construction. No building may be constructed within 20 feet of a sediment trap or basin.

17. All inlets in non–sump areas shall have asphalt berms installed at the time of base paving establishment.

18. The sediment control inspector has the option of requiring additional sediment control measures, as deemed necessary.

19. All trap elevations are relative to the outlet elevation, which must be on existing undisturbed ground.

20. Vegetative stabilization shall be performed in accordance with the Standards and Specifications for Soil Erosion and Sediment Control.

21. Sediment trap(s)/basin(s) shall be cleaned out and restored to the original dimensions when sediment has accumulated to the point of one–half (1/2) the wet storage depth of the trap/basin (1/4 the wet storage depth for ST–III) or when required by the sediment control inspector.

22. Sediment removed from traps/basins shall be placed and stabilized in approved areas, but not within a floodplain.

23. All sediment basins and traps must be surrounded with a welded wire safety fence. The fence must be at least 42 inches high, have posts spaced no farther apart than 8 feet, have mesh openings no greater the two inches in width and four inches in height, with a minimum of 14 gauge wire. Safety fence must be maintained in good condition at all times.

24. No excavation in the areas of existing utilities is permitted unless their location has been determined. Call "Miss Utility" at 1–800–257–7777, 48 hours prior to the start of work.

25. Off–site spoil or borrow areas must have prior approval by DPS.

26. Sediment trap/basin dewatering for cleanout or repair may only be done with the DPS inspector's permission. The inspector must approve the dewatering method for each application. The following methods may be considered:

   A. Pump discharge may be directed to another on–site sediment trap or basin, provided it is of sufficient volume and the pump intake is floated to prevent agitation or suction of deposited sediments; or

   B. the pump intake may utilize a Removable Pumping Station and must discharge into an undisturbed area through a non–erosive outlet; or

   C. the pump intake may be floated and discharge into a Dirt Bag (12 oz. non–woven fabric), or approved equivalent, located in an undisturbed buffer area.
   Remember: Dewatering operation and method must have prior approval by the DPS inspector.

27. The permittee must notify the Department of all utility construction activities within the permitted limits of disturbance prior to the commencement of those activities.

28. Topsoil must be applied to all pervious areas within the limits of disturbance prior to permanent stabilization in accordance with MDE "Standards and Specifications for Soil Preparation, Topsoiling, and Soil Amendments".

STANDARD SYMBOLS

AT–GRADE INLET PROTECTION	AGIP	REMOVABLE PUMPING STATION	RPS
BAFFLE BOARDS	BB	RIPRAP INFLOW PROTECTION	RRP
BENCHING	BENCHING	RIPRAP OUTLET SEDIMENT TRAP ST III	ST–III
CATCH BASIN INSERT	CBI	ROCK OUTLET PROTECTION 1	ROP1
CLEAR WATER DIVERSION PIPE	CWD – 12 (DESIGNATION, CWD–12 REFERS TO 12 INCH CLEAR WATER DIVERSION)	ROCK OUTLET PROTECTION II	ROPII
CLEAR WATER PIPE	CWP	ROCK OUTLET PROTECTION III	ROPIII
COMBINATION INLET PROTECTION	COIP	SILT FENCE	SF
CONCRETE WASHOUT STRUCTURE	CWS	SILT FENCE ON PAVEMENT	SFOP
CURB INLET PROTECTION	CIP	SOD	
DIVERSION FENCE	DF	STABILIZED CONSTRUCTION ENTRANCE	SCE
EARTH DIKE	A–1 (PLACE DESIGNATION (A–1, B–2, etc.) ON FLOW CHANNEL SIDE OF DIKE)	STANDARD INLET PROTECTION	SIP
EMERGENCY SPILLWAY	ES	STOCKPILE AREA	
FILTER BAG	FB	STONE CHECK DAM	CD
FILTER BERM	FB–A / FB–B	STONE/RIPRAP OUTLET SEDIMENT TRAP ST II	ST–II
FILTER LOG	FL–18 (DESIGNATION, FL–18 REFERS TO 18 INCH DIAMETER FILTER LOG)	SUBSURFACE DRAINS	SSD
GABION INFLOW PROTECTION	GP	SUMP PIT	SP
GABION INLET PROTECTION	GIP	SUPER SILT FENCE	SSF
HORIZONTAL DRAW–DOWN DEVICE	HDDD	TEMPORARY ACCESS BRIDGE	TB
LIMIT OF DISTURBANCE	LOD	TEMPORARY ACCESS CULVERT	
MEDIAN INLET PROTECTION	MIP	TEMPORARY ASPHALT BERM	TAB
MEDIAN SUMP INLET PROTECTION	MSIP	TEMPORARY BARRIER DIVERSION	TBD
MOUNTABLE BERM	MB	TEMPORARY GABION OUTLET STRUCTURE	TGOS
PERIMETER DIKE/SWALE	PDS–1	TEMP. SOIL STABILIZATION MATTING–TYPE A	
PERM. SOIL STABILIZATION MATTING–TYPE B		TEMP. SOIL STABILIZATION MATTING–TYPE E	
PERM. SOIL STABILIZATION MATTING–TYPE C		TEMP. SOIL STABILIZATION MATTING–TYPE D	
PIPE OUTLET SEDIMENT TRAP ST I	ST–I	TEMPORARY STONE OUTLET STRUCTURE	TSOS
PIPE SLOPE DRAIN	PSD – 12 (DESIGNATION, PSD–12 REFERS TO 12 INCH PIPE SLOPE DRAIN)	TEMPORARY SWALE	A–1 (PLACE DESIGNATION (A–1, B–2, etc.) ON FLOW CHANNEL SIDE OF SWALE)
PLUNGE POOL	PP	WASH RACK OPTION	WR
PORTABLE SEDIMENT TANK	PST	CHESAPEAKE BAY CRITICAL AREA	
DRAINAGE BOUNDARY	PA	TREE PROTECTION FENCE	TPF
EXISTING CONTOURS	100	WETLAND	
PROPOSED CONTOURS	100	WETLAND BUFFER	
		100–YEAR FLOODPLAIN	

STANDARD NOTES

1. The contractor will immediately inform the county of any discrepancies found between the project plans and contract specifications.
2. For construction, all horizontal control shall be NAD 83/91 and vertical control NAVD 88.
3. Types of storm drain structures refer to the 'Design Standards' of Montgomery County Department of Transportation, unless otherwise noted.
4. Information concerning underground utilities was obtained from available records, The contractor must determine the exact location and elevations of the lines by digging test pits by hand at all utility crossings well in advance of trenching. If clearances are less than shown on this plan or six inches, whichever is less, the contractor shall contact the county.
5. Repairs to utilities or property damaged as a result of the contractor's negligence or method of operation must be made at the contractor's expense before proceeding with construction.
6. Call "Miss Utility" at 1–800–257–7777 fourty–eight (48) hours prior to beginning excavation to determine the exact location of existing utilities.
7. Clearing to be limited to the "limit of disturbance" as shown on the plans.
8. All grading shall be done in such a manner as to provide positive drainage.
9. Disturbed areas adjacent to established lawns shall be sodded. Other disturbed areas shall be seeded and mulched.
10. The contractor shall obtain a roadside tree permit for any maintenance, treatment, planting, removal or root cutting on trees within the public right–of–way before starting a job. Permit requirements may be obtained from the Department of Natural Resources – Maryland Forest, Park and Wildlife service whose telephone number is (301) 854–6060.
11. Contact the Washington Suburban Sanitary Commission system maintenance engineer before excavating beneath or in the vicinity of existing water or sewer lines. Backfill to be done under the supervision of W.S.S.C. call 301–699–4420.
12. Contact Washington gas dispatch officer at (703) 750–4831 before excavating beneath or in the vicinity of existing gas main and service laterals.
13. Prior to vegetative stabilization, all disturbed areas must be topsoiled per the Montgomery County "Standards and Specifications for topsoil".
14. Prior to clearing trees, installing sediment control measures, or grading, a preconstruction meeting must be conducted on–site with the Montgomery County Department of Permitting Services (MCDPS) sediment control inspector (240) 777–6210 (48 hours notice) and the MNCPPC, Planning Department, Plans Enforcement inspector (301) 495–4571 (48 hours notice), the Owners representative, and the site Engineer.
15. The limits of disturbance shall be field marked prior to clearing of trees, installation of sediment control measures, construction, or other land disturbing activities.
16. The permittee must obtain written approval from the MNCPPC inspector, certifying that the limits of disturbance and tree protection measures are correctly marked and installed prior to commencing any clearing.
17. Clear and grade for installation of sediment control devices.
18. Instal sediment control devices. Traps and basins shall be constructed prior to construction of any earth dikes that convey drainage to a trap and/or basin.
19. Once the sediment control devices are installed, the permittee must obtain written approval from the MCDPS inspector before proceeding with any additional clearing, grubbing or grading.

NOTE 1: All sequences should call for the permittee to obtain written approval from MCDPS inspector, prior to the removal of any sediment control devices.

NOTE 2: Any site that has a proposed storm drain diversion should have its Sequence of Construction state the following:
1) The construction of the diversion in the storm drain construction step; and
2) Once the drainage area is stabilized, the storm drain system must be flushed, and temporary pipes removed, and any permanent pipes unblocked or constructed.

OWNER/DEVELOPER'S CERTIFICATION

I/We hereby certify that all clearing, grading, construction, and or development will be done pursuant to this plan and that any responsible personnel involved in the construction project will have a Certificate of Attendance at Department of Natural Resources approved training progrom for the control of sediment and erosion before beginning the project.

Signature _____ Date _____

Printed Name and Title _____

DESIGN CERTIFICATION

I hereby certify that this plan has been prepared in accordance with the "2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control," Montgomery County Department of Permitting Services Executive Regulations 5–90, 7–02AM and 36–90, and Montgomery County Department of Public Works and Transportation "Storm Drain Design Criteria" dated August 1988.

Design Engineer Signature _____ Date _____

Printed Name _____ Registration Number _____

P.E. CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLANDLICENSE NO. 28377 , EXPIRATION DATE: 12–31–16

SITE INFORMATION		
DISTURBED AREA (LOD)	CUT (CY)	FILL (CY)
PHASE 1: 2.785 ac		
PHASE 2: 3.759 ac	2680	235
SPA: 0.447 ac		
TOTAL: 6.991 ac		

THE MARYLAND–NATIONAL CAPITAL PARK AND PLANNING COMMISSION, DEPARTMENT OF PARK AND PLANNING

M–NCPPC PERMIT NO. _____

M–NCPPC PARK FACILITY CODE _____

REVIEWED BY _____

APPROVED BY _____ CHIEF, CONSTRUCTION SECTION

DATE APPROVED _____

M–NCPPC PERMIT SHEET # _____ OF _____

THIS IS NOT A PERMIT TO BEGIN CONSTRUCTION

This approval is for technical review only. For permit information, contact Jay Childs, Construction Supervisor at (301)495–2574.

MONTGOMERY CO. DEPARTMENT OF PERMITTING SERVICES APPROVED FOR:

NOTE: MCDPS APPROVAL DOES NOT NEGATE THE NEED FOR A MCDPS ACCESS PERMIT.

Stormwater Management:	Sediment Control Technical Requirements:	Administrative Requirements:
Reviewed Date	WRC 5/26/15	Reviewed Date
Approved Date	Reviewed Date	
SM FILE #	Approved Date	

MCDPS APPROVAL OF THIS PLAN WILL EXPIRE TWO YEARS FROM THE DATE OF APPROVAL IF THE PROJECT HAS NOT STARTED.

DPS approval of a sediment control or stormwater management plan is for demonstrated compliance with minimum environmental runoff treatment standards and does not create or imply any right to divert or concentrate runoff onto any adjacent property without that property owner's permission. It does not relieve the design engineer or other responsible person of professional liability or ethical responsibility for the adequacy of the drainage design as it affects uphill or downhill properties.

JOHNSON, MIRMIRAN & THOMPSON
Engineering A Brighter Future®
72 Loveton Circle, Sparks, MD 21152
Telephone: (410) 329-3100; Fax: (410) 472-2200; WEB: WWW.JMT.COM

NO.	REVISION	DATE	BY

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Design Section _____ Date _____

APPROVED

Chief, Division of Transportation Engineering _____ Date _____

Designed by: DLA Drawn by: FGY Checked by: SAM

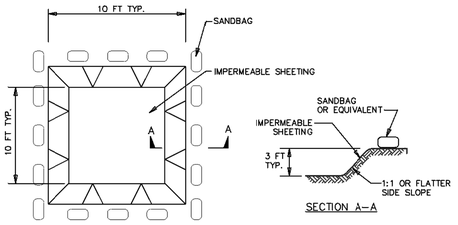
EROSION AND SEDIMENT CONTROL SC–01 NOTES SHEET
NEEDWOOD ROAD
BIKE PATH/TRAIL–PHASE II

SCALE: AS SHOWN DATE: SEPTEMBER 2015

Project No. : 501304 SHEET 2 of 6

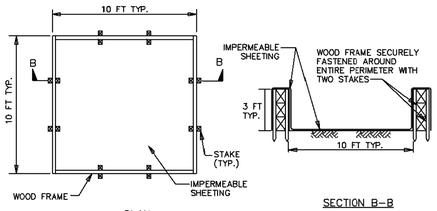
DETAIL H-6 ONSITE CONCRETE WASHOUT STRUCTURE

STANDARD SYMBOL: CWS



PLAN

EXCAVATED WASHOUT STRUCTURE



PLAN

WASHOUT STRUCTURE WITH WOOD PLANKS

1 OF 2

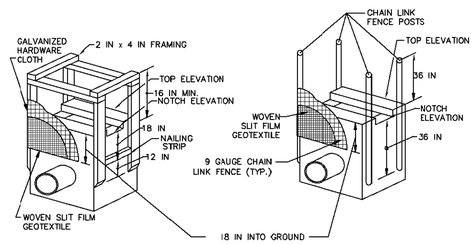
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

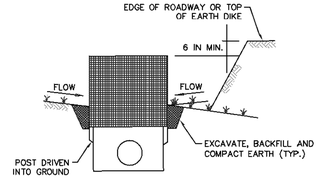
DETAIL E 9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SIP

TYPE A MAXIMUM DRAINAGE AREA = ¼ ACRE
TYPE B MAXIMUM DRAINAGE AREA = 1 ACRE



ISOMETRIC VIEW



SECTION FOR TYPE A AND B

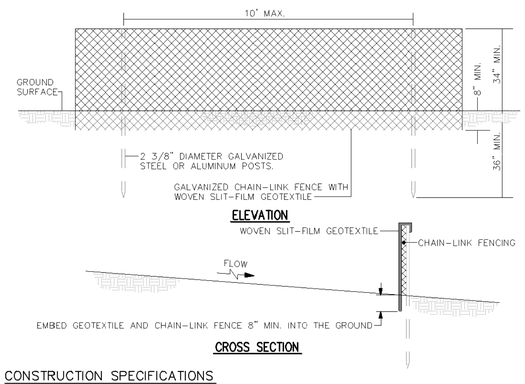
1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF

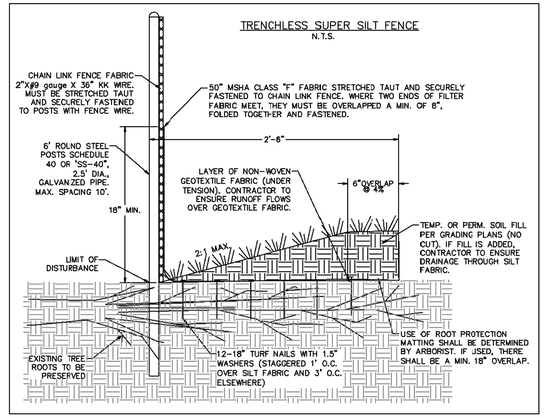


CONSTRUCTION SPECIFICATIONS

1. INSTALL 2 3/8 INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN-LINK FENCE (2 3/8 INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT-FILM GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN-LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID-SECTION. EMBED GEOTEXTILE AND CHAIN-LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTIONS H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN-LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	PAGE E.5	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



SEQUENCE OF CONSTRUCTION

1. Prior to clearing trees, installing sediment control measures, or grading, a pre-application meeting must be conducted on-site with the Montgomery County Department of Permitting Services (MCDPS) Sediment Control Inspector (240) 777-0210 (48 hours notice) and the MNCPPC, Planning Department, Plans Enforcement Inspector (301) 495-4571 (48 hours notice), the owners representative, and the site engineer.
2. The Limits of Disturbance (LOD) must be field marked prior to clearing of trees, installation of sediment control measures, construction, or other land disturbing activities.
3. Contractor shall locate the staging and stockpile area within the LOD upon the DPS inspector's approval. Contractor is responsible for any additional E&S controls for staging and stockpile area as required by the DPS inspector.
4. Install any and all Tree Protection Fence (TPF) shown on the plans or as directed by the MNCPPC inspector.
5. The permittee must obtain written approval from the MNCPPC inspector certifying that the limits of disturbance and Tree Protection measures are correctly marked and installed prior to commencing any clearing.
6. Install Super Silt Fence (SSF) #1-4 and Curb Inlet Protection (CIP) #1-2.
7. Construct sidewalk and curb from Sta. 400+50 to Sta. 405+50. Provide same day stabilization.
8. Install proposed storm drain system from I-1 to FC-1 and Open Back Inlet. Install Standard Inlet Protection SIP #1. Provide same day stabilization.
9. When all upstream drainage areas are stabilized place Bio-Swale and Rain Garden media layers as depicted in the stormwater detail sheet. Provide same day stabilization.
10. Construct sidewalk and curb from Sta. 405+50 to Sta. 408+25. Provide same day stabilization.
11. The permittee shall obtain written approval from MCDPS inspector, prior to the removal of any sediment control device.
12. Submit as-built.

Stormwater Concept Number: 269036

Project Name/Subdivision: Needwood Road Bike Path/Trail
Property Size/Area: 0.447 Acres
Property Address/Location: 5900 Muncaster Mill Road Derwood/MD 20855

Owner/Applicant Information:
Name: Dept. of Transportation - Div. of Transportation Eng. Bruce Johnston
Mailing Address: 100 Edison Park Drive, 4th Floor
City: Gaithersburg State: MD Zip: 20878 Phone: 240-777-7236

Engineering Information:
Name: Johnson, Mirmiran & Thompson David Adams
Mailing Address: 72 Loveton Circle
City: Sparks State: MD Zip: 21152 Phone: 410-329-3100

Type of Application: SPA Water Quality Inventory
Type of Submittal: New
Stormwater Concept Number:

Preliminary Plan # (if applicable): N/A
Watershed: Washington Metro Area
Lot(s): Various
Block(s): N/A
Parcel(s): Various
Subdivision: N/A
Municipality: N/A

-No dwelling units proposed.

Overall Impervious Area: 0.127 acres
Impervious Area Outside Sensitive Areas: 0.127 acres

Environmental Sensitive Areas Disturbed: 0.000 acres, 0.00%
Environmental Sensitive Areas Preserved: 0.000 acres, 0.00%
Environmental Sensitive Areas Total: 0.000 acres, 0.00%

THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION, DEPARTMENT OF PARK AND PLANNING

M-NCPPC PERMIT NO.
M-NCPPC PARK FACILITY CODE
REVIEWED BY
APPROVED BY
CHIEF, CONSTRUCTION SECTION
DATE APPROVED
M-NCPPC PERMIT SHEET # ____ OF ____

THIS IS NOT A PERMIT TO BEGIN CONSTRUCTION

This approval is for technical review only. For permit information, contact Jay Childs, Construction Supervisor at (301)495-2574.

MCDPS APPROVED FOR:

Stormwater Management:

Reviewed Date
Approved Date
SM FILE #

Sediment Control Technical Requirements:

WRC 5/26/15
Reviewed Date
Approved Date

Administrative Requirements:

Reviewed Date

SEDIMENT CONTROL PERMIT #

NOTE
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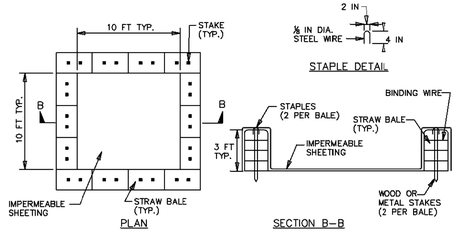
DETAIL H-6 ONSITE CONCRETE WASHOUT STRUCTURE

STANDARD SYMBOL: CWS



NOTE: CAN BE TWO STACKED BALES OR PARTIALLY EXCAVATED TO REACH 3 FT DEPTH

WASHOUT STRUCTURE WITH STRAW BALES

CONSTRUCTION SPECIFICATIONS

1. LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC.
2. SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
3. PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
4. PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
5. KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET-VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E 9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SIP

CONSTRUCTION SPECIFICATIONS

1. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18 INCHES BELOW THE NOTCH ELEVATION.
3. FOR TYPE A, USE NOMINAL 2 INCH X 4 INCH CONSTRUCTION GRADE LUMBER POSTS, DRIVEN 1 FOOT INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2X4 FRAME AS SHOWN. STRETCH ½ INCH GALVANIZED HARDWARE CLOTH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. FASTEN GEOTEXTILE SECURELY TO THE HARDWARE CLOTH WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND HARDWARE CLOTH A MINIMUM OF 18 INCHES BELOW THE WEIR CREST. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED TO THE POST.

   FOR TYPE B, USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH, DRIVEN A MINIMUM OF 36 INCHES BELOW THE WEIR CREST AT EACH CORNER OF THE STRUCTURE. FASTEN 9 GAUGE OR HEAVIER CHAIN LINK FENCE, 42 INCHES IN HEIGHT, SECURELY TO THE FENCE POSTS WITH WIRE TIES. FASTEN GEOTEXTILE SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 18 INCHES BELOW THE WEIR CREST.
4. BACKFILL AROUND THE INLET IN LOOSE 4 INCH LIFTS AND COMPACT UNTIL SOIL IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.
5. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

JOHNSON, MIRMIRAN & THOMPSON
Engineering A Brighter Future®
72 Loveton Circle, Sparks, MD 21152
Telephone: (410) 329-3100; Fax: (410) 472-2200; WEB: WWW.JMT.COM

NO.	REVISION	DATE	BY

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL
Chief, Design Section — Date
APPROVED
Chief, Division of Transportation Engineering — Date

Designed by: DLA Drawn by: FGY Checked by: SAM

EROSION AND SEDIMENT CONTROL SC-03 DETAIL SHEET
NEEDWOOD ROAD BIKE PATH/TRAIL-PHASE II

SCALE: AS SHOWN
DATE: SEPTEMBER 2015

Project No. : 501304 SHEET 3 of 6

LEGEND

- EX. CONTOUR (SURVEY)
- EX. CONTOUR (GIS)
- PROPOSED CONTOUR
- EX. BUILDING
- PROPERTY BOUNDARY
- PROPOSED PATH/TRAIL (PATH WIDTH = 8 FT)
- SSF — SUPER SILT FENCE
- (X) TREES TO BE REMOVED
- DRAINAGE AREA
- TPF — TREE PROTECTION FENCE

Note: Vegetative stabilization of perimeter controls and areas specified must occur within three days of installation of temporary sediment and erosion control structures.

THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION, DEPARTMENT OF PARK AND PLANNING

M-NCPPC PERMIT NO. ______

M-NCPPC PARK FACILITY CODE ______

REVIEWED BY ______

APPROVED BY ______ CHIEF, CONSTRUCTION SECTION

DATE APPROVED ______

M-NCPPC PERMIT SHEET # ______ OF ______

THIS IS NOT A PERMIT TO BEGIN CONSTRUCTION

This approval is for technical review only. For permit information, contact Jay Childs, Construction Supervisor at (301)495-2574.

MONTGOMERY CO. DEPARTMENT OF PERMITTING SERVICES APPROVED FOR:

NOTE: MCDPS APPROVAL DOES NOT NEGATE THE NEED FOR A MCDPS ACCESS PERMIT.

Stormwater Management:	Sediment Control Technical Requirements:	Administrative Requirements:
Reviewed ______ Date ______	WRC 5/26/15 Reviewed Date	Reviewed ______ Date ______
Approved ______ Date ______	Approved ______ Date ______	SEDIMENT CONTROL PERMIT NO. ______
SM FILE # ______		MCDPS: APPROVAL OF THIS PLAN WILL EXPIRE ONE YEAR FROM THE DATE OF APPROVAL IF THE PROJECT HAS NOT STARTED.

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NO.	REVISION	DATE	BY

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

Chief, Design Section ______ Date ______

APPROVED

Chief, Division of Transportation Engineering ______ Date ______

Designed by: DLA Drawn by: FGY Checked by: SAM

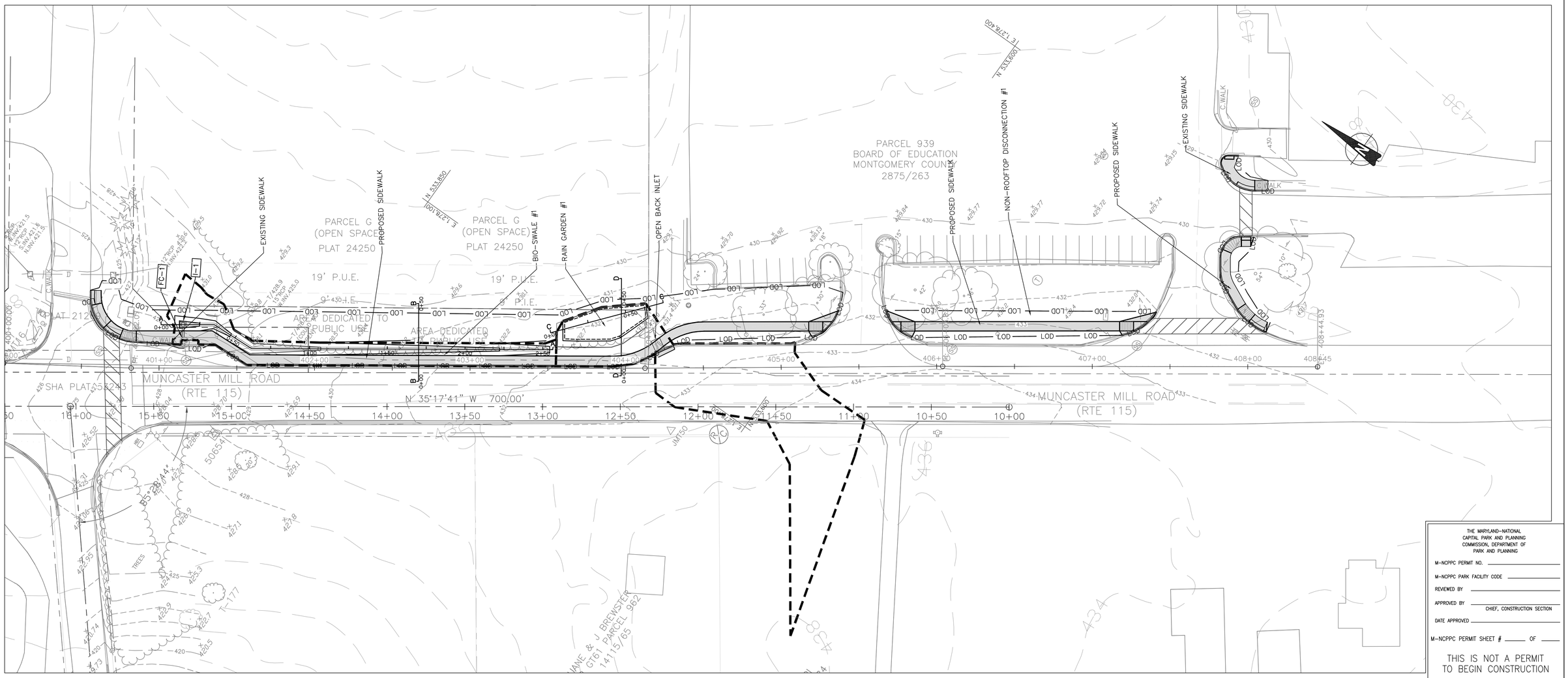
EROSION AND SEDIMENT CONTROL SC-01 PLAN SHEET

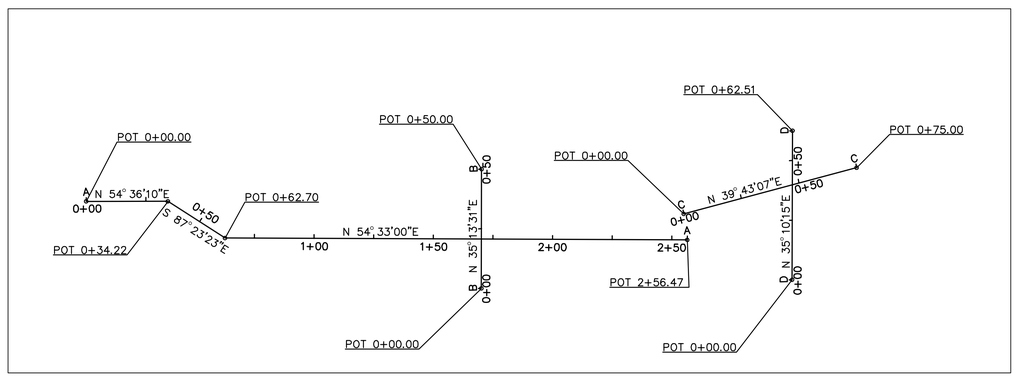
NEEDWOOD ROAD BIKE PATH/TRAIL-PHASE II

SCALE: 1"=30'

DATE: SEPTEMBER 2015

Project No.: 501304 SHEET 4 of 6





LEGEND

- EX. CONTOUR (SURVEY)
- EX. CONTOUR (GIS)
- PROPOSED CONTOUR
- EX. BUILDING
- PROPERTY BOUNDARY
- PROPOSED PATH/TRAIL –PERVIOUS PAVING
- PROPOSED ASPHALT PATH/TRAIL–IMPERVIOUS
- TREES TO BE REMOVED
- DRAINAGE AREA BOUNDARY
- TPF TREE PROTECTION FENCE

BASELINE CONTROL COORDINATES			
LOCATION	STATION	NORTHING	EASTING
(A–A)	POT 0+00.00	533,944.33	1,277,936.37
	POT 0+34.22	533,916.43	1,277,956.19
	POT 0+62.70	533,887.98	1,277,957.48
	POT 2+56.47	533,729.47	1,278,068.93
(B–B)	POT 0+00.00	533,788.13	1,278,002.42
	POT 0+50.00	533,816.97	1,278,043.27
(C–C)	POT 0+00.00	533,736.99	1,278,076.98
	POT 0+75.00	533,689.06	1,278,134.67
(D–D)	POT 0+00.00	533,683.94	1,278,080.68
	POT 0+62.51	533,719.95	1,278,131.78

THE MARYLAND–NATIONAL CAPITAL PARK AND PLANNING COMMISSION, DEPARTMENT OF PARK AND PLANNING

M–NCPPC PERMIT NO. _____

M–NCPPC PARK FACILITY CODE _____

REVIEWED BY _____

APPROVED BY _____
CHIEF, CONSTRUCTION SECTION

DATE APPROVED _____

M–NCPPC PERMIT SHEET # ____ OF ____

THIS IS NOT A PERMIT TO BEGIN CONSTRUCTION

This approval is for technical review only. For permit information, contact Jay Childs, Construction Supervisor at (301)495–2574.

MONTGOMERY CO. DEPARTMENT OF PERMITTING SERVICES APPROVED FOR:

Stormwater Management:

_____
Reviewed Date

_____
Approved Date

SM FILE #

Sediment Control Technical Requirements:

WRC 5/26/15
Reviewed Date

Approved Date

Administrative Requirements:

_____
Reviewed Date

SEDIMENT CONTROL PERMIT NO.

_____

MCDPS APPROVAL OF THIS PLAN WILL EXPIRE TWO YEARS FROM THE DATE OF APPROVAL IF THE PROJECT HAS NOT STARTED.

NOTE: MCDPS APPROVAL DOES NOT NEGATE THE NEED FOR A MCDPS ACCESS PERMIT.

DPS approval of a sediment control or stormwater management plan is for demonstrated compliance with minimum environmental runoff treatment standards and does not create or imply any right to divert or concentrate runoff onto any adjacent property without that property owner's permission. It does not relieve the design engineer or other responsible person of professional liability or ethical responsibility for the adequacy of the drainage design as it affects uphill or downhill properties.

JOHNSON, MIRMIRAN & THOMPSON
Engineering A Brighter Future®
72 Loveton Circle, Sparks, MD 21152
Telephone: (410) 329-3100, Fax: (410) 472-2200, WEB: WWW.JMT.COM

NO.	REVISION	DATE	BY

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

_____ _____
Chief, Design Section Date

APPROVED

_____ _____
Chief, Division of Transportation Engineering Date

Designed by: XXX Drawn by: XXX Checked by: _____

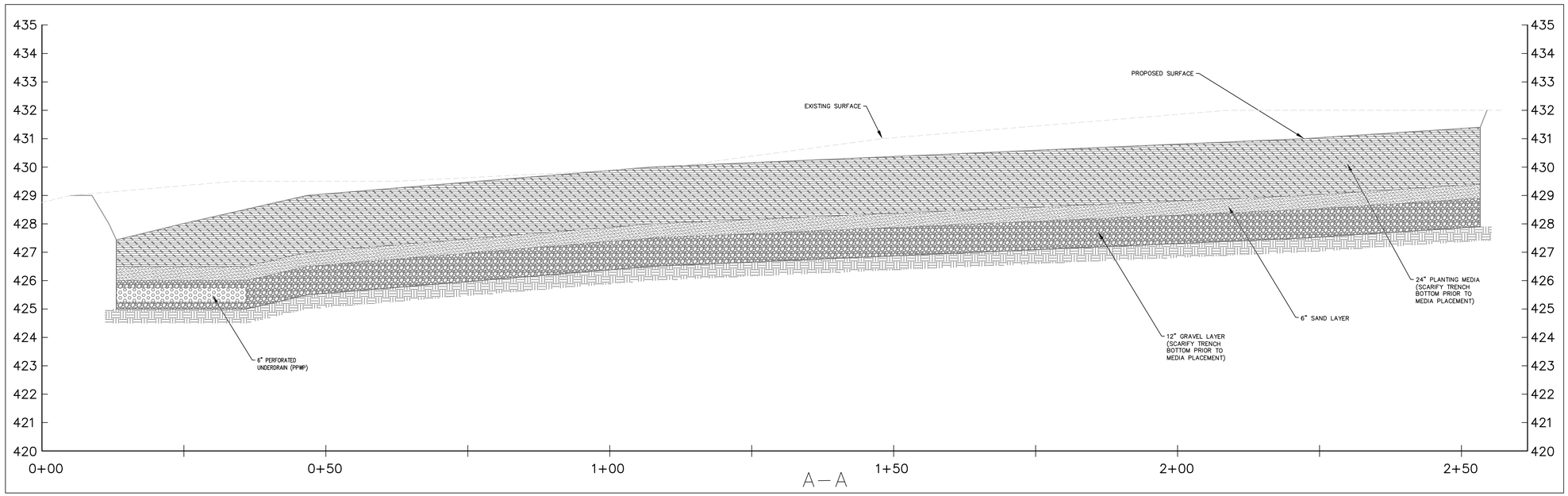
SWM–01 PLAN SHEET

NEEDWOOD ROAD BIKE PATH/TRAIL–PHASE II

SCALE: 1"=30'

DATE: SEPTEMBER 2015

Project No. : 501304 SHEET 5 of 6



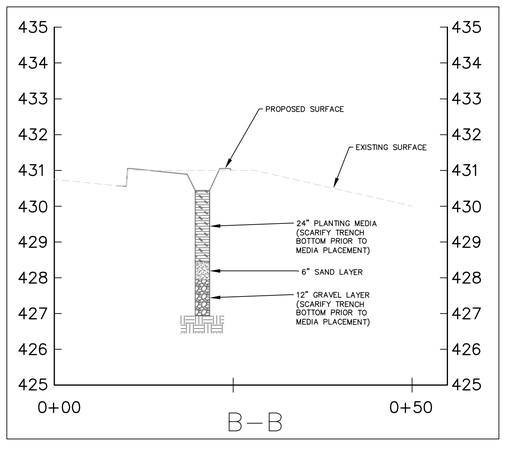
A–A

CONSTRUCTION INSPECTION CHECK–OFF LIST FOR SWALES

STAGE	MCDPS INSPECTOR	OWNER/ DEVELOPER
MANDATORY NOTIFICATION: Inspection and approval of each practice is required at these points prior to proceeding with construction. The permittee is required to give the MCDPS Inspector twenty–four (24) hours notice (DPS telephone 240–777– 0311). The DPS inspector may waive an inspection, and allow the owner/ developer to make the required inspection per a prior scheduled arrangement which has been confirmed with the DPS inspector in writing. Work completed without MCDPS approval may result in the permittee having to remove and reconstruct the unapproved work. The permittee must maintain a "record set" of approved SC/SM plans on–site at all times. Upon completion of the project, a formal Stormwater Management As–Built must be submitted to MCDPS unless a Record Drawing Certification has been allowed instead. Each of the steps listed below must be verified by either the MCDPS Inspector OR the Owner/Developer.	INITIALS/ DATE	INITIALS/ DATE
1. Placement of backfill of underdrains and installation of diaphragms, forebays, check dams, or weirs conforms to approved plans		
2. Final grading and establistment of permanent stabilization conforms to approved plans		

NOTES:

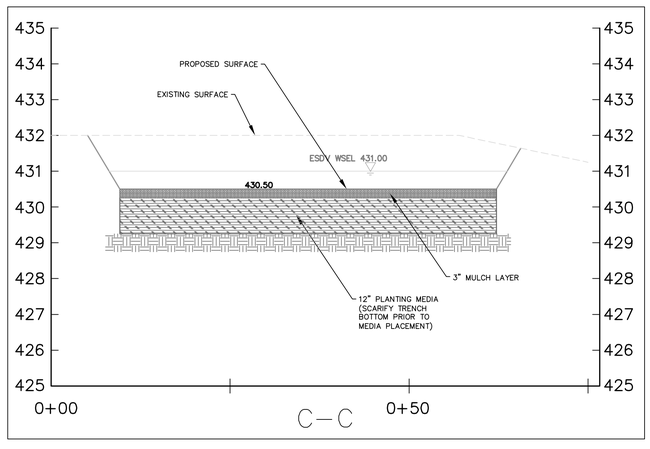
1) PLANTING MEDIA SHALL CONFORM TO MONTGOMERY COUNTY MICRO–BIORETENTION FACILITY PLANTING MEDIA SPECIFICATIONS, FOR A 12" RAIN GARDEN PLANTING MEDIA DEPTH. SPECIFICATIONS ARE AS FOLLOWS: 1/3 PERLITE OR SOLITE, 1/3 COMPOST AND 1/3 TOPSOIL. THE PERLITE SHALL BE COARSE GRADE HORTICULTURAL PERLITE. THE COMPOST SHALL BE HIGH GRADE COMPOST FREE OF STONES AND PARTIALLY COMPOSTED WOODY MATERIAL. THE TOPSOIL COMPONENT SHALL MEET THE FOLLOWING CRITERIA: CONTAIN NO MORE THAN 10% CLAY, 10–25% SILT AND 60–75% SAND AND BE FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN 2 INCHES.
2) THE MULCH LAYER IS AN IMPORTANT PART OF THE RAIN GARDEN DEVISE. MUCH OF THE POLLUTANT REMOVAL CAPACITY OF THE RAIN GARDEN SYSTEM IS WITHIN THE MULCH LAYER. THE SURFACE MULCH LAYER WILL CONSIST OF STANDARD DOUBLE SHREDDED AGED HARDWOOD MULCH. THE MULCH SHOULD BE APPLIED UNIFORMLY TO A DEPTH OF APPROXIMATELY 3 INCHES. YEARLY REPLENISHING MAY BE NECESSARY. PINE BARK IS NOT ACCEPTABLE.



B–B

CONSTRUCTION INSPECTION CHECK–OFF LIST FOR LANDSCAPE INFILTRATION

STAGE	MCDPS INSPECTOR	OWNER/ DEVELOPER
MANDATORY NOTIFICATION: Inspection and approval of each practice is required at these points prior to proceeding with construction. The permittee is required to give the MCDPS Inspector twenty–four (24) hours notice (DPS telephone 240–777–0311). The DPS inspector may waive an inspection, and allow the owner/developer to make the required inspection per a prior scheduled arrangement which has been confirmed with the DPS inspector in writing. Work completed without MCDPS approval may result in the permittee having to remove and reconstruct the unapproved work. Upon completion of the project, a formal Stormwater Management As–Built must be submitted to MCDPS unless a Record Drawing Certification has been allowed instead. Each of the steps listed below must be verified by either the MCDPS Inspector OR the Owner/Developer.	INITIALS/ DATE	INITIALS/ DATE
1. Excavation to subgrade conforms to approved plans		
2. Placement of backfill and observation well conforms to approved plans		
3. Placement of filter fabric, soil, and gravel media conforms to approved plans		
4. Construction of appurtenant conveyance structures conforms to approved plans		
5. Final grading and establistment of permanent stabilization conforms to approved plans		



C–C

CONSTRUCTION INSPECTION CHECK–OFF LIST FOR LANDSCAPE INFILTRATION

STAGE	MCDPS INSPECTOR	OWNER/ DEVELOPER
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1. Excavation to subgrade conforms to approved plans		
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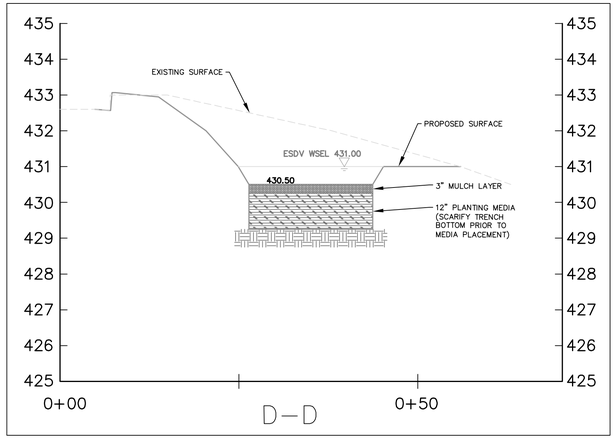
3. Placement of filter fabric, soil, and gravel media conforms to approved plans		
4. Construction of appurtenant conveyance structures conforms to approved plans		
5. Final grading and establistment of permanent stabilization conforms to approved plans		



D–D

CONSTRUCTION INSPECTION CHECK–OFF LIST FOR LANDSCAPE INFILTRATION

STAGE	MCDPS INSPECTOR	OWNER/ DEVELOPER
MANDATORY NOTIFICATION: Inspection and approval of each practice is required at these points prior to proceeding with construction. The permittee is required to give the MCDPS Inspector twenty–four (24) hours notice (DPS telephone 240–777–0311). The DPS inspector may waive an inspection, and allow the owner/developer to make the required inspection per a prior scheduled arrangement which has been confirmed with the DPS inspector in writing. Work completed without MCDPS approval may result in the permittee having to remove and reconstruct the unapproved work. Upon completion of the project, a formal Stormwater Management As–Built must be submitted to MCDPS unless a Record Drawing Certification has been allowed instead. Each of the steps listed below must be verified by either the MCDPS Inspector OR the Owner/Developer.	INITIALS/ DATE	INITIALS/ DATE
1. Excavation to subgrade conforms to approved plans		
2. Placement of backfill and observation well conforms to approved plans		
3. Placement of filter fabric, soil, and gravel media conforms to approved plans		
4. Construction of appurtenant conveyance structures conforms to approved plans		
5. Final grading and establistment of permanent stabilization conforms to approved plans		

THE MARYLAND–NATIONAL CAPITAL PARK AND PLANNING COMMISSION, DEPARTMENT OF PARK AND PLANNING

M–NCPPC PERMIT NO. _____

M–NCPPC PARK FACILITY CODE _____

REVIEWED BY _____

APPROVED BY _____
CHIEF, CONSTRUCTION SECTION

DATE APPROVED _____

M–NCPPC PERMIT SHEET # ____ OF ____

THIS IS NOT A PERMIT TO BEGIN CONSTRUCTION

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MONTGOMERY CO. DEPARTMENT OF PERMITTING SERVICES APPROVED FOR:

Stormwater Management:

_____ Reviewed Date

_____ Approved Date

SM FILE #

Sediment Control Technical Requirements:

WRC 5/26/15

Reviewed Date

Approved Date

Administrative Requirements:

Reviewed Date

SEDIMENT CONTROL PERMIT NO.

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NO.	REVISION	DATE	BY

MONTGOMERY COUNTY
DEPARTMENT OF TRANSPORTATION
GAITHERSBURG, MARYLAND

RECOMMENDED FOR APPROVAL

_____ Date
Chief, Design Section

APPROVED

_____ Date
Chief, Division of Transportation Engineering

Designed by: XXX Drawn by: XXX Checked by: _____

SWM–02 DETAIL SHEET

NEEDWOOD ROAD BIKE PATH/TRAIL–PHASE II

SCALE: 1"=30'

DATE: SEPTEMBER 2015

Project No. : 501304

SHEET 6 of 6