

**STORMWATER MANAGEMENT
CONCEPT AND PRELIMINARY PLAN REPORT**
SWM-9835-2024
SEC-9834-2024

PROJECT:

**AUTO SPA EXPRESS
GAITHERSBURG**

PROJECT LOCATION:

10009 Fields Road, Gaithersburg, Maryland 20878
Montgomery County

Bohler Engineering
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Gaithersburg, Maryland 20878
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BEPC# MDA230090.00



CITY OF GAITHERSBURG DEPARTMENT OF PUBLIC WORKS	
STORMWATER MANAGEMENT	
APPLICATION NO.	SWM-9835-2024
CONCEPT PLAN <input checked="" type="checkbox"/>	PRELIMINARY PLAN <input checked="" type="checkbox"/>
APPROVAL DATE	3/25/25
BY	<i>[Signature]</i>

I, Michael J Birkland, P.E., 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. 34261, Expiration Date: 05/14/2025.

March 24, 2025

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NARRATIVE

A. SITE DESCRIPTION / PROPOSED DEVELOPMENT:

The subject site is at 10009 Fields Road, Gaithersburg, MD 20878. The site is made up of Parcel B, Block A, Washingtonian Center, totaling 1.50 acres (or 65,426 square feet). Property is zoned MXD (Mixed Use Development) and is in the Muddy Branch Watershed. The current use is Commercial (Vacant Restaurant) with associated parking and utilities. There are three existing stormwater management facilities on the property including a Stormfilter, Infiltration Trench and underground quantity storage with a control structure for the 2-year event. These facilities are proposed to be removed under this application as they are no longer in keeping with the last stormwater management requirements, as discussed later in this report.

Proposed improvements include Automobile Car wash with associated infrastructure, and site stormwater management. Additionally, this application includes partial improvements to the existing sidewalk along Fields Road, as well as off-site improvements to the adjacent property at 10003 Fields Road, Gaithersburg MD, including demolition of the existing car wash and modifications to the existing parking lot.

For stormwater management requirements, the total LOD of 68,725 Sq. Ft. is being considered. The existing site imperviousness within the LOD is 49,852 Sq. Ft., or 73%, which is greater than 40%, so the site will be considered a Redevelopment.

B. SOILS DESCRIPTION:

The existing soil has been mapped by the U.S. Department of Agriculture, Soils Conservation Service, and is shown to be:

MAPPED SOIL TYPES		
SOIL TYPE	SOIL DESCRIPTION	HIDROLOGIC SOIL GROUP
2B	Glenelg silt loam	B
66UB	Wheaton-Urban land complex	B

C. EXISTING AND PROPOSED CONDITIONS HYDROLOGY:

The majority of the site currently drains in a northerly direction and through on-site quality and quantity facilities. The site's runoff, and a small area of the adjacent Parcel C, then drain to an existing Montgomery County-maintained storm drain system (ex. 18" RCP), as shown. The existing drainage patterns will continue to be maintained with the proposed development.

D. STORMWATER MANAGEMENT: REQUIRED/PROVIDED

1) **ESD TO THE MEP**

The existing site is 73% percent impervious and is therefore considered a Redevelopment for stormwater management purposes.

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ESD to the MEP will be required for a target PE of 1.00 in. over 50% of the existing impervious area within the LOD minus the reduction in impervious area within the LOD.

MDE Chapter 5 ESD measures were considered for this project and the table below summarizes the design approach for each ESD measure.

MDE Chapter 5 Measures Considered - Auto Spa Express Gaithersburg		
CATEGORY	TYPE	NOTES
Section 5.3/Alternative Surfaces		
	A.1 Green Roof	The architecture of the building makes this measure impractical.
	A.2 Permeable Pavements	This measure is not practical for the intended use (car wash).
	A.3 Reinforced Turf	This measure is not practical for the intended use (car wash).
Section 5.4/Non-Structural		
	N.1 Disconnection of Rooftop Runoff	No practical location for disconnect route.
	N.2 Disconnection of Non-Rooftop Runoff	No practical location for disconnect route.
	N.3 Sheet Flow to Conservation Area	There is no downstream conservation area to drain to, which makes this measure impractical.
Section 5.4/Micro-Scale Practices		
	M.1 Rainwater Harvesting	No practical reuse of cistern runoff and number of rainbarrels required for treatment volume is not practical.
	M.2 Submerged Gravel Wetlands	Existing hydrologic soil group is B, which makes this measure impractical. Additionally, site acreage is not large enough to maintain the required submerged flow conditions.
	M.3 Landscape Infiltration	No practical location for this measure.
	M.4 Infiltration Berms	Site is highly impervious, which makes this measure impractical.
	M.5 Dry Wells	Given the drainage area limitations (1,000 SF), this measure is not practical for the proposed improvements.
	M.6 Micro-Bioretenion	This measure was chosen, given the appropriate drainage area and location within proposed landscape island, which allows it to treat the full ESD volume required for the site.
	M.7 Rain Gardens	Given the drainage area limitations (2,000 SF), this measure is not practical for the proposed improvements.
	M.8 Swales (Grass and Bio)	No practical location for a swale and project utilizes curb and gutter.
	M.9 Enhanced Filters	This practice is not needed since full ESD volume treatment was achieved with the proposed Micro-Bioretenion facility.

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ESD to the MEP will be achieved by one Micro-Bioretenion facility. The following ESD Summary Table summarizes the drainage area to the facility, as well as the required and provided ESD_v and P_E for the project. The Appendices contain the related calculations.

DA NAME	ESD PRACTICE	DRAINAGE AREA (SF) (ON AND OFF-SITE)	IMPERVIOUS AREA (SF) (ON AND OFF-SITE)	ESD _v REQUIRED (CF) (FOR AUTO SPA AND OFF-SITE)	MIN ESD _v (1" PE) (CF)	MAX ESD _v (2.6" PE) (CF)	ESD _v ACHIEVED (CF)	PE ACHIEVED (IN.)
DA-1	MB #1	7,068	6,348	1,101	506	1,314	1,120	2.2"

The full ESD_v requirement was achieved on-site since the achieved ESD_v of 1,120 CF is greater than the required ESD_v of 1,101 CF.

2) TREATMENT FOR VOLUME NOT ABLE TO BE TREATED IN ESD MEASURES

Not Applicable. Full ESD_v requirement met in ESD measure.

3) QUANTITY CONTROL

The Concept and Preliminary Plan proposes to provide Quantity Control of the 2-year developed storm down to 2-year pre-developed rate, assuming woods in good condition, given the design approved for the existing restaurant development. Storm drain will be sized for the 10-year, and a portion of the site's runoff will be captured in storm drain and sent to the underground system. The peak discharge will be controlled via a control structure with internal components, such as a low flow orifice, that will control the release rate but allow the larger storms to pass through to the existing downstream storm drain system. Details will be provided at Final engineering, but a review of the vertical and horizontal constraints, appropriate for this step in the stormwater management review process, has been done as part of Bohler's due diligence.

E. DOWNSTREAM IMPACTS AND CAPACITY

The connections to the downstream storm system will require a plan approval and permit from Montgomery County because a modification (new connection) to their system is proposed. An analysis will be done to MCDOT's standards and will demonstrate compliance with MCDOT's standards. Proposed work will be within an existing public storm drain easement.

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F. EROSION AND SEDIMENT CONTROL:

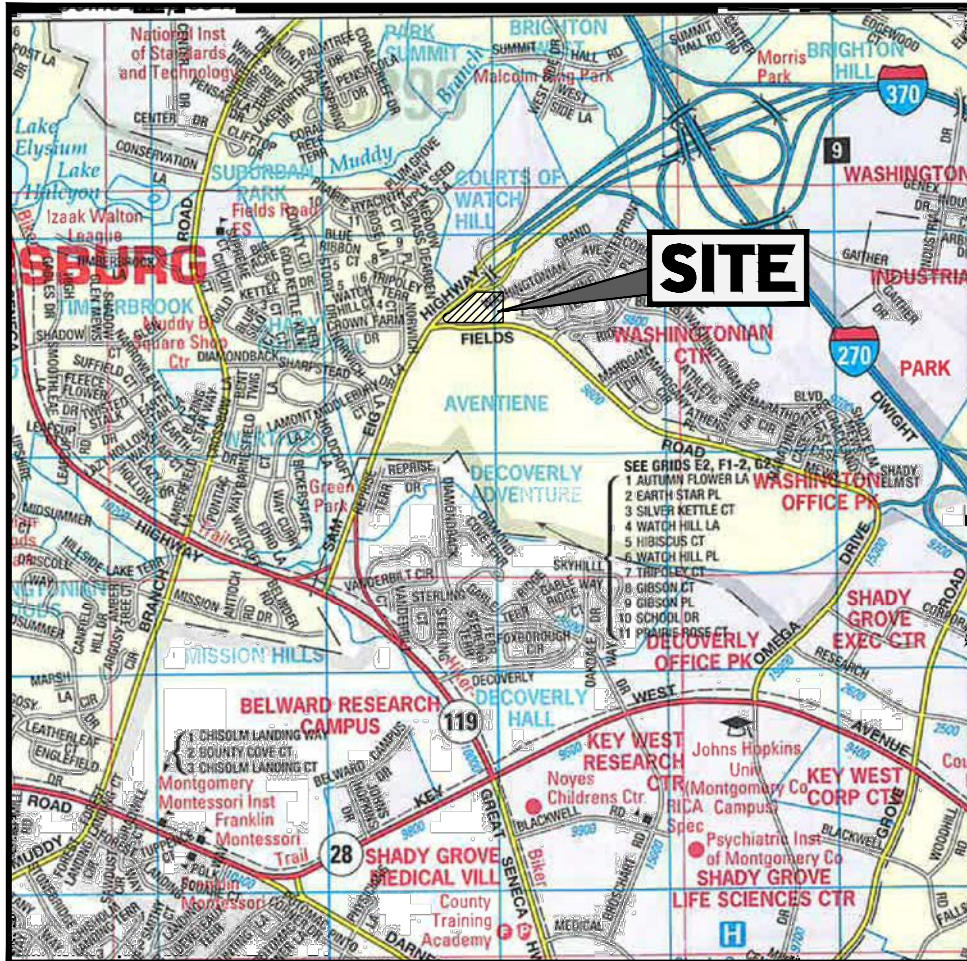
Erosion and sediment controls will be integrated into the stormwater design for the site. During construction, MDE measures such as super silt fence, silt fence, inlet protection, and a stabilized construction entrance will be utilized to ensure that sediment generated by the construction will be controlled in accordance with requirements, and that runoff leaving the site will do so at non-erosive velocities. Temporary and permanent stabilization of the site will be required to be in accordance with MDE regulations. A Sediment Control Concept and Preliminary Plan is being submitted under a separate plan set and concurrent with the Stormwater Management Concept and Preliminary Plan.

G. CONCLUSION

Full ESD requirements will be met via an on-site Micro-Bioretenion sized for the drainage area to it, and providing the required level of management for the proposed work. 2-year Quantity Control will be achieved via one underground SWM facility with storage pipes and a control structure.

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Appendix A
Location Map



LOCATION MAP

SCALE: 1" = 2000'

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Appendix B
Environmental Site Design (ESD) Computations

ESD_v Requirement based on LOD

Step 1 - Determine ESD Requirements based on LOD

A) NEW DEVELOPMENT OR REDEVELOPMENT	
SITE AREA BEFORE DEDICATIONS (LOD AREA INCLUDING OFF-SITE IMPROVEMENTS)	68725 SF
EXISTING IMPERVIOUS AREA (INCLUDES OFF-SITE AREA WITHIN LOD)	49852 SF
EXISTING SITE PERCENT IMPERVIOUS	73%
REDEVELOPMENT (>40%) OR NEW DEVELOPMENT (<40%)	REDEVELOPMENT
B) PROPOSED SITE (WITHIN LOD):	
AREA OF DISTURBANCE (LOD)	68725 SF
EXISTING IMPERVIOUS AREA	49852 SF
50% OF EXISTING IMPERVIOUS AREA	24926 SF
PROPOSED IMPERVIOUS WITHIN LOD	45417 SF
DECREASE IN IMPERVIOUS AREA	4435 SF
PROPOSED SITE IMPERVIOUS PERCENTAGE	66.09%
PROPOSED PERCENT IMPERVIOUS (ROUNDED UP TO NEAREST 5%)	Target PE = 1"
C) SOIL GROUP AREAS FOR TARGET PE:	
LOD AREA WITHIN HYDROLOGIC GROUP "A"	= 0.0% of LOD
LOD AREA WITHIN HYDROLOGIC GROUP "B"	= 0.0% of LOD
LOD AREA WITHIN HYDROLOGIC GROUP "C"	= 0.0% of LOD
LOD AREA WITHIN HYDROLOGIC GROUP "D"	= 0.0% of LOD
TOTAL AREA	0 SF
D) TARGET P_E:	
PE FOR HYDROLOGIC GROUP 'A' AT % IMPERVIOUS	0.00 in.
PE FOR HYDROLOGIC GROUP 'B' AT % IMPERVIOUS	0.00 in.
PE FOR HYDROLOGIC GROUP 'C' AT % IMPERVIOUS	0.00 in.
PE FOR HYDROLOGIC GROUP 'D' AT % IMPERVIOUS	0.00 in.
WEIGHTED AVERAGE PE, TARGET PE	1.00
A = 50% OF EXISTING IMPERVIOUS AREA (24,926 SF) - DECREASE IN IMPERVIOUS AREA (4,435 SF) =	
	20491 SF
R _v = 0.05 + 0.009 X 66.09% (PROPOSED SITE IMPERVIOUS %) =	
	0.64
TARGET PE	
	1.00
REQUIRED ESD _v = (P _E X R _v X A) / 12 =	
	= 1101 CF
TOTAL REQUIRED ESD_v:	= 1101 CF FOR AUTO SPA EXPRESS PROJECT REQUIREMENT

PROP. MB #1

Use of Micro-Bioretenion (M-6)

Step 2 - ESD Design

Drainage Area = 7068 SF

Proposed Impervious Area = 6348 SF

Percent Impervious 89.8%

$R_v = 0.05 + 0.009 (\% \text{ IMPERVIOUS}) = 0.858$

Minimum Allowable Volume (Pe = 1")

$ESD_v = (PE \cdot R_v \cdot A) / 12 = 506 \text{ CF}$

1) Microbioretenion Facility Characteristics

Df = Depth of Filter Bed = 4.50 FT

Dp = Ponding Depth = 1.00 FT

n = Media Porosity 0.40

BIO-RETENTION DIMENSIONS

Af = Surface Area of Filter Bed = 400 SF

2) Required Surface Area for Filter Bed

Af (MIN) = 2% of Total Drainage Area (A) = 141 SF

400 SF > 141 SF

3) ESDv Provided

Volume Above Filter Bed

Af = Surface Area of Filter Bed = 400 SF

Aw = Area at Water Surface Elevation = 400 SF

Dp = Ponding Depth = 1.00 FT

Volume = $[(A_w + A_f) / 2] \cdot D_p = 400 \text{ CF}$

Volume in Filter Media

Af = Surface Area of Filter Bed = 400 SF

Df = Depth of Filter Bed = 4.50 SF

Volume = $A_f \cdot D_f \cdot n = 720 \text{ CF}$

Volume Provided

400 CF + 720 CF = 1120 CF

Maximum Allowable Volume (Pe = 2.6")

$ESD_v = (PE \cdot R_v \cdot A) / 12 = 1314 \text{ CF}$

USE CALCULATED VOLUME

Percent of Max ESDv (%) 85

TOTAL ESDv PROVIDED:

= 1120 CF

TOTAL PE PROVIDED:

2.22 inches

TOTAL PERFORATED PVC UNDERDRAIN REQUIRED = 5% OF Af:

= 20 FT

TOTAL PERFORATED PVC UNDERDRAIN PROVIDED:

= 22 FT

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Appendix C
NRCS SOILS REPORT

Custom Soil Resource Report Soil Map



Map Scale: 1:993 if printed on A landscape (11" x 8.5") sheet.




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



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)


Soils


 Soil Map Unit Polygons


 Soil Map Unit Lines


 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit


 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp


 Mine or Quarry


 Miscellaneous Water


 Perennial Water

 Rock Outcrop


 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip


 Sodic Spot


 Spoil Area

 Stony Spot


 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

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.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
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 20, Sep 6, 2024

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

Date(s) aerial images were photographed: May 9, 2022—Aug 15, 2022

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2B	Glenelg silt loam, 3 to 8 percent slopes	B	0.9	35.2%
66UB	Wheaton-Urban land complex, 0 to 8 percent slopes	B	1.7	64.8%
Totals for Area of Interest			2.6	100.0%