

SHEET INDEX	
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2	EXISTING CONDITIONS
3	OVERALL MAP
4	ENVIRONMENTAL CONCEPT PLAN
5	SCHEMATIC SEDIMENT AND EROSION CONTROL PLAN
6	STORMWATER MANAGEMENT NOTES AND DETAILS

ENVIRONMENTAL CONCEPT PLAN CENTRAL FLEET VEHICLE STORAGE LOT

PARCELS 'A' AND 'E'

ZONING: POR-MXD-6 (PLANNED OFFICE RESEARCH) DISTRICT

TAX MAP No.: 24 GRID No.: 6 PARCEL No.: 852

SECOND ELECTION DISTRICT

HOWARD COUNTY, MARYLAND

SWM NARRATIVE

INTRODUCTION:

This report will demonstrate how the criteria set forth in the Maryland Stormwater Design Manual, Volumes I and II (effective October 2000, revised May 2009) will be satisfied on this project. The goal of creating hydrology similar to that of "Woods in Good Condition" will be accomplished through the use of the practices contained within Chapter 5 of said manual. The achievement of this goal will remove the requirement of providing Channel Protection Volume.

GENERAL SITE CONDITIONS:

This Howard County Central Fleet, Vehicle Storage Lot is a proposed vehicle storage area on Parcels 'A' and 'E' located on Tax Map 24, Parcel 852 of the Howard County, Maryland Tax Map Database System. Both Parcel 'A' and 'E' are zoned POR-MXD-6 and properties consists of 1.00 acre and 6.263 acres respectively. Neither of these properties are encumbered with a Preservation Easement Dedicated to Howard County Maryland Agricultural Land Preservation Program. Soils in the area of proposed improvements consist of M8, M8C, and U8b. In planning for the possible use of this area, work was provided and shown on an as-built on SDP-03-026, where grading, storm drainage and a retaining wall was provided.

This proposed vehicle storage lots is located on the southwest corner of Parcel 'E' with the bulk of the improvements located on Parcel 'A'. To the west of the proposed improvements is the east bound line of Baltimore National Pike (U.S. Route 40) and bordering Parcel 'E' to the south is the public road, Ellicott Center Drive. To the southwest of this proposed vehicle storage is Section One of Ellicott Center, which is zoned B-2 and currently being leased by Howard County Bureau of Facilities. Although this plan shows access from the B-2 zoned parcel, an alternative access has been shown, but not proposed for construction at this time, in the case that the lease is not extended. However, ESD treatment adequate for this possible access has been proposed as part of the Environmental Concept Plan.

The bulk of the drainage from this proposed vehicle storage is collected in an existing inlet provided during the above referenced as-built on SDP-03-026. This inlet will be utilized as a control structure for one of bio-retention facility proposed on this Environmental Concept Plan.

I. NATURAL RESOURCE PROTECTION:

To ensure the protection of natural resources located on this site, all buffers will be honored and all improvement will be located outside of environmentally sensitive areas.

II. MAINTENANCE OF NATURAL FLOW PATTERNS:

It is the intent of the proposed design to discharge runoff similar to the characteristics and direction of this site prior to any of the proposed improvements.

III. REDUCTION OF IMPERVIOUS AREAS THROUGH BETTER SITE DESIGN, ALTERNATIVE SURFACES AND NONSTRUCTURAL PRACTICES

Only the minimum amount of paving is being proposed at this time. The alternative access will only be constructed if future circumstances require access from Ellicott Center Drive.

IV. INTEGRATION OF EROSION AND SEDIMENT CONTROLS INTO STORMWATER STRATEGY:

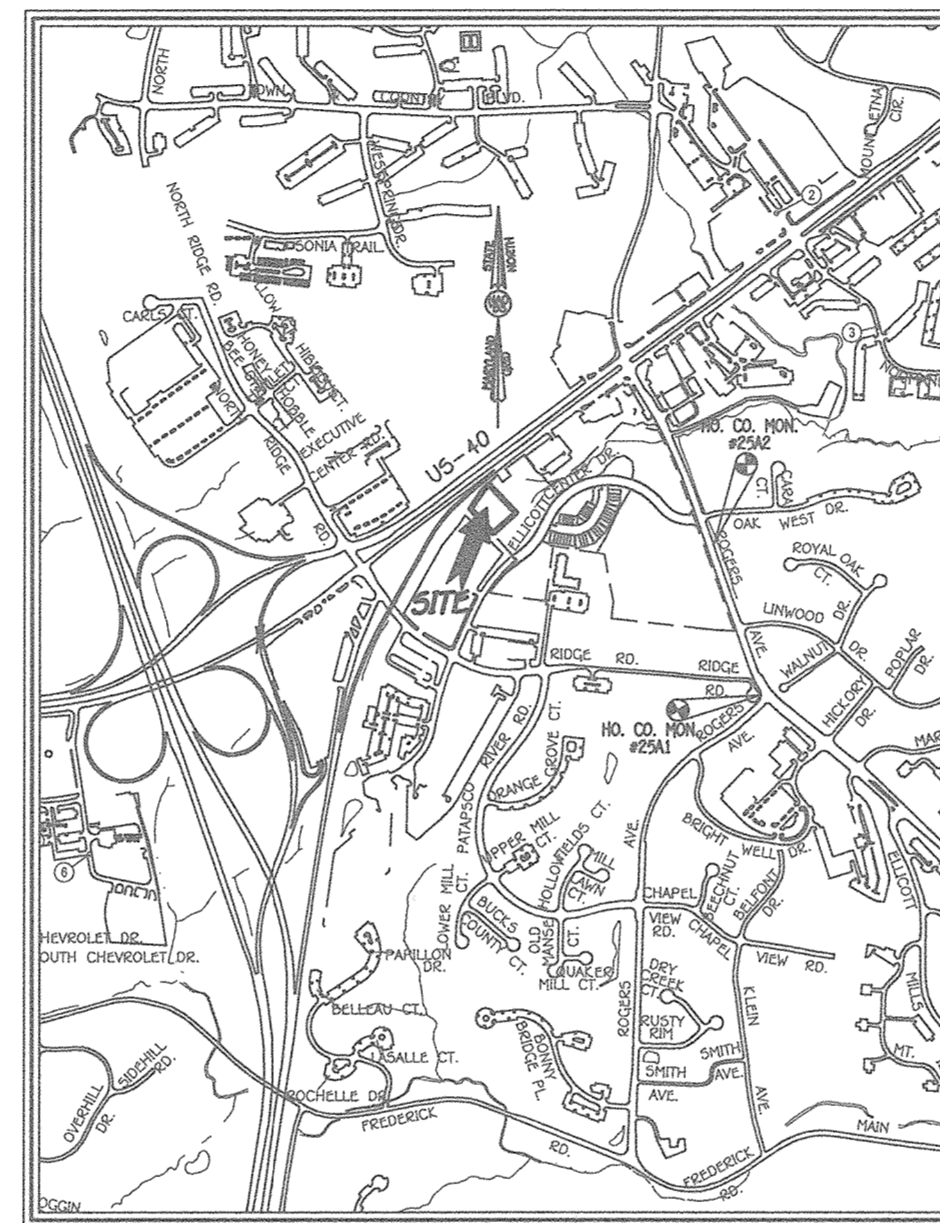
If required sediment trapping will be placed in the area of bio-retention facilities.

V. IMPLEMENTATION OF ESD PLANNING TECHNIQUES AND PRACTICES TO THE MAXIMUM EXTENT PRACTICABLE (MEP)

The full required ESD volume is being provided for proposed improvements and the alternative access should the need ever arise.

VI. REQUEST FOR DESIGN MANUAL WAIVER:

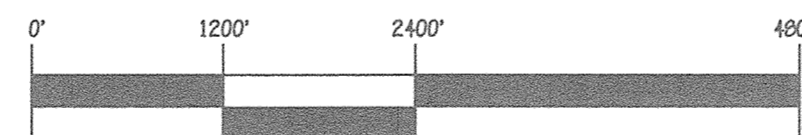
No waivers or alternative compliance requests are being requested at this time.



VICINITY MAP

SCALE: 1" = 1200'

ADC MAP
MAP 21 GRID A7



SCALE: 1" = 1200'

HOWARD COUNTY
GEODETIC SURVEY CONTROL NO.25A1
N 586,257.521 E 1,366,847.164
ELEVATION: 396.349
HOWARD COUNTY
GEODETIC SURVEY CONTROL NO.25A2
N 587,502.711 E 1,366,556.444
ELEVATION: 348.098

LEGEND	
SYMBOL	DESCRIPTION
---	EXISTING CONTOUR 2' INTERVAL
---	EXISTING CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 2' INTERVAL
x382.2	SPOT ELEVATION
---	SOILS
---	LIMIT OF DISTURBANCE
---	SUPER SILT FENCE
---	BIO RETENTION FACILITY (F-6) OR (M-6) AS NOTED
---	DRAINAGE AREA
---	STREAM BUFFER
---	WETLAND BUFFER
---	FLOODPLAIN
---	PROPOSED CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 2' INTERVAL
---	EXISTING TREZLINE
---	FOREST CONSERVATION EASEMENT
---	STEEP SLOPES
---	STEEP SLOPES

STORMWATER MANAGEMENT PRACTICES									
AREA ID	LOCATION	DRAINAGE AREA	% IMPERVIOUS	ESDV REQUIRED CUFT.	ESDV PROVIDED CUFT.	DRY WELLS M-5 (Y/N)	MICRO BIO-RETENTION M-6 (Y/N)	BIO SWALE M-8 (Y/N)	PERMEABLE A-2 (Y/N)
M-6(1)	PARCEL 'A'	37,538	67%	3,277	3,703		Y		
M-8(1)	PARCEL 'E'	5,360	48%	304	335			Y	

GENERAL NOTES

- THE SUBJECT PROPERTY IS POR-MXD-6 (PER 10/06/13 COMPREHENSIVE ZONING PLAN).
- COORDINATES BASED ON NAD'83 MARYLAND COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL.
STATIONS NO. 25A1 AND NO. 25A2:
HOWARD COUNTY MONUMENT NO. 25A1 N 586,257.503 E 1,366,847.149 ELEV. 396.349
HOWARD COUNTY MONUMENT NO. 25A2 N 587,502.660 E 1,365,556.401 ELEV. 348.098
- BOUNDARY IS BASED ON A FIELD RUN SURVEY PERFORMED BY FISHER, COLLINS & CARTER ON OR ABOUT MARCH, 2011.
- CONTOURS ARE BASED ON A TOPOGRAPHIC FIELD RUN SURVEY PERFORMED BY FISHER, COLLINS & CARTER, ON OR ABOUT OCTOBER 23, 2018 AND SUPPLEMENTED WITH TOPOGRAPHY TAKEN FROM SDP-03-026 CREATED BY DAFT, McCUNE, WALKER INC. AND APPROVED BY HOWARD COUNTY IN JULY 2003.
- STORM WATER MANAGEMENT IS IN ACCORDANCE WITH THE M.D.E. STORM WATER DESIGN MANUAL, VOLUMES I & II, REVISED 2009. THIS PLAN PROPOSES THE USE OF ONE (1) M-6 MICRO-BIORETENTION FACILITY AND ONE (1) M-8 BIO SWALE.
- THIS PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT. NO PUBLIC WATER AND SEWER WILL BE UTILIZED FOR THIS PROJECT.
- ANY DAMAGE TO THE COUNTY'S RIGHT-OF-WAY SHALL BE CORRECTED AT THE DEVELOPER'S EXPENSE.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE REQUIRED WETLANDS, STREAM(S) OR THEIR BUFFERS, FOREST CONSERVATION EASEMENT AREAS AND 100 YEAR FLOODPLAIN.
- LANDSCAPING WILL BE PROVIDED AT THE SITE DEVELOPMENT PLAN STAGE OF THIS PROJECT.
- FOREST CONSERVATION OBLIGATIONS HAVE BEEN PREVIOUSLY FULFILLED UNDER F-12-014.
- APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN AND/OR RED-LINE REVISION PLAN. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN STAGES AND/OR RED-LINE REVISION PROCESS. THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED REVIEW COMMENTS (INCLUDING COMMENTS THAT MAY ALTER THE OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES THROUGH THE PLAN REVIEW PROCESS.
- SOIL BORING INFORMATION WILL BE PROVIDED AT THE SITE DEVELOPMENT PLAN STAGE OF THIS PROJECT.

SITE ANALYSIS DATA CHART

- PRESENT ZONING DESIGNATION = POR-MXD-6.
- TOTAL AREA OF THIS SUBMISSION = 7.263 AC.*
- LIMIT OF DISTURBED AREA = 1.1 AC.*
- PROPOSED USE: VEHICLE STORAGE
- PREVIOUS HOWARD COUNTY FILES: F-03-021, SDP-03-026, ECP-11-052, ZB 1093M, WP-12-087, PB CASE NO. 391, F-12-014, S-12-001
- TOTAL AREA OF FLOODPLAIN LOCATED ON SITE 1.241 AC.
(LOCATED ON PARCEL 'E' ONLY)
- TOTAL AREA OF SLOPES IN EXCESS OF 15% TO 25% = 0.90 AC*
(WITHIN L.O.D. = 0.00 AC.*)
- TOTAL AREA OF SLOPES IN EXCESS OF 25% = 2.34 AC*
(WITHIN L.O.D. = 0.94 AC.*)
- NET TRACT AREA = 7.263 AC.
(TOTAL SITE AREA - FLOODPLAIN - STEEP SLOPES AREA)
(7.263 AC. - (1.241 AC. + 0.90 AC.)) = 5.122 AC.
- TOTAL AREA OF WETLANDS (INCLUDING BUFFER) LOCATED ON SITE = 1.185 AC.*
(LOCATED ON PARCEL 'E' ONLY)
- TOTAL FOREST 2.782 AC.*
- TOTAL GREEN OPEN AREA = 6.62 AC.*
- TOTAL IMPERVIOUS AREA = 0.64 AC.*
- ERODIBLE SOILS = 4.37 AC.*
(WITHIN L.O.D. = 0.54 AC.*)

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Die A. Mason for US
Chief, Division of Land Development
Date: 7/23/19

Chad Edmister NY
Chief, Development Engineering Division
Date: 8-2-19



PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21476, EXPIRATION DATE: 7/14/21.

Frank John Manalansan II 7/14/19
FRANK JOHN MANALANSAN II DATE

OWNER/DEVELOPER

HOWARD COUNTY
3430 COURT HOUSE DRIVE
ELLCOTT CITY, MARYLAND 21043
ATTN: MR. RICHARD LEE
410-313-7548

CENTRAL FLEET

VEHICLE STORAGE LOT

PARCELS 'A' & 'E'

ZONED: POR-MXD-6

TAX MAP NO.: 24 GRID NO.: 6 PARCEL NO.: 852
SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND
SCALE: AS SHOWN DATE: JULY, 2019

SHEET 1 OF 6

SOILS LEGEND			
SOIL	NAME	CLASS	Kw
BAA	Balle silt loam, 0 to 3 percent slopes	D	0.32
GnB	Glenville-Balle, 0 to 8 percent slopes	C	0.37
MdB	Manor loam, 3 to 8 percent slopes	B	0.24
MdC	Manor loam, 8 to 15 percent slopes	B	0.24
MdD	Manor loam, 15 to 25 percent slopes	B	0.24
UdB	Urban land-Udorthents complex, 0 to 8 percent slopes	X	0.20

SOIL INFORMATION TAKEN FROM WEBSOIL SURVEY

LEGEND	
SYMBOL	DESCRIPTION
---	EXISTING CONTOUR 2' INTERVAL
---	EXISTING CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 2' INTERVAL
---	PROPOSED CONTOUR 10' INTERVAL
x362.2	SPOT ELEVATION
---	SOILS
---	LIMIT OF DISTURBANCE
---	SUPER SILT FENCE
---	RAIN RETENTION FACILITY (F-6) OR (F-6) AS NOTED
---	DRAINAGE AREA
---	STREAM BUFFER
---	WETLAND BUFFER
---	FLOODPLAIN
---	PROPOSED CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 2' INTERVAL
---	EXISTING TREELINE
---	FOREST CONSERVATION EASEMENT
---	STEEP SLOPES
---	STEEP SLOPES

Existing Conditions Narrative

The site is located off of Ellicott Center Drive in the Ellicott City section of Howard County, Maryland. It is our understanding that the project will involve the construction of a parking lot that will be incorporated into the adjacent County facility. The project will occur on a 7.3 +/- acre parcel shown on tax map 24 as parcel 852.

The majority of the site is forested and has been previously encumbered with a Forest Conservation Easement. The FCE includes both upland and wetland forest, forest on steep slopes and forest within stream buffers. The Forest Conservation Easement, identified on the ECP as Parcel E, 6.3 +/- acres, was established as part of the prior development approval on the site.

The portion of the site outside the FCE has been previously developed. A one acre development area, identified as Parcel A on the ECP, includes stabilized pad site with retaining walls and stormwater management facilities having been previously constructed. The pad site is vegetated with a mix of young trees and grasses. Broomsedge is the most notable herbaceous species. Woody succession is dominated by black locust, Bradford pear and Virginia pine were also noted. The locust range from 1-4" in dbh but do not create contiguous cover that would be considered forest per the FCA regulations.

No wetlands, streams, or buffer occur on Parcel A.

No forest or specimen trees occur on Parcel A.

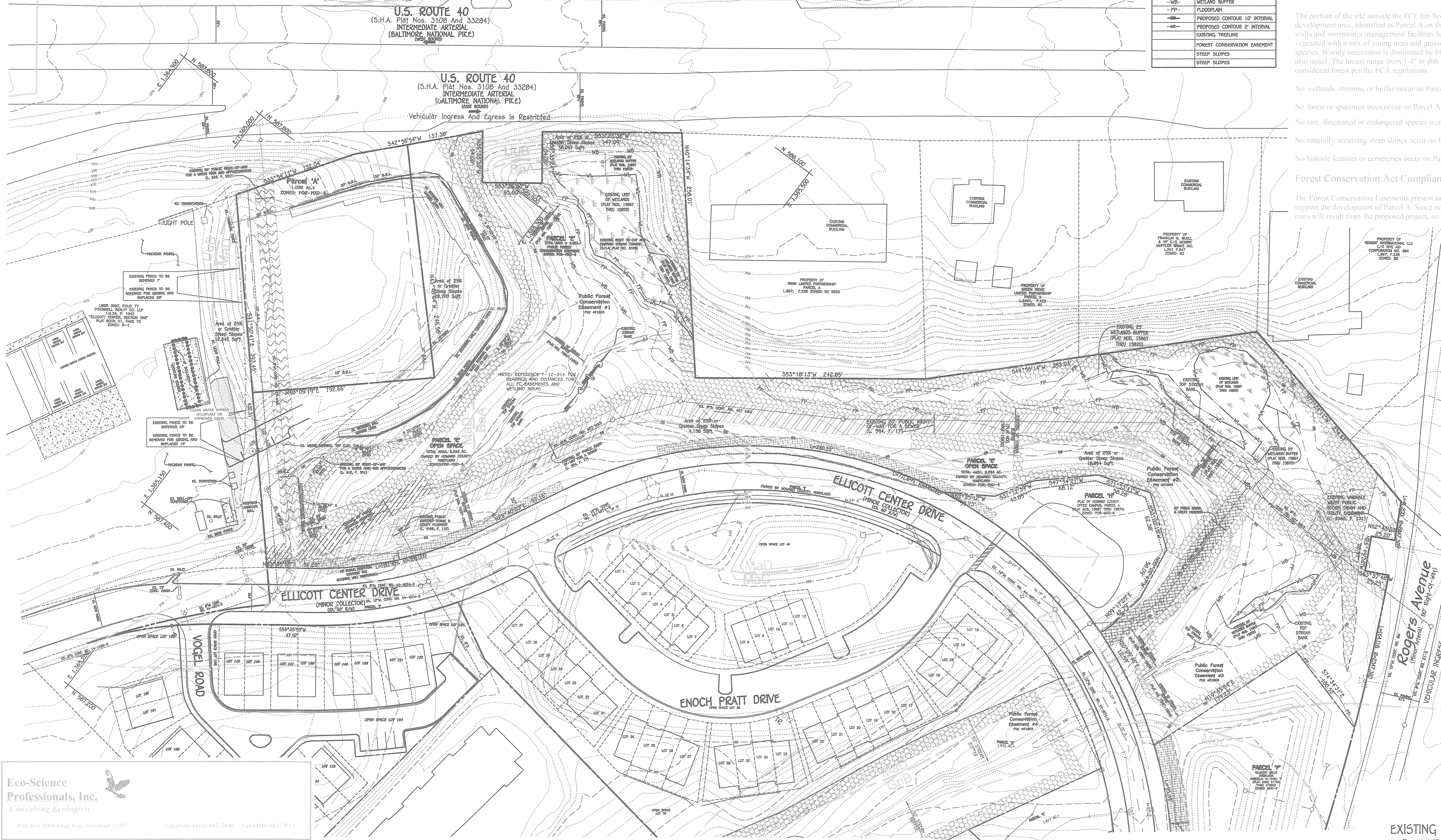
No rare, threatened or endangered species were observed on the property.

No naturally occurring steep slopes occur on Parcel A.

No historic features or cemeteries occur on Parcel A.

Forest Conservation Act Compliance

The Forest Conservation Easements present on the property, Parcel E, were established to support the development of Parcel A. Since no new forest clearing or disturbance of specimen trees will result from the proposed project, no further FCA compliance should be required.



Eco-Science Professionals, Inc.
Consulting Ecologists
P.O. Box 5006 Glen Arm, Maryland 21087
Telephone (410) 683-7840 Fax (410) 683-7817

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Dir. J. Manis
Chief, Division of Land Development
7/23/19 Date

Chad Edelman
Chief, Development Engineering Division
8-22-19 Date



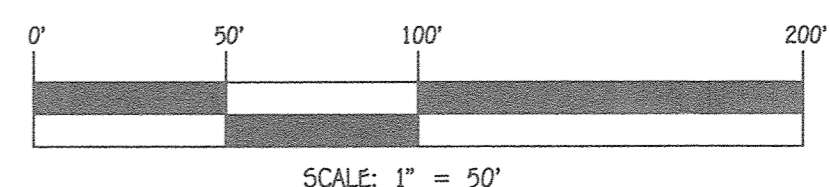
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Frank John Manalansan II
FRANK JOHN MANALANSAN II
7/14/19 DATE

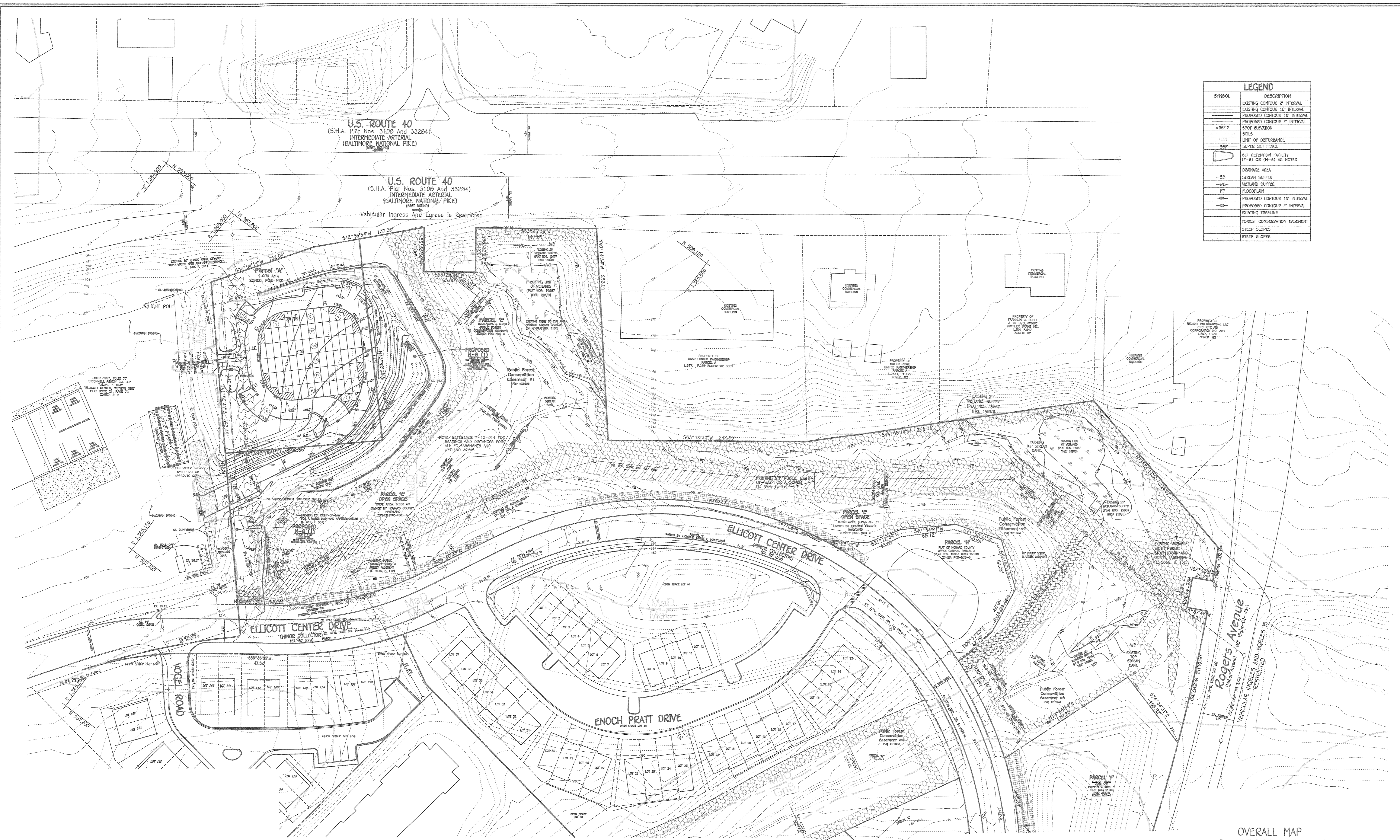
OWNER/DEVELOPER

HOWARD COUNTY
3430 COURT HOUSE DRIVE
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. RICHARD LEE
410-313-7540



EXISTING CONDITION PLAN
CENTRAL FLEET
VEHICLE STORAGE LOT
PARCELS 'A' & 'E'
ZONED: POR-MXD-6

TAX MAP NO.: 24 GRID NO.: 6 PARCEL NO.: 852
SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND
SCALE: AS SHOWN DATE: JULY, 2019
SHEET 2 OF 6



LEGEND	
SYMBOL	DESCRIPTION
---	EXISTING CONTOUR 2' INTERVAL
---	EXISTING CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 2' INTERVAL
x382.2	SPOT ELEVATION
---	SOILS
---	LIMIT OF DISTURBANCE
---	SUPER SILT FENCE
---	BIO RETENTION FACILITY (F-1) OR (F-1-S) AS NOTED
---	DRAINAGE AREA
---	STREAM BUFFER
---	WETLAND BUFFER
---	FLOODPLAIN
---	PROPOSED CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 2' INTERVAL
---	EXISTING TREELINE
---	FOREST CONSERVATION EASEMENT
---	STEEP SLOPES
---	STEEP SLOPES

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

John M. ... 7/23/19
 Chief, Development Engineering Division
 Date

Chris ... 8/22/19
 Chief, Development Engineering Division
 Date



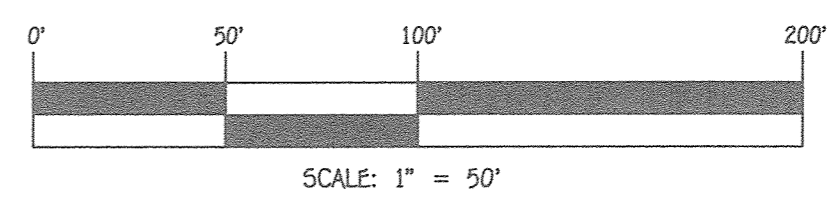
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Frank John Manalansan II 7/14/19
 FRANK JOHN MANALANSAN II DATE

OWNER/DEVELOPER

HOWARD COUNTY
 3430 COURT HOUSE DRIVE
 ELICOTT CITY, MARYLAND 21043
 ATTN: MR. RICHARD LEE
 410-313-7540



OVERALL MAP
CENTRAL FLEET
 VEHICLE STORAGE LOT
 PARCELS 'A' & 'E'
 ZONED: POR-MXD-6

TAX MAP NO.: 24 GRID NO.: 6 PARCEL NO.: 052
 SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND
 SCALE: AS SHOWN DATE: JULY, 2019
 SHEET 3 OF 6

FISHER, COLLINS & CARTER, INC.
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
 CENTRAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE
 ELICOTT CITY, MARYLAND 21042
 (410) 461-2999

U.S. ROUTE 40
(S.H.A. Plat Nos. 3108 And 33284)
INTERMEDIATE ARTERIAL
(BALTIMORE NATIONAL PIKE)
(EAST BOUND)

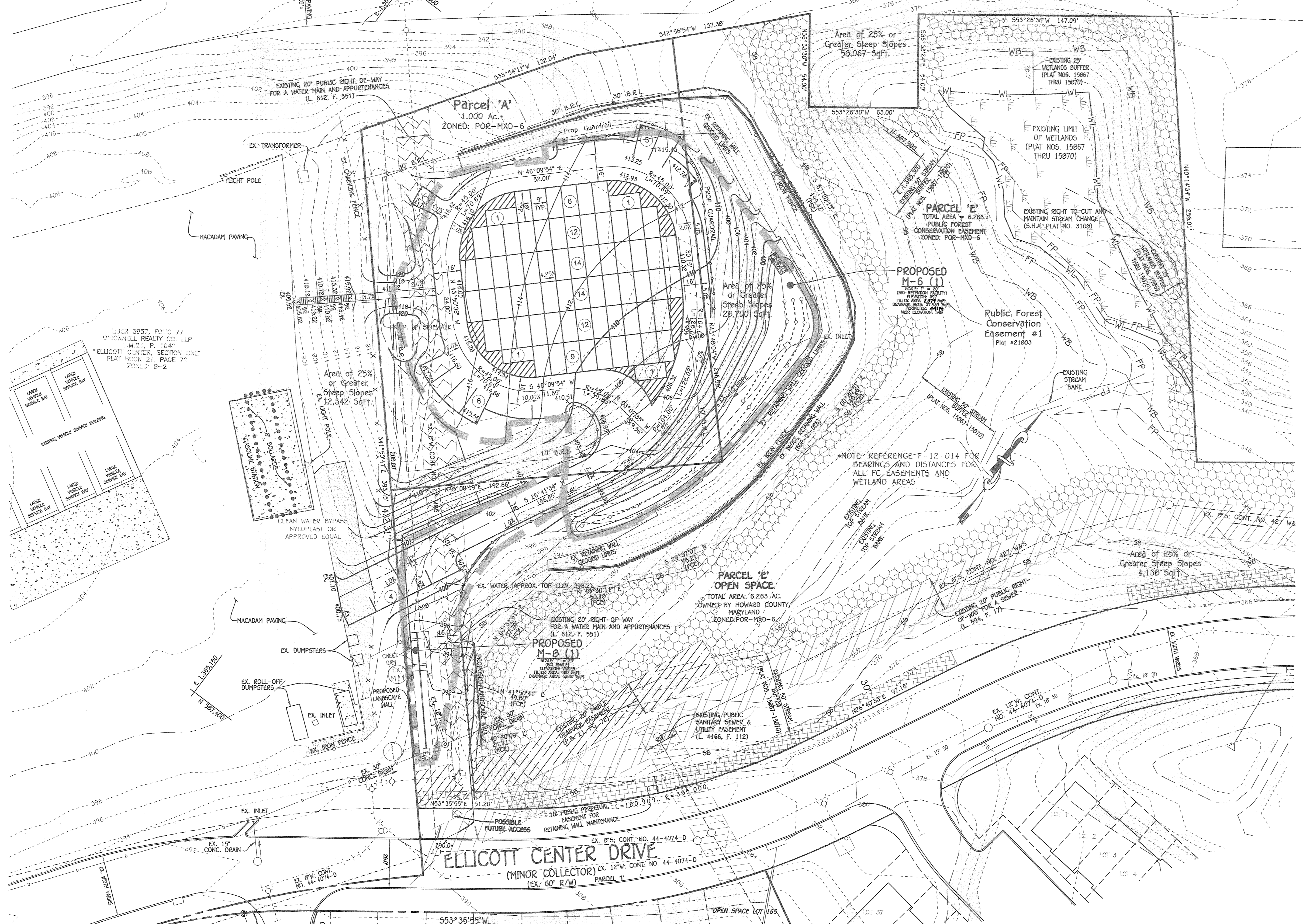
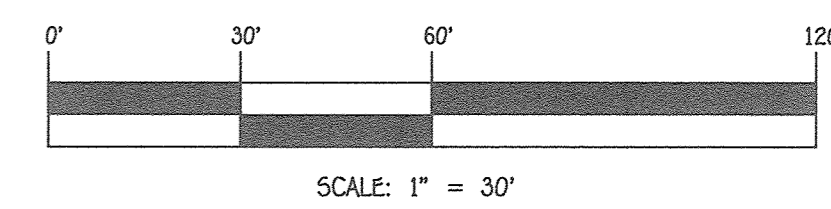
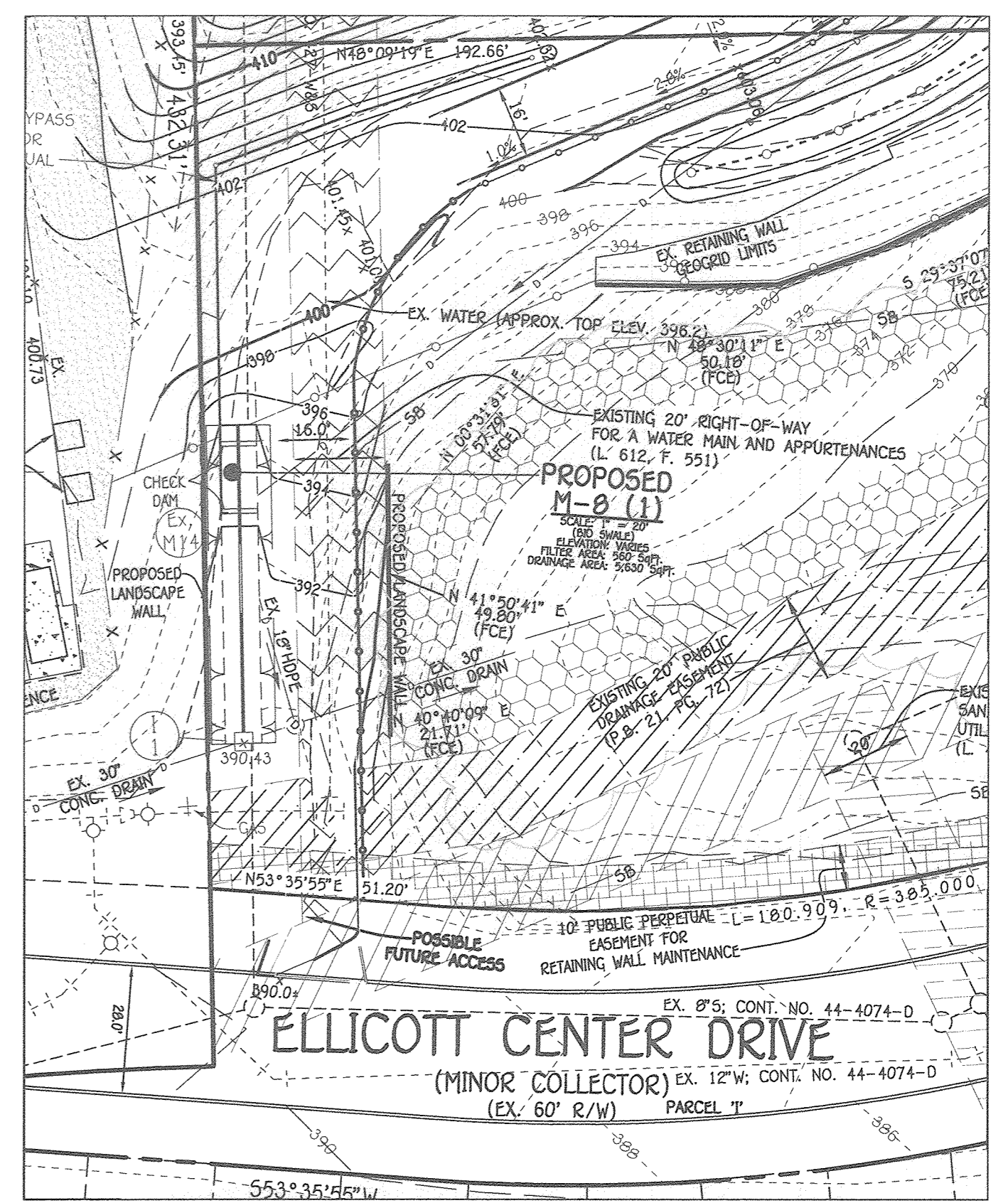
Vehicular Ingress And Egress Is Restricted

*NOTE: FOR LIMITS OF DISTURBANCE SEE SHEET 3 AND 5

LEGEND	
SYMBOL	DESCRIPTION
---	EXISTING CONTOUR 2' INTERVAL
---	EXISTING CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 10' INTERVAL
---	PROPOSED CONTOUR 2' INTERVAL
x362.2	SPOT ELEVATION
SOILS	
---	LIMIT OF DISTURBANCE
---	SUPER SILT FENCE
---	NO RETENTION FACILITY (F-4) OR (F-6) AS NOTED
---	DRAINAGE AREA
---	STREAM BUFFER
---	WETLAND BUFFER
---	FLOODPLAIN
---	PROPOSED CONTOUR 10' INTERVAL
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---	EXISTING TREELINE
---	FOREST CONSERVATION EASEMENT
---	STEEP SLOPES

SOILS LEGEND		
SOIL	NAME	CLASS
BAA	Baile silt loam, 0 to 3 percent slopes	D
MAB	Manor loam, 3 to 8 percent slopes	B
MAC	Manor loam, 8 to 15 percent slopes	B
MAD	Manor loam, 15 to 25 percent slopes	B
UaB	Urban land-Udorthents complex, 0 to 8 percent slopes	X

NOTES:
 * Hydric soils and/or contains hydric inclusions
 ** May contain hydric inclusions
 † Generally only within 100-year floodplain areas



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Frank John Malalansan II
 Chief, Development Engineering Division
 Date: 7/23/19

Chil Chant
 Chief, Development Engineering Division
 Date: 8/22/19



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Frank John Malalansan II
 FRANK JOHN MALALANSAN II
 DATE: 7/14/19

OWNER/DEVELOPER

HOWARD COUNTY
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 ELICOTT CITY, MARYLAND 21043
 ATTN: MR. RICHARD LEE
 410-313-7540

ENVIRONMENTAL CONCEPT PLAN
CENTRAL FLEET
 VEHICLE STORAGE LOT
 PARCELS 'A' & 'E'
 ZONED: POR-MXD-6

TAX MAP NO.: 24 GRID NO.: 6 PARCEL NO.: 852
 SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND
 SCALE: AS SHOWN DATE: JULY, 2019

SHEET 4 OF 6

FISHER, COLLINS & CARTER, INC.
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS

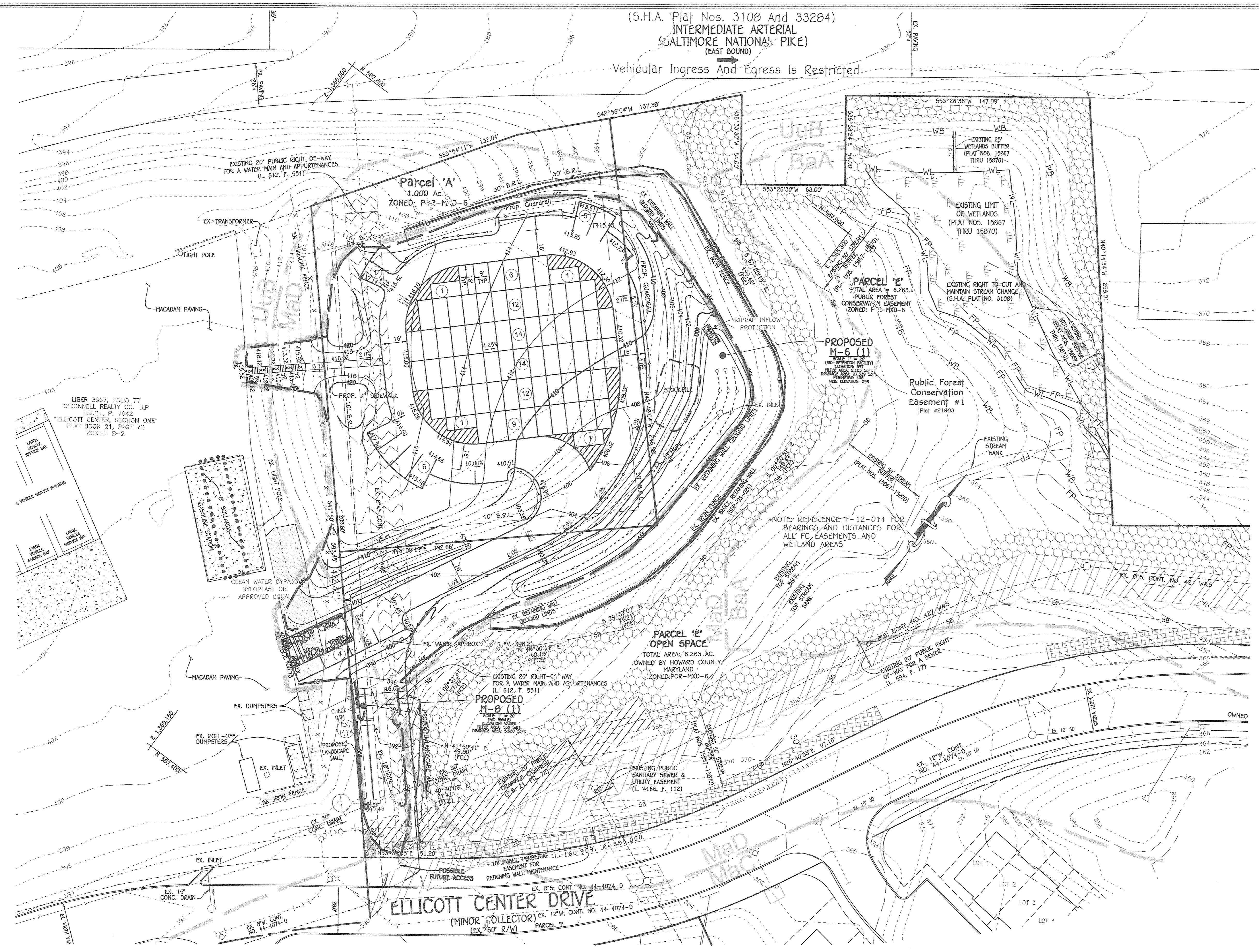
CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE
 ELICOTT CITY, MARYLAND 21042
 (410) 461-2995

(S.H.A. Plat Nos. 3108 And 33284)
 INTERMEDIATE ARTERIAL
 BALTIMORE NATIONAL PIKE
 (EAST BOUND)

Vehicle Ingress And Egress Is Restricted

SOILS LEGEND			
SOIL	NAME	CLASS	k _w
BaA	Baile silt loam, 0 to 3 percent slopes	D	0.32
GrB	Glenville-Baile, 0 to 8 percent slopes	C	0.37
MaB	Manor loam, 3 to 8 percent slopes	B	0.24
MaC	Manor loam, 8 to 15 percent slopes	B	0.24
MaD	Manor loam, 15 to 25 percent slopes	B	0.24
UaB	Urban land-Udorhents complex, 0 to 8 percent slopes	X	0.28

SOIL INFORMATION TAKEN FROM WEBSOIL SURVEY



LEGEND	
SYMBOL	DESCRIPTION
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---	EXISTING CONTOUR 10' INTERVAL
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x362.2	SPOT ELEVATION
SOILS	SOILS
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---	PROPOSED CONTOUR 2' INTERVAL
---	EXISTING TREELINE
---	FOREST CONSERVATION EASEMENT
---	STEEP SLOPES
---	STEEP SLOPES

NOTE: REFERENCE F-12-014 FOR BEARINGS AND DISTANCES FOR ALL FC EASEMENTS AND WETLAND AREAS

LIBER 3957, FOLIO 77
 O'DONNELL REALTY CO. LLP
 T.M. 24, P. 1042
 "ELLCOTT CENTER, SECTION ONE"
 PLAT BOOK 21, PAGE 72
 ZONED: B-2

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Joni J. Mann for *us* 7/23/19 Date
 Chief, Division of Land Development

Al Carl NY 8-22-19 Date
 Chief, Development Engineering Division



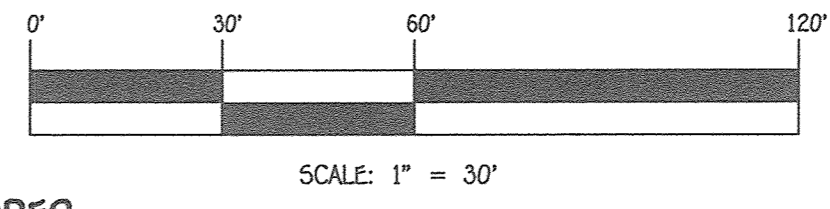
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Frank John Manalansan II 7/14/19 DATE
 FRANK JOHN MANALANSAN II

OWNER/DEVELOPER

HOWARD COUNTY
 3430 COURT HOUSE DRIVE
 ELLCOTT CITY, MARYLAND 21043
 ATTN: MRS. RICHARD LEE
 410-313-7540



SCHEMATIC SEDIMENT AND EROSION CONTROL PLAN
 CENTRAL FLEET
 VEHICLE STORAGE LOT
 PARCELS 'A' & 'E'
 ZONED: POR-MXD-6

TAX MAP NO.: 24 GRID NO.: 6 PARCEL NO.: 852
 SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND
 SCALE: AS SHOWN DATE: JULY, 2019
 SHEET 5 OF 6

FISHER, COLLINS & CARTER, INC.
 CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
 CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE
 ELLCOTT CITY, MARYLAND 21042
 (410) 461-2899

INFILTRATION AND FILTER SYSTEM CONSTRUCTION SPECIFICATIONS

INFILTRATION AND FILTER SYSTEMS EITHER TAKE ADVANTAGE OF EXISTING PERMEABLE SOILS OR CREATE A PERMEABLE MEDIUM SUCH AS SAND FOR ICI, AND RE V. IN SOME INSTANCES WHERE PERMEABILITY IS GREAT, THESE FACILITIES MAY BE USED FOR QP AS WELL. THE MOST COMMON SYSTEMS INCLUDE INFILTRATION TRENCHES, INFILTRATION BASINS, SAND FILTERS, AND ORGANIC FILTERS.

WHEN PROPERLY PLANTED, VEGETATION WILL THRIVE AND ENHANCE THE FUNCTIONING OF THESE SYSTEMS. FOR EXAMPLE, PRE-TREATMENT BUFFERS WILL TRAP SEDIMENTS THAT OFTEN ARE BOUND WITH PHOSPHOROUS AND METALS. VEGETATION PLANTED IN THE FACILITY WILL AID IN NUTRIENT UPTAKE AND WATER STORAGE. ADDITIONALLY, PLANT ROOTS WILL PROVIDE ARTERIES FOR STORMWATER TO PERMEATE SOIL FOR GROUNDWATER RECHARGE. FINALLY, SUCCESSFUL PLANTINGS PROVIDE AESTHETIC VALUE AND WILDLIFE HABITAT MAKING THESE FACILITIES MORE DESIRABLE TO THE PUBLIC.

DESIGN CONSTRAINTS:

- > PLANTING BUFFER STRIPS OF AT LEAST 20 FEET WILL CAUSE SEDIMENTS TO SETTLE OUT BEFORE REACHING THE FACILITY, THEREBY REDUCING THE POSSIBILITY OF CLOGGING.
- > DETERMINE AREAS THAT WILL BE SATURATED WITH WATER AND WATER TABLE DEPTH SO THAT APPROPRIATE PLANTS MAY BE SELECTED (HYDROLOGY WILL BE SIMILAR TO BIORETENTION FACILITIES, SEE FIGURE A.5 AND TABLE A.4 FOR PLANTING MATERIAL GUIDANCE).
- > PLANTS KNOWN TO SEND DOWN DEEP TAPROOTS SHOULD BE AVOIDED IN SYSTEMS WHERE FILTER FABRIC IS USED AS PART OF FACILITY DESIGN.
- > TEST SOIL CONDITIONS TO DETERMINE IF SOIL AMENDMENTS ARE NECESSARY.
- > PLANTS SHALL BE LOCATED SO THAT ACCESS IS POSSIBLE FOR STRUCTURE MAINTENANCE.
- > STABILIZE HEAVY FLOW AREAS WITH EROSION CONTROL MATS OR SOO.
- > TEMPORARILY DIVERT FLOWS FROM SEEDING AREAS UNTIL VEGETATION IS ESTABLISHED.
- > SEE TABLE A.5 FOR ADDITIONAL DESIGN CONSIDERATIONS.

BIO-RETENTION

SOIL BED CHARACTERISTICS
THE CHARACTERISTICS OF THE SOIL FOR THE BIORETENTION FACILITY ARE PERHAPS AS IMPORTANT AS THE FACILITY LOCATION, SIZE, AND TREATMENT VOLUME. THE SOIL MUST BE PERMEABLE ENOUGH TO ALLOW RUNOFF TO FILTER THROUGH THE MEDIA, WHILE HAVING CHARACTERISTICS SUITABLE TO PROMOTE AND SUSTAIN A ROBUST VEGETATIVE COVER CROP. IN ADDITION, MUCH OF THE NUTRIENT POLLUTANT UPTAKE (NITROGEN AND PHOSPHORUS) IS ACCOMPLISHED THROUGH ABSORPTION AND MICROBIAL ACTIVITY WITHIN THE SOIL PROFILE. THEREFORE, SOILS MUST BALANCE THEIR CHEMICAL AND PHYSICAL PROPERTIES TO SUPPORT BIOTIC COMMUNITIES ABOVE AND BELOW GROUND.

THE PLANTING SOIL SHOULD BE A SANDY LOAM, LOAMY SAND, LOAM (USDA), OR A LOAM/SAND MIX (SHOULD CONTAIN A MINIMUM 35 TO 60% SAND, BY VOLUME). THE CLAY CONTENT FOR THESE SOILS SHOULD BE LESS THAN 25% BY VOLUME (ENVIRONMENTAL QUALITY RESOURCES (EQ2), 1996; ENGINEERING TECHNOLOGY INC. AND BEHRENBASS, INC. (ET&B), 1993). SOILS SHOULD FALL WITHIN THE SM, ML, SC CLASSIFICATIONS OR THE UNIFIED SOIL CLASSIFICATION SYSTEM (USCS). A PERMEABILITY OF AT LEAST 1.0 FEET PER DAY (0.5"/HR) IS REQUIRED (A CONSERVATIVE VALUE OF 0.5 FEET PER DAY IS USED FOR DESIGN). THE SOIL SHOULD BE FREE OF STONES, STUMPS, ROOTS, OR OTHER WOODY MATERIAL OVER 1" IN DIAMETER. BRUSH OR SEEDS FROM NOXIOUS WEEDS (E.G., JOHNSON GRASS, MUGWORT, NUTSEDGE, AND CANADA THISTLE OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMPAR 5.08.01.12.) SHOULD NOT BE PRESENT IN THE SOILS. PLACEMENT OF THE PLANTING SOIL SHOULD BE IN 12 TO 18 LIFTS THAT ARE LOOSELY COMPACTED (TAMPED LIGHTLY WITH A BACKHOE BUCKET OR TRAVERSED BY DOZER TRACKS). THE SPECIFIC CHARACTERISTICS ARE PRESENTED IN TABLE A.3.

TABLE A.3 PLANTING SOIL CHARACTERISTICS

PARAMETER	VALUE
PH RANGE	5.2 TO 7.00
ORGANIC MATTER	1.5 TO 4.0% (BY WEIGHT)
MAGNESIUM	35 LBS. PER ACRE, MINIMUM
PHOSPHORUS (PHOSPHATE - P2O5)	75 LBS. PER ACRE, MINIMUM
POTASSIUM (POTASH - K2O)	85 LBS. PER ACRE, MINIMUM
SOLUBLE SALTS	500 PPM
CLAY	10 TO 25 %
SILT	30 TO 55 %
SAND	35 TO 60%

MULCH LAYER

THE MULCH LAYER PLAYS AN IMPORTANT ROLE IN THE PERFORMANCE OF THE BIORETENTION SYSTEM. THE MULCH LAYER HELPS MAINTAIN SOIL MOISTURE AND AVOIDS SURFACE SEALING, WHICH REDUCES PERMEABILITY. MULCH HELPS PREVENT EROSION, AND PROVIDES A MICROENVIRONMENT SUITABLE FOR SOIL BIOTA AT THE MULCH/SOIL INTERFACE. IT ALSO SERVES AS A PRETREATMENT LAYER, TRAPPING THE FINE SEDIMENTS, WHICH REMAIN SUSPENDED AFTER THE PRIMARY PRETREATMENT.

THE MULCH LAYER SHOULD BE STANDARD LANDSCAPE STYLE, SINGLE OR DOUBLE SHREDDED HARDWOOD MULCH OR CHIPS. THE MULCH LAYER SHOULD BE WELL AGED (STOCKPILED OR STORED FOR AT LEAST 12 MONTHS), UNIFORM IN COLOR, AND FREE OF OTHER MATERIALS, SUCH AS WEED SEEDS, SOIL, ROOTS, ETC. THE MULCH SHOULD BE APPLIED TO A MAXIMUM DEPTH OF THREE INCHES. GRASS CLIPPINGS SHOULD NOT BE USED AS A MULCH MATERIAL.

PLANTING GUIDANCE

PLANT MATERIAL SELECTION SHOULD BE BASED ON THE GOAL OF SIMULATING A TERRESTRIAL FORESTED COMMUNITY OF NATIVE SPECIES. BIORETENTION SIMULATES AN UPLAND-SPECIES ECOSYSTEM. THE COMMUNITY SHOULD BE DOMINATED BY TREES, BUT HAVE A DISTINCT COMMUNITY OF UNDERSTORY TREES, SHRUBS AND HERBACEOUS MATERIALS. BY CREATING A DIVERSE, DENSE PLANT COVER, A BIORETENTION FACILITY WILL BE ABLE TO TREAT STORMWATER RUNOFF AND WITHSTAND URBAN STRESSES FROM INSECTS, DISEASE, DROUGHT, TEMPERATURE, WIND, AND EXPOSURE. THE PROPER SELECTION AND INSTALLATION OF PLANT MATERIALS IS KEY TO A SUCCESSFUL SYSTEM. THERE ARE ESSENTIALLY THREE ZONES WITHIN A BIORETENTION FACILITY (FIGURE A.5). THE LOWEST ELEVATION SUPPORTS PLANT SPECIES ADAPTED TO STANDING AND FLUCTUATING WATER LEVELS. THE MIDDLE ELEVATION SUPPORTS PLANTS THAT LIKE DRIER SOIL CONDITIONS, BUT CAN STILL TOLERATE OCCASIONAL INUNDATION BY WATER. THE OUTER EDGE IS THE HIGHEST ELEVATION AND GENERALLY SUPPORTS PLANTS ADAPTED TO DRIER CONDITIONS. A SAMPLE OF APPROPRIATE PLANT MATERIALS FOR BIORETENTION FACILITIES ARE INCLUDED IN TABLE A.4. THE LAYOUT OF THE PLANT MATERIAL SHOULD BE FLEXIBLE, BUT SHOULD FOLLOW THE GENERAL PRINCIPALS DESCRIBED IN TABLE A.5. THE OBJECTIVE IS TO HAVE A SYSTEM, WHICH RESEMBLES A RANDOM, AND NATURAL PLANT LAYOUT, WHILE MAINTAINING OPTIMAL CONDITIONS FOR PLANT ESTABLISHMENT AND GROWTH. FOR A MORE EXTENSIVE BIORETENTION PLAN, CONSULT ET&B, 1993 OR CLAYTOR AND SCHUELEK, 1997.

OPERATION AND MAINTENANCE SCHEDULE FOR BIO-RETENTION AREAS (M-6) AND (M-8)

1. ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING.
2. SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDER BEYOND TREATMENT. TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFICIENT STAKES AND WIRES.
3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
4. SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

PLANTING SPECIFICATIONS

Plants, related material, and operations shall meet the detailed description as given on the plans and as described herein.

All plant material, unless otherwise specified, shall be nursery grown, uniformly branched, have a vigorous root system, and shall conform to the species, size, root and shape shown on the plant list and the American Association of Nurserymen (AAN) Standards. Plant material shall be healthy, vigorous, free from defects, decay, disfiguring roots, sun scald injuries, abrasions of the bark, plant disease, insect pest eggs, borers and all forms of insect infestations or objectionable disfigurements. Plant material that is weak or which has been cut back from larger grades to meet specified requirements will be rejected. Trees with forked leaders will not be accepted. All plants shall be freshly dug; no heated-in plants from cold storage will be accepted.

Unless otherwise specified, all general conditions, planting operations, details and planting specification shall conform to "Landscape Specification Guidelines for Baltimore-Washington Metropolitan Area", (hereinafter "Landscape Guidelines") approved by the Landscape Contractors Association of Metropolitan Washington and the Potomac Chapter of the American Society of Landscape Architect, latest edition, including all agenda.

Contractor shall be required to guarantee all plant material for a period of one year after date of acceptance in accordance with the appropriate section of the Landscape Guidelines. Contractor's attention is directed to the maintenance requirements found within the one year specifications including watering and replacement of specified plant material.

Contractor shall be responsible for notifying utility companies, utility contractors and "Miss Utility" a minimum of 48 hours prior to beginning any work. Contractor may make minor adjustments in spacing and location of plant material to avoid conflicts with utilities. Damage to existing structure and utilities shall be repaired at the expense of the Contractor.

Protection of existing vegetation to remain shall be accomplished by the temporary installation of 4 foot high snow fence or blaze orange safety fence at the drip line.

Contractor is responsible for installing all material in the proper planting season for each plant type. All planting is to be completed within the growing season of completion of site construction.

bid shall be based on actual site conditions. No extra payment shall be made for work arising from site conditions differing from those indicated on drawings and specifications.

Plant quantities are provided for the convenience of the contractor only. If discrepancies exist between quantities shown on plan and those shown on the plant list, the quantities on the plan take precedence.

All shrubs shall be planted in continuous trenches or prepared planting beds and mulched with composted hardwood mulch as details and specified except where noted on plans.

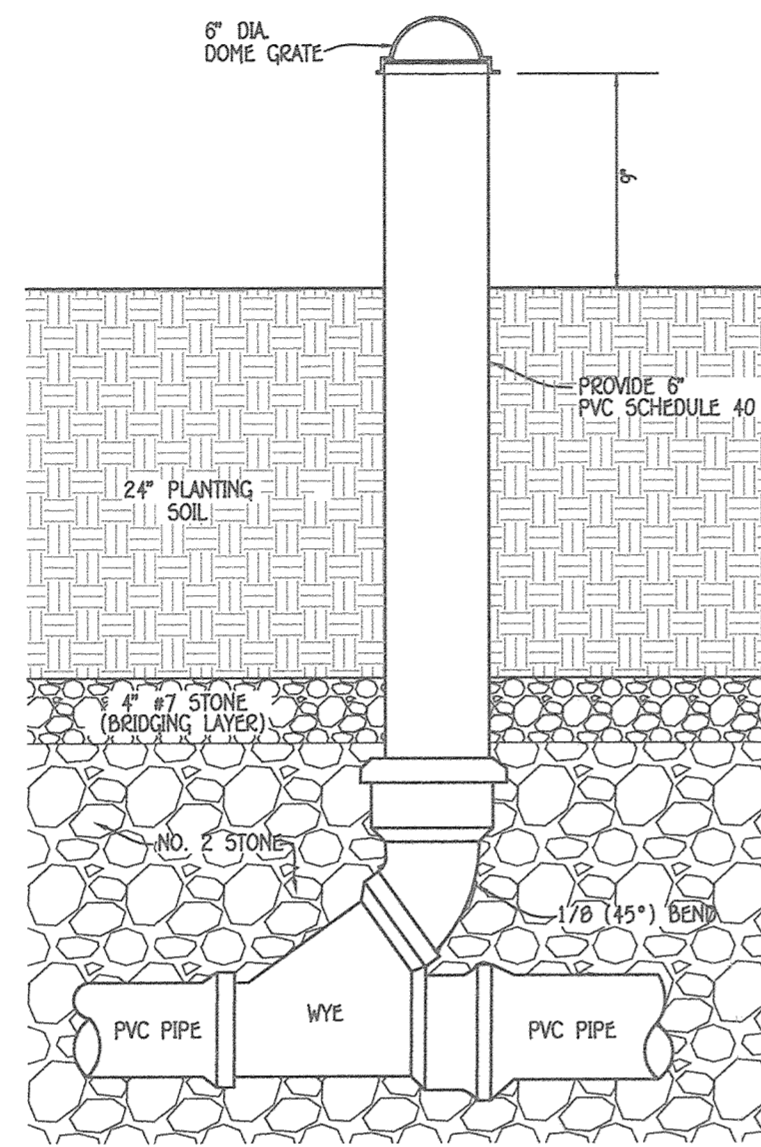
Positive drainage shall be maintained in planting beds 2 percent slope.

Planting mix shall be as follows: Deciduous Plants - Two parts topsoil, one part well-rotted cow or horse manure. Add 3 lbs. of standard fertilizer per cubic yard of planting mix. Evergreen Plants - Two parts topsoil, one part humus or other approved organic material. Add 3 lbs. of evergreen (acidic) fertilizer per cubic yard of planting mix. Topsoil shall conform to the Landscape Guidelines.

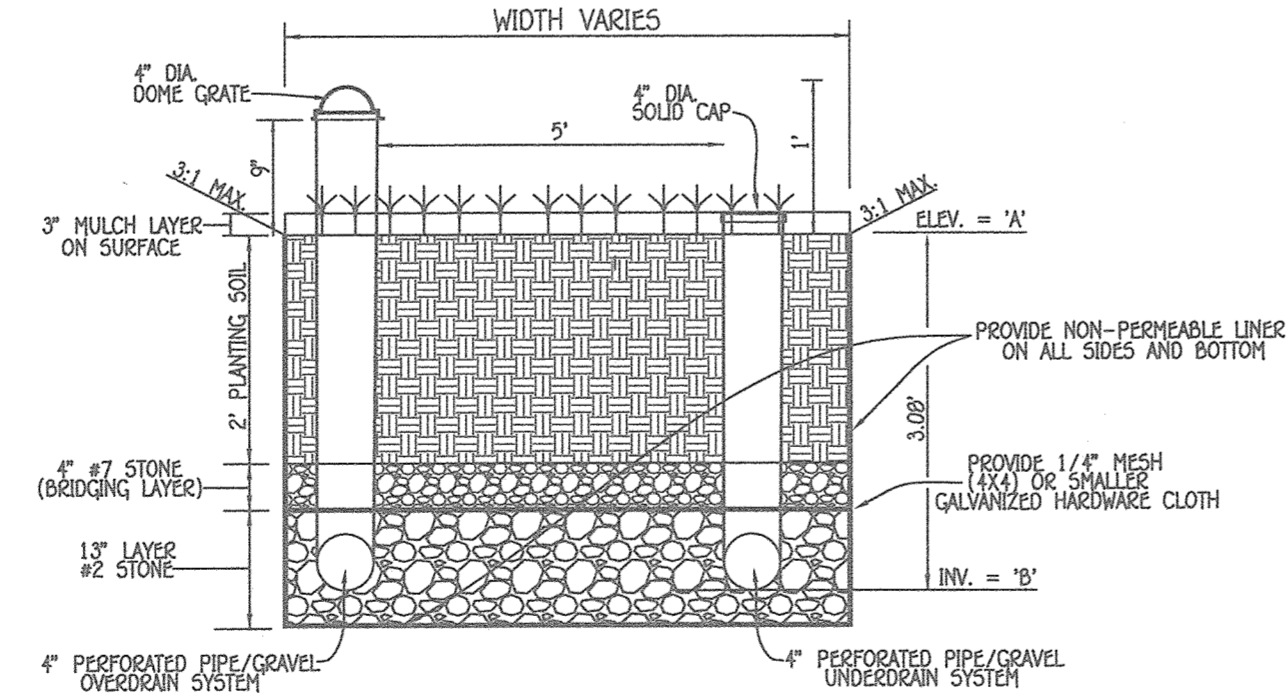
Weed Control: Incorporate a pre-emergent herbicide into the planting bed following recommended rates on the label. Caution: Be sure to carefully check the chemical used to assure its adaptability to the specific ground cover to be treated.

All areas within contract limits disturbed during or prior to construction not designated to receive plants and mulch shall be fine graded and seeded.

This plan is intended for landscape use only. see other plan sheets for more information on grading, sediment control, layout, etc.

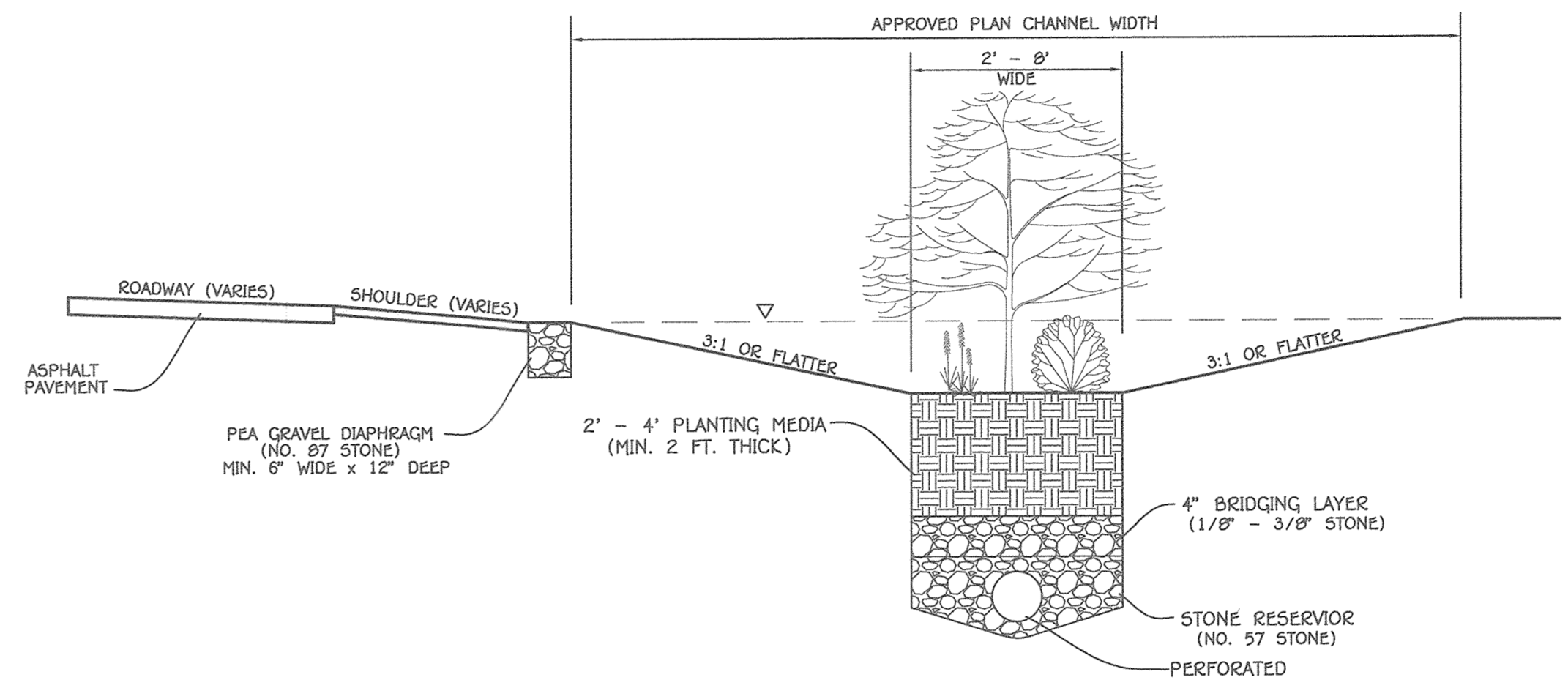


TYPICAL CLEAN-OUT DETAIL
NOT TO SCALE

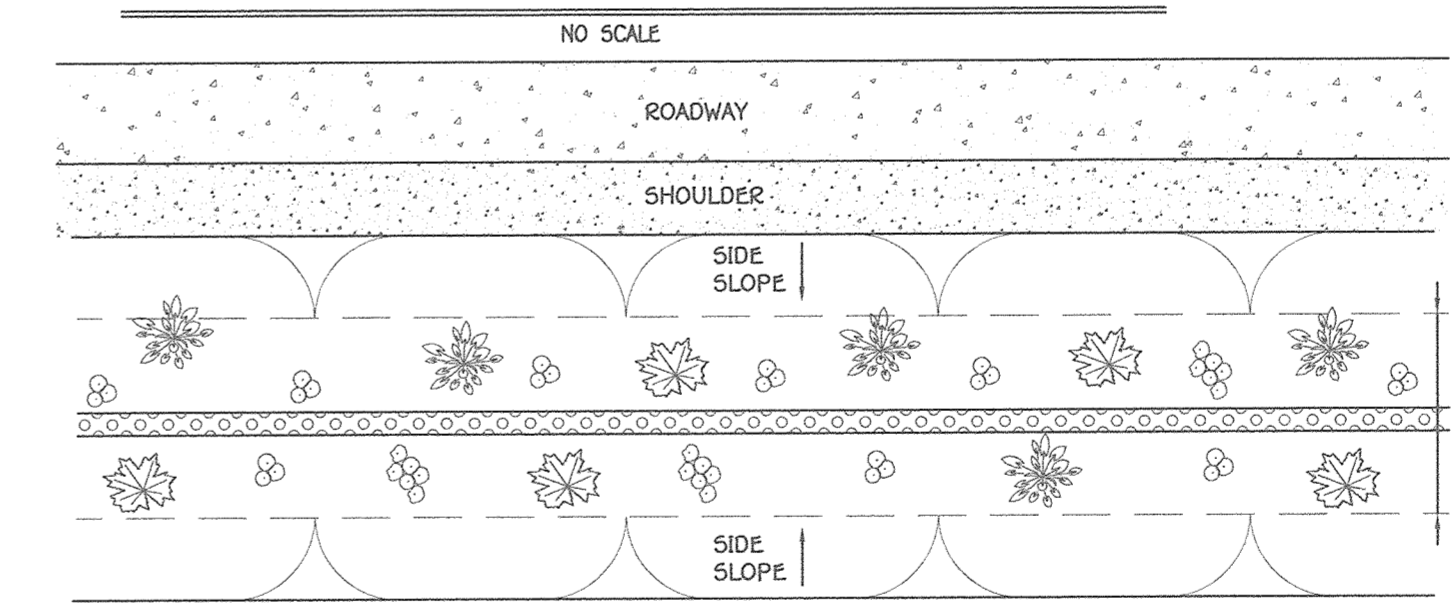


TYPICAL SECTION BIO-RETENTION FACILITY (M-6)
NOT TO SCALE

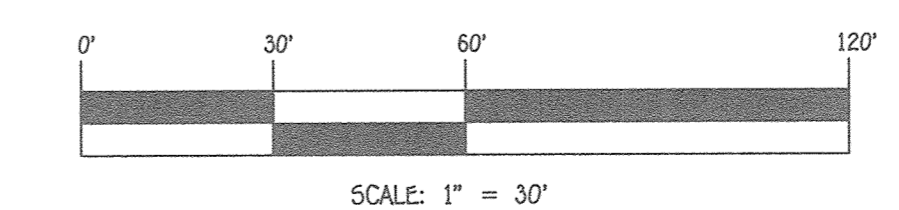
FACILITY NO.	A	B
M-6 (1)	397.00	393.92



TYPICAL SECTION - BIO-SWALE (M-8)



PLAN - BIO-SWALE (M-8)
NOT TO SCALE



FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
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ELLCOTT CITY, MARYLAND 21042
(410) 461-2895

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Don J. Mann for US
Chief, Division of Land Development 7/23/19 Date
John Schuman J.S.
Chief, Development Engineering Division 8/22/19 Date



PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21476, EXPIRATION DATE: 7/14/21.
Frank John Manalansan II 7/14/19 DATE
FRANK JOHN MANALANSAN II

OWNER/DEVELOPER
HOWARD COUNTY
3430 COURT HOUSE DRIVE
ELLCOTT CITY, MARYLAND 21043
ATTN: MR. RICHARD LEE
410-313-7548

STORMWATER MANAGEMENT NOTES & DETAILS
CENTRAL FLEET
VEHICLE STORAGE LOT
PARCELS 'A' & 'E'
ZONED: POR-MXD-6
TAX MAP NO.: 24 GRID NO.: 6 PARCEL NO.: 852
SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND
SCALE: AS SHOWN DATE: JULY, 2019
SHEET 6 OF 6 ECP-19-044