

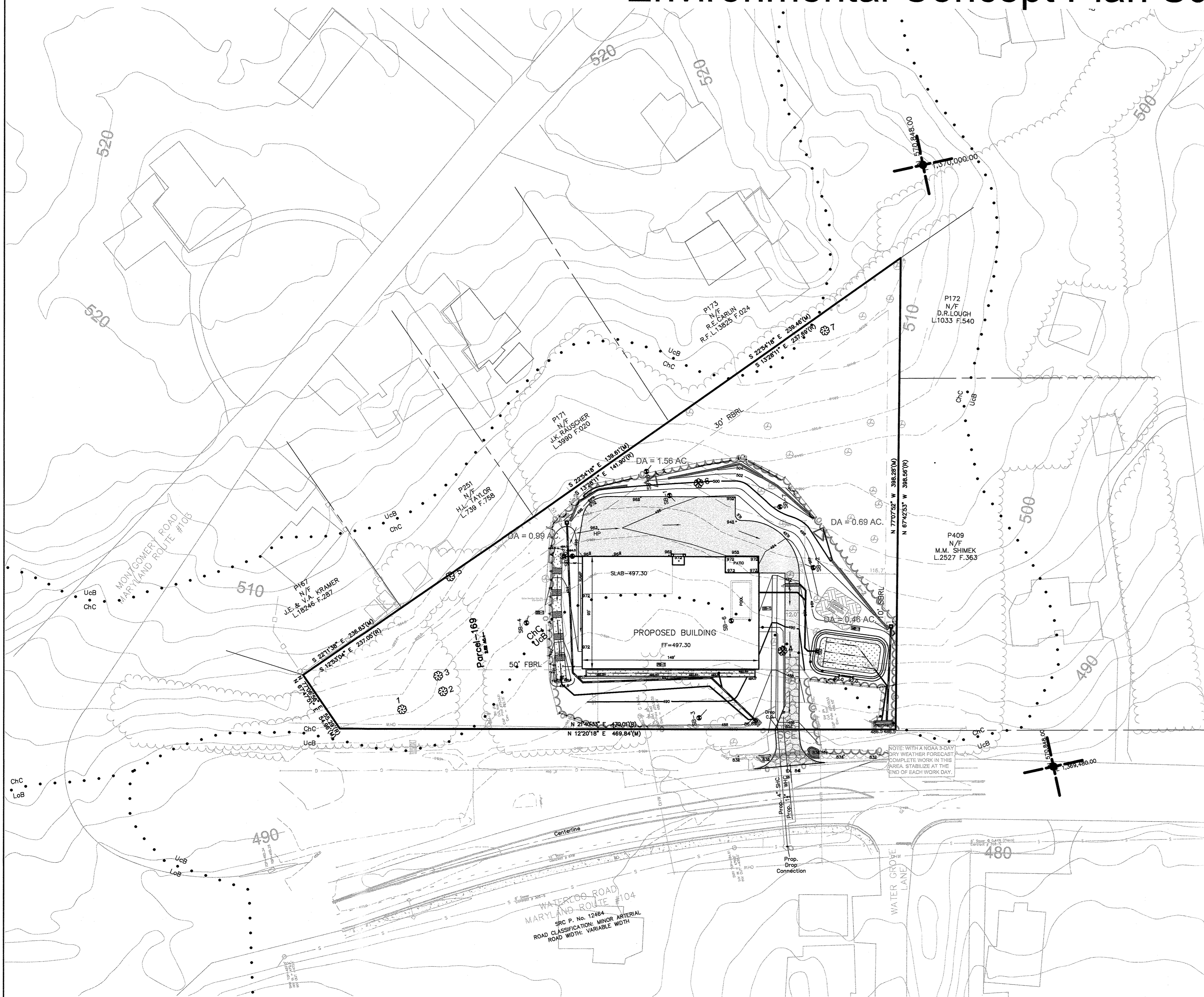
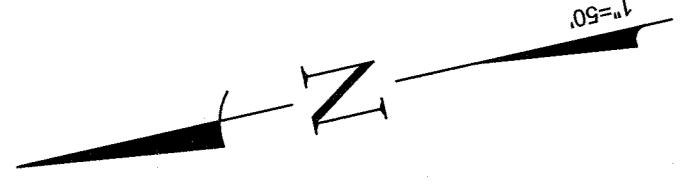
SHEET INDEX

1 OF 2 E-01 COVER SHEET
2 OF 2 E-02 ENVIRONMENTAL CONCEPT PLAN

HOWARD COUNTY

Project: ECP-19-016

Environmental Concept Plan Submission



| EXISTING | Legend | PROPOSED |
|-------------------|----------------------------|----------|
| | Asphalt Paving | |
| | Concrete | |
| | Curb & Gutter | |
| | Utility Pole | |
| EX. ELEC. (E) | Electric | |
| EX. 8" SEW. (S) | Sewer | 6" SEW. |
| EX. 15" S/D (D) | Storm Drain | 24" RCP |
| EX. 6" WAT. (W) | Water Line | 6" WAT. |
| EX. 6" HP GAS (G) | Gas | 4" GAS |
| EX. TELE (T) | Telephone | TELE |
| | Pavement Centerline | |
| | Buildings | |
| | Fence | |
| | Limits of Disturbance | |
| | Building Restriction Line | |
| | Fence Posts | |
| | Fence | |
| | Existing Soil Types | |
| | Edge of Proposed Tree Line | |
| | Edge of Existing Tree Line | |
| | Specimen Tree | |
| | Ponding Top | |

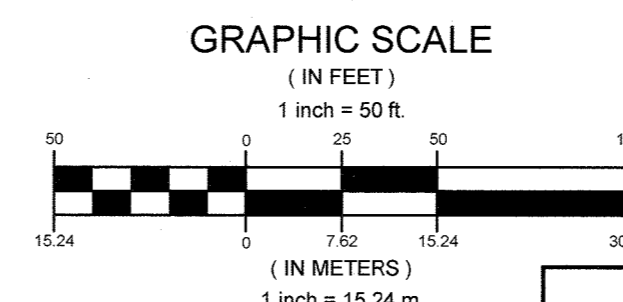
Note: For the property lines, M = Measured R = Record
Design Narrative

The new development has been designed in accordance with the 2000 Maryland Stormwater Management Design Manual as revised in 2009. A soil report was prepared on July 23, 2018 and is included as an attachment to this submission. It was determined that the infiltration rate did not exceed 0.52 in./hr. and so permeable pavement and any ground infiltration practices such as infiltration trenches and basins were ruled out as an option to provide stormwater management. A green roof was considered, however the owners determined that the roof area would be better suited for photovoltaic panels. Drywells were considered as well, but the soils do not support proper drainage.

The stormwater management for the Weaver-DuVall residence consists of a bio-swale, a micro-bioretention facility, a planter box micro-bioretention facility, a permanent earth dike, a grass swale, and a storm drain system within the confines of the property. All stormwater management facilities are to be owned and maintained by the property owner. A bio-swale is designed to provide treatment for a portion of the roof of the dwelling and convey surface run-off from the northern portion of the site. A micro-bioretention facility is designed to provide treatment for the majority of the driveway and a portion of the roof of the dwelling. A planter box micro-bioretention facility is utilized on the site to allow for treatment of the western portion of the roof.

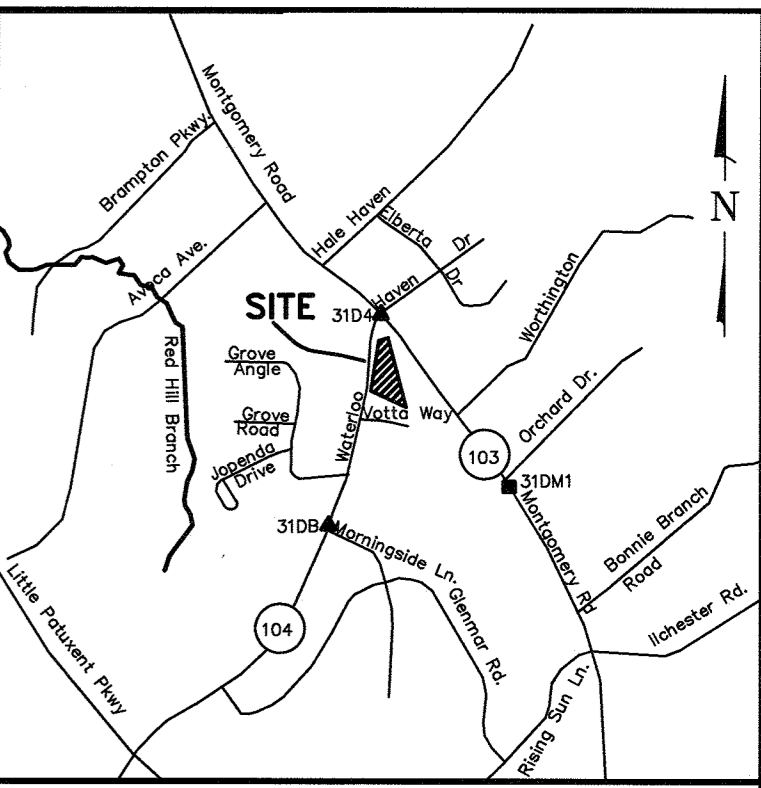
A grass swale is utilized to facilitate runoff from the driveway on the property. The driveway has a 5% slope, so the grass swale is designed to run along its side. With a 5% slope on the swale, we are not taking credit for the ESD that would be treated (103 cu. ft.) in this grass swale. Though it is not a formal grass swale, the design storm (2.6 in) has a flow velocity of 0.47 fps and the 10-year flow velocity is 1.29 fps. Both are well under erosive velocities: 1 fps and 4 fps respectively.

The sizing for the amount of ESD treatment required includes the new impervious area and the total drainage area to each facility. The ESD treatment required for a PE of 1.80" for this site is 3,983 cu. ft. The bio-swale, micro-bioretention facility, and the planter box combined treat 4,369 cu. ft. (see Table 1) which exceeds the requirement. The average proposed treatment PE is 1.97".



GENERAL NOTES

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- THE COORDINATES SHOWN HEREON ARE BASED ON HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM.
- THE PROPERTY IS ZONED R-20 PER 10/06/13 COMPREHENSIVE ZONING PLAN.
- THERE ARE NO PROTECTED ENVIRONMENTAL FEATURES ON SITE.
- FOREST CONSERVATION REQUIREMENTS WILL BE MET USING ONSITE RETENTION.
- THIS PROPERTY IS WITHIN THE METROPOLITAN DISTRICT.
- TOPOGRAPHICAL INFORMATION WAS ACQUIRED BY A SURVEY DONE BY MHG ON 3/28/2018. HORIZONTAL DATUM IS BASED ON THE MARYLAND COORDINATE SYSTEM NAD 83(2011) DATUM BY HOWARD COUNTY DEPT. OF PUBLIC WORKS - SURVEY DIVISION. STATIONS 31D4 AND 31D5 WAS USED TO ESTABLISH THE HORIZONTAL CONTROL FOR THIS SITE ON 3/28/2018. VERTICAL DATUM IS BASED ON NAVD 88, FROM HOWARD COUNTY DEPT. OF PUBLIC WORKS - SURVEY DIVISION. BENCHMARKS USED ARE 31D4 - ELEV. 494.445 AND 31D5 - ELEV. 492.348. THE VERTICAL DATUM ON THIS PLAN IS FROM FIELD SURVEY METHODS BY MHG ON MARCH 28, 2018 AND MEETS NATIONAL MAP ACCURACY STANDARDS FOR A 30 SCALE TOPOGRAPHY.
- THE ONLY EXISTING STRUCTURE (A SHED) ONSITE WILL BE REMOVED. IT HAS BEEN NOTED ON THE PLANS.
- 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.



VICINITY MAP
SCALE 1" = 2,000'
ADC Map Coordinates: Map 28, Grid A-566

SITE ANALYSIS DATA CHART

- A. TOTAL AREA OF SITE: 2.53 AC.
- B. LIMIT OF DISTURBED AREA: 1.37 AC.
- C. PRESENT ZONING DESIGNATION: R-20
- D. PROPOSED USES FOR SITE AND STRUCTURES: SINGLE FAMILY HOME
- E. FLOOR SPACE: FLOOR 1 SINGLE FAMILY HOME: 14,126 SF
- F. BUFFERS = 0.00 ACRES
- G. FLOODPLAINS = 0.00 ACRES
- H. FORESTS = 0.56 ACRES
- I. STEEP SLOPES (15%-24.9%) = 0.00 ACRES
- J. STEEP SLOPES (25%+) = 0.00 ACRES
- K. ERODIBLE SOILS = 0.00 ACRES
- L. GREEN OPEN AREA = 1.36 ACRES
- M. IMPERVIOUS AREA = 0.60 ACRES

SOILS CHART

| MAP UNIT SYMBOL | MAP UNIT NAME | K VALUE | DRAINAGE CLASS | HIGH ERODIBILITY (Y/N)* | HYDRIC SOIL (Y/N) | HYDRO-LOGIC SOIL GROUP |
|-----------------|---|---------|--|-------------------------|-------------------|------------------------|
| ChC | Chillum-Russett loams, 5 to 10% slopes | 0.43 | Well Drained / Moderately Well Drained | NO | NO | C |
| UcB | Urban land-Chillum-Beltsville complex, 0 to 5% slopes | - | Well Drained / Moderately Well Drained | NO | NO | C/D |
| LoB | Legore-Monalto-Urban land complex, 0 to 8% slopes | 0.64 | Well Drained | NO | NO | B/C/D |

Soil information found at <http://websoilsurvey.sc.gov.usda.gov/App/WebSoilSurvey.aspx> and https://docs.wixstatic.com/ugd/49874f_3a64e1a18b7e43fb2f05093cda8809f.pdf

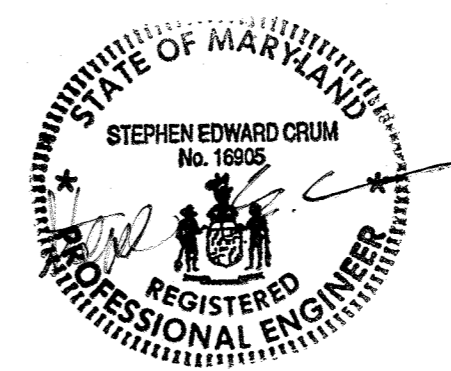
DEVELOPER'S CERTIFICATION

I/We certify that all development and construction will be done according to this plan for sediment and erosion control, and that all responsible personnel involved in the construction project will have a Certificate of Attendance this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements of the Howard Soil Conservation District.

John Weaver, Owner
Date: 7/26/18
Printed Name & Title

PARCEL 169 Tax Map 31 COUNTY REF. ECP-19-016

ENVIRONMENTAL CONCEPT PLAN: COVER SHEET
SINGLE FAMILY HOME
WEAVER/DuVALL RESIDENCE
GRID 0008, ZONING R-20, ELLICOTT CITY, PLAT 0031
1ST ELECTION DISTRICT - HOWARD COUNTY - MARYLAND



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. 16905, Expiration Date: 04/21/2020

MHG Macris, Hendricks & Glascock, P.A.
Engineers ■ Planners
Landscape Architects ■ Surveyors

9220 Wightman Road, Suite 120
Montgomery Village, Maryland
20886-1279
Phone 301.670.0840
Fax 301.948.0693
www.mhga.com

| | |
|-----------------------|----------------|
| Proj. Mgr. DAC | Designer LKS |
| Date 4/23/19 | Scale 1" = 20' |
| Project No. 18.129.11 | Sheet 1 of 2 |

ENGINEER'S CERTIFICATION

I certify that this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements of the Howard Soil Conservation District.

Stephen E. Crum
Design Engineer Signature
Stephen E. Crum, P.E.
Printed Name
Date: 04-25-19
16905
MD Registration Number

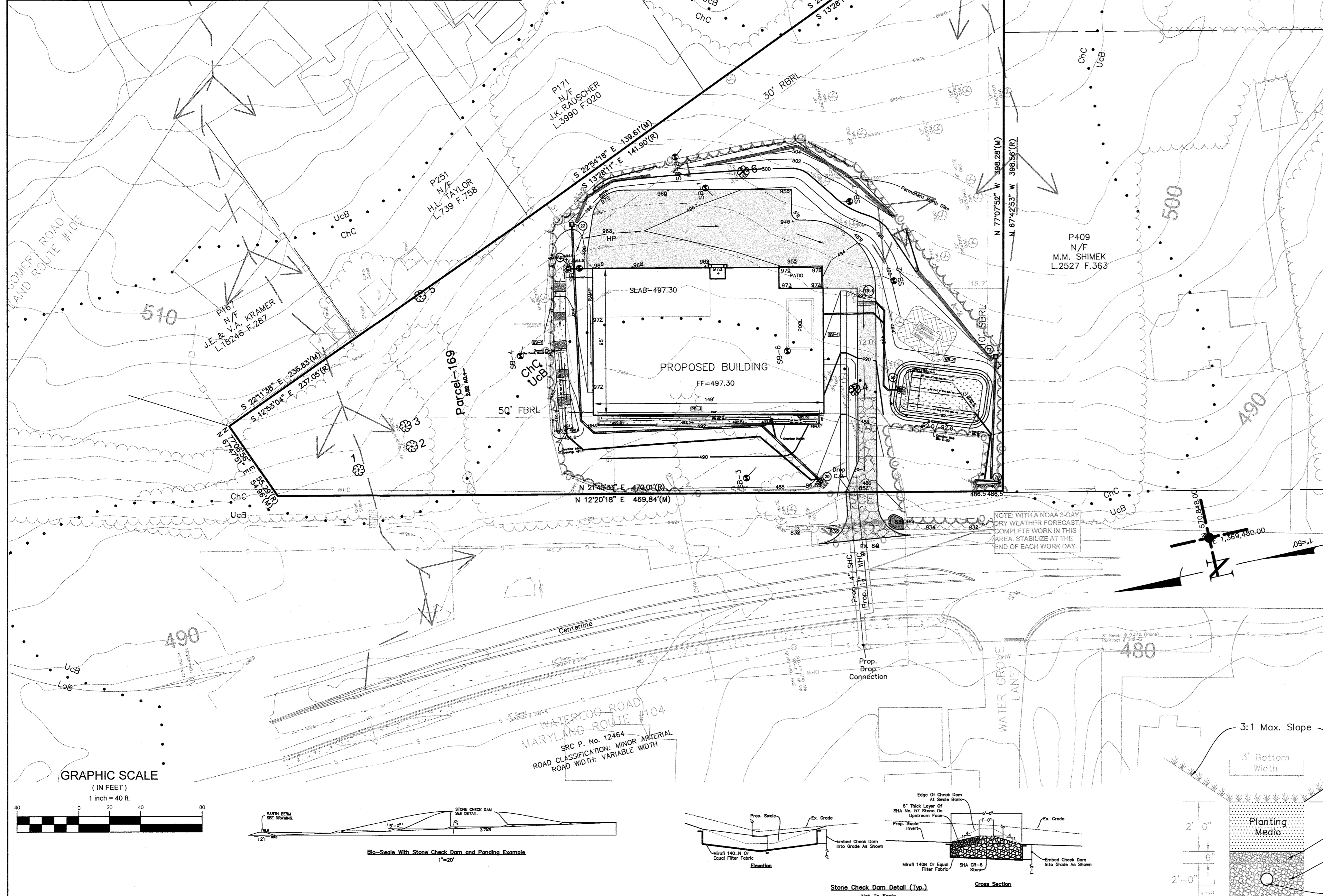
Owner/Applicant:
Weaver/DuVall
4959 Waterloo Road
Ellicott City, MD 21043
Contact: John Spears
Phone: 301-943-8319
E-mail: John@SustainableDesign.com

| | |
|------------------|-----------|
| Horizontal Datum | NAD 83/91 |
| Vertical Datum | NAVD 88 |

Approved: Department of Planning and Zoning

John Weaver
Chief, Development Engineering Division
Date: 5.8.19
Kevin L. ...
Chief, Division of Land Development
Date: 4-24-19

| WATERLOO ROAD; ESD SUMMARY | | | | | | |
|----------------------------|----------------------------------|---------------------|----------------------|--------------|------|------|
| NO. | FACILITY DESCRIPTION | TREATMENT AREA (SF) | IMPERVIOUS AREA (SF) | UNIT PE (IN) | RV | ESDV |
| MB1 | Micro-Bioretentation | 20,000 | 13,487 | 1.83 | 0.66 | 2008 |
| BS-1 | Bio-Swale | 42,945 | 13,334 | 1.40 | 0.33 | 1651 |
| PB1 | Planter Box Micro-Bioretentation | 4,938 | 4,938 | 1.82 | 0.95 | 710 |
| TOTALS | | 67,883.0 | 31,759 | 0.47 | | 4369 |
| | | | AVG. PE | 1.64 | | |



MHG
Macris, Hendricks & Glascock, P.A.
9220 Wightman Road, Suite 120
Montgomery Village, MD 20886
Phone: (301) 670-0840 Fax: (301) 948-0993

USER: L. Searles
DATE: 3/28/19
PROJECT No.: 2018.129.11
FILE: ESD_MB-1.XLS

Waterloo Road: MB-1
Environmental Site Design (ESD) Sloping Criteria

Site Data:
Total Drainage Area (DA) 59,444 SF = 1.36 Acres
Total Impervious (I) Area 26,205 SF = 0.6 Acres = 44.1%

Determine Target P_t:

| HSG | A | B | C | D |
|--------------------|--------|--------|--------|--------|
| HSG DA (SF) | 59,444 | 59,444 | 59,444 | 59,444 |
| % of Total DA | 100.0% | 100.0% | 100.0% | 100.0% |
| HSG I Area (SF) | 26,205 | 26,205 | 26,205 | 26,205 |
| HSG I Percent (I%) | 44.1% | 44.1% | 44.1% | 44.1% |
| HSG RCN | 70 | 70 | 70 | 70 |
| HSG P _t | 1.87 | 1.87 | 1.87 | 1.87 |

See Abridged Rainfall Targets/RCN Reductions Table(s) Below
Target RCN = 70 x 100% = 70.0
Target Rainfall = P_t = 1.87 x 100% = 1.87"

HYDROLOGIC SOIL GROUP A

| %I | RCN | P _t | 1.0" | 1.2" |
|----|-----|----------------|------|------|
| 0% | 40 | 40 | 38 | 38 |
| 5% | 43 | 43 | 38 | 38 |

HYDROLOGIC SOIL GROUP B

| %I | RCN | P _t | 1.0" | 1.2" |
|----|-----|----------------|------|------|
| 0% | 61 | 61 | 55 | 55 |
| 5% | 63 | 63 | 55 | 55 |

HYDROLOGIC SOIL GROUP C

| %I | RCN | P _t | 1.0" | 1.2" |
|-----|-----|----------------|------|------|
| 40% | 84 | 71 | 70 | 70 |
| 45% | 85 | 71 | 70 | 70 |
| 50% | 86 | 71 | 70 | 70 |

HYDROLOGIC SOIL GROUP D

| %I | RCN | P _t | 1.0" | 1.2" |
|----|-----|----------------|------|------|
| 0% | 80 | 80 | 77 | 77 |
| 5% | 81 | 81 | 77 | 77 |

Determine Q_t:
Q_t = Runoff depth in inches that must be treated using ESD practices
= P_t x R_v
= 1.87 x 0.45
= 0.85"

Determine ESD_v:
ESD_v = Runoff volume used in the design of specific ESD practices
= (P_t x I_A) / 12
= (1.87 x 0.45 x 59444) / 12
= 3,983 CU FT

Minimum ESD Target:
As a minimum, ESD shall be used to address both R_v and WQ_v requirements

Determine RE_v:
RE_v = Groundwater Recharge volume component of ESD_v
= (S_r x I_A) / 12
= (0.13 x 0.45 x 59444) / 12
= 288 CU FT

SOIL SPECIFIC RECHARGE FACTOR (S)

| HSG | (S) | % AREA | (S) ₁ (%) |
|--------------------|------|--------|----------------------|
| A | 0.38 | 0.0% | 0 |
| B | 0.26 | 0.0% | 0 |
| C | 0.13 | 100.0% | 0.13 |
| D | 0.06 | 0.0% | 0 |
| COMPOSITE S = 0.13 | | | |

Determine WQ_v:
WQ_v = Water Quality volume component of ESD_v = 1.0' Eastern Zone and 0.9' Western Zone
= (P_t x I_A) / 12
= (1.87 x 0.45 x 59444) / 12
= 2,213 CU FT

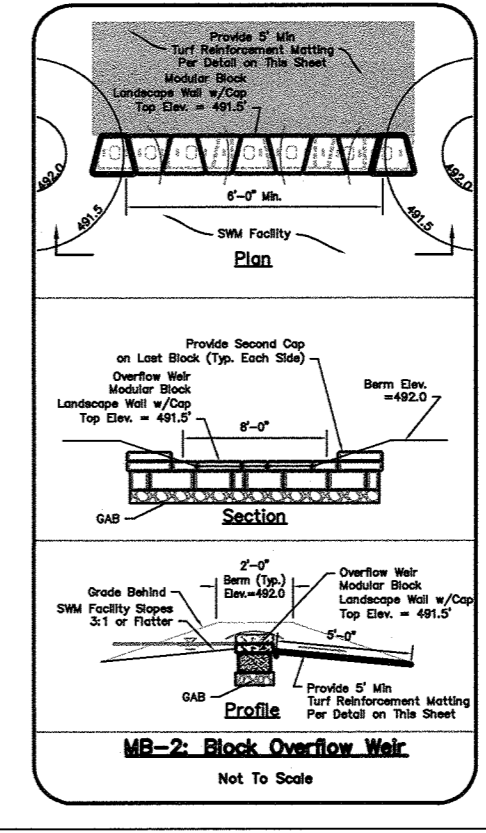
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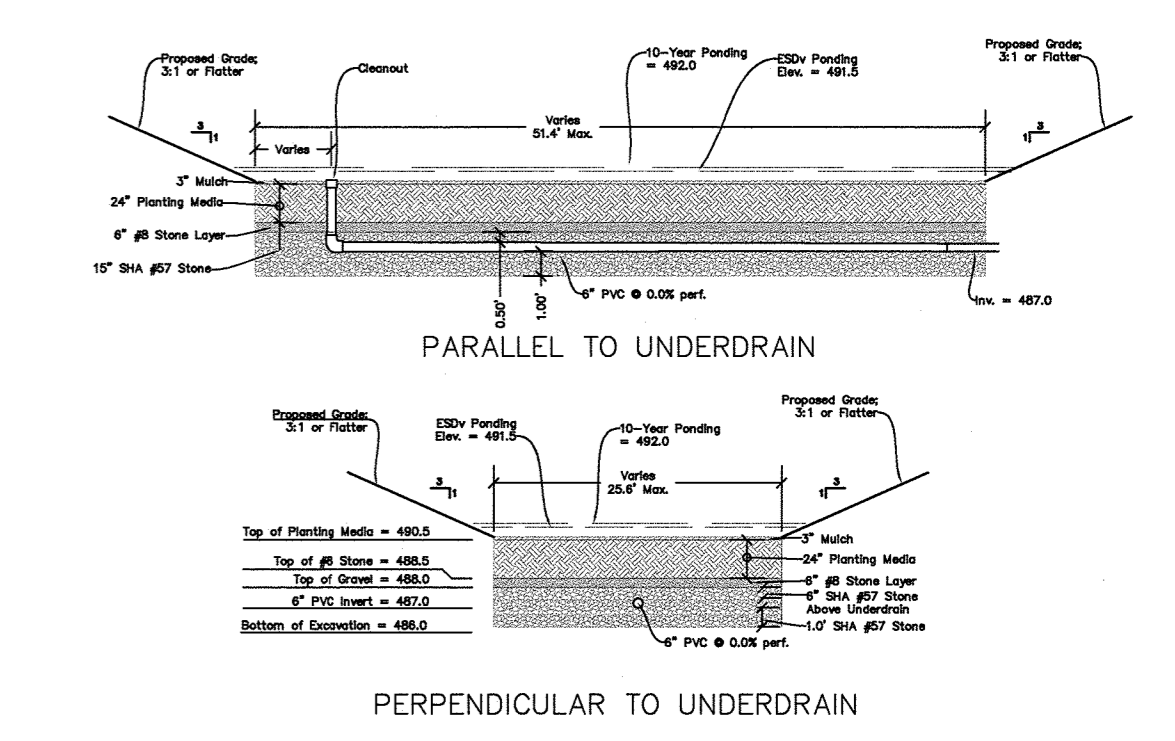
Average Treatment P_t for Development Area
It is not practicable for all parts of the development area to drain to stormwater facilities. It is therefore necessary to average the treated ESD_v from all drainage areas over the entire development area. This is accomplished using the relationship between P_t and ESD_v such that the ESD_v term in the summation of all treated stormwater volumes, while the site data is based on the development area.

Determine Avg. Treatment P_t for Total Site:
P_t = (ESD_v) / (R_v x I_A)
Treated ESD_v = 4,369 CU FT (From ESD SUMMARY Sheet)
Site Area (A) = 59,444 SF
Site R_v = 0.45
Avg. P_t = (4,369) / (0.45 x 59444)
Avg. P_t = 1.97

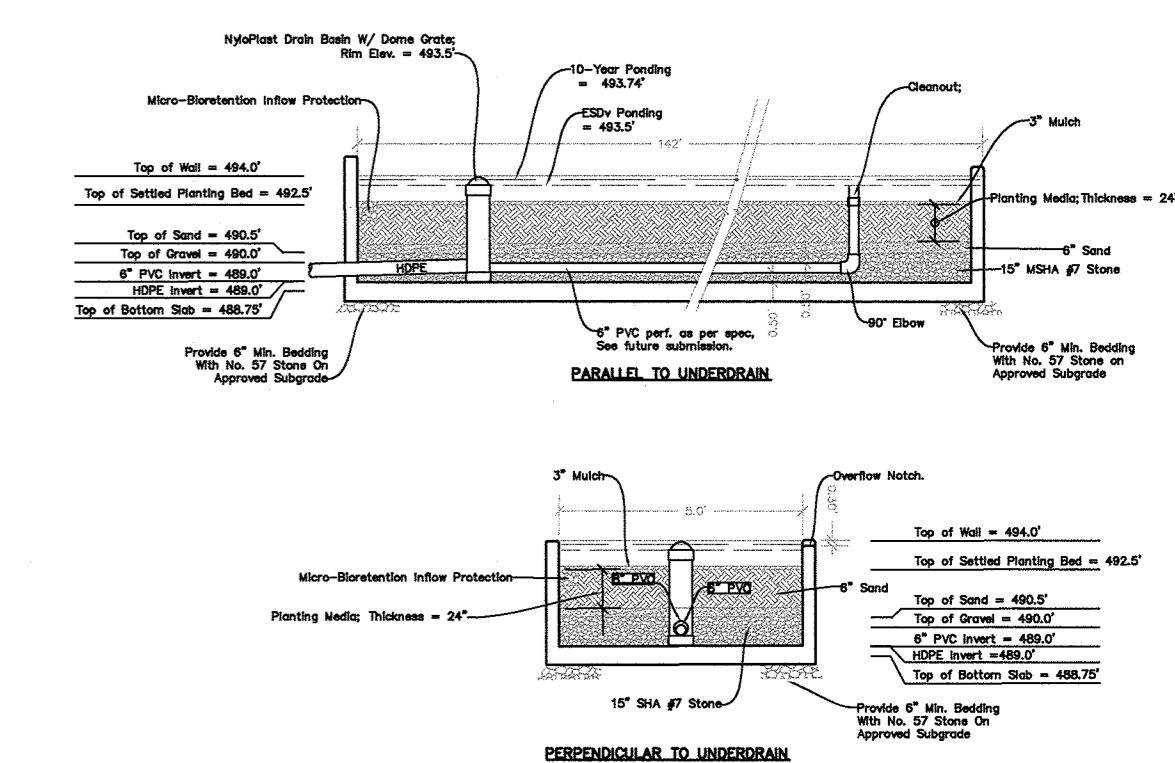
Target P_t = 1.87"
Avg. Treatment P_t = 1.97"
ESD_v Required = 3983 cu ft
ESD_v Provided = 4369 cu ft



MICRO-BIORETENTION SECTIONS (TYPICAL)



PLANTER BOX MICRO-BIORETENTION SECTIONS (TYPICAL)



SWM LEGEND

- Existing Contour
- Proposed Contour
- Limits of Disturbance
- Existing Drainage Divide
- Proposed Contour
- Proposed Drainage Divide
- SWM (MB) Micro-Bioretentation
- Dry Well
- Soil Mapping Unit
- Proposed Inlet
- Proposed Trench Drain
- Proposed Storm Drain
- Trees to Be Removed

SESC LEGEND

- Existing Contour
- Proposed Contour
- Proposed Trap and Basin Contour
- Limits of Disturbance
- Existing Drainage Divide
- Proposed Drainage Divide
- Stabilized Construction
- Super Silt Fence
- Diversion Fence
- Permanent Earth Dike
- Approx. Stockpile Area

SPECIMEN TREE LIST

| ID # | Common Name | Botanical Name | DBH | CRZ (s.f.)/CRZ (radius) | Conditions/Remarks | Disposition |
|------|--------------|-------------------------|-----|-------------------------|--|-------------|
| 1 | Red Maple | Acer rubrum | 39 | 10,746 | 58.5 Fair/Good; dead wood, vines | Save |
| 2 | White Oak | Quercus alba | 41 | 11,876 | 61.5 Fair/Good; dead wood, vines | Save |
| 3 | White Oak | Quercus alba | 34 | 8,167 | 51 Poor; dead wood, vines, cavity, rot | Save |
| 4 | White Oak | Quercus alba | 36 | 9,156 | 54 Poor; lightning strike wound, base rot to 30", some dead wood | Save |
| 5 | Chestnut Oak | Quercus prinus | 31 | 6,789 | 46.5 Fair; dead wood | Remove |
| 6 | Tulip Poplar | Liriodendron tulipifera | 38 | 10,202 | 57 Fair/Poor; cavity, hollowing, deadwood | Save |
| 7 | White Oak | Quercus alba | 30 | 6,359 | 45 Fair/Good; slight lean, canopy lopsided, some dead wood | Remove |

Notes: Diameters are given for each trunk of multiple bole trees when division occurs below 4.5 feet. If major division occurs above 4.5 feet, only the trunk diameter at 4.5 feet is given. Trunk ID Numbers correspond to those assigned on the Natural Resource Inventory/Forest Stand Delineation Map.

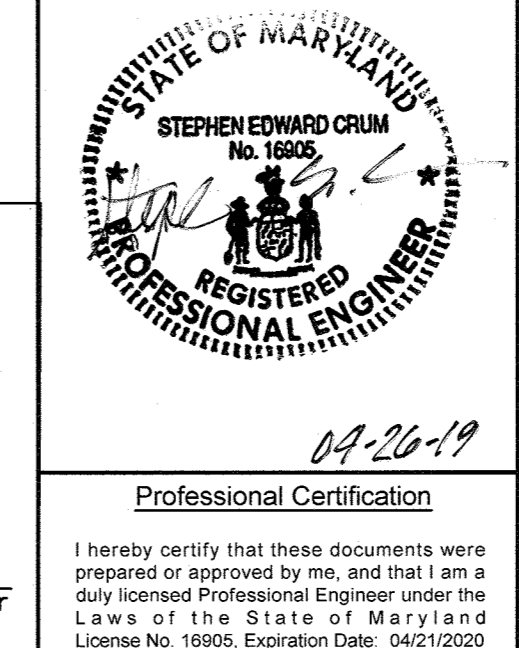
Approved: Department of Planning and Zoning

Chief, Development Engineering Division
Date: 5-8-19

Chief, Division of Land Development
Date: 4-29-19

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I certify that this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements of the Howard Soil Conservation District.

Design Engineer Signature: Stephen E. Crum, P.E.
Date: 04-26-19
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MD Registration Number



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SINGLE FAMILY HOME
WEAVER/DuVALL RESIDENCE
GRID 0008, ZONING R-20, ELLICOTT CITY, PLAT 0031
1ST ELECTION DISTRICT - HOWARD COUNTY - MARYLAND

MHG Macris, Hendricks & Glascock, P.A.
Engineers ■ Planners
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Proj. Mgr. DAC
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