# **GENERAL NOTES**

- SUBJECT PROPERTY ZONED R-ED IN ACCORDANCE WITH THE OCTOBER 6, 2013 COMPREHENS
- GROSS AREA OF PROPERTY = 5.8680 AC.±
- 3.5 FLOODPLAIN = 0.0 AC. AND STEEP SLOPES = 2.11 AC
- NET AREA OF PROJECT = 3.76 AC.
- NUMBER OF PROPOSED BUILDABLE LOTS =

- 36.A. WIDTH 12 FEET (16 FEET SERVING MORE THEN ONE RESIDENCE);
- 36.B. SURFACE SIX (6") INCHES OF COMPACTED CRUSHED RUN BASE WITH TAR AND CHIP COATING
- 36.C. GEOMETRY MAXIMUM 15% GRADE, MAXIMUM 10% GRADE CHANGE AND 45-FOOT TURNING
- 36.D. STRUCTURES (CULVERTS/BRIDGES) CAPABLE OF SUPPORTING 25 GROSS TONS
- 36.E. DRAINAGE ELEMENTS CAPABLE OF SAFELY PASSING 100 YEAR FLOOD WITH NO MORE THAN ONE FOOT DEPTH OVER DRIVEWAY SURFACE;
- 36.F. MAINTENANCE SUFFICIENT TO ENSURE ALL WEATHER USE 37. ALL LOTS/RESIDENTIAL UNITS IN THIS SUBDIVISION ARE SUBJECT TO THE MIHU REQUIRMENT THAT IS TO BE APPROVED BY THE DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT.
- 38. IN ACCORDANCE WITH SECTION 16.128 OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, A PRE-SUBMISSION COMMUNITY MEETING WAS HELD ON NOVEMBER 2, 2016 AT
- 39. ALL WELL AND SEPTIC SYSTEMS MUST BE PROPERLY ABANDONED WITH DOCUMENTATION SENT TO THE HEALTH DEPARTMENT PRIOR TO SIGNATURE OF THE RECORD PLAT.
- 40. THERE ARE 21 SPECIMEN TREES ON THE PROPERTY. NINE SPECIMEN TREES ARE PROPOSED TO BE REMOVED TO FACILITATE DRIVEWAY OR HOUSE DEVELOPMENT AS REQUESTED UNDER WP-17-124. 1. THE EXISTING STORAGE BUILDING AND SHED ARE TO REMAIN ON LOT 1 AND ARE CONSIDERED
- NON-CONFORMING STRUCTURES TO THE 30' SETBACK FROM THE PROJECT BOUNDARY SINCE IT PRE-DATES THE NEW APPLICATION OF THE R-ED SETBACKS FROM AN EXISTING PROPERTY LINE. 42. ON FEBRUARY 26, 2018 AN ALTERNATIVE COMPLIANCE PETITION WP-17-124 TO WAIVE SECTION 16.116(A)(1)&(2), SECTION 16.116(B)(1) AND SECTION16.1205(A)(7) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, TO PERMIT GRADING, REMOVAL OF
- VEGETATIVE COVER AND TREES, PAVING AND NEW STRUCTURES WITHIN 25' OF WETLANDS, WITHIN 50' OF AN INTERMITTENT STREAM BANK AND ON LANDS WITH EXISTING STEEP SLOPES, AND TO PERMIT THE REMOVAL OF SPECIMEN TREES, WAS APPROVED BY THE DIRECTOR OF PLANNING AND ZONING SUBJECT TO THE FOLLOWING CONDITIONS: • COMPLIANCE WITH SRC COMMENTS SP-17-006 AND PLANNING BOARD APPROVAL PB CASE 433
- FOR THE PROPOSED SUBDIVISION PLAN DESIGN, LAYOUT AND LOCATION OF LOTS, SHARED • NO ADDITIONAL DISTURBANCE OR GRADING SHALL OCCUR BEYOND THE LIMITS OF
- DISTURBANCE (LOD) OF THE 25% STEEP SLOPES THAT ARE DETAILED ON THE PRELIMINARY GRADING PLAN AND AS APPROVED BY THE PLANNING BOARD, UNLESS IT CAN BE SUFFICIENTLY DEMONSTRATED TO BE WARRANTED OR JUSTIFIED BY THE PETITIONER AS NECESSARY DISTURBANCE OR THROUGH THE FILING OF AN ADDITIONAL ALTERNATIVE COMPLIANCE
- THE AFFECTED STEEP SLOPE AREAS MUST BE SUFFICIENTLY STABILIZED BY SOIL STABILIZATION DEVICES/METHODS THAT SHALL LESSEN THE ERODIBILITY OF SOILS AND RUNOFF. THE IMPACTED STEEP SLOPE AREAS MUST BE REVEGETATED OR STABILIZED WITH SUITABLE NATIVE SPECIES THAT WILL BIND THE SURFACE TIGHTLY. THESE STABILIZATION TECHNIQUES MUST BE CLEARLY DEMONSTRATED ON THE SITE DEVELOPMENT PLAN. ullet THE REMOVAL OF NINE (9) SPECIMEN TREES WILL REQUIRE MITIGATION WITH THE PLANTING OF 2:1 REPLACEMENT TREES (18 TOTAL) WITH A MINIMUM OF 3" CALIPER NATIVE PLANT SPECIES. THE REPLACEMENT TREES SHALL BE PROPOSED WITHIN A REASONABLE LOCATION ON THE SITE, BONDED AND SHOWN ON THE LANDSCAPE PLAN WITH THE FORTHCOMING FINAL PLAN. THE REMAINING TWELVE (12) SPECIMEN TREES SHALL BE SAVED AND PROTECTED DURING CONSTRUCTION ACTIVITIES. ANY ADDITIONAL REMOVAL OF SPECIMEN TREES SHALL REQUIRE THE SUBMITTAL OF A NEW ALTERNATIVE COMPLIANCE PETITION APPLICATION. • PROVIDE TREE PROTECTION FENCING AT THE TREES DRIP LINE, OR FARTHER OUT, TO PREVENT TREE DAMAGE FROM EXCAVATION, SOIL COMPACTION OF SOIL OVER ROOTS, THESE PROTECTION TECHNIQUES MUST BE DEMONSTRATED ONT EH SITE DEVELOPMENT PLAN. PROVIDE A NOTE ON THE SP PLAN (SP-17-006), THE FINAL PLAT AND THE SITE DEVELOPMENT PLAN REGARDING THIS ALTERNATIVE COMPLIANCE PETITION APPROVAL. THIS NOTE SHALL
- ALTERNATIVE COMPLIANCE APPROVAL, AND THE CONDITIONS OF APPROVAL 43. A PRIVATE ROAD STREET NAME SIGN ASSEMBLY SHALL BE FABRICATED AND INSTALLED BY HOWARD COUNTY BUREAU OF HIGHWAYS AT THE DEVELOPERS/OWNERS EXPENSE. CONTACT HOWARD COUNTY TRAFFIC DIVISION AT 410-313-5751 FOR DETAILS AND COST ESTIMATES.

INCLUDE THOSE SUBDIVISION REGULATION SECTIONS PETITIONED, THE DATE OF THE

44. ON THE APPROACH SIDE OF A STOP SIGN, NO STREET TREE TO BE PLANTED WITHIN 30' OF THE

# APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS. APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING CHIEF, DIVISION OF LAND DEVELOPMENT CHIEF, DEVELOPMENT ENGINEERING DIVISION

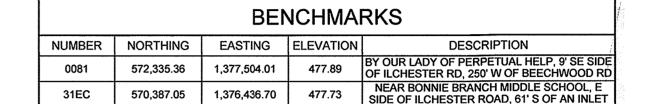
GENERAL NOTES CONTINUED:

i. THE HOWARD COUNTY PLANNING BOARD SIGNED THE DECISION AND ORDER FOR PB CASE 433 ON

MARCH 1, 2018, GRANTING APPROVAL OF SP-17-006.

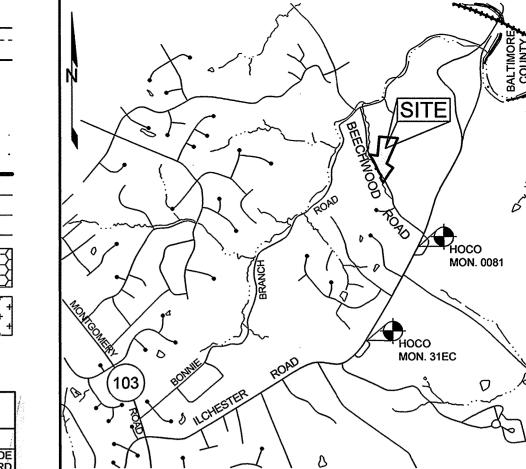
# SUPPLEMENTAL INFORMATION PLAN

LOTS 1, 3 THRU 7 AND OPEN SPACE LOTS 2, 8 THRU 11



FOREST CONSERVATIO

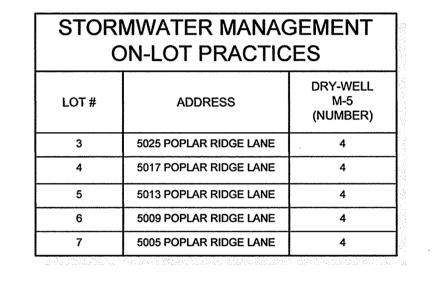
**LEGEND** 

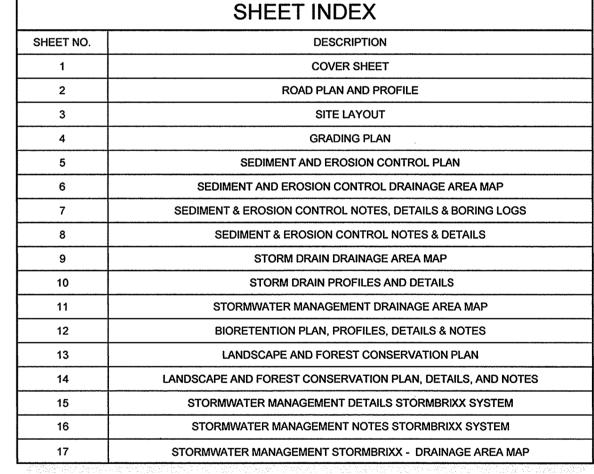


HOWARD COUNTY, MARYLAND ADC® MAP 21, GRID D4 & D5 **VICINITY MAP** 



MINIMUM LOT SIZE CHART					
LOT NUMBER	GROSS AREA (SF)	PIPESTEM AREA (SF)	NET AREA (SF)	MINIMUM LOT SIZE (SF)	
1	45,612 ±	691 ±	44,921 ±	6,000	
3	15,215 ±	4,134 ±	11,081 ±	6,000	
4	9,474 ±	2,383 ±	7,091 ±	6,000	
5	9,886 ±	1,930 ±	7,956 ±	6,000	
6	8,795 ±	1,568 ±	7,227 ±	6,000	
7	7,696 ±	1,210 ±	6,486 ±	6,000	





# OWNER/DEVELOPER

JOSEPH C. & LISA ANN PENKUSKY 4707 BEECHWOOD ROAD ELLICOTT CITY, MD 21043 443-324-4807

# **COVER SHEET** PENKUSKY PROPERTY

LOTS 1, 3 THRU 7, AND OPEN SPACE LOTS 2, 8 THRU 11 TAX MAP 31 GRID 4

**1ST ELECTION DISTRICT** 

16005 Frederick Road, 2nd Floor Woodbine, Maryland 21797 Phone: 443.325.5076 Fax: 410.696.2022

ENGINEERING GROUP, LLC Email: info@sillengineering.com Civil Engineering for Land Development

CHECKED BY: PS SCALE: AS SHOWN DATE: DECEMBER 16, 2020 PROJECT #: \_\_\_\_\_15-028\_ ROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME . AND THAT I AM A DULY

HOWARD COUNTY, MARYLAND

DESIGN BY:

# PENKUSKY PROPERTY

HOWARD COUNTY, MARYLAND

PARCEL 119 255,608.7607 S.F.± 5.8680 AC± L. 12616 F. 91 1 INCH = 50 FEET **LOCATION MAP GENERAL NOTES CONTINUED: GENERAL NOTES CONTINUED:** 47. THE HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING, IN A LETTER DATED AUGUST 13, 2019, HAS DETERMINED THE DISTURBANCE, TO ALLOW A PUBLIC SEWER LINE CONNECTION AND a. THE R-1 ("STOP") SIGN AND THE STREET NAME SIGN (SNS) ASSEMBLY FOR THIS DEVELOPMENT GRADING FOR THE REQUIRED SIGHT DISTANCE, IN THE WETLAND AND STREAM BUFFERS, IS THE FOLLOWING MITIGATION METHODS: MUST BE INSTALLED BEFORE THE BASE PAVING IS COMPLETED. NECESSARY SUBJECT TO THE FOLLOWING MITIGATION METHODS: b. TRAFFIC CONTROL DEVICE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MUST BE 47.A. THE APPLICANT SHALL OBTAIN ANY REQUIRED PERMITS FOR THE PUBLIC SEWER LINE REQUIRED TO WIDEN THE DRIVEWAY AND TO CONSTRUCT THE STORM DRAIN SYSTEM AND FIELD APPROVED BY HOWARD TRAFFIC DIVISION (410-313-2430) PRIOR TO INSTALLATION. CONNECTION. c. ALL TRAFFIC CONTROL DEVICES AND THEIR LOCATIONS SHALL BE IN ACCORDANCE WITH THE 47.B. DURING CONSTRUCTION, THE PROPOSED WORK AREA WITHIN THE 50' STREAM BANK BUFFER LATEST EDITION OF THE "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL BE ADEQUATELY PROTECTED BY A SILT FENCE TO CONTROL WATER RUN-OFF. 47.C. THE 50' STREAM BANK BUFFER AND THE 25% STEEP SLOPE AREAS DISTURBED SHALL BE 54.C. THE ULTIMATE/LOWER STREAM CHANNEL AND ITS BUFFER MUST BE DELINEATED ON THE d. ALL SIGN POST USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY STABILIZED AND RE-VEGETATED UPON COMPLETION OF THE SEWER LINE AND THE PLAT AND MUST BE LOCATED ENTIRELY WITHIN OPEN SPACE, EXCEPT THE STREAM BUFFER SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED ("QUICK PUNCH"), SQUARE TUBE USE-IN-COMMON DRIVEWAY CONSTRUCTION BACK TO ITS ORIGINAL PRECONSTRUCTION MAY BE WITHIN THE PIPESTEM AREAS OF THE RESIDENTIAL LOTS. POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) -3' LONG. THE ANCHOR SHALL NOT EXTEND MORE THAN TWO "QUICK PUNCH" CONDITION. THE DISTURBED AREA SURROUNDING THE PUBLIC SEWER EASEMENT SHALL BE HOLES ABOVE GROUND LEVEL. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF

RESTORED WITH NATIVE TREES ALONG THE STREAM BANK EDGE TO CRETE A RIPARIAN BUFFER AND NATIVE TREES ARE TO BE PLANTED WITHIN A FOREST CONSERVATION EASEMENT ADJACENT TO THE ROADWAY DISTURBANCE AS PROPOSED

45,612 GSF±

47.D. THE APPLICANT SHALL OBTAIN ANY REQUIRED PERMITS AND AUTHORIZATIONS FROM THE MARYLAND DEPARTMENT OF THE ENVIRONMENT AND U.S. ARMY CORPS OF ENGINEERS FOR ACTIVITIES IN REGULATED STREAM BUFFER AREAS PRIOR TO SUBMISSION OF ANY GRADING PERMIT APPLICATIONS, IF APPLICABLE AND REFERENCE THE APPLICABLE MDE OR USAGE PERMITS OR TRACKING NUMBERS ON ANY ASSOCIATED PERMITS, IF APPLICABLE. 48. SEE NOTE 37 FOR MIHU REQUIREMENTS.

49. PRIOR TO FINAL SUBDIVISION ACCEPTANCE (AFTER CONSTRUCTION IS COMPLETE), IT IS A REQUIREMENT THAT TRAFFIC ENGINEERING REVIEW THE PROPOSED EMBANKMENT GRADING TO ENSURE ADEQUATE SIGHT DISTANCE HAS BEEN PROVIDED. 50. THIS SUPPLEMENTAL PLAN IS NOT SUBJECT TO COUNCIL BILLS 61-2019, 62-2019, AND 63-2019 BECAUSE THE PRELIMINARY EQUIVALENT SKETCH PLAN, SP-17-006, WAS SIGNED ON MAY 8, 2018

WHICH IS PRIOR TO THE FEBRUARY 5, 2020 ENACTMENT DATE OF THESE BILLS, PER SECTION 16.102(h)(1) OF THE SUBDIVISION REGULATIONS. 51. A PERMIT TO THE MARYLAND DEPARTMENT OF ENVIRONMENT AND ARMY CORPS OF ENGINEERS TO DISTURB THE STREAM BUFFER SYSTEM HAS BEEN APPROVED BY THOSE AGENCIES. THE PERMIT NO IS 202060573/20-NT-3081. APPROVAL OF THE PERMIT IS REQUIRED PRIOR TO

SUBMISSION OF ANY GRADING PERMIT TO HOWARD COUNTY.

52. ALTHOUGH THE WETLAND AND STREAM STUDY IDENTIFIED A WETLAND AREA ON SITE. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT HAS DETERMINED THAT THE WETLAND AREA IN OPEN SPACE 10 IS A REGULATED STREAM. THIS PLAN SHOWS THE STREAM AND ITS BUFFER. 53. LOT 1 CONTAINS STEEP SLOPES THAT ARE 25% OR GREATER. PER SECTION 16.120(b)(4)(iii)(a) STEEP SLOPES MAY BE LOCATED ON A RESIDENTIAL LOT THAT'S 20,000 SF OR GREATER IF THE

SLOPES ARE LOCATED NO CLOSER THAN 35 FEET FROM THE BUILDING ENVELOPE.

54. THE HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING, IN A LETTER DATED AUGUST 24, 2020. HAS DETERMINED THE DISTURBANCE, IN THE STREAM BUFFER, IS APPROVED UNDER WP-21-007 SYSTEM TO 54.A. THE DISTURBANCE TO THE STREAM AND ITS BUFFER SHALL BE LIMITED TO THE GRADING

54.B. ANY NATURALVEGETATION DISTURBED DURING THE GRADING IN THE STREAM BUFFER MUST BE RESTORED TO ITS NATURAL CONDITION ONCE THE CONSTRUCTION IS COMPLETED.

P/O OPEN SPACE

54.D. A COPY OF THE MARYLAND DEPARTMENT OF ENVIRONMENT PERMIT APPROVAL FOR THE DISTURBANCE TO THE STREAM CHANNEL MUST BE PROVIDED TO DPZ PRIOR TO THE RECORDATION OF THE FINAL PLAT AND REFERENCED AS A NOTE ON THE PLAT.

54.E. ADDTIONAL LANDSCAPING THAT INCLUDES A MIX OF AT LEAST 2 TREES AND 8 SHRUBS TO

HELP SLOW STORMWATER RUNOFF, CONTROL EROSION AND REDUCE SEDIMENTATION TO THE STREAM MUST BE PROVIDED IN THE STREAM BUFFER. THIS ADDITIONAL LANDSCAPING MUST BE SHOWN ON THE FINAL LANDSACPE PLAN AND BONDED WITH THE FINAL PLAN. 54.F INCLUDE THIS ALTERNATIVE COMPLIANCE PETITION DECISION AS A GENERAL NOTE ON THE PLAT AND SITE DEVELOPMENT PLAN. THIS NOTE SHALL INCLUDE THE PETITION'S FILE NUMBER, THE REGULATORY SECTIONS, THE DECISION DATE, AND THE CONDITIONS OF

THIS ALTERNATIVE COMPLIANCE IS FOR THE FOLLOWING SECTIONS; PER 12-007 \*SECTION 16.116(a)(2)(i) - GRADING, REMOVAL OF VEGETATIVE COVER AND TREES, PAVING, AND NEW STRUCTURES SHALL

NOT BE PERMITTED WITHIN FIFTY FEET OF AN INTERMITTENT STREAM BANK. \*SECTION 16.116(a)(3) - IN RESIDENTIAL SUBDIVISIONS, WETLANDS, STREAMS, AND THEIR BUFFERS SHALL BE IN REQUIRED OPEN SPACE OR A NON-BUILDABLE PRESEVATION PARCEL RATHER THAN ON RESIDENTIAL LOTS.

8,486 SF± OR 0.19 AC±

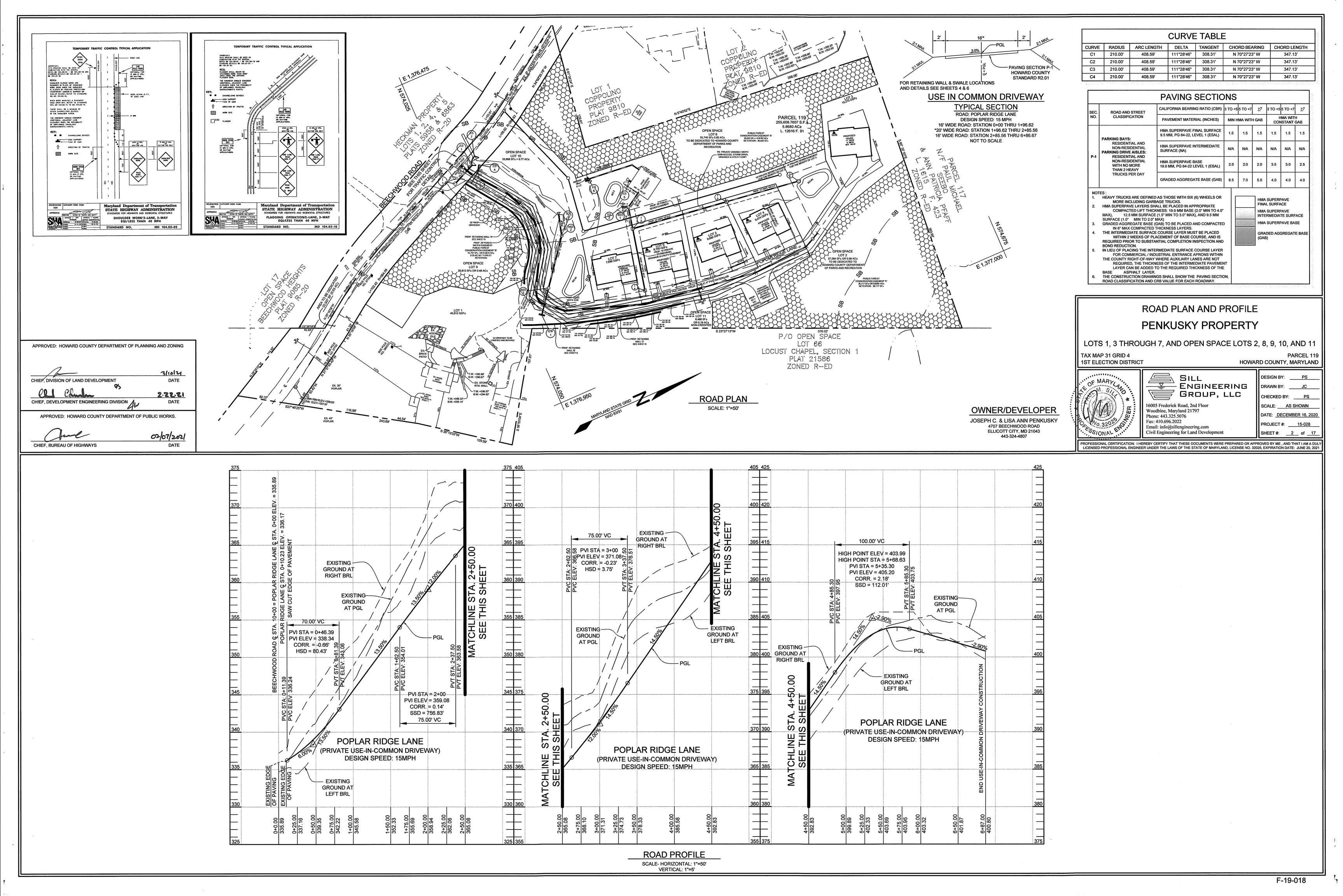
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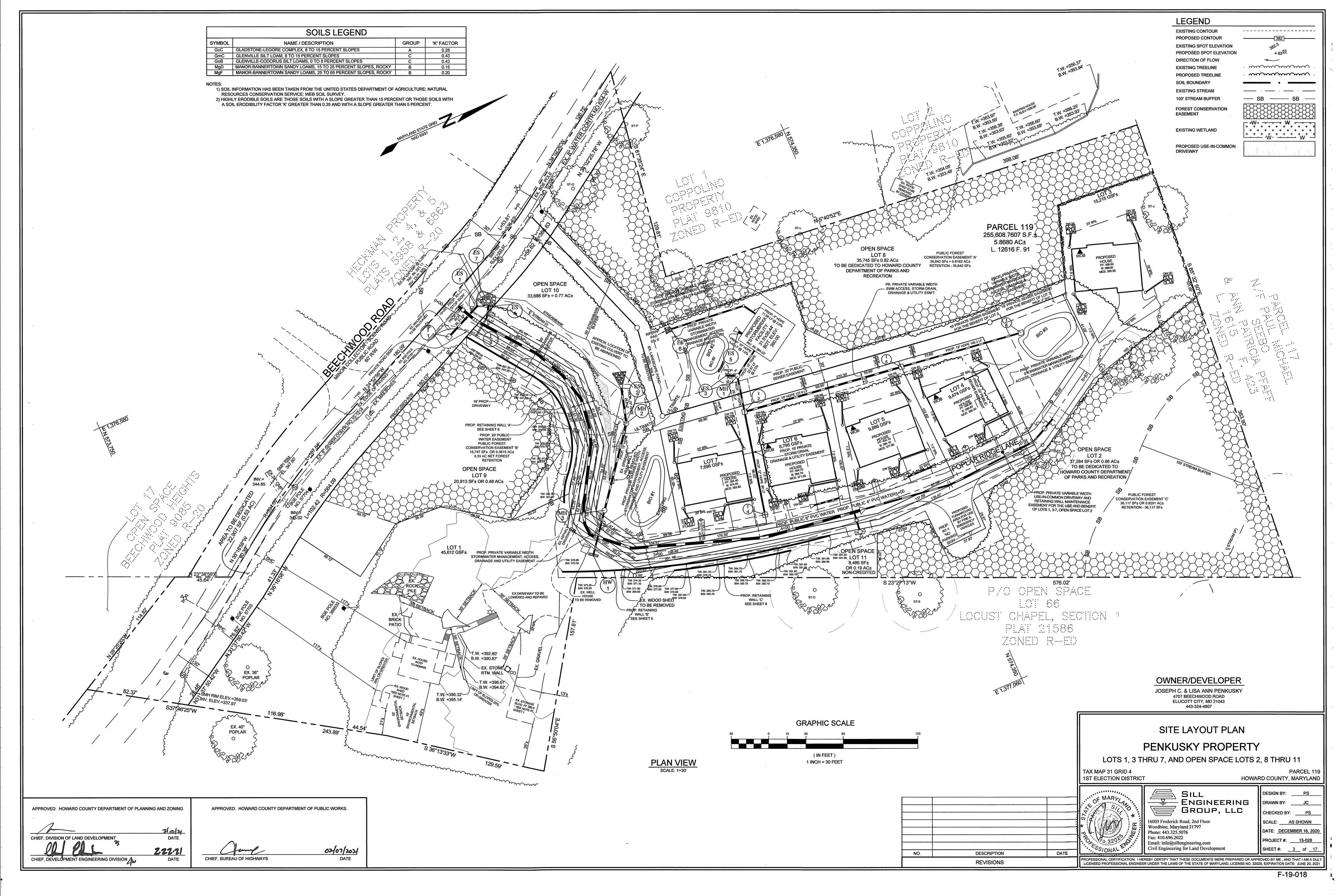
37,284 SF± OR 0.8559 AC±

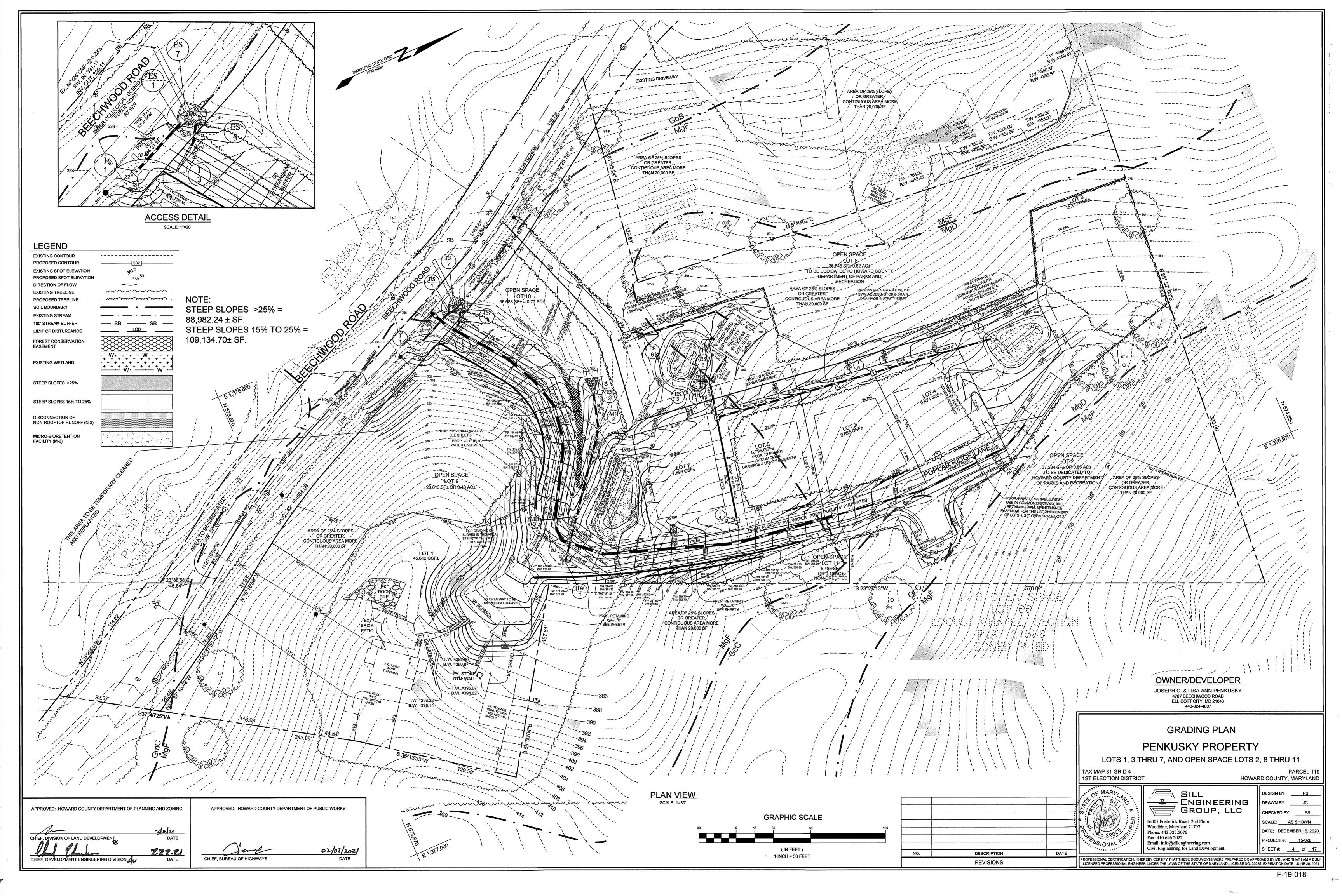
TO BE DEDICATED TO HOWARD COUNTY DEPARTMENT

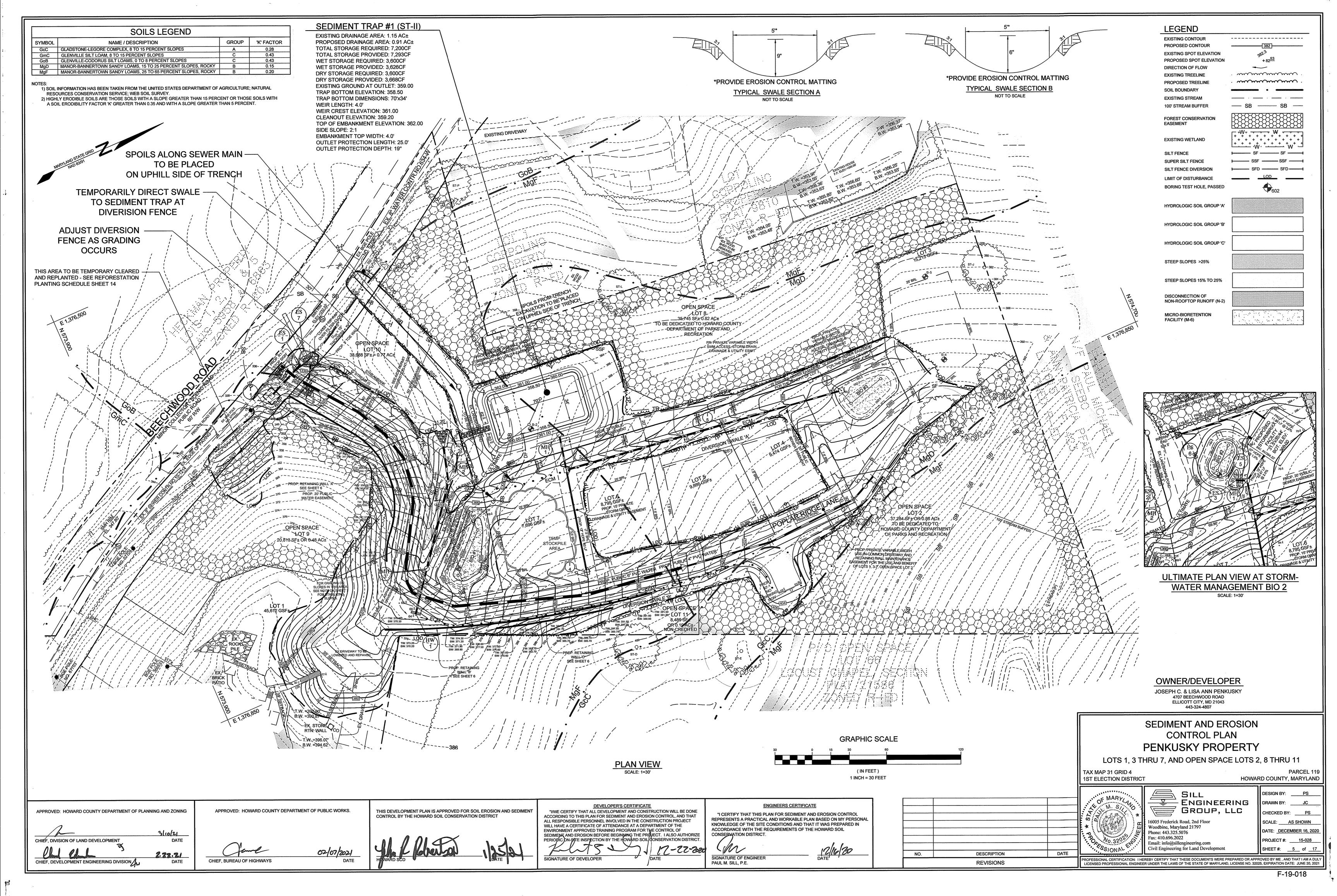
OF PARKS AND RECREATION

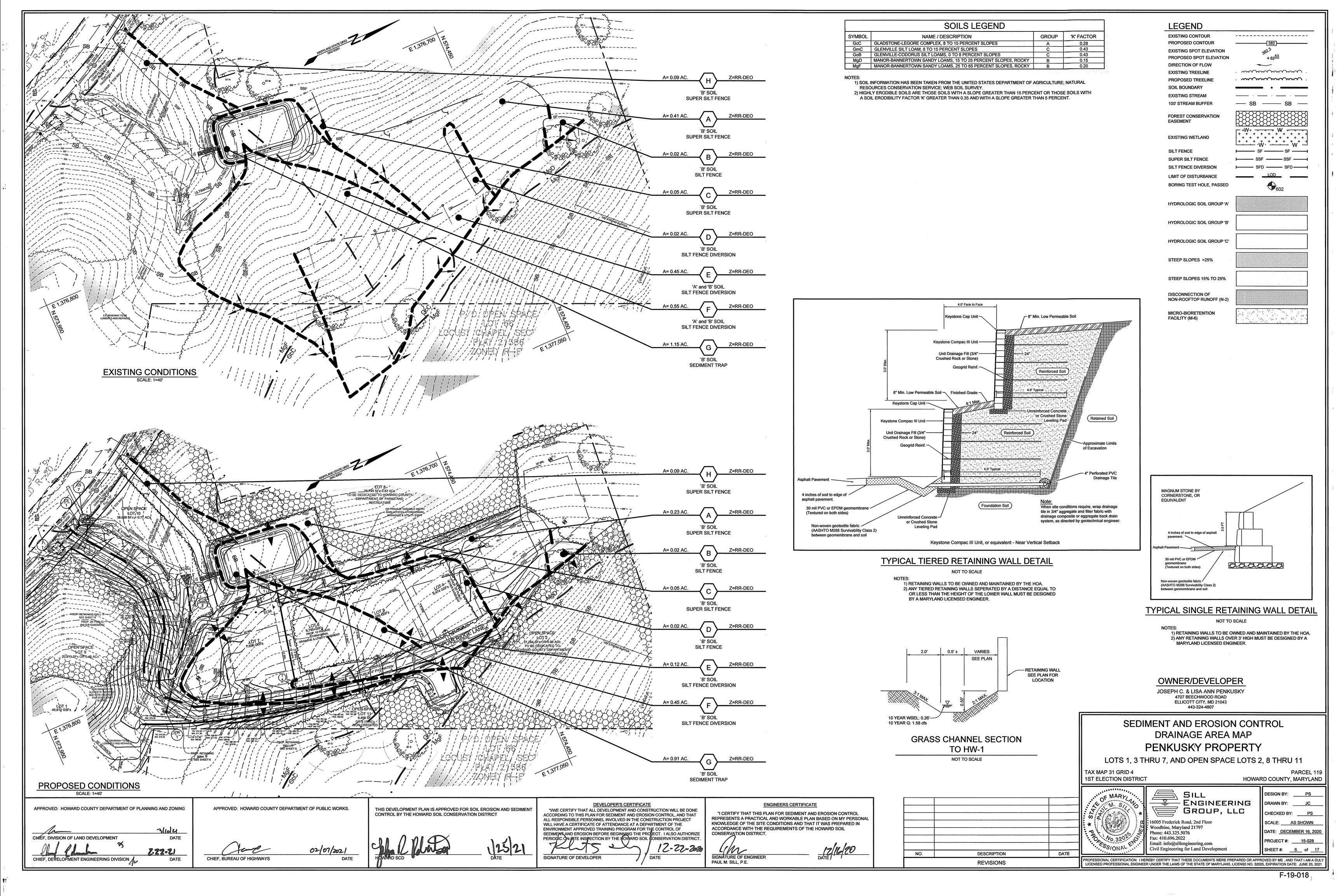
(IN FEET)











. A PRE-CONSTRUCTION MEETING MUST OCCUR WITH THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION INSPECTION DIVISION (CID), 410-313-1855 AFTER THE FUTURE LOD AND PROTECTED AREAS ARE MARKED CLEARLY IN THE FIELD. A MINIMUM OF 48 HOURS NOTICE TO CID MUST BE GIVEN AT THE FOLLOWING

 A: PRIOR TO THE START OF EARTH DISTURBANCE B. UPON COMPLETION OF THE INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE

PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. C. PRIOR TO THE START OF ANOTHER PHASE OF CONSTRUCTION OR OPENING OF ANOTHER GRADING UNIT. D. PRIOR TO THE REMOVAL OR MODIFICATION OF SEDIMENT CONTROL PRACTICES. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY

THE INSPECTION AGENCY IS MADE. OTHER RELATED STATE AND FEDERAL PERMITS SHALL BE REFERENCED, TO ENSURE COORDINATION AND TO AVOID CONFLICTS WITH THIS PLAN. ALL VEGETATION AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION

AND SEDIMENT CONTROL: AND REVISIONS THERETO FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION IS REQUIRED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) CALENDAR DAYS AS TO ALL OTHER DISTURBED AREAS ON THE PROJECT SITE EXCEPT FOR THOSE AREAS UNDER

ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR TOPSOIL (SEC. B-4-2), FRMANENT SEEDING (SEC. B-4-5), TEMPORARY SEEDING (SEC. B-4-4) AND MULCHING (SEC. B-4-3), TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES IF THE GROUND IS FROZEN, INCREMENTAL STABILIZATION (SEC. B-4-1) SPECIFICATIONS SHALL BE ENFORCED IN AREAS WITH > 15' OF CUT AND/OR FILL. STOCKPILES (SEC. B-4-8) IN EXCESS OF 20 FT. MUST BE BENCHED WITH STABLE OUTLET. ALL CONCENTRATED FLOW, STEEP SLOPE, AND HIGHLY ERODIBLE AREAS SHALL RECEIVE SOIL STABILIZATION

ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE, AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM CID. SITE ANALYSIS:

AREA DISTURBED AREA TO BE ROOFED OR PAVED: AREA TO BE VEGETATIVELY STABILIZED: TOTAL CUT: TOTAL FILL: OFFSITE WASTE/BORROW AREA LOCATION:

ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE CID. THE SITE AND ALL

CONTROLS SHALL BE INSPECTED BY THE CONTRACTOR WEEKLY; AND THE NEXT DAY AFTER EACH RAIN EVENT. A WRITTEN REPORT BY THE CONTRACTOR, MADE AVAILABLE UPON REQUEST, IS PART OF EVERY INSPECTION AND SHOULD INCLUDE: INSPECTION DATE

 INSPECTION TYPE (ROUTINE, PRE-STORM EVENT, DURING RAIN EVENT) NAME AND TITLE OF INSPECTOR

WEATHER INFORMATION (CURRENT CONDITIONS AS WELL AS TIME AND AMOUNT OF LAST RECORDED

 BRIEF DESCRIPTION OF PROJECT'S STATUS (E.G., PERCENT COMPLETE) AND/OR CURRENT ACTIVITIES EVIDENCE OF SEDIMENT DISCHARGES

IDENTIFICATION OF PLAN DEFICIENCIES

 IDENTIFICATION OF SEDIMENT CONTROLS THAT REQUIRE MAINTENANCE IDENTIFICATION OF MISSING OR IMPROPERLY INSTALLED SEDIMENT CONTROLS

• COMPLIANCE STATUS REGARDING THE SEQUENCE OF CONSTRUCTION AND STABILIZATION REQUIREMENTS PHOTOGRAPHS

 MONITORING/SAMPLING MAINTENANCE AND/OR CORRECTIVE ACTION PERFORMED

 OTHER INSPECTION ITEMS AS REQUIRED BY THE GENERAL PERMIT FOR STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES (NPDES, MDE).

TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPES LENGTHS OR THAT WHICH CAN AND SHALL BE BACKFILLED AND STABILIZED BY THE END OF EACH WORKDAY, WHICHEVER IS SHORTER. 0. ANY MAJOR CHANGES OR REVISIONS TO THE PLAN OR SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE HSCD PRIOR TO PROCEEDING WITH CONSTRUCTION. MINOR REVISIONS MAY BE ALLOWED BY THE

CID PER THE LIST OF HSCD-APPROVED FIELD CHANGES. DISTURBANCE SHALL NOT OCCUR OUTSIDE THE L.O.D. A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM ACREAGE OF 20 AC. PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BEEN STABILIZED AND APPROVED BY THE HSCD. UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE HSCD, NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.

2. WASH WATER FROM ANY EQUIPMENT, VEHICLES, WHEELS, PAVEMENT, AND OTHER SOURCES MUST BE TREATED IN A

SEDIMENT BASIN OR OTHER APPROVED WASHOUT STRUCTURE. 13. TOPSOIL SHALL BE STOCKPILED AND PRESERVED ON-SITE FOR REDISTRIBUTION ONTO FINAL GRADE. 14. ALL SILT FENCE AND SUPER SILT FENCE SHALL BE PLACED ON-THE-CONTOUR, AND BE IMBRICATED AT 25' MINIMUM

INTERVALS, WITH LOWER ENDS CURLED UPHILL BY 2' IN ELEVATION. 15. STREAM CHANNELS MUST NOT BE DISTURBED DURING THE FOLLOWING RESTRICTED TIME PERIODS (INCLUSIVE):

 USEI ANDIP MARCH 1 - JUNE 15 USE III AND IIIP OCTOBER 1 - APRIL 30 USEIV MARCH 1 - MAY 31

16. A COPY OF THIS PLAN, THE <u>2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL</u>, AND ASSOCIATED PERMITS SHALL BE ON-SITE AND AVAILABLE WHEN THE SITE IS ACTIVE.

EARTHWORK QUANTITIES ARE SOLELY FOR THE PURPOSE OF CALCULATING FEES. CONTRACTOR TO VERIFY ALL QUANTITIES PRIOR TO THE START OF CONSTRUCTION. TO BE DETERMINED BY CONTRACTOR, WITH PRE-APPROVAL OF THE SEDIMENT CONTROL INSPECTOR WITH AN

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREA

A MOUND OR PILE OF SOIL PROTECTED BY APPROPRIATELY DESIGNED EROSION AND SEDIMENT CONTROL MEASURES.

 TO PROVIDE A DESIGNATED LOCATION FOR THE TEMPORARY STORAGE OF SOIL THAT CONTROLS THE POTENTIAL FOR FROSION SEDIMENTATION AND CHANGES TO DRAINAGE PATTERNS

CONDITIONS WHERE PRACTICE APPLIES • STOCKPILE AREAS ARE UTILIZED WHEN IT IS NECESSARY TO SALVAGE AND STORE SOIL FOR LATER USE.

THE STOCKPILE LOCATION AND ALL RELATED SEDIMENT CONTROL PRACTICES MUST BE CLEARLY INDICATED ON THE THE FOOTPRINT OF THE STOCKPILE MUST BE SIZED TO ACCOMMODATE THE ANTICIPATED VOLUME OF MATERIAL AND BASED ON A SIDE SLOPE RATIO NO STEEPER THAN 2:1. BENCHING MUST BE PROVIDED IN ACCORDANCE WITH SECTION B-3 LAND GRADING

RUNOFF FROM THE STOCKPILE AREA MUST DRAIN TO A SUITABLE SEDIMENT CONTROL PRACTICE. ACCESS THE STOCKPILE AREA FROM THE UPGRADE SIDE. CLEAR WATER RUNOFF INTO THE STOCKPILE AREA MUST BE MINIMIZED BY USE OF A DIVERSION DEVICE SUCH AS AN EARTH DIKE, TEMPORARY SWALE OR DIVERSION FENCE. PROVISIONS MUST BE MADE FOR DISCHARGING

CONCENTRATED FLOW IN A NON-EROSIVE MANNER. WHERE RUNOFF CONCENTRATES ALONG THE TOE OF THE STOCKPILE FILL, AN APPROPRIATE EROSION/SEDIMENT CONTROL PRACTICE MUST BE USED TO INTERCEPT THE DISCHARGE.

STOCKPILES MUST BE STABILIZED IN ACCORDANCE WITH THE 3/7 DAY STABILIZATION REQUIREMENT AS WELL AS STANDARD B-4-1 INCREMENTAL STABILIZATION AND STANDARD B-4-4 TEMPORARY STABILIZATION. IF THE STOCKPILE IS LOCATED ON AN IMPERVIOUS SURFACE, A LINER SHOULD BE PROVIDED BELOW THE STOCKPILE TO FACILITATE CLEANUP. STOCKPILES CONTAINING CONTAMINATED MATERIAL MUST BE COVERED WITH IMPERMEABLE SHEETING

THE STOCKPILE AREA MUST CONTINUOUSLY MEET THE REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION, SIDE SLOPES MUST BE MAINTAINED AT NO STEEPER THAN A 2:1 RATIO, THE STOCKPILE AREA MUST BE KEPT FREE OF EROSION, IF THE VERTICAL HEIGHT OF A STOCKPILE EXCEEDS 20 FEET FOR 2:1 SLOPES, 30 FEET FOR 3:1 SLOPES, OR 40 FEET FOR 4:1 SLOPES, BENCHING MUST BE PROVIDED IN ACCORDANCE WITH SECTION B-3 LAND GRADING

STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

TO STABILIZE DISTURBED SOILS WITH VEGETATION FOR UP TO 6 MONTHS.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIÉF, DIVISION OF LAND DEVELOPMENT

TO USE FAST GROWING VEGETATION THAT PROVIDES COVER ON DISTURBED SOILS. CONDITIONS WHERE PRACTICE APPLIES:

EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR A PERIOD OF 6 MONTHS OR LESS. FOR LONGER DURATION OF TIME, PERMANENT STABILIZATION PRACTICES ARE REQUIRED.

SELECT ONE OR MORE OF THE SPECIES OR SEED MIXTURES LISTED IN TABLE B.1 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3), AND ENTER THEM IN THE TEMPORARY SEEDING SUMMARY BELOW ALONG WITH APPLICATION RATES, SEEDING DATES AND SEEDING DEPTHS. IF THIS SUMMARY IS NOT PUT ON THE PLAN AND COMPLETED, THEN TABLE B.1 PLUS FERTILIZER AND LIME RATES MUST BE PUT ON THE PLAN. FOR SITES HAVING SOIL TESTS PERFORMED. USE AND SHOW THE RECOMMENDED RATES BY THE TESTING AGENCY.

SOIL TESTS ARE NOT REQUIRED FOR TEMPORARY SEEDING. WHEN STABILIZATION IS REQUIRED OUTSIDE OF A SEEDING SEASON. APPLY SEED AND MULCH OR STRAW MULCH ALONE AS PRESCRIBED IN SECTION B-4-3.A.1.B AND MAINTAIN UNTIL THE NEXT SEEDING SEASON.

DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION TO STABILIZE DISTURBED SOILS WITH PERMANENT VEGETATION.

PURPOSE TO USE LONG-LIVED PERENNIAL GRASSES AND LEGUMES TO ESTABLISH PERMANENT GROUND COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES • EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR 6 MONTHS OR MORE.

A. SEED MIXTURES

1. GENERAL USE A. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED IN TABLE B.3 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3) AND BASED ON THE SITE CONDITION OR PURPOSE

B.2. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN B. ADDITIONAL PLANTING SPECIFICATIONS FOR EXCEPTIONAL SITES SUCH AS SHORELINES,

STREAM BANKS, OR DUNES OR FOR SPECIAL PURPOSES SUCH AS WILDLIFE OR AESTHETIC TREATMENT MAY BE FOUND IN USDA-NRCS TECHNICAL FIELD OFFICE GUIDE, SECTION 342 - CRITICAL AREA

C. FOR SITES HAVING DISTURBED AREA OVER 5 ACRES, USE AND SHOW THE RATES RECOMMENDED BY THE SOIL TESTING AGENCY. D. FOR AREAS RECEIVING LOW MAINTENANCE, APPLY UREA FORM FERTILIZER (46-0-0) AT 3 ½

1000 SQUARE FEET (150 POUNDS PER ACRE) AT THE TIME OF SEEDING IN ADDITION TO THE SOIL AMENDMENTS SHOWN IN THE PERMANENT SEEDING SUMMARY. 2 TUREGRASS MIXTURES A. AREAS WHERE TURF GRASS MAY BE DESIRED INCLUDE LAWNS, PARKS, PLAYGROUNDS, AND

COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE. B. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED BELOW BASED ON THE SITE CONDITIONS OR PURPOSE. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE

PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN. I KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN AREAS THAT RECEIVE INTENSIVE MANAGEMENT. IRRIGATION REQUIRED IN THE AREAS OF CENTRAL MARYLAND AND EASTERN SHORE. RECOMMENDED CERTIFIED KENTUCKY BLUEGRASS CULTIVARS SEEDING RATE: 1.5 TO 2.0 POUNDS PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT

II. KENTUCKY BLUEGRASS/PERENNIAL RYE: FULL SUN MIXTURE: FOR USE IN FULL SUN AREAS WHERE B.22 RAPID ESTABLISHMENT IS NECESSARY AND WHEN TURF WILL RECEIVE MEDIUM TO INTENSIVE MANAGEMENT. CERTIFIED PERENNIAL RYEGRASS CULTIVARS/CERTIFIED KENTUCKY BLUEGRASS SEEDING RATE: 2 POUNDS MIXTURE PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT. III. TALL FESCUE/KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN DROUGHT

PRONE AREAS AND/OR FOR AREAS RECEIVING LOW TO MEDIUM MANAGEMENT IN FULL RECOMMENDED MIXTURE INCLUDES; CERTIFIED TALL FESCUE CULTIVARS 95 TO 100 PERCENT, CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 0 TO 5 PERCENT. SEEDING RATE: 5 TO 8 POUNDS PER 1000 SQUARE FEET. ONE OR MORE CULTIVARS MAY BE

IV. KENTUCKY BLUEGRASS/FINE FESCUE: SHADE MIXTURE: FOR USE IN AREAS WITH SHADE IN BLUEGRASS LAWNS. FOR ESTABLISHMENT IN HIGH QUALITY, INTENSIVELY MANAGED TURE AREA MIXTURE INCLUDES: CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 30 TO 40 PERCENT AND CERTIFIED FINE FESCUE AND 60 TO 70 PERCENT SEEDING RATE: 1½ TO 3 POUNDS PER 1000 SQUARE FEET

NOTES: SELECT TURFGRASS VARIETIES FROM THOSE LISTED IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77. "TUREGRASS CUI TIVAR RECOMMENDATIONS FOR MARYLAND" CHOOSE CERTIFIED MATERIAL. CERTIFIED MATERIAL IS THE BEST GUARANTEE OF CULTIVAR PURITY. THE CERTIFICATION PROGRAM OF THE MARYLAND DEPARTMENT OF AGRICULTURE, TURF AND SEED SECTION, PROVIDES A RELIABLE MEANS OF CONSUMER PROTECTION AND ASSURES A PURE GENETIC LINE C. IDEAL TIMES OF SEEDING FOR TURF GRASS MIXTURES

WESTERN MD: MARCH 15 TO JUNE 1, AUGUST 1 TO OCTOBER 1 (HARDINESS ZONES: 5B, 6A) CENTRAL MD: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONE: 6B) SOUTHERN MD, EASTERN SHORE: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONES: 7A, 7B)

D. TILL AREAS TO RECEIVE SEED BY DISKING OR OTHER APPROVED METHODS TO A DEPTH OF 2 TO 4 INCHES, LEVEL AND RAKE THE AREAS TO PREPARE A PROPER SEEDBED, REMOVE STONES AND DEBRIS OVER 11/2 INCHES IN DIAMETER. THE RESULTING SEEDBED MUST BE IN SUCH CONDITION THAT FUTURE MOWING OF GRASSES WILL POSE NO DIFFICULTY. E. IF SOIL MOISTURE IS DEFICIENT, SUPPLY NEW SEEDINGS WITH ADEQUATE WATER FOR PLANT GROWTH (1/2 TO 1 INCH EVERY 3 TO 4 DAYS DEPENDING ON SOIL TEXTURE) UNTIL THEY ARE FIRMLY ESTABLISHED. THIS IS ESPECIALLY TRUE WHEN SEEDINGS ARE MADE LATE IN THE

PLANTING SEASON, IN ABNORMALLY DRY OR HOT SEASONS, OR ON ADVERSE SITES. B. SOD: TO PROVIDE QUICK COVER ON DISTURBED AREAS (2:1 GRADE OR FLATTER). 1 GENERAL SPECIFICATIONS

A. CLASS OF TURFGRASS SOD MUST BE MARYLAND STATE CERTIFIED. SOD LABELS MUST BE MADE AVAILABLE TO THE JOB FOREMAN AND INSPECTOR. B. SOD MUST BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF % INCH, PLUS OR MINUS 1/4 INCH AT THE TIME OF CUTTING, MEASUREMENT FOR THICKNESS MUST EXCLUDE TOP

GROWTH AND THATCH. BROKEN PADS AND TORN OR UNEVEN ENDS WILL NOT BE C. STANDARD SIZE SECTIONS OF SOD MUST BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE WHEN SUSPENDED VERTICALLY WITH A FIRM

GRASP ON THE UPPER 10 PERCENT OF THE SECTION. D. SOD MUST NOT BE HARVESTED OR TRANSPLANTED WHEN MOISTURE CONTENT (EXCESSIVELY DRY OR WET) MAY ADVERSELY AFFECT ITS SURVIVAL.

E. SOD MUST BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD OF 36 HOURS, SOD NOT TRANSPLANTED WITHIN THIS PERIOD MUST BE APPROVED BY AN AGRONOMIST OR SOIL SCIENTIST PRIOR TO ITS INSTALLATION.

2. SOD INSTALLATION A. DURING PERIODS OF EXCESSIVELY HIGH TEMPERATURE OR IN AREAS HAVING DRY SUBSOIL, LIGHTLY IRRIGATE THE SUBSOIL IMMEDIATELY PRIOR TO LAYING THE SOD. B. LAY THE FIRST ROW OF SOD IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO IT AND TIGHTLY WEDGED AGAINST EACH OTHER. STAGGER LATERAL JOINTS TO PROMOTE

MORE UNIFORM GROWTH AND STRENGTH, ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE AIR DRYING OF THE ROOTS. C. WHEREVER POSSIBLE, LAY SOD WITH THE LONG EDGES PARALLEL TO THE CONTOUR AND WITH STAGGERING JOINTS. ROLL AND TAMP, PEG OR OTHERWISE SECURE THE SOD TO

PREVENT SLIPPAGE ON SLOPES, ENSURE SOLID CONTACT EXISTS BETWEEN SOD ROOTS AND THE UNDERLYING SOIL SURFACE.

D. WATER THE SOD IMMEDIATELY FOLLOWING ROLLING AND TAMPING UNTIL THE UNDERSIDE OF THE NEW SOD PAD AND SOIL SURFACE BELOW THE SOD ARE THOROUGHLY WET. COMPLETE THE OPERATIONS OF LAYING, TAMPING AND IRRIGATING FOR ANY PIECE OF SOD WITHIN EIGHT HOURS.

A. IN THE ABSENCE OF ADEQUATE RAINFALL, WATER DAILY DURING THE FIRST WEEK OR AS OFTEN AND SUFFICIENTLY AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF 4 INCHES.

WATER SOD DURING THE HEAT OF THE DAY TO PREVENT WILTING. B. AFTER THE FIRST WEEK, SOD WATERING IS REQUIRED AS NECESSARY TO MAINTAIN ADEQUATE MOISTURE CONTENT

C. DO NOT MOW UNTIL THE SOD IS FIRMLY ROOTED. NO MORE THAN 1/2 OF THE GRASS LEAF MUST BE REMOVED BY THE INITIAL CUTTING OR SUBSEQUENT CUTTINGS. MAINTAIN A GRASS HEIGHT OF AT LEAST 3 INCHES UNLESS OTHERWISE SPECIFIED.

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT

CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT

STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING,

 THE PROCESS OF PREPARING THE SOILS TO SUSTAIN ADEQUATE VEGETATIVE STABILIZATION. TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH.

CONDITIONS WHERE PRACTICE APPLIES WHERE VEGETATIVE STABILIZATION IS TO BE ESTABLISHED.

A. SOIL PREPARATION

1 TEMPORARY STABILIZATION a. SEEDBED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT AFTER THE SOIL IS LOOSENED. IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER ARE TO BE TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.

 APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS. c. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS 2. PERMANENT STABILIZATION

a. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE: I SOIL PHIRETWEEN 6.0 AND 7.0

II. SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM). III. SOIL CONTAINS LESS THAN 40 PERCENT CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30 PERCENT SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED. THEN A SANDY SOIL (LESS THAN 30 PERCENT SILT PLUS CLAY) WOULD BE

IV. SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT. V. SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE

APPROVED PLAN, THEN SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 d. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY

THE RESULTS OF A SOIL TEST e. MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. RAKE LAWN AREAS TO SMOOTH THE SURFACE, REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDED PREPARATION. TRACK SLOPES 3:1 OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSE AND FRIABLE. SEEDBED

B. TOPSOILING 1. TOPSOIL IS PLACED OVER PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION. THE PURPOSE IS TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH, SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH. MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.

LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.

TOPSOIL SALVAGED FROM AN EXISTING SITE MAY BE USED PROVIDED IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-NRCS. 3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:

a. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH. b. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT

THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH. d. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE. 4. AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.

5. TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING

a. TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND, OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS.GRAVEL.

STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 11/2 INCHES IN DIAMETER. TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE, OR OTHERS AS TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED

AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL

AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL. 6. TOPSOIL APPLICATION a. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING

b. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.

TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION. C. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)

1. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OF 5 ACRES OR MORE. SOIL ANALYSIS MAY BE PERFORMED BY A RECOGNIZED PRIVATE OR COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSIS

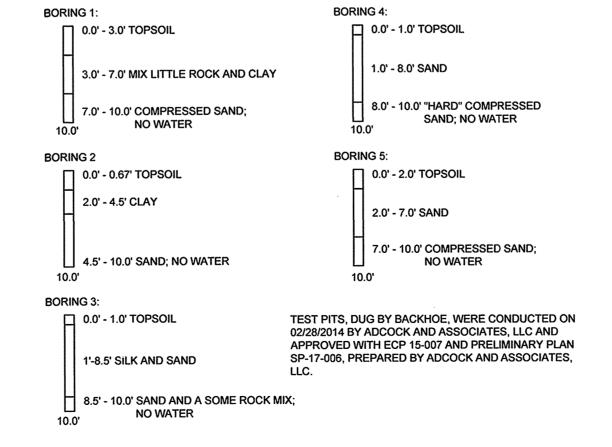
2. FERTILIZERS MUST BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROPRIATE EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS MUST ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE LAWS AND MUST BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTY

3. LIME MATERIALS MUST BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED EXCEPT WHEN HYDROSEFDING) WHICH CONTAINS AT LEAST 50 PERCENT TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE MUST BE GROUND TO SUCH FINENESS THAT AT LEAST 50 PERCENT WILL PASS THROUGH A #100 MESH SIEVE AND 98 TO 100 PERCENT WILL PASS THROUGH A #20 MESH SIEVE.

4. LIME AND FERTILIZER ARE TO BE EVENLY DISTRIBUTED AND INCORPORATED INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. 5. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, SPREAD

GROUND LIMESTONE AT THE RATE OF 4 TO 8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL.

STORMWATER MANAGEMENT TEST BORINGS



**DEVELOPER'S CERTIFICATE** 

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE

ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT

SEDIMENT AND FROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE

PERIODIC DINSITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT

ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT

WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE

ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF

TABLE B.1: TEMPORARY SEEDING FOR SITE STABILIZATION

PLANT SPECIES	SEEDING RATE		SEEDING	RECOMMENDED SEEDING DATES BY PLANT HARDINESS ZONE			
PLAINT SPECIES	LB/AC	LB/1000 FT <sup>2</sup>	(INCHES)	5b & 6a	6b	7a & 7b	
COOL-SEASON GRASSES		•					
ANNUAL RYEGRASS (LOLIUM PERENNE SSP. MULTIFLORUM)	40	1.0	0.5	MARCH 15 TO MAY 31; AUG 1 TO SEP 30	MARCH 1 TO MAY 15; AUG 1 TO OCT 15	FEB 15 TO APR 30; AUG 15 TO NOV 30	
BARLEY (HORDEUM VULGARE)	96	2.2	1.0	MARCH 15 TO MAY 31; AUG 1 TO SEP 30	MARCH 1 TO MAY 15; AUG 1 TO OCT 15	FEB 15 TO APR 30; AUG 15 TO NOV 30	
OATS (AVENA SATIVA)	72	1.7	1.0	MARCH 15 TO MAY 31; AUG 1 TO SEP 30	MARCH 1 TO MAY 15; AUG 1 TO OCT 15	FEB 15 TO APR 30; AUG 15 TO NOV 30	
WHEAT (TRITICUM AESTIVUM)	120	2.8	1.0	MARCH 15 TO MAY 31; AUG 1 TO SEP 30	MARCH 1 TO MAY 15; AUG 1 TO OCT 15	FEB 15 TO APR 30; AUG 15 TO NOV 30	
CEREAL RYE (SECALE CEREALE)	112	2.8	1.0	MARCH 15 TO MAY 31; AUG 1 TO OCT 31	MARCH 1 TO MAY 15; AUG 1 TO NOV 15	FEB 15 TO APR 30; AUG 15 TO DEC 15	
WARM-SEASON GRASSES							
FOXTAIL MILLET (SETARIA ITALICA)	30	0.7	0.5	JUN 1 TO JUL 31	MAY 16 TO JUL 31	MAY 1 TO AUG 14	
PEARL MILLET (PENNISETUM GLAUCUM)	20	0.5	0.5	JUN 1 TO JUL 31	MAY 16 TO JUL 31	MAY 1 TO AUG 14	

FERTILIZER RATE (10-20-20): 436 LB/AC (10LB/1000SF) LIME RATE: 2 TONS/AC (90LB/1000SF)

1. SEEDING RATES FOR THE WARM-SEASON GRASSES ARE IN POUNDS OF PURE LIVE SEED (PLS). ACTUAL PLANTING RATES SHALL BE ADJUSTED TO REFLECT PERCENT SEED GERMINATION AND PURITY, AS TESTED. ADJUSTMENTS ARE USUALLY NOT NEEDED FOR THE COOL-SEASON GRASSES. SEEDING RATES LISTED ABOVE ARE FOR TEMPORARY SEEDINGS, WHEN PLANTED ALONE. WHEN PLANTED AS A NURSE CROP WITH PERMANENT SEED MIXES, USE 1/3 OF THE SEEDING RATE LISTED ABOVE FOR BARLEY, OATS, AND WHEAT, FOR SMALLER-SEEDED GRASSES (ANNUAL RYEGRASS, PEARL MILLET, FOXTAIL MILLET), DO NOT EXCEED MORE THAN 5% (BY WEIGHT) OF THE OVERALL PERMANENT SEEDING MIX. CEREAL RYE GENERALLY SHOULD NOT BE USED AS A NURSE CROP, UNLESS PLANTING WILL OCCUR IN VERY LATE FALL BEYOND THE SEEDING DATES FOR OTHER TEMPORARY SEEDINGS. CEREAL RYE HAS ALLELOPATHIC PROPERTIES THAT INHIBIT THE GERMINATION AND GROWTH OF OTHER PLANTS. IF IT MUST BE USED AS A NURSE CROP, SEED AT 1/3 OF THE RATE LISTED ABOVE. OATS ARE THE RECOMMENDED NURSE CROP FOR WARM-SEASON GRASSES.

FOR SANDY SOILS, PLANT SEEDS AT TWICE THE DEPTH LISTED ABOVE. THE PLANTING DATES LISTED ARE AVERAGES FOR EACH ZONE AND MAY REQUIRE ADJUSTMENT TO REFLECT LOCAL CONDITIONS, ESPECIALLY NEAR THE BOUNDARIES OF THE ZONE.

TABLE B.5: RECOMMENDED PLANTING DATES FOR PERMANENT COVER IN MARYLAND

	PLANT HARDINESS ZONES					
TYPE OF PLANT MATERIAL	5b & 6a	6b	7a & 7b			
SEEDS- COOL-SEASON GRASSES (INCLUDES MIXES WITH FORBS AND/OR LEGUMES)	MAR 15 TO MAY 31 AUG 1 TO SEP 30	MAR 1 TO MAY 15 AUG 1 TO OCT 15	FEB 15 TO APR 30 AUG 15 TO OCT 31 NOV 1 TO NOV 30+			
SEEDS- WARM-SEASON/ COOL-SEASON GRASS MIXES (INCLUDES MIXES WITH FORBS AND/OR LEGUMES)	MAR 15 TO MAY 31++	MAR 1 TO MAY 15++	FEB 15 TO APR 30++			
	JUN 1 TO JUN 15*	MAY 16 TO JUN 15*	MAY 1 TO MAY 31*			
SOD - COOL-SEASON	MAR 15 TO MAY 31	MAR 1 TO MAY 15	FEB 15 TO APR 30			
	JUN 1 TO AUG 31*	MAY 16 TO SEP 14*	MAY 1 TO SEP 30*			
	SEP 1 TO NOV 1*	SEP 15 TO NOV 15*::	OCT 1 TO DEC 1*a			
UNROOTED WOODY MATERIALS; BARE-ROOT PLANTS; BULBS, RHIZOMES, CORMS AND TUBERS <sup>2</sup>	MARCH 15 TO MAY 31	MARCH 1 TO MAY 15	FEB 15 TO APR 30			
	JUN 1 TO JUN 30*	MAY 16 TO JUN 30*	MAY 1 TO JUN 30*			
CONTAINERIZED STOCK; BALLED-AND-BURLAPPED STOCK	MAR 15 TO MAY 31	MAR 1 TO MAY 15	FEB 15 TO APR 30			
	JUN 1 TO JUN 30*	MAY 16 TO JUN 30*	MAY 1 TO JUN 30*			
	SEP 1 TO NOV 15*n	SEP 15 TO NOV 30*a	OCT 1 TO DEC 15*n			

1. THE PLANTING DATES LISTED ARE AVERAGES FOR EACH ZONE. THESE DATES MAY REQUIRE ADJUSTMENT TO REFLECT LOCAL CONDITIONS, ESPECIALLY NEAR THE BOUNDARIES OF THE ZONES. WHEN SEEDING TOWARD THE END OF THE LISTED PLANTING DATES, OR WHEN CONDITIONS ARE EXPECTED TO BE LESS THAN OPTIMAL, SELECT AN APPROPRIATE NURSE CROP FROM TABLE B.1 TEMPORARY SEEDING FOR SITE STABILIZATION AND PLANT TOGETHER WITH THE PERMANENT SEEDING MIX. 2. WHEN PLANTED DURING THE GROWING SEASON, MOST OF THESE MATERIALS MUST BE PURCHASED AND KEPT IN A DORMANT CONDITION UNTIL PLANTING. BARE-ROOT GRASSES ARE THE EXCEPTION—THEY MAY BE SUPPLIED AS GROWING ◆ ADDITIONAL PLANTING DATES FOR THE LOWER COASTAL PLAIN, DEPENDENT ON ANNUAL RAINFALL AND TEMPERATURE

TRENDS. RECOMMEND ADDING A NURSE CROP, AS NOTED ABOVE, IF PLANTING DURING THIS PERIOD. ♦♦ WARM-SEASON GRASSES NEED A SOIL TEMPERATURE OF AT LEAST 50 DEGREES F IN ORDER TO GERMINATE. IF SOIL TEMPERATURES ARE COLDER THAN 50 DEGREES, OR MOISTURE IS NOT ADEQUATE, THE SEEDS WILL REMAIN DORMANT UNTIL CONDITIONS ARE FAVORABLE. IN GENERAL, PLANTING DURING THE LATTER PORTION OF THIS PERIOD ALLOWS MORE TIME FOR WEED EMERGENCE AND WEED CONTROL PRIOR TO PLANTING. WHEN SELECTING A PLANTING DATE, CONSIDER THE NEED FOR WEED CONTROL VS. THE LIKELIHOOD OF HAVING SUFFICIENT MOISTURE FOR LATER PLANTINGS, ESPECIALLY ON

 ADDITIONAL PLANTING DATES DURING WHICH SUPPLEMENTAL WATERING MAY BE NEEDED TO ENSURE PLANT ESTABLISHMENT. ☐ FREQUENT FREEZING AND THAWING OF WET SOILS MAY RESULT IN FROST-HEAVING OF MATERIALS PLANTED IN LATE FALL, IF PLANTS HAVE NOT SUFFICIENTLY ROOTED IN PLACE. SOD USUALLY NEEDS 4 TO 6 WEEKS TO BECOME SUFFICIENTLY ROOTED. LARGE CONTAINERIZED AND BALLED-AND-BURLAPPED STOCK MAY BE PLANTED INTO THE WINTER MONTHS AS

PERMANENT SEEDING SUMMARY

**ENGINEERS CERTIFICATE** 

REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL

"I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL

KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN

ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL

CONSERVATION DISTRICT.

HARDINESS ZONE (FROM FIGURE B.3): <u>7a</u> SEED MIXTURE (FROM TABLE B.3): 8, 9, 1						FERTILIZER RATE (10-20-20)		
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	RATE
8	TALL FESCUE	100	SEE TABLE B.5 ABOVE/COOL SEASON	14-12 IN	45LB/	90LB /	90LB /	2 TONS /
9	TALL FESCUE/ KENTUCKY BLUEGRASS	60-40	SEE TABLE B.5 ABOVE/COOL SEASON	14-12 IN		(2.0 LB/	AC (2.0 LB/ 1000SF)	AC (90 LB / 1000 SF)
1	SWITCHGRASS/ CREEPING RED FESCUE	10-15	SEE TABLE B.5 ABOVE/WARM SEASON	14-12 IN	10005F)	10005F)	10003F)	1000 5F)

LONG AS THE GROUND IS NOT FROZEN AND SOIL MOISTURE IS ADEQUATE.

STANDARD STABILIZATION NOTE

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. DURING GRADING AND AFTER EACH RAINFALL, CONTRACTOR WILL INSPECT AND PROVIDE NECESSARY MAINTENANCE TO THE SEDIMENT CONTROL MEASURES ON THIS PLAN.

AS A CONDITION OF WP-17-124, THIS PROJECT MUST SUFFICIENTLY STABILIZE THE STEEP LAND/TERRAIN THAT IS BEING DISTURBED. THIS WILL BE DONE WITH PERMANENT PLANTING OF NATIVE SPECIES OF GROUND COVERS AND FERNS IN SHADE AREAS ASARUM CANADENSE - WILD GINGER

SEDUM TERATUM - MOUNTAIN STONECROP ONOCLEA SENSIBILIS - SENSITIVE FERN OSMUNDA CINNAMOMEA - CINNAMON FERN POLYSTICHUM ACROSTICHOIDES - CHRISTMAS FERN

MITCHELLA REPENS - PARTRIDGE BERRY

FOR AREAS OF SUN, SEE THE PERMANENT SEEDING SUMMERY SEE PLAN FOR LOCATIONS.

SEQUENCE OF CONSTRUCTION

DISTURBED AREA. (1 WEEK)

 OBTAIN GRADING PERMIT. NOTIFY HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS AT (410) 313-1880

AT LEAST 24 HOURS BEFORE STARTING ANY WORK. INSTALL STABILIZED CONSTRUCTION ENTRANCE, SILT FENCE, AND SUPER SILT FENCE. (1 WEEK) CLEAR AND GRUB AREA ALONG THE SEWER MAIN AND INSTALL SEWER MAIN. (2 WEEKS)

5. INSTALL DIVERSION SWALE 'A' AND PERMANENTLY STABILIZE WITH SOD AND EROSION CONTROL MATTING (1 WEEK) 6. CLEAR AND GRUB AREA RELATED TO SEDIMENT TRAP #1 AND INSTALL DIVERSION FENCE FROM

SEDIMENT TRAP #1 TO POPLAR RIDGE LANE AND INSTALL SEDIMENT TRAP #1. (2 WEEKS) INSTALL STORM DRAIN FROM I-2 TO MH-1 AND TEMPORARY PIPE TO SEDIMENT TRAP #1. SWALE 'A' IS

8. INSTALL REMAINING DIVERSION FENCE. DIVERSION FENCE ALONG POPLAR RIDGE LANE TO BE TIED INTO I-2 TO CONVEY SEDIMENT LADEN WATER TO SEDIMENT TRAP #1. (2 DAYS)

9. CLEAR AND GRUB REMAINING SITE. (1 WEEK) INSTALL WATER MAIN AND REMAINING STORM DRAINS AND ROUGH GRADE SITE. WITH THE INSTALLATION OF STORM DRAIN ES-2 TO HW-1. CONSTRUCT DIVERSION SWALE 'B' AND PERMANENTLY

STABILIZE SWALE WITH SOD AND EROSION CONTROL MATTING. DRAINAGE AREA TO HW-1 TO BE PERMANENTLY STABILIZED AT THIS TIME. (2 WEEKS) 9. CONSTRUCT RETAINING WALLS AND BASE PAVE DRIVEWAY, INSTALLING IMPERMEABLE LINER AND SOD

BETWEEN WALL BASE AND EDGE OF USE-IN-COMMON DRIVEWAY. (2 WEEKS) 10. FINE GRADE SITE. (1 MONTH) 11. WITH THE DRAINAGE AREAS STABILIZED TO BIOS #1 AND #3, CONSTRUCT THEM, ENSURING NO SEDIMENT LADEN RUNOFF ENTERS THEM. (1 MONTH)

14. UPON STABILIZATION OF ALL DISTURBED AREAS AND WITH THE PERMISSION OF THE SEDIMENT

CONTROL INSPECTOR, REMOVE ALL SEDIMENT CONTROL MEASURES AND STABILIZE ANY REMAINING

12 WITH PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR, CONVERT SEDIMENT TRAP #1 TO BIO #2 AND CONSTRUCT STORMBRIXX FACILITY. REMOVE TEMPORARY PIPE FROM MH-1 TO SEDIMENT TRAP #1 AND CONSTRUCT PIPE FROM MH-1 TO ES-3 AND STORMBRIXX FACILITY. (1 MONTH) 13. FINAL PAVE USE-IN-COMMON DRIVEWAY. (2 WEEKS)

OWNER/DEVELOPER

JOSEPH C. & LISA ANN PENKUSKY 4707 BEECHWOOD ROAD **ELLICOTT CITY, MD 21043** 

# **SEDIMENT & EROSION CONTROL** NOTES, DETAILS & BORING LOGS PENKUSKY PROPERTY

LOTS 1, 3 THRU 7, AND OPEN SPACE LOTS 2, 8 THRU 11

TAX MAP 31 GRID 4 **1ST ELECTION DISTRICT** 

DATE

16005 Frederick Road, 2nd Floor Woodbine, Maryland 21797 Phone: 443.325.5076 Fax: 410.696.2022

<del>♀</del> Engineering GROUP, LLC Email: info@sillengineering.com Civil Engineering for Land Developmer

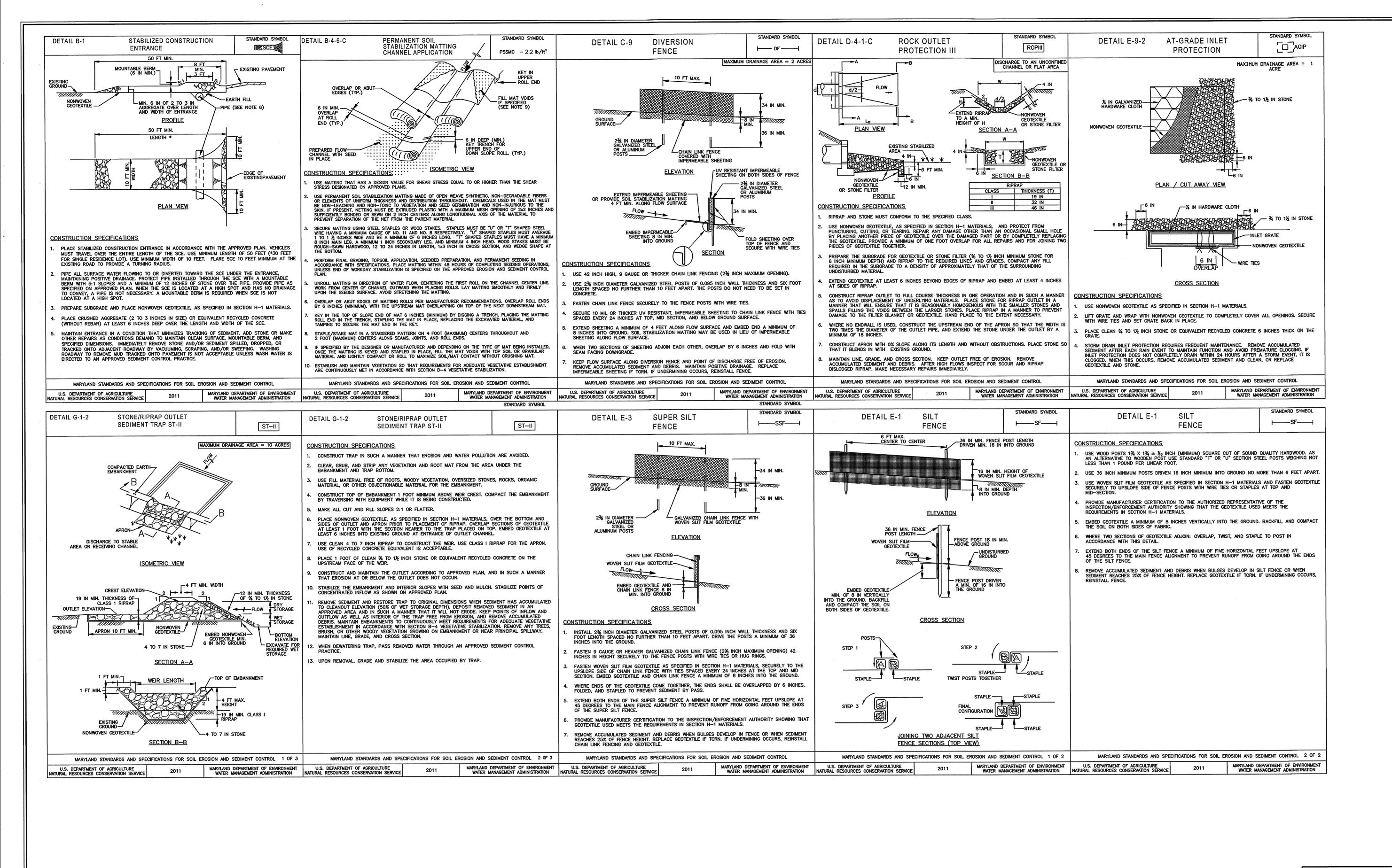
DRAWN BY: JC CHECKED BY: PS SCALE: AS SHOWN DATE: DECEMBER 16, 202 PROJECT #: \_\_\_\_\_15-028\_

HOWARD COUNTY, MARYLAND

DESIGN BY: PS

DESCRIPTION NO. **ĞNATURE OF DEVELOPER** CHIEF, BUREAU OF HIGHWAYS CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE **REVISIONS** PAUL M. SILL. P.E.

ICENSED PROFESSIONAL ENGINEER LINDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32025, EXPIRATION DATE: JUNE 20, 2021

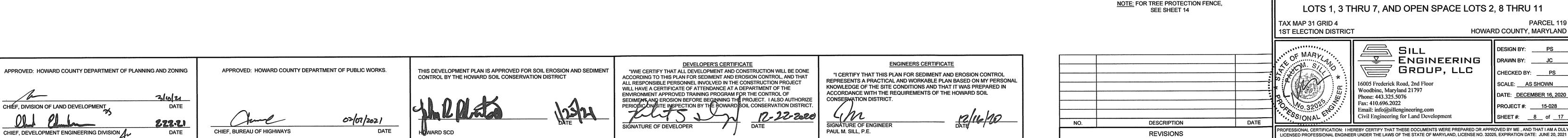


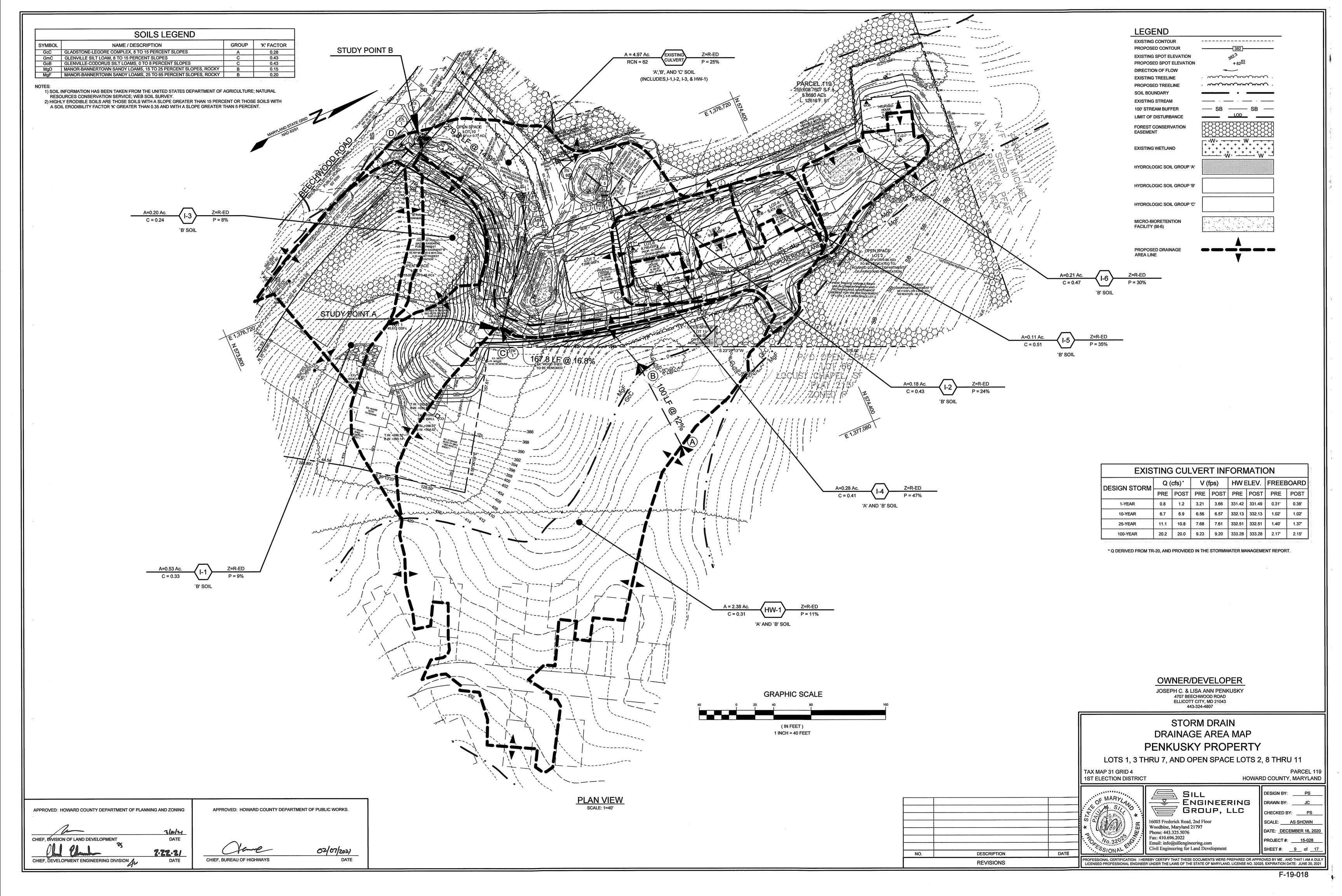
# OWNER/DEVELOPER

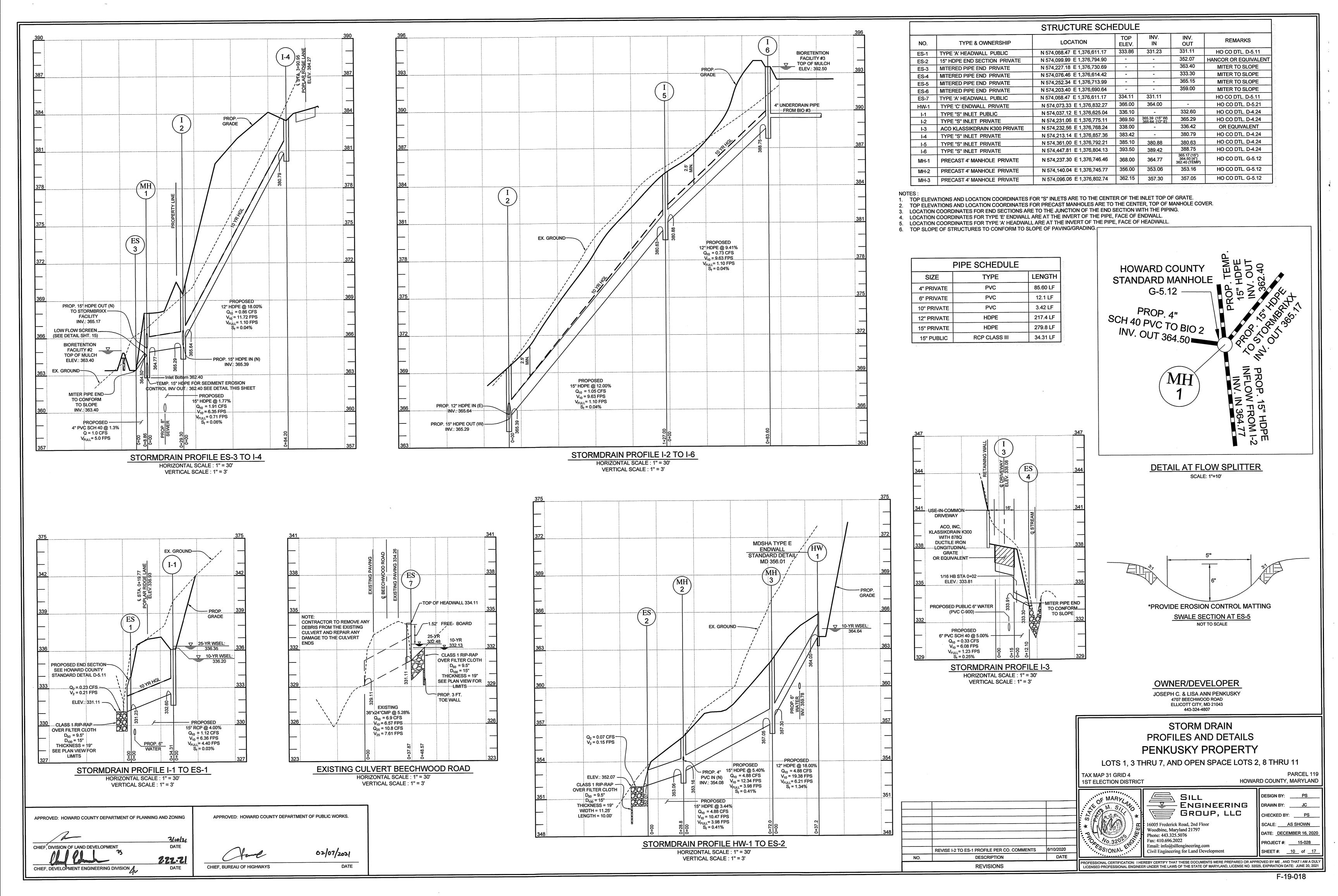
JOSEPH C. & LISA ANN PENKUSKY 4707 BEECHWOOD ROAD ELLICOTT CITY, MD 21043 443-324-4807

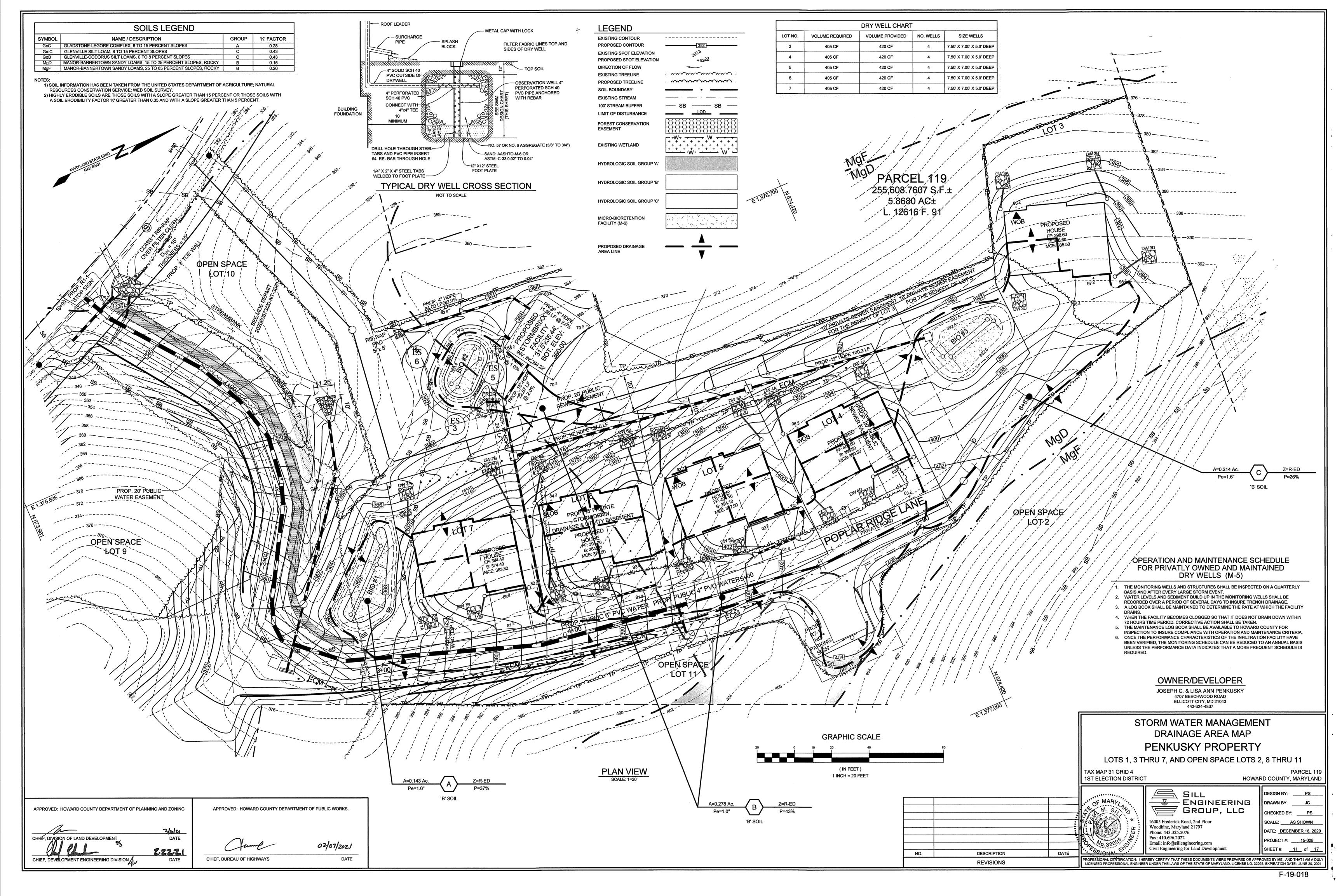
SEDIMENT & EROSION CONTROL NOTES & DETAILS

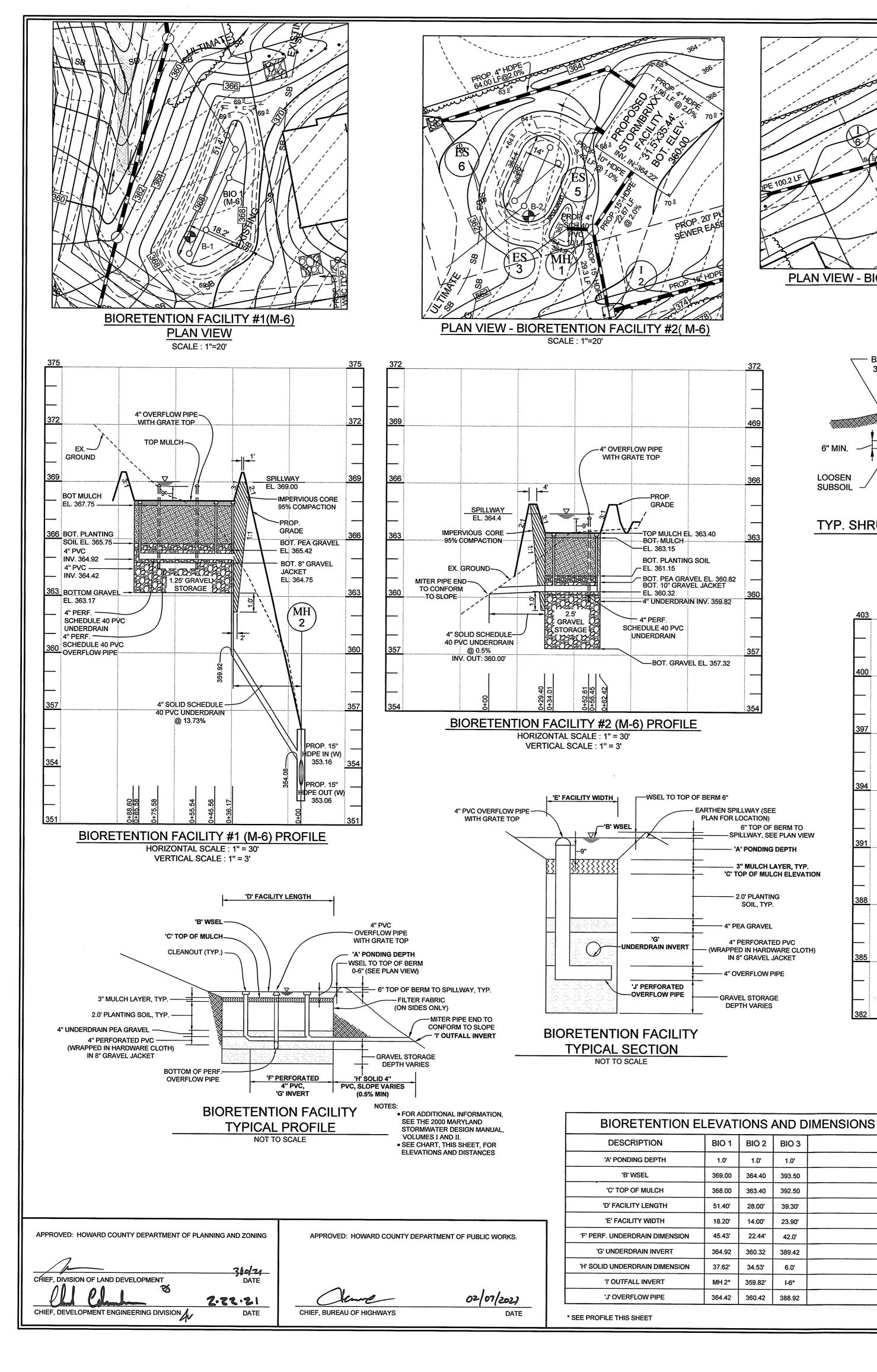
PENKUSKY PROPERTY

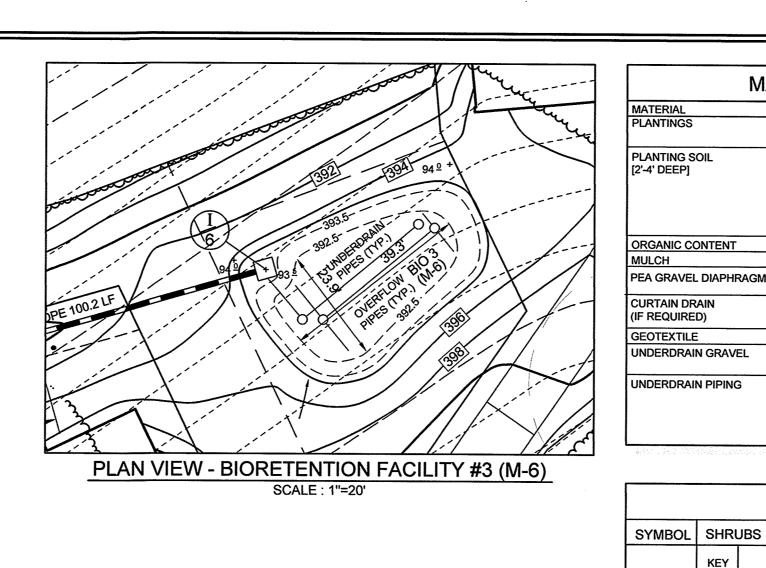


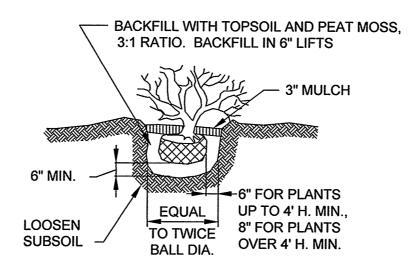












TYP. SHRUB PLANTING DETAIL

**EARTHEN SPILLWAY (SEE** 

PLAN FOR LOCATION)

6" TOP OF BERM TO

SPILLWAY, SEE PLAN VIEW

- 'A' PONDING DEPTH

— 2.0' PLANTING

4" PERFORATED PVC

IN 8" GRAVEL JACKET

- 4" OVERFLOW PIPE

BIO 1 | BIO 2 | BIO 3

364.40

363.40

28.00'

14.00'

22.44'

360.32

34.53'

359.82'

364.42 360.42 388.92

1.0' 1.0'

393.50

392.50

39.30

23.90'

42.0'

389.42

6.0'

I-6\*

1.0'

369.00

368.00

51.40'

18.20'

45.43'

364.92

37.62'

MH 2\*

-GRAVEL STORAGE

VRAPPED IN HARDWARE CLOTH)

- 4" PEA GRAVEL

- 3" MULCH LAYER, TYP.

'C' TOP OF MULCH ELEVATION

AMELIS X INTERMEDIA | WITCH HAZEL 'JELENA' AS SHOWN SILKY DOGWOOD (MIN. 10' O.C.) 36"-48" HT. **CORNUS AMOMUM** HERBACEOUS SPECIES BIO 1 BIO 2 BIO 3 **EUPATORIUM DUBIUM** AS SHOWN WARF JOE-PYE WEED 'LITTLE JOE' RUDEBECKIA LACINIATA TALL CONEFLOWER NOTE: PLANT MATERIAL MUST COVER 50% OF THE MULCH AREA AT MATURE GROWTH. BIO 1 - BIORETENTION AREA = 660 S.F. OR 0.015 AC. BIO 2 - BIORETENTION AREA = 350 S.F. OR 0.031 AC. BIO 3 - BIORETENTION AREA = 731 S.F. OR 0.017 AC.

MATERIALS SPECIFICATIONS FOR BIORETENTION FACILITIES

PEA GRAVEL: NO. 8 OR NO

NO. 57 OR NO. 6 AGGREGAT

4" TO 6" RIGID SCHEDULE

SPACING

SIZE

(1/8" TO 3/8")

(3/8" TO 3/4")

BIORETENTION PLANT LIST

COMMON NAME

40 PVC OR SDR35

STONE: 2" TO 5"

PLANTINGS ARE SITE-SPECIFIC. SEE PLANT LIST THIS SHEET

CLAY CONTENT < 5%

PE TYPE 1 NONWOVEN

GALVANIZED HARDWARE CLOTH.

USDA SOIL TYPES LOAMY SAND OR SANDY LOAM;

AGED 6 MONTHS, MINIMUM; NO PINE OR WOOD CHIPS

SLOTTED OR PERFORATED PIPE, 3/8" PERF. @ 6" ON

PERFORATED PIPE SHALL BE WRAPPED WITH 1/4"

QUANTITY | QUANTITY | QUANTITY

ENTER, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES: NOT NECESSARY UNDERNEATH PIPES.

SPECIFICATION
SEE PLANT LIST THIS SHEE

LOAMY SAND (60% - 65%) &

MIN. 10% BY DRY WEIGHT (ASTM-D-2974

COMPOST (35%-40%)

SANDY LOAM (30%).

RGANIC CONTENT

KEY

EOTEXTILE

COARSE SAND (30%) & COMPOST (40%)

SHREDDED HARDWOOD

PEA GRAVEL: ASTM-D-448

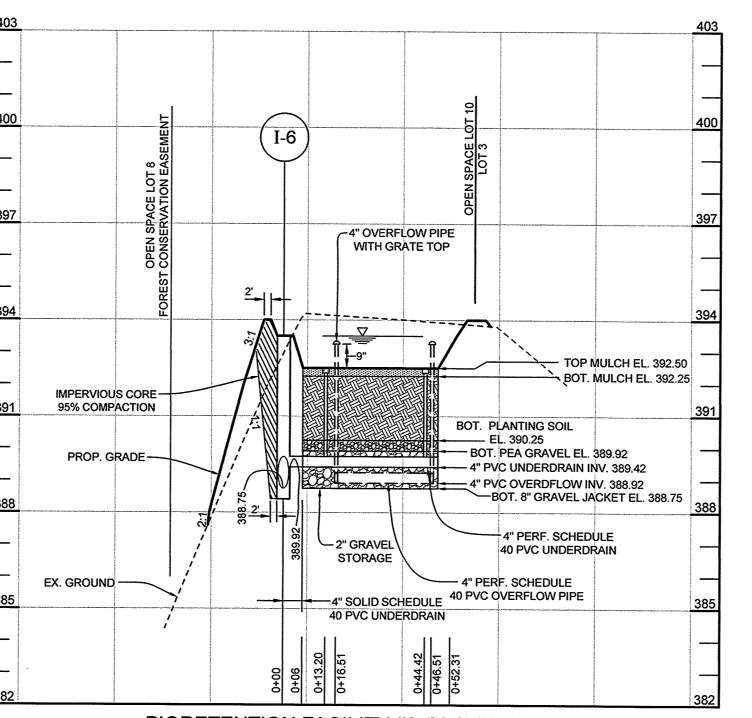
AASHTO M-43

AASHTO M-278

**BOTANICAL NAME** 

F 758, TYPE PS 28 OR

ORNAMENTAL STONE: WASHED



**BIORETENTION FACILITY #3 (M-6) PROFILE** HORIZONTAL SCALE: 1" = 30' VERTICAL SCALE: 1" = 3'

SIZE

4" PERFORATED

4" SOLID

NOTE: FOR SWM BORING LOGS SEE SHEET 7

SWM PIPE SCHEDULE

**TYPE** 

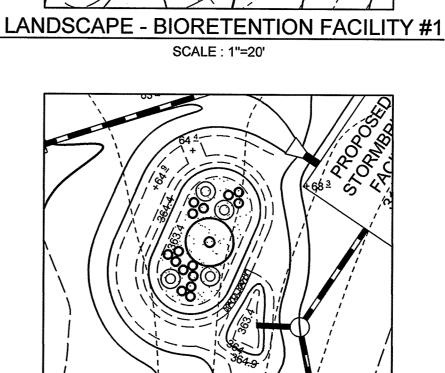
SCH 40 PVC

SCH 40 PVC

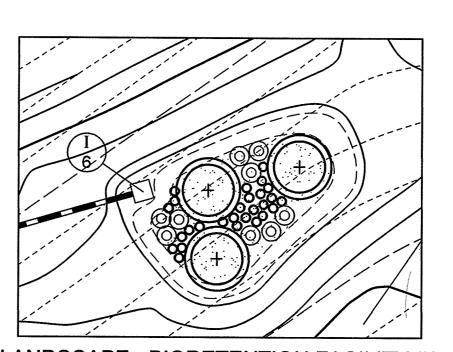
LENGTH

109.87 LF

76.15 LF



**LANDSCAPE - BIORETENTION FACILITY #2** SCALE: 1"=20"



LANDSCAPE - BIORETENTION FACILITY #3 SCALE: 1"=20'

NO. DESCRIPTION DATE **REVISIONS** 

B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION. RAIN GARDENS, LANDSCAPE **INFILTRATION & INFILTRATION BERMS** 

1. MATERIAL SPECIFICATIONS

THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.

2. FILTERING MEDIA OR PLANTING SOIL

THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON GRASS. OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05.

THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION)

ORGANIC CONTENT - MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (35% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%) CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.

• PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED INTO THE SOIL TO INCREASE OR DECREASE PH.

THERE SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPS OIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE

3. COMPACTION

IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING A LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR

EQUIPMENT WITH TURF TYPE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL

PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.

CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE

COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS A CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACTURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.

ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE

WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO

WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18", DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER

4. PLANT MATERIAL RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION

COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.

ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL, SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED

TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.

GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE

6. UNDERDRAINS

UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA: PIPE- SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTMF 758, TYPE PS28,

PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 1/2" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH A 1/4" (NO. 4 OR 4X4)

GALVANIZED HARDWARE CLOTH. • GRAVEL - THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW

THE UNDERDRAIN THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.

 A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,0000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER. • A 4" LAYER OF PEA GRAVEL (%" TO %" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND

UNDERDRAIN TO PREVENT MIGRATION OF FINES INTO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".

THE MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

7. MISCELLANEOUS

THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED OPERATION AND MAINTENANCE SCHEDULE FOR

MICRO-BIORETENTION (M-6), FACILITIES 1, 2 & 3 a. THE HOA SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. 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. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE L PERFORM A PLANT INSPECTION IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION. THE HOA SHALL REMOVE DEAD OR DISEASED VEGETATION CONSIDERED BEYOND TREATMENT.

REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES THE HOA SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE

YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED. d. THE HOA SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

e. THE HOA SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE UNDERDRAINS WITHIN THE BIO-RETENTION

THE HOA SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL STORM DRAIN PIPES AND STRUCTURES WITHIN PRIVATE EASEMENTS.

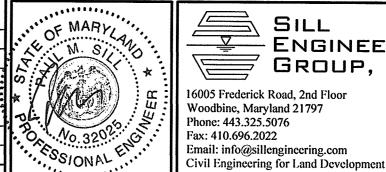
# OWNER/DEVELOPER

JOSEPH C. & LISA ANN PENKUSKY 4707 BEECHWOOD ROAD ELLICOTT CITY, MD 21043 443-324-4807

# BIORETENTION PLAN, PROFILES, DETAILS & NOTES

PENKUSKY PROPERTY

LOTS 1, 3 THRU 7, AND OPEN SPACE LOTS 2, 8 THRU 11 TAX MAP 31 GRID 4 PARCEL 119 **1ST ELECTION DISTRICT** 



\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	SILL ENGINE GROUP
Frederick 1	Road, 2nd Floor
lbine, Mary	
: 443.325.5	076
110.696.202	22

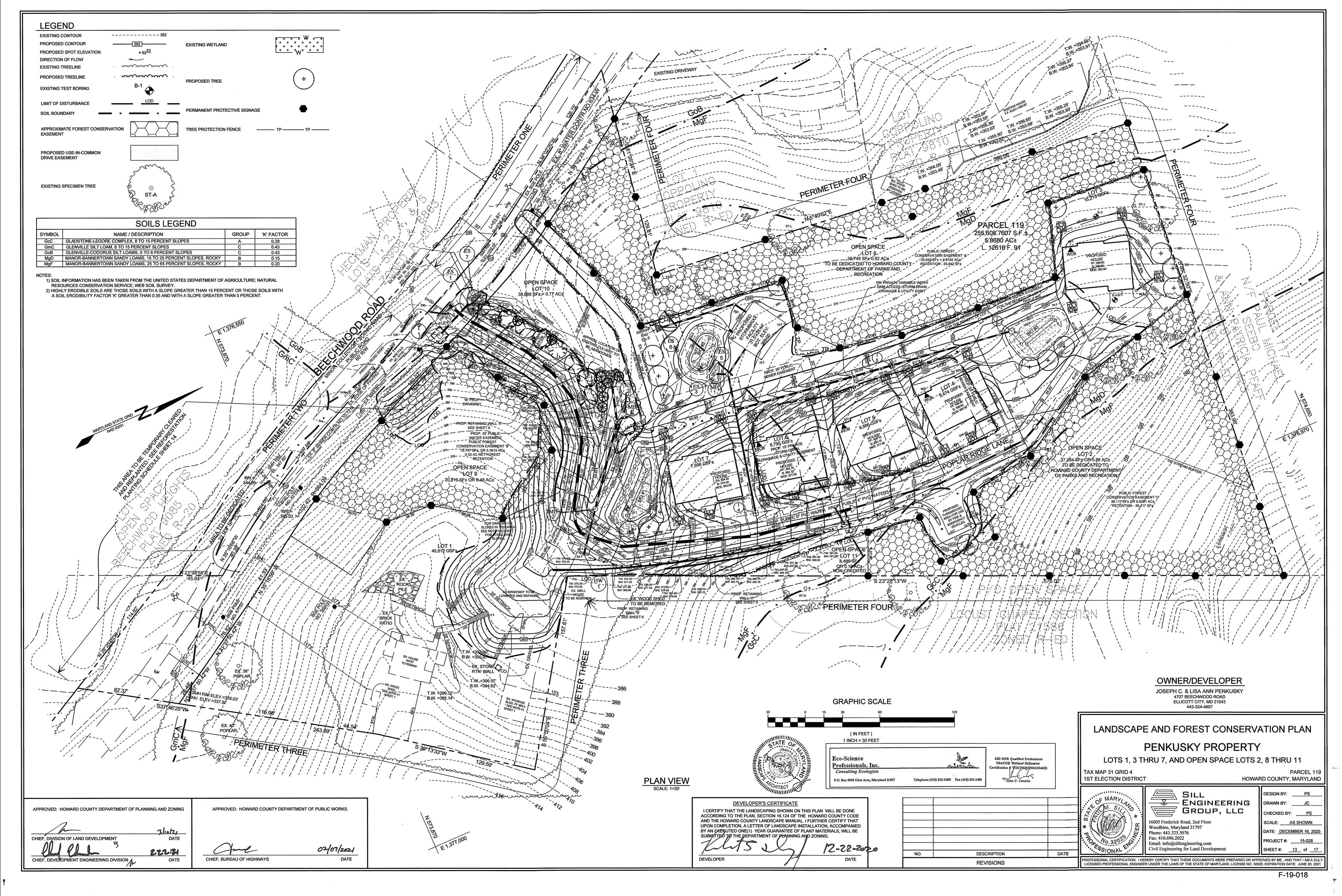
DESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME , AND THAT I AM A DUL'

DESIGN BY: ERING DRAWN BY: \_\_\_\_\_JC , LLC CHECKED BY: PS SCALE: AS SHOWN DATE: DECEMBER 16, 2020 PROJECT#: <u>15-028</u>

SHEET#: 12 of 17

HOWARD COUNTY, MARYLAND

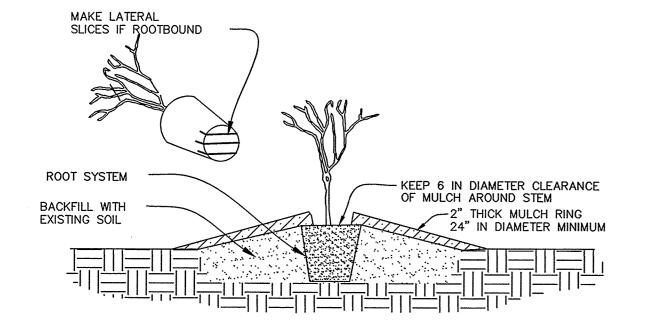
ICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32025, EXPIRATION DATE: JUNE 20, 2021 F-19-018



	REFORESTATION PLANTING SCHEDULE					
B)	17 ± SQ. FT. NITS REQUIRED: 26 NITS PROVIDED: 31.5					
QUANTITY	SPECIES	SIZE	SPACING	TOTAL FCA UNITS		
1	ACER RUBRUM - RED MAPLE	1" CAL.	15' O.C.			
. 3	LIRIODENDRON TULIPIFERA - TULIP POPLAR	1" CAL.	15' O.C.			
2	PRUNUS SEROTINA - BLACK CHERRY	1" CAL.	15' O.C.			
3	QUERCUS ALBA - WHITE OAK	1" CAL.	15' O.C.			
9	9 TOTAL 1" CALIPER TREE X 3.5 UNITS/TREE = FCA UNIT CREDIT 31.5					
	TOTAL UNIT CREDIT 31.5					

# PLANTING NOTES:

- PLANTING DENSITY BASED ON 700 PLANTING UNITS PER ACRE, 1"CALIPER TREE = 3.5 UNITS, WHIPS WITH SHELTER = 2 PLANTING UNITS.
- PLANTING SHALL BE MADE IN A CURVILINEAR FASHION ALONG CONTOUR. THE PLANTING SHOULD AVOID A GRID APPEARANCE BUT SHOULD BE SPACED TO FACILITATE MAINTENANCE.
- MULTIFLORA ROSE/HEAVY BRUSH REMOVAL/CONTROL MAY BE REQUIRED PRIOR TO INSTALLATION OF PLANTING.
- ALL WHIPS ARE REQUIRED TO BE INSTALLED WITH TREE SHELTERS PER HOWARD COUNTY FCA REQUIREMENTS. SHELTERS ARE NOT REQUIRED FOR 1 " CALIPER TREES BUT ARE RECOMMENDED TO REDUCE DEER DAMAGE.



PLANTING PROCEDURE FOR CONTAINER GROWN PLANTS

- REMOVE THE PLANT EITHER BY CUTTING OR INVERTING THE CONTAINER 2. USE A KNIFE TO CUT THROUGH BOTTOM HALF OF THE ROOT BALL. . PLANT SHRUBS ON FORMED UP MOUNDS 4" ABOVE THE EXISTING GRADE
- WHEN HIGH WATER TABLE CONDITIONS EXIST, OTHERWISE PLANT FLUSH WITH EXISTING GRADE.
- 4. PLANTING HOLE TO BE 2-3 TIMES THE DIAMETER OF THE CONTAINER. 5. INSERT FERTILIZER TABLET, BACKFILL 2/3 OF THE ROOT BALL AND WATER.
- 6. AFTER WATER PERCOLATES, BACKFILL HOLE TO TOP OF ROOT BALL AND GENTLY TAMP SOIL TO FIRM CONTACT WITH PLANT. 7. APPLY MULCH RING AROUND PLANT KEEPING A 6 IN CLEARANCE FROM STEM.
  - **CONTAINER PLANTING DETAIL**

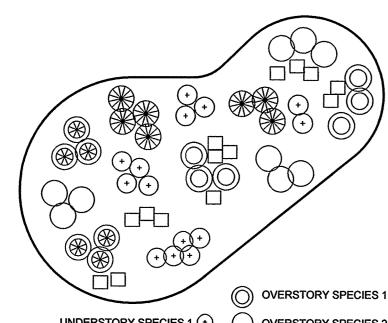
# PLANTING/SOIL SPECIFICATIONS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

DIVISION OF LAND DEVELOPMENT

CHIEF, DEVELOPMENT ENGINEERING DIVISION A

- INSTALLATION OF B&B / CONTAINER STOCK SHALL BE PERFORMED MARCH 15 MAY 30 OR SEPTEMBER 15 -**NOVEMBER 15**
- DISTURBED AREAS SHALL BE SEEDED AND STABILIZED AS PER GENERAL CONSTRUCTION PLAN FOR PROJECT PLANTING AREAS NOT IMPACTED BY SITE GRADING SHALL HAVE NO ADDITIONAL TOPSOIL INSTALLED.
- 3. BAREROOT PLANTS SHALL BE INSTALLED SO THAT THE TOP OF ROOT MASS IS LEVEL WITH THE TOP EXISTING GRADE. ROOTS SHALL BE DIPPED IN AN ANTI-DESICCANT GEL PRIOR TO PLANTING. BACKFILL IN THE PLANTING PITS SHALL CONSIST OF 3 PARTS EXISTING SOIL AND 1 PART PINE FINES OR EQUIVALENT
- FERTILIZER SHALL CONSIST OF AGRIFORM 22-8-2, OR EQUIVALENT, APPLIED AS PER MANUFACTURERS' SPECIFICATIONS, FOR WOODY PLANTS. HERBACEOUS PLANTS SHALL BE FERTILIZED WITH OSMOCOTE 8-6-12.
- PLANTS SHALL BE TRANSPORTED TO THE SITE IN A TARPED OR COVERED TRUCK. PLANTS SHALL BE KEPT MOIST PRIOR TO PLANTING.
- 6. ALL NON-ORGANIC DEBRIS ASSOCIATED WITH THE PLANTING OPERATION SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.



UNDERSTORY SPECIES 1 (+) OVERSTORY SPECIES 2 UNDERSTORY SPECIES 2 OVERSTORY SPECIES 3

THIS DIAGRAM SHOWS A TYPICAL DISPERSAL OF SPECIES WITHIN PLANTING AREA. THE SPACING SHALL BE IN ACCORDANCE WITH THE APPROVED PLANTING SCHEDULE. WHERE THE SIZE OF THE PLANTING STOCK VARIES, THE PLANTING UNITS SHALL INSTALLED AT AVERAGED SPACING TO PROVIDE APPROXIMATELY UNIFORM

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

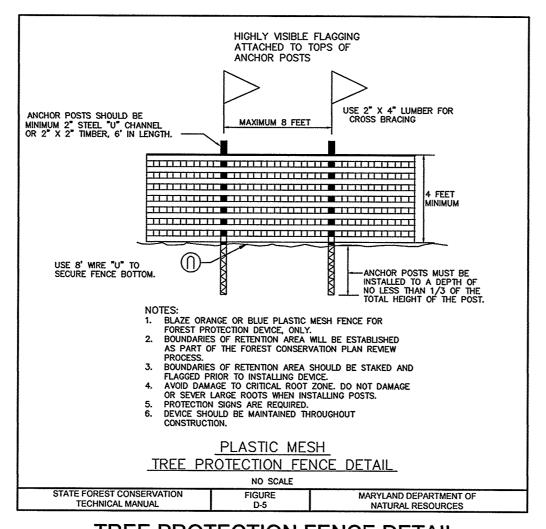
CHIEF, BUREAU OF HIGHWAYS

REFORESTATION RANDOM PLANTING DISTRIBUTION PLAN NOT TO SCALE

3/10/24

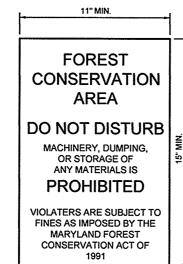
DATE

2.22.21



TREE PROTECTION FENCE DETAIL

NOT TO SCALE



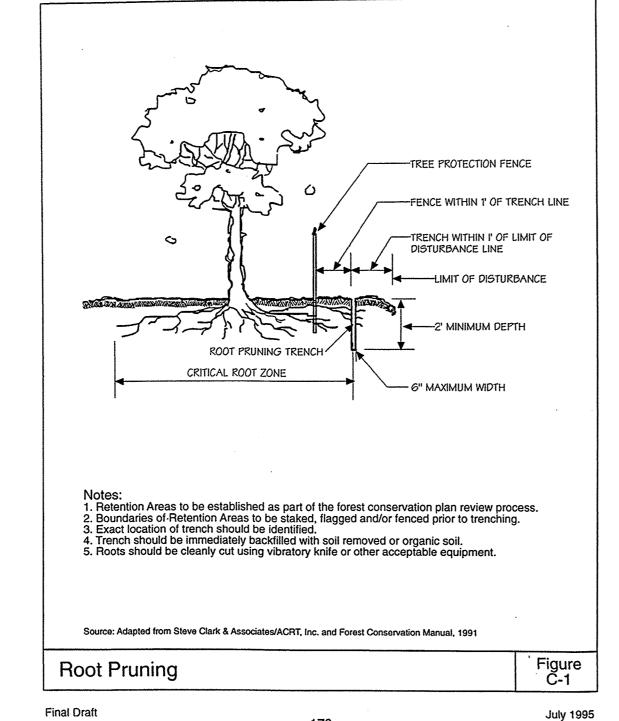
1. BOTTOM OF SIGN TO BE HIGHER THAN TOP OF TREE PROTECTION FENCE. 2. SIGNS TO BE PLACED APPROXIMATELY 50' APART. CONDITIONS ON SITE AFFECTING VISIBILITY MAY WARRANT

PLACING SIGNS CLOSER OR FARTHER

- 3. ATTACHMENT OF SIGNS TO TREES IS PROHIBITED. 4. SEE SDP 16-041 FOR SIGN LOCATIONS. 5. SIGNAGE SHALL BE IN PLACE FOR
  - PERPETUITY.

# **FOREST CONSERVATION SIGN DETAIL**

State Forest Conservation Manual Appendix C: Sample Details and Specifications



**DEVELOPER'S CERTIFICATE** I CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16,124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL, I FURTHER CERTIFY THAT UPON COMPLETION, A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE(1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE 16-22-202 DATE

FOREST CONSERVATION WORKSHEET **NET TRACT AREA** TOTAL TRACT AREA 5.9 AC AREA WITHIN 100 YEAR FLOODPLAIN & UTILITY EASEMENT 0.0 AC AREA TO REMAIN IN AGRICULTURAL PRODUCTION 0.0 AC NET TRACT AREA 5.9 AC LAND USE CATEGORY (FROM TABLE 3.2.1 PAGE 40, MANUAL) ARA MPD CIA XX AFFORESTATION THRESHOLD (NET TRACT AREA x 15%) 0.9 AC CONSERVATION THRESHOLD (NET TRACT AREA x 20%) 1.2 AC **EXISTING FOREST COVER** EXISTING FOREST COVER (EXCLUDING FLOODPLAIN) 4.5 AC AREA OF FOREST ABOVE AFFORESTATION THRESHOLD 3.6 AC AREA OF FOREST ABOVE CONSERVATION THRESHOLD 3.3 AC **BREAK EVEN POINT** FOREST RETENTION ABOVE THRESHOLD WITH NO MITIGATION 0.7 AC **BREAK-EVEN POINT** 1.9 AC CLEARING PERMITTED WITHOUT MITIGATION 2.6 AC PROPOSED FOREST CLEARING TOTAL AREA OF FOREST TO BE CLEARED OR RETAINED OUTSIDE FCE 2.6 AC TOTAL AREA OF FOREST TO BE RETAINED IN FCE 1.9 AC PLANTING REQUIREMENTS REFORESTATION FOR CLEARING ABOVE CONSERVATION THRESHOLD 0.7 AC

NOTE PLANTING REQUIRED TO OFFSET TEMPORARY GRADING TO SATIFY SITE DISTANCE REQUIRMENT AND TO ACHIEVE NECESSARY FOREST RETENTION SIZE STANDARD. A TOTAL OF 2,465 SF IS TO BE GRADED, WITH 1,647 SF IN FCE B.

REFORESTATION FOR CLEARING BELOW CONSERVATION THRESHOLD

CREDIT FOR RETENTION ABOVE THE CONSERVATION THRESHOLD

TOTAL REFORESTATION AND AFFORESTATION REQUIRED

# FOREST CONSERVATION PLAN NOTES

TOTAL REFORESTATION REQUIRED

TOTAL AFFORESTATION REQUIRED

- NO RARE, THREATENED OR ENDANGERED SPECIES, OR THEIR HABITATS' WERE OBSERVED ON THE PROPERTY.
- SURROUNDING LAND USE IS PRIMARILY MEDIUM DENSITY RESIDENTIAL DEVELOPMENT. APPROXIMATELY 2.5 ACRES OF FOREST IS PRESENT WITHIN 100 FEET OF THE SUBJECT PROPERTY.
- THE SITE IS LOCATED WITHIN THE PATAPSCO RIVER WATERSHED (02-13-09). THIS SECTION OF THE WATERSHED IS CLASSIFIED AS A USE I.
- NO HISTORIC ELEMENTS OR CEMETERIES ARE KNOWN TO OCCUR ON THE PROPERTY NO 100 YEAR FLOODPLAIN IS PRESENT ON THE PROPERTY.
- THERE ARE STEEP SLOPES (25% AND GREATER), WETLANDS, STREAMS AND THEIR BUFFERS ON THE
- THIS PROJECT WILL COMPLY WITH THE REQUIREMENT OF SECTION 16.1200 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION WITH 1.9 ACRES OF ON SITE RETENTION. THIS RETENTION ACREAGE MEETS THE BREAK EVEN POINT FOR THE PROJECT.NO SURETY IS REQUIRED FOR ON SITE FOREST RETENTION
- THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION WITH AREAS DEFINED AS FOREST CONSERVATION EASEMENTS. 10. NO STOCKPILES, PARKING AREAS, EQUIPMENT CLEANING AREAS, ETC. SHALL OCCUR WITHIN AREAS
- DESIGNATED AS NON-DISTURBANCE AREAS. CONSTRUCTION. SUPER SILT FENCE SHALL BE INSTALLED ALONG LIMITS OF DISTURBANCE OCCURRING WITHIN 50 FEET OF THE PROPOSED FOREST RETENTION LIMITS. PERMANENT SIGNAGE SHALL BE INSTALLED ALONG THE FOREST CONSERVATION EASEMENT BOUNDARY TO PREVENT FUTURE ENCROACHMENT INTO
- THE AREA, SIGNAGE SHALL BE PLACED AT 50-100 FOOT INTERVALS ALONG THE BOLINDARY 12. ROOT PRUNING ALONG THE PROPOSED LOD SHALL BE USED TO MINIMIZE IMPACTS TO THE CRITICAL ROOT ZONE OF THE SPECIMEN TREES TO BE RETAINED. THE APPROXIMATE LIMIT OF THE ROOT PRUNING IS SHOWN
- ON THE PLANS 13. THE FOREST CONSERVATION ACT REQUIREMENTS FOR THIS PROJECT WILL BE MET THROUGH THE 1.9 ACRES OF RETENTION AND 0.04 REFORESTATION. CLEARING IN AND OUTSIDE OF FCE B IS NEEDED TO MEET THE SITE DISTANCE REQIREMENT AT BEECHWOOD ROAD. THE REFORESTATION IS WITHIN FCE B, SURETY REQUIRED FOR THE REFORESTATION, OF \$823.00 (\$0.50 X 1,647 SF) SHALL BE POSTED WITH THE FINAL PLAT
- 14. PUBLIC FOREST CONSERVATION EASEMENTS HAS BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT. HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.

## LEADER MUST REMAIN INTACT 1. CONSULT INTERNATIONAL DO NOT HEAVILY PRUNE THE SOCIETY OF ARBORICULTUR TREE AT PLANTING, PRUNE SUIDELINES FOR FURTHER ONLY CROSSOVER LIMBS, CO DETAILS OF PLANTING DOMINANT LEADERS, AND SPECIFICATIONS, OR CONSUL\* BROKEN OR DEAD BRANCHES MTH A QUALIFIED PROFESSIONA LATERAL BRANCHES MAY B 2. EACH TREE SHALL BE PRUNED: HOWEVER, DO NO PLANTED SUCH THAT THE REMOVE THE TERMINAL BUDS TRUNK FLARE IS VISIBLE A OF BRANCHES THAT EXTEN THE TOP OF THE ROOT BALL. TO THE EDGE OF THE CROWN 3. STAKES SHALL BE REMOVED NO -2 STRANDS OF GALVANIZED LATER THAN THE END OF THE WRE TWISTED FOR SUPPORT FIRST GROWING SEASON AFTER RIGHT STAKES- SET IN 4. PLACE UPRIGHT STAKES GROUND TO FIRM BEARING PARALLEL TO WALKS & BEYOND EDGE OF ROOT BALL BUILDINGS RUBBER HOSE, MIN. 0.5" 5. KEEP MULCH 1" FROM TRUNK CUT BURLAP, ROPE AND WIRE OOPS FROM TOP HALF OF 6 SEE ARCHITECTURAL PLANS FOR ADDITIONAL PLANTINGS WIRE BASKET DOWN 8" HICH EXCEED HOWARD COUNTY -MIN. 2" DEPTH MULCH @ 6'2 -4" EARTH SAUCER 7. TREES ARE NOT TO BE PLANTED OVER PRIVATE FINISH GRADE SEWAGE EASEMENT ROOT BALL SHALL BE FLUSH WITH ORIGINAL GRADE OR RAISED UP TO 2" MAX. -PLANTING MIX- SEE PLANTING -PLACE ROOT BALL ON UNEXCAVATED OR TAMPED SOIL PLANTING HOLE 2-3 TIMES ROOT BALL DIAMETER

TYPICAL TREE PLANTING AND STAKING DECIDUOUS TREES UP TO 2-1/2" CALIPER NOT TO SCARE

Eco-Science

Professionals, I

Consulting Ecologists

P.O. Box 5006 Glen Arm, Maryland 21057

POST-CONSTRUCTION MANAGEMENT PLAN

HOWARD COUNTY REQUIRES A TWO YEAR POST-CONSTRUCTION MANAGEMENT PLAN BE PREPARED AS PART OF THE FOREST CONSERVATION PLAN. THE PLAN GOES INTO EFFECT UPON ACCEPTANCE OF THE CONSTRUCTION CERTIFICATION OF COMPLETION BY THE COUNTY. ECO-SCIENCE PROFESSIONALS, OR ANOTHER QUALIFIED PROFESSIONAL DESIGNATED BY THE DEVELOPER, WILL BE RESPONSIBLE FOR IMPLEMENTATION OF THE POST-CONSTRUCTION MANAGEMENT PLAN.

# THE FOLLOWING ITEMS WILL BE INCORPORATED INTO THE PLAN:

PERMANENT SIGNAGE INDICATING THE LIMITS OF THE RETENTION/REFORESTATION AREAS TO BE

CONSTRUCTION PERIOD PROTECTION PROGRAM

THE SOIL PROTECTION AREA, OR CRITICAL ROOT ZONE, OF A TREE IS THAT PORTION OF THE SOIL COLUMN

WHERE MOST OF ITS ROOTS MAY BE FOUND. THE MAJORITY OF ROOTS RESPONSIBLE FOR WATER AND

PLACED AROUND THE CRITICAL ROOT ZONE OF THE FOREST IN AREAS WHERE THE FOREST LIMITS OCCUR

NUTRIENT UPTAKE ARE LOCATED JUST BELOW THE SOIL SURFACE. TEMPORARY FENCING SHALL BE

EXISTING FOREST LIMITS OCCURRING WITHIN 25 FEET OF THE LIMITS OF DISTURBANCE SHALL BE

AROUND THE AFFORESTATION AREA PRIOR TO PLANT INSTALLATION, AS SHOWN ON THE PLAN.

PROTECTED USING TEMPORARY PROTECTIVE FENCING. PERMANENT SIGNAGE SHALL BE PLACED

UPON STAKING OF LIMITS OF DISTURBANCE A PRE-CONSTRUCTION MEETING WILL BE HELD BETWEEN THE

DEVELOPER, CONTRACTOR AND APPROPRIATE COUNTY INSPECTOR. THE PURPOSE OF THE MEETING WILL

ALL EQUIPMENT STORAGE, PARKING, SANITARY FACILITIES, MATERIAL STOCKPILING, ETC. ASSOCIATED

PROPOSED FOREST CONSERVATION EASEMENT. CLEANING OF EQUIPMENT WILL BE LIMITED TO AREA

WITHIN THE LOD OF THE PROPOSED HOMESITES. WASTEWATER RESULTING FROM EQUIPMENT CLEANING

2. HOLD PRE-CONSTRUCTION MEETING BETWEEN DEVELOPER, CONTRACTOR AND COUNTY

4. BEGIN MULTIFLORA ROSE REMOVAL. INSTALL PERMANENT PROTECTIVE SIGNAGE FOR EASEMENTS AND INITIATE PLANTINGS IN ACCORDANCE WITH FOREST CONSERVATION PLAN.

ECO-SCIENCE PROFESSIONALS, OR ANOTHER QUALIFIED PROFESSIONAL DESIGNATED BY THE DEVELOPER,

WILL MONITOR CONSTRUCTION OF THE PROJECT TO ENSURE THAT ALL ACTIVITIES ARE IN COMPLIANCE

PROFESSIONAL DESIGNATED BY THE DEVELOPER, WILL NOTIFY THE COUNTY THAT CONSTRUCTION HAS

BEEN COMPLETED AND ARRANGE FOR A POST-CONSTRUCTION MEETING TO REVIEW THE PROJECT SITE.

THE MEETING WILL ALLOW THE COUNTY INSPECTOR TO VERIFY THAT PLANTINGS HAVE BEEN INSTALLED

UPON COMPLETION OF CONSTRUCTION. ECO-SCIENCE PROFESSIONALS, OR ANOTHER QUALIFIED

PLANTING WILL BE COMPLETED WITHIN TWO(2) YEARS OF SUBDIVISION APPROVAL

3. BUILD ACCESS ROADS, INSTALL WELL AND SEPTIC SYSTEMS, AND CONSTRUCT HOUSES. STABILIZE

6. HOLD POST-CONSTRUCTION MEETING WITH COUNTY INSPECTORS TO ASSURE COMPLIANCE WITH

WITH CONSTRUCTION OF THE PROJECT WILL BE RESTRICTED TO THOSE AREAS OUTSIDE OF THE

WILL BE CONTROLLED TO PREVENT RUNOFF INTO ENVIRONMENTALLY SENSITIVE AREAS.

THE FOLLOWING TIMETABLE REPRESENTS THE PROPOSED TIMETABLE FOR THE PROJECT.

BE TO VERIFY THAT ALL SEDIMENT CONTROL IS IN ORDER, AND TO NOTIFY THE CONTRACTOR OF POSSIBLE

1. SOIL PROTECTION AREA (CRITICAL ROOT ZONE)

WITHIN 25 FEET OF THE LIMIT OF DISTURBANCE.

PENALTIES FOR NON-COMPLIANCE WITH THE FCP.

BELOW FIND A PROPOSED SEQUENCE OF CONSTRUCTION.

ALL DISTURBED AREAS ACCORDINGLY

FCP. SUBMIT CERTIFICATION OF INSTALLATION.

7. MONITOR AND MAINTAIN PLANTINGS FOR 2 YEARS.

5. REMOVE SEDIMENT CONTROL.

WITH THE FOREST CONSERVATION PLAN.

1. INSTALL ALL SIGNAGE AND SEDIMENT CONTROL DEVICES.

C. STORAGE FACILITIES/EQUIPMENT CLEANING

2. FENCING AND SIGNAGE

B. PRE-CONSTRUCTION MEETING

D. SEQUENCE OF CONSTRUCTION

E. CONSTRUCTION MONITORING

F. POST-CONSTRUCTION MEETING

0.0 AC

0.6 AC

0.0 AC

0.0 AC

0.0 AC

- PLACED IN FOREST CONSERVATION EASEMENTS SHALL BE MAINTAINED. GENERAL SITE INSPECTIONS/MAINTENANCE OF PLANTINGS
- SITE INSPECTIONS WILL BE PERFORMED A MINIMUM OF THREE TIMES DURING THE GROWING SEASON. THE PURPOSE OF THE INSPECTIONS WILL BE TO ASSESS THE HEALTH OF THE AFFORESTATION PLANTINGS. APPROPRIATE MEASURES WILL BE TAKEN TO RECTIFY ANY PROBLEMS WHICH MAY ARISE
- IN ADDITION, MAINTENANCE OF THE AFFORESTATION PLANTINGS WILL INVOLVE THE FOLLOWING STEPS: WATERING - ALL PLANT MATERIAL MUST RECEIVE 2 GALLONS OF WATER, EITHER THROUGH PRECIPITATION OR WATERING, WEEKLY DURING FIRST GROWING SEASON. DURING THE SECOND
- GROWING SEASON, ONCE A MONTH DURING MAY-SEPTEMBER, IF NEEDED. REMOVAL OF INVASIVE EXOTICS AND NOXIOUS WEEDS. OLD FIELD SUCCESSIONAL SPECIES WILL
- BE RETAINED IDENTIFICATION OF SERIOUS PLANT PESTS AND DISEASES, TREATMENT WITH APPROPRIATE
- PRUNING OF DEAD BRANCHES.
- PLANTS WILL BE EXAMINED A MINIMUM TWO TIMES DURING THE GROWING SEASON FOR SERIOUS PLANT PESTS AND DISEASES. SERIOUS PROBLEMS WILL BE TREATED WITH THE APPROPRIATE
- AFTER 12 AND 24 MONTHS, REPLACEMENT OF PLANTS, IF REQUIRED, IN ACCORDANCE WITH THE
- GUARANTEE REQUIREMENTS SHOWN ON THE FCP.
- THE BANK DEVELOPER WILL PROVIDE APPROPRIATE MATERIALS TO SUBSEQUENT PROPERTY OWNERS INFORMING THEM OF THE LOCATION AND PURPOSE OF THE FOREST CONSERVATION EASEMENTS ON THE PROPERTY. MATERIALS MAY INCLUDE SITE PLANS AND INFORMATION EXPLAINING THE INTENT OF THE FOREST CONSERVATION LAW
- FINAL INSPECTION
- AT THE END OF THE TWO YEAR POST-CONSTRUCTION MANAGEMENT PERIOD. ECO-SCIENCE PROFESSIONALS, OR ANOTHER QUALIFIED PROFESSIONAL, WILL SUBMIT TO THE ADMINISTRATOR OF THE HOWARD COUNTY FOREST CONSERVATION PROGRAM CERTIFICATION THAT ALL RETENTION/AFFORESTATION REQUIREMENTS HAVE BEEN MET. UPON ACCEPTANCE OF THIS CERTIFICATION, THE COUNTY WILL RELEASE THE DEVELOPER FROM ALL FUTURE OBLIGATIONS AND RELEASE THE DEVELOPER'S BOND.

# FOREST CONSERVATION EASEMENTS

EASEMENTS ARE A LEGAL MEANS OF PROVIDING PERMANENT PROTECTION OF FORESTS, FARMLAND AND OPEN SPACE. IN ACCORDANCE WITH THE CRITERIA OUTLINED IN THE HOWARD COUNTY FOREST CONSERVATION MANUAL, A FOREST CONSERVATION EASEMENT WILL BE RECORDED FOR THE RETENTION AREAS THE SUBJECT PROPERTY. SUBMISSION OF THE EASEMENTS FOR RECORDATION WILL OCCUR PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.

TYPICAL EVERGREEN TREE PLANTING DETAIL

NOT TO SCALE

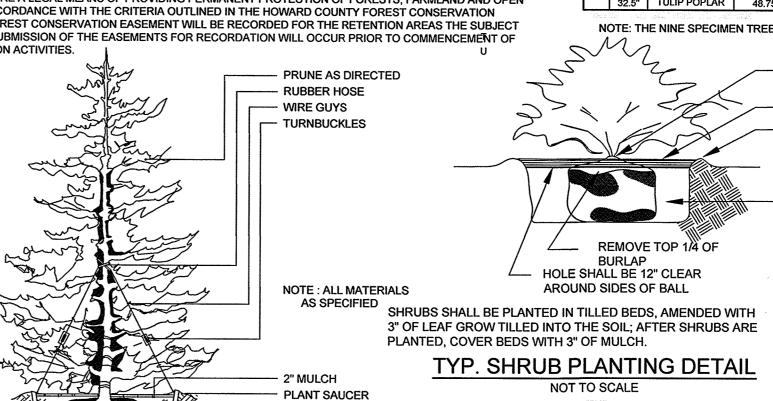
NO.

MD DNR Qualified Professional

USACOE Wetland Delineator

Telephone (410) 832-2480 Fax (410) 832-24

NOT TO SCALE



REMOVE BURLAP FROM TOP

BACKFILL MATERIAL. SEE PLANTING

/SOIL SPECIFICATIONS, NOTE 3

2"X4"X3' WOOD STAKES

PLACE ROOT BALL ON

1'-0" ALL SIDES

UNEXCAVATED OR TAMPED

DESCRIPTION

**REVISIONS** 

1/3 OF BALL

OWNER/DEVELOPER

JOSEPH C. & LISA ANN PENKUSKY 4707 BEECHWOOD ROAD **ELLICOTT CITY, MD 21043** 

# LANDSCAPE AND FOREST CONSERVATION **DETAILS AND NOTES**

**1ST ELECTION DISTRICT** LESSIONAL Civil Engineering for Land Developmen

DATE

SCALE: AS SHOWN

F-19-018

RETAINED/REMOVED

REMOVED

REMOVED

EVERGREEN TREES AND EIGHT (8) SHRUBS ARE TO BE PLANTED IN THE STREAM BUFFER. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING WILL BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF \$6,240.00. A TOTAL OF 19 SHADE TREES, 1 FOR THE REQUIRED PERIMETER LANDSCAPING AND 18

FOR THE REQUIRED TREE MITIGATION, PLUS 2 SHADE TREES AND 8 SHRUBS: 19 X \$300, 2 X \$150, AND 8 X \$30 = \$6.240.00 2. AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTING HEREWITH LISTED AND APPROVED FOR THE SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPING MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE

THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISION OF SECTION 16.124 OF THE HOWARD

COUNTY CODE AND THE LANDSCAPE MANUAL. IN ADDITION TO THE REQUIRED PERIMETER LANDSCAPING TREES THE DEVELOPER SHALL PLANT EIGHTEEN (18) SHADE TREES. ADDITIONALLY, PER WP-21-007, TWO (2)

PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATES. THE OWNER, TENANT, AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING, INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES, AND WALLS, ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY. REPAIRED OR REPLACED.

4. AS A CONDITION OF WP-17-124 APPROVAL, A TOTAL OF 18 REPLACEMENT TREES MUST BE PROVIDED FOR THE REMOVAL OF THE 9 SPECIMEN TREES. A TOTAL OF 18 COLUMBIA LONDON PLANE TREES HAVE TO BEEN PROVIDED TO MITIGATE THE LOSS OF THE 9 SPECIMEN TREES.

SCHEDULE A: F	PERIMETER L	ANDSCAPE	EDGE		
CATEGORY	1	ENT TO WAYS	ADJACENT TO PERIMETE PROPERTIES		
PERIMETER/FRONTAGE DESIGNATION LANDSCAPE TYPE	1 B	2 B	3 A	4 A	
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	192	423	448	1487	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) REMAINING PERIMETER LENGTH	YES 192 LF 0 LF	YES (1.) 423 LF 0 LF	YES (1.) 130 LF 318 LF	YES 1427 LF 60 LF	
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) REMAINING PERIMETER LENGTH	NO	NO .	NO	NO	
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES SHRUBS	1:50=0 1:40=0 -	1:50=0 1:40=0 -	1:60=0 (1.) - -	1:60=1 - -	
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES SHRUBS	- - -	- - -		3 - -	

SPECIES

A 31" TULIP POPLAR 46.5

B 36.5" TULIP POPLAR 54.75

CRZ

LANDSCAPE PLAN NOTES

1. LOT 1 WILL BE OCCUPIED BY AN EXISTING HOUSE AND, THEREFORE, NO PERIMETER LANDSCAPING IS REQUIRED. TWO OF THE THREE PROVIDED SHADE TREES IN PERIMETER 4 COUNT TOWARD THE REQUIRED

18 SHADE TREES FOR THE SPECIMEN TREE MITIGATION AS A CONDITION OF APPROVAL FOR WP-21-007, A TOTAL OF 2 TREES AND 8 SHRUBS AREA REQUIRED TO BE PLANTED WITHIN THE STREAM BUFFER OF OPEN SPACE LOT 10. THESE PLANTINGS ARE TO BE INCLUDED AS PART OF THIS SUBDIVISION'S LANDSCAPE SURETY AND TO BE INSPECTED.

## LANDSCAPE PLANT LIST KEY QUANTITY **BOTANICAL NAME** SIZE NOTE PLATANUS X ACERIFOLIA 'COLUMBIA' 3" CAL. B&B 'COLUMBIA LONDON PLANE LIQUIDAMBAR STYRACIFLUA 3" CAL. B&B AMERICAN SWEETGUM CERCIS CANIDENSI: 3" CAL. B&B EASTERN REDBUG **QUERCUS ALBA** 3" CAL. B&B WHITE OAK ILEX OPACA 3" CAL. B&B AMERICAN HOLLY KALMIA LATIFOLIA 5 GAL. MOUNTAIN LAUREL

SPECIMEN TREE TABLE

C 32.5" TULIP POPLAR 48.75 REMOVED POOR, TRUNK ROT AND LIMB DIEBACK RETAINED E 40" WHITE OAK FAIR, LIMB DIEBACK RETAINED 53.25 ROOT PRUNE & PROTECT BEFORE GRADING IN THE CR RED OAK RETAINED RED OAK RETAINED H 30" WHITE OAK BLACK OAK RETAINED J 36" TULIP POPLAR RETAINED K 34.5" TULIP POPLAR 51.75 POOR, OLD LIGHTENING STRIKE, TRUNK ROT REMOVED, WP-17-124 RED OAK 45.75 FAIR, SOME DIEBACK RETAINED TULIP POPLAR 48.75 RETAINED OAK SP. 63.75 DEAD AND DECAYING RETAINED RED OAK RETAINED P 31" AMERICAN BEECH 46.5 RETAINED Q 35.5" TULIP POPLAR 53.25 REMOVED R 30.5" TULIP POPLAR 45.75 REMOVED S 32" TULIP POPLAR 45 REMOVED 35.5" TULIP POPLAR 53.25 REMOVED 32.5" TULIP POPLAR 48.75 REMOVED NOTE: THE NINE SPECIMEN TREES TO BE REMOVED WERE APPROVED BY WP-17-024.

GROUND LINE TO BE SAME

AS NURSERY LINE 3" MULCH - 1.5" EARTH BERM FLOOD WITH WATER WITHIN FOUR HOURS OF PLANTING

AND AGAIN THE NEXT DAY PLANTING MIX 4 PARTS **TOPSOIL AND 1 PART LEAF** GROW (BY VOLUME)

443-324-4807

PENKUSKY PROPERTY

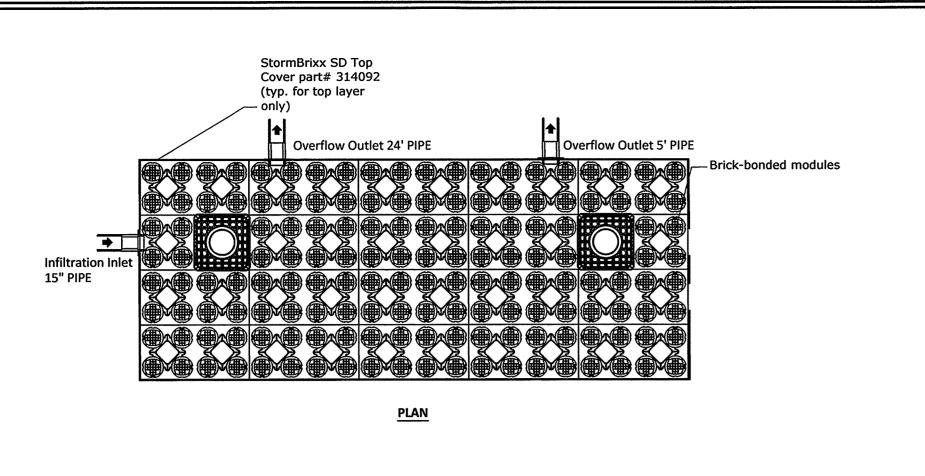
LOTS 1, 3 THRU 7, AND OPEN SPACE LOTS 2, 8 THRU 11 TAX MAP 31 GRID 4

PARCEL 119 HOWARD COUNTY, MARYLAND DESIGN BY: PS ENGINEERING DRAWN BY: \_\_\_\_\_JC\_\_ GROUP, LLC

16005 Frederick Road, 2nd Floor Woodbine, Maryland 21797 Phone: 443,325,5076 Fax: 410.696.2022 Email: info@sillengineering.com

LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32025, EXPIRATION DATE: JUNE 20, 2021

CHECKED BY: PS DATE: <u>DECEMBER 16, 2020</u> PROJECT#: 15-028 SHEET#: <u>14</u> of <u>17</u> OFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME , AND THAT I AM A DUL



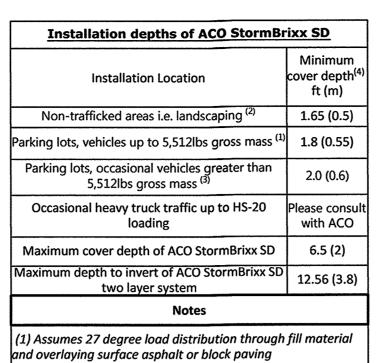
6" [150mm] minimum of native

- backfill, 3/4" crushed stone, or

pea gravel at 95% compaction

— Cover and frame

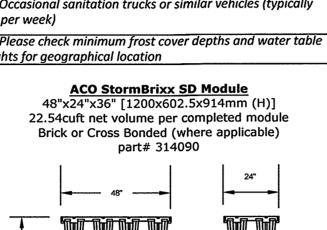
part#314056



gardening/landscaping work (3) Occasional sanitation trucks or similar vehicles (typically

(2) Minimum cover depth to avoid accidental damage from

(4) Please check minimum frost cover depths and water table heights for geographical location



\*All systems must be designed and installed to meet or exceed ACO StormBrixx minimum requirements. Although ACO StormBrixx offers support during the design, review, and construction phases of the module system, it is the ultimate responsibility of the Engineer of Record to design the system in full compliance with all applicable engineering practices, laws, and regulations.

- Geotextile fabric (6oz minimum) around entire perimeter of tank **SECTION PROFILE** Undisturbed earth base of excavation or made ground with a minimum CBR of 5% and suitable for anticipated load, to be certified by a Maryland licensed Professional

Engineer

\_Concrete load distribution

**Outlets** 

(location

based on

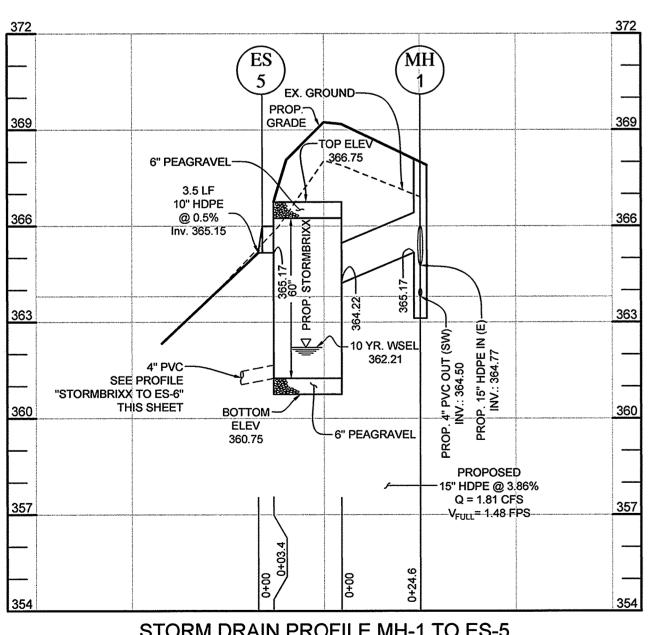
SD Access Plate part#314075

plate (by others)

\* FOR INSTALLATION GUIDE, SEE SHEET 16 OF 17.

# INFILTRATION - STORMBRIXX SD TWO LAYERS WITH ACCESS PLATES

NOT TO SCALE



Finished road surface; bitumen,

concrete, etc. (Surface and

depth to suit engineer's spec)

Extension Shaft part#314038-

Infiltration Inlet →

Stormbrixx Side Panel; part# 314091\_

(typ. for all exterior sides)

6" [150mm] minimum of native

backfill, 3/4" crushed stone, or -

pea gravel at 95% compaction

(location based on usage)

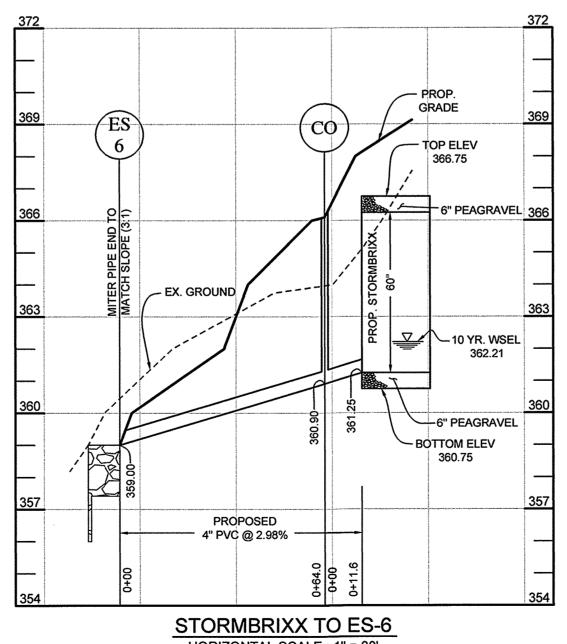
12" (300mm) minimum of native \_\_\_

backfill, 3/4" crushed stone, or

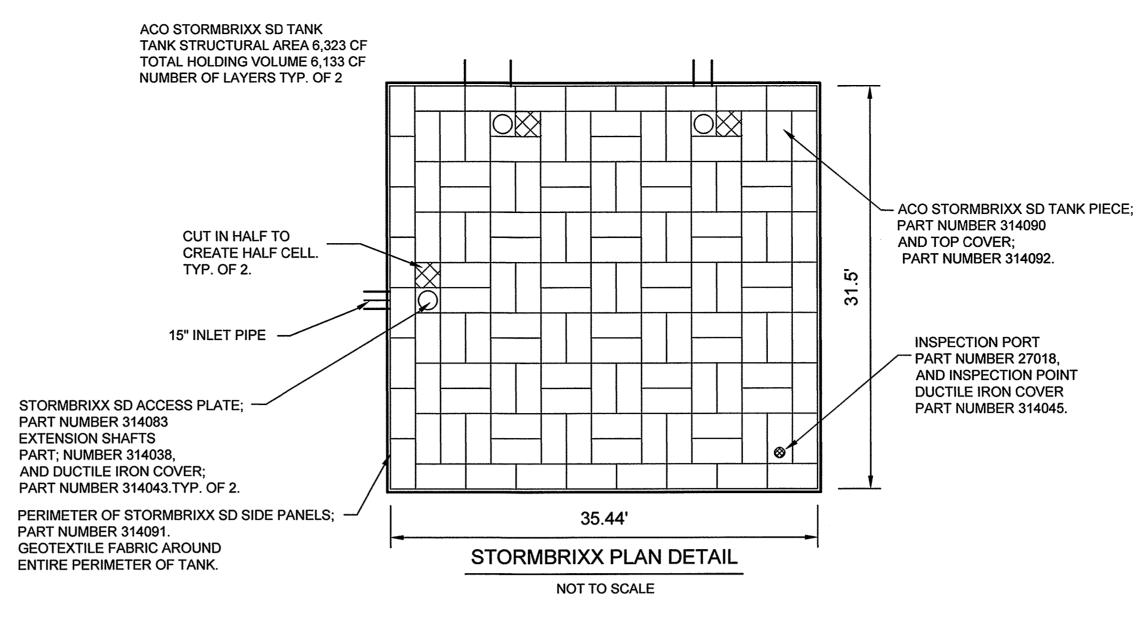
pea gravel at 95% compaction

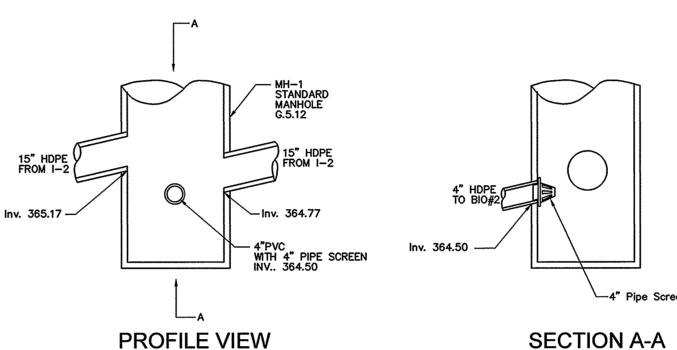
STORM DRAIN PROFILE MH-1 TO ES-5 HORIZONTAL SCALE: 1" = 30' VERTICAL SCALE: 1" = 3'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS. APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING 3/10/21 CHIEF, DIVISION OF LAND DEVELOPMENT 02/07/2021 12.23 CHIEF, DEVELOPMENT ENGINEERING DIVISION CHIEF, BUREAU OF HIGHWAYS DATE



HORIZONTAL SCALE: 1" = 30' VERTICAL SCALE: 1" = 3'





NOT TO SCALE

4" PIPE SCREEN BY PLUMMINGSUPPLY.COM (OR EQUIVALENT)

- FITS 4" PVC AND HDPE

- CONTRACTOR TO SECUE WITH MARINE EXPOY

NOT TO SCALE

# LOW FLOW PIPE SCREEN DETAIL FOR MH-1

NOT TO SCALE

# LOW FLOW SCREEN MAINTENANCE

- 1. Visually inspect Low Flow Screen after each major storm event (2-year event or greater) but not less than 2 times per year. All debris and trash shall be removed from the screen and manhole. any damage to the screen shall be repaired.
- 2. During the bi-annual inspection, sediment and other eroded materials shall be removed when accumulated to a depth of 1 foot.

# **Maintenance Procedures:**

- 1. Conform to all local, state and federal regulations.
- 2. Determine if maintenance is required. If a pre-treatment device is installed, follow manufacturer recommendations.
- 3. Flush with clean water forcing debris from the system using high-pressure jet/nozzle.
- 4. Use a vacuum pump truck to evacuate debris from the inflow and outflow points.
- 5. Repeat steps 3 and 4 until no debris is evident.

# **Cleaning Procedures:**

- 1. The frequency of cleaning is site specific and is affected mainly by the land use and pollutants that may enter the system. It's recommended that the ACO StormBrixx system be inspected at minimum every six months. The ACO StormBrixx system is inspected and cleaned through the access chambers or inspection ports by simply opening or removing the
- 2. Complete a visual inspection to evaluate the silt and debris accumulation within the system, if the area cannot be fully observed insert an inspection camera to view the entirely of the tank. If the level silt and debris within the system is greater than 3 inches then maintenance is required.
- 3. Maintenance is achieved using high-pressure jet/nozzle to loosen and suspend debris ad build up that can be removed with a vacuum hose. Once debris and build up has been removed, remove any cleaning equipment (be sure to close and secure if needed any access chamber covers or inspection port covers) We also recommend cleaning of any upstream manholes or devices that connect to the StormBrixx system. Nearly all municipalities own or work closely with private companies who have vacuum equipment with the combined capability to both break up and removed build up and debris.

# **GENERAL NOTES**

- 1. IT IS THE CUSTOMERS RESPONSIBILITY THAT EACH PRODUCT IS FIT FOR IT'S INTENDED PURPOSE AND THAT THE ACTUAL CONDITIONS ARE SUITABLE.
- 2. IT IS THE CUSTOMERS RESPONSIBILITY TO FOLLOW ACO. INC. INSTALLATION INSTRUCTIONS FOR EACH PRODUCT. SEEK ENGINEERING ADIVE FOR INSTALLATIONS NOT ILLUSTRATED IN
- THE INSTALLATION GUIDELINES. 3. CONTRACTOR TO CONTACT MANUFACTURER WELL IN ADVANCE OF CONSTRUCTION TO
  - RECEIVE SPECIFIC DETAILS ON STORMBRIXX UNIT CONSTRUCTION. 4. ALL FABRICATIONS TO BE COMPLETED BY INSTALLING CONTRACTOR.

  - DIMENSIONS ARE FROM OUTSIDE TO OUTSIDE
  - 6. FOR FURTHER PRODUCT INFORMATION, CUT SHEETS, SPECIFICATIONS AND INSTALLATION INSTRUCTIONS, PLEASE VISIT US AT OUR WEBSITE: WWW.ACOUSA.COM/PRODUCTS/SURFACE-WATER-MANAGEMENT/ACO-STORMBRIXX.

# STORMBRIXX MAINTENANCE

ACO StormBrixx is a unique and patented geocellular stormwater management system for detention and infiltration usage Its versatile design allows the system to be used in configurations and applications across all construction environments as a standalone solution or as part of an integrated LID (Low Impact Development) or BMP (Best Management Practices). Systems may or may include pre-treatment to remove sediment and/or contaminates prior to entering the storage area. Those without pre-treatment require greater attention to system functionality and may require additional maintenance. I order to sustain proper system functionality, ACO offers the following general maintenance guidelines for the StormBrixx

# Prevention Measures:

- 1. Prior to & During Construction Siltation prevention of the stormwater system.
- a. Conform to all local, state and ferial regulations for sediment and erosion control during construction.
- b. Install site erosion and sediment BMP's (Best Management Practices) required to prevent siltation of the stormwater
- c. Inspect and maintain erosion and sediment BMP's during construction.
- 2. Post Construction Prior to commissioning to ACO StormBrixx system
- a. Remove and properly dispose of construction erosion and sediment BMP's per all local, state and federal regulations. Care should be taken during removal of the BMP's as not to allow collected sediment or debris into the stormwater
- b. Flush the ACO StormBrixx system to remove any sediment or construction debris immediately after the BMP's removal. Follow the maintenance procedure outlined.

- Follow all local, state and federal regulations regarding stormwater BMP inspection requirements .
- ACO INC. makes the following recommendations:
- 1. During the first service year a visual inspection should be completed during and after each major rainfall event, in addition to every 6 month period, to monitor and establish each sediment and debris buildup occurs.
- Each ACO StormBrixx system is unique to the application and multiple criteria can affect maintenance frequency such as:
- a.) System Design: pre-treatment/no-pretreatment, inlet protection, stand-alone device.
- b.) Surface Area collecting from: hardscape, gravel, soil or any other surface c.) Adjacent Area: soil runoff, gravel, trash.
- 2. Second year; establish an annual inspection frequency based on the information collected during the first year. At a
- minimum an inspection should be performed at 6 month intervals.
- 3. Inspect: a. ACO StormBrixx access chambers & Inspection ports.
- b. Inflow and outflow points.
- c. Discharge area.
- 4. Identify and Report maintenance required: a. Sediment and debris accumulation.
- b. System backing up.

# OWNER/DEVELOPER

JOSEPH C. & LISA ANN PENKUSKY 4707 BEECHWOOD ROAD ELLICOTT CITY, MD 21043 443-324-4807

# STORMWATER MANAGEMENT DETAILS STORMBRIXX SYSTEM PENKUSKY PROPERTY

LOTS 1, 3 THRU 7, AND OPEN SPACE LOTS 2, 8 THRU 11

.ESSIONAL

DATE

DESCRIPTION

**REVISIONS** 

TAX MAP 31 GRID 4

**1ST ELECTION DISTRICT** 

SILL ENGINEERING GROUP, LLC

ROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DUL'

16005 Frederick Road, 2nd Floor Woodbine, Maryland 21797 Phone: 443.325.5076 Fax: 410.696.2022 Email: info@sillengineering.com Civil Engineering for Land Development

DRAWN BY: \_\_\_\_\_JC\_\_ CHECKED BY: PS SCALE: AS SHOWN DATE: DECEMBER 16, 2020 PROJECT#: <u>15-028</u> SHEET #: \_\_15\_\_ of \_\_17

DESIGN BY: PS

HOWARD COUNTY, MARYLAND

LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32025, EXPIRATION DATE: JUNE 20, 2021

PARCEL 119

F-19-018

# **ACO StormBrixx Installation Guide**

# Introduction

ACO StormBrixx modules are easily assembled with each tank module consisting of male and female connections that allow for brickbonding locking the system together securely, with side panels inserted only around the perimeter of the system. This open design allows for easy access to clean. When properly designed, applied, installed, and maintained, ACO Stormbrixx systems are engineered to achieve a 50-60 year design life.

ACO StormBrixx system can be utilized for detention, infiltration, reuse, and specialty applications across a wide range of industries, including commercial, residential, and landscape applications. The product's modular design allows the system to be configured in almost any shape (even around utilities) and to be located under any pervious or impervious surface.

ACO offers two different module heights (SD & HD) that can be stacked uniformly up to three layers high for SD and four layers high for HD. This allows for numerous height configurations up to 9' (2.74 m) tall. Modules can be buried up to a maximum invert of 14' (4.26 m) and require a minimum cover of 24" (610 m) for load rating. When selecting the proper module type, it is important to consider the minimum required cover, any groundwater or limiting zone restrictions, footprint requirements, and al local, state, and federal regulations, please consult the designing engineer if unclear on any of the above.

# **Excavate Site**

The foundation (subgrade) of the subsurface storage structure is an extremely important part of the module system installation, as this is the location where the system applies to the load generated at the surface. If the subgrade lacks adequate support or encounters potential settlement, the entire system could be adversely affected. When installing an underground storage solution, it is imperative that a geotechnical investigation be performed to ensure a storm foundation. Bearing Capacity

The bearing capacity is the ability of the soil to resist settlement; i.e. it is the amount of weight the soil can support. This is important versus the native condition because the system is replacing earth, the additional load displacement of the earth is not offset by the difference in weight.

If minimum subgrade bearing capacity cannot be achieved because of the weak soil, a suitable design will need to be completed by a Geotechnical Engineer. This design may include the over excavation of the subgrade and an engineered fill or slurry being placed. Additional material such a geogrid or other products may also be required. Please contract a Geotechnical Engineer prior to selecting products or designing the subgrade.

# Limiting Zones

strength and stability of the underlying subgrade. The 2 main forms of limiting zones are water tabled and bedrock. **Excavation** 

Limiting zones are conditions in the underlying soils that cab affect the maximum available depth for installation and can reduce the

Stake out and excavate to elevations per approved plans. Excavate the designated surveyed area following all relevant local, state,

Typical excavations should include: - minimum 12" (305 mm) perimeter around ACO StormBrixx to allow for adequate compaction of backfill - Enough depth to accommodate a minimum 6" (152 mm) base (if required) below the StormBrixx System.

Soil compaction occurs as the soil particles are pressed together and pore space is eliminated. By compacting the soils to 95% (recommended by ACO), the subgrade strength will increase, in turn limiting both the potential for the soil to move once installed and for differential settlement to occur throughout the system. If designing the specific compaction requirement, settlement should be limited to less than 1" (25 mm) through the entire subgrade and should not exceed a 1/2" (13 mm) of differential settlement between any two adjacent units within the system over time.

# **Excavation Requirements**

- a. Subgrade excavation must be a minimum of 6" (152 mm) below designed StormBrixx invert.
- b. The excavation should extend a minimum of 12" (305 mm) beyond the StormBrixx dimensions in each length and width to allow for adequate placement of side backfill material.
- c. Remove objectionable material encountered within the excavation, including protruding material from the walls.
- d. Furnish, install, monitor and maintain excavation support (e.g., shoring, bracing, trench boxes, etc.) as required by Federal, State and Local Laws, Ordinances, Regulations and Safety Requirements.

# Lay Sub Base

Level the bottom of the excavation as shown on plans. Base of excavation must be uniform, level and free o debris and soft or vielding subgrade areas. Compact to at least 95% standard proctor density (or as required by Engineer) unless infiltration of stormwater into subgrade is desired.

- Subgrade shall be unfrozen, level (plus or minus 1%), and free of lumps or debris with no standing water, mud or muck. Do not use materials nor mix with materials that are frozen and/or coated with ice or frost
- Unstable, unsuitable and/or compromised areas should be brought to the Engineer' attention and mitigating efforts determined prior to compacting the subgrade.
- Subgrade must be compacted to 95% Standard Proctor Density o as approved by the Engineer of Record. If code requirements restrict subgrade compaction, it is the requirement of the geotechnical Engineer to verify that the bearing capacity and
- settlement criteria for support of the system are met. The sub grade is constructed of 6" (152 mm) angular stone or pea gravel. The bed has not been designed as a structural element

but is utilized to provide a level surface for the installation of the system and provide an even distribution of load o the subgrade. NOTE: The Engineer of Record shall be responsible for minimum soil bearing capacity required based on Load Rating and top cover depth. Minimum soil bearing capacity is required so that settlements are less than 1" (25 mm) through the entire subgrade and do not exceed long term 1/2" (13 mm) differential settlement between any two adjacent units within the systems. Subgrade must be designed to ensure soil bearing capacity is maintained throughout all soil saturation levels.

# Lay Membrane/Geotextile

# Option A: Impermeable Layer

In designs that prevent runoff from infiltrating into the surrounding soil (detention or reuse applications) or groundwater from entering the systems, an impermeable liner is required. When incorporating a liner as part of the system, ACO recommend the use of a manufactured product such as a PVC liner, the liner is wrapped around the geocellular tank prior to backfill.

# **Option B: Permeable Layer**

- 1. Install specified geotextile fabric and/or liner material in panels of the proper length, and place hem over the sub grade, covering the floor of the excavation. The geotextile fabric and/or liner should extend at least 24" (600 mm) beyond the edge of the StormBrixx system. Adjacent panels of material should be overlapped by a minimum of 12" (300 mm) or more in sealed system joins (may require heat-welding)
- 2. Use pins, stables, sandbags to hold the geotextile in place, preventing it from blowing or sliding out of position
- 3. Patch any holes made in the Geotextile by placing a small patch of fabric over the damaged area. The patch must be large enough to cover the damaged area with at least 12" (300 mm) of overlap on undamaged material.
- 4. If a liner and/or additional geotextile is required per plans, install these as shown on the project plans.

3/10/2

DATE

DATE

222.21

5. Correct any unsatisfactory conditions.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT

CHIEF, DEVELOPMENT ENGINEERING DIVISION A

NOTE: ACO does not provide membrane liners or geotextile fabrics with ACO StormBrixx systems. This should be purchased separately. Please consult with membrane liner manufacture and install in accordance with the liner manufacturers

# Assemble ACO StormBrixx Tanks

# The Modular System

ACO StormBrixx is a geocellular tank that is designed to fit together easily to form a strong, long lasting construction.

# Ease of Installation

Installation is easy with a snap-lock system consisting of male and female connectors that audibly lock into place during assembly, two half modules will connect to create a full height module. Half modules snap and lock into one another vertically by placing one atop another and by using the male and female connections layers and adjacent modules can be attached.

# Types of Configurations

• Brick-bonding: Brick-bonding or cross-bonding can be applied to ACO StormBrixx to provide structural strength and is a key feature of the product. The brickbonding method is like Lego's and creates a single solid structure comprised of individual modules that are interlocked together creating one rigid block. Repeat for subsequent layers using connectors to bond layers to

• Irregular Shapes: ACO StormBrixx systems can be easily configured to site specific requirements. Irregular shapes are not a

problem as the tank can be constructed to avoid tree pits, buildings and other ground constraints, while offering countless

# configurations to meet requirements. **Column Connections**

# See pages 13-14 for instructions regarding layout options for ACO StormBrixx

# **Assemble Tanks**

- 1. Determine the starting location. ACO recommends to use an inlet or outlet pipe as a guide. Using a string line, establish two adjacent edges of the ACO StormBrixx footprint. Ensure that the corner is square. Mark these two edges with marking paint and remove string line.
- 2. Being placing the ACO StormBrixx in the corner of the marked area using the perfeered configuration pattern.
- 3. Do NOT place units on their sides, as this will void the warranty, check plans to ensure the correct orientation of the systems. ACO StormBrixx units should fit together evenly, variations in the height of the layers (< 1/2 ") are acceptable, but reasonable efforts should be made to minimize these. If gaps or height variations persist through 3 or more adjacent units, remove modules and pull back the textile to repair and flatten base.
- 4. Sediment Forebay: An essential step of designing, installing, and maintaining a subsurface system is preventing silt, sediment and debris from entering the system. A sediment forebay can be designed into a ACO StormBrixx HD (not SD) geocellular tank to capture the water quality flow or "first flush" as defined by a regulatory or permitting agency, this can be done by incorporating sediment rows (or bays) at the inlets of the systems to prevent debris from entering the rest if the system (see below). The sediment forebay is built into the system utilizing side panels to isolate a section if the system which is then wrapped with geotextile fabric to separate this from the rest of the StromBrixx tank, this allows for the full system capacity to be utilized while storing any sentiment, silt or debris in one easy-to-remove location with the fabric-wrapped modules provide filtration and promote settling of pollutants.
- 5. Ventilation of System: Subsurface systems require ventilation to prevent pressurized build up when the system is operating at full capacity which in turn can cause the system to surcharge or even fail. ACO StormBrixx offers easy connection of ventilation pipes directly to the module to evenly distribute the system pressure.
- a. The openings for ventilation must be cut out the top of the StormBrixx modules before they are installed.
- b. A sawzall with extra-long saw blade is required to cut out the openings for the pipe penetrations in the side panels and the top of the StormBrixx module for ventilation.
- c. The pipe adapter is mounted in the previously cut out opening on the top of the StormBrixx module allowing the installer to connect the desired pipe size needed for ventilation as per engineering's specification.
- d. The geotextile is cut in and is pushed over the pipe adaptor to encapsulate the StormBrixx.

# **Install Layer Connectors**

# Option A: Single Layer System

If only one layer of ACO StormBrixx is installed, no connectors are required. Laying stormbrixx in the brick-bonding patterns provides additional stability for the overall system. If the units are fully brick-bonded, the structure will not need connectors to hold the system together.

# **Option B: Multiple Layer System**

Installing several layers: Layer connectors are used if two or more layers of ACO StormBrixx are installed. Two individual connectors snap together and are inserted between the individual layers as positional fixing. This helps prevent lateral movement between layers. These two connectors should protrude from the top of the structure by approximately 1" (25 mm), depending on which module version is used. These protruding layer connectors fit the base of the second layer and are key to minimizing lateral movement during backfill and overall installation.

- ACO StormBrixx SD: To align two layers, a double connector is used at the edge of the module (page 34)
- ACO StormBrixx HD: A centrally positioned double connector per module connects two layers (page 48)

# **Build Access & Inspection Points** Option A: Entrance Via Remote Access Plate

To obtain access to the ACO StormBrixx SD unit the remote access plate can used. This plate is located within the overall system. Modules are removed to create free movement for inspection and cleaning of the system. With the access plate, an easy installation is possible at any desired position apart from the perimeter edge of the tank.

Note: Please ensure the access plate is not used on the edge of the structure. Ths unit must be used at least one unit inside the ACO StormBrixx structure.

# Option B: Entrance Via The Access Unit

Access can be gained to the ACO StormBrixx system by using the access unit. These units can be installed both within the structure and on the outer edges. They replace the half-length ACO StormBrixx layers and when all four walls are removed, full access to the system can be achieved. For multi-layer systems, the units stack on top of each other and integrate with the ACO StormBrixx

Each access chamber has markings that will indicate the different size openings can be cut out to accommodate various pipe sizes 4" to 18"(100 mm to 450 mm). To create an opening within the access chamber, drill a hole to get the saw blade inserted and cut along the guide provided. Access chambers are extended to the surface using the ACO combi-point shafts or by using 18" (450 mm) twin wall pipe cut to suitable length. Access covers are placed at the pavement surface. In the event that a larger access caber is required due to large pipe inlets/outlets/etc., ACO recommends a square, 4' x 4' concrete access, which replaces a section of the geocellular tank. Contact ACO for details.

# Place Pipe Connections

The ACO StormBrixx system offers pipe adapters that can be used for the connection of inlet and outlet pipes as well as any ventilation pipes. These are typically located within the side panels of the StormBrixx. Pipe connector sized range from 4" (100 mm) to 15" (450 mm) markings on the side panels will indicate the different size openings. The openings for inlets and outlets must be cut out before installing the side panels, a Sawzall with extra-long saw blade is required to cut out the pipe connection opening in the side panel. The pipe adapter is mounted in the previously cut out opening in the side panel and fixed securely. The geotextile is cut and pushed over the pipe and sealed.

# Wrap System in Membrane Liner or Geotextile Fabric

Upon completion of ACO StormBrixx assembly, wrap modules in geotextile fabric and/or membrane liner.

- Geotextile fabric shall be wrapped and secured per manufacturer's recommendations.
- Seal any access ports/pipe connections per manufacturer's requirements
- NOTE: If damage occurs to the geotextile fabric or impermeable membrane liner, repair material in accordance geotextile/liner manufacturer's recommendations.
- 1. Cut strips of geotextile to fit over the top and down both sides of the ACO StormBrixx with at least 24" (600 mm) material on each side of the system. This 24" (600 mm) flap should overlay the geotextile placed below StormBrixx creating a clean overlap
- 2. Use duct tape, sand bags or other ballast to temporarily secure overlaps
- 3. Where the geotextile intersects an Inspection or Maintenance Port, cut and "X" into the geotextile and pull it over the pipe. The flaps of the "X" should point AWAY from the ACO StromBrixx. Cut excess fabric away and seal geotextile to the pipe using blackjack or polyurethane sealant.
- 4. Fold geotextile for outside corners and lay excess material flat against the ACO StormBrixx. Leave corners loose to avoid creating weak spots in the material and temporarily secure excess fabric with duct tape.
- 5. Where the inlet and outlet pipes connect to the ACO StormBrixx cut an "X" into the geotextile so that the pipe makes DIRECT contact with the StormBrixx modules, pull the flaps of the "X" over the pipe so that the flaps of the "X" point AWAY from the system. Cut excess fabric away and seal geotextile to the pipe using blackjack or polyurethane sealant.
- 6. Walk bottom edge of geotextile along the sides of ACO StormBrixx to eliminate gaps between the fabric and the bottom corner
- 7. Seal the liner using tape or heat welding and ensure the ACO StormBrixx system is fully sealed with no rips, tears or punctures. Backfill Site

# **Backfill Sides**

The backfill is designed to limit the strain on the product through displacement of load and ensure the product's longevity. Therefore, a minimum of 12" -wide (305 mm) angular stone or well-graded granular soil/aggregate, typically road base or earthen fill (maximum 1"-3" [25-80 mm] particle size) must be placed around all sides of the system. In addition, a minimum layer of 24" (610 mm) angular stone, sand or good quality of native backfill is required on top of the system. All material is to be place evenly in 12" (305 mm) lifts around and on top of the system and aligned with vibratory plate compactor.

- 1. Once the geotextile is secured, begin to place the side backfill.
- 2. Place backfill material around perimeter of the ACO StormBrixx distributing the material evenly to prevent movement of the ACO StormBrixx modules. All backfill material must meet requirements listed in the specifications.
- 3. Place material utilizing an excavator, dozer or conveyor boom
- 4. Use a trench roller or plate compactor to compact backfill in 12" (305 mm) lifts to provide a uniform distribution
- 5. Continue placing and compacting backfill in 12" (305 mm) lifts until the material reaches the top of the StormBrixx units NOTE: While some backfill materials will yield a 95% proctor density without compaction, vibratory compaction of the material must be completed to ensure the stability of the system. Skipping this step will void the manufacturer's warranty.
- Do not apply vehicular load to the ACO StormBrixx modules during placement of side backfill. All material placement should occur with equipment located on the native soil surrounding the system
- If damage occurs to the geotextile fabric or impermeable liner, repair the material in accordance with the geotextile/liner Manufacture's recommendations.

Dump backfill material adjacent to the ACO StormBrixx and, using an excavator, dozer or conveyor boom to push the material over the system and use a walk-behind plate vibrator to settle the backfill and provide an even distribution in maximum 12" (305 mm) lifts. Backfill must meet requirements listed in specifications, suitable materials are as follows - Well - graded granular soil/aggregate, typically road base or earthen fill (maximum 1" - 3" [25 - 80 mm] particle size) crushed angular stone placed between modules and road base or earthen fill.

- 1. Place fill into the geotextile. a. Maximum 12" (305 mm) lifts, compacted with a vibratory plate or walk behind roller to as minimum of 90% Standard Proctor Density.
- 2. The minimum top cover to finished grade should not be less than 24" (610 mm) and the maximum deoth from final grade to the bottom of the lowest module should not exceed 14' (4.27 m) for ACO StormBrixx HD installations and 21" (6.40 m) for HD
- 3. Lightly compact top backfill to 95% standard proctor density (or as shown on plans) using your walk-behind trench roller. Alternately, a roller (maximum gross vehicle weight of 60 tons) may be used. Roller must remain in static mode until a minimum of 24" (610 mm) of cover has been placed over the modules
- 4. Finish to surface and complete with vegetative cover

# Impervious & Pervious Areas

- 1. Place fill onto the geotextile. a. Maximum 12" (305 mm) lifts compacted with a vibratory plate or walk behind roller to a minimum 95% Standard Proctor Density or to meet the Engineer of Record's specification.
- 2. Sub base materials should be referenced by the approved engineering drawings.
- 3. The minimum top cover to finished grade should not be less than 24" (610 mm) and the maximum depth from final grade to the bottom of the lowest module should not exceed 14' (4.27 m) for ACO StormBrixx HD installations and 21" (6.40 m) for HD
- 4. Lightly compact top backfill to 95% standard proctor density (or as shown on plans) using your walk-behind trench roller. Alternately, a roller (maximum gross vehicle weight of 6 tons) may be used. Roller must remain in static mode until a minimum of 24" (610 mm) of cover has been placed over the modules.
- 5. Finish to the surface and complete with asphalt, concrete, pavement, etc.

- A vibratory roller may only be utilized after a minimum 24" (610 mm) of compacted material has been installed or for the installation of the asphalt wearing course.
- If damage occurs to the geotextile fabric, repair the material in accordance with the geotextile Manufacturer's recommendations Material Placement Material Type/Description
- Finished Surface Topsoil, hardscape, stone, concrete or asphalt per engineer of record
- Compactable Fill Granular well graded soil/aggregate, typically road base of earthen fill, Crushed angular stone, maximum 1"-3" (25- 80 mm) particle size
- Top Backfill Granular well graded soil/aggregate, typically road base of earthen fill, Crushed angular stone, maximum 1"-3" (25-80 Side Backfill Granular well graded soil/aggregate, typically road base of earthen fill, Crushed angular stone, maximum 1"-3" (25-80
- mm) particle size Granular well graded soil/aggregate, earthen fill, with ability to compact to 95% proctor density

# Site Traffic Considerations

Construction loads are often the heaviest loads f the system will experience, care must be taken during backfilling and compaction, and post-installation construction traffic should be ruted around the system if possible.

NO.

DESCRIPTION

**REVISIONS** 

- A minimum of 12" (305 mm) of material must be maintained between the Dozer tracks and top of the StromBrixx modules. For best results ACO recommends push at least 14" (360 mm) of backfill over modules, so that as the material compacts beneath the doer, as 12" (305 mm) minimum lift is maintained. It is recommended that the dozer drive straight on and back straight off the system during backfill placement. Turning movements are likely to dislodge backfill material, reducing the thickness of the lift and potentially damaging the ACO StormBrixx system. Once there is a minimum of 12" (305 mm) or more of cover, use either a small roller (not vibrating) or up to a 24,000 lbs excavator or track dozer to traverse the top of the ACO StormBrixx. These should not change direction when on top of the ACO StormBrixx system, as this will create excess dynamic loads.
- Some materials will compact significantly while others may dislodge excessively during construction. Never allow lift thickness to compact to less than 12" (305 mm) without adding more material ensuring 12" (305 mm) lifts at all times. Dump trucks should not drive over or dump material on top of the StormBrixx system.

# Typical Plant Equipment Weights (LBS)

John Deere 550J LGP	18,252
Caterpillar D5K LGP	21,347
New Holland D95 LGP	20,700
Case 850K LGP	20,700
Komatsu D39PX-21	19,620

# **Secure The Installation**

Many construction vehicles exceed the AASGTO HS20 standard most detention systems are designed to meet. To prevent damage from these vehicles, the installation should be secured to prevent unauthorizes traffic from driving over the system once it has been installed. A. Projects nearing completion should use warning tape or temporary fencing to secure the installation. Regardless of what method is selected to secure the installation, it must remain in place until construction activity has concluded and no further access of vehicles exceeding the HS20 standard is necessary.

Removing pollutants from stormwater runoff is an important component of any stormwater management plan. Pretreatment works to prevent water quality deterioration and also plays an integral part in allowing the system to maintain performance over time and increase longevity. Treatment products vary in complexity, deign, and effectiveness, and therefore, should be selected based on specific project requirements.

OWNER/DEVELOPER

JOSEPH C. & LISA ANN PENKUSKY 4707 BEECHWOOD ROAD ELLICOTT CITY, MD 21043 443-324-4807

# STORMWATER MANAGEMENT NOTES STORMBRIXX SYSTEM PENKUSKY PROPERTY

LOTS 1, 3 THRU 7, AND OPEN SPACE LOTS 2, 8 THRU 11 TAX MAP 31 GRID 4

SILL

DESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME , AND THAT I AM A DUI.)

DATE

**1ST ELECTION DISTRICT** 

ENGINEERING GROUP IIC 16005 Frederick Road, 2nd Floor Woodbine, Maryland 21797 Phone: 443 325 5076 Fax: 410.696.2022 Email: info@sillengineering.com Civil Engineering for Land Development

DRAWN BY: \_\_\_\_\_JC\_\_ CHECKED BY: PS SCALE: AS SHOWN DATE: DECEMBER 16, 2020 PROJECT #: 15-028 SHEET #: \_\_16\_\_ of \_\_17\_\_

DESIGN BY: PS

HOWARD COUNTY, MARYLAND

PARCEL 119

LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32025, EXPIRATION DATE: JUNE 20, 2021 F-19-018

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS

02/07/2021

