

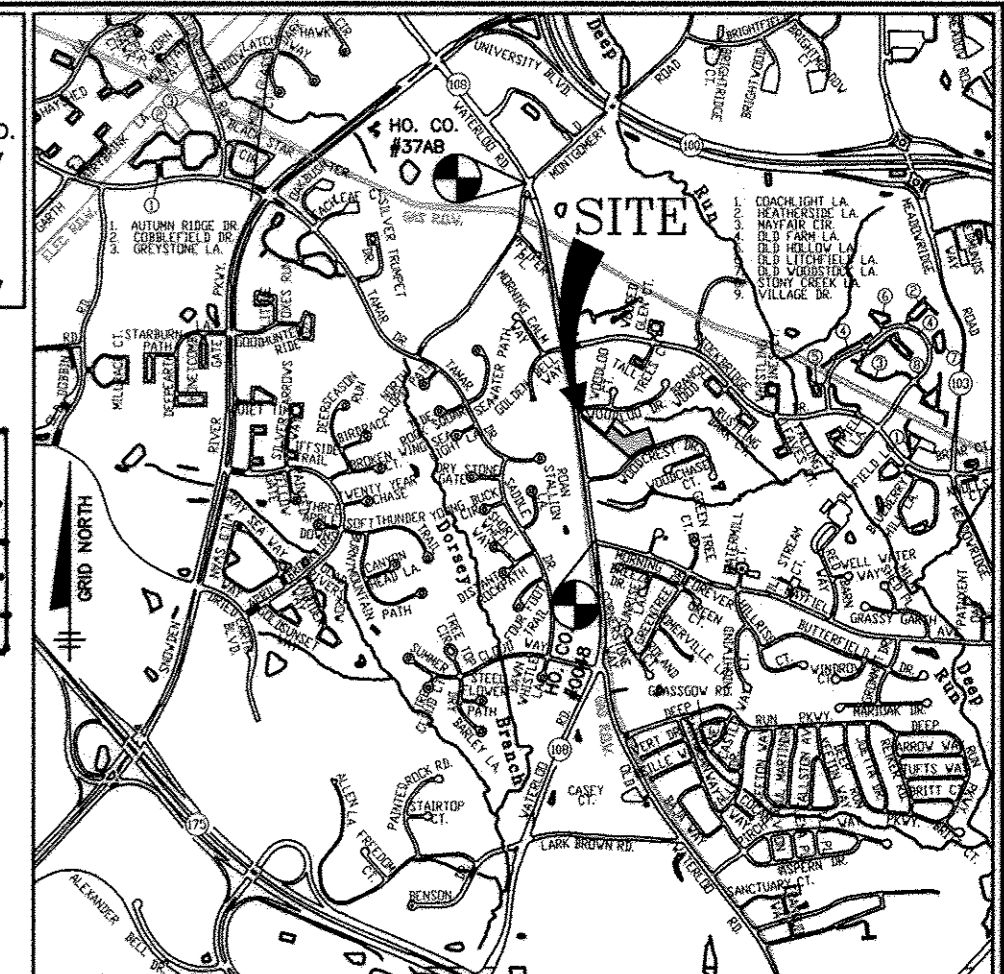
FINAL CONSTRUCTION PLANS WOODBROOK SECTIONS 2 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND

SOILS LEGEND			
MAP SYMBOL	SOIL TYPE	MAPPING UNIT	K FACTOR
Fa	D	FALLSINGTON SANDY LOAM - 0 TO 2 PERCENT SLOPES	0.20
UcB	C (B,D)	URBAN LAND: CHILLUM/BELTSVILLE COMPLEX - 0 TO 5 PERCENT SLOPES	0.37
UcD	C (B,D)	URBAN LAND: CHILLUM/BELTSVILLE COMPLEX - 5 TO 10 PERCENT SLOPES	0.37

USDA-NRCS WEBSITE, MAP #19 SAVAGE NE

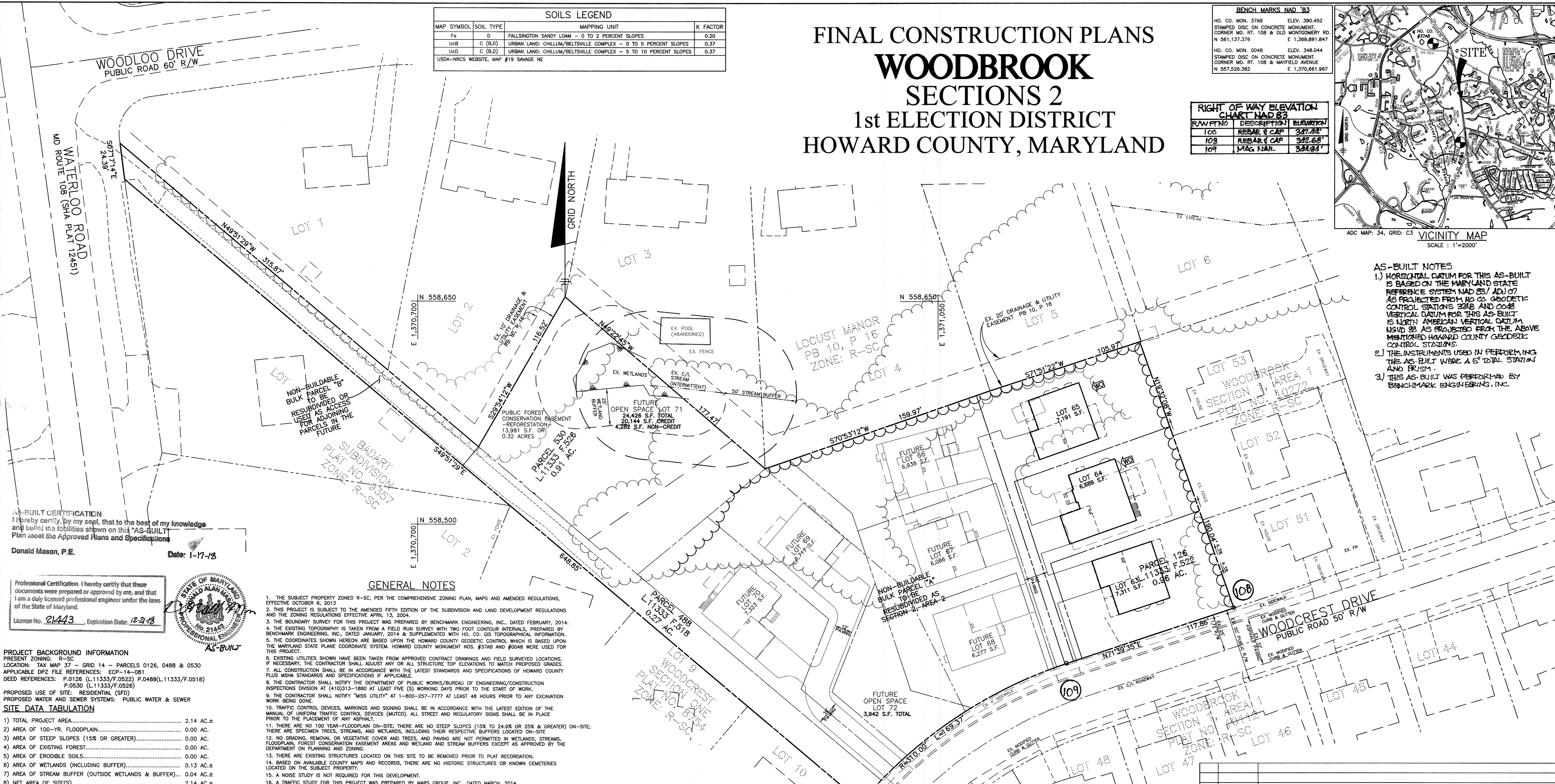
BENCH MARKS NAD '83		
HO. CO. MON. 3748	ELEV. 390.452	
STAMPED DISC ON CONCRETE MONUMENT, CORNER MD. RT. 108 & OLD MONTGOMERY RD. N 561.137.378 E 1.369,891.847		
HO. CO. MON. 0048	ELEV. 348.044	
STAMPED DISC ON CONCRETE MONUMENT, CORNER MD. RT. 108 & WATFELD AVENUE N 557,526.362 E 1,370,661.967		

RIGHT OF WAY ELEVATION CHART NAD '83		
R/W PT NO	DESCRIPTION	ELEVATION
100	REBAR & CAP	327.22'
103	REBAR & CAP	342.65'
109	MAG NAIL	334.83'



ADC MAP: 34, GRID: C3 VICINITY MAP
SCALE: 1"=2000'

- AS-BUILT NOTES**
- HORIZONTAL DATUM FOR THIS AS-BUILT IS BASED ON THE MARYLAND STATE REFERENCE SYSTEM NAD 83 / ADJ 07 AS PROJECTED FROM NO. 02 GEODETIC CONTROL STATIONS 2048 AND 0048 VERTICAL DATUM FOR THIS AS-BUILT IS NORTH AMERICAN VERTICAL DATUM NGVD 88 AS PROJECTED FROM THE ABOVE MENTIONED HOWARD COUNTY GEODETIC CONTROL STATIONS.
 - THE INSTRUMENTS USED IN PERFORMING THE AS-BUILT WERE A TOTAL STATION AND PRISM.
 - THIS AS-BUILT WAS PERFORMED BY BENCHMARK ENGINEERING, INC.



AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications.
Donald Mason, P.E. Date: 1-17-13

Professional Certification I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443 Expiration Date: 12-21-13

PROJECT BACKGROUND INFORMATION
PRESENT ZONING: R-SC - PARCELS 0126, 0488 & 0530
LOCATION: TAX MAP 37 - GRID 14 - PARCELS 0126, 0488 & 0530
APPLICABLE DPZ FILE REFERENCES: ECP-14-081
DEED REFERENCES: P.0126 (L.11333/F.0522) P.0488(L.11333/F.0518) P.0530 (L.11333/F.0526)
PROPOSED USE OF SITE: RESIDENTIAL (SPD)
PROPOSED WATER AND SEWER SYSTEMS: PUBLIC WATER & SEWER

SITE DATA TABULATION

1) TOTAL PROJECT AREA.....	2.14 AC.±
2) AREA OF 100-YR. FLOODPLAIN.....	0.00 AC.±
3) AREA OF STEEP SLOPES (15% OR GREATER).....	0.00 AC.±
4) AREA OF EXISTING FOREST.....	0.00 AC.±
5) AREA OF ERODIBLE SOILS.....	0.00 AC.±
6) AREA OF WETLANDS (INCLUDING BUFFER).....	0.13 AC.±
7) AREA OF STREAM BUFFER (OUTSIDE WETLANDS & BUFFER).....	0.04 AC.±
8) NET AREA OF SITE(S).....	2.14 AC.±
9) NUMBER OF LOTS ALLOWED.....	4/AC.-8
10A) NUMBER OF RESIDENTIAL LOTS PROPOSED THIS PHASE.....	3
10B) NUMBER OF RESIDENTIAL LOTS PROPOSED TOTAL.....	8
11) AREA OF PLAN SUBMISSION.....	2.14 AC.±
12) APPROXIMATE LIMIT OF DISTURBANCE.....	1.44 AC.±
13) PRESENT ZONING DESIGNATION.....	R-SC
14) PROPOSED USES FOR THE SITE & STRUCTURES.....	RESIDENTIAL - SPD
15) MINIMUM LOT SIZE.....	6,000 S.F.
16) OPEN SPACE REQUIRED (25%/2.14AC).....	0.54 AC.±
17) OPEN SPACE TO BE PROVIDED (CREDITED).....	0.55 AC.±
18) OPEN SPACE PROVIDED FUTURE (TOTAL).....	0.55 AC.±
19) RECREATIONAL OPEN SPACE PROVIDED.....	N/A
20) RECREATIONAL OPEN SPACE REQUIRED.....	N/A
21) NUMBER OF PARKING SPACES REQUIRED.....	N/A
22) TOTAL NUMBER OF PARKING SPACES PROVIDED.....	N/A
23) BUILDING COVERAGE AREA (IMPERVIOUS).....	0.27 AC.±(±13%)
24) TOTAL IMPERVIOUS AREA.....	0.53 AC.±(±25%)

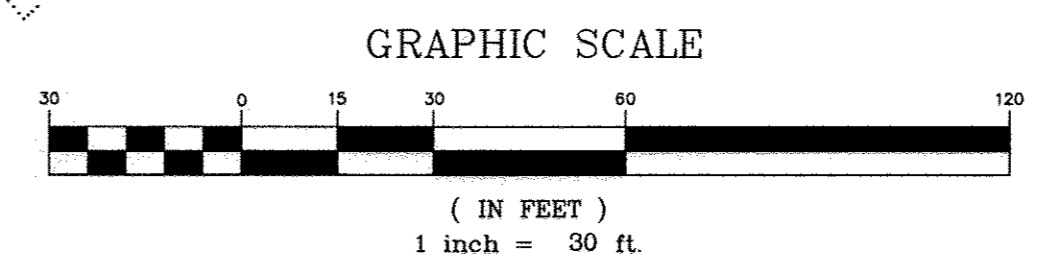
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Joseph P. Boudali 1/20/15
CHIEF, DEVELOPMENT ENGINEERING DIVISION
Koslow 1-23-15
CHIEF, DIVISION OF LAND DEVELOPMENT

GENERAL NOTES

- THE SUBJECT PROPERTY ZONED R-SC, PER THE COMPREHENSIVE ZONING PLAN, MAPS AND AMENDED REGULATIONS, EFFECTIVE OCTOBER 6, 2013.
- THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE ZONING REGULATIONS EFFECTIVE APRIL 13, 2004.
- THE BOUNDARY SURVEY FOR THIS PROJECT WAS PREPARED BY BENCHMARK ENGINEERING, INC., DATED FEBRUARY, 2014.
- THE EXISTING TOPOGRAPHY IS TAKEN FROM A FIELD RUN SURVEY WITH TWO FOOT CONTOUR INTERVALS, PREPARED BY BENCHMARK ENGINEERING, INC., DATED JANUARY, 2014 & SUPPLEMENTED WITH HO. CO. GS TOPOGRAPHICAL INFORMATION.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. #3748 AND #0048 WERE USED FOR THIS PROJECT.
- EXISTING UTILITIES SHOWN HAVE BEEN TAKEN FROM APPROVED CONTRACT DRAWINGS AND FIELD SURVEYED LOCATIONS. IF NECESSARY, THE CONTRACTOR SHALL ADJUST ANY OR ALL STRUCTURE TOP ELEVATIONS TO MATCH PROPOSED GRADES.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSMA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTIONS DIVISION AT (410)313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- THERE ARE NO 100 YEAR-FLOODPLAIN ON-SITE. THERE ARE NO STEEP SLOPES (15% TO 24.9% OR 25% & GREATER) ON-SITE. THERE ARE SPECIES TREES, STREAMS, AND WETLANDS, INCLUDING THEIR RESPECTIVE BUFFERS LOCATED ON-SITE.
- NO GRADING, REMOVAL OR VEGETATIVE COVER AND TREES, AND PAVING ARE NOT PERMITTED IN WETLANDS, STREAMS, FLOODPLAIN, FOREST CONSERVATION EASEMENT AREAS AND WETLAND AND STREAM BUFFERS EXCEPT AS APPROVED BY THE DEPARTMENT OF PLANNING AND ZONING.
- THERE ARE EXISTING STRUCTURES LOCATED ON THIS SITE TO BE REMOVED PRIOR TO PLAT RECORDATION.
- BASED ON AVAILABLE COUNTY MAPS AND RECORDS, THERE ARE NO HISTORIC STRUCTURES OR KNOWN CEMETERIES LOCATED ON THE SUBJECT PROPERTY.
- A NOISE STUDY IS NOT REQUIRED FOR THIS DEVELOPMENT.
- A TRAFFIC STUDY FOR THIS PROJECT WAS PREPARED BY MARS GROUP, INC., DATED MARCH, 2014.
- THIS SITE IS WITHIN THE METROPOLITAN DISTRICT; WATER & SEWER IS PUBLIC, CONNECTING INTO EXISTING CONTRACT #14-3057-0; THE DRAINAGE AREA IS THE LOWER NORTH BRANCH PATAPSCO RIVER WATERSHED.
- ADEQUATE SITE DISTANCE IS AVAILABLE AT THE ENTRANCE BASED ON FIELD VERIFICATION. THIS PROJECT IS SUBJECT TO A SIGN AND SIGNAGE PLAN TO BE PREPARED AND SUBMITTED WITH THIS PLAN SUBMISSION.
- A GEOTECHNICAL REPORT FOR THIS PROJECT WAS PREPARED BY HELLIS-CARNES ENGINEERING ASSOCIATES, INC., DATED AUGUST 8, 2014.
- THERE ARE WETLANDS LOCATED ON-SITE AS OUTLINED IN THE WETLANDS DELINEATION REPORT PREPARED BY ECO-SCIENCE PROFESSIONAL, INC. DATED JUNE 8, 2014.
- LANDSCAPING FOR THIS SUBDIVISION IS PROVIDED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. THE FUTURE OBLIGATION FOR SECTION 2, PHASE 2 WILL BE DETERMINED IN ACCORDANCE WITH THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL AT THE TIME OF THE FUTURE DEVELOPMENT. FINANCIAL SURETY IN THE AMOUNT OF \$1,650.00 (\$300 FOR EACH OF THE 4 TREES, \$150 FOR EACH OF THE 3 EVERGREENS AND \$30 FOR EACH OF THE 6 SHRUBS) FOR THE REQUIRED PERIMETER LANDSCAPING SHALL BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT.
- A PRIVATE RANGE OF ADDRESS SIGN ASSEMBLY SHALL BE FABRICATED AND INSTALLED BY HOWARD COUNTY BUREAU OF HIGHWAYS AT THE DEVELOPERS/OWNERS EXPENSE. CONTACT HOWARD COUNTY TRAFFIC DIVISION ST 41-031305752 FOR DETAILS AND COST ESTIMATES.
- REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE HOWARD COUNTY ZONING REGULATIONS SHALL OCCUR AT THE SUBDIVISION AND/OR SITE DEVELOPMENT PLAN STAGES. THEREFORE, THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED COMMENTS (INCLUDING THOSE THAT MAY ALTER OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES.
- THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION WILL BE FULFILLED BY PROVIDING 0.32 ACRES OF REFORESTATION ON THIS SITE. THE TOTAL FOREST CONSERVATION OBLIGATION HAS BEEN MET BY THIS PLAN BY THE ON-SITE REFORESTATION OF 0.32 AC. WITHIN A FOREST CONSERVATION EASEMENT. FINANCIAL SURETY IN THE AMOUNT OF \$10,454.40 FOR THE PLANTING IS TO BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT. THE PURPOSE OF NON-BUILDABLE BULK PARCEL "A" IS TO BE THE FUTURE PHASE 2 DEVELOPMENT. THE PURPOSE OF NON-BUILDABLE BULK PARCEL "B" IS TO PROVIDE ACCESS AND/OR LOT AREA FOR POTENTIAL RESUBDIVISION OF ADJOINING LOTS.
- TRASH COLLECTION: TRASH COLLECTION FOR THIS SUBDIVISION SHALL BE AT THE INTERSECTION OF THE PRIVATE DRIVEWAY AND THE PUBLIC ROAD.
- THE TOTAL OPEN SPACE OBLIGATION OF 0.54 ACRES WILL BE PROVIDED AT THE TIME OF THE FUTURE SUBDIVISION OF NON-BUILDABLE BULK PARCEL "A". THE OPEN SPACE LOT SHALL BE PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
- THIS PROJECT REQUIRES MANAGEMENT OF THE 10 YEAR (Q0) AND 100 YEAR (Q1) EVENTS DUE TO BEING WITHIN THE WATERSHED OF DEEP RUN ABOVE ANY RAILROAD CROSSING, AS REQUIRED BY DESIGN MANUAL VOLUME III, SECTION 5.2.1.A. FINAL PLANS SHALL SHOW THE CONTROL OF THESE MANAGEMENT VOLUMES. STORMWATER MANAGEMENT WILL BE PROVIDED IN ACCORDANCE WITH THE STORMWATER MANAGEMENT ACT OF 2007. ENVIRONMENTAL SITE DESIGN (ESD) HAS BEEN COMPLETED BY THE USE OF MICRO-BIORETENTION (M-8), LANDSCAPE INFILTRATION (M-3), AND DRY WELL (M-5) FACILITIES. ALL ECP PRACTICES SHALL BE PRIVATELY OWNED AND MAINTAINED BY THE OWNERS OR THE H.O.A. ECP-14-081 WAS APPROVED FOR THIS PARCEL ON 1-9-15.
- TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERY LOCATIONS ON THESE LOTS.
- THERE ARE NO HISTORIC SITES/FEATURES LOCATED ON THESE LOTS.
- ON JUNE 8, 2015, WP-15-140 WAS APPROVED BY THE DEPARTMENT OF PLANNING AND ZONING. THE FOLLOWING SECTIONS OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS WERE WAIVED: SECTION 16.1210(j)(2), 16.1210(i)(1), 16.144(b) & 16.145, 16.144(g) & 16.146 AND 16.1205(g)(7). APPROVAL IS SUBJECT TO THE FOLLOWING CONDITIONS:
 - THE PETITIONER MUST RECEIVE APPROVAL OF F-15-096 WOODBROOK, SECTION 2, PHASE 1, TO CONSOLIDATE THE 3 PARCELS AND CREATE 3 BUILDABLE LOTS AND 2 NON-BUILDABLE BULK PARCELS.
 - ADD THE WAIVER PETITION, WP-15-140 ON F-15-096, SECTION 2, PHASE 1 AS GENERAL NOTE STATING THE REQUEST, THE APPROVAL DATE AND CONDITIONS IN WHICH IT WAS APPROVED.
 - A NOTE SHALL BE PROVIDED ON THE FINAL PLAN FOR F-15-096 AND THE SUPPLEMENTAL PLAN THAT THE 255 OPEN SPACE REQUIREMENT WILL BE TEMPORARILY DEFERRED UNDER SECTION 2, PHASE 1, F-15-096 AND WILL BE PROVIDED IN ITS ENTIRETY UNDER SECTION 2, PHASE 2 OF WOODBROOK.
 - A 12' ACCESS DRIVE WILL BE REQUIRED FOR THE OPEN SPACE ACCESS. A GENERAL NOTE SHOULD BE ADDED TO THE FINAL PLAN AND ALSO STATE THAT HOWARD COUNTY WILL NOT BE RESPONSIBLE FOR THE MAINTENANCE OF THE OPEN SPACE ACCESS DRIVE IF THE OPEN SPACE LOT IS DEDICATED TO HOWARD COUNTY.
 - SHOW THE 1 SPECIMEN TREE BEING REMOVED AND LABELED PER WP-15-140 ON THE SUPPLEMENTAL PLAN FOR F-15-096. THE SPECIMEN TREE REMOVAL SHALL BE MITIGATED BY THE PLANTING OF 2 PERIMETER SHADE TREES OF 3" CALIPER.
 - PETITIONER SHALL ADDRESS ALL COMMENTS FROM ALL SRC AGENCIES FOR F-15-096.
 - COMPLY WITH ALL COMMENTS FOR THE APPROVED ECP-14-081.
 - A PRIVATE RANGE OF ADDRESS SIGN SHALL BE FABRICATED AND INSTALLED BY HOWARD COUNTY BUREAU OF HIGHWAYS AT THE DEVELOPERS/OWNERS EXPENSE. CONTACT HOWARD COUNTY TRAFFIC DIVISION AT 410-313-5752 FOR DETAILS AND COST ESTIMATES.

APPROVED: DEPARTMENT OF PUBLIC WORKS
McNamee 1/18/2015
CHIEF, BUREAU OF HIGHWAYS

PLAN VIEW



SHEET INDEX	
NO.	DESCRIPTION
1	COVER SHEET
2	GRADING AND SEDIMENT & EROSION CONTROL PLAN
3	SEDIMENT AND EROSION CONTROL NOTES AND DETAILS
4	STORM DRAIN DRAINAGE AREA MAP
5	STORM DRAIN PROFILES, NOTES & DETAILS AND TRAFFIC CONTROL PLAN
6	STORMWATER MANAGEMENT DRAINAGE AREA MAP
7	STORMWATER MANAGEMENT NOTES AND DETAILS
8	STORMWATER MANAGEMENT NOTES AND BORINGS LOGS
9	LANDSCAPE PLAN, NOTES AND DETAILS
10	FOREST CONSERVATION PLAN, NOTES AND DETAILS

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
ENGINEERS • LAND SURVEYORS • PLANNERS
8480 BALTIMORE NATIONAL PIKE • SUITE 315
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644
www.benchmark-engineering.com

PROFESSIONAL CERTIFICATION:
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 45577; Expiration Date: 06-08-2016

OWNER: JOHN R. & CHARLES E. NEIGHOFF, ET AL
4936 WHARFF ROAD
ELLCOTT CITY, MARYLAND 21043

DEVELOPER: SECURITY DEVELOPMENT, LLC
P.O. BOX 417
ELLCOTT CITY, MARYLAND 21041
410-465-4244

PROJECT: WOODBROOK SECTION 2, PHASE 1
LOTS 63-65 AND NON-BUILDABLE PARCELS "A" AND "B"

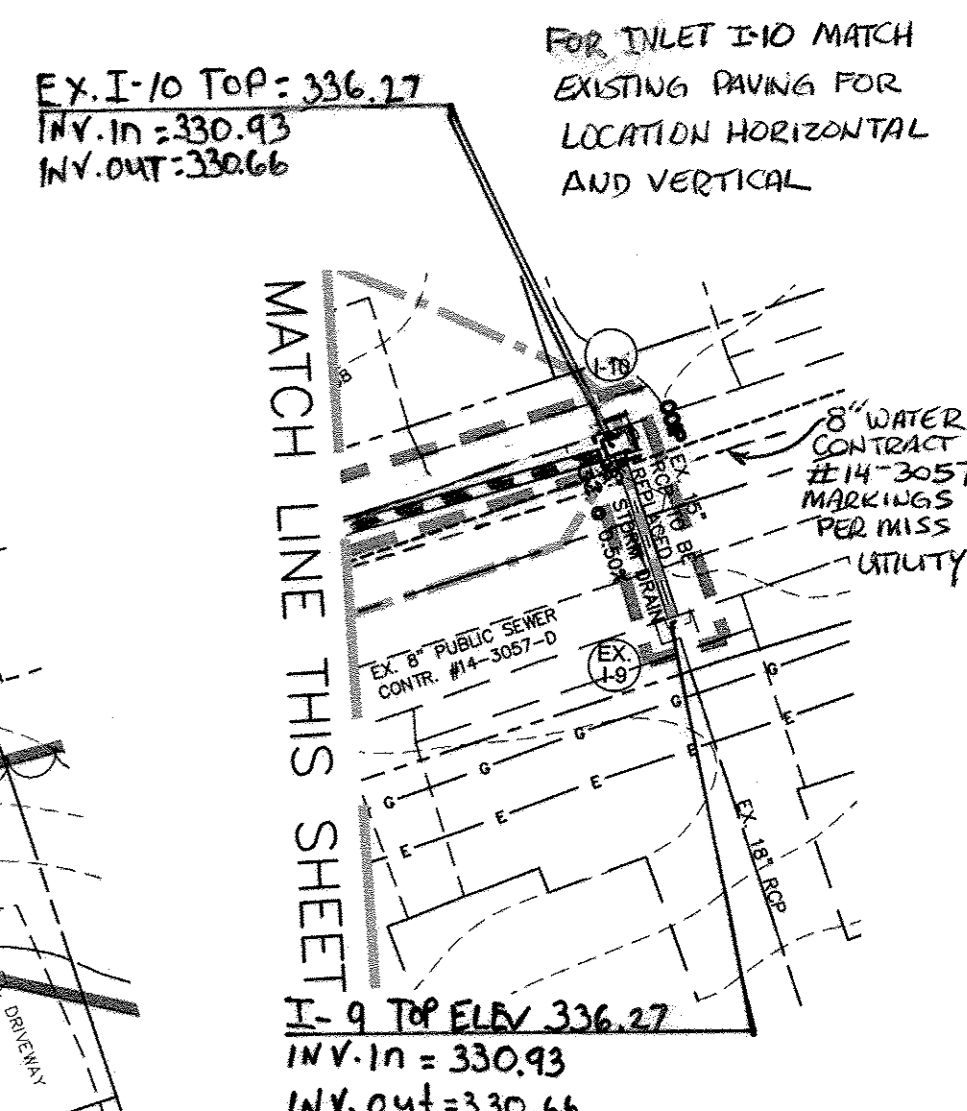
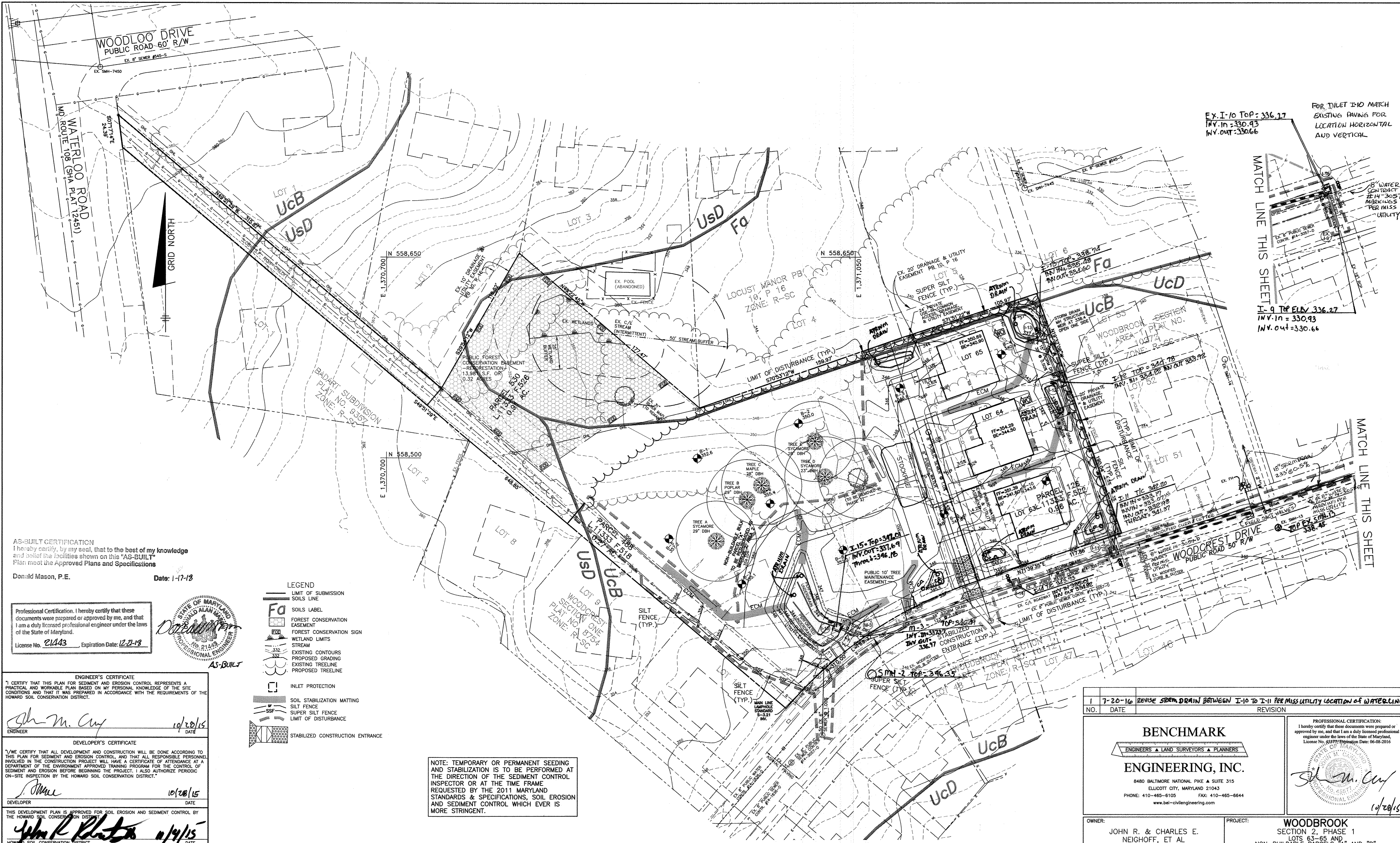
LOCATION: TAX MAP 37, GRID 14
PARCELS 126, 488 AND 530
1st ELECTION DISTRICT
6201 E. WATERLOO ROAD & 6247 WOODCREST DRIVE
HOWARD COUNTY, MARYLAND

TITLE: COVER SHEET

DATE: SEPTEMBER, 2015 PROJECT NO. 2370
OCTOBER, 2015

SCALE: AS SHOWN DRAWING 1 OF 10

Design: jc Draft: jc Check: -



AS-BUILT CERTIFICATION
 I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications

Donald Mason, P.E. Date: 1-17-13

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 21443 Expiration Date: 12-2-13



ENGINEER'S CERTIFICATE
 I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

John M. Cuy 10/20/15
 ENGINEER DATE

DEVELOPER'S CERTIFICATE
 I HEREBY CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SOIL EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

John R. Khaton 10/20/15
 DEVELOPER DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

John R. Khaton 11/19/15
 HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Joseph D. Daniels 11/20/15
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Kathy D. Owen 11-23-15
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

- LEGEND**
- LIMIT OF SUBMISSION SOILS LINE
 - Fa SOILS LABEL
 - FOREST CONSERVATION EASEMENT
 - FOREST CONSERVATION SIGN
 - WETLAND LIMITS
 - STREAM
 - 332 EXISTING CONTOURS
 - 332 PROPOSED GRADING
 - EXISTING TREELINE
 - PROPOSED TREELINE
 - INLET PROTECTION
 - SOIL STABILIZATION MATTING
 - SILT FENCE
 - SUPER SILT FENCE
 - LIMIT OF DISTURBANCE
 - STABILIZED CONSTRUCTION ENTRANCE

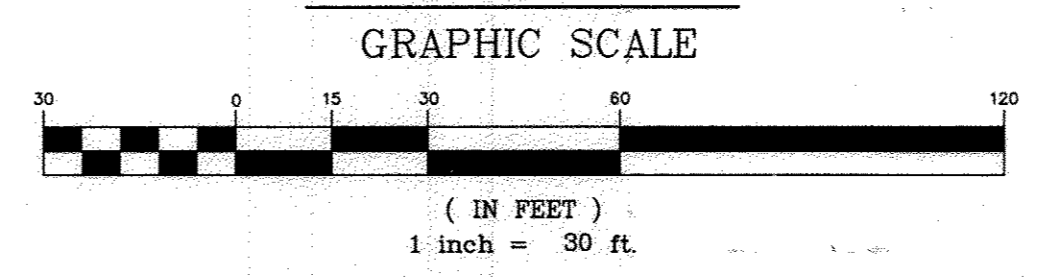
NOTE: TEMPORARY OR PERMANENT SEEDING AND STABILIZATION IS TO BE PERFORMED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR OR AT THE TIME FRAME REQUESTED BY THE 2011 MARYLAND STANDARDS & SPECIFICATIONS, SOIL EROSION AND SEDIMENT CONTROL WHICH EVER IS MORE STRINGENT.

SOILS LEGEND			
MAP SYMBOL	SOIL TYPE	MAPPING UNIT	K FACTOR
Fa	D	FALLSINGTON SANDY LOAM - 0 TO 2 PERCENT SLOPES	0.20
UcB	C (B,D)	URBAN LAND: CHILLUM/BELTSVILLE COMPLEX - 0 TO 5 PERCENT SLOPES	0.37
UcD	C (B,D)	URBAN LAND: CHILLUM/BELTSVILLE COMPLEX - 5 TO 10 PERCENT SLOPES	0.37
USDA-NRCS WEBSITE, MAP #19 SAVAGE NE			
* INDICATES HYDRIC SOILS			

APPROVED: DEPARTMENT OF PUBLIC WORKS

Michael 11/18/2015
 CHIEF, BUREAU OF HIGHWAYS DATE

PLAN VIEW



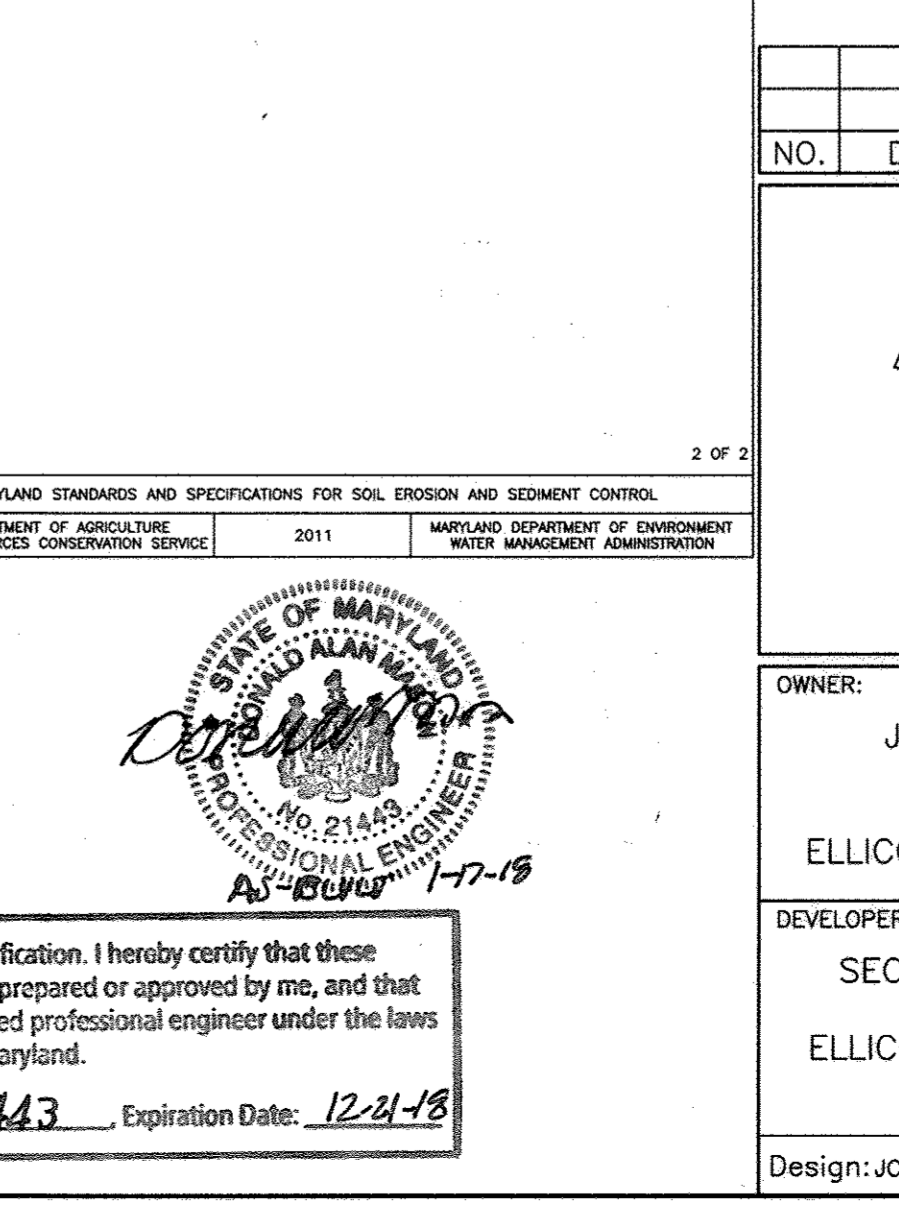
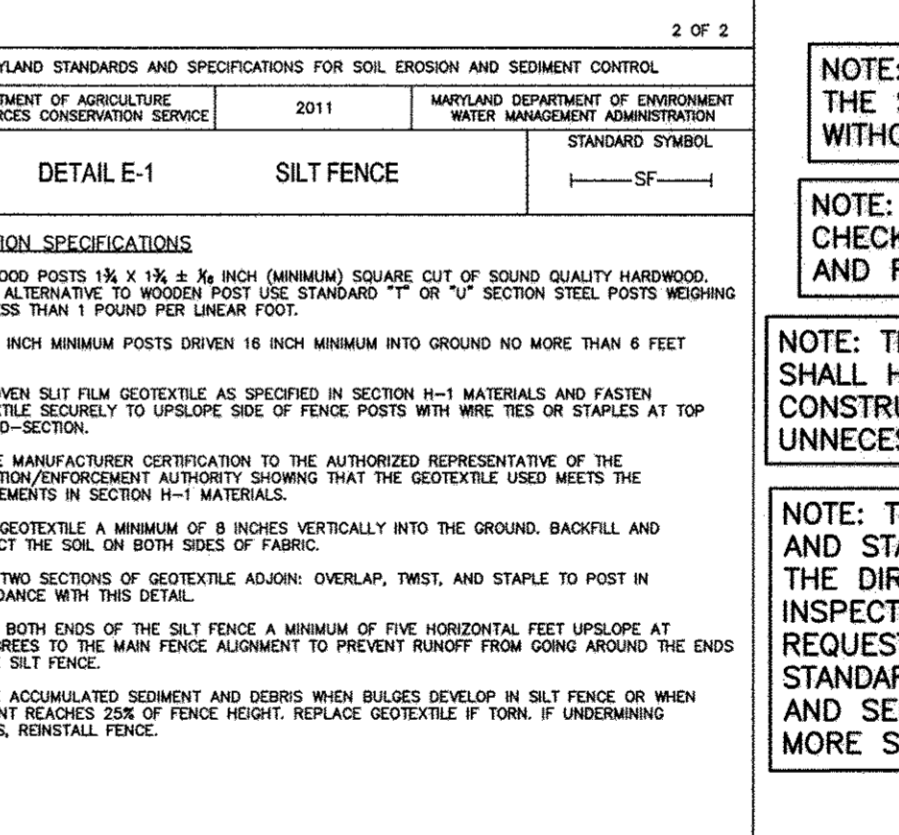
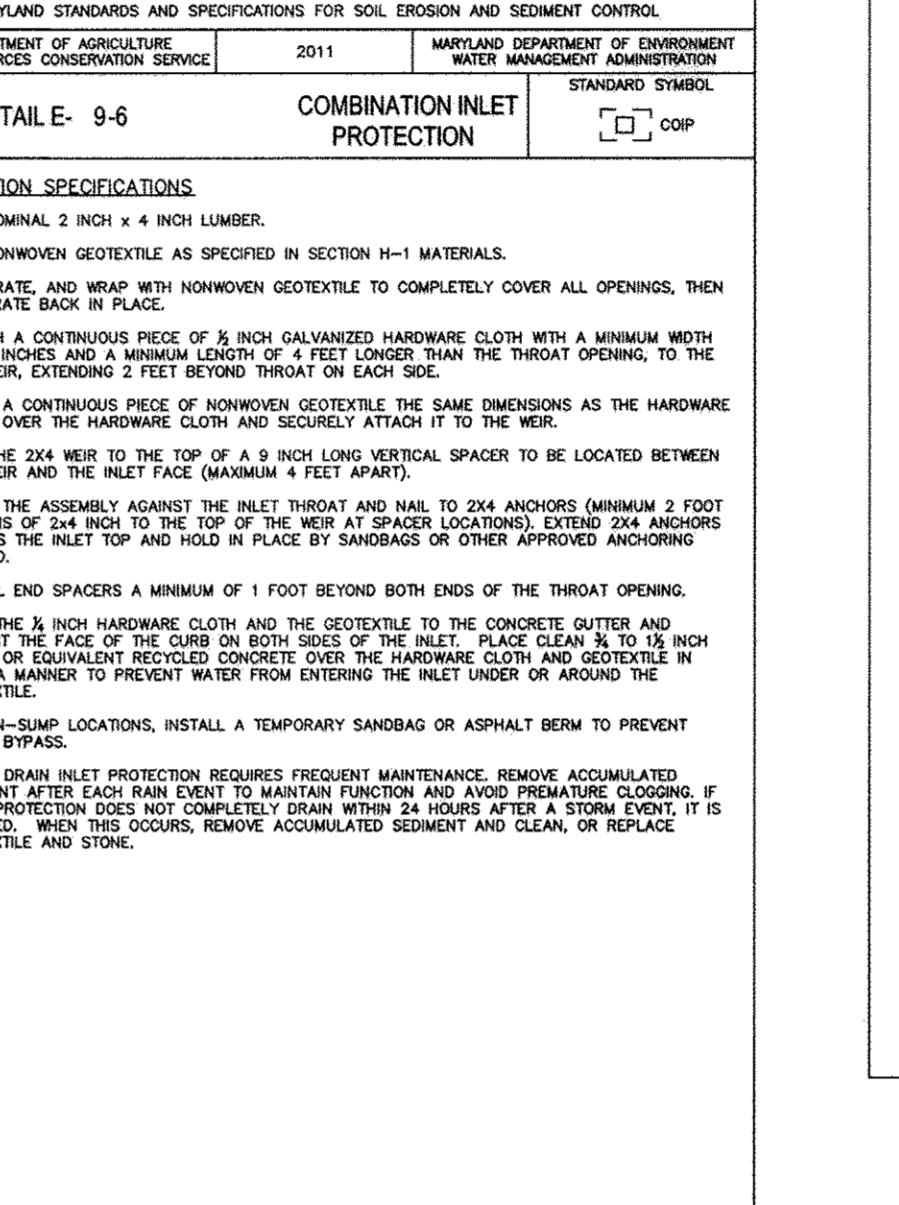
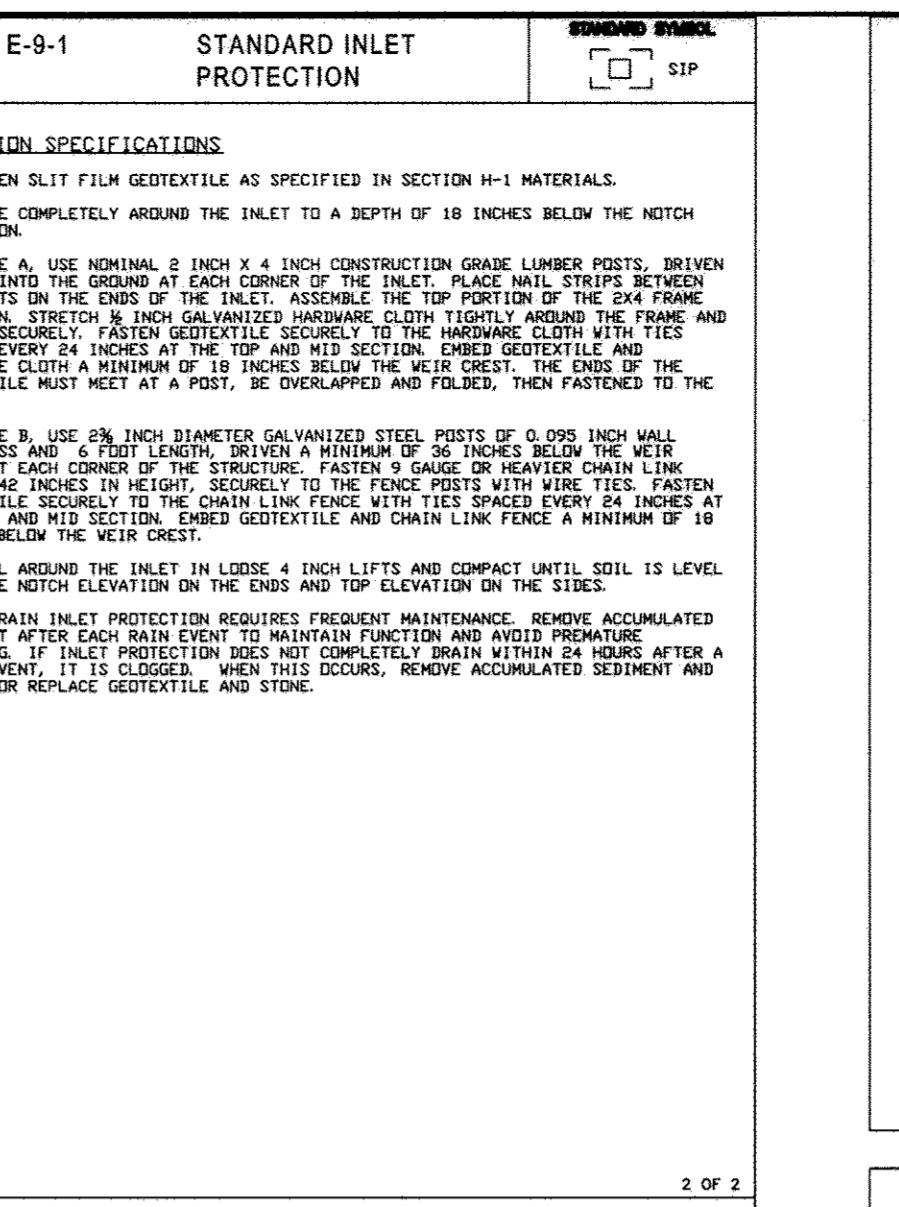
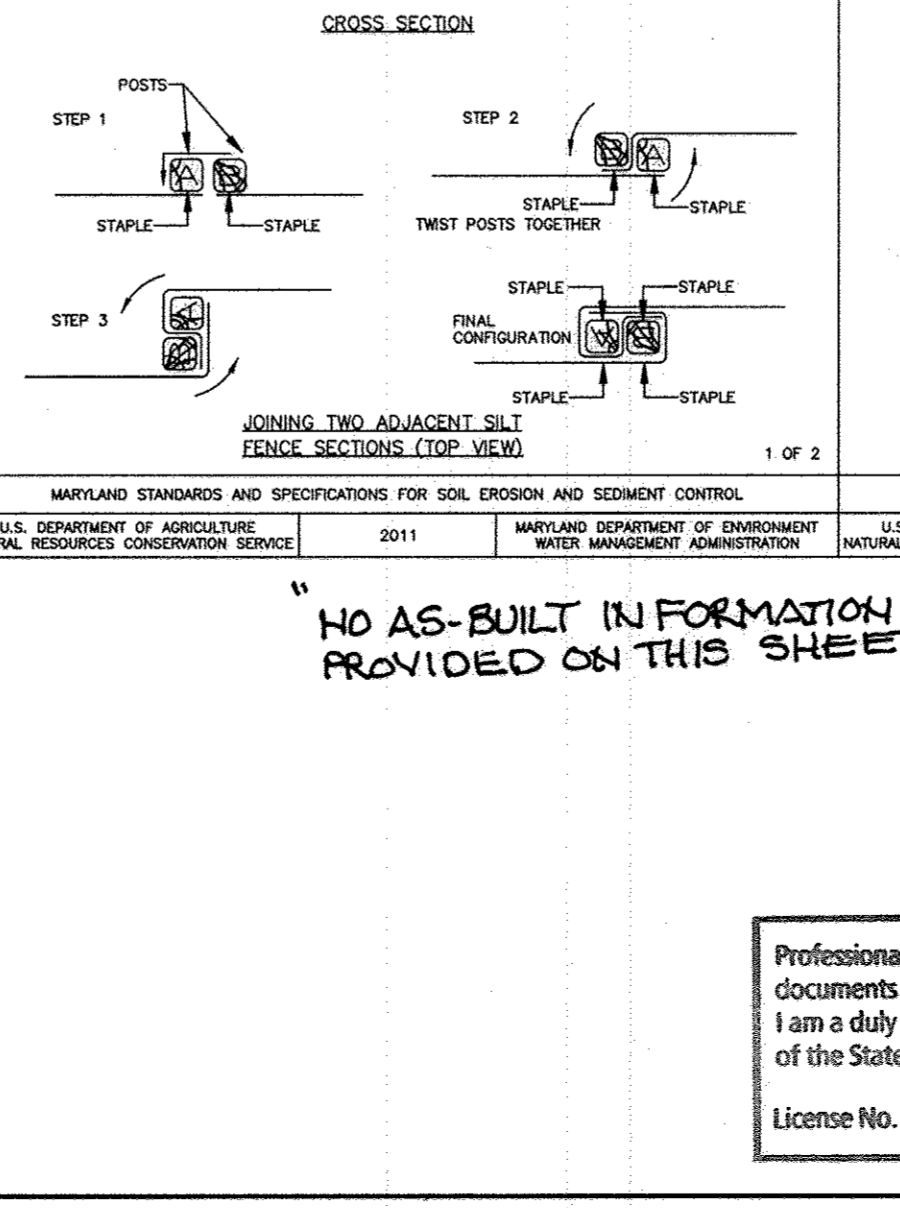
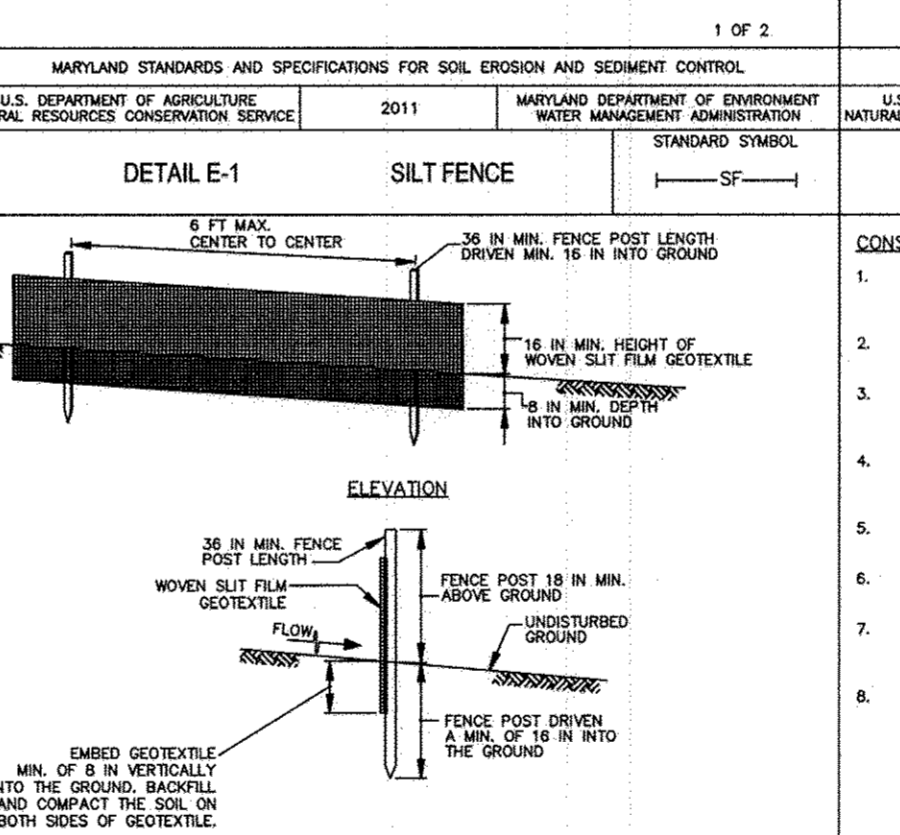
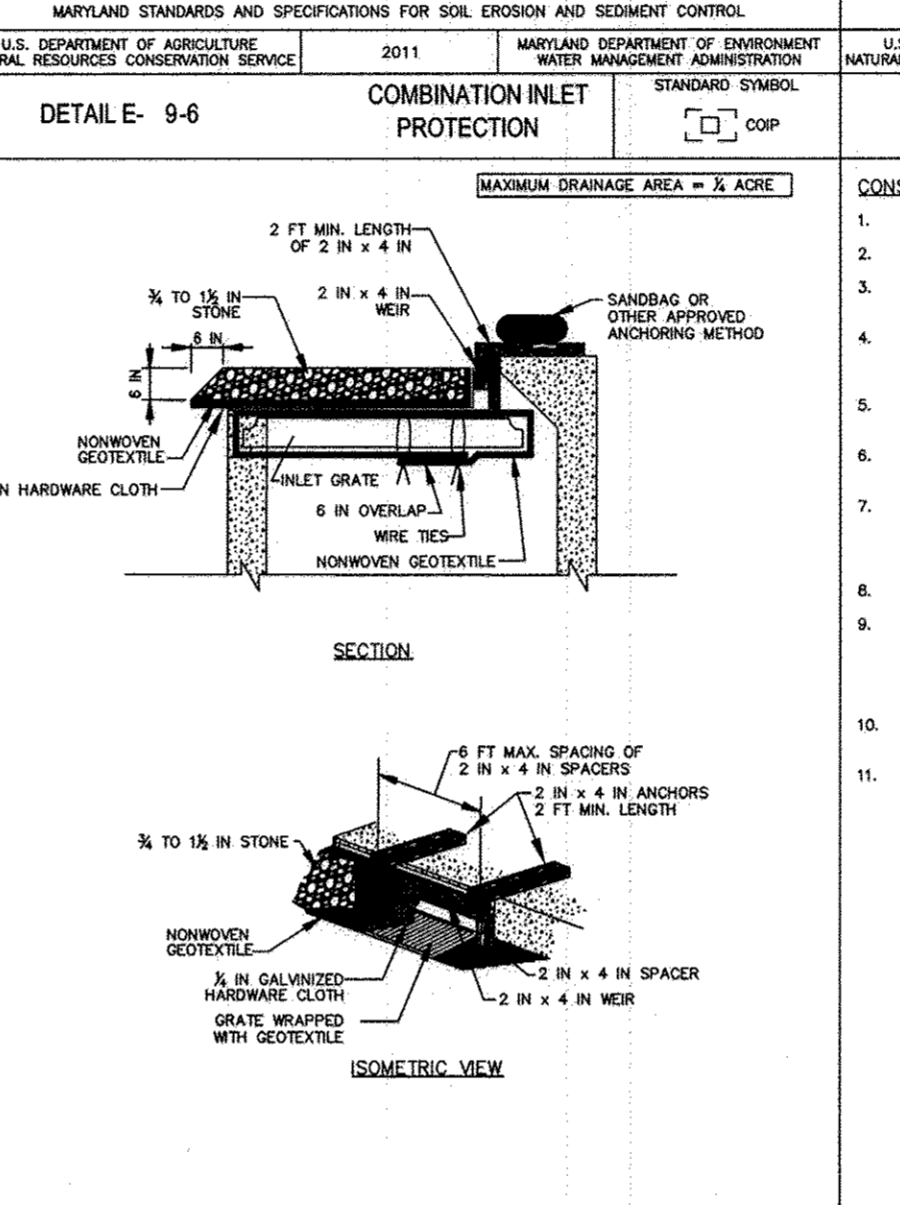
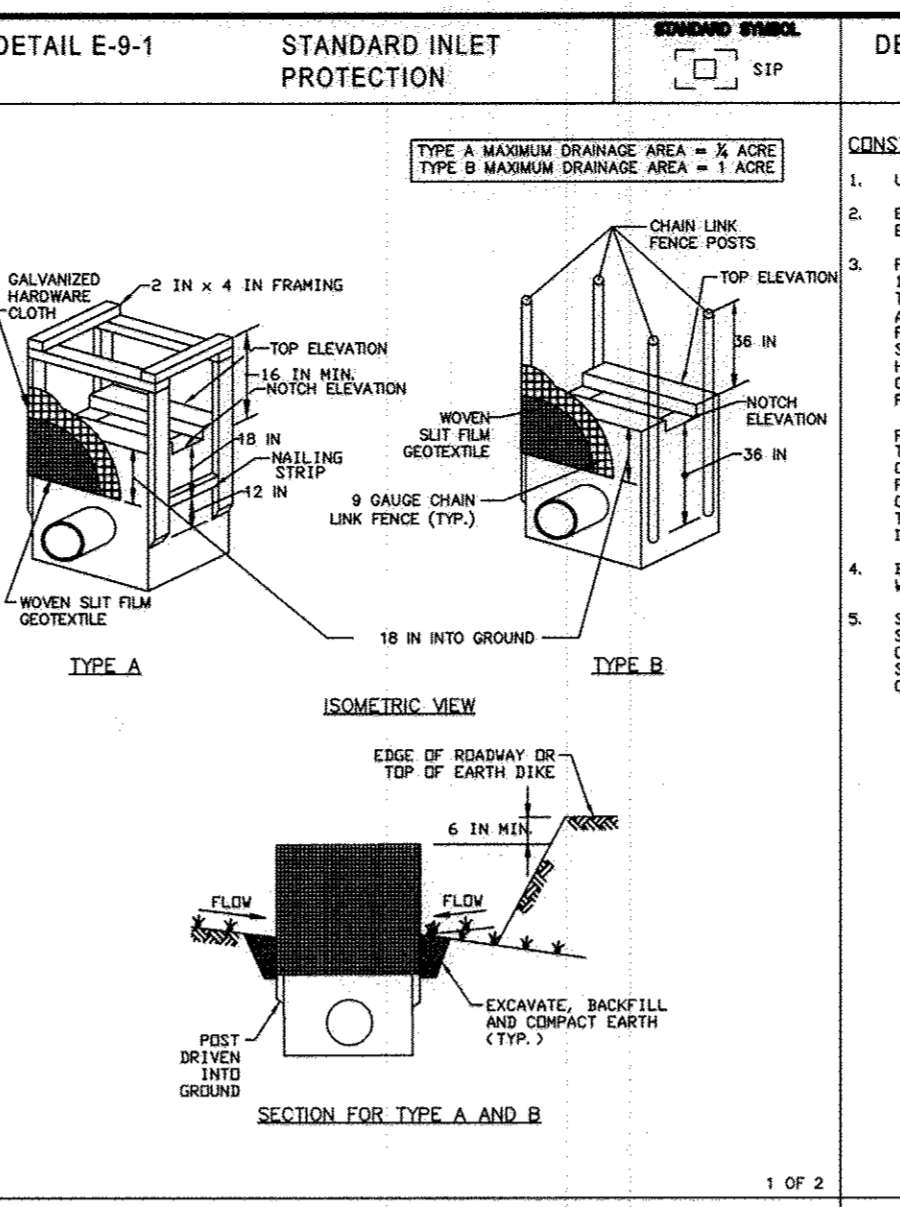
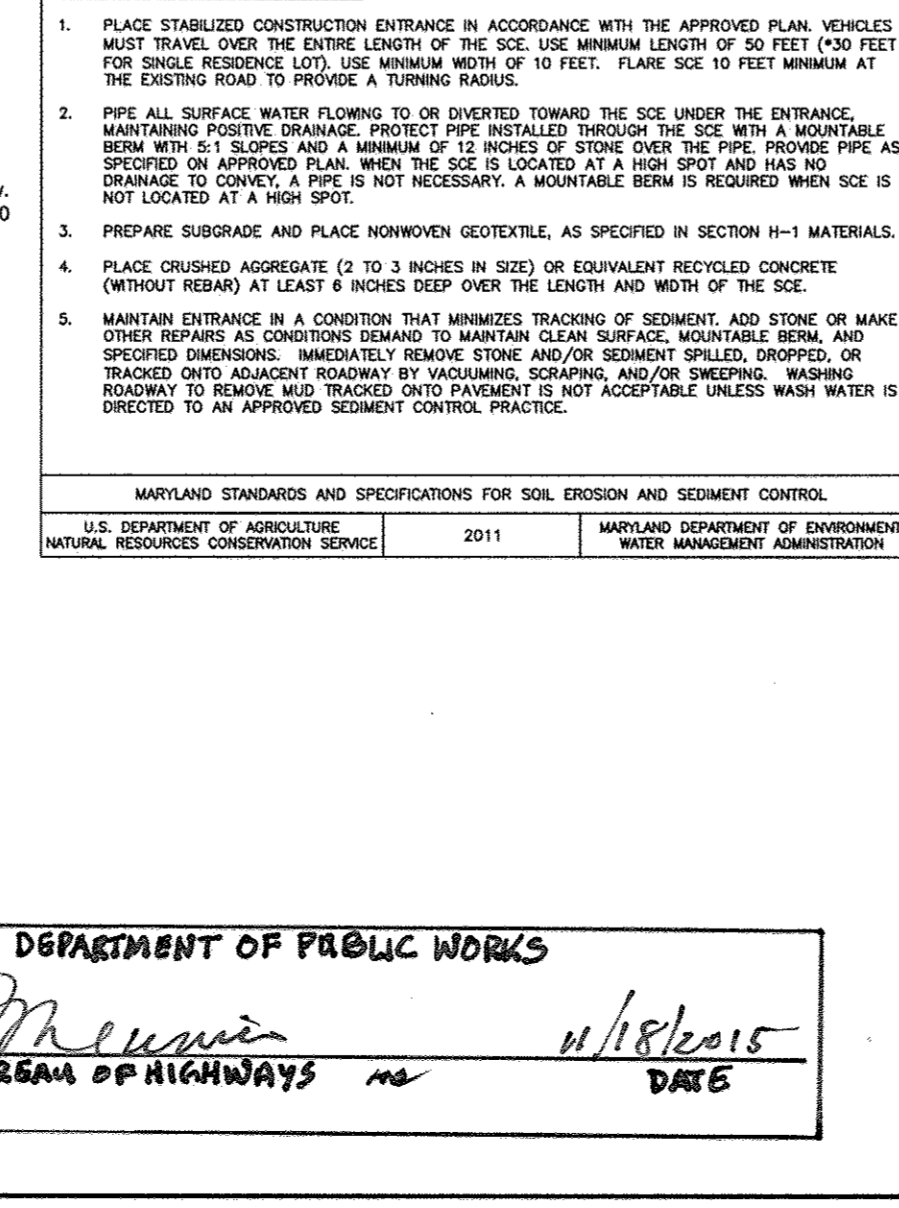
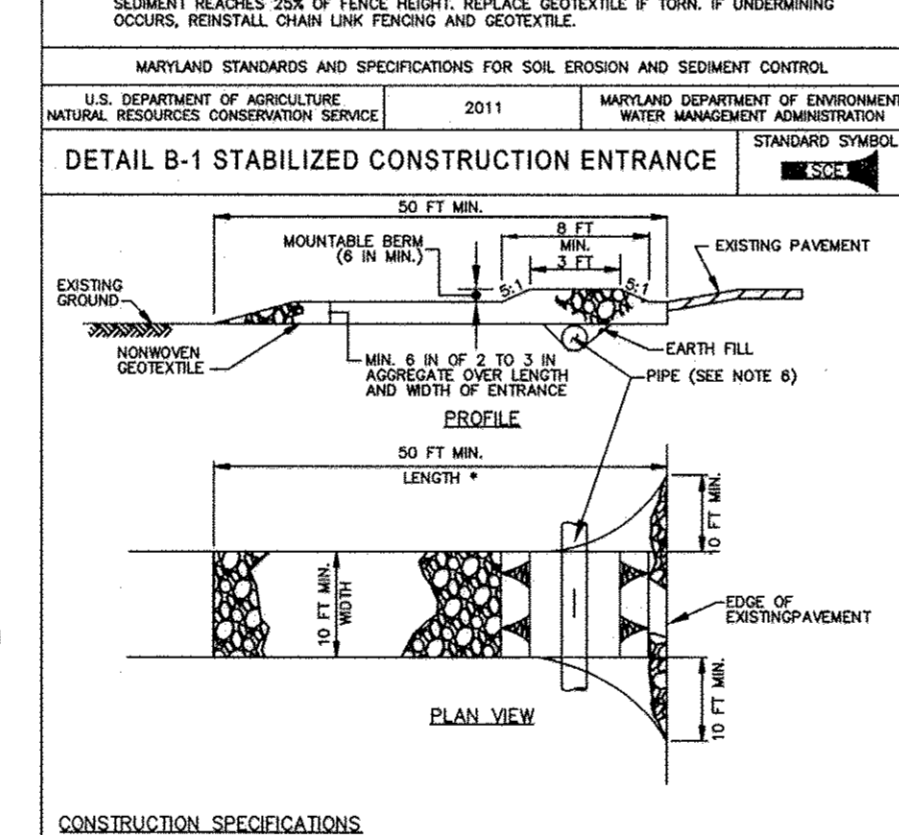
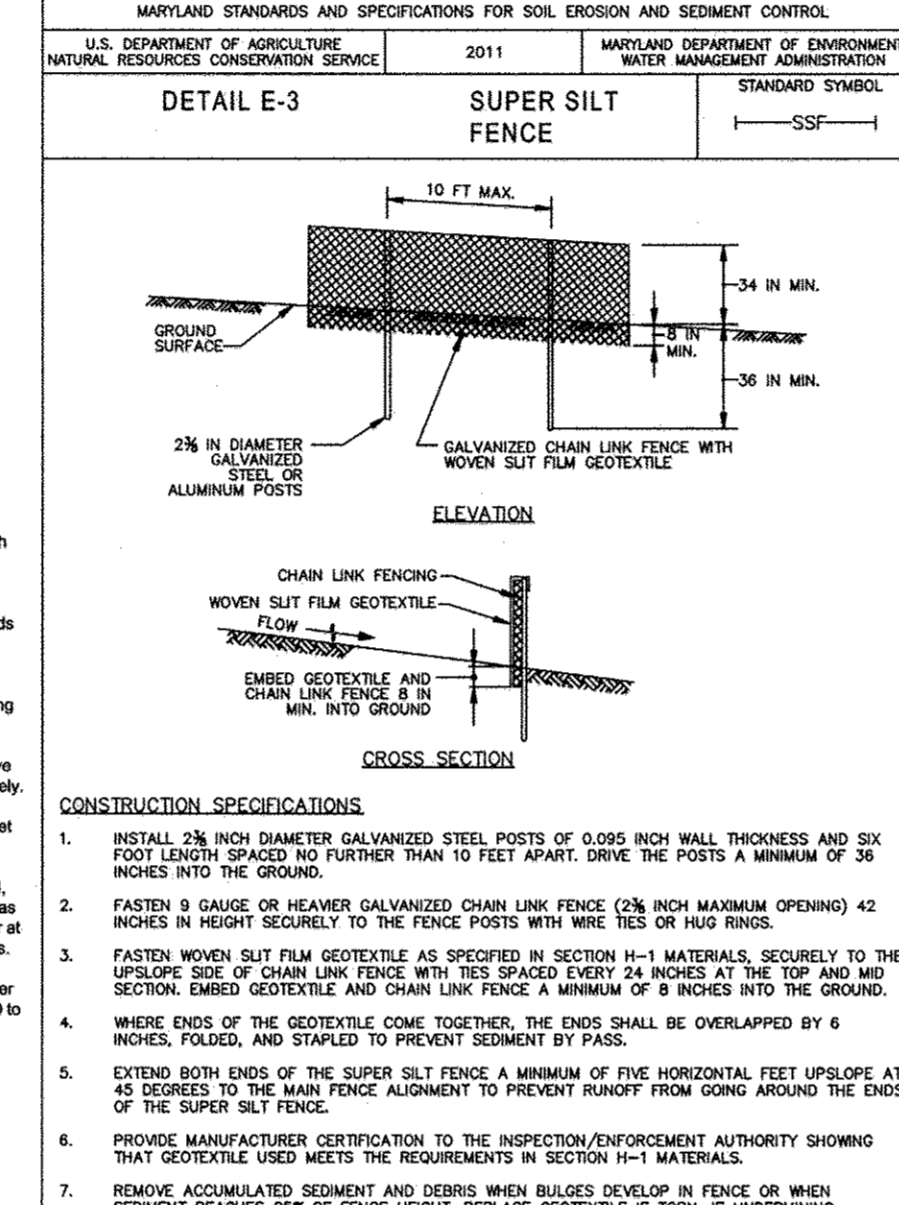
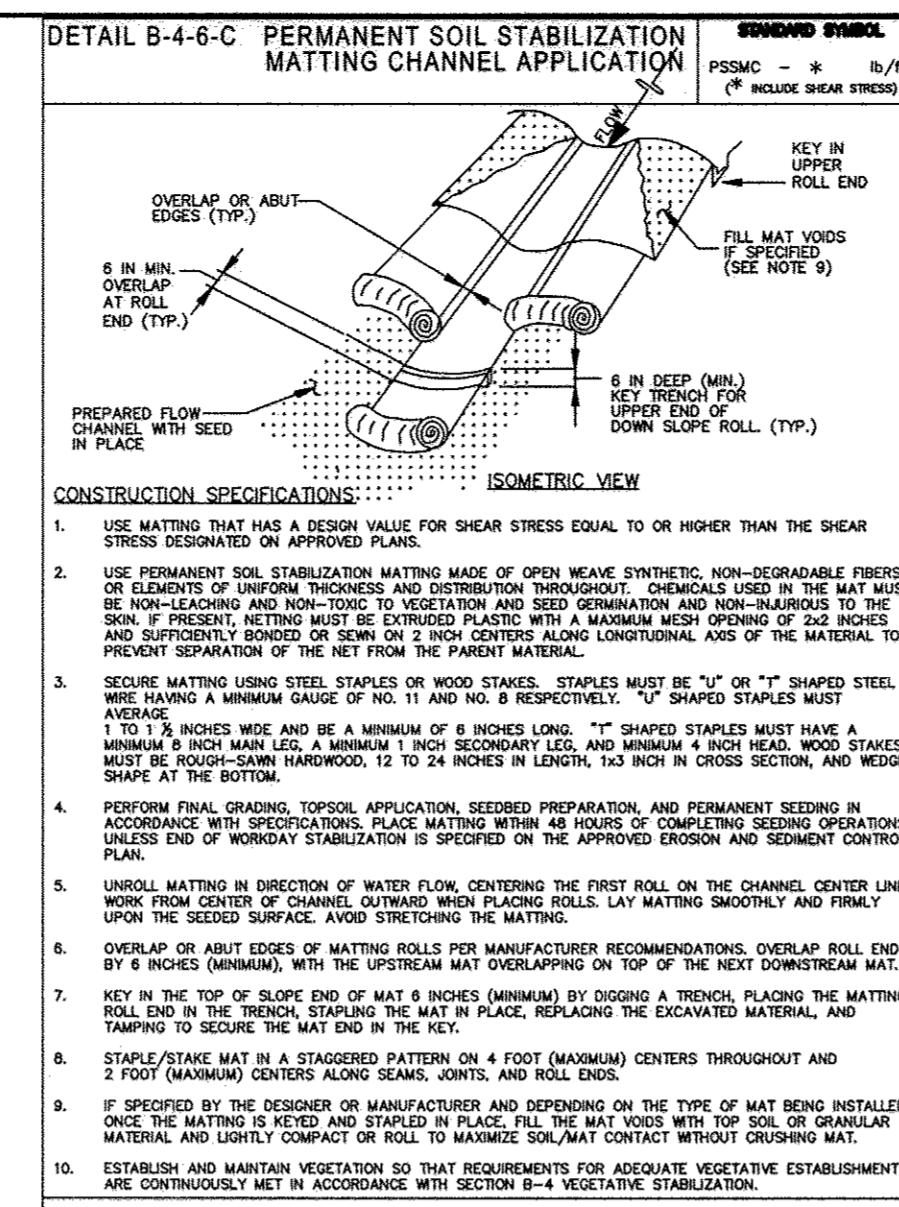
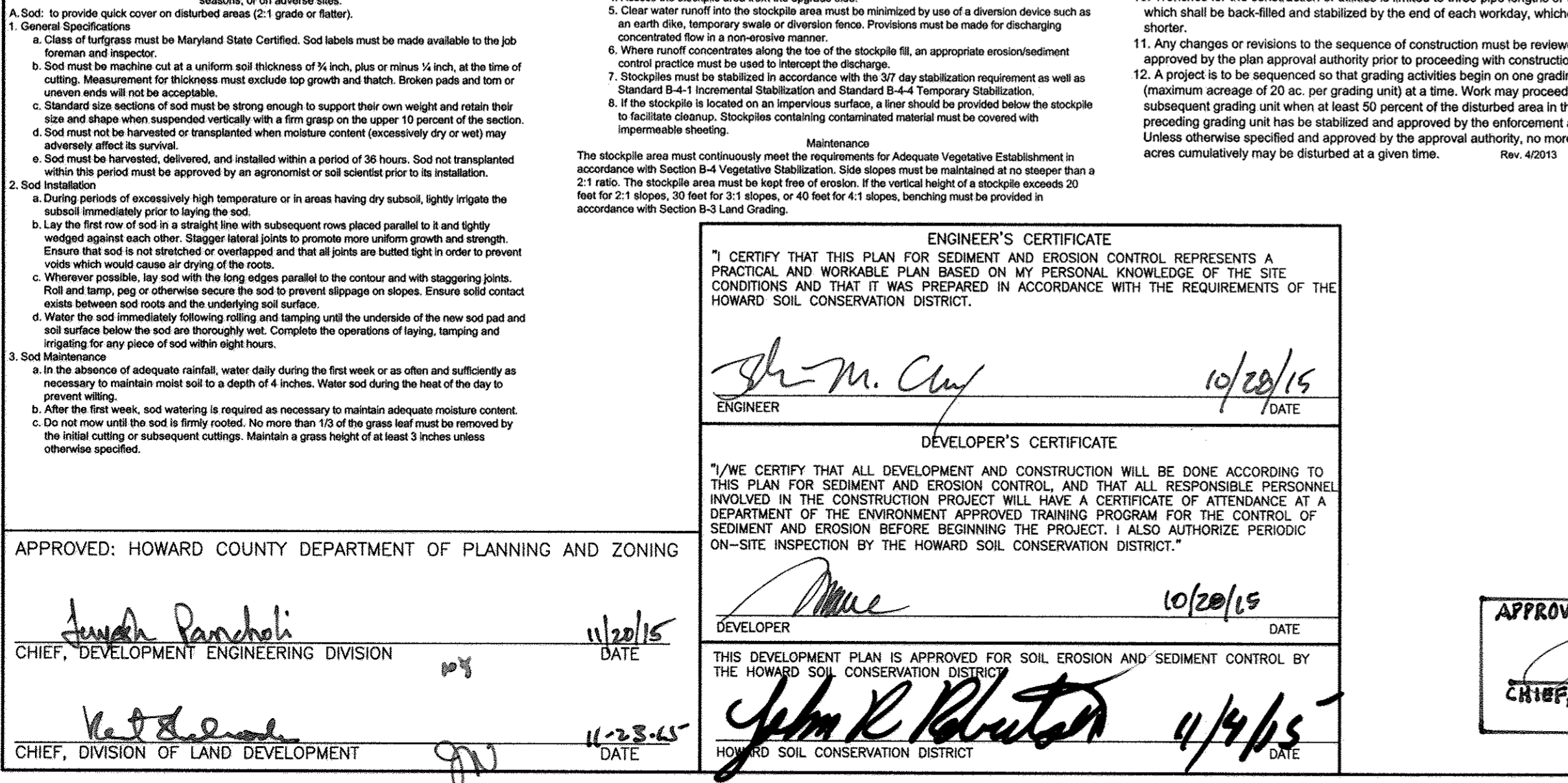
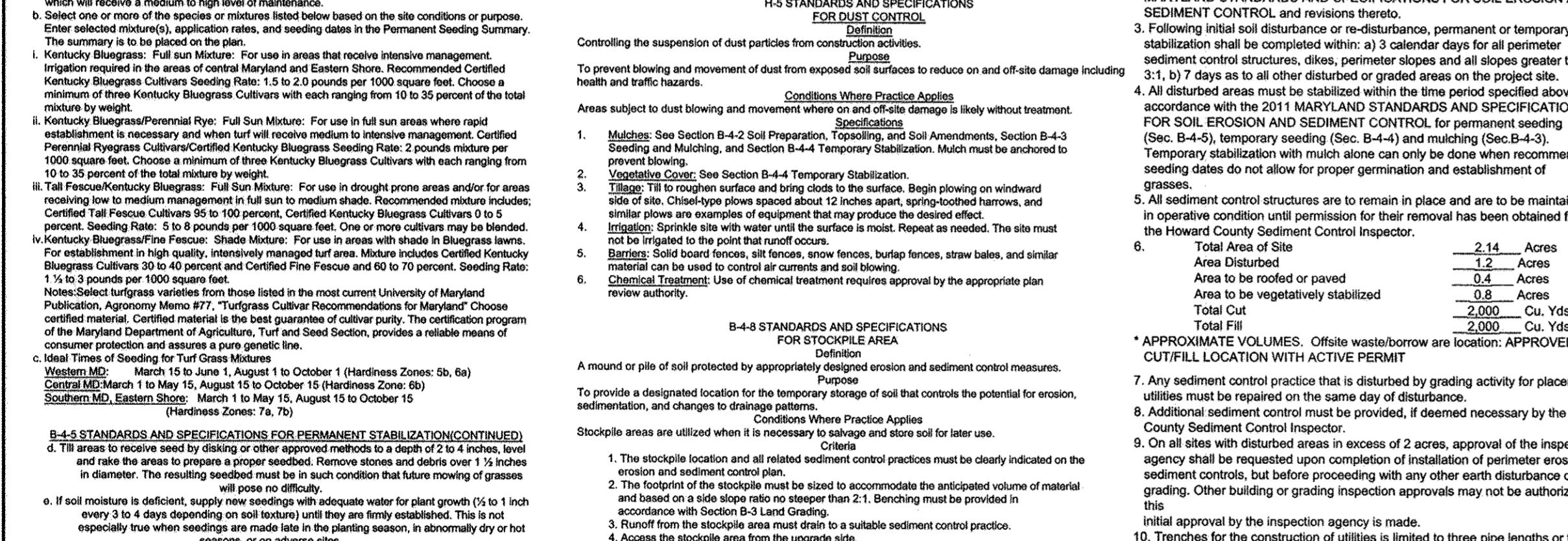
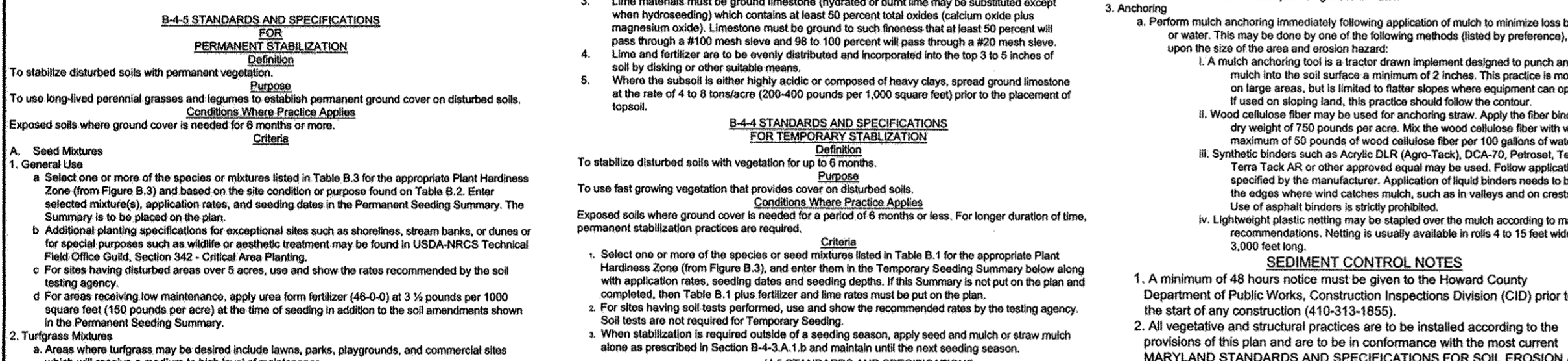
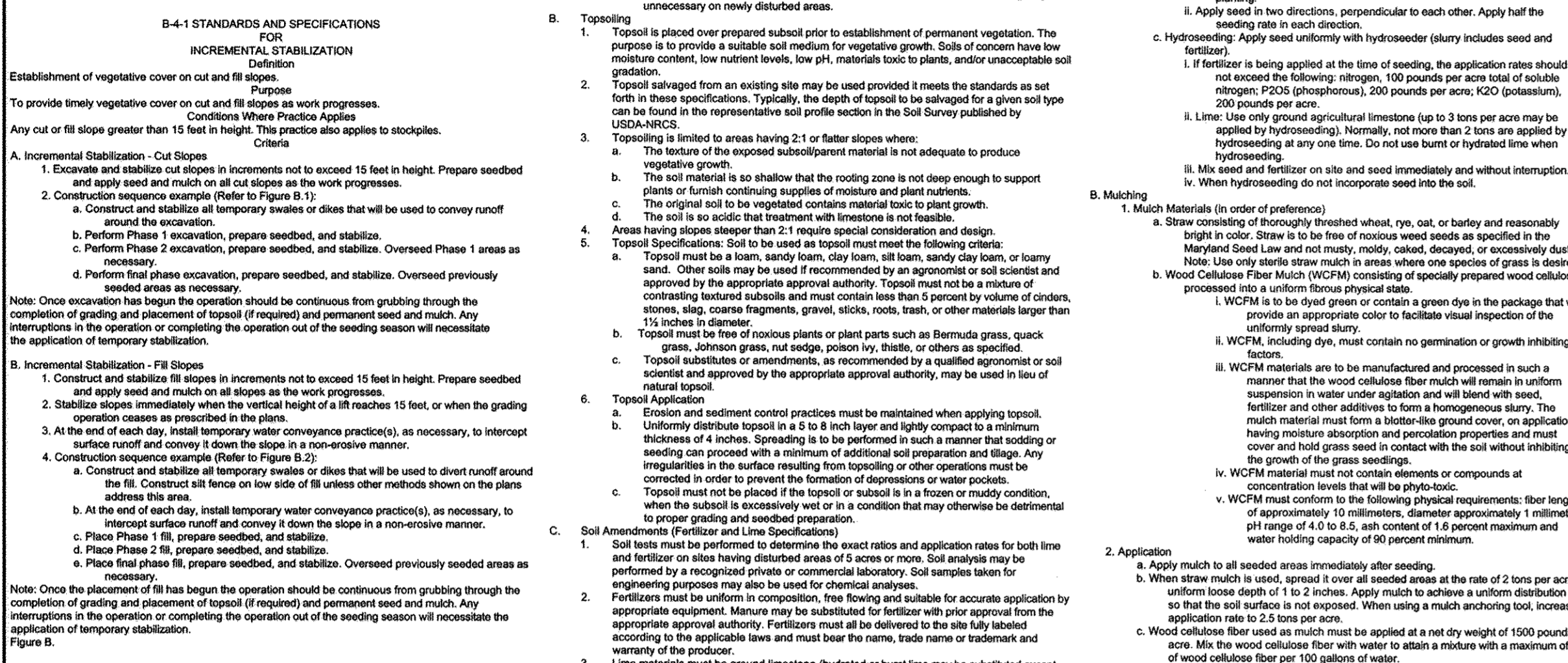
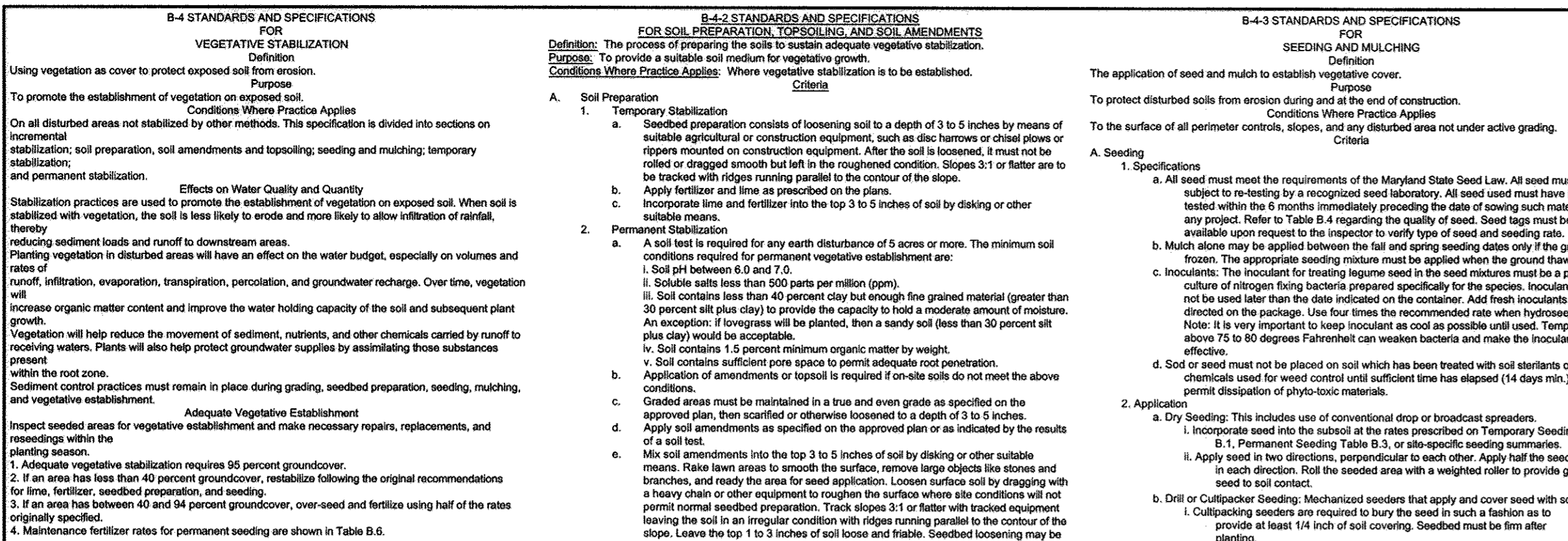
NO.	DATE	REVISION
1	7-20-16	REVISE SIDRM DRAIN BETWEEN I-10 TO I-11 PER MISS UTILITY LOCATION OF WATERLINE

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE & SUITE 315
 ELLICOTT CITY, MARYLAND 21043
 PHONE: 410-465-6105 FAX: 410-465-6644
 www.bei-civilengineering.com

PROFESSIONAL CERTIFICATION:
 I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 45577 Expiration Date: 06-08-2016

John M. Cuy 10/20/15
 PROFESSIONAL ENGINEER

OWNER: JOHN R. & CHARLES E. NEIGHOFF, ET AL 4936 WHARFF ROAD ELLICOTT CITY, MARYLAND 21043	PROJECT: WOODBROOK SECTION 2, PHASE 1 LOTS 63-65 AND NON-BUILDABLE PARCELS "A" AND "B"
DEVELOPER: SECURITY DEVELOPMENT, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244	LOCATION: 6201 E. WATERLOO ROAD & 6247 WOODCREST DRIVE HOWARD COUNTY, MARYLAND 1st ELECTION DISTRICT TAX MAP 37, GRID 14 PARCELS 126, 488 AND 530
DATE: OCTOBER, 2015	TITLE: GRADING AND SEDIMENT & EROSION CONTROL PLAN
DESIGN: jc	PROJECT NO. 2370
DRAFT: jc	SCALE: AS SHOWN
CHECK: -	DRAWING 2 OF 10



Plant Species	Seeding Rate ¹ lb/ac	Seeding Depth ² (inches)	Recommended Seeding Date by Plant Hardiness Zone ³			
			5b and 6a	6b	7a and 7b	8a and 8b
Cool-Season Grasses:						
Annual Ryegrass (<i>Lolium perenne</i>)	40	1.0	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 1 to Oct 15	Feb 15 to Apr 30; Aug 1 to Oct 15
Hard Fescue (<i>Festuca duriuscula</i>)	95	2.2	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 1 to Oct 15	Feb 15 to Apr 30; Aug 1 to Oct 15
Oats (<i>Avena sativa</i>)	72	1.7	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 1 to Oct 15	Feb 15 to Apr 30; Aug 1 to Oct 15
Wheat (<i>Triticum aestivum</i>)	120	2.8	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 1 to Oct 15	Feb 15 to Apr 30; Aug 1 to Oct 15
Corral Yew (<i>Scirpus caryocarpus</i>)	112	2.8	Mar 15 to May 31; Aug 1 to Oct 15	Mar 1 to May 15; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 1 to Oct 15	Feb 15 to Apr 30; Aug 1 to Oct 15
Warm-Season Grasses:						
Forstal Millet (<i>Setaria italica</i>)	30	0.7	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14
Pearl Millet (<i>Pennisetum glaucum</i>)	20	0.5	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14

Type of Plant Material	Plant Hardiness Zone	Seeding Dates		To seed 7b
		5b and 6a	6b	
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 1 to Oct 15	Feb 15 to Apr 30 Aug 1 to Oct 15
Seeds - Warm-Season Grasses/Cool-Season Grass Mixes (includes mixes with forbs and/or legumes)	Mar 15 to May 31 Jun 1 to Jun 15	Mar 1 to May 15 May 16 to Jun 15	Feb 15 to Apr 30 May 1 to Jun 30	Feb 15 to Apr 30 May 1 to Jun 30
Sod - Cool-Season	Mar 15 to May 31 Jun 1 to Jun 15	Mar 1 to May 15 May 16 to Jun 15	Feb 15 to Apr 30 May 1 to Jun 30	Feb 15 to Apr 30 May 1 to Jun 30
Unrooted Woody Materials, Bare-Root Plants: Bulbs, Rhizomes, Corms, and Tubers	Mar 15 to May 31 Jun 1 to Jun 15	Mar 1 to May 15 May 16 to Jun 15	Feb 15 to Apr 30 May 1 to Jun 30	Feb 15 to Apr 30 May 1 to Jun 30
Containerized Stock, Balled-and-Barrooted Stock	Mar 15 to May 31 Jun 1 to Jun 15	Mar 1 to May 15 May 16 to Jun 15	Feb 15 to Apr 30 May 1 to Jun 30	Feb 15 to Apr 30 May 1 to Jun 30

NOTE: NO CHANGES ARE ALLOWED TO THE SEQUENCE OF CONSTRUCTION WITHOUT PRIOR HOWARD SCD APPROVAL.

NOTE: ALL SUPER SILT FENCES TO BE CHECKED DAILY TO ENSURE COMPLIANCE AND REPAIRED IMMEDIATELY AS REQUIRED.

NOTE: THE AREAS OF ESD IMPLEMENTATION SHALL HAVE LIMITED ACCESS FROM HEAVY CONSTRUCTION EQUIPMENT TO AVOID UNNECESSARY COMPACTION WHEN PRACTICAL.

NOTE: TEMPORARY OR PERMANENT SEEDING AND STABILIZATION IS TO BE PERFORMED AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR AT THE TIME FRAME REQUESTED BY THE 2011 MARYLAND STANDARDS & SPECIFICATIONS, SOIL EROSION AND SEDIMENT CONTROL WHICH EVER IS MORE STRINGENT.

NO.	DATE	REVISION
DAY 1		Obtain grading permit.
DAY 2-10		Clear and grub site for installation of perimeter sediment control devices established under the approved Site Development Plan.
DAY 11-12		Stabilize all disturbed areas in accordance with the temporary seeded notes.
DAY 13-20		Begin installation of proposed utility connections at existing manholes. This process to include daily control measures to prevent sediment, fully stabilize the remaining areas. Install final paving and complete ESD construction and install final paving and complete ESD construction.
DAY 21-30		Upon approval by the sediment control inspector, begin use-in-common driveway and necessary site grading.
DAY 31-40		Begin installation of all other utilities as applicable.
DAY 41-50		Construct remaining utilities as applicable. This work shall be approved by appropriate agencies prior to proceeding with further construction.
DAY 51-60		Complete remaining mass grading of site.
DAY 61-65		Install base course paving for use-in-common driveway (Private Road).
DAY 66-79		Once the utility and roadway construction is completed, fully stabilize the remaining areas. Install final paving and complete ESD construction and install final paving and complete ESD construction.
DAY 80-84		Install required landscaping.
DAY 85-89		Upon approval by Howard County sediment control inspector, remove remaining equipment and permanently stabilize any remaining disturbed areas.

NO CHANGES ARE ALLOWED TO THE SEQUENCE OF CONSTRUCTION WITHOUT PRIOR HOWARD SCD APPROVAL.

NOTE: ALL SUPER SILT FENCES TO BE CHECKED DAILY TO ENSURE COMPLIANCE AND REPAIRED IMMEDIATELY AS REQUIRED.

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NO. DATE REVISION

BENCHMARK ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE & SUITE 315
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644
www.bel-civilengineering.com

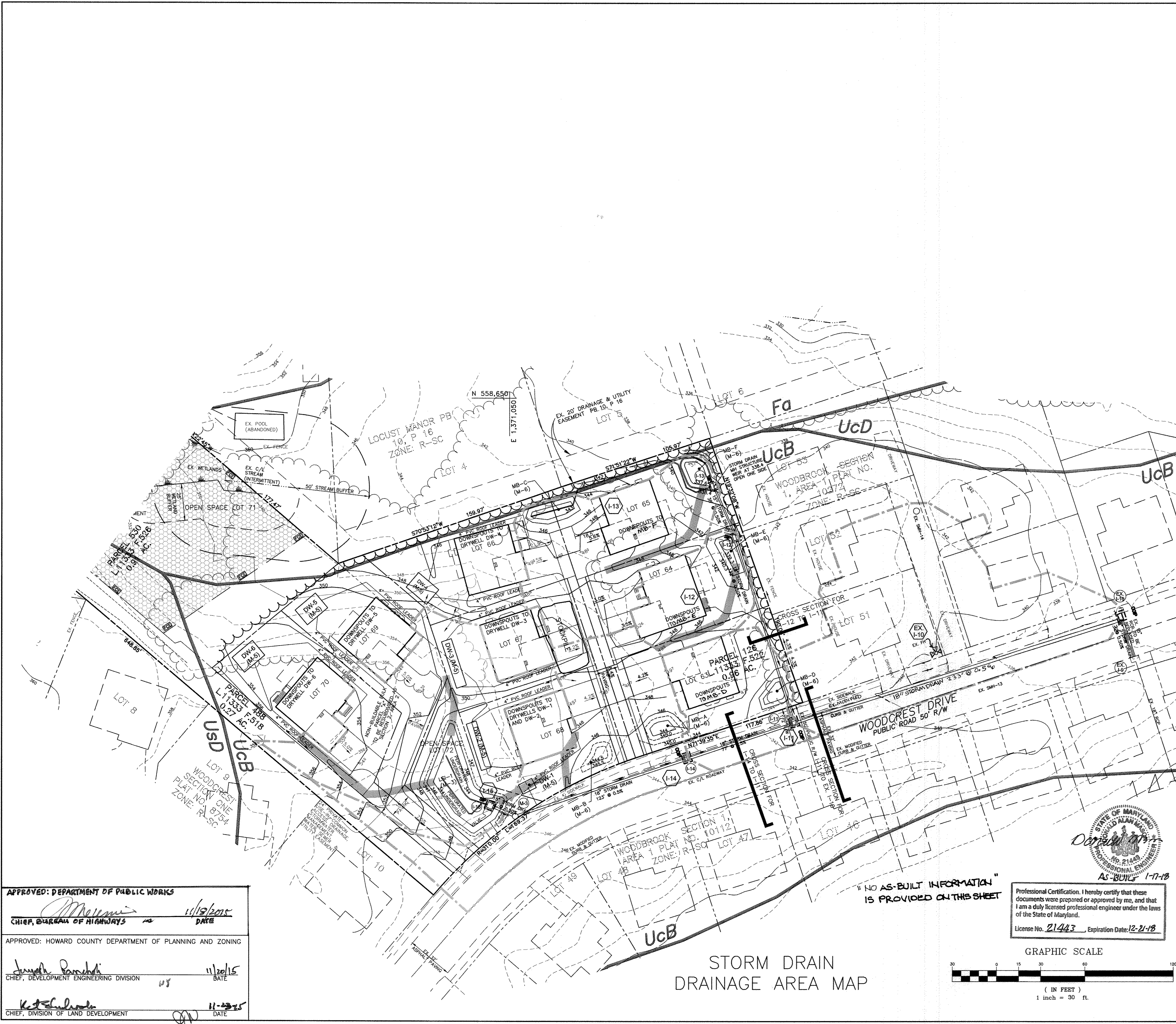
OWNER: PROJECT: **WOODBROOK SECTION 2, PHASE 1**

DEVELOPER: SECURITY DEVELOPMENT, LLC
P.O. BOX 417
ELLCOTT CITY, MARYLAND 21041
410-465-4244

TITLE: **SEDIMENT & EROSION CONTROL NOTES, AND DETAILS**

DATE: SEPTEMBER 2015 PROJECT NO. 2370
OCTOBER, 2015

Design:JC Draft: JC Check: - SCALE: AS SHOWN DRAWING 3 OF 10



SOILS LEGEND			
MAP SYMBOL	SOIL TYPE	MAPPING UNIT	K FACTOR
*Fa	D	FALLSINGTON SANDY LOAM - 0 TO 2 PERCENT SLOPES	0.20
Ucb	C (B,D)	URBAN LAND: CHILLUM/BELTSVILLE COMPLEX - 0 TO 5 PERCENT SLOPES	0.37
Ucd	C (B,D)	URBAN LAND: CHILLUM/BELTSVILLE COMPLEX - 5 TO 10 PERCENT SLOPES	0.37

USDA-NRCS WEBSITE, MAP #19 SAVAGE NE
* INDICATES HYDRIC SOILS



- LEGEND
- LIMIT OF SUBMISSION SOILS LINE
 - Fa** SOILS LABEL
 - FOREST CONSERVATION EASEMENT
 - FOREST CONSERVATION SIGN
 - WETLAND LIMITS
 - STREAM
 - EXISTING CONTOURS
 - PROPOSED GRADING
 - EXISTING TREELINE
 - PROPOSED TREELINE

NO.	DATE	REVISION
1	7-20-16	REVISE STORM DRAIN BASED ON MISUTILITY MARKING OF WATER LINE

BENCHMARK
ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
6480 BALTIMORE NATIONAL PIKE & SUITE 315 & ELLICOTT CITY, MARYLAND 21043
(P) 410-465-8105 (F) 410-465-8644
WWW.BEI-CIVILENGINEERING.COM

PROFESSIONAL CERTIFICATION:
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 45577, Expiration Date: 06-08-2016

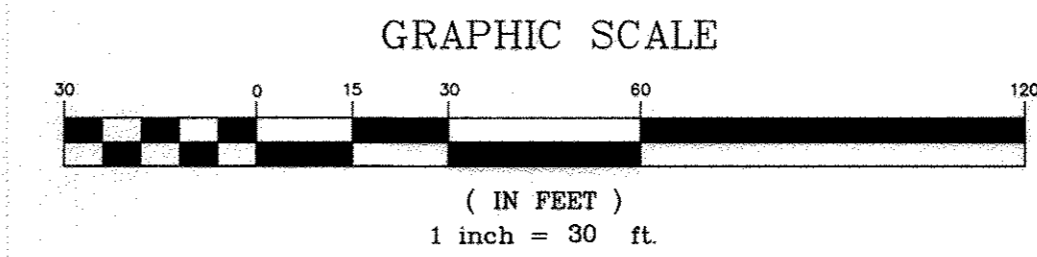
John M. C...
10/28/15

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature] 11/18/2015
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[Signature] 11/20/15
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

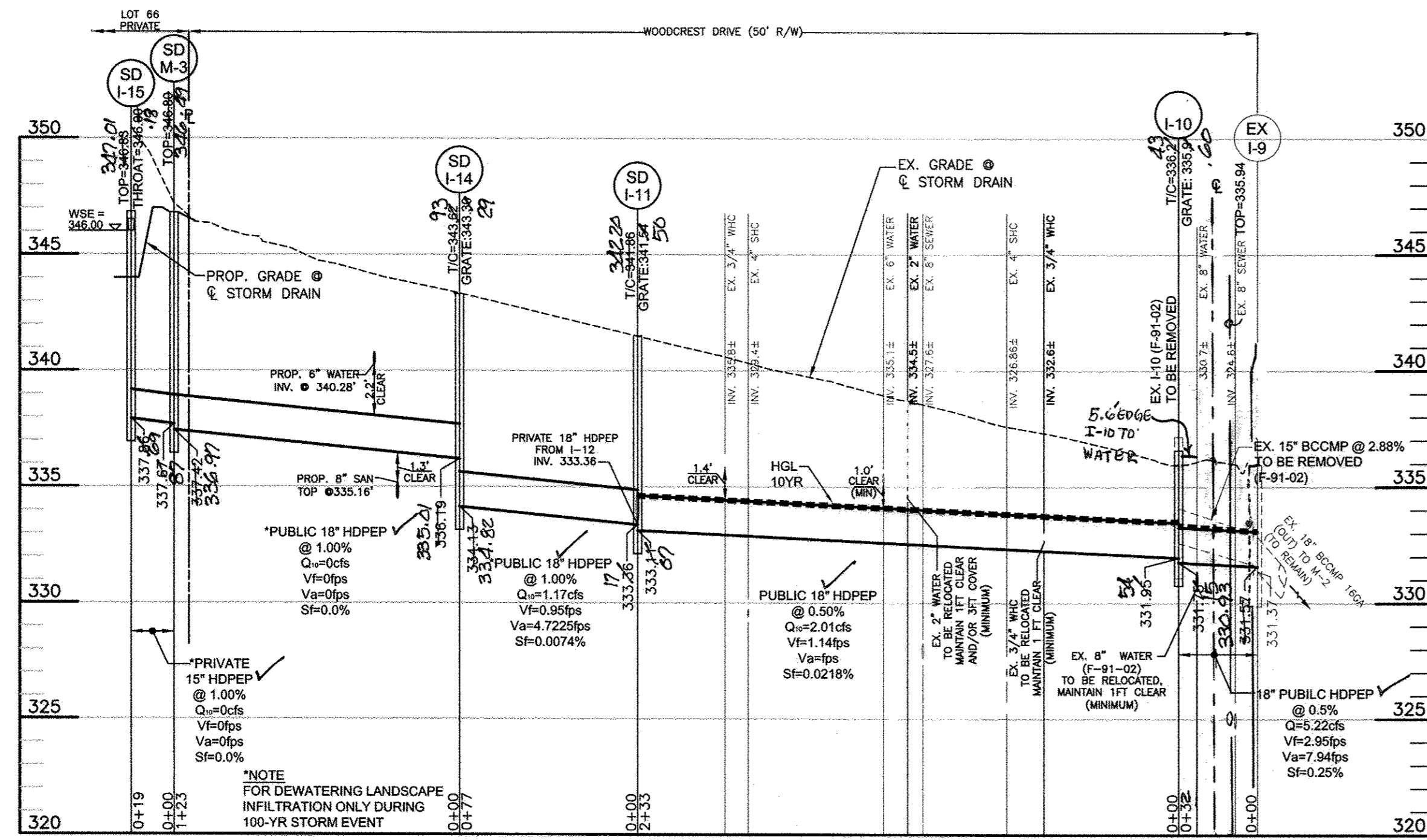
[Signature] 11-23-15
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

STORM DRAIN DRAINAGE AREA MAP

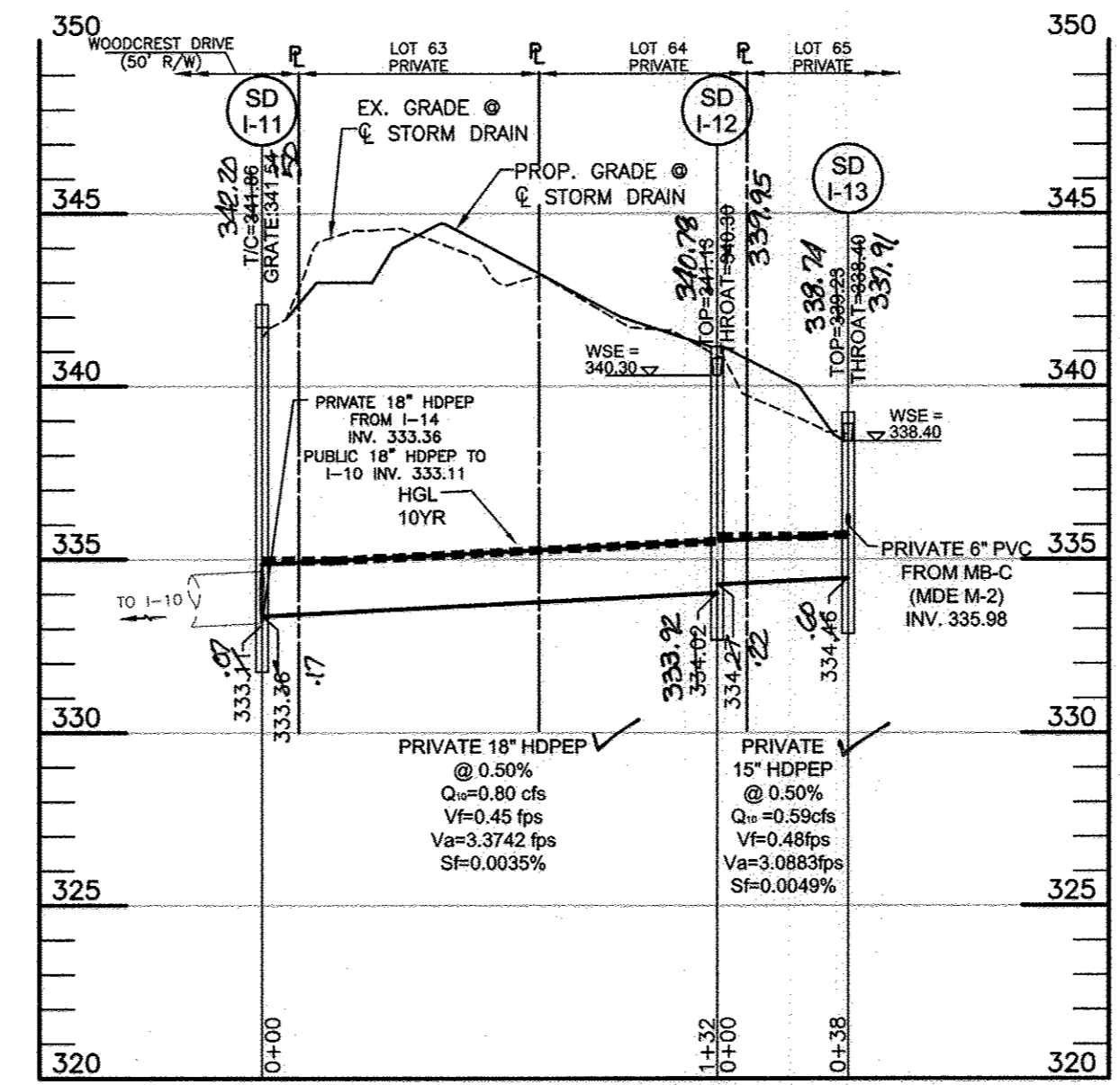


Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-18

OWNER: JOHN R. & CHARLES E. NEIGHOFF, ET AL 4936 WHARFF ROAD ELLICOTT CITY, MARYLAND 21043	PROJECT: WOODBROOK SECTION 2, PHASE 1 LOTS 63-65 AND "NON-BUILDABLE PARCELS "A" AND "B" LOCATION: TAX MAP 37, GRID 14 PARCELS 126, 488 AND 530 1st ELECTION DISTRICT 6201 E. WATERLOO ROAD & 6247 WOODCREST DRIVE HOWARD COUNTY, MARYLAND
DEVELOPER: SECURITY DEVELOPMENT, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244	TITLE: STORM DRAIN DRAINAGE AREA MAP
DATE: SEPTEMBER, 2015 OCTOBER, 2015	PROJECT NO. 2370
Design: Jc Draft: Jc Check: -	SCALE: DRAWING 4 OF 10



I-15 TO EX. I-9
STORM DRAIN PROFILE
1"=50' HORIZONTAL
1"=5' VERTICAL



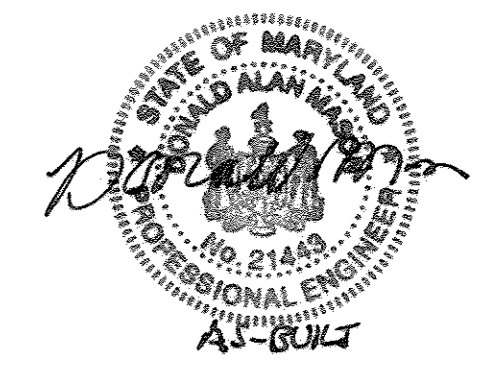
I-11 TO EX. I-13
STORM DRAIN PROFILE
1"=50' HORIZONTAL
1"=5' VERTICAL

AREA AND "C" FACTOR TABULATION

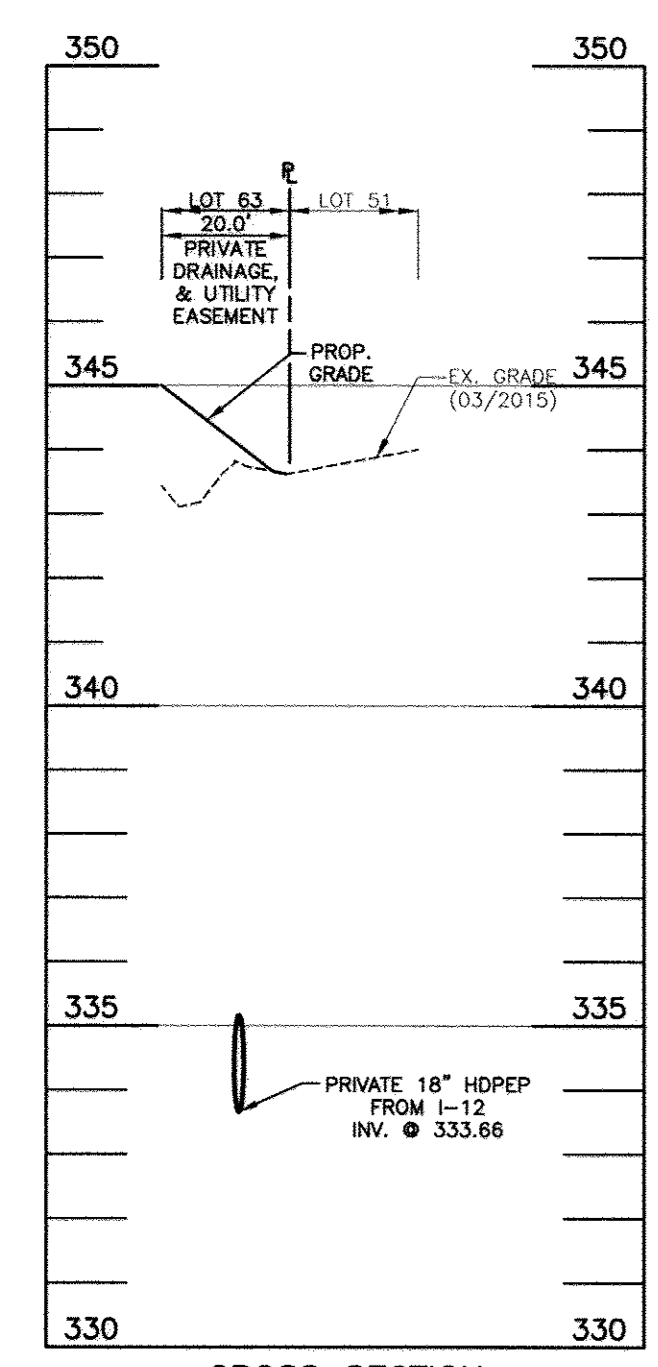
PROJECT: WOODBROOK SECTION 2 DATE: 4/27/2015 BY: jc

PHASE	INLET #	ZONING (Z)	SUBAREA (B)	AREA (Ac) (A)	"C" FACTOR (C)<25	% IMPERVIOUS (P)<25
	EX I-10	POR		0.46	0.51	75.0
	I-11	POR		0.15	0.52	75.6
	I-12	POR		0.11	0.37	65.0
	I-13	POR		0.24	0.37	65.0
	I-14	POR		0.33	0.54	77.1
	I-15	POR		0.34	0.37	65.0

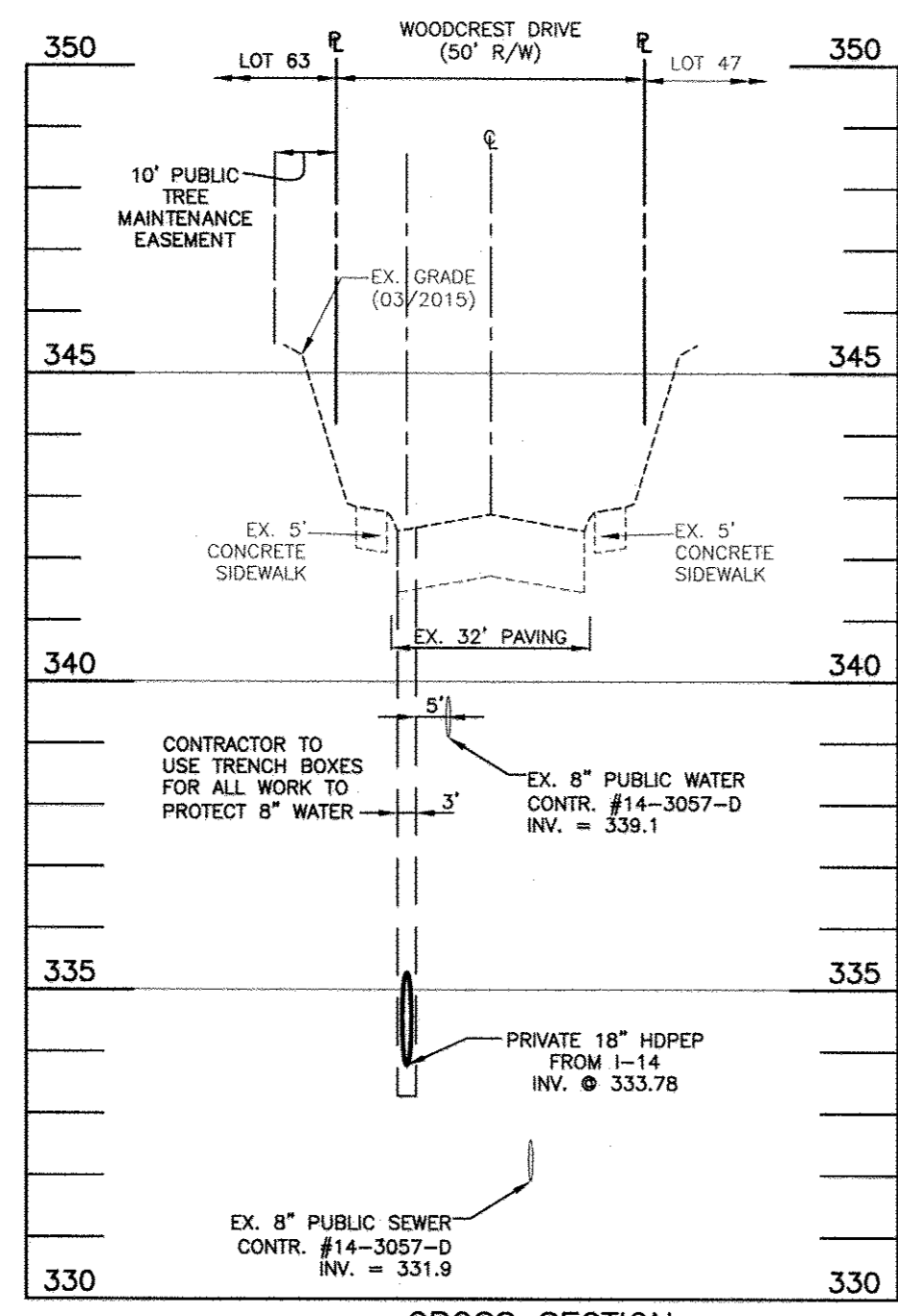
AS-BUILT CERTIFICATION
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on this "AS-BUILT" Plan meet the Approved Plans and Specifications
Donald Mason, P.E. Date: 1-17-18



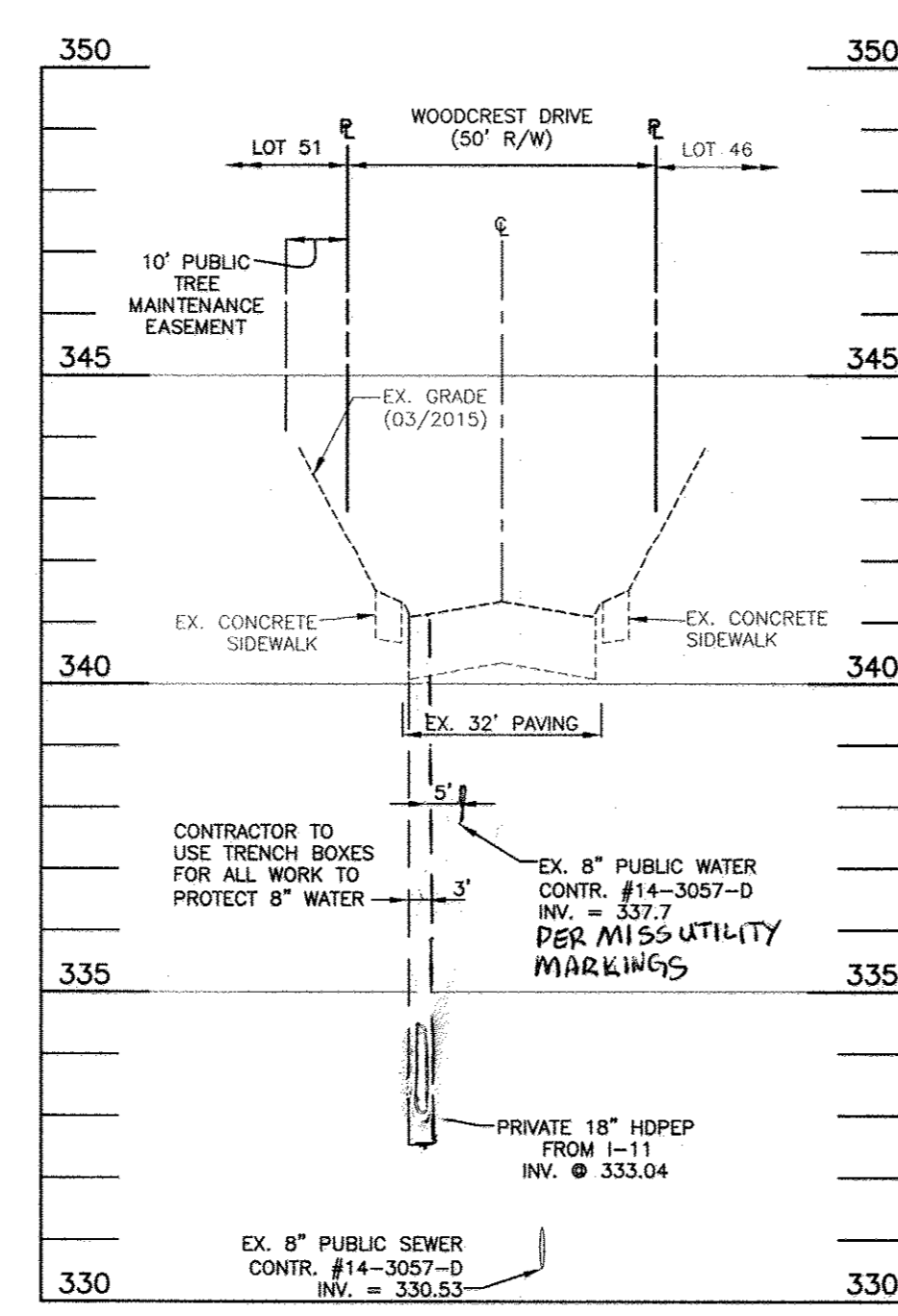
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-18



CROSS SECTION
I-12 TO I-11
SCALE:
HORZ. 1"=30'
VERT. 1"=3'



CROSS SECTION
I-14 TO I-11
SCALE:
HORZ. 1"=30'
VERT. 1"=3'



CROSS SECTION
I-11 TO I-10
SCALE:
HORZ. 1"=30'
VERT. 1"=3'

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION

IMPORTANT: THIS DRAWING SHALL BE USED IN COMBINATION WITH THE GENERAL NOTES NO. 104.00-01 - 104.00-18 AND STANDARD DETAILS NO. 104.01-01 - 104.01-01.

NOTES:
1. SHOULDER CLOSED SIGNS ARE REQUIRED IN PLACE OF SHOULDER WORK SIGNS WHEN THE SHOULDER IS CLOSED BY POSITIVE PROTECTION (TEMPORARY CONCRETE BARRIER OR SOLID BARRIER). REFER TO STANDARD NO. 104.00-18.
2. WHEN WORK REQUIRES A PAVEMENT EDGE DROP-OFF, REFER TO STANDARD NO. 104.00-18.
3. THERE SHALL BE A MINIMUM OF SEVEN CHANNELIZING DEVICES IN THE SHOULDER TAPER.
4. THE ENGINEER SHOULD CONSIDER ADDITIONAL ADJACENT LANE CLOSURES WHEN THE POSSIBILITY OF UNPLANNED TRAVELWAY ENCROACHMENTS EXISTS.

KEY:
■ CHANNELIZING DEVICES
▲ SIGN SUPPORT
▲ FACE OF SIGN
▲ DIRECTION OF TRAFFIC
■ WORK SITE

**Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION**
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
**SHOULDER WORK-2-LANE, 2-WAY
EQL/LESS THAN 40 MPH**
STANDARD NO. MD 104.02-02

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION

IMPORTANT: THIS DRAWING SHALL BE USED IN COMBINATION WITH THE GENERAL NOTES NO. 104.00-01 - 104.00-18 AND STANDARD DETAILS NO. 104.01-01 - 104.01-01.

NOTES:
1. REFER TO MD 104.01-01 FOR GUIDANCE ON PAVEMENT MARKINGS THROUGH LANE SHIFTS.
2. THIS TYPICAL SHALL BE USED FOR ANY LANE SHIFT WHICH SATISFIES EITHER CONDITION 'A' OR 'B'.
3. CONDITION 'A': LANE SHIFT IS 'ASBUILT' - SHIFTS HAS A TAPER LENGTH LESS THAN THE VALUE SPECIFIED IN THE TAPER LENGTH CRITERIA TABLE REFER TO MD 104.00-01.
4. PRELIMINARY SIGNS CANNOT BE MAINTAINED THROUGH THE SHIFT.
5. FOR LANE SHIFTS WHICH DO NOT SATISFY ABOVE CONDITIONS:
- DELETE 'REVERSE CURVE' WARNING SIGNS, AND
- REPLACE LANE SHIFT SIGNS WITH 'ROAD WORK' SIGNS OR OTHER APPROPRIATE SIGNS AS SHOWN IN TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATIONS.
6. THERE SHALL BE A MINIMUM OF SEVEN CHANNELIZING DEVICES IN THE SHOULDER TAPER.
7. THE ENGINEER SHOULD CONSIDER ADDITIONAL ADJACENT LANE CLOSURES WHEN THE POSSIBILITY OF UNPLANNED TRAVELWAY ENCROACHMENTS EXISTS.

KEY:
■ CHANNELIZING DEVICES
▲ SIGN SUPPORT
▲ FACE OF SIGN
▲ DIRECTION OF TRAFFIC
■ WORK SITE

**Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION**
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
**LANE SHIFT RIGHT OR LEFT SIDE-2-LANE,
2-WAY EQL/LESS THAN 40 MPH'S MIN -
12 HRS. OR DAYTIME ONLY**
STANDARD NO. MD 104.02-04

TEMPORARY TRAFFIC CONTROL TYPICAL APPLICATION

IMPORTANT: THIS DRAWING SHALL BE USED IN COMBINATION WITH THE GENERAL NOTES NO. 104.00-01 - 104.00-18 AND STANDARD DETAILS NO. 104.01-01 - 104.01-01.

NOTES:
1. FLAGGER SHALL NEVER BE STATIONED MORE THAN 500' AWAY FROM THE ADVANCE FLAGGER SIGN.
2. THE ENGINEER SHOULD CONSIDER ADDITIONAL ADJACENT LANE CLOSURES WHEN THE POSSIBILITY OF UNPLANNED TRAVELWAY ENCROACHMENTS EXISTS.

KEY:
■ CHANNELIZING DEVICES
▲ SIGN SUPPORT
▲ FACE OF SIGN
▲ DIRECTION OF TRAFFIC
■ WORK SITE
■ FLAGGER

**Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION**
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
**FLAGGING OPERATION-2-LANE, 2-WAY
EQL/LESS THAN 40 MPH**
STANDARD NO. MD 104.02-10

PIPE SCHEDULE

SIZE	TYPE	LENGTH (L.F.)	MAINTENANCE
18"	HDPEP	46.4	PUBLIC
15"	HDPEP	57	PRIVATE
18"	HDPEP	132	PRIVATE

All HDPE pipes shall have smooth interior. No interior corrugations.

STRUCTURE TABLE

NUMBER	TYPE	LOCATION	INVERT IN	INVERT OUT	TOP ELEV.	THROAT ELEV.	STD. DETAIL	INLET WIDTH	MAINTENANCE
INLETS									
EX I-9	A-5	N 558473.3879 E 1371474.8718	330.93	331.67	331.37	332.07	335.04	335.23	PUBLIC
I-10	A-5	N 558505.2320 E 1371464.1156	331.52	331.95 (18")	331.75	332.38	336.00	335.50	PUBLIC
I-11	S	N 558431.6775 E 1371242.8815	333.17	333.36 (18")	333.15	333.75	341.00	340.50	PUBLIC
I-12	A-5	N 558556.0309 E 1371203.6176	332.22	332.27 (15")	332.02	332.44	341.00	340.50	PRIVATE
I-13	A-5	N 558590.7253 E 1371188.5820	335.28	335.98 (6")	335.46	336.23	340.25	339.71	PRIVATE
I-14	S	N 558407.4169 E 1371170.1148	335.01	335.98 (18")	335.82	336.73	343.62	343.21	PUBLIC
I-15	A-5	N 558373.8506 E 1371037.0134	337.27	337.88	337.21	338.03	346.00	345.00	PRIVATE
MANHOLES									
M-3	4" DIA	N 558366.5529 E 1371054.0436	337.37	337.07 (15")	337.42 (18")	341.48	346.00	NA	PUBLIC
END SECTIONS									
N/A									

STRUCTURE LOCATION FOR MANHOLES IS AT THE CENTER OF THE MANHOLE RIM.
STRUCTURE LOCATION FOR INLETS IS AT THE CENTER OF THE INLET FACE.
EXISTING INLET I-9 MEASURED TO CENTER OF STRUCTURE. EXISTING INLET I-10 MAY HAVE TO BE REPLACED DEPENDING ON THE INVERT OF THE STRUCTURE.
STRUCTURE LOCATION FOR THE END-SECTIONS IS AT THE MIDDLE OF THE END OF THE STRUCTURE.
PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.
PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.

APPROVED: DEPARTMENT OF PUBLIC WORKS
[Signature] 4/18/2015
CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[Signature] 11/20/15
CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 11-23-15
CHIEF, DIVISION OF LAND DEVELOPMENT

CONSTRUCTION SPECIFICATIONS.

- THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
- THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.
- GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE REPAIRED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.
- A STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR THE RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS. FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER FABRIC OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.
- THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SOUR AROUND TO THE STONE WILL OCCUR.

NO. 1 DATE 7-20-16 REVISION REVISE PROFILE & CROSS SECTION FOR I-10 & I-11

**BENCHMARK
ENGINEERING, INC.**
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6480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043
(P) 410-465-8100 (F) 410-465-8844
WWW.BEI-CIVILENGINEERING.COM

OWNER: JOHN R. & CHARLES E. NEIGHOFF, ET AL
4936 WHARFF ROAD
ELLICOTT CITY, MARYLAND 21043

DEVELOPER: SECURITY DEVELOPMENT, LLC
P.O. BOX 417
ELLICOTT CITY, MARYLAND 21041
410-465-4244

PROJECT: WOODBROOK SECTION 2, PHASE 1
LOTS 63-65 AND NON-BUILDABLE PARCELS "A" AND "B"
TAX MAP 37, GRID 14
PARCELS 126, 488 AND 530
1st ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: STORM DRAIN PROFILES, NOTES & DETAILS AND TRAFFIC CONTROL PLAN

DATE: SEPTEMBER, 2015 PROJECT NO. 2370
OCTOBER, 2015

Design: JMC Draft: NAF Check: - SCALE: DRAWING 5 OF 10

AS-BUILT F-15-096

CONSTRUCTION SPECIFICATIONS

B.A.C Specifications for Micro-Bioretenion, Rain Gardens, Landscape Infiltration & Infiltration Berms

- Material Specifications**
The allowable materials to be used in these practices are detailed in Table B.A.1.
- 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-bioretenion 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 textual analysis is required for the site stockpiled topsoil. If topsoil is imported, then a textual analysis shall be performed for each location where the topsoil was excavated.

- Compaction**
It is very important to minimize compaction of both the base of bioretention practices and the required backfill. When possible, use excavation hoists to remove original soil. If practices are excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high pressure tires will 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 restructure 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 final grade.

- Plant Material**
Recommended plant material for micro-bioretenion practices can be found in Appendix A, Section A.2.3.
- Plant Installation**
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. Fine 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 1/8" 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 cover after installation.

Trunks 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**
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.

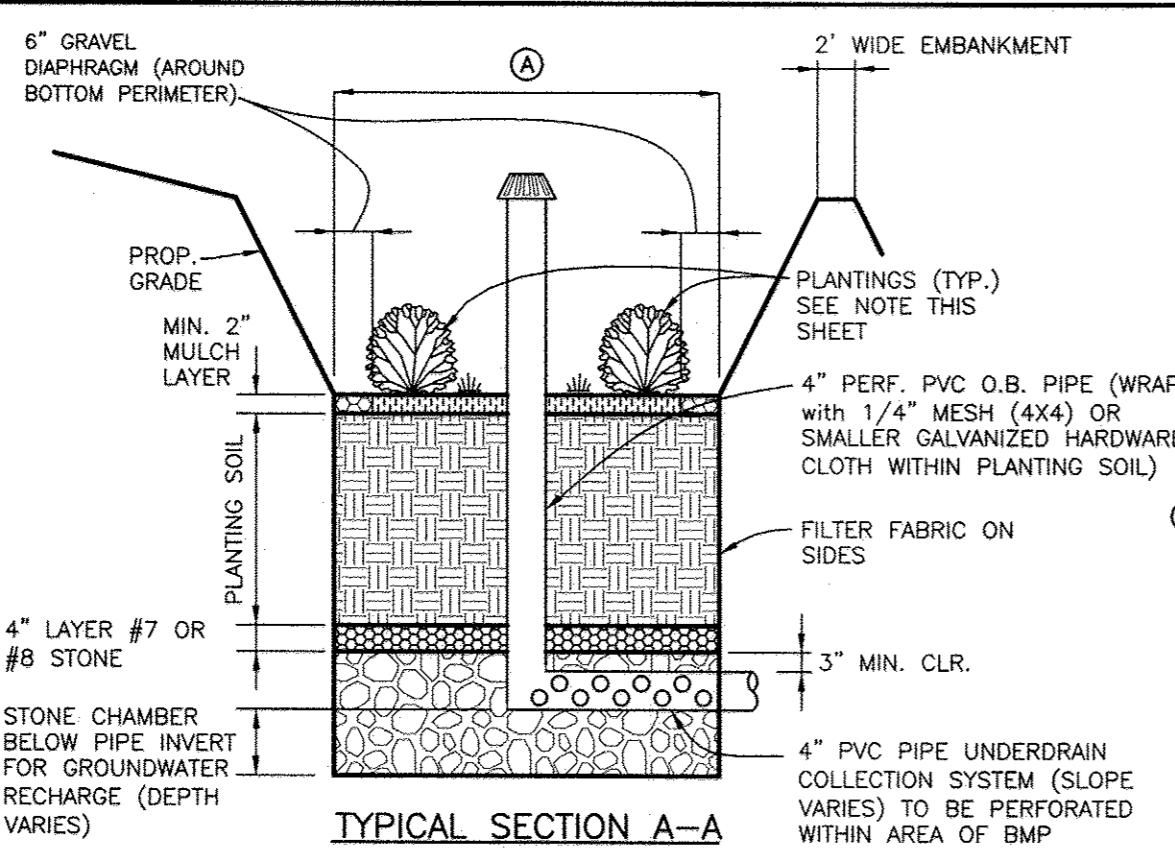
The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bioretention structure is to improve water quality. Adding fertilizers, defers, or, at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch are used to amend the soil. Rototill urea fertilizer at a rate of 2 pounds per 1000 square feet.

- Underdrains**
Underdrains should meet the following criteria:
 - Pipe - Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTM F758, Type PS 28, or AASHTO-M-278) in a gravel layer. The preferred material is slotted, 4" rigid pipe (e.g., PVC or HDPE).
 - Perforations - If perforated pipe is used, perforations should be 3/8" 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.
 - Main collector pipe shall be at a minimum 0.5% slope.
 - A rigid, non-perforated observation well must be provided (one per every 1,000 square feet) to provide a clean-out port and monitor performance of the filter.
 - A 4" layer of pea gravel (1/4" to 3/8" 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".

These practices may not be constructed until all contributing drainage area has been stabilized

7. Miscellaneous

These practices may not be constructed until all contributing drainage area has been stabilized



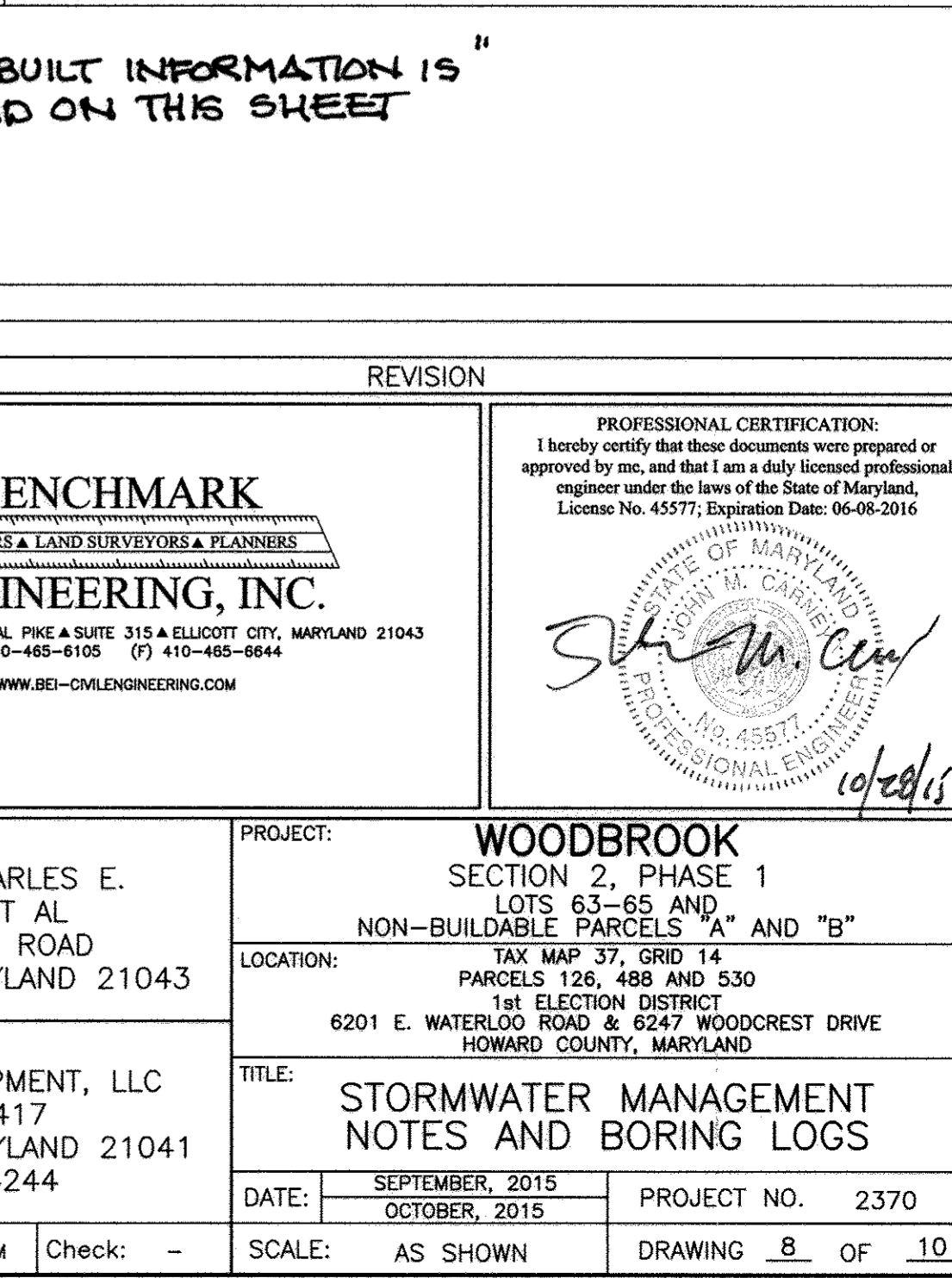
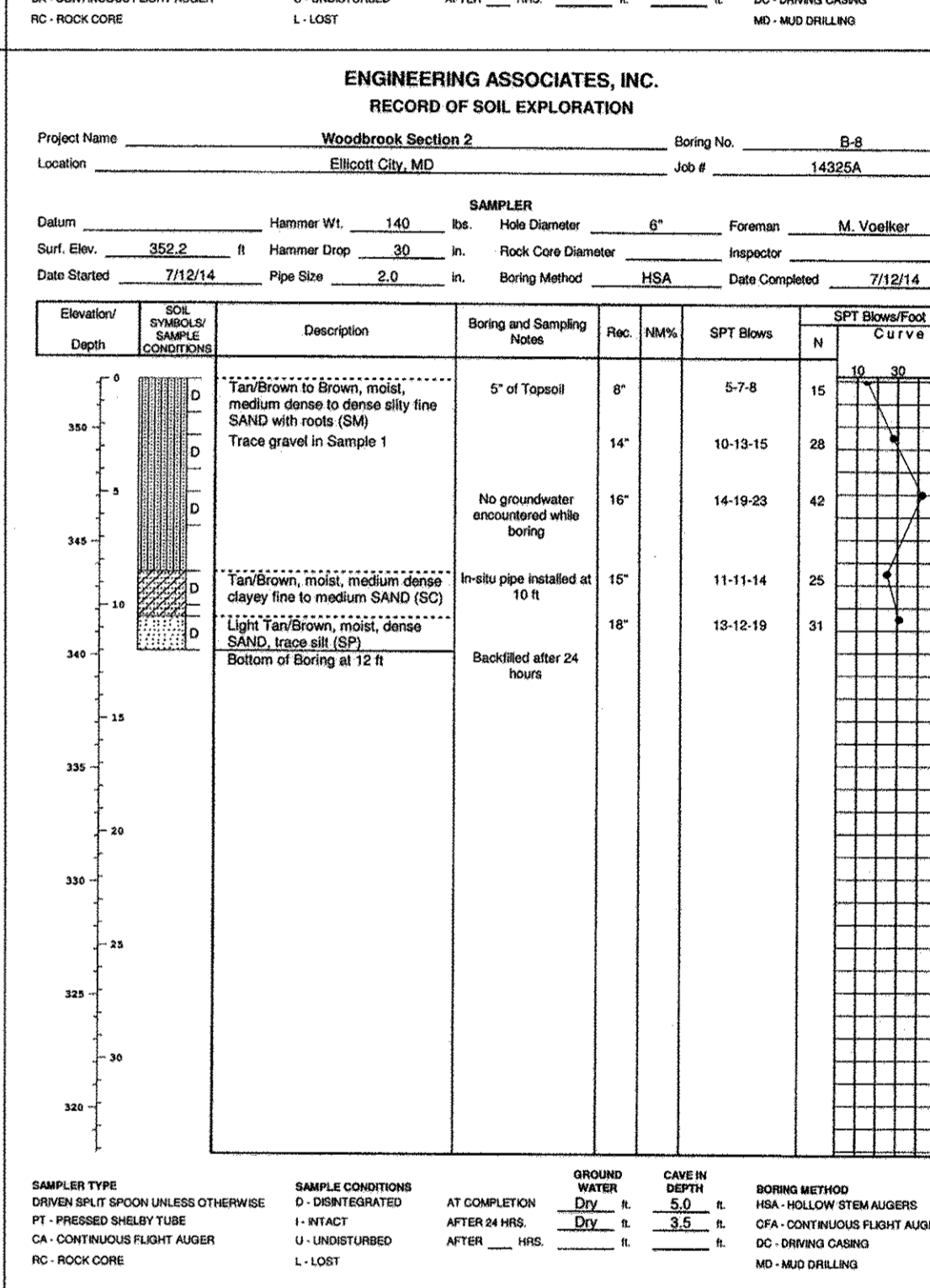
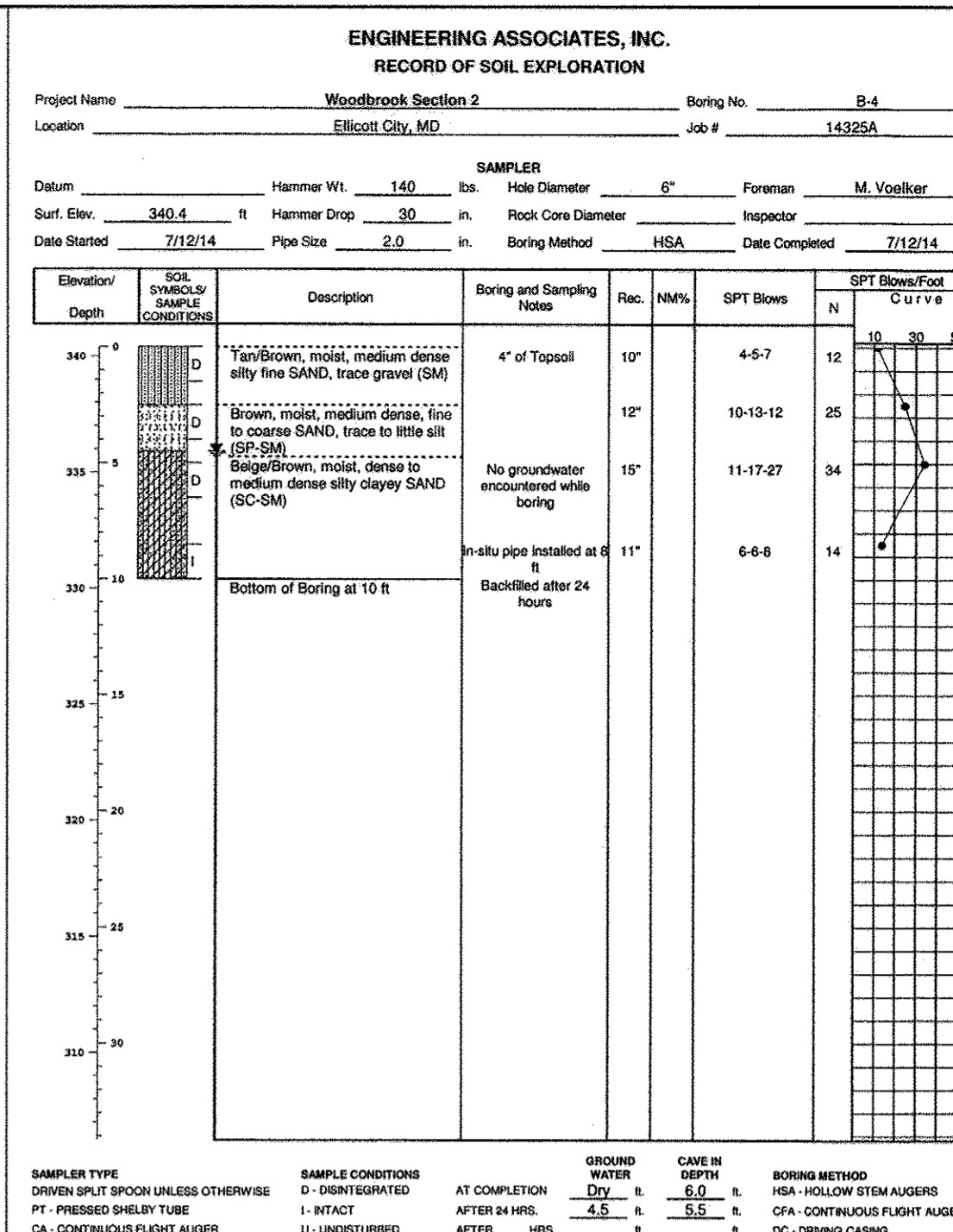
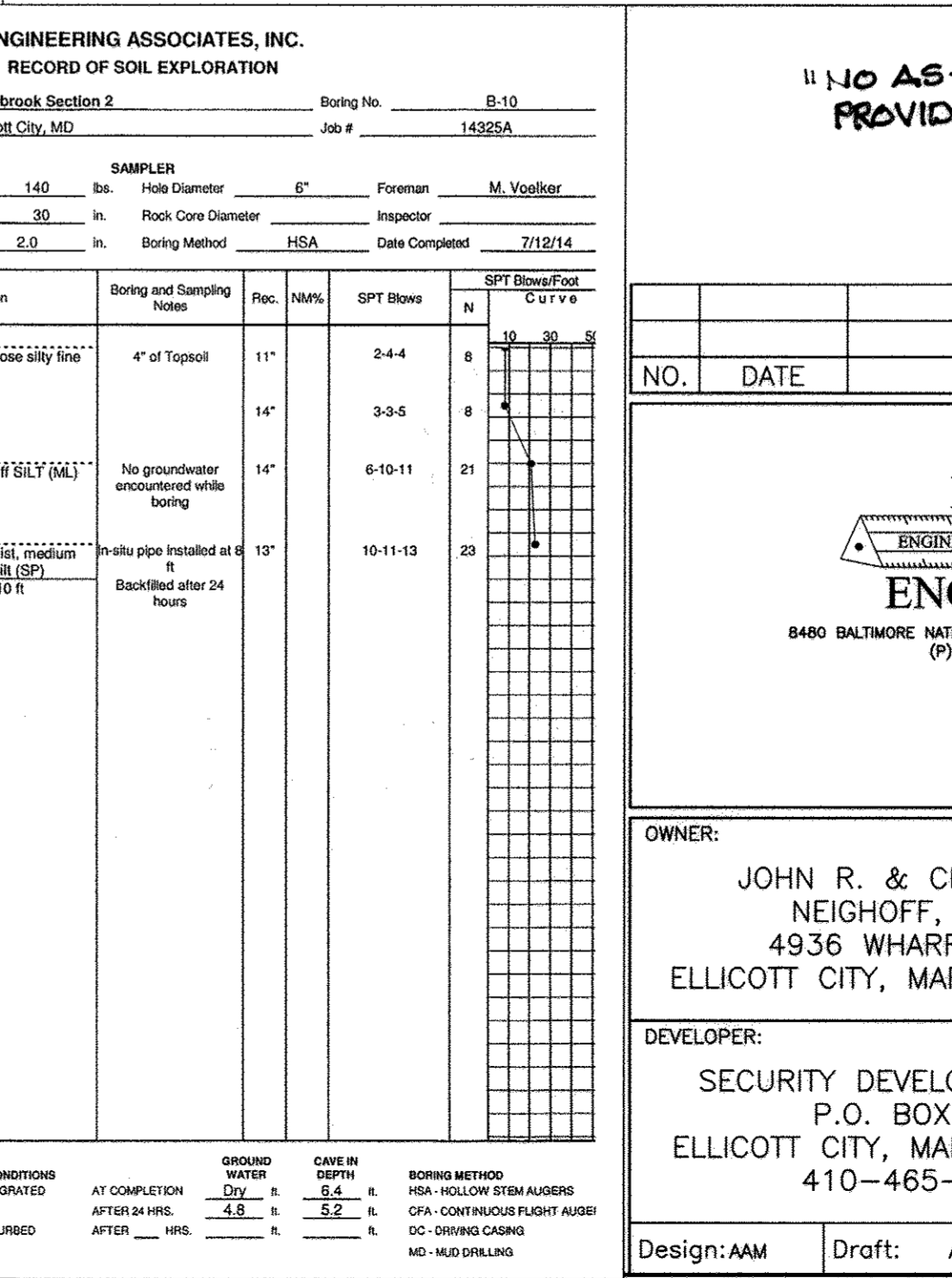
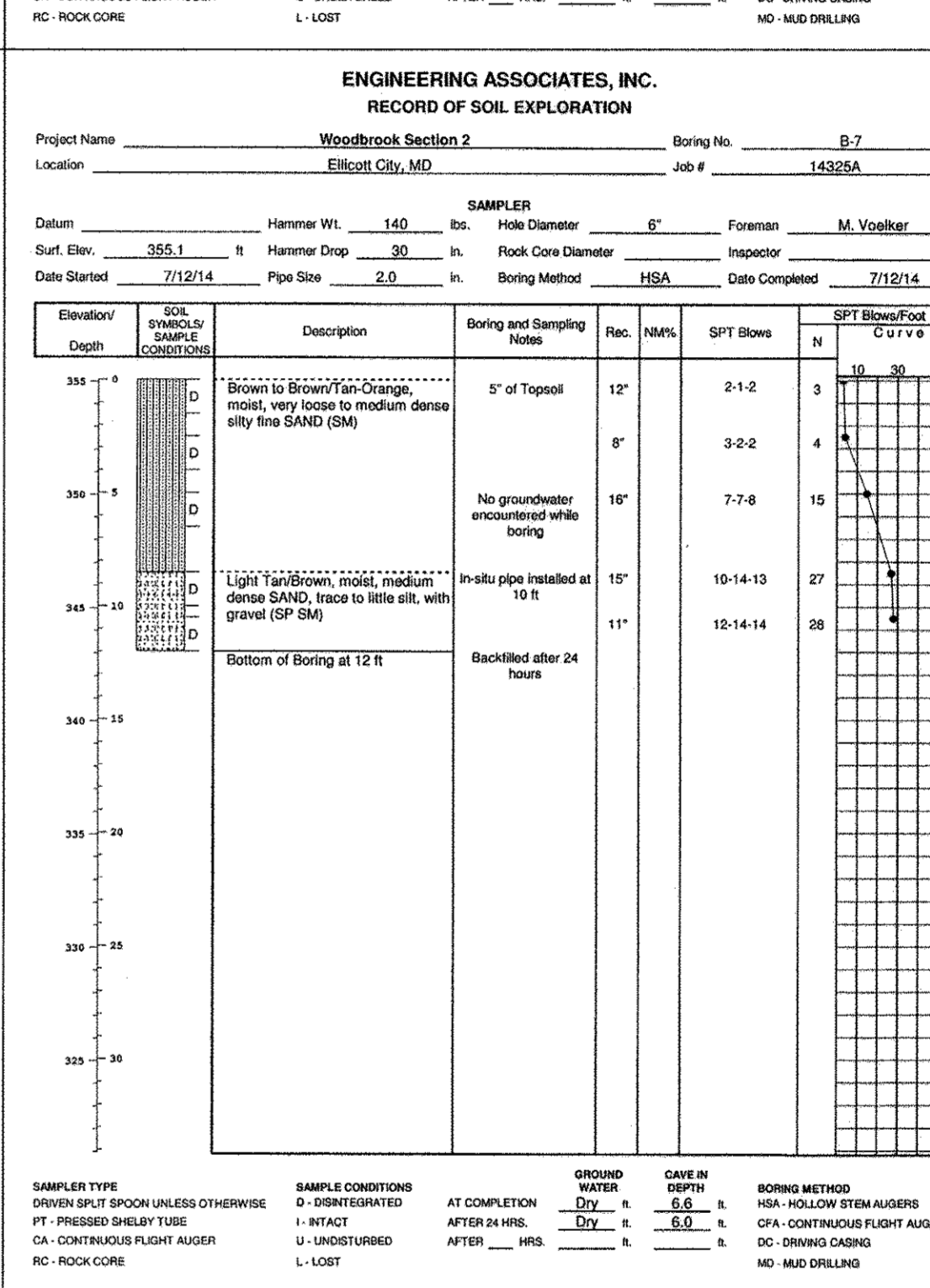
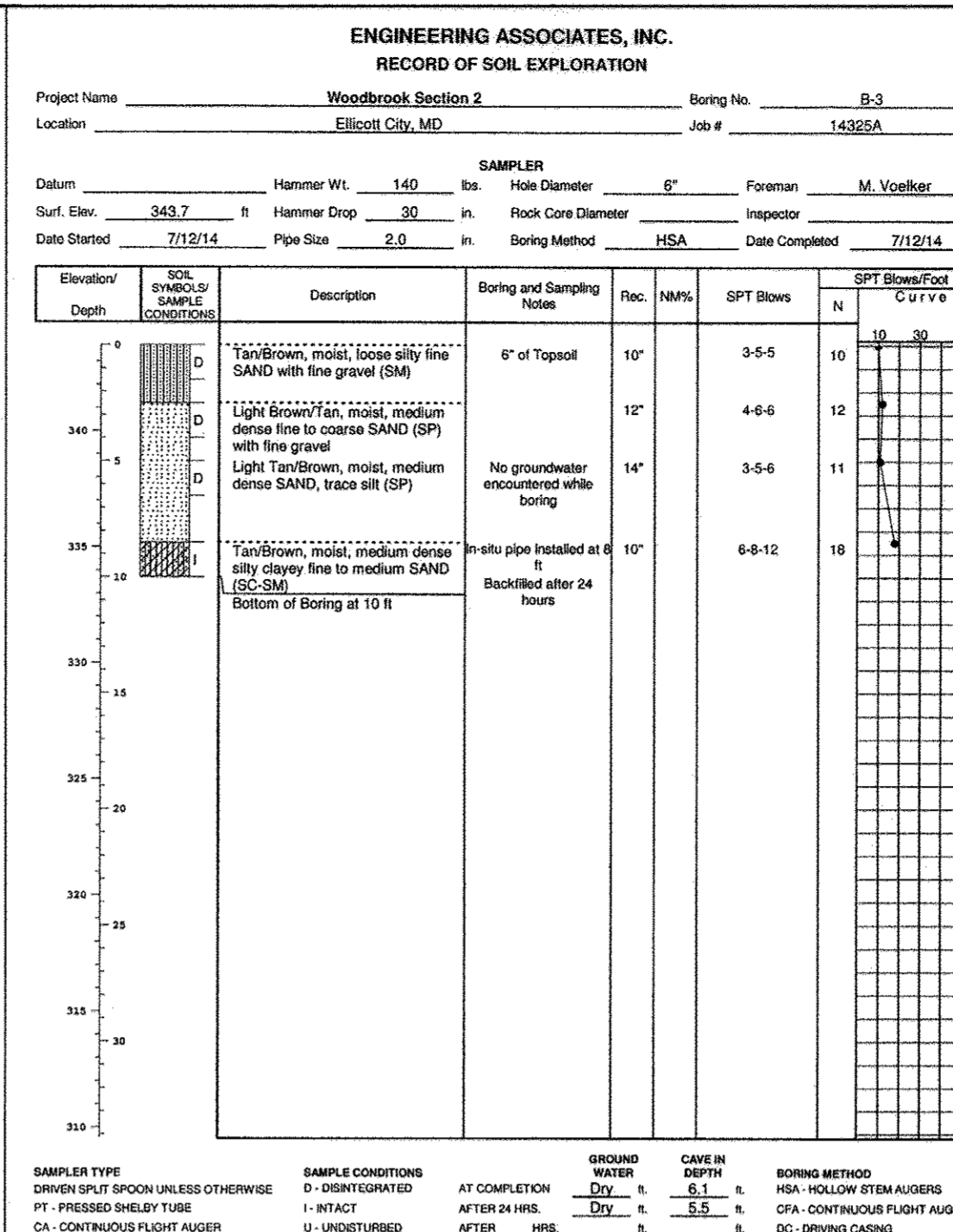
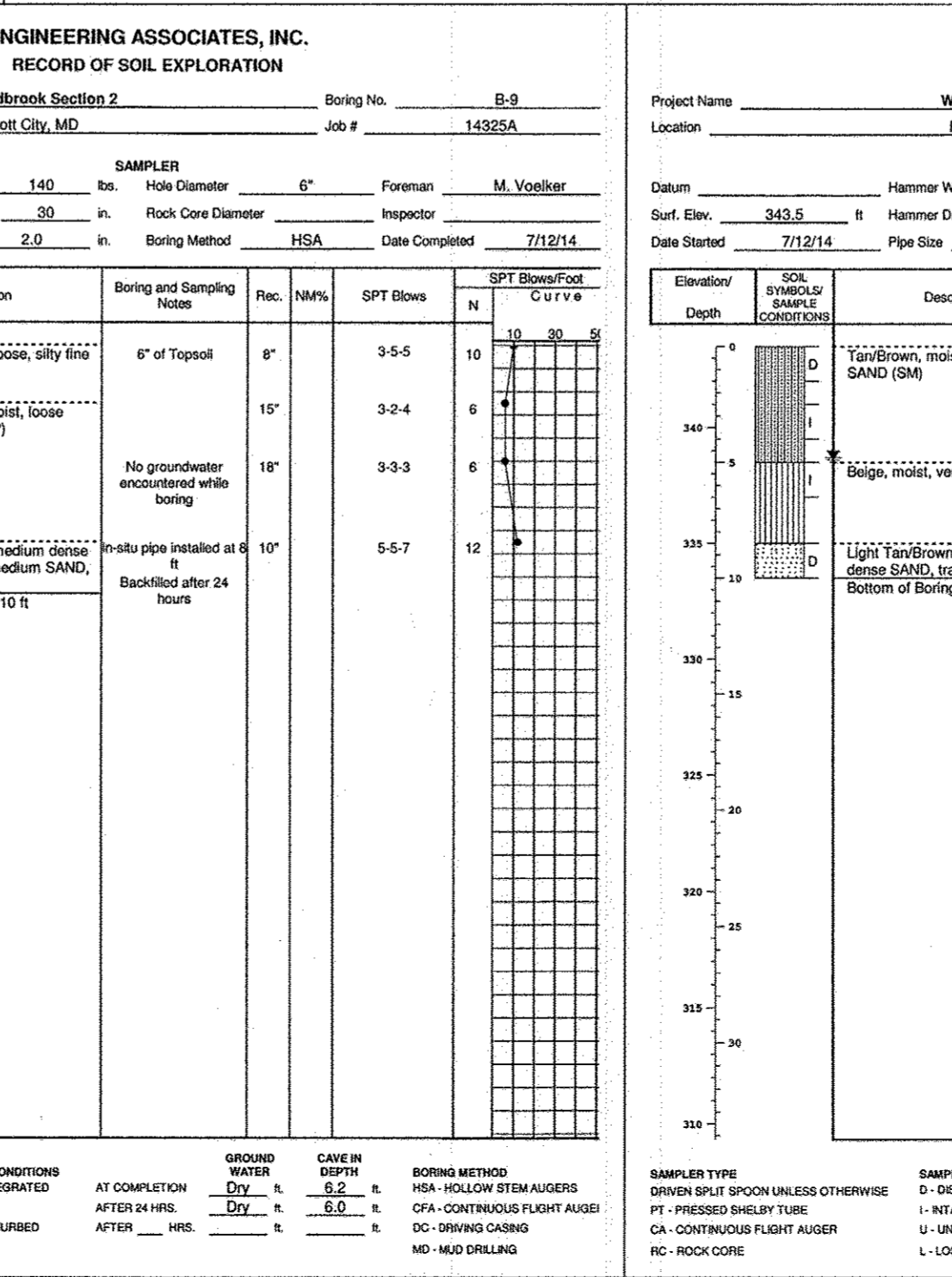
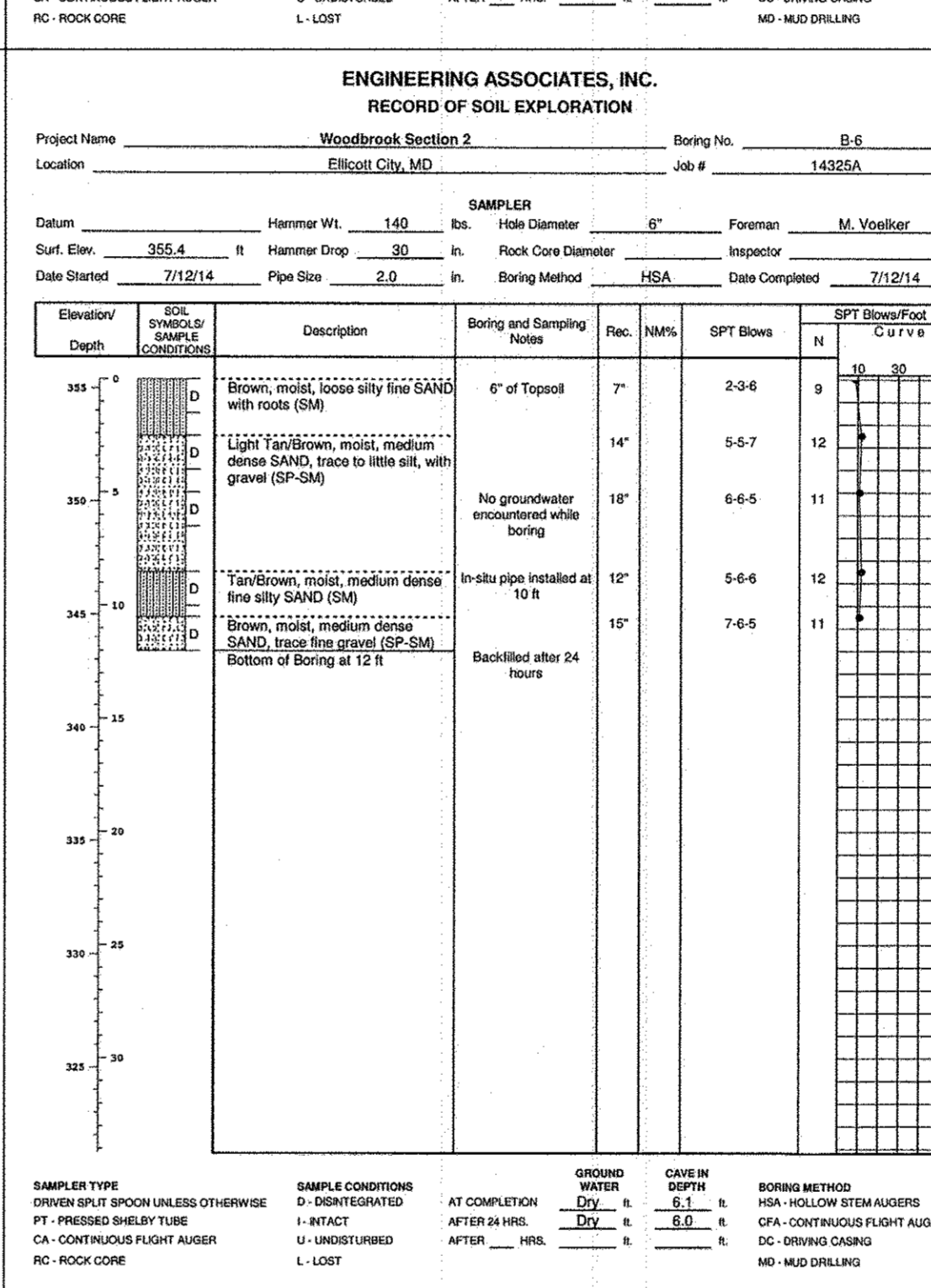
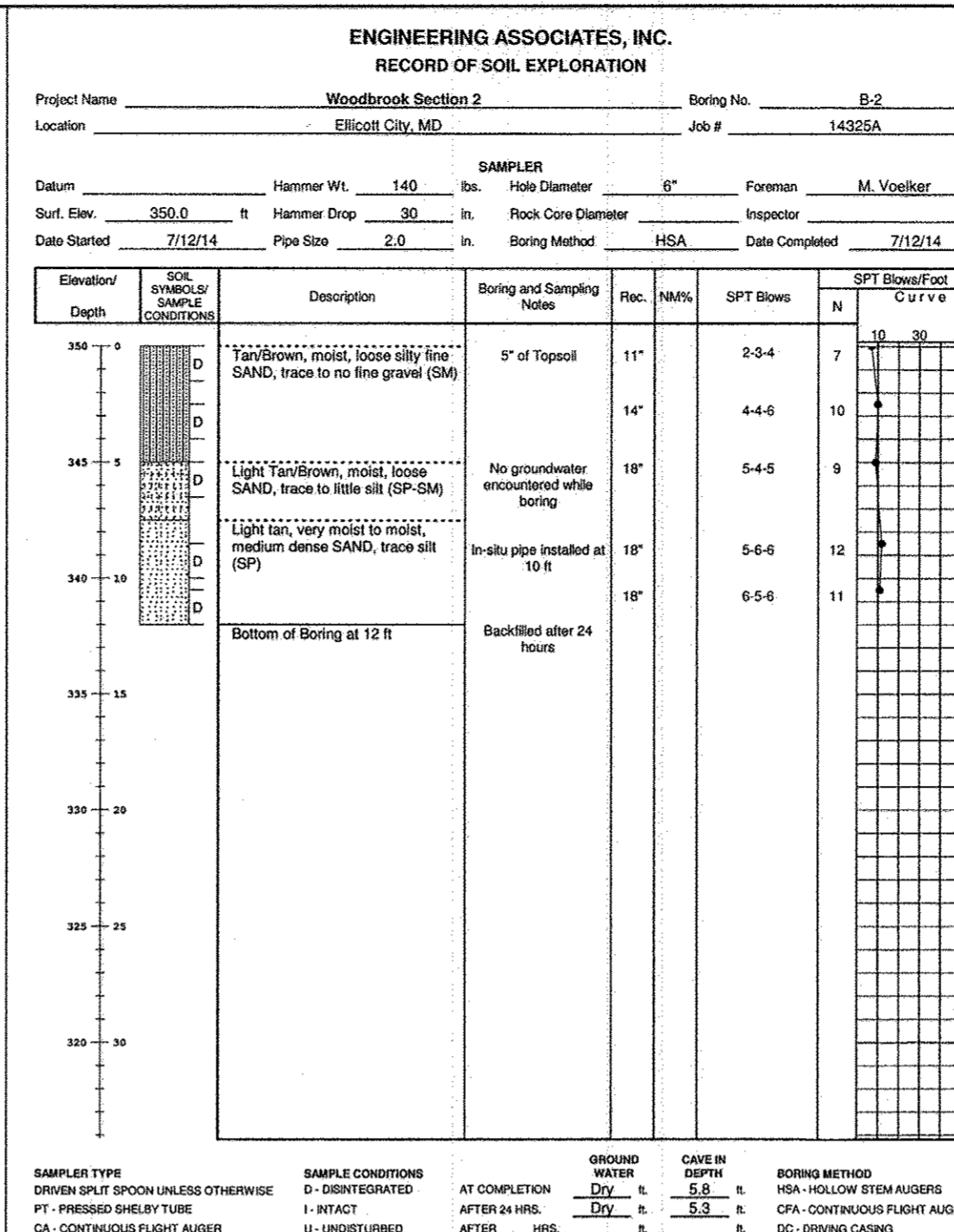
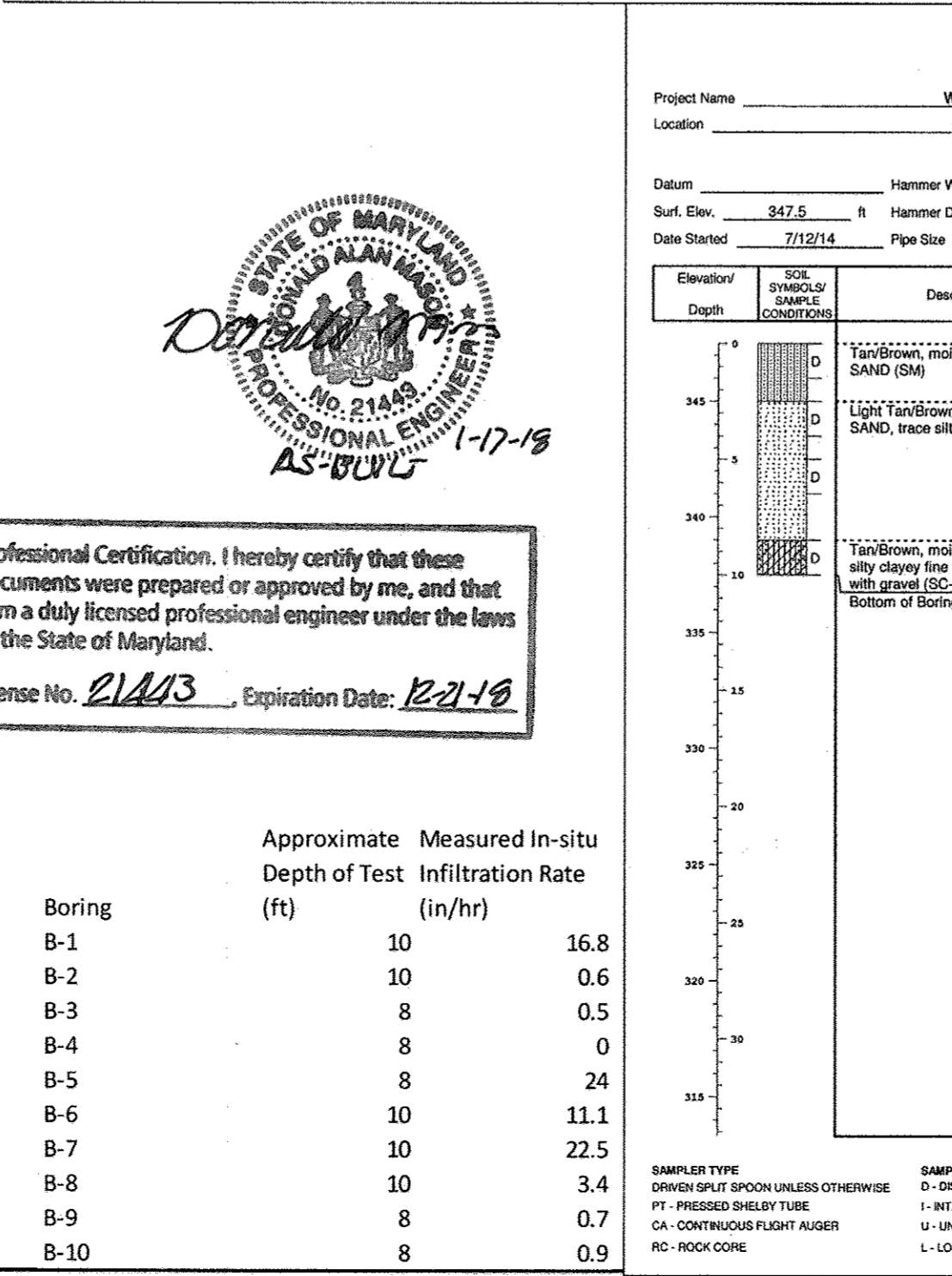
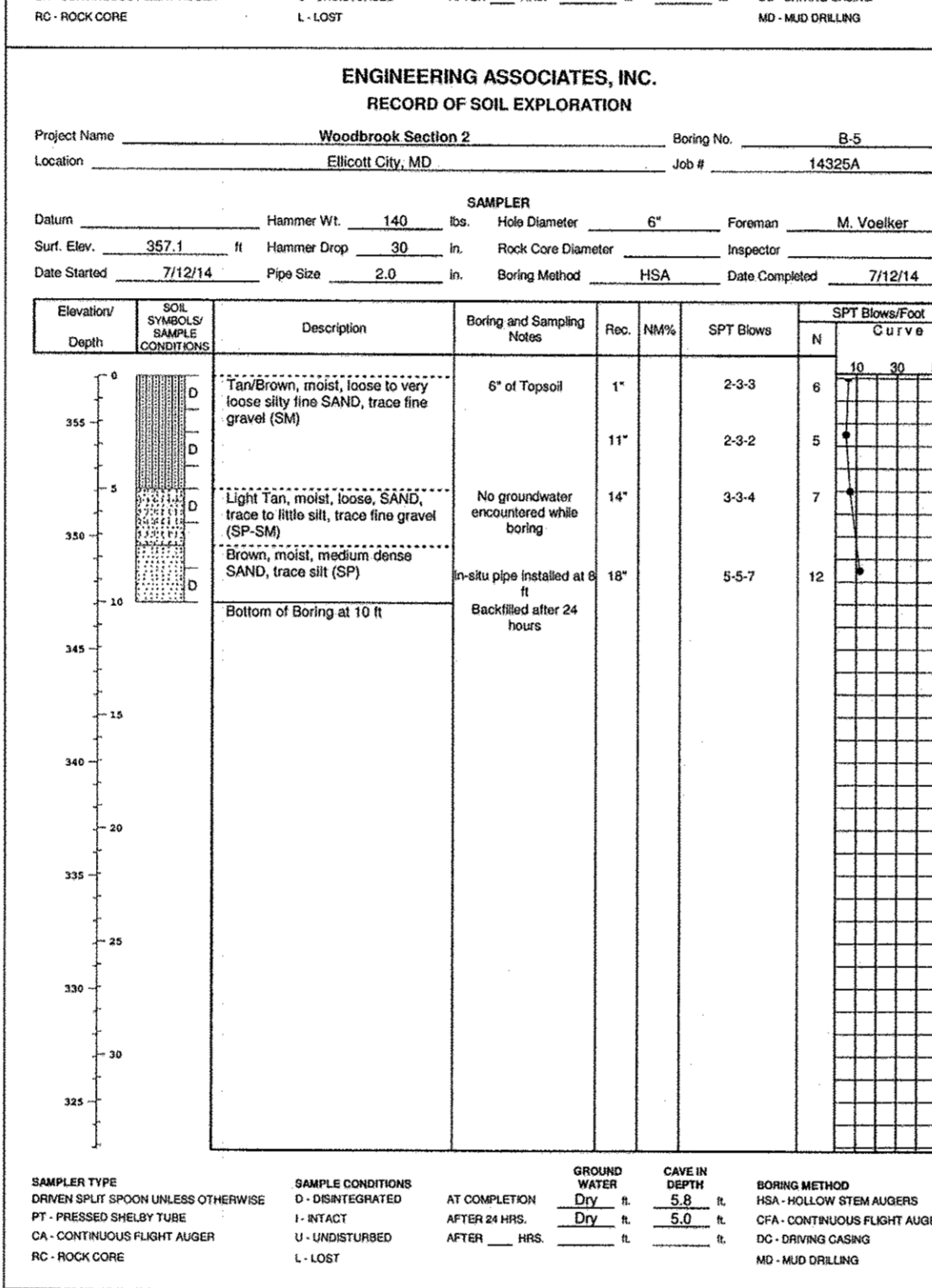
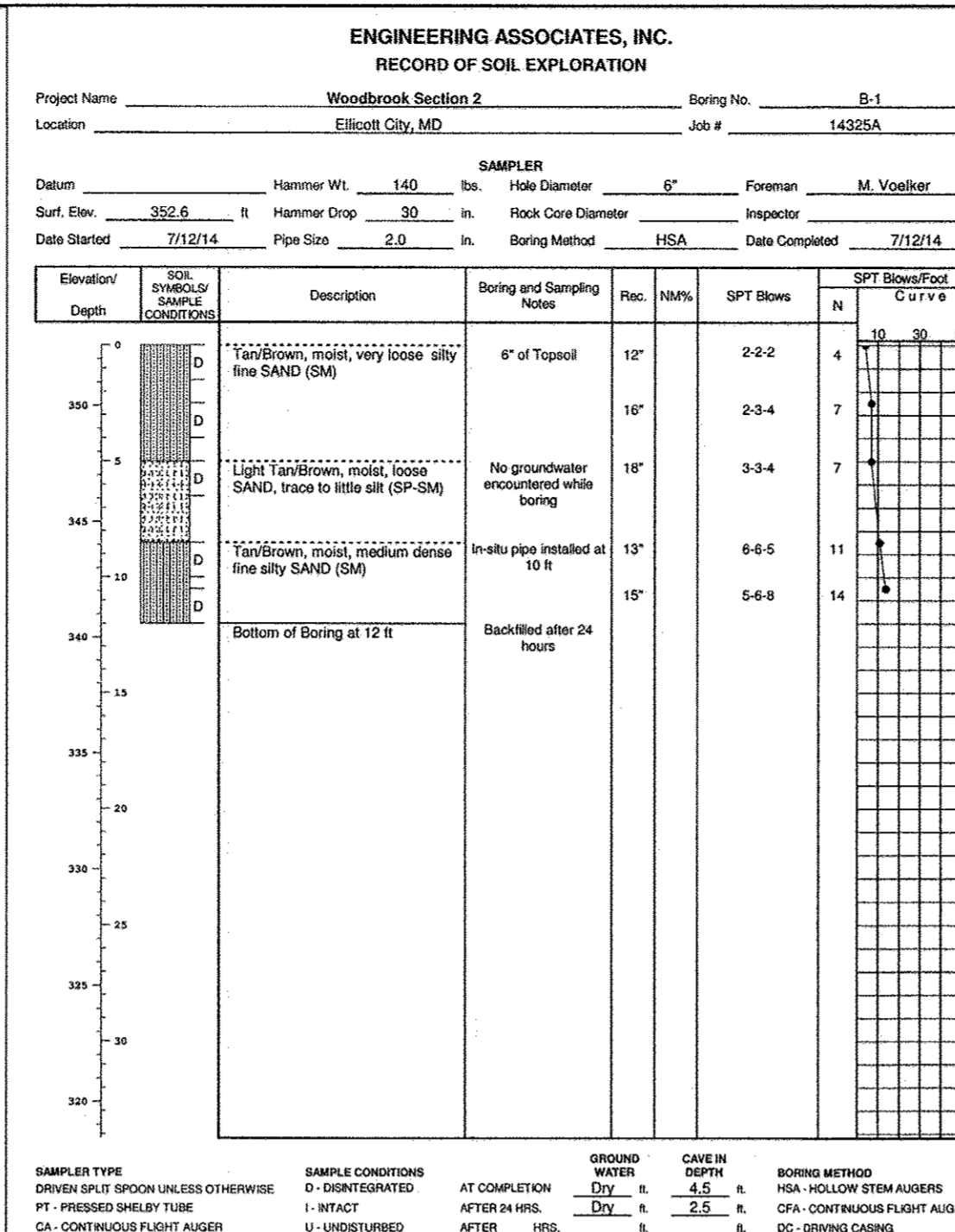
CONSTRUCTION SPECIFICATIONS

These specifications are appropriate to all ponds within the scope of the Standard for practice MD-378. All references to ASTM and AASHTO specifications apply to the most recent version.

Site Preparation
Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped to topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the toe of the embankment.
Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry stream channels, management ponds, a minimum of a 25-foot radius around the inlet structure shall be cleared.
All cleared and grubbed material shall be disposed of outside and below the limits of the dam and reservoir as directed by the owner or his representative. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use on the embankment and other designated areas.

Earth Fill
Material - The fill material shall be taken from approved designated borrow areas. If shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionable material. The fill material for the center of the embankment, and cut-off trench shall conform to Unified Soil Classification Group, SC, CL, or CL and shall be at least 30% passing the #20 sieve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer.
Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent erosion of the embankment.
Placement - Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8 inch thick (before compaction) layers which are to be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portions of the embankment. The principal spillway must be installed concurrently with fill placement and not excavated in the embankment.
Compaction - The movement of the hauling and spreading equipment over the fill shall be controlled so that the surface of each lift shall be traversed by not less than one tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out.

When required by the reviewing agency the minimum required density shall be not less than 95% of maximum dry density with a moisture content within +/- 2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).
Cut-Off Trench - The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be at least four feet below existing ground as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be placed in layers not greater than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.
Embankment Core - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment.
Structure Backfill
Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material used to fill the voids shall be placed adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.
Excavation and Sediment Control
Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures.



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 21443, Expiration Date: 12-1-19

Table with columns: Boring, Depth of Test (ft), Measured In-situ Infiltration Rate (in/hr). Rows include borings B-1 through B-10.

NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET

Professional Certification, BENCHMARK ENGINEERING, INC. logo, project information for Woodbrook Section 2, Phase 1, and drawing details including title, date, and scale.



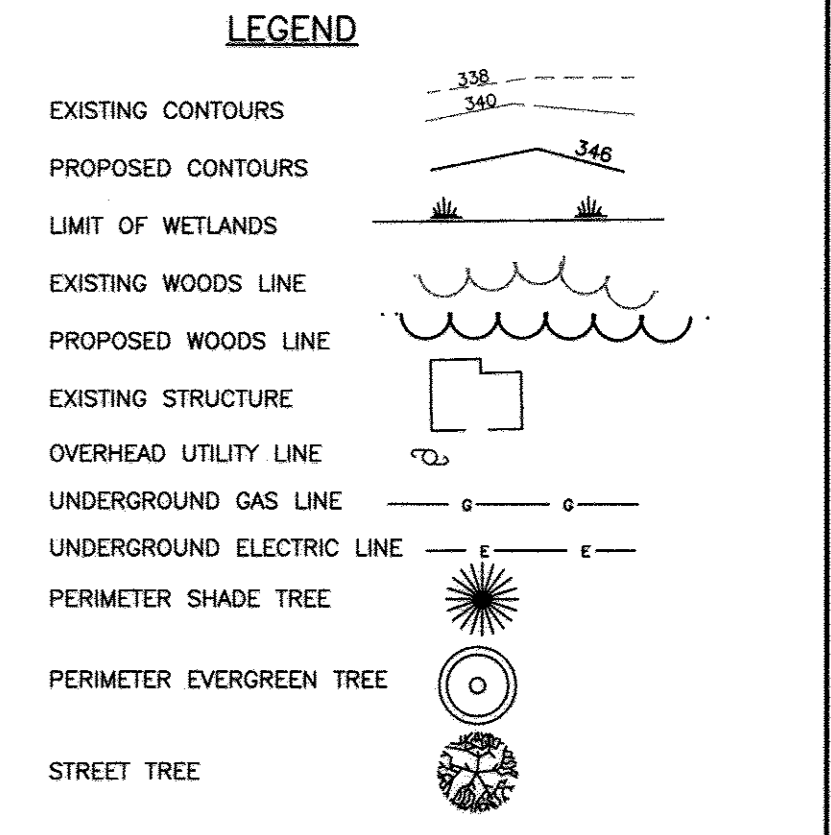
STREET TREE REQUIREMENTS		
ROADWAY NAME:	WOODCREST DRIVE	TOTAL
LINEAR FEET OF ROAD FRONTAGE	287	287
LINEAR FEET OF CREDIT	0	0
LINEAR FEET OF OBLIGATION	287	287
STREET TREES REQUIRED (1:40)	7	7
NUMBER OF SHADE TREES PROVIDED:	7	7

STREET TREE PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
	7	Acer rubrum 'autumn flame' AUTUMN FLAME RED MAPLE	2 1/2" MIN. CAL. B & B FULL HEAD

DEVELOPER'S/BUILDER'S CERTIFICATE
 I/WE 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/WE FURTHER CERTIFY THAT UPON COMPLETION A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.
 [Signature]
 JAMES SCHULTZ MEMBER
 SECURITY DEVELOPMENT, LLC
 DATE 10/28/15

SCHEDULE A PERIMETER LANDSCAPE EDGE				
CATEGORY	ADJACENT TO ROADWAY	NO	YES	
	ADJACENT TO PERIMETER PROPERTIES	YES	NO	
PERIMETER NO. / LANDSCAPE TYPE		(1) A	(2) B	TOTAL
LINEAR FEET OF PERIMETER (FRONTAGE/ROADWAY)		136'	108'	
CREDIT FOR EXISTING VEGETATION: NO OR YES (w/LINEAR FEET) (DESCRIBE BELOW IF NEEDED)		NO	NO	
CREDIT FOR WALL, FENCE OR BERM: NO OR YES (w/LINEAR FEET) (DESCRIBE BELOW IF NEEDED)		NO	NO	
NUMBER OF PLANTS REQUIRED: SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTE) SHRUBS		2 - - -	2 3 - -	4 3 - -
NUMBER OF PLANTS PROVIDED: SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTE) SHRUBS (10:1 SUBSTITUTE) (DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)		2 - - -	2 3 - -	4 3 - -

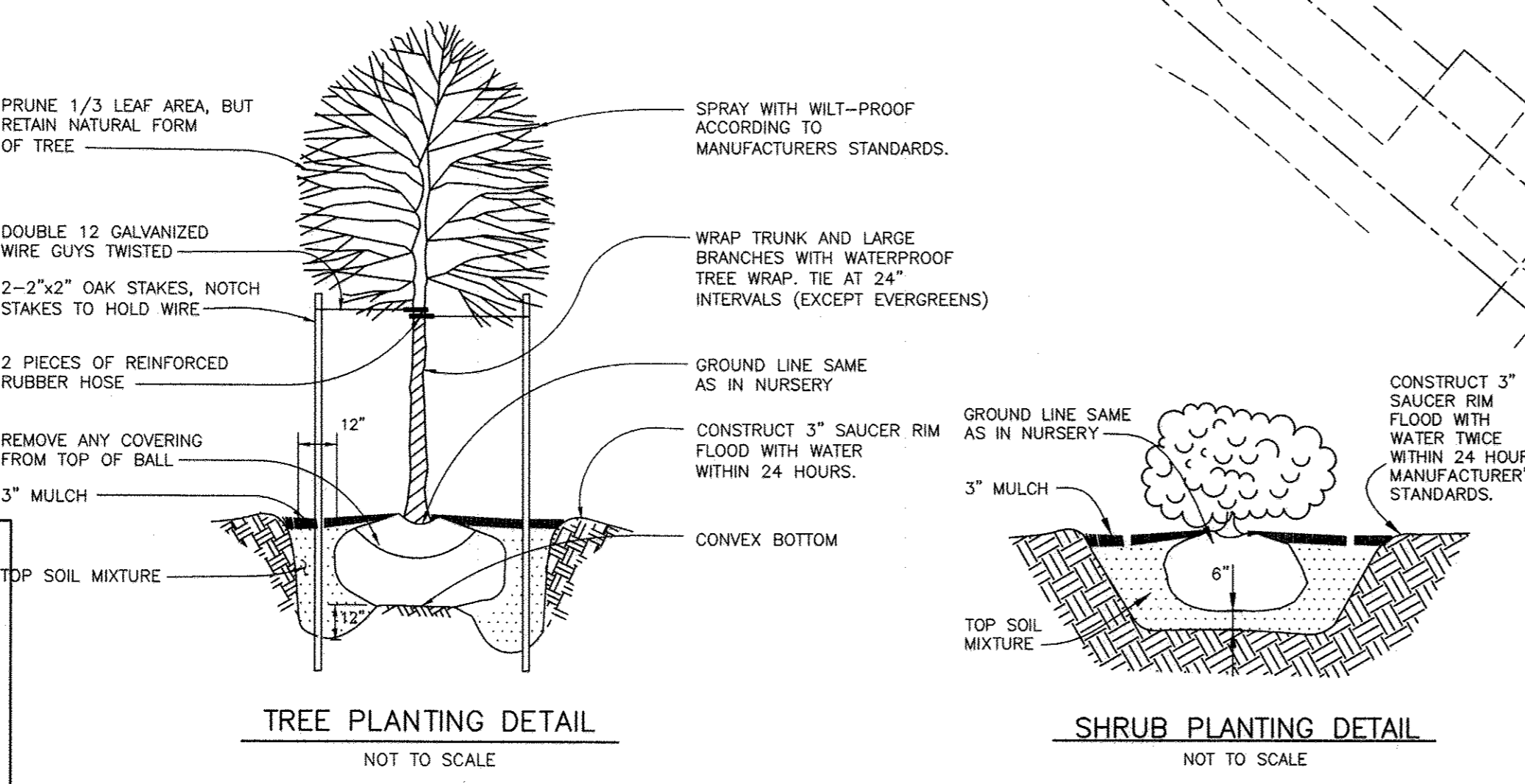
PERIMETER PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
	4	Tilia cordata 'greenpire' GREENSPIRE LITTLELEAF LINDEN	2 1/2" MIN. CAL. B & B FULL HEAD
	3	Ilex opaca AMERICAN HOLLY	5' - 6' HEIGHT



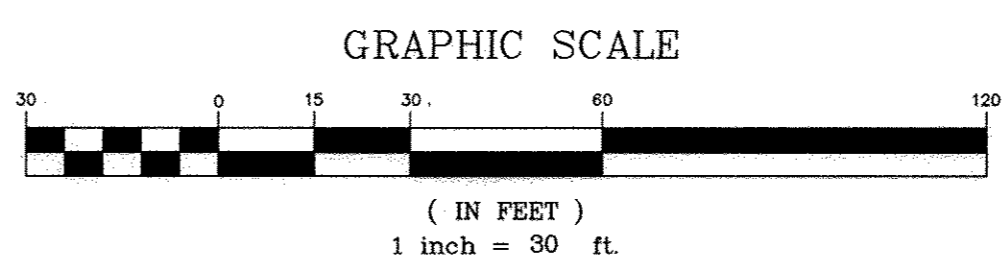
APPROVED: DEPARTMENT OF PUBLIC WORKS
 [Signature]
 CHIEF, DIVISION OF HIGHWAYS
 DATE 11/18/2015

LANDSCAPE NOTES:
 1. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL.
 2. AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE 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 PLAN MAY RESULT IN DENIAL OR DELAY IN RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATIONS.
 3. THE OWNER, TENANTS 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. FINANCIAL SURETY IN THE AMOUNT OF \$1,650.00 (\$300 FOR EACH OF THE 4 TREES, \$150 FOR EACH OF THE 3 EVERGREENS AND \$30 FOR EACH OF THE 6 SHRUBS) FOR THE REQUIRED PERIMETER LANDSCAPING SHALL BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT.
 5. THE FUTURE OBLIGATION FOR SECTION 2, PHASE 2 WILL BE DETERMINED IN ACCORDANCE WITH THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL AT THE TIME OF THE FUTURE DEVELOPMENT.
 6. THE EASTERN BOUNDARY LINE IS INTERNAL TO THE SAME SUBDIVISION AND THEREFOR NO LANDSCAPE OBLIGATION IS REQUIRED.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature]
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE 11/20/15
 [Signature]
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE 11-23-15
 [Signature]
 DIRECTOR
 DATE



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
 License No. 214431, Expiration Date 12-31-19



"NO AS-BUILT INFORMATION IS PROVIDED ON THIS SHEET"

NO.	DATE	REVISION
<p>BENCHMARK ENGINEERING, INC. ENGINEERS & LAND SURVEYORS & PLANNERS 8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043 PHONE: 410-465-6105 FAX: 410-465-6644 www.bei-civilengineering.com</p>		
<p>PROFESSIONAL CERTIFICATION: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 45577; Expiration Date: 06-09-2016</p>		
OWNER:	<p>JOHN R. & CHARLES E. NEIGHOFF, ET AL 4936 WHARFF ROAD ELLICOTT CITY, MARYLAND 21043</p>	
DEVELOPER:	<p>SECURITY DEVELOPMENT, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21041 410-465-4244</p>	
PROJECT:	<p>WOODBROOK SECTION 2, PHASE 1 LOTS 63-65 AND NON-BUILDABLE PARCELS "A" AND "B"</p>	
LOCATION:	<p>TAX MAP 37, GRID 14 PARCELS 126, 488 AND 530 1st ELECTION DISTRICT 6201 E. WATERLOO ROAD & 6247 WOODCREST DRIVE HOWARD COUNTY, MARYLAND</p>	
TITLE:	<p>LANDSCAPE PLAN, NOTES, AND DETAILS</p>	
DATE:	SEPTEMBER, 2015	PROJECT NO. 2370
SCALE:	1"=30'	DRAWING 9 OF 10

