SITE DEVELOPMENT PLAN

ORCHARD PARK SECTION 3

ROMANIK PROPERTY, LOT 1 AND ORCHARD HILL, OPEN SPACE LOT 3

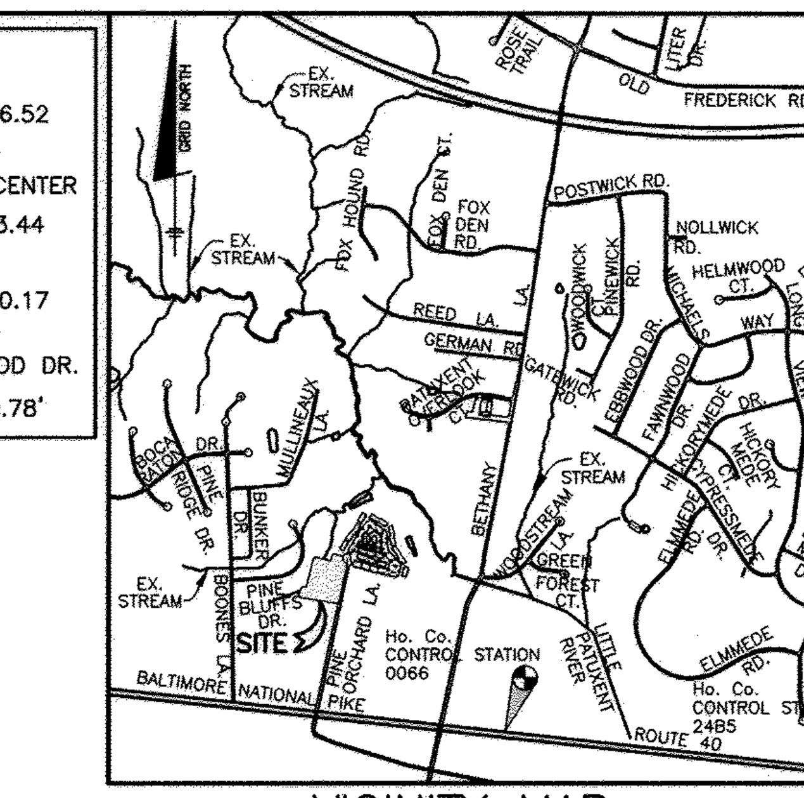
SDP-13-055

LEGEND

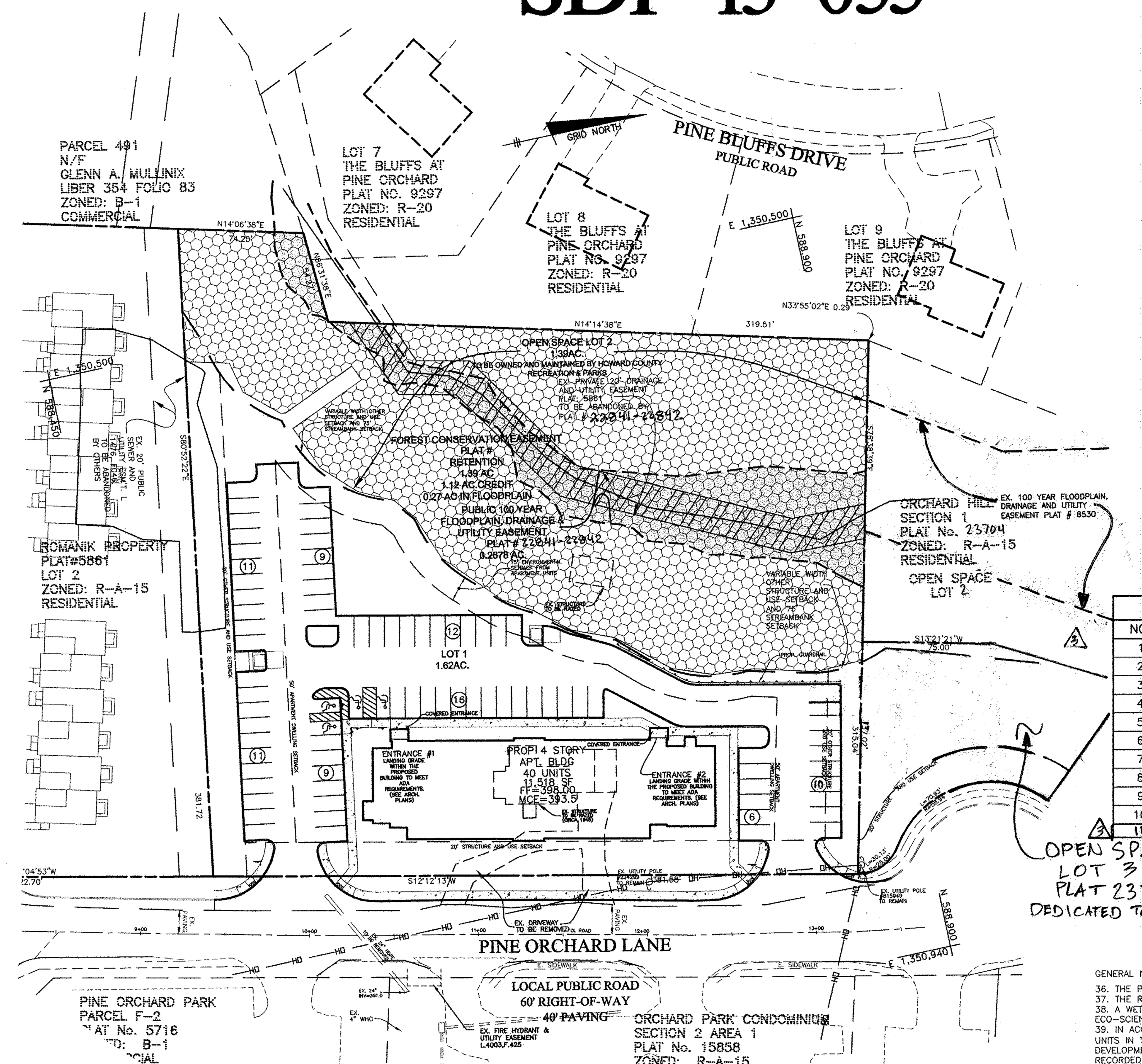
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING TREELINE
- PROPOSED TREELINE
- EXISTING STREAM
- EXISTING STREAMBANK BUFFER
- 100 YEAR FLOODPLAIN LIMITS
- 100 YEAR FLOODPLAIN DRAINAGE & UTILITY EASEMENT
- FOREST CONSERVATION EASEMENT
- FOREST CONSERVATION SIGN
- EXISTING STRUCTURE
- PROPOSED BUILDING
- SLOPES 25% OR GREATER
- MODERATE SLOPES
- EX. 20' DRAINAGE AND UTILITY EASEMENT
- PUBLIC DRAINAGE & UTILITY EASEMENT, PLAT #
- PUBLIC WATER & UTILITY EASEMENT
- PROP. MICRO-BIORETENTION FACILITY
- PROP. PERMEABLE PAVEMENT
- PROP. GAZEBO/PAVILION
- PROP. 5' PARK BENCH
- PROP. LANDSCAPING
- LIMIT OF DISTURBANCE
- EARTH DIKE
- STABILIZED CONSTRUCTION ENTRANCE
- SUPER SILT FENCE — SSF — SSF —
- SILT FENCE — SF — SF —
- INLET PROTECTION

DENSITY EXCHANGE CHART	
RECEIVING PARCEL INFORMATION	TAX MAP 24, GRID 1, PARCEL 647
TOTAL AREA OF SUBDIVISION	3.01 AC
AREA OF FLOODPLAIN	0.27 AC
AREA OF STEEP SLOPES	0.26 AC
DENSITY UNITS PER NET AREA	2.47 * 15 = 37 D.U.
NUMBER OF UNITS PROPOSED	40
NEIGHBORHOOD PRESERVATION DENSITY EXCHANGE RIGHTS REQUIRED	1 (APARTMENT UNITS =0.33 RIGHTS PER UNIT–0.33X3=0.99 UNITS)
SENDING PARCEL INFORMATION	PHELPS PROPERTY F-14-042 TAX MAP 18, GRID 1, PARCEL 357

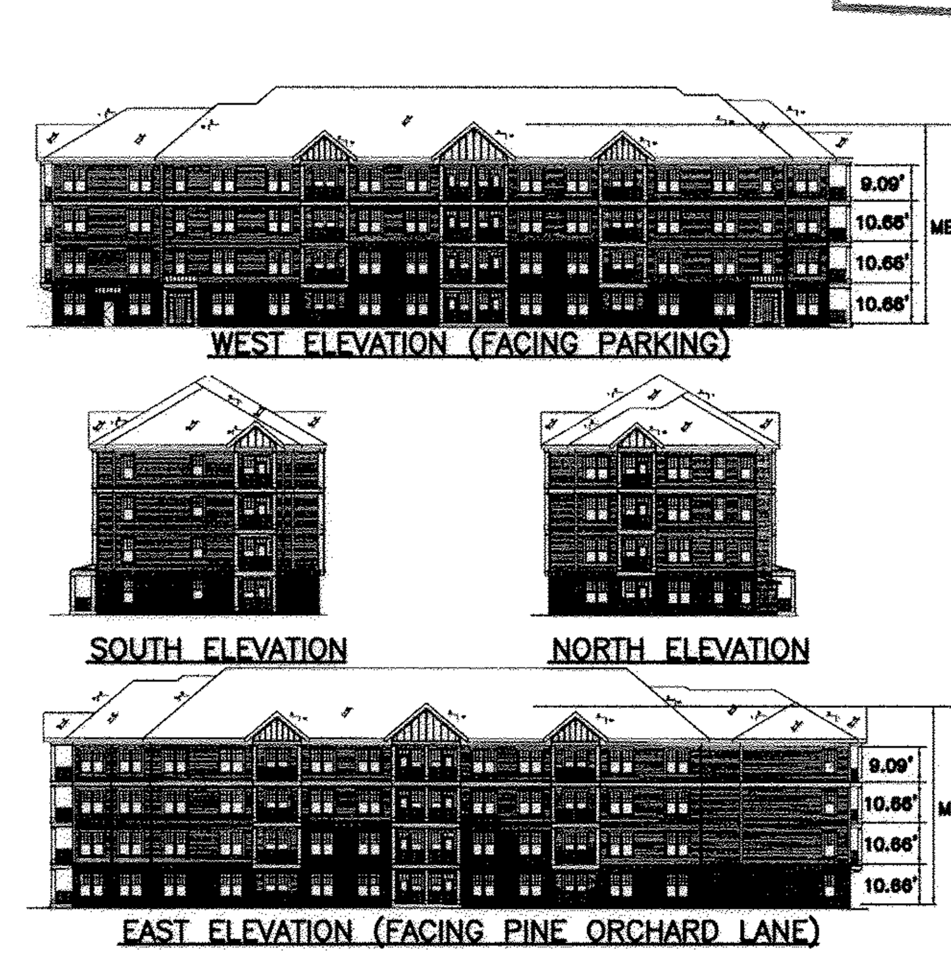
BENCH MARKS	
HO. CO. #0066 (NAD '83)	ELEV. 386.52
STANDARD DISC ON CONCRETE MONUMENT RT. 40 BY ENCHANTED FOREST SHOPPING CENTER	
N 587380.50	E 1,352603.44
HO. CO. #24B5 (NAD '83)	ELEV. 390.17
STANDARD DISC ON CONCRETE MONUMENT ISLAND AT CORNER OF RT. 40 AND DOGWOOD DR.	
N 586956.27'	E 1356570.78'



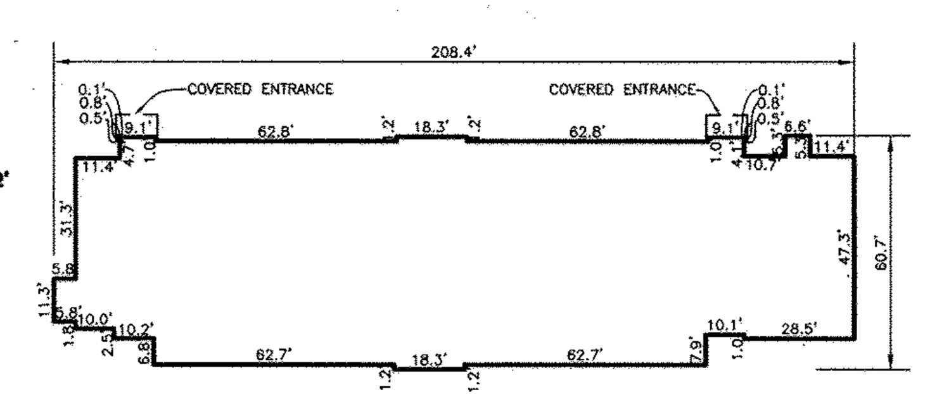
VICINITY MAP
SCALE: 1" = 2000'
ADC MAP 20 GRID A6



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: 12-21-16
6-25-15



BUILDING ELEVATIONS
SCALE: 1" = 50'



BUILDING FOOTPRINT
SCALE: 1" = 50'

GRAPHIC SCALE
(IN FEET)
1 inch = 50 ft.

PARKING TABULATIONS

PROPOSED BUILDING USE: APARTMENT
NUMBER OF UNITS PROPOSED: 40
NUMBER OF SPACES REQUIRED: *1.7/UNIT=68 SPACES
0.3/UNIT OVERFLOW=12 SPACES
TOTAL =80 SPACES

NUMBER OF SPACES PROVIDED: 84 (INCLUDING 4 HC SPACES)

*BASED ON AN ANALYSIS PREPARED BY THE TRAFFIC GROUP DATED JULY 30, 2013 THE PARKING NEEDS MAY BE REDUCED.

SITE ANALYSIS DATA/TABULATION

A) TOTAL PROJECT AREA.......... 3.30± AC.
3.01 AC. ROMANIK PROPERTY LOT 1 *
0.29 AC. ORCHARD HILL LOT 3
* USED FOR DENSITY
B) AREA OF WETLANDS AND BUFFER.......... N/A — 0.29 AC. OPEN SPACE (NOT TO COUNT AS DENSITY)
C) AREA OF 100-YR. FLOODPLAIN.......... 0.27± AC.
D) AREA OF EXISTING FOREST.......... 2.0± AC.
E) AREA OF STEEP SLOPES 25% OF GREATER... 0.26± AC.
F) NET AREA OF SITE.......... 2.48± AC.
G) AREA OF MODERATE SLOPES 15% TO 25%... 1.3± AC.
H) HIGHLY ERODIBLE SOILS (K> 0.35) .... 0.7± AC. (0.3± AC. OUTSIDE STEEP SLOPES AND FLOODPLAIN)
I) NUMBER OF UNITS ALLOWED .... 37 (2.48± AC.*15)
J) NUMBER OF RESIDENTIAL UNITS PROPOSED... 40 (3 ALLOCATIONS THRU DENSITY EXCHANGE; PHELPS PROPERTY) 4 STORY, 10 UNITS PER FLOOR
K) AREA OF PLAN SUBMISSION.......... 3.0± AC.
L) LIMIT OF DISTURBED AREA.......... 1.99 ± AC
M) OPEN SPACE REQUIRED.......... 0.75 AC. (25%*3.0 AC)
RECREATIONAL SPACE REQUIRED.......... 400 SF PER UNIT 40 UNITS*400=16,000 SF
N) OPEN SPACE PROVIDED.......... 1.39 AC. OR 46% (OPEN SPACE LOT 2)
RECREATIONAL OPEN SPACE PROVIDED.......... 23,160 SF (SEE SHEET 2 FOR CHART)
O) PRESENT ZONING DESIGNATION.......... R-A-15
P) PROPOSED USE.......... SINGLE FAMILY ATTACHED/APARTMENTS
Q) IMPERVIOUS COVER.......... 0.9± AC.
R) APPLICABLE DPZ #.......... F-84-130, PLAT # 5861, WP-13-074, ECP-13-012, F-14-025, F-14-042, F-16-092
S) PROPOSED WATER AND SEWER .... _X_ PUBLIC, ____ PRIVATE F-88-291
T) PROPOSED USE OF SITE .... APARTMENT BUILDING-11,100 SF

THIS DEVELOPMENT IS SUBJECT TO THE ZONING REGULATIONS, SECTION 112.F. REQUIRING 10% OF THE UNITS BE DEVELOPED AS MODERATE INCOME HOUSING UNITS (MIHU) OR 4 UNITS.

SHEET INDEX

ADDRESS CHART

LEVEL	STREET ADDRESS	UNIT NUMBERS
1	3200 PINE ORCHARD LANE	101–110
2	3200 PINE ORCHARD LANE	201–210
3	3200 PINE ORCHARD LANE	301–310
4	3200 PINE ORCHARD LANE	401–410

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS CONSTRUCTION INSPECTION DIVISION AT (410)313-1880 AT LEAST FIVE(5) WORKING DAYS PRIOR TO THE START OF WORK.
3. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK.
4. SUBJECT PROPERTY ZONED R-A-15 PER THE 10-06-13 COMPREHENSIVE ZONING PLAN ~~AND THE COMP LITE ZONING AMENDMENTS EFFECTIVE 7-28-06 AND 10-6-13.~~
5. THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE ZONING REGULATIONS EFFECTIVE 10-06-13. DEVELOPMENT OR CONSTRUCTION ON THESE LOTS MUST COMPLY WITH THE SETBACK AND BUFFER REGULATIONS IN EFFECT AT THE TIME OF SUBMISSION OF THE SITE DEVELOPMENT PLAN, WAIVER PETITION APPLICATION, OR BUILDING/GRADING PERMIT.
6. BOUNDARY IS BASED ON A BOUNDARY SURVEY CONDUCTED BY BENCHMARK ENGINEERING, INC. ON OR ABOUT DECEMBER 2012.
7. 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. 0066 AND 24B5 WERE USED FOR THIS PROJECT.
8. EXISTING TOPOGRAPHY SHOWN HEREON IS BASED ON FIELD RUN SURVEY PERFORMED BY BENCHMARK ENGINEERING, INC. PERFORMED ON OR ABOUT DECEMBER 2012.
9. EXISTING UTILITIES SHOWN HAVE BEEN TAKEN FROM CONTRACT DRAWINGS AND FIELD SURVEYED LOCATIONS. IF NECESSARY, CONTRACTOR SHALL ADJUST ANY OR ALL STRUCTURE TOP ELEVATIONS TO MATCH SDP GRADES.
10. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO CEMETERIES LOCATED ON THIS SITE.
11. THE STRUCTURE LOCATED ON THE PROPERTY IS NOT LISTED ON THE HISTORIC REGISTRY BUT IS OLDER THAN 50 YEARS. THE DPZ, RESOURCE CONSERVATION DIVISION HAS DETERMINED THE SITE DOES NOT REQUIRE HDC APPROVAL PRIOR TO DEMOLITION. THE EXISTING STRUCTURE LOCATED ON THIS SITE, BUILT CIRCA 1945, WILL BE REMOVED PRIOR TO PLAT RECORDATION.
12. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAMS, THEIR REQUIRED BUFFERS OR 100 YEAR FLOODPLAIN EXCEPT THAT WHICH IS SPECIFIED IN APPROVED WP-13-074, OR FOREST CONSERVATION EASEMENTS (SEE GENERAL NOTES 22 AND 35 BELOW).
13. THE FLOODPLAIN SHOWN IS BASED ON A FLOODPLAIN STUDY PREPARED BY BENCHMARK ENGINEERING, INC. DATE AUGUST 28, 2012.
14. THE TRAFFIC STUDY FOR THIS PROJECT WAS PREPARED BY MARS GROUP DATED JANUARY 2013.
15. PREVIOUS HOWARD COUNTY FILE NUMBERS: F-84-130, PLAT # 5861, WP-13-074, ECP-13-012, S-88-018, P-88-035, F-88-291, ZB-837M, F-14-025, F-14-042, F-16-092
16. THIS SITE IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
17. WATER IS PUBLIC. THE CONTRACT NUMBER IS 24-1764-D. THE DRAINAGE AREA IS "PATAPSCO".
18. SEWER IS PUBLIC. THE CONTRACT NUMBER IS 24-1462-D. THE DRAINAGE AREA IS "PATAPSCO".
19.) THE REQUIRED PERIMETER PLANTINGS AND PARKING LOT PLANTINGS ARE PROVIDED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT FOR SDP-13-055 IN THE AMOUNT OF **$20,410.00** ($9,600.00 FOR 32 SHADE TREES, $6,600.00 FOR 44 EVERGREEN TREES, $1,800 FOR 12 ORNAMENTAL TREES AND $2,250.00 FOR 75 SHRUBS). THE ADDITIONAL $160.00 SURETY FEE IS FOR THE DISTURBANCE WITHIN THE FOREST CONSERVATION EASEMENT. SEE NOTE 20.
20. THE FOREST CONSERVATION OBLIGATION FOR THIS PLAN HAS BEEN MET BY PROVIDING 1.12 AC. OF CREDITED ON-SITE RETENTION. FOREST CONSERVATION SURETY OF **$160.00** HAS BEEN POSTED AS PART OF THE LANDSCAPE SURETY FOR THE DISTURBANCE WITHIN THE FOREST CONSERVATION EASEMENT.
21. THE FOREST CONSERVATION EASEMENTS HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION ACT. 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.
22. STORMWATER MANAGEMENT FOR THIS SITE COMPLIES WITH ECP-13-012 WHICH WAS APPROVED ON NOVEMBER 26, 2012. THE METHODS OF TREATMENT ARE 2 MICRO-BIORETENTION AND 6 AREAS OF PERVIOUS CONCRETE WITHIN THE PROPOSED PARKING AREAS.
23. THE GEOTECHNICAL REPORT WAS PREPARED BY GEO LABS, INC. ON FEBRUARY 20 – 21, 2013.
24. THE PROPOSED FIRE HYDRANT TO BE CONSTRUCTED AS PART OF AN ADVANCED DEPOSIT ORDER(ADO).
25. DESIGN ADVISORY PANEL MEETING WAS HELD ON FEBRUARY 27, 2013. AS A RESULT, NO ADDITIONAL MEETING IS NECESSARY.
26. THE PROPOSED BUILDING WILL UTILIZE AN AUTOMATIC SPRINKLER SYSTEM FOR FIRE PROTECTION.
27. TRASH COLLECTION SHALL BE PROVIDED PRIVATELY.
28. KNOX BOX SHALL BE PLACED ON THE FRONT OF ALL BUILDINGS NO MORE THAN 6' TO THE RIGHT OF THE MAIN ENTRANCE AT A HEIGHT OF 4-5'. IT SHALL BE ELECTRONICALLY SUPERVISED TO NOTIFY THE OWNER THAT IT IS BEING ACCESSED (INTEGRATED WITH THE FIRE ALARM SYSTEM).
29. ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-½" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) – 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
30. ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MDMUTCD).
31. ALL OUTDOOR LIGHTING SHALL COMPLY WITH THE REQUIREMENTS OF ZONING SECTION 134. ALL PROPOSED EXTERIOR LIGHTING SHALL BE DIRECTED/REFLECTED AWAY FROM ALL ADJACENT PUBLIC ROADS AND RESIDENTIAL ZONING DISTRICTS. LIGHT TRESPASS ONTO ANY PROPERTY ZONED OR USED FOR RESIDENTIAL PURPOSES SHALL BE LIMITED TO 0.5 FOOT CANDLES.
32. A NOISE STUDY IS NOT REQUIRED FOR THIS DEVELOPMENT.
33. STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (2006), SECTION 5.5.A. A MINIMUM SPACING OF 20 FEET SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
34. ALL PLAN DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
35. THIS PLAN IS SUBJECT TO WAIVER PETITION WP-13-074 APPROVED NOVEMBER 14, 2012 TO SECTION 16.116(a)(2)(ii) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATION WHICH STATES, REMOVAL OF VEGETATIVE COVER AND TREES, PAVING AND NEW CONSTRUCTION SHALL NOT BE PERMITTED WITHIN 75' OF A PERENNIAL STREAMBANK AND SECTION 16.1202(a)(7) & (10) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, WHICH REQUIRES THE RETENTION OF STATE CHAMPION TREES, TREES 75% OF THE DIAMETER OF THE STATE CHAMPION TREES, AND TREES 30" IN DIAMETER OR LARGER SUBJECT TO THE FOLLOWING:
   1. APPROVAL OF THIS WAIVER IS FOR THE REMOVAL OF FIVE SPECIMEN TREES AS SHOWN ON THE WAIVER PETITION EXHIBIT. NO OTHER SPECIMEN TREES MAY BE REMOVED.
   2. REMOVAL OF THE FIVE SPECIMEN TREES WILL REQUIRE MITIGATION AT A RATIO OF ONE 3"-4" CALIPER TREE PER EACH SPECIMEN TREE REMOVED. THE MITIGATION PLANTING SHALL BE PROVIDED AS PART OF THE LANDSCAPE PLAN WITH THE SUBDIVISION AND/OR SITE DEVELOPMENT PLAN.
   3. ONCE CONSTRUCTION IS COMPLETE THE TEMPORARY LIMIT OF DISTURBANCE WITHIN THE ENVIRONMENTAL FEATURES SHALL BE STABILIZED AS NECESSARY WITH SEED, SOD, FOREST RESOURCES OR SUITABLE GROUND COVER.
   4. PROVIDE ADEQUATE OUTLET PROTECTION FOR EACH BIORETENTION OUTLET TO PREVENT SOIL EROSION.
   5. OBTAIN ALL NECESSARY AUTHORIZATION OF REGULATED ACTIVITY FROM THE MARYLAND DEPARTMENT OF THE ENVIRONMENT.

GENERAL NOTES CONT.:

36. THE PROPOSED FIRE HYDRANT TO BE CONSTRUCTED AS PART OF AN ADVANCED DEPOSIT ORDER(ADO).
37. THE ROOF MANIFOLD SHALL MAINTAIN A MINIMUM SLOPE OF 1.0%.
38. A WETLAND DELINEATION AND FOREST STAND DELINEATION REPORT OF THIS PROPERTY WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. ON AUGUST 27, 2012. THERE ARE ON WETLANDS ONSITE.
39. IN ACCORDANCE WITH SECTION 112.0.G OF THE ZONING REGULATIONS AT LEAST 10% OF THE DWELLING UNITS IN THE R-A-15 DEVELOPMENTS SHALL BE MODERATE INCOME HOUSING UNITS (MIHU). THIS DEVELOPMENT PROJECT REQUIRES 4 UNITS AND IS PROPOSING 4 UNITS. THE MIHU AGREEMENT WAS RECORDED AS LIBER 15608 FOLIO 187 , AND THE MIHU COVENANTS WERE RECORDED AS LIBER 1568 FOLIO 194
40. IN ACCORDANCE WITH SECTION 112.0.D.1.e. OF THE ZONING REGULATIONS THE PLANNING DIRECTOR HAS DETERMINED THE INCREASED BUILDING LENGTH IS ACCEPTABLE BECAUSE THE DESIGN OF THE BUILDING WILL MITIGATE THE VISUAL IMPACT OF THE PROPOSED BUILDING LENGTH.
41. IN ACCORDANCE WITH SECTION 128.0.A.10 OF THE ZONING REGULATIONS OPEN SPACE LOT 3 ORCHARD HILL IS CONSIDERED A PART OF THIS DEVELOPMENT THEREFORE THE STRUCTURE AND USE SETBACKS FROM THE INTERNAL PROPERTY LINES SHALL NOT APPLY. ALSO THE USE SETBACK FOR THE PROPOSED PATHWAY ALONG AND WITHIN THE ADJOINING THE TOWNS AT PATUXENT ORCHARD DEVELOPMENT SHALL NOT APPLY IN ACCORDANCE WITH THE SAME SECTION BECAUSE THE TWO PROJECTS CAN BE CONSIDERED INTEGRATED DEVELOPMENTS WITH THE SHARED USE PATHWAY.
42. THE RECREATIONAL OPEN SPACE REQUIREMENTS FOR THIS PROJECT HAS BEEN MET THROUGH ONSITE AMENITIES AND OFFSITE AMENITIES LOCATED IN THE COMMUNITY OF ORCHARD PARK SECTION 1 BY SHARED USE OF THE CLUBHOUSE, POOL AND OTHER AMENITIES.
43. A DESIGN MANUAL WAIVER HAS BEEN APPROVED DATED JULY 8, 2013 TO WAIVE DESIGN MANUAL, VOLUME VI, DETAIL R-1.03 TO ALLOW THE USE OF A MODIFIED CLOSED TYPICAL SECTION IV WITH 5' CONCRETE SIDEWALK NEXT TO THE CURB FOR A PUBLIC SIDEWALK WITHIN THE METROPOLITAN DISTRICT.
44. USING THE NEIGHBORHOOD PRESERVATION DENSITY EXCHANGE OPTION DESCRIBED IN SECTION 128.0.K OF THE ZONING REGULATIONS, THE DEVELOPMENT RIGHTS FOR 3 OF THE RESIDENTIAL APARTMENT UNITS HAVE BEEN TRANSFERRED FROM PHELPS PROPERTY, TAX MAP 18, PARCEL 357 VIA SENDING PLAT F-14-042 TO THE ORCHARD PARK RECEIVING PLAT F-14-025.
45. THE ARTICLES OF INCORPORATION FOR THE HOA WAS FILED WITH THE MD STATE DEPARTMENT OF ASSESSMENTS AND TAXATION ON 9.29.15 #D16794877.
46. THE HOA DECLARATION OF COVENANTS WAS RECORDED WITH THE LAND RECORDS OFFICE OF HOWARD COUNTY ON 3.15.16 AS L. 16739, F. 121.
47. ADDITIONAL LANDSCAPING OF 1 SHADE & 1 EVERGREEN TREE WERE PROVIDED PER REVISION #3. NO SURETY IS REQUIRED.

SWM SUMMARY TABLE													
Pe=	2.2	inches											
D.A.	MDE Type	Total DA	Impervious Area	Qe	Af				ESDv			REv	
					Required	Provided	2% DA	Depth	Required	Provided	75% ESDv	Required	Provided
MBR 1	(M-6)	16,490	14,089	1.80	1814	1867	PASS	2.0	1857	1867	PASS	REv requirement calculati	127
MBR 2	(M-6)	3,220	2,700	1.77	354	408	PASS	2.0	356	408	PASS		28
PP-1	(A-2)	5530	4018	1.55	N/A	N/A	N/A	N/A	996	3931	PASS		189
PP-2	(A-2)	4879	3421	1.50	N/A	N/A	N/A	N/A	882	3444	PASS		160
PP-3	(A-2)	5953	4009	1.44	N/A	N/A	N/A	N/A	1079	4271	PASS		252
PP-4	(A-2)	4555	2935	1.39	N/A	N/A	N/A	N/A	319	3324	PASS		145
PP-5	(A-2)	1242	270	0.54	N/A	N/A	N/A	N/A	191	1129	PASS		38
PP-6	(A-2)	4721	2008	0.95	N/A	N/A	N/A	N/A	881	3879	PASS		109
											PASS		0
		46,590	33,450		2,168	2,275			6,561	22,253		1,021	1,048

ESD CHART				
ESD	DA	%IMP.	SURFACE AREA	NOTES
MBR-1	0.38 AC.	85	1867 SF	ALL BUILDING, PARKING LOT RUNOFF
MBR-2	0.07 AC.	84	408 SF	PARKING LOT RUNOFF
PP-1	0.13 AC.	100	1512 SF	PARKING LOT RUNOFF
PP-2	0.11 AC.	100	1458 SF	PARKING LOT RUNOFF
PP-3	0.14 AC.	100	1944 SF	PARKING LOT RUNOFF
PP-4	0.10 AC.	100	1620 SF	PARKING LOT RUNOFF
PP-5	0.03 AC.	100	804 SF	PARKING LOT RUNOFF
PP-6	0.11 AC.	100	2713 SF	PARKING LOT RUNOFF

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6.17.14
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-19-14
DIRECTOR — DATE 6/19/14

PERMIT INFORMATION CHART

SUBDIVISION NAME:		SECTION/AREA:		LOT/PARCEL #
ORCHARD PARK SECTION 3 (ROMANIK PROPERTY)		NA		LOT 1
PLAT No. OR L/F	GRID No.	ZONE	TAX MAP NO	ELECTION DISTRICT	CENSUS TRACT
5861, 23704, 22841-22842	1	R-A-15	24	2	6012.00

NO.	DATE	REVISION
3	10-27-15	ADD OPEN SPACE LOT 3, REVISE REC. OPEN SPACE AREA PROVIDED
1	6-1-15	REMOVE PROP. SHED ON PARCEL 'B'

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 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. 22390, Expiration Date: 6.30.15.
5-5-14

OWNER:
LAKESHORE I, LLC
C/O SECURITY DEVELOPMENT
8480 BALTIMORE NATIONAL PIKE
SUITE 415
ELLICOTT CITY, MD 21043

DEVELOPER:
SECURITY DEVELOPMENT, LLC
PO BOX 417
ELLICOTT CITY, MD 21041
410-465-4244

ORCHARD PARK
SECTION 3
3200 PINE ORCHARD LANE
ROMANIK PROPERTY, LOT 1 AND ORCHARD HILL, OPEN SPACE LOT 3

TAX MAP: 24 & 17, GRID: 1 & 19, PARCEL: 647 & P/O 130
ZONED: R-A-15
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT PLAN
TITLE SHEET

DATE:	MAY 2014	BEI PROJECT NO.	1796
SCALE:	AS SHOWN	SHEET	1 OF 11

AS-BUILT

SDP-13-055

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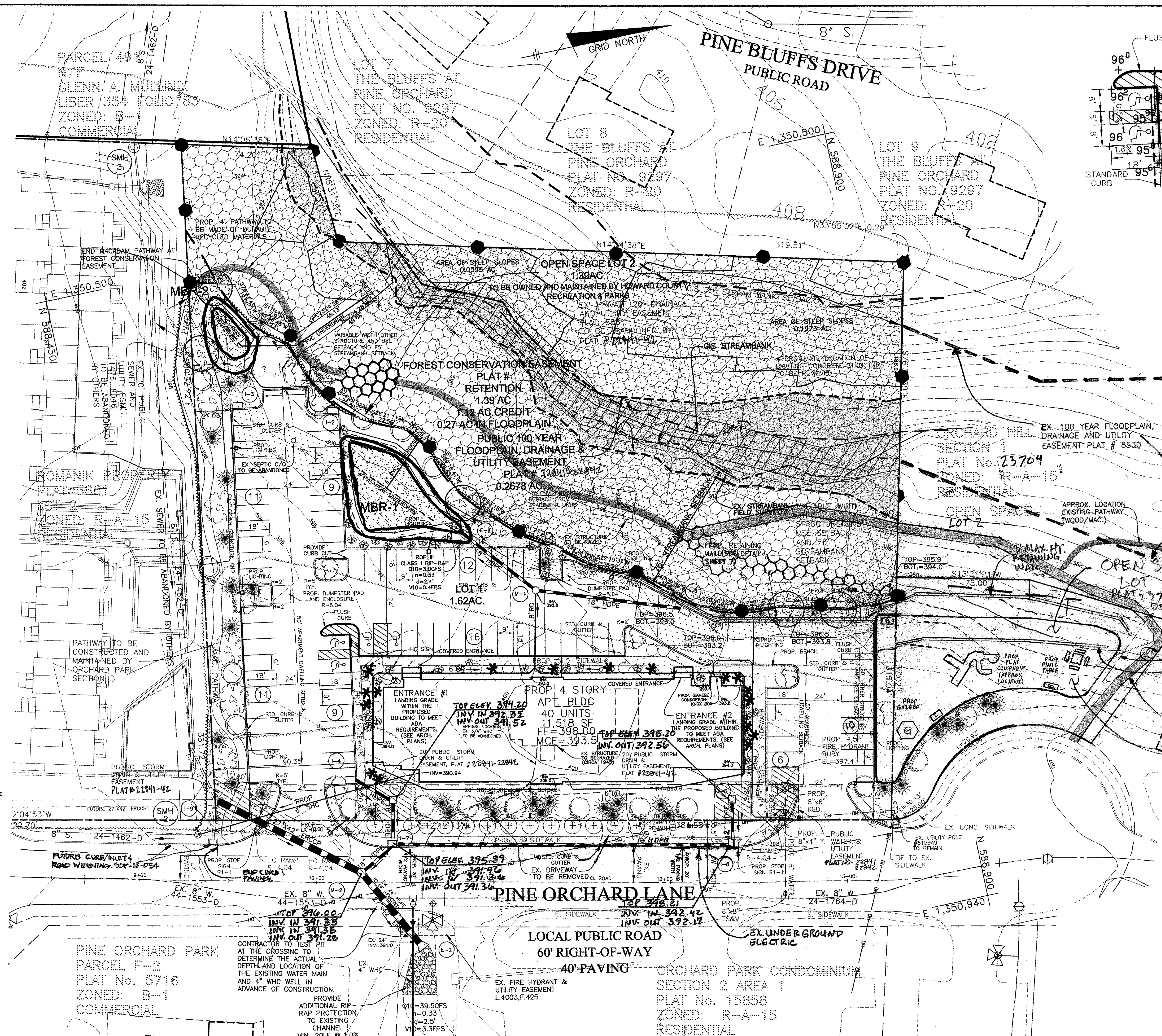
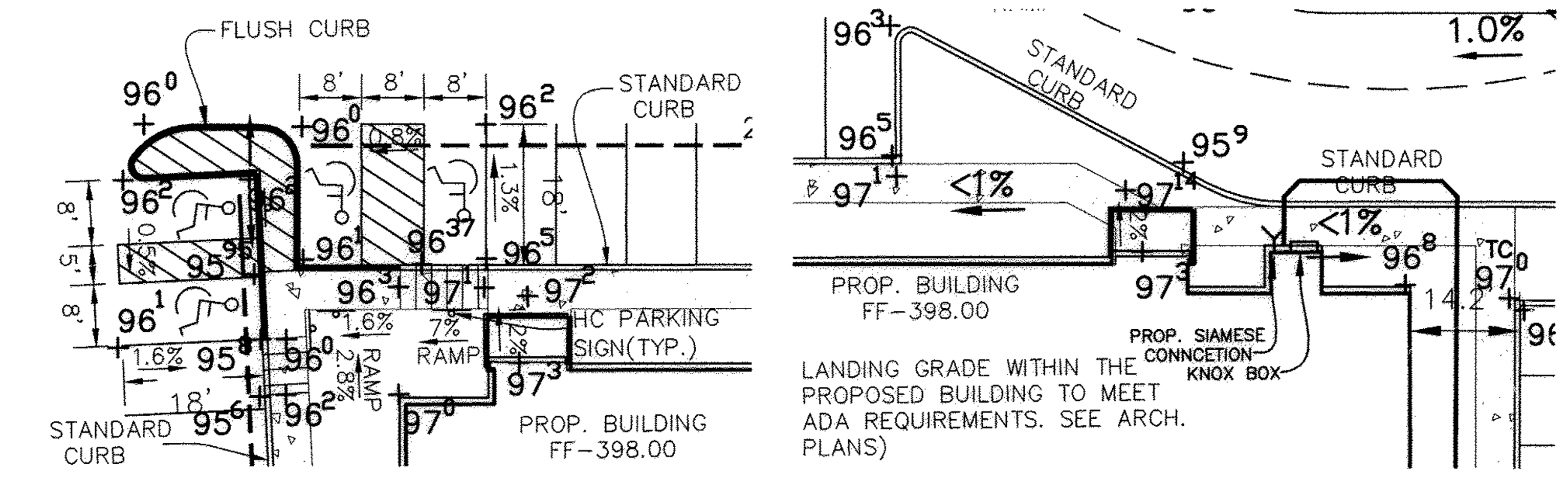
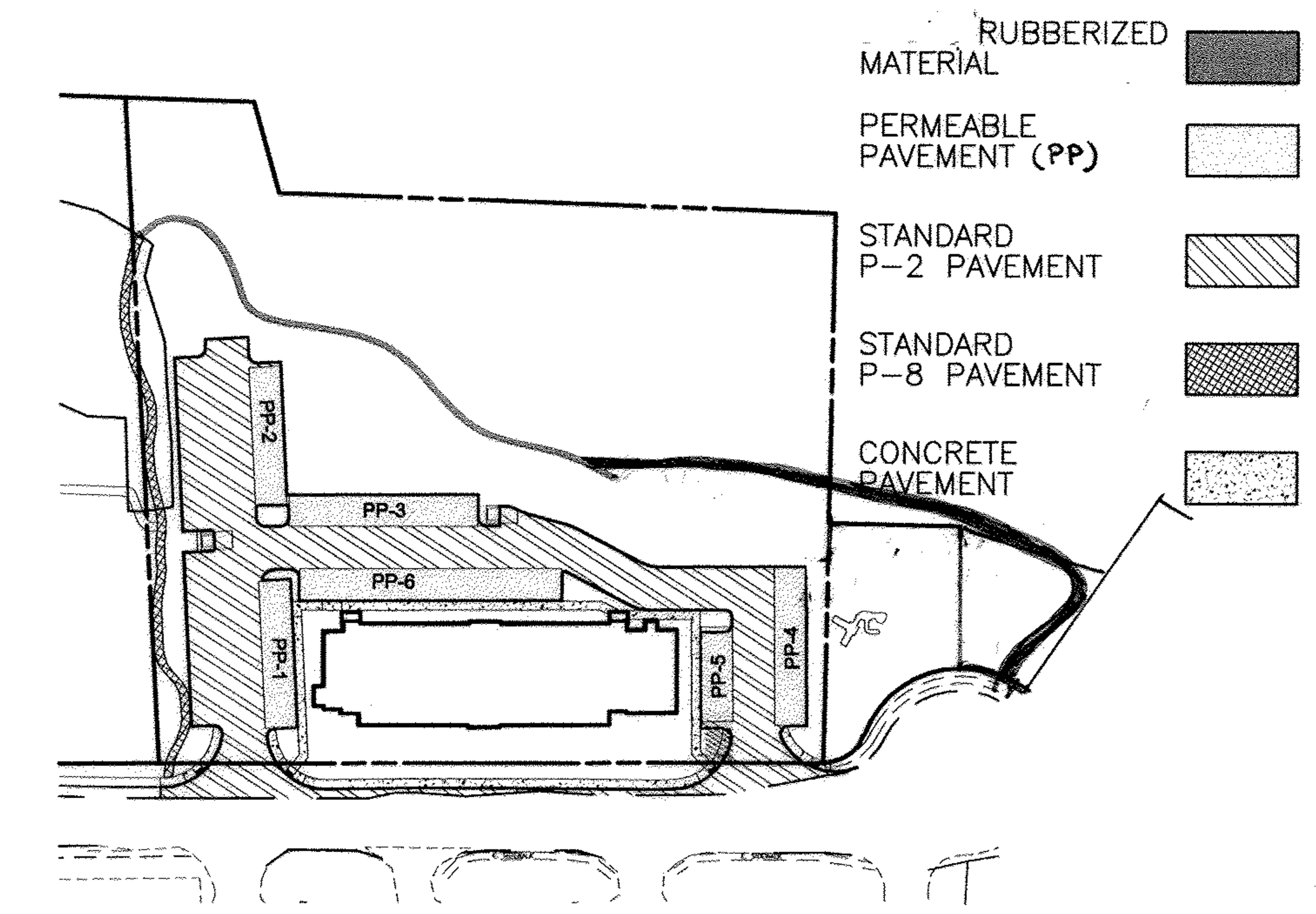




HANDICAP PARKING DETAIL

SCALE: 1"=20'



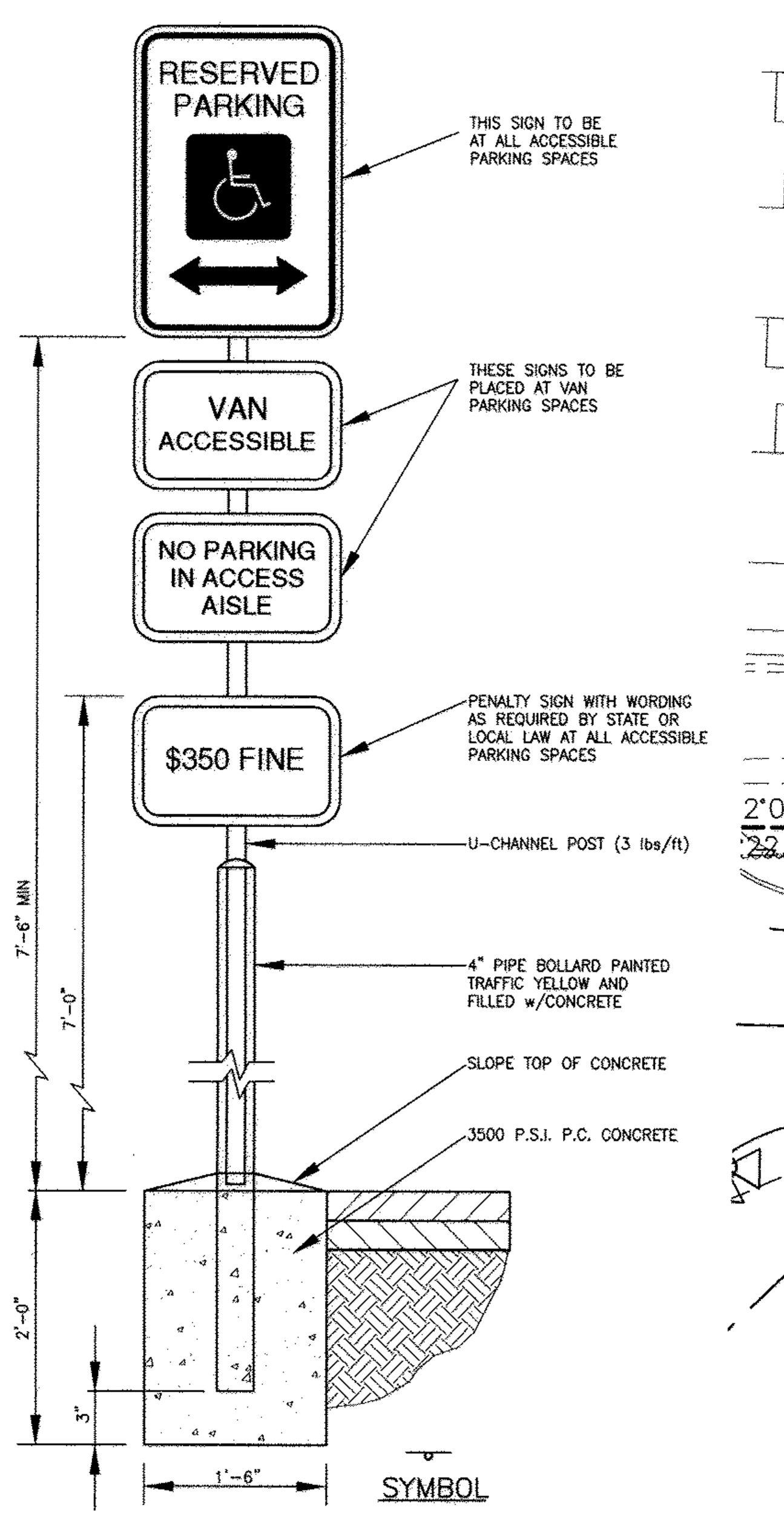
SITE PAVING DETAIL

SCALE: 1"=100'

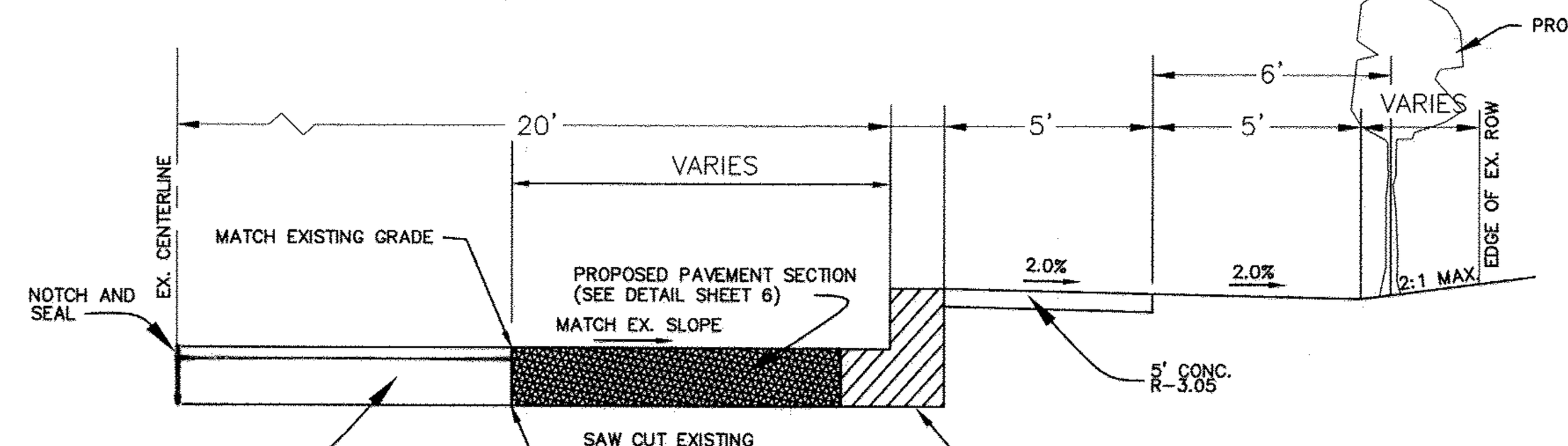
PAVED/RUBBERIZED PATHWAY IS TO MEANDER THROUGH THE FOREST CONSERVATION EASEMENT TO AVOID ANY TREE REMOVAL AND TO LIMIT DISTURBANCE TO ANY ENVIRONMENTAL FEATURES. THE PATHWAY IS TO BE CONSTRUCTED AND MAINTAINED BY ORCHARD PARK, SECTION 3 PER THIS PLAN.

Recreation Open Space Tabulation			
Unit	Credit per Unit	Amenity Credits	Quantity (SF)
Asphalt Pathway	3 sf/1 sf of Pathway	1600 sf	4800
RUBBERIZED PATHWAY	3 sf/1 sf Pathway	2120 sf	6360
Picnic Area	500 sf	1	500
Seating/5' Bench	200 sf	3	600
Gazebo/Pavilion	2000 sf	1	2000
Recreation Area	6900sf	1	6900
Tot Lot/ Play Equip.	2000 sf	1	2000
Total			23,160

THIS PROJECT IS TO BE ANNEXED INTO THE ORCHARD PARK COMMUNITY UPON COMPLETION AND IS AUTHORIZED BY DPZ PLANNING DIRECTOR TO UTILIZE THE EXISTING RECREATIONAL FACILITIES, SUCH AS THE CLUBHOUSE, POOL ETC., AS PART OF THE RECREATIONAL OPEN SPACE OBLIGATIONS.



HANDICAP SIGN DETAIL
NOT TO SCALE



HALF SECTION DETAIL PINE ORCHARD LANE WIDENING IMPROVEMENTS
LOCAL ROAD
(STA. 9+14 TO STA. 13+14)
NOT TO SCALE

GRAPHIC SCALE

30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	
CHIEF, DEVELOPMENT ENGINEERING DIVISION (signed)	DATE 6-17-14
CHIEF, DIVISION OF LAND DEVELOPMENT (signed)	DATE 6-19-14
DIRECTOR (signed)	DATE 6/19/14

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 6-25-15

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: 12-21-16

NO.	DATE	REVISION
3	10.27.15	REMOVE BENCHES, ADD ADDITIONAL REC AREA, LOT 3
2	6-1-15	REMOVE SHED & DRYWELL ON PARCEL 'B'
1	9-22-2014	REVISE I-7 & I-8 TO A-5 INLETS AND SHOW UG ELECTRIC

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 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. 22390, Expiration Date: 6.30.15.
5-5-17

OWNER:
LAKESHORE I, LLC
C/O SECURITY DEVELOPMENT
8480 BALTIMORE NATIONAL PIKE
SUITE 415
ELLICOTT CITY, MD 21043

DEVELOPER:
SECURITY DEVELOPMENT, LLC
PO BOX 417
ELLICOTT CITY, MD 21041
410-465-4244

ORCHARD PARK
SECTION 3
3200 PINE ORCHARD LANE
ROMANIK PROPERTY, LOT 1 AND ORCHARD HILL, OPEN SPACE LOT 3

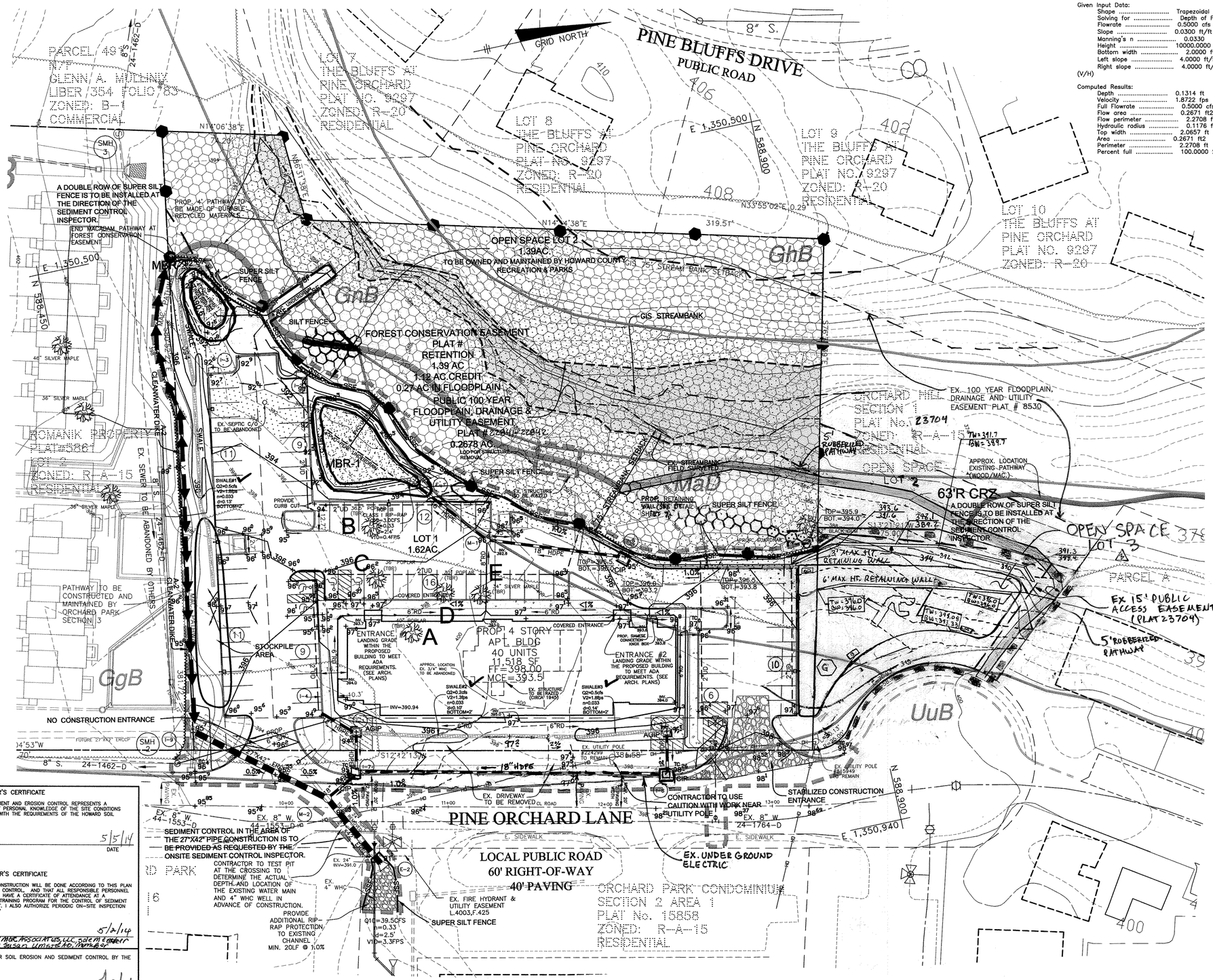
TAX MAP: 24 & 17, GRID: 1 & 19, PARCEL: 647 & P/O 130
ZONED: R-A-15
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT PLAN
SITE PLAN

DATE:	MAY 2014	BEI PROJECT NO.	1796
SCALE:	1"=30'	SHEET	2 OF 11

AS-BUILT

SDP-13-055



SWALE #1

Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	0.5000 cfs
Slope	0.0300 ft/ft
Manning's n	0.0330
Height	10000.0000 ft
Bottom width	2.0000 ft
Left slope	4.0000 ft/ft (V/H)
Right slope	4.0000 ft/ft (V/H)

Computed Results:

Depth	0.1314 ft
Velocity	1.8722 fps
Full Flowrate	0.5000 cfs
Flow area	0.2671 ft2
Flow perimeter	2.2708 ft
Hydraulic radius	0.1176 ft
Top width	2.0657 ft
Area	0.2671 ft2
Perimeter	2.2708 ft
Percent full	100.0000 %

SWALE #2

Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	0.2000 cfs
Slope	0.0260 ft/ft
Manning's n	0.0330
Height	10000.0000 ft
Bottom width	2.0000 ft
Left slope	6.0000 ft/ft (V/H)
Right slope	6.0000 ft/ft (V/H)

Computed Results:

Depth	0.0783 ft
Velocity	1.2686 fps
Full Flowrate	0.2000 cfs
Flow area	0.1577 ft2
Flow perimeter	2.1588 ft
Hydraulic radius	0.0730 ft
Top width	2.0261 ft
Area	0.1577 ft2
Perimeter	2.1588 ft
Percent full	100.0000 %

SWALE #3

Given Input Data:

Shape	Trapezoidal
Solving for	Depth of Flow
Flowrate	0.5000 cfs
Slope	0.0250 ft/ft
Manning's n	0.0330
Height	1.0000 ft
Bottom width	2.0000 ft
Left slope	2.5000 ft/ft (V/H)
Right slope	2.5000 ft/ft (V/H)

Computed Results:

Depth	0.1379 ft
Velocity	1.7644 fps
Full Flowrate	11.8534 cfs
Flow area	0.2834 ft2
Flow perimeter	2.2970 ft
Hydraulic radius	0.1234 ft
Top width	2.1103 ft
Area	2.4000 ft2
Perimeter	4.1541 ft
Percent full	13.7885 %

ENGINEER'S CERTIFICATE

"I HEREBY 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."

ENGINEER – CHRISTOPHER A. MALAGARI — DATE 5/5/14

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT 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 SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

DEVELOPER LAKESHORE I, LLC BY MBC ASSOCIATES, LLC, SOLE MEMBER — DATE 5/2/14
BY: SUSAN WINSTEAD, MANAGER

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

HOWARD SCD — DATE 5/13/14

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6.17.14

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6.19.14

DIRECTOR — DATE 6/19/14

SOILS LEGEND

MAP SYMBOL	SOIL GROUP	SOIL TYPE
GgB	B	GLENELG LOAM, 3 TO 8 PERCENT SLOPES
GhB	B	GLENELG–URBAN LAND COMPLEX LOAM, 0 TO 8 PERCENT SLOPES
GnB*	C	GLENVILLE–BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES
MaD	B	MANOR LOAM, 15 TO 25 PERCENT SLOPES
UuB	D	URBAN LAND–UDORTHENTS COMPLEX, 0 TO 8 PERCENT SLOPES

FROM NATURAL RESOURCES CONSERVATION SERVICES WEB SOIL SURVEY 2.0
* HYDRIC SOILS

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 6-25-15

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: 12-21-16

NO.	DATE	REVISION
3	10-27-15	ADD OPEN SPACE LOT 3, REVISE REC. OPEN SPACE, REMOVE BEAM
2	6-1-15	REMOVE SHED & DRYWELL ON PARCEL 'B'
1	9-22-2014	REVISE I-7 & I-8 TO A-8 INLETS AND SHOW UG ELECTRIC

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 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. 22320, Expiration Date: 6.30.15.
STATE OF MARYLAND — CHRISTOPHER ALAN MALAGARI — PROFESSIONAL ENGINEER — 5.5.14

OWNER:
LAKESHORE I, LLC
C/O SECURITY DEVELOPMENT
8480 BALTIMORE NATIONAL PIKE
SUITE 415
ELLICOTT CITY, MD 21043

DEVELOPER:
SECURITY DEVELOPMENT, LLC
PO BOX 417
ELLICOTT CITY, MD 21041
410-465-4244

ORCHARD PARK
SECTION 3
3200 PINE ORCHARD LANE
ROMANIK PROPERTY, LOT 1 AND ORCHARD HILL, OPEN SPACE LOT 3

TAX MAP: 24 & 17, GRID: 1 & 19, PARCEL: 647 & P/O 130
ZONED: R-A-15
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT PLAN
GRADING, SEDIMENT & EROSION CONTROL PLAN

DATE:	MAY 2014	BEI PROJECT NO.	1796
SCALE:	1"=30'	SHEET	3 OF 11

AS-BUILT

SDP-13-055

P:\1796 ROMANIK dwg 8060514.dwg, 5/1/2014 1:19:33 PM, cogle

B-4 STANDARDS AND SPECIFICATIONS
FOR
VEGETATIVE STABILIZATION
Definition
Using vegetation as cover to protect exposed soil from erosion.
Purpose
To promote the establishment of vegetation on exposed soil.
Conditions Where Practice Applies
On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.
Effects on Water Quality and Quantity
Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.
Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.
Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.
Sediment control practices must remain in place during grading, seedbed preparation, seeding, mulching, and vegetative establishment.
Adequate Vegetative Establishment
Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseedings within the planting season.
1. Adequate vegetative stabilization requires 95 percent groundcover.
2. If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
3. If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
4. Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

B-4-1 STANDARDS AND SPECIFICATIONS
FOR
INCREMENTAL STABILIZATION
Definition
Establishment of vegetative cover on cut and fill slopes.
Purpose
To provide timely vegetative cover on cut and fill slopes as work progresses.
Conditions Where Practice Applies
Any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles.
Criteria
A. Incremental Stabilization - Cut Slopes
1. Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
2. Construction sequence example (Refer to Figure B.1):
a. Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
b. Perform Phase 1 excavation, prepare seedbed, and stabilize.
c. Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as necessary.
d. Perform final phase excavation, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.
Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.
B. Incremental Stabilization - Fill Slopes
1. Construct and stabilize fill slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all slopes as the work progresses.
2. Stabilize slopes immediately when the vertical height of a lift reaches 15 feet, or when the grading operation ceases as prescribed in the plans.
3. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
4. Construction sequence example (Refer to Figure B.2):
a. Construct and stabilize all temporary swales or dikes that will be used to divert runoff around the fill. Construct silt fence on low side of fill unless other methods shown on the plans address this area.
b. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
c. Place Phase 1 fill, prepare seedbed, and stabilize.
d. Place Phase 2 fill, prepare seedbed, and stabilize.
e. Place final phase fill, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.
Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.
Figure B.

B-4-4 STANDARDS AND SPECIFICATIONS
FOR
TEMPORARY STABLIZATION
Definition
To stabilize disturbed soils with vegetation for up to 6 months.
Purpose
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.
Criteria
1. 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.
2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
3. 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.

ENGINEER'S CERTIFICATE

"I HEREBY 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."

C. Malagari 5/5/14
ENGINEER – CHRISTOPHER A. MALAGARI DATE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT 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 SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

Susan Umstead 5/2/14
DEVELOPER LAKESHORE I, LLC, BY: MEC Associates LLC, sole member
BY: SUSAN UMSTEAD, MEMBER

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

5/13/14
HOWARD SCD DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

6.17.14
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

6-18-14
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

6/18/14
DIRECTOR DATE

B-4-2 STANDARDS AND SPECIFICATIONS
FOR
SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS
Definition
The process of preparing the soils to sustain adequate vegetative stabilization.
Purpose
To provide a suitable soil medium for vegetative growth.
Conditions Where Practice Applies
Where vegetative stabilization is to be established.
Criteria
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.
b. 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 pH between 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 acceptable.
iv. Soil contains 1.5 percent minimum organic matter by weight.
v. Soil contains sufficient pore space to permit adequate root penetration.
b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
c. 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 inches.
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 seedbed 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 loosening may be unnecessary on newly disturbed areas.
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.
2. 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 nutrients.
c. 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 criteria:
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 1½ inches in diameter.
b. 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 specified.
c. 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 topsoil.
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.
c. 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 analyses.
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 of the producer.
3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) 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.

H-5 STANDARDS AND SPECIFICATIONS
FOR
DUST CONTROL
Definition
Controlling the suspension of dust particles from construction activities.
Purpose
To prevent blowing and movement of dust from exposed soil surfaces to reduce on and off-site damage including health and traffic hazards.
Conditions Where Practice Applies
Areas subject to dust blowing and movement where on and off-site damage is likely without treatment.
Specifications
1. Mulches: See Section B-4-2 Soil Preparation, Topsoiling, and Soil Amendments, Section B-4-3 Seeding and Mulching, and Section B-4-4 Temporary Stabilization. Mulch must be anchored to prevent blowing.
2. Vegetative Cover: See Section B-4-4 Temporary Stabilization.
3. Tillage: Till to roughen surface and bring clods to the surface. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are examples of equipment that may produce the desired effect.
4. Irrigation: Sprinkle site with water until the surface is moist. Repeat as needed. The site must not be irrigated to the point that runoff occurs.
5. Barriers: Solid board fences, silt fences, snow fences, burlap fences, straw bales, and similar material can be used to control air currents and soil blowing.
6. Chemical Treatment: Use of chemical treatment requires approval by the appropriate plan review authority.

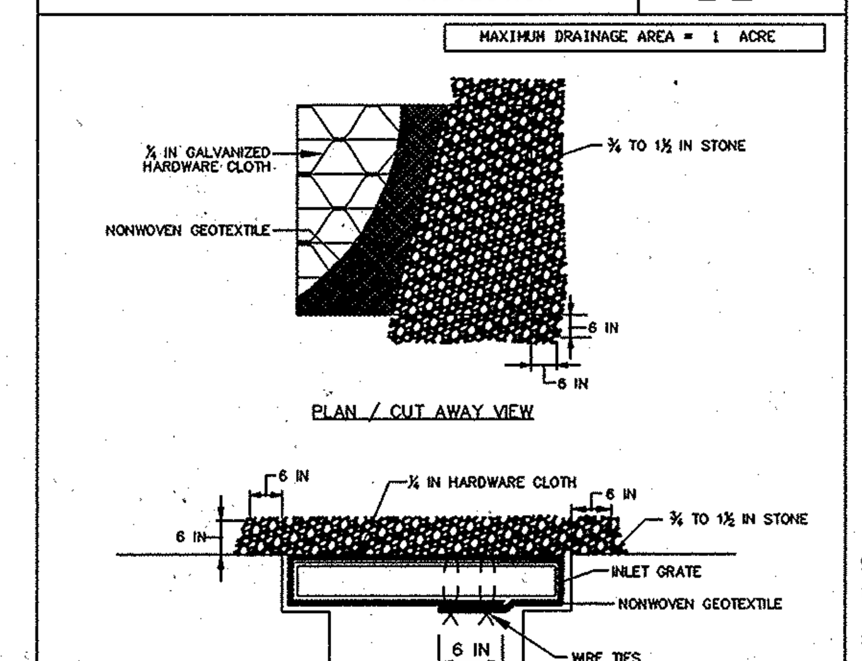
B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION(CONTINUED)
d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1 ½ inches in diameter. The resulting seedbed must 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 (½ to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is not especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.
A. Sod: to provide quick cover on disturbed areas (2:1 grade or flatter).
1. General Specifications
a. Class of turfgrass 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 ¾ inch, plus or minus ¼ 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 acceptable.
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.
3. Sod Maintenance
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 1/3 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.

B-4-3 STANDARDS AND SPECIFICATIONS
FOR
SEEDING AND MULCHING
Definition
The application of seed and mulch to establish vegetative cover.
Purpose
To protect disturbed soils from erosion during and at the end of construction.
Conditions Where Practice Applies
To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.
Criteria
A. Seeding
1. Specifications
a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
2. Application
a. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
i. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P2O5 (phosphorous), 200 pounds per acre; K2O (potassium), 200 pounds per acre.
ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
iii. Mix seed and fertilizer on site and seed immediately and without interruption.
iv. When hydroseeding do not incorporate seed into the soil.
B. Mulching
1. Mulch Materials (in order of preference)
a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. Note: Use only sterile straw mulch in areas where one species of grass is desired.
b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
2. Application
a. Apply mulch to all seeded areas immediately after seeding.
b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
3. Anchoring
a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
iii. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly prohibited.
iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

B-4-8 STANDARDS AND SPECIFICATIONS
FOR
STOCKPILE AREA
Definition
A mound or pile of soil protected by appropriately designed erosion and sediment control measures.
Purpose
To provide a designated location for the temporary storage of soil that controls the potential for erosion, 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.
Criteria
1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. 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.
3. Runoff from the stockpile area must drain to a suitable sediment control practice.
4. Access the stockpile area from the upgrade side.
5. 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.
6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
7. 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.
8. 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.
Maintenance
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.

DETAIL E-9-2 AT-GRADE INLET PROTECTION
STANDARD SYMBOL AGIP

MAXIMUM DRAINAGE AREA = 1 ACRE



CONSTRUCTION SPECIFICATIONS
1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

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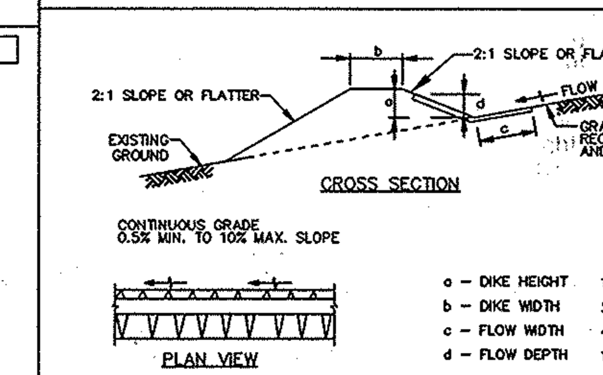
DETAIL C-1 EARTH DIKE
STANDARD SYMBOL A-1



	DIKE TYPE A	DIKE TYPE B
a – DIKE HEIGHT	18 IN MIN.	30 IN MIN.
b – DIKE WIDTH	24 IN MIN.	36 IN MIN.
c – FLOW WIDTH	4 FT MIN.	6 FT MIN.
d – FLOW DEPTH	12 IN MIN.	24 IN MIN.

FLOW CHANNEL STABILIZATION
A-1 SEED WITH STRAW MULCH AND TACK. (NOT ALLOWED FOR CLEAR WATER DIVERSION.)
A-2/B-2 SEED WITH SOIL STABILIZATION MATTING OR LINE WITH SOD.
A-3/B-3 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PRESSED INTO SOIL A MINIMUM OF 7 INCHES AND FLUSH WITH GROUND.

CONSTRUCTION SPECIFICATIONS
1. REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
2. EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
3. COMPACT FILL.
4. CONSTRUCT FLOW CHANNEL ON AN UNINTERRUPTED, CONTINUOUS GRADE, ADJUSTING THE LOCATION DUE TO FIELD CONDITIONS AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE.
5. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
6. STABILIZE EARTH DIKE WITHIN THREE DAYS OF INSTALLATION. STABILIZE FLOW CHANNEL FOR CLEAR WATER DIVERSION WITHIN 24 HOURS OF INSTALLATION.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AND MAINTAIN POSITIVE DRAINAGE. KEEP EARTH DIKE AND POINT OF DISCHARGE FREE OF EROSION, AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
8. UPON REMOVAL OF EARTH DIKE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS OF REMOVAL STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

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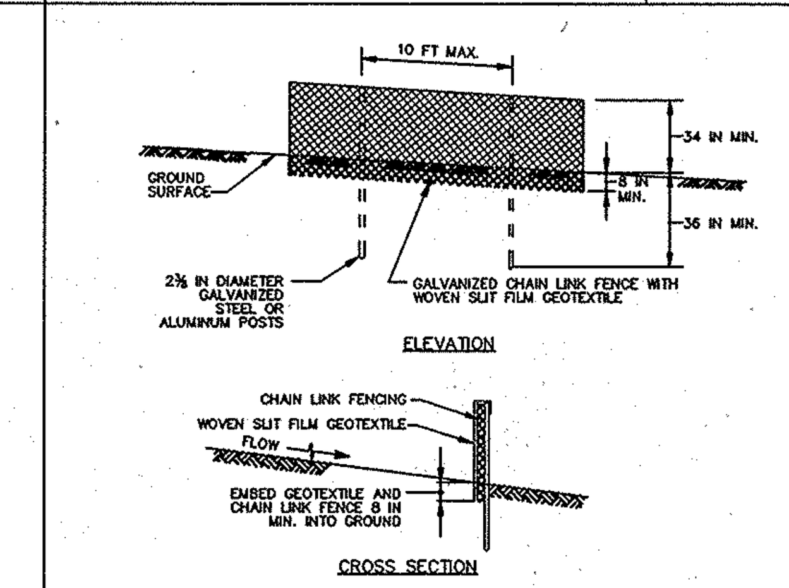
DETAIL E-3 SUPER SILT FENCE
STANDARD SYMBOL SSF



CONSTRUCTION SPECIFICATIONS
1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

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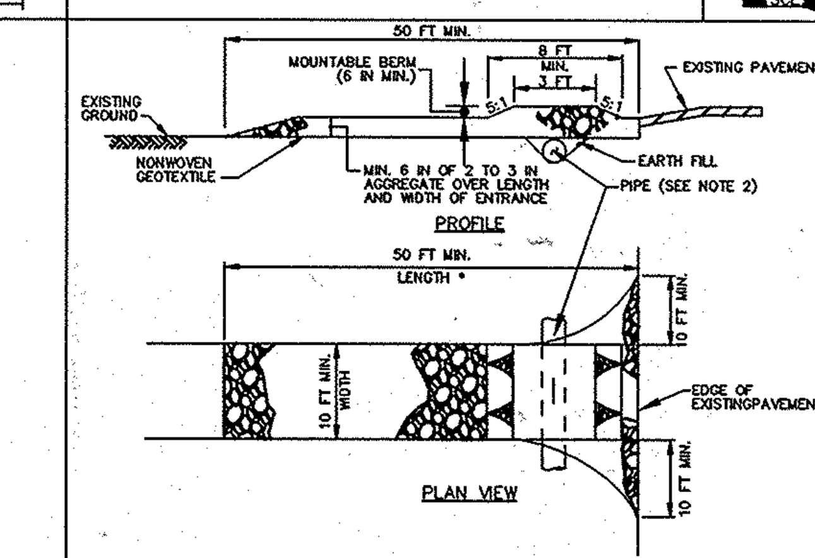
DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE
STANDARD SYMBOL SCE



CONSTRUCTION SPECIFICATIONS
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

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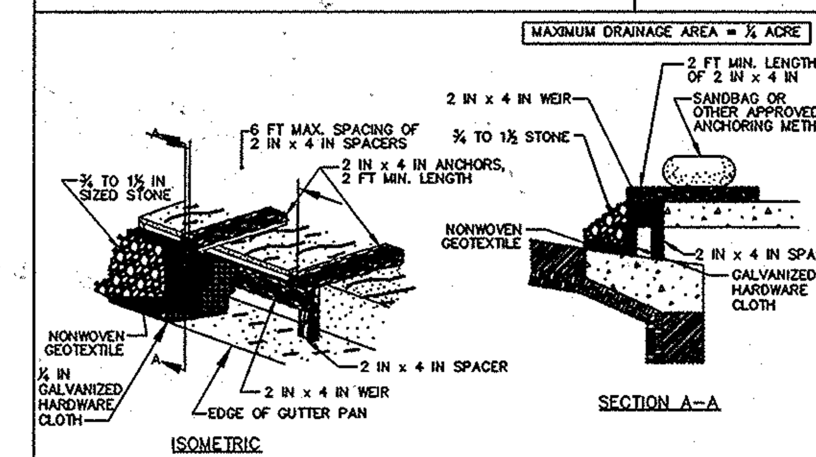
DETAIL E-9-3 CURB INLET PROTECTION
STANDARD SYMBOL CIP

MAXIMUM DRAINAGE AREA = ¼ ACRE



CONSTRUCTION SPECIFICATIONS
1. USE NOMINAL 2 INCH x 4 INCH LUMBER
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
3. NAIL THE 2x4 WEIR TO 9 INCH LONG VERTICAL SPACERS (MAXIMUM 6 FEET APART).
4. ATTACH A CONTINUOUS PIECE OF ¼ INCH GALVANIZED HARDWARE CLOTH, WITH A MINIMUM WIDTH OF 30 INCHES AND A MINIMUM LENGTH OF 4 FEET LONGER THAN THE THROAT OPENING, TO THE 2x4 WEIR, EXTENDING IT 2 FEET BEYOND THROAT ON EACH SIDE.
5. PLACE A CONTINUOUS PIECE OF NONWOVEN GEOTEXTILE OF THE SAME DIMENSIONS AS THE HARDWARE CLOTH OVER THE HARDWARE CLOTH AND SECURELY ATTACH TO THE 2x4 WEIR.
6. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL TO 2x4 ANCHORS (MINIMUM 2 FEET LENGTH). EXTEND THE ANCHORS ACROSS THE INLET TOP AND HOLD IN PLACE BY SANDBAGS OR OTHER APPROVED ANCHORING METHOD.
7. INSTALL END SPACERS A MINIMUM OF 1 FOOT BEYOND THE ENDS OF THE THROAT OPENING.
8. FORM THE HARDWARE CLOTH AND THE GEOTEXTILE TO THE CONCRETE GUTTER AND FACE OF CURB TO SPAN THE INLET OPENING. COVER THE HARDWARE CLOTH AND GEOTEXTILE WITH CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE.
9. AT NON-SUMP LOCATIONS, INSTALL A TEMPORARY SANDBAG OR ASPHALT BERM TO PREVENT INLET BYPASS.
10. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

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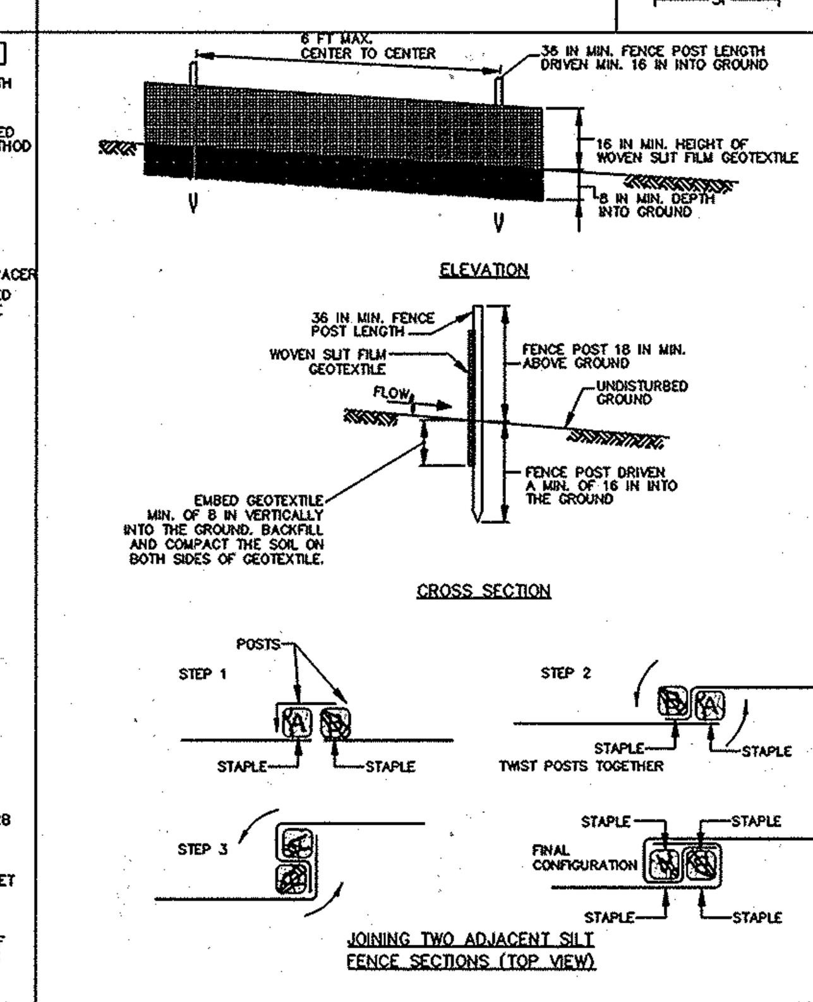
DETAIL E-1 SILT FENCE
STANDARD SYMBOL SF



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DETAIL E-1 SILT FENCE
STANDARD SYMBOL SF

CONSTRUCTION SPECIFICATIONS
1. USE WOOD POSTS 1¾ X 1¾ ± ⅙ INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

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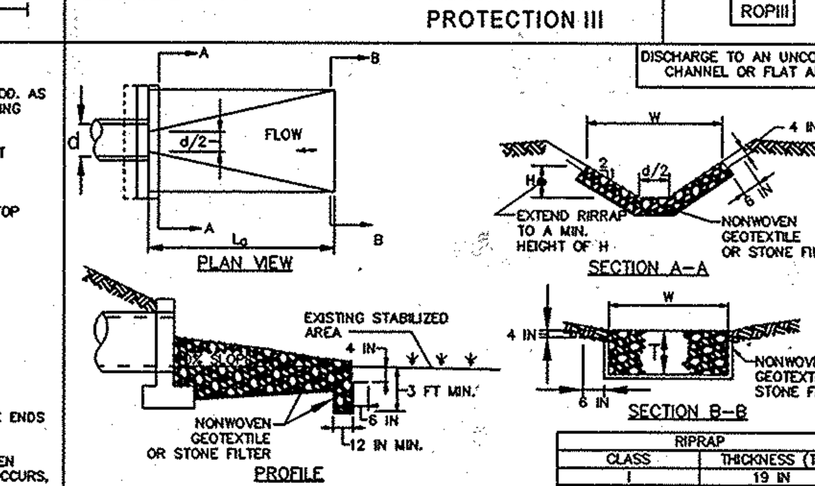
DETAIL D-4-1-C ROCK OUTLET PROTECTION III
STANDARD SYMBOL ROPIII

DISCHARGE TO AN UNCONFINED CHANNEL OR FLAT AREA



RIPRAP CLASS	THICKNESS (T)
I	19 IN
II	32 IN
III	46 IN

CONSTRUCTION SPECIFICATIONS
1. RIPRAP AND STONE MUST CONFORM TO THE SPECIFIED CLASS.
2. USE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCTURING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE TOGETHER.
3. PREPARE THE SUBGRADE FOR GEOTEXTILE OR STONE FILTER (⅜ TO 1½ INCH MINIMUM STONE FOR 6 INCH MINIMUM DEPTH) AND RIPRAP TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
4. EXTEND GEOTEXTILE AT LEAST 6 INCHES BEYOND EDGES OF RIPRAP AND EMBED AT LEAST 4 INCHES AT SIDES OF RIPRAP.
5. CONSTRUCT RIPRAP OUTLET TO FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. PLACE STONE FOR RIPRAP OUTLET IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE RIPRAP IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
6. WHERE NO ENDWALL IS USED, CONSTRUCT THE UPSTREAM END OF THE APRON SO THAT THE WIDTH IS TWO TIMES THE DIAMETER OF THE OUTLET PIPE, AND EXTEND THE STONE UNDER THE OUTLET BY A MINIMUM OF 18 INCHES.
7. CONSTRUCT APRON WITH 0% SLOPE ALONG ITS LENGTH AND WITHOUT OBSTRUCTIONS. PLACE STONE SO THAT IT BLENDS IN WITH EXISTING GROUND.
8. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND RIPRAP DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

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B-4-5 STANDARDS AND SPECIFICATIONS
FOR
PERMANENT STABILIZATION
Definition
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.
Criteria
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 found on Table 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 Guild, Section 342 - Critical Area Planting.
c For sites having disturbed areas 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 pounds per 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. Turfgrass Mixtures
a. Areas where turfgrass 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 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 sun to medium shade. 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 blended.
iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1 ½ 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, "Turfgrass Cultivar 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)

SEDIMENT CONTROL NOTES

1. A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTION, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION, (313-1850).
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT "MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL", REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) ~~7~~ 3 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) ~~14~~ 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE ~~1994~~ 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS (SEC. 51) SOD ~~(SEC. 54)~~, TEMPORARY SEEDING ~~(SEC. 50)~~ AND MULCHING ~~(SEC. 52)~~. TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. 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 THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. SITE ANALYSIS:

TOTAL AREA OF SITE (THIS SUBMISSION)	3.19	ACRES
AREA DISTURBED	1.88	ACRES
AREA TO BE ROOFED OR PAVED	0.90	ACRES
AREA TO BE VEGETATIVELY STABILIZED	0.98	ACRES
TOTAL CUT	2200	CY
TOTAL FILL	2200	CY
OFFSITE WASTE/BORROW AREA LOCATION	*	

*IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY THE SPOIL/BORROW SITE AND NOTIFY AND GAIN APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR OF THE SITE AND ITS GRADING PERMIT NUMBER AT THE TIME OF CONSTRUCTION.

8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

No As-Built information is required on this sheet

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER 6-25-15

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: 12-21-16

SEQUENCE OF CONSTRUCTION

NOTIFY SEDIMENT CONTROL DIVISION 48 HOUR PRIOR TO START OF CONSTRUCTION

1.) OBTAIN GRADING PERMIT.	DAY 1
2.) INSTALL PERIMETER SEDIMENT CONTROLS, CLEANWATER DIKE RUNNING WEST, SUPER SILT FENCE	DAY 2-6
3.) REMOVE EXISTING ONSITE STRUCTURES AND CLEAR & GRUB SITE.	DAY 7-14
4.) INSTALL STORMDRAIN BYPASS SYSTEM I-9, M-2 TO E-2 AND STABILIZE DISTURBED AREA TO INLETS PER TEMPORARY SEEDING NOTES. INSTALL CLEANWATER DIKE TO INLET 9.	DAY 15-21
5.) GRADE SITE AND BEGIN CONSTRUCTION OF BUILDING.	ON-GOING
6.) WITH SITE GRADED INSTALL STORM DRAIN SYSTEM I-6 TO E-1 AND REMAINING STORM DRAIN AND PROVIDE INLET PROTECTION. INSTALL WATER AND SEWER CONNECTIONS AND FIRE HYDRANT.	DAY 22-36
7.) AS BUILDING IS BEING CONSTRUCTED INSTALL CONCRETE CURB AND GUTTER AND BEGIN INSTALLING IMPERVIOUS PAVEMENT. DO NOT INSTALL PERMEABLE PAVEMENT UNLESS CONTRIBUTING AREAS ARE STABILIZED. A GEOTECHNICAL ENGINEER SHOULD BE PRESENT WHEN PERMEABLE PAVEMENT IS INSTALLED.	DAY 37-127
8.) WITH CURB AND GUTTER INSTALLED CONSTRUCT SIDEWALKS AND DUMPSTER PADS.	DAY 128-135
9.) FINAL GRADE AND STABILIZE IN ACCORDANCE WITH PERMANENT SEEDBED NOTES. CONSTRUCT ON LOT STORMWATER MANAGEMENT FACILITIES (MBR 1 & 2) AND STABILIZE DISTURBED AREAS.	DAY 135-150
10.) INSTALL LANDSCAPING PER LANDSCAPE PLAN.	DAY 151-157
11.) WITH THE APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL DEVICES AND STABILIZE ANY REMAINING DISTURBED AREAS.	

NOTE:
EROSION CONTROL MATTING SHALL BE PLACED IN SWALES WHERE DEEMED NECESSARY UNTIL VEGETATION IS ESTABLISHED OR SOLID SOD SHOULD BE USED.

NO.	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 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. 22390, Expiration Date: 6.30.15.
STATE OF MARYLAND CHRISTOPHER ALAN MALAGARI No. 22390 PROFESSIONAL ENGINEER 5-5-14

OWNER:
LAKESHORE I, LLC
C/O SECURITY DEVELOPMENT
8480 BALTIMORE NATIONAL PIKE
SUITE 415
ELLICOTT CITY, MD 21043

DEVELOPER:
SECURITY DEVELOPMENT, LLC
PO BOX 417
ELLICOTT CITY, MD 21041
410-465-4244

ORCHARD PARK
SECTION 3
3200 PINE ORCHARD LANE
ROMANIK PROPERTY, LOT 1 AND ORCHARD HILL, PARCEL B

TAX MAP: 24 & 17, GRID: 1 & 19, PARCEL: 647 & P/O 130
ZONED: R-A-15
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT PLAN
GRADING, SEDIMENT & EROSION CONTROL DETAILS

DATE: MAY 2014	BEI PROJECT NO. 1796
SCALE: AS SHOWN	SHEET 4 OF 10

AS-BUILT

SDP-13-055

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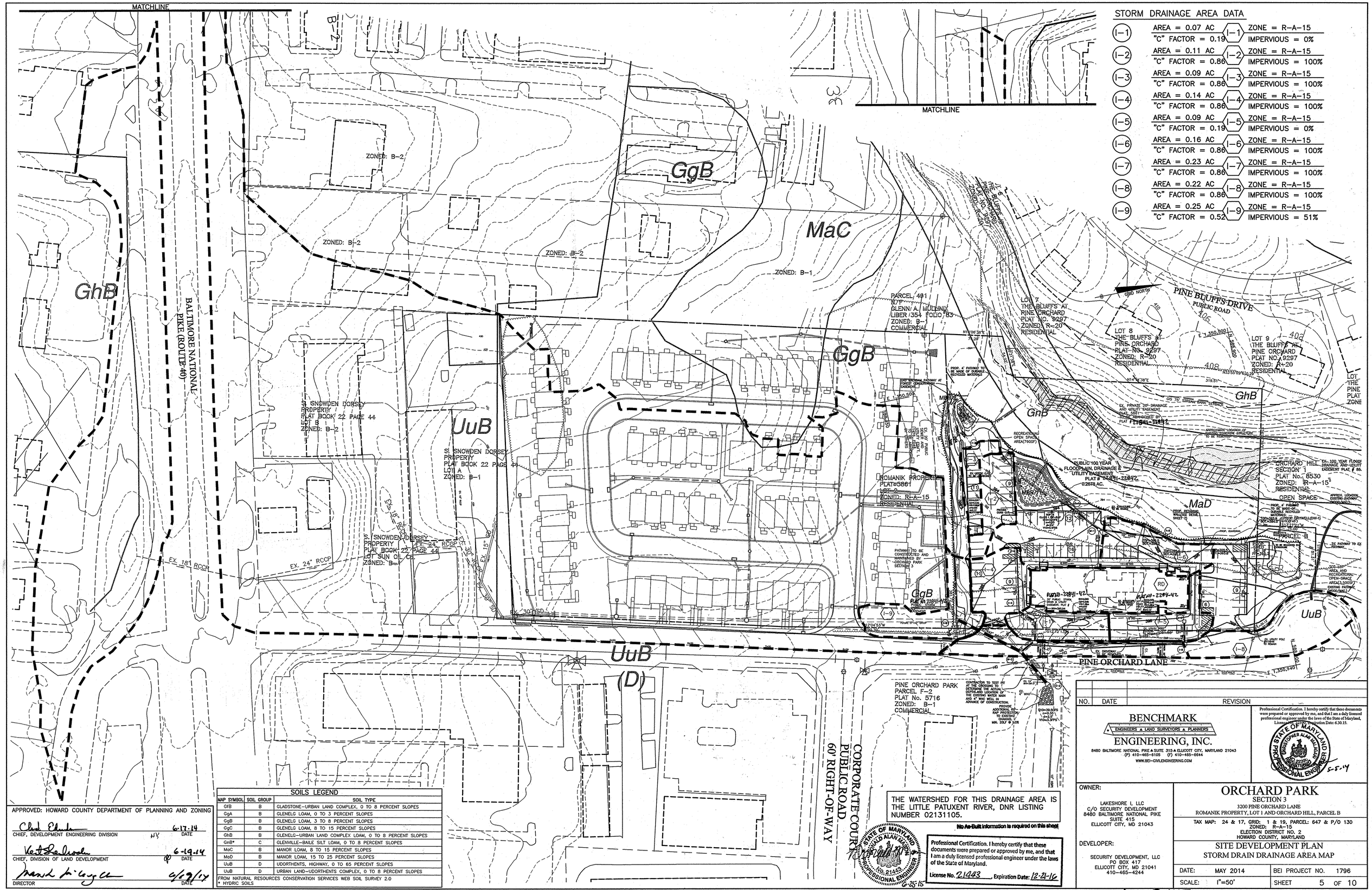

STORM DRAINAGE AREA DATA

I-1	AREA = 0.07 AC "C" FACTOR = 0.19	I-1	ZONE = R-A-15 IMPERVIOUS = 0%
I-2	AREA = 0.11 AC "C" FACTOR = 0.86	I-2	ZONE = R-A-15 IMPERVIOUS = 100%
I-3	AREA = 0.09 AC "C" FACTOR = 0.86	I-3	ZONE = R-A-15 IMPERVIOUS = 100%
I-4	AREA = 0.14 AC "C" FACTOR = 0.86	I-4	ZONE = R-A-15 IMPERVIOUS = 100%
I-5	AREA = 0.09 AC "C" FACTOR = 0.19	I-5	ZONE = R-A-15 IMPERVIOUS = 0%
I-6	AREA = 0.16 AC "C" FACTOR = 0.86	I-6	ZONE = R-A-15 IMPERVIOUS = 100%
I-7	AREA = 0.23 AC "C" FACTOR = 0.86	I-7	ZONE = R-A-15 IMPERVIOUS = 100%
I-8	AREA = 0.22 AC "C" FACTOR = 0.86	I-8	ZONE = R-A-15 IMPERVIOUS = 100%
I-9	AREA = 0.25 AC "C" FACTOR = 0.52	I-9	ZONE = R-A-15 IMPERVIOUS = 51%

SOILS LEGEND

MAP SYMBOL	SOIL GROUP	SOIL TYPE
GfB	B	GLADSTONE–URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES
GgA	B	GLENELG LOAM, 0 TO 3 PERCENT SLOPES
GgB	B	GLENELG LOAM, 3 TO 8 PERCENT SLOPES
GgC	B	GLENELG LOAM, 8 TO 15 PERCENT SLOPES
GhB	B	GLENELG–URBAN LAND COMPLEX LOAM, 0 TO 8 PERCENT SLOPES
GnB*	C	GLENVILLE–BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES
MaC	B	MANOR LOAM, 8 TO 15 PERCENT SLOPES
MaD	B	MANOR LOAM, 15 TO 25 PERCENT SLOPES
UuB	D	UDORTHENTS, HIGHWAY, 0 TO 65 PERCENT SLOPES
UuB	D	URBAN LAND–UDORTHENTS COMPLEX, 0 TO 8 PERCENT SLOPES

FROM NATURAL RESOURCES CONSERVATION SERVICES WEB SOIL SURVEY 2.0
* HYDRIC SOILS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6-17-14

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-19-14

DIRECTOR — DATE 6/19/14

THE WATERSHED FOR THIS DRAINAGE AREA IS THE LITTLE PATUXENT RIVER, DNR LISTING NUMBER 02131105.

No As-Built information is required on this sheet

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: 12-21-16

DONALD ALAN MARCH — No. 21443 — PROFESSIONAL ENGINEER — 12-05-15

NO.	DATE	REVISION

BENCHMARK
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STATE OF MARYLAND — CHRISTOPHER ALAN MARCHIONNO — No. 21443 — PROFESSIONAL ENGINEER — 5-5-14

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ORCHARD PARK
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ROMANIK PROPERTY, LOT I AND ORCHARD HILL, PARCEL B

TAX MAP: 24 & 17, GRID: 1 & 19, PARCEL: 647 & P/O 130
ZONED: R-A-15
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT PLAN
STORM DRAIN DRAINAGE AREA MAP

DATE:	MAY 2014	BEI PROJECT NO.	1796
SCALE:	1"=50'	SHEET	5 OF 10

AS-BUILT

SDP-13-055

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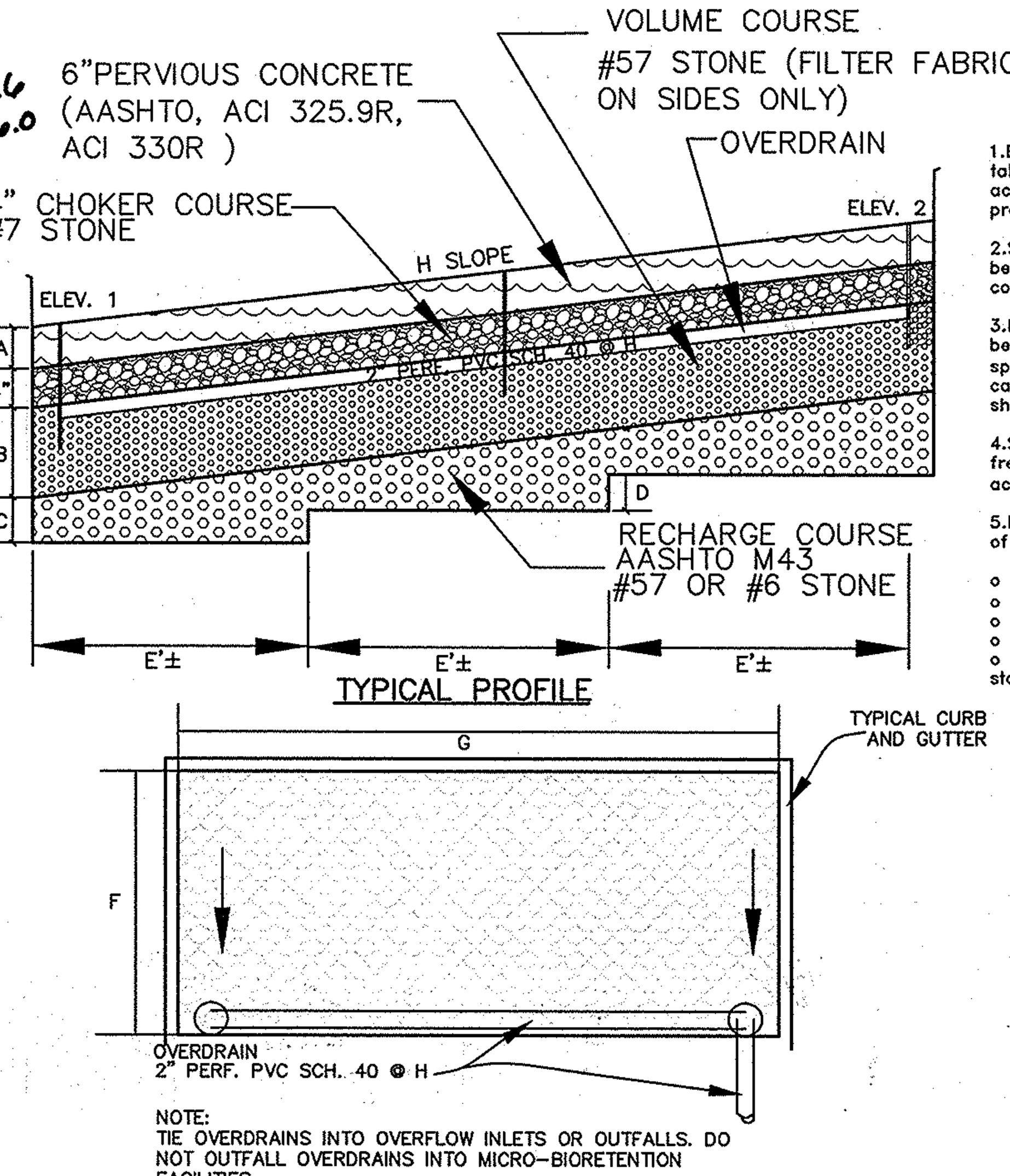
PERMEABLE SURFACE DESIGN TABLES

	PP-1	PP-2	PP-3	PP-4	PP-5	PP-6
ELEV. 1	~~396.20~~ 395.3	~~394.40~~ 391.4	~~390.00~~ 394.6	~~397.40~~ 395.5	396.40 ✓	396.~~00~~ 2
ELEV. 2	~~394.00~~ 396.1	~~391.40~~ 394.5	~~390.40~~ 396.0	~~395.00~~ 397.5	396.4~~0~~ 7	396.~~30~~ 5
DIMENSIONS						
'A'	0.5' ✓	0.5' ✓	0.5' ✓	0.5' ✓	0.5' ✓	0.5' ✓
'B'	2.6'	2.40'	2.20'	2.10'	1.25'	1.73'
'C'	0.33'–1.13'	0.33'–0.83'	0.33'–1.33'	0.33'–1.33'	0.33'–1.33'	0.33'–1.33'
'D'	0.50'	0.50'	0.50'	0.50'	0.50'	0.50'
'E'	43'	41	55	45'	27'	50'
'F'	17' ✓	17' ✓	17' ✓	17' ✓	17' ✓	17' ✓
'G'	85' ✓	79' ✓	109' ✓	90' ✓	54' ✓	150' ✓
SLOPE						
'H'	~~1.5%~~ 1.0%	~~0.8%~~ 3.7%	~~1.5%~~ 1.3%	~~2.7%~~ 2.2%	~~0.8%~~ 0.5%	0.2% ✓
CLEAN-OUT NUMBER	3	2	4	3	2	2
CLEAN-OUT SPACING	±43'	±37'	±36'	±64'	±90'	±54'



NOTE:
TIE OVERDRAINS INTO OVERFLOW INLETS OR OUTFALLS. DO NOT OUTFALL OVERDRAINS INTO MICRO-BIORETENTION FACILITIES.

TYPICAL PERMEABLE SURFACE (A-2) BMP DETAILS

NOT TO SCALE

CONSTRUCTION AND INSPECTION SPECIFICATIONS FOR ALTERNATIVE SURFACES (A-2 PERMEABLE PAVING)

1.Erosion and Sediment Control: Final grading for installation shall not take place until the surrounding site is stabilized. If this cannot be accomplished, runoff from disturbed areas shall be diverted around proposed pavement locations.

2.Soil Compaction: Sub soils shall not be compacted. Construction should be performed with lightweight, wide tracked equipment to minimize compaction. Excavated materials should be placed in a contained area.

3.Distribution Systems: Overdrain, underdrain, and distribution pipes shall be checked to ensure that both the material and perforations meet specifications (see Appendix B.4). The upstream ends of pipes should be capped prior to installation. All underdrain or distribution pipes used should be installed flat along the bed bottom.

4.Subbase Installation: Subbase aggregate shall be clean, washed, and free of fines. The subbase shall be placed in lifts and lightly rolled according to the specifications (see Appendix B.4).

5.Inspection:Regular inspections shall be made during the following stages of construction:

- o During excavation to subgrade.
- o During placement and backfill of any drainage or distribution system(s).
- o During placement of the subbase material.
- o During placement of the surface material.
- o Upon completion of final grading and establishment of permanent stabilization.

[OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED STORMWATER INFILTRATION TRENCHES (I-1), DRY WELLS (M-5)]

a. The Owner shall inspect the monitoring wells and structures on a quarterly basis and after every heavy storm event.

b. The Owner shall record the water levels and sediment build up in the monitoring wells over a period of several days to insure trench drainage.

c. The Owner shall maintain a log book to determine the rate at which the facility drains.

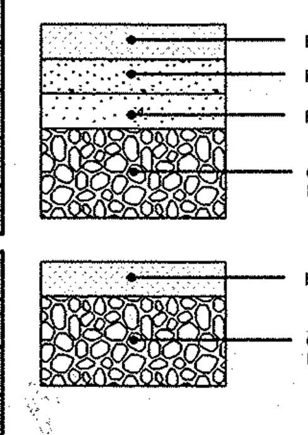
d. When the facility becomes clogged so that it does not drain down within a seventy-two (72) hour time period, corrective action shall be taken.

e. The maintenance log book shall be available to Howard County for inspection to insure compliance with operation and maintenance criteria.

f. Once the performance characteristics of the infiltration facility have been verified, the monitoring schedule can be reduced to an annual basis unless the performance data indicates that a more frequent schedule is required.

SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)	3 TO <5	5 TO <7	≥7	3 TO <5	5 TO <7	≥7
		PAVEMENT MATERIAL (INCHES)	MIN HMA WITH GAB			HMA WITH CONSTANT GAB		
P-2	PARKING DRIVE AISLES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY; LOCAL ROADS: ACCESS PLACE, ACCESS STREET; CUL-DE-SAC: RESIDENTIAL	HMA SUPERPAVE FINAL SURFACE 9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		HMA SUPERPAVE INTERMEDIATE SURFACE 9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
		HMA SUPERPAVE BASE 19.0 MM PG 64-22, LEVEL 1 (LOW ESAL)	2.0	2.0	2.0	3.5	2.0	2.0
		GRADED AGGREGATE BASE (GAB)	8.0	4.0	3.0	4.0	4.0	4.0

SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)	3 TO <5	5 TO <7	≥7	3 TO <5	5 TO <7	≥7
		PAVEMENT MATERIAL (INCHES)	MIN HMA WITH GAB			HMA WITH CONSTANT GAB		
P-8	SIDEWALK AND PARKING AREA (PRIVATE) NOTE: THIS SECTION MAY BE USED IN LIEU OF CONCRETE SIDEWALK IN OFFSITE, PRIVATELY MAINTAINED AREAS ONLY.)	HMA SUPERPAVE FINAL SURFACE 12.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
		GRADED AGGREGATE BASE (GAB)	1.0	1.0	1.0	1.0	1.0	1.0



HOWARD COUNTY PAVING SECTION DETAIL

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED PERMEABLE PAVEMENT (A-2)

1. Pavement surfaces should be swept and vacuumed (if porous concrete) to reduce sediment accumulation and ensure continued surface porosity. Sweeping should be performed at least twice annually with a commercial cleaning unit. Washing or compressed air units should not be used to perform surface cleaning.
2. Drainage pipes, inlets, stone edge drains and other structures within or draining to the subbase should be cleaned out at regular intervals.
3. Deicers should be used in moderation. Deicers should be non-toxic and be applied either as calcium magnesium acetate or as pretreated salt. Snow plowing should be done carefully with blades set one-inch above the surface. Plowed snow piles and snowmelt should not be directed to permeable pavement.

MICRO-BIORETENTION PLANTING TABLE

PLANTS	MBR-1	MBR-2
VINCA MINOR (COMMON PERIWINKLE)	19	5
AJUSTA REPTAN S (CREEPING BUGLEWEED)	57	13
IRIS VERSICOLOR (IRIS)	57	13
ELYMUS VIRGINICUS (VIRGINIA WILD RYE)	19	5
VACCINIUM ATROCOCCUM (HIGHBUSH BLUEBERRY)	19	5
ACER RUBRUM (RED MAPLE)	1	1

OPERATION AND MAINTENANCE SCHEDULE FOR LANDSCAPE INFILTRATION (M-3) MICRO-BIORETENTION (M-6), RAIN GARDENS (M-7), BIORETENTION SWALE (M-8), ENHANCED FILTERS (M-9)

a. THE OWNER 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 A.4.1 AND 2.

b. THE OWNER SHALL PERFORM A PLANT INSPECTION IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLAN MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.

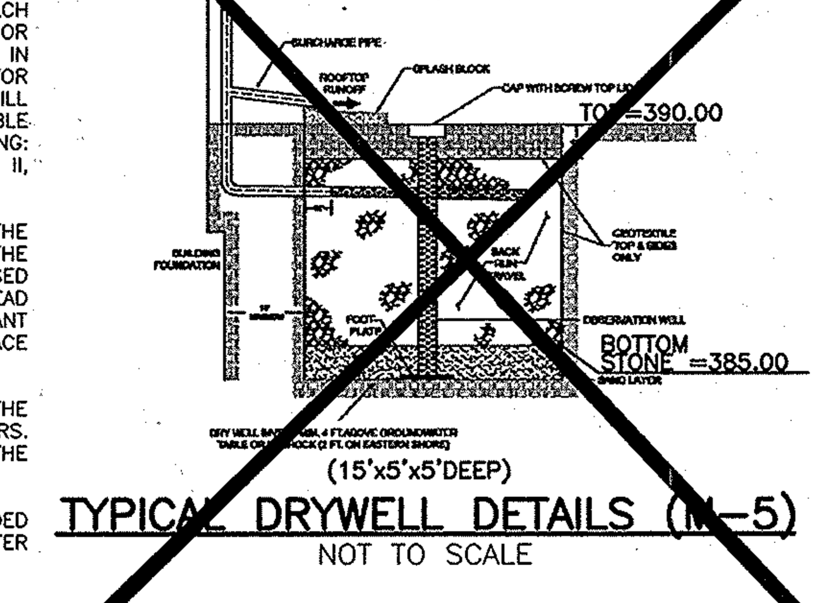
c. THE OWNER SHALL INSPECT MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.

d. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

e. FILTER MATERIAL MUST BE REPLACED WHEN THE WATER REMAINS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 24 HOURS FOLLOWING A 1 OR 2 YEAR STORM EVENT OR MORE THAN 48 HOURS FOLLOWING A 10 YEAR STORM EVENT.

MATERIALS AND SPECIFICATIONS FOR (M-6) MICRO-BIORETENTION

MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS (IF REQUIRED)	SEE APPENDIX A; TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2.0' TO 4.0' DEEP)	LOAMY SAND (60-65%) & COMPOST (35-40%) OR LOAMY SAND (30%) COARSE SAND (30%) & COMPOST (35-40%)	N/A	USDA SOIL TYPES: LOAMY SAND, SANDY LOAM; CLAY CONTENT <5%
ORGANIC CONTENT	MIN. 10% BY DRY WEIGHT (ASTM D2974)	N/A	-
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM
PEA GRAVEL DIAPHRAGM	PEA GRAVEL: ASTM D-448	#8 OR #9 (1/8" TO 3/8")	
GEOTEXTILE		N/A	PE TYPE 1 - NONWOVEN
GRAVEL (UNDERDRAINS & BERMS)	AASHTO M-43	#57 OR #6 AGGREGATE (3/8" TO 3/4")	#8 STONE
UNDERDRAIN PIPING	F758, TYPE PS28 OR AASHTO M-278	4" TO 6" RIGID SCH.40 PVC OR SDR35	SLOTTED OR PERFORATED: 3/8" PERFS. @ 6" O/C, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES, NOT NECESSARY UNDERNEATH PIPES. PERFORATED PIPE SHALL BE WRAPPED WITH 1/4" GALVANIZED HARDWIRE CLOTH
POURED-IN-PLACE CONC. (IF REQUIRED)	MSHA MIX NO.3; f'c=3500psi @ 28 DAYS, NORMAL WEIGHT, AIR ENTRAINED; REINFORCING TO MEET ASTM 615-60	N/A	ON-SITE TESTING OF POURED-IN-PLACE CONC. REQUIRED; 28 DAY STRENGTH TEST AND SLUMP TEST: ALL CONC. DESIGN (CAST -IN-PLACE or PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND. - DESIGN TO INCLUDE MEETING ACI CODE 350.R/89: VERTICAL LOADING (H-10 or H-20) ALLOWABLE HORIZONTAL LOADING (BASED ON SOIL PRESSURES); AND ANALYSIS OF POTENTIAL CRACKING
SAND (1.0' DEEP)	AASHTO M-6 OR ASTM C-33	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE (AASHTO) #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND

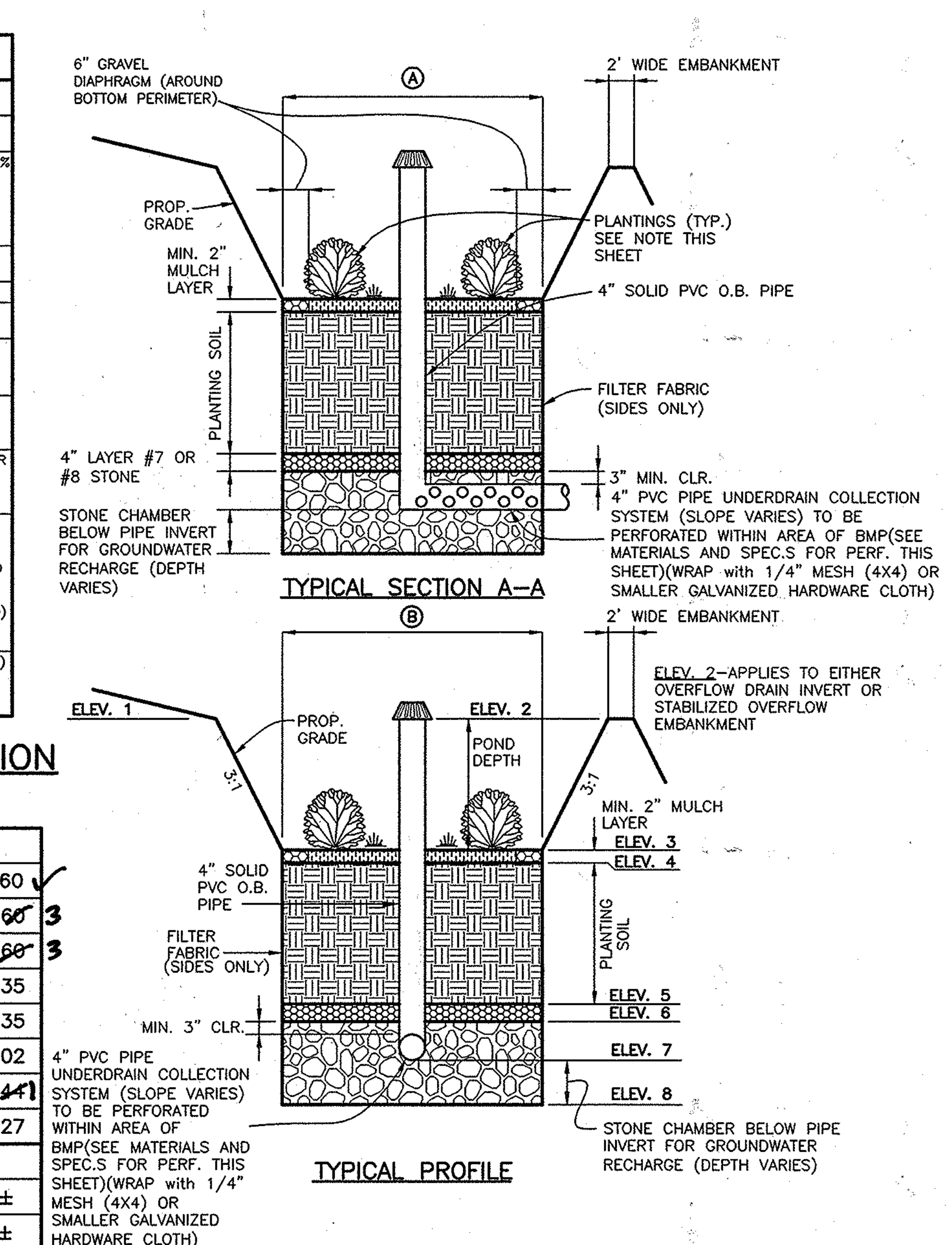


TYPICAL DRYWELL DETAILS (M-5)

NOT TO SCALE

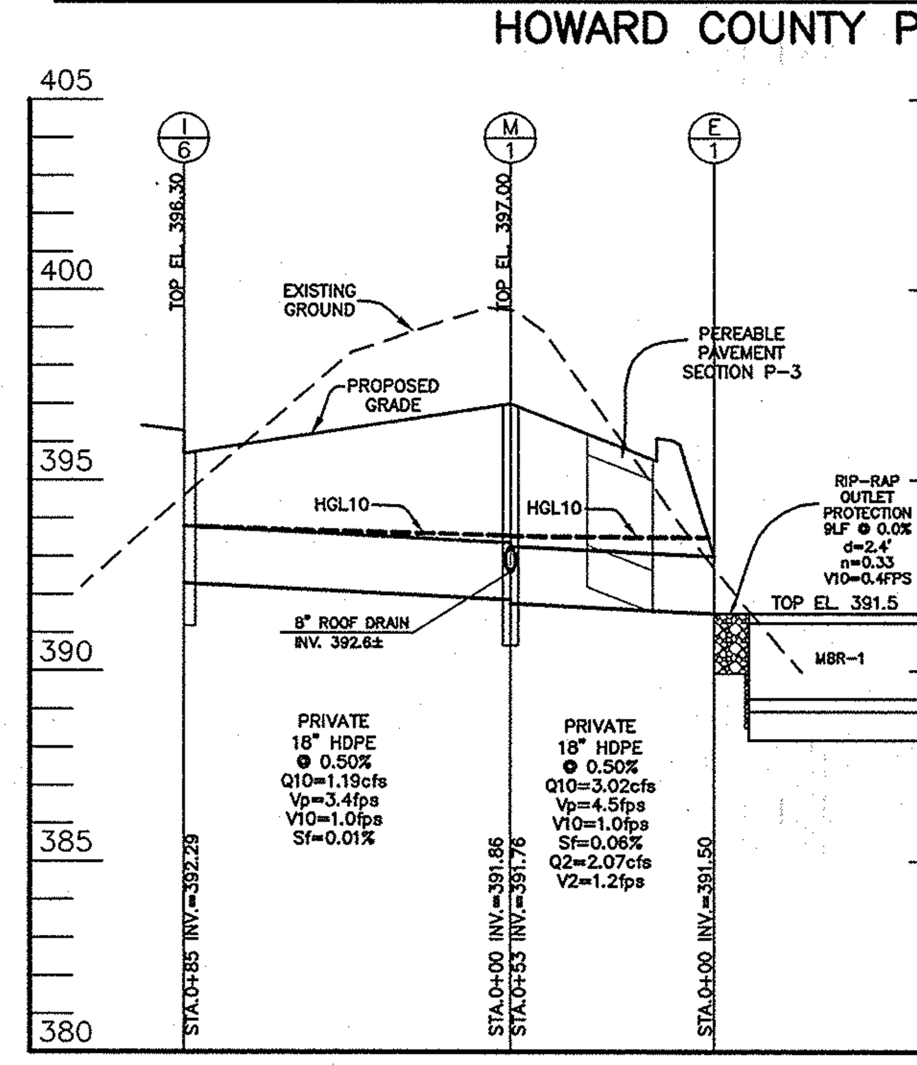
(M-6) MICRO-BIORETENTION DESIGN TABLES

#1		#2	
ELEV. 1	~~392.50~~ 393.4	ELEV. 1	391.60 ✓
ELEV. 2	392.5~~0~~ 1	ELEV. 2	391.6~~0~~ 3
ELEV. 3	391.5~~0~~ 2	ELEV. 3	390.6~~0~~ 3
ELEV. 4	391.25	ELEV. 4	390.35
ELEV. 5	389.25	ELEV. 5	388.35
ELEV. 6	388.92	ELEV. 6	388.02
ELEV. 7	388.34 ✓	ELEV. 7	387.~~44~~ 1
ELEV. 8	388.17	ELEV. 8	387.27
DIMENSIONS		DIMENSIONS	
'A'	48'±	'A'	32'±
'B'	38'±	'B'	16'±
TOTAL SF	1867	TOTAL SF	408

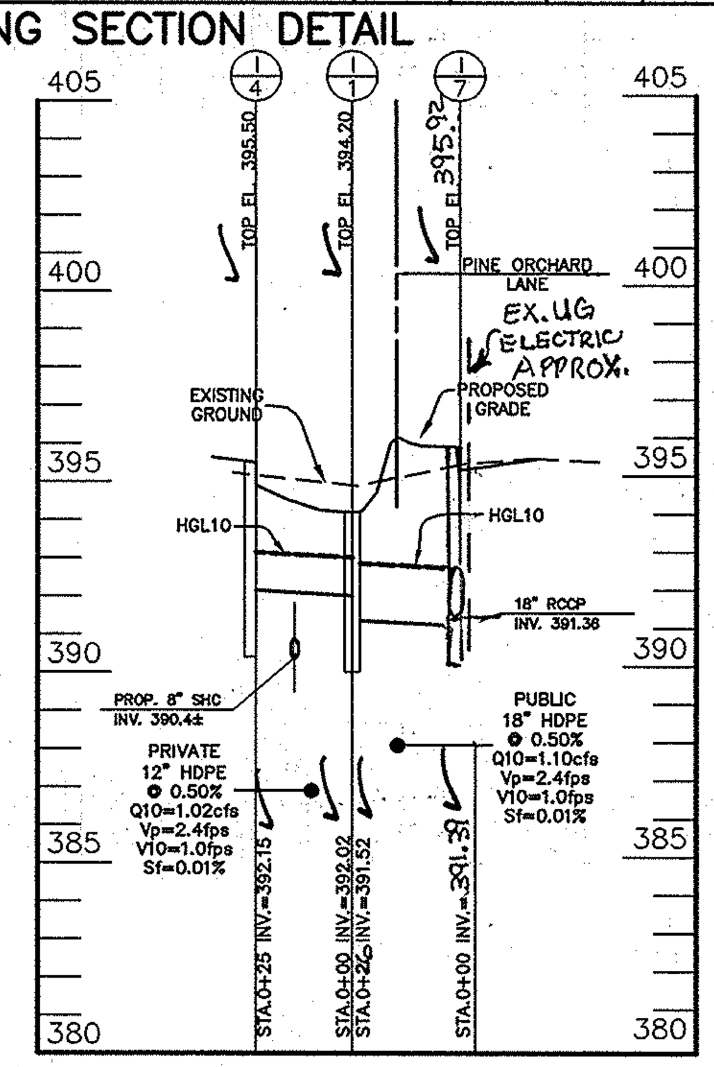


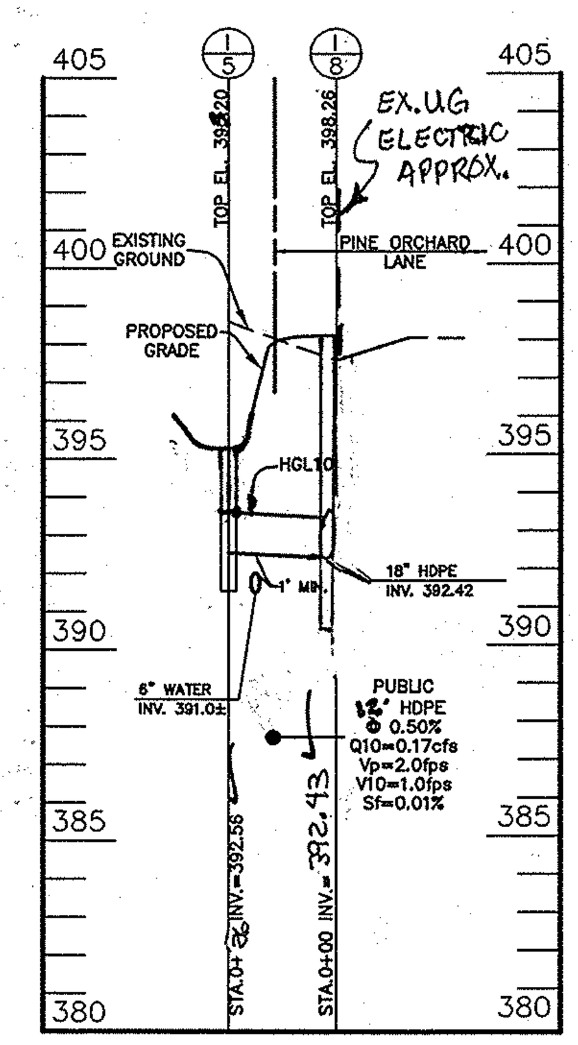
TYPICAL MICRO-BIORETENTION DETAILS

NOT TO SCALE

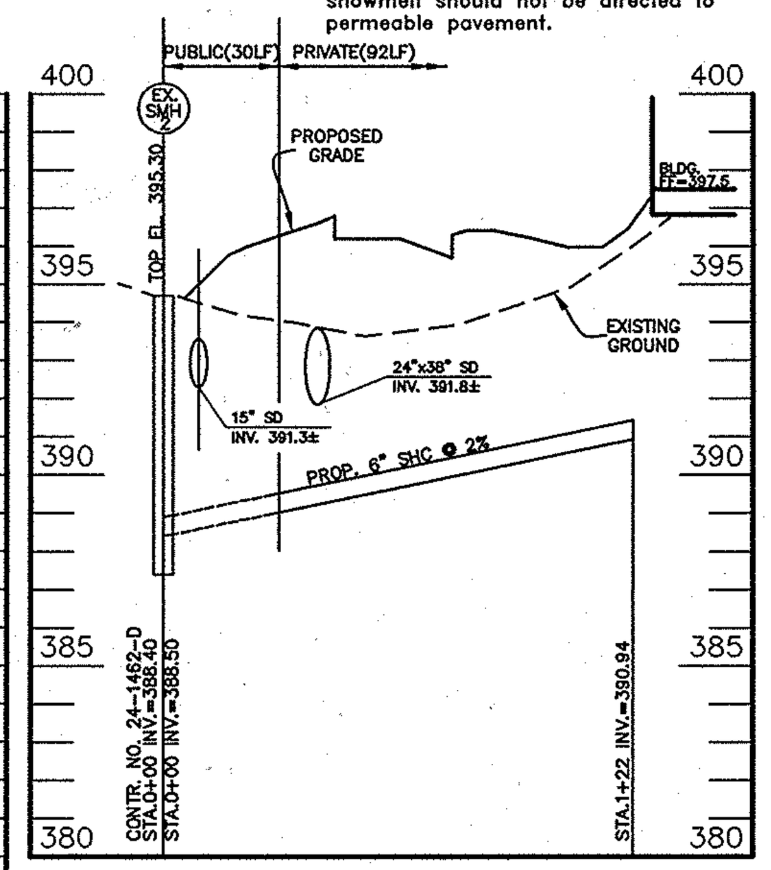


STORM DRAIN PROFILE
SCALE: VERTICAL 1"=5'
HORIZONTAL 1"=50'





STORM DRAIN PROFILE
SCALE: VERTICAL 1"=5'
HORIZONTAL 1"=50'

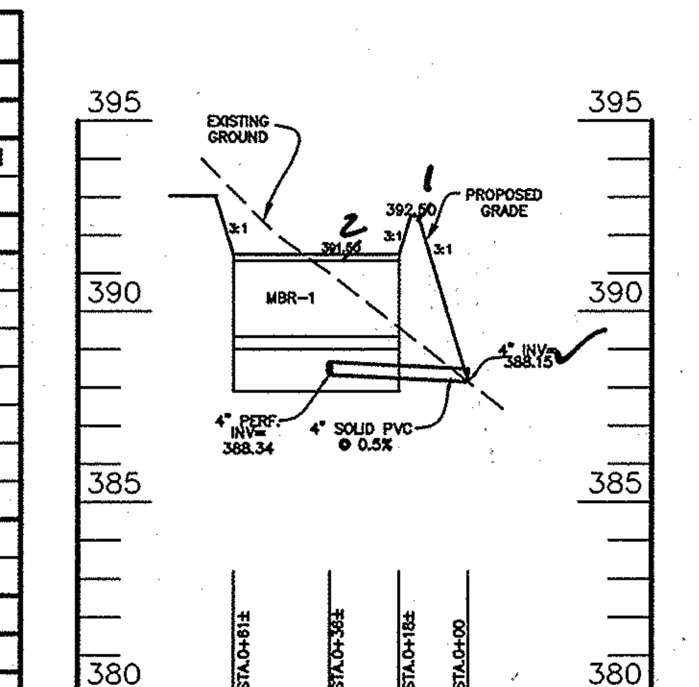


SHC PROFILE
SCALE: VERTICAL 1"=5'
HORIZONTAL 1"=50'

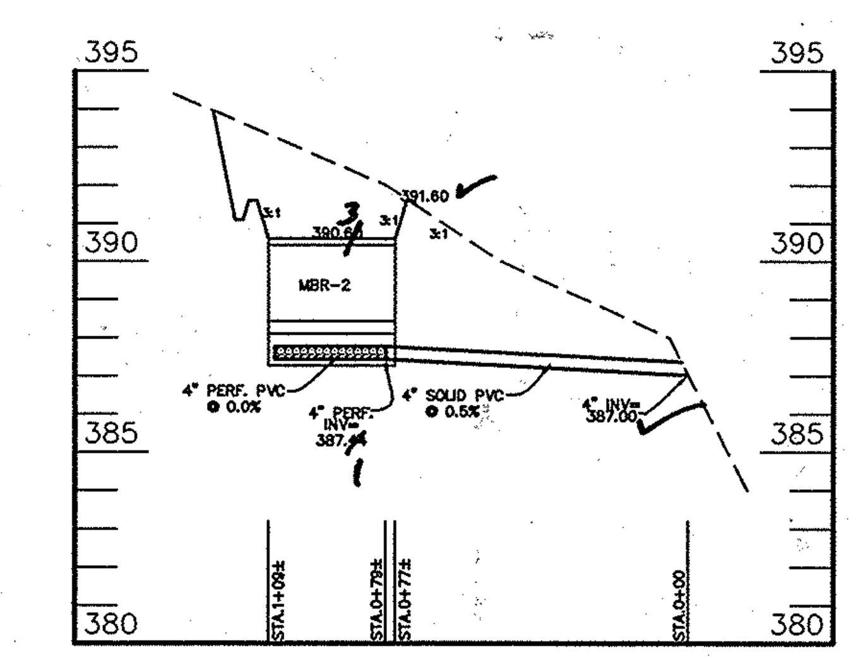
STRUCTURE SCHEDULE

NO.	TYPE	LOCATION	PIPE INV. IN	PIPE INV. OUT	TOP ELEV.	THROAT ELEV.	OWNERSHIP	HO. CO. STD.
		END SECTIONS						
E-1	18" HDPE END SECT.	N 588652.3, E 1350677.1	---	391.50	NA	NA	PRIVATE	HPDE END SECTION
E-2	27"X42" END SECT.	N 588580.3, E 1350897.7	---	390.99	NA	NA	PUBLIC	SHA MD-369.00
		INLETS						
I-1	YARD	N 588582.9, E 1350816.4	392.02 ✓	391.52 ✓	394.20 ✓	NA	PRIVATE	D-4.14
I-2	5' CONC. FLOW THRU	N 588543.0, E 1350582.6	–	–	393.40	392.70	PRIVATE	SHA MD-374.68
I-3	5' CONC. FLOW THRU	N 588547.3, E 1350556.7	–	–	393.30	392.60	PRIVATE	SHA MD-374.68
I-4	TYPE DOUBLE S	N 588561.2, E 1350802.6	–	392.15 ✓	395.50 ✓	NA	PRIVATE	SHA MD-379.04
I-5	YARD	N 588770.3, E 1350856.3	–	392.56 ✓	~~393.20~~ ✓	NA	PRIVATE	D-4.14
I-6	TYPE DOUBLE S	N 588767.7, E 1350745.3	–	392.29	396.30	NA	PRIVATE	SHA MD-379.04
I-7	TYPE A-5	N 588577.2, E 1350842.6	391.46 ✓	391.36 ✓	395.~~92~~ 89	NA	PUBLIC	D-4-01
I-8	TYPE A-5	N 588765.0, E 1350883.1	392.43 ✓	392.~~42~~ 17	398.26	NA	PUBLIC	D-4-01
I-9	TYPE DOUBLE S	N 588484.2, E 1350796.2	–	~~392.00~~ 391.80	395.70	NA	PUBLIC	D-4.23
		MANHOLES						
M-1	4'-0" MANHOLE	N 588686.4, E 1350717.7	391.86	391.76	397.00	NA	PRIVATE	G-5.12
M-2	5'-0" MANHOLE	N 588556.9, E 1350852.9	391.35 ✓	391.25 ✓	~~395.70~~ 396.00	NA	PUBLIC	G-5.13

1) STRUCTURE LOCATION FOR MANHOLES IS AT THE CENTER OF THE MANHOLE.
2) STRUCTURE LOCATION FOR INLETS IS AT THE CENTER OF THE INLET TOP OF CURB.
3) STRUCTURE ELEVATION AND LOCATION FOR END SECTIONS IS AT THE MIDPOINT OF THE END OF PIPE BEGINNING OF END SECTION.
4) PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.
5) STRUCTURE LOCATION FOR CURB OR COMBINATION INLETS IS AT THE CENTER FACE OF CURB.
6) STRUCTURE LOCATION FOR TYPE D INLETS IS AT THE CENTER TOP OF SLAB.



MBR-1 PROFILE
SCALE: VERTICAL 1"=5'
HORIZONTAL 1"=50'

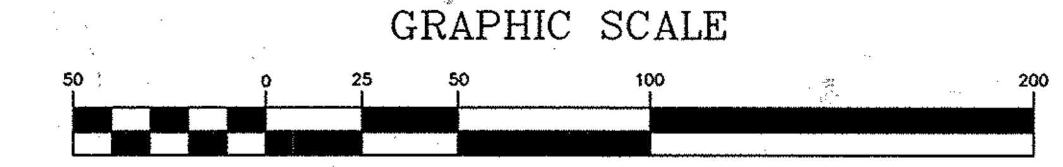


MBR-2 PROFILE
SCALE: VERTICAL 1"=5'
HORIZONTAL 1"=50'

STORMDRAIN PIPE SCHEDULE

PIPE SIZE	LENGTH	TYPE
4"	80'±	PERF. PVC
4"	113±	SOLID PVC
6"	340'±	PVC (RD)
12"	53'	HDPE
15"	0	HDPE
18"	380'	HDPE
27"x42"	143'	ERCCP

GRAPHIC SCALE



(IN FEET)
1 inch = 50 ft.

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 6-25-15

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

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: 12-21-16

ENGINEER'S CERTIFICATE

"I HEREBY 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."

C. Malagari 5/5/14
ENGINEER – CHRISTOPHER A. MALAGARI DATE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT 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 SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

Susan Umstead 5/2/14
DEVELOPER / OWNER — By: LAKESHORE I, LLC By MBC ASSOCIATES, LLC, Its Member By SUSAN UMSTEAD, Member — DATE

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

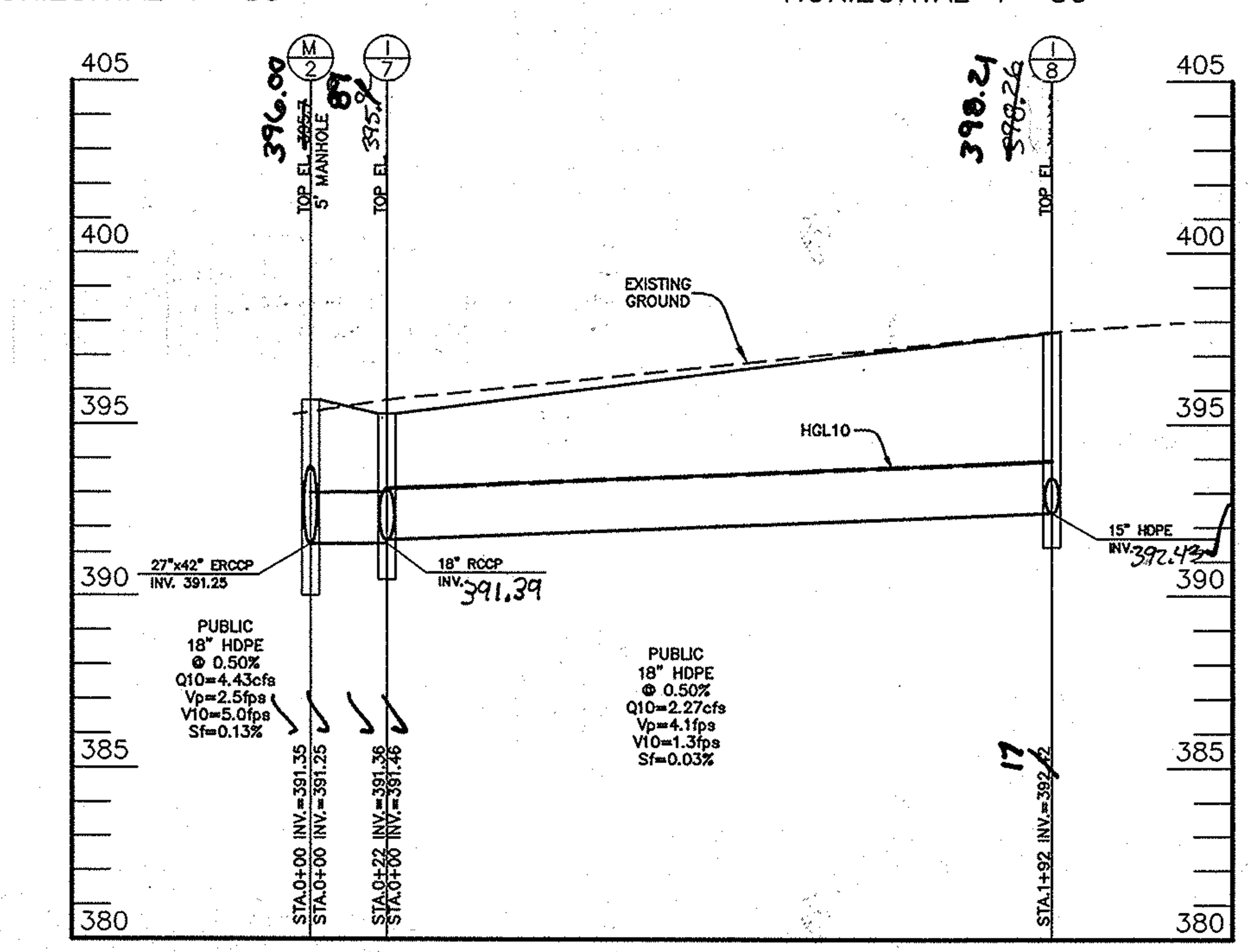
John R. Robertson 5/13/14
HOWARD SCD DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

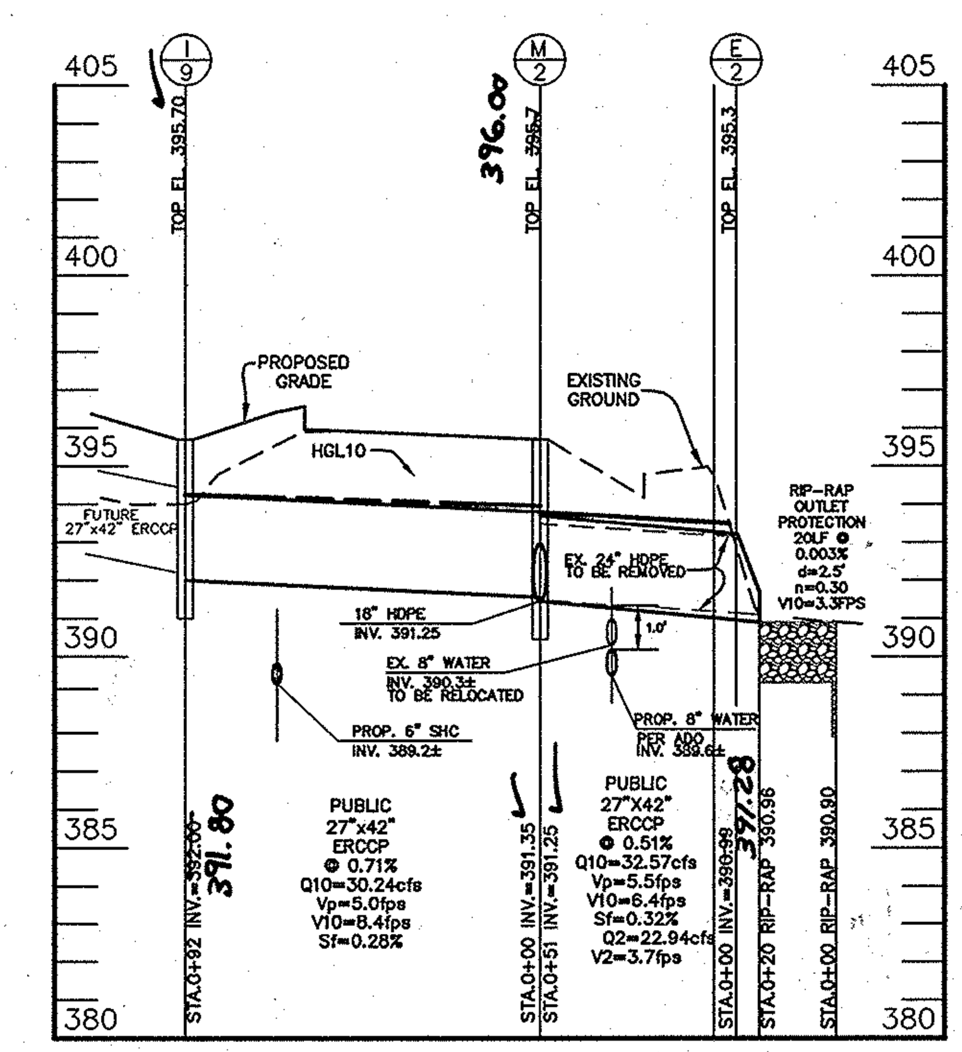
Chad Edmondson 6-17-14
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Kent Sheubrooks 6-19-14
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

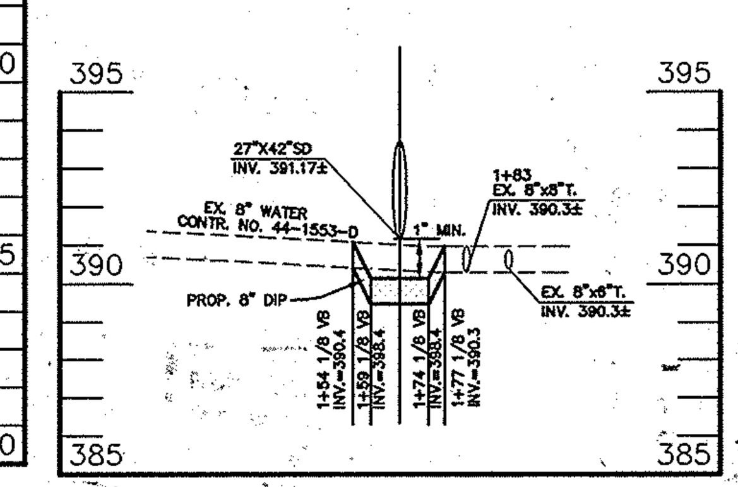
Marsha McLaughlin 6/19/14
DIRECTOR DATE



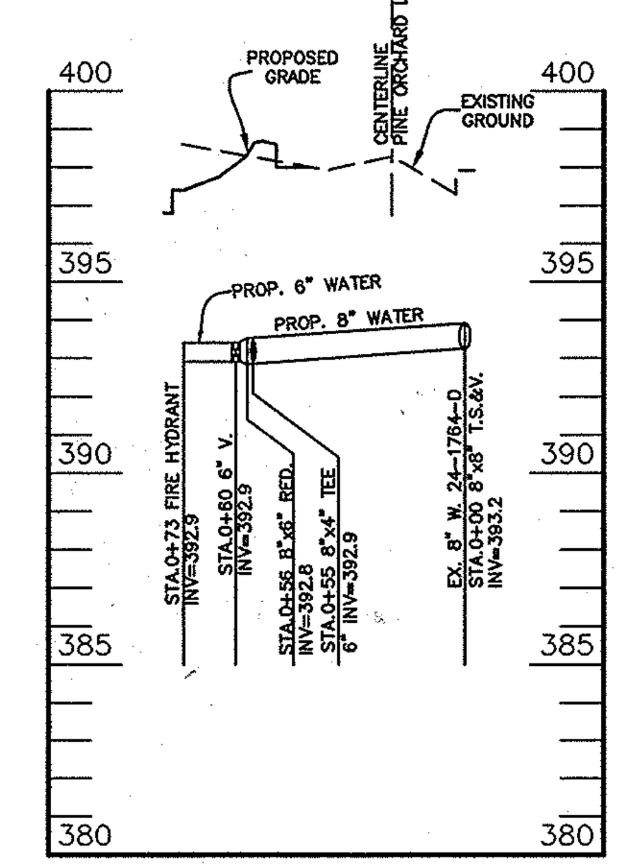
STORM DRAIN PROFILE
SCALE: VERTICAL 1"=5'
HORIZONTAL 1"=50'



STORM DRAIN PROFILE
SCALE: VERTICAL 1"=5'
HORIZONTAL 1"=50'



PUBLIC WATER PROFILE
SCALE: VERTICAL 1"=5'
HORIZONTAL 1"=50'



PUBLIC WATER PROFILE
SCALE: VERTICAL 1"=5'
HORIZONTAL 1"=50'

NO.	DATE	REVISION
2	6-1-15	REMOVE DRYWELL DETAIL
1	9-22-2014	REVISE I-7 & I-8 TO A-5 INLETS AND SHOW UG ELECTRIC

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 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. 22390, Expiration Date: 6.30.15.
STATE OF MARYLAND — CHRISTOPHER ALAN MALAGARI — No. 22390 — PROFESSIONAL ENGINEER 5-5-14

OWNER:
LAKESHORE I, LLC
C/O SECURITY DEVELOPMENT
8480 BALTIMORE NATIONAL PIKE
SUITE 415
ELLICOTT CITY, MD 21043

DEVELOPER:
SECURITY DEVELOPMENT, LLC
PO BOX 417
ELLICOTT CITY, MD 21041
410-465-4244

ORCHARD PARK
SECTION 3
3200 PINE ORCHARD LANE
ROMANIK PROPERTY, LOT 1 AND ORCHARD HILL, PARCEL B

TAX MAP: 24 & 17, GRID: 1 & 19, PARCEL: 647 & P/O 130
ZONED: R-A-15
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT PLAN
STORMWATER MANAGEMENT NOTES, DETAILS AND STORM DRAIN PROFILES

DATE:	MAY 2014	BEI PROJECT NO.	1796
SCALE:	AS SHOWN	SHEET	6 OF 10

AS-BUILT

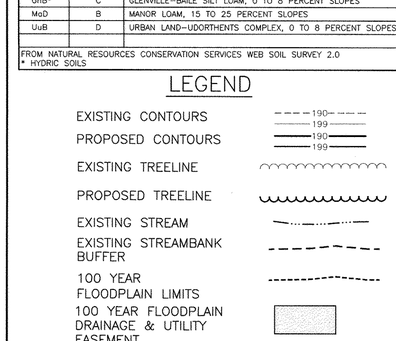
SDP-13-055

P:\1796 ROMANIK\dwg\8000V1.dwg, 5/1/2014 1:21:51 PM, cogle

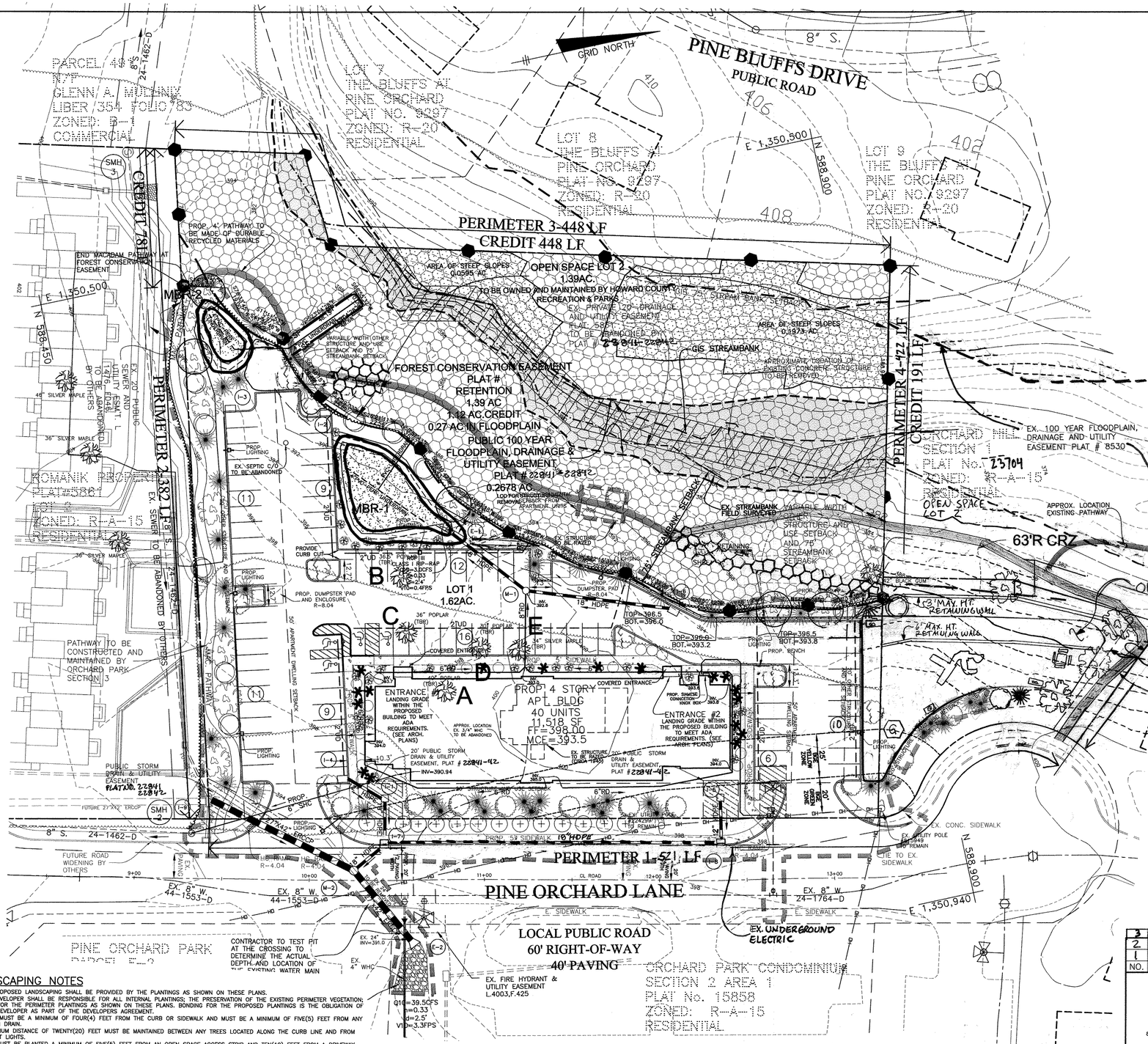
SOILS LEGEND		
MAP SYMBOL	SOIL GROUP	SOIL TYPE
GgB	B	GLENELG LOAM, 3 TO 8 PERCENT SLOPES
GhB	B	GLENELG–URBAN LAND COMPLEX LOAM, 0 TO 8 PERCENT SLOPES
GnB*	C	GLENVILLE–BAILE SILT LOAM, 0 TO 8 PERCENT SLOPES
MaD	B	MANOR LOAM, 15 TO 25 PERCENT SLOPES
UuB	D	URBAN LAND–UDORTHENTS COMPLEX, 0 TO 8 PERCENT SLOPES
FROM NATURAL RESOURCES CONSERVATION SERVICES WEB SOIL SURVEY 2.0		
* HYDRIC SOILS		

LEGEND

EXISTING CONTOURS
PROPOSED CONTOURS
EXISTING TREELINE
PROPOSED TREELINE
EXISTING STREAM
EXISTING STREAMBANK BUFFER
100 YEAR FLOODPLAIN LIMITS
100 YEAR FLOODPLAIN DRAINAGE & UTILITY EASEMENT
FOREST CONSERVATION EASEMENT
FOREST CONSERVATION SIGN
EXISTING STRUCTURE
PROPOSED BUILDING
SLOPES 25% OR GREATER
MODERATE SLOPES
EX. 20' DRAINAGE AND UTILITY EASEMENT
PUBLIC DRAINAGE & UTILITY EASEMENT,PLAT #
PUBLIC WATER & UTILITY EASEMENT
PROP. MICRO–BIORETENTION FACILITY
PROP. PERMEABLE PAVEMENT
PROP. GAZEBO/PAVILION
PROP. 5' PARK BENCH



TYPICAL BLOCK RETAINING WALL DETAIL
NTS



LANDSCAPING NOTES

1.) THE PROPOSED LANDSCAPING SHALL BE PROVIDED BY THE PLANTINGS AS SHOWN ON THESE PLANS.
2.) THE DEVELOPER SHALL BE RESPONSIBLE FOR ALL INTERNAL PLANTINGS; THE PRESERVATION OF THE EXISTING PERIMETER VEGETATION; AND FOR THE PERIMETER PLANTINGS AS SHOWN ON THESE PLANS. BONDING FOR THE PROPOSED PLANTINGS IS THE OBLIGATION OF THE DEVELOPER AS PART OF THE DEVELOPERS AGREEMENT.
3.) TREES MUST BE A MINIMUM OF FOUR(4) FEET FROM THE CURB OR SIDEWALK AND MUST BE A MINIMUM OF FIVE(5) FEET FROM ANY STREET LIGHTS.
4.) A MINIMUM DISTANCE OF TWENTY(20) FEET MUST BE MAINTAINED BETWEEN ANY TREES LOCATED ALONG THE CURB LINE AND FROM ANY DRIVEWAY AND A MINIMUM OF FIVE(5) FEET FROM DRAIN INLET STRUCTURES.
5.) TREE MUST BE PLANTED A MINIMUM OF FIVE(5) FEET FROM AN OPEN SPACE ACCESS STRIP AND TEN(10) FEET FROM A DRIVEWAY LANDSCAPE MANUAL.
6.) THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SEC.–16.124 OF THE HOWARD COUNTY CODE AND
7.) SIX (6) SPECIMEN TREES WERE FOUND ON–SITE AS PER FOREST STAND DELINEATION PREPARED BY ECO–SCIENCE PROFESSIONALS, INC. DATED AUGUST, 2012. AS APPROVED UNDER WP–13–074 FIVE(5) OF THE SPECIMEN TREES ARE TO BE REMOVED WITH A REQUIRED MITIGATION AT A RATIO OF ONE 3"–4" CALIPER TREE FOR EACH SPECIMEN TREE REMOVED. SPECIMEN TREE F WILL BE RETAINED AS PART OF THIS PROJECT. ROOT PRUNING ALONG THE PROPOSED LIMITS OF DISTURBANCE WILL BE PROVIDED TO REDUCE AND INSURE ITS SURVIVAL.
8.) THE REQUIRED PERIMETER PLANTINGS AND PARKING LOT PLANTINGS ARE PROVIDED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT FOR SDP–13–055 IN THE AMOUNT OF $20,410.00 ($9,600.00 FOR 32 SHADE TREES, $6,600.00 FOR 44 EVERGREEN TREES, $1,800.00 FOR 12 ORNAMENTAL TREES AND $2,250.00 FOR 75 SHRUBS) THE ADDITIONAL $160.00 FEE IS FOR THE DISTURBANCE WITHIN THE FOREST CONSERVATION EASEMENT. SEE NOTE 8 SHEET 8.
9.) AT THE TIME OF PLANT INSTALLATION, ALL SHRUBS AND TREES LISTED AND APPROVED ON THE LANDSCAPE PLAN, SHALL COMPLY WITH THE PROPER HEIGHT REQUIREMENT IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATIONS OF THE REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING.
10.) THE OWNERS, TENANT AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIAL AND BERMS, FENCES AND WALLS. ALL PLANT MATERIAL SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHERE NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS.
11.) IN ACCORDANCE WITH THE PRE–SUBMISSION COMMUNITY MEETING HELD ON FEBRUARY 18, 2013 THE DEVELOPER HAS AGREED TO PLANT ADDITIONAL LANDSCAPING (EVERGREENS) ALONG THE PARKING LOTS ADJACENT TO THE RESIDENTIAL PROPERTIES. DPZ WILL ENFORCE THIS AGREEMENT AS PART OF THE INTERNAL LANDSCAPE REQUIREMENTS AND SURETY FOR THE PROVIDED TREES WILL BE POSTED AS PART OF THE DEVELOPER'S AGREEMENT.
12.) ADDITIONAL LANDSCAPING OF 2 SHADE 3½ EVERGREEN TREE WERE PROVIDED PER REVISION #3. NO ADDITIONAL SURETY IS REQUIRED.

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 OF A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE–YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

DEVELOPER / OWNER — LAKESHORE I, LLC, BY HOWARD ASSOCIATES, INC., SOLE MEMBER By: Susan Umstead, Member — 5/2/14 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 6.17.14 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT — 6-19-14 DATE

DIRECTOR — 6/19/14 DATE

GRAPHIC SCALE

30 0 15 30 60 120
(IN FEET)
inch = 30 ft.

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 6-25-15

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

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: 12-21-16

J. CHRIS OGLE
DNR QUALIFIED PROFESSIONAL

SCHEDULE A PERIMETER LANDSCAPE EDGE							
CATEGORY	ADJACENT TO ROADWAY	YES	NO	NO	NO	YES	TOTAL
	ADJACENT TO PERIMETER PROPERTIES	NO	YES	YES	YES	YES	
PERIMETER NO. / LANDSCAPE TYPE		(1) B	(2) B	(3) C	(4) A	DUMPSTER(2) 8	
LINEAR FEET OF PERIMETER (FRONTAGE/ROADWAY)		521	382	448	422	25 EACH 50	
CREDIT FOR EXISTING VEGETATION: NO OR YES (w/LINEAR FEET) (DESCRIBE BELOW IF NEEDED)		NO	YES 78	YES 448	YES 191	NO	
LINEAR FEET OF REQUIRED PERIMETER LANDSCAPING		521[1]	304	–	231	50	
CREDIT FOR WALL, FENCE OR BERM: NO OR YES (w/LINEAR FEET) (DESCRIBE BELOW IF NEEDED)		NO –	NO –	NO –	NO –	NO	
NUMBER OF PLANTS REQUIRED:	SHADE TREES	10	6	–	4	2(1EACH)	22
	EVERGREEN TREES –	13	8	–	–	2(1EACH)	23
	OTHER TREES (2:1 SUBSTITUTE)	–	–	–	–	–	–
	SHRUBS	–	–	–	–	–	–
NUMBER OF PLANTS PROVIDED:	SHADE TREES	0	6	–	4	2	12
	EVERGREEN TREES	#23	8	–	–	2	33
	OTHER TREES (2:1 SUBSTITUTE)	*10	–	–	–	–	10
	SHRUBS (10:1 SUBSTITUTE)	–	–	–	–	–	–
	(DESCRIBE PLANT SUBSTITUTION	–	–	–	–	–	–
	CREDITS BELOW IF NEEDED)	–	–	–	–	–	–

* 10 EVERGREEN TREES SUBSTITUTED FOR 10 SMALL ORNAMENTAL TREES SUBSTITUTED FOR 10 SHADE TREES.

SCHEDULE B – PARKING LOT INTERNAL LANDSCAPING	
NUMBER OF PARKING SPACES:	83
NUMBER OF TREES/LS–ISLES REQUIRED: 1/10	8
NUMBER OF TREES PROVIDED: SHADE TREES	8
OTHER TREES (2:1 SUBSTITUTION)	*
SHRUBS (10:1 SUBSTITUTION)	–

SCHEDULE C – RESIDENTIAL DEVELOPMENT INTERNAL LANDSCAPING			
SYMBOL	QUANTITY	NAME	REMARKS
	1/3 UNITS 40 UNITS 13 (10 SHADE TREES AND 30 SHRUBS ARE PROVIDED)	QUERCUS RUBRA NORTHERN RED OAK	2 1/2"–3" CAL

STREET TREE LANDSCAPE PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
+	390LF/30 1.3	ACER TATARICUN TATARIAN MAPLE BGE GREEN ZONE LESS THAN 25' MAX HT.	2 1/2" CAL

STREET TREES FOR ORCHARD HILL, PARCEL B WERE SATISFIED UNDER F–88–231

LANDSCAPE PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
	11	ACER RUBRUM'OCTOBER GLORY' OCTOBER GLORY RED MAPLE SHADE TREE	2 1/2"–3" CAL
	*5	LIRIODENDRON TULIPIFERA 'TULIP POPLAR' SHADE TREE	3"–4" CAL
	12 **1	ACER GINALLA "AMUR MAPLE" SMALL DECIDUOUS TREE	1 1/2"–2" CAL BGE GREEN ZONE LESS THAN 25' MAX HT.
	33	LLEX 'NELLIE R. STEVENS' NELLIE R. STEVENS HOLLY	5'– 6' HT. BGE GREEN ZONE LESS THAN 25' MAX HT.
	8	PRUNUS SARGENTII "SARGENT CHERRY" LARGE DECIDUOUS TREE	2 1/2" – 3' HT
	10 ***9	LLEX CRENATA 'HELLERI' "HELLER JAPANESE HOLLY"	18" – 24" HT
	10 ***7	BUXUS MICROPHYLLA KOREANA "WINTERGREEN BOXWOOD"	2 1/2" – 3' HT
	10 ***7	EUONYMUS KIAUTSCHOVICUS "SIEBODIANA" "SIEBOLD EUONYMUS"	2 1/2" – 3' HT
	12	PINUS STROBUS "WHITE PINE"	6' – 8' HT
	22	LLEX CRENATA 'HELLERI' "HELLER JAPANESE HOLLY"	18" – 24" HT

* 5 ADDITIONAL SHADE TREES FOR THE 5 SPECIMEN TREES REMOVED UNDER WP–13–074. SEE NOTE #7 THIS SHEET.
** 1 ADDITIONAL SHADE TREE FOR THE LOD WITHIN THE FOREST CONSERVATION EASEMENT. SEE NOTE #8 SHEET 8.
*** ENHANCED LANDSCAPING TO MITIGATE THE 15' WIDE LANDSCAPE AREA BETWEEN THE BUILDING AND PARKING AREA.

NO.	DATE	REVISION
3	10.27.15	OBVIOUS BENCHES AND ADDITIONAL REC. AREA LOT 3
2	6-1-15	REMOVE SHED & DRYWELL FROM PARCEL 'B'
1	9-22-2014	REVISE I-7 TO I-8 TO A-5 INLETS AND SHOW UG ELECTRIC

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
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(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. 22041 Expiration Date: 6.30.15.
STATE OF MARYLAND CHRISTOPHER ALAN WALKER No. 22041 PROFESSIONAL ENGINEER
5-6-14

OWNER:
LAKESHORE I, LLC
C/O SECURITY DEVELOPMENT
8480 BALTIMORE NATIONAL PIKE
SUITE 415
ELLICOTT CITY, MD 21043

DEVELOPER:
SECURITY DEVELOPMENT, LLC
PO BOX 417
ELLICOTT CITY, MD 21041
410–465–4244

ORCHARD PARK
SECTION 3
3200 PINE ORCHARD LANE
ROMANIK PROPERTY, LOT 1 AND ORCHARD HILL, OPEN SPACE LOT 3
TAX MAP: 24 & 17, GRID: 1 & 19, PARCEL: 647 & P/O 130
ZONED: R–A–15
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT PLAN
LANDSCAPE AND FOREST CONSERVATION PLAN

DATE:	MAY 2014	BEI PROJECT NO.	1796
SCALE:	1"=30'	SHEET	7 OF 11

AS-BUILT

SDP-13-055

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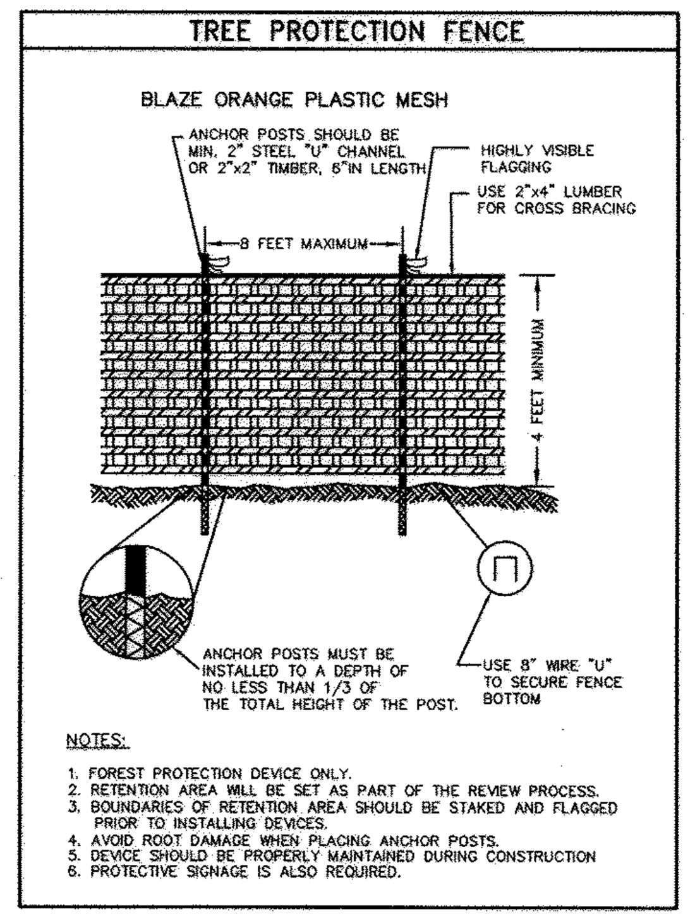
TREE PROTECTION FENCE



FOREST CONSERVATION NOTES:

1. ANY FOREST CONSERVATION EASEMENT (FCE) AREA SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF HOWARD COUNTY WHICH RESTRICT THE DISTURBANCE AND USE OF THESE AREAS.

2. THE FOREST CONSERVATION EASEMENTS HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE, FOREST CONSERVATION ACT. NO CLEARING, GRADING, OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENTS; HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED

3. LIMITS OF DISTURBANCE SHALL BE RESTRICTED TO AREAS OUTSIDE THE LIMIT OF TEMPORARY FENCING OR THE FCE BOUNDARY, WHICHEVER IS GREATER.

4. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST CONSERVATION EASEMENT, EXCEPT AS PERMITTED BY HOWARD COUNTY DPZ.

5. NO STOCKPILES, PARKING AREAS, EQUIPMENT CLEANING AREAS, ETC. SHALL OCCUR WITHIN AREAS DESIGNATED AS FOREST CONSERVATION EASEMENTS.

6. TEMPORARY FENCING SHALL BE USED TO PROTECT FOREST RESOURCES DURING CONSTRUCTION. THE FENCING SHALL BE PLACED ALONG ALL FCE BOUNDARIES WHICH OCCUR WITHIN 15 FEET OF THE PROPOSED LIMITS OF DISTURBANCE.

7. PERMANENT SIGNAGE SHALL BE PLACED 50–100' APART ALONG THE BOUNDARIES OF ALL AREAS INCLUDED IN FOREST CONSERVATION EASEMENTS.

8. THE TOTAL FOREST CONSERVATION OBLIGATION AMOUNT HAVE BEEN MET BY THE ON–SITE RETENTION OF 1.12 AC. WITHIN A FOREST CONSERVATION EASEMENT. A $160.00 FEE IS REQUIRED FOR THE DISTURBANCE WITHIN THE FOREST CONSERVATION EASEMENT TO REMOVE THE EXISTING STRUCTURE. THE LIMIT OF DISTURBANCE IS 400SF (400*$0.40/SF). THIS FEE WILL BE ADDED TO THE LANDSCAPE SURETY. PLANTING OF 2" CALIBER TREES IS REQUIRED FOR THE DISTURBANCE AT 100 PER ACRE OF LOD. SEE LANDSCAPE PLANT LIST SHEET 7.

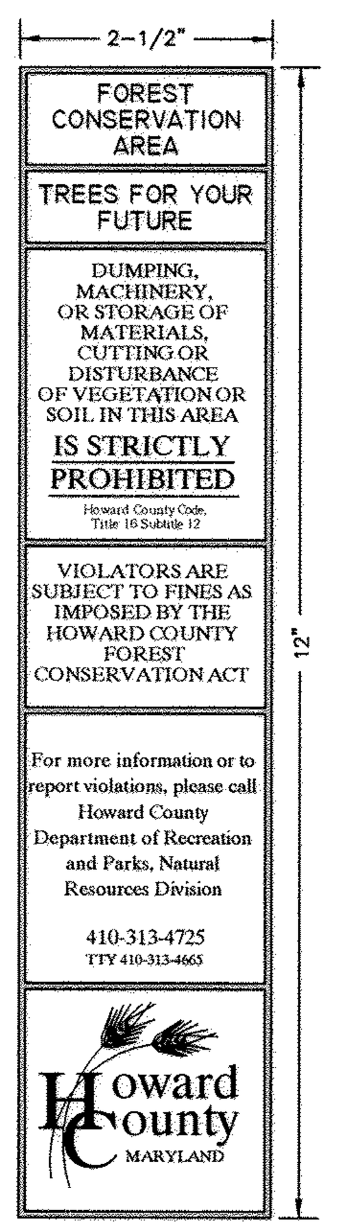
FOREST CONSERVATION WORKSHEET

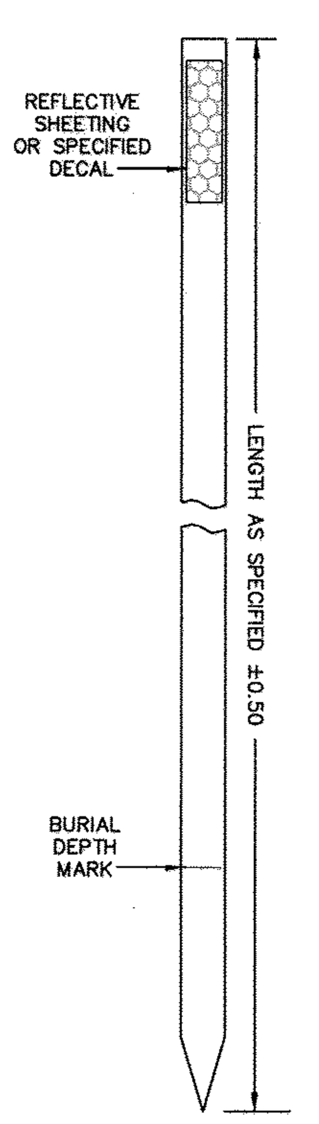
ORCHARD PARK SECTION 3

Computations by: JCO — BEI JOB No. 1796 — Date: 10/9/2013

NET TRACT AREA:			
A.	Total tract area	3.30	ac.
B.	Other deductions: (floodplain)	0.27	ac.
C.	Net Tract Area	3.03	ac.
LAND USE CATEGORY:			
	Select category (AR, MDR, ID, HDR, MPD, CI)	HDR	
D.	Afforestation Threshhold → 15% x "F" =	0.45	ac.
E.	Conservation threshhold → 20% x "F" =	0.61	ac.
EXISTING FOREST COVER:			
F.	Existing forest cover	2.00	ac.
G.	Area of forest above afforestation threshold	1.55	ac.
H.	Area of forest above conservation threshold	1.39	ac.
BREAK EVEN POINT:			
I.	Forest retention above threshold with no mitigation	0.88	ac.
J.	Clearing permitted without mitigation	1.12	ac.
PROPOSED FOREST CLEARING:			
K.	Total area of forest to be cleared	0.88	ac.
L.	Total area of forest to be retained	1.12	ac.
PLANTING REQUIREMENTS:			
M.	Reforestation for clearing above conservation threshold	0.22	ac.
N.	Reforestation for clearing below conservation threshold	0.00	ac.
O.	Credit for retention above conservation threshold	0.51	ac.
P.	Total reforestation required	0.00	ac.
Q.	Total afforestation required	0.00	ac.
R.	Credit for landscaping - may not exceed 20% of "S."	0.00	ac.
S.	Total reforestation and afforestation required	0.00	ac.

3



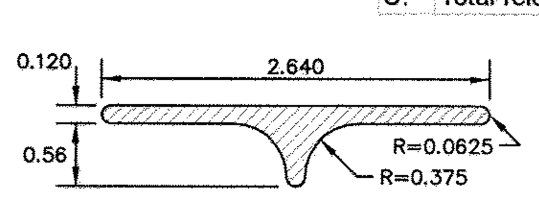


MARKER DETAIL

DECAL SPECIFICATIONS

Materials:
Number 3690 Scotchcal non–reflective substrate.

Color:
Dark green text and border on beige background.



MARKER – SECTION VIEW

FCE CARSONITE MARKER
NOT TO SCALE

FOREST CONSERVATION EASEMENT CHART		
EASEMENT #	AREA	TYPE
1	1.39 AC. (1.12 AC. CREDIT)	RETENTION

Specimen Tree Data

Key	Species, Size (dbh)	CRZ diameter	Comments/Condition
A	Tulip poplar, 40"	120'	good condition
B	Tulip poplar, 36.5"	110'	good condition
C	Tulip poplar, 36"	108'	good condition
D	Tulip poplar, 30"	90'	good condition
E	Silver Maple, 34"	102'	good condition
F	Black gum, 42"	126'	good condition

FOREST PROTECTION PROCEDURES – Preconstruction Phase

1) The edge of the woods to be protected will be marked (staked or flagged) in the field per the limits of forest conservation easement shown in the approved site development plan prior to the start of construction activity. All areas within protective easement are to be considered "off limits" to any construction activities. The optional protective fencing shall be installed at the outside edge of forested areas and should be combined with sediment control devices when possible. The limit of the critical root zone and therefore the location of the protective devices is to be determined as follows:

   Edge of Forested Area – 1 foot of protective radius/inch of DBH or an eight foot protective radius, whichever is greater.

   Critical Root Zone for the forest on this site is an average of 12 feet from the trunk of the tree. Critical root zones for Specimen Tree 'F' 63'.

2) Construction activities expressly prohibited within the preservation areas are:

   Placing or stockpiling backfill or top soil in protected areas
   Felling trees into protected areas
   Driving construction equipment into or through protected areas
   Burning in or in close proximity to protected areas
   Stacking or storing supplies of any kind
   Concrete wash–off areas.
   Conducting trenching operations
   Grading beyond the limits of disturbance
   Parking vehicles or construction equipment
   Removal of root mat or topsoil
   Siting and construction of: Utility lines
   Access roads
   Impervious surfaces
   Stormwater management devices
   Staging areas

3) Protective fencing (see Figure "Protective Fencing") shall be the responsibility of the general contractor. The general contractor shall affix signs to the fencing at 25' minimum intervals indicating that these areas are "Forest Retention Area" (see Figure "Signage"). The general contractor shall take great care to assure the restricted areas are not violated and theat root systems are protected from smothering, flooding, excessive wetting from dewatering operations, off–site runoff, spillage, and drainage or solutions containing materials hazardous to tree roots.

4) The general contractor shall be responsible for any tree damaged or destroyed within the preservation areas whether caused by the contractor, his agents, employees, subcontractors, or licensees.

5) Foot traffic shall be kept to a minimum in the protective areas.

6) All trees which are not to be preserved within fifty feet of any tree preservation areas are to be removed in a manner that will not damage those trees that are designated for preservation. It is highly recommended that tree stumps within this fifty foot area be ground out with a stump grinding machine to minimize damage.

7) The general contractor shall designate a "wash out" area onsite for concrete trucks which will not drain toward a protected area.

8) A pre–construction meeting shall be held with local authorities before any disturbance has taken place on site.

FOREST PROTECTION PROCEDURES – Construction Phase

Forest and tree conditions should be monitored during construction and corrective measures taken when appropriate.

The following shall be monitored:

a) Soil compaction
b) Root injury – prune and monitor; consider crown reduction
c) Limb injury – prune and monitor
d) Flooded conditions – drain and monitor; correct problem
e) Drought conditions – water and monitor; correct problem
f) Other stress signs – determine reason, correct, and monitor

FOREST PROTECTION PROCEDURES – Post Construction Phase

The following measures shall be taken:

1) Corrective measures if damages were incurred due to negligence:

   a) Stress reduction

   b) Removal of dead or dying trees. This may be done only if trees pose an immediate safety hazard.

2) Removal of temporary structures:

   a) No burial of discarded materials will occur onsite within the conservation area.

   b) No open burning within 100 feet of a wooded area.

   c) All temporary forest protection structures will be removed after construction.

   d) Remove temporary roads by removing stone or broadcasting mulch; pre–construction elevation should be maintained.

   e) Aerate compacted soil.

   f) Replant disturbed sites with trees, shrubs and/or herbaceous plants.

   g) Retain signs for retention areas or specimen trees.

   h) A County official shall inspect the entire site.

3) Future protection measures:

   a) Howard County and the developer shall arrange for the dedication of an appropriate forest conservation easement at a later date.

FOREST PROTECTION PROCEDURES – Preconstruction Phase

Stress Reduction and Protection of Specimen Trees
Isolated from Forest Retention Areas and
General Forest Retention Areas
(as they may apply)

Isolated specimen trees that are to be preserved will be examined to determine if stress reduction techniques are needed. Protective measures and their evaluation criteria are provided on this plan only if they are employed herein.

Root Pruning

Evaluation Criteria

Will the critical root zone be affected by construction activities such as grade changes, digging for foundations and roads or utility installation?

Design Considerations

a) Prune prior to construction as shown on the plan (see Figure "Root Pruning Detail.")
b) Prune root with a clean cut using proper pruning equipment such as a vibratory knife.
c) Exact location of pruning trench should be identified, and immediately backfilled to cover exposed roots after pruning with soil removed other topsoil, peat moss, or other suitable material or with other high organic soil.
d) For trees over 15" in diameter, root pruning may be done up to one year in advance of construction.
e) Tree(s) will be monitored for signs of stress.

Crown Reduction or Pruning

Evaluation Criteria

Has the root system been significantly reduced (>30%) or are there dead, damaged, or diseased limbs?

Design Considerations

a) Reduce only at specified times of the year:
   Flowering trees – only after flowering and before bud set
   Non–Flowering trees – in late winter, early spring or mid summer
b) No more than 1/3 of the crown should be removed at one time using acceptable pruning methods (see Figure "Crown Reduction Detail")
c) Monitor for signs of stress

Watering

Evaluation Criteria

Will construction activities alter the hydrology of the site?
Has or will root pruning occur?

Design Considerations

a) Water only as necessary
b) Monitor for signs of stress (see Figure "Tree Planting and Maintenance Calendar")

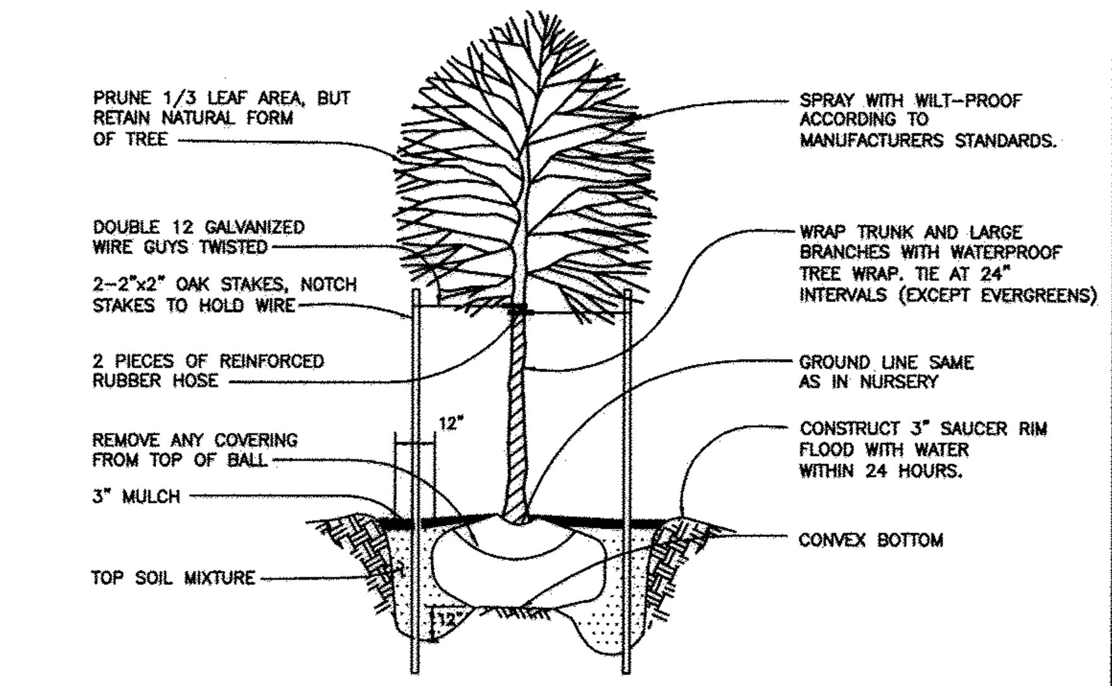
Fertilizing

Evaluation Criteria

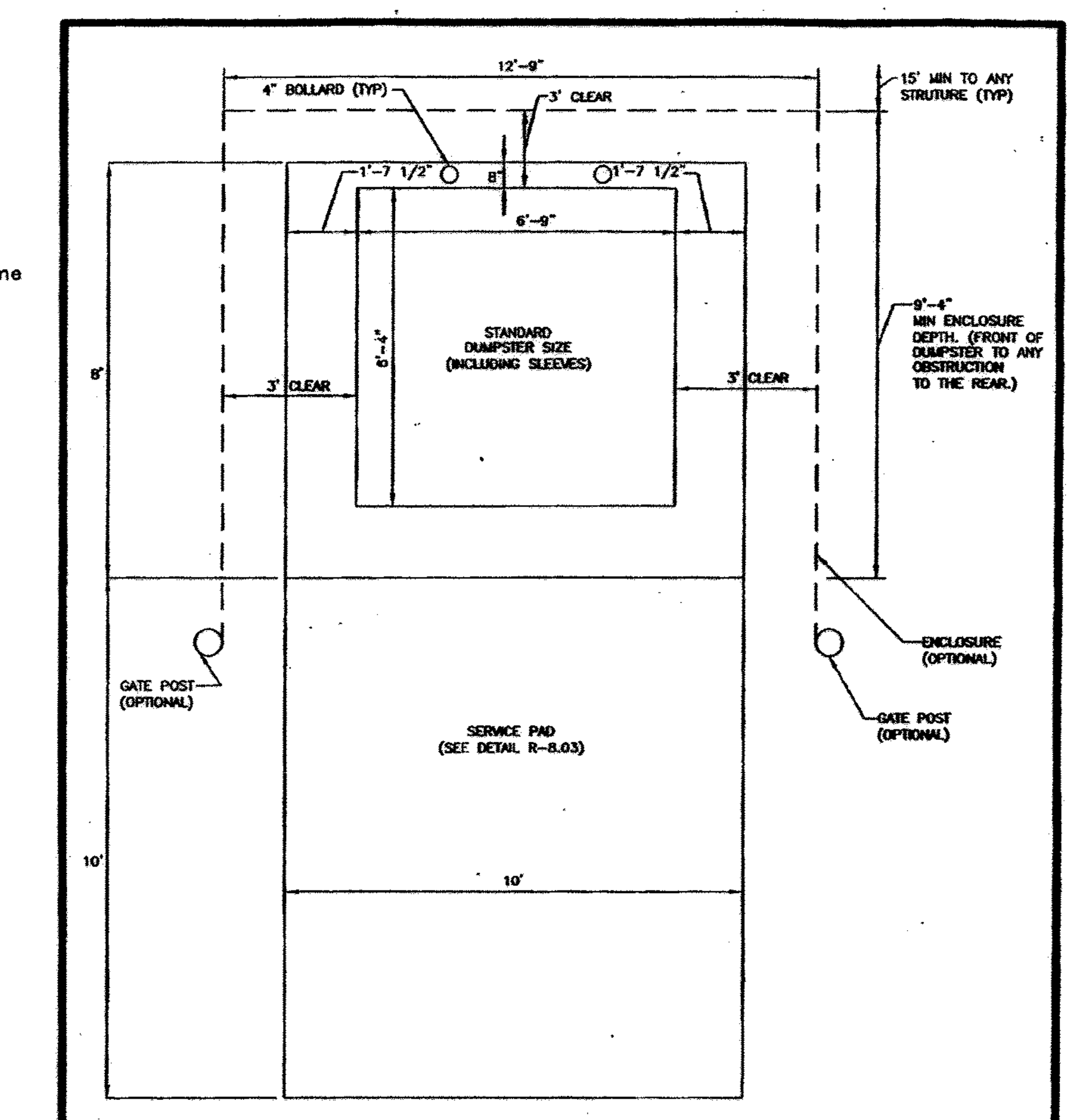
Is or will be tree(s) be under stressful conditions? Has or will root pruning occur?

Design Considerations

a) Use low nitrogen and slow release fertilizers.
b) Apply in late fall or early spring (see Figure "Tree Planting and Maintenance and Calendar")
c) For small trees (<3" in diameter), use punch hole method or pressurized injection method (see Figure "Application of Fertilizers by Injection.")
d) For larger trees (>3" diameter), use punch hole method or pressurized injuction method (see Figure "Application of Fertilizers by Injection.")
e) Do not apply fertilizer any closer than 3' from tree trunk for pressurized injection method.
f) Monitor for signs of stress.



TREE PLANTING DETAIL
NOT TO SCALE



NOTES:

1. ENCLOSURE GATES ARE NOT RECOMMENDED.
2. IF ENCLOSURE GATES ARE INSTALLED, MINIMUM OPENING OF 12'–9" MUST BE MAINTAINED WHEN GATES ARE SECURED OPEN.
3. A MINIMUM OF 15' CLEAR SPACE SHALL BE PROVIDED FROM THE ENCLOSURE TO ANY STRUCTURE.

Howard County, Maryland Department of Public Works	SOLID WASTE Single Container Enclosure	Detail R–8.04

No As-Built information is required on this sheet

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: 12-21-16

6-26-15

J. CHRIS OGLE
DNR QUALIFIED PROFESSIONAL

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 OF A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE–YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

DEVELOPER / OWNER: LAKESHORE I, LLC, BY: MLC Associates, LLC, Sole member, By: Susan Umstead, member — DATE: 5/8/14

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 6.17.14

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 6-19-14

DIRECTOR — DATE: 6/19/14

NO.	DATE	REVISION
3	10.27.15	REMOVE BENCHES, ADD ADDITIONAL REC AREA. LOT 3

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410–465–6105 (F) 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. 22390, Expiration Date: 6.30.15.

5-5-14

OWNER:
LAKESHORE I, LLC
C/O SECURITY DEVELOPMENT
8480 BALTIMORE NATIONAL PIKE
SUITE 415
ELLICOTT CITY, MD 21043

DEVELOPER:
SECURITY DEVELOPMENT, LLC
PO BOX 417
ELLICOTT CITY, MD 21041
410–465–4244

ORCHARD PARK
SECTION 3
3200 PINE ORCHARD LANE
ROMANIK PROPERTY, LOT 1 AND ORCHARD HILL, OPEN SPACE LOT 3

TAX MAP: 24 & 17, GRID: 1 & 19, PARCEL: 647 & P/O 130
ZONED: R–A–15
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT PLAN
FORREST CONSERVATION NOTES AND DETAILS

DATE:	MAY 2014	BEI PROJECT NO.	1796
SCALE:	AS SHOWN	SHEET	8 OF 11

AS-BUILT

SDP-13-055

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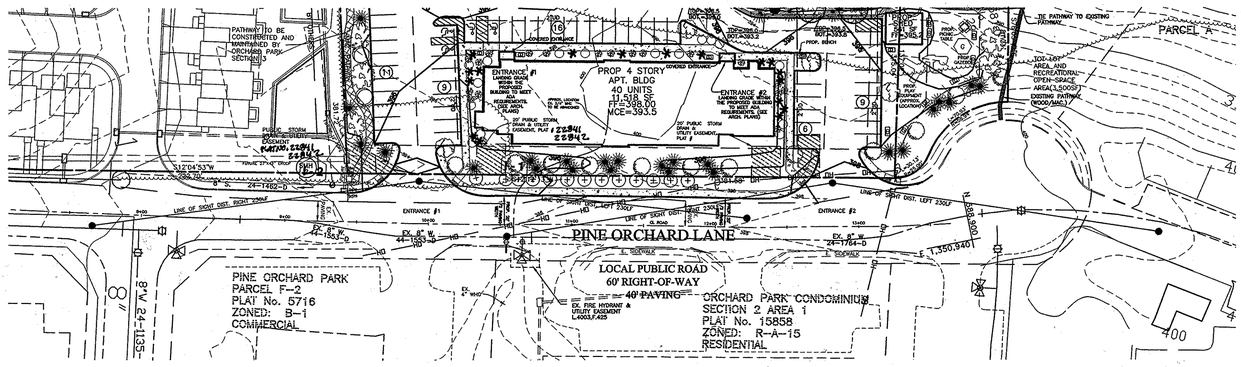
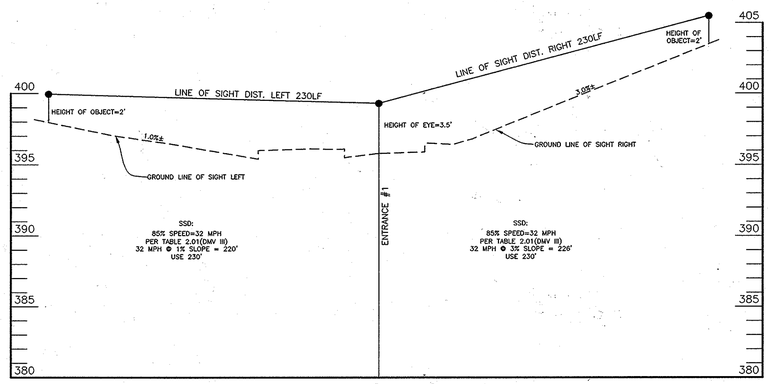


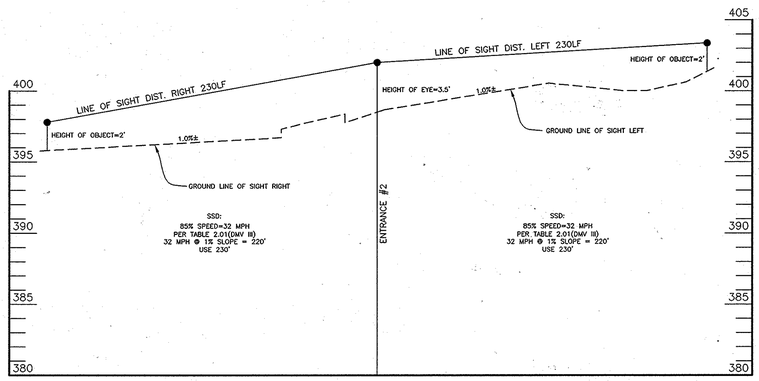
GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.



SIGHT DISTANCE–ENTRANCE #1
SCALE: VERTICAL 1"=5'
HORIZONTAL 1"=50'



SIGHT DISTANCE–ENTRANCE #2
SCALE: VERTICAL 1"=5'
HORIZONTAL 1"=50'

NOTE:
EXISTING TOPOGRAPHY IS TAKEN FROM A FIELD RUN SURVEY WITH 2 FOOT CONTOUR INTERVALS PREPARED BY BENCHMARK ENGINEERING, INC. DATED DECEMBER 2012.

PER HOWARD COUNTY DESIGN MANUAL VOL.III;
STOPPING SIGHT DISTANCE IS MEASURED USING A HEIGHT OF EYE OF 3.5 FEET AND HEIGHT OF OBJECT OF 2.0 FEET. THE DISTANCE IS MEASURED FROM A POINT 10 FEET BACK FROM THE EDGE OF PAVING.

BASED ON 85TH PERCENTILE SPEED ON PINE ORCHARD LANE (MARS GROUP, DECEMBER 2012): 32MPH

CONCLUSION: SIGHT DISTANCE ADEQUATE BOTH ENTRANCES.

No As-Built information is required on this sheet

DONALD ALAN MASON — STATE OF MARYLAND — No. 21443 — PROFESSIONAL ENGINEER — 6-25-15

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: 12-21-16

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6-17-14

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-19-14

DIRECTOR — DATE 6/19/14

NO.	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 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. 21443, Expiration Date: 6.30.15.

CHRISTOPHER ALAN MARSHALL — STATE OF MARYLAND — No. 21443 — PROFESSIONAL ENGINEER — 5-5-14

OWNER:
LAKESHORE I, LLC
C/O SECURITY DEVELOPMENT
8480 BALTIMORE NATIONAL PIKE
SUITE 415
ELLICOTT CITY, MD 21043

DEVELOPER:
SECURITY DEVELOPMENT, LLC
PO BOX 417
ELLICOTT CITY, MD 21041
410-465-4244

ORCHARD PARK
SECTION 3
3200 PINE ORCHARD LANE
ROMANIK PROPERTY, LOT 1 AND ORCHARD HILL, PARCEL B

TAX MAP: 24 & 17, GRID: 1 & 19, PARCEL: 647 & P/O 130
ZONED: R-A-15
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT PLAN
SIGHT DISTANCE EXHIBIT

DATE:	MAY 2014	BEI PROJECT NO.	1796
SCALE:	AS SHOWN	SHEET	9 OF 10

AS-BUILT

SDP-13-055

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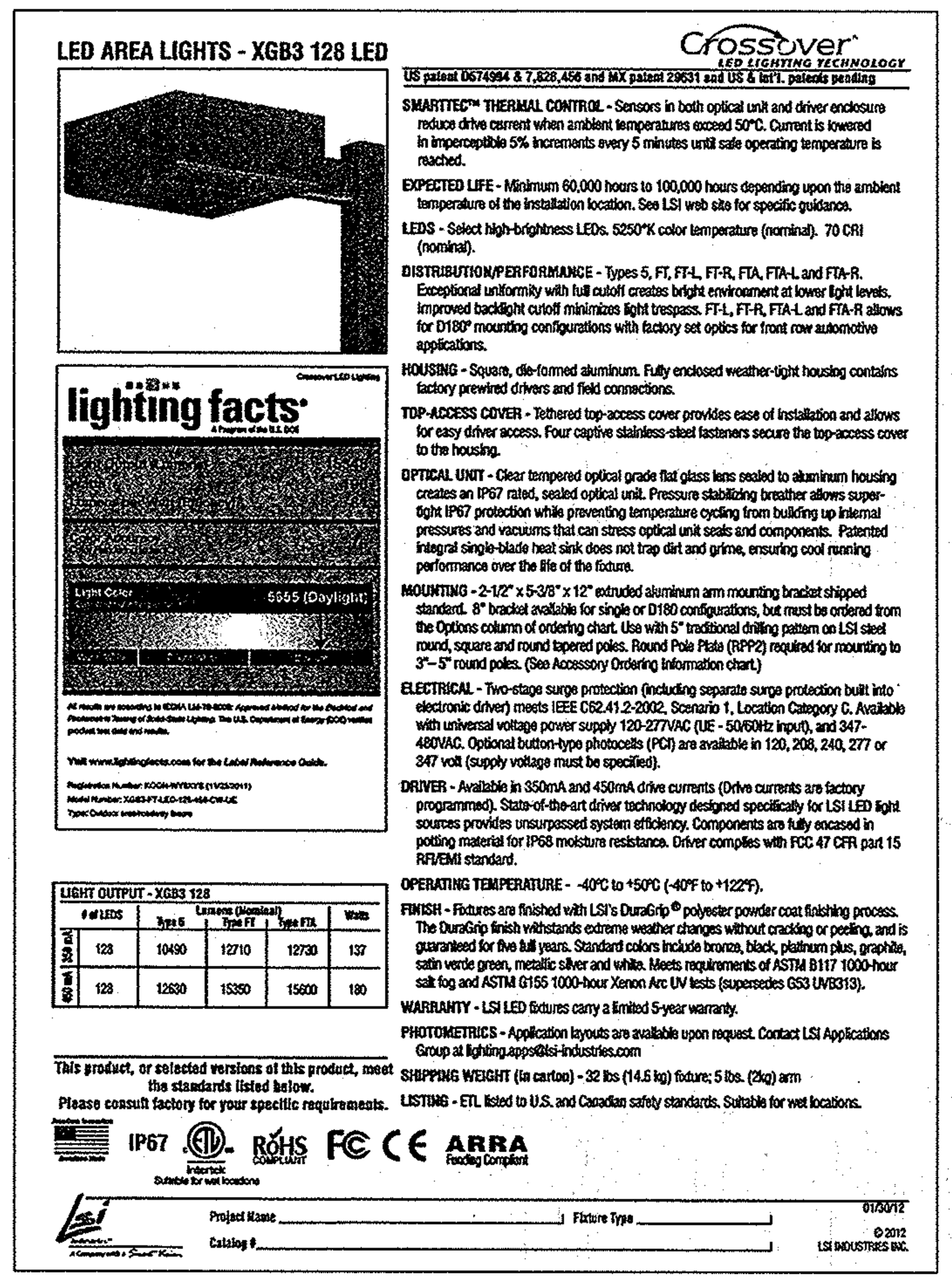

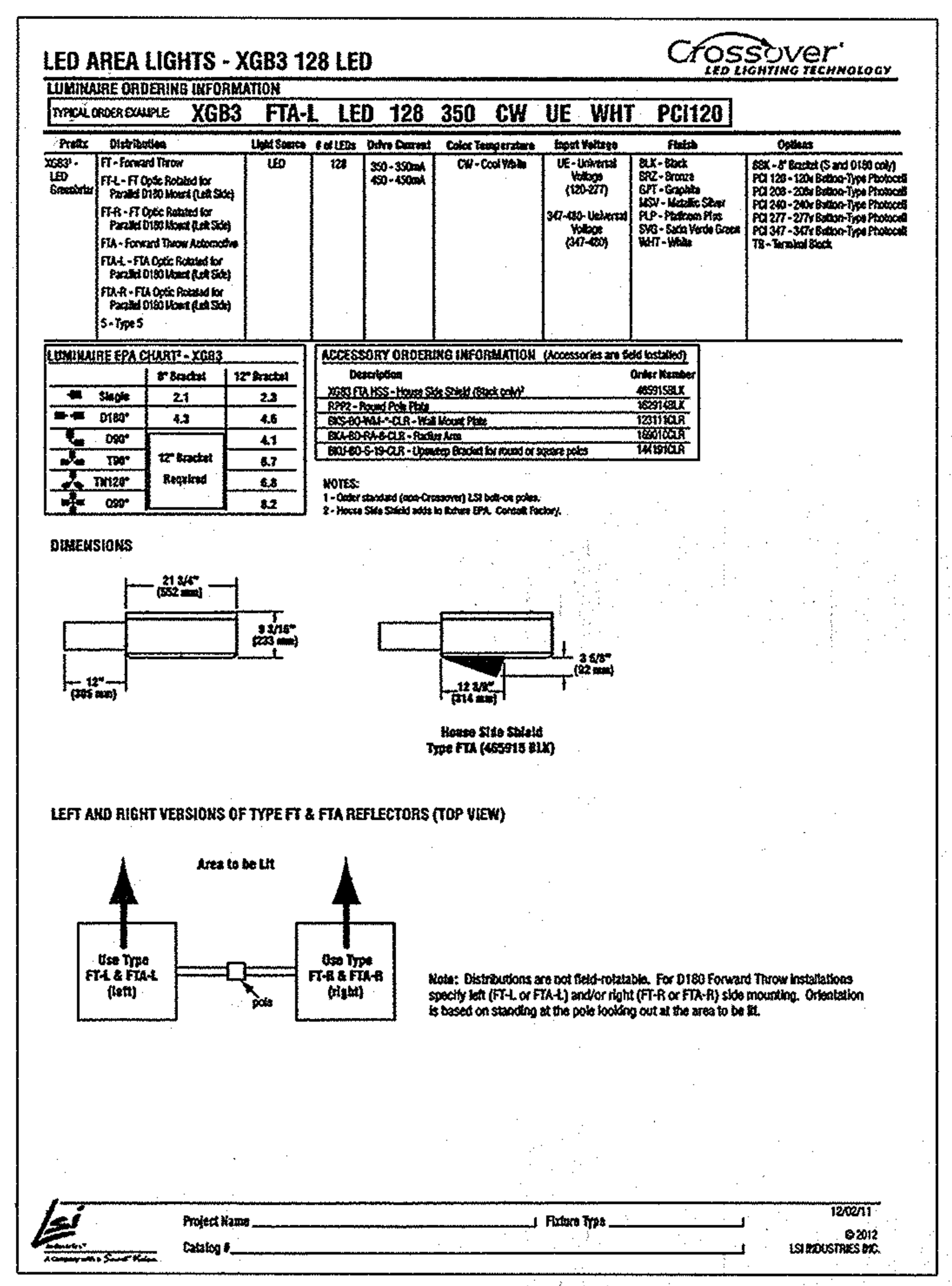

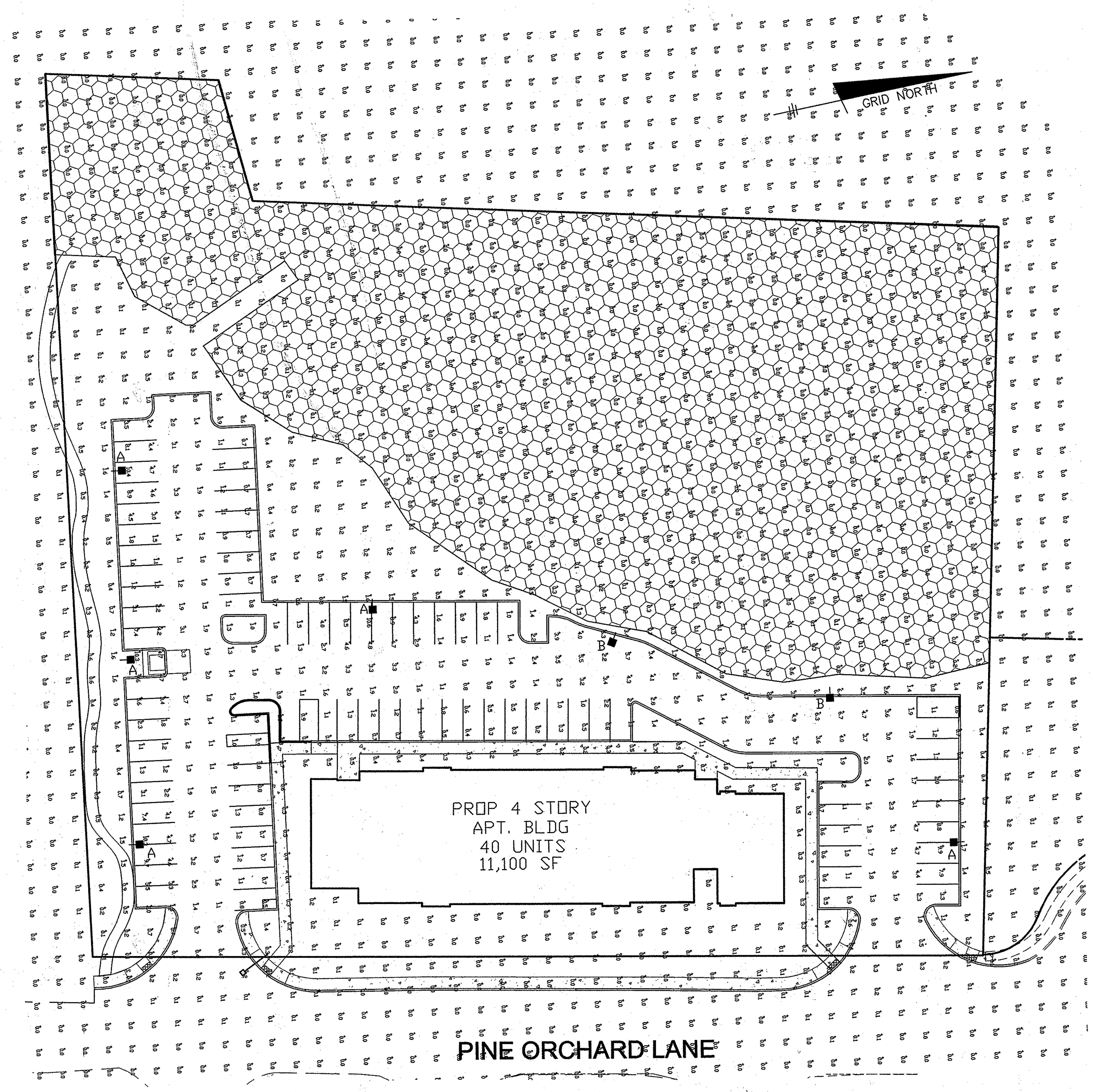

NOTES:

BASED ON THE INFORMATION PROVIDED, ALL DIMENSIONS AND LUMINAIRE LOCATIONS SHOWN REPRESENT RECOMMENDED POSITIONS. THE ENGINEER AND/OR ARCHITECT MUST DETERMINE THE APPLICABILITY OF THE LAYOUT TO EXISTING OR FUTURE FIELD CONDITIONS.

THIS LIGHTING PLAN REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH THE ILLUMINATING ENGINEERING SOCIETY (IES) APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRES MAY VARY DUE TO CHANGES IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS/LED'S AND OTHER VARIABLE FIELD CONDITIONS. CALCULATIONS DO NOT INCLUDE OBSTRUCTIONS SUCH AS BUILDINGS, CURBS, LANDSCAPING, OR ANY OTHER ARCHITECTURAL ELEMENTS UNLESS NOTED.

ALL OUTDOOR LIGHTING SHALL COMPLY WITH THE REQUIREMENTS OF ZONING SECTION 134. ALL PROPOSED EXTERIOR LIGHTING SHALL BE DIRECTED/REFLECTED AWAY FROM ALL ADJACENT PUBLIC ROADS AND RESIDENTIAL ZONING DISTRICTS. LIGHT TRESPASS ONTO ANY PROPERTY ZONED OR USED FOR RESIDENTIAL PURPOSES SHALL BE LIMITED TO 0.5 FOOT CANDLES.

LIGHT TRESPASS GREATER THAN 0.5 FOOT CANDLES IS ALLOW TO ENCROACH ONTO PARCEL 'B' IN ACCORDANCE WITH SECTION 128.A.10 OF THE ZONING REGULATIONS FOR INTEGRATED DEVELOPMENT.

No As-Built information is required on this sheet

STATE OF MARYLAND · DONALD ALAN MASON · No. 21443 · PROFESSIONAL ENGINEER

6-25-15

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: 12-21-16

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

OFFSITE LIGHT LOCATION			
STREET NAME	LOCATION	OFFSET	FIXTURE/POLE TYPE
PINE ORCHARD LANE	AS SHOWN	7'±	150 WATT HPS VAPOR PREMIER POST-TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE

ONSITE LIGHTING ONLY
Total Project Watts
Total Watts = 964

Luminaire Schedule

Symbol	Qty	Label	Arrangement	Description	LLF	Lumens/Lamp	Arr. Lum. Lumens	Arr. Watts
	4	A	SINGLE	XGB3-FT-LED-128-350-CW-UE-S-20'POLE + 2'BASE	1.000	N.A.	12706	136
	2	B	SINGLE	XGB3-3-LED-128-350-CW-UE-S-20'POLE + 2'BASE	1.000	N.A.	11794	142

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
ALL CALC POINTS	Illuminance	Fc	0.39	10.6	0.0	N.A.	N.A.
INSIDE CURB	Illuminance	Fc	2.16	10.6	0.2	10.80	53.00

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Signature	Date
CHIEF, DEVELOPMENT ENGINEERING DIVISION	6.17.14
CHIEF, DIVISION OF LAND DEVELOPMENT	6-19-14
DIRECTOR	6/19/14

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NO.	DATE	REVISION

BENCHMARK
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LSI Industries
American Innovation Through Technology
A SmartVision for the Future
10000 ALLIANCE RD. CINCINNATI, OHIO 45242 USA
(513) 793-3200 * FAX (513) 793-6023

OWNER:

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ELLICOTT CITY, MD 21043

DEVELOPER:

SECURITY DEVELOPMENT, LLC
PO BOX 417
ELLICOTT CITY, MD 21041
410-465-4244

ORCHARD PARK
SECTION 3
3200 PINE ORCHARD LANE

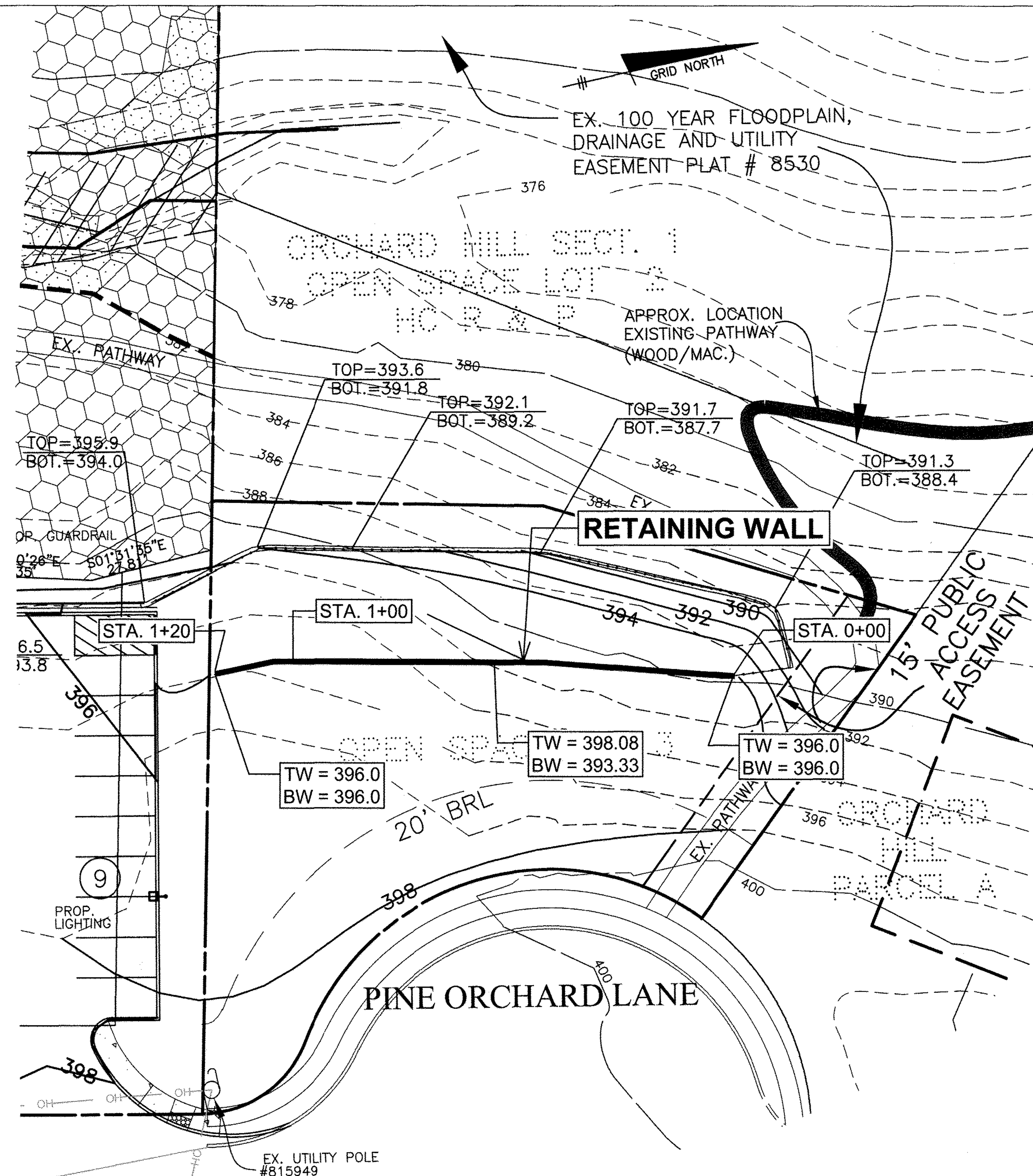
TAX MAP: 24, GRID: 1, PARCEL: 647
ZONED: R-A-15
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

SITE DEVELOPMENT PLAN
LIGHTING PHOTOMETRIC PLAN

DATE:	MAY 2014	BEI PROJECT NO.	1796
SCALE:	1"=30'	SHEET	10 OF 10

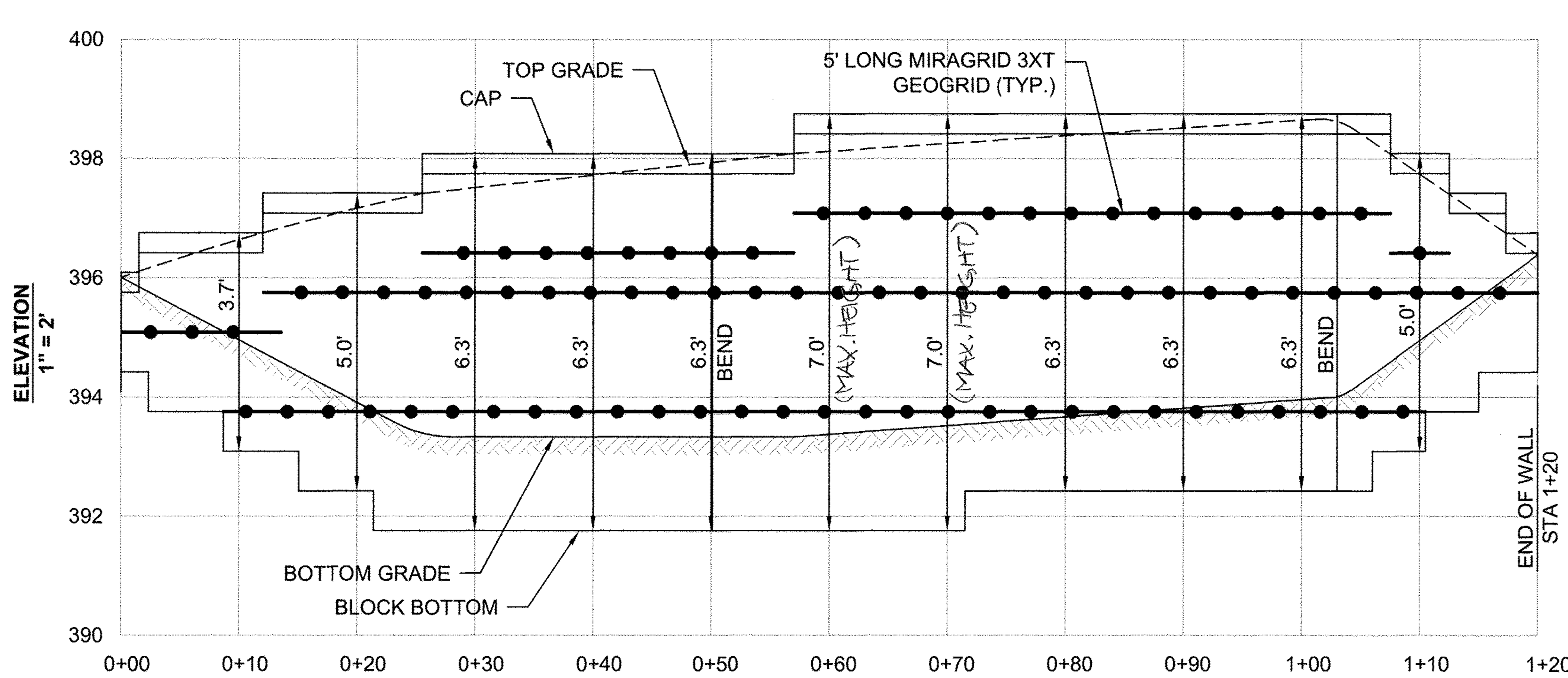
AS-BUILT

SDP-13-055



WALL LOCATION PLAN

1" = 20'



WALL STATION

1" =10'

WALL ELEVATION

SPECIFICATIONS

MODULAR CONCRETE BLOCK RETAINING WALL

PART 1: GENERAL

1.01 DESCRIPTION

A. WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTION OF A MODULAR RETAINING WALL SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN, AND DIMENSIONS SHOWN ON THE PLANS.

B. WORK INCLUDES PREPARING FOUNDATION SOIL, FURNISHING AND INSTALLING LEVELING PAD, UNIT DRAINAGE FILL AND BACKFILL TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS.

C. WORK INCLUDES FURNISHING AND INSTALLING GEOGRID SOIL REINFORCEMENT OF THE TYPE, SIZE, LOCATION, AND LENGTHS DESIGNATED ON THE CONSTRUCTION DRAWINGS.

1.02 DELIVERY, STORAGE AND HANDLING

A. CONTRACTOR SHALL CHECK ALL MATERIALS UPON DELIVERY TO ASSURE THAT THE PROPER TYPE, GRADE, COLOR, AND CERTIFICATION HAS BEEN RECEIVED.

B. CONTRACTOR SHALL PROTECT ALL MATERIALS FROM DAMAGE DUE TO JOB SITE CONDITIONS AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. DAMAGED MATERIALS SHALL NOT BE INCORPORATED INTO THE WORK.

PART 2: PRODUCTS

2.01 MODULAR CONCRETE RETAINING WALL UNITS

A. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING ARCHITECTURAL REQUIREMENTS:

FACE COLOR - COLOR MAY BE SPECIFIED BY THE OWNER.

FACE FINISH - SCULPTURED ROCK FACE IN ANGULAR TRI-PLANER OR FLAT CONFIGURATION. OTHER FACE FINISHES WILL NOT BE ALLOWED WITHOUT WRITTEN APPROVAL OF OWNER.

BOND CONFIGURATION - RUNNING WITH BONDS NOMINALLY LOCATED AT MIDPOINT VERTICALLY ADJACENT UNITS, IN BOTH STRAIGHT AND CURVED ALIGNMENTS.

EXPOSED SURFACES OF UNITS SHALL BE FREE OF CHIPS, CRACKS OR OTHER IMPERFECTIONS WHEN VIEWED FROM A DISTANCE OF 10 FEET UNDER DIFFUSED LIGHTING.

B. MODULAR CONCRETE MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C1372 - STANDARD SPECIFICATIONS FOR SEGMENTAL RETAINING WALL UNITS.

C. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING STRUCTURAL AND GEOMETRIC REQUIREMENTS MEASURED IN ACCORDANCE WITH APPROPRIATE REFERENCES:

COMPRESSIVE STRENGTH = 3000 PSI MINIMUM; ABSORPTION = 8% MAXIMUM (6% IN NORTHERN STATES) FOR STANDARD WEIGHT AGGREGATES;

DIMENSIONAL TOLERANCES = ±1/8" FROM NOMINAL UNIT DIMENSIONS NOT INCLUDING ROUGH SPLIT FACE, ±1/16"

UNIT HEIGHT - TOP AND BOTTOM PLANES; UNIT SIZE - 8" (H) X 18" (W) X 12" (D) MINIMUM;

UNIT WEIGHT - 75 LBS/UNIT MINIMUM FOR STANDARD WEIGHT AGGREGATES;

INTER-UNIT SHEAR STRENGTH - 1000 PLF MINIMUM AT 2 PSI NORMAL PRESSURE; AT 2 PSI NORMAL FORCE.

GEOGRID/UNIT PEAK CONNECTION STRENGTH - 1000 PLF MINIMUM

D. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING CONSTRUCTABILITY REQUIREMENTS: (IF APPLICABLE)

VERTICAL SETBACK = 1/8"± PER COURSE (NEAR VERTICAL) OR 1"+ PER COURSE PER THE DESIGN; ALIGNMENT AND GRID POSITIONING MECHANISM - FIBERGLASS PINS, TWO PER UNIT MINIMUM;

MAXIMUM HORIZONTAL GAP BETWEEN ERECTED UNITS SHALL BE - 1/2 INCH.

2.02 SHEAR CONNECTORS (IF APPLICABLE)

A. SHEAR CONNECTORS SHALL BE 1/2 INCH DIAMETER THERMOSET ISOPTHALIC POLYESTER RESIN-PROTRUDED FIBERGLASS REINFORCEMENT RODS OR EQUIVALENT TO PROVIDE CONNECTION BETWEEN VERTICALLY AND HORIZONTALLY ADJACENT UNITS. STRENGTH OF SHEAR CONNECTORS BETWEEN VERTICAL ADJACENT UNITS SHALL BE APPLICABLE OVER A DESIGN TEMPERATURE OF 10 DEGREES F TO + 100 DEGREES F. B. SHEAR CONNECTORS SHALL BE CAPABLE OF HOLDING THE GEOGRID IN THE PROPER DESIGN POSITION DURING GRID PRE-TENSIONING AND BACKFILLING.

2.03 BASE LEVELING PAD MATERIAL

A. MATERIAL SHALL CONSIST OF A COMPACTED #57 CRUSHED STONE BASE AS SHOWN ON THE CONSTRUCTION DRAWINGS.

2.04 UNIT DRAINAGE FILL

A. UNIT DRAINAGE FILL SHALL CONSIST OF #57CRUSHED STONE

2.05 REINFORCED BACKFILL

A. REINFORCED BACKFILL SHALL TYPE SM, BE FREE OF DEBRIS AND MEET THE FOLLOWING GRADATION TESTED IN ACCORDANCE WITH ASTM D-422 AND MEET OTHER PROPERTIES SHOWN ON THE PLAN:

SIEVE SIZE	PERCENT PASSING
2 INCH	100-75
3/4 INCH	100-75
NO. 40	0-60
NO. 200	0-35

PLASTICITY INDEX (PI) <10 AND LIQUID LIMIT <35 PER ASTM D-4318.

B. MATERIAL CAN BE SITE EXCAVATED SOILS WHERE THE ABOVE REQUIREMENTS CAN BE MET. UNSUITABLE SOILS FOR BACKFILL (HIGH PLASTIC CLAYS OR ORGANIC SOILS) SHALL NOT BE USED IN THE REINFORCED SOIL MASS.

2.06 GEOGRID SOIL REINFORCEMENT

A. GEOSYNTHETIC REINFORCEMENT SHALL CONSIST OF GEOGRIDS MANUFACTURED SPECIFICALLY FOR SOIL REINFORCEMENT APPLICATIONS AND SHALL BE MANUFACTURED FROM HIGH TENACITY POLYESTER YARN.

2.07 DRAINAGE PIPE

A. THE DRAINAGE PIPE SHALL BE PERFORATED CORRUGATED HDPE PIPE MANUFACTURED IN ACCORDANCE WITH ASTM D-1248.

PART 3 EXECUTION

3.01 EXCAVATION

A. CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS. OWNER'S REPRESENTATIVE SHALL BE RESPONSIBLE FOR INSPECTING AND APPROVING THE EXCAVATION PRIOR TO PLACEMENT OF LEVELING MATERIAL OR FILL SOILS.

3.02 BASE LEVELING PAD

A. LEVELING PAD MATERIAL SHALL BE PLACED TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS, TO A MINIMUM THICKNESS OF 6 INCHES AND EXTEND LATERALLY A MINIMUM OF 6" IN FRONT AND BEHIND THE MODULAR WALL UNIT.

B. LEVELING PAD SHALL BE PREPARED TO INSURE FULL CONTACT TO THE BASE SURFACE OF THE CONCRETE UNITS.

3.03 MODULAR UNIT INSTALLATION

A. FIRST COURSE OF UNITS SHALL BE PLACED ON THE LEVELING PAD AT THE APPROPRIATE LINE AND GRADE. ALIGNMENT AND LEVEL SHALL BE CHECKED IN ALL DIRECTIONS AND INSURE THAT ALL UNITS ARE IN FULL CONTACT WITH THE BASE AND PROPERLY SEATED.

B. PLACE THE FRONT OF UNITS SIDE-BY-SIDE. DO NOT LEAVE GAPS BETWEEN ADJACENT UNITS. LAYOUT OF CORNERS AND CURVES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

C. INSTALL SHEAR/CONNECTING DEVICES PER MANUFACTURER'S RECOMMENDATIONS.

D. PLACE AND COMPACT DRAINAGE FILL WITHIN AND BEHIND WALL UNITS. PLACE AND COMPACT BACKFILL SOIL BEHIND DRAINAGE FILL. FOLLOW WALL ERECTION AND DRAINAGE FILL CLOSELY WITH STRUCTURE BACKFILL.

E. MAXIMUM STACKED VERTICAL HEIGHT OF WALL UNITS, PRIOR TO UNIT DRAINAGE FILL AND BACKFILL PLACEMENT AND COMPACTION, SHALL NOT EXCEED THREE COURSES.

3.04 STRUCTURAL GEOGRID INSTALLATION

A. GEOGRID SHALL BE ORIENTED WITH THE HIGHEST STRENGTH AXIS PERPENDICULAR TO THE WALL ALIGNMENT.

B. GEOGRID REINFORCEMENT SHALL BE PLACED AT THE STRENGTHS, LENGTHS, AND ELEVATIONS SHOWN ON THE CONSTRUCTION DESIGN DRAWINGS OR AS DIRECTED BY THE ENGINEER.

C. THE GEOGRID SHALL BE LAID HORIZONTALLY ON COMPACTED BACKFILL AND ATTACHED TO THE MODULAR WALL UNITS. PLACE THE NEXT COURSE OF MODULAR CONCRETE UNITS OVER THE GEOGRID. THE GEOGRID SHALL BE PULLED TAUT, AND ANCHORED PRIOR TO BACKFILL PLACEMENT ON THE GEOGRID.

D. GEOGRID REINFORCEMENTS SHALL BE CONTINUOUS THROUGHOUT THEIR EMBEDMENT LENGTHS AND PLACED SIDE-BY-SIDE TO PROVIDE 100% COVERAGE AT EACH LEVEL. SPLICED CONNECTIONS BETWEEN SHORTER PIECES OF GEOGRID OR GAPS BETWEEN ADJACENT PIECES OF GEOGRID ARE NOT PERMITTED.

3.05 REINFORCED BACKFILL PLACEMENT

A. REINFORCED BACKFILL SHALL BE PLACED, SPREAD, AND COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF SLACK IN THE GEOGRID AND INSTALLATION DAMAGE.

B. REINFORCED BACKFILL SHALL BE PLACED AND COMPACTED IN LIFTS NOT TO EXCEED 6 INCHES WHERE HAND COMPACTION IS USED, OR 8 - 10 INCHES WHERE HEAVY COMPACTION EQUIPMENT IS USED. LIFT THICKNESS SHALL BE DECREASED TO ACHIEVE THE REQUIRED DENSITY AS REQUIRED.

C. REINFORCED BACKFILL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AS DETERMINED BY ASTM D698. THE MOISTURE CONTENT OF THE BACKFILL MATERIAL PRIOR TO AND DURING COMPACTION SHALL BE UNIFORMLY DISTRIBUTED THROUGHOUT EACH LAYER AND SHALL BE + 3% TO - 3% OF OPTIMUM.

D. ONLY LIGHTWEIGHT HAND-OPERATED EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET FROM THE TAIL OF THE MODULAR CONCRETE UNIT.

E. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY UPON THE GEOGRID REINFORCEMENT. A MINIMUM FILL THICKNESS OF 6 INCHES IS REQUIRED PRIOR TO OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TRACKED VEHICLE TURNING SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND DAMAGING THE GEOGRID.

F. RUBBER TIRED EQUIPMENT MAY PASS OVER GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.

G. AT THE END OF EACH DAY'S OPERATION, THE CONTRACTOR SHALL SLOPE THE LAST LIFT OF REINFORCED BACKFILL AWAY FROM THE WALL UNITS TO DIRECT RUNOFF AWAY FROM WALL FACE. THE CONTRACTOR SHALL NOT ALLOW SURFACE RUNOFF FROM ADJACENT AREAS TO ENTER THE WALL CONSTRUCTION SITE.

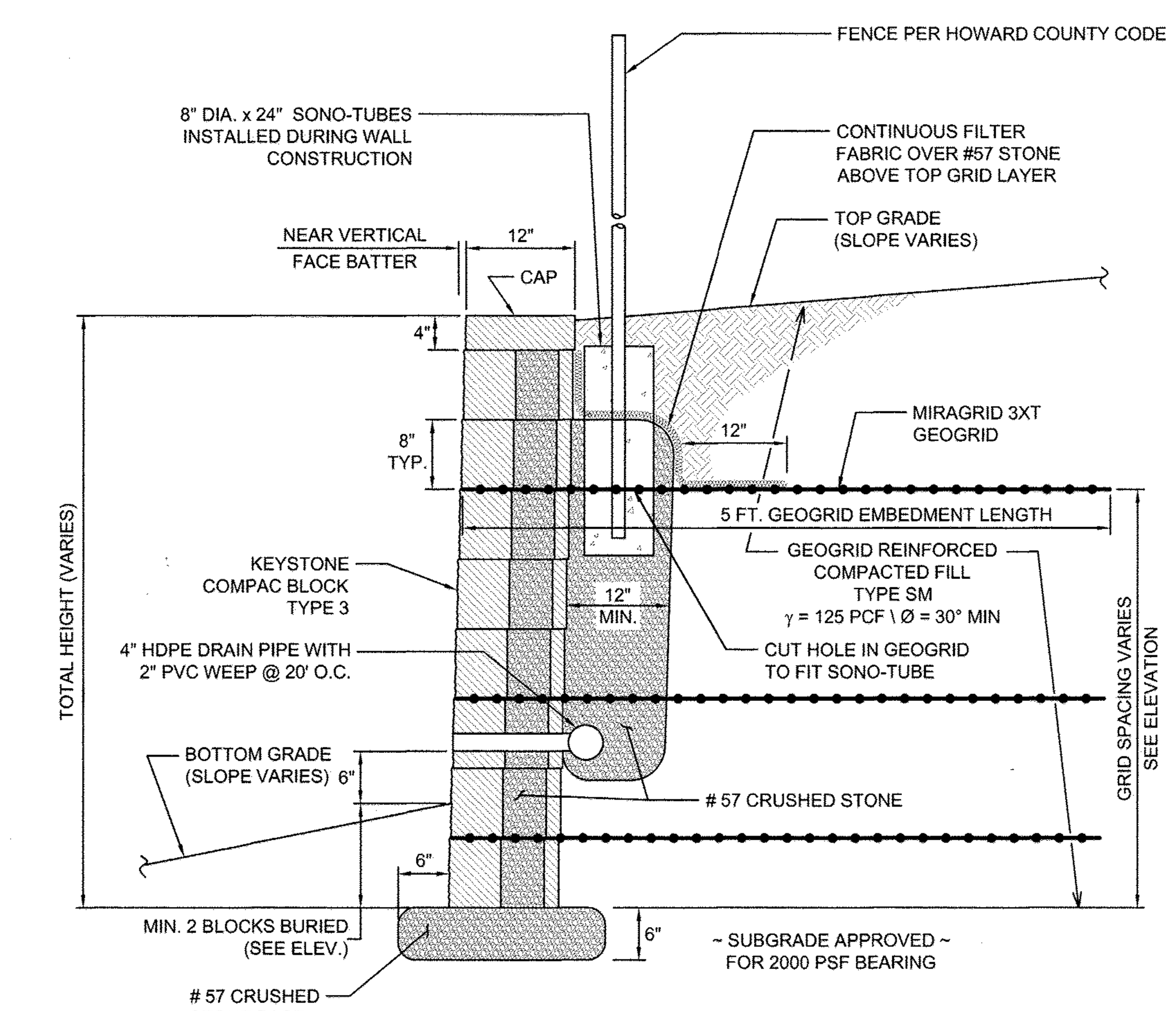
3.06 CAP INSTALLATION

A. CAP UNITS SHALL BE GLUED TO UNDERLYING UNITS WITH AN ALL-WEATHER ADHESIVE RECOMMENDED BY THE MANUFACTURER.

3.07 FIELD QUALITY CONTROL

A. THE OWNER SHALL ENGAGE INSPECTION AND TESTING SERVICES, INCLUDING INDEPENDENT LABORATORIES, TO PROVIDE QUALITY ASSURANCE AND TESTING SERVICES DURING CONSTRUCTION.

B. AS A MINIMUM, QUALITY ASSURANCE TESTING SHOULD INCLUDE FOUNDATION SOIL INSPECTION, SOIL AND BACKFILL TESTING, VERIFICATION OF DESIGN PARAMETERS, AND OBSERVATION OF CONSTRUCTION FOR GENERAL COMPLIANCE WITH DESIGN DRAWINGS AND SPECIFICATIONS.



TYPICAL WALL SECTION

N.T.S.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
DIRECTOR	DATE

NO.	DATE	REVISION
3	10.27.15	ADD RETAINING WALL DETAIL SHEET

HILLIS-CARNES ENGINEERING ASSOCIATES

10975 Guilford Road, Suite A Annapolis Junction, Maryland
(410) 880-4788 WWW.HCEA.COM Fax: (410) 880-4098

OWNER:

LAKESHORE I, LLC
C/O SECURITY DEVELOPMENT
8480 BALTIMORE NATIONAL PIKE
SUITE 415
ELLICOTT CITY, MD 21043

DEVELOPER:

SECURITY DEVELOPMENT, LLC
PO BOX 417
ELLICOTT CITY, MD 21041
410-465-4244

ORCHARD PARK

SECTION 3

3200 PINE ORCHARD LANE

ROMANIK PROPERTY, LOT 1 AND ORCHARD HILL, OPEN SPACE LOT 3

TAX MAP: 24 & 17, GRID: 1 & 19, PARCEL: 647 & P/O 130
ZONED: R-A-15
ELECTION DISTRICT NO. 2
HOWARD COUNTY, MARYLAND

(3) RETAINING WALL PLAN AND DETAILS

DATE: JANUARY 2018	HCEA PROJECT NO. 16106-A
SCALE: AS SHOWN	SHEET 11 OF 11

SDP-13-055