

GENERAL NOTES

- 1. The subject property is zoned "R-12" per the 02/02/04 Comprehensive Plan.
2. This site is located within the Metropolitan Area.
3. Public water and sewer to be utilized, contracts #14-3637-D, #14-3260-#44-193, and #10-3041.
4. Howard County Soil Map No. 26.
5. Gross area of site: 12.777 ac ±.
6. Area of proposed public R/W: 0.907 ac ±.
7. Number of proposed buildable lots: 34.
8. Area of proposed buildable lots: 6,308 ac ±.
9. Number of proposed open space lots: 3.
10. Area of proposed open space lot: 5.562 ac ±.
11. Open Space requirements:
a.) Open Space required (40%-7,200sf minimum lot size): 12.776 ac ± x 0.40 = 5.110 ac ±.
b.) Open Space provided: 5.562 ac ± (0.054 ac ± non-credited).
c.) Recreational open space requirements:
a.) Open Space required (200sf per buildable lot): 33 x 200 = 6,600 sf.
b.) Open Space provided: 0.054 ac ± (WP-11-140).

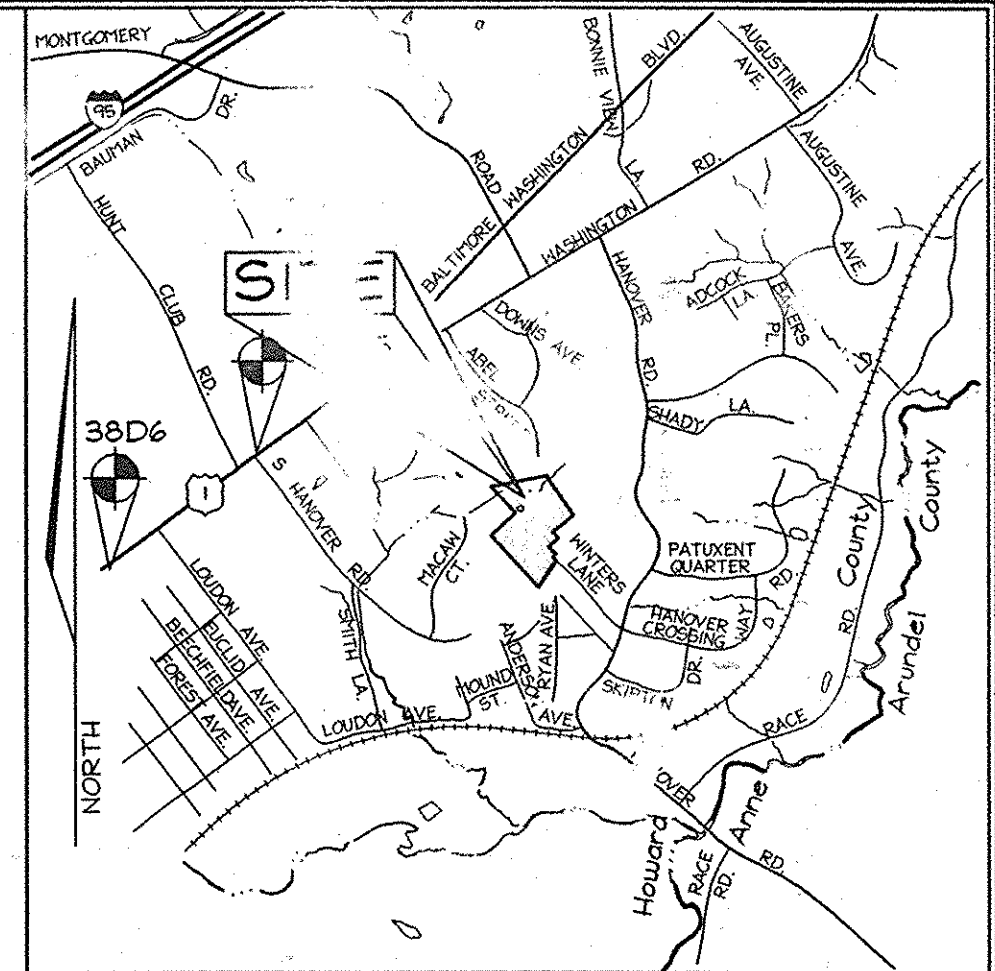
FINAL ROAD CONSTRUCTION PLAN
SUMMER HAVEN
Phase I and II

LOTS 3 THRU 12 & 16 THRU 39 OPEN SPACE LOTS 13 & 14,
NON-CREDITED OPEN SPACE LOT 15

A Resubdivision of Summer Haven Lot 2, Plat #15439
HOWARD COUNTY, MARYLAND

LEGEND

- Existing Contour
Existing Spot Elevation
Existing Stream Buffer
Existing Wetland Buffer
Existing Wetland
Wetland
Existing Trees to Remain
25% or greater slopes
15% or greater slopes
Proposed Light Pole
Soil Boundary



VICINITY MAP
SCALE: 1"=2000'

BENCHMARKS

Table with 5 columns: Sta., N, E, El., (meters) and Sta., N, E, El., (feet). Includes benchmarks 38D5 and 38D6.

SHEET INDEX

Table with 3 columns: Description, Sheet No., and Notes. Lists various sheets related to the project, including cover sheet, road plan, and utility details.

CENTERLINE ROAD CURVE DATA

Table with 7 columns: Curve, Radius, Length, Delta, Chord Bearing, Chord Length, Tangent. Lists curve data for C1 and C2.

STREET LIGHT TABLE

Table with 5 columns: Fixture Type, Pole Type, Location, and Street. Lists specifications for street lighting fixtures and pole types.

Note: Light pole location given at center of base

MINIMUM LOT SIZE

Table with 4 columns: Lot No., Gross Area (sf), Pipestem Area (sf), Minimum Lot Size (sf). Lists minimum lot size requirements for lots 8 through 33.

U.S. EQUIVALENT COORDINATE TABLE

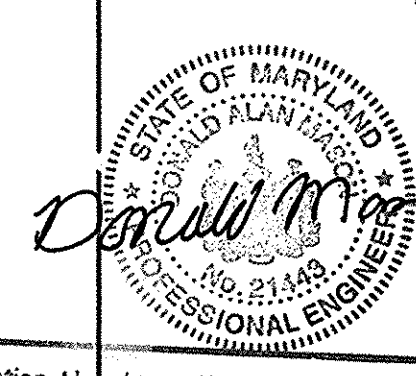
Table with 3 columns: Point, Northing, Easting. Lists U.S. equivalent coordinate data for points 20 through 37.

RIGHT OF WAY ELEVATION CHART NAD 83. Table with 6 columns: R/W PT. NO., Description, Elevation, R/W PT. NO., Description, Elevation. Lists elevations for various right-of-way points.

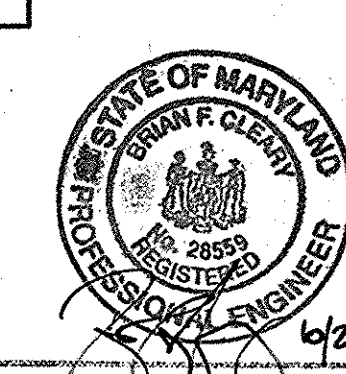
AS-BUILT NOTES:

- 1) HORIZONTAL DATUM FOR THIS AS-BUILT IS BASED ON THE MARYLAND STATE REFERENCE SYSTEM NAD 83/AD 91 AS PROJECTED FROM H.O. CO. GEODETIC CONTROL STATIONS 38D5 AND 38D6. VERTICAL DATUM FOR THIS AS-BUILT IS NORTH AMERICAN VERTICAL DATUM NAVD 29 AS PROJECTED FROM THE ABOVE MENTIONED HOWARD COUNTY GEODETIC CONTROL STATIONS.
2) THE INSTRUMENTS USED IN PERFORMING THE AS-BUILT WERE A 5" TOTAL STATION AND PRISM AND RTK GPS.
3) THIS AS-BUILT WAS PERFORMED BY BENCHMARK ENGINEERING, INC.

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 10-22-14



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: 12-21-14

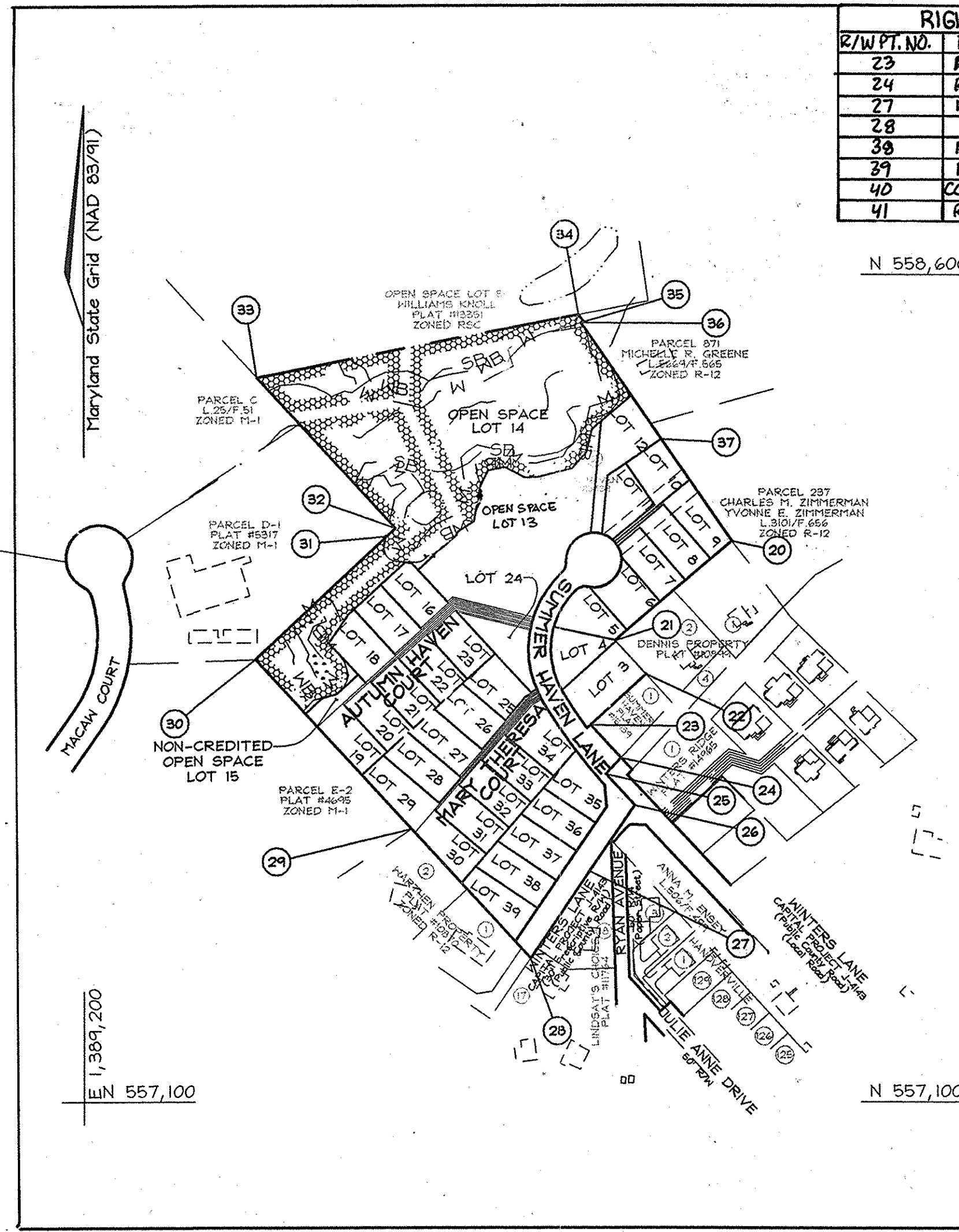
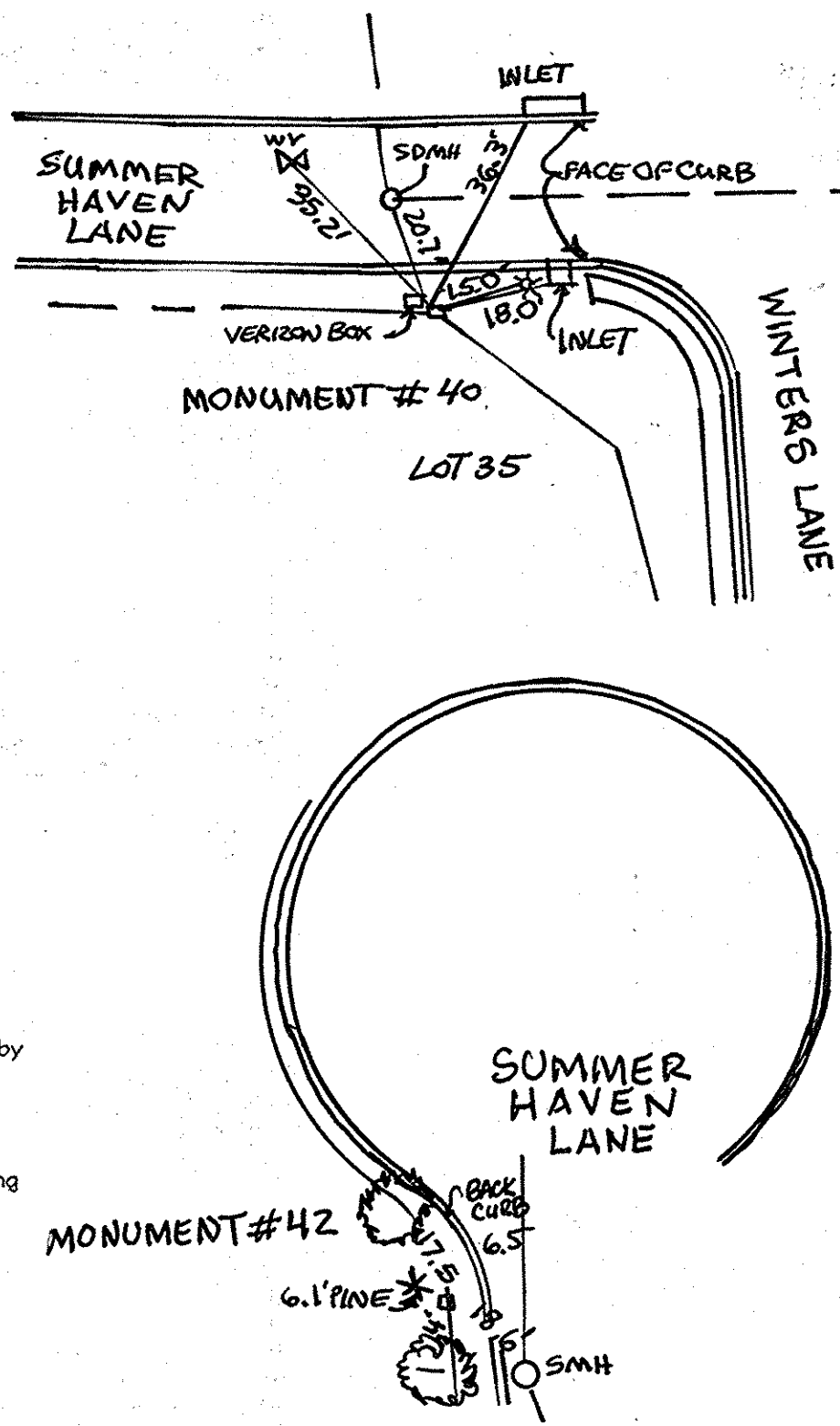


Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28559 Expiration Date: 7-22-13

FOR REVISIONS BY BENCHMARK ENGINEERING, INC. ONLY

OWNERS/DEVELOPERS

JAMES L. NEWBURN
5570 Serratt Place Suite 201
Columbia, MD 21044
(410) 997-3815
B.Z. ENTERPRISES INC.
PO Box 68
Reisterstown, MD 21136
(410) 935-8887



LOCATION MAP

SCALE: 1"=200'

- 45. WAIVER PETITION WP-11-140 WAS APPROVED BY LETTER DATED MARCH 23, 2011 TO WAIVE ARTICLE II, SECTION 16.12(a)(4)(i) REQUIRING OPEN SPACE OF REGULAR IN SHAPE, ARTICLE II, SECTION 16.12(a)(4)(ii) REQUIRING RECREATIONAL OPEN SPACE NOT TO INCLUDE SWIM CREDITS, ARTICLE II, SECTION 16.12(a)(4)(iv) REQUIRING 20% OF ROAD FRONTAGE AND ARTICLE II, SECTION 16.12(a)(4)(v) REQUIRING 200 SF OF RECREATIONAL OPEN SPACE PER LOT, SUBJECT PER THE FOLLOWING CONDITIONS:
1) SUBMIT A PLAN OF REVISION TO CONVERT OPEN SPACE LOT 24 INTO A BUILDABLE LOT AND THAT THIS WILL REQUIRE THE ONE HOUSING ALLOCATION ABOVE THOSE GRANTED UNDER F-06-008 TO TAKE APFO TESTING.
2) ONCE THE REVISION PLAN IS RECORDED AND PLANNING REVISION TO THE APPROVED ROAD CONSTRUCTION PLANS FOR F-06-008 IS APPROVED SITE DEVELOPMENT PLANS SDP-10-047 MAY BE PROCESSED TO REFLECT THE CONVERSION OF OPEN SPACE LOT 24 TO A BUILDABLE LOT AND SHOW THE RECREATIONAL PATHWAY AND AMENITIES. A NOTE SHALL BE ADDED TO ALL DEVELOPMENT PLANS REGARDING THE WAIVER PETITION FILE NUMBER, ACTION TAKEN AND DATE.
3) THE DEVELOPER SHALL PROVIDE ALL THE RECREATIONAL AMENITIES (GAZEBO, PICNIC TABLES, BENCH AND 5' WIDE MULCHED PATHWAY) AS SHOWN ON AND APPROVED UNDER THE WAIVER PETITION LOCATED WITHIN H.O.A. OPEN SPACE LOT 13 & 14 & 15 & 16 & 17 & 18 & 19 & 20 & 21 & 22 & 23 & 24 & 25 & 26 & 27 & 28 & 29 & 30 & 31 & 32 & 33 & 34 & 35 & 36 & 37 & 38 & 39. THE 5' WIDE MULCHED RECREATIONAL OPEN SPACE PATHWAY SHALL BE CONSTRUCTED OF MATERIALS THAT ARE DESIRABLE AND RESISTANT TO STORM DRAINAGE RUNOFF.
4) THE 5' WIDE MULCHED PATHWAY LOCATED ACROSS OPEN SPACE LOT 13 & 14 IN SHALL BE MAINTAINED BY THE HOMEOWNERS' ASSOCIATION FOR THE SUMMER HAVEN SUBDIVISION. A NOTE SHALL BE ADDED TO THE PLAN OF REVISION AND ALL OTHER ASSOCIATED DEVELOPMENT PLANS THAT HOWARD COUNTY WILL NOT BE RESPONSIBLE FOR THE UPKEEP AND MAINTENANCE OF THE 5' WIDE MULCHED RECREATIONAL OPEN SPACE PATHWAY AND THE OTHER RECREATIONAL AMENITIES AS APPROVED UNDER WAIVER PETITION WP-11-140.

ROAD CLASSIFICATION

Table with 3 columns: Road Name, Classification, R/W. Lists Summer Haven Lane as Public Access Street (40' R/W) and Mary Theresa Court as Private Access Place (24' R/W).

- 22. Landscaping for this subdivision is provided in accordance with a Landscape Plan included with the road construction drawings in accordance with Section 16.12 of the Howard County Code and the Landscape Manual. Surety in the amount of \$21,450.00 (\$16,800.00 for 56 shade trees, \$4,050.00 for 21 evergreen trees, \$600.00 for 20 shrubs) provided with the DPR, Developer's Agreement.
23. This plan is subject to the 5th Edition Subdivision and Land Development Regulations and to the 1993 Zoning Regulations as amended by CB 50-2001.
24. This project complies with the requirements of section 16.1200 of the Howard County Code for Forest Conservation by planting 2.04 acres of reforestation within Forest Conservation Easement 1, retaining 0.28 acres of forest and planting 0.08 acres of reforestation within Forest Conservation Easement 2, and planting 0.31 acres of reforestation and retaining 0.87 acres of forest within Forest Conservation Easement 3. Total retention = 1.15 ac. Total reforestation provided = 2.43 ac. \$62,944.30 surety to be posted with the Developer's Agreement. Requested Fee-in-lieu for 0.12 ac remaining obligation is \$2,613.50.
25. All existing wells and septic systems to be properly abandoned according to the Howard County Health Department Regulations.
26. The back of proposed storm drain inlet -II- is to have a weir opening to allow collection of the stormwater runoff from the Winters Ridge stormwater quality management facility, see detail sheet B.
27. At the site development plan stage, the BRL's effective at that time must be shown on the plan.
28. The Maryland Aviation Administration (MAA) waterfowl deterrence requirements for stormwater management and sediment control structures will be met by the use of waterfowl exclusion and septic boulders (see typical detail sheet A), and it will utilize MAA approved species and seed mixtures for SH-11 facility landscaping.
29. The coordinates shown hereon are based upon the Howard County Geodetic Control which is based on the Maryland State Plane Coordinate system. Howard County monument numbers 38D5 and 38D6 were used for this project.
30. The lots shown hereon comply with the minimum ownership width and lot area as required by the Maryland State Department of the Environment.
31. For flag or pipestem lots, refuse collection, snow removal and road maintenance are provided to the junction of the flag or pipestem and road right-of-way line and not to the pipestem lot driveway.
32. The contractor shall notify the following utility companies or agencies at least five (5) working days before starting work shown on these plans:
State Highway Administration 410.531.5533
BGE (contractor services) 410.850.4620
BGE (underground damage control) 410.787.9668
Miss Utility 1.800.257.7777
Colonial Pipeline Company 410.745.1390
Howard County, Dept. of Public Works, Bureau of Utilities 410.313.4900
Howard County Health Department 410.313.2640
33. The contractor shall notify Miss Utility at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
34. The contractor shall notify the Department of Public Works/Bureau of Engineering Construction Inspection Division at (410) 313-1880 at least five (5) working days prior to the start of work. All fills for public road surfaces require 98% compaction (AASHTO-T-180).
35. All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA standards and specifications if applicable.
36. Traffic control devices, markings and signing shall be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD). All street and regulatory signs shall be in place prior to the placement of any asphalt.
37. All street sign posts shall be 2" square metal tube posts (14 gauge) installed into a 3" sleeve (2.5" square metal tube, 12 gauge) with a cap on top.
38. Driveway(s) shall be provided prior to issuance of a use and occupancy permit to ensure safe access for fire and emergency vehicles per the following requirements:
a.) Width - 12 feet (14 feet serving more than one residence);
b.) Surface - six (6") inches of compacted crusher run base with tar and chip coating (1-1/2" Minimum);
c.) Geometry - Maximum 14% grade, Maximum 10% grade change and 45-foot turning radius;
d.) Structures (culverts/bridges) - capable of supporting 25 gross tons (H25-loading);
e.) Drainage elements - capable of safely passing 100 year flood with no more than 1 foot depth over surface;
f.) Structure clearances - minimum 12 Feet;
g.) Maintenance - sufficient to ensure all weather use.
40. This plan is subject to petition HP-06-02, approved by the planning director on August 9, 2005, waiver from Section 16.146 of the Howard County Subdivision and Land Development Regulations to allow Summer Haven Phase 2 to be submitted as a final plan in accordance with the approved sketch plan S-03-14, without a preliminary plan submission for phase 2.
41. Proposed quadrants per Howard County Standard Detail R-7.01 R-7.09.
42. A minimum 2" wide mulch pathway shall be maintained between street lights and street trees.
43. THE 5' WIDE MULCH PATHWAY LOCATED ACROSS OPEN SPACE LOT 13 & 14 SHALL BE MAINTAINED BY THE HOA FOR THE SUMMER HAVEN SUBDIVISION. HOWARD COUNTY WILL NOT BE RESPONSIBLE FOR THE UPKEEP AND MAINTENANCE OF THE 5' WIDE MULCHED RECREATIONAL OPEN SPACE PATHWAY AND THE OTHER RECREATIONAL AMENITIES AS APPROVED UNDER WAIVER PETITION WP-11-140.
44. THE DEPARTMENT OF PLANNING AND ZONING HAS DETERMINED THE GAZEBO TO BE A COMMUNITY AMENITY AND HAS APPROVED PROPOSED LOCATION.
45. THE 5' X 20' CONC. REFUSE & RE-CYCLING PADS ARE TO BE UTILIZED BY RESIDENTS LIVING ON MARY THERESA COURT (LOTS 25 - 34) AND AUTUMN HAVEN COURT (LOTS 16 - 24).

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[Signature] 9/22/06
CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
[Signature] 8-31-06
CHIEF, BUREAU OF HIGHWAYS

Revision table with columns: No., Date, Description, By. Includes revision 1 dated 9/16/11 for adding recreational amenities.

COVER SHEET
SUMMER HAVEN
PHASE I AND II
LOTS 3-12 & 16 THRU 39, OPEN SPACE LOTS 13 & 14, NON-CREDITED OPEN SPACE LOT 15
A Resubdivision of Summer Haven Lot 2, Plat #15439
TAX MAP 38 GRID 14 1ST ELECTION DISTRICT
PARCELS 718, 721 & P/O 233 HOWARD COUNTY, MARYLAND
Design by: PS
Drawn by: AY
Checked by: ZYF
Scale: As Shown
Date: Aug. 09, 2006
No. No.: 3157
Sheet No.: 1 of 13

AS-BUILT

F-06-008

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AN INDIVIDUALLY LICENSED PROFESSIONAL ENGINEER UNDER LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21443 EXPIRATION DATE: 12-21-2014

Donald Mason 2-5-10
For Revisions by Benchmark Engineering, Inc. only

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 10-22-14

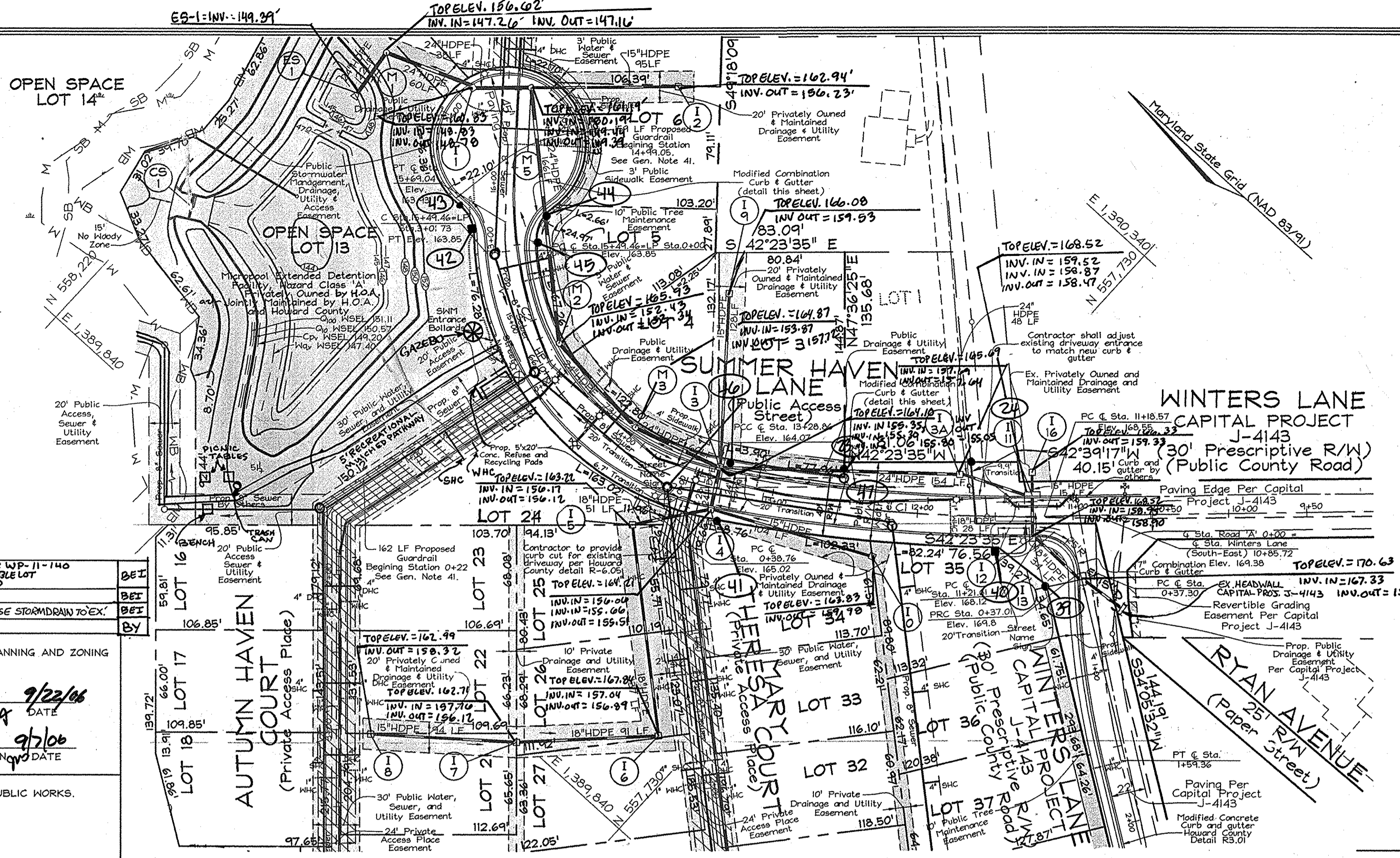


NO.	DATE	REVISION	BY
3	9-16-11	ADD RECREATIONAL AMENITIES PER WP-11-140 CHANGE OPEN SPACE LOT 34 TO BUILDABLE LOT	981
2	9-7-10	REVISE SIDEWALK IN FRONT OF LOT 1	982
1	2-2-10	ADD EX. HEADWALL, REMOVE I-M, REVISE SIDEWALK TO EX.	983

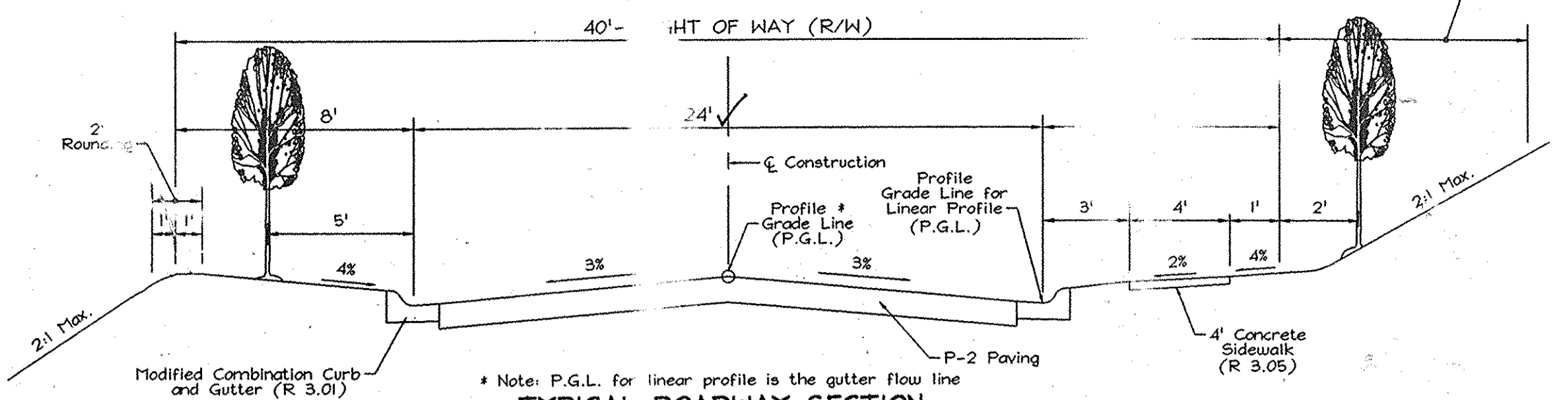
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Cindy Kanak 9/22/06
CHIEF, DIVISION OF LAND DEVELOPMENT JR DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
Chris DeMunnin 9/7/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Walter J. Mahall 8-31-06
CHIEF, BUREAU OF HIGHWAYS DATE



PLAN VIEW
SCALE: 1"=50'

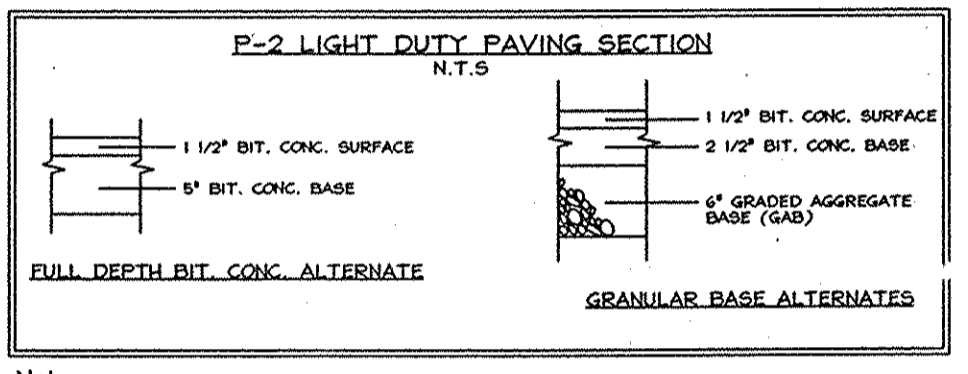


TYPICAL ROADWAY SECTION
CLASSIFICATION: PUBLIC ACCESS STREET

CURB TRANSITIONS

INLET	DIRECTION	LENGTH
I-3	North-West	20'
I-3	South-East	20'
I-4	North-West	6.70'
I-4	South-East	20'
I-11	North-West	9.90'
I-12	North-West	20'
I-12	South-East	20'

Note: See Howard County Standard Detail R-3.02 for more information.

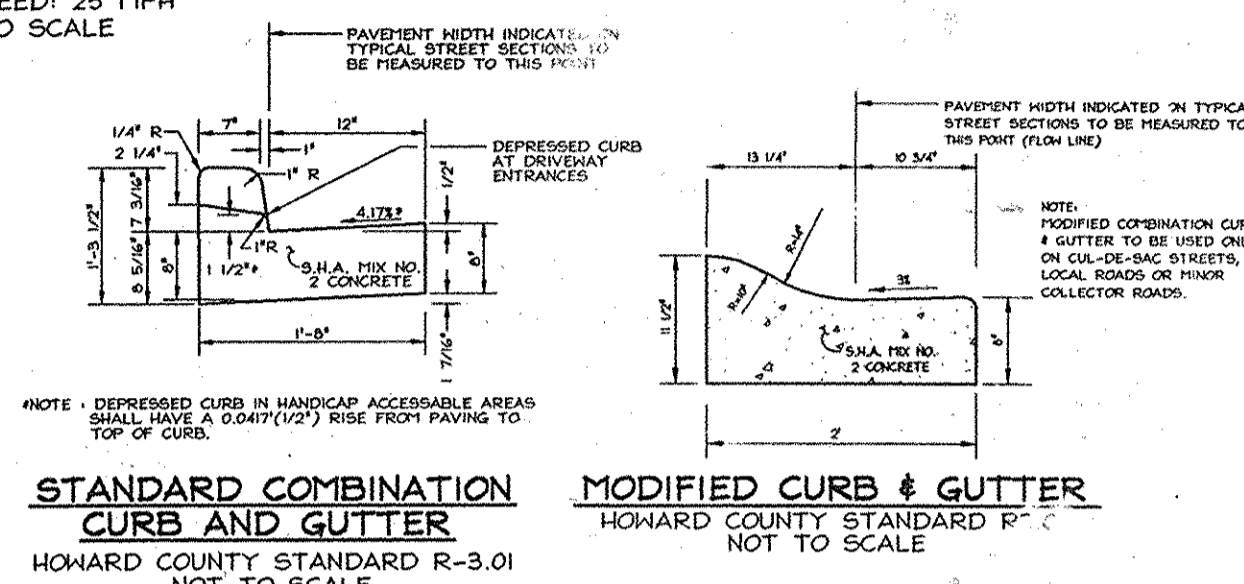


P-2 LIGHT DUTY PAVING SECTION
N.T.S.

OWNERS/DEVELOPERS

JAMES L. NEUBURN
5570 Sterett Place Suite 201
Columbia, MD 21044
(410) 997-3815

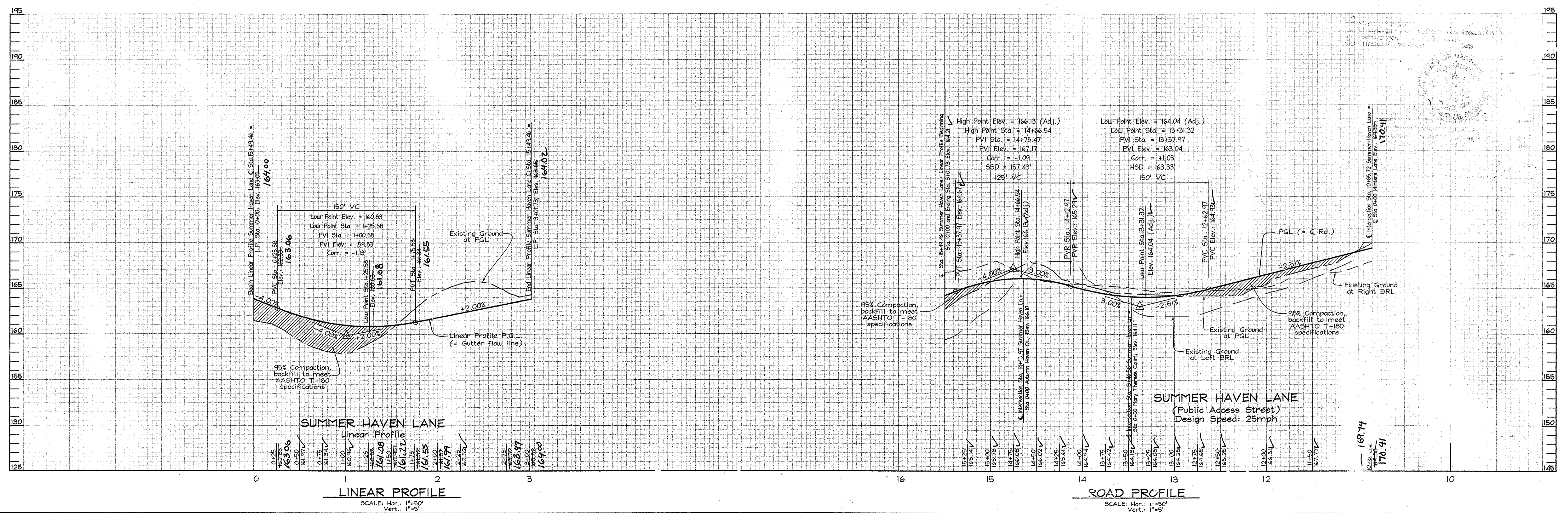
B.Z. ENTERPRISES INC.
PO Box 68
Reisterstown, MD 21136
(410) 935-8887



ROAD PLAN AND PROFILE
SUMMER HAVEN LANE
SUMMER HAVEN
PHASE I AND II
LOTS 3-12 & 16 THRU 39, OPEN SPACE LOTS 13 & 14, NON-CREDITED
OPEN SPACE LOT 15
A Resubdivision of Summer Haven Lot 2, Pct #5439
TAX MAP 38, GRID 14, PARCELS 718, 721 & 710 233
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel: 410-567-5200 Fax: 410-796-1562
E-mail: info@fsh.biz

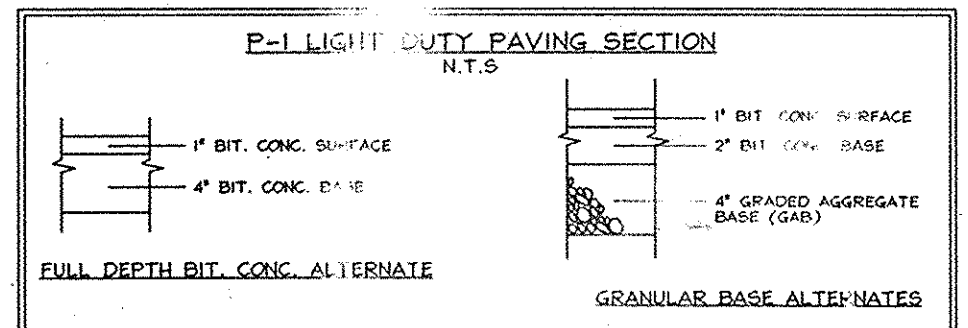
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DRAWN BY: PS
CHECKED BY: ZYF
SCALE: As Shown
DATE: Aug. 09, 2006
W.O. No.: 3157
SHEET No. 2 OF 13



PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 21443, EXPIRATION DATE: 12-21-2014.

Donald Mason
 PROFESSIONAL ENGINEER
 No. 21443
 State of Maryland

For Revisions by Benchmark Engineering, Inc. only



Note: Paving sections shown relate to a CBR value of 7. Actual CBR test results may cause modification of these paving sections.

MARY THERESA COURT AND AUTUMN HAVEN COURT PAVING SECTIONS
 NOT TO SCALE

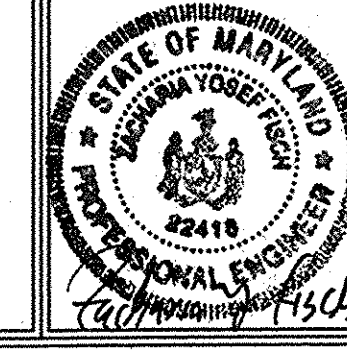
OWNERS/DEVELOPERS

JAMES L. NEWBURN
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 (410) 997-3815

B.Z. ENTERPRISES INC.
 PO Box 66
 Reisterstown, MD 21136
 (410) 936-8867

ROAD PLAN AND PROFILES MARY THERESA COURT AND AUTUMN HAVEN COURT
SUMMER HAVEN
 PHASE I AND II

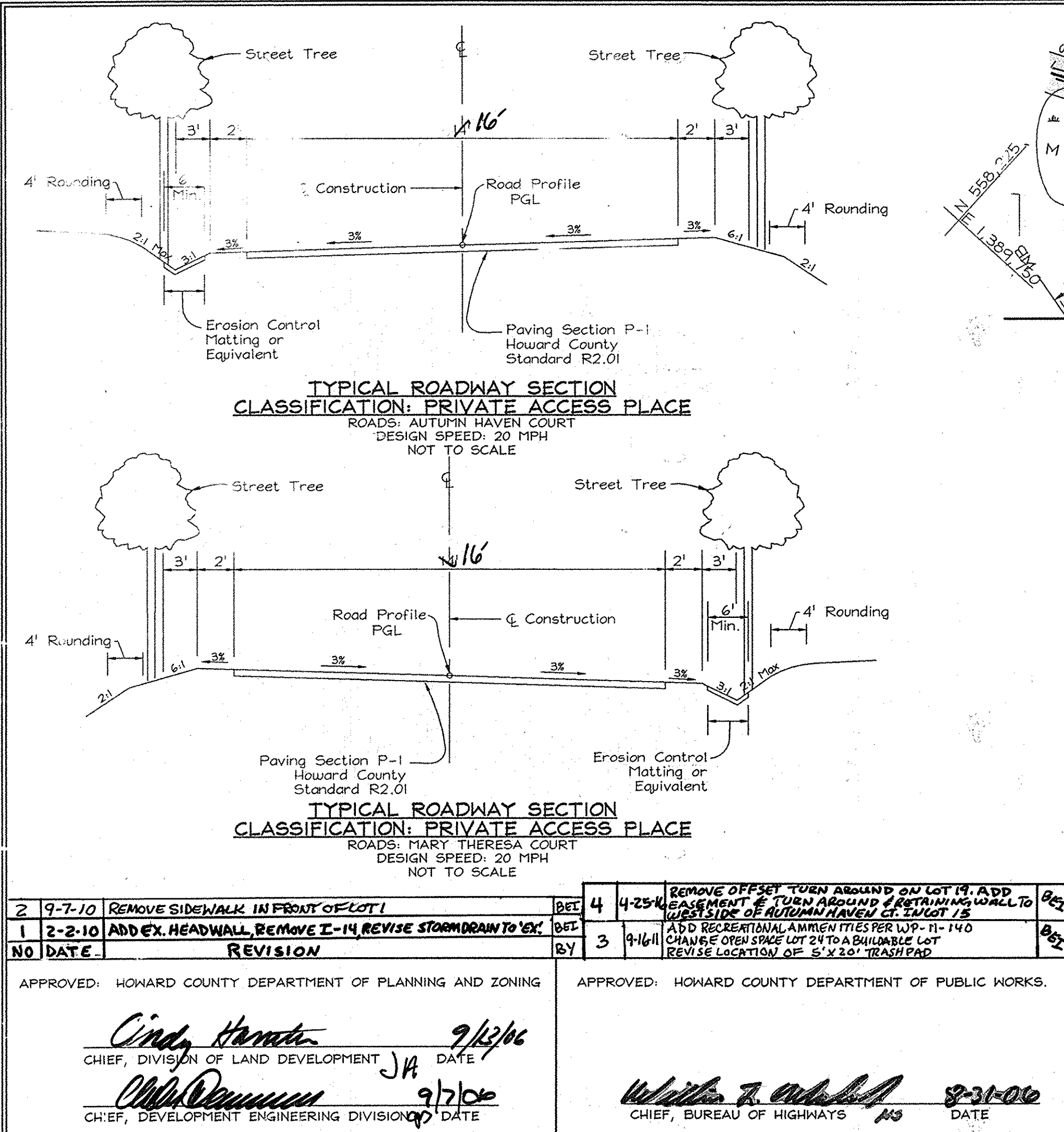
LOTS 3-12 & 16 THRU 29, OPEN SPACE LOTS 13 & 14, NON-CREDITED OPEN SPACE LOT 15
 A Resubdivision of Summer Haven Lot 2, Parcel #15439
 TAX MAP 38 GRID 15 PARCELS 7, 8, 721 & P/O 233
 1ST ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND



FSH Associates

Engineers Planners Surveyors
 6339 Howard Lane Elkridge, MD 21075
 Tel: 410-567-5200 Fax: 410-796-1562
 E-mail: info@fsh.biz

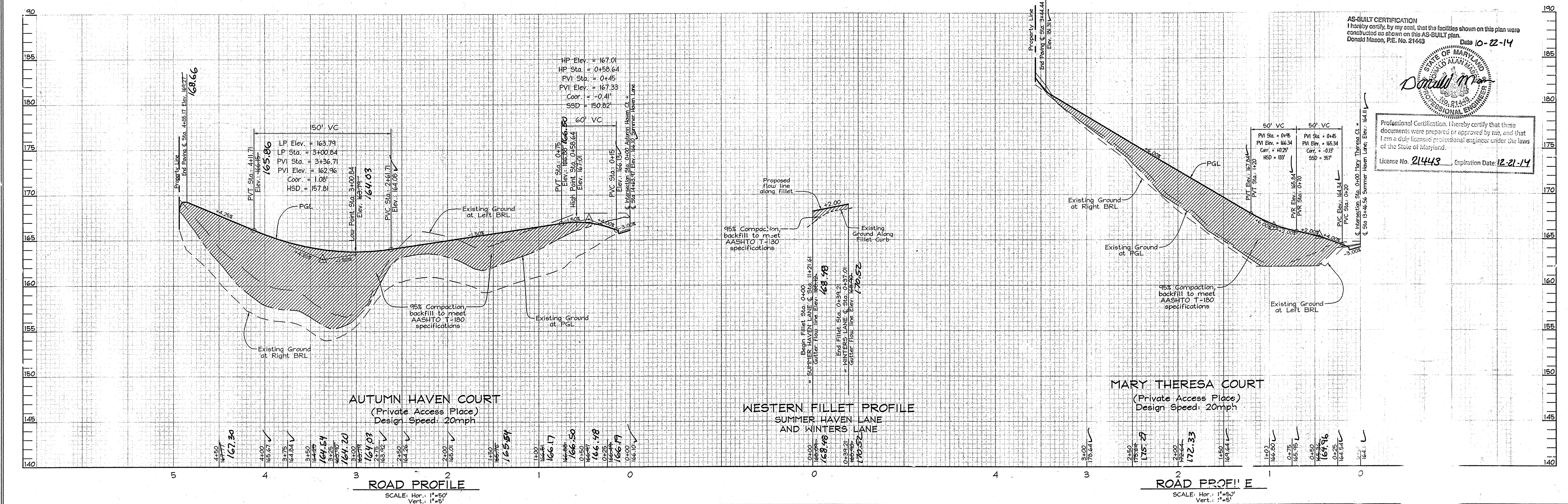
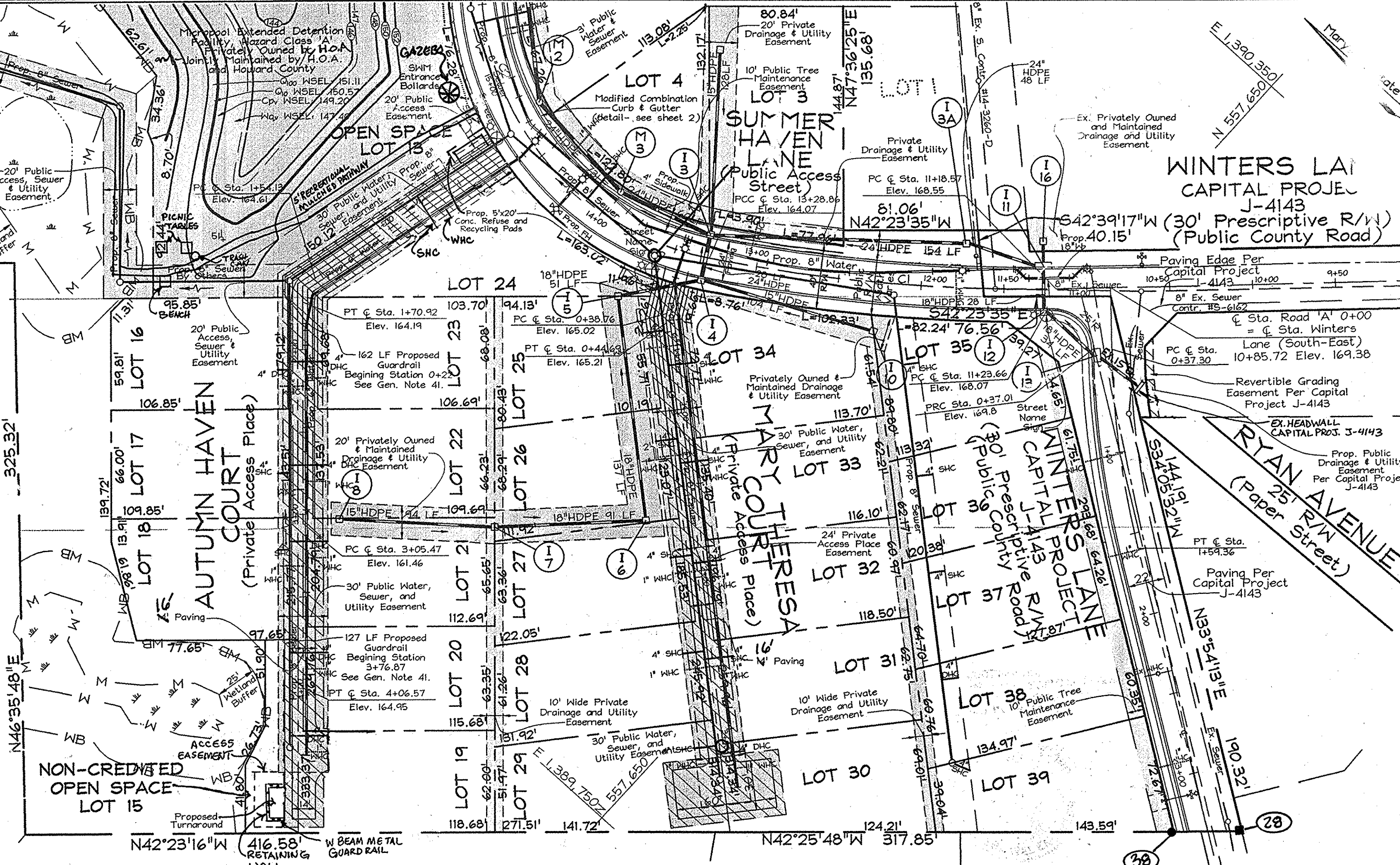
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 DRAWN BY: PS
 CHECKED BY: ZYF
 SCALE: As Shown
 DATE: Aug. 09, 2006
 M.O. No.: 3157
 SHEET No. 3 OF 13



NO.	DATE	REVISION	BY	DATE
2	9-7-10	REMOVE SIDEWALK IN FRONT OF LOT 1	BY	9/13/10
1	2-2-10	ADD EX. HEADWALL, REMOVE 1-14, REVISE STORM DRAIN TO EX. 15	BY	9/17/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Cindy Hamer 9/13/10
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

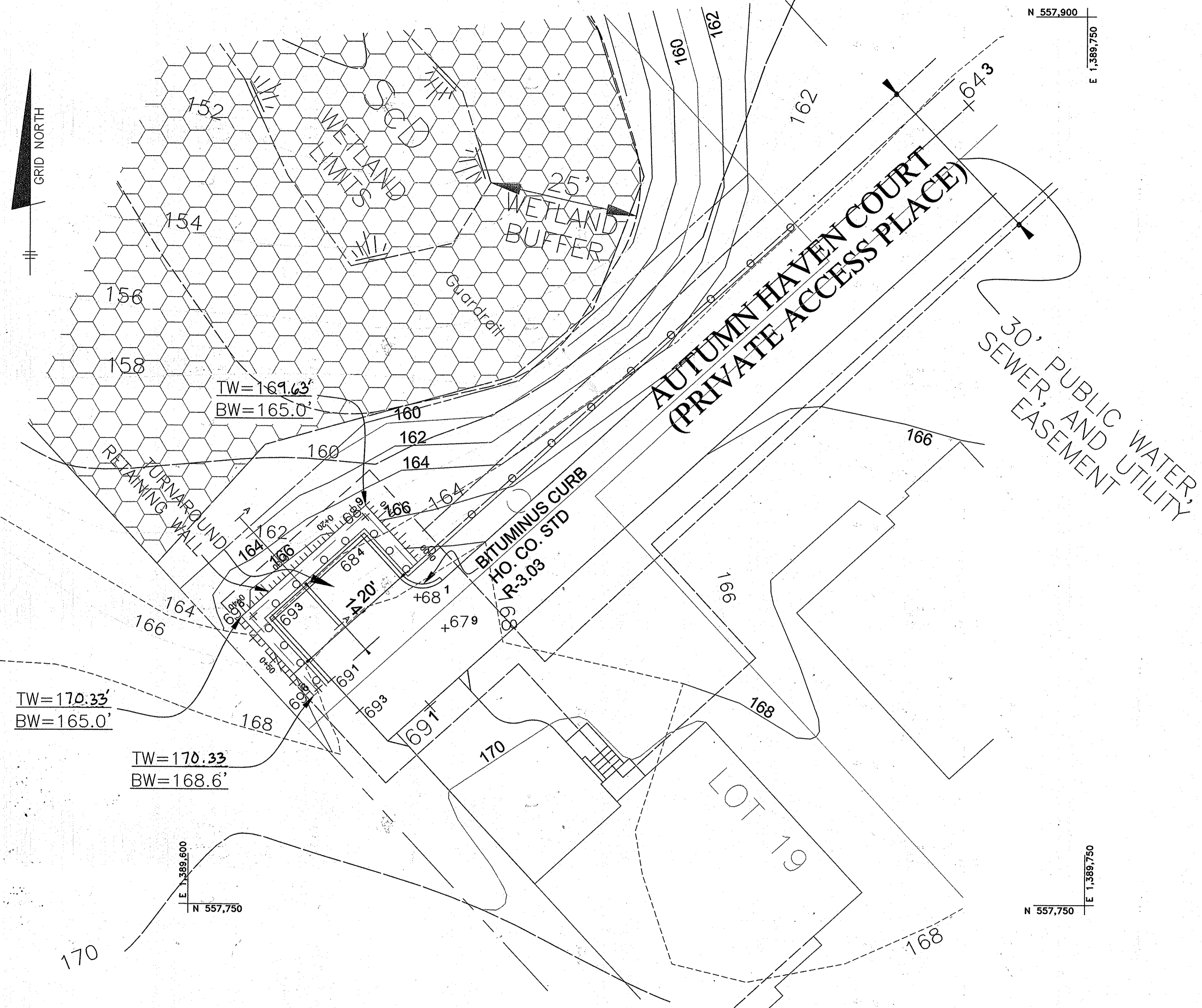
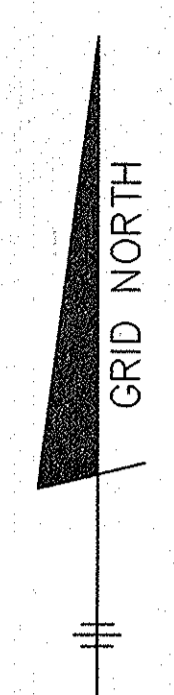
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
Walter Z. ... 8-31-06
 CHIEF, BUREAU OF HIGHWAYS DATE



AS-BUILT CERTIFICATION
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 Donald Mason, P.E. No. 21443
 Date 10-22-14



Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a fully licensed professional engineer under the laws of the State of Maryland.
 License No. 21443, Expiration Date: 12-21-14



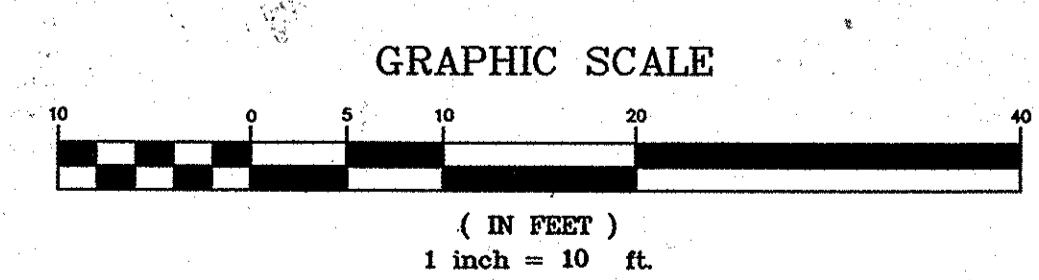
LEGEND

EXISTING CONTOURS	<u>160</u>
PROPOSED CONTOURS	<u>160</u>
LIMIT OF WETLANDS	
FOREST CONSERVATION EASEMENT	

TW=169.63'
BW=165.0'

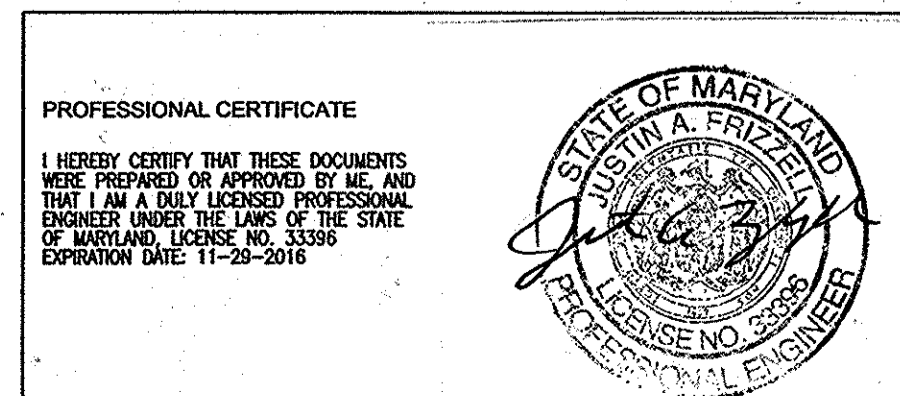
TW=170.33'
BW=165.0'

TW=170.33'
BW=168.6'



NOTE: SHEET 3A ADDED TO SHOW
RETAINING WALL DESIGN.

APPROVED: DEPARTMENT OF PLANNING AND ZONING	
	6-6-16
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
	6-2-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE
	6-2-16
DIRECTOR	DATE



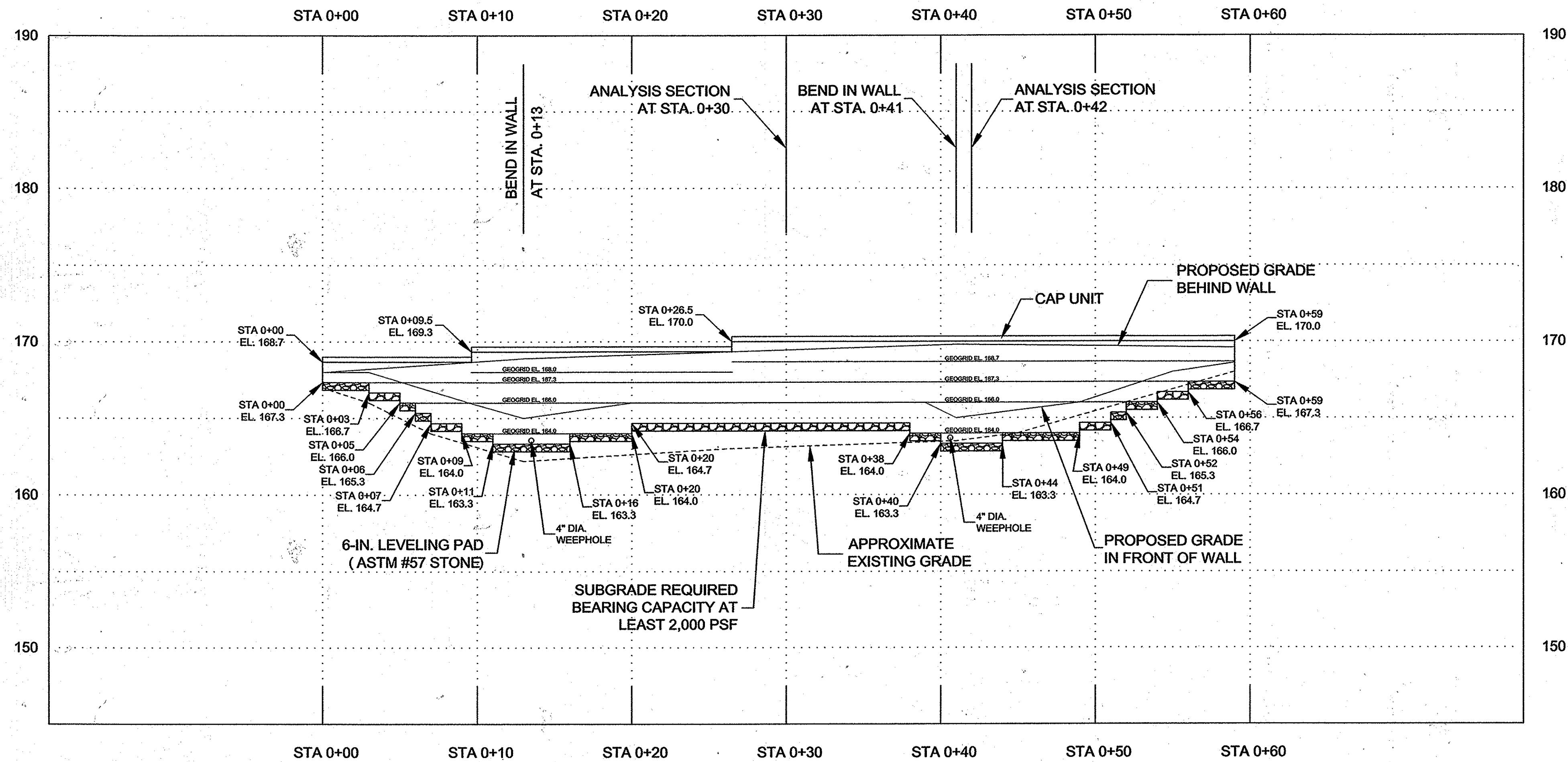
HKA HARDIN-KIGHT ASSOCIATES, INC.
CONSULTING ENGINEERS

Title: Retaining Wall Plan View

Project: Summer Haven

Designed By:	Date:
JAF	2/26/2016
Checked By:	Project No:
SEK	16114
Scale:	HKA Drawing No.:
As Shown	1 of 4

<p align="center">BENCHMARK ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ELLICOTT CITY, MARYLAND 21043 PHONE: 410-465-6105 FAX: 410-465-6644 E-MAIL: bsi@bei-civilengineering.com</p>	
OWNERS/DEVELOPERS:	PROJECT:
B.Z. ENTERPRISES INC. PO BOX 60 REISTERSTOWN, MD 21136 410-935-8887	SUMMER HAVEN REVISE FINAL ROAD CONSTRUCTION PLAN
NEWBUREN INVESTMENTS II, LLC 5570 STERRETT PLACE, SUITE 201 COLUMBIA, MARYLAND 21044 410-997-3815	LOCATION: TAX MAP 38, GRID 14 PARCELS 718, 721 & P/O 233 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND
TITLE: ROAD PLAN TURNAROUND	
DATE: FEBRUARY, 2016	PROJECT NO. 2160
DES: DAM	DRAFT: EDD
CHECK: DAM	SCALE: AS SHOWN
DRAWING 3A OF 13	

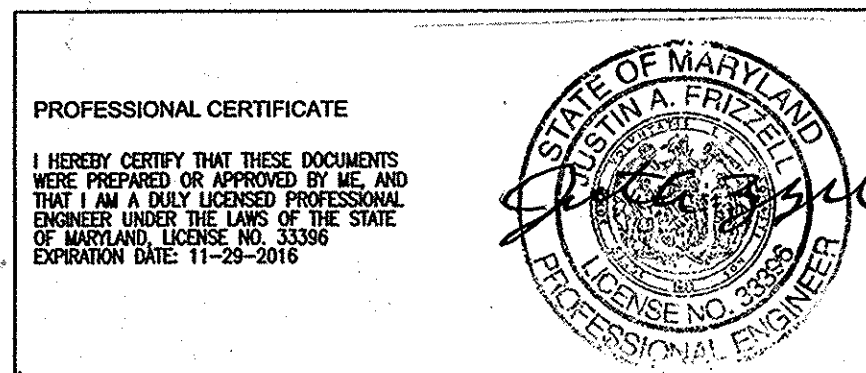


RETAINING WALL PROFILE
GRID TYPE - MIRAFI 3XT OR EQUIV.
GRID LENGTH - 5.5 FT.

NOTE: SHEET 3B ADDED TO SHOW
 RETAINING WALL DESIGN.

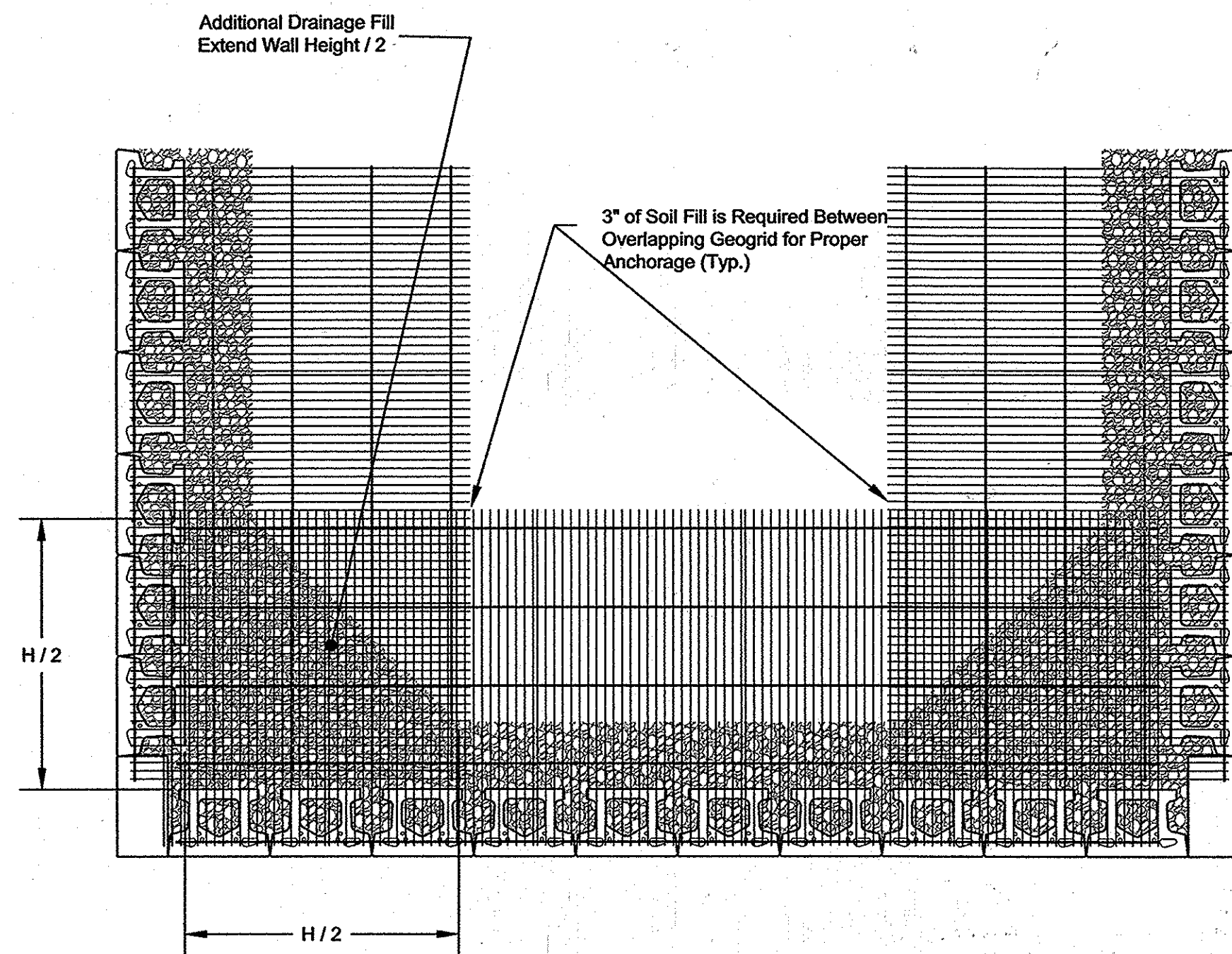
NO.	DATE	REVISION
BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLICOTT CITY, MARYLAND 21043 PHONE: 410-465-6105 FAX: 410-465-6844 E-MAIL: bel@bel-civilengineering.com <small>Professional Certification: I hereby certify that these documents 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.</small>		
OWNERS/DEVELOPERS: B.Z. ENTERPRISES INC. PO BOX 60 REISTERSTOWN, MD 21136 410-935-8887 NEWBUREN INVESTMENTS II, LLC 5570 STERRETT PLACE, SUITE 201 COLUMBIA, MARYLAND 21044 410-997-3815		PROJECT: SUMMER HAVEN PHASE I & II REVISED FINAL ROAD CONSTRUCTION PLAN LOCATION: TAX MAP 38, GRID 14 PARCELS 718, 721 & P/O 233 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND TITLE: ROAD PLAN TURNAROUND DATE: FEBRUARY, 2016 PROJECT NO. 2160 SCALE: AS SHOWN DRAWING 30 OF 13
DESIGNED BY: JAF CHECKED BY: SEK SCALE: As Shown		DATE: 2/26/2016 PROJECT NO: 16114 HKA DRAWING NO: 2 of 4

APPROVED: DEPARTMENT OF PLANNING AND ZONING	
<i>K. J. Schuch</i> CHIEF, DIVISION OF LAND DEVELOPMENT	6-6-16 DATE
<i>Old Phanton</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	6-2-16 DATE
<i>W. H.</i> DIRECTOR	<i>W. H.</i> DATE



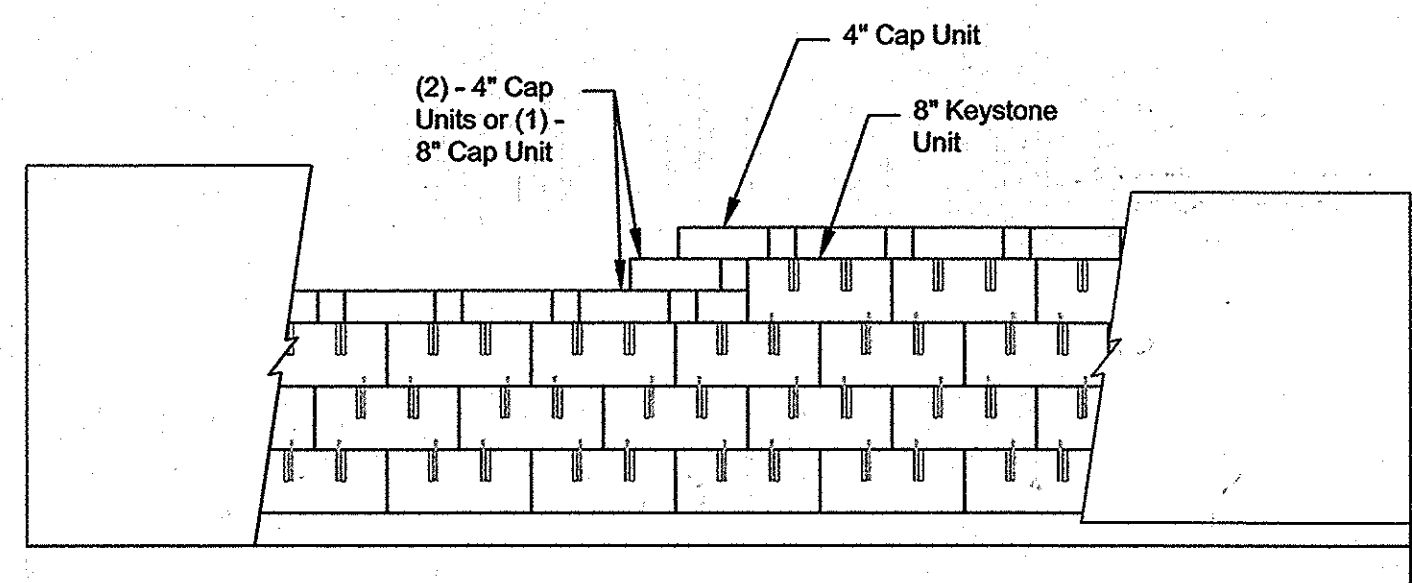
HARDIN-KIGHT ASSOCIATES, INC.
 CONSULTING ENGINEERS
 Title: Retaining Wall Profile
 Project: Summer Haven

Designed By:	Date:
JAF	2/26/2016
Checked By:	Project No:
SEK	16114
Scale:	HKA Drawing No:
As Shown	2 of 4



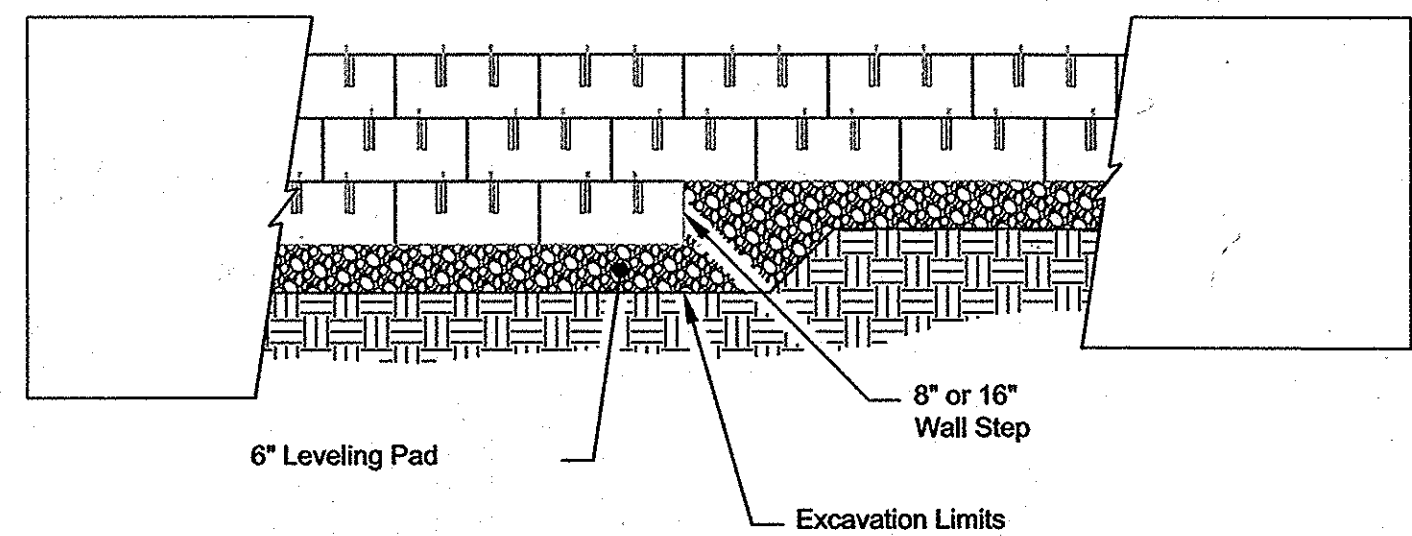
- Note:
1. Check with manufacturer specifications on correct direction of orientation for geogrid to obtain proper strength.
 2. Corner units recommended for outside corners. Availability May Vary.

Geogrid Installation at Corners



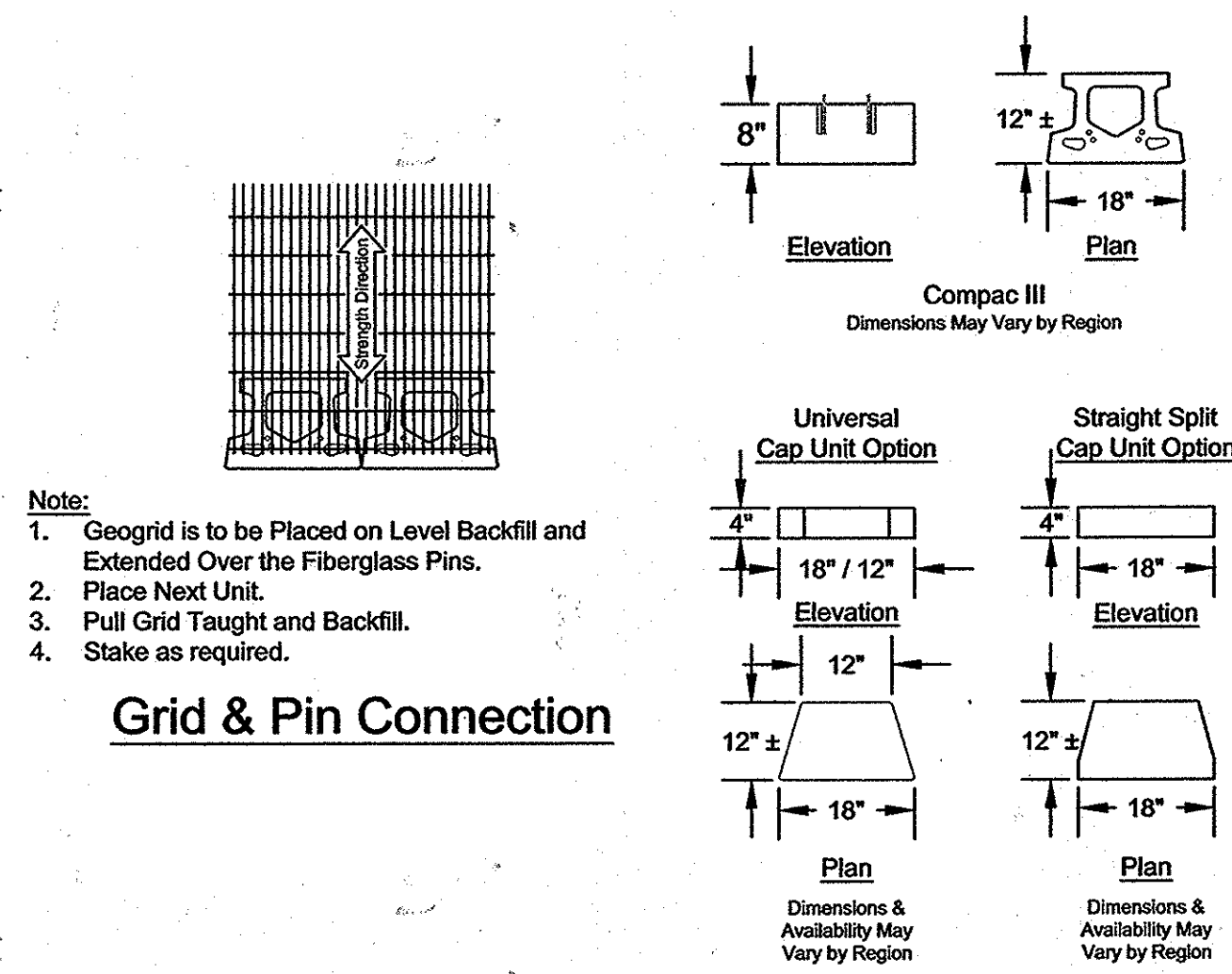
- Note:
1. Secure all cap units with Keystone Kapeal or equal.

Top of Wall Steps



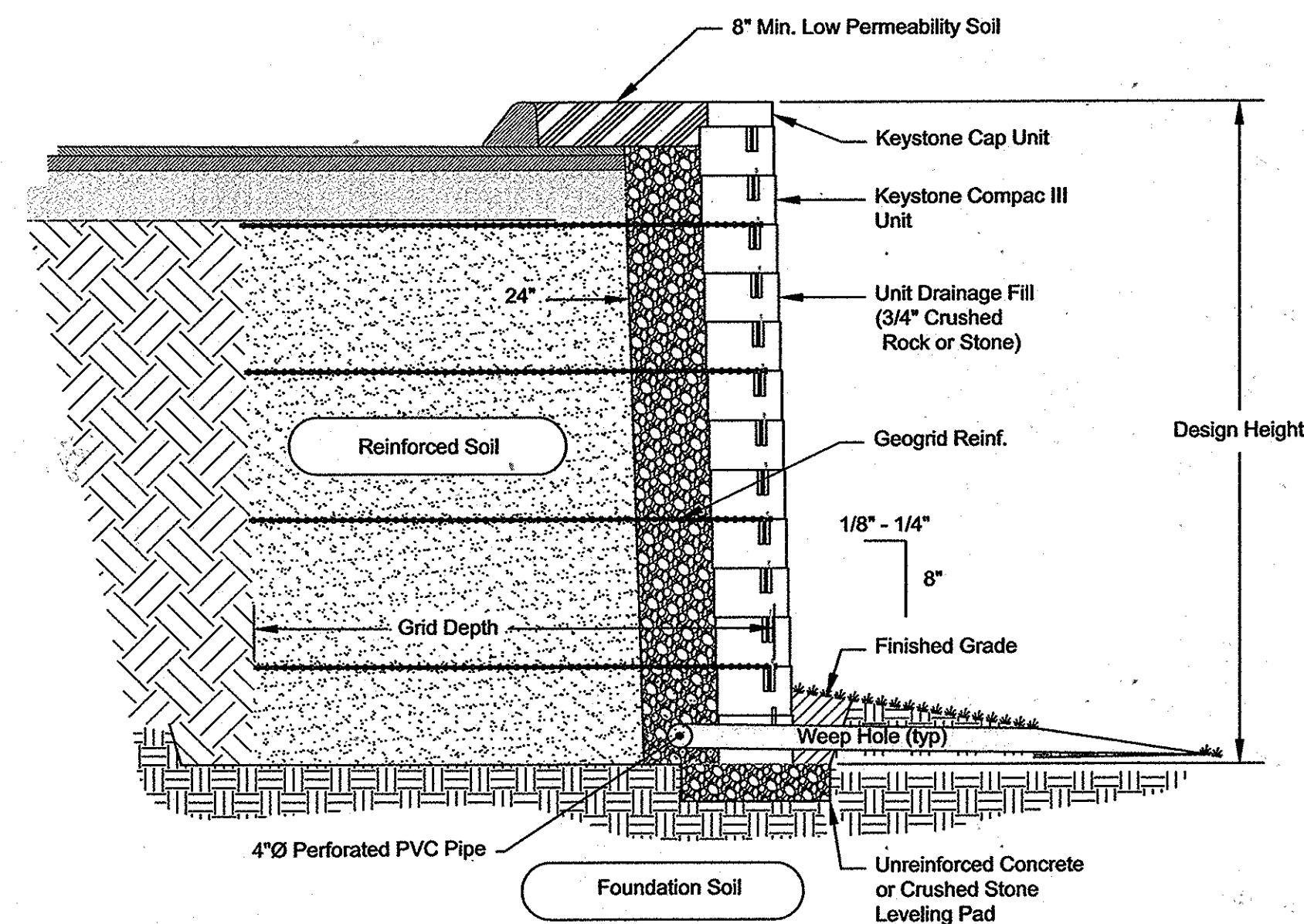
- Notes:
1. The leveling pad is to be constructed of crushed stone or 2,000 psiz unreinforced concrete
 2. The base foundation is to be approved by the site geotechnical engineer prior to placement of the leveling pad.

Leveling Pad Elevation Detail

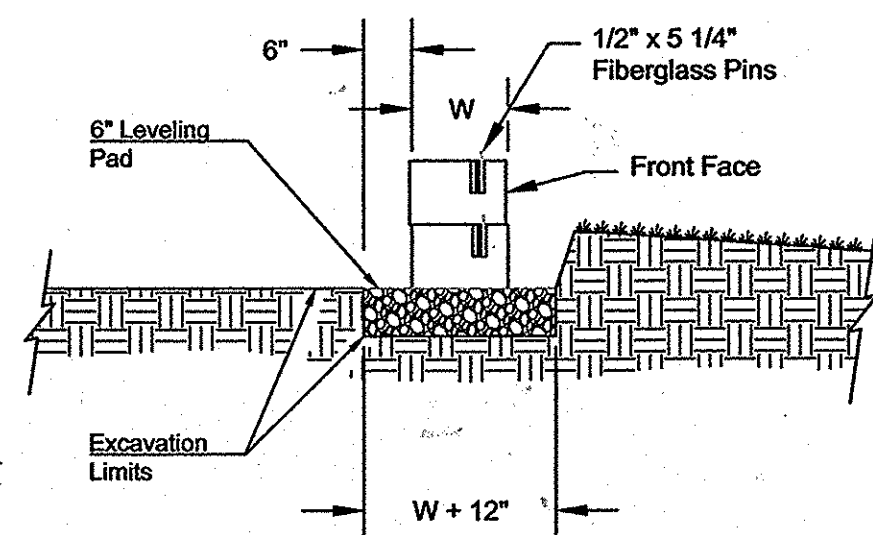


- Note:
1. Geogrid is to be placed on level backfill and extended over the fiberglass pins.
 2. Place next unit.
 3. Pull grid taut and backfill.
 4. Stake as required.

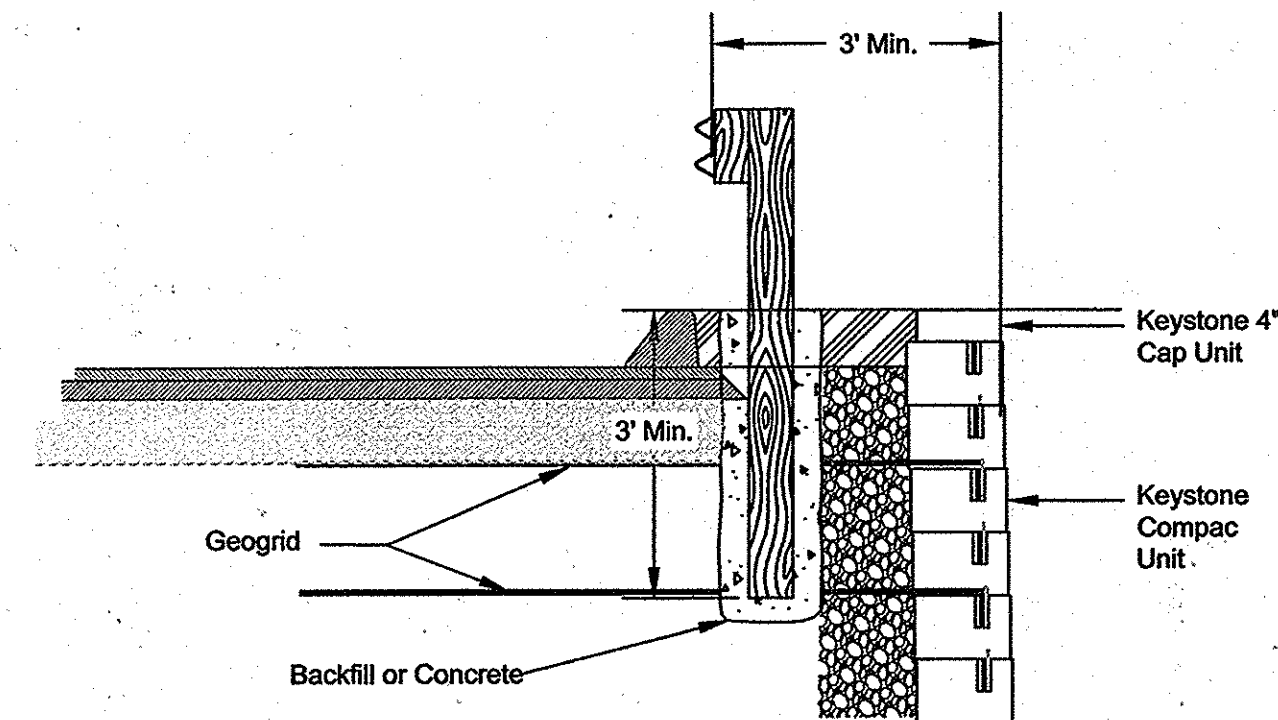
Grid & Pin Connection



Typical Reinforced Wall Section



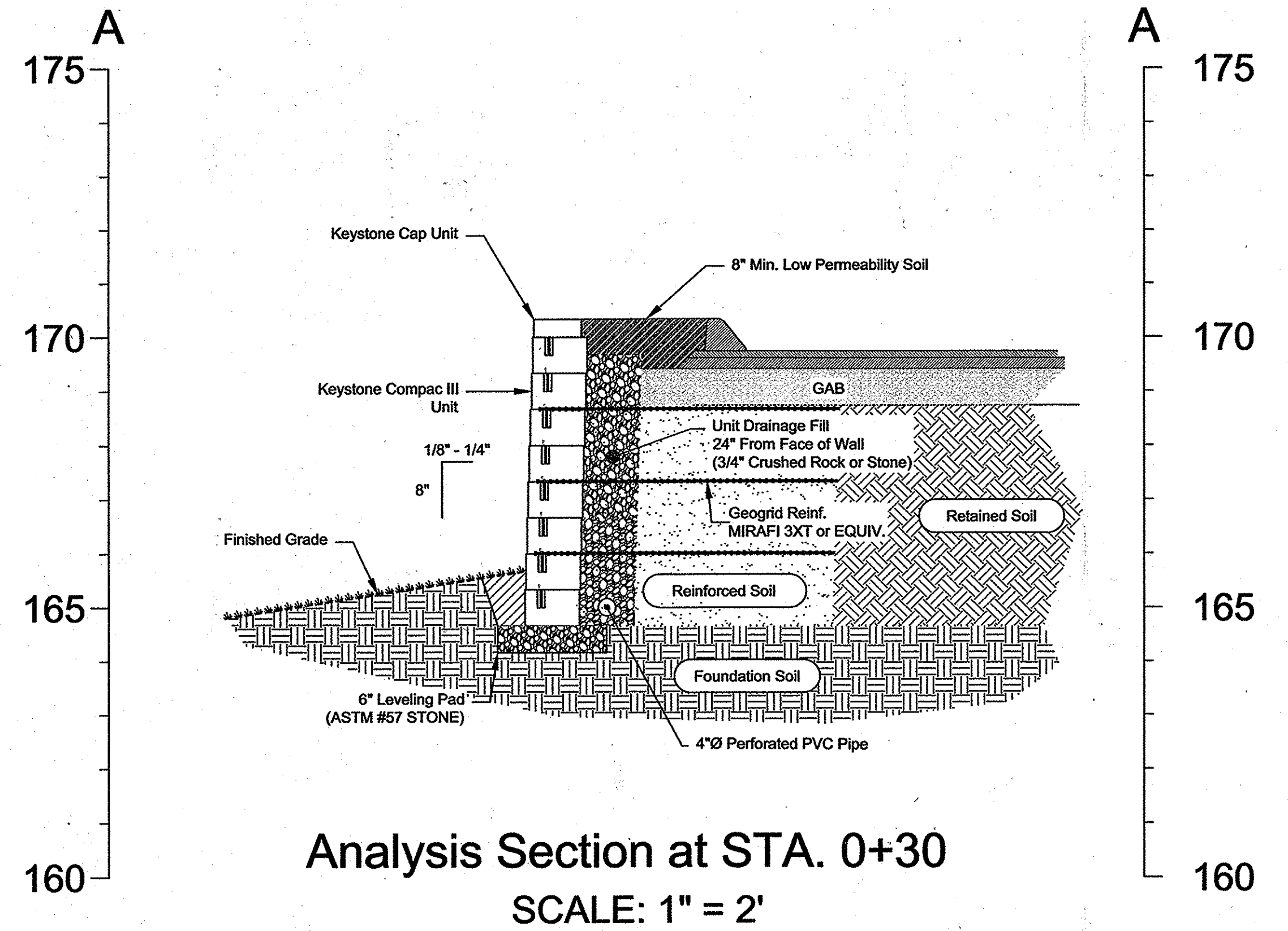
Leveling Pad Section Detail



- Notes:
1. Auger through geogrid layers.
 2. Backfill or concrete guardrail post in place. Guardrail designed by others.

Curb: According to Howard Co. Bit. Curb Std R-3.03

Typical Curb & Guardrail Detail



**Analysis Section at STA. 0+30
SCALE: 1" = 2'**

NO.	DATE	REVISION
BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE SUITE 315 ELLICOTT CITY, MARYLAND 21043 PHONE: 410-465-8105 FAX: 410-465-8844 E-MAIL: bob@bel-civilengineering.com		
OWNERS/DEVELOPERS: B.Z. ENTERPRISES INC. PO BOX 60 REISTERSTOWN, MD 21136 410-935-8887		PROJECT: SUMMER HAVEN PHASE I & II REVISED FINAL ROAD CONSTRUCTION PLAN
NEWBUREN INVESTMENTS II, LLC 5570 STERRETT PLACE, SUITE 201 COLUMBIA, MARYLAND 21044 410-997-3815		LOCATION: TAX MAP 38, GRID 14 PARCELS 718, 721 & P/O 233 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND
TITLE: ROAD PLAN TURNAROUND		
DATE: FEBRUARY, 2016	PROJECT NO. 2160	
DES: DAM	DRAFT: EDD	CHECK: DAM
SCALE: AS SHOWN	DRAWING 3C OF 13	

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[Signature] 6-6-16 DATE
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 6-2-16 DATE
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] DATE
 DIRECTOR

NOTE: SHEET 3C ADDED TO SHOW RETAINING WALL DESIGN.

PROFESSIONAL CERTIFICATE

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. 35269 EXPIRATION DATE: 11-28-2016

[Signature]



HKA HARDIN-KIGHT ASSOCIATES, INC.
 CONSULTING ENGINEERS

Title: Retaining Wall Details

Project: Summer Haven

Designed By: JAF Date: 2/26/2016

Checked By: SEK Project No: 16114

Scale: NTS or As Shown HKA Drawing No: 3 of 4

SUMMER HAVEN SEGMENTAL RETAINING WALL SPECIFICATIONS

PART 1: GENERAL

- 1.01 Description**
- Work shall consist of furnishing and construction of a KEYSTONE Compac Unit Retaining Wall System or equal in accordance with these specifications and in reasonably close conformity with the lines, grades, design, and dimensions shown on the plans.
 - 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.
 - Work includes furnishing and installing geogrid soil reinforcement of the type, size, location, and lengths designated on the construction drawings.
- 1.02 Reference Documents**
- American Society for Testing and Materials (ASTM)
 - C140 Sampling and Testing Concrete Masonry Units
 - C1372 Specification for Dry-Cast Segmental Retaining Wall Units
 - D422 Particle-Size Analysis of Soils
 - D698 Laboratory Compaction Characteristics of Soil -Standard Effort
 - D1557 Laboratory Compaction Characteristics of Soil -Modified Effort
 - D3034 Polyvinyl Chloride Pipe (PVC)
 - D4318 Liquid Limit, Plastic Limit and Plasticity Index of Soils
 - D4475 Horizontal Shear Strength of Pultruded Reinforced Plastic Rods
 - D4476 Flexural Properties of Fiber Reinforced Pultruded Plastic Rods
 - D4595 Tensile Properties of Geotextiles - Wide Width Strip
 - D5262 Unconfined Tension Creep Behavior of Geosynthetics
 - D5818 Evaluate Installation Damage of Geosynthetics
 - D6637 Tensile Properties of Geogrids - Single or Multi-Rib
 - D6638 Connection Strength - Reinforcement/Segmental Units
 - D6706 Geosynthetic Pullout Resistance in Soil
 - D6916 Shear Strength Between Segmental Concrete Units
 - American Association of State Highway and Transportation Officials (AASHTO)
 - M 252 Corrugated Polyethylene Drainage Pipe
 - Geosynthetic Research Institute (GRI)
 - GG4(a) Determination of the Long-Term Design Strength of Stiff Geogrids
 - GG4(b) Determination of the Long-Term Design Strength of Flexible Geogrids
 - National Concrete Masonry Association (NCMA)
 - SRWU-1 Test Method for Determining Connection Strength of SRW
 - SRWU-2 Test Method for Determining Shear Strength of SRW

- 1.03 Delivery, Storage and Handling**
- Contractor shall check all materials upon delivery to assure that the proper type, grade, color, and certification has been received.
 - Contractor shall protect all materials from damage due to jobsite conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

PART 2: PRODUCTS

- 2.01 Definitions**
- Modular Unit - a concrete retaining wall element machine made from Portland cement, water, and aggregates.
 - Structural Geogrid - a structural element formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth and function primarily as reinforcement.
 - Unit Drainage Fill - drainage aggregate, which is placed within and immediately behind the modular concrete units.
 - Reinforced Backfill - compacted soil, which is placed within the reinforced soil volume as outlined on the plans.

- 2.02 Modular Concrete Retaining Wall Units**
- Modular concrete units shall conform to the following architectural requirements:
 - Color - The Owner will specify standard manufacturers' color.
 - Face finish - The Owner will specify sculptured rock face in angular tri-planer or straight face 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.
 - Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.
 - Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with ASTM C140 Sampling and Testing Concrete Masonry Units:
 - Compressive strength: ≥ 3000 psi (21 MPa);
 - Absorption: 8 % for standard weight aggregates;
 - Dimensional tolerances: $\pm 1/8"$ (3 mm) from nominal unit dimensions not including rough split face, $\pm 1/16"$ (1.5 mm) unit height - top and bottom planes;
 - Unit size: 8" (203 mm) (H) x 18" (457 mm)(W) x 18" (457 mm)(D) minimum;
 - Unit weight: 100 lbs/unit (45 kg) minimum for standard weight aggregates.
 - Modular concrete units shall conform to the following performance testing:
 - Inter-unit shear strength in accordance with ASTM D6916 (NCMA SRWU-2): 1500 pif (21 kN/m) minimum at 2 psi (13 MPa) normal pressure;
 - Geogrid/unit peak connection strength in accordance with ASTM D6638 (NCMA SRWU-1): 900 pif (13 kN/m) minimum at 2-psi (13 MPa) normal force.
 - Modular concrete units shall conform to the following constructability requirements:
 - Vertical setback: $1/8"$ (3 mm) \pm per course (near vertical) 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 (13 mm).

- 2.03 Shear Connectors**
- Shear connectors shall be $1/2$ -inch (12 mm) diameter thermoset isophthalic polyester resin-pultruded fiberglass reinforcement rods or equivalent to provide connection between vertically and horizontally adjacent units with the following requirements:
 - Flexural Strength in accordance with ASTM D4476: 128,000 psi (882 MPa) minimum;
 - Short Beam Shear in accordance with ASTM D4475: 6,400 psi (44 MPa) minimum.
 - Shear connectors shall be capable of holding the geogrid in the proper design position during grid pre-tensioning and backfilling.

- 2.04 Base Leveling Pad Material**
- Material shall consist of a compacted crushed stone base or non-reinforced concrete as shown on the construction drawings. A minimum of 6 inches deep and 24 inches wide compacted base is required. The base materials must be approved by a Maryland Registered Professional Engineer.

- 2.05 Unit Drainage Fill**
- Unit drainage fill shall consist of clean 1" (25 mm) minus crushed stone or crushed gravel meeting the following gradation tested in accordance with ASTM D-422:

Sieve Size	Percent Passing
1 inch (25 mm)	100
3/4-inch (19 mm)	75 - 100
No. 4	0 - 10
No. 50	0 - 5
 - Drainage fill shall be placed within cores of, between, and behind units to meet this requirement.

- 2.06 Reinforced Backfill**
- Reinforced backfill shall be free of debris and meet the following gradation tested in accordance with ASTM D-422:

Sieve Size	Percent Passing
3-inch (76 mm)	100
3/4-inch (19 mm)	100 - 75
No. 40	0 - 60
No. 200	0 - 35

 Plasticity Index (PI) < 15 and Liquid Limit < 40 per ASTM D-4318.
 - 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 backfill or in the reinforced soil mass.
 - Contractor shall submit reinforced fill sample to the Geotechnical Engineer for approval prior to the use of any proposed reinforced fill material.

- 2.07 Geogrid Soil Reinforcement**
- Geosynthetic reinforcement shall consist of geogrids manufactured specifically for soil reinforcement applications and shall be manufactured from high tenacity polyester yarn or high-density polyethylene. Polyester geogrid shall be knitted from high tenacity polyester filament yarn with a molecular weight exceeding 25,000 Meg/m and a carboxyl end group values less than 30. Polyester geogrid shall be coated with an impregnated PVC coating that resists peeling, cracking, and stripping.
 - Ta, Long Term Allowable Tensile Design Load, of the geogrid material shall be determined as follows:

$$Ta = Tult / (RFcr * RFD * RFD * FS)$$
 Ta shall be evaluated based on a 75-year design life.
 - Tult, Short Term Ultimate Tensile Strength shall be determined in accordance with ASTM D4595 or ASTM D6637. Tult is based on the minimum average roll values (MARV).
 - RFcr, Reduction Factor for Long Term Tension Creep RFcr shall be determined from 10,000-hour creep testing performed in accordance with ASTM D5262. Reduction value = 1.45 minimum.
 - RFD, Reduction Factor for Durability RFD shall be determined from polymer specific durability testing covering the range of expected soil environments. RFD = 1.10 minimum.
 - RFid, Reduction Factor for Installation Damage RFid shall be determined from product specific construction damage testing performed in accordance with ASTM D5818 (GRI-GG4). Test results shall be provided for each product to be used with project specific or more severe soil type. RFid = 1.05 minimum.
 - FS, Overall Design Factor of Safety FS shall be 1.5 unless otherwise noted for the maximum allowable working stress calculation.

- The maximum design tensile load of the geogrid shall not exceed the laboratory tested ultimate strength of the geogrid/facing unit connection as limited by the "Hinge Height" divided by a factor of safety of 1.5. The connection strength testing and computation procedures shall be in accordance with ASTM D6638 Connection Strength between Geosynthetic Reinforcement and Segmental Concrete Units (NCMA SRWU-1).
- Soil Interaction Coefficient, Ci Ci values shall be determined per ASTM D6706 (GRI:GG5) at a maximum 0.75-inch (19 mm) displacement.
- Manufacturing Quality Control The geogrid manufacturer shall have a manufacturing quality control program that includes QC testing by an independent laboratory. The QC testing shall include:
 - Tensile Strength Testing
 - Melt Flow Index (HDPE)
 - Molecular Weight (Polyester)

- 2.08 Drainage Pipe**
- The drainage pipe shall be perforated or slotted PVC pipe manufactured in accordance with ASTM D3034 or corrugated HDPE pipe manufactured in accordance with AASHTO M252.

- 2.09 Geotextile Filter Fabric**
- When required, Geotextile filter fabric shall be 4.0 oz/sy, polypropylene, needlepunched nonwoven fabric. (Mirafix 140N or equivalent)

PART 3: EXECUTION

- 3.01 Excavation**
- Contractor shall excavate to the lines and grades shown on the construction drawings. The Geotechnical Engineer shall inspect the excavation and approve prior to placement of leveling material or fill soils. Proof roll foundation area as directed to determine if remedial work is required.
 - Over-excavation and replacement of unsuitable foundation soils and replacement with approved compacted fill will be performed under the direction of the Geotechnical Engineer.

- 3.02 Base Leveling Pad**
- Leveling pad material shall be placed to the lines and grades shown on the construction drawings, to a minimum thickness of 6 inches (150 mm) and extend laterally a minimum of 6" (150 mm) in front and behind the modular wall unit.
 - Soil leveling pad materials shall be compacted to a minimum of 95% Standard Proctor density per ASTM D-698 or 92% Modified Proctor Density per ASTM D1557.
 - Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

- 3.03 Modular Unit Installation**
- 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.
 - 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.
 - Install shear/connecting devices per manufacturer's recommendations.
 - 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.
 - Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction, shall not exceed two courses.

- 3.04 Structural Geogrid Installation**
- Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.
 - Geogrid reinforcement shall be placed at the strengths, lengths, and elevations shown on the construction design drawings or as directed by the Engineer.
 - 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.
 - 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**
- Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.
 - Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches (150 mm) where hand compaction is used, or 8 to 10 inches (200 to 250 mm) where heavy compaction equipment is used. Lift thickness shall be decreased to achieve the required density as required.
 - Reinforced backfill shall be compacted to a minimum of 95% Standard Proctor density per ASTM D698 or 92% Modified Proctor Density per ASTM D1557. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be approved by the Geotechnical Engineer.
 - Only lightweight hand-operated equipment shall be allowed within 3 feet (1m) from the tail of the modular concrete unit.
 - Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches (150 mm) 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.

- Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH (15 KPH). Sudden braking and sharp turning shall be avoided.
- 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**
- Cap units shall be glued to underlying units with an all-weather adhesive recommended by the manufacturer.

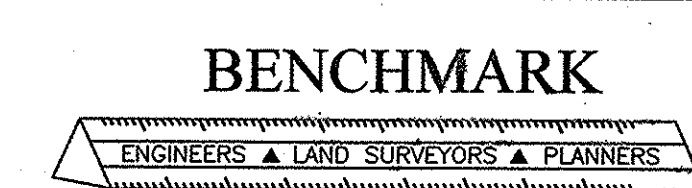
- 3.07 As-built Construction Tolerances**
- Vertical alignment: $\pm 1.5"$ (40 mm) over any 10' (3 m) distance.
 - Wall Batter: within 0.5 degrees of design batter.
 - Horizontal alignment: $\pm 1.5"$ (40 mm) over any 10' (3 m) distance. Corners, bends & curves: ± 1 ft (300 mm) to theoretical location.
 - Maximum horizontal gap between erected units shall be $1/2$ inch (13 mm).

- 3.08 Field Quality Control**
- Quality Assurance - The Geotechnical Engineer (Hardin-Kight Associates, Inc.) will provide quality assurance and testing services during construction.
 - Quality assurance shall include foundation soil inspection. Verification of geotechnical design parameters. Quality assurance shall also include observation of construction for general compliance with design drawings and project specifications. Quality assurance is best performed by Hardin-Kight Associates, Inc.
 - Quality Control - Only qualified and experienced technicians and engineers shall perform testing and inspection services.
 - Quality control testing shall include soil and backfill testing to verify soil types and compaction and verification that the retaining wall is being constructed in accordance with the design plans and project specifications.

PART 4: DESIGN CRITERIA

- The required bearing capacity for the retaining wall is 2,000 psf.
- Design Φ (soil) = 30 degrees.
- Design unit weight = 120 pcf.
- Retaining wall was not designed to resist hydrostatic pressure.
- Construction must be monitored by a professional engineer.

NO.	DATE	REVISION



BENCHMARK
ENGINEERS • LAND SURVEYORS • PLANNERS
ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE • SUITE 315
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644
E-MAIL: bel@bel-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: 12-31-16.

OWNERS/DEVELOPERS: B.Z. ENTERPRISES INC. PO BOX 60 REISTERSTOWN, MD 21136 410-935-8887	PROJECT: SUMMER HAVEN PHASE I & II REVISED FINAL ROAD CONSTRUCTION PLAN
NEWBUREN INVESTMENTS II, LLC 5570 STERRETT PLACE, SUITE 201 COLUMBIA, MARYLAND 21044 410-997-3815	LOCATION: TAX MAP 38, GRID 14 PARCELS 718, 721 & P/Q 233 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND
TITLE: ROAD PLAN TURNAROUND	DATE: FEBRUARY, 2016 PROJECT NO. 2160
DES: DAM	DRAFT: EDD
CHECK: DAM	SCALE: AS SHOWN
DRAWING 30	OF 13

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Val S. Doud 6-6-16
CHIEF, DIVISION OF LAND DEVELOPMENT DATE


Paul Edulson 6-2-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

N/A DATE

NOTE: SHEET 3D ADDED TO SHOW
RETAINING WALL DESIGN.

PROFESSIONAL CERTIFICATE

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: 11-29-2016

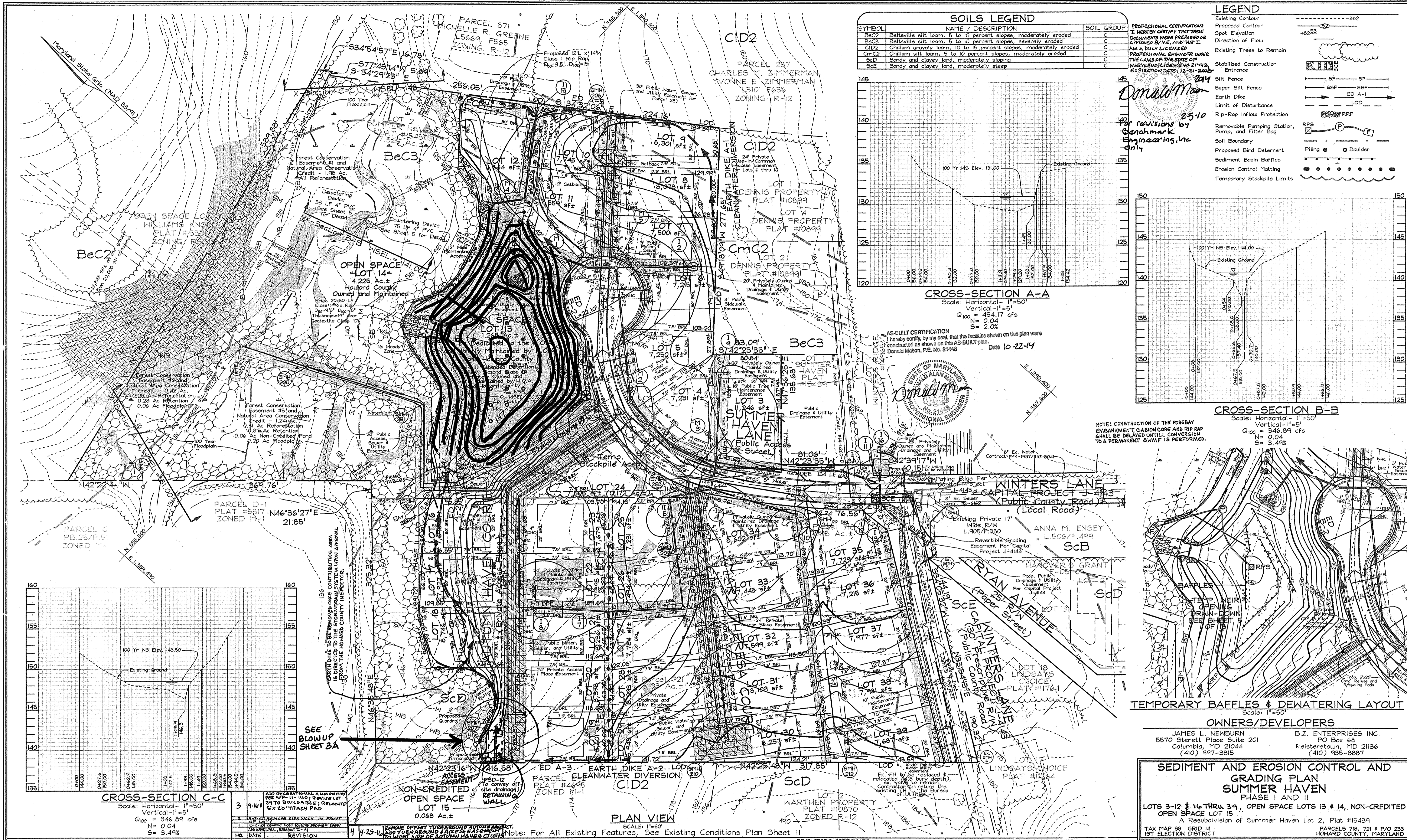


HARDIN-KIGHT ASSOCIATES, INC.
CONSULTING ENGINEERS

Title: **Retaining Wall Specifications**

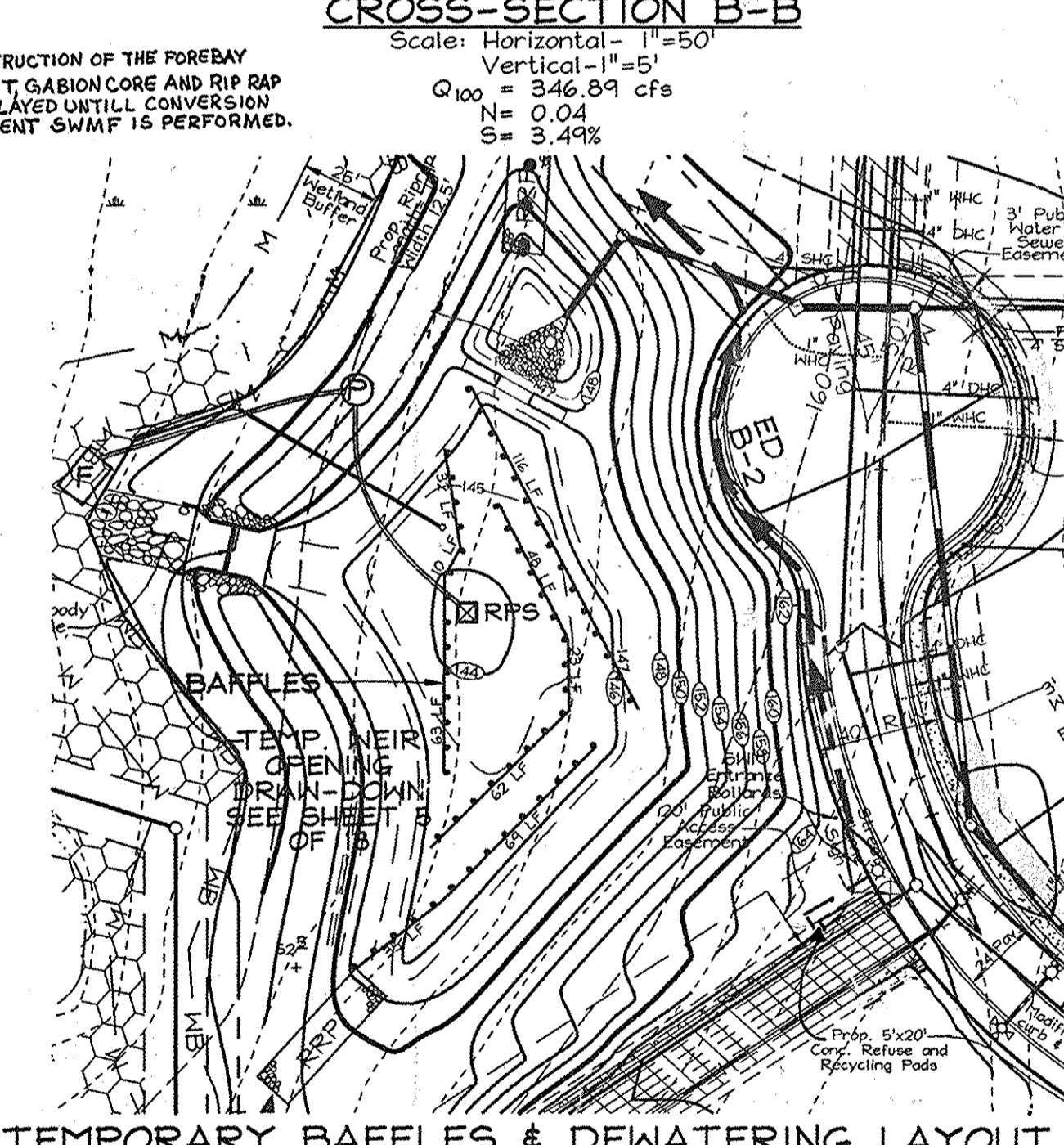
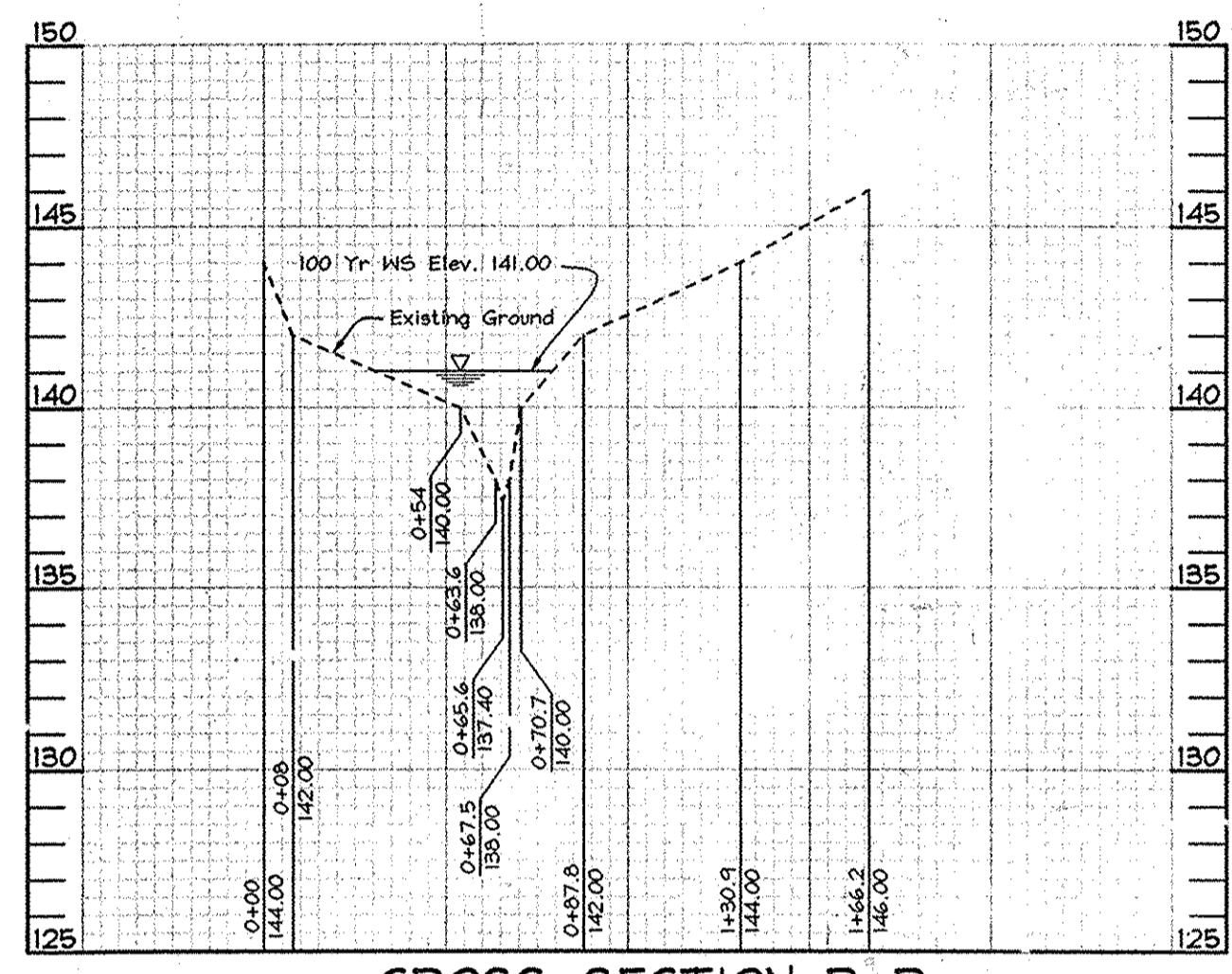
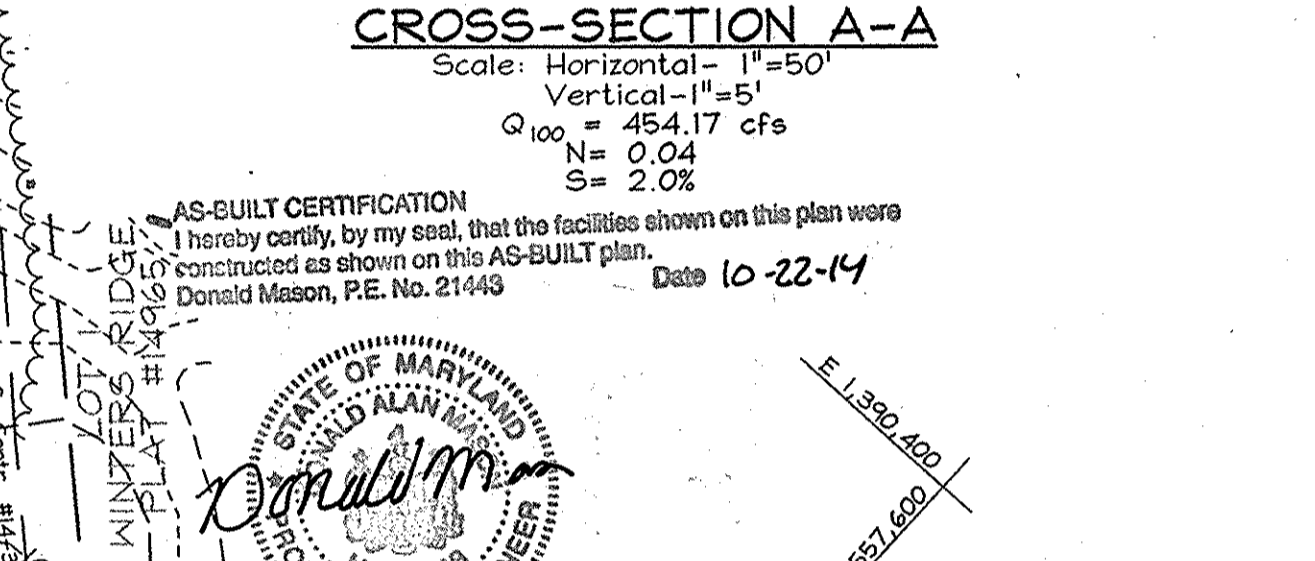
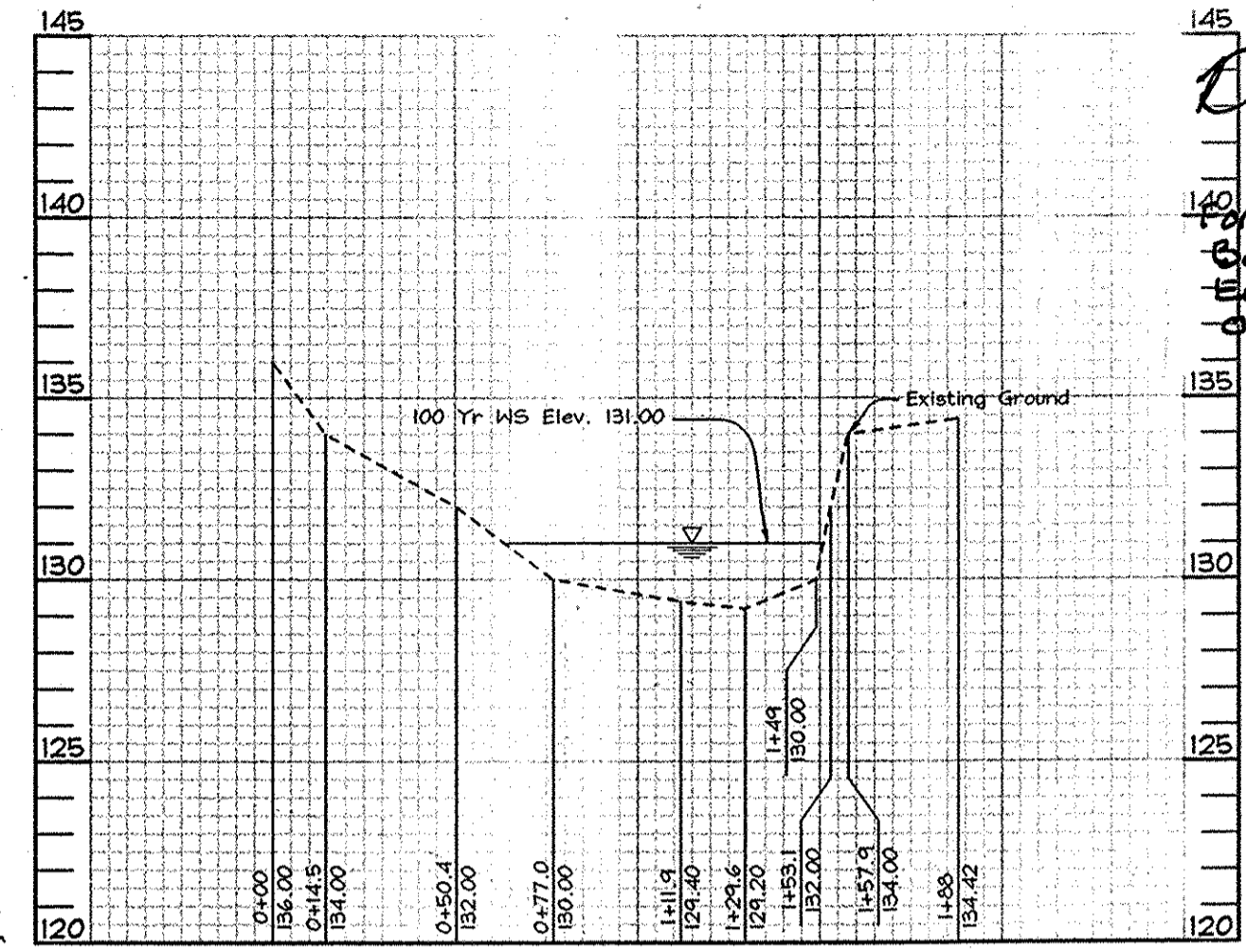
Project: **Summer Haven**

Designed By: JAF	Date: 2/26/2016
Checked By: SEK	Project No: 16114
Scale:	HKA Drawing No: 4 of 4



SYMBOL	NAME / DESCRIPTION	SOIL GROUP
BeC2	Beltville silt loam, 5 to 10 percent slopes, moderately eroded	C
BeC3	Beltville silt loam, 5 to 10 percent slopes, severely eroded	C
CID2	Chillum gravelly loam, 10 to 15 percent slopes, moderately eroded	C
CmC2	Chillum silt loam, 5 to 10 percent slopes, moderately eroded	C
ScD	Sandy and clayey land, moderately sloping	C
ScE	Sandy and clayey land, moderately steep	C

SYMBOL	DESCRIPTION
---	Existing Contour
- - - -	Proposed Contour
•	Spot Elevation
→	Direction of Flow
⊕	Existing Trees to Remain
▬▬▬	Stabilized Construction Entrance
SF	Silt Fence
SSF	Super Silt Fence
ED	Earth Dike
LOD	Limit of Disturbance
RRP	Rip-Rap Inflow Protection
RPS	Removable Pumping Station, Pump, and Filter Bag
○	Soil Boundary
▬▬▬	Proposed Bird Deterrent
▬▬▬	Sediment Basin Baffles
▬▬▬	Erosion Control Matting
▬▬▬	Temporary Stockpile Limits



OWNERS/DEVELOPERS
 JAMES L. NEWBURN
 5570 Sterett Place Suite 201
 Columbia, MD 21044
 (410) 997-3815
 B.Z. ENTERPRISES INC.
 PO Box 68
 FeistersLoun, MD 21136
 (410) 936-8387

SEDIMENT AND EROSION CONTROL AND GRADING PLAN
SUMMER HAVEN
 PHASE I AND II
 LOTS 3-12 & 16 THRU 39, OPEN SPACE LOTS 13, 14, NON-CREDITED OPEN SPACE LOT 15.
 A Resubdivision of Summer Haven Lot 2, Plat #15439
 TAX MAP 38, GRID 14
 1ST ELECTION DISTRICT
 PARCELS 718, 721 & P/O 233
 HOWARD COUNTY, MARYLAND

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Candy Kramon 7/22/06
 CHIEF, DIVISION OF LAND DEVELOPMENT
Chris Williams 9/10/06
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

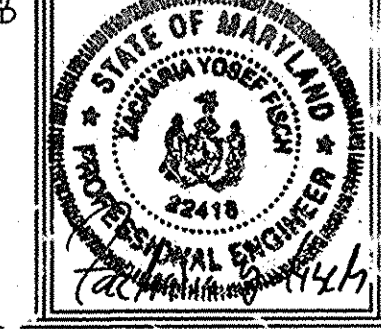
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
William Z. Williams 9-31-06
 CHIEF, BUREAU OF HIGHWAYS

THESE PLANS HAVE BEEN REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.
 THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
 APPROVED: *James L. Newburn* 8/22/06
 HOWARD SOIL CONSERVATION DISTRICT

DEVELOPER'S CERTIFICATE
 I HEREBY CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE IN ACCORDANCE TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE CERTIFICATION OF ATTENDANCE AT DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.
 APPROVED: *James L. Newburn* August 19, 2006
 SIGNATURE OF DEVELOPER

ENGINEER'S CERTIFICATE
 I HEREBY CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A FEASIBLE AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.
 APPROVED: *Zacharia Y. Fisch* 8/10/06
 SIGNATURE OF ENGINEER

DESIGN BY: PS
 DRAWN BY: AT
 CHECKED BY: ZYF
 SCALE: As Shown
 DATE: Aug. 09, 2006
 W.O. No.: 3157
 SHEET No. 4 OF 13



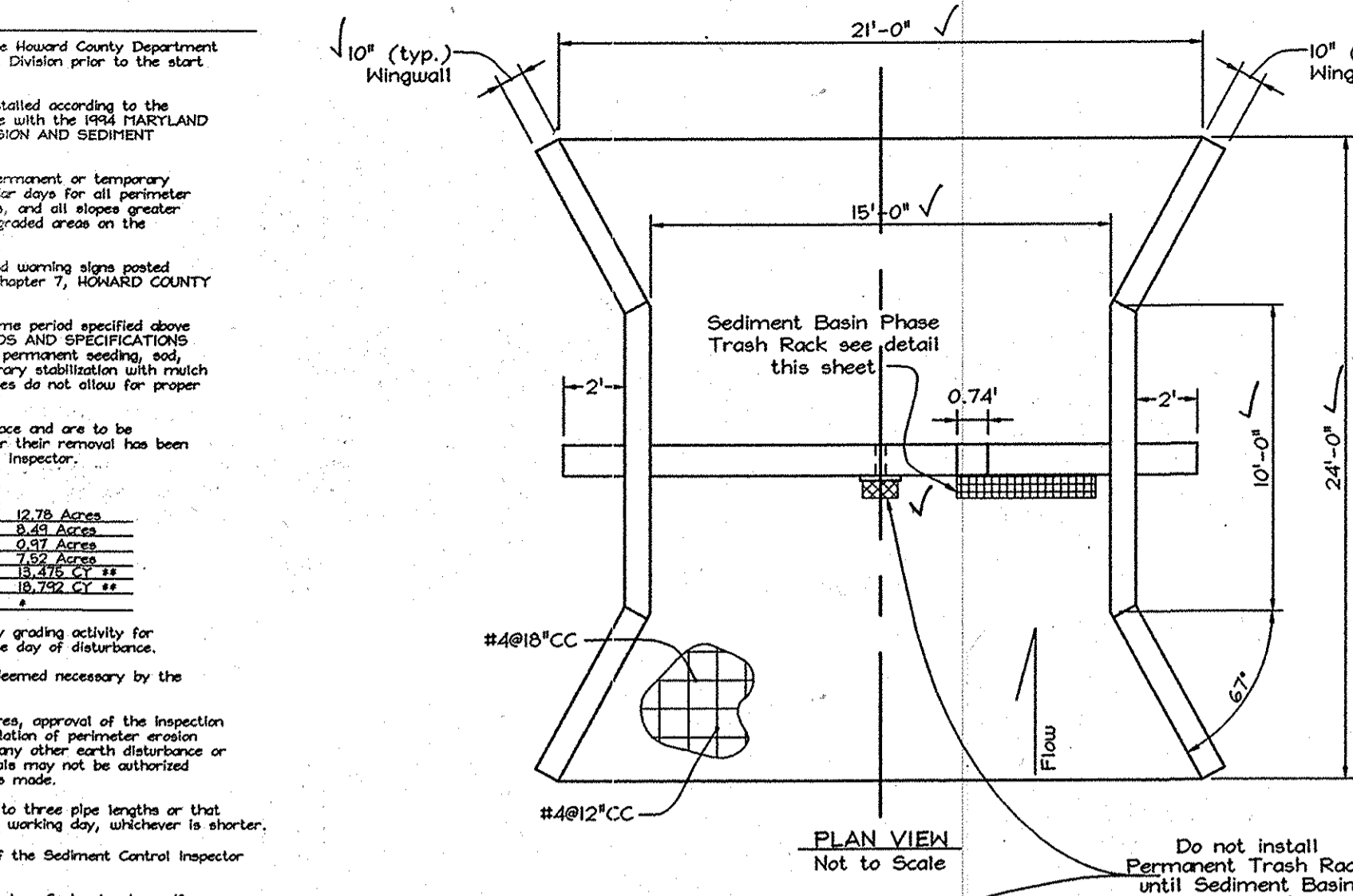
SH Associates
 Engineers Planner - Surveyors
 9 Howard Lane Elkridge, MD 21075
 410-937-6200 • fax 410-936-1562
 info@shassoc.com

2.0 STANDARDS AND SPECIFICATIONS FOR TOPSOIL

Definition: Placement of topsoil over a prepared subsoil prior to establishment of permanent vegetation. Purpose: To provide a suitable soil medium for vegetation growth. Conditions Where Practice Applies: This practice is limited to areas having 21 or flatter slopes...

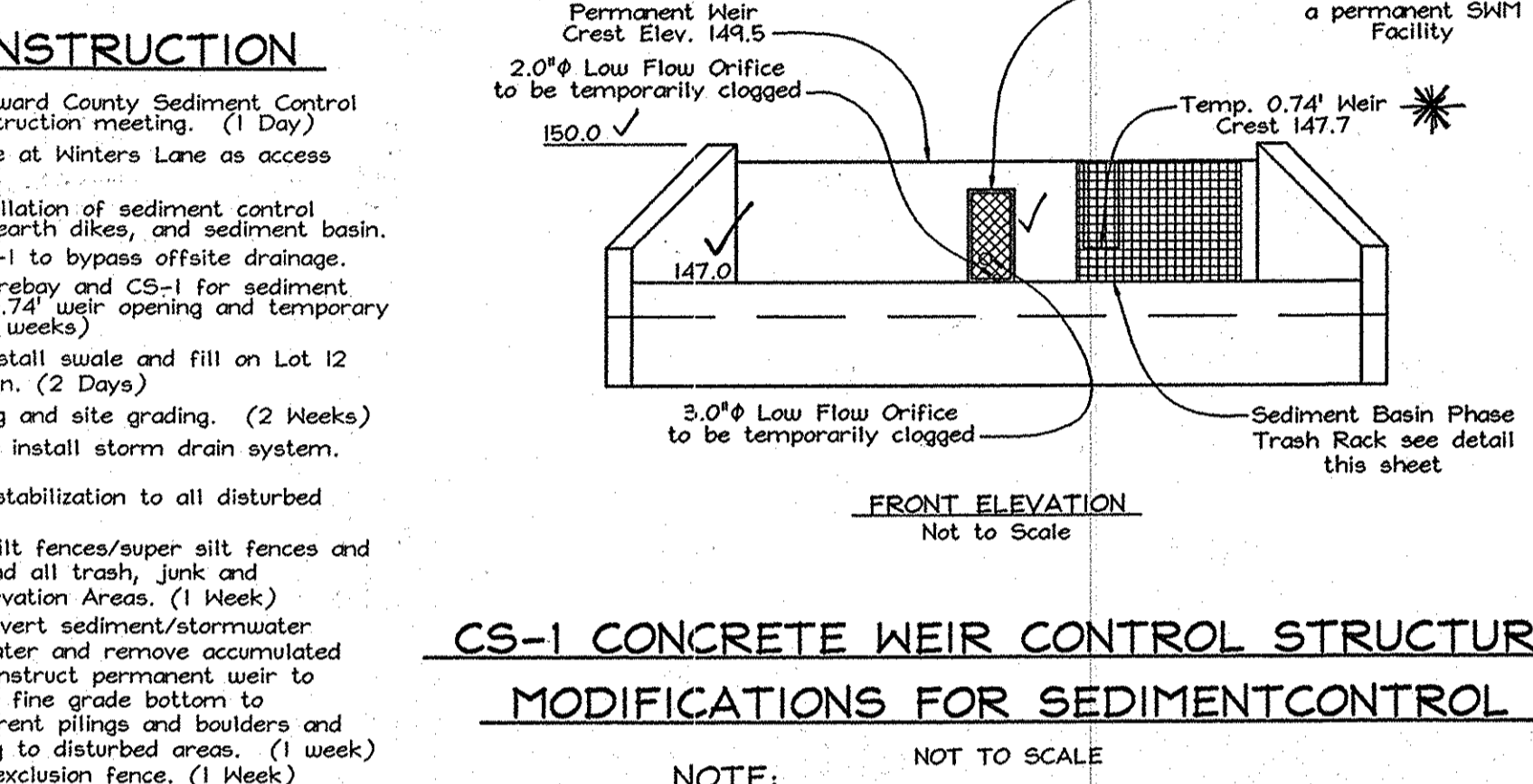
SEDIMENT CONTROL NOTES

- 1. A minimum of 48 hours notice must be given to the Howard County Department of Planning, License and Permit... 2. All vegetation and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the HANCOCK HIGHLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL...



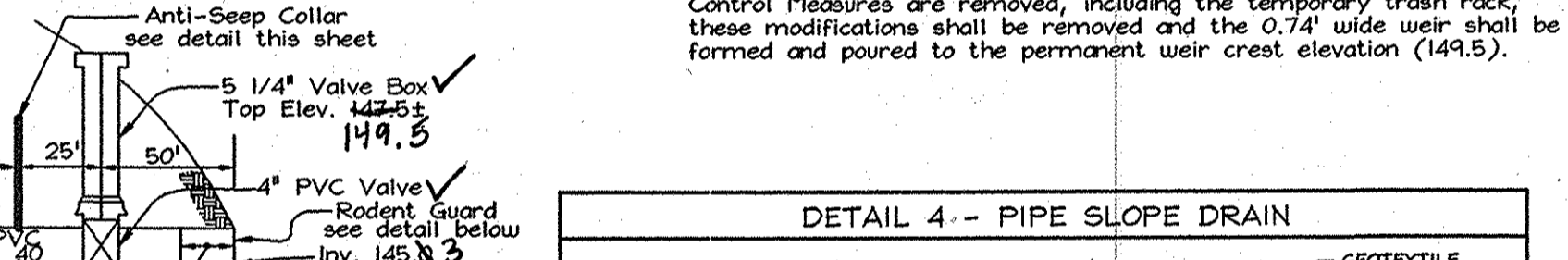
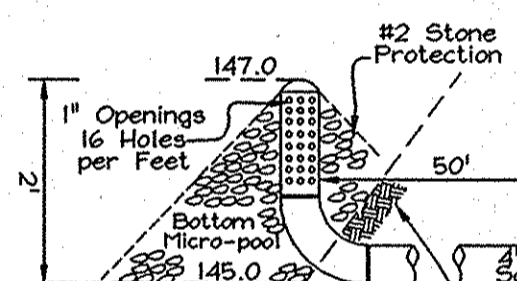
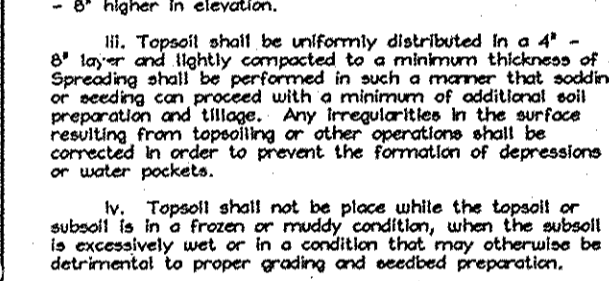
SEQUENCE OF CONSTRUCTION

- 1. Obtain grading permit and contact Howard County Sediment Control Inspector (SCI) to arrange a preconstruction meeting... 2. Install Stabilized Construction Entrance at Winters Lane as access point for construction... 3. Clear and grub as necessary for installation of sediment control features...



CS-1 CONCRETE WEIR CONTROL STRUCTURE MODIFICATIONS FOR SEDIMENT CONTROL

NOTE: Contractor shall form up a 0.74' wide temporary weir notch in the weir wall at crest elevation 147.7, providing a 2' x 2' keyway... Do not install Permanent Trash Rack until Sediment Basin is converted to a permanent SWM Facility.



PERMANENT SEEDING NOTES

APPLY TO GRADED OR CLEAR AREAS NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT VEGETATIVE COVER IS REQUIRED... SEEDING PREPARATION: Loosen upper three inches of soil by raking, disking or other acceptable means before seeding...

RODENT GUARD DETAIL

NOTE: This detail is for use on all pipe diameters. The rodent guard shall be installed on all pipe diameters... Anti-Seep Collar - 1/8" Gum Rubber With Wood Frame.

CONSTRUCTION SPECIFICATIONS PIPE SLOPE DRAIN

1. The Pipe Slope Drain (PSD) shall have a slope of 3 percent or steeper... 2. The top of the earth dike over the inlet pipe shall be at least 2 times the pipe diameter measured at the invert of the pipe.

ANTI-SEEP COLLAR

1. Unroll the Anti-Seep and attach the boards to the edges to form a square... 2. Cut a round hole in the center of the rubber that is larger than the pipe diameter... 3. Push the pipe through the Anti-Seep, install the seal between the pipe and the Anti-Seep, carefully backfill and compact with suitable soil.

TRASH RACK DETAIL

1. Length - minimum of 50' (30' for a single residence lot)... 2. Width - 10' minimum, should be flared at the existing road to provide a turning radius... 3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing aggregate...

SEDIMENT BASIN SCHEDULE (CS-1)

Table with 2 columns: Description and Value. Includes Drainage Area (15.89 Ac), Storage Required (28,602 cu ft), Wet Storage (144.0), and Elevation (149.5).

SEDIMENT AND EROSION CONTROL DETAILS

PHASE I AND II SUMMER HAVEN OPEN SPACE LOT 15 A Resubdivision of Summer Haven Lot 2, Plot #15439 TAX MAP 38, GRID 14, 1ST ELECTION DISTRICT

TRASH RACK DETAIL

1. Trash rack to be centered over opening... 2. Trash rack to conform to ASTM A-36... 3. All surfaces to be coated with ZRC cold galvanizing compound after welding.

SECURING DETAIL SEDIMENT BASIN TRASH RACK

1. Wrap filter & hardware cloth around ends (sides, top & bottom) & secure sides between grade & washer... 2. Weld grate to 1/4" x 4" steel grate & secure steel to conc. with 1/2" galvanized bolt & washer, 2 each side.

SEDIMENT AND EROSION CONTROL DETAILS

PHASE I AND II SUMMER HAVEN OPEN SPACE LOT 15 A Resubdivision of Summer Haven Lot 2, Plot #15439 TAX MAP 38, GRID 14, 1ST ELECTION DISTRICT

SEDIMENT AND EROSION CONTROL DETAILS

PHASE I AND II SUMMER HAVEN OPEN SPACE LOT 15 A Resubdivision of Summer Haven Lot 2, Plot #15439 TAX MAP 38, GRID 14, 1ST ELECTION DISTRICT

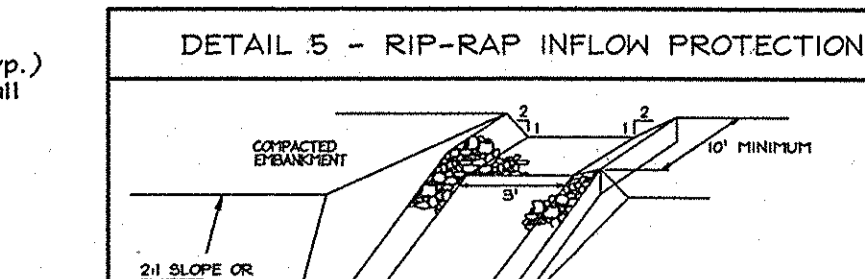
SEDIMENT AND EROSION CONTROL DETAILS

PHASE I AND II SUMMER HAVEN OPEN SPACE LOT 15 A Resubdivision of Summer Haven Lot 2, Plot #15439 TAX MAP 38, GRID 14, 1ST ELECTION DISTRICT

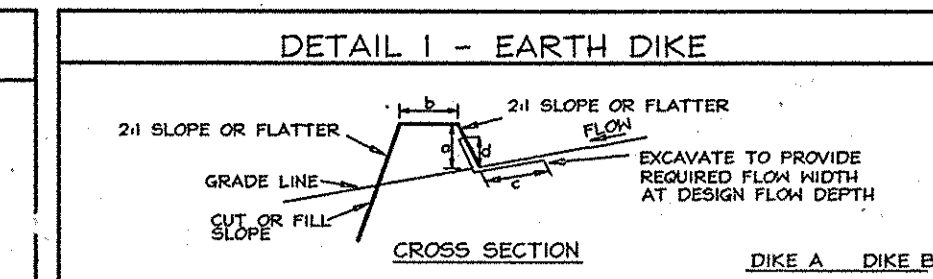
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING. Chief, Division of Land Development. Date: 7/22/14.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS. Chief, Bureau of Highways. Date: 7/22/14.

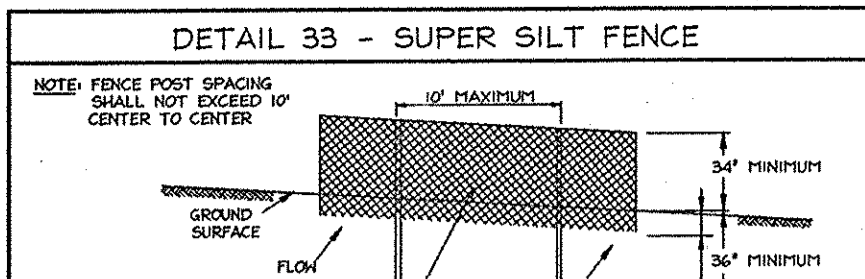
USDA-NATURAL RESOURCES CONSERVATION SERVICE. THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.



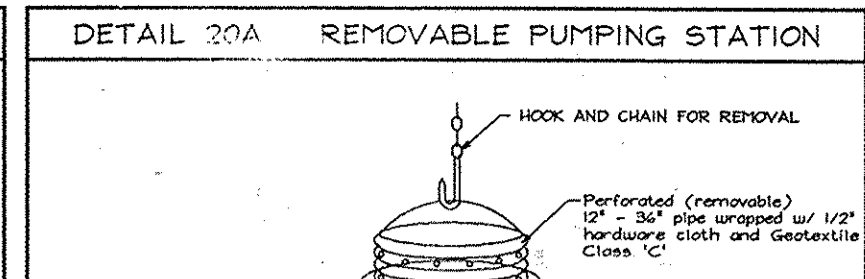
1. Rip-rap lined inflow channels shall be 1' in depth, have a trapezoidal cross section with 2:1 or flatter side slopes and 2' (min.) bottom width... 2. Filter cloth shall be installed under all rip-rap. Filter cloth shall be Geotextile Class C.



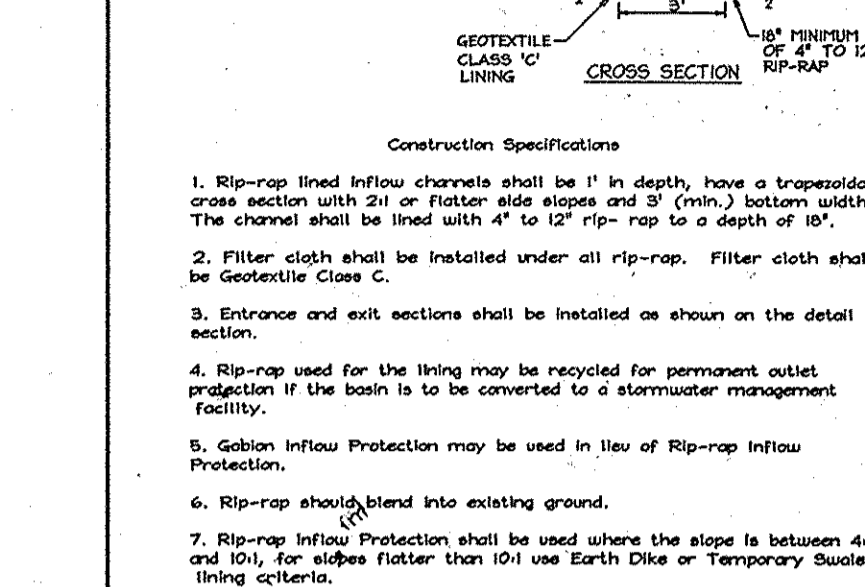
1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%... 2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.



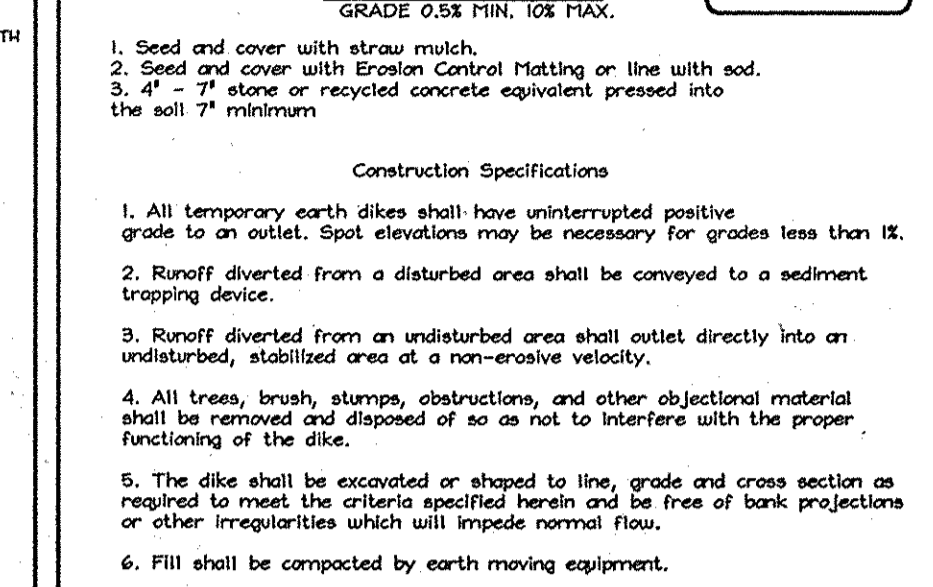
1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing... 2. Chain link fence shall be fastened securely to the fence posts with wire ties.



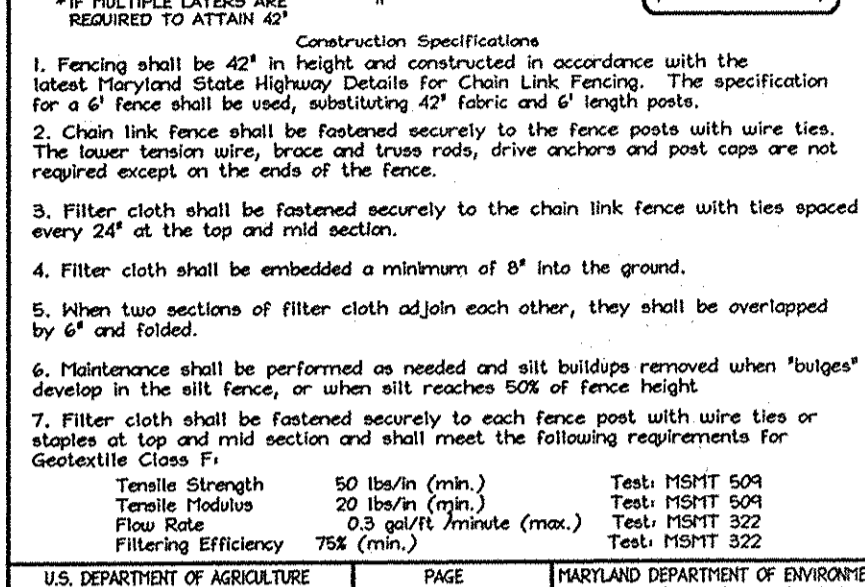
1. The outer pipe should be 40" dia. or shall, in any case, be at least 4" greater than the inner pipe... 2. After installing the outer pipe, backfill around outer pipe with 2" aggregate of gravel.



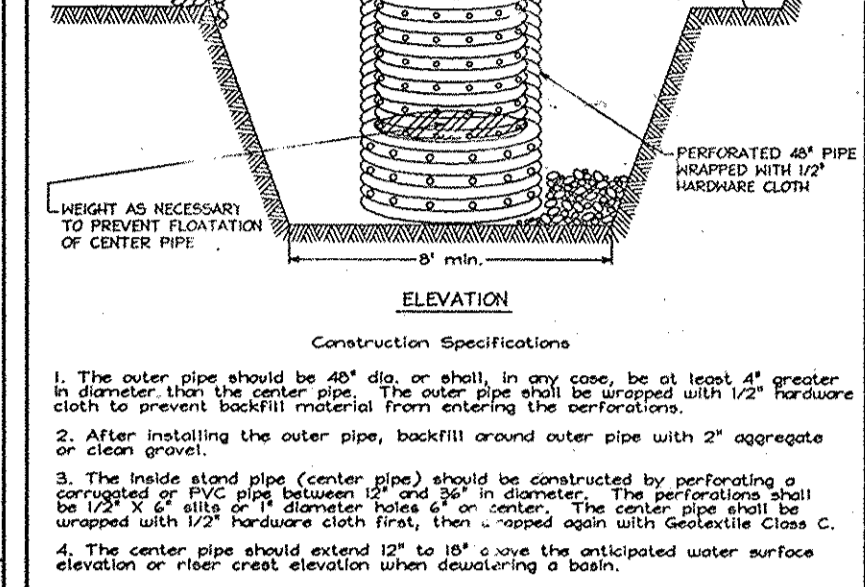
1. Rip-rap should extend into existing ground... 2. Rip-rap protection shall be used where the slope is between 4:1 and 10:1, for slopes flatter than 10:1 use Earth Dike or Temporary Stone Lining criteria.



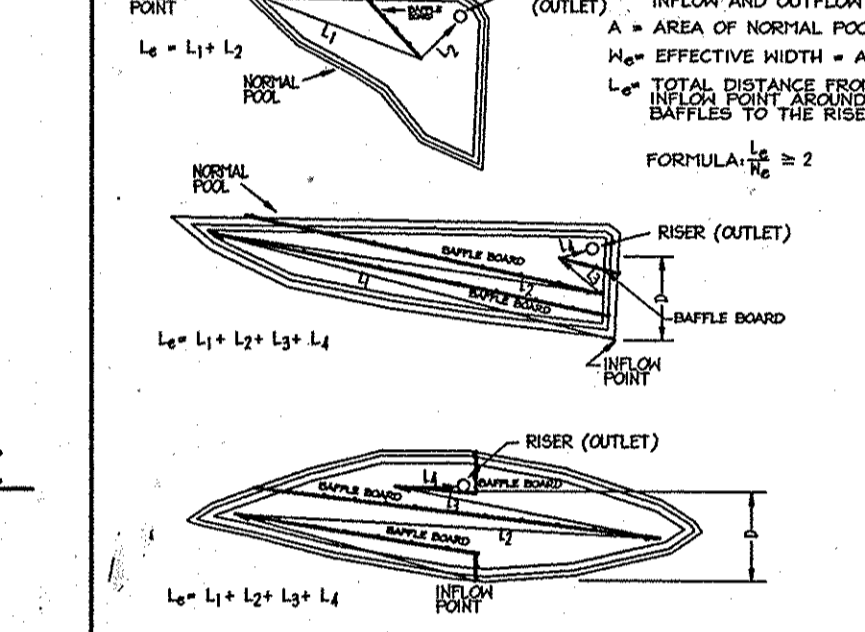
1. Length - minimum of 50' (30' for a single residence lot)... 2. Width - 10' minimum, should be flared at the existing road to provide a turning radius... 3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing aggregate.



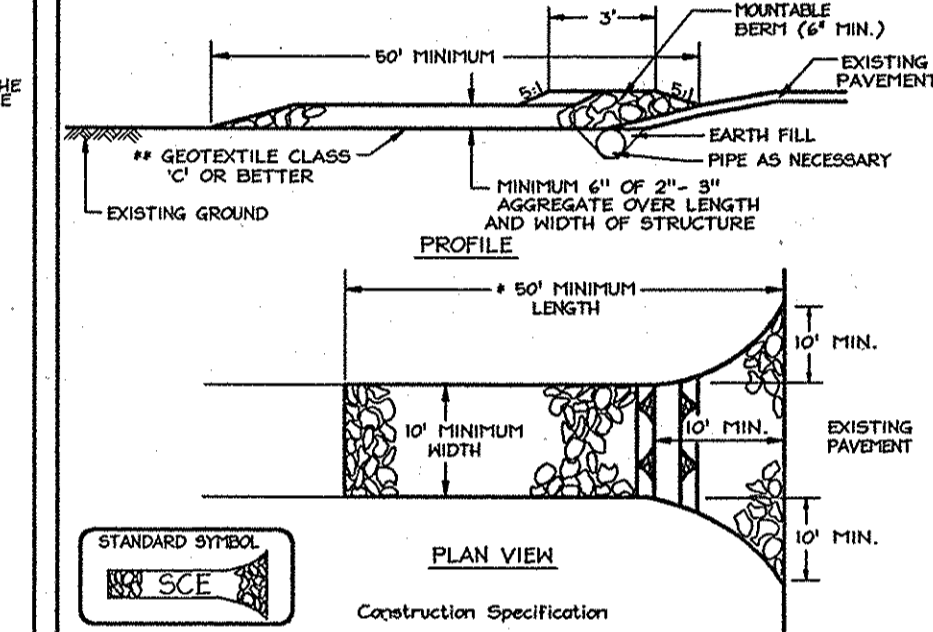
1. Fence posts shall be a minimum 3/4" diameter 16' minimum into the ground... 2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F.



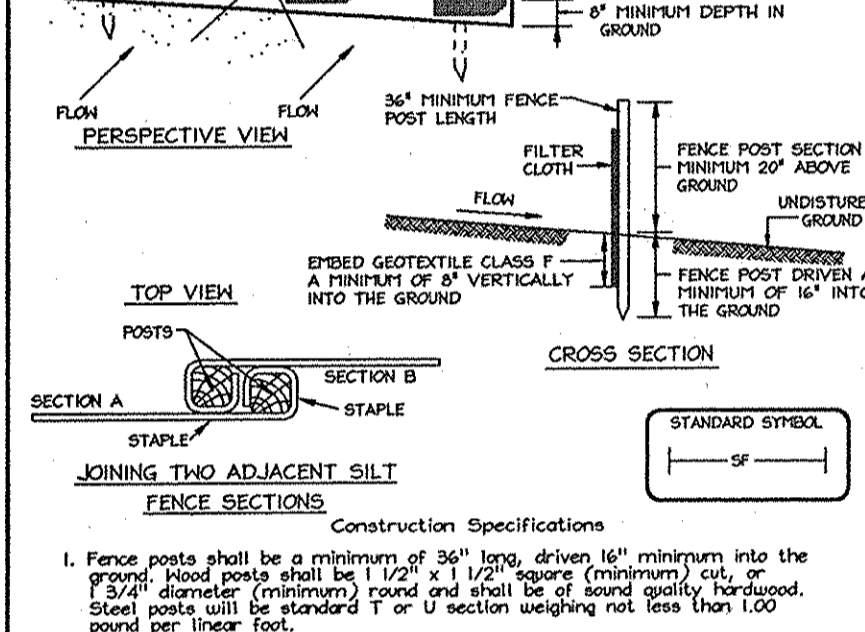
1. Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth... 2. Staple the matting to the subgrade using 16" staples between staples.



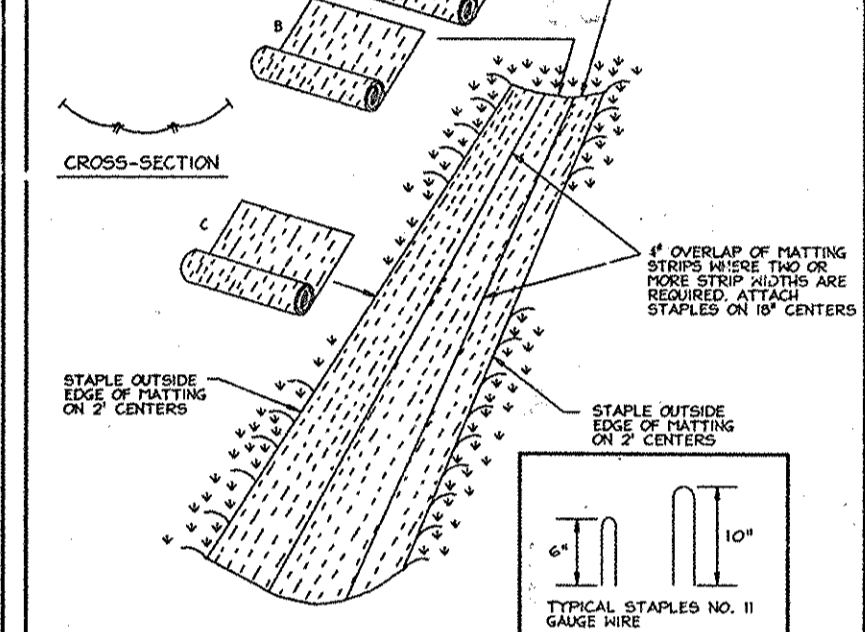
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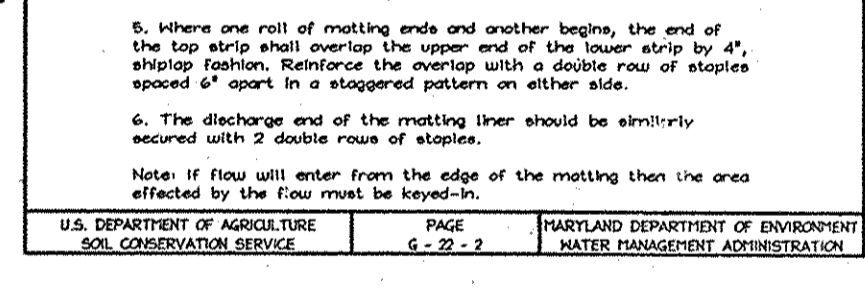
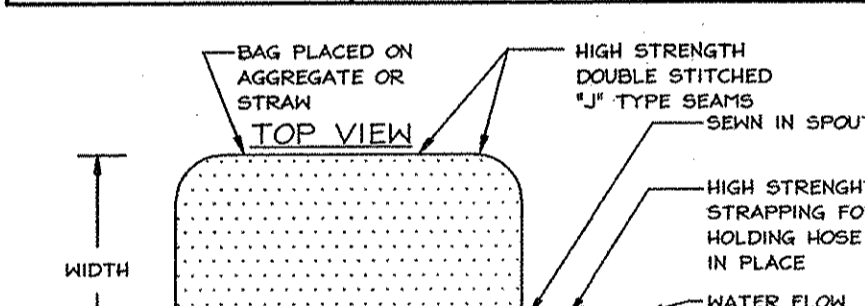
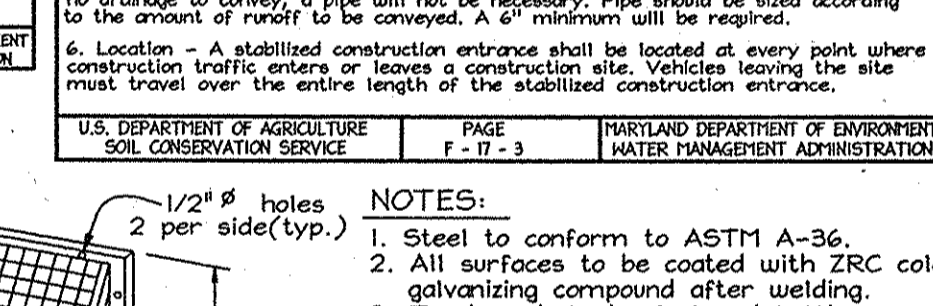
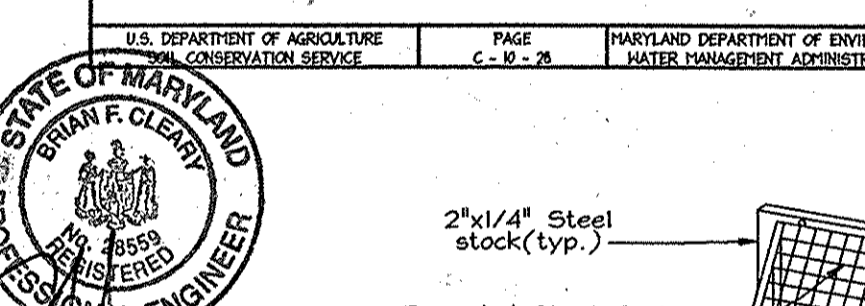
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CONSTRUCTION SPECIFICATIONS PIPE SLOPE DRAIN

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TRASH RACK DETAIL

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SEDIMENT BASIN SCHEDULE (CS-1)

Table with 2 columns: Description and Value. Includes Drainage Area (15.89 Ac), Storage Required (28,602 cu ft), Wet Storage (144.0), and Elevation (149.5).

SEDIMENT AND EROSION CONTROL DETAILS

PHASE I AND II SUMMER HAVEN OPEN SPACE LOT 15 A Resubdivision of Summer Haven Lot 2, Plot #15439 TAX MAP 38, GRID 14, 1ST ELECTION DISTRICT

SEDIMENT AND EROSION CONTROL DETAILS

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SEDIMENT AND EROSION CONTROL DETAILS

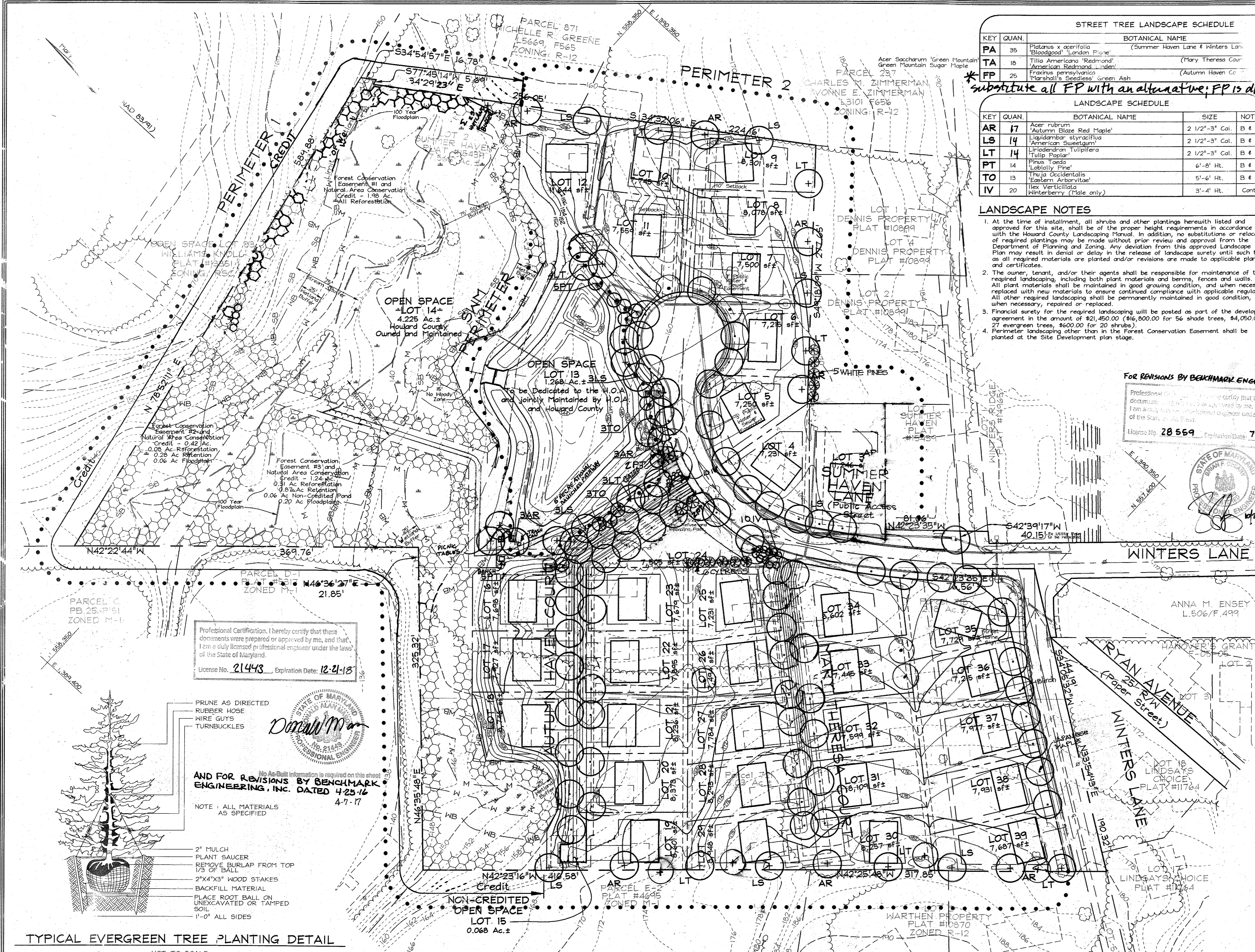
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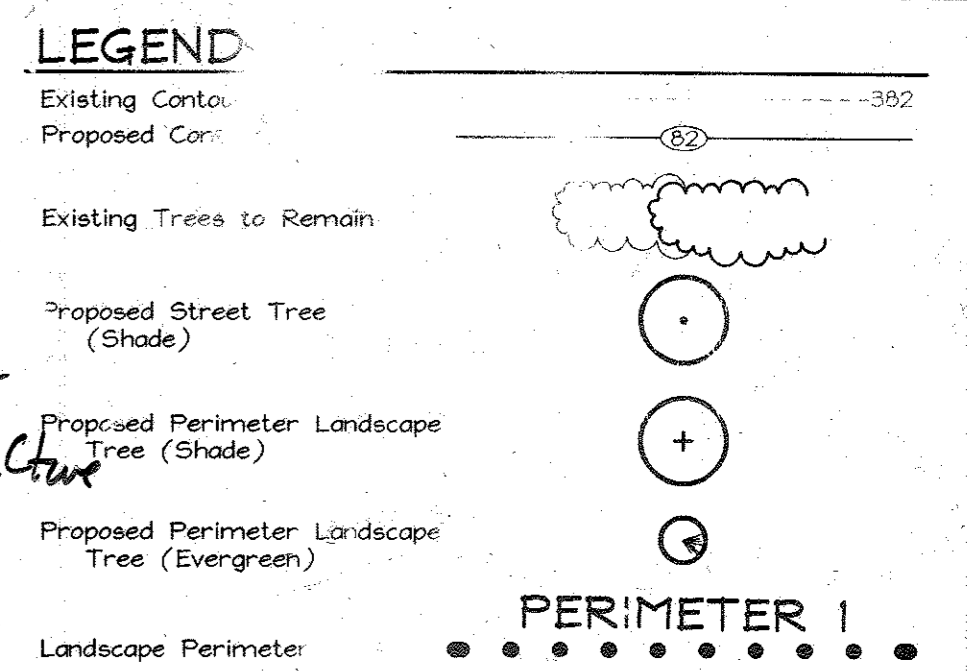
STREET TREE LANDSCAPE SCHEDULE

KEY	QUAN.	BOTANICAL NAME	SIZE	NOTE
PA	35	Platanus x acerifolia (London Plane)	(Summer Haven Lane & Winters Lane)	Cal. B & B
TA	18	Tilia Americana 'Redmond' (Mary Theresa Court)		Cal. B & B
FP	25	Fraxinus pennsylvanica (American Redwood)	(Autumn Haven Court)	Cal. B & B

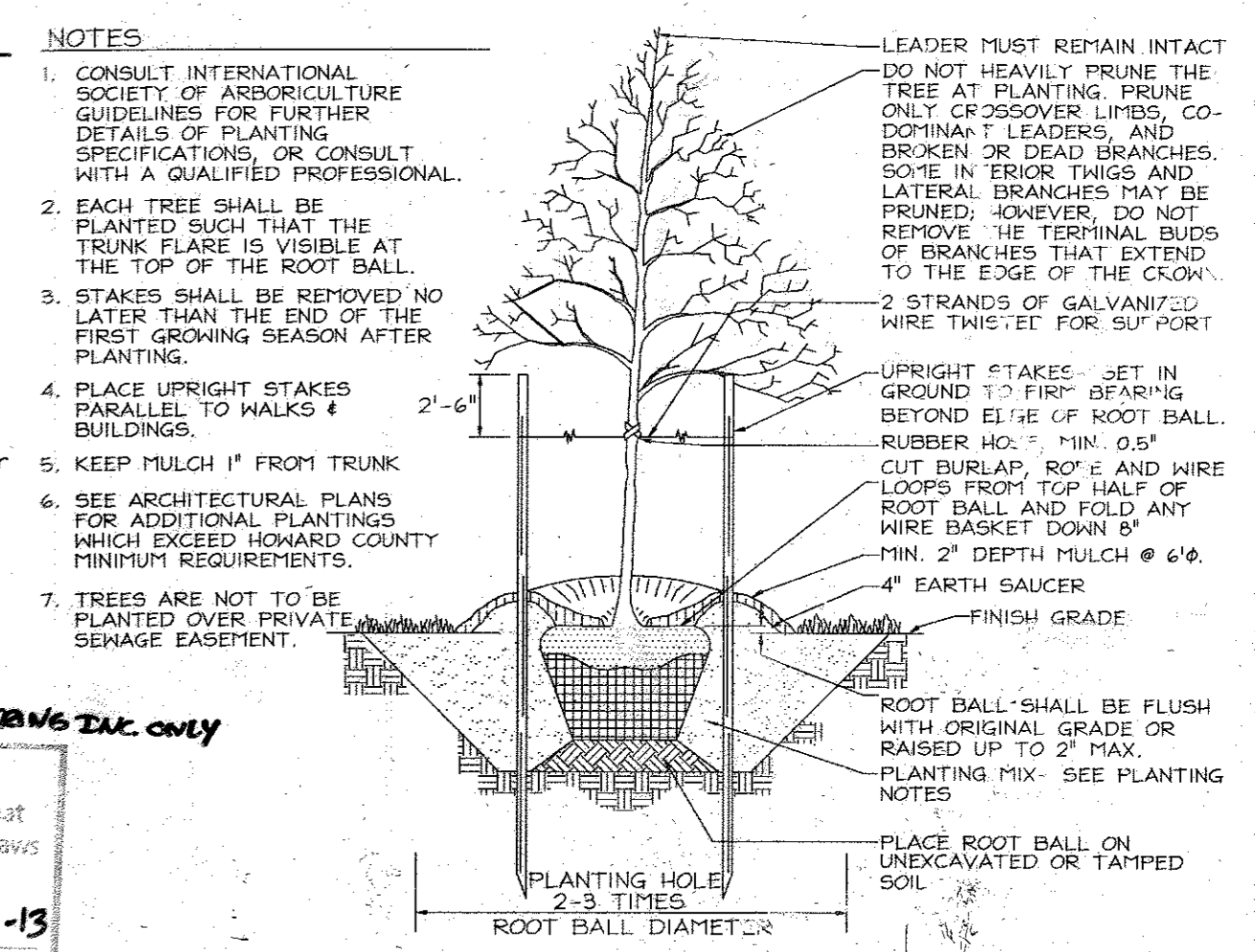
** substitute all FP with an alternative; FP is diseased at this time; do not use tree's attractive to larvae per MAA*

LANDSCAPE SCHEDULE

KEY	QUAN.	BOTANICAL NAME	SIZE	NOTE
AR	17	Acer rubrum 'Autumn Blaze Red Maple'	2 1/2"-3" Cal.	B & B
LS	14	Liquidambar styraciflua 'American Sweetgum'	2 1/2"-3" Cal.	B & B
LT	14	Liriodendron tulipifera 'Tulip Poplar'	2 1/2"-3" Cal.	B & B
PT	14	Pinus taeda 'Loblolly Pine'	6'-8' Ht.	B & B
TO	13	Thuja occidentalis 'Eastern Arborvitae'	5'-6' Ht.	B & B
IV	20	Ilex verticillata (Winterberry - male only)	3'-4' Ht.	Cont.



- LANDSCAPE NOTES**
- At the time of installation, all shrubs and other plantings hereunto listed and approved for this site shall be of the proper height requirements in accordance with the Howard County Landscaping Manual. In addition, no substitutions or relocation of required plantings may be made without prior review and approval from the Department of Planning and Zoning. Any deviation from this approved Landscape Plan may result in denial or delay in the release of landscape surety until such time as all required materials are planted and/or revisions are made to applicable plans and certificates.
 - The owner, tenant, and/or their agents shall be responsible for maintenance of the required landscaping, including both plant materials and berms, fences and walls. All plant materials shall be maintained in good growing condition, and when necessary, replaced with new materials to ensure continued compliance with applicable regulations. All other required landscaping shall be permanently maintained in good condition, and when necessary, repaired or replaced.
 - Financial surety for the required landscaping will be posted as part of the developer's agreement in the amount of \$21,450.00 (\$16,800.00 for 56 shade trees, \$4,650.00 for 27 evergreen trees & \$600.00 for 20 shrubs).
 - Perimeter landscaping other than in the Forest Conservation Easement shall be planted at the Site Development plan stage.



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

SCHEDULE A PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO ROADWAYS	ADJACENT TO PERIMETER PROPERTIES
Perimeter/Frontage Designation	A	A
Linear Feet of Roadway	2,183	817
Frontage/Perimeter (Yes, No, Linear Feet)	Yes	No
Credit for Existing Vegetation (Yes, No, Linear Feet)	1,023	-
Remaining Perimeter Length (Yes, No, Linear Feet)	560	-
Number of Plants Required		
Shade Trees	160	9
Evergreen Trees	160	14
Shrubs	-	-
Number of Plants Provided		
Shade Trees	9	14
Evergreen Trees	-	-
Other Trees (2:1 Substitution)	-	-
Shrubs (10:1 Substitution)	-	-
(Describe Plant Substitution Credits Below if needed)	-	-

* Existing woods to remain

SCHEDULE D STORMWATER MANAGEMENT AREA LANDSCAPING

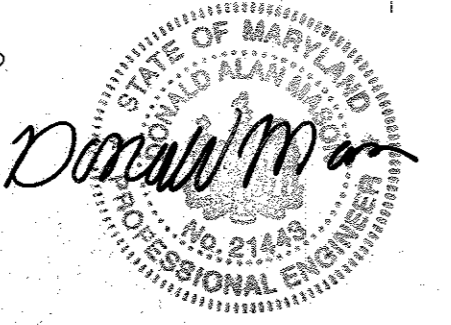
Linear Feet of Perimeter	1,094 LF
Credit for Existing Vegetation (No, Yes and Linear Feet)	No
Credit for other Landscaping (No, Yes and %)	N/A
Number of Trees Required	
Shade Trees (1:50)	22 Shade Trees
Evergreen Trees (1:40)	27 Evergreen Trees
Number of Trees Provided	
Shade Trees (1:50)	22 Shade Trees
Evergreen Trees (1:40)	27 Evergreen Trees
Other Trees (2:1 Substitution)	0 Trees (0 Substitution Trees)

STREET TREE SCHEDULE

STREET NAME	LF REQUIRED	TREES REQUIRED	PROVIDED
Summer Haven Lane	1,067	27	27
Mary Theresa Court	700	18	18
Autumn Haven Court	980	25	25
Winters Lane	337	8	8

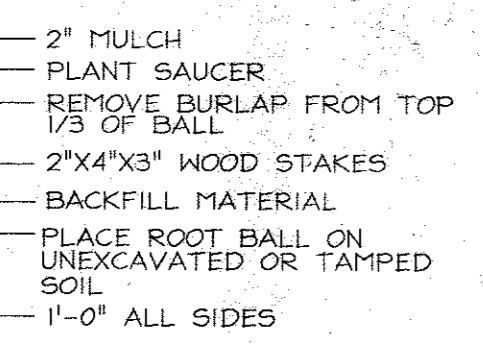
* SEE PLAN VIEW FOR TREES PLANTED

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: 12-11-18



AND FOR REVISIONS BY BENCHMARK ENGINEERING, INC. DATED 4-25-16

NOTE: ALL MATERIALS AS SPECIFIED



TYPICAL EVERGREEN TREE PLANTING DETAIL
NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[Signature] 9/16/16
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

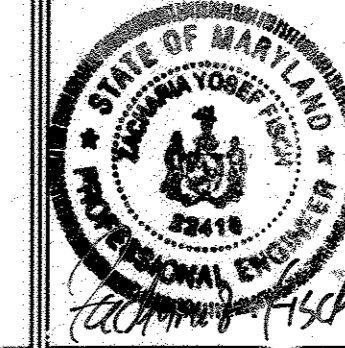
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
[Signature] 8/31/16
CHIEF, BUREAU OF HIGHWAYS DATE

DEVELOPER'S BUILDER'S CERTIFICATE
I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE(1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.
[Signature] August 10, '16
SIGNATURE OF DEVELOPER DATE

Note: For All Existing Features, See Existing Conditions Plan Sheet II

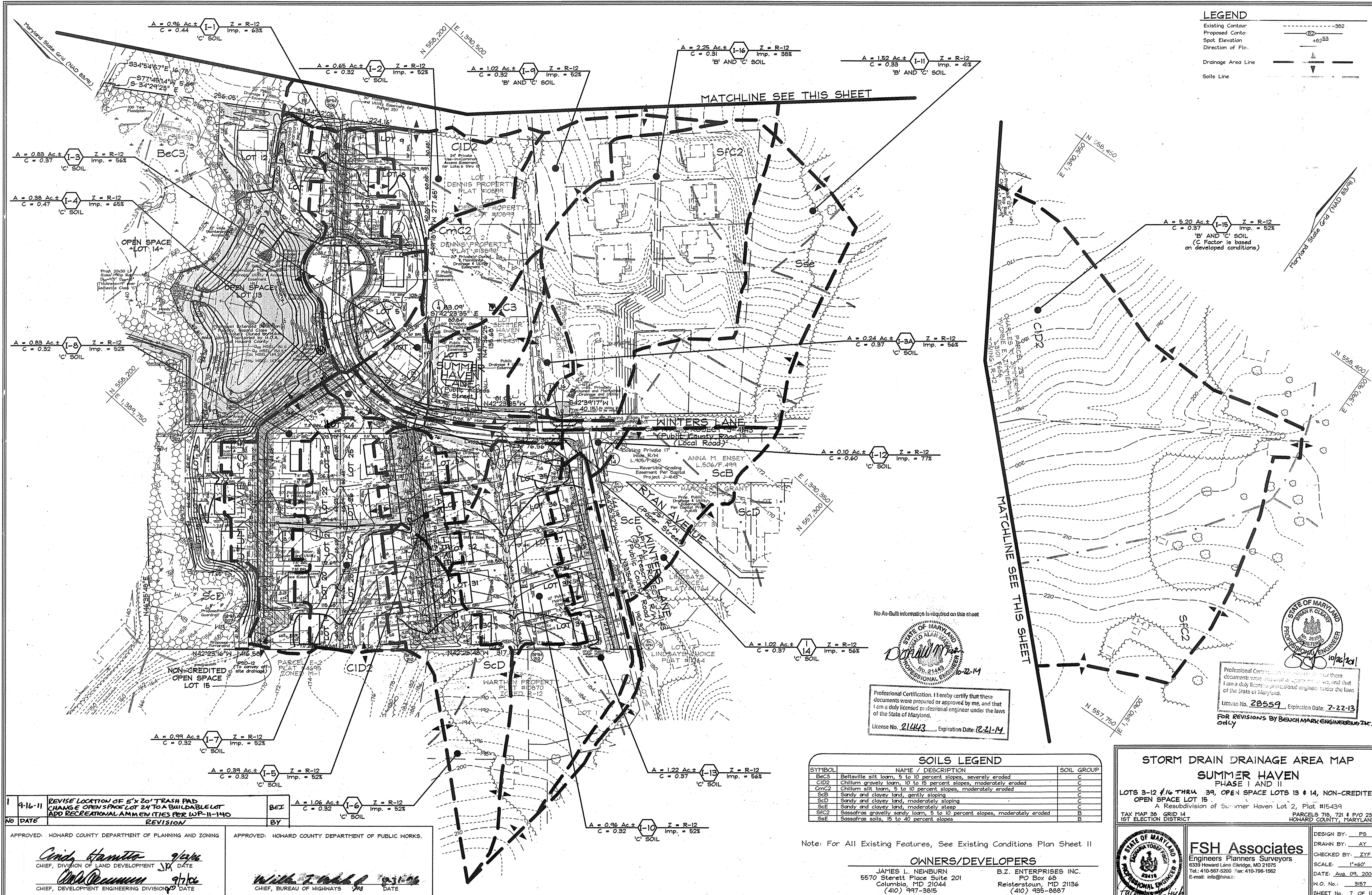
NO.	DATE	REVISION	BY
4	4-7-17	UPDATE TREES PER AS-PLANTED MARKED PLAN	BET
3	4-25-16	REMOVE PROPOSED PERIMETER LANDSCAPING WITHIN FOREST CONSERVATION AREA Q.5 LOT 14	BET
2	7-16-11	ADD RECREATIONAL AMENITIES PER WP-1100 CHANGE ORDERS PER 154 TO A DRAINAGE LOT	BET
1	9-7-10	REMOVE SIDEWALK IN FRONT OF LOT 1	BET

OWNERS/DEVELOPERS
JAMES L. NEWBURN
5570 Sterett Place Suite 201
Columbia, MD 21044
(410) 997-3815
B.Z. ENTERPRISES INC.
PO Box 68
Reisterstown, MD 21136
(410) 935-8867



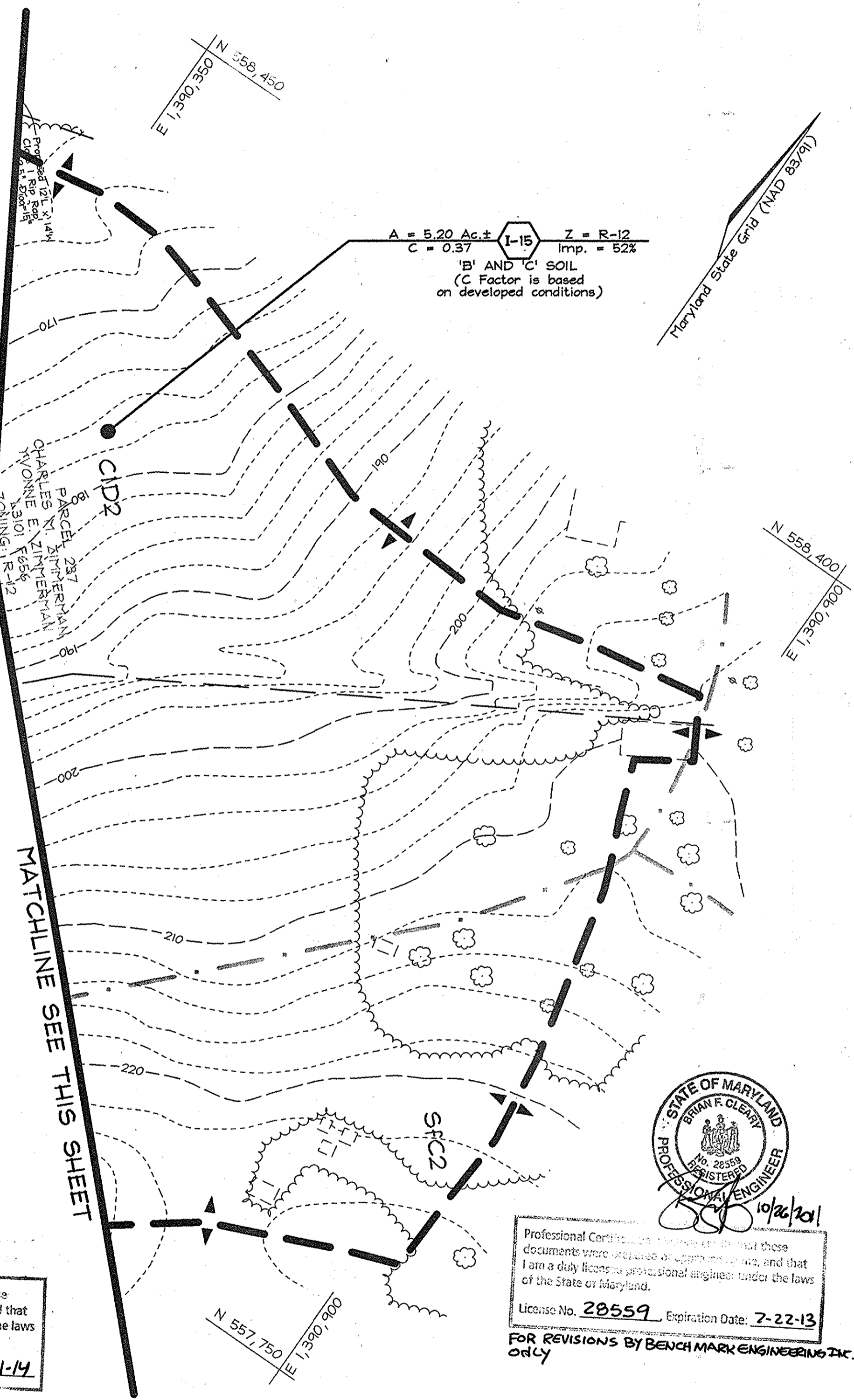
FSH Associates
Engineers
8330 Howard Lane
Tel: 410-567-5200
E-mail: info@fsha.com
DESIGN BY: PS
DRAWN BY: AT
CHECKED BY: ZYF
SCALE: 1"=50'
DATE: Aug. 09, 2008
W.D. No. 3:57
SHEET NO. 6 OF 13

LANDSCAPE PLAN, NOTES AND DETAILS
SUMMER HAVEN
PHASE I AND II
LOTS 3-12 & 16 THRU 39, OPEN SPACE LOTS 13 & 14, NON-CREDITED OPEN SPACE LOT 15
TAX MAP 38 GRID 13 PARCELS 718, 721 & P/O 218
1ST ELECTION DISTRICT: PARCELS 718, 721 & P/O 218 HOWARD COUNTY, MARYLAND



LEGEND

Existing Contour	---	382
Proposed Contour	---	+82.53
Spot Elevation	•	
Direction of Flow	→	
Drainage Area Line	---	
Soils Line	---	



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: 12-21-14



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. 20559, Expiration Date: 7-22-13
 FOR REVISIONS BY BENCH MARK ENGINEERS INC. ONLY

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	SOIL GROUP
BeC3	Beltville silt loam, 5 to 10 percent slopes, severely eroded	C
CID2	Chillum gravelly loam, 10 to 15 percent slopes, moderately eroded	C
CmC2	Chillum silt loam, 5 to 10 percent slopes, moderately eroded	C
ScB	Sandy and clayey loam, gently sloping	C
ScD	Sandy and clayey loam, moderately sloping	C
Ssc	Sandy and clayey land, moderately steep	C
SFC2	Sassafras gravelly sandy loam, 5 to 10 percent slopes, moderately eroded	B
SsE	Sassafras soils, 15 to 40 percent slopes	B

STORM DRAIN DRAINAGE AREA MAP
SUMMER HAVEN
 PHASE I AND II
 LOTS 3-12 & 16 THRU 39, OPEN SPACE LOTS 13 & 14, NON-CREDITED OPEN SPACE LOT 15
 A Resubdivision of Summer Haven Lot 2, Plat #15439
 TAX MAP 38 GRID 14 1ST ELECTION DISTRICT
 PARCELS 710, 721 & P/O 233 HOWARD COUNTY, MARYLAND

1	9-16-11	REVISE LOCATION OF 5'x20' TRASH PAD CHANGE OPEN SPACE LOT 2 TO A BUILDABLE LOT ADD RECREATIONAL AMENITIES PER WP-11-140	BEI
No	DATE	REVISION	BY

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Chris Hamstra 9/16/11
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
William J. [Name] 9/16/11
 CHIEF, BUREAU OF HIGHWAYS
 DATE

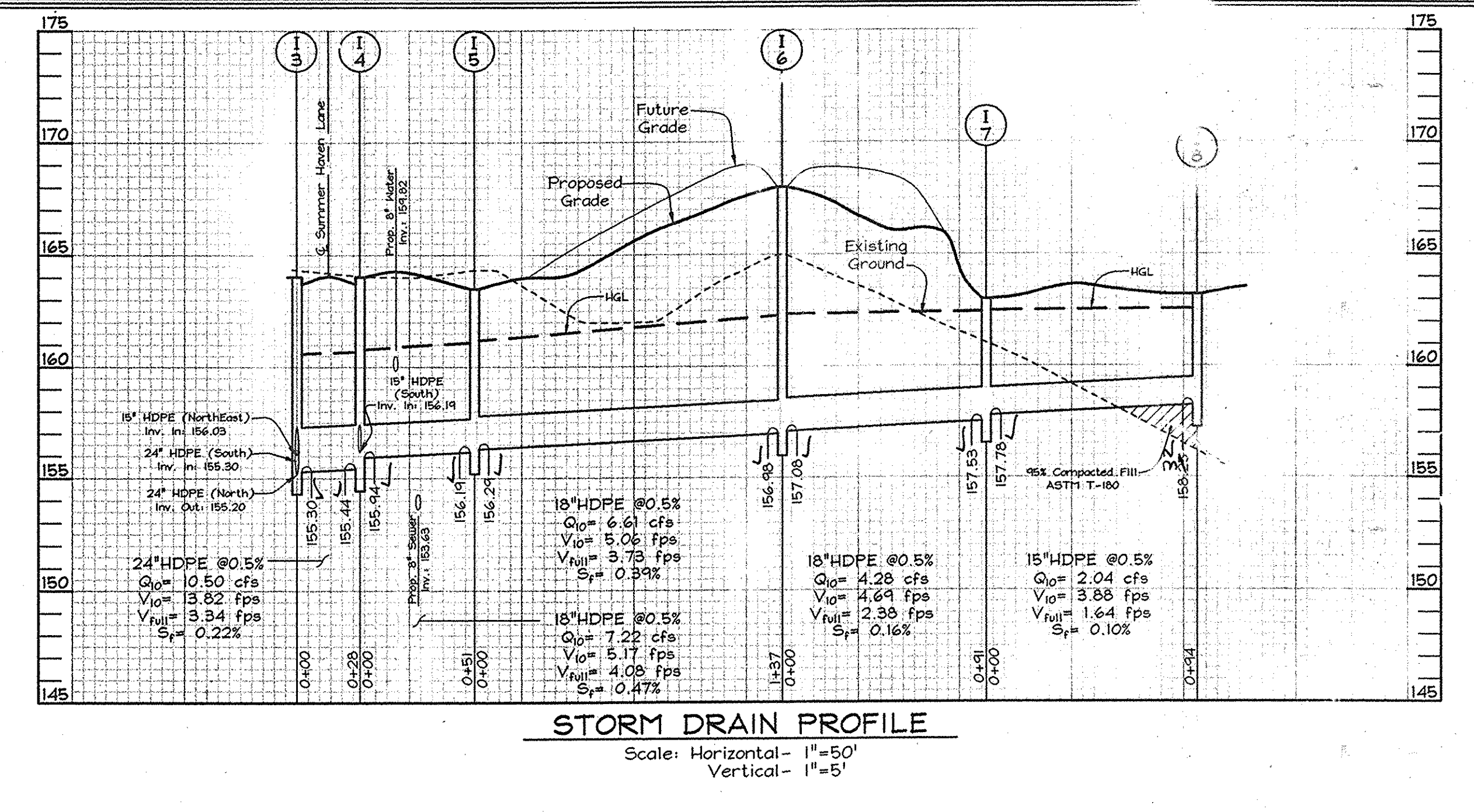
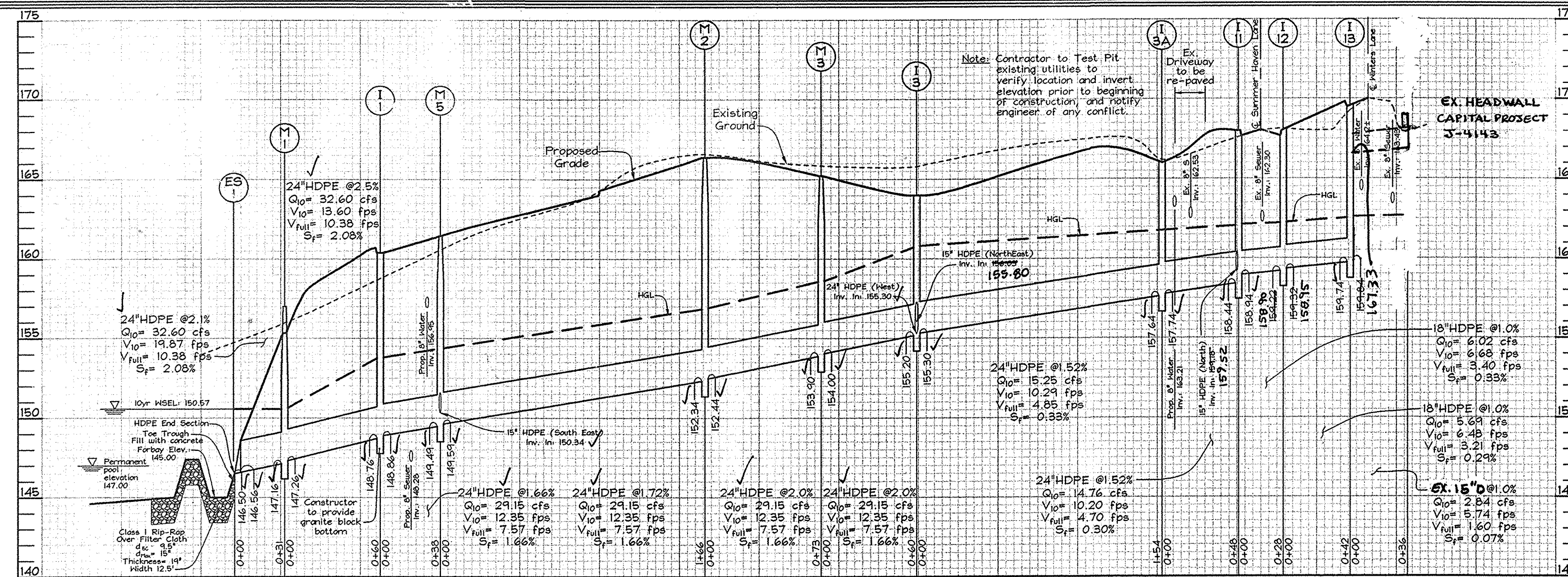
Note: For All Existing Features, See Existing Conditions Plan Sheet II

OWNERS/DEVELOPERS

JAMES L. NEWBURN 5570 Sterett Place Suite 201 Columbia, MD 21044 (410) 997-3815	B.Z. ENTERPRISES INC. PO Box 68 Reisterstown, MD 21136 (410) 935-8887
--	--

FSH Associates
 Engineers Planners Surveyors
 6399 Howard Lane Elkridge, MD 21075
 Tel: 410-567-5200 Fax: 410-796-1562
 E-mail: info@fsna.biz

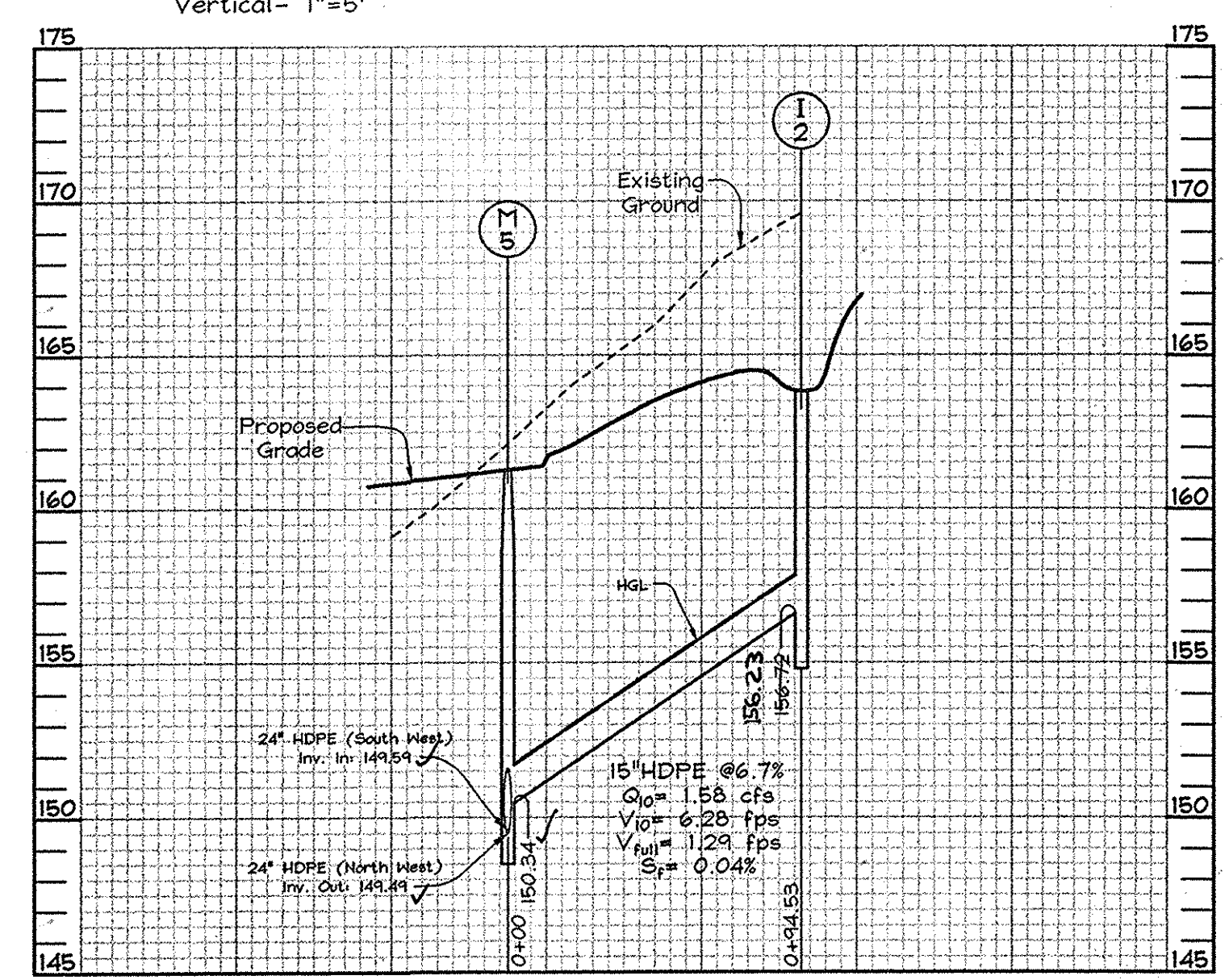
DESIGN BY: PS
 DRAWN BY: AY
 CHECKED BY: ZYF
 SCALE: 1"=60'
 DATE: Aug. 09, 2006
 S.H. No.: 3157
 SHEET No. 7 OF 13



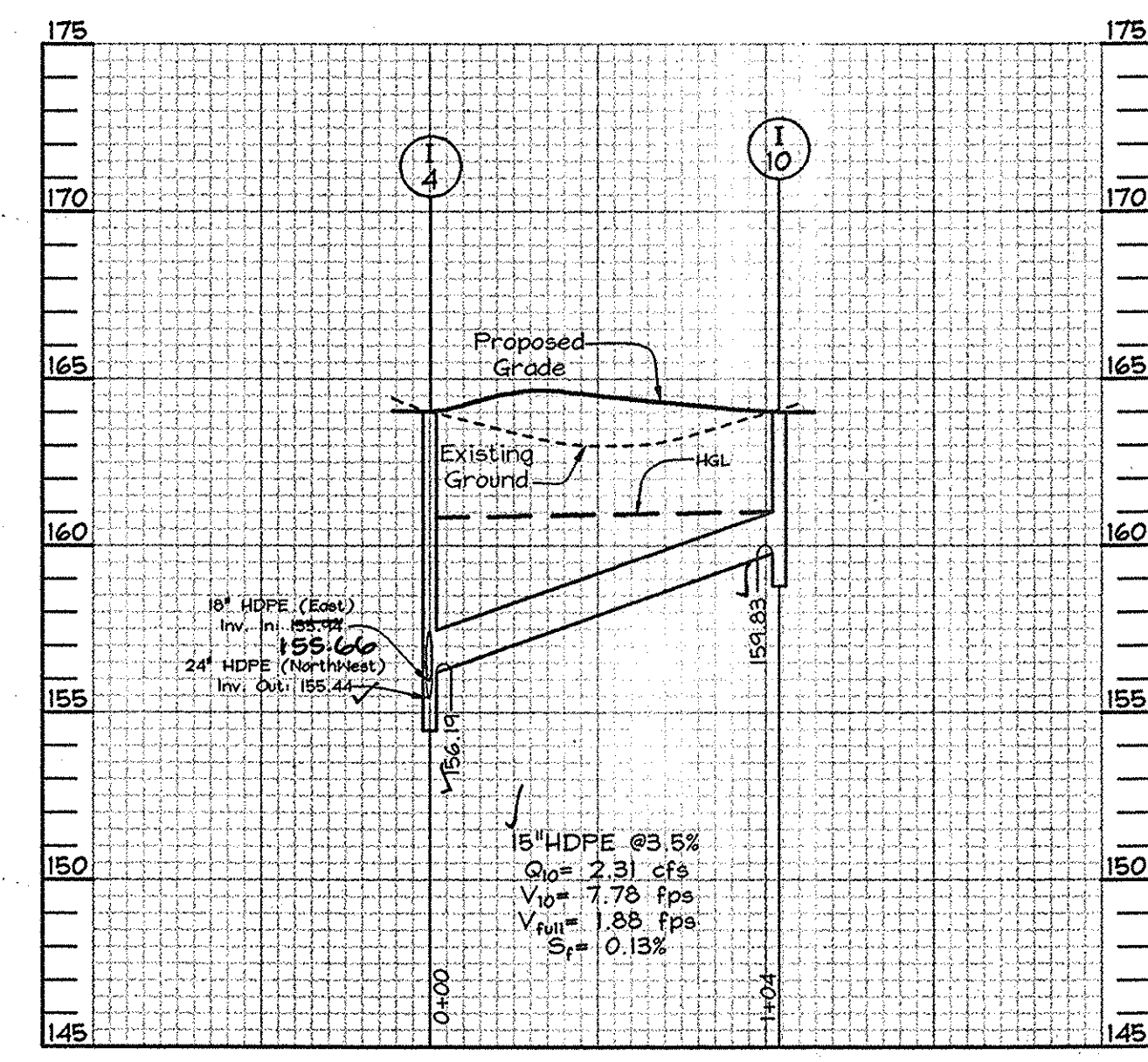
STORM DRAIN PROFILE
 Scale: Horizontal - 1"=50'
 Vertical - 1"=5'

NO.	TYPE	LOCATION	TOP ELEV.	INV. IN	INV. OUT	REMARKS
I-1	Single Type 'S' Inlet	Summer Haven Linear Profile Sta. 1+25.88 @ Curb	160.83	148.06	148.76	SD 4.22
I-2	Single Type 'S' Inlet	N 558,025.04 E 1,390,219.17	162.94	156.80	156.72	SD 4.22
I-3	'A-5' Precast Inlet	Summer Haven Lane Sta. 13+31.32 12' Right	164.26	155.30	155.20	SD 4.01
I-3A	Single Type 'S' Inlet	Summer Haven Lane Sta. 11+73.78 26.79' Right	164.26	157.74	157.64	SD 4.22
I-4	'A-5' Precast Inlet	Summer Haven Lane Sta. 13+31.32 12' Left	164.26	155.30	155.44	SD 4.01
I-5	Single Type 'S' Inlet	N 557,856.09 E 1,389,990.60	163.32	156.29	156.19	SD 4.22
I-6	Single Type 'S' Inlet	N 557,751.84 E 1,389,901.23	163.84	157.08	156.98	SD 4.22
I-7	Single Type 'S' Inlet	N 557,816.69 E 1,389,836.86	162.71	157.78	157.53	SD 4.22
I-8	Single Type 'S' Inlet	N 557,889.45 E 1,389,777.61	162.87	158.25	158.25	SD 4.22
I-9	Single Type 'S' Inlet	N 557,921.18 E 1,390,155.12	160.88	159.53	159.46	SD 4.22
I-10	Single Type 'S' Inlet	N 557,728.09 E 1,390,078.83	163.80	159.52	159.33	SD 4.22
I-11	'A-10' Precast Inlet	Summer Haven Lane Sta. 11+26.15 12.00' Right	168.58	158.30	158.44	SD 4.02
I-12	'A-5' Precast Inlet	Summer Haven Lane Sta. 11+26.15 12.00' Left	168.58	158.30	158.39	SD 4.01
I-13	Double Type 'S' Inlet	Winters Lane Sta. 0+40.83 8.90' Right	168.93	159.04	159.74	SD 4.23
I-15	Single Type 'S' Inlet	N 558,297.21 E 1,390,234.13	156.50	-	152.61	SD 4.22
I-16	Single Type 'S' Inlet	N 557,688.93 E 1,390,188.18	166.30	-	159.33	SD 4.22
M-1	Precast Manhole (4')	N 558,178.70 E 1,390,109.29	150.62	147.20	147.16	G 5.12
M-2	Precast Manhole (4')	N 557,970.20 E 1,390,045.44	168.93	152.44	152.34	G 5.12
M-3	Precast Manhole (4')	N 557,897.21 E 1,390,038.27	164.97	154.00	153.90	G 5.12
M-4	Precast Manhole (4')	N 558,234.08 E 1,390,142.40	157.40	151.50	151.40	G 5.12
M-5	Precast Manhole (4')	N 558,094.68 E 1,390,155.24	161.19	158.29	158.49	G 5.12
ES-1	24" HDPE End Section	N 558,176.05 E 1,390,087.72	147.39	146.56	146.50	Handover or equivalent.
ES-2	24" HDPE End Section	N 558,257.83 E 1,390,113.60	151.54	149.65	149.50	Handover or equivalent.

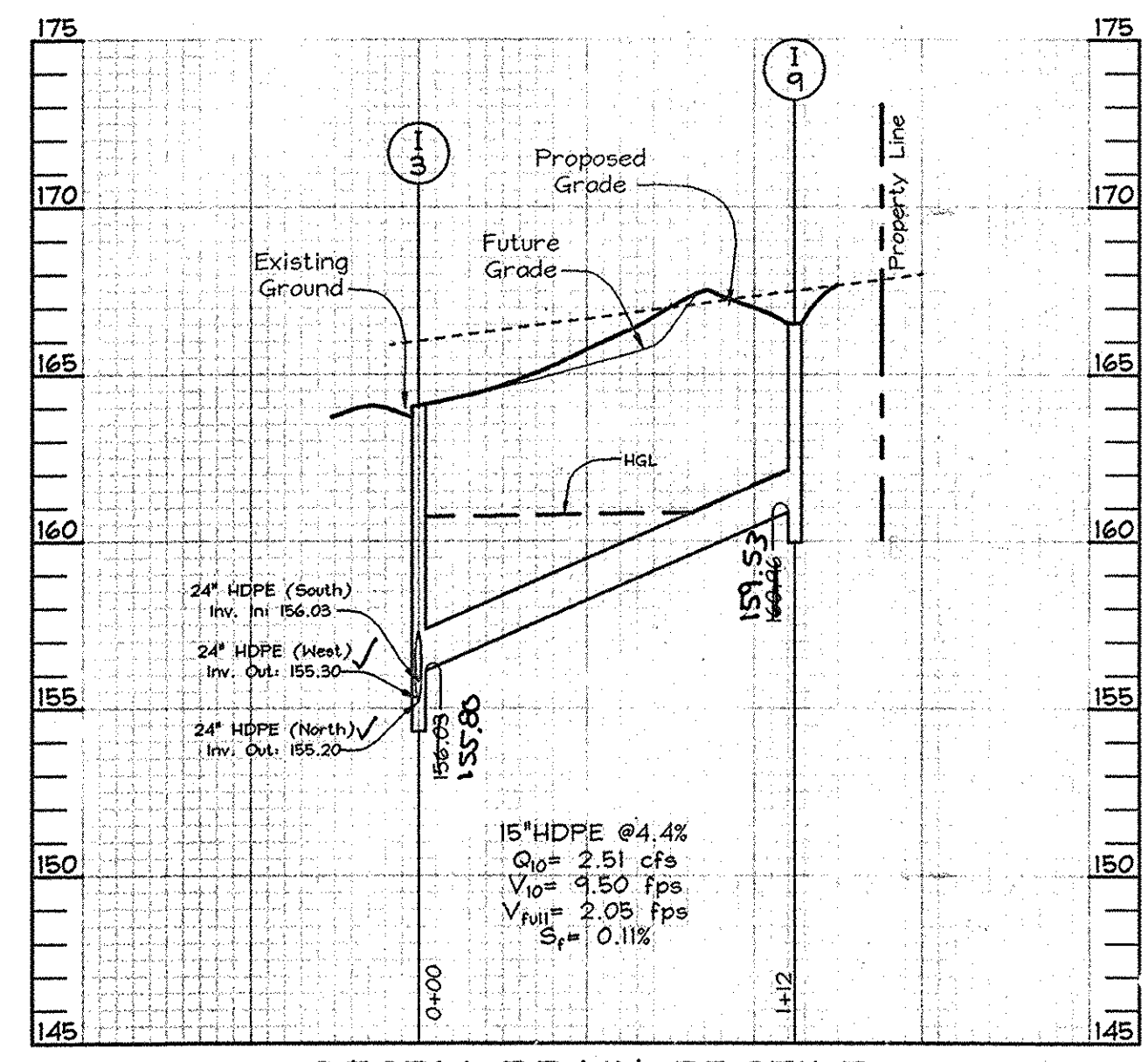
STORM DRAIN PROFILE
 Scale: Horizontal - 1"=50'
 Vertical - 1"=5'



STORM DRAIN PROFILE
 Scale: Horizontal - 1"=50'
 Vertical - 1"=5'



STORM DRAIN PROFILE
 Scale: Horizontal - 1"=50'
 Vertical - 1"=5'



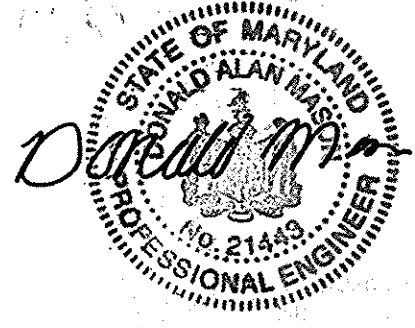
STORM DRAIN PROFILE
 Scale: Horizontal - 1"=50'
 Vertical - 1"=5'

NOTES:
 1. Top elevations for Type 'S' Inlets along curb and gutters are to the center, edge of grate at the flow line. Top elevations for Type 'S' Inlets in grass areas are to the center, top of grate.
 2. Top elevations for Precast Manholes are to the center, top of manhole cover.
 3. Top elevations for A-5 and A-10 Inlets are to the center of inlet, top of curb.
 4. Top slope of structures to conform to slope of paving or grading.

PROFESSIONAL CERTIFICATION: I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM AN INDIVIDUALLY LICENSED PROFESSIONAL ENGINEER UNDER THE JURISDICTION OF THE STATE OF MARYLAND, LICENSE NO. 21463, EXPIRATION DATE: 12-21-2015.

Donald Mason, P.E.
 PROFESSIONAL ENGINEER

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. 21463 Date 10-22-14

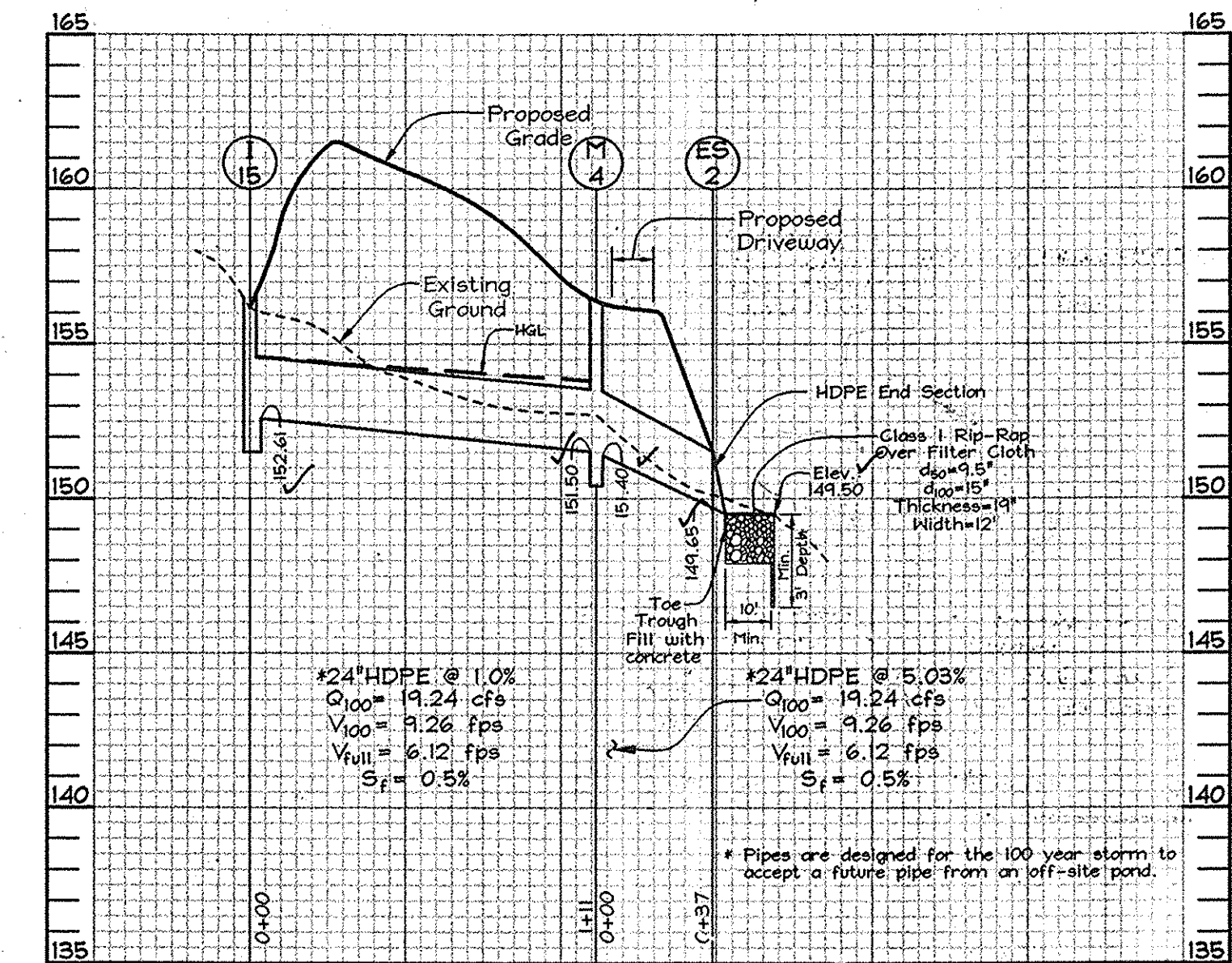


For Revisions by Benchmark Engineering, Inc. Only.

NO.	DATE	REVISION	BY
2	9-16-11	REVISE TITLE BLOCK	BEF
1	2-2-10	REMOVE I-14 FROM STRUCTURE SCHEDULE & STORM DRAIN PROFILE	BEF

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Cindy Hamlin, 9/23/14
 CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
 Mike Zwick, 9-23-14
 CHIEF, BUREAU OF HIGHWAYS

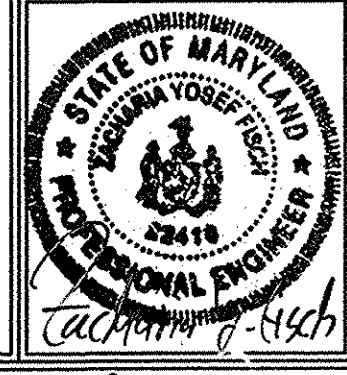


STORM DRAIN PROFILE
 Scale: Horizontal - 1"=50'
 Vertical - 1"=5'

NOTE: For all pipes where the HGL is greater than 2 feet from the crown of the pipe, provide a rubber gasket.

SIZE	TYPE	LENGTH
15"	HDPE	420 LF
18"	HDPE	385 LF
24"	HDPE	806 LF

STORM DRAIN PROFILES
 SUMMER HAVEN
 PHASE I AND II
 LOTS 3-12 & 16 THRU 39, OPEN SPACE LOTS 13 & 14, NON-CREDITED OPEN SPACE LOT 15
 A Resubdivision of Summer Haven Lot 2, Plat #15439
 TAX MAP 38 GRID 14 1ST ELECTION DISTRICT PARCELS 718, 721 & P/O 233 HOWARD COUNTY, MARYLAND



FSH Associates
 Engineers
 6339 H. WARD
 TEL: 410-581-1100
 E-mail: info@fshe.com

DESIGN BY: PS
 DRAWN BY: AY
 CHECKED BY: ZTF
 SCALE: As Shown
 DATE: Aug. 09, 2006
 W.O. No.: 3157
 SHEET No. 8 OF 13

AS-BUILT

SWM PLANTING NOTES

147.0 - edge of Lot 13 - 44,1700 s.f. / 1.01 Ac.
To be planted with Seed Mixture No.3 per MAA
Seeding Specifications at 131 lbs of PLS/acre

Proposed 2' x 2' Detention Piling
Proposed 2' x 2' Detention Boulder

Emergent Planting Area
with Goose Exclusion Fence

MAA APPROVED SEEDING MIX FOR SWM AREA

Seed Application (lbs of PLS/acre)	Amount required (lbs)
60% Fowl Meadow Grass	83.83
30% Cheatings Fescue	34.34
10% Perennial Ryegrass	14.14
Supplemental Seed	
Redtop	3.03

EMERGENT PLANTING (1090 S.F.) (32 PLANTINGS, 24" O.C. WITHIN 6' x 20'-40" PLOTS)

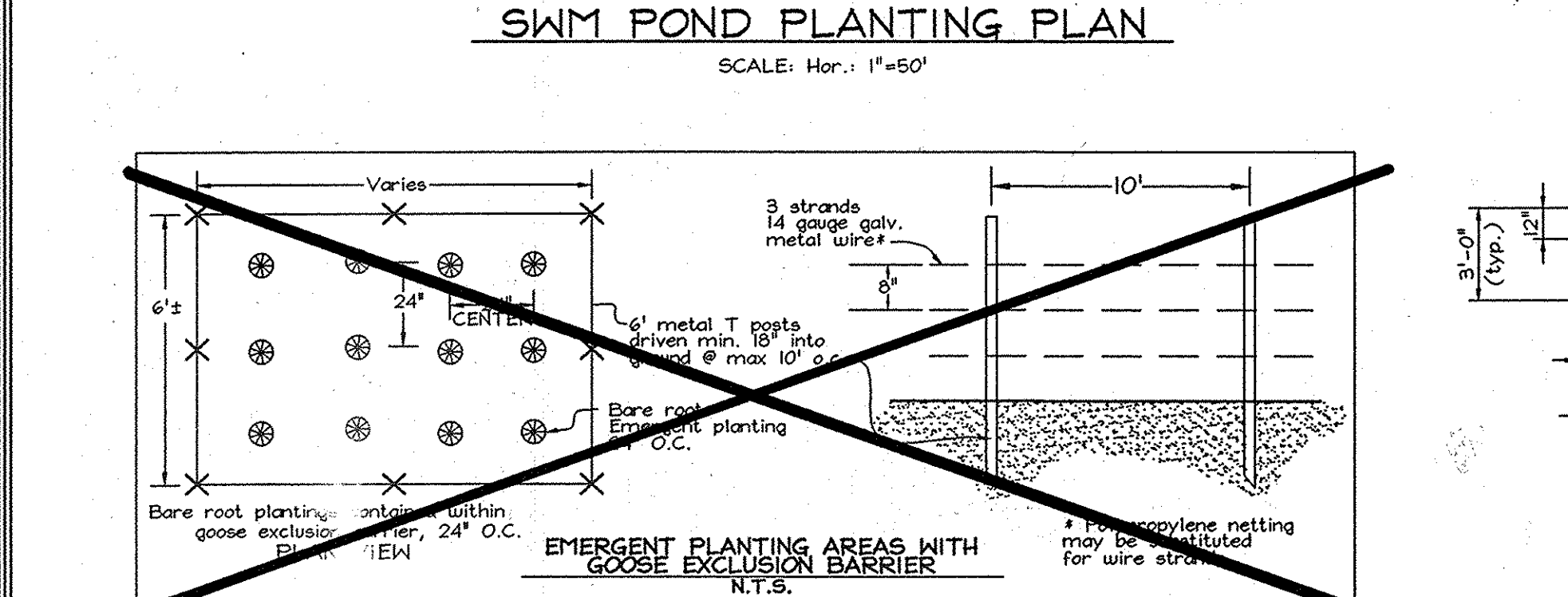
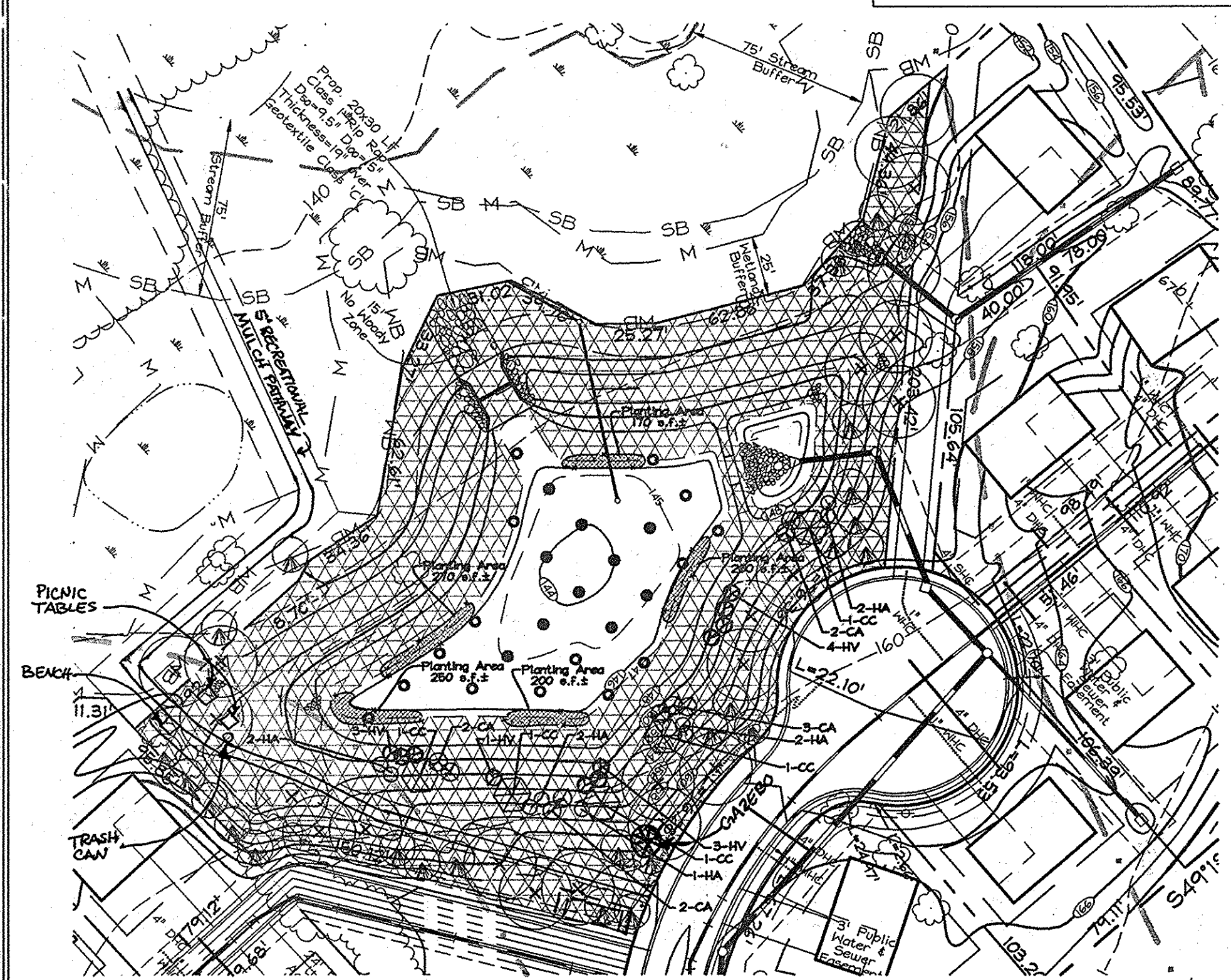
COMMON NAME	SCIENTIFIC NAME	NETFLAND INDICATOR	PLANTING STOCK	QUANTITY
Sweetgum	Liquidambar styraciflua	OBL	Bare root	23
Marsh Hibiscus	Hibiscus moscheutos	OBL	Bare root	23
Cardinal Flower	Lobelia cardinalis	FACH+	Bare root	23
Lizard Tail	Saururus cernuus	OBL	Bare root	23

EMERGENT PLANTING NARRATIVE
Vegetation establishment is expected through natural plant propagation and will be enhanced by supplemental planting around the pond area. Supplemental planting in 6' wide plots of varying length (20'-40', see plan) is protected with goose exclusion fencing. Plant installation may be delayed one year after grading to allow the graded area to settle and hydrology to stabilize.

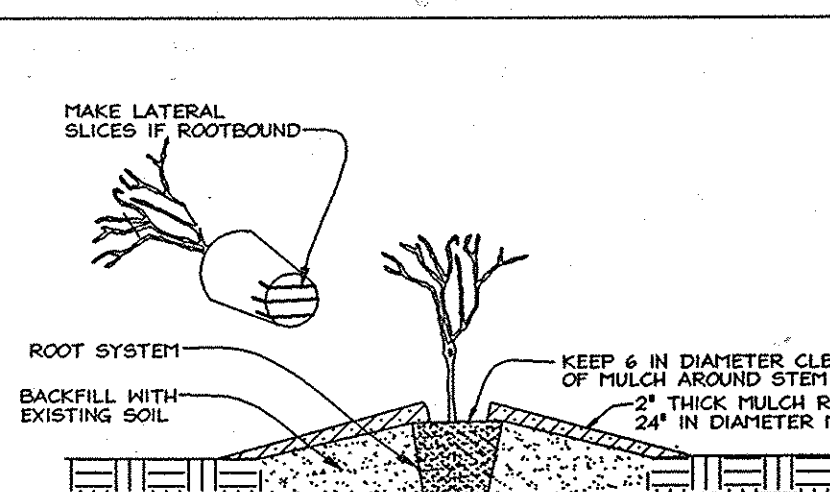
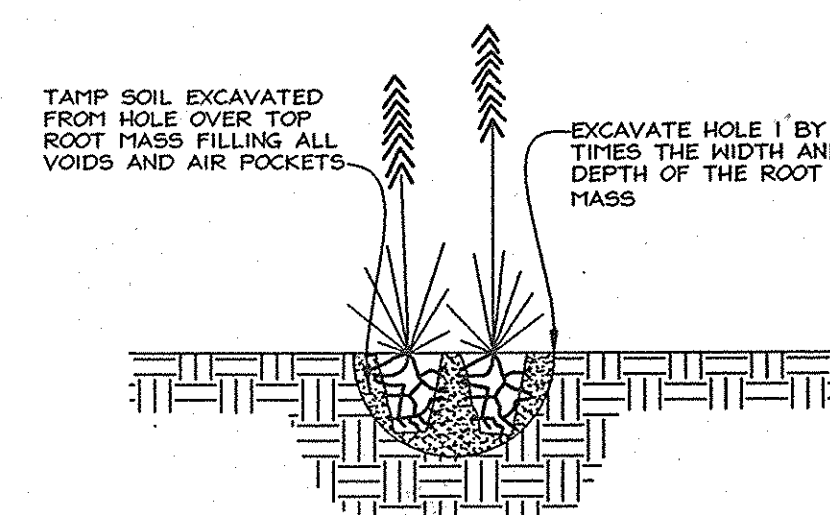
SWM POND WOODY PLANT SCHEDULE

KEY SYMBOL	QUAN.	BOTANICAL NAME	SIZE	NOTE
CA	9	Clethra alnifolia	3'-4' Ht.	Cont.
CC	5	Cercis canadensis	3'-4' Ht.	Cont.
HA	9	Hydrangea arborescens	3'-4' Ht.	Cont.
HV	11	Hamamelis virginiana	3'-4' Ht.	Cont.

NOTE: SEE SHEET 6 OF 13 FOR DETAILS OF SWM BUFFER/UPLAND PLANTINGS



EMERGENT PLANTING NOT TO SCALE



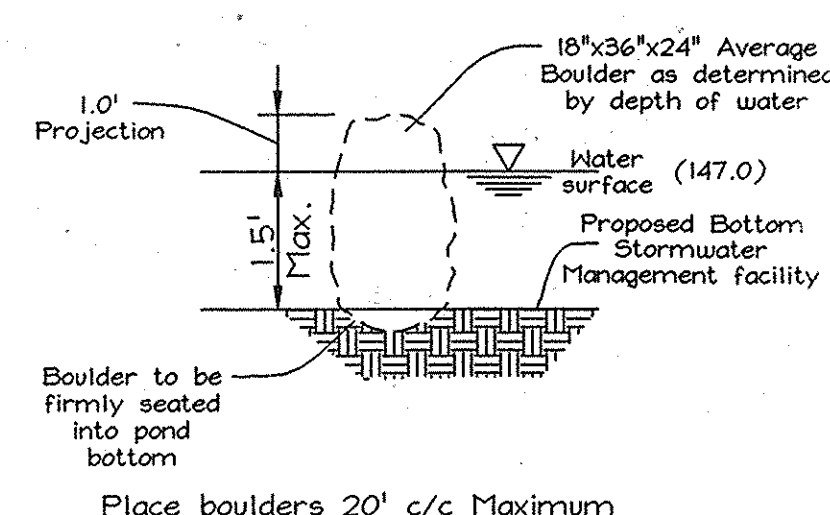
CONTAINER PLANTING
NOT TO SCALE

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

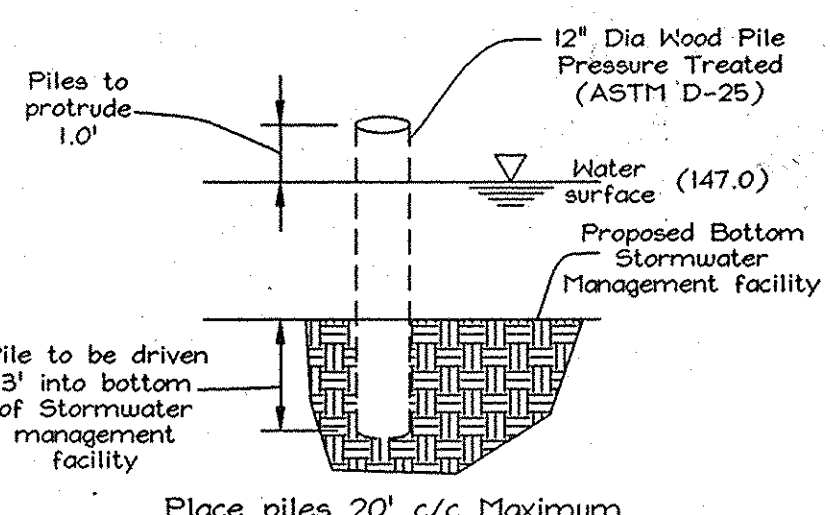
EMERGENT PLANTING SPECIFICATIONS

- Rooted herbaceous plants may be locally harvested and planted immediately following harvest.
- If not planted immediately after delivery to the job site, plants must be protected from direct exposure to the sun and roots must be kept moist at all times.
- All plants shall contain new roots, while in color.
- All plants must appear healthy, with no leaf spots, damage, wilting or evidence of insects or disease.
- Planting operations must be followed immediately by installation of wire barriers.

BIRD DETERRENT BOULDER PLACEMENT DETAIL
NOT TO SCALE

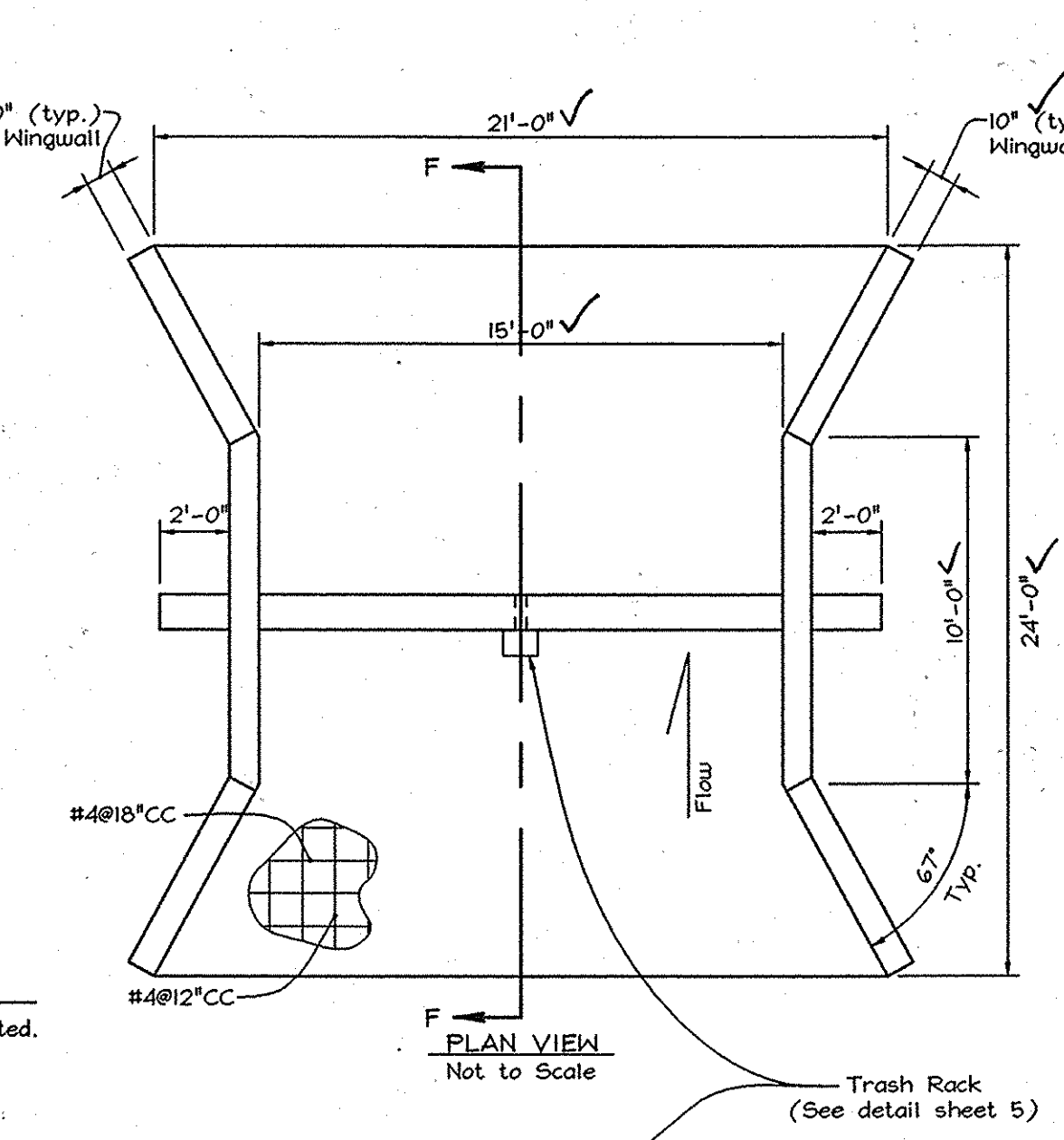


BIRD DETERRENT PILING PLACEMENT DETAIL
NOT TO SCALE



TYP. OFFFALL DETAIL FOR ES-1 & ES-2
Not to Scale

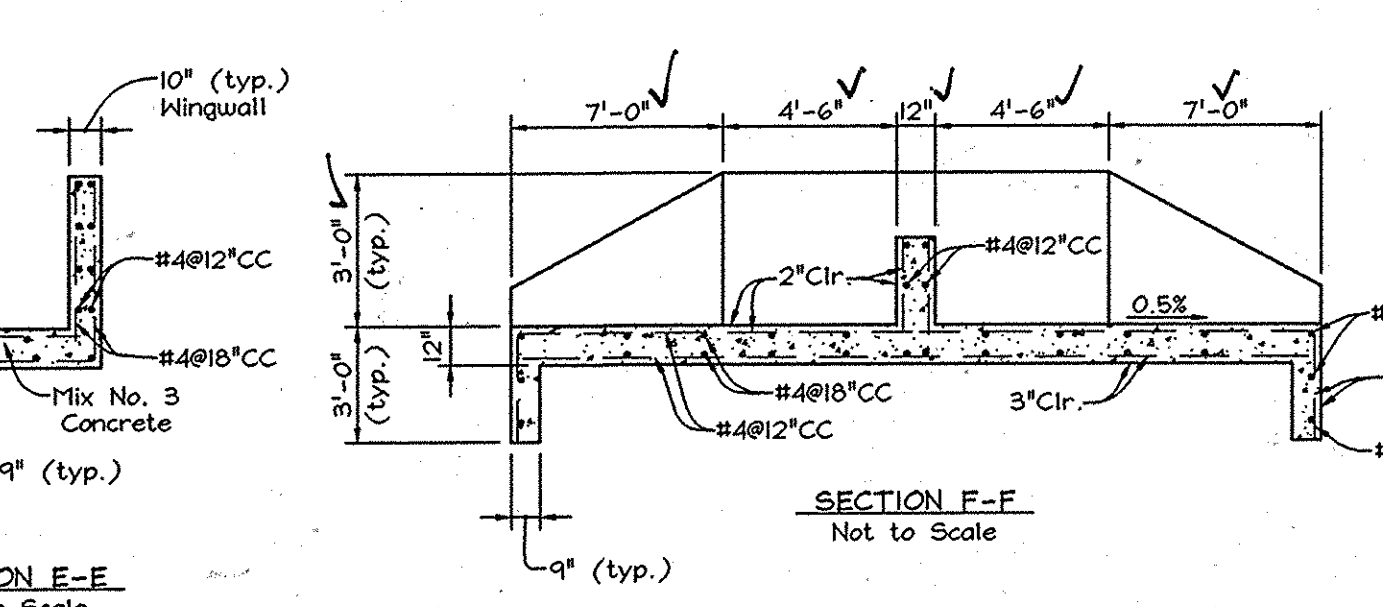
Structure	Q(c.f.s.)	S	n	b	d	d _{max}	d ₅₀	B (Blanket Thickness)
ES-1	32.6 cfs	0.0%	0.0%	4.95'	1.0'	15'	9.5'	19"
ES-2	19.24 cfs	0.0%	0.0%	4.95'	1.0'	15'	9.5'	19"



STORMWATER MANAGEMENT SUMMARY TABLE

CATEGORY	DA-1	DA-2	DA-3	REMARKS
CHANNEL PROTECTION VOLUME (Cp)	0.64/0.64	N/A	N/A	Q _v < 2cfs for DA-2 & 3 (See Note #1 Below)
WATER QUALITY VOLUME (WQV)	0.115/0.115	N/A	N/A	DA-1 provided in micro-pool/detention structure (See Note #2 Below)
RECHARGE VOLUME/AREA (Re)/ (Res)	Site Area 12.75 ac. 0.052/0.052	---	---	Rea method treats required 0.57 Ac. + impervious areas. (See Note #3 Below)
OVERBANK FLOOD STORAGE (Q _v)	N/A	N/A	N/A	Not Required by Howard County
EXTREME FLOOD STORAGE (Q _v)	N/A	N/A	N/A	Not Required by Howard County

- NOTES:**
- Channel protection volume (Cp) is not required for this site.
 - The water quality volume (WQV) will be provided for DA-1 as follows: 1/2 (.115 Ac. Ft.) within the micro-pool and 1/2 (.115 Ac. Ft.) provided through 24 hr. extended release within the SWM facility. Reductions taken include credits for water quality through sheet flow to buffer credits, natural area conservation credits, and Rea treatment allowance for volume reduction. DA-2 and DA-3 will not have impervious area which would require WQV.
 - The Recharge Volume is provided through roof top drainage to grass channels in rear of Lots 19 thru 39 yields 31 Ac. treated. Use-in-common driveways drain to grass channels with 0.32 Ac. treated. Total treated = 0.63 Ac. impervious area.
 - Overbank and extreme flood storage volume is not required for this site.



CS-1 CONCRETE WEIR CONTROL STRUCTURE
NOT TO SCALE

MAA SEEDING SPECIFICATIONS

ITEM 903 SEEDING

DESCRIPTION
903-1.1 GENERAL. This item provides specifications for seeding of areas as designated on plans or as directed by the MAA Engineer. Only MAA approved species, mixtures, and rates of application provided in this item may be used to establish vegetation. All activities associated with seeding including soil preparation, seed application, fertilization, and maintenance shall conform to these approved standards.

MATERIALS
903-2.1 SEED. All seed shall comply with the Maryland Seed Law (Agricultural Article of the Annotated Code of Maryland). Only MAA approved species, mixtures, and rates of application provided in this item may be used to establish vegetation. Seed will be sampled and tested by an inspector from the Turf and Seed Section, Maryland Department of Agriculture (MDA), Annapolis, Maryland. All straw and turf seed and mixtures shall be free from the following state-listed restricted noxious weeds:
corn cockle (Agrostemma githago)
bentgrass (Agrostis spp.)
redtop (Agrostis gigantea)
wild onion (Allium canadense)
wild garlic (Allium vineale)
bindweed (Coniopsis spp.)
doddler (Cuscuta spp.)
barnyard grass (Cyperus glomeratus)
fall fescue (Festuca arundinacea)
meadow fescue (Festuca pratensis)
velvetgrass (Holcus lanatus)
annual bluegrass (Poa annua)
rough bluegrass (Poa trivialis)
timothy (Phleum pratense)
Johnson grass (Sorghum holopogon)

APPROVED PLANT SPECIES

MAA SEED MIXTURES	Purity (%)	Minimum % Germination (%)	Pure % Seed
Certified Turf-Type Tall Fescue (Festuca arundinacea)	90	90	1.15
Certified Kentucky Bluegrass (Poa pratensis)	90	80	1.99
Hard Fescue (Festuca longifolia)	90	90	1.15
Cheatings Red Fescue (Festuca rubra corniculata)	90	90	1.15
Annual Ryegrass (Lolium multiflorum)	90	85	1.34
Perennial Ryegrass (Lolium perenne)	90	80	1.99
Fowl Meadow Grass (Poa polystris)	90	80	1.99
Little Bluestem (Andropogon scoparius)	62	94	1.71

SEEDING SEASONS

Permanent Cool-Season Grasses: March 1 to April 20 and August 1 to October 20, inclusive.

Temporary Cover of Annual Ryegrass: March 1 to April 30 and August 1 to November 30, inclusive.

Temporary Cover of Warm-Season Grasses (Little Bluestem only): May 1 to July 31, inclusive. Rate of application should be 15.6 lbs-PLS per acre.

Seeding seasons are based on typical years and can be subject to variation, which may be modified by the MAA Engineer based on seasonal trends.

If the time required to complete any of the operations necessary under this item, within the specified planting season or any authorized extensions thereof, extends beyond the Contract period, then such time will be charged against the Contract time, and liquidated damages will be enforced with respect to this portion of work.

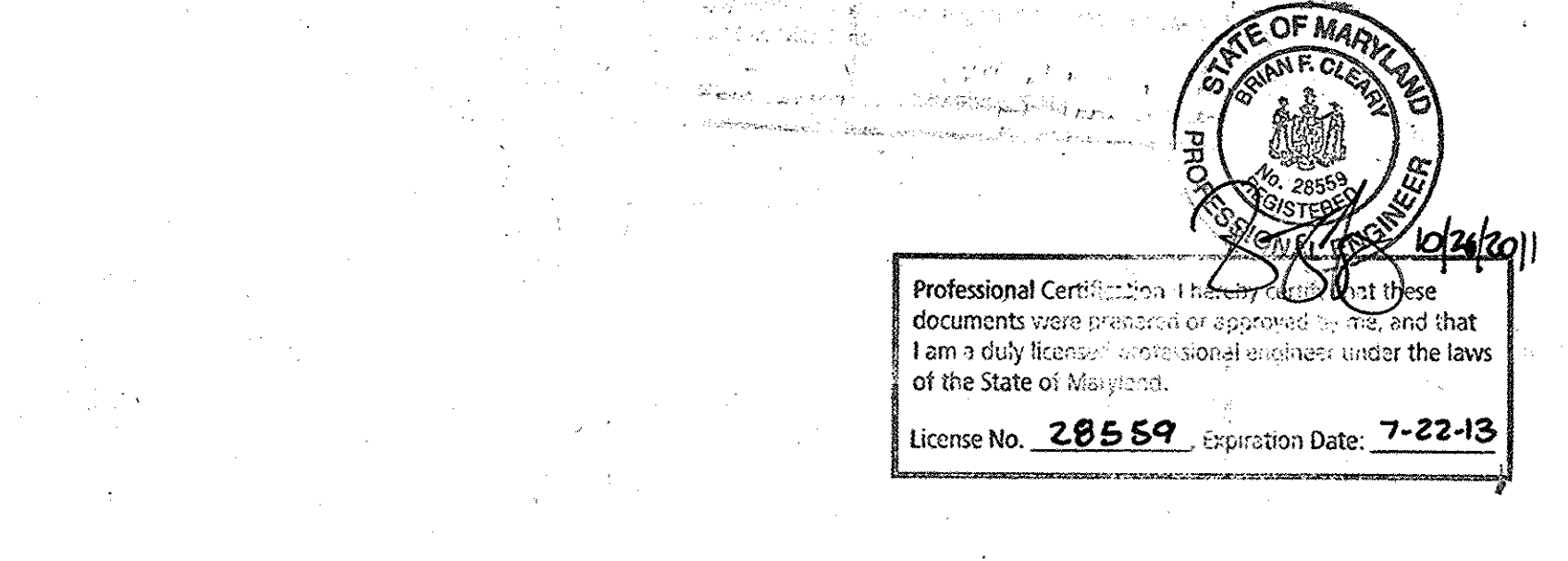
903-2.2 LIME. Lime shall consist of pure lime and contain at least 85 percent total carbonate. Lime shall be ground to a fineness so that at least 90 percent will pass through a No. 20 mesh sieve and 50 percent will pass through a No. 100 mesh sieve. Dolomitic lime or a high magnesia lime shall contain at least 10 percent magnesium oxide. Lime shall be applied by approved methods detailed in Section 903-3.3 of this item. The rate of application will be based on results of soil tests.

903-2.3 FERTILIZER. Fertilizer shall be standard commercial fertilizer supplied separately or in mixtures and meet the requirements of applicable state and federal laws (O-F-241) as well as standards of the Association of Official Agricultural Chemists. Nitrogen-Phosphorus-Potassium (N-P-K) concentrations shall be determined from analysis of soil samples. Plans of fertilizer application shall conform to standards described in Section 903-3.3 of this item. Fertilizer shall be furnished in standard containers that are clearly labeled with name, weight, and guaranteed analysis of the contents (percentage of total nitrogen, available phosphoric acid, and water-soluble potash). Fertilizer shall not contain any hydrated lime or cyanamide compounds. Fertilizer failing to meet the specified analysis may be approved by the MAA Engineer, providing sufficient materials are applied to conform with the specified nutrients per unit of measure without additional cost to the contractor.

The fertilizers may be applied in the following forms:
a. A dry, free-flowing fertilizer suitable for application by a common fertilizer spreader;
b. A finely ground fertilizer soluble in water, suitable for application by power sprayers; or
c. A granular or pellet form suitable for application by blower equipment.

903-2.1.2 PURITY. All seed shall be free of all state-designated noxious weeds listed in this item and conform to MAA specifications. To ensure compliance, MAA requires sampling and testing of seed by the Turf and Seed Section, Maryland Department of Agriculture (MDA). The Contractor shall furnish the MAA Engineer with duplicate signed test results by the Turf and Seed Section certifying that each lot of seed has been laboratory tested within six months of date of delivery. This statement shall include the following information:
- name and address of laboratory,
- date of test,
- lot number,
- the results of tests as to name, percentages of purity and of germination, and
- and, in the case of a mixture, the proportions of each kind of seed.

Seed shall be furnished in standard containers with the seed name, lot number, net weight, percentage of purity, germination rate and hard seed, and percentage of maximum used seed content clearly marked. All seed containers shall be tagged with a MAA supervised mix program seed tag.



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 10-22-14

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: 12-21-14

AND FOR REVISIONS BY BENCHMARK ENGINEERING, INC. DATED 4-26-16.

OWNERS/DEVELOPERS
JAMES L. NEUBURN
5570 Sterrett Place Suite 2.1
Columbia, MD 21044
(410) 997-3815

B.Z. ENTERPRISES INC.
PO Box 66
Reisterstown, MD 21136
(410) 935-8657

STORMWATER MANAGEMENT PLAN
SUMMER HAVEN
PHASE I AND II
LOTS 3-12 & 16 THRU 39, OPEN SPACE LOT 24 TO A BUILDABLE LOT
OPEN SPACE LOT 15
A Resubdivision of Summer Haven Lot 2, Plot #15439
TAX MAP 38 GRID 14
1ST ELECTION DISTRICT

DESIGN BY: PS
DRAWN BY: ABMAY
CHECKED BY: ZTF
SCALE:
DATE: Aug. 09, 2006
W.O. No.: 3157
SHEET No. 9 OF 13

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
7/23/16
DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
9/16/16
DATE

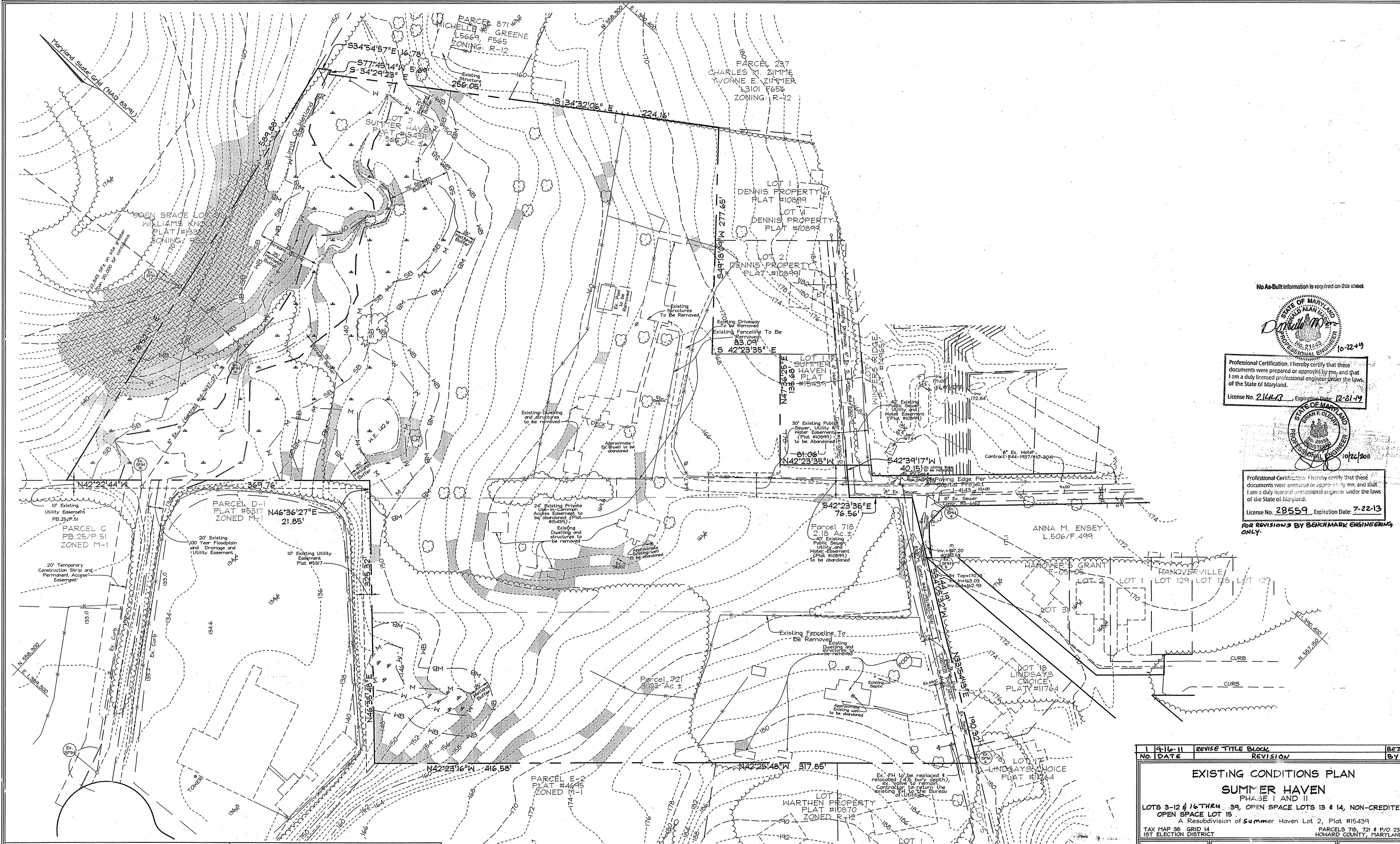
REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS
USDA-NATURAL RESOURCES CONSERVATION SERVICE
THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT
HOWARD SCD DATE

DEVELOPER'S CERTIFICATE
I HEREBY CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE IN ACCORDANCE TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE RECEIVED CERTIFICATE OF ATTENDANCE AT THE DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL BE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.
James C. Neuber August 10, 2016
SIGNATURE OF DEVELOPER DATE

ENGINEER'S CERTIFICATE
I HEREBY CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL MEETS ALL APPLICABLE FEDERAL AND STATE REQUIREMENTS AND IS A FEASIBLE AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTICED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.
Zacharia T. Fisch 8/10/16
SIGNATURE OF ENGINEER DATE

AS-BUILT

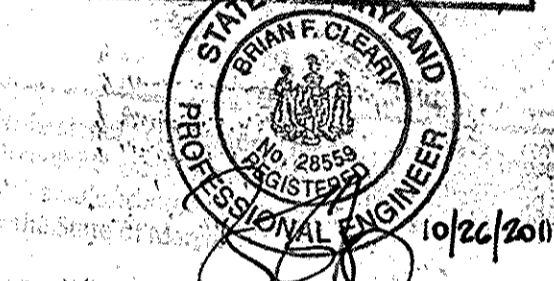
F5H As
Engineers Plan
6338 Howard
Tel: 410-561-
mail: info@f5h.com



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: 10-22-19



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. 28559 Expiration Date: 7-22-13

FOR REVISIONS BY BENCHMARK ENGINEERING ONLY.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Cindy Kinnitt 9/23/11
 CHIEF, DIVISION OF LAND DEVELOPMENT, DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
William J. ... 8-31-10
 CHIEF, BUREAU OF HIGHWAYS, DATE

PLAN VIEW
 SCALE: 1"=50'

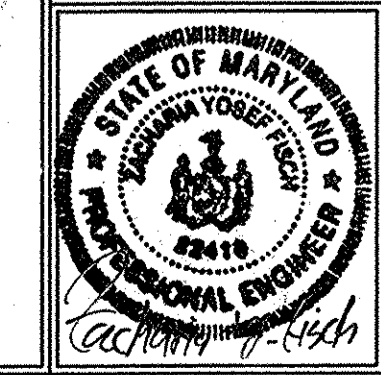
OWNERS/DEVELOPERS
 JAMES L. NEWBURN
 5570 Sterett Place Suite 201
 Columbia, MD 21044
 (410) 997-3815

B.Z. ENTERPRISES INC.
 PO Box 68
 Reisterstown, MD 21136
 (410) 435-8887

No.	DATE	REVISE TITLE BLOCK	BY
1	4-16-11	REVISE	BTZ
2		TITLE BLOCK REVISION	BTZ

EXISTING CONDITIONS PLAN
 SUMMER HAVEN
 PHASE I AND II

LOTS 3-12 & 16 THRU 39, OPEN SPACE LOTS 13 & 14, NON-CREDITED
 OPEN SPACE LOT 15
 A Resubdivision of Summer Haven Lot 2, Plat #15439
 TAX MAP 38 GRID 14 PARCELS 718, 721 & P/O 235
 1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND

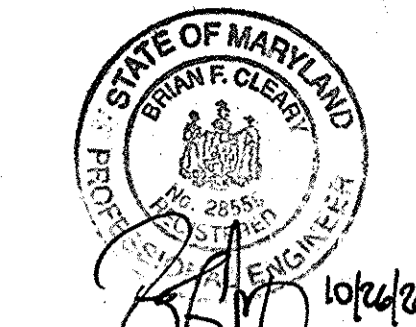


FSH Associates
 Engineers Planners Surveyors
 6335 Toward Lane Ellicott City, MD 21120
 Tel. 410-567-5200 Fax 410-796-1000
 E-mail info@fsha.com

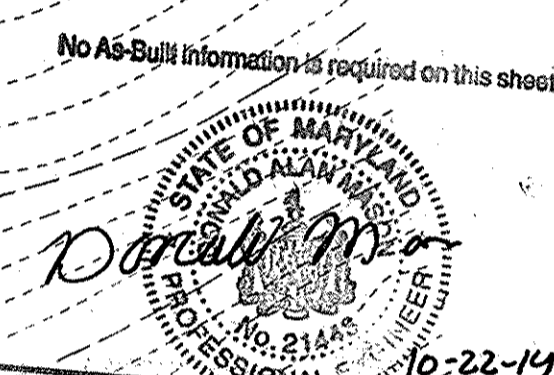
DESIGN BY: PS
 DRAWN BY: AY
 CHECKED BY: ZYF
 SCALE: As Shown
 DATE: Aug. 03, 2006
 P.L.O. No.: 3157
 SHEET No. 11 OF 18

As-Built

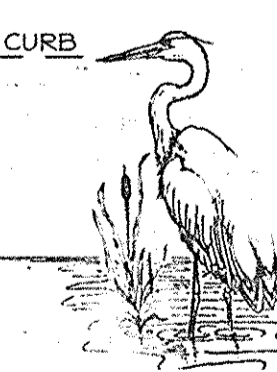
F-06-008



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. 28559
 Expiration Date: 7-22-13
 FOR REVISIONS BY BENCHMARK ENGINEERING, INC. ONLY



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: 10-22-14



EXPLORATION RESEARCH, INC.
 ENVIRONMENTAL CONSULTANTS
 8518 FOREST STREET
 ELICOTT CITY, MARYLAND 21043
 TEL: (410) 750-1150 FAX: (410) 750-7850

FINAL FOREST CONSERVATION PLAN
SUMMER HAVEN
 PHASE I AND II
 LOTS 3-12, 31 & 39 OPEN SPACE LOTS 13 & 14, NON-CREDITED OPEN SPACE LOT 15
 A Resubdivision of Summer Haven Lot 2, Plat #15439
 TAX MAP 38 GRID 14 1ST ELECTION DISTRICT
 PARCELS 718, 721 & P/O 233 HOWARD COUNTY, MARYLAND

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Cindy Hamitt 9/22/14
 CHIEF, DIVISION OF LAND DEVELOPMENT J.A. DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
William J. ... 8/31/14
 CHIEF, BUREAU OF HIGHWAYS M.D. DATE

- LEGEND**
- Forest Conservation Easement Retention Area
 - Forest Conservation Easement Reforestation Area
 - Forest Conservation Easement Non-Credited Area
 - FCE Signage
 - Tree Protection Fence

NO.	DATE	REVISION	BY
2	9-16-11	ADD RECREATIONAL AMENITIES PER W-11-140 CHANGE OF OPEN SPACE LOT 24 TO A BUNDABLE LOT	BEI
1	9-7-10	REMOVE SIDEWALK FROM IN FRONT OF LOT 1	BEI

OWNERS/DEVELOPERS

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 5570 Sterett Place Suite 201
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 (410) 997-3815

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 Reisterstown, MD 21136
 (410) 435-8897

FSH Associates
 Engineers Planners Surveyors
 6339 Howard Lane
 Columbia, MD 21044
 Tel: 410-567-5200
 E-mail: info@fsh.com

DESIGN BY: AB
 DRAWN BY: JZF
 CHECKED BY: JZF
 SCALE: 1"=50'
 DATE: Aug. 04, 2008
 H.O. No.: 3157
 SHEET No. 12 OF 18

M:\Summer Haven 3 - 574\p\3157_FCF_s12.dwg, 8/10/2008 2:42:32 PM, 1800x, 11

FOREST CONSERVATION WORKSHEET

Net Total Area	Acres
A. Total Tract	2.78
B. Within 100' Floodplain	0.82
C. Deductions: Area p/o FCP for F-00-115	0
D. Forest Area	11.96
Zoning Category: Residential	
Land Use Category	
E. Afforestation (15 % x D)	1.79
F. Conservation (20 % x D)	2.39
Existing Forest Cover	
G. Existing Forest on Ne Tract Area	2.66
H. Forest Area Above Conservation Threshold	0.27
Break-even Point	
I. Forest Retention Above Threshold with no Mitigation	2.45
J. Clearing Permitted without Mitigation	0.21
Proposed Forest Clearing	
K. Forest Areas to be Cleared	1.51
L. Forest Areas to be Retained	1.15
Planting Requirements	
M. Reforestation for Clearing Above Threshold	0.07
N. Reforestation for Clearing Below the Threshold	2.48
P. Credit for Retention Above Conservation Threshold	0
Q. Total Reforestation Required	2.55
R. Total Afforestation Required	0
S. Total Reforestation and Afforestation Requirement	2.55

FOREST CONSERVATION NARRATIVE

This Forest Conservation Plan has been developed in accordance with the Howard County Forest Conservation Act of 1991. The total tract area consists of 12.78 acres of land, including a 0.63 Ac area of floodplain. This area was deducted for a net tract of 12.15 Ac. The site contains 2.66 acres of forest cover on the net tract.

Forest retained in easements will total 1.15 acres. A total of 2.43 acres of reforestation planting is proposed. Three forest conservation easements will be established. Total area contained within easements is 3.90 acres. The easements will contain floodplain area, with Easement 1 being newly forested for credit. Easements 2 and 3 have uncredited existing forested floodplain, being retained to meet forest depth criteria in some locations. Additionally, Easement 3 contains an existing pond, which has been deducted from the credited area. All easements contain wetlands, streams and their buffers, floodplain, and steep slopes. For the remaining 0.12 acres of obligation, we propose a fee-in-lieu payment of \$2,613.50 (\$5,227 s.f. @ \$50/s.f.).

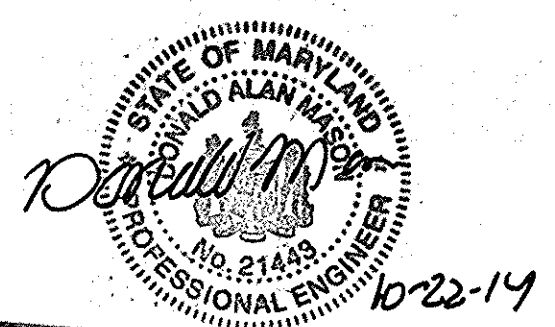
New on-site plantings will be 2-3' containerized whip stock planted at 350 stems/acre with tree shelters. Plant material will be chosen to create a forested floodplain area and wetlands as appropriate and in compliance with Maryland Aviation Administration requirements for planting in proximity to BWI Airport.

Forest Conservation Surety in the amount of \$62,944.30 will be posted with the Developers Agreement. Reforestation-2.43 Ac./105,951 s.f. @ \$50/s.f. = \$52,925.50 Retention-1.15 Ac./50,944.0 s.f. @ \$20/s.f. = \$10,018.80

FOREST CONSERVATION EASEMENT TABLE

EASEMENT	TYPE	AREA (ACRES)
1	Reforestation	2.04
2	Retention	0.08
	Retention	0.26
	Uncredited	0.06
3	Reforestation	0.31
	Retention	0.87
	Uncredited	0.26
TOTAL		3.90
	Reforestation	2.43
	Retention	1.15

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: 12-31-14

FOREST CONSERVATION EASEMENT #1
Reforestation Area 1 : 2.04 Ac. (714 trees @ 350 TPA)

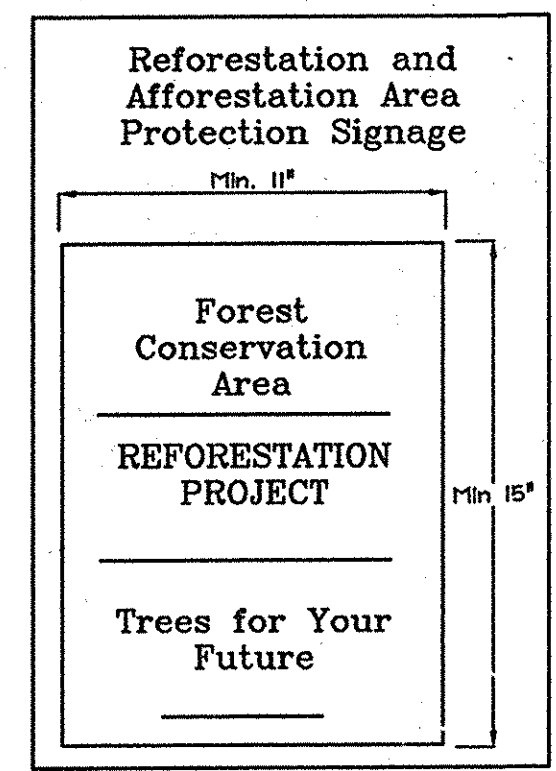
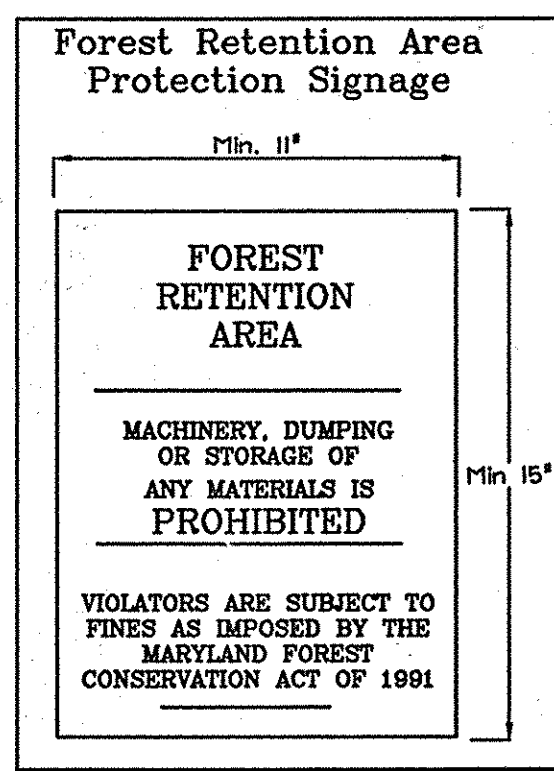
Qty	Botanical Name	Common Name	Min. Size	Spacing	Notes
119	Liquidambar styraciflua	Sweetgum	WHIP 2-3'	11' o.c.	1-3 Gallon Container Grown with tree shelters
119	Liriodendron tulipifera	Tulip Poplar	WHIP 2-3'	11' o.c.	
119	Populus deltoides	Cottonwood	WHIP 2-3'	11' o.c.	
119	Tilia americana	Basswood	WHIP 2-3'	11' o.c.	
119	Ostrya virginiana	Hop-Hornbeam	WHIP 2-3'	11' o.c.	
119	Acer negundo	Box-elder	WHIP 2-3'	11' o.c.	

FOREST CONSERVATION EASEMENT #2
Reforestation Area 2 : 0.08 Ac. (28 trees @ 350 TPA)

Qty	Botanical Name	Common Name	Min. Size	Spacing	Notes
5	Liquidambar styraciflua	Sweetgum	WHIP 2-3'	11' o.c.	1-3 Gallon Container Grown with tree shelters
5	Liriodendron tulipifera	Tulip Poplar	WHIP 2-3'	11' o.c.	
5	Populus deltoides	Cottonwood	WHIP 2-3'	11' o.c.	
5	Tilia americana	Basswood	WHIP 2-3'	11' o.c.	
4	Ostrya virginiana	Hop-Hornbeam	WHIP 2-3'	11' o.c.	
4	Acer negundo	Box-elder	WHIP 2-3'	11' o.c.	

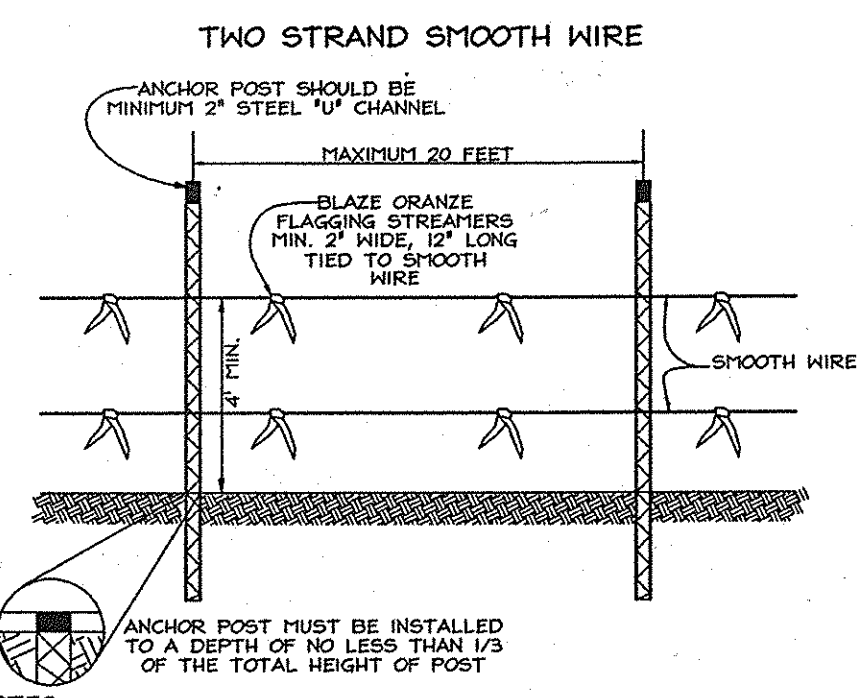
FOREST CONSERVATION EASEMENT #3
Reforestation Area 3 : 0.31 Ac. (109 trees @ 350 TPA)

Qty	Botanical Name	Common Name	Min. Size	Spacing	Notes
18	Liquidambar styraciflua	Sweetgum	WHIP 2-3'	11' o.c.	1-3 Gallon Container Grown with tree shelters
18	Liriodendron tulipifera	Tulip Poplar	WHIP 2-3'	11' o.c.	
19	Populus deltoides	Cottonwood	WHIP 2-3'	11' o.c.	
18	Tilia americana	Basswood	WHIP 2-3'	11' o.c.	
18	Ostrya virginiana	Hop-Hornbeam	WHIP 2-3'	11' o.c.	
18	Acer negundo	Box-elder	WHIP 2-3'	11' o.c.	

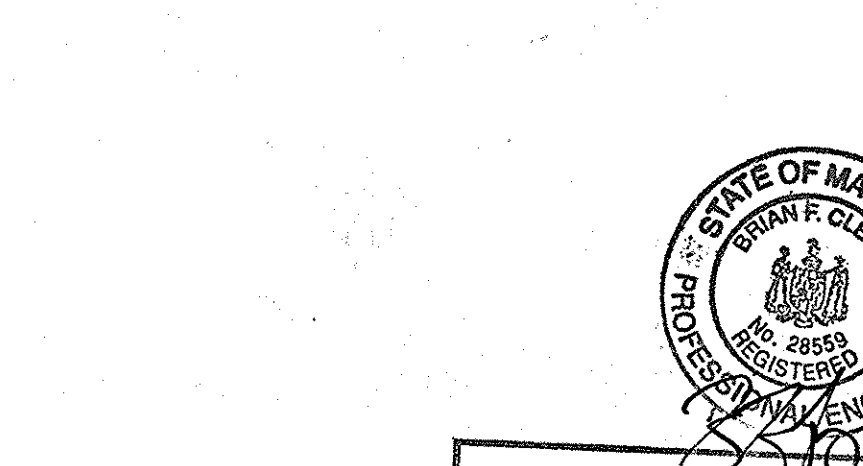


SIGN DETAIL: PERMANENT SIGN

SIGNAGE NOTE: ALL TREE PROTECTION SIGNS SHALL BE PLACED ON METAL "T" POSTS OR PRESSURE TREATED WOOD POLES. NO ATTACHMENT OF SIGNS TO TREES IS PERMITTED.



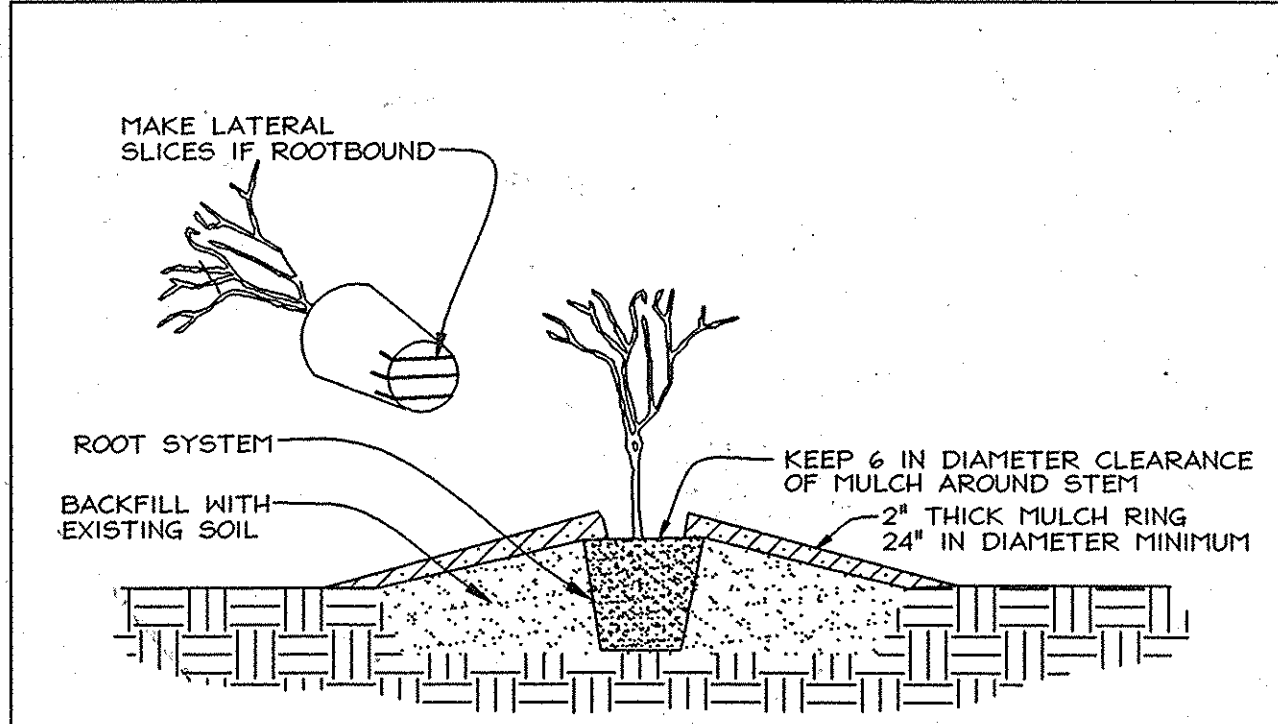
TREE PROTECTION DETAIL
NOT TO SCALE



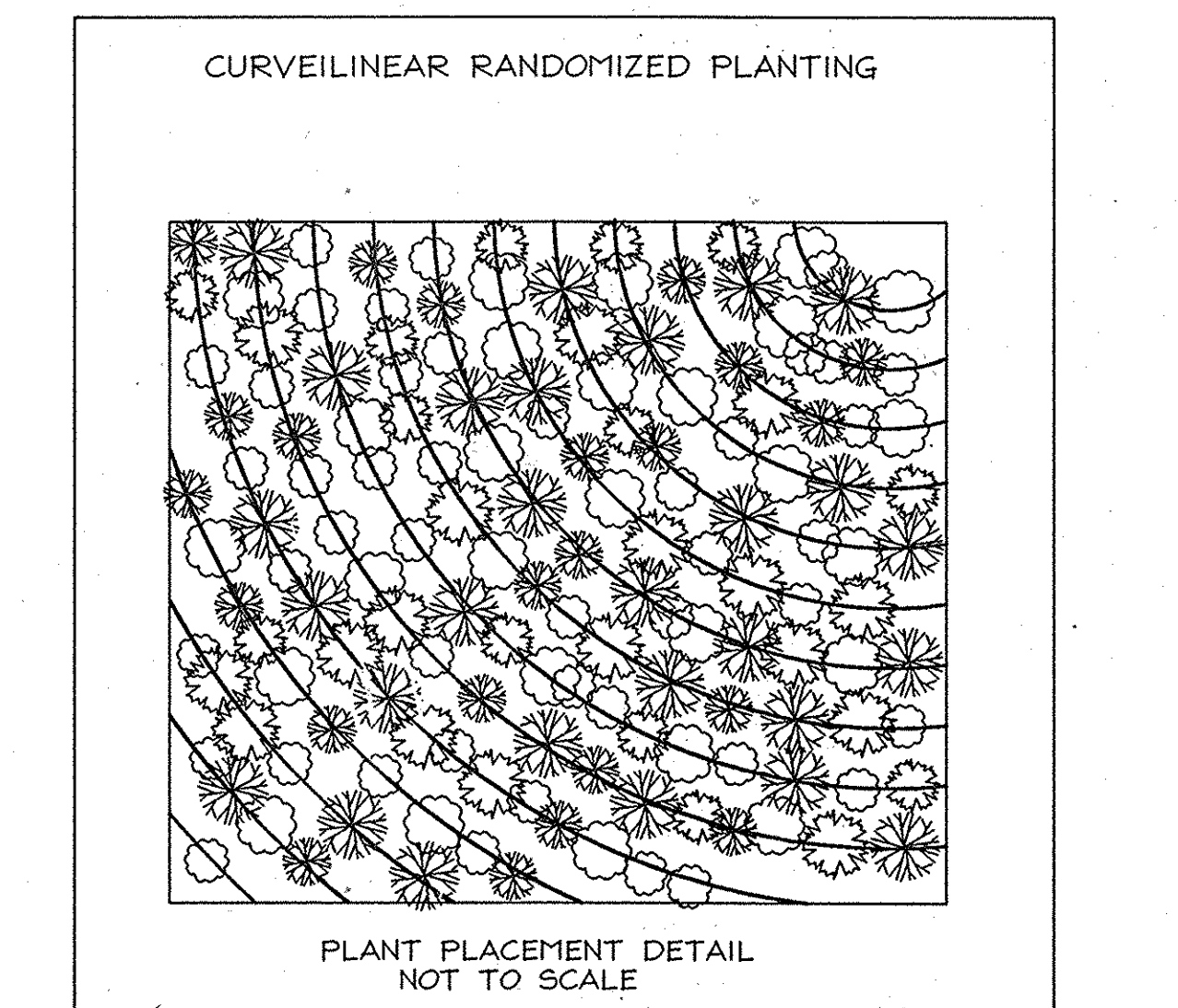
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28559, Expiration Date: 7-22-13
FOR REVISIONS BY BENCHMARK ENGINEERING, INC. ONLY.

MANAGEMENT NOTES FOR FOREST RETENTION AREAS

- All proposed activities shall adhere to the conditions, schedules and terms of an approved sediment control and erosion plan.
- After the boundaries of the retention area have been staked and flagged and before any disturbance has taken place on-site, a preconstruction meeting at the construction site shall take place. The developer, contractor or project manager, and appropriate County inspectors shall attend.
- Tree protection areas shall be established and maintained throughout construction.
 - All retention areas within 50 feet of proposed construction activities shall be protected by highly visible, well anchored temporary protection devices (silt fence or blaze orange plastic mesh).
 - All protection devices shall be in place prior to any grading or land clearing.
 - All protection devices shall be properly maintained and shall remain in place until construction has ceased.
 - Attachment of signs, fencing or other objects to trees is prohibited.
 - No equipment, machinery, vehicles, materials or excessive pedestrian traffic shall be allowed within protected areas.
 - If the critical root zone (see detail) is affected by construction activities such as grade change, digging for foundations and roads or utility installation:
 - Prune roots with a clean cut using proper pruning equipment (see root pruning detail).
 - Water and fertilize as needed.
- During construction phase, monitor and correct condition of retained trees for: soil compaction, root injury, flood conditions, drought conditions and other stress signs.
 - Inspect existing trees around the perimeter of disturbed limits for evidence of soil compaction, root injury, limb injury, or other stress signs and correct with proper management techniques such as root or limb pruning, soil aeration, fertilization, crown reduction or watering. Inspection and evaluation shall be performed by a licensed arborist.
 - Inspect for dead or dying trees or limbs which may pose safety hazard and remove.
 - No burial of discarded materials will occur onsite within the conservation areas.
 - No burning within 100 feet of wooded area.
 - All temporary forest protection structures will be removed after construction. Temporary signage shall be replaced with permanent signage on posts in locations shown.
 - Following completion of construction, prior to use, the County inspector shall inspect the entire area.



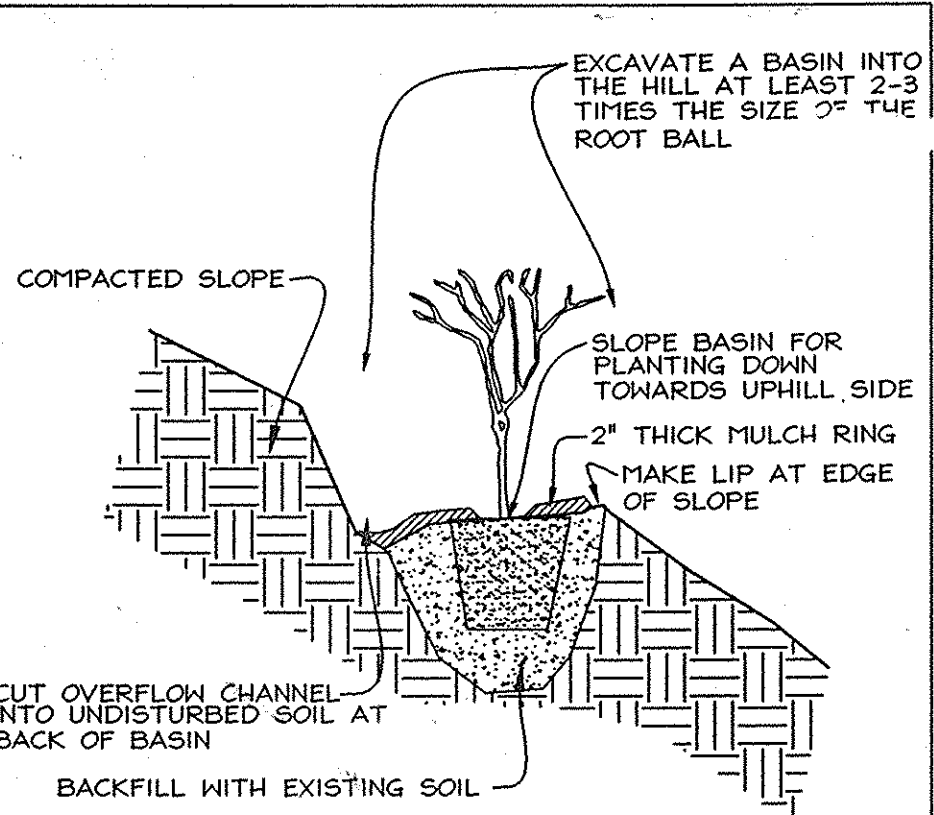
- PLANTING PROCEDURE FOR CONTAINER GROWN PLANTS**
- REMOVE THE PLANT EITHER BY CUTTING OR INVERTING THE CONTAINER. USE A KNIFE TO CUT THROUGH BOTTOM HALF OF THE ROOT BALL.
 - PLANT SHRUBS ON FORMED UP MOUNDS 4\"/>



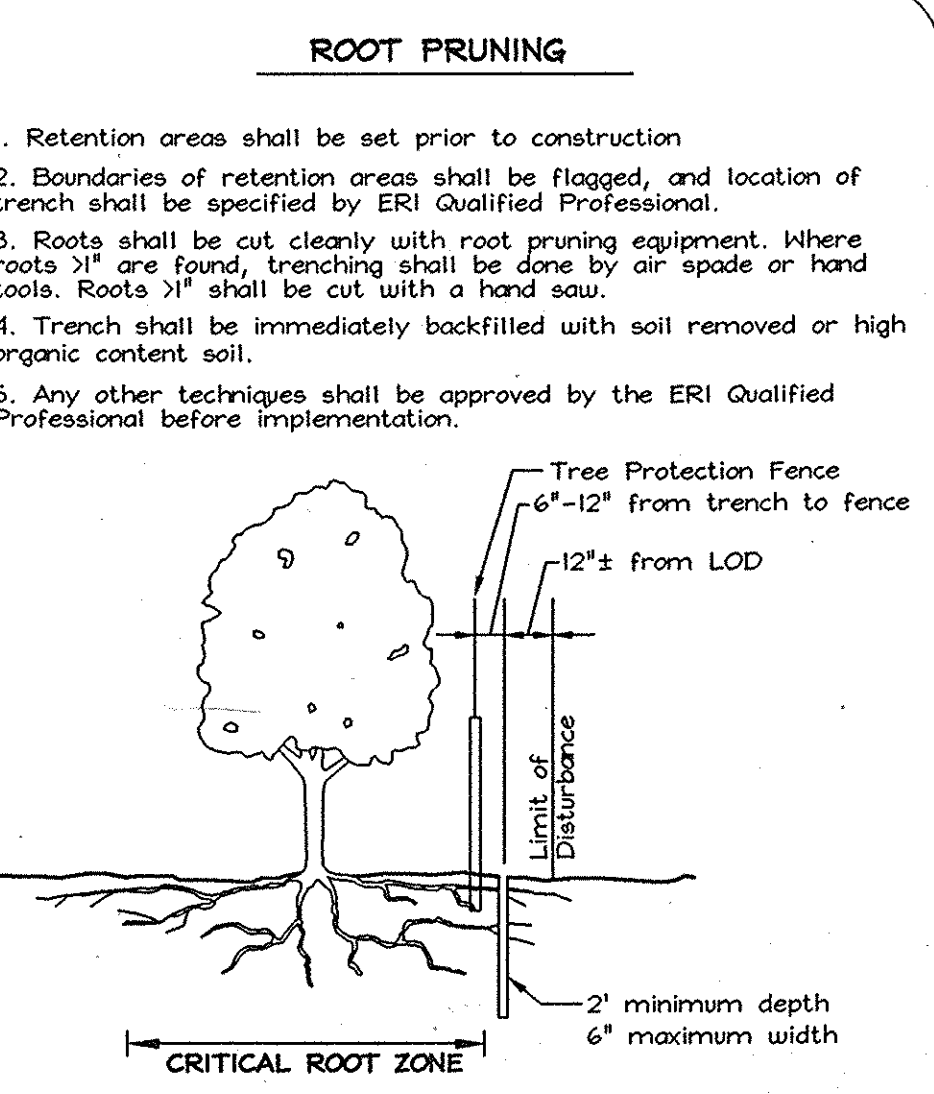
- ROOT PRUNING**
- Retention areas shall be set prior to construction.
 - Boundaries of retention areas shall be flagged, and location of trench shall be specified by ERI Qualified Professional.
 - Roots shall be cut cleanly with root pruning equipment. Where roots are found, trenching shall be done by air spade or hand tools. Roots 1/2\"/>

Soil Protection Zone Notes

- The Soil Protection Zone shall include all areas contained inside the Limit of Disturbance.
- Where possible, the Soil Protection Zone shall extend to the drip line of specimen trees. For other groups of trees, the zone shall be the drip line or 40% of the height of the tree, whichever is greater.
- No construction activity is permitted within the Soil Protection Zone.
- If soil has been compacted or grading has taken place in the vicinity of the Soil Protection Zone, root pruning shall be implemented per Root Pruning detail, shown on this plan.
- Root pruning shall occur prior to the beginning of construction.
- Where the Soil Protection Zone must encroach inside the Critical Root Zone of a tree, soil disturbance shall be mitigated with vertical mulching, radial trenching, or another method approved by the ERI Forest Conservation Professional.
- Prior to construction, the Limits of Disturbance shall be marked and the ERI Professional shall determine which trees will need preventative treatment or removal.
- Tree maintenance and removal shall be undertaken by a qualified MID Tree Expert to ensure damage to surrounding trees is minimized.
- Brush and limbs removed for construction shall be chipped and spread at the edge of the Soil Protection Zone to a depth of 6 inches. This shall occur outside the Soil Protection Zone where compaction could impact otherwise unprotected Critical Root Zone.



- PLANTING ON STEEP SLOPES**
NOT TO SCALE
- PLANT AS PER CONTAINER PLANTING DETAIL EXCEPT PREP OF PLANTING AREA.
 - A BASIN FOR PLANTING IS CUT INTO THE SLOPE WITH PLANT BEING PLACED NEAR THE DOWNHILL EDGE OF THE BASIN.
 - BASIN SHOULD SLOPE TOWARD UPHILL SIDE TO ALLOW RAIN TO BE CAPTURED AND INFILTRATE.
 - AN OVERFLOW CHANNEL SHALL BE CUT INTO UNDISTURBED SOIL AT THE REAR OF THE BASIN TO ALLOW EXCESS RUNOFF AND SEDIMENT TO ESCAPE WITHOUT DAMAGING THE BASIN.
 - MULCH AROUND PLANT IN BASIN.



EXPLORATION RESEARCH, INC.
ENVIRONMENTAL CONSULTANTS
LANDSCAPE ARCHITECTS
8310 FOREST STREET
ELLSWORTH CITY, MARYLAND 21043
TEL: (410) 700-1150 FAX: (410) 700-7500
EMAIL: EXPLORATION@ERINC.COM

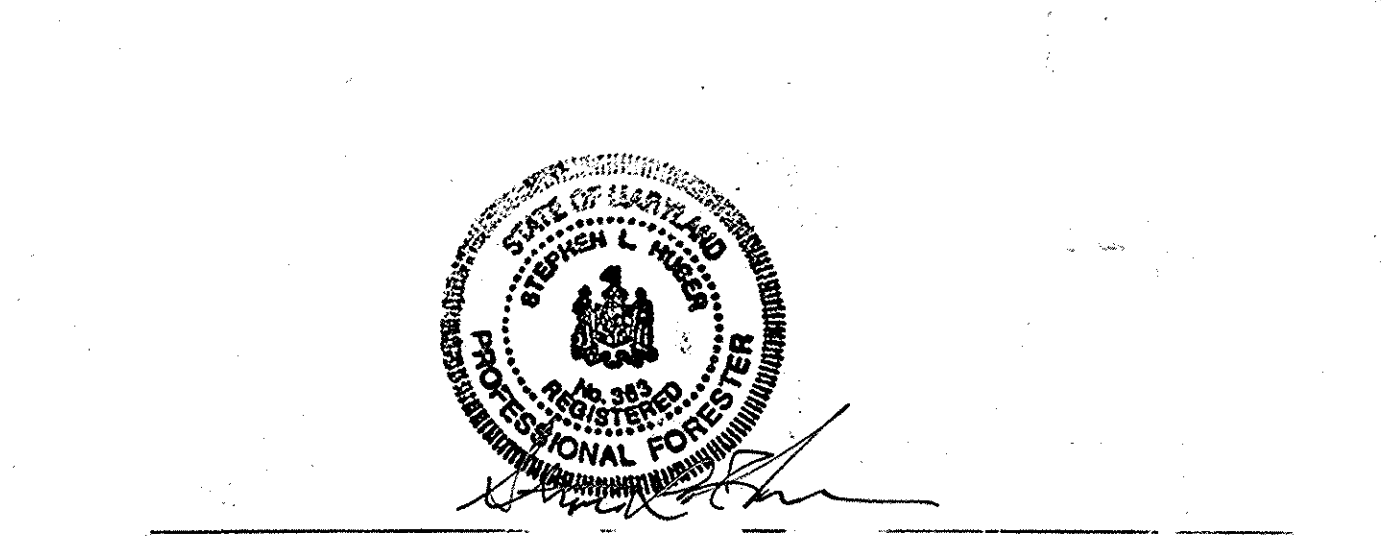
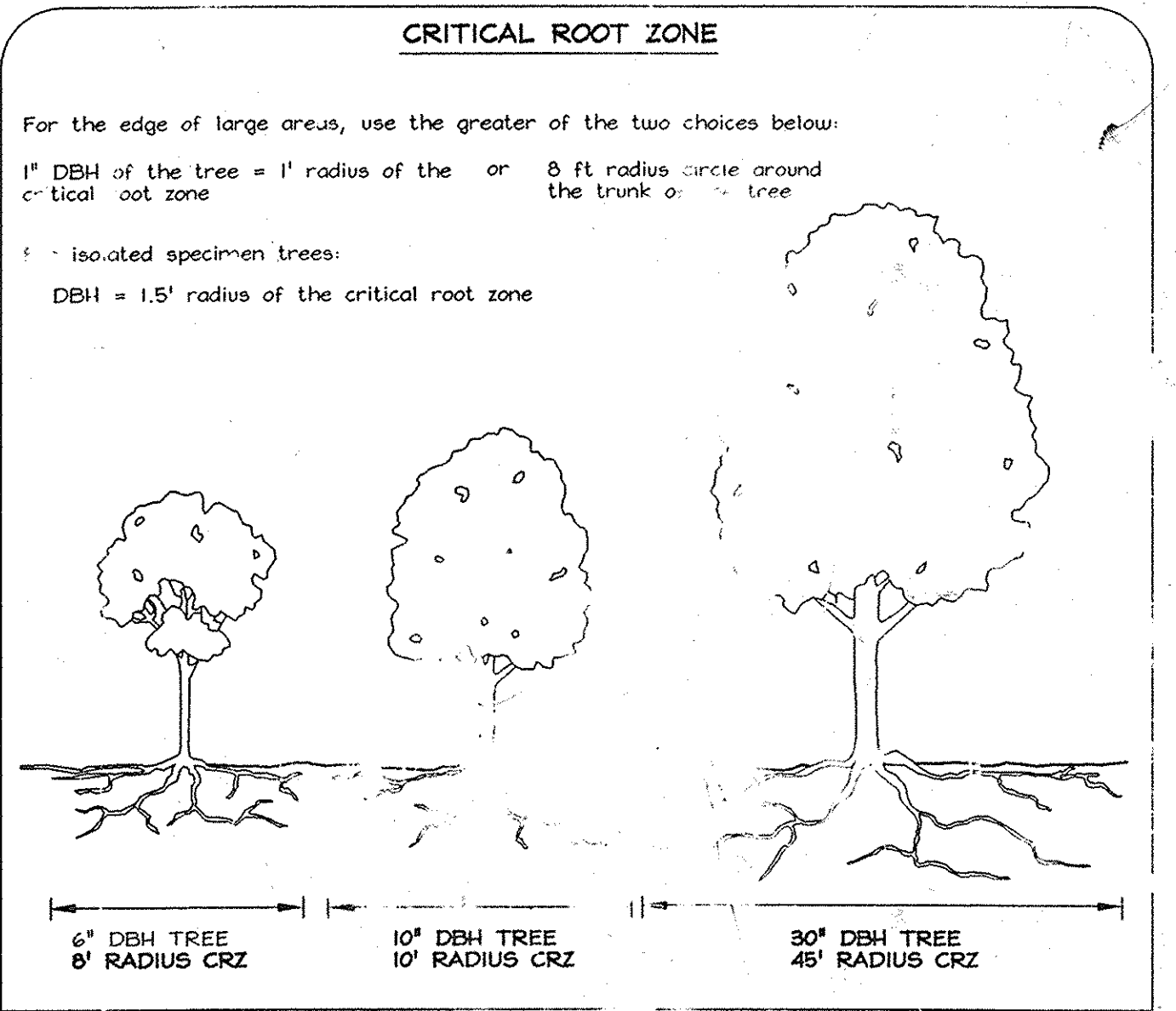
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(410) 997-3815

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Area Monitoring Note
The first growing season determine if supplemental watering is necessary. If supplemental watering is necessary, the watering shall be 75% of the amount of water applied to the planting site. The watering shall be applied if the soil is dry to a depth of 2\"/>

Reforestation Area Planting Notes

- Initial planting inspection and certification required by ERI qualified professional 24 hours in advance.
- Reforestation areas may be planted as soon as the ground is no longer frozen. Alternate conditions warranted.
- Soil amendments and fertilization will be made based upon the results of soil analysis for organic matter content and pH. Analysis shall be provided using a slow release, soluble 16-8-8 contained in polyethylene perforated bags such as those manufactured by ADCO Harkis, P.O. Box 310 Hollins, VA 22423 or approved equal.
- Plant materials shall be planted in accordance with the planting diagram, planting details and planting schedule.
- Plant stock must be protected from frost at all times prior to planting. Materials held for planting shall be moistened and placed in cool shaded areas until ready for placement.
- Planting materials shall be nurse grown and inspected prior to planting. Plants not conforming to the American Standards for Nursery Stock specifications for size, form, vigor, or roots, or due to trunk wounds, breakage, discoloration, insect or disease must be replaced.
- Newly planted trees may require watering at least once per week during the first growing season depending on rainfall in order to establish. The initial watering operation should allow for watering until installation to completely soak hardy till materials.
- Mulch shall be applied in accordance with the diagram provided and shall consist of composted, shredded hardwood bark mulch, free of wood alcohol.
- Planting holes shall be excavated to a minimum diameter of 2.5 to 3 times the diameter of the root ball or container. Mechanical angoring is preferred with excavation of the sides of each hole.
- All nursery stock to be sprayed with deer repellent containing Bitrex such as Repellex All nursery stock to be grown with deer repellent tablets in growing medium, such as Repellex Tablets.



FINAL FOREST CONSERVATION NOTES & DETAILS
SUMMER HAVEN PHASE I AND II

LOTS 3-12, 16 THRU 39, OPEN SPACE LOTS 3 & 14, NON-CREDITED OPEN SPACE LOT 15
A Resubdivision of Summer Haven Lot 2 Plat #15429

TAX MAP 98 GRID 4
1ST ELECTION DISTRICT

ARCELS 719, P/O 233
HOWARD COUNTY, MARYLAND

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Ellicott City, MD 21075
Tel: 410-567-5200 Fax 410-716-1662
E-mail: info@fshabiz.com

DESIGN: AB
DRAWN: ZYF
CHECKED: ZYF
SCALE: As Shown
DATE: 09.01.2006
O. No.: 3157
SHEET No. 13 OF 13