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

GENERAL NOTES

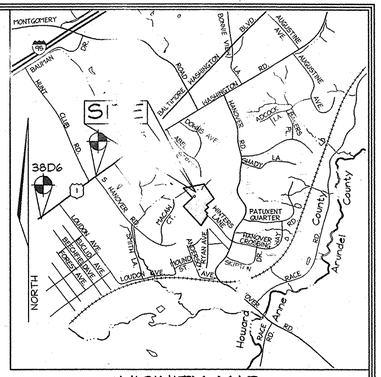
The subject property is zoned "R-12" per the 02/02/04 Comprehensive Zoning Plan.
2. This site is located within the Metropolitan District.
3. Public water and sewer to be utilized, contracts #14-3637-D, #14-3260-#44-193, and #10-3041.
4. Howard County Soils Map no. 36.
5. Gross area of site: 12.777 ac.±
6. Area of proposed public R/W: 0.907 ac.±
7. Number of proposed buildable lots 34
   Area of proposed buildable lots 6.308 ac.±
8. Number of proposed open space lots: 3
   Area of proposed open space lot: 5.562 ac.±
9. 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: 0.0 SEE WP-11-140
10. Topography is based on an Aerial Topographic Survey prepared by Wings Aerial Mapping Co., Inc. in 1993, and supplemented by field run topographic by FSH Associates on October, 2005.
11. Boundary for Parcels 718 & 721 prepared by Fisher, Collins & Carter, Inc. on August 1, 2002. Boundary for Lot 2 Summer Haven prepared by Fisher, Collins & Carter, Inc. on September 30, 1985.
12. Stormwater Management & Water Quality is provided as necessary in accordance with the 2000 Stormwater Management Manual. Pond to be a micro pool extended detention pond hazard class 'A'. Facility to be owned by the Homeowners Association and jointly maintained with Howard County.
13. A.P.F.O. Traffic Study prepared by Mars Group, and approved under Sketch Plan S-03-14 on May 11, 2003.
14. Wetlands Delineation and report prepared by Exploration Research, Inc. and approved under Sketch Plan S-03-14 on June 11, 2003.
15. Forest Stand Delineation and report prepared by Exploration Research, Inc. and approved under Sketch Plan S-03-14 on May 11, 2003.
16. There are no historic structures or cemeteries on-site.
17. 100-Year Floodplain study prepared by FSH Associates and approved under P-05-09 on June 30, 2005.
18. County file numbers: F-02-163; F-93-83; S-03-14; P-05-09; WP-06-02, WP-11-140, PLAT #21677 (F-11-098)
19. No grading, removal of vegetative cover or trees, or placement of new structures is permitted within the limits of wetlands, stream(s), or their buffers and forest conservation easement areas.
20. All Existing Buildings, Structures, and Fence lines on site to be removed.
21. Parking Requirements per Zoning Regulations, Section 133.B(1) and D(2)
    a.) Number of parking spaces required: 68 spaces (2.0 per unit x 34 units)
    b.) Parking spaces provided on private driveway pads and garages.
    Parking Requirements per Howard County Design Manual Volume III, Section 2.8.2.
    a.) Number of parking spaces required: 17 spaces (0.5 per unit x 34 units)
    b.) Parking spaces provided along one side of Road A per Howard County Design Manual Volume III, Table 2.11.
22. All Fill Areas within Public Right-Of-Ways to have 95% Compaction.
23. Landscaping for this subdivision is provided in accordance with a Landscape Plan included with the road construction drawings in accordance with Section 16.124 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 27 evergreen trees, $600.00 for 20 shrubs) provided with the DPW, Developer's Agreement.
24. 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.
25. 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
26. All existing wells and septic systems to be properly abandoned according to the Howard County Health Department Regulations.
27. The back of proposed storm drain inlet 1-11 is to have a weir opening to allow collection of the stormwater runoff from the Winters Ridge stormwater quality management facility, see detail sheet 8.
28. At the site development plan stage, the BRL's effective at that time must be shown on the plan.
29. The Maryland Aviation Administration (MAA) waterfowl deterrence requirements for stormwater management and sediment control structures will be met by the use of waterfowl exclusion pilings and boulders (see typical detail sheet 9), and it will utilize MAA approved species and seed mixtures for SWM facility landscaping.
30. 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.
31. The lots shown hereon comply with the minimum ownership width and lot area as required by the Maryland State Department of the Environment.
32. 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.
33. 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)	410.787.9068
Miss Utility	1.800.257.7777
Colonial Pipeline Company	410.795.1390
Howard County, Dept. of Public Works, Bureau of Utilities	410.313.4900
Howard County Health Department	410.313.2640

34. The contractor shall notify Miss Utility at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
35. 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 the start of work. All fills for public road surfaces require 95% compaction (AASHTO-T-180).
36. All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA standards and specifications if applicable.
37. 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.
38. 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.
39. 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's - sufficient to ensure all weather use
40. This plan is subject to petition WP-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 guardrails per Howard County Standard Details R.7.01 - R.7.09.
42. A minimum 20' distance 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 AMMENITIES 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. WAIVER PETITION WP-11-140 WAS APPROVED BY LETTER DATED MARCH 23, 2011 TO WAIVE ARTICLE II, SECTION 16.121(a)(4)(ii) REQUIRING OPEN SPACE LOTS TO BE REGULAR IN SHAPE; ARTICLE II SECTION 16.121(a)(4)(iii) REQUIRING RECREATIONAL OPEN SPACE NOT TO INCLUDE SWM CREDITS; ARTICLE II, SECTION 16.121(a)(4)(iv) REQUIRING 20' OF ROAD FRONTAGE; AND ARTICLE II, SECTION 16.121(a)(4)(vi) REQUIRING 200 SF OF RECREATIONAL OPEN SPACE PER LOT, SUBJECT PER THE FOLLOWING CONDITIONS:
    1). SUBMIT A PLAT 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 PLAT IS RECORDED, A REDLINE REVISION TO THE APPROVED ROAD CONSTRUCTION PLANS FOR F-06-008 & APPROVED SITE DEVELOPE 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 PATH WAY) AS SHOWN ON AND APPROVED UNDER THE WAIVER PETITION LOCATED WITHIN HOA, OPEN SPACE LOT 13 & COUNTY OWNED OPEN SPACE LOT 14. THE 5'WIDE MULCHED PATHWAY SHALL BE CONSTRUCTED OF MATERIALS THAT ARE DESIREABLE AND RESISTANT TO STORM DRAINAGE RUNOFF.
    4). THE 5'WIDE MULCHED PATHWAY LOCATED ACROSS OPEN SPACE LOT 13 & 14 SHALL BE MAINTAINED BY THE HOMEOWNER'S ASSOCIATION FOR THE SUMMER HAVEN SUBDIVISION. A NOTE SHALL BE ADDED TO THE PLAT 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 AMMENITIES AS APPROVED UNDER WAIVER PETITION WP-11-140.
46. THE 5'x20' 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)

LEGEND

Existing Contour — 552
Existing Spot Elevation 382.5
Existing Stream Buffer SB
Existing Wetland Buffer WB
Existing Wetland W
Wetland
Existing Trees to Remain
25% or greater slopes
15% or greater slopes
Proposed Light Pole
Soil Boundary



VICINITY MAP

SCALE: 1"=2000'

BENCHMARKS

Sta. 38D5	N 170,194.1301	E 422,613.4088	El.: 59.0479 (meters)
	N 558,378.575	E 1,386,524.158	El.: 193.726 (feet)
Sta. 38D6	N 169,821.3237	E 422,146.4658	El.: 53.4097 (meters)
	N 557,155.459	E 1,384,992.262	El.: 175.228 (feet)

SHEET INDEX

DESCRIPTION	SHEET No.
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Road Plan and Profile Summer Haven Lane	2 of 13
Road Plan and Profiles Autumn Haven Court & Mary Theresa Court	3 of 13
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Sediment and Erosion Control Details	5 of 13
Landscape Plan, Notes and Details	6 of 13
Storm Drain Drainage Area Map	7 of 13
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Stormwater Management Plan	9 of 13
Stormwater Management Profile and Details	10 of 13
Existing Conditions Plan	11 of 13
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Final Forest Conservation Notes & Details	13 of 13

CENTERLINE ROAD CURVE DATA

CURVE	RADIUS	LENGTH	DELTA	CHORD BEARING	CHORD LENGTH	TANGENT
C1	1000.00'	210.29'	12°02'55"	N37°21'21"W	209.90'	105.53'
C2	170.00'	240.18'	80°57'02"	N09°08'37"E	220.70'	145.07'

STREET LIGHT TABLE

FIXTURE TYPE	POLE TYPE	LOCATION	STREET
100 watt HPS vapor Premier post top mounted	14' black fiberglass	L.P. Sta. 1+65, 3' behind curb	Summer Haven Lane
100 watt HPS vapor Premier post top mounted	14' black fiberglass	℄ Sta. 14+80.44' 16.3 left	Summer Haven Lane
100 watt HPS vapor Premier post top mounted	14' black fiberglass	℄ Sta. 13+65.04 16.3' left	Summer Haven Lane
100 watt HPS vapor Premier post top mounted	14' black fiberglass	℄ Sta. 11+31.94 15.7' left	Summer Haven Lane

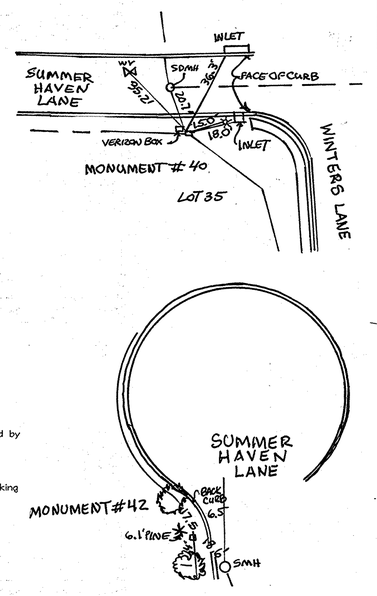
Note: Light pole location given at center of base

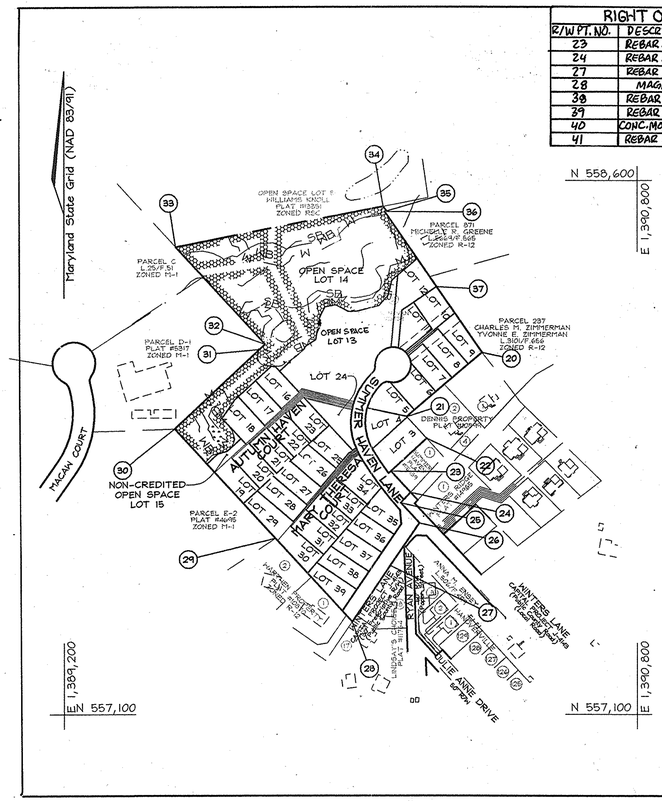
MINIMUM LOT SIZE

LOT NO.	GROSS AREA (sf)	PIPESTEM AREA (sf)	MINIMUM LOT SIZE (sf)
8	8,078	246	7,832
9	8,301	532	7,769
10	7,745	471	7,274
12	11,644	2,099	9,545
16	7,648	434	7,214
17	7,927	677	7,250
18	8,746	865	7,881
19	8,602	1,244	7,358
20	8,373	1,044	7,329
21	8,236	838	7,398
22	7,845	630	7,265
23	7,679	416	7,263
25	7,230	28	7,202
26	7,494	190	7,304
27	7,764	351	7,433
28	8,243	499	7,794
29	8,949	643	8,306
30	8,257	676	7,581
31	8,109	523	7,586
32	7,549	374	7,225
33	7,445	223	7,222

U.S. EQUIVALENT COORDINATE TABLE

POINT	NORTHING	EASTING
20	558,116.3228	1,390,366.6828
21	557,935.2788	1,390,156.1816
22	557,873.9138	1,390,212.2019
23	557,782.4373	1,390,111.9478
24	557,722.5741	1,390,166.6471
25	557,693.0459	1,390,139.4424
26	557,636.5020	1,390,191.0610
27	557,517.0895	1,390,110.2363
28	557,354.1248	1,390,004.0734
29	557,593.7345	1,389,789.6194
30	557,901.4214	1,389,508.7833
31	558,124.9707	1,389,745.1367
32	558,139.9784	1,389,761.0110
33	558,413.1223	1,389,511.7820
34	558,526.9427	1,390,090.5669
35	558,513.2324	1,390,100.1719
36	558,512.0259	1,390,244.6133
37	558,300.9804	1,390,239.6049





LOCATION MAP

SCALE: 1"=200'

ROAD CLASSIFICATION

ROAD NAME	CLASSIFICATION	R/W
Summer Haven Lane	Public Access Street	40'
Mary Theresa Court	Private Access Place	24'
Autumn Haven Court	Private Access Place	24'

RIGHT OF WAY ELEVATION CHART NAD 83

R/W PT. NO.	DESCRIPTION	ELEVATION	R/W PT. NO.	DESCRIPTION	ELEVATION
23	REBAR & CAP	167.41'	42	CONC. MONUMENT	163.38'
24	REBAR & CAP	166.55'	43	REBAR & CAP	162.49'
27	REBAR & CAP	172.32'	44	X-CUT IN WALK	163.35'
28	MAGNAIL	180.67'	45	REBAR & CAP	164.03'
38	REBAR & CAP	181.25'	46	REBAR & CAP	164.31'
39	REBAR & CAP	171.18'	47	REBAR & CAP	165.48'
40	CONC. MONUMENT	168.40'	48	REBAR & CAP	173.06'
41	REBAR & CAP	164.43'			

AS-BUILT NOTES:

1.) HORIZONTAL DATUM FOR THIS AS-BUILT IS BASED ON THE MARYLAND STATE REFERENCE SYSTEM NAD 83/ADJ.91 AS PROJECTED FROM HO.CO. GEODETIC CONTROL STATIONS 38D5 AND 38D6. VERTICAL DATUM FOR THIS AS-BUILT IS NORTH AMERICAN VERTICAL DATUM NGVD 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 BENCHMAR 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

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

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

STATE OF MARYLAND — BRIAN F. CLEARY — No. 28559 — REGISTERED PROFESSIONAL ENGINEER — 6/24/2014

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

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT JA — DATE 9/22/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/7/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS MS — DATE 8-31-06

NO	DATE	REVISION	BY
1	9/16/11	ADD RECREATIONAL AMMENITIES PER WP-11-140 CHANG OPEN SPACE LOT 24 TO A BUILDABLE LOT REVISE LOCATION OF 5'X 20' TRASH PAD	BEI

OWNERS/DEVELOPERS

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

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

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

STATE OF MARYLAND — TIMOTHY JOSEPH FISCH — No. 20113 — PROFESSIONAL ENGINEER

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel.: 410-567-5200 Fax: 410-796-15.7
E-mail: info@fsha.biz

DESIGN BY: PS
DRAWN BY: AY
CHECKED BY: ZYF
SCALE: As Shown
DATE: Aug. 09, 2006
W.O. 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, AND THAT I AM A DULY 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

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

NO.	DATE	REVISION	BY
3	9-16-11	ADD RECREATIONAL AMMENITIES PER WP-11-140 CHANGE OPEN SPACE LOT 24 TO A BUILDABLE LOT REVISE LOCATION OF 5'X 20' TRASH PAD	BEI
2	9-7-10	REMOVE SIDEWALK IN FRONT OF LOT 1	BEI
1	2-2-10	ADD EX. HEADWALL, REMOVE I-14, REVISE STORMDRAIN TO EX.	BEI

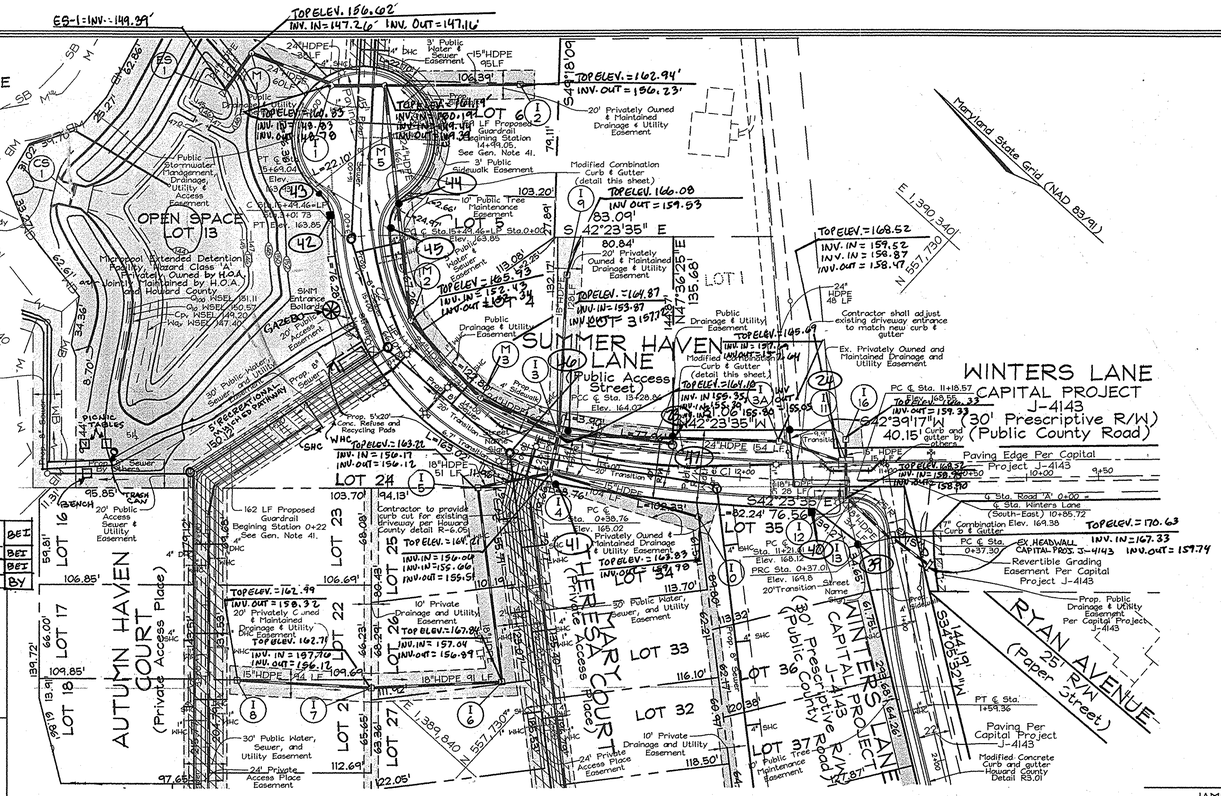
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Harrison 9/22/06
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

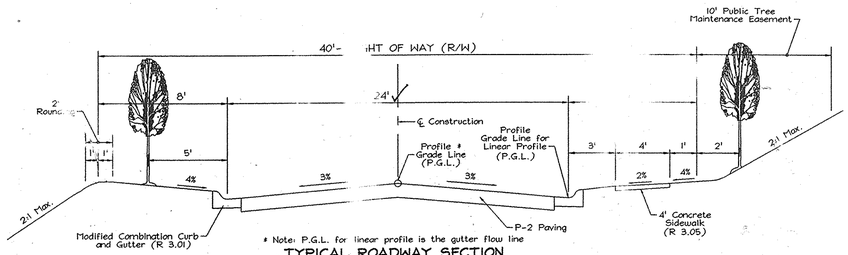
9/7/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

William J. Mitchell 8-31-06
CHIEF, BUREAU OF HIGHWAYS DATE



PLAN VIEW
SCALE: 1"=50'



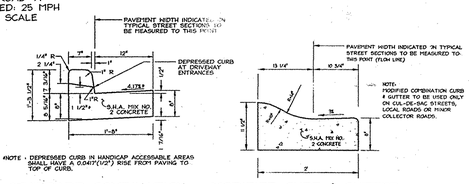
* Note: P.G.L. for linear profile is the gutter flow line

TYPICAL ROADWAY SECTION
CLASSIFICATION: PUBLIC ACCESS STREET

ROADS: ROAD 'A'
DESIGN SPEED: 25 MPH
NOT TO SCALE

CURB TRANSITIONS		
INLET	DIRECTION	LENGTH
1-3	North-West	20'
1-3	South-East	20'
1-4	North-West	6.70'
1-4	South-East	20'
1-11	North-West	9.90'
1-12	North-West	20'
1-12	South-East	20'

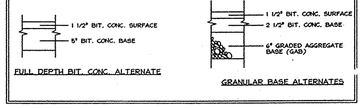
Note: See Howard County Standard Detail R-3.02 for more information.



STANDARD COMBINATION CURB AND GUTTER
HOWARD COUNTY STANDARD R-3.01
NOT TO SCALE

MODIFIED CURB & GUTTER
HOWARD COUNTY STANDARD R-3.02
NOT TO SCALE

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



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

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

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, Plat #15439

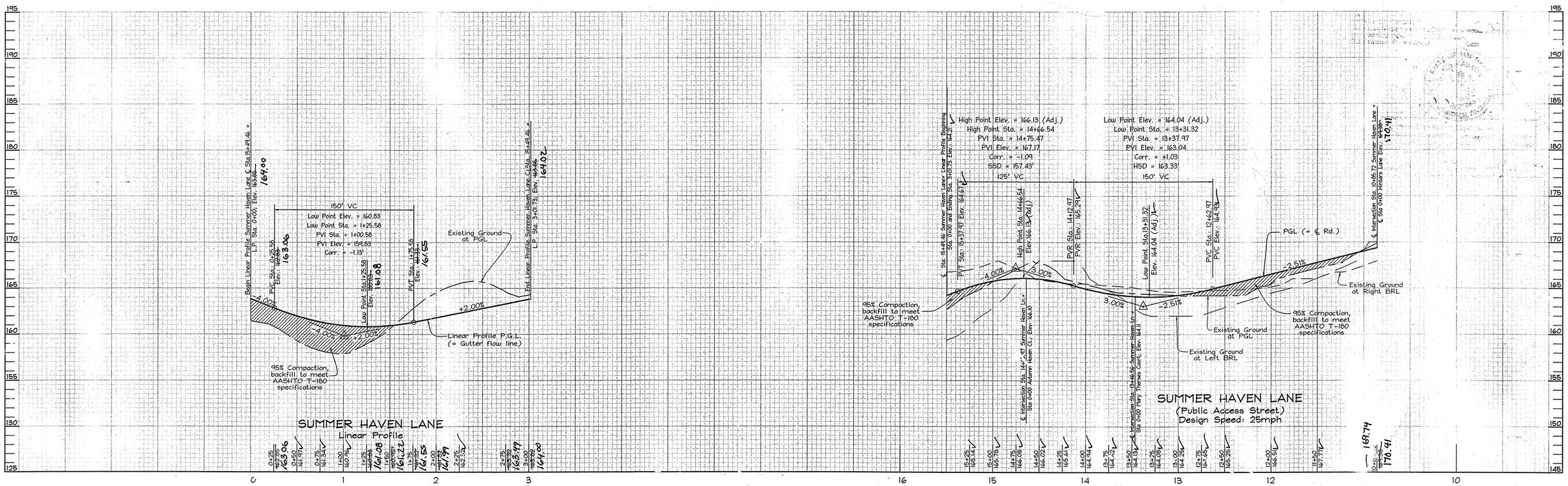
TAX MAP 38 GRID 14
1ST ELECTION DISTRICT

PARCELS 718, 721 & P/O 233
HOWARD COUNTY, MARYLAND

STATE OF MARYLAND ZACHARIA YOSEFFISCH 22418 PROFESSIONAL ENGINEER

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

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

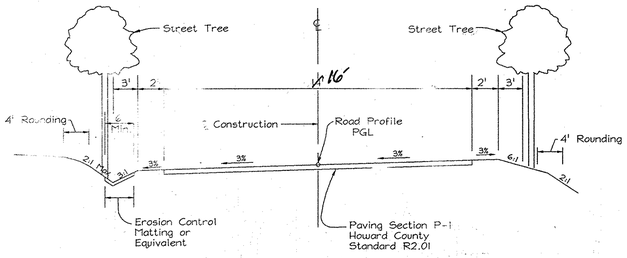


LINEAR PROFILE
SCALE: Hor.: 1"=50'
Vert.: 1"=5'

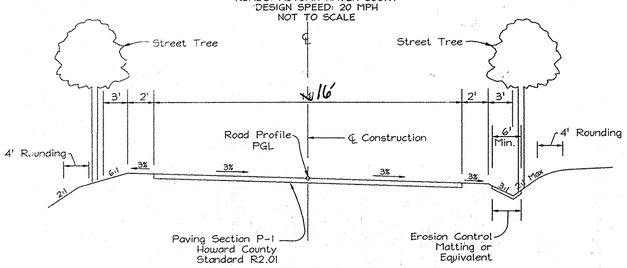
ROAD PROFILE
SCALE: Hor.: 1"=50'
Vert.: 1"=5'

AS-BUILT

F-06-008



TYPICAL ROADWAY SECTION
CLASSIFICATION: PRIVATE ACCESS PLACE
ROADS: AUTUMN HAVEN COURT
DESIGN SPEED: 20 MPH
NOT TO SCALE



TYPICAL ROADWAY SECTION
CLASSIFICATION: PRIVATE ACCESS PLACE
ROADS: MARY THERESA COURT
DESIGN SPEED: 20 MPH
NOT TO SCALE

NO	DATE	REVISION	BY
2	9-7-10	REMOVE SIDEWALK IN FRONT OF LOT 1	BEL
1	2-2-10	ADD EX. HEADWALL, REMOVE E-14, REVISE STORMDRAIN TO 'EX'	BEL
4	4-25-06	REMOVE OFFSET TURN AROUND ON LOT 19, ADD EASEMENT & TURN AROUND RETAINING WALL TO WESTSIDE OF AUTUMN HAVEN CT. (WOT 15	BEL
3	9-6-11	ADD RECREATIONAL AMENITIES PER WP-11-140 CHANGE OPEN SPACE LOT 24 TO A BUILDABLE LOT REVISE LOCATION OF 5'X20' TRASH PAD	BEL

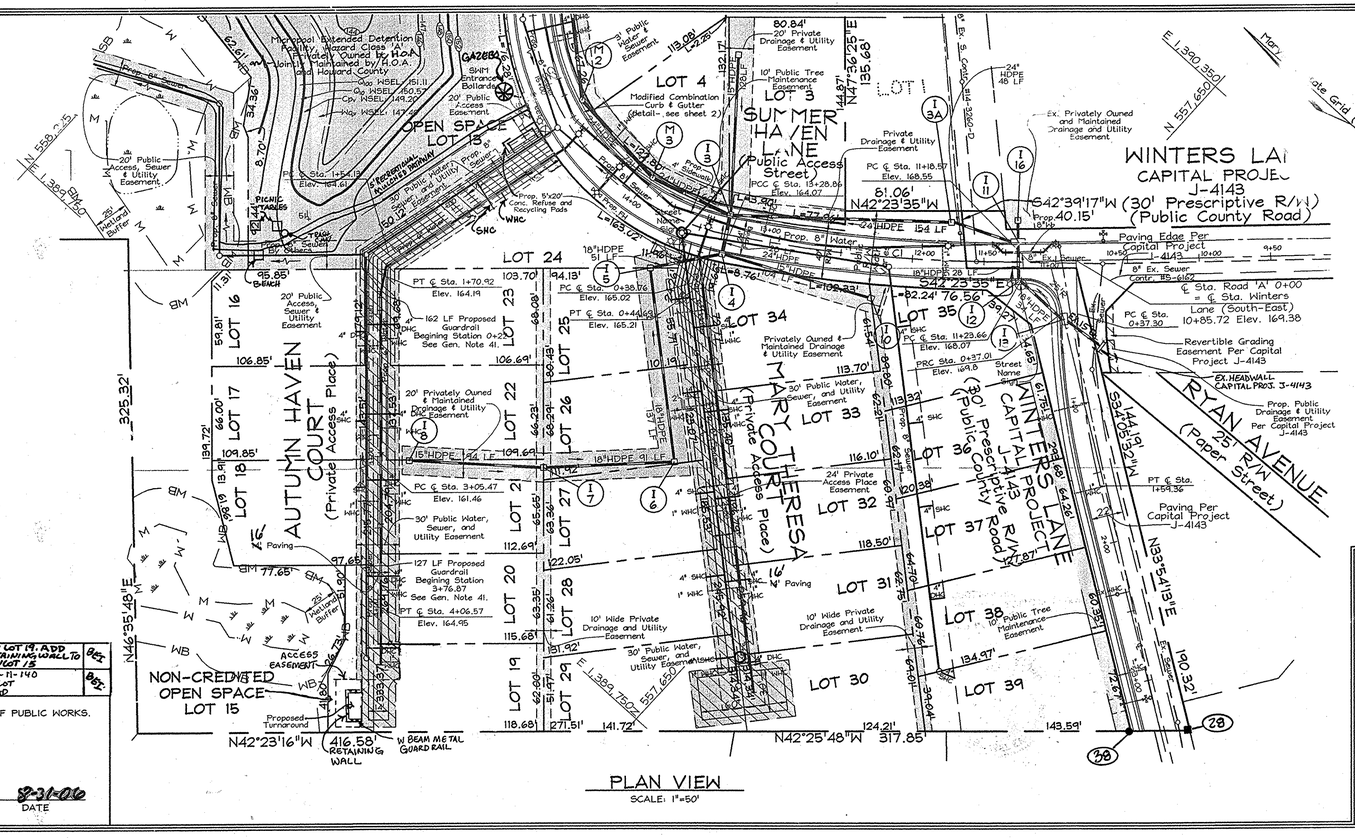
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9/12/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/7/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 8-31-06



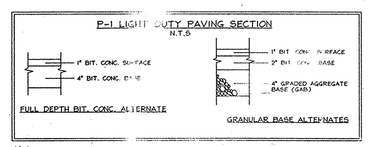
PLAN VIEW
SCALE: 1"=50'

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: 12-21-2014

Donald Mason

For Revisions by Benchmark Engineering, Inc. only

P-1 LIGHT DUTY PAVING SECTION
N.T.S.



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

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

OWNERS/DEVELOPERS

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

B.Z. ENTERPRISES INC.
PO Box ec
Reisterstown, MD 21136
(410) 235-8867

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

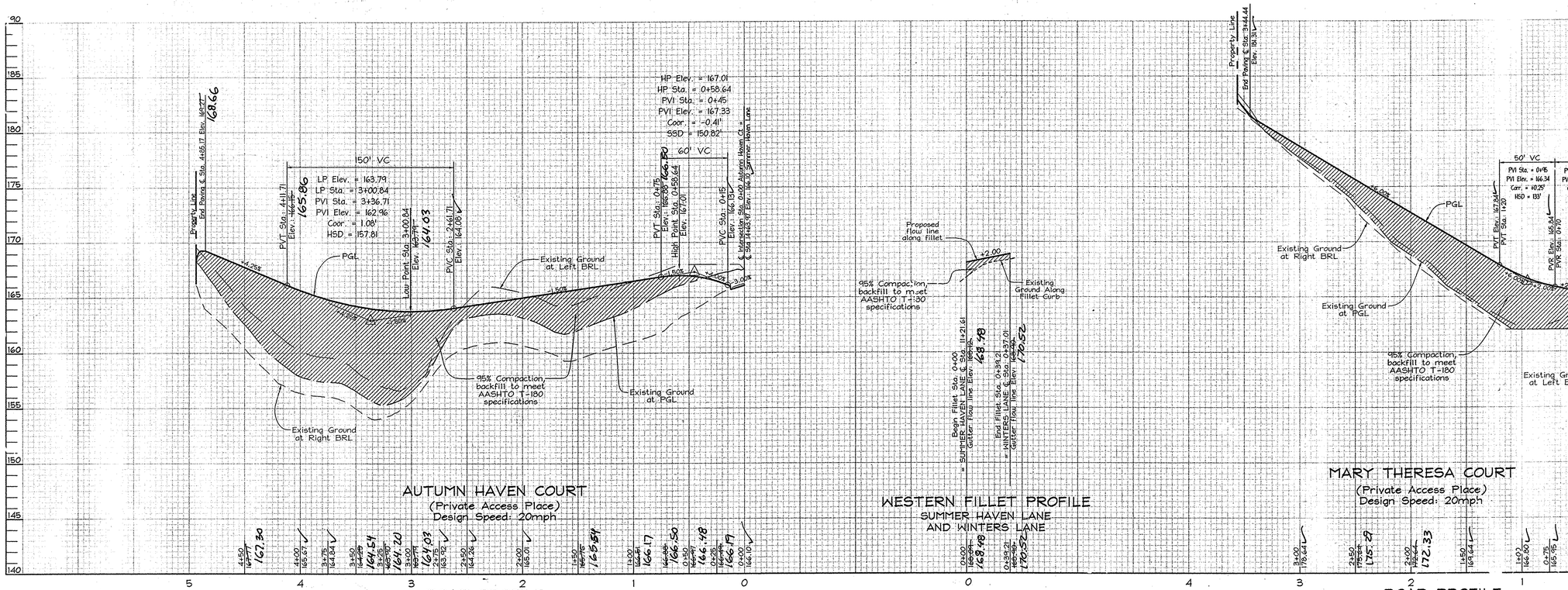
LOTS 3-12 & 16 THRU 39, OPEN SPACE LOTS 13 & 14, NON-CREDITED OPEN SPACE LOT 15
A Resubdivision of Summer Haven Lot 2, Plat #15439

TAX MAP 38 GRID 14 — PARCELS 7,8, 721 & P/O 233
1ST ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

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

DES.GN BY: FS
DR.WN BY: PS
CHECKED BY: ZYF
SCALE: As Shown
DATE: Aug. 09, 2006
W.O. No.: 3157
SHEET No. 3 OF 13



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

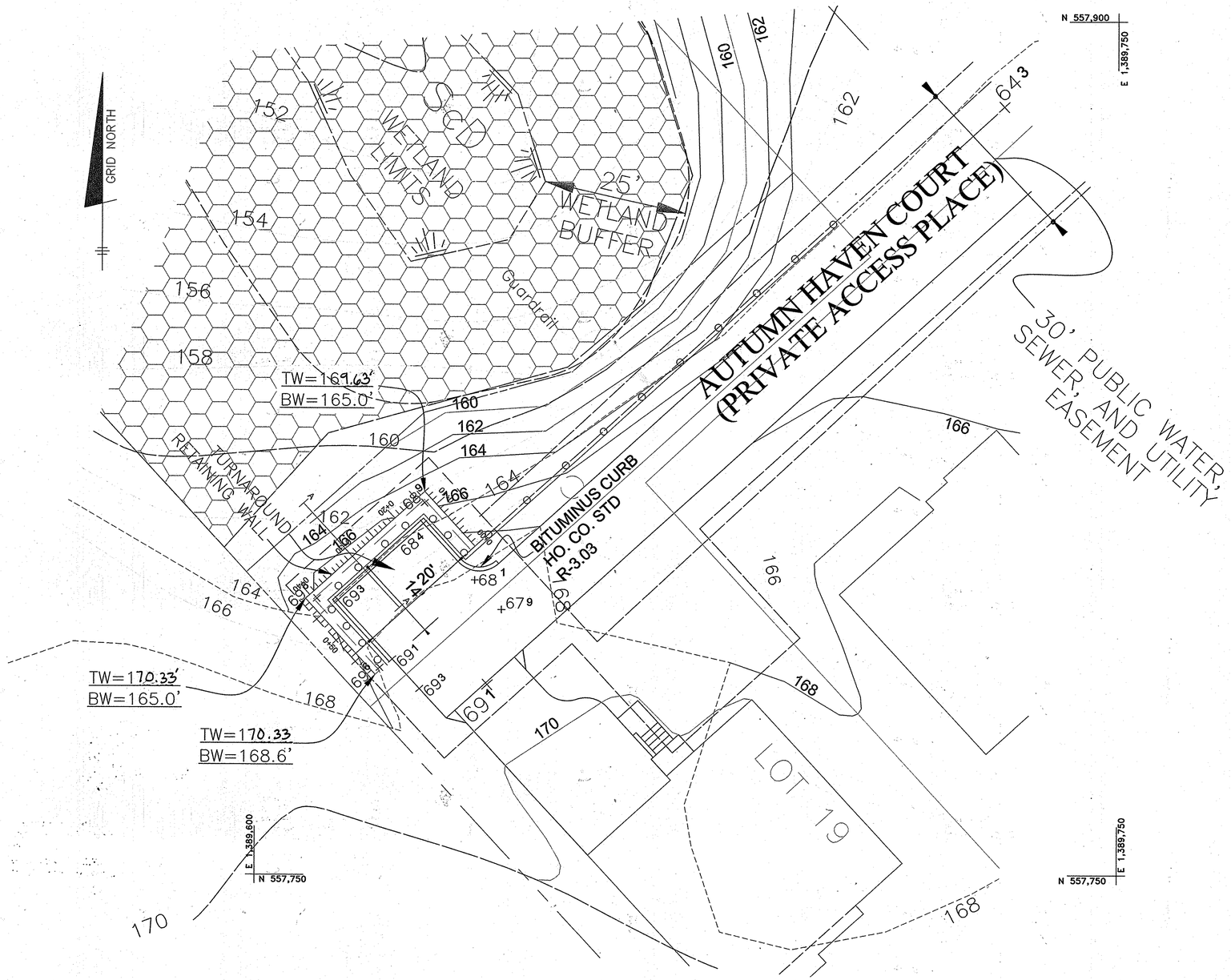
STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

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

AS-BUILT

F-06-008

M:\Summer Haven 3157\dwg\final\3157_3h_s3.dwg, 8/10/2006 2:36:49 PM, nhorn, 1:1



LEGEND

EXISTING CONTOURS 160

PROPOSED CONTOURS 160

LIMIT OF WETLANDS

FOREST CONSERVATION EASEMENT

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)

1 inch = 10 ft.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-6-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6-7-16

DIRECTOR — DATE

NOTE: SHEET 3A 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. 33396 EXPIRATION DATE: 11-29-2016

STATE OF MARYLAND — JUSTIN A. FRITZLEN — LICENSE NO. 33396 — PROFESSIONAL ENGINEER

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

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: bei@bei-civilengineering.com

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 21443 Expiration Date: 12-21-16.

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
REVISE FINAL ROAD CONSTRUCTION PLAN

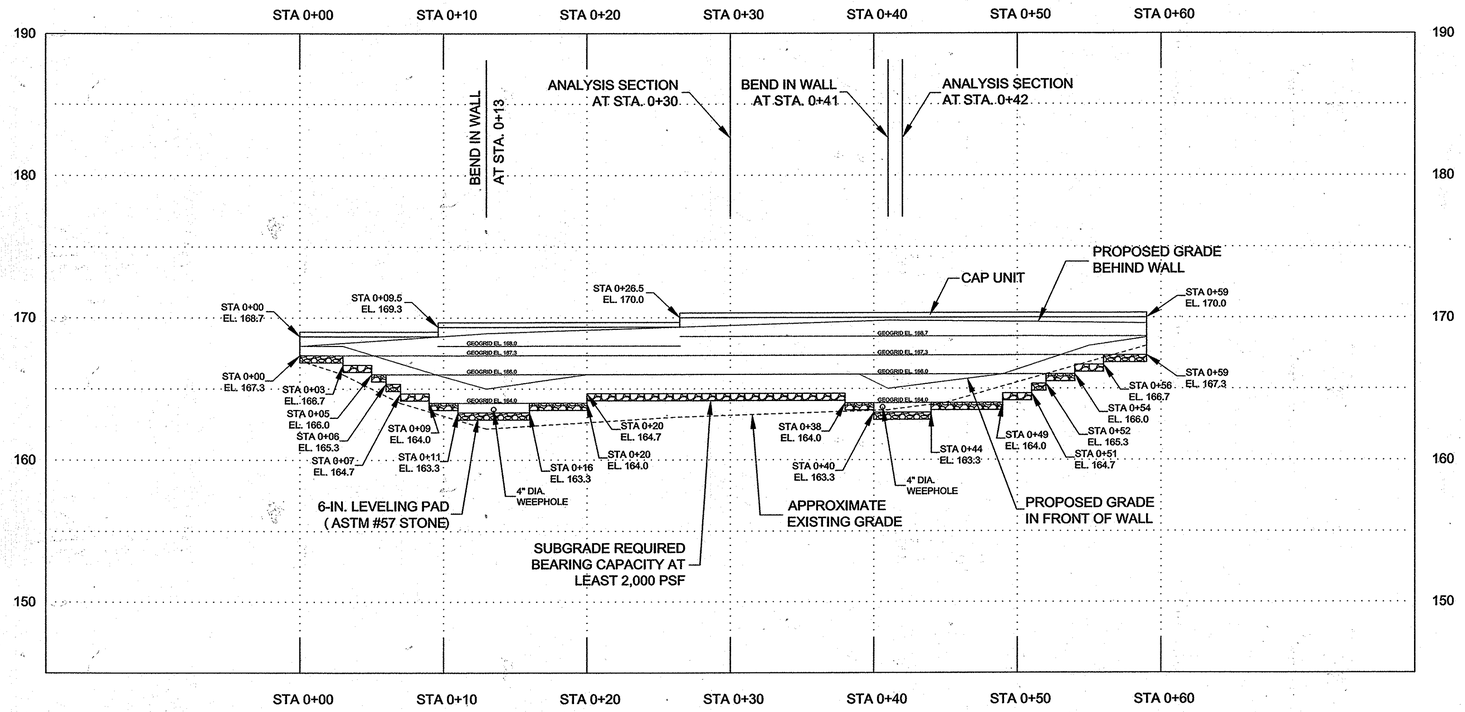
LOCATION: TAX MAP 38, GRID 14
PARCELS 718, 721 & P/O 233
1st ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: ROAD PLAN
TURNAROUND

DATE: FEBRUARY, 2016 — PROJECT NO. 2160

DES: DAM | DRAFT: EDD | CHECK: DAM | SCALE: AS SHOWN | DRAWING 3A OF 13

F-06-008



RETAINING WALL PROFILE

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

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-6-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6.2.16

DIRECTOR — DATE N/A

NOTE: SHEET 3B 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. 33306 EXPIRATION DATE: 11-29-2016

STATE OF MARYLAND — JUSTIN A. FRITZFIELD — 33306 — PROFESSIONAL ENGINEER

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: As Shown	HKA Drawing No: 2 of 4

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: bei@bei-civilengineering.com

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 21443 Expiration Date: 12-21-16.

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

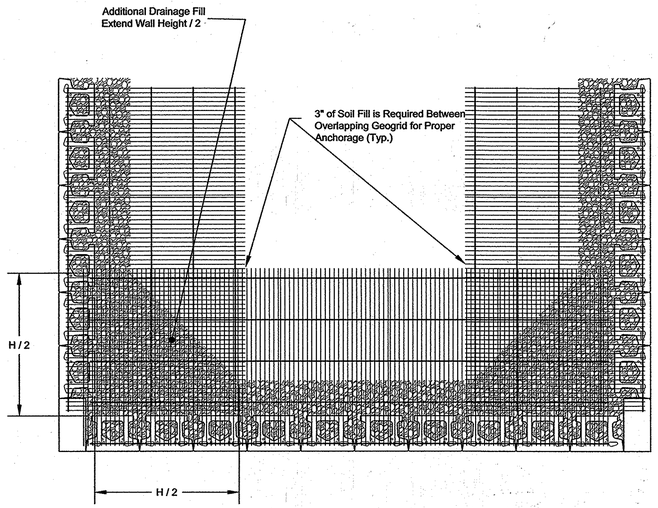
LOCATION: TAX MAP 38, GRID 14
PARCELS 718, 721 & P/O 233
1st ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: ROAD PLAN TURNAROUND

DATE: FEBRUARY, 2016 — PROJECT NO. 2160

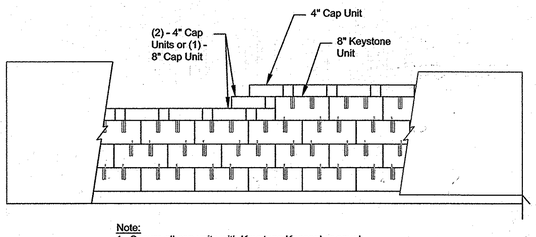
DES: DAM — DRAFT: EDD — CHECK: DAM — SCALE: AS SHOWN — DRAWING 3B OF 13

F-06-008



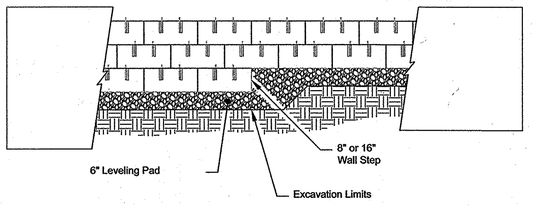
Note:
1. Check with manufacturer specifications on correct direction of orientation for geogrid to obtain proper strength.
2. Corner units recommended for outside corners. Availability May Vary.

Geogrid Installation at Corners



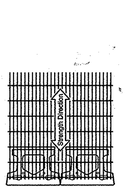
Note:
1. Secure all cap units with Keystone Kapseal or equal.

Top of Wall Steps



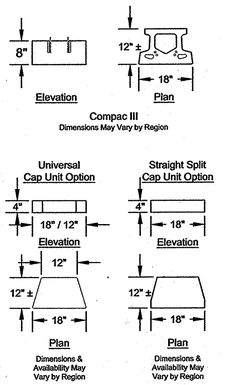
Notes:
1. The leveling pad is to be constructed of crushed stone or 2,000 psi± unreinforced concrete
2. The base foundation is to be approved by the site geotechnical engineer prior to placement of the leveling pad.

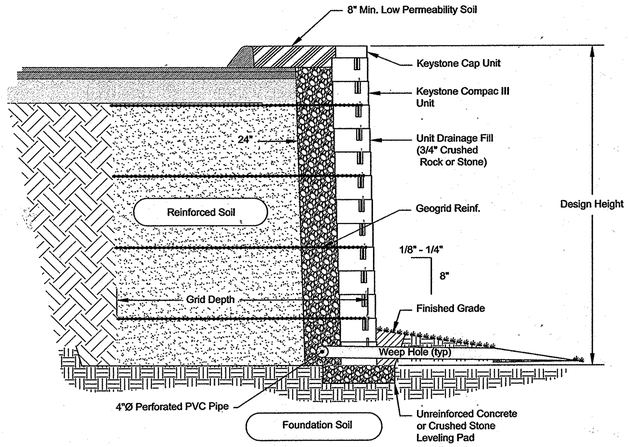
Leveling Pad Elevation Detail



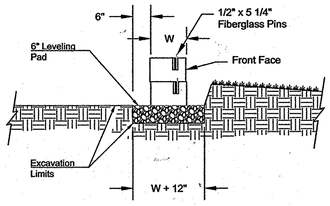
Note:
1. Geogrid is to be Placed on Level Backfill and Extended Over the Fiberglass Pins.
2. Place Next Unit.
3. Pull Grid Taught and Backfill.
4. Stake as required.

Grid & Pin Connection

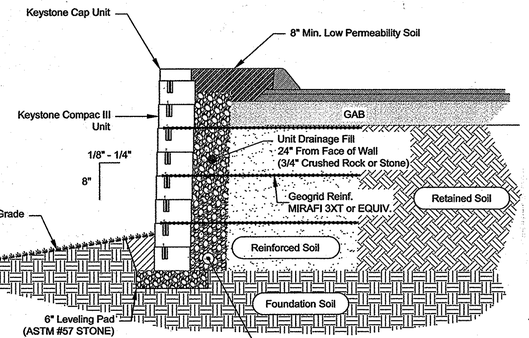




Typical Reinforced Wall Section

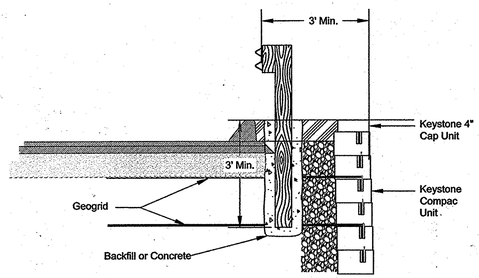


Leveling Pad Section Detail



Analysis Section at STA. 0+30

SCALE: 1" = 2'



Notes:
Guardrail:
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

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: 12-21-16.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6-6-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6-7-16

DIRECTOR — DATE

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. 53305 EXPIRATION DATE: 11-29-2016

STATE OF MARYLAND — JUSTIN A. FRIZELL — 53305 — PROFESSIONAL ENGINEER

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

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

DES: DAM | DRAFT: EDD | CHECK: DAM | SCALE: AS SHOWN | DRAWING 3C OF 13

F-06-008

SUMMER HAVEN
SEGMENTAL RETAINING WALL SPECIFICATIONS

PART 1: GENERAL

1.01 Description

A. 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.

B. Work includes preparing foundation soil, furnishing and installing leveling pad, unit drainage fill and backfill to the lines and grades shown on the construction drawings.

C. Work includes furnishing and installing geogrid soil reinforcement of the type, size, location, and lengths designated on the construction drawings.

1.02 Reference Documents

A. American Society for Testing and Materials (ASTM)

1. C140 Sampling and Testing Concrete Masonry Units
2. C1372 Specification for Dry-Cast Segmental Retaining Wall Units
3. D422 Particle-Size Analysis of Soils
4. D698 Laboratory Compaction Characteristics of Soil -Standard Effort
5. D1557 Laboratory Compaction Characteristics of Soil -Modified Effort
6. D3034 Polyvinyl Chloride Pipe (PVC)
7. D4318 Liquid Limit, Plastic Limit and Plasticity Index of Soils
8. D4475 Horizontal Shear Strength of Pultruded Reinforced Plastic Rods
9. D4476 Flexural Properties of Fiber Reinforced Pultruded Plastic Rods
10. D4595 Tensile Properties of Geotextiles - Wide Width Strip
11. D5262 Unconfined Tension Creep Behavior of Geosynthetics
12. D5818 Evaluate Installation Damage of Geosynthetics
13. D6637 Tensile Properties of Geogrids - Single or Multi-Rib
14. D6638 Connection Strength - Reinforcement/Segmental Units
15. D6706 Geosynthetic Pullout Resistance in Soil
16. D6916 Shear Strength Between Segmental Concrete Units

B. American Association of State Highway and Transportation Officials (AASHTO)

1. M 252 Corrugated Polyethylene Drainage Pipe

C. Geosynthetic Research Institute (GRI)

1. GG4(a) Determination of the Long-Term Design Strength of Stiff Geogrids
2. GG4(b) Determination of the Long-Term Design Strength of Flexible Geogrids

D. National Concrete Masonry Association (NCMA)

1. SRWU-1 Test Method for Determining Connection Strength of SRW
2. SRWU-2 Test Method for Determining Shear Strength of SRW

1.03 Delivery, Storage and Handling

A. Contractor shall check all materials upon delivery to assure that the proper type, grade, color, and certification has been received.

B. Contractor shall protect all materials from damage due to jobsite conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

PART 2: PRODUCTS

2.01 Definitions

A. Modular Unit - a concrete retaining wall element machine made from Portland cement, water, and aggregates.

B. 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.

C. Unit Drainage Fill - drainage aggregate, which is placed within and immediately behind the modular concrete units.

D. Reinforced Backfill - compacted soil, which is placed within the reinforced soil volume as outlined on the plans.

2.02 Modular Concrete Retaining Wall Units

A. Modular concrete units shall conform to the following architectural requirements:

1. Color - The Owner will specify standard manufacturers' color.
2. 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.
3. Bond configuration - running with bonds nominally located at midpoint vertically adjacent units, in both straight and curved alignments.
4. Exposed surfaces of units shall be free of chips, cracks or other imperfections when viewed from a distance of 10 feet under diffused lighting.

B. Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.

C. Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with ASTM C140 Sampling and Testing Concrete Masonry Units:

1. Compressive strength: ≥ 3000 psi (21 MPa);
2. Absorption: 8 % for standard weight aggregates;
3. Dimensional tolerances: ± 1/8" (3 mm) from nominal unit dimensions not including rough split face, ±1/16" (1.5 mm) unit height - top and bottom planes;
4. Unit size: 8" (203 mm) (H) x 18" (457 mm)(W) x 18" (457 mm)(D) minimum;
5. Unit weight: 100 lbs/unit (45 kg) minimum for standard weight aggregates.

D. Modular concrete units shall conform to the following performance testing:

1. Inter-unit shear strength in accordance with ASTM D6916 (NCMA SRWU-2): 1500 plf (21 kN/m) minimum at 2 psi (13 MPa) normal pressure;
2. Geogrid/unit peak connection strength in accordance with ASTM D6638 (NCMA SRWU-1): 900 plf (13 kN/m) minimum at 2-psi (13 MPa) normal force.

E. Modular concrete units shall conform to the following constructability requirements:

1. Vertical setback: 1/8" (3 mm) ± per course (near vertical) per the design;
2. Alignment and grid positioning mechanism - fiberglass pins, two per unit minimum;
3. Maximum horizontal gap between erected units shall be 1/2 inch (13 mm).

2.03 Shear Connectors

A. Shear connectors shall be 1/2-inch (12 mm) diameter thermoset isopthalic polyester resin-pultruded fiberglass reinforcement rods or equivalent to provide connection between vertically and horizontally adjacent units with the following requirements:

1. Flexural Strength in accordance with ASTM D4476: 128,000 psi (882 MPa) minimum;
2. Short Beam Shear in accordance with ASTM D4475: 6,400 psi (44 MPa) minimum.

B. 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

A. 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

A. 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

B. Drainage fill shall be placed within cores of, between, and behind units to meet this requirement.

2.06 Reinforced Backfill

A. 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.

B. Material can be site-excavated soils where the above requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the backfill or in the reinforced soil mass.

C. 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

A. 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.

B. Ta, Long Term Allowable Tensile Design Load, of the geogrid material shall be determined as follows:

Ta = Tult / (RFcr*RFd*RFid*FS)

Ta shall be evaluated based on a 75-year design life.

1. 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).
2. 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.
3. 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.
4. 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.
5. FS, Overall Design Factor of Safety
   FS shall be 1.5 unless otherwise noted for the maximum allowable working stress calculation.

C. 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).

D. Soil Interaction Coefficient, Ci
Ci values shall be determined per ASTM D6706 (GRI:GG5) at a maximum 0.75-inch (19 mm) displacement.

E. 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

A. 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

A. When required, Geotextile filter fabric shall be 4.0 oz/sy, polypropylene, needlepunched nonwoven fabric. (Mirafi 140N or equivalent)

PART 3: EXECUTION

3.01 Excavation

A. 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.

B. 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

A. 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.

B. 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.

C. Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

3.03 Modular Unit Installation

A. First course of units shall be placed on the leveling pad at the appropriate line and grade. Alignment and level shall be checked in all directions and insure that all units are in full contact with the base and properly seated.

B. Place the front of units side-by-side. Do not leave gaps between adjacent units. Layout of corners and curves shall be in accordance with manufacturer's recommendations.

C. Install shear/connecting devices per manufacturer's recommendations.

D. Place and compact drainage fill within and behind wall units. Place and compact backfill soil behind drainage fill. Follow wall erection and drainage fill closely with structure backfill.

E. Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction, shall not exceed two courses.

3.04 Structural Geogrid Installation

A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.

B. Geogrid reinforcement shall be placed at the strengths, lengths, and elevations shown on the construction design drawings or as directed by the Engineer.

C. The geogrid shall be laid horizontally on compacted backfill and attached to the modular wall units. Place the next course of modular concrete units over the geogrid. The geogrid shall be pulled taut, and anchored prior to backfill placement on the geogrid.

D. Geogrid reinforcements shall be continuous throughout their embedment lengths and placed side-by-side to provide 100% coverage at each level. Spliced connections between shorter pieces of geogrid or gaps between adjacent pieces of geogrid are not permitted.

3.05 Reinforced Backfill Placement

A. Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.

B. Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches (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.

C. 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.

D. Only lightweight hand-operated equipment shall be allowed within 3 feet (1m) from the tail of the modular concrete unit.

E. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches (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.

F. 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.

G. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall units to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

3.06 Cap Installation

A. Cap units shall be glued to underlying units with an all-weather adhesive recommended by the manufacturer.

3.07 As-built Construction Tolerances

A. Vertical alignment: ± 1.5" (40 mm) over any 10' (3 m) distance.

B. Wall Batter: within 0.5 degrees of design batter.

C. Horizontal alignment: ± 1.5" (40 mm) over any 10' (3 m) distance.
Corners, bends & curves: ± 1 ft (300 mm) to theoretical location.

D. Maximum horizontal gap between erected units shall be 1/2 inch (13 mm).

3.08 Field Quality Control

A. Quality Assurance - The Geotechnical Engineer (Hardin-Kight Associates, Inc.) will provide quality assurance and testing services during construction.

B. 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.

C. Quality Control - Only qualified and experienced technicians and engineers shall perform testing and inspection services.

D. 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

A. The required bearing capacity for the retaining wall is 2,000 psf.

B. Design Φ (soil) = 30 degrees.

C. Design unit weight = 120 pcf.

D. Retaining wall was not designed to resist hydrostatic pressure.

E. Construction must be monitored by a professional engineer.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

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

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

DIRECTOR 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. 33396 EXPIRATION DATE: 11-29-2016

STATE OF MARYLAND — JUSTIN A. FRIZZELL — LICENSE NO. 33396 — PROFESSIONAL ENGINEER

HARDIN-KIGHT ASSOCIATES, INC.
CONSULTING ENGINEERS

Title: Retaining Wall Specifications		Designed By: JAF	Date: 2/26/2016
		Checked By: SEK	Project No: 16114
Project: Summer Haven		Scale:	HKA Drawing No: 4 of 4

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: bei@bei-civilengineering.com

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 21443 Expiration Date: 12-21-16.

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

DES: DAM	DRAFT: EDD	CHECK: DAM	DATE: FEBRUARY, 2016	PROJECT NO. 2160
			SCALE: AS SHOWN	DRAWING 3D OF 13

F-06-008

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	SOIL GROUP
BeC2	Beltsville silt loam, 5 to 10 percent slopes, moderately eroded	C
BeC3	Beltsville silt loam, 5 to 10 percent slopes, severely eroded	C
ClD2	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

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: 12-21-2015

Donald Mason 2014

25-10 For revisions by Benchmark Engineering, Inc only

LEGEND

Existing Contour	382
Proposed Contour	82
Spot Elevation	+82.53
Direction of Flow	
Existing Trees to Remain	
Stabilized Construction Entrance	SCE
Silt Fence	SF — SF
Super Silt Fence	SSF — SSF
Earth Dike	ED A-1
Limit of Disturbance	LOD
Rip-Rap Inflow Protection	RRP
Removable Pumping Station, Pump, and Filter Bag	RPS, P, F
Soil Boundary	
Proposed Bird Deterrent	Piling, Boulder
Sediment Basin Baffles	
Erosion Control Matting	
Temporary Stockpile Limits	

CROSS-SECTION A-A

Scale: Horizontal- 1"=50'
Vertical-1"=5'
Q_{100} = 454.17 cfs
N= 0.04
S= 2.0%

CROSS-SECTION B-B

Scale: Horizontal- 1"=50'
Vertical-1"=5'
Q_{100} = 346.89 cfs
N= 0.04
S= 3.49%

CROSS-SECTION C-C

Scale: Horizontal- 1"=50'
Vertical-1"=5'
Q_{100} = 346.89 cfs
N= 0.04
S= 3.49%

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

NOTE: CONSTRUCTION OF THE FOREBAY EMBANKMENT, GABION CORE AND RIP RAP SHALL BE DELAYED UNTILL CONVERSION TO A PERMANENT SWMP IS PERFORMED.

NO.	DATE	REVISION
3	9-16-11	ADD OPERATIONAL AMMENDMENT PER WP-11-140; REVISE LOT 24 TO BUILDABLE; RELOCATE 5'x 20' TRASH PAD
2	12-5-07	REMOVE KIOSK ONLY IN FRONT OF LOT 6
1	2-5-07	ADD REMOVE WORK TO FIRST SEDIMENT TRAP
		ADD MEADHALL, REMOVE 'E-14'
4	4-25-16	REMOVE OFFSET TURNAROUND AUTOMATICALLY AND TURNAROUND LOCATED AT WEST SIDE OF AUTUMN HAVEN CT. LOT 15

PLAN VIEW
SCALE: 1"=50'
Note: For All Existing Features, See Existing Conditions Plan Sheet II

TEMPORARY BAFFLES & DEWATERING LAYOUT

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) 935-8887

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 — PARCELS 718, 721 & P/O 233
1ST ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9/22/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/1/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 8-31-06

THESE PLANS HAVE BEEN REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE 8/22/06

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/22/06

DEVELOPER'S CERTIFICATE

"I/WE 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 A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL 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."

SIGNATURE OF DEVELOPER — DATE August 15, '06

ENGINEERS CERTIFICATE

"I HEREBY CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL 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 PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

SIGNATURE OF ENGINEER — DATE 8/10/06
ZACHARIA Y. FISCH

STATE OF MARYLAND ZACHARIA YOSEF FISCH 22418 PROFESSIONAL ENGINEER

SH Associates
Engineers Planners Surveyors
3 Howard Lane Elkridge, MD 21075
410-557-5200 fax: 410-796-1562
info@sha.biz

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

F-06-008

AS-BUILT

M:\Summer Haven 3157\dwg\final\3157_3g_s4.dwg, 8/10/2006 2:38:12 PM, rthomas, 1:1

21.0 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 vegetable growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.

Conditions Where Practice Applies

I. This practice is limited to areas having 2:1 or flatter slopes where:

a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.

b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.

c. The original soil to be vegetated contains material toxic to plant growth.

d. The soil is so acidic that treatment with limestone is not feasible.

II. For the purpose of these Standards and Specifications, areas having slopes steeper than 2:1 require special consideration and design for adequate stabilization. Areas having slopes steeper than 2:1 shall have the appropriate stabilization shown on the plans.

Construction and Material Specifications

I. Topsoil salvaged from the existing site may be used provided that it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-SCS in cooperation with Maryland Agricultural Experimental Station.

II. Topsoil Specifications - Soil to be used as topsoil must meet the following:

i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or a soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger that 1 and 1/2" in diameter.

ii. Topsoil must be free of plants or plant parts such as Bermuda grass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistle, or others as specified.

iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

II. For sites having disturbed areas under 5 acres:

i. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.

iii. For sites having disturbed areas over 5 acres:
i. On soil meeting topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.
b. Organic content of topsoil shall be not less than 1.5 percent by weight.
c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.
d. No sod or seed shall be placed on soil soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.

NOTE: Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.

ii. Place topsoil (if required) and apply soil ammendments specified in 20.0 Vegetative Stabilization-Section I-Vegetative Stabilization Methods and Materials.

V. Topsoil Application

i. When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade Stabilization Structures, Earth Dikes, Slope Silt Fence and Sediment Traps and Basins.

ii. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" - 8" higher in elevation.

iii. Topsoil shall be uniformly distributed in a 4" - 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.

iv. Topsoil shall not be place while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

PERMANENT SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: Loosen upper three inches of soil by raking, discing or other acceptable means before seeding, if not previously loosened.

SOIL AMENDMENTS: In lieu of soil test recommendations, use one of the following schedules:

1) Preferred-Apply 2 tons per acre dolomitic limestone (92 lbs/100 sq.ft.) and 600 lbs per acre 10-10-10 fertilizer (14 lbs./1000 sq.ft.) before seeding. Harrow or disc into upper three inches of soil. At the time of seeding, apply 400 lbs. per acre 30-0-0 ureaform fertilizer (9 lbs/1000 sq.ft.)
2) Acceptable-Apply 2 tons per acre dolomitic limestone (92 lbs/1000 sq.ft.) and apply 1000 lbs. per acre 10-10-10- fertilizer (23 lbs./1000 sq.ft.) before seeding. Harrow or disc into upper three inches of soil.

SEEDING: For the periods March 1 thru April 30, and August 1 thru October 15, seed with 60 lbs. per acre (1.4 lbs/1000 sq.ft.) of Turf Type Tall Fescue. For the period May 1 thru July 31, seed with 60 lbs. Turf Type Tall Fescue per acre and 2 lbs. per acre (.05 lbs./1000 sq.ft.) of weeping lovegrass. During the period of October 16 thru February 28, protect site by: Option (1) 2 tons per acre well anchored straw mulch and seed as soon as possible in the spring. Option (2) Use sod. Option (3) Seed with 60 lbs/acre Kentucky 31 Tall Fescue and mulch with 2 tons/acre well anchored straw.

MULCHING: Apply 1 1/2 to 2 tons per acre (70 to 90 lbs/1000 sq. ft.) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gal/1000 sq.ft.) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 348 gallons per acre (8 gal/1000 sq.ft.) for anchoring.

MAINTENANCE: Inspect all seeded areas and make needed repairs, replacements and reseedings.

TEMPORARY SEEDING NOTES

SEEDBED PREPARATION: Loosen upper three inches of soil by raking, discing or other acceptable means before seeding, if not previously loosened.

SOIL AMENDMENTS: Apply 600 lbs. per acre 10-10-10 fertilizer (14 lbs./1000 sq.ft).

SEEDING: For periods March 1 thru April 30 and from August 15 thru November 15, seed with 2 1/2 bushel per acre of annual rye (3.2 lbs./1000 sq.ft.) For the period May 1 thru August 14, seed with 3 lbs. per acre of little bluestem (.07 lbs./1000 sq.ft.). For the period November 1 thru February 28, protect site by applying 2 tons per acre of well anchored straw mulch and seed as soon as possible in the spring, or use sod.

MULCHING: Apply 1 1/2 to 2 tons per acre (70 to 90 lbs./1000 sq.ft.) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gal/1000 sq.ft.) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 348 gallons per acre (8 gal/1000 sq.ft.) for anchoring.

REFER TO MAA SEEDING SPECIFICATIONS ON SHEET 9 FOR RATES AND METHODS NOT COVERED.

SEDIMENT CONTROL NOTES

1. A minimum of 48 hours notice must be given to the Howard County Department of Inspection, License and Permits Sediment Control Division prior to the start of any construction (313-1855).
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 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL and revisions thereto.
3. Following initial soil disturbance or redisturbance, permanent or temporary stabilization shall be completed within: (a) 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes, and all slopes greater than 3:1, (b) 14 days as to all other disturbed or graded areas on the project site.
4. All sediment traps/basins shown must be fenced and warning signs posted around their perimeter in accordance with Vol. I, Chapter 7, HOWARD COUNTY DESIGN MANUAL, Storm Drainage.
5. All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding, sod, temporary seeding, and mulching (Sec. G). Temporary stabilization with mulch alone shall be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
6. All sediment control structures are to remain in place and are to be maintained in operative condition until permission for their removal has been obtained from the Howard County Sediment Control Inspector.
7. Site Analysis :

Total Area	12.78 Acres
Area Disturbed	8.49 Acres
Area to be roofed or paved	0.97 Acres
Area to be vegetatively stabilized	7.52 Acres
Total Cut	13,475 CY **
Total Fill	18,792 CY **
Offsite waste/borrow area location	*

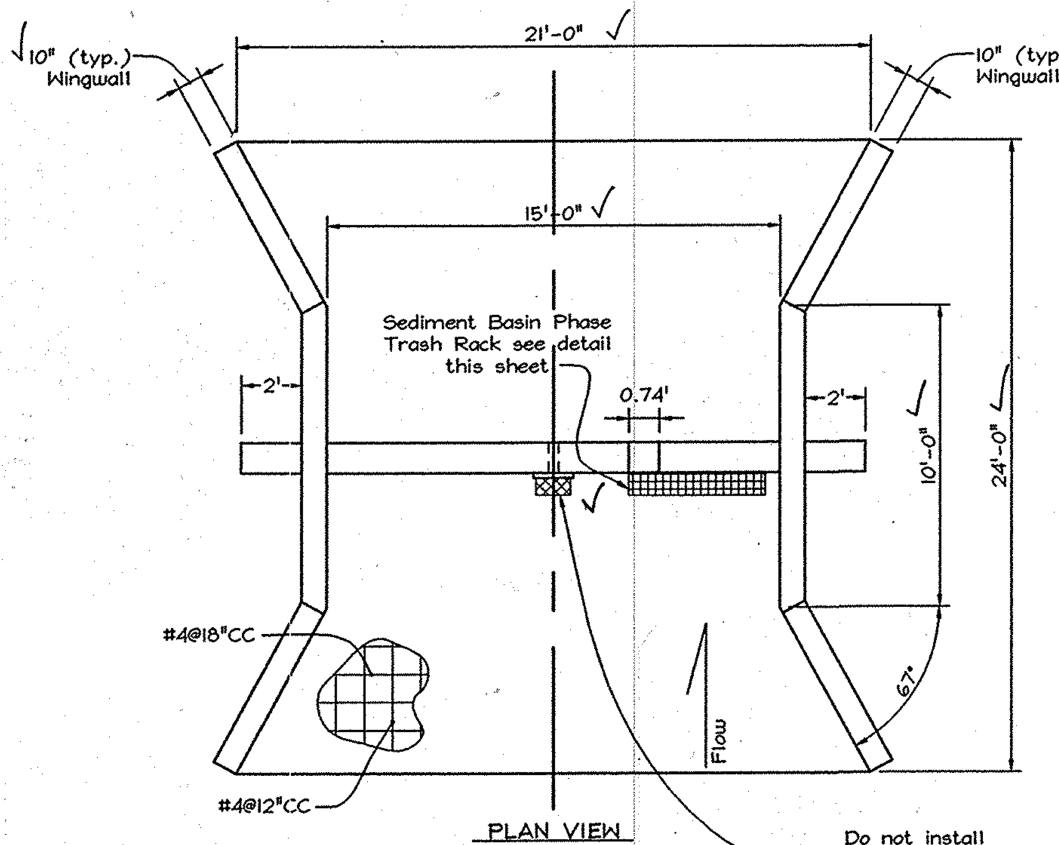
8. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
9. Additional sediment controls must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
10. On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.
11. Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized within one working day, whichever is shorter.

* To be determined by contractor, with pre-approval of the Sediment Control Inspector with an approved and active grading permit

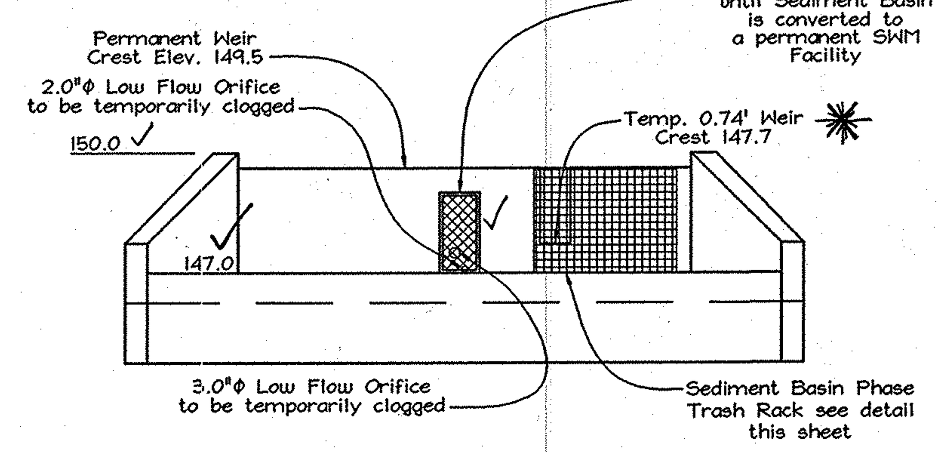
**Total cut and fill quantities are for permit purposes only. Contractor to verify earthwork quantities.

SEQUENCE OF CONSTRUCTION

1. Obtain grading permit and contact Howard County Sediment Control Inspector (SCI) to arrange a preconstruction meeting. (1 Day)
2. Install Stabilized Construction Entrance at Winters Lane as access point for construction. (1 Day)
3. Clear and grub as necessary for installation of sediment control features, including super silt fences, earth dikes, and sediment basin.
4. Install storm drain system I-15 to S-1 to bypass offsite drainage.
5. Install silt fence, super silt fence, forebay and CS-1 for sediment basin use phase. Provide temporary 0.74' weir opening and temporary trash rack per detail this sheet. (2 weeks)
6. After Sediment Basin construction, install swale and fill on Lot 12 as well as earth dikes leading to basin. (2 Days)
7. With permission of SCI, begin clearing and site grading. (2 Weeks)
8. Grade roads and lots to subgrade and install storm drain system. (8 Weeks)
9. Pave roadways and apply permanent stabilization to all disturbed areas. (2 Weeks)
10. With permission of SCI, remove all silt fences/super silt fences and stabilize those areas. Remove any and all trash, junk and non-woody debris from Forest Conservation Areas. (1 Week)
11. Flush storm drains of sediment. Convert sediment/stormwater basin to permanent SWM(CS-1): dewater and remove accumulated sediment blocking devices on weir, construct permanent weir to proposed elevation, install trash rack, fine grade bottom to proposed elevations, install bird deterrent pilings and boulders and apply permanent seeding and mulching to disturbed areas. (1 week)
12. Install landscape plantings and goose exclusion fence. (1 Week)
NOTE: See Public Water and Sewer Plans, Contract #14-4265-D , for sediment and erosion control details related to the sewer construction located outside this plans limit of disturbance.



PLAN VIEW
Not to Scale



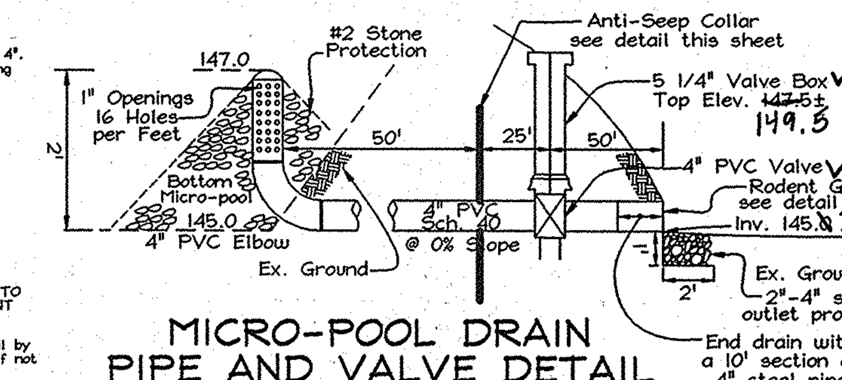
FRONT ELEVATION
Not to Scale

CS-1 CONCRETE WEIR CONTROL STRUCTURE MODIFICATIONS FOR SEDIMENTCONTROL

NOT TO SCALE

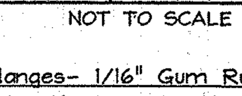
NOTE:

Contractor shall form up a 0.74' wide temporary weir notch in the weir wall at crest elevation 147.7, providing a 2"x2" keyway. Contractor shall extend permanent weir crest to elevation 149.5, leaving a 0.74' wide opening to elevation 149.5. Once Sediment Control Measures are removed, including the temporary trash rack, these modifications shall be removed and the 0.74' wide weir shall be formed and poured to the permanent weir crest elevation (149.5).



MICRO-POOL DRAIN PIPE AND VALVE DETAIL

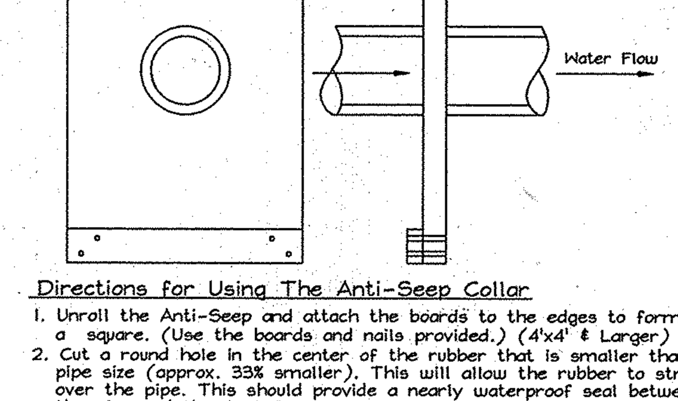
NOT TO SCALE



RODENT GUARD DETAIL

NOT TO SCALE

Anti- Seep Flanges- 1/16" Gum Rubber With Wood Frame
Installation instructions come attached to each Anti-Seep

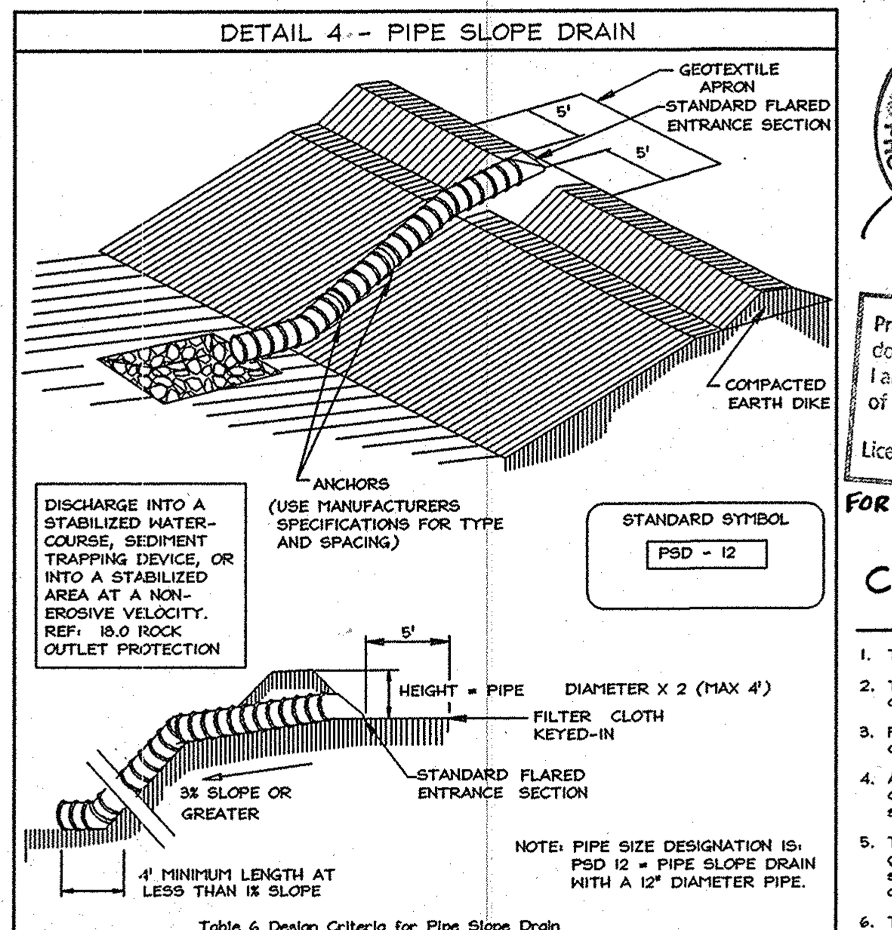


Directions for Using The Anti-Seep Collar
1. Unroll the Anti-Seep and attach the boards to the edges to form a square. (Use the boards and nails provided.) (4'x4' & Larger)
2. Cut a round hole in the center of the rubber that is smaller than the pipe size (approx. 33% smaller). This will allow the rubber to stretch over the pipe. This should provide a nearly waterproof seal between the pipe and the Anti-Seep.
3. Slip the pipe through the Anti-Seep, inspect the seal between the pipe and the Anti-Seep, carefully backfill and compact with suitable soil.

ANTI- SEEP COLLAR

NOT TO SCALE

DETAIL 4 - PIPE SLOPE DRAIN



STANDARD SYMBOL: PSD - 12

NOTE: PIPE SIZE DESIGNATION IS: PSD 12 = PIPE SLOPE DRAIN WITH A 12" DIAMETER PIPE.

Table 6 Design Criteria for Pipe Slope Drain

Size	Pipe/Tubing Diameter (D) in	Maximum Drainage Area (Acres)
PSD-12	12	0.5
PSD-18	18	1.5
PSD-21	21	2.5
PSD-24	24	3.5
PSD-24 (2)	24	5.0

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE B - 5 - 4 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

CONSTRUCTION SPECIFICATIONS PIPE SLOPE DRAIN

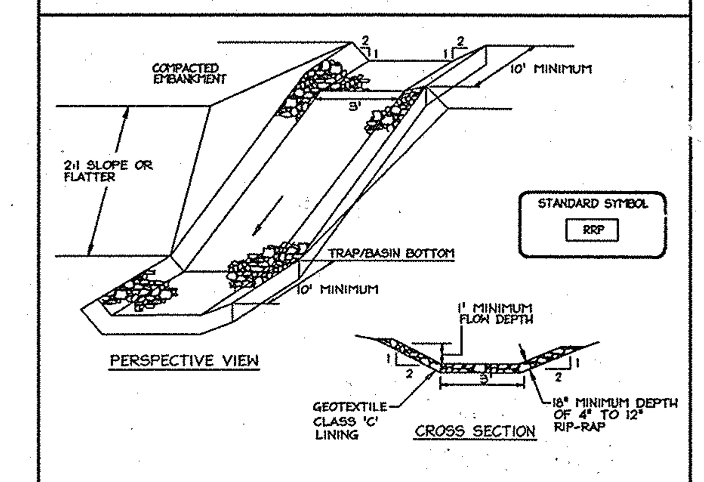
1. The Pipe Slop Drain (PSD) shall have a slope of 3 percent or steeper.
2. The top of the earth dike over the inlet pipe shall be at least 2 times the pipe diameter measured at the invert of the pipe.
3. Flexible tubing is preferred. However, corrugated metal pipe or equivalent PVC pipe can be used. All connections shall be watertight.
4. A flared end section shall be attached to the inlet end of pipe with a watertight connection. Filter cloth shall be placed under the inlet of the pipe slope drain and shall extend out 5' from the inlet. The filter cloth shall be "keyed in" on all side.
5. The Pipe Slope Drain shall be securely anchored to the slope by staking at the grommets provided. Spacing for anchors shall be as provided by manufacturer's specification. In no case shall less than two (2) anchors be provided, equally spaced along the length of pipe. These details should be provided by pipe suppliers.
6. The soild around and under the pipe and end section shall be hand tamped in 4 inch lifts to the top of the earth dike.
7. All pipe connections shall be watertight.
8. Whenever possible where a PSD drains an unstabilized area, it shall outlet into a sediment trap or basin. If this is not possible then the slope drain will discharge into a stable conveyence that leads to a sediment trap or basin. When discharging into a trap or basin the PSD shall discharge at the same elevation as the wet pool elevation. The discharge from the PSD must be as far away from the sediment control outlet as possible.
9. When the drainage area is stabilized, the PSD shall discharge onto a stabilized area at a non-erosive velocity.
10. Inspection and any required maintenance shall be performed periodically and after each rain event.
11. The inlet must be kept open at all times.

STATE OF MARYLAND BRIAN F. CLEARY No. 28559 REGISTERED PROFESSIONAL ENGINEER 10/26/2011

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 BEI ONLY

DETAIL 5 - RIP-RAP INFLOW PROTECTION

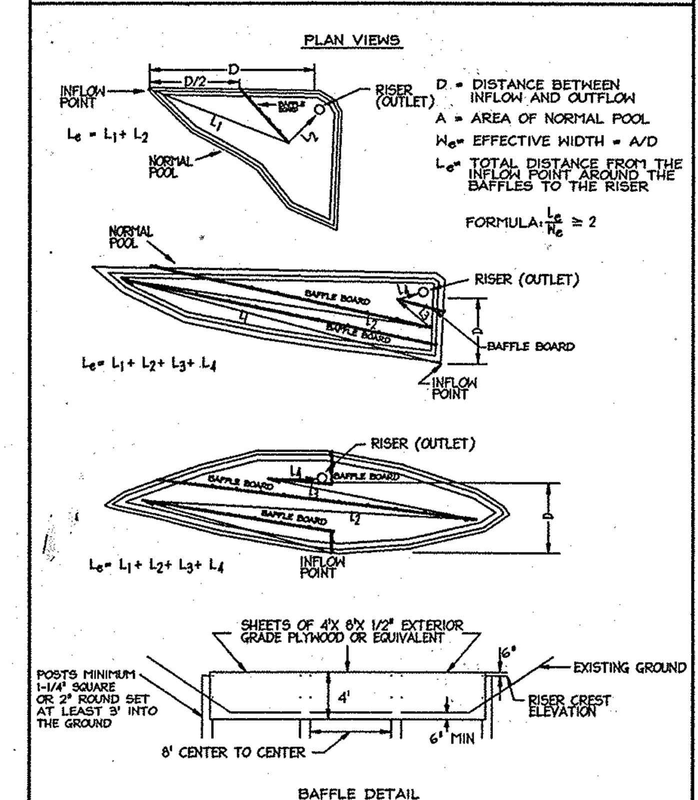


Construction Specifications

1. Rip-rap lined inflow channels shall be 1' in depth, have a trapezoidal cross section with 2:1 or flatter side slopes and 3' (min.) bottom width. The channel shall be lined with 4" to 12" rip- rap to a depth of 18".
2. Filter cloth shall be installed under all rip-rap. Filter cloth shall be Geotextile Class C.
3. Entrance and exit sections shall be installed as shown on the detail section.
4. Rip-rap used for the lining may be recycled for permanent outlet protection if the basin is to be converted to a stormwater management facility.
5. Gabion Inflow Protection may be used in lieu of Rip-rap Inflow Protection.
6. Rip-rap should blend into existing ground.
7. Rip-rap Inflow 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 Swale lining criteria.

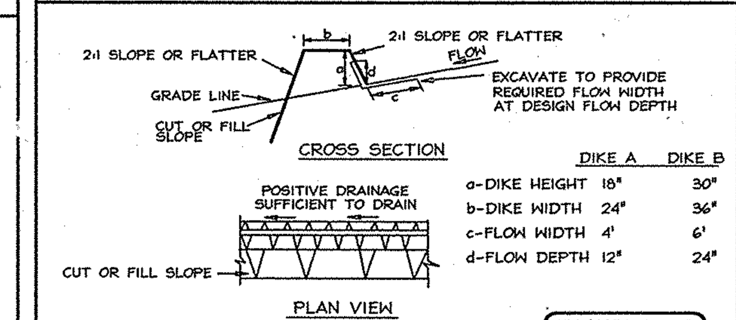
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE B - 6 - 2 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 18 - SEDIMENT BASIN BAFFLES



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE C - 10 - 28 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 1 - EARTH DIKE



	DIKE A	DIKE B
a-DIKE HEIGHT	18"	30"
b-DIKE WIDTH	24"	36"
c-FLOW WIDTH	4'	6'
d-FLOW DEPTH	12"	24"

STANDARD SYMBOL A-2 B-3

FLOW CHANNEL STABILIZATION
GRADE 0.5% MIN. 10% MAX.

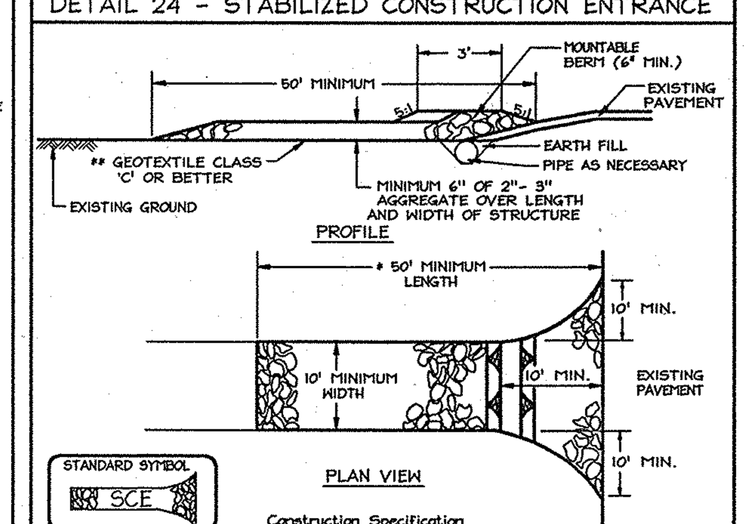
1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4" - 7" stone or recycled concrete equivalent pressed into the soil 7" minimum

Construction Specifications

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.
3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area at a non-erosive velocity.
4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.
5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
6. Fill shall be compacted by earth moving equipment.
7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.
8. Inspection and maintenance must be provided periodically and after each rain event.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE A - 1 - 6 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

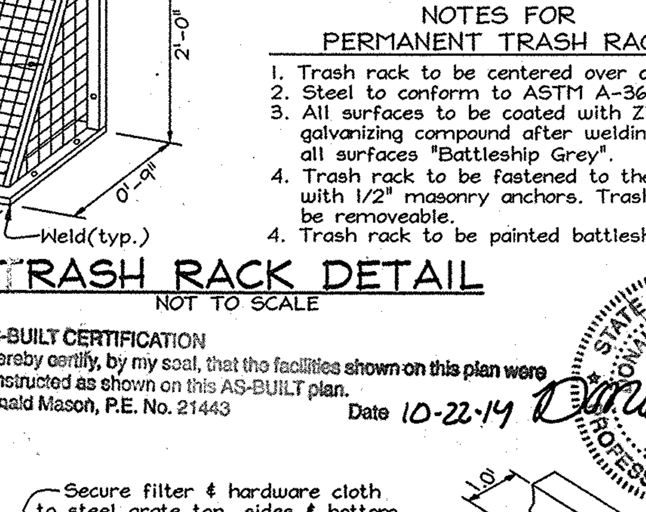
DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



Construction Specification

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 stone. ** The plan approval authority may not require single family residences to use geotextile.
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage.Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey, a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE F - 17 - 3 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



NOTES:
1. Steel to conform to ASTM A-36.
2. All surfaces to be coated with ZRC cold galvanizing compound after welding.
3. Trash rack to be fastened to the concrete with 1/2" masonry anchors. Trash rack to be removeable.

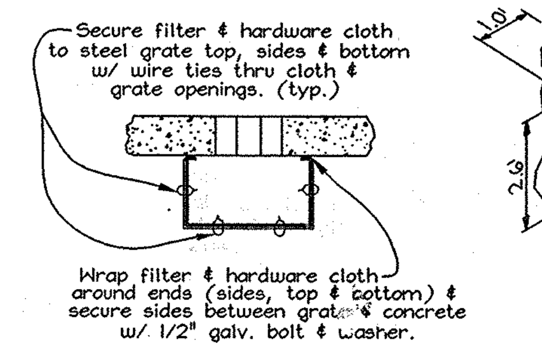
NOTES FOR PERMANENT TRASH RACK
1. Trash rack to be centered over opening.
2. Steel to conform to ASTM A-36.
3. All surfaces to be coated with ZRC cold galvanizing compound after welding. Paint all surfaces "Battleship Grey".
4. Trash rack to be fastened to the wall with 1/2" masonry anchors. Trash rack to be removeable.
4. Trash rack to be painted battleship gray.

TRASH RACK DETAIL

NOT TO SCALE

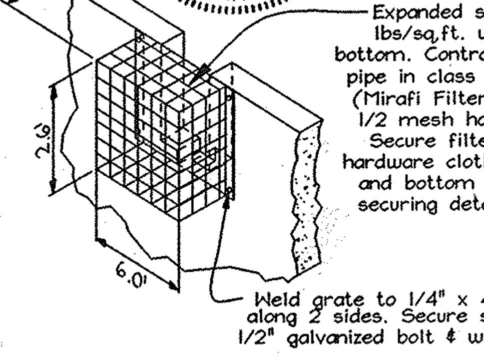
AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 10-22-14

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER



SECURING DETAIL

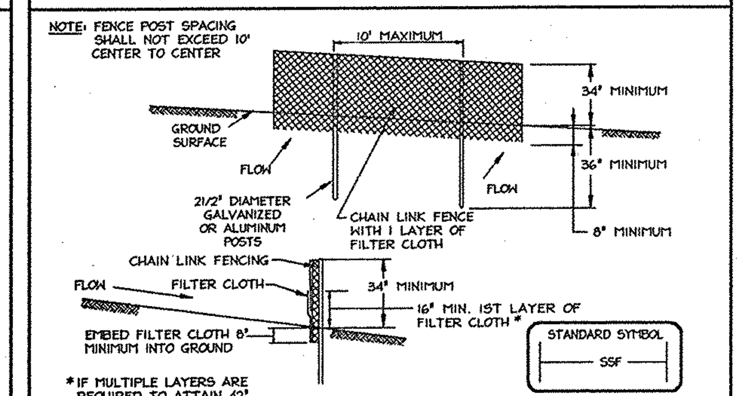
Not to Scale



SEDIMENT BASIN TRASH RACK

Not to Scale

DETAIL 33 - SUPER SILT FENCE



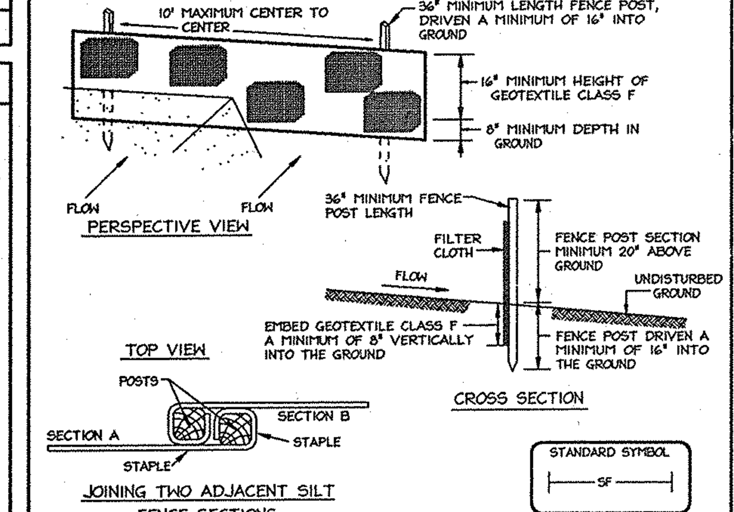
Construction Specifications

1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42" fabric and 6' length posts.
2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.
3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.
4. Filter cloth shall be embedded a minimum of 8" into the ground.
5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height
7. Filter cloth 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:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE H - 26 - 3 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 22 - SILT FENCE



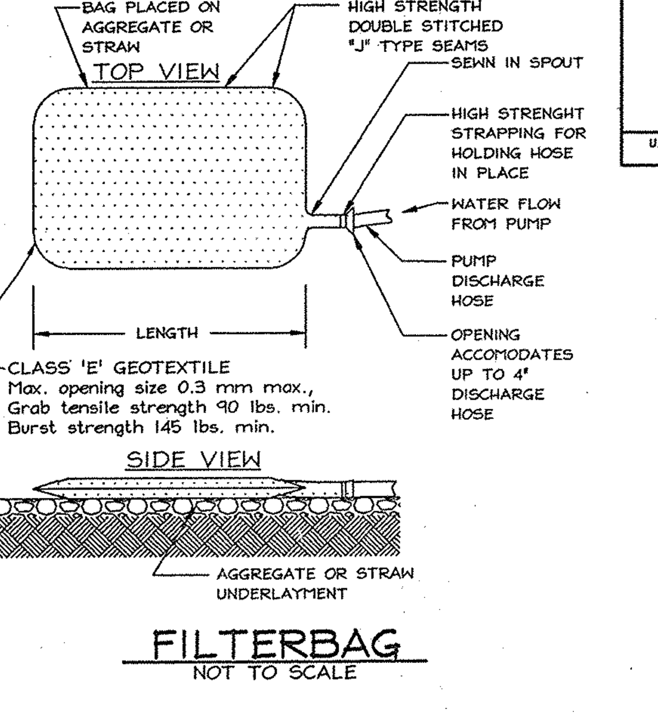
Construction Specifications

1. Fence posts shall be a minimum of 36" long, driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighing not less than 1.00 pound per linear foot.
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:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft /minute (max.)	Test: MSMT 322
Filtering Eggeciency	75% (min.)	Test: MSMT 322

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reaches 50% of the fabric height.

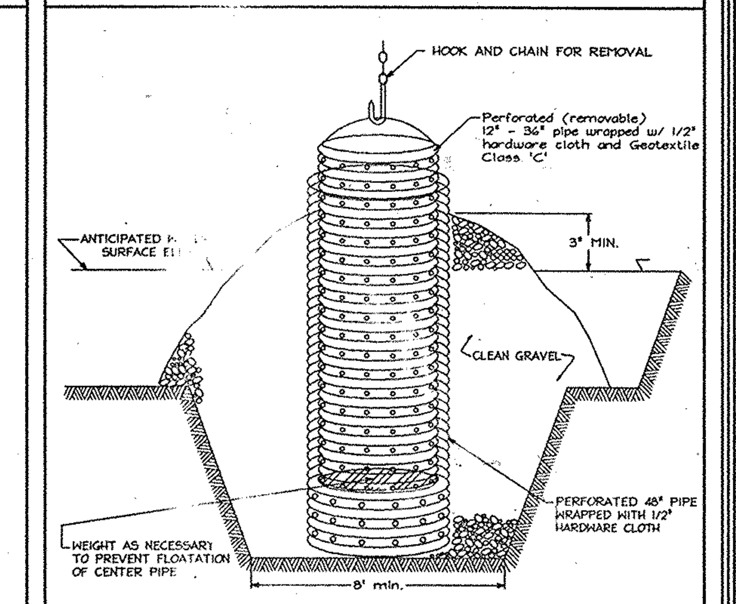
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE E - 15 - 3 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



FILTERBAG

NOT TO SCALE

DETAIL 20A REMOVABLE PUMPING STATION



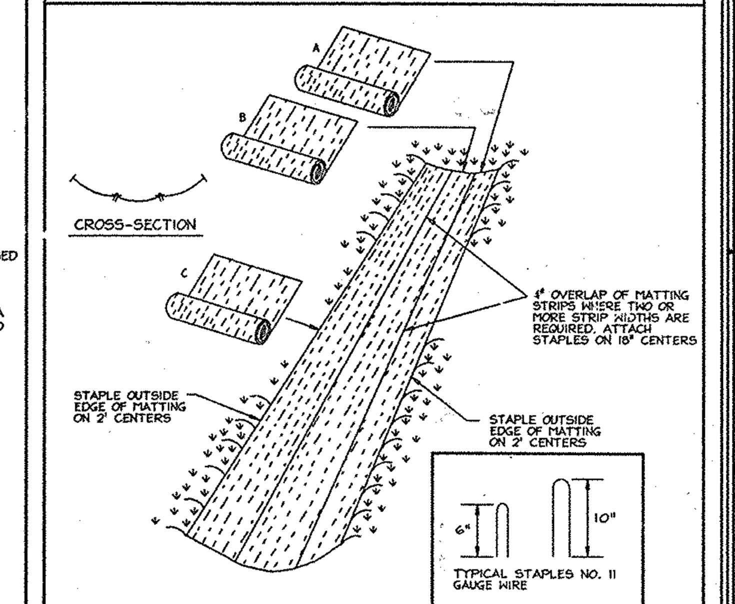
ELEVATION

Construction Specifications

1. The outer pipe should be 48" dia. or shall, in any case, be at least 4" greater in diameter than the center pipe. The outer pipe shall be wrapped with 1/2" hardware cloth to prevent backfill material from entering the perforations.
2. After installing the outer pipe, backfill around outer pipe with 2" aggregate or clean gravel.
3. The inside stand pipe (center pipe) should be constructed by perforating a corrugated or PVC pipe between 12" and 36" in diameter. The perforations shall be 1/2" X 6" slits or 1" diameter holes 6" on center. The center pipe shall be wrapped with 1/2" hardware cloth first, then wrapped again with Geotextile Class C.
4. The center pipe should extend 12" to 18" above the anticipated water surface elevation or riser crest elevation when dewatering a basin.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE D - 12 - 4 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 30 - EROSION CONTROL MATTING



Construction Specifications

1. Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with a row of staples about 4" down slope from the trench. Spacing between staples is 6".
2. Staple the 4" overlap in the channel center using an 18" spacing between staples.
3. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.
4. Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.
5. Where one roll of matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4", shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.
6. The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

Note: If flow will enter from the edge of the matting then the area effected by the flow must be keyed-in.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE G - 22 - 2 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

SEDIMENT BASIN SCHEDULE (CS-1)

Drainage Area 15.89 Ac.
Storage Required 28,602 cu.ft. wet ~~& dry~~
Storage Provided 28,602 cu.ft. ~~wet~~ & dry
Weir Length 15' tot.
Bottom Elevation: 144.0
Cleanout Elevation: 146.5
Embankment Elevation: 152.4 (constructed)
Wet Storage Elevation: 147.7
Dry Storage Elevation: 149.5
Q_1 Existing: 5.55 CFS
Q_1 Proposed: 4.73 CFS @ elevation 149.27
Q_{10} Existing: 25.88 CFS
Q_{10} Proposed: 52.97 CFS @ elevation 150.53

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

NO	DATE	REVISION	BY
1	9-16-11	REVISE TITLE BLOCK	BEI

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — 9/22/06 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 9/7/06 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE

THESE PLANS HAVE BEEN REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE

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

HOWARD SOIL CONSERVATION DISTRICT — DATE

DEVELOPER'S CERTIFICATE

"I/WE 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 A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL 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."

SIGNATURE OF DEVELOPER — August 10, '06 DATE

ENGINEERS CERTIFICATE

"I HEREBY CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL 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 PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Zacharia Y. Fisch 8/10/06
SIGNATURE OF ENGINEER — DATE
ZACHARIA Y. FISCH

STATE OF MARYLAND ZACHARIA YOSEF FISCH 22418 PROFESSIONAL ENGINEER

SEDIMENT AND EROSION CONTROL DETAILS

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 ...tes
Engineers ...ors
6339 Howard La...
Tel.: 410-567-52...
E-mail: info@fsh...

DESIGN BY:	PS
DRAWN BY:	AY
CHECKED BY:	ZYF
SCALE:	1"=50'
DATE	Aug. 09, 2006
W.O. No.:	3157
SHEET No.	5 OF 13

AS- BUILT

F-06-008

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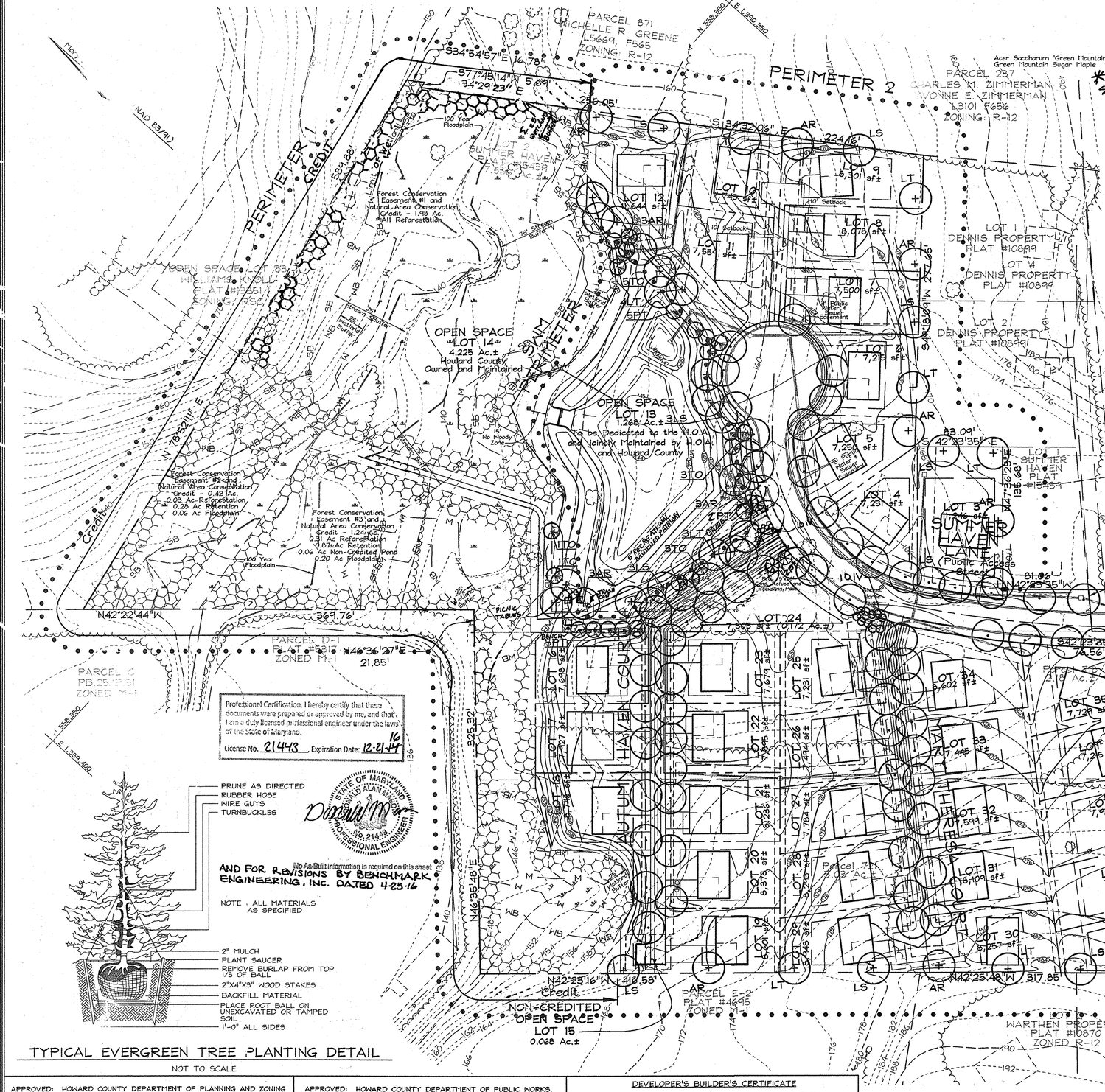


STREET TREE LANDSCAPE SCHEDULE

KEY	QUAN.	BOTANICAL NAME		SIZE	NOTE
PA	35	Platanus x acerifolia 'Bloodgood' 'London Plane'	(Summer Haven Lane & Winters Lane)	2½" Cal.	B & B
TA	18	Tilia Americana 'Redmond' 'American Redmond Linden'	(Mary Theresa Court)	2½" Cal.	B & B
FP	25	Fraxinus pennsylvanica 'Marshall's Seedless' Green Ash	(Autumn Haven Ct.*)	2½" Cal.	B & B

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

1. At the time of installment, all shrubs and other plantings herewith listed and approved for this site, shall be of the proper height requirements in accordance with the Howard County 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.
2. 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.
3. 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, $4,050.00 for 27 evergreen trees, $600.00 for 20 shrubs).
4. Perimeter landscaping other than in the Forest Conservation Easement shall be planted at the Site Development plan stage.

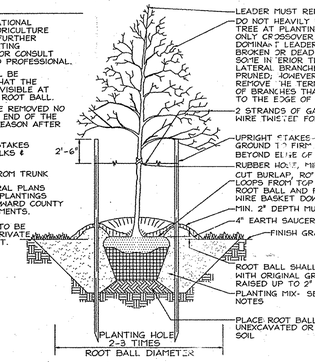
LEGEND

Existing Contour ——— 362
Proposed Contour ——— 362
Existing Trees to Remain
Proposed Street Tree (Shade)
Proposed Perimeter Landscape Tree (Shade)
Proposed Perimeter Landscape Tree (Evergreen)
Landscape Perimeter ••••••••••

PERIMETER 1

NOTES

1. CONSULT INTERNATIONAL SOCIETY OF ARBORICULTURE GUIDELINES FOR FURTHER DETAILS OF PLANTING SPECIFICATIONS, OR CONSULT WITH A QUALIFIED PROFESSIONAL.
2. EACH TREE SHALL BE PLANTED SUCH THAT THE TRUNK FLARE IS VISIBLE AT THE TOP OF THE ROOT BALL.
3. STAKES SHALL BE REMOVED NO LATER THAN THE END OF THE FIRST GROWING SEASON AFTER PLANTING.
4. PLACE UPRIGHT STAKES PARALLEL TO WALKS & BUILDINGS.
5. KEEP MULCH 1" FROM TRUNK
6. SEE ARCHITECTURAL PLANS FOR ADDITIONAL PLANTINGS WHICH EXCEED HOWARD COUNTY MINIMUM REQUIREMENTS.
7. TREES ARE NOT TO BE PLANTED OVER PRIVATE OR PUBLIC SEWAGE EASEMENT.



TYPICAL TREE PLANTING AND STAKING

DECIDUOUS TREES UP TO 2-1/2" CALIPER — NOT TO SCALE

TYPICAL EVERGREEN TREE PLANTING 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. 21443, Expiration Date: 12-21-16

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

No As-Built information is required on this sheet AND FOR REVISIONS BY BENCHMARK ENGINEERING, INC. DATED 4-25-16

NOTE: ALL MATERIALS AS SPECIFIED

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. 28569, Expiration Date: 7-22-13

STATE OF MARYLAND — BRIAN F. CLEARY — No. 28569 — PROFESSIONAL ENGINEER — 10/4/2013

SCHEDULE A PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO ROADWAYS	ADJACENT TO PERIMETER PROPERTIES	
		1	2
Perimeter/Frontage Designation		A	A
Landscape Type		2,183	817
Linear Feet of Roadway Frontage/Perimeter		Yes: 1623 560	No
Credit for Existing Vegetation (Yes, No, Linear Feet)		No	No
Remaining Perimeter Length			
Credit for Wall, Fence or Berm (Yes, No, Linear Feet)		1:60 9	1:60 14
Remaining Perimeter Length			
Number of Plants Required			
Shade Trees		9	14
Evergreen Trees		-	-
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 Substition 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

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9/22/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/19/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 8-31-06

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 OF DEVELOPER — DATE August 10, '06

NO.	DATE	REVISION	BY
3	4-25-16	REMOVE PROPOSED PERIMETER LANDSCAPING WITHIN THE FOREST CONSERVATION AREA & LOT 14	BEL
2	9-16-11	ADD RECREATIONAL AMMENITIES PER WP-11-140 & CHANGE OPEN SPACE LOT 14 TO A SHARABLE LOT BETWEEN LOTS 1 & 2	BEL
1	9-7-10	REMOVE SIDEWALK IN FRONT OF LOT 1	BEL

Note: For All Existing Features, See Existing Conditions Plan Sheet 11

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

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

A Resubdivision of Summer Haven Lot 2, Plat #15439

TAX MAP 38 GRID 14 — PARCELS 718, 721 & P/O 233
1ST ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

STATE OF MARYLAND — MICHAEL YOSEF FISCH — #24418 — PROFESSIONAL ENGINEER — 10/4/2013

FSH Associates
Engineers Planners Surveyors
5339 Howard Lane Elkridge MD 21075
Tel.: 410-567-5200 Fax: 410-796-1550
E-mail: fsh@fsha.biz

DESIGN BY: PS
DRAWN BY: AY
CHECKED BY: ZYF
SCALE: 1"=50'
DATE: Aug. 09, 2006
W.O. No.: 3157
SHEET No. 6 OF 13

AS-BUILT

F-06-008

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. 28559, Expiration Date: 7-22-13

FOR REVISIONS BY BENCH MARK ENGINEERING INC. ONLY

NO	DATE	REVISION	BY
1	9-16-11	REVISE LOCATION OF 5'x20' TRASH PAD CHANGE OPEN SPACE LOT 24 TO A BUILDABLE LOT ADD RECREATIONAL AMMENITIES PER WP-11-140	BEI

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9/23/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/7/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 8-31-06

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	SOIL GROUP
BeC3	Beltsville silt loam, 5 to 10 percent slopes, severely eroded	C
ClD2	Chillum gravely 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 land, gently sloping	C
ScD	Sandy and clayey land, moderately sloping	C
ScE	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

Note: For All Existing Features, See Existing Conditions Plan Sheet 11

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

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 718, 721 & P/O 233
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@fsha.biz

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

AS-BUILT

F-06-008

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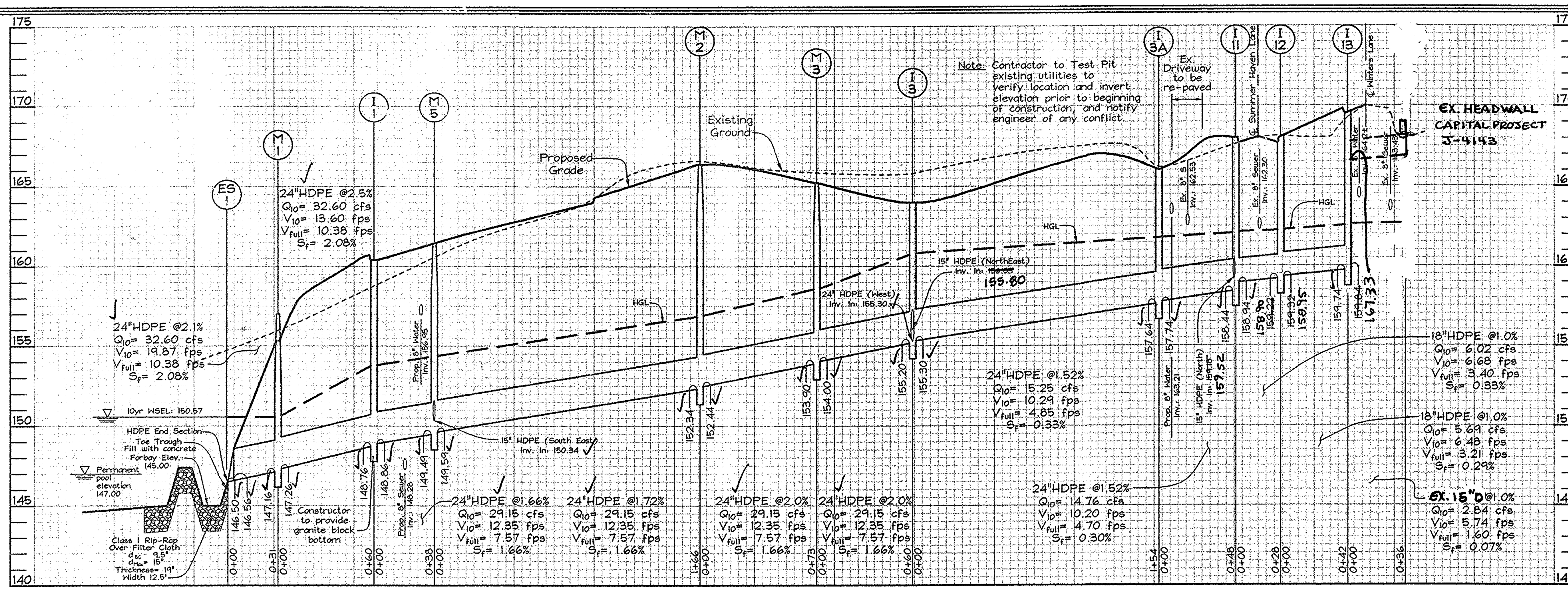
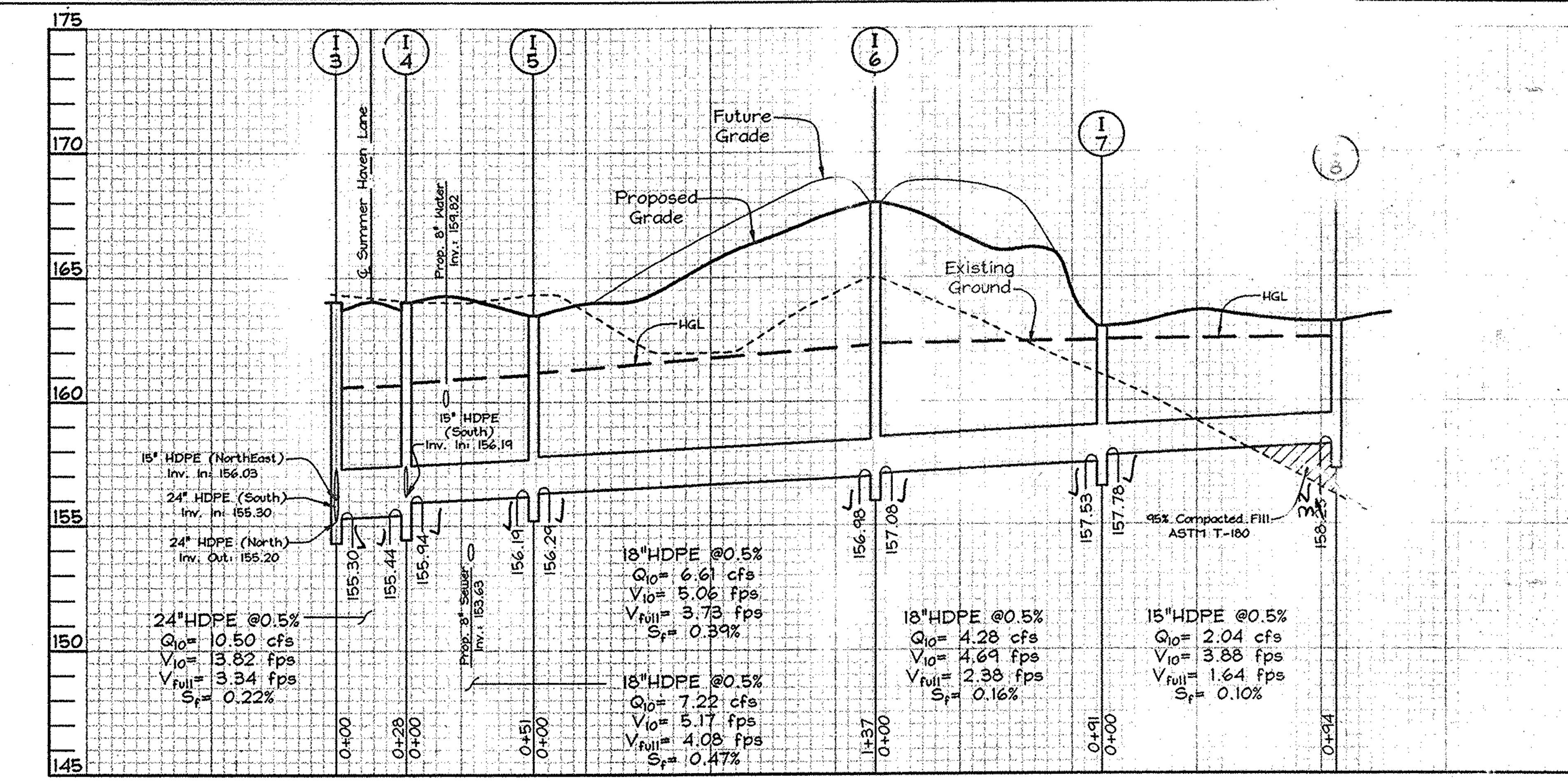


STORM DRAIN PROFILE

Scale: Horizontal- 1"=50'
Vertical- 1"=5'



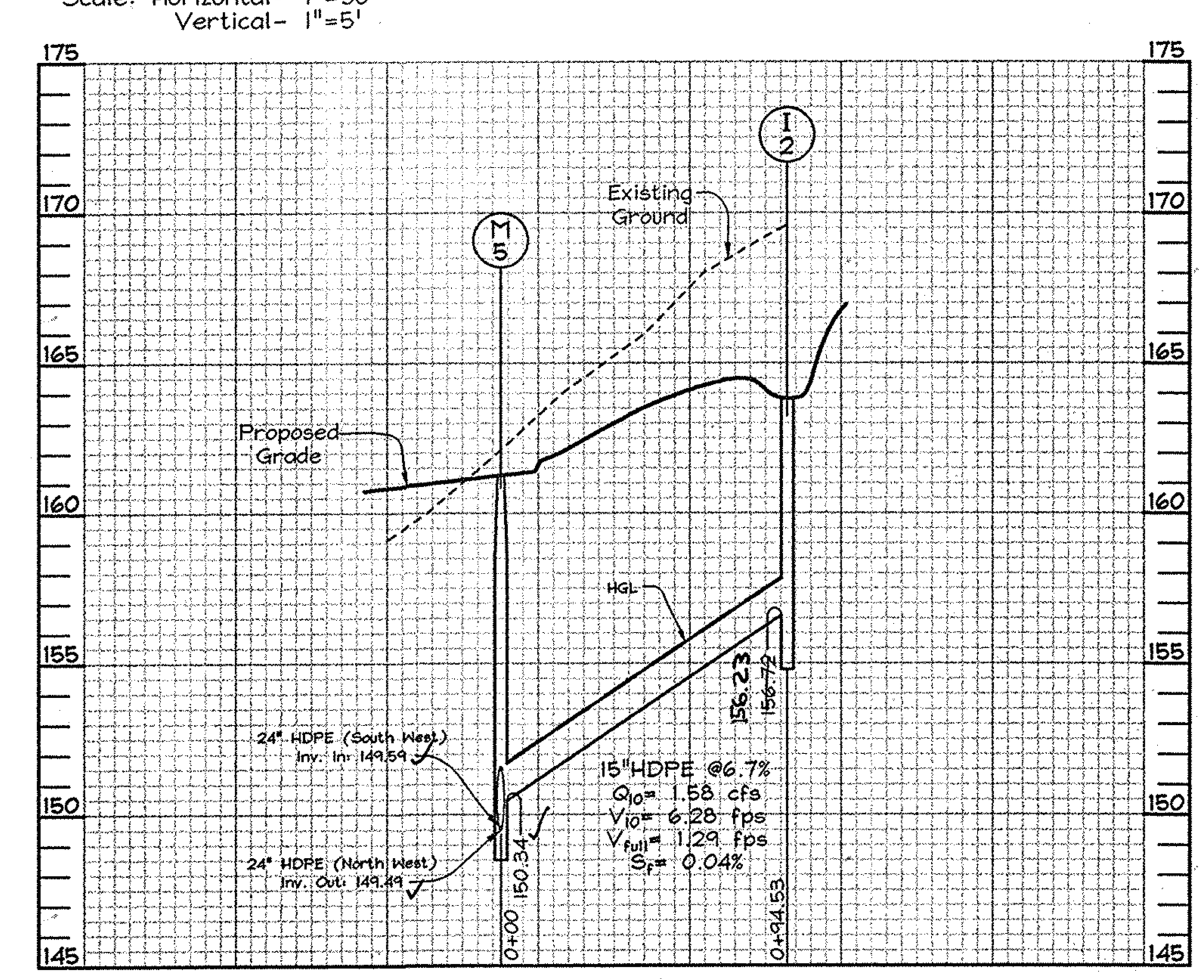
STORM DRAIN PROFILE

Scale: Horizontal- 1"=50'
Vertical- 1"=5'

STRUCTURE SCHEDULE

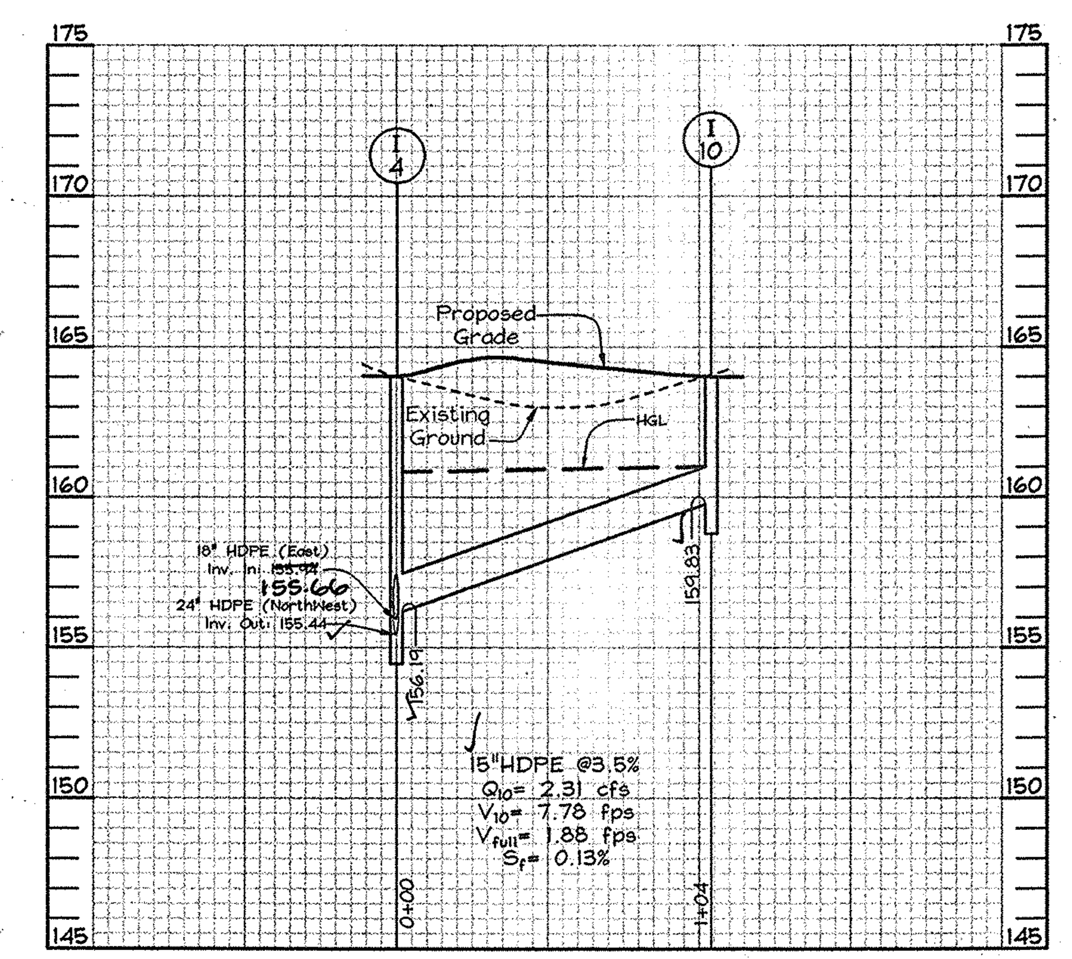
NO.	TYPE	LOCATION	TOP ELEV.	INV. IN	INV. OUT	REMARKS
I-1	Single Type 'S' Inlet	Summer Haven Linear Profile Sta.1+25.88 @ Curb	160.83	24" 148.86	148.76	SD 4.22
I-2	Single Type 'S' Inlet	N 558,025.04 E 1,390,219.17 162.94	~~163.80~~	155.80	~~156.72~~ 156.23	SD 4.22
I-3	'A-5' Precast Inlet	Summer Haven Lane Sta. 13+31.32 12' Right	164.26	15" ~~156.03~~ 24" 155.30 24" 155.30	155.20	SD 4.01
I-3A	Single Type 'S' Inlet	Summer Haven Lane Sta. 11+73.78 26.79' Right	165.69 ~~166.00~~	157.74	157.64	SD 4.22
I-4	'A-5' Precast Inlet	Summer Haven Lane Sta. 13+31.32 12' Left	164.26	18" ~~155.94~~ 155.66 18" 156.19	155.44	SD 4.01
I-5	Single Type 'S' Inlet	N 557,856.09 E 1,389,990.60 163.32	~~163.50~~	156.29	156.19	SD 4.22
I-6	Single Type 'S' Inlet	N 557,751.84 E 1,389,901.23 167.84	~~168.00~~	157.08	156.98	SD 4.22
I-7	Single Type 'S' Inlet	N 557,816.69 E 1,389,836.86 162.71	~~163.00~~	157.78	157.53	SD 4.22
I-8	Single Type 'S' Inlet	N 557889.45 E 1,389,777.61 162.87	~~163.20~~	-	158.~~25~~ 32	SD 4.22
I-9	Single Type 'S' Inlet	N 557,921.18 E 1,390,155.12 166.08	~~166.50~~	159.53	~~160.96~~	SD 4.22
I-10	Single Type 'S' Inlet	N 557,728.09 E 1,390,078.83	163.80	159.52	159.83	SD 4.22
I-11	'A-10' Precast Inlet	Summer Haven Lane Sta. 11+26.15 12.00' Right	168.58	15" ~~159.18~~ 18" 158.94	158.44	SD 4.02
I-12	'A-5' Precast Inlet	Summer Haven Lane Sta. 11+26.15 12.00' Left	168.58	~~159.32~~ 158.90	~~159.22~~ 158.95	SD 4.01
I-13	Double Type 'S' Inlet	Winters Lane Sta. 0+40.83 8.90' Right 170.63	~~168.93~~	~~159.84~~ 167.33	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 1,390,109.29 156.62	~~157.00~~	147.26	147.16	G 5.12
M-2	Precast Manhole (4')	N 557,970.20 E 1,390,045.44 165.93	~~166.18~~	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	~~156.50~~	151.50	151.40	G 5.12
M-5	Precast Manhole (4')	N 558,094.68 E 1,390,155.24 161.19	~~160.89~~	15" 150.34 24" 149.59	149.49	G 5.12
ES-1	24" HDPE End Section	N 558,176.05 E 1,390,087.72	147.39	146.56	146.50	Handcor or equivalent
ES-2	24" HDPE End Section	N 558,257.83 E 1,390,113.60	151.54	149.65	149.50	Handcor or equivalent

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.



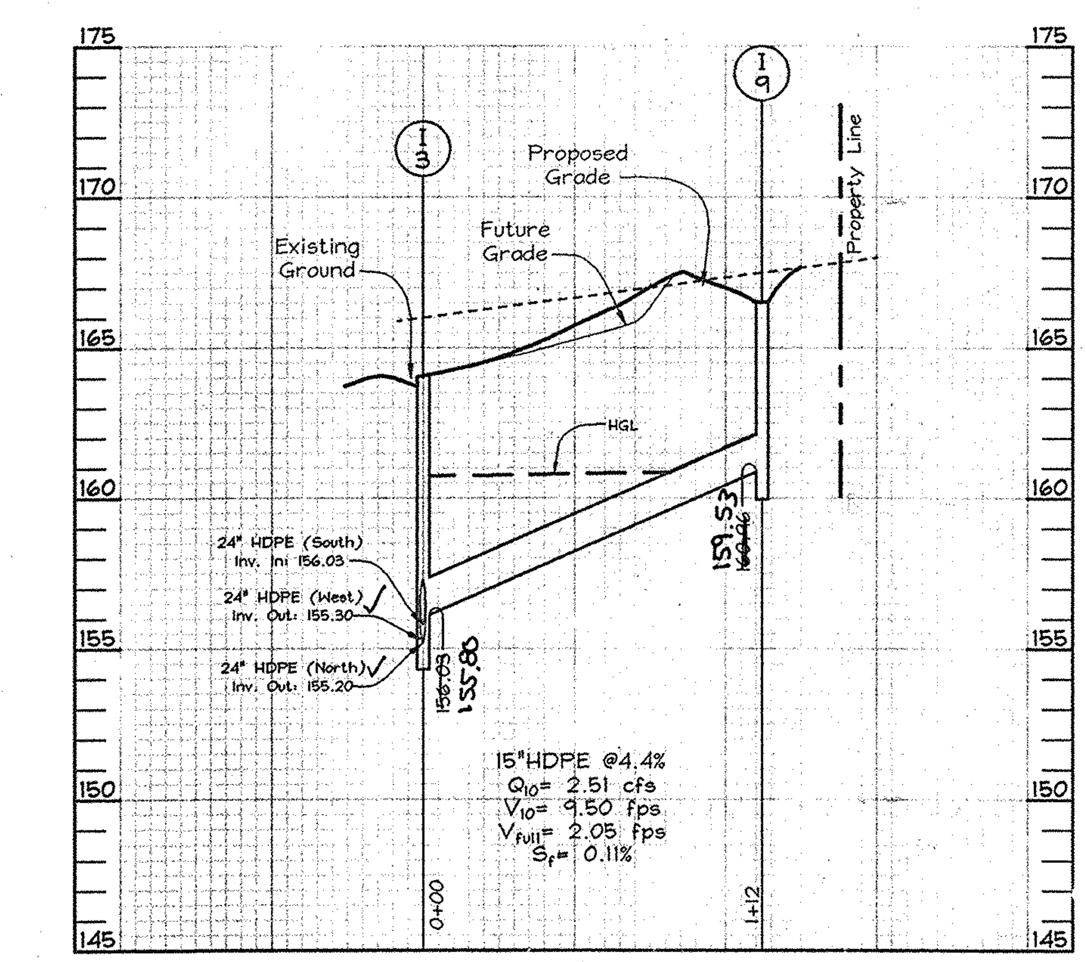
STORM DRAIN PROFILE

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'

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

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-~~2012~~ 2014

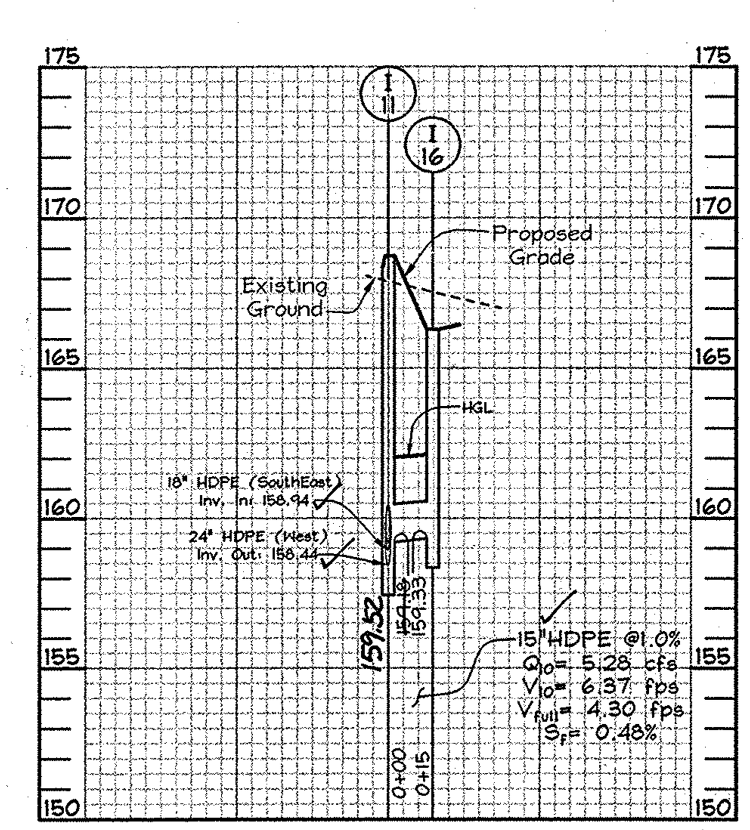
STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

Donald Mason 2-5-10

For Revisions by Benchmark Engineering, Inc. Only.

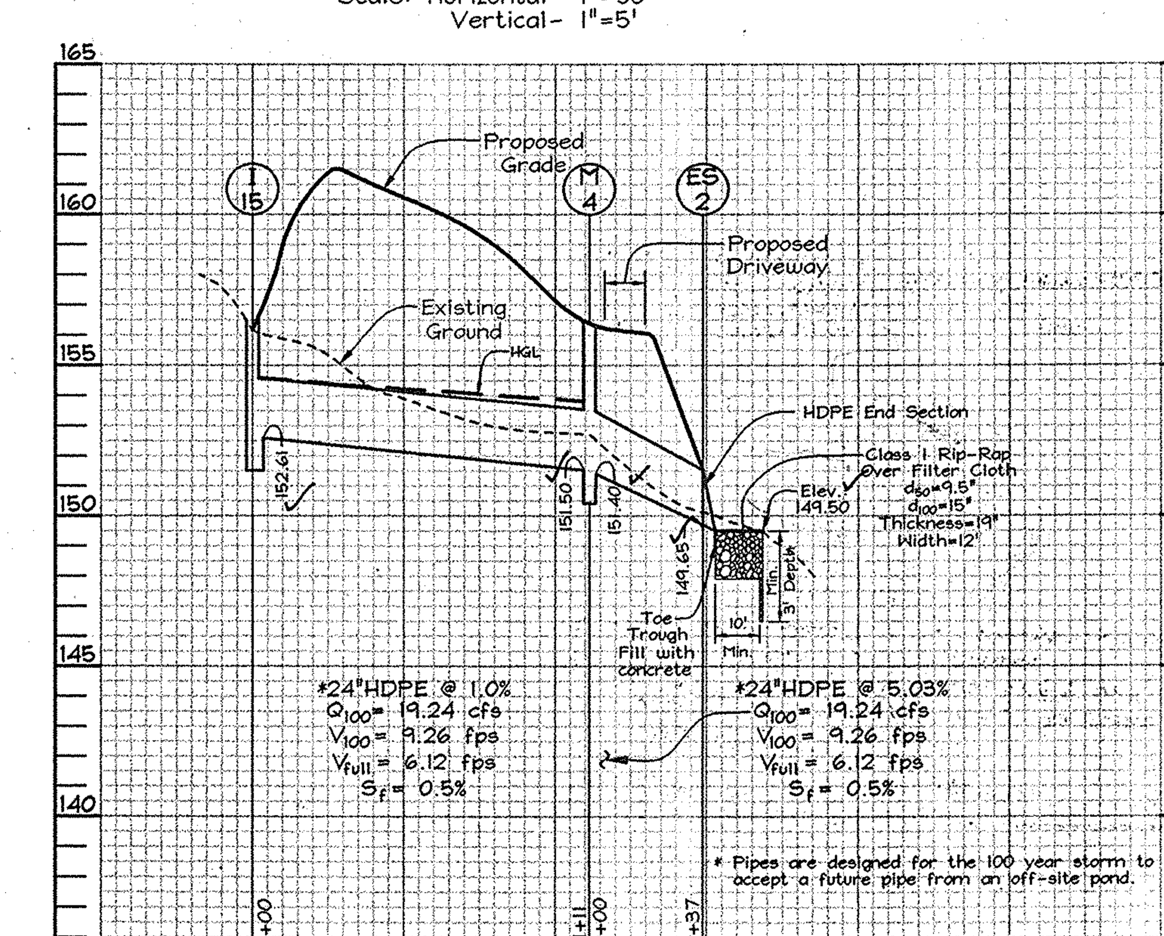
AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443. Date 10-22-14

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER



STORM DRAIN PROFILE

Scale: Horizontal- 1"=50'
Vertical- 1"=5'



STORM DRAIN PROFILE

Scale: Horizontal- 1"=50'
Vertical- 1"=5'

PIPE SCHEDULE

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

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

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 9/22/06
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

9/7/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

8-31-06
CHIEF, BUREAU OF HIGHWAYS DATE

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

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

STATE OF MARYLAND ZACHARIA YOSEF FISCH 23418 PROFESSIONAL ENGINEER

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane
Tel 410-567-
E-mail: info@

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

AS-BUILT

F-06-008

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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 ... d De... ent Piling

Proposed ... d De... ent Boulder

Emergent ... nting Area with Goose Exclusion Fence

MAA APPROVED SEEDING MIX FOR SWM AREA

Seed	Rate of Application (lbs of PLS/acre)	Amount required (lbs)
60% Fowl Meadow Grass	83	83.83
30% Chewings Fescue	34	34.34
10% Perennial Ryegrass	14	14.14
Supplemental Seed		
Redtop	3	3.03

EMERGENT PLANTING
(1090 S.F) (92 PLANTINGS, 24" O.C. WITHIN 8 - 6'x 20-40'± PLOTS)

COMMON NAME	SCIENTIFIC NAME	WETLAND INDICATOR	PLANTING STOCK	QUANTITY
Swamp Milkweed	Asclepias incarnata	OBL	Bare root	23
Marsh Hibiscus	Hibiscus moscheutos	OBL	Bare root	23
Cardinal Flower	Lobelia cardinalis	FACW+	Bare root	23
Lizard Tail	Saururus cernuus	OBL	Bare root	23

EMERGENT PLANTING NARRATIVE

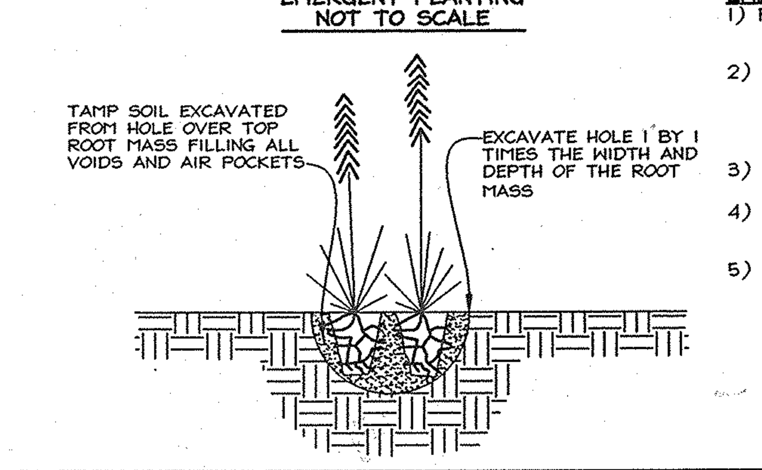
Vegetation establishment is expected though natural plant propagation and will be enhanced by supplemental planting around the pond area. Supplemental planting in 6' wide plots of varying length (20'-40', see plan) is protected with goose exclusion fencing. Plant installation may be delayed one year 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 Sweet Pepperbush	3'-4' Ht.	Cont.
CC		5	Cercis canadensis Eastern Redbud	3'-4' Ht.	Cont.
HA		9	Hydrangea arborescens Wild Hydrangea	3'-4' Ht.	Cont.
HV		11	Hamamelis virginiana Witchhazel	3'-4' Ht.	Cont.

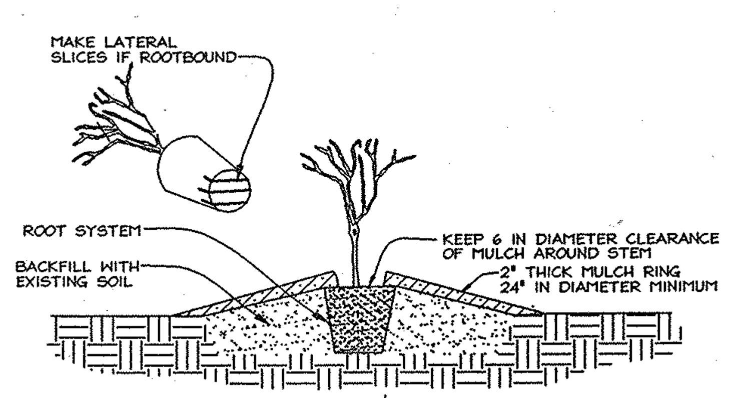
NOTE: SEE SHEET 6 OF 13 FOR DETAILS OF SWM BUFFER/UPLAND PLANTINGS

EMERGENT PLANTING
NOT TO SCALE



EMERGENT PLANTING SPECIFICATIONS

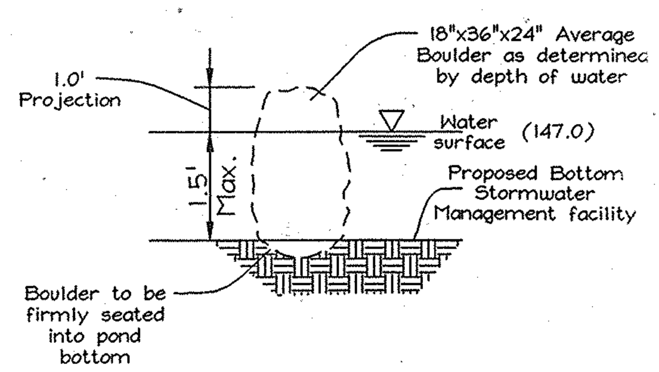
1) Rooted herbaceous plants may be locally harvested and planted immediately following harvest.
2) If not planted immediately after delivery to the job site, plants must be protected from direct exposure to the sun and roots must be kept moist at all times.
3) All plants shall contain new roots, white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



CONTAINER PLANTING
NOT TO SCALE

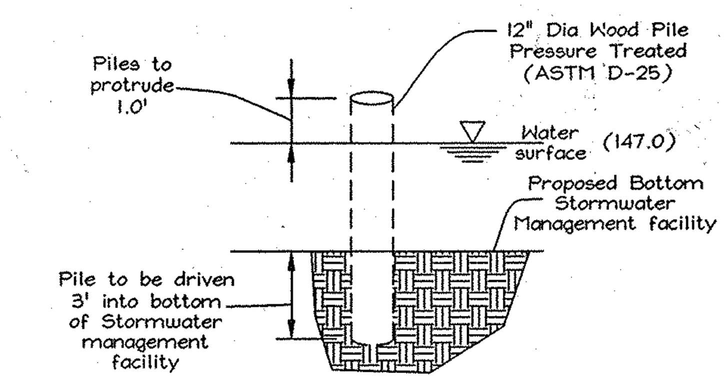
PLANTING PROCEDURE FOR CONTAINER GROWN PLANTS

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



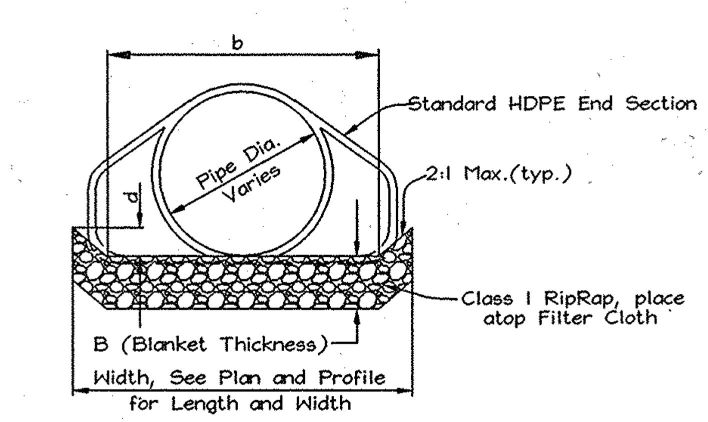
Place boulders 20' c/c Maximum

BIRD DETERRENT BOULDER PLACEMENT DETAIL
NOT TO SCALE



Place piles 20' c/c Maximum

BIRD DETERRENT PILING PLACEMENT DETAIL
NOT TO SCALE



TYP. OUTFALL 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%	0.06	4.95'	1.0'	15"	9.5"	19"
ES-2	19.24 cfs	0.0%	0.06	4.95'	1.0'	15"	9.5"	19"

MAA SEEDING SPECIFICAT[ION]S

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. The species, mixtures, and methods of application provided in this item have been designed to reduce the attractiveness of airport grounds to wildlife. 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 also 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 lawn 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 giganted)
wild onion (Allium canadense)
wild garlic (Allium vineale)
bindweed (Calstegia spp.)
dodder (Cuscuta spp.)
Bermuda grass (Cynodon dactylon)
orchardgrass (Dactylis glomerata)
tall fescue (Festuca arundinacea)
meadow fescue (Festuca pratensis)
velvetgrass (Holcus lanatus)
annual bluegrass (Poa annua)
rough bluegrass (Poa trivialis)
timothy (Phleum pratense)
Johnson grass (Sorgum halepense)

Restricted noxious-weed seed may not exceed 0.5 percent by weight of any seed mixture. In addition, all seeds sold in Maryland shall be free from the following listed prohibited noxious weeds: balloonvine (Cardiospermum halicacabum), quackgrass (Etytrigia repens), sicklepod (Senna obtusifolid), sorghum (Sorghum spp.), Canada thistle (Cirsium arvense), plumeless thistle (Carduus spp. -includes musk this... and curled thistle), and serrated tussock (Nassella trichotoma).

903-2.1.1 APPROVED SPECIES. The following table contains species that are approved by MAA for use in seed mixtures. Purity requirements and germination requirements are also provided.

APPROVED PLANT SPECIES
MAA SEED MIXTURES

	Purity(a) Not Less than%	Minimum % Germination(b)	Pure ...ve Seed F...or
Certified Turf-Type Tall Fescue (Festuca arundinacea)	98	90	1.13
Certified Kentucky Bluegrass (Poa pratensis)	90	80	1.39
Hard Fescue (Festuca longifolia)	98	90	1.13
Chewings Red Fescue (Festuca rubra commutata)	98	90	1.13
Annual Ryegrass (Lolium multiflorum)	95	85	1.34
Perennial Ryegrass (Lolium perenne)	90	80	1.39
Fowl Meadow Grass (Poa palustris)	95	80	1.39
Little Bluestem (Andropogon scoparius)	62	94	1.71

(a) The percentage weight of pure seed present shall be free of any agriculture seeds, inert matter, and other seeds distinguishable by their appearance.
(b) The percentage of germination shall be actual sprouts and shall not include hard seeds unless specifically permitted by the MAA Engineer.

903-2.1.2 PURITY. All seed shall be free of all state-designated noxious weeds listed in Paragraph 2.1.1 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 copies of a statement 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,
- percentage of weed content for the seed furnished,
- and, in the case of a mixture, me proportions of each kind of seed.

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

903-2.1.3 ... APPLICATION RATES. Only seed mixtures and application ... in this item may be used unless otherwise approved b... gineer. Seed mixtures shall meet criteria detailed in Paragraph ... mixtures have been formulated to minimize the attractivene... wildlife of common landscape scenarios. The appropriate ... for application will be designated based on environment... may vary from site to site. All planting rates listed are i... Live Seed (PLS) per acre.

Seed mixtu... scenarios, and rates for permanent cool-season grasses ar...

a. Seed Mix... relatively flat areas (grade less than 4:1) subject to normal cond... and regular mowing (Application rate = 234 lbs PLS/acre);
b. Seed Mix... No. 2 sloped areas (grade greater than 4:1) not subject to regular mowi... (Application rate = 115 lbs PLS/acre); and
c. Seed Mixture No. 3 - wetlands and their associated buffer zones (Application rate = 131 lbs PLS/acre).

Seed Mixture No. 1: Relatively flat areas regularly mowed and exposed to normal conditions (Application rate = 234 lbs PLS/acre)

Seed	Rate of Application (lbs of PLS/acre)
85% Certified Turf-Type Tall Fescue	192
10% Certified Kentucky Bluegrass	28
5% Perennial Ryegrass	14
Supplemental Seed	
Annual Ryegrass	25

Seed Mixture No. 2: Sloped areas not subject to regular mowing (Application rate = 115 lbs PLS/acre)

Seed	Rate of Application (lbs of PLS/acre)
75% Hard Fescue	85
20% Chewings Fescue	23
5% Kentucky Bluegrass	7
Supplemental Seed	
Redtop	3

Seed Mixture No. 3: - Wetland areas and their associated buffer zones (Application rate = 131 lbs PLS/acre)

Seed	Rate of Application (lbs of PLS/acre)
60% Fowl Meadow Grass	83
30% Chewings ...scue	34
10% Perennial ...grass	14
Supplemental ...ed	
Redtop	3

903-2.1.4 SEEDING SEASONS. Application of seed and seed mixtures shall occur within a specified seeding season unless otherwise approved by the MAA Engineer. No seed or seed mixtures are to be applied on frozen ground or when the temperature is at or below 35 degrees Fahrenheit (7 2 degrees Centigrade). Under these conditions, a layer of mulch should be applied in accordance with Item 905, Mulching, to stabilize the site, and permanent seeding should occur in the subsequent seeding season. Seed application may occur during the seeding season dates listed below. Seeding performed after October 20 should be a temporary cover of annual ryegrass and followed by overseeding of the appropriate seed mixture during the spring seeding season.

SEEDING SEASONS

Permanent Cool-Season Grasses	March 1 to April 20 and August 1 to October 20, inclusive
Temporary Cover of Annual Rye/Redtop	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 13.6 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.

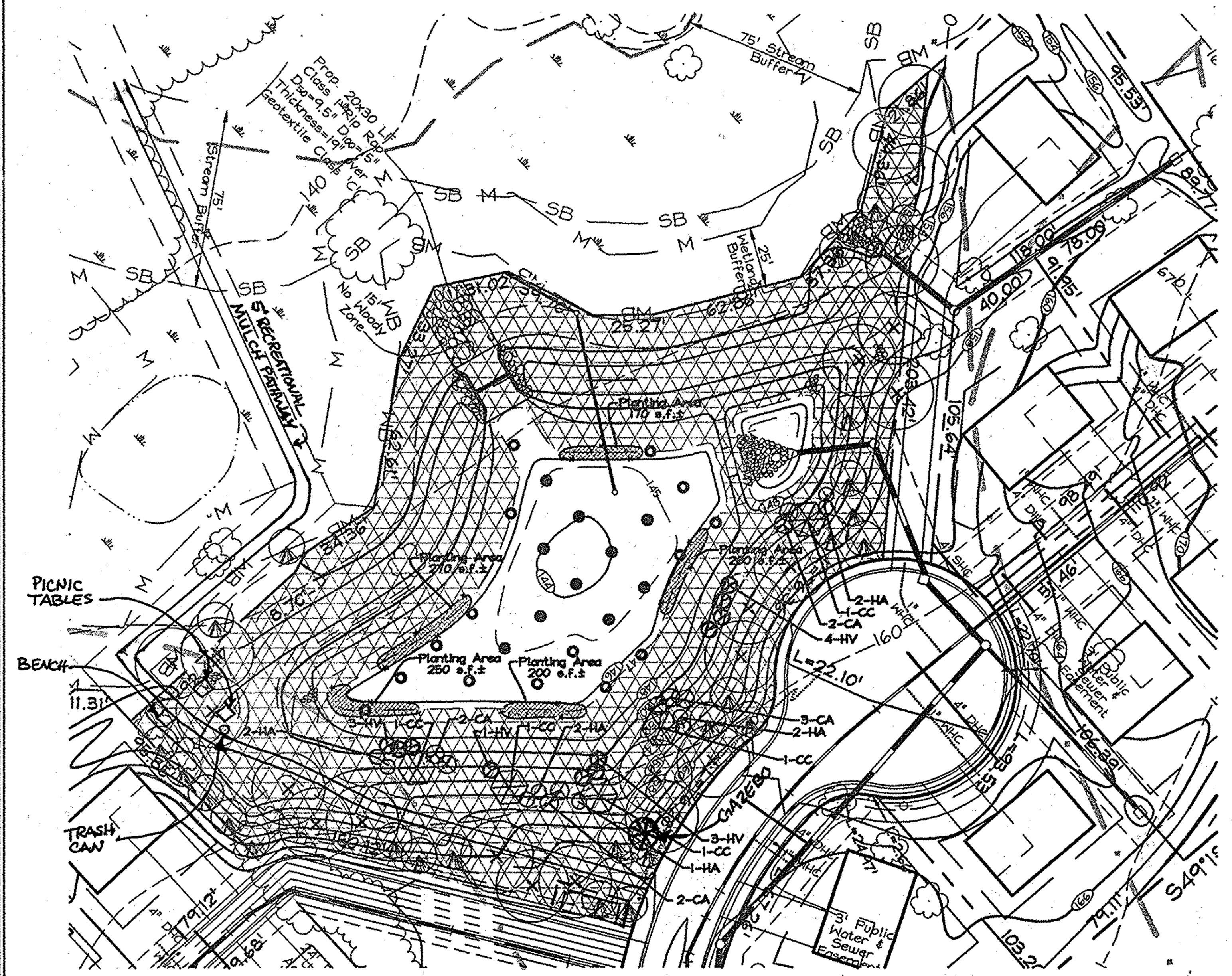
If the time required to complete any of the operations necessary under this item, within the specified planting season or any authorized extensions thereof, extends beyond the Contract period, then such time will be charged against the Contract time, and liquidated damages will be enforced with respect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

903-2.2 LIME. Lime shall consist of ground limestone and contain at least 85 percent total carbonates. 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 magnesium 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.

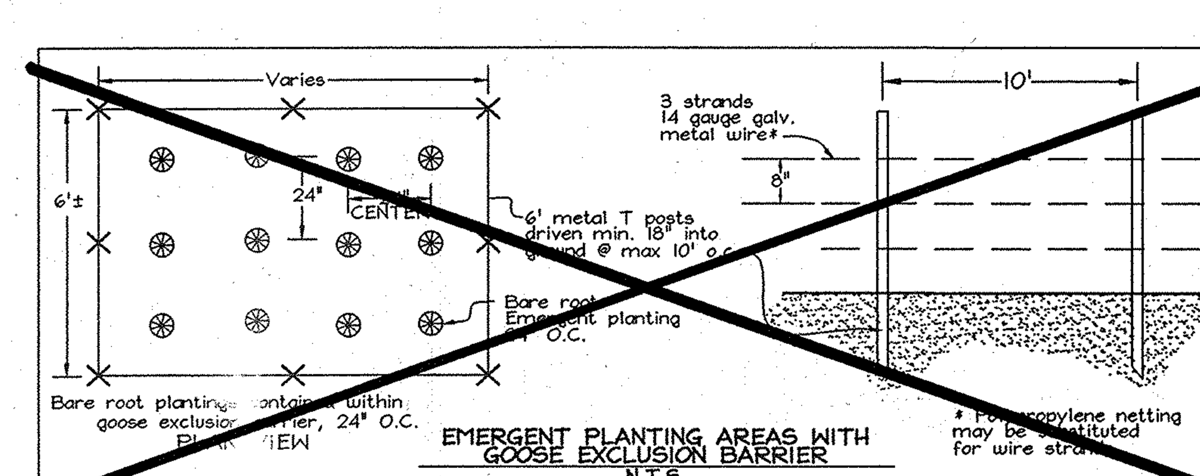
903-2.3 FERTILIZER. Fertilizer shall be standard commercial fertilizer (supplied separately or in mixtures) and meet the requirements of applicable state and federal laws (O-F-241) as well as standards of the Association of Official Agricultural Chemists. Nitrogen-Phosphorus- Potassium (N-P-K) concentrations shall be determined from analysis of soil samples. Methods 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). Mixed fertilizers shall not contain any hydrated lime or cyanamide compounds. Fertilizers 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 MAA.

The fertilizers may be supplied 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.



SWM POND PLANTING PLAN
SCALE: Hor.: 1"=50'



EMERGENT PLANTING AREAS WITH GOOSE EXCLUSION BARRIER
N.T.S.

STORMWATER MANAGEMENT SUMMARY TABLE

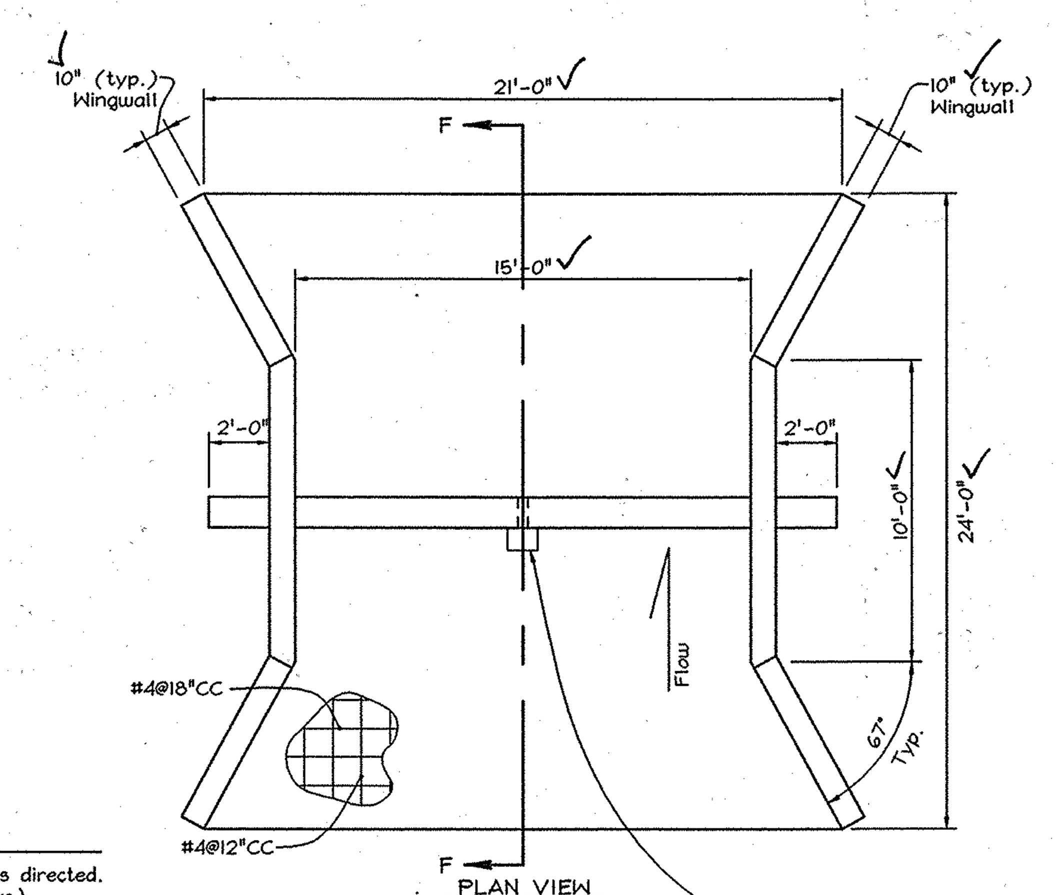
CATEGORY	DA-1	DA-2	DA-3	
CHANNEL PROTECTION VOLUME (Cp_v) Required/Provided (AF)	0.64/0.64	N/A	N/A	Q_1 < 2cfs for DA-2 & 3 (See Note #1 Below)
WATER QUALITY VOLUME (WQ_v) Required/Provided (AF)	0.115/0.115	N/A	N/A	DA-1 provided in micro-pool/e.d. structure (See Note #2 Below)
RECHARGE VOLUME/AREA (Re_v)/(Re_a) Required/Provided (AF)	Site Area 12.78 ac. 0.05af/0.05af 0.57/0.63ac	- - -	- - -	Re_a method treats required 0.57 Ac.+ impervious areas. (See Note #3 Below)
OVERBANK FLOOD STORAGE (Q_p)	N/A	N/A	N/A	Not Required by Howard County
EXTREME FLOOD VOLUME (Q_f)	N/A	N/A	N/A	Not Required by Howard County

NOTES:

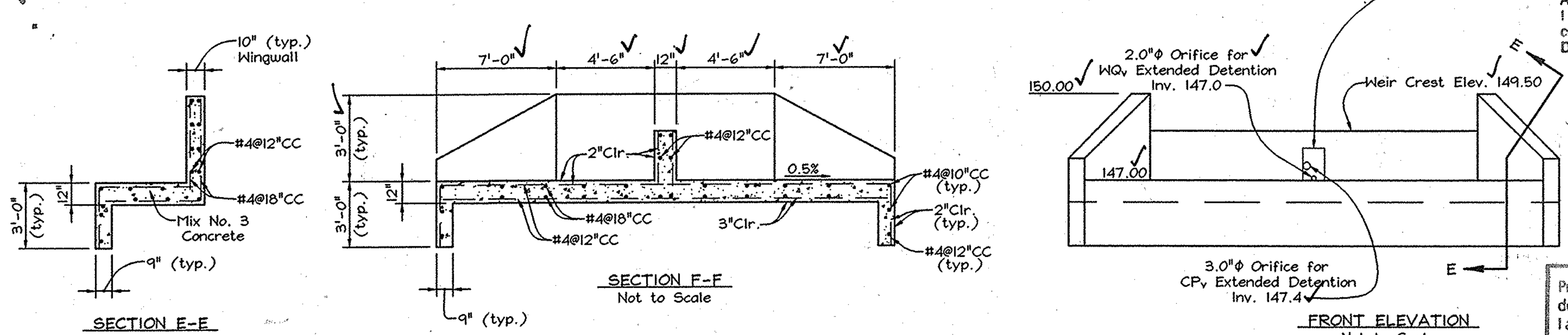
1. Channel protection volume (Cp_v) is not required for this site.
2. The water quality volume (Wqv) will be provided for DA-1 as follows: ½ (.113 Ac. Ft.) within the micro-pool and ½ (.113 Ac.Ft.) provided through 24 hr. extended release within the SWM facility. Reductions taken include credits for 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.
3. 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.
4. Overbank and extreme flood storage volume is not required for this site.

NOTES:

1. All exposed edges to have a 3/4"x3/4" chamfer or as directed.
2. Concrete shall be SHA mix #3(fc=3500 psi @ 28 days)
3. Reinforcing steel shall be ASTM A-615 grade 60.
4. See section thru weir structure details sheet 10 of 13 for all inverts and elevations of structures



PLAN VIEW
Not to Scale



SECTION E-E
Not to Scale

SECTION F-F
Not to Scale

FRONT ELEVATION
Not to Scale

CS-1 CONCRETE WEIR CONTROL STRUCTURE
NOT TO SCALE

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 16

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

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

10/26/2011

NO	DATE	REVISION	BY
2	4-26-16	REMOVE GOOSE EXCLUSION BARRIER	
1	9-16-11	REVISE LOCATION OF 5' x 20' TRASH PAD CHANGE OPEN SPACE LOT 24 TO A BUILDABLE LOT ADD RECREATIONAL AMMENITIES PER WP-11-004	BEI

OWNERS/DEVELOPERS

JAMES L. NEWBURN
5570 Sterett Place Suite 2..
Columbia, MD 21044
(410) 997-3815

B.Z. ENTERPRISES INC.
PO Box 68
Reisterstown, MD 21136
(410) 935-8687

STORMWATER MANAGEMENT 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 Sum... ...ven 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

CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE 7/22/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE 9/7/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS DATE

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

USDA-NATURAL RESOURCES CONSERVATION SERVICE DATE

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

HOWARD SCD DATE

DEVELOPER'S CERTIFICATE

"I/WE 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 A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL 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."

SIGNATURE OF DEVELOPER DATE August 10, '06

ENGINEERS CERTIFICATE

"I HEREBY CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL 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 PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Zacharia Y. Fisch 8/10/06
SIGNATURE OF ENGINEER DATE
ZACHARIA Y. FISCH

FSH As...ates
Engineers Plan... ...eyors
6339 Howar... ...e Elkrid...
Tel.: 410-56...
E-mail: info@...

DESIGN BY: PS
DRAWN BY: AB&AY
CHECKED BY: ZYF
SCALE:
DATE: Aug. 09, 2006
W.O. No.: 3157
SHEET No. 9 OF 13

AS-BUILT

F-06-008

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MARYLAND 378
STORMWATER MANAGEMENT FACILITY CONSTRUCTION SPECIFICATIONS
CONSTRUCTION SPECIFICATIONS (FOR SWM DETENTION FACILITY CS-1)

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

Site Preparation

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the toe of the embankment.

Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 25-foot radius around the inlet structure shall be cleared.

All cleared and grubbed material shall be disposed of outside and below the limits of the dam and reservoir as directed by the owner or his representative. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use on the embankment and other designated areas.

Earth Fill

Material- The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionable materials. Fill material for the center of the embankment, and cut off trench shall conform to Unified Soil Classification GC, SC, CH, or CL and must have at least 30% passing the #200 sieve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer. Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent erosion of the embankment.

Placement- Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8 inch thick (before compaction) layers which are to be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portions of the embankment. The principal spillway must be installed concurrently with fill placement and not excavated into the embankment.

Compaction- The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out.

When required by the reviewing agency the minimum required density shall not be less than 95% of maximum dry density with a moisture content within +\-2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

Cut Off Trench- The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be at least four feet below existing grade or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability.

Embankment Core - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction

Structure Backfill

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operated closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

Structure backfill may be flowable fill meeting the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 313 as modified. The mixture shall have a 100-200 psi; 28 day unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and a minimum resistivity of 2,000 ohm-cm. Material shall be placed such that minimum of 6" (measured perpendicular to the outside of the pipe) of flowable fill shall be under (bedding), over and, on the sides of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slump of the fill shall be 7" to assure flowability of the material. Adequate measures shall be taken (sand bags, etc.) to prevent floating the pipe. When using flowable fill, all metal pipe shall be bituminous coated. Any adjoining soil fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material shall completely fill all voids adjacent to the flowable fill zone. At no time during the backfilling operation shall driver equipment be allowed to operate closer than four feet, measured horizontally, to any part of the structure. Under no circumstances shall equipment be driven over any part of a structure or pipe unless there is a compacted fill of 24" or greater over the structure or pipe. Backfill (flowable fill)zone shall be of the type and quality conforming to that specified for the core of the embankment or other embankment materials.

Pipe Conduits

All pipes shall be circular in cross section.

Corrugated Metal Pipe - All of the following criteria shall apply for corrugated metal pipe:

1. Materials - (Polymer Coated steel pipe)- Steel pipes with polymeric coating shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 & M-246 with watertight coupling bands or flanges.

Materials - (Aluminum Coated Steel Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274 with watertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt.

Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-196 or M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

2. Coupling, bands, anti-seep collars, end sections, etc., must be composed of the same material and coatings as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at lease 24 mils in thickness.

3. Connections - All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered to be watertight.

All connections shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24 inches diameter: flanges on both ends of the pipe with a circular 3/8 inch thick closed cell circular neoprene gasket; and a 12-inch wide hugger type band with o-ring gaskets having a minimum diameter of 1/2 inch greater than the corrugation depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long annular corrugated band using a minimum of 4(four) rods and lugs, 2 on each connecting pipe end. A 24-inch wide by 3/8-inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8inch closed cell gaskets the full width of the flange is also acceptable.

Helically corrugated pipe shall have either continuously welded seams or have lock seams with internal caulking or a neoprene bead.

4. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

5. Backfilling shall conform to "Structure Backfill".
6. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Reinforced Concrete PipeAll of the following criteria shall apply for reinforced concrete pipe:

1. Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.

2. Bedding - Reinforced concrete pipe conduits shall be laid in a concrete bedding/cradle for their entire length. This bedding/cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 50% of its outside diameter with a minimum thickness of 6 inches. Where a concrete cradle is not needed for structural reasons, flowable fill may be used as described in the "Structure Backfill" section of this standard. Gravel bedding is not permitted.

3. Laying pipe - Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.

4. Backfilling shall conform to "Structure Backfill".

5. Other details (anti-seep collars, valves, etc.) shall be shown on the drawings.

Plastic PipeThe following criteria shall apply for plastic pipe:

1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4" -10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

2. Joints and connections to anti-seep collars shall be completely watertight.

3. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

4. Backfilling shall conform to "Structure Backfill".

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Drainage Diaphragms - When a drainage diaphragm is used, a registered professional engineer will supervise the design and construction inspection.

Concrete

Concrete shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 414, Mix No. 3.

Rock Riprap

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction Materials, Section 311.

Geotextile shall be placed under all riprap and shall meet requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.09, Class C.

Care of Water during Construction

All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect to be occupied by the permanent works. The contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment required for removal of water from various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from water as required or directed by the engineer for constructing each part of the work free from water as required or directed by the engineer for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the spillway or outlet works and so as not to interfere in any way with the operation or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level at the locations being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water sumps from which the water shall be pumped.

Stabilization

All borrow areas shall be graded to provide proper drainage and left in a sightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service Standards and Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings.

Erosion and Sediment Control

Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures.

OPERATION AND MAINTENANCE SCHEDULE FOR STORMWATER MANAGEMENT DETENTION FACILITY

STORMWATER MANAGEMENT FACILITY

ROUTINE MAINTENANCE BY H.O.A.

1. FACILITY WILL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHOULD BE PERFORMED DURING WET WEATHER TO DETERMINE IF IT IS FUNCTIONING PROPERLY.
2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES A YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHOULD BE MOWED AS NEEDED.
3. DEBRIS AND LITTER NEXT TO THE OUTLET STRUCTURE SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
4. VISIBLE SIGNS OF EROSION IN THE POND AS WELL AS RIPRAP OUTLET AREAS SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
5. 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. FOR THE FIRST GROWING SEASON ADDITIONAL WATERING OF THE WOODY PLANTS MAY BE NECESSARY IF INSUFFICIENT RAINFALL OCCURS. SEE "REFORESTATION AREA PLANTING NOTES" ON SHEET 13 FOR ADDITIONAL INSTRUCTIONS ON PLANT MAINTENANCE.

NON-ROUTINE MAINTENANCE BY HOWARD COUNTY, MARYLAND

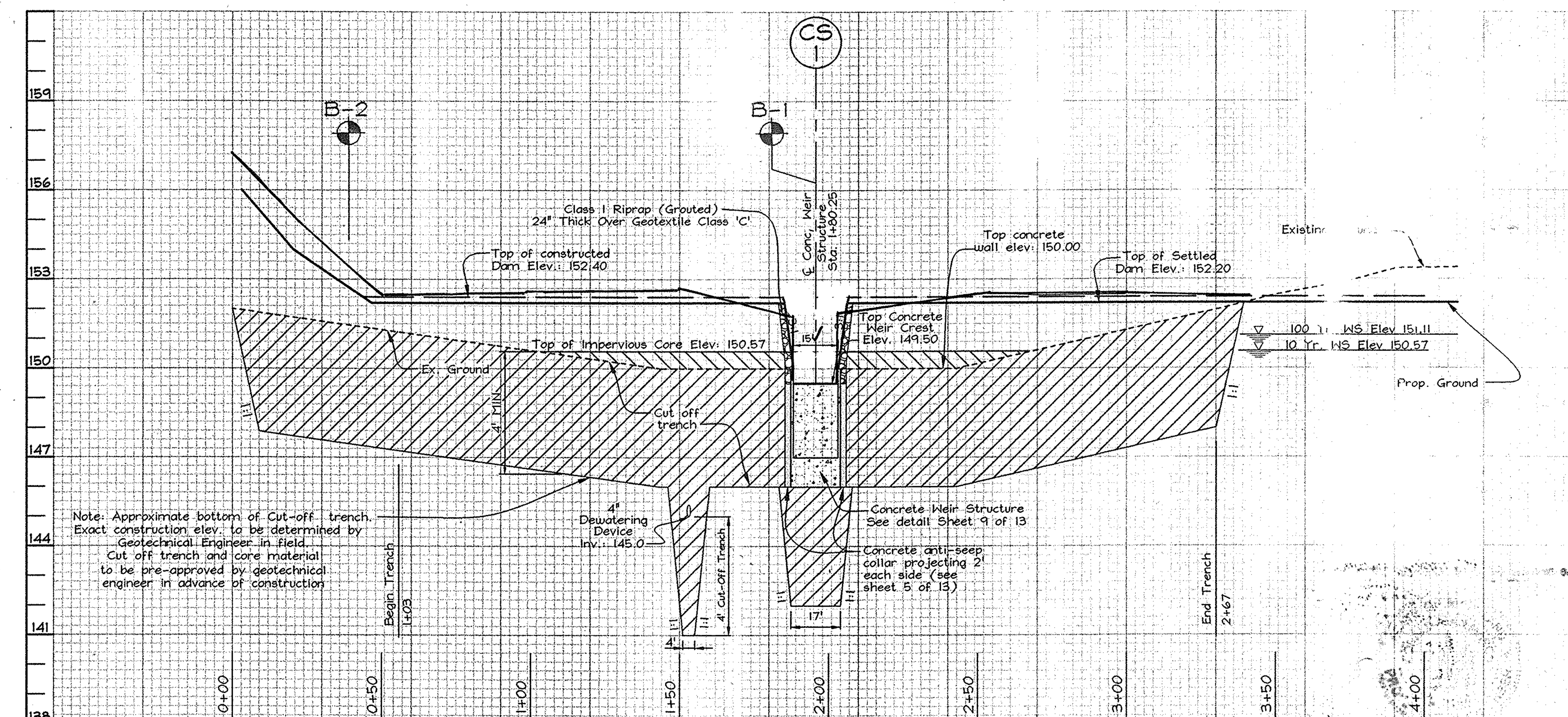
1. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON DETECTION OF ANY DAMAGE. THE COMPONENTS SHOULD BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
2. SEDIMENT SHOULD BE REMOVED WHEN ITS ACCUMULATION SIGNIFICANTLY REDUCES THE DESIGN STORAGE, INTERFERE WITH THE FUNCTION OF THE RISER, WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, OR WHEN DEEMED NECESSARY BY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

Recharge Obligation (Total Site)
Rev Req'd: N/A*
Rea Req'd: 0.57 Ac
Rea Prov'd.: 0.63 Ac

POND SUMMARY	1YEAR(CPv)	10 YEAR**	100 YEAR
Flow Into Pond	14.89 cfs	73.01 cfs	109.56 cfs
Flow Out of Pond	0.29 cfs	60.99 cfs	91.73 cfs
WS Elevation	149.2	150.57	151.11
Storage Volume	0.64 ac.ft		

WATER QUALITY FOR AREA TO POND**
WQv Req'd: 0.23 ac.ft
WQv Prov'd: 0.51 ac.ft(wet pool) 0.11 ac.ft(extended detention)
Total Provided: 0.62 ac.ft

* Recharge is met through the Percent Area Method.
** Assumes clogged Low Flow Orifices.

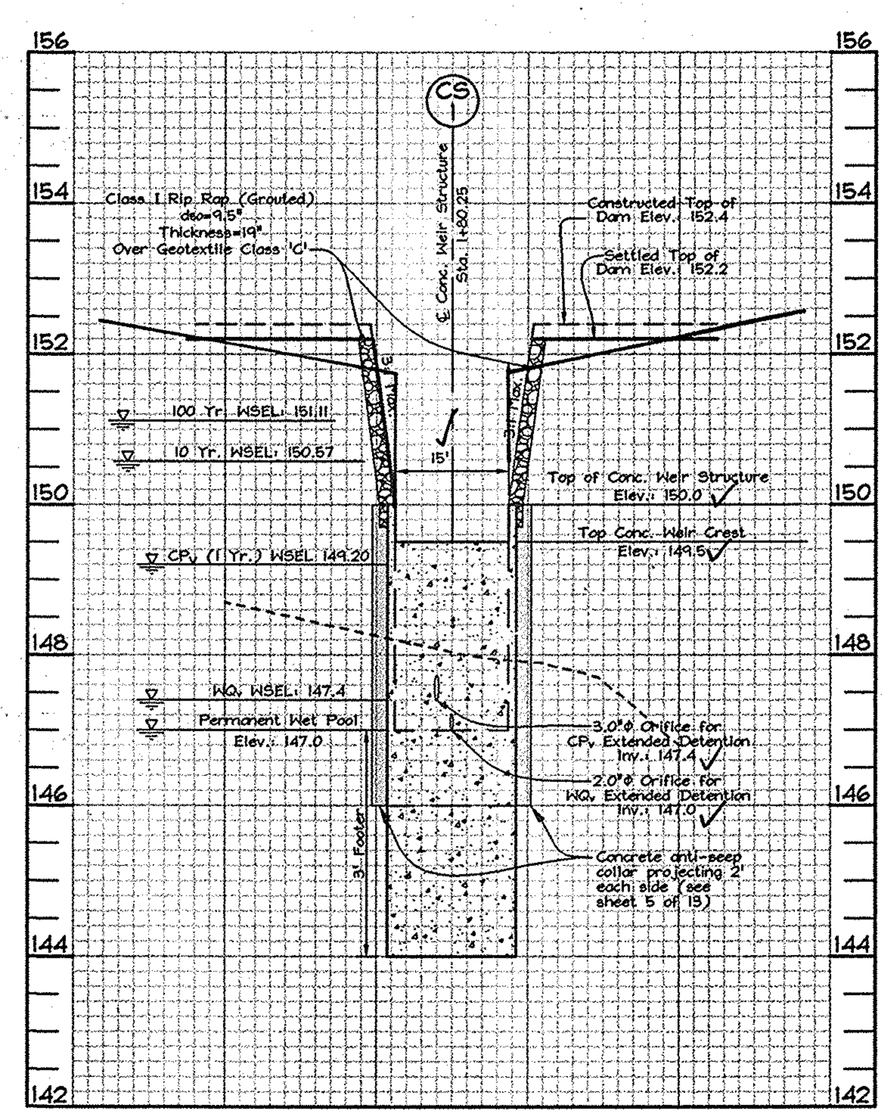


SWM POND
SECTION THRU EMBANKMENT
Scale: Horizontal- 1"=30'
Vertical-1"=3'

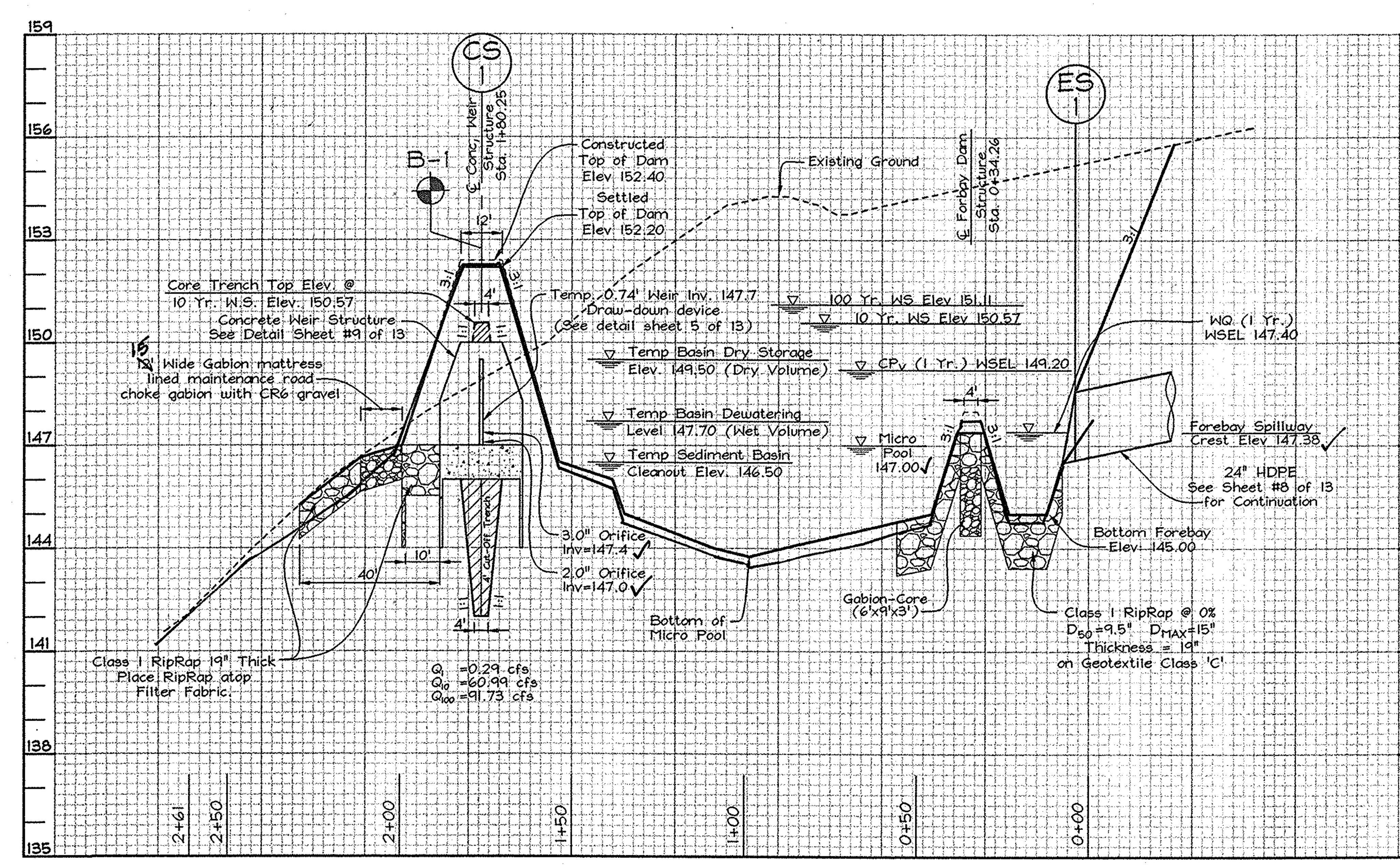
AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 10-22-14

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER

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



WEIR DETAIL
SCALE: Hor.: 1"=20'
Vert.: 1"=2'



SWM POND
SECTION THRU FACILITY
Scale: Horizontal- 1"=30'
Vertical-1"=3'

STATE OF MARYLAND BRIAN F. CLEARY No. 28559 REGISTERED PROFESSIONAL ENGINEER 9/26/2011

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 Sterett Place Suite 201
Columbia, MD 21044
(410) 997-3815

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

STORMWATER MANAGEMENT PROFILE AND DETAILS
SUMMER HAVEN
PHASE I AND II
LOTS 3-12 & 16THRU 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

NO.	DATE	REVISION	BY
1	9-16-11	REVISE TITLE BLOCK	BEI

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Cindy Hamilton 9/22/06
CHIEF, DIVISION OF LAND DEVELOPMENT DATE
9/7/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

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

DEVELOPER'S CERTIFICATE
"I/WE 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 A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL 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."
James L Newburn August 10, 06
SIGNATURE OF DEVELOPER DATE

ENGINEERS CERTIFICATE
"I HEREBY CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL 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 PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."
Zacharia Y. Fisch 8/10/06
SIGNATURE OF ENGINEER DATE
ZACHARIA Y. FISCH

STATE OF MARYLAND ZACHARIA YOSEF FISCH 22419 PROFESSIONAL ENGINEER

FSH Associates
Engineers Planners Surveyors

DESIGN BY: PS
DRAWN BY:
CHECKED BY: ZYF
SCALE: As Shown
DATE: Aug. 09, 2006
W.O. No.: 3157
SHEET No. 10 OF 13

AS-BUILT

F-06-008

Summer Haven 3157\dwg\final\3157_3o_s10.dwg, 8/10/2006 2:41:39 PM, rthomas, 1:1

No As-Built information is required on this sheet

STATE OF MARYLAND
DONALD ALAN MUIR
No. 21443
PROFESSIONAL ENGINEER
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

STATE OF MARYLAND
BRIAN F. CLEARY
No. 28559
REGISTERED
PROFESSIONAL ENGINEER
10/26/2011

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.

No.	DATE	REVISION	BY
1	9-16-11	REVISE TITLE BLOCK	BEI

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 233
1ST ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9/22/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/7/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 8-31-06

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) 935-8887

STATE OF MARYLAND
JOSHUA YOSEF HSU
21419
PROFESSIONAL ENGINEER

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

DESIGN BY: FS
DRAWN BY: AY
CHECKED BY: ZYF
SCALE: As Shown
DATE: Aug. 09, 2006
W.O. No.: 3157
SHEET No. 11 OF 18

F-06-008

AS-BUILT

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FINAL FOREST CONSERVATION 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 233

1ST ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

STATE OF MARYLAND — BRIAN F. CLEARY — No. 28559 — REGISTERED PROFESSIONAL ENGINEER — 10/4/2011

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.

No As-Built information is required on this sheet

STATE OF MARYLAND — DONALD MOSER — No. 21443 — PROFESSIONAL ENGINEER — 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

STATE OF MARYLAND — STEPHEN L. KAUFFMAN — No. 22419 — REGISTERED PROFESSIONAL FORESTER — 10-22-14

STATE OF MARYLAND — JOSEPH YOSEF KOHN — No. 22419 — PROFESSIONAL ENGINEER — 10-22-14

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9/20/11

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/20/11

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 8-31-11

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

No.	DATE	REVISION	BY
2	9-16-11	ADD RECREATIONAL AMMENITIES PER WP-11-140. CHANGE OPEN SPACE LOT 24 TO A BUILDABLE LOT. RELOCATE 5'x20' TRASH PAD	BEI
1	9-7-10	REMOVE SIDEWALK FROM IN FRONT OF LOT 1	BEI

OWNERS/DEVELOPERS
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Columbia, MD 21044
(410) 997-3815

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

EXPLORATION RESEARCH, INC.
ENVIRONMENTAL CONSULTANTS
8318 FORREST STREET
ELLICOTT CITY, MARYLAND 21043
TEL: (410) 750-1150 FAX: (410) 750-7350

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, Maryland 21075
Tel.: 410-567-5201 Fax: 410-567-5382
E-mail: info@fsh.com

DESIGN BY: AB
DRAWN BY:
CHECKED BY: ZYF
SCALE: 1"=50'
DATE: Aug. 09, 2006
W.O. No.: 3157
SHEET No. 12 OF 13

AS-BUILT

F-06-008

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FOREST CONSERVATION WORKSHEET

	Acres
Net T a	
A. Tota. Trac.	2.78
Within 100 ear Floodplain	0.82
deduction Are p/o FCP for F-00-115)	0
ract Area	11.96
Zoning se Categor Residential	
Land Use Category	
E. Afforest num (15 % x D)	1.79
F. Conservat Threshol (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
Breakeven 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. @ $0.50/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./105,851 s.f. @ $0.50/s.f. = $52,925.50
Retention-1.15 Ac./50,094.0 s.f. @ $0.20/s.f. = $10,018.80

FOREST CONSERVATION EASEMENT TABLE

EASMENT	TYPE	AREA (ACRES)
1	Reforestation	2.04
2	Reforestation Retention Uncredited	0.08 0.28 0.06
3	Reforestation Retention Uncredited	0.31 0.87 0.26
TOTAL		3.90
	Reforestation Retention	2.43 1.15

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

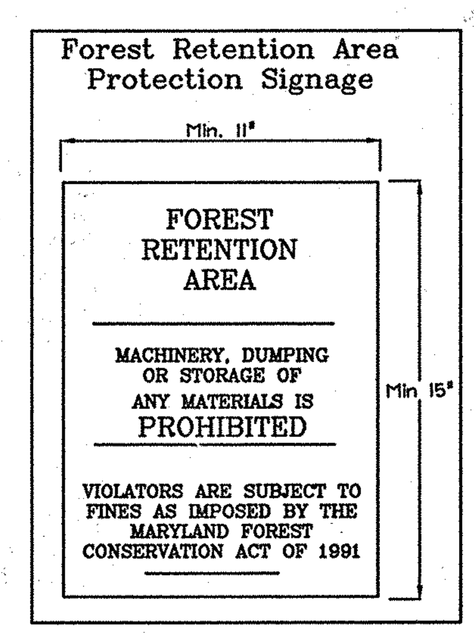
Qty	Botanical Name	Common Name	Min. Size	Spacing	Notes
119	Liquidambar styraciflua	Sweetgum	WHIP 2-3'	11' o.c.	1-3 Gallon Container Grown with tree shelters
119	Liriodendron tulipifera	Tulip Poplar	WHIP 2-3'	11' o.c.	
119	Populus deltoides	Cottonwood	WHIP 2-3'	11' o.c.	
119	Tilia americana	Basswood	WHIP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

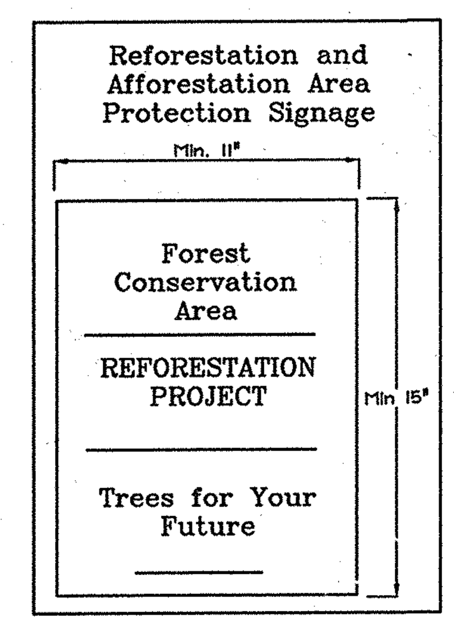
FOREST CONSERVATION EASEMENT #2
Reforestation Area 2 : 0.08 Ac. (28 trees @ 350 TPA)

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.	

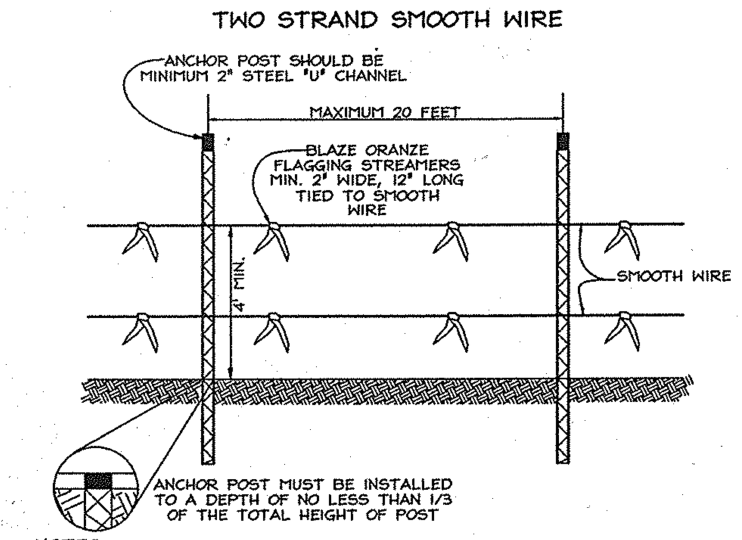




SIGN DETAIL: PERMANENT SIGN

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.

TWO STRAND SMOOTH WIRE



NOTES:
1. FOREST PROTECTION DEVICE ONLY.
2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
4. ROOT DAMAGE SHOULD BE AVOIDED.
5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

TREE PROTECTION DETAIL
NOT TO SCALE

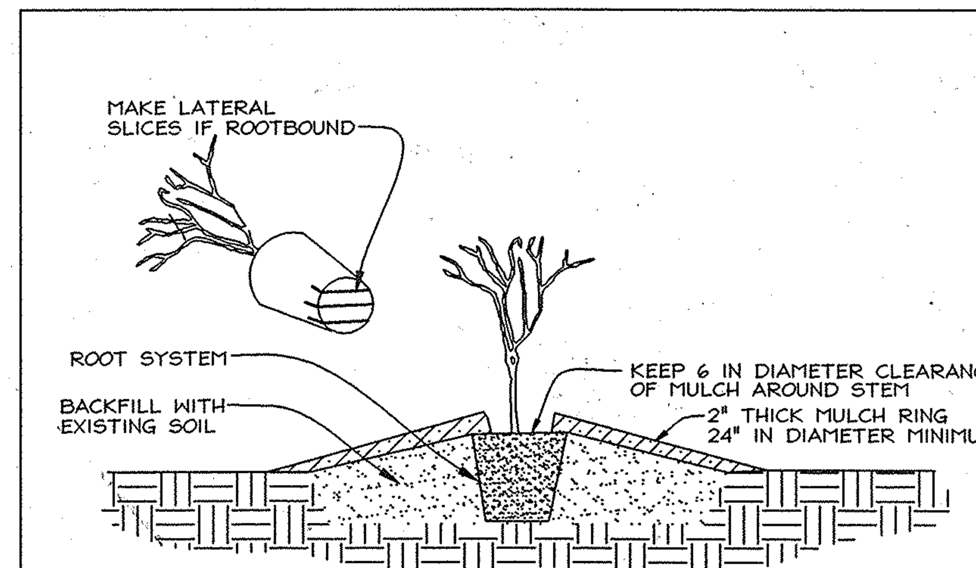
No As-Built information is required on this sheet

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

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER 10-22-14

MANAGEMENT NOTES FOR FOREST RETENTION AREAS

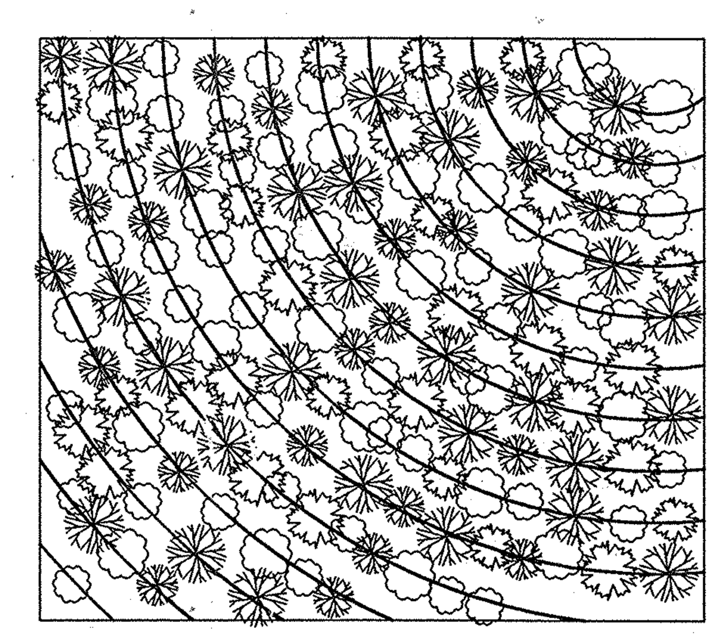
1. All proposed activities shall adhere to the conditions, schedules and terms of an approved sediment control and erosion plan.
2. After the boundaries of the retention area have been staked and flagged and before any disturbance has taken place on-site, a preconstruction meeting at the construction site shall take place. The developer, contractor or project manager, and appropriate County inspectors shall attend.
3. Tree protection for all retained areas:
   a. 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).
   b. All protection devices shall be in place prior to any grading or land clearing.
   c. All protection devices shall be properly maintained and shall remain in place until construction has ceased.
   d. Attachment of signs, fencing or other objects to trees is prohibited.
   e. No equipment, machinery, vehicles, materials or excessive pedestrian traffic shall be allowed within protected areas.
4. If the critical root zone (see detail) is affected by construction activities such as grade change, digging for foundations and roads or utility installation:
   a. Prune roots with a clean cut using proper pruning equipment (see root pruning detail)
   b. Water and fertilize as needed.
5. During construction phase, monitor and correct condition of retained trees for: soil compaction, root injury, flood conditions, drought conditions and other stress signs.
6. Post-Construction Phase
   a. 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.
   b. Inspect for dead or dying trees or limbs which may pose safety hazard and remove.
   c. No burial of discarded materials will occur onsite within the conservation areas.
   d. No burning within 100 feet of wooded area.
   e. All temporary forest protection structures will be removed after construction. Temporary signage shall be replaced with permanent signage on posts in locations shown.
   f. Following completion of construction, prior to use, the County inspector shall inspect the entire area.



CONTAINER PLANTING
NOT TO SCALE

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

CURVEILINEAR RANDOMIZED PLANTING



PLANT PLACEMENT DETAIL
NOT TO SCALE

1. MIX TREE AND SHRUB SPECIES IN THE STAGING AREA.
2. SET THE GUIDE CURVILINEAR LINE AS CLOSE TO CONTOUR AS POSSIBLE

The forest conservation easements have been established to fulfill the requirements of Section 16.1200 of the Howard County Code and the Forest Conservation Manual. No clearing, grading or construction is permitted within the forest conservation easements, however, forest management practices as defined in the Deed of Forest Conservation Easement are allowed.

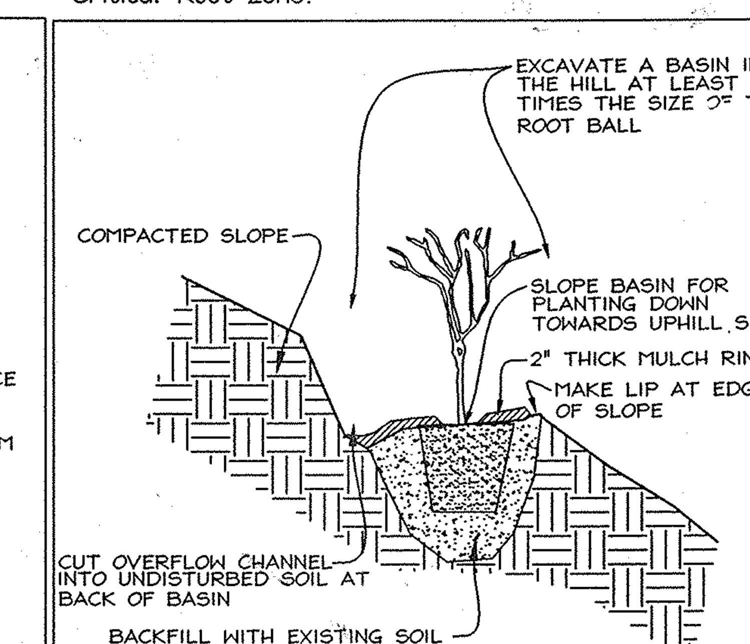
STATE OF MARYLAND BRIAN F. CLEARY No. 28559 REGISTERED PROFESSIONAL ENGINEER 10/26/2011

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.

Soil Protection Zone Notes

1. The Soil Protection Zone shall include all areas contained inside the Limit of Disturbance.
2. 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.
3. No construction activity is permitted within the Soil Protection Zone.
4. 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.
5. Root pruning shall occur prior to the beginning of construction.
6. 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.
7. Prior to construction, the Limits of Disturbance shall be marked and the ERI Professional shall determine which trees will need preventative treatment or removal.
8. Tree maintenance and removal shall be undertaken by a qualified MD Tree Expert to ensure damage to surrounding trees is minimized.
9. 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.

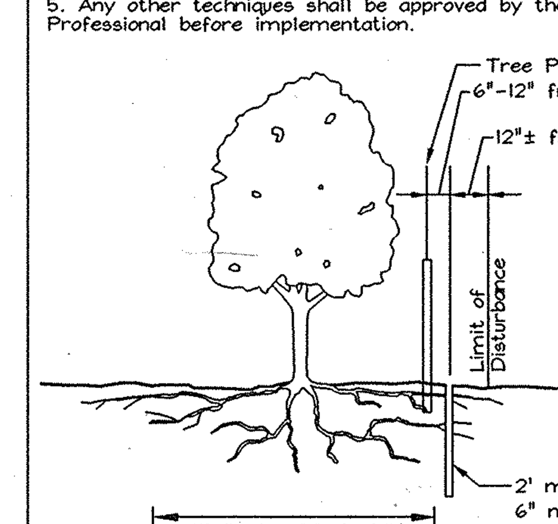


PLANTING ON STEEP SLOPES
NOT TO SCALE

1. PLANT AS PER CONTAINER PLANTING DETAIL EXCEPT PREP OF PLANTING AREA
2. A BASIN FOR PLANTING IS CUT INTO THE SLOPE WITH PLANT BEING PLACED NEAR THE DOWNHILL EDGE OF THE BASIN.
3. BASIN SHOULD SLOPE TOWARD UPHILL SIDE TO ALLOW RAIN TO BE CAPTURED AND INFILTRATE.
4. 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.
5. MULCH AROUND PLANT IN BASIN.

ROOT PRUNING

1. Retention areas shall be set prior to construction
2. Boundaries of retention areas shall be flagged, and location of trench shall be specified by ERI Qualified Professional.
3. Roots shall be cut cleanly with root pruning equipment. Where roots >1" are found, trenching shall be done by air spade or hand tools. Roots >1" shall be cut with a hand saw.
4. Trench shall be immediately backfilled with soil removed or high organic content soil.
5. Any other techniques shall be approved by the ERI Qualified Professional before implementation.



Reforestation Area Monitoring Notes

Monit visit the first growing season ... ermine if supplemental ... rly spring visits will ... ner kill. ... s of ... or othe ... autum
2. Th... e shall be 75% of th ... planted ... e two year maintenance ... dlings ... eratio on the planting site ... urvi umber if they are ... post
... e end of the two-year post ... survival rates will result in a ... 3 to 4 foot height standard ... son post construction period, wi ... e potential of attaining a 2" cal ... will be determined by a stratified rand ... antings ... cies composition of the sample populati ... onate to ... unt of each species in the entire planti ... ed ... e monitoring will assess plant survivabili ... first growing ... and make recommendations for reinforce ... if required at ... ne.

Reforestation Area Planting Notes

1. Initial planting inspection and certification req ... g contractor notify ERI qualified professional 24 hours in advan...
2. Reforestation areas may be planted as soo ... so Late winter- early spring plantings are pr ... st planting dates will vary from year to year but planting begin as soon as the ground is no longer frozen. Alternate ... may be considered as conditions warrants.
3. Soil amendments and fertilization re ... will be made based upon the results of soil analysis for ... phorus, potassium, organic matter content and pH. If ... will be provided using a slow release, soluble 16-8- ... ysis ... ned to ... 5-8 years contained in polyethylene perforated ... such as manufactured by ADCO Works, P.O. Box 310 Hollins, ... 11423 or approved equal.
4. Plant materials shall be planted in ... rdance with the planting diagram, planting details and planti... chedule.
5. Plant stock must be protected fro... esiccation at all times prior to planting. Materials held for plan... shall be moistened and placed in cool shaded areas until ready ... acement.
6. 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, desiccation, insect or disease must be replaced.
7. Newly planted trees may requi... watering at least once pe... ek during the first growing season depending on rainfall in order to g... stablished. The initial planting operation should allow for watering duri... nstallation to completely soak backfill materials.
8. Mulch shall be applied in accordance with the diagram provided and shall consist of composted, shredded hardwood bark mulch, free of wood alcohol.
9. Planting holes shou... be excavated to a minimum diameter of 2.5 to 3 times the diamete... the root ball or container Mechanical angering is preferred with sc... cation of the sides of each ole
10. 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.

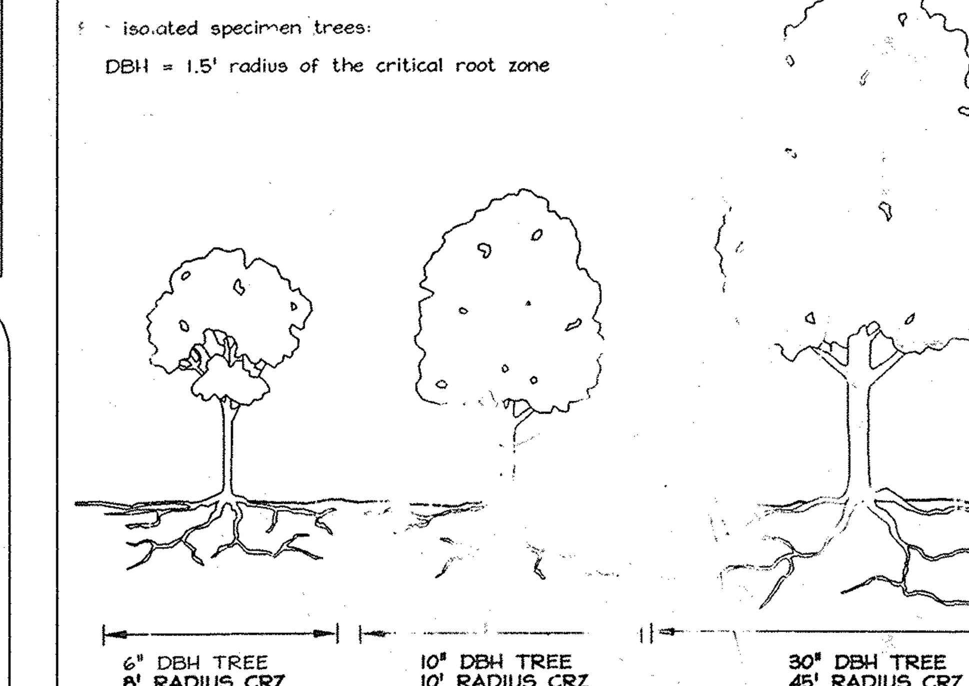
CRITICAL ROOT ZONE

For the edge of large areas, use the greater of the two choices below:

1" DBH of the tree = 1' radius of the critical root zone or 8 ft radius circle around the trunk of the tree

For isolated specimen trees:

DBH = 1.5' radius of the critical root zone



STATE OF MARYLAND STEPHEN L. HUBER No. 383 REGISTERED PROFESSIONAL FORESTER

EXPLORATION RESEARCH, INC.
ENVIRONMENTAL CONSULTANTS
LANDSCAPE ARCHITECTS
8318 FORREST STREET
ELLICOTT CITY, MARYLAND 21043
TEL: (410) 750-1150 FAX: (410) 750-7350
EMAIL: EXPLORATIONRES@CS.COM

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

NO	DATE	REVISION	BY
1	9-16-11	REVISE TITLE BLOCK	BEI

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 9/23/16
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 9/7/06

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

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 #15439

TAX MAP 38 GRID 4 — PARCELS 718, 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@fsha.biz

STATE OF MARYLAND ZACHARIA YOSEF FISCH No. 23419 PROFESSIONAL ENGINEER

DESIGN	AB
DRAWN	
CHECKED	ZYF
SCALE	As Shown
DATE	Aug. 01, 2006
JOB No.	3157
SHEET No.	13 OF 13

F-06-008

AS-BUILT

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