

GENERAL NOTES

- STORM WATER MANAGEMENT TO BE PROVIDED FOR THIS DEVELOPMENT BY ENVIRONMENTAL SITE DESIGN UTILIZING MICRO-BIOTRETENTION FACILITIES (M-6), ROOFTOP DISCONNECTS (N-1), NON-ROOFTOP DISCONNECTS (N-2), SHEETFLOW TO BUFFER (N-3), AND DRY WELLS (M-5). THE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION OR THE PRIVATE LOT OWNER. REFERENCE 2010 MDE STORMWATER DESIGN MANUAL (CHAPTER 5).
- THE SUBJECT PROPERTY IS ZONED "RR-DEO" IN ACCORDANCE WITH THE OCTOBER 6, 2013 COMPREHENSIVE ZONING PLAN. THIS SITE IS NOT LOCATED IN A HISTORIC DISTRICT.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 34HA AND 34GB WERE USED FOR THIS PROJECT.
- NO RARE, THREATENED OR ENDANGERED SPECIES OR THEIR HABITATS WERE OBSERVED ON THE PROPERTY.
- THERE IS APPROXIMATELY 7.50 ACRES OF 100-YR FLOODPLAIN LOCATED WITHIN THE LIMITS OF THIS SITE.
- SEDMENT AND EROSION CONTROL WILL BE PROVIDED FOR THIS SITE.
- WETLANDS SHOWN ON-SITE ARE BASED ON A FIELD INVESTIGATION PERFORMED BY JOHN CANOLES OF ECO-SCIENCE PROFESSIONALS, INC. DATED JUNE 10, 2016. THERE ARE NO PROPOSED DISTURBANCES TO THE WETLANDS OR ASSOCIATED BUFFERS.
- A FOREST STAND DELINEATION AND ENVIRONMENTAL RESOURCES ASSESSMENT WAS PERFORMED BY JOHN CANOLES OF ECO-SCIENCE PROFESSIONALS, INC. DATED JUNE 10, 2016.
- A TOTAL OF 18 LOTS ARE PROPOSED UNDER THIS PLAN.
- WETLANDS AND THEIR BUFFERS WILL NOT BE IMPACTED BY THE CONSTRUCTION OF THE SITE.
- APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN AND/OR RED-LINE REVISION PLAN. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SHALL OCCUR AT THE SUBDIVISION PLAN/PLAT AND/OR SITE DEVELOPMENT PLAN STAGES AND/OR RED-LINE REVISION PROCESS. THE APPLICANT AND CONSULTANT SHOULD EXPECT ADDITIONAL AND MORE DETAILED REVIEW COMMENTS (INCLUDING COMMENTS THAT MAY ALTER THE OVERALL SITE DESIGN) AS THIS PROJECT PROGRESSES THROUGH THE PLAN REVIEW PROCESS.
- WATER AND SEWER SERVICE TO BE PROVIDED BY PRIVATE WELLS AND SEPTIC SYSTEMS.
- A PRE-SUBMISSION COMMUNITY MEETING WAS HELD ON MARCH 29, 2016 AT 8:00 PM AT THE BOARD ROOM AT CLARET HALL. A SECOND COMMUNITY MEETING WAS HELD FEBRUARY 21, 2017, AT THE SAME TIME AND LOCATION AS THE FIRST.
- APPROXIMATE FLOODPLAIN DELINEATION GENERATED FROM PRELIMINARY HEC-RAS ANALYSIS, PREPARED BY ROBERT H. VOGEL ENGINEERING, INC.
- WAIVERS MAY BE REQUIRED FOR REMOVAL OF SPECIMEN TREES AND STREAM BUFFER DISTURBANCES.
- LOCATION OF EXISTING WELL ON GREENE PROPERTY, LOT 1, TAKEN FROM PUBLIC RECORDS.
- THIS PROPERTY IS IN GROWTH TIER III, PER SB-236. MAJOR SUBDIVISIONS OF 5 LOTS OR MORE ARE PERMITTED UTILIZING ON-SITE SEPTIC SYSTEMS, COMMUNITY SEPTIC SYSTEMS OR A SHARED FACILITY IN HOWARD COUNTY SUBJECT TO PLANNING BOARD REVIEW AND APPROVAL RECOMMENDATION.

ENVIRONMENTAL CONCEPT PLAN

THE ESTATES AT RIVER HILL

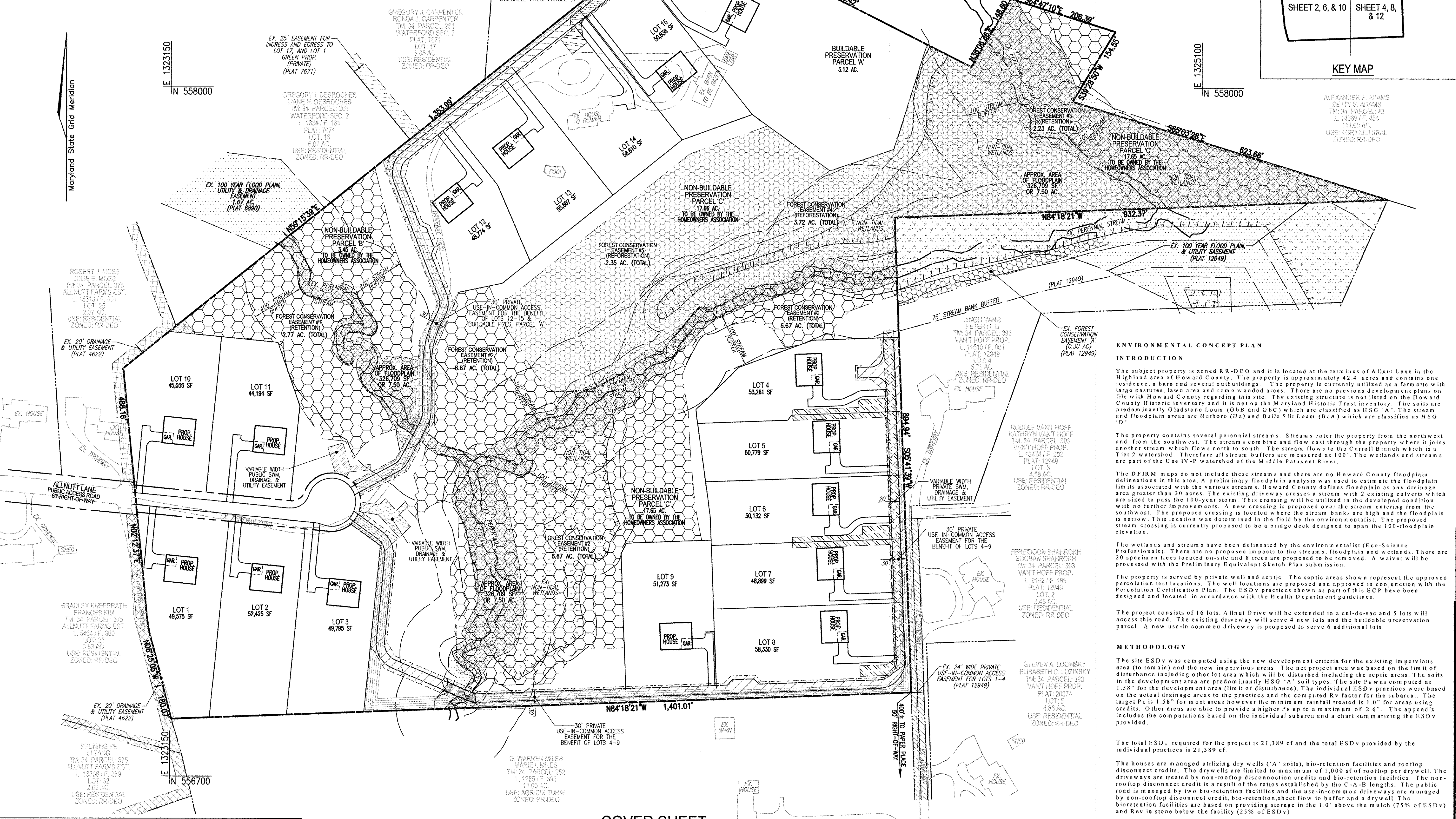
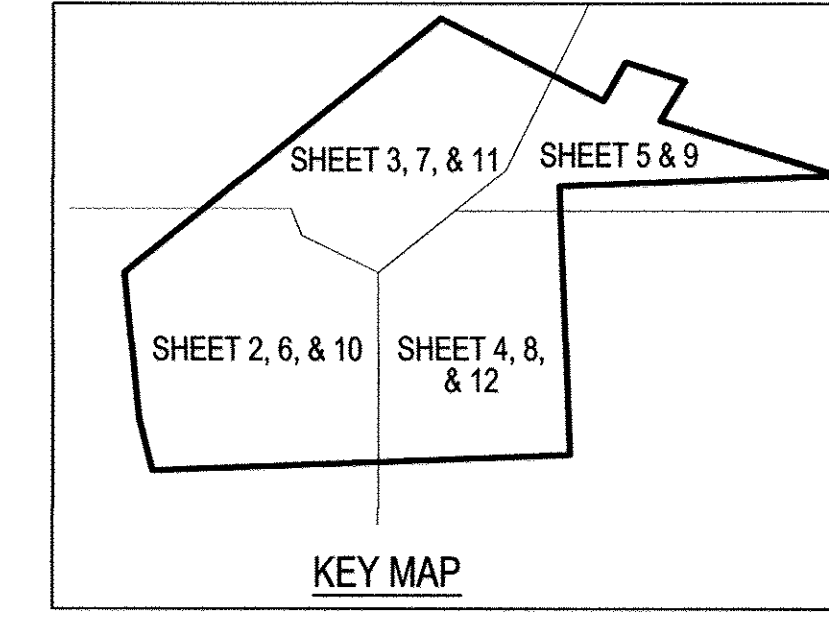
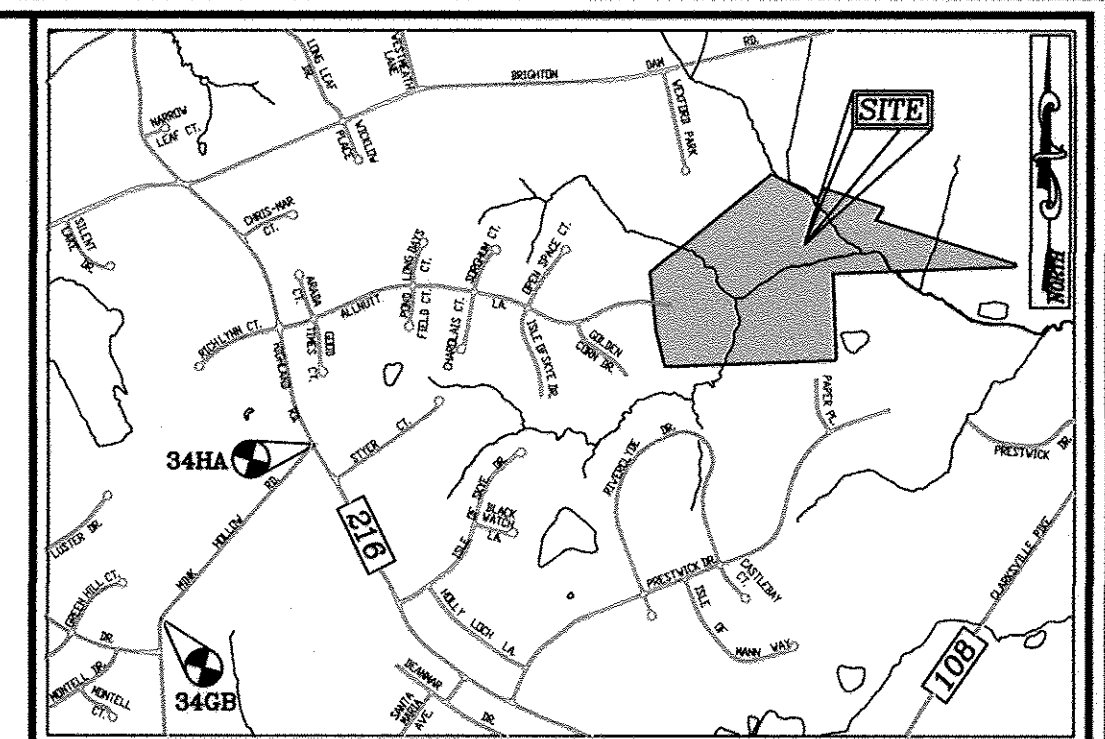
LOTS 1-15, BUILDABLE PRESERVATION PARCEL 'A', AND NON-BUILDABLE PRESERVATION PARCELS 'B' & 'C'

A RE-SUBDIVISION OF THE "GREENE PROPERTY", LOT 1

13550 ALLNUTT LANE
HIGHLAND, MD 20777

SITE DATA

LOCATION: TAX MAP 34, BLOCK 23
PARCEL: 389
5TH ELECTION DISTRICT
PRESENT ZONING: RR-DEO
GROSS AREA OF PROJECT: 42.41 AC.
AREA OF RIGHT-OF-WAY DEDICATION: 0.60 AC.
LIMIT OF DISTURBANCE: 16.32 AC.
PROPOSED USE OF SITE: RESIDENTIAL (SFD)
NUMBER OF RESIDENTIAL LOTS PROPOSED: 16 LOTS
AREA OF RESIDENTIAL LOTS PROPOSED: 20.63 AC.
IMPERVIOUS AREA: 3.35 AC.
AREA OF STREAM/BUFFER: 12.75 AC.
AREA OF WETLANDS/BUFFER: 9.11 AC.
AREA OF MODERATE SLOPES (15% - 24.99%): 0.00 AC.
AREA OF STEEP SLOPES (25% OR GREATER): 0.00 AC.
AREA OF FLOOD PLAIN: 7.50 AC.
NET PROJECT AREA: 34.91 AC.
AREA OF EXISTING FOREST COVER: 17.87 AC.
AREA OF ERODIBLE SOILS: 0.39 AC.
AREA MANAGED BY ESDV (THIS PLAN): 16.32 AC.
"IMPERVIOUS AREA": 3.35 AC.
"GREEN AREA": 12.97 AC.



LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING EDGE OF PAVING
- EXISTING STREAM BUFFER
- EXISTING STREAM
- EXISTING TREELINE
- PROPOSED TREELINE
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- EXISTING WOOD FENCE
- EXISTING METAL FENCE
- EX. PUBLIC 100-YEAR FLOOD PLAN
- EX. 25' EASEMENT FOR INGRESS AND EGRESS TO LOT 12 AND LOT 1 GREEN PROP. (PRIVATE) (PLAT 7671)
- EX. 24' WIDE PRIVATE USE-IN-COMMON ACCESS EASEMENT FOR LOTS 1-4 (PLAT 12949)
- EX. FOREST CONSERVATION EASEMENT #5 (PLAT 12949)
- EX. 20' DRAINAGE & UTILITY EASEMENT (PLAT 4622)
- PROP. PRIVATE USE-IN-COMMON ACCESS EASEMENT
- PROP. VARIABLE WIDTH PRIVATE SWM, DRAINAGE & UTILITY EASEMENT
- PROP. PUBLIC SWM, DRAINAGE & UTILITY EASEMENT

SHEET INDEX

DESCRIPTION	SHEET NO.
COVER SHEET	1 OF 12
LAYOUT PLAN	2 OF 12
LAYOUT PLAN	3 OF 12
LAYOUT PLAN	4 OF 12
LAYOUT PLAN	5 OF 12
SOILS MAP, GRADING, EROSION, AND SEDIMENT CONTROL PLAN	6 OF 12
SOILS MAP, GRADING, EROSION, AND SEDIMENT CONTROL PLAN	7 OF 12
SOILS MAP, GRADING, EROSION, AND SEDIMENT CONTROL PLAN	8 OF 12
SOILS MAP, GRADING, EROSION, AND SEDIMENT CONTROL PLAN	9 OF 12
STORMWATER MANAGEMENT DRAINAGE AREA MAP, NOTES, AND DETAILS	10 OF 12
STORMWATER MANAGEMENT DRAINAGE AREA MAP, NOTES, AND DETAILS	11 OF 12
STORMWATER MANAGEMENT DRAINAGE AREA MAP, NOTES, AND DETAILS	12 OF 12

ENVIRONMENTAL CONCEPT PLAN INTRODUCTION

The subject property is zoned RR-DEO and is located at the terminus of Allnut Lane in the Highland area of Howard County. The property is approximately 42.4 acres and contains one residence, a barn and several outbuildings. The property is currently utilized as a farm etc with large pastures, lawn area and some wooded areas. There are no previous development plans on file with Howard County regarding this site. The existing structure is not listed on the Howard County Historic Inventory and it is not on the Maryland Historic Trust Inventory. The soils are predominantly G1ndstone Loam (G1B and G1C) which are classified as HSG "A". The stream and floodplain areas are Haboro (Ha) and Basic Silt Loam (BaA) which are classified as HSG "D".

The property contains several perennial streams. Streams enter the property from the northwest and from the southwest. The streams combine and flow east through the property where it joins another stream which flows north to south. The stream flows to the Carroll Branch which is a Tier 2 watershed. Therefore all stream buffers are measured as 100'. The wetlands and streams are part of the Use IV-P watershed of the Middle Patuxent River.

The D FIR maps do not include these streams and there are no Howard County floodplain delineations in this area. A preliminary floodplain analysis was used to estimate the floodplain limit associated with the various streams. Howard County defines floodplain as any drainage area greater than 30 acres. The existing driveway crosses a stream with 2 existing culverts which are sized to pass the 100-year storm. This crossing was designed in the developed condition with no further improvements. A new crossing is proposed over the stream entering from the southwest. The proposed crossing is located where the stream banks are high and the floodplain is narrow. This location was determined in the field by the environmentalist. The proposed stream crossing is currently proposed to be a bridge deck designed to span the 100-floodplain elevation.

The wetlands and streams have been delineated by the environmentalist (Eco-Science Professionals). There are no proposed impacts to the streams, floodplain and wetlands. There are 20 specimen trees located on-site and 8 trees are proposed to be removed. A waiver will be processed with the Preliminary Equivalent Sketch Plan submission.

The property is served by private well and septic. The septic areas shown represent the approved percolation test locations. The well locations are proposed and approved in conjunction with the Percolation Certification Plan. The ESDV practices shown as part of this ECP have been designed and located in accordance with the Health Department guidelines.

The project consists of 16 lots. Allnut Drive will be extended to a cul-de-sac and 5 lots will access this road. The existing driveway will serve 4 new lots and the buildable preservation parcel. A new use-in-common driveway is proposed to serve 6 additional lots.

METHODOLOGY

The site ESDV was computed using the new development criteria for the existing impervious area (to remain) and the new impervious areas. The net project area was based on the limit of disturbance including other lot area which will be disturbed including the septic areas. The soils in the development area are predominantly HSG "A" soil types. The site P_u was computed as 1.58" for the development area (lim it disturbance). The individual ESDV practices were based on the actual drainage areas to the practices and the computed Rv factor for the subarea. The target P_u is 1.58" for most areas however the minimum rainfall treated is 1.0" for areas using grasses. Other areas are able to provide a higher P_u up to a maximum of 2.6". The appendix includes the computations based on the individual subarea and a chart summarizing the ESDV provided.

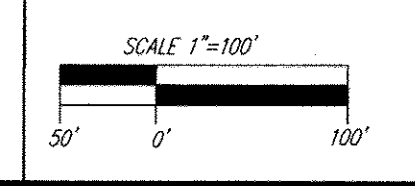
The total ESDV required for the project is 21,389 cf and the total ESDV provided by the individual practices is 21,389 cf.

The houses are managed utilizing dry wells ('A' soils), bio-retention facilities and rooftop disconnect credits. The drywells are limited to maximum of 1,000 sf of rooftop per drywell. The driveways are treated by non-rooftop disconnect credits and bio-retention facilities. The non-rooftop disconnect credit is a result of the ratios established by the C-A-B lengths. The public road is managed by two bio-retention facilities and the use-in-common driveways are managed by non-rooftop disconnect credit, bio-retention, sheet flow to buffer and a drywell. The bio-retention facilities are based on providing storage in the 1.0' above the mitch (75% of ESDV) and Rev in stone below the facility (25% of ESDV).

The 2011 Sediment and Erosion Control Standards will be utilized to protect existing environmental features through the implementation of silt fence and other appropriate practices.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

6-21-17
DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION
6-13-17
DATE
CHIEF, DIVISION OF LAND DEVELOPMENT



COVER SHEET
SCALE: 1"=100'

OWNER
RENE L. GELBER
JEANNE M. GELBER
13550 ALLNUTT LANE
HIGHLAND, MD 20777
(410) 480-0023

DEVELOPER
TRINITY QUALITY HOMES, INC.
3675 PARK AVE., SUITE 301
ELICOTT CITY, MD 21043
(410) 480-0023

ENVIRONMENTAL CONCEPT PLAN

COVER SHEET

THE ESTATES AT RIVER HILL
LOTS 1-15, BUILDABLE PRESERVATION PARCEL 'A', AND NON-BUILDABLE PRESERVATION PARCELS 'B' & 'C'
A RE-SUBDIVISION OF THE "GREENE PROPERTY", LOT 1

PARCEL: 389
TAX MAP: 34 GRID: 23
5TH ELECTION DISTRICT

13550 ALLNUTT LANE
HIGHLAND, MD 20777

ZONED: RR-DEO
L 4772 / F. 265
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET
ELICOTT CITY, MD 21043
TEL: 410.461.7666
FAX: 410.461.8961

PROFESSIONAL CERTIFICATE

DESIGN BY: RHV
DRAWN BY: JMR
CHECKED BY: RHV
DATE: JUNE 2017
SCALE: AS SHOWN
W.O. NO.: 15-39

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. 16193, EXPIRATION DATE: 06-27-2018

1 SHEET OF 12

MATCHLINE - SHEET 3

LOT AREA TABULATION			
LOT	GROSS AREA	PIPESTEM AREA	NET AREA
1	49,575 SF	N/A	49,575 SF
2	52,425 SF	N/A	52,425 SF
3	49,795 SF	N/A	49,795 SF
10	45,036 SF	N/A	45,036 SF
11	44,194 SF	N/A	44,194 SF

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING EDGE OF PAVING
- EXISTING STREAM BUFFER
- EXISTING STREAM
- EXISTING TREETRINE
- PROPOSED TREETRINE
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- EXISTING SPECIMEN TREES
- EXISTING WOOD FENCE
- EXISTING METAL FENCE
- EX. PUBLIC 100-YEAR FLOOD PLAN
- EX. 20' DRAINAGE & UTILITY EASEMENT (PLAT 4622)
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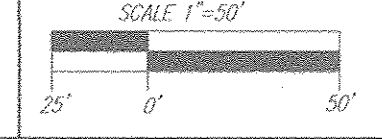
MATCHLINE - SHEET 4

MATCHLINE - SHEET 3
MATCHLINE - SHEET 4

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] CHIEF, DEVELOPMENT ENGINEERING DIVISION
 [Signature] CHIEF, DIVISION OF LAND DEVELOPMENT

6-21-17 DATE
 6-13-17 DATE

LAYOUT PLAN
 SCALE: 1"=50'



SPECIMEN TREE CHART					
NO.	SIZE (DBH)	CRZ (FEET)	COMMON NAME	CONDITION	COMMENTS
ST 1	30"	45'	TULIP POPLAR	GOOD CONDITION	TO BE REMOVED
ST 3	35"	52.5'	BLACK OAK	POOR CROWN AND SHAPE	TO BE REMOVED
ST 5	32"	48'	TULIP POPLAR	TRIPLE STEMMED	TO REMAIN
ST 6	57"	85.5'	RED OAK	GOOD, SPLITS TO THREE STEMS ABOVE BH	TO REMAIN
ST 7	44.5"	68.75'	TULIP POPLAR	FAIR, SOME DIEBACK NOTED	TO REMAIN
ST 8	62.5"	93.75'	TULIP POPLAR	FAIR, CROWN DIEBACK, TWO STEMS ABOVE BH	TO REMAIN
ST 21	44"	66'	RED OAK	POOR, SEVERE DIEBACK	TO BE REMOVED
ST 22	38"	57'	RED OAK	POOR, NOTABLE DIEBACK	TO REMAIN
ST 23	33.5"	50.25'	TULIP POPLAR	POOR, TRUNK ROT	TO BE REMOVED

OWNER
 RENE L. GELBER
 JEANNE M. GELBER
 13550 ALLNUTT LANE
 HIGHLAND, MD 20777
 (410) 480-0023

DEVELOPER
 TRINITY QUALITY HOMES, INC.
 3675 PARK AVE., SUITE 301
 ELLICOTT CITY, MD 21043
 (410) 480-0023

NO. _____ REVISION _____ DATE _____

ENVIRONMENTAL CONCEPT PLAN
 LAYOUT PLAN
 THE ESTATES AT RIVER HILL
 LOTS 1-15, BUILDABLE PRESERVATION PARCEL 'A',
 AND NON-BUILDABLE PRESERVATION PARCELS 'B' & 'C'
 A RE-SUBDIVISION OF THE "GREENE PROPERTY", LOT 1

PARCEL: 389 ZONED: RR-DEO
 TAX MAP: 34, GRID: 23 L. 4772 / F. 285
 5TH ELECTION DISTRICT 13550 ALLNUTT LANE HIGHLAND, MD 20777 HOWARD COUNTY, MARYLAND

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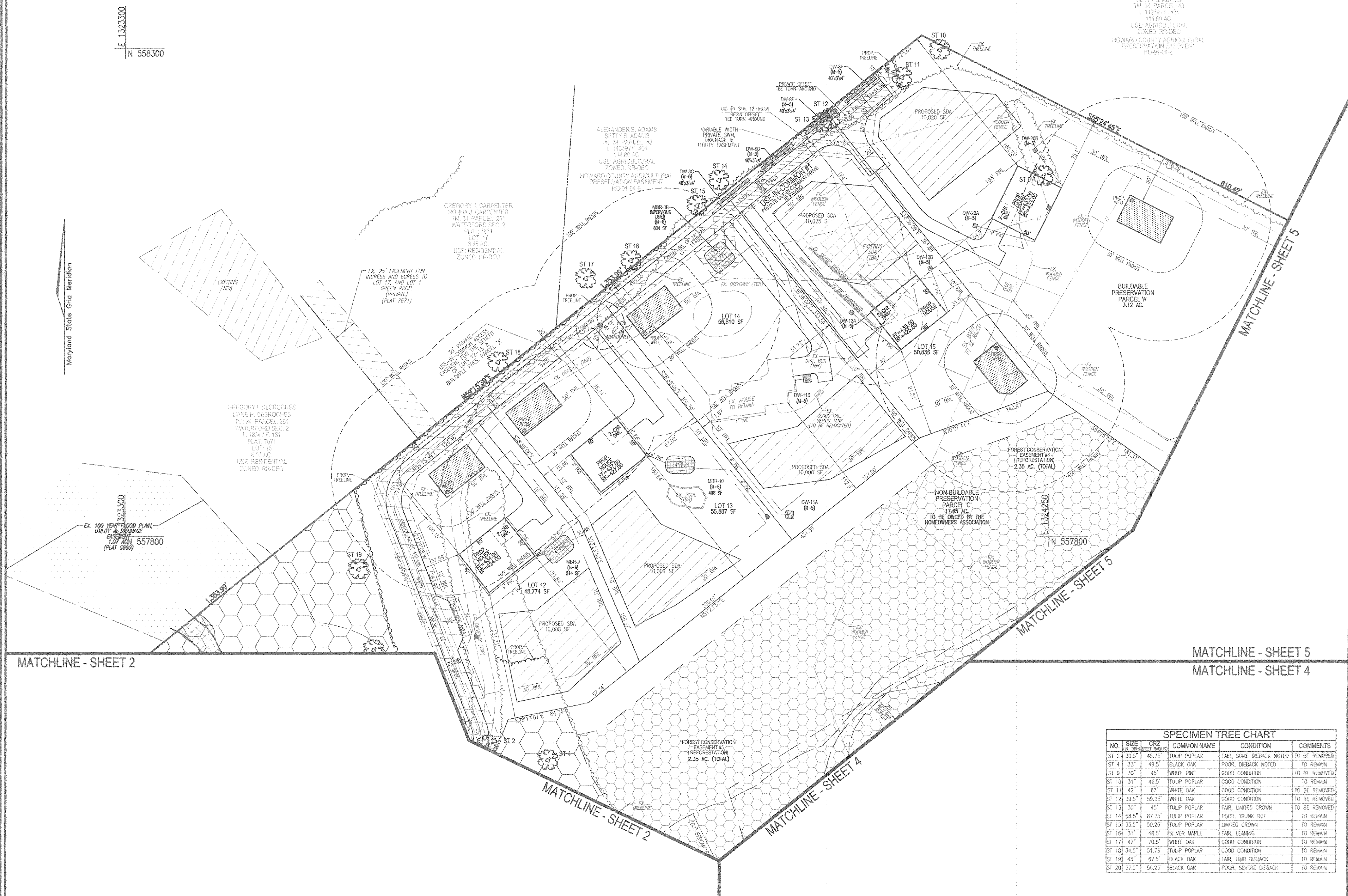
DESIGN BY: RHY
 DRAWN BY: JMR
 CHECKED BY: RHY
 DATE: JUNE, 2017
 SCALE: AS SHOWN
 W.O. NO.: 15-39

2 SHEET OF 12

LOT	GROSS AREA	PIPESTEM AREA	NET AREA
12	48,774 SF	2,055 SF	46,719 SF
13	55,887 SF	4,014 SF	51,873 SF
14	56,810 SF	4,775 SF	52,035 SF
15	50,836 SF	5,576 SF	45,260 SF
B.P.P. 'A'	3.12 AC.	6,219 SF	2.98 AC.

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING EDGE OF PAVING
- EXISTING STREAM BUFFER
- EXISTING STREAM
- EXISTING TREELINE
- PROPOSED TREELINE
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
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- EX. PUBLIC 100-YEAR FLOOD PLAN
- PROP. PRIVATE USE-IN-COMMON ACCESS EASEMENT
- PROP. VARIABLE WIDTH PRIVATE SWM, DRAINAGE & UTILITY EASEMENT
- EX. 25' EASEMENT FOR INGRESS AND EGRESS TO LOT 11, AND LOT 1 GREEN PROP. (PRIVATE) (PLAT 7671)



E 1323300
N 558300

ALEXANDER E. ADAMS
BETTY S. ADAMS
TM: 34 PARCEL: 43
L: 14389 / F: 464
114.60 AC.
USE: AGRICULTURAL
ZONED: RR-DEO
HOWARD COUNTY AGRICULTURAL
PRESERVATION EASEMENT
HO-91-04-E

GREGORY I. CARPENTER
RONDA L. CARPENTER
TM: 34 PARCEL: 261
WATERFORD SEC. 2
PLAT: 7671
LOT: 17
3.85 AC.
USE: RESIDENTIAL
ZONED: RR-DEO

GREGORY I. DESROCHES
LAMB H. DESROCHES
TM: 34 PARCEL: 261
WATERFORD SEC. 2
L: 1634 / F: 181
PLAT: 7671
LOT: 16
6.97 AC.
USE: RESIDENTIAL
ZONED: RR-DEO

FOREST CONSERVATION
EASEMENT #5
(REPRESENTATION)
2.35 AC. (TOTAL)

NON-BUILDABLE
PRESERVATION
PARCEL 'C'
17.65 AC.
TO BE OWNED BY THE
HOMEOWNERS ASSOCIATION

SPECIMEN TREE CHART

NO.	SIZE (IN. DBH)	CRZ (FEET RADIUS)	COMMON NAME	CONDITION	COMMENTS
ST 2	30.5"	45.75'	TULIP POPLAR	FAIR, SOME DIEBACK NOTED	TO BE REMOVED
ST 4	35"	49.5'	BLACK OAK	POOR, DIEBACK NOTED	TO REMAIN
ST 9	30"	45'	WHITE PINE	GOOD CONDITION	TO BE REMOVED
ST 10	31"	46.5'	TULIP POPLAR	GOOD CONDITION	TO REMAIN
ST 11	42"	63'	WHITE OAK	GOOD CONDITION	TO BE REMOVED
ST 12	39.5"	59.25'	WHITE OAK	GOOD CONDITION	TO BE REMOVED
ST 13	30"	45'	TULIP POPLAR	FAIR, LIMITED CROWN	TO BE REMOVED
ST 14	38.5"	57.75'	TULIP POPLAR	POOR, TRUNK ROT	TO REMAIN
ST 15	33.5"	50.25'	TULIP POPLAR	LIMITED CROWN	TO REMAIN
ST 16	31"	46.5'	SILVER MAPLE	FAIR, LEANING	TO REMAIN
ST 17	47"	70.5'	WHITE OAK	GOOD CONDITION	TO REMAIN
ST 18	34.5"	51.75'	TULIP POPLAR	GOOD CONDITION	TO REMAIN
ST 19	45"	67.5'	BLACK OAK	FAIR, LIMB DIEBACK	TO REMAIN
ST 20	37.5"	56.25'	BLACK OAK	POOR, SEVERE DIEBACK	TO REMAIN

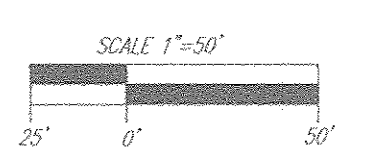
MATCHLINE - SHEET 2

MATCHLINE - SHEET 5
MATCHLINE - SHEET 4

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

 CHIEF, DEVELOPMENT ENGINEERING DIVISION

 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 6.21.17
 DATE: 6.13.17



LAYOUT PLAN
SCALE: 1"=50'

OWNER
RENE L. GELBER
JEANNE M. GELBER
13550 ALLNUTT LANE
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(410) 480-0023

DEVELOPER
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NO.	REVISION	DATE

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PARCEL: 389
TAX MAP: 34 GRID: 23
5TH ELECTRON DISTRICT

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ZONED: RR-DEO
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HOWARD COUNTY, MARYLAND

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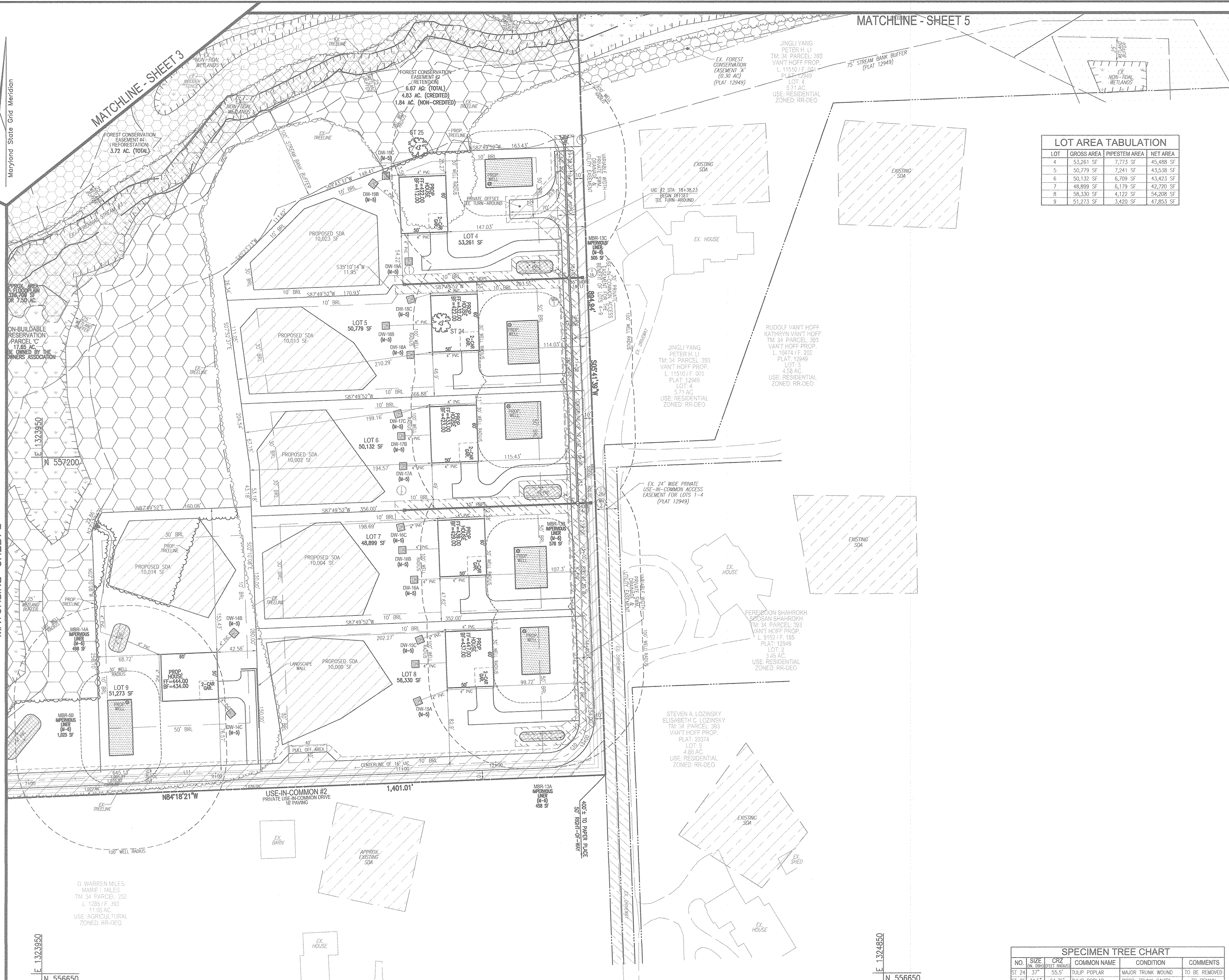
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3 SHEET OF 12

MATCHLINE - SHEET 5

MATCHLINE - SHEET 3

MATCHLINE - SHEET 2



LOT AREA TABULATION

LOT	GROSS AREA	PIPESTEM AREA	NET AREA
4	53,261 SF	7,773 SF	45,488 SF
5	50,779 SF	7,241 SF	43,538 SF
6	50,132 SF	6,709 SF	43,423 SF
7	48,899 SF	6,179 SF	42,720 SF
8	58,330 SF	4,122 SF	54,208 SF
9	51,273 SF	3,420 SF	47,853 SF

LEGEND:

- PROPERTY LINE
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- ADJACENT PROPERTY LINE
- EXISTING EDGE OF PAVING
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- EX. FOREST CONSERVATION EASEMENT 'A' (PLAT 12949)

SPECIMEN TREE CHART

NO.	SIZE (in. DBH/FEET HEIGHT)	CRZ	COMMON NAME	CONDITION	COMMENTS
ST 24	37"	55.5'	TULIP POPLAR	MAJOR TRUNK WOUND	TO BE REMOVED
ST 25	34.5"	51.75'	TULIP POPLAR	POOR, TRUNK CAVITY	TO REMAIN

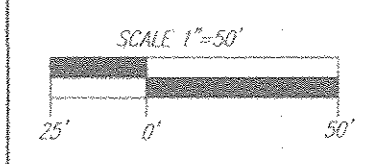
OWNER
RENE L. GELBER
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DEVELOPER
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ELLCOTT CITY, MD 21043
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APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

John Chen 6-21-17
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Robert L. Gelber 6-13-17
CHIEF, DIVISION OF LAND DEVELOPMENT DATE



LAYOUT PLAN
SCALE: 1"=50'

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
LAYOUT PLAN
THE ESTATES AT RIVER HILL
LOTS 1-15, BUILDABLE PRESERVATION PARCEL 'A',
AND NON-BUILDABLE PRESERVATION PARCELS 'B' & 'C'
A RE-SUBDIVISION OF THE "GREENE PROPERTY", LOT 1

PARCEL: 389 ZONED: RR-DEO
TAX MAP: 34 GRID: 23 L. 4772 / F. 265
5TH ELECTION DISTRICT HIGHLAND, MD 20777 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET TEL: 410.461.7666
ELLCOTT CITY, MD 21043 FAX: 410.461.8961

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193 EXPIRATION DATE: 09-27-2018

DESIGN BY: RHV
DRAWN BY: JMR
CHECKED BY: RHV
DATE: JUNE 2017
SCALE: AS SHOWN
W.O. NO.: 15-39

4 SHEET OF 12

- LEGEND:**
- PROPERTY LINE
 - RIGHT-OF-WAY LINE
 - ADJACENT PROPERTY LINE
 - EXISTING EDGE OF PAVING
 - EXISTING STREAM BUFFER
 - EXISTING STREAM
 - EXISTING TREELINE
 - PROPOSED TREELINE
 - EXISTING WETLANDS
 - EXISTING WETLAND BUFFER
 - EXISTING SPECIMEN TREES
 - EXISTING WOOD FENCE
 - EXISTING METAL FENCE
 - EX. PUBLIC 100-YEAR FLOOD PLAN
 - EX. FOREST CONSERVATION EASEMENT 'A' (PLAT 12949)



ALEXANDER E. ADAMS
 BETTY S. ADAMS
 TRM 34 PARCEL 43
 L. 14399 / F. 464
 114.89 AC.
 USE: AGRICULTURAL
 ZONED: RR-DEO
 HOWARD COUNTY AGRICULTURAL
 PRESERVATION EASEMENT
 HO-91-04-E

GREG PANG
 WON HEE PANG
 TRM 34 PARCEL 44A
 WILLOW POND
 L. 13808 / F. 453
 PLOT 21074
 LOT PARK A
 10.45 AC.
 USE: RESIDENTIAL
 ZONED: RR-DEO

MATCHLINE - SHEET 4

LAYOUT PLAN
 SCALE: 1"=50'

E 1324600
 N 557600



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Clark 6.21.17
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Walter Lewis 6.13.17
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

OWNER
 RENE L. GELBER
 JEANNE M. GELBER
 13550 ALLNUTT LANE
 HIGHLAND, MD 21043
 (410) 480-0023

DEVELOPER
 TRINITY QUALITY HOMES, INC.
 3675 PARK AVE., SUITE 301
 ELLICOTT CITY, MD 21043
 (410) 480-0023

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
LAYOUT PLAN
THE ESTATES AT RIVER HILL
 LOTS 1-15, BUILDABLE PRESERVATION PARCEL 'A',
 AND NON-BUILDABLE PRESERVATION PARCELS 'B' & 'C'
 A RE-SUBDIVISION OF THE "GREENE PROPERTY", LOT 1

PARCEL: 389 ZONED: RR-DEO
 TAX MAP: 34 GRID: 23 L. 4772 / F. 285
 5TH ELECTION DISTRICT HIGHLAND, MD 20777 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL
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PROFESSIONAL CERTIFICATE

STATE OF MARYLAND
 ROBERT H. VOGEL
 REGISTERED PROFESSIONAL ENGINEER

DESIGN BY: RHY
 DRAWN BY: JMR
 CHECKED BY: RHY
 DATE: JUNE 2017
 SCALE: AS SHOWN
 W.O. NO.: 15-39

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5 SHEET OF 12

MATCHLINE - SHEET 7

MATCHLINE - SHEET 7

MATCHLINE - SHEET 7
MATCHLINE - SHEET 8

LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING EDGE OF PAVING
- EXISTING STREAM BUFFER
- EXISTING STREAM
- EXISTING TREELINE
- PROPOSED TREELINE
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- EXISTING SPECIMEN TREES
- EXISTING WOOD FENCE
- EXISTING METAL FENCE
- EX. PUBLIC 100-YEAR FLOOD PLAIN
- EX. 20' DRAINAGE & UTILITY EASEMENT (PLAT 4622)
- PROP. PRIVATE USE-IN-COMMON ACCESS EASEMENT
- PROP. PUBLIC SWM, DRAINAGE & UTILITY EASEMENT
- EXISTING 1' CONTOUR
- EXISTING 2' CONTOUR
- SOILS
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- EXISTING STEEP SLOPES (20% SLOPES OR GREATER)
- EXISTING MODERATE SLOPES (15% TO 19.9% SLOPES)
- LOD
- LIMIT OF DISTURBANCE
- SCE
- STABILIZED CONSTRUCTION ENTRANCE
- SUPER SILT FENCE
- SILT FENCE
- OVERAGE FENCE

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
B/A	BALL SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.37	YES
Co	COODORUS AND HATBORO SILT LOAMS, 0 TO 3 PERCENT SLOPES	C	.32	NO
G/b	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	A	.28	NO
G/c	GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	A	.28	NO
G/bB	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C	.43	YES
Hb	HATBORO-COODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.37	YES

SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE
 -HOWARD COUNTY SOILS MAP NUMBER 16 - CLARKSVILLE NN

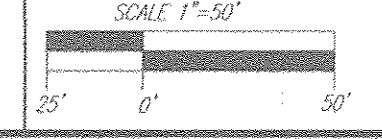
NOTE:
 HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 6-21-17
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 6-13-17
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE



GRADING PLAN
 SCALE: 1"=50'

OWNER
 RENE L. GELBER
 JEANNE M. GELBER
 13550 ALLNUTT LANE
 HIGHLAND, MD 20777
 (410) 480-0023

DEVELOPER
 TRINITY QUALITY HOMES, INC.
 3875 PARK AVE., SUITE 301
 ELLICOTT CITY, MD 21043
 (410) 480-0023

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
 SOILS MAP, GRADING, EROSION, AND
 SEDIMENT CONTROL PLAN
 THE ESTATES AT RIVER HILL
 LOTS 1-15, BUILDABLE PRESERVATION PARCEL 'A',
 AND NON-BUILDABLE PRESERVATION PARCELS 'B' & 'C'
 A RE-SUBDIVISION OF THE 'GREENE PROPERTY', LOT 1

PARCEL: 388 ZONED: RR-DEO
 TAX MAP: 34 GRID: 23 13550 ALLNUTT LANE L 4772 / F. 285
 5TH ELECTION DISTRICT HIGHLAND, MD 20777 HOWARD COUNTY, MARYLAND

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 ENGINEERS • SURVEYORS • PLANNERS
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 ELLICOTT CITY, MD 21043 FAX: 410.461.8961

PROFESSIONAL CERTIFICATE

STATE OF MARYLAND
 ROBERT H. VOGEL
 161810
 REGISTERED ENGINEER

DESIGN BY: RHY
 DRAWN BY: JMR
 CHECKED BY: RHY
 DATE: JUNE 2017
 SCALE: AS SHOWN
 W.O. NO.: 15-39

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. 161810, EXPIRATION DATE: 06-27-2018

6 SHEET OF 12

SOILS LEGEND			
SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR / ERODIBLE
BaA	BALE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.37 YES
Co	CODORUS AND HATBORO SILT LOAMS, 0 TO 3 PERCENT SLOPES	C	.32 NO
GbB	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	A	.28 NO
GbC	GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	A	.28 NO
GmB	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C	.43 YES
Ho	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.37 YES

SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE
 HOWARD COUNTY SOILS MAP NUMBER 16 - CLARKSVILLE, MD
 NOTE:
 HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT
 OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH
 A SLOPE GREATER THAN 5 PERCENT

LEGEND:	
	PROPERTY LINE
	RIGHT-OF-WAY LINE
	ADJACENT PROPERTY LINE
	EXISTING EDGE OF PAVING
	EXISTING STREAM BUFFER
	EXISTING STREAM
	EXISTING TREELINE
	PROPOSED TREELINE
	EXISTING WETLANDS
	EXISTING WETLAND BUFFER
	EXISTING WOODED TREES
	EXISTING SPECIES FENCE
	EXISTING METAL FENCE
	EX. PUBLIC 100-YEAR FLOOD PLAIN
	PROP. PRIVATE USE-IN-COMMON ACCESS EASEMENT
	PROP. VARIABLE WIDTH PRIVATE SWM, DRAINAGE & UTILITY EASEMENT
	EX. 25' EASEMENT FOR INGRESS AND EGRESS TO LOT 17 AND LOT 1 GREEN PROP. (PRIVATE) (PLAN 7671)
	EXISTING 10' CONTOUR
	EXISTING 2' CONTOUR
	SOILS
	PROPOSED 10' CONTOUR
	PROPOSED 2' CONTOUR
	EXISTING STEEP SLOPES (20% SLOPES OR GREATER)
	EXISTING MODERATE SLOPES (15% TO 19.99% SLOPES)
	LIMIT OF DISTURBANCE
	STABILIZED CONSTRUCTION ENTRANCE
	SUPER SILT FENCE
	SILT FENCE
	DIVERSION FENCE



MATCHLINE - SHEET 6

MATCHLINE - SHEET 9
 MATCHLINE - SHEET 8

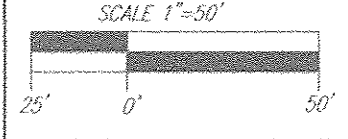
MATCHLINE - SHEET 6
 MATCHLINE - SHEET 8

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

 CHIEF, DEVELOPMENT ENGINEERING DIVISION

 CHIEF, DIVISION OF LAND DEVELOPMENT

6.21.17
 DATE
 6.13.17
 DATE



GRADING PLAN
 SCALE: 1"=50'

OWNER
 RENE L. GELBER
 JEANNE M. GELBER
 13550 ALLNUTT LANE
 HIGHLAND, MD 21043
 (410) 480-0023

DEVELOPER
 TRINITY QUALITY HOMES, INC.
 3675 PARK AVE., SUITE 301
 ELLICOTT CITY, MD 21043
 (410) 480-0023

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
 SOILS MAP, GRADING, EROSION, AND
 SEDIMENT CONTROL PLAN
THE ESTATES AT RIVER HILL
 LOTS 1-15, BUILDABLE PRESERVATION PARCEL 'A',
 AND NON-BUILDABLE PRESERVATION PARCELS 'B' & 'C'
 A RE-SUBDIVISION OF THE "GREENE PROPERTY", LOT 1

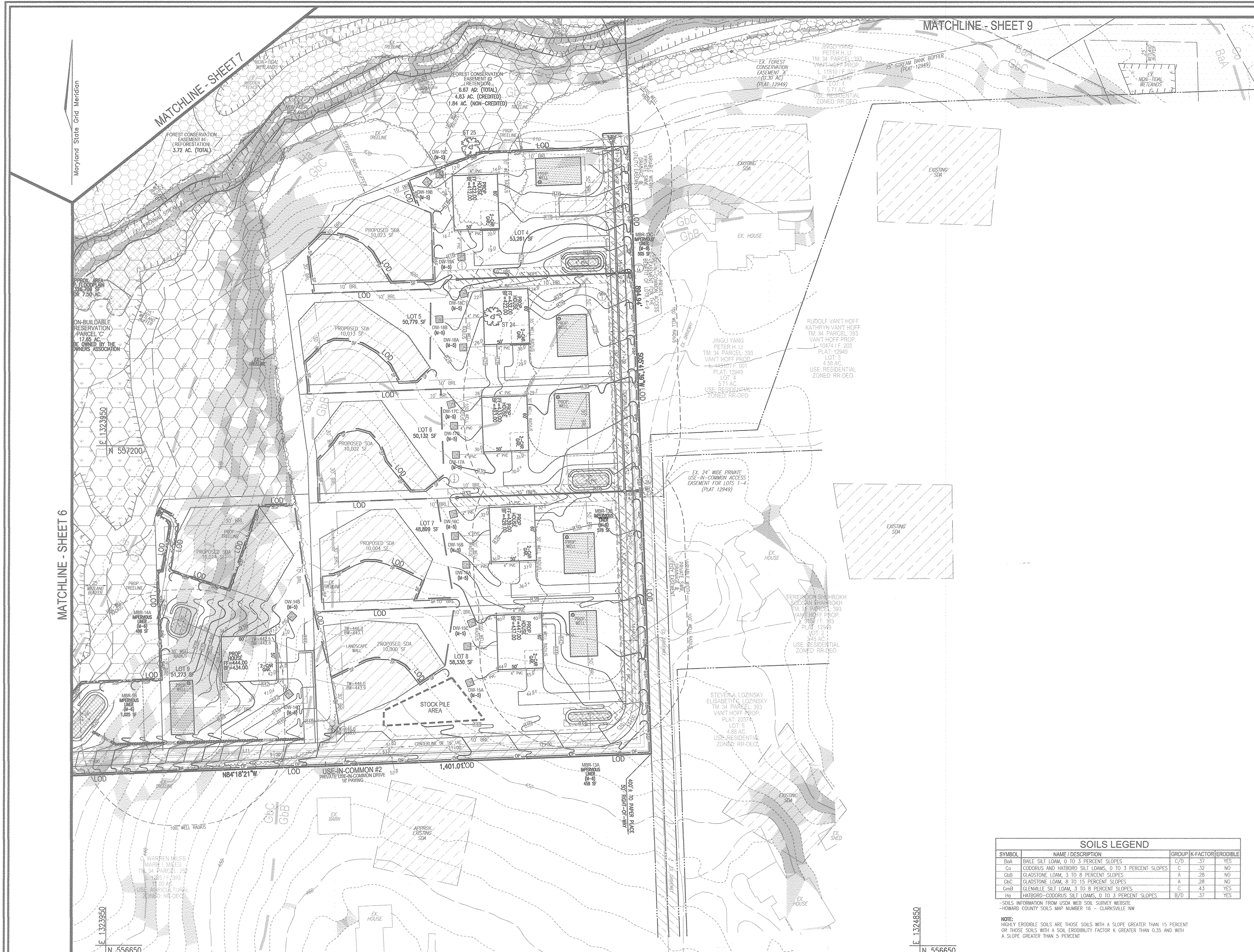
PARCEL: 389 ZONED: RR-DEO
 TAX MAP: 34 GRD: 23 L. 4772 / F. 285
 5TH ELECTION DISTRICT HIGHLAND, MD 20777 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL
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 OF MARYLAND, LICENSE NO. 16193
 EXPIRATION DATE 09-27-2018

DESIGN BY: RHV
 DRAWN BY: JMR
 CHECKED BY: RHV
 DATE: JUNE 2017
 SCALE: AS SHOWN
 W.O. NO.: 15-39

7 SHEET OF 12



- LEGEND:**
- PROPERTY LINE
 - RIGHT-OF-WAY LINE
 - ADJACENT PROPERTY LINE
 - EXISTING EDGE OF PAVING
 - EXISTING STREAM BUFFER
 - EXISTING STREAM
 - EXISTING TREETRINE
 - PROPOSED TREETRINE
 - EXISTING WETLANDS
 - EXISTING WETLAND BUFFER
 - EXISTING SPECIMEN TREES
 - EXISTING WOOD FENCE
 - EXISTING METAL FENCE
 - EX. PUBLIC 100-YEAR FLOOD PLAN
 - PROP. PRIVATE USE-IN-COMMON ACCESS EASEMENT
 - PROP. VARIABLE WIDTH PRIVATE SWM, DRAINAGE & UTILITY EASEMENT
 - EX. 24' WIDE PRIVATE USE-IN-COMMON ACCESS EASEMENT FOR LOTS 1-4 (PLAT 12949)
 - EX. FOREST CONSERVATION EASEMENT #2 (PLAT 12949)
 - 3.30 EXISTING 10' CONTOUR
 - 3.25 EXISTING 2' CONTOUR
 - 3.20 SOILS
 - 3.15 PROPOSED 10' CONTOUR
 - 3.10 PROPOSED 2' CONTOUR
 - EXISTING STEEP SLOPES (20% SLOPES OR GREATER)
 - EXISTING MODERATE SLOPES (15% TO 19.99% SLOPES)
 - LOD LIMIT OF DISTURBANCE
 - SCE STABILIZED CONSTRUCTION ENTRANCE
 - SBF SUPER SILT FENCE
 - SF SILT FENCE
 - OF DIVERSION FENCE

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BaA	BALE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.37	YES
Co	CODORUS AND HATBORO SILT LOAMS, 0 TO 3 PERCENT SLOPES	C	.32	NO
ClB	GLASTONING LOAM, 3 TO 6 PERCENT SLOPES	A	.28	NO
CnC	GLASTONING LOAM, 8 TO 15 PERCENT SLOPES	A	.28	NO
GmB	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C	.43	YES
Hs	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.37	YES

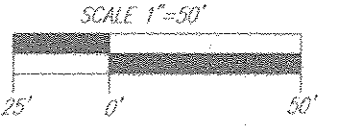
SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE
 -HOWARD COUNTY SOILS MAP NUMBER 16 - CLARKSVILLE NW

NOTE:
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APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 6-21-17
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 6-13-17
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE



GRADING PLAN
 SCALE: 1"=50'

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
SOILS MAP, GRADING, EROSION, AND
SEDIMENT CONTROL PLAN
THE ESTATES AT RIVER HILL
 LOTS 1-15, BUILDABLE PRESERVATION PARCEL 'A',
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 A RE-SUBDIVISION OF THE 'GREENE PROPERTY', LOT 1

PARCEL: 389 ZONED: RR-DEO
 TAX MAP: 34 GRID: 23 13550 ALLNUTT LANE L. 4772 / F. 285
 5TH ELECTION DISTRICT HIGHLAND, MD 20777 HOWARD COUNTY, MARYLAND

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 DATE: JUNE 2017
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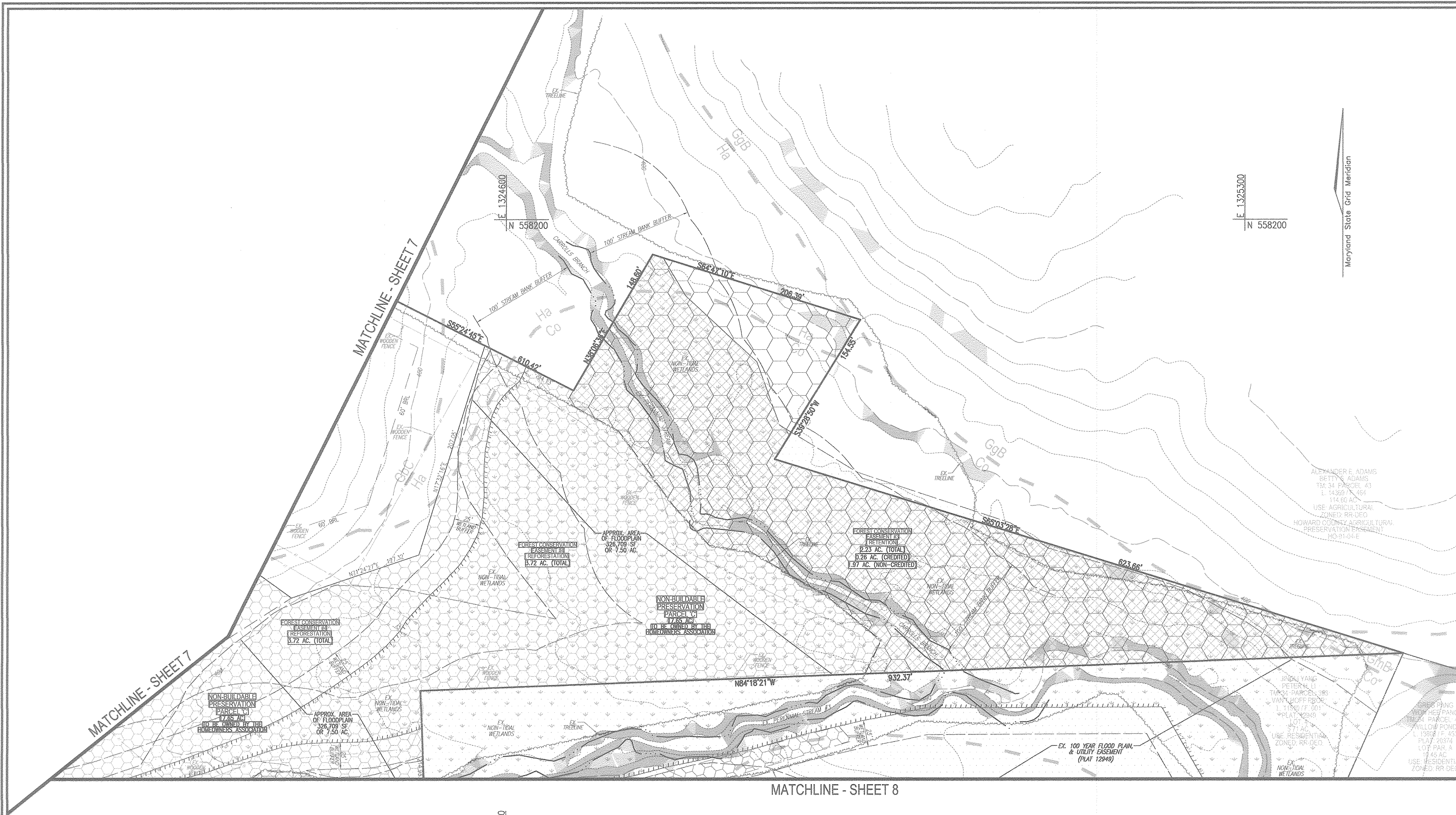
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 18183 EXPIRATION DATE: 09-27-2018

ROBERT H. VOGEL, PE No. 16193

8 SHEET OF 12

OWNER
 RENE L. GELBER
 JEANNE M. GELBER
 13550 ALLNUTT LANE
 HIGHLAND, MD 20777
 (410) 480-0023

DEVELOPER
 TRINITY QUALITY HOMES, INC.
 3875 PARK AVE., SUITE 301
 ELLICOTT CITY, MD 21043
 (410) 480-0023



LEGEND:

[Symbol]	PROPERTY LINE
[Symbol]	RIGHT-OF-WAY LINE
[Symbol]	ADJACENT PROPERTY LINE
[Symbol]	EXISTING EDGE OF PAVING
[Symbol]	EXISTING STREAM BUFFER
[Symbol]	EXISTING STREAM
[Symbol]	EXISTING TREELINE
[Symbol]	PROPOSED TREELINE
[Symbol]	EXISTING WETLANDS
[Symbol]	EXISTING WETLAND BUFFER
[Symbol]	EXISTING SPECIMEN TREES
[Symbol]	EXISTING WOOD FENCE
[Symbol]	EXISTING METAL FENCE
[Symbol]	EX. PUBLIC 100-YEAR FLOOD PLAN
[Symbol]	EX. FOREST CONSERVATION EASEMENT 'A' (PLAT 12949)
[Symbol]	EXISTING 1' CONTOUR
[Symbol]	EXISTING 2' CONTOUR
[Symbol]	SOILS
[Symbol]	EXISTING STEEP SLOPES (20% SLOPES OR GREATER)
[Symbol]	EXISTING MODERATE SLOPES (15% TO 19.99% SLOPES)

MATCHLINE - SHEET 7

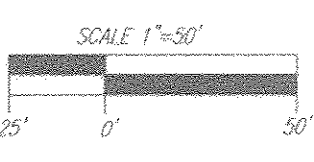
MATCHLINE - SHEET 8

GRADING PLAN
SCALE: 1"=50'

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BaA	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.37	YES
Ca	CODORUS AND HARBORO SILT LOAMS, 0 TO 3 PERCENT SLOPES	C	.32	NO
GaB	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	A	.28	NO
GaC	GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	A	.28	NO
GmB	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C	.43	YES
Hg	HARBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.37	YES

NOTE:
HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

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[Signature] 6-13-17
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(410) 480-0023

NO.	REVISION	DATE

ENVIRONMENTAL CONCEPT PLAN
SOILS MAP, GRADING, EROSION, AND
SEDIMENT CONTROL PLAN

THE ESTATES AT RIVER HILL
LOTS 1-15, BUILDABLE PRESERVATION PARCEL 'A',
AND NON-BUILDABLE PRESERVATION PARCELS 'B' & 'C'
A RE-SUBDIVISION OF THE "GREENE PROPERTY", LOT 1

PARCEL: 389 ZONED: RR-DEO
TAX MAP: 34 GRID: 23 L. 4172 / F. 285
5TH ELECTION DISTRICT 13550 ALLNUTT LANE HIGHLAND, MD 20777 HOWARD COUNTY, MARYLAND

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DRAWN BY: JMR
CHECKED BY: RHY
DATE: JUNE 2017
SCALE: AS SHOWN
W.O. NO.: 15-39

9 SHEET OF 12

MATCHLINE - SHEET 11

SOILS LEGEND				
SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BaA	BALL SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	.37	YES
Co	CODORUS AND HARBOR SILT LOAMS, 0 TO 3 PERCENT SLOPES	C	.32	NO
GmB	GLAUSTONE LOAM, 3 TO 8 PERCENT SLOPES	A	.28	NO
GcC	GLAUSTONE LOAM, 8 TO 15 PERCENT SLOPES	A	.28	NO
GmB	GLENNVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C	.43	YES
Ha	HARBOR-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	.37	YES

NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT.

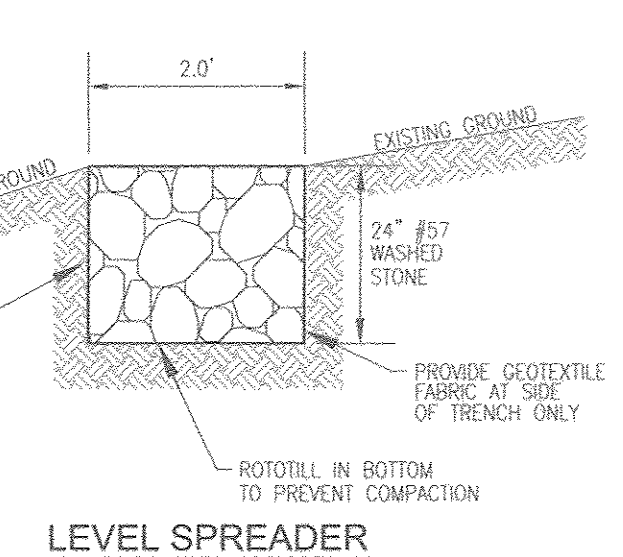
LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
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- EXISTING EDGE OF PAVING
- EXISTING STREAM BUFFER
- EXISTING STREAM
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- EXISTING WETLAND BUFFER
- EXISTING SPECIMEN TREES
- EXISTING WOOD FENCE
- EXISTING METAL FENCE
- EX. PUBLIC 100-YEAR FLOOD PLAN
- EX. 20' DRAINAGE & UTILITY EASEMENT (PLAT 4622)
- PROP. PRIVATE USE-IN-COMMON EASEMENT
- PROP. PUBLIC SWM, DRAINAGE & UTILITY EASEMENT
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- SOILS
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- EXISTING STEEP SLOPES (20% SLOPES OR GREATER)
- EXISTING MODERATE SLOPES (15% TO 19.99% SLOPES)
- DRAINAGE AREA DIVIDE
- PROPOSED MICRO-BIORETENTION FACILITY (M-6)
- PROPOSED DRY WELL (M-5)
- AREA OF DRAINAGE TO SHEETFLOW TO LEVEL SPREADER AND CONSERVATION (N-3)
- AREA OF DRAINAGE TO GO TO DRY WELL (M-5)
- AREA OF DRAINAGE TO GO TO MICRO-BIORETENTION FACILITY (M-6)
- AREA OF DRIVEWAY DRAINAGE TO GO TO NON-ROOFTOP DISCONNECT (N-2)
- AREA OF ROOFTOP DRAINAGE TO GO TO ROOFTOP DISCONNECT (N-1)
- ROOFTOP DISCONNECT (N-1)

APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS

- 1. MATERIAL SPECIFICATIONS**
THE ALLOWED MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.
- 2. FILTERING MEDIA OR PLANTING SOIL**
THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVIDE A HINDERANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 16.03.01.05.
THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:
• SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION).
• ORGANIC CONTENT - MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH A MIXTURE OF LOAMY SAND (60%-65%) AND COMPOST (40% TO 45%) OR SANDY LOAM LOAM, COMPOST (20%), AND COMPOST (20%).
• CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
• PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE OR DECREASE PH.
THIS SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL, IF TOPSOIL IS IMPORTED. THESE ANALYSES SHOULD BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.
- 3. COMPACTION**
IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TIRE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO LEAKAGE FAILURE.
COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLAGE OPERATION SUCH AS CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLAGE OPERATIONS ARE TO RESTRUCTURE THE SOIL PROFILE THROUGHOUT THE 12" COMPACTOR ZONE. SUBSTITUTE METHODS HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.
- 4. PLANT MATERIAL**
RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION A2.3.
- 5. PLANT INSTALLATION**
COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3" SHREDDED OR CHIPPED HARDWOOD MULCH IS THE ONLY ACCEPTABLE MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.
ROOTSTOCK OF THE PLANT MATERIAL SHALL BE KEPT moist during transport and on-site storage. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION. TREES SHALL BE BRANDED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.
GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLOUS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.
THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL AREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.
- 6. UNDERDRAINS**
UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:
• PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM 750, TYPE PS 28, OR A5870-M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OF HOLES).
• PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE BRANDED WITH A 1/2" (NO. 4) OR 1/4" (NO. 10) GALVANIZED UNPOURED CLOTH.
• GRAVEL - THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAN.
• THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.
• A RIGID NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER.
• A 4" LAYER OF FINE GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAN TO PREVENT MIGRATION OF FINES IN TO THE UNDERDRAN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".
THIS MAIN COLLECTOR PIPE FOR UNDERDRAN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).
- 7. MISCELLANEOUS**
THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE HAS BEEN STABILIZED.

LOT #	FACILITY	A	B	C	D	E	F	G	UNDERDRAN INV. OUT	OUTFALL INV.	FACILITY SIZE
NBRP-B	MBR-1A	426.00	425.00	424.75	422.75	422.42	420.72	421.75	421.75	421.00	885 SF
	MBR-1B	421.00	420.00	419.75	417.75	417.42	415.72	416.75	416.75	416.00	1,165 SF
LOT 1	MBR-2A	450.00	449.00	448.75	446.75	446.42	444.72	445.75	445.75	437.00	355 SF
	MBR-2B	432.00	431.00	430.75	428.75	428.42	426.72	427.75	427.00	420.00	304 SF
LOT 2	MBR-3	426.00	425.00	424.75	422.75	422.42	420.72	421.75	421.75	421.00	294 SF
	MBR-4	420.00	419.00	418.75	416.75	416.42	414.72	415.75	415.00	415.00	579 SF
LOT 11	MBR-4A	433.00	432.00	431.75	429.75	429.42	427.72	428.75	428.00	423.00	1168 SF
	MBR-4B	442.00	441.00	440.75	438.75	438.42	436.72	437.75	437.00	432.50	135 SF
NBRP-B	MBR-5A	418.00	417.00	416.75	414.75	414.42	412.72	413.75	413.00	410.00	1,028 SF
	MBR-5B										



LEVEL SPREADER NOT TO SCALE

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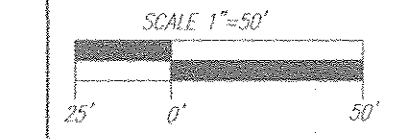


SWM DRAINAGE AREA MAP
SCALE: 1"=50'

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 6-21-17

 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 6-13-17



NO. _____ REVISION _____ DATE _____

**ENVIRONMENTAL CONCEPT PLAN
STORMWATER MANAGEMENT DRAINAGE
AREA MAP, NOTES, AND DETAILS**

THE ESTATES AT RIVER HILL
LOTS 1-15, BUILDABLE PRESERVATION PARCEL 'A',
AND NON-BUILDABLE PRESERVATION PARCELS 'B' & 'C'
A RE-SUBDIVISION OF THE "GREENE PROPERTY", LOT 1
13550 ALLNUTT LANE
HIGHLAND, MD 20777

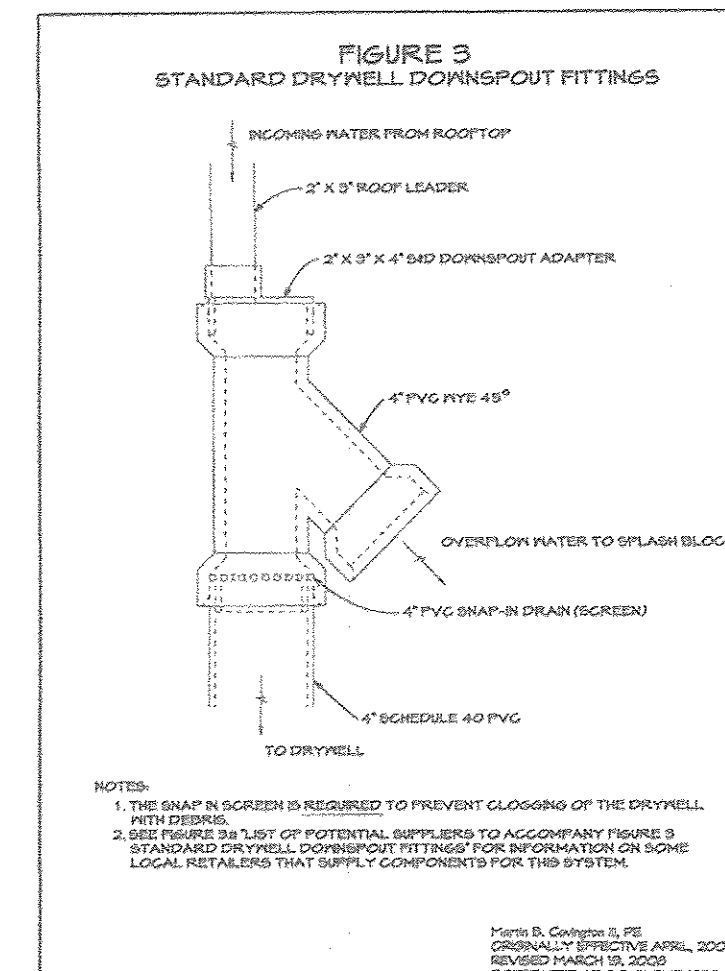
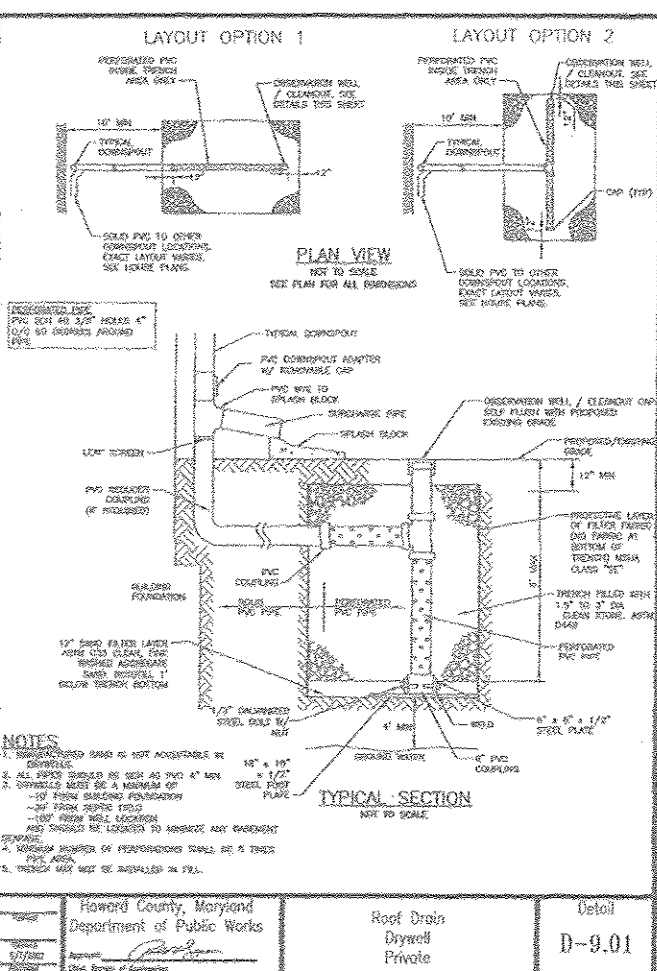
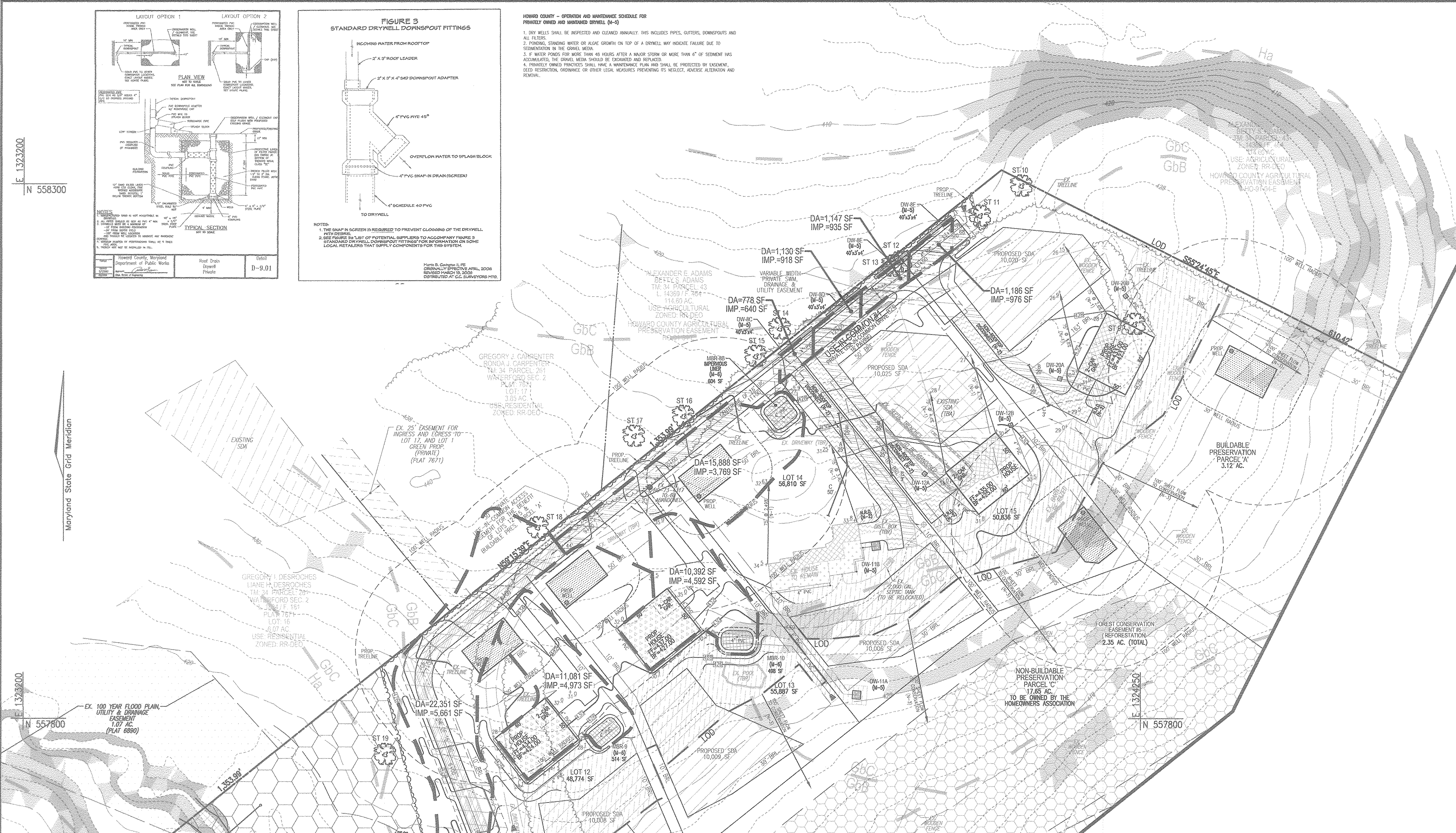
PARCEL: 389 TAX MAP: 34 GRD: 23 ZONED: RR-DE
5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET ELLICOTT CITY, MD 21043 TEL: 410.461.7666 FAX: 410.461.8961

PROFESSIONAL CERTIFICATE
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16183 EXPIRATION DATE: 08-27-2018

DESIGN BY: RHY
DRAWN BY: JMR
CHECKED BY: RHY
DATE: JUNE 2017
SCALE: AS SHOWN
W.O. NO.: 15-39

10 SHEET OF 12



HOWARD COUNTY - OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DRYWELL (M-5)

1. DRY WELLS SHALL BE INSPECTED AND CLEANED ANNUALLY THIS INCLUDES PIPES, GUTTERS, DOWNPOUTS AND ALL FILTERS.
2. FURNISH STANDING WATER OR ALGAE GROWTH ON TOP OF A DRYWELL MAY INDICATE FAILURE DUE TO SEDIMENTATION IN THE GRAVEL MEDIA.
3. IF WATER Pools FOR MORE THAN 48 HOURS AFTER A MAJOR STORM OR MORE THAN 4" OF STORMWATER HAS ACCUMULATED, THE GRAVEL MEDIA SHOULD BE EXAMINED AND REPLACED.
4. PRIVATELY OWNED PRACTICES SHALL HAVE A MAINTENANCE PLAN AND SHALL BE PROTECTED BY LANDSCAPE, VEGETATION, DISTANCE, OR OTHER LEGAL MEASURES PREVENTING ITS WELLS, ADJACENT AREAS AND REMOVAL.

LEGEND:

[Symbol]	PROPERTY LINE
[Symbol]	RIGHT-OF-WAY LINE
[Symbol]	ADJACENT PROPERTY LINE
[Symbol]	EXISTING EDGE OF PAVING
[Symbol]	EXISTING STREAM BUFFER
[Symbol]	EXISTING STREAM
[Symbol]	EXISTING TREELINE
[Symbol]	PROPOSED TREELINE
[Symbol]	EXISTING WETLANDS
[Symbol]	EXISTING WETLAND BUFFER
[Symbol]	EXISTING SPECIMEN TREES
[Symbol]	EXISTING WOOD FENCE
[Symbol]	EXISTING METAL FENCE
[Symbol]	EX. PUBLIC 100-YEAR FLOOD PLAN
[Symbol]	PROP. PRIVATE USE-IN-COMMON ACCESS ASSESSMENT
[Symbol]	PROP. VARIABLE WIDTH PRIVATE SWM, DRAINAGE & UTILITY EASEMENT
[Symbol]	EX. 25' EASEMENT FOR INGRESS AND EGRESS TO LOT 17 AND LOT 1 GREEN PROP. (PRIVATE) (PLAT 7671)
[Symbol]	EXISTING 10' CONTOUR
[Symbol]	EXISTING 2' CONTOUR
[Symbol]	SOILS
[Symbol]	PROPOSED 10' CONTOUR
[Symbol]	PROPOSED 2' CONTOUR
[Symbol]	EXISTING STEEP SLOPES (20% SLOPES OR GREATER)
[Symbol]	EXISTING MODERATE SLOPES (15% TO 19.9% SLOPES)
[Symbol]	DRAINAGE AREA DIVIDE
[Symbol]	PROPOSED MICRO-BIORETENTION FACILITY (M-6)
[Symbol]	PROPOSED DRY WELL (M-5)
[Symbol]	AREA OF DRAINAGE TO SHEETFLOW TO LEVEL SPREADER AND CONSERVATION (N-3)
[Symbol]	AREA OF DRAINAGE TO GO TO DRY WELL (M-5)
[Symbol]	AREA OF DRAINAGE TO GO TO MICRO BIO-RETENTION FACILITY (M-6)
[Symbol]	AREA OF DRIVEWAY DRAINAGE TO GO TO NON-ROOFTOP DISCONNECT (N-2)
[Symbol]	AREA OF ROOFTOP DRAINAGE TO GO TO ROOFTOP DISCONNECT (N-1)
[Symbol]	AREA OF ROOFTOP DRAINAGE TO GO TO MICRO BIO-RETENTION FACILITY (M-6) AND SHEETFLOW TO CONSERVATION (N-3)
[Symbol]	AREA OF ROOFTOP DRAINAGE TO GO TO DRY WELL (M-5) AND SHEETFLOW TO CONSERVATION (N-3)
[Symbol]	ROOFTOP DISCONNECT (N-1)

MATCHLINE - SHEET 10

MATCHLINE - SHEET 12

HOWARD COUNTY - OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DISCONNECTION OF ROOFTOP RUNOFF (N-1), DISCONNECTION OF NON-ROOFTOP RUNOFF (N-2)

A. MAINTENANCE OF AREAS RECEIVING DISCONNECTED RUNOFF IS GENERALLY NO DIFFERENT THAN THAT REQUIRED FOR OTHER LAWN OR LANDSCAPED AREAS. THE OWNER SHALL ENSURE THE AREAS RECEIVING RUNOFF ARE PROTECTED FROM FUTURE COMPACTION OR DEVELOPMENT OF IMPERVIOUS AREA IN COMMERCIAL AREAS. FOOT TRAFFIC SHOULD BE DISCOURAGED AS WELL.

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SHEETFLOW TO CONSERVATION AREA (N-3)

1. CONSERVATION AREAS SHALL REMAIN UNDISTURBED AND UNMANAGED OTHER THAN ROUTINE DEBRIS REMOVAL AND REPAIRING AREAS OF CONCENTRATED FLOW. INVASIVE AND NOXIOUS PLANT REMOVAL AND BI-ANNUAL MOWING FOR MEADOW AREAS MAY BE NEEDED. SIGNS DELINEATING THE LIMITS OF THE CONSERVATION SHOULD BE MAINTAINED AND SUPPLEMENTAL PLANTINGS PERFORMED AS NEEDED.

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
BGA	BALL SILET LOAM, 0 TO 3 PERCENT SLOPES	G/D	.37	YES
Co	CODORUS AND HATERBORO SILT LOAMS, 0 TO 3 PERCENT SLOPES	C	.32	NO
GB	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	A	.28	NO
Gc	GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	A	.28	NO
Gm	GLENNVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C	.43	YES
GmB	GLENNVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	B/D	.37	YES

NOTE: HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL ERODIBILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT.

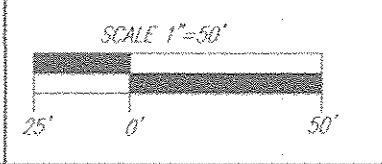
MICRO-BIORETENTION FACILITY ELEVATIONS (M-6)

LOT #	FACILITY	A	B	C	D	E	F	G	UNDERDRAIN INV. CUT	OUTFALL INV. SIZE	FACILITY SIZE
LOT 14	MR-8B	428.02	427.00	426.75	424.75	424.42	423.42	422.72	423.75	420.00	604 SF
LOT 12	MR-9	426.00	425.00	424.75	422.75	422.42	421.42	420.72	421.75	421.00	514 SF
LOT 13	MR-10	429.00	428.00	427.75	425.75	425.42	424.42	423.72	424.75	420.50	498 SF

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 6-21-17
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 6-13-17
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE



SWM DRAINAGE AREA MAP
 SCALE: 1"=50'

OWNER
 RENE L. GELBER
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 HIGHLAND, MD 20777
 (410) 480-0023

DEVELOPER
 TRINITY QUALITY HOMES, INC.
 3675 PARK AVE., SUITE 301
 ELLICOTT CITY, MD 21043
 (410) 480-0023

NO. REVISION DATE

**ENVIRONMENTAL CONCEPT PLAN
 STORMWATER MANAGEMENT DRAINAGE
 AREA MAP, NOTES, AND DETAILS**

THE ESTATES AT RIVER HILL
 LOTS 1-15, BUILDABLE PRESERVATION PARCEL 'A',
 AND NON-BUILDABLE PRESERVATION PARCELS 'B' & 'C'
 A RE-SUBDIVISION OF THE "GREENE PROPERTY", LOT 1

PARCEL: 389 ZONED: RR-DEO
 TAX MAP: 34 GRID: 23 L. 4772 / F. 285
 CITY ELECTION DISTRICT: 15550 ALLNUTT LANE HOWARD COUNTY, MARYLAND
 HIGHLAND, MD 20777

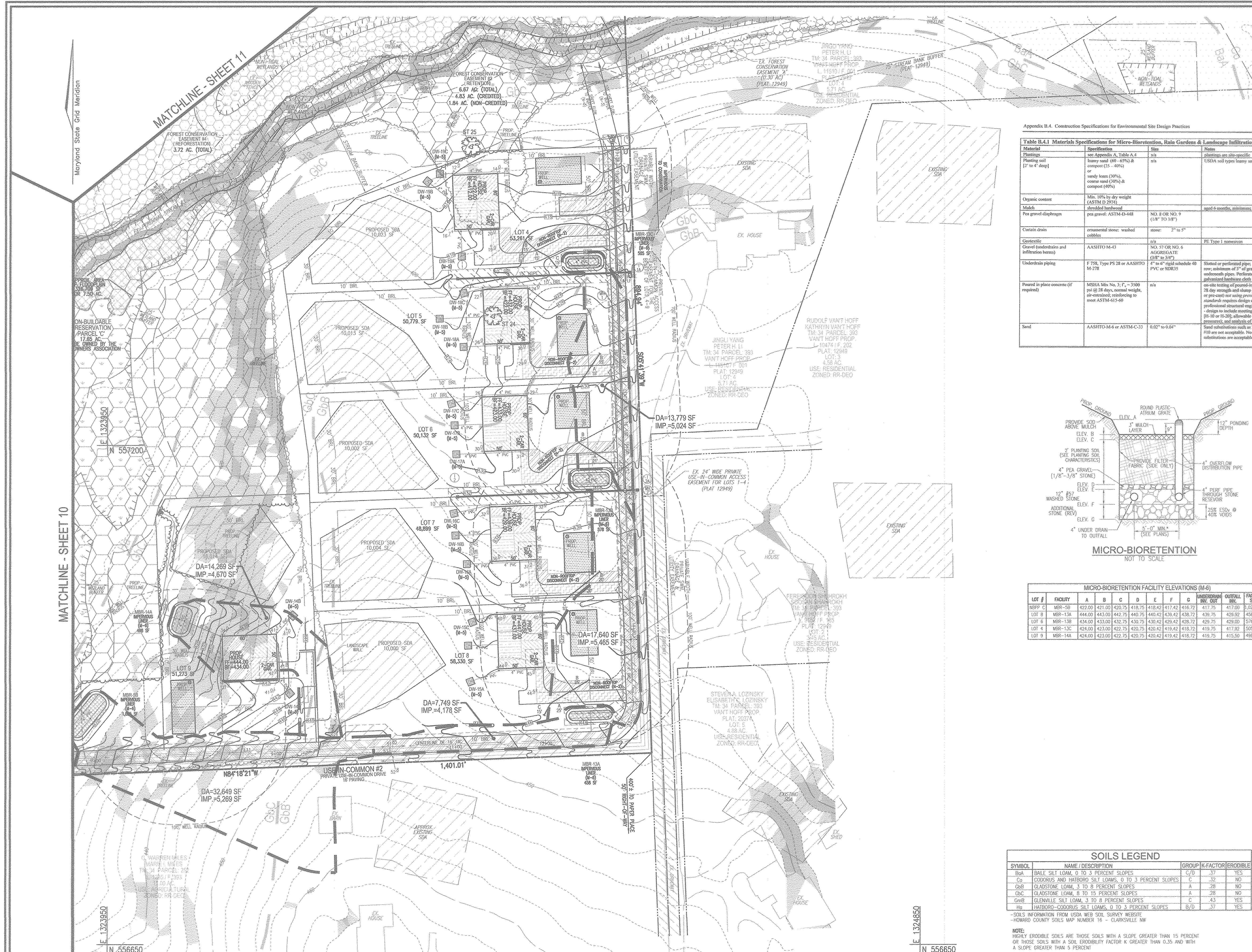
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PROFESSIONAL CERTIFICATE

DESIGN BY: RHV
 DRAWN BY: JMR
 CHECKED BY: RHV
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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. 16183 EXPIRATION DATE 09-27-2018

11 SHEET OF 12

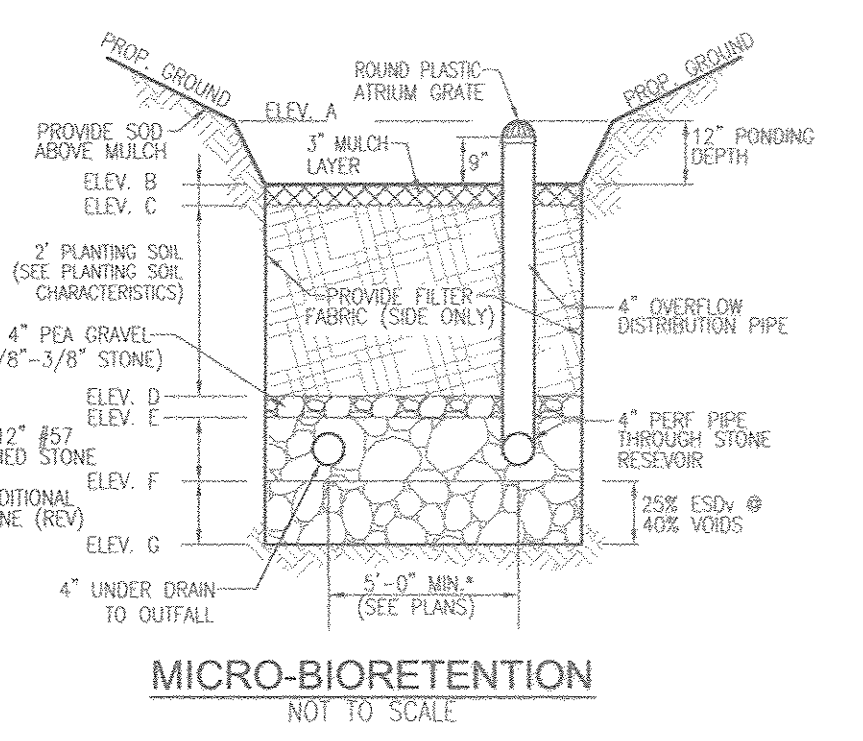


LEGEND:

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- ADJACENT PROPERTY LINE
- EXISTING EDGE OF PAVING
- EXISTING STREAM BUFFER
- EXISTING STREAM
- EXISTING TREELINE
- PROPOSED TREELINE
- EXISTING WETLANDS
- EXISTING WETLAND BUFFER
- EXISTING SPECIMEN TREES
- EXISTING WOOD FENCE
- EXISTING METAL FENCE
- EX. PUBLIC 100-YEAR FLOOD PLAIN
- PROP. PRIVATE USE-IN-COMMON ACCESS EASEMENT
- PROP. VARIABLE WIDTH PRIVATE SWM, DRAINAGE & UTILITY EASEMENT
- EX. 24' WIDE PRIVATE USE-IN-COMMON ACCESS EASEMENT FOR LOTS 1-4 (PLAT 12949)
- EX. FOREST CONSERVATION EASEMENT 'A' (PLAT 12949)
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- SOILS
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- EXISTING STEEP SLOPES (20% SLOPES OR GREATER)
- EXISTING MODERATE SLOPES (15% TO 19.9% SLOPES)
- DRAINAGE AREA DIVIDE
- PROPOSED MICRO-BIORETENTION FACILITY (M-6)
- PROPOSED DRY WELL (M-5)
- AREA OF DRAINAGE TO SHEETFLOW TO LEVEL SPREADER AND CONSERVATION (N-3)
- AREA OF DRAINAGE TO GO TO DRY WELL (M-5)
- AREA OF DRAINAGE TO GO TO MICRO-BIORETENTION FACILITY (M-6)
- AREA OF DRIVEWAY DRAINAGE TO GO TO NON-ROOFTOP DISCONNECT (N-2)
- AREA OF ROOFTOP DRAINAGE TO GO TO ROOFTOP DISCONNECT (N-1)
- ROOFTOP DISCONNECT (N-1)

Table B.4.1 Materials Specifications for Micro-Bioretention, Rain Gardens & Landscape Infiltration-

Material	Specification	Site	Notes
Planting soil	see Appendix A, Table A.4 heavy sand (0-6%) & compost (5-10%) or sandy loam (30%) coarse sand (30%) & compost (40%)	n/a	USDA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2922)	n/a	aged 6 months, minimums no pine or wood chips
Mulch	sterilized hardwood pea gravel: ASTM-D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")	
Curtain drain	ornamental stone: washed cobble	stone: 2" to 5"	
Geotextile	AASHTO M-43	NO. 57 OR NO. 6 AGRIGRATE (3/8" to 3/4")	PE Type 1 nonwoven
Underdrain piping	F 738, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	Slotted or perforated pipe; 3/8" per 6" on center, 4 holes per row; minimum 4" of gravel over pipes; not necessary underdrain pipes. Perforated pipe shall be wrapped with 1/4 inch polyethylene landscape fabric
Poured in place concrete (if required)	MSHA Min No. 3, F _c = 3500 psi @ 28 days, normal weight, air-entrained, reinforcing to meet ASTM-610-60	n/a	on-site testing of poured-in-place concrete required; 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) not using previously approved form or load standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland + design to include meeting ACI Code 308.2R; vertical loading [H 10 or H-20]; allowable horizontal loading (based on soil assessment) and analysis of potential conditions
Sand	AASHTO M-66 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone (AASHTO) #10 are not acceptable. No calcium carbonate or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand



MICRO-BIORETENTION FACILITY ELEVATIONS (M-6)

LOT #	FACILITY	A	B	C	D	E	F	G	UNDERDRAIN	OUTLET	FACILITY SIZE
MRRP C	MRR-5B	422.00	421.00	420.75	418.75	418.42	417.42	416.72	417.75	417.00	3,025 SF
LOT 8	MRR-13A	444.00	443.00	442.75	440.75	440.42	439.42	438.72	439.75	429.92	458 SF
LOT 6	MRR-13B	434.00	433.00	432.75	430.75	430.42	429.42	428.72	429.75	429.00	578 SF
LOT 4	MRR-13C	424.00	423.00	422.75	420.75	420.42	419.42	418.72	419.75	417.92	505 SF
LOT 9	MRR-14A	424.00	423.00	422.75	420.75	420.42	419.42	418.72	419.75	415.50	498 SF

SOILS LEGEND

SYMBOL	NAME / DESCRIPTION	GROUP	K-FACTOR	ERODIBLE
Bsa	BAILE SILT LOAM, 0 TO 3 PERCENT SLOPES	C/D	37	YES
Co	CODORUS AND HATBORO SILT LOAMS, 0 TO 3 PERCENT SLOPES	C	32	NO
Gcb	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	A	28	NO
Gbc	GLADSTONE LOAM, 8 TO 15 PERCENT SLOPES	A	28	NO
Ghb	GREENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C	43	YES
Hb	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES	B/D	37	YES

NOTES:
-SOILS INFORMATION FROM USDA WEB SOIL SURVEY WEBSITE
-HOWARD COUNTY SOILS MAP NUMBER 16 - CLARKSVILLE NW
-HIGHLY ERODIBLE SOILS ARE THOSE SOILS WITH A SLOPE GREATER THAN 15 PERCENT OR THOSE SOILS WITH A SOIL DRAINABILITY FACTOR K GREATER THAN 0.35 AND WITH A SLOPE GREATER THAN 5 PERCENT

MICROBIORETENTION NOTES:

- ONLY THE SIDES OF MICROBIORETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYERS OR AT THE BOTTOM OF THE MICROBIORETENTION WILL CAUSE THE MRR TO FAIL, AND THEREFORE SHALL NOT BE INSTALLED.
- WRAP THE PERFORATED MRR UNDERDRAIN PIPE WITH 1/4" MESH (4x4) OR SMALLER GALVANIZED HARBORING CLOTH.
- PROVIDE 5" MINIMUM SPACING BETWEEN UNDER DRAIN AND PERFORATED PIPE THROUGH STONE RESERVOIR OR SPACE PIPE EQUALLY ACROSS BOTTOM FOR SMALL BIOS. (SEE PLANS)

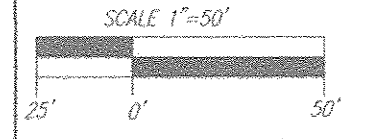
OPERATION AND MAINTENANCE SCHEDULE FOR (M-6) MICROBIORETENTION AREAS

- ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER, SAND MEDIA AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. CHECK FOR DEWATERING WITHIN 48 HOURS, WHEN NECESSARY, REPLACE FILTER MEDIA PER PLAN.
- SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD, DISEASED AND EXCESSIVE VEGETATION CONSIDERED BEYOND TREATMENT. REPLACEMENT OF ALL DISEASED TREES, SHRUBS, DEFICIENT STAKES AND WIRES WILL BE REQUIRED.
- MULCH LAYER SHALL BE INSPECTED EACH SPRING, ONCE EVERY 2 TO 3 YEARS, REMOVE EXCESSIVE MULCH LAYER AND APPLY NEW 2 TO 3 INCH LAYER.
- SOIL EROSION AND FLOW BLOCKAGES TO BE ADDRESSED ON AN AS NEEDED BASIS WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORMS. INSPECT CLEAN OUTS AND OBSERVATION WELLS ALONG WITH OVERFLOW/OUTLET/EXIT PIPES.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 6-21-17
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 6-13-17
CHIEF, DIVISION OF LAND DEVELOPMENT DATE



SWM DRAINAGE AREA MAP
SCALE: 1"=50'

OWNER
RENE L. GELBER
JEANNE M. GELBER
13550 ALLNUTT LANE
HIGHLAND, MD 20777
(410) 480-0023

DEVELOPER
TRINITY QUALITY HOMES, INC.
3675 PARK AVE., SUITE 301
ELLICOTT CITY, MD 21043
(410) 480-0023

NO. REVISION DATE

**ENVIRONMENTAL CONCEPT PLAN
STORMWATER MANAGEMENT DRAINAGE
AREA MAP, NOTES, AND DETAILS**

THE ESTATES AT RIVER HILL
LOTS 1-15, BUILDABLE PRESERVATION PARCEL 'A',
AND NON-BUILDABLE PRESERVATION PARCELS 'B' & 'C'
A RE-SUBDIVISION OF THE "GREENE PROPERTY", LOT 1

PARCEL: 389 ZONED: RR-DEO
TAX MAP: 34 GRD: 23 L. 4772 / F. 285
5TH ELECTION DISTRICT HIGHLAND, MD 20777 HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL
ENGINEERS • SURVEYORS • PLANNERS**

8407 MAIN STREET TEL: 410.461.7666
ELLICOTT CITY, MD 21043 FAX: 410.461.8961

PROFESSIONAL CERTIFICATE

DESIGN BY: RHV
DRAWN BY: JMR
CHECKED BY: RHV
DATE: JUNE, 2017
SCALE: AS SHOWN
W.O. NO.: 15-39

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. 16183 EXPIRATION DATE: 09-27-2018

12 SHEET OF 12