PRELIMINARY EQUIVALENT SKETCH & REVISED PERCOLATION CERTIFICATION PLAN

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

ZONED: RC-DEO

TAX MAP No. 7 GRID No. 18 & TAX MAP No. 8 GRID No. 13 PARCEL No. 5

4th ELECTION DISTRICT HOWARD COUNTY, MARYLAND

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Minimum Lot Size Chart

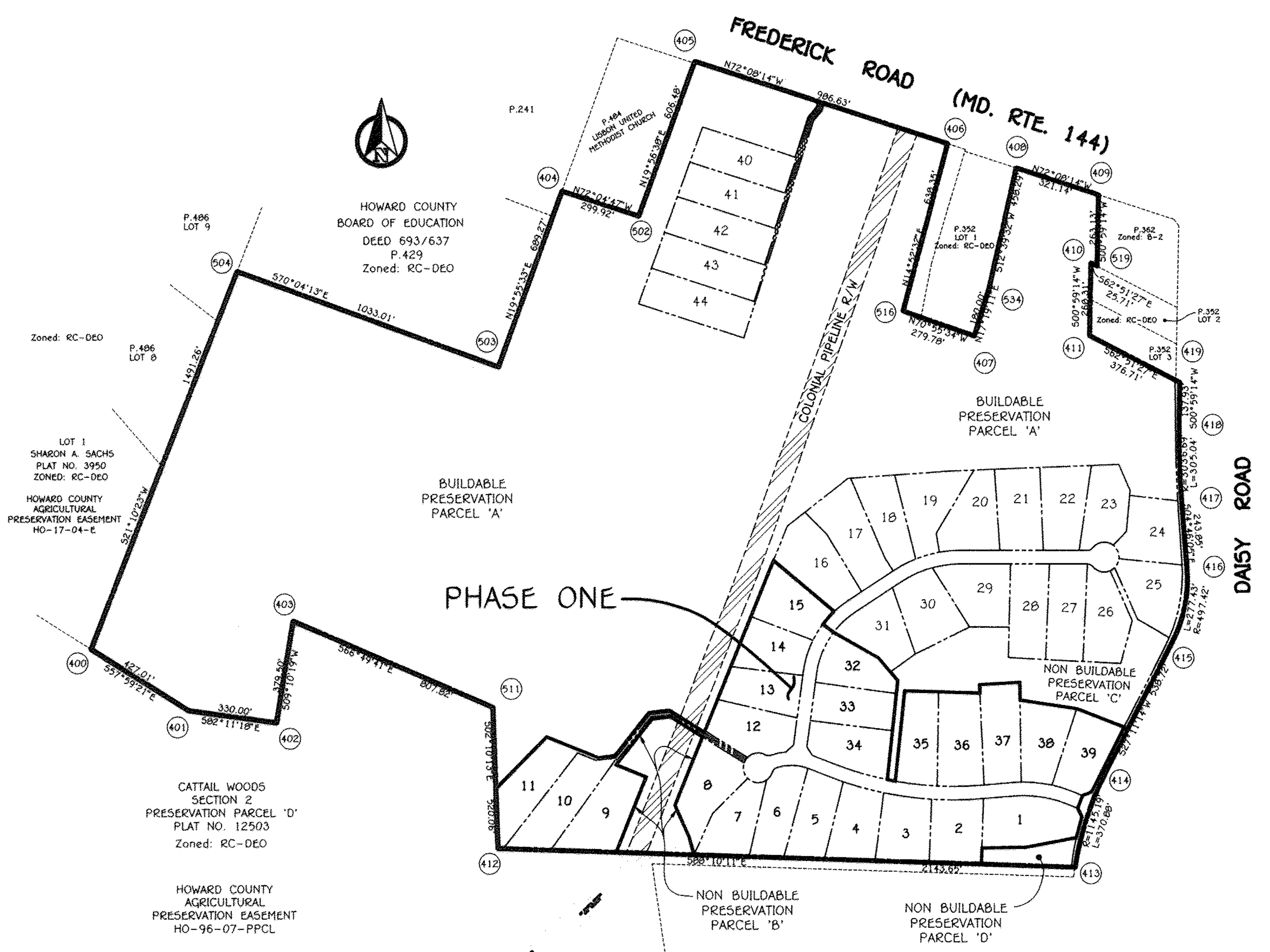
LOT No.	GROSS AREA	PIPESTEM AREA	MINIMUM LOT SIZE
9	63,809 Sq.Ft.	4,313 Sq.Ft.	59,496 Sq.Ft.
10	61,671 Sq.Ft.	5,761 Sq.Ft.	55,910 Sq.Ft.
11	60,715 Sq.Ft.	5,681 Sq.Ft.	55,034 Sq.Ft.
40	51,551 Sq.Ft.	1,050 Sq.Ft.	50,501 Sq.Ft.
41	52,786 Sq.Ft.	1,707 Sq.Ft.	51,079 Sq.Ft.
42	56,698 Sq.Ft.	2,356 Sq.Ft.	54,342 Sq.Ft.
43	58,754 Sq.Ft.	3,028 Sq.Ft.	55,726 Sq.Ft.
44	60,810 Sq.Ft.	3,700 Sq.Ft.	57,110 Sq.Ft.

ROADWAY INFORMATION CHART

ROAD NAME	CLASSIFICATION	DESIGN SPEED	POSTED SPEED LIMIT	R/W WIDTH
LINDEN GROVE	PUBLIC ACCESS STREET	30 M.P.H.	25 M.P.H.	50'
HERITAGE RIDGE	PUBLIC ACCESS STREET	30 M.P.H.	25 M.P.H.	50'
KIMBERLYS WAY	PRIVATE DRIVEWAY	15 M.P.H.	------	24' EASE.

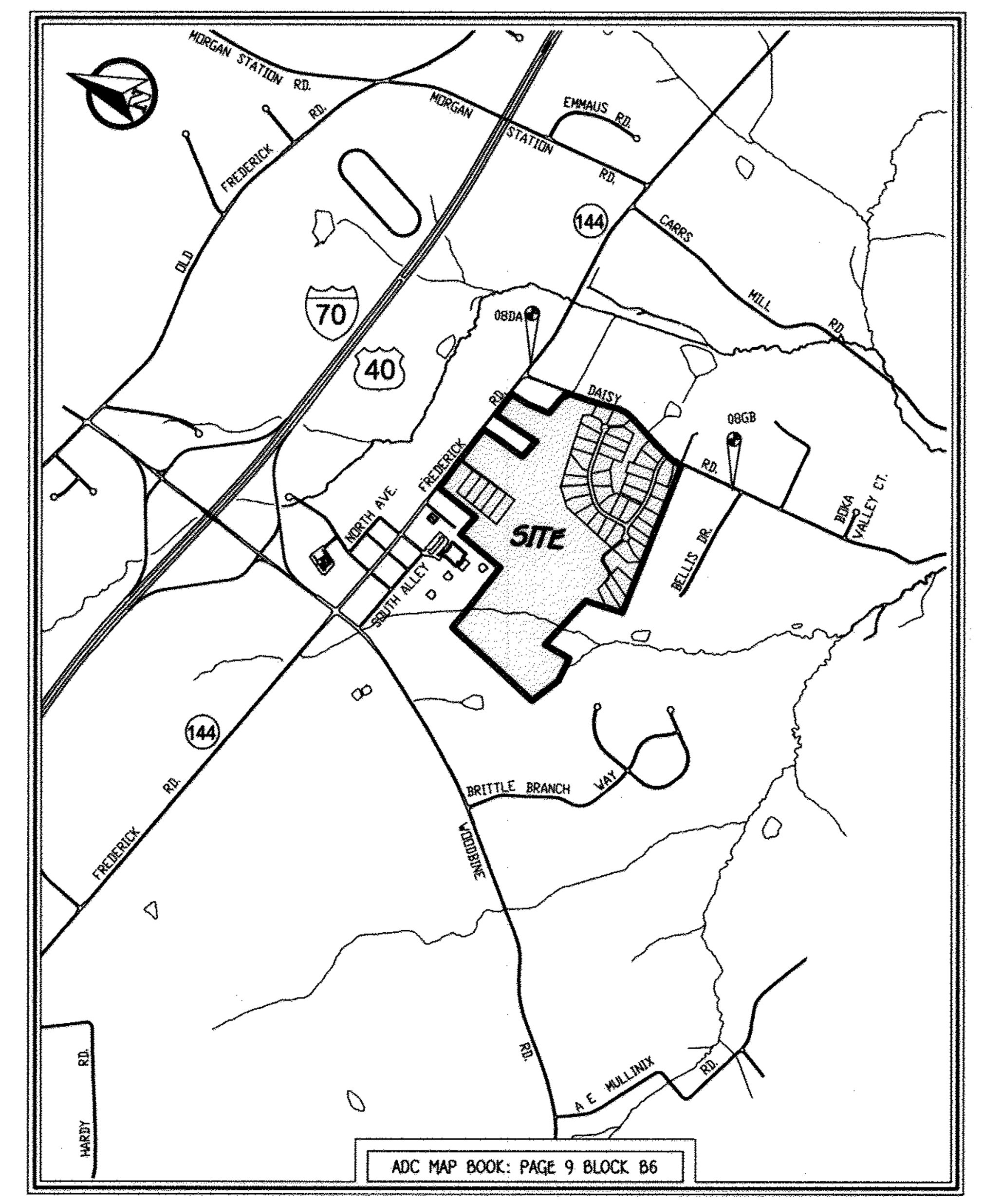
TRAFFIC CONTROL SIGNS

ROAD NAME	CENTERLINE STA.	OFFSET	POSTED SIGN	SIGN CODE
LINDEN GROVE	0+43	21'L	STOP w/ROAD NAME SIGN	R1-1
LINDEN GROVE	2+00	14'R	SPEED LIMIT 25	R2-1
HERITAGE RIDGE	0+32	18'L	STOP	R1-1
HERITAGE RIDGE	1+52	14'R	SPEED LIMIT 25	R2-1
FREDERICK ROAD	14+02	20'L	STOP	R1-1



SITE MAP

SCALE: 1" = 400'



VICINITY MAP

SCALE: 1" = 2000'

DENSITY TABULATION

1. TRACT AREA = 176.680 ACRES
2. FLOODPLAIN AREA = 6.204 ACRES
3. STEEP SLOPES AREA = 0.60 ACRES
4. NET TRACT AREA = 169.876 ACRES (176.680 AC - 6.204 AC. - 0.60 AC.)
5. DENSITY ALLOWED BY MATTER OF RIGHT: 176.680 ACRES X 1 DWELLING UNIT/4.25 ACRES = 41.57 or 41 SINGLE FAMILY DETACHED UNITS.
6. BONUS DENSITY ALLOWED PER SEC. 104.0.G.c.2 IS ONE (1) ADDITIONAL LOT PER 25 ACRES GROSS OF PRESERVATION PARCEL CREATED. PRESERVATION PARCEL 'A' = 113.832 AC. BONUS DENSITY ALLOWED = 113.832/25 = 4.55 OR FOUR (4) LOTS
7. TOTAL NUMBER OF PROPOSED DWELLING UNITS = 45 UNITS (44 CLUSTER LOTS + 1 BUILDABLE PRESERVATION PARCEL)

PHASING TABULATION

PHASE	ALLOCATION YEAR	No. OF LOTS
1	2020	23 AND BUILDABLE PRESERVATION PARCEL
2	2021	21

U.S. Equivalent Coordinate Table

Point #	Northing	Easting	Point #	Northing	Easting
413	604616.22	1294962.11	516	606663.51	1294319.80
414	604967.59	1295075.66	406	607280.46	1294483.68
415	605446.79	1295321.81	405	607583.10	1293544.61
416	605715.41	1295375.04	502	607012.99	1293337.74
417	605958.42	1295354.77	404	607105.27	1293052.37
419	606401.07	1295347.09	503	606457.27	1292817.47
411	606572.93	1295011.87	504	606809.39	1291846.32
410	606841.20	1295016.49	400	605418.79	1291307.70
519	606829.47	1295039.37	401	605192.44	1291669.78
409	607092.56	1295043.90	402	605147.59	1291996.72
408	607191.07	1294738.24	403	605522.24	1292057.21
534	606743.92	1294637.81	511	605204.37	1292799.86
407	606572.08	1294584.22	412	604684.68	1292819.55

GENERAL NOTES:

1. PROPERTY ZONED RC-DEO WITH A TIER III DESIGNATION PER 10/6/13 COMPREHENSIVE ZONING PLAN.
2. AREA TABULATION:
   A. TOTAL TRACT AREA = 176.680 Ac±
   B. AREA OF PROPOSED ROAD R/W = 4.410 Ac±
   C. AREA OF PROPOSED BUILDABLE LOTS = 50.765 Ac±
   D. AREA OF PROPOSED BUILDABLE PRESERVATION PARCELS 'A' = 113.756 Ac±
   E. AREA OF PROPOSED NON-BUILDABLE PRESERVATION PARCELS = 7.749 Ac±
   F. FLOODPLAIN AREA = 6.204 AC.±
   G. STEEP SLOPE AREA = 0.60 AC.±
   H. AREA OF STREAMS (INCLUDING BUFFERS) = 7.84 AC.±
   I. NET TRACT AREA = 169.876 AC.±
   J. PREVIOUS HOWARD COUNTY FILE NUMBERS: ECP-17-019, WP-18-001, PB-
   K. DEED REFENCES: L. 445/F. 767, L. 954/F. 441, L. 993/F. 380, L. 15899/F. 246
   L. TOTAL AREA OF WETLANDS (INCLUDING BUFFERS) = 1.57 AC.±
3. NUMBER OF LOTS/PARCELS:
   A. BUILDABLE LOTS = 44
   B. BUILDABLE PRESERVATION PARCELS = 1
   C. NON-BUILDABLE PRESERVATION PARCELS = 3
   D. MODERATE INCOME HOUSING UNITS REQUIRED = 5 MIHU (45 UNITS x 10% = 5 MIHU); THE REQUIREMENT WILL BE MET BY A FEE-IN-LIEU PAYMENT.
4. SOILS INFORMATION TAKEN FROM NRCS WEB SOIL SURVEY.
5. THE FOREST STAND & WETLANDS DELINEATION REPORT DATED DECEMBER, 2016 WAS PREPARED BY ECO-SCIENCE PROFESSIONAL, INC AND WAS UPDATED ON AUGUST 4, 2017.
6. THERE ARE STEEP SLOPES OF 25% OR GREATER ON SITE OF 0.60 ACRES.
7. NO CEMETERIES EXIST ON SITE BY VISUAL OBSERVATION OR LISTED IN AVAILABLE HOWARD COUNTY CEMETERY INVENTORY MAP.
8. THERE ARE NO HISTORIC HOUSE STRUCTURES ON-SITE.
9. SITE IS ADJACENT TO TWO SCENIC ROADS (DAISY ROAD & FREDERICK ROAD. A SCENIC ROADS REPORT HAS BEEN PROVIDED BY FISHER, COLLINS & CARTER, INC. DATED 10/24/16.
10. THE TRAFFIC STUDY FOR THIS PROJECT WAS PREPARED BY MARS GROUP DATED APRIL 19, 2016.
11. THERE ARE EXISTING STRUCTURES LOCATED WITHIN BUILDABLE PRESERVATION PARCEL 'A' TO REMAIN. PER THE ZONING DIVISION, A BARN IS A PERMITTED ACCESSORY USE TO A PRINCIPAL FARM USE. A DWELLING IS NOT REQUIRED IN ORDER TO RETAIN THE BARN.
12. BUILDABLE PRESERVATION PARCEL 'A' TO BE PRIVATELY OWNED AND ENCUMBERED BY AN EASEMENT AGREEMENT WITH THE LISBON GROVE HOMEOWNERS ASSOCIATION, INC. AND HOWARD COUNTY, MARYLAND. THE USE OF PARCEL 'A' WOULD BE FOR AN AGRICULTURAL USE AND A PROPOSED BUILDING SITE.
13. NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D' WILL BE OWNED BY THE LINDEN GROVE PROPERTY HOMEOWNERS ASSOCIATION, INC. AND THE PRESERVATION EASEMENT WILL BE HELD BY HOWARD COUNTY, MARYLAND. THE USE FOR PARCEL 'B' IS FOR STORM WATER MANAGEMENT. THE USE FOR PARCEL 'C' IS STORM WATER MANAGEMENT. THE USE FOR PARCEL 'D' IS FOR STORM WATER MANAGEMENT.
14. ALL LOTS AREAS ARE MORE OR LESS.
15. DRIVEWAYS SHALL BE PROVIDED PRIOR TO ISSUANCE OF A USE AND OCCUPANCY PERMIT FOR ANY NEW DWELLINGS TO ENSURE SAFE ACCESS FOR FIRE AND EMERGENCY VEHICLES PER THE FOLLOWING MINIMUM REQUIREMENTS:
    A) WIDTH - 12 FEET (16 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 15% GRADE, MAXIMUM 10% GRADE CHANGE AND 45-FOOT TURNING RADIUS;
    D) STRUCTURES (CULVERTS/BRIDGES) - CAPABLE OF SUPPORTING 25 GROSS TONS (H25-LOADING);
    E) DRAINAGE ELEMENTS - CAPABLE OF SAFELY PASSING 100 YEAR FLOOD WITH NO MORE THAN 1 FOOT DEPTH OVER SURFACE;
    F) STRUCTURE CLEARANCES - MINIMUM 12 FEET;
    G) MAINTENANCE - SUFFICIENT TO ENSURE ALL WEATHER USE.
16. 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.
17. ARTICLES OF INCORPORATION FOR THE LINDEN GROVE PROPERTY HOMEOWNERS ASSOCIATION, INC. WILL BE FILED WITH THE STATE DEPARTMENT OF ASSESSMENTS AND TAXATION PRIOR TO RECORDATION OF THE FINAL PLAT.
18. A PRE-SUBMISSION COMMUNITY MEETING WAS HELD FOR THIS PROJECT ON 2/23/17 AT THE GLENWOOD LIBRARY AT 6:00 P.M.
19. [hatch symbol] THIS AREA DESIGNATES A PRIVATE SEWERAGE AREA OF AT LEAST 10,000 SQUARE FEET AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT FOR INDIVIDUAL SEWAGE DISPOSAL. IMPROVEMENTS OF ANY NATURE IN THESE AREAS ARE RESTRICTED UNTIL PUBLIC SEWERAGE IS AVAILABLE. THESE AREAS SHALL BECOME NULL AND VOID UPON CONNECTION TO A PUBLIC SEWERAGE SYSTEM. THE COUNTY HEALTH OFFICER SHALL HAVE THE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWERAGE AREA. RECORDATION OF A MODIFIED AREA SHALL NOT BE NECESSARY.
20. THE LOTS SHOWN HEREON COMPLY WITH THE MINIMUM OWNERSHIP WIDTH AND LOT AREA AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT.
21. ANY CHANGES TO THE PRIVATE SEWERAGE AREA SHALL REQUIRE A REVISED PERC CERTIFICATION PLAN.
22. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAM(S), OR THEIR REQUIRED BUFFERS, FLOODPLAIN AND FOREST CONSERVATION EASEMENT AREAS.
23. THE 100 YEAR FLOODPLAIN DELINEATED ON THIS PLAN HAS BEEN DETERMINED TO BE "NOT CRITICAL" BASED ON A REPORT PREPARED BY FISHER, COLLINS AND CARTER, INC. ON JANUARY 6, 2017.
24. THE FOREST CONSERVATION REQUIREMENTS PER SECTION 16.1200 OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION MANUAL FOR THIS SUBDIVISION WILL BE FULFILLED BY 4.24 AC.± OF ON-SITE CREDITED RETENTION AND 12.27 AC.± OF ON-SITE AFFORESTATION. THERE IS NO SURETY FOR FOREST RETENTION. SURETY FOR ON-SITE PLANTING IS $267,241.00, (12.27 ac. x 43,560 sq.ft. x $0.50).
25. PERIMETER LANDSCAPING FOR THIS DEVELOPMENT SHALL BE IN ACCORDANCE WITH SECTION 16.124 OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND LANDSCAPE MANUAL. FINAL LANDSCAPING REVIEW AND SURETY IS DEFERRED UNTIL THE FINAL SUBDIVISION PLAN STAGE.
26. STREET TREES ALONG PUBLIC ROADS WILL BE PROVIDED AT THE FINAL PLAN STAGE AND WILL BE INCLUDED IN DED'S COST ESTIMATE.
27. THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS ALTERNATIVE COMPLIANCES HAVE BEEN APPROVED.
28. THE EXISTING TOPOGRAPHY INFORMATION SHOWN IS BASED ON HOWARD COUNTY AERIAL CONTOURS (2' interval) AND SUPPLEMENTED WITH A FIELD RUN TOPOGRAPHIC SURVEY PERFORMED ON OR ABOUT 7/21/16 BY FISHER, COLLINS & CARTER, INC.
29. BOUNDARY INFORMATION IS BASED ON A SURVEY PERFORMED ON OR ABOUT 11/11/14 BY FISHER, COLLINS & CARTER, INC.
30. COORDINATES BASED ON NAD '83, MARYLAND COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NOS:
    CONTROL STATION NO. 08 DA N 606,934.18 E 1,295,730.52 ELEV. 554.836
    CONTROL STATION NO. 08 GB N 603,764.82 E 1,294,891.90 ELEV. 570.387
31. THIS PROPERTY IS NOT LOCATED WITHIN THE METROPOLITAN DISTRICT. PRIVATE WELL AND PRIVATE SEPTIC WILL BE UTILIZED FOR THIS PROJECT
32. STORM WATER MANAGEMENT IS IN ACCORDANCE WITH THE M.D.E. STORM WATER DESIGN MANUAL, VOLUMES I & II, REVISED 2009. WE ARE PROVIDING STORM WATER MANAGEMENT BY THE USE OF 3 AREAS OF (N-1) ROOFTOP DISCONNECTION CREDIT, 3 AREAS OF (N-2) NON-ROOFTOP DISCONNECTION CREDIT, 83 AREAS OF (M-5) DRYWELLS, 8 (M-6) MICRO-BIORETENTION FACILITIES AND 6 (F-6) BIO-RETENTION FACILITIES TO MEET AND EXCEED THE REQUIRED ESD VOLUME.
33. STORM WATER MANAGEMENT DEVICES LOCATED ON INDIVIDUAL LOTS WILL BE OWNED AND MAINTAINED BY THAT PARTICULAR LOT OWNER AND SUBJECT TO THE REQUIREMENTS OF A RECORDED DECLARATION OF COVENANT, SWM DEVICES LOCATED WITHIN THE PUBLIC R/W WILL BE PRIVATELY OWNED AND JOINTLY MAINTAINED, AND SWM DEVICES LOCATED ON PARCELS WILL BE OWNED AND MAINTAINED BY THE H.O.A., SWM FACILITIES SERVING PUBLIC ROADS, BUT LOCATED ON PRIVATE LOTS WILL BE PRIVATELY OWNED AND JOINTLY MAINTAINED.
34. A NOISE STUDY WAS PREPARED BY MARS GROUP DATED MAY, 2017 AND APPROVED ON OCTOBER 24, 2017.
35. ALL WELLS SHALL BE DRILLED PRIOR TO FINAL PLAT RECORDATION. IT IS THE DEVELOPER'S RESPONSIBILITY TO SCHEDULE THE WELL DRILLING PRIOR TO FINAL PLAT SUBMISSION. IT WILL NOT BE CONSIDERED "GOVERNMENT DELAY" IF THE WELL DRILLING HOLDS UP HEALTH DEPARTMENT SIGNATURE OF THE RECORD PLAT.
36. ANY WELL INSTALLED FOR POTABLE WATER CONSUMPTION ON LOTS 40 THRU 44 IN THE LINDEN GROVE SUBDIVISION SHALL BE SAMPLED AND ANALYZED FOR VOLATILE ORGANIC COMPOUNDS (VOC).
37. THE R1-1 "STOP" SIGN AND THE STREET NAME SIGN (SNS) ASSEMBLY FOR THIS DEVELOPMENT MUST BE INSTALLED BEFORE THE BASE PAVING IS COMPLETED.
38. THE TRAFFIC CONTROL DEVICE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MUST BE FIELD APPROVED BY HOWARD COUNTY TRAFFIC DIVISION (410) 313-2430 PRIOR TO THE INSTALLATION OF ANT OF THE TRAFFIC CONTROL DEVICES.
39. ALL TRAFFIC CONTROL DEVICES AND THEIR LOCATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MdMUTCD).
40. ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED ("QUICK PUNCH" TYPE), SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) - 3' LONG. THE ANCHOR SHALL NOT EXTEND MORE THAN TWO "QUICK PUNCH" HOLES ABOVE GROUND LEVEL. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
41. THE PLANNING BOARD APPROVED PB CASE No. 432 ON JANUARY 24, 2018.
42. A GROUNDWATER APPROPRIATIONS PERMIT NUMBER FOR THIS PROPOSED SUBDIVISION IS HO2017G002/01.
43. EXISTING WELLS, SEPTIC SYSTEMS AND SEWAGE DISPOSAL AREAS WITHIN 100 FEET OF THE PROPERTY AND THOSE WELLS WITHIN 200 FEET DOWN GRADIENT OF EXISTING AND PROPOSED SEPTIC SYSTEMS OR SEWAGE DISPOSAL AREAS HAVE BEEN SHOWN.
44. ALL PROPOSED ROADSIDE SWALES FOR THE SUBDIVISION MUST BE AT LEAST 50 FEET FROM ALL WELL AREAS OR AT LEAST 100 FEET IF THE SWALE IS DESIGNED FOR INFILTRATION
45. A TECHNICAL DRAWING, E.G. THE PLAN VIEW ON A SEPTIC SYSTEM INSTALLATION PLAN, ILLUSTRATING THE DRAINFIELD TRENCH LAYOUT FOR AN INITIAL SYSTEM AND FOR TWO REPLACEMENT SYSTEMS MUST BE SUBMITTED FOR THE PROPOSED RESIDENCE ON EACH RESPECTIVE LOT OF THIS SUBDIVISION PRIOR TO BUILDING PERMIT APPROVAL BY THE HEALTH DEPARTMENT.
    A. ON LOT 36, THE LIMITATIONS OF SOIL PROPERTIES ARE SUCH THAT A HOUSE WITH NO MORE THAN 4 BEDROOMS CAN BE SUPPORTED WITHIN THE DESCRIBED SEWAGE DISPOSAL AREA UNLESS AN EXHIBIT PREPARED BY A CERTIFIED PROFESSIONAL ILLUSTRATES THAT ABSOPTION TRENCH AREA FOR MORE BEDROOMS CAN BE ACCOMODATED WITHIN THE SDA.
    B. ON PROPOSED LOTS 2, 3, 29, 32, 37, AND 38, THE LIMITATIONS OF SOIL PROPERTIES ARE SUCH THAT A RESIDENCE WITH NO MORE THAN FIVE (5) BEDROOMS CAN BE SUPPORTED WITHIN THE DESCRIBED SEWAGE DISPOSAL AREA UNLESS AN EXHIBIT PREPARED BY A CERTIFIED PROFESSIONAL ILLUSTRATES THAT ABSOPTION TRENCH AREA FOR MORE BEDROOMS CAN BE ACCOMODATED WITHIN THE SDA.
    C. ON ALL OTHER LOTS, 6 OR MORE BEDROOMS MAY BE PERMITTED IF AN EXHIBIT DEMONSTRATING THAT THE SDA WILL ACCOMMODATE 3 DRAINFIELDS FOR A RESIDENCE HAVING 6 BEDROOMS OR MORE IS PRESENTED BY A CERTIFIED PROFESSIONAL
46. MICRO BIO-RETENTION (M-6) FACILITIES 1 & 3 THRU 7 WILL HAVE IMPERMEABLE LINERS.
47. THIS PLAN IS SUBJECT TO A WAIVER (WP-18-001) FROM SECTION 16.116.f.3 - ACCESS RESTRICTIONS, RESTRICTING TWO POINTS OF ACCESS FROM A MINOR ARTERIAL ROADWAY. THE PURPOSE OF THE TWO ACCESSES IS TO SEPARATE THE USE-IN-COMMON RESIDENTIAL DRIVEWAY FROM THE EXISTING FARM USE DRIVEWAY. THIS WAIVER WAS APPROVED BY THE HOWARD COUNTY PLANNING BOARD ON JANUARY 18, 2018 WITH THE FOLLOWING CONDITION:
    1. THE APPLICANT SHALL COORDINATE THE DESIGN OF THE DRIVEWAYS FOR FUTURE LOTS 40-44 WITH THE FIRE DEPARTMENT TO ENSURE ADEQUATE VEHICLE TURNAROUND AND ANY NECESSARY PULLOVER AREAS AND WITH THE DEVELOPMENT ENGINEERING DIVISION AND STATE HIGHWAY ADMINISTRATION TO ENSURE ADEQUATE SITE DISTANCE. THE PROPOSED ACCESS MUST MEET ALL SHA ACCESS AND SIGHT DISTANCE REQUIREMENTS.
48. THIS PROPERTY IS DESIGNATED AS A TIER III PROPERTY PER THE SUSTAINABLE GROWTH AND AGRICULTURAL ACT OF 2012, MAP 6-3, AS APPROVED BY THE HOWARD COUNTY COUNCIL AS PART OF PLAN HOWARD 2030.
49. LOTS 1, 2 AND 3 HAVE SEWAGE DISPOSAL AREAS THAT ARE UPGRADIENT FROM AN EXISTING WELL AT 1626 DAISY ROAD. LOTS 1, 2 AND 3 SHALL BE CONSIDERED NON-BUILDABLE UNTIL THE DOWNGRADIENT WELL AT 1626 DAISY ROAD IS SEALED. A NEW WELL MUST BE INSTALLED AT 1626 DAISY ROAD AND CONNECTED TO THE RESIDENCE PRIOR TO HEALTH DEPARTMENT SIGNATURE OF THE RECORD PLAT. IF THE EXISTING WELL IS TO BE SEALED, IT MUST BE SEALED PRIOR TO HEALTH DEPARTMENT SIGNATURE OF THE RECORD PLAT.

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

[signature] PLANNING DIRECTOR VTM — 3-22-18 DATE

APPROVED FOR PRIVATE WATER AND PRIVATE SEWERAGE SYSTEMS, HOWARD COUNTY HEALTH DEPARTMENT.

[signature] for Maura Rossman — COUNTY HEALTH OFFICER — 2/28/2018 DATE

APPROVED
PLANNING BOARD OF HOWARD COUNTY
DATE 12-7-17 (DdO signed 1-18-18)

OWNER & DEVELOPER:
HERITAGE LAND DEVELOPMENT
15950 NORTH AVENUE
LISBON, MARYLAND 21765
410-489-7900

STATE OF MARYLAND — ALDO MICHAEL VITUCCI — PROFESSIONAL ENGINEER

[signature] Aldo M. Vitucci, P.E. — 2/16/18 Date

"Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly Licensed Professional Engineer under the laws of the State of Maryland, License No. 20748, Expiration Date 2-22-19."

0' 2000' 4000'
Scale: 1" = 2000'

FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE
ELLICOTT CITY, MARYLAND 21042
(410) 461 - 2855

PRELIMINARY EQUIVALENT SKETCH & REVISED PERCOLATION CERTIFICATION PLAN

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

ZONED: RC-DEO
TAX MAP No. 7 GRID No. 18 &
TAX MAP No. 8 GRID No. 13 PARCEL No. 5
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JANUARY 25, 2018

MATCH LINE SEE SHEET 3

MATCH LINE SEE SHEET 4

DENOTES AREAS OF ENHANCED LANDSCAPING TO SCREEN PROPOSED HOUSES FROM SCENIC ROADWAY. PROPOSED LANDSCAPING TO BE SHOWN AND REVIEWED AT FINAL PLAN STAGE.

CENTERLINE LINE TABLE

Line #	Length	Direction
L1	101.63'	S68° 33' 59"E
L2	123.58'	S85° 15' 28"W
L3	78.99'	S68° 50' 50"E
L4	47.41'	N67° 46' 54"E
L5	318.99'	S7° 32' 06"W
L6	202.93'	N56° 47' 38"E
L7	534.14'	S89° 59' 07"W

LEGEND

SYMBOL	DESCRIPTION
	PROPOSED STORM DRAIN LINE
	PROPOSED DRYWELL
	NON-ROOFTOP DISCONN.
	BOUNDARY/RIGHT OF WAY LINE
B.R.L.	BUILDING RESTRICTION LINE
	PROPOSED CURB
W	PROPOSED WELL
	PROPOSED WELL BOX
	EXISTING 10 FT. CONTOUR
	EXISTING 2 FT. CONTOUR
	PROPOSED SEPTIC FIELD
	25% OR GREATER SLOPES
	15% - 24.99% SLOPES
	EXISTING/PROPOSED TREELINE
463	PASSED PERC
329	FAILED PERC
	DENOTES NO PARKING ZONE
GmA GgA	SOIL TYPE

"R7-1(1) NO PARKING" SIGN DETAIL
NOT TO SCALE

"R7-1 NO PARKING" SIGN DETAIL
NOT TO SCALE

NOTE: "NO PARKING" SIGNS TO BE PLACED NO MORE THAN 80 FEET APART. LEFT ARROW SIGN PLACED AT THE START OF THE NO PARKING AREA, RIGHT ARROW AT THE END WITH THE DOUBLE ARROW SIGN R7-1(1) IN BETWEEN.

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE 3-22-18

APPROVED FOR PRIVATE WATER AND PRIVATE SEWERAGE SYSTEMS,
HOWARD COUNTY HEALTH DEPARTMENT.

COUNTY HEALTH OFFICER — DATE 2/28/2018

CENTERLINE CURVE TABLE

Curve #	Delta	Arc Length	Radius	Chord Bearing	Chord Length
C1	026.1758	205.58'	450.00'	N81° 39' 15"W	203.80'
C2	025.8949	564.94'	1250.00'	S81° 47' 41"E	560.14'
C4	049.2589	300.91'	350.00'	S32° 09' 52"W	291.72'
C5	033.1914	246.20'	425.00'	S73° 23' 23"W	242.77'
C3	043.3711	158.96'	210.00'	S89° 28' 02"W	155.20'

0' 100' 150' 200'
Scale: 1" = 100'

OWNER & DEVELOPER:
HERITAGE LAND DEVELOPMENT
15950 NORTH AVENUE
LISBON, MARYLAND 21765
410-489-7900

STATE OF MARYLAND — ALDO M. VITUCCI — No. 20748 — REGISTERED PROFESSIONAL ENGINEER

Aldo M. Vitucci, P.E. — Date 1/26/18

"Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly Licensed Professional Engineer under the laws of the State of Maryland, License No. 20748, Expiration Date 2-22-19."

NOTE:
MICRO BIO-RETENTION (M-6) FACILITIES 1 & 3 THRU 7 WILL HAVE IMPERMEABLE LINERS.

FISHER, COLLINS & CARTER, INC.
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PRELIMINARY EQUIVALENT SKETCH,
REVISED PERCOLATION CERTIFICATION & LANDSCAPE PLAN

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

ZONED: RC-DEO
TAX MAP No. 7 GRID No. 18 &
TAX MAP No. 8 GRID No. 13 PARCEL No. 5
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JANUARY 25, 2018
SHEET 2 of 14

SP-17-003

I:\2012\12026\dwg\Sketch Preliminary\12026 Sheet 2-4 SP sketch preliminary plan.dwg, SHEET 2, 1/26/2018 11:05:40 AM, 1:1

SOILS LEGEND

SOIL	NAME	CLASS	Kw
BrD	Brinklow channery loam, 15 to 25 percent slopes	B	.20
GgA	Glenelg loam, 0 to 3 percent slopes	B	.20
GgB	Glenelg loam, 3 to 8 percent slopes	B	.20
GgC	Glenelg loam, 8 to 15 percent slopes	B	.20
*GmA	Glenville silt loam, 0 to 3 percent slopes	C	.37
*GmB	Glenville silt loam, 3 to 8 percent slopes	C	*** .37
*GnB	Glenville-Baile silt loams, 0 to 8 percent slopes	C	*** .37
MaC	Manor loam, 8 to 15 percent slopes	B	.24

NOTES:

* Hydric soils and/or contains hydric inclusions

** May contain hydric inclusions

† Generally only within 100-year floodplain areas

*** Denotes Erodible Soils

LEGEND

SYMBOL	DESCRIPTION
	PROPOSED STORM DRAIN LINE
	PROPOSED DRYWELL
	NON-ROOFTOP DISCONN.
	BOUNDARY/RIGHT OF WAY LINE
B.R.L.	BUILDING RESTRICTION LINE
	PROPOSED CURB
	PROPOSED WELL
	PROPOSED WELL BOX
	EXISTING 10 FT. CONTOUR
	EXISTING 2 FT. CONTOUR
	PROPOSED SEPTIC FIELD
	25% OR GREATER SLOPES
	15% - 24.99% SLOPES
	EXISTING/PROPOSED TREELINE
463	PASSED PERC
329	FAILED PERC
GmA GgA	SOIL TYPE

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR 3-22-18 DATE

Scale: 1" = 100' (0' 100' 150' 200')

APPROVED FOR PRIVATE WATER AND PRIVATE SEWERAGE SYSTEMS, HOWARD COUNTY HEALTH DEPARTMENT.

COUNTY HEALTH OFFICER 2/28/2018 DATE

FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE
ELLICOTT CITY, MARYLAND 21042
(410) 461 - 2855

OWNER & DEVELOPER:
HERITAGE LAND DEVELOPMENT
15950 NORTH AVENUE
LISBON, MARYLAND 21765
410-489-7900

STATE OF MARYLAND ALDO MICHAEL VITUCCI PROFESSIONAL ENGINEER

Aldo M. Vitucci, P.E. 1/26/19 Date

"Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly Licensed Professional Engineer under the laws of the State of Maryland, License No. 20748, Expiration Date 2-22-19."

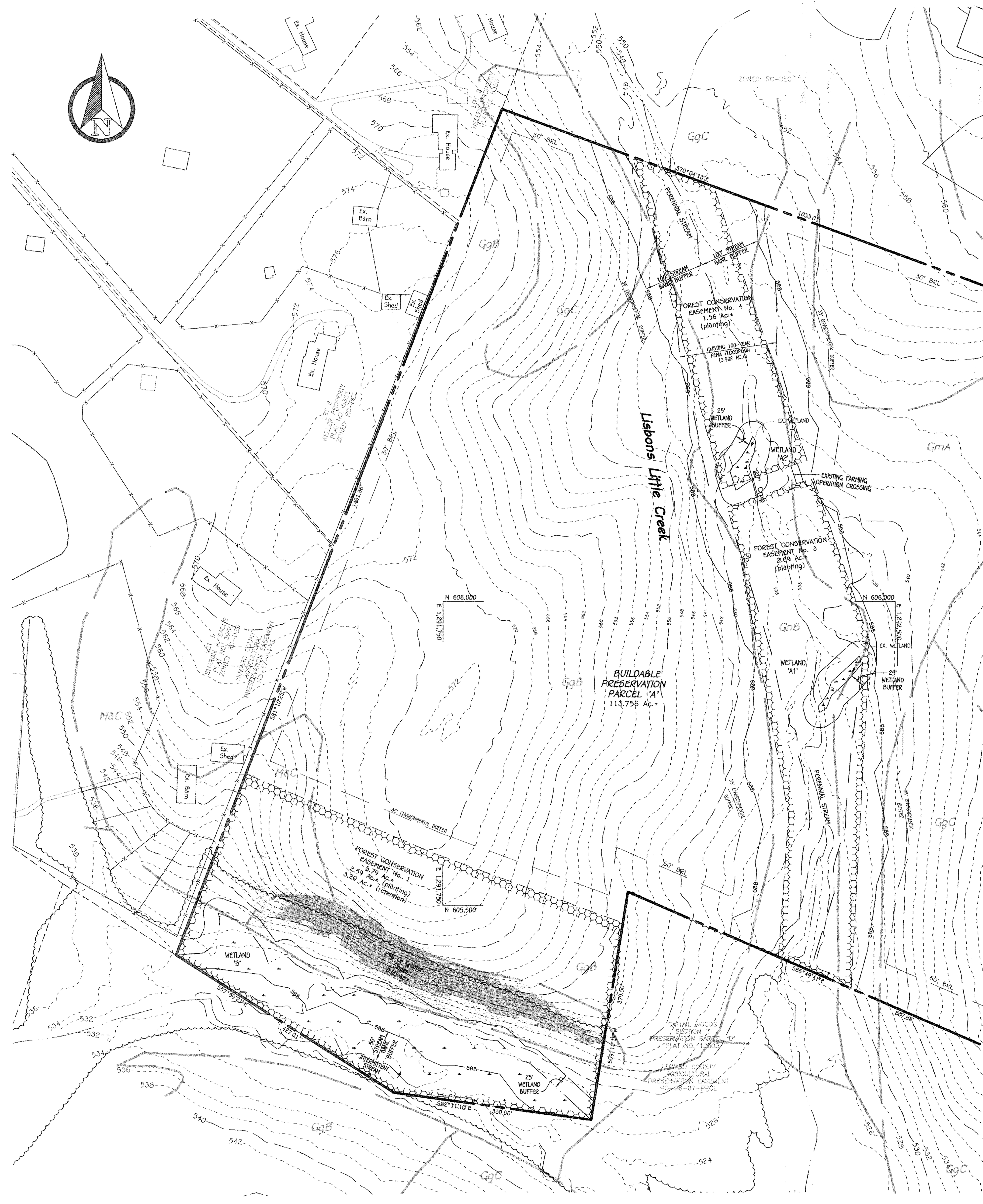
PRELIMINARY EQUIVALENT SKETCH,
REVISED PERCOLATION CERTIFICATION & LANDSCAPE PLAN

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION
PARCEL 'A' & NON-BUILDABLE PRESERVATION
PARCELS 'B' THRU 'D'

ZONED: RC-DEO
TAX MAP No. 7 GRID No. 18 &
TAX MAP No. 8 GRID No. 13 PARCEL No. 5
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JANUARY 25, 2018

SP-17-003



SCHEDULE A
PERIMETER LANDSCAPE EDGE

PERIMETER	P-1	P-2	P-3	P-4*	P-5	P-6	P-7	P-8	P-9	P-10	P-11	P-12	P-13	P-14
CATEGORY	Adjacent to Perimeter Properties	Adjacent to Preservation Parcel	Adjacent to Preservation Parcel	Adjacent to Roadway	Adjacent to Preservation Parcel	Front to Roadway	Adjacent to Roadway	Adjacent to Perimeter Properties	Adjacent to Preservation Parcel	Adjacent to Preservation Parcel	Adjacent to Roadway	Adjacent to Preservation Parcel	Adjacent to Preservation Parcel	Adjacent to Preservation Parcel
LANDSCAPE TYPE	A	A	A	C	A	N/A	B	A	A	A	B	A	A	A
LINEAR FEET OR ROADWAY FRONTAGE/PERIMETER	1479.8'	468.9'	2406.2'	1087.0'	2350.4'	268.1'	79.6'	659.0'	537.4'	419.2'	355.9'	702.3'	386.4'	702.5'
CREDIT FOR EXISTING VEGETATION (YES, NO LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CREDIT FOR WALL, FENCE OR BERM (YES, NO LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	–	–	–	–	–	–	–	–	–	–	–	–	–	–
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES SHRUBS	25 – –	8 – –	40 – –	27 54 –	39 – –	– – –	2 2 –	11 – –	9 – –	7 – –	7 9 –	12 – –	6 – –	12 – –

*P-4 HAS BEEN EXTENDED BEYOND THE LOTS ONTO THE NON-BUILDABLE PRESERVATION PARCELS TO SCREEN THE PROPOSED HOUSES FROM THE SCENIC ROADWAY.

LEGEND

SYMBOL	DESCRIPTION
	PROPOSED STORM DRAIN LINE
	PROPOSED DRYWELL
	NON-ROOFTOP DISCONN.
	BOUNDARY/RIGHT OF WAY LINE
B.R.L.	BUILDING RESTRICTION LINE
	PROPOSED CURB
W	PROPOSED WELL
	PROPOSED WELL BOX
	EXISTING 10 FT. CONTOUR
	EXISTING 2 FT. CONTOUR
	PROPOSED SEPTIC FIELD
	25% OR GREATER SLOPES
	15% – 24.99% SLOPES
	EXISTING/PROPOSED TREELINE
463	PASSED PERC
F 329	FAILED PERC
GmA GgA	SOIL TYPE

STREET TREE SCHEDULE

QTY.	SIZE	COMMENTS
ROW LENGTH = 1281' 2562'/40 = 64.05 64 TREES	2 1/2–3" CAL.	40' APART ON PUBLIC R/W (Road 'A')
ROW LENGTH = 1603' 3206'/40 = 80.15 80 TREES	2 1/2–3" CAL.	40' APART ON PUBLIC R/W (Road 'B')

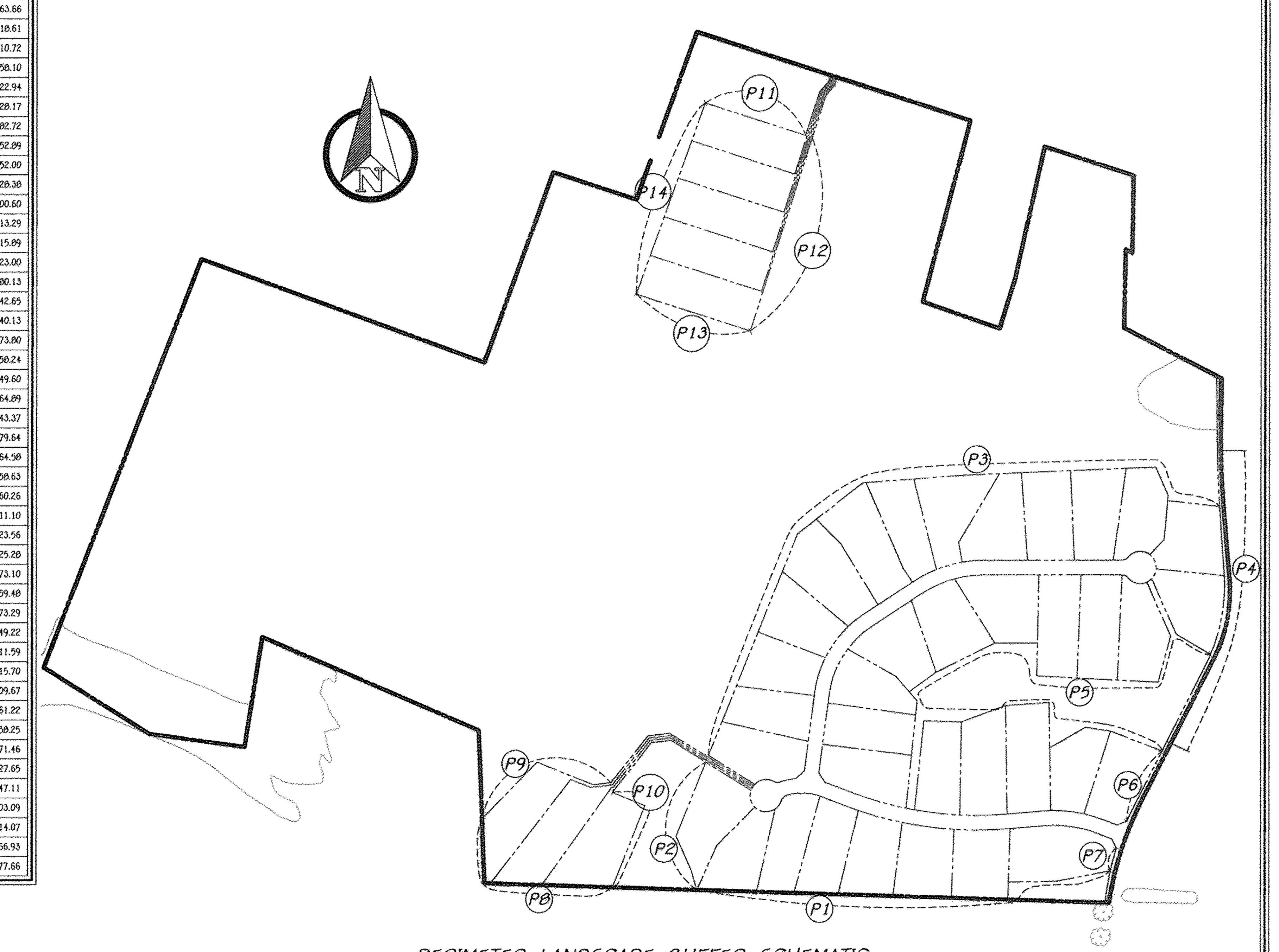
TRASH/RECYCLE PAD LANDSCAPING

LINEAR FEET OF PERIMETER	LOTS 9–11 PAD: 18 l.f.	LOTS 40–44 PAD: 24 l.f.
NUMBER OF SHRUBS PROVIDED:	8	10

NOTES: 1. THE TRASH/RECYCLE PAD LANDSCAPING WILL BE MAINTAINED BY THE USERS OF THE PRIVATE USE-IN-COMMON MAINTENANCE AGREEMENT.
2. THE LANDSCAPING SHALL BE INSTALLED AROUND THE PERIMETER OF THE PAD EXCLUDING THE SIDE ADJACENT TO THE PUBLIC ROAD RIGHT-OF-WAY.
3. THE PERIMETER LANDSCAPING OBLIGATIONS WILL BE FULFILLED AND BE THE RESPONSIBILITY OF THE DEVELOPER FOR THE LANDSCAPING AT THE F-PLAN STAGE.

Perc Point Table

Point #	Elevation	Northing	Easting	Point #	Elevation	Northing	Easting	Point #	Elevation	Northing	Easting
300	552.42	604827.30	1294826.03	349	579.83	605735.13	1293910.39	377	561.27	605419.30	1294296.70
301	550.25	604799.90	1294935.39	350	577.47	605826.46	1293937.05	378	565.04	605399.05	1294212.68
303	551.01	604795.67	1294879.14	351	574.20	605844.39	1294018.13	379	559.04	605353.34	1294275.62
304	548.59	604740.56	1294937.96	352	0.00	605897.93	1293968.49	380	565.54	605368.13	1294166.05
305	551.24	604776.54	1294802.36	353	571.38	605882.67	1294062.19	381	561.32	605320.68	1294217.59
307	548.00	604643.22	1294550.76	354	567.73	605945.43	1294096.82	382	557.54	605302.16	1294283.60
308	549.66	604672.29	1294513.60	355	568.23	605916.70	1294180.94	383	556.58	605260.25	1294276.62
309	555.05	604647.70	1294422.06	356	563.52	606006.68	1294142.84	384	561.81	605275.71	1294153.43
310	554.28	604707.53	1294431.04	357	562.53	605993.70	1294239.54	385	561.55	605193.92	1294216.15
461	547.82	604692.09	1294579.86	358	564.03	605935.43	1294321.95	386	564.67	605162.04	1294177.99
311	559.96	604674.39	1294330.52	359	560.04	606003.83	1294300.80	387	561.71	605119.79	1294270.50
312	562.75	604656.37	1294219.54	360	558.00	606047.38	1294293.46	388	566.80	605130.38	1294163.66
313	564.14	604704.89	1294227.57	361	556.95	606033.96	1294416.55	389	568.08	605068.77	1294218.61
314	563.94	604685.39	1294130.66	362	559.86	605987.57	1294522.65	390	571.56	605006.21	1294210.72
315	561.29	604660.32	1294033.32	363	558.14	606021.82	1294552.75	391	568.30	605004.20	1294258.10
316	564.11	604731.54	1294050.68	364	562.87	605932.88	1294501.83	392	559.01	605117.96	1294322.94
317	0.00	604698.13	1293969.33	365	560.77	605956.68	1294598.65	393	555.38	605215.16	1294328.17
318	560.57	604664.37	1293880.79	366	559.63	605963.46	1294655.53	394	554.13	605158.03	1294382.72
319	563.76	604731.28	1293898.33	443	0.00	605991.57	1294823.58	395	550.98	605182.93	1294452.89
320	561.61	604716.04	1293823.92	444	555.51	605954.19	1294823.15	396	552.00	605109.02	1294452.00
321	557.85	604669.12	1293768.68	445	0.00	605951.90	1294735.79	397	548.62	605126.00	1294528.38
322	563.45	604782.57	1293807.06	446	556.15	606016.39	1294718.72	398	549.73	605058.82	1294600.60
323	550.38	604669.81	1293667.08	447	554.00	606072.27	1294735.09	399	545.85	605149.82	1294613.29
324	543.10	604674.72	1293552.73	448	555.10	606069.49	1294681.61	400	546.26	605214.00	1294615.89
325	545.39	604718.55	1293600.74	438	448.00	606083.13	1295017.09	401	548.77	605283.51	1294623.00
462	557.04	604734.02	1293727.38	439	554.25	605995.82	1294997.06	402	546.04	605248.40	1294680.13
326	542.95	604734.85	1293544.10	440	552.00	606028.13	1294941.40	403	545.08	605293.66	1294742.65
327	548.44	604816.12	1293620.72	441	548.42	606065.88	1294909.27	404	542.93	605215.08	1294740.13
328	543.77	604818.98	1293544.22	442	553.91	605989.92	1294869.45	405	544.01	605108.77	1294773.80
463	545.82	604890.14	1293578.18	435	554.12	606021.79	1295136.31	407	542.24	605149.06	1294858.24
449	554.56	604682.56	1293248.34	437	551.95	606044.38	1295085.50	408	543.24	605113.99	1294949.60
450	554.78	604728.03	1293266.19	430	552.01	605892.11	1295323.45	409	538.91	605173.48	1294964.89
451	558.13	604705.04	1293152.10	431	550.96	605954.63	1295317.61	410	538.64	605120.04	1295043.37
452	557.32	604738.47	1293059.71	432	552.16	605932.34	1295249.18	412	540.20	605048.01	1295079.64
453	556.65	604609.40	1293023.54	433	549.95	605970.31	1295182.70	470	561.12	607417.56	1293764.58
454	0.00	604731.47	1292959.36	434	552.35	605923.34	1295177.39	471	558.89	607444.20	1293658.63
455	0.00	604799.74	1292942.89	428	557.31	605665.62	1295324.62	472	561.13	607392.71	1293660.26
456	548.23	604757.10	1292895.63	429	556.37	605656.15	1295336.97	473/474	561.25	607360.64	1293611.10
457	545.43	604732.19	1292835.03	427	556.95	605571.93	1295280.64	475	566.45	607299.02	1293723.56
458	544.38	604826.99	1292849.61	425	553.02	605526.45	1295223.32	476	565.79	607282.93	1293625.28
460	542.54	604926.84	1292863.03	424	549.80	605486.63	1295121.52	477	564.02	607299.24	1293573.10
331	558.50	605106.45	1293702.29	423	542.95	605377.01	1295114.68	478	568.45	607210.44	1293559.48
332	561.77	605100.03	1293749.83	421	545.86	605427.37	1294990.34	479	574.00	607149.46	1293673.29
333	558.44	605175.39	1293689.56	420	549.86	605510.86	1294995.98	480	572.13	607142.90	1293549.22
334	555.88	605226.38	1293640.69	419	547.56	605452.83	1294923.88	482	575.12	607076.83	1293511.59
464	551.69	605119.62	1293617.76	418	545.89	605390.27	1294861.68	483	569.87	607048.44	1293615.70
335	563.62	605197.92	1293792.35	417	549.89	605456.14	1294852.28	484	569.74	606999.94	1293509.67
336	558.33	605271.40	1293660.38	416	554.01	605531.28	1294835.47	485/486	570.23	606954.67	1293461.22
337	560.68	605274.41	1293716.07	415	550.25	605457.99	1294797.28	487	576.26	606892.02	1293558.25
338	560.96	605337.78	1293691.16	413	549.20	605399.90	1294751.70	489	573.76	606891.21	1293471.46
339	563.63	605345.41	1293741.32	414	556.00	605499.64	1294725.65	488	571.81	606906.07	1293427.65
340	565.29	605351.77	1293785.07	369	563.88	605571.17	1294679.50	490	574.01	606812.36	1293447.11
341	564.04	605408.25	1293709.19	371	566.51	605527.91	1294587.62	491	572.21	606825.09	1293403.09
342	568.11	605439.49	1293772.85	372	569.70	605556.18	1294560.21	492	572.13	606756.63	1293414.07
343	572.00	605511.04	1293821.72	370	568.12	605586.64	1294623.93	493	573.96	606669.61	1293466.93
344	570.68	605543.93	1293763.85	368	569.81	605684.18	1294654.39	494	570.53	606698.56	1293377.66
345	575.77	605624.62	1293833.58	373	567.01	605490.41	1294487.58				
346	579.20	605694.59	1293807.17	374	563.04	605446.84	1294383.98				
347	578.80	605728.18	1293839.82	375	565.42	605484.12	1294336.11				
348	579.48	605760.63	1293861.60	376	559.69	605409.82	1294352.37				



PERIMETER LANDSCAPE BUFFER SCHEMATIC
No Scale

APPROVED FOR PRIVATE WATER AND PRIVATE SEWERAGE SYSTEMS, HOWARD COUNTY HEALTH DEPARTMENT.

COUNTY HEALTH OFFICER — 2/28/2018 DATE

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — 3-22-18 DATE

FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK – 10272 BALTIMORE NATIONAL PIKE
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LISBON, MARYLAND 21765
410-489-7900

STATE OF MARYLAND — ALDO MICHAEL VITUCCI — PROFESSIONAL ENGINEER

Aldo M. Vitucci, P.E. — 2/16/18 Date

"Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly Licensed Professional Engineer under the laws of the State of Maryland, License No. 20748. Expiration Date 2-22-19."

PRELIMINARY EQUIVALENT SKETCH,
REVISED PERCOLATION CERTIFICATION & LANDSCAPE PLAN

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

ZONED: RC-DEO
TAX MAP No. 7 GRID No. 18 &
TAX MAP No. 8 GRID No. 13 PARCEL No. 5
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JANUARY 25, 2018

SP-17-003

I:\2012\12026\dwg\Sketch Preliminary\12026 Sheet 2-4 SP sketch preliminary plan.dwg, SHEET 4, 1:1

LEGEND

SYMBOL	DESCRIPTION
	PROPOSED STORM DRAIN LINE
	PROPOSED DRYWELL (M-5)
	BOUNDARY/RIGHT OF WAY LINE
B.R.L.	BUILDING RESTRICTION LINE
	PROPOSED CURB
	DRYWELL (M-5)
	PROPOSED WELL
	PROPOSED WELL BOX
	EXISTING 10 FT. CONTOUR
	EXISTING 2 FT. CONTOUR
	PROPOSED SEPTIC FIELD
	25% OR GREATER SLOPES
	15% - 24.99% SLOPES
	EXISTING/PROPOSED TREELINE
	NON-ROOFTOP DISCONNECTION

NOTE:
STORMWATER MANAGEMENT FACILITY Nos. 1, 3, 4, 5, 6 & 7 SHALL HAVE AN IMPERVIOUS LINER DUE TO THE CLOSE PROXIMITY TO ADJACENT WELL BOXES.

SEDIMENT CONTROL LEGEND

SYMBOL	DESCRIPTION
—SSF—SSF—SSF—	SUPER-SILT FENCE
—SF—SF—SF—	SILT FENCE
S.C.E.	STABILIZED CONSTRUCTION ENTRANCE
S.I.P. (A)	STANDARD INLET PROTECTION INLET TYPE ('A' or 'B')
L.O.D.	LIMIT OF DISTURBANCE
R.P.S.	REMOVABLE PUMPING STATION
F.B.	FILTER BAG
TYPE A-2	EARTH DIKE

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — 3-22-18 — DATE

MATCH LINE SEE SHEET 6
MATCH LINE SEE SHEET 7
MATCH LINE SEE SHEET 7
MATCH LINE SEE SHEET 6
HERITAGE RIDGE
LINDEN GROVE
10+00 (PUBLIC ACCESS STREET)
DAISY ROAD
Lot 14 41,849 sq.ft.±
Lot 13 40,757 sq.ft.±
Lot 12 48,041 sq.ft.±
Lot 33 42,801 sq.ft.±
Lot 34 47,932 sq.ft.±
Lot 35 44,502 sq.ft.±
Lot 36 54,222 sq.ft.±
Lot 37 55,204 sq.ft.±
Lot 38 42,529 sq.ft.±
Lot 39 48,071 sq.ft.±
Lot 1 60,555 Sq.Ft.±
Lot 2 45,307 Sq.Ft.±
Lot 3 45,730 Sq.Ft.±
Lot 4 46,155 Sq.Ft.±
Lot 5 45,502 Sq.Ft.±
Lot 6 45,204 Sq.Ft.±
Lot 7 44,807 Sq.Ft.±
ESD No. 1 MICRO BIO-RETENTION (M-6) W/IMPERMEABLE LINER
ESD No. 2 MICRO BIO-RETENTION (M-6)
ESD No. 3 MICRO BIO-RETENTION (M-6) W/IMPERMEABLE LINER
ESD No. 5 MICRO BIO-RETENTION (M-6) W/IMPERMEABLE LINER
NON-BUILDABLE PRESERVATION PARCEL 'D'
PRIVATE STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT
PUBLIC STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT
20' PUBLIC DRAINAGE & UTILITY EASEMENT
4'x18' Pad For Mailboxes
Existing Driveway
Existing Well To Be Sealed. (See General Note #49 On Sheet 1)
EX. 12"x18" CMP TO REMAIN
TIE-INTO EXISTING WHITE LINE
PROPOSED SOLID WHITE LINE
EX. HOUSE

Scale: 1" = 50'

FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
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OWNER & DEVELOPER:
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15950 NORTH AVENUE
LISBON, MARYLAND 21765
410-489-7900

Aldo M. Vitucci, P.E. — 1/26/18 — Date

"Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly Licensed Professional Engineer under the laws of the State of Maryland, License No. 20748, Expiration Date 2-22-19."

GRADING, SEDIMENT & EROSION CONTROL PLAN

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

ZONED: RC-DEO
TAX MAP No. 7 GRID No. 18 &
TAX MAP No. 8 GRID No. 13 PARCEL No. 5
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JANUARY 25, 2018
SHEET 5 of 14

SP-17-003

MATCH LINE SEE SHEET 7

MATCH LINE SEE SHEET 5

BUILDABLE PRESERVATION PARCEL 'A' 113,832 Ac.±

BUILDABLE PRESERVATION PARCEL 'A' 113,832 Ac.±

NON BUILDABLE PRESERVATION PARCEL 'C' 4.598 Ac.±

FOREST CONSERVATION EASEMENT No. 6 1.44 Ac.± (planting)

Lot 15 46,295 sq.ft.±

Lot 16 59,550 sq.ft.±

Lot 17 59,737 sq.ft.±

Lot 18 44,714 sq.ft.±

Lot 19 51,702 sq.ft.±

Lot 20 50,370 sq.ft.±

Lot 21 49,720 sq.ft.±

Lot 22 49,939 sq.ft.±

Lot 23 44,701 sq.ft.±

Lot 24 49,037 sq.ft.±

Lot 25 48,522 sq.ft.±

Lot 26 49,343 sq.ft.±

Lot 27 49,680 sq.ft.±

Lot 28 49,255 sq.ft.±

Lot 29 51,117 sq.ft.±

Lot 30 50,850 sq.ft.±

Lot 31 47,141 sq.ft.±

Lot 32 40,570 sq.ft.±

HERITAGE RIDGE L-5 (PUBLIC ACCESS STREET)

DAISY ROAD

ESD No. 16 BIO-RETENTION (F-6)

ESD No. 10 BIO-RETENTION (F-6)

ESD No. 11 BIO-RETENTION (F-6)

ESD No. 7 MICRO BIO-RETENTION (M-6) w/IMPERMEABLE LINER

ESD No. 6 MICRO BIO-RETENTION (M-6) w/IMPERMEABLE LINER

ESD No. 1 BIO-RETENTION (F-6)

S.O.S.T.#1 S.O.S.T.#2 S.O.S.T.#3 S.O.S.T.#4 S.O.S.T.#5 S.O.S.T.#6

TEMPORARY STOCK PILE AREA

12' SWM ACCESS (GRASS)

18" FLEXIBLE PIPE

15" HDPE

18" HDPE

10" HDPE

PRIVATE STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT

PUBLIC STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT

20' PUBLIC DRAINAGE & UTILITY EASEMENT

EX. 70' COLONIAL PIPELINE EASEMENT

EXISTING PIPELINE TRANSMISSION R/W (COLONIAL PIPELINE)

VEHICULAR INGRESS/EGRESS IS RESTRICTED

MODIFIED CURB & GUTTER

SIGN-ADD TOP (R1-1) (TYP.)

PROP. 30' PUBLIC R/W

EX. 15"x18" CMP TO BE REPLACED w/(3)-30" RCCP

N 606,000

E 1,294,000

N 605,400

E 1,295,250

LEGEND

SYMBOL	DESCRIPTION
	PROPOSED STORM DRAIN LINE
	PROPOSED DRYWELL (M-5)
	BOUNDARY/RIGHT OF WAY LINE
B.R.L.	BUILDING RESTRICTION LINE
	PROPOSED CURB
	DRYWELL (M-5)
W	PROPOSED WELL
	PROPOSED WELL BOX
	EXISTING 10 FT. CONTOUR
	EXISTING 2 FT. CONTOUR
	PROPOSED SEPTIC FIELD
	25% OR GREATER SLOPES
	15% - 24.99% SLOPES
	EXISTING/PROPOSED TREELINE
	NON-ROOFTOP DISCONNECTION

NOTE:
STORMWATER MANAGEMENT FACILITY Nos. 1, 3, 4, 5, 6 & 7 SHALL HAVE AN IMPERVIOUS LINER DUE TO THE CLOSE PROXIMITY TO ADJACENT WELL BOXES.

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE 3-22-18

0' 50' 100' 150'
Scale: 1" = 50'

FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE
ELLICOTT CITY, MARYLAND 21042
(410) 461 - 2855

OWNER & DEVELOPER:
HERITAGE LAND DEVELOPMENT
15950 NORTH AVENUE
LISBON, MARYLAND 21765
410-489-7900

Aldo M. Vitucci, P.E. — Date 1/26/18

"Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly Licensed Professional Engineer under the laws of the State of Maryland, License No. 20748, Expiration Date 2-22-19."

GRADING, SEDIMENT & EROSION CONTROL PLAN

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

ZONED: RC-DEO

TAX MAP No. 7 GRID No. 18 &
TAX MAP No. 8 GRID No. 13 PARCEL No. 5
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JANUARY 25, 2018
SHEET 6 of 14

5P-17-003

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TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE 3-22-18

SEDIMENT CONTROL LEGEND

- SUPER-SILT FENCE
- SILT FENCE
- STABILIZED CONSTRUCTION ENTRANCE
- S.I.P. (A) STANDARD INLET PROTECTION, INLET TYPE ('A' or 'B')
- L.O.D. LIMIT OF DISTURBANCE
- R.P.S. REMOVABLE PUMPING STATION
- F.B. FILTER BAG
- TYPE A-2 EARTH DIKE

LEGEND

SYMBOL	DESCRIPTION
	PROPOSED STORM DRAIN LINE
	PROPOSED DRYWELL (M-5)
	BOUNDARY/RIGHT OF WAY LINE
B.R.L.	BUILDING RESTRICTION LINE
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	PROPOSED SEPTIC FIELD
	25% OR GREATER SLOPES
	15% - 24.99% SLOPES
	EXISTING/PROPOSED TREELINE
	NON-ROOFTOP DISCONNECTION

BUILDABLE PRESERVATION PARCEL 'A' 113.832 Ac.±

NON-BUILDABLE PRESERVATION PARCEL 'B' 2.349 Ac.±

FOREST CONSERVATION EASEMENT No. 6 0.51 Ac.± (planting)

FOREST CONSERVATION EASEMENT No. 2 1.90 Ac.± 0.8 Ac.± (planting) 1.10 Ac.± (retention)

Lot 11 60,715 sq.ft.±

Lot 10 61,671 sq.ft.±

Lot 9 63,809 sq.ft.±

Lot 8 54,857 sq.ft.±

MATCH LINE SEE SHEET 5

MATCH LINE SEE SHEET 5

MATCH LINE SEE SHEET 6

PROPOSED 100-YEAR FLOODPLAIN, DRAINAGE AND UTILITY EASEMENT (2.302 Ac.±)

PRIVATE STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT

PRIVATE STORMWATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT

MICRO BIO RETENTION No. 15

EXISTING PIPELINE EASEMENT (COLONIAL PIPELINE)

EX. 12" SD TO REMAIN

EX. 48" CMP REPLACE W/54" RCCP

12' SWM ACCESS (GRASS)

VEHICULAR INGRESS/EGRESS IS OBSTRUCTED

EX. SHED

EX. HOUSE

PP-339562

OH

CATOCTIN WOODS GEORGE V. PRESERVATION PARCEL PLAT NO. 12903 Zoned: RC-DEO

HOWARD COUNTY AGRICULTURAL PRESERVATION EASEMENT 10-86-017 (1986)

N 605,250' E 1,393,000

N 605,250 E 1,393,250

N 604,500 E 1,393,000

PLAN
0' 50' 100' 150'
Scale: 1" = 50'

PLAN
0' 50' 100' 150'
Scale: 1" = 50'

GRADING, SEDIMENT & EROSION CONTROL PLAN

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

ZONED: RC-DEO
TAX MAP No. 7 GRID No. 18 & TAX MAP No. 8 GRID No. 13 PARCEL No. 5
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JANUARY 25, 2018
SHEET 7 of 14

SP-17-003

FISHER, COLLINS & CARTER, INC.
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410-489-7900

STATE OF MARYLAND — ALDO MICHAEL VITUCCI — PROFESSIONAL ENGINEER

Aldo M. Vitucci, P.E. — Date 1/26/18

"Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly Licensed Professional Engineer under the laws of the State of Maryland, License No. 20748, Expiration Date 2-22-19."

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	25% OR GREATER SLOPES
	15% - 24.99% SLOPES
	EXISTING/PROPOSED TREELINE
	NON-ROOFTOP DISCONNECTION

CULVERT DESIGN SUMMARY

Proposed Culvert	Roadway	Inv. In.	Inv. Out	Ex. Pipe Size	Design Storm	Ex. Q	Design Q	Roadway Elev.	Headwater Elev.
(3) 30" RCCP CULVERTS	Daisy Rd. Sta. 19+31±	534.80	533.78	19"x18" CMP	50-YR	70.51	66.29	538.29	537.29
54" RCCP CULVERTS	Daisy Rd. Sta. 7+00±	526.80	526.60	48" CMP	100-YR	113.92	152.66	535.00	533.95

RECOMMENDATIONS:

The culverts are being design on the 10 and 50-year storms pending the classification of the roadways. The requirement of providing 1-foot of freeboard from the design storm headwater elevation to the edge of roadway is a design manual requirement in the Howard County Design Manual Volume I - Storm Drainage and Floodplains. The majority of the culverts will need to be replaced with either multiple culverts or a single pipe culvert that is larger is diameter to obtain the required 1-foot of freeboard. As shown in the chart above in the culvert # column, the proposed pipe information is located there. These culverts vary in size and material type which depends on how much vertical room we have to place the culvert in. Drainage Area 'C''s existing culvert is located well offsite along Daisy Road. This culvert is located 306 feet south of the intersection of Lisbon Grove and Daisy Road intersection. This culvert is located 87'-90' south of the property line. With the development of this site there is not a significant increase in the Q heading to this design point.

Scale: 1" = 50'

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Aldo M. Vitucci, P.E. — 1/26/18 Date

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GRADING, SEDIMENT & EROSION CONTROL PLAN

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

ZONED: RC-DEO
TAX MAP No. 7 GRID No. 18 &
TAX MAP No. 8 GRID No. 13 PARCEL No. 5
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JANUARY 25, 2018
SHEET 8 of 14

SP-17-003

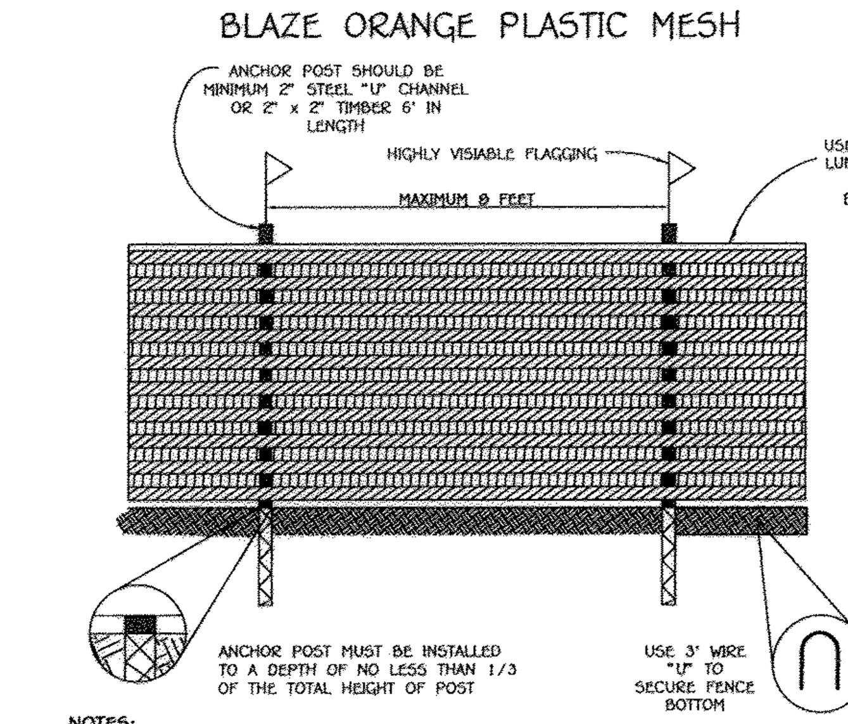
I:\2012\12026\dwg\Sketch Preliminary\12026 Sheet 5-8 SP sediment control plan.dwg, SHEET 8, 1/25/2018 3:18:36 PM, 1:1

MATCH LINE SEE SHEET 10

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR 3-22-18
DATE

BLAZE ORANGE PLASTIC MESH



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

SOILS LEGEND

SOIL	NAME	CLASS
BrD	Brinklow channery loam, 15 to 25 percent slopes	B
GgA	Glenelg loam, 0 to 3 percent slopes	B
GgB	Glenelg loam, 3 to 8 percent slopes	B
GgC	Glenelg loam, 8 to 15 percent slopes	B
GmA *	Glenville silt loam, 0 to 3 percent slopes	C
GmB *	Glenville silt loam, 3 to 8 percent slopes	C
GnB *	Glenville-Baile silt loams, 0 to 8 percent slopes	C
MaC	Manor loam, 8 to 15 percent slopes	B

NOTES:
* Hydric soils and/or contains hydric inclusions
** May contain hydric inclusions
† Generally only within 100-year floodplain areas

Construction Period Protection Program

A. Forest Protection Techniques

1. Soil Protection Area (Critical Root Zone)

The soil protection area, or critical root zone, of a tree is that portion of the soil column where most of its roots may be found. The majority of roots responsible for water and nutrient uptake are located just below the soil surface.

The limit of disturbance (LOD) line depicted on the plan shows the proposed extent of construction activities. Eco-Science Professionals, or another qualified professional designated by the developer, will assist in the field flagging of the LOD to ensure that the Critical Root Zone for the Forest Retention Area is determined in accordance with the in-Field Edge Determination Guidelines in Appendix B. Eco-Science Professionals, or another qualified professional, will also assess the condition of the new forest edge to determine if selective thinning or pruning is needed to improve the condition of the edge.

2. Fencing and Signage

All forest retention areas will be protected from unauthorized intrusion by appropriate signage and fencing. Signage and fencing will be installed prior to any construction activity. Installation of these devices will be supervised by Eco-Science Professionals or another qualified professional. Fencing will placed along all LOD lines that occur within 35 feet of existing treelines. Signage will be placed along the edge of the FCE every 100 feet. Fencing will consist of blaze orange mesh fence or super silt fence. See Forest Conservation Plan for standard specifications.

B. Pre-Construction Meeting

Upon staking of limits of disturbance and installation of all signage, a pre-construction meeting will be held between the developer, contractor and appropriate County inspector. The purpose of the meeting will be to verify that all tree protection measures outlined in the FCP are in place, that all sediment control is in order, and to notify the contractor of possible penalties for non-compliance with the FCP.

C. Storage Facilities/Equipment Cleaning

All equipment storage, parking, sanitary facilities, material stockpiling, etc. associated with construction of the project will be restricted to those areas shown within the limit of disturbance. Meaning of equipment will be prohibited from all forest retention areas. Wastewater resulting from equipment cleaning will be controlled to prevent runoff into wetlands, streams and other environmentally sensitive areas.

D. Sequence of Construction

The following timetable represents the proposed timetable for construction of the proposed project. The construction start date for this project has not been formalized. The actual project start date is predicated on the issuance of all necessary permits and approvals for the project. The items outlined in the Forest Conservation Plan will be enacted upon commencement of the project.

Below find a sequence of construction.

1. Install all tree protection signage, fencing, and sediment control devices.
2. Hold pre-construction meeting between developer, contractor and County inspector.
3. Grade site and construct improvements. Stabilize all disturbed areas in accordance with grading plan.
4. Remove sediment control. Replace any forest retention signage in poor condition.
5. Hold post-construction meeting with County inspectors to assure compliance with FCP.

E. Construction Monitoring

Eco-Science Professionals, or another qualified professional designated by the developer, will monitor construction of the project to ensure that all activities are in compliance with the Forest Conservation Plan. This will include inspections to ensure that signage is properly maintained and that no unauthorized intrusions have been made into forest retention areas.

F. Activities Permitted During Construction

The forest conservation plan will allow the following activities within forest resources during the construction phase of the project:

1. Passive recreation (birdwatching, hiking, etc.)

These activities will not damage or negatively impact the forest resources on the property.

G. Post-Construction Meeting

Upon completion of construction, Eco-Science Professionals, or another qualified professional designated by the developer, will notify the County that construction has been completed and arrange for a post-construction meeting to review the project site. The meeting will allow the County inspector to verify that all Forest Conservation Easement areas have been properly retained and that all post construction protection measures (permanent signage) have been installed.

Post-Construction Management Plan

The post-construction management plan will further ensure that all Forest Conservation Easement Areas are maintained. The developer will be responsible for implementation of the post-construction management plan.

The following items will be incorporated into the plan for the subject property:

A. Signage

Signage indicating the limits of the forest retention areas shall be maintained.

SITE DATA

A. TOTAL AREA OF THIS SUBMISSION = 176.680 ac.±.
B. PRESENT ZONING DESIGNATION = RC-DEO
C. PROPOSED USE: RESIDENTIAL SUBDIVISION (SINGLE FAMILY DETACHED)
D. TOTAL AREA OF FLOODPLAIN: 6.204 Ac.
E. TOTAL AREA OF SLOPES: 25% or GREATER = 0.60 Ac.
15%-24.99% = 1.94 Ac.
F. NET TRACT AREA = 169.876 Ac±
(TOTAL SITE AREA - FLOODPLAIN - STEEP SLOPES AREA)
G. TOTAL AREA OF WETLANDS (INCLUDING BUFFER) = 1.57 Ac±
H. TOTAL AREA OF STREAMS (INCLUDING BUFFER) = 7.84 Ac±
I. TOTAL AREA OF EXISTING FOREST = 4.3 Ac.±
J. NO SPECIMEN TREES/CHAMPION TREES ARE PRESENT OUTSIDE OF THE EXISTING FOREST LIMITS. BECAUSE NO FOREST CLEARING IS PROPOSED, SPECIMEN TREE DATA WAS NOT COLLECTED.

Wetland Data

Wetland system	Cowardin classification	Dominant vegetation
A-1	LGO1A/C	reed canary grass and jewelweed
A-2	LGO1A/C	reed canary grass, false nettle, jewelweed and arrowwood.
B	PFO1A/C	Red Maple, Spicebush, Winterberry, arrowwood, skunk cabbage, false nettle and jewelweed.
C	PFO1A/C	jewelweed and Silver Maple.

FOREST STAND ANALYSIS TABLE

KEY	TYPE OF COMMUNITY	AREA	SOIL INFORMATION: SOIL TYPE	SOIL INFORMATION: TYPICAL FOREST COVER	SOIL INFORMATION: WOODLAND SUITABILITY INDEX	SOIL INFORMATION: HABITAT VALUE	EXISTING VEGETATION (Type and approx. %)	STAND CHARACTERISTICS: SIZE AVG. DIAM	STAND CHARACTERISTICS: AGE	STAND CHARACTERISTICS: GENERAL CONDITIONS	FOREST AREA IN SENSITIVE ENVIRONMENTS
A	Successional	1.10 Ac	GmB	Mixed Hardwoods	80-90	Good	Acer Saccharinum 25% Acer Rubrum 20% Morus Alba 15% Prunus Serofina 20%	6-14	30-40	Fair high invasive cover	1.16 ± buffers
B	Oak/Poplar	3.20 Ac	BrD Co	Oak/Poplar water tolerant Hardwoods	68-90 90-100	Good Good	Liriodendron Tulipfera 70% Acer Rubrum 10% Prunus Serofina 10% Quercus Alba 5% Nyssa Sylvatica 10%	8-20	40-60	Good	3.14 ± buffers and slopes

0' 100' 150' 200'
Scale: 1" = 100'

JUSTIFICATION FOR FOREST EASEMENT PLACEMENT

THE PROPOSED FOREST CONSERVATION EASEMENT AREAS ARE LOCATED WITHIN PRIORTY AREAS WHICH CONSIST OF WETLANDS, STREAMS, THEIR BUFFERS AND/OR FLOODPLAIN. THESE AREAS ARE LOCATED IN F.C.E. #1 THRU #4. THE REMAINING EASEMENT AREAS (F.C.E. #5 & #6) ARE PLACED TO HELP SCREEN THE PROPOSED HOUSES FROM THE EXISTING ROADWAYS.

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Eco-Science Professionals, Inc.
CONSULTING ECOLOGISTS

MD DNR Qualified Professional
USACOE Wetland Delineator
Certification # WDCP93MD0610044B
JOHN P. CANOLES 3/22/18

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STATE OF MARYLAND ALDO MICHAEL VITUCCI PROFESSIONAL ENGINEER

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PRELIMINARY FOREST CONSERVATION PLAN

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'
ZONED: RC-DEO
TAX MAP No. 7 GRID No. 18 &
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4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
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SHEET 9 of 14

SP-17-003

Planting Notes:

Planting units defined by the spacing requirements established in the FCA Manual. One plant unit is defined as 1 seedling or whip without shelter. The Manual states that 700 seedlings/whips without shelters are required per acre, or 350 whips w/shelters, or 200 1" caliper trees, or 100 2" caliper trees. By conversion it has been determined that a seeding or whip without shelter = 1 unit, whip with shelter = 2 units, 1" caliper tree = 3.5 units and 2" caliper tree = 7 units. The use of plant units simplifies the plant density calculations when mixing stock size.

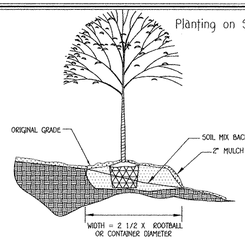
** – These species should not be planted within the wetland limits.

1" caliper trees should be staggered along the outer perimeter of the planting area to serve as demarcation of the boundary. The trees should be no closer than 15 Foot Spacing. Whip spacing to be placed on 11 foot centers, shelters will be required per Howard County policy.

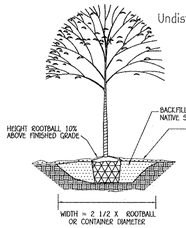
Planting shall be made in a curvilinear fashion along contour. The planting should avoid a grid appearance but should be spaced to facilitate maintenance Multiflora rose/heavy brush removal/control may be required prior to installation of planting.

All whips are required to be installed with tree shelters per Howard County FCA requirements.

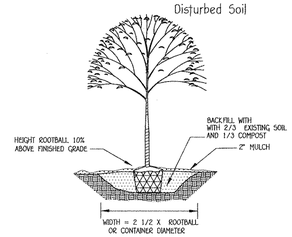
Planting on Slope



Undisturbed Soil



Disturbed Soil



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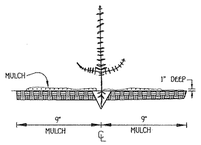
Seeding and Whip Planting Specification



PATTERN SPACING DIAGRAM

* – whip w/shelter 11' on center spacing
\# – 1" caliper tree 15' on center spacing
Species shall be randomly intersperced, rows should be planting along contours

0' 100' 150' 200'
Scale: 1" = 100'

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TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — 2-22-18 DATE

FCE Planting Area # 1 - 2.59 acres

Planting units required: 1814 (907 whips)
Planting units provided: 1814 (907 whips)

Qty	Species	Size	Spacing	Total FCA Units
120	Acer rubrum - Red maple	2-3' whip	11' o.c.	
120	Cercis canadensis - Red bud	2-3' whip	11' o.c.	
117	Cornus florida - Flowering dogwood	2-3' whip	11' o.c.	
110	Liriodendron tulipifera - Tulip poplar	2-3' whip	11' o.c.	
110	Prunus serotina - Black cherry	2-3' whip	11' o.c.	
110	Robinia pseudo-acacia - Black locust	2-3' whip	11' o.c.	
110	Quercus alba - White oak	2-3' whip	11' o.c.	
110	Viburnum prunifolium - Blackhaw	2-3' whip	11' o.c.	
907 Total whip plantings (2 planting units per tree) =				1814 Total FCA unit credit

WHIPS w/shelters = 350/ACRE = 350 x 2.59 AC. = 906.5 WHIPS
2 Planting units = 1 Whip

FCE Planting Area # 2 - 0.80 acres

Planting units required: 560 (280 whips)
Planting units provided: 560 (280 whips)

Qty	Species	Size	Spacing	Total FCA Units
35	Acer rubrum - Red maple	2-3' whip	11' o.c.	
35	Cercis canadensis - Red bud	2-3' whip	11' o.c.	
35	Cornus florida - Flowering dogwood	2-3' whip	11' o.c.	
35	Liriodendron tulipifera - Tulip poplar	2-3' whip	11' o.c.	
35	Prunus serotina - Black cherry	2-3' whip	11' o.c.	
35	Robinia pseudo-acacia - Black locust	2-3' whip	11' o.c.	
35	Quercus alba - White oak	2-3' whip	11' o.c.	
35	Viburnum prunifolium - Blackhaw	2-3' whip	11' o.c.	
280 Total whip plantings (2 planting units per tree) =				560 Total FCA unit credit

WHIPS w/shelters = 350/ACRE = 350 x 0.80 AC. = 280 WHIPS
2 Planting units = 1 Whip

FCE Planting Area # 3 - 2.69 acres

Planting units required: 1884 (942 whips)
Planting units provided: 1884 (942 whips)

Qty	Species	Size	Spacing	Total FCA Units
125	Acer rubrum - Red maple	2-3' whip	11' o.c.	
126	Cercis canadensis - Red bud	2-3' whip	11' o.c.	
126	Cornus florida - Flowering dogwood	2-3' whip	11' o.c.	
125	Liriodendron tulipifera - Tulip poplar	2-3' whip	11' o.c.	
110	Prunus serotina - Black cherry	2-3' whip	11' o.c.	
110	Robinia pseudo-acacia - Black locust	2-3' whip	11' o.c.	
110	Quercus alba - White oak	2-3' whip	11' o.c.	
110	Viburnum prunifolium - Blackhaw	2-3' whip	11' o.c.	
942 Total whip plantings (2 planting units per tree) =				1884 Total FCA unit credit

WHIPS w/shelters = 350/ACRE = 350 x 2.69 AC. = 941.5 WHIPS
2 Planting units = 1 Whip

FCE Planting Area # 4 - 1.56 acres

Planting units required: 1092 (546 whips)
Planting units provided: 1092 (546 whips)

Qty	Species	Size	Spacing	Total FCA Units
70	Acer rubrum - Red maple	2-3' whip	11' o.c.	
70	Cercis canadensis - Red bud	2-3' whip	11' o.c.	
70	Cornus florida - Flowering dogwood	2-3' whip	11' o.c.	
70	Liriodendron tulipifera - Tulip poplar	2-3' whip	11' o.c.	
70	Prunus serotina - Black cherry	2-3' whip	11' o.c.	
70	Robinia pseudo-acacia - Black locust	2-3' whip	11' o.c.	
66	Quercus alba - White oak	2-3' whip	11' o.c.	
60	Viburnum prunifolium - Blackhaw	2-3' whip	11' o.c.	
546 Total whip plantings (2 planting units per tree) =				1092 Total FCA unit credit

WHIPS w/shelters = 350/ACRE = 350 x 1.56 AC. = 546 WHIPS
2 Planting units = 1 Whip

FCE Planting Area # 5 - 3.19 acres

Planting units required: 2234 (1117 whips)
Planting units provided: 2234 (767 whips and 200 trees)

Qty	Species	Size	Spacing	Total FCA Units
100	Acer rubrum - Red maple	1" cal.	15' o.c.	
100	Quercus alba - White oak	1" cal.	15' o.c.	
200 Total 1" caliper trees (3.5 planting units per tree) =				700 Total FCA unit credit
75	Acer rubrum - Red maple	2-3' whip	11' o.c.	
75	Cercis canadensis - Red bud	2-3' whip	11' o.c.	
117	Cornus florida - Flowering dogwood	2-3' whip	11' o.c.	
100	Liriodendron tulipifera - Tulip poplar	2-3' whip	11' o.c.	
100	Prunus serotina - Black cherry	2-3' whip	11' o.c.	
100	Robinia pseudo-acacia - Black locust	2-3' whip	11' o.c.	
100	Quercus alba - White oak	2-3' whip	11' o.c.	
100	Viburnum prunifolium - Blackhaw	2-3' whip	11' o.c.	
767 Total whip plantings (2 planting units per tree) =				1534 Total FCA unit credit
Total Unit Credit			(1534 + 700)	2234

1" CAL. TREES = 200/ACRE (200 TREES/200 = 1.00 AC.)
WHIPS w/shelters = 350/ACRE = 350 x 2.19 AC. = 766.5 WHIPS
3.5 Planting units = 1 - 1" Cal. Tree
2 Planting units = 1 Whip

FCE Planting Area # 6 - 1.44 acres

Planting units required: 1008 (504 whips)
Planting units provided: 1008 (329 whips and 100 trees)

Qty	Species	Size	Spacing	Total FCA Units
50	Acer rubrum - Red maple	1" cal.	15' o.c.	
50	Quercus alba - White oak	1" cal.	15' o.c.	
100 Total 1" caliper trees (3.5 planting units per tree) =				350 Total FCA unit credit
30	Acer rubrum - Red maple	2-3' whip	11' o.c.	
30	Cercis canadensis - Red bud	2-3' whip	11' o.c.	
49	Cornus florida - Flowering dogwood	2-3' whip	11' o.c.	
50	Liriodendron tulipifera - Tulip poplar	2-3' whip	11' o.c.	
50	Prunus serotina - Black cherry	2-3' whip	11' o.c.	
40	Robinia pseudo-acacia - Black locust	2-3' whip	11' o.c.	
40	Quercus alba - White oak	2-3' whip	11' o.c.	
40	Viburnum prunifolium - Blackhaw	2-3' whip	11' o.c.	
329 Total whip plantings (2 planting units per tree) =				658 Total FCA unit credit
Total Unit Credit			(658 + 350)	1008

1" CAL. TREES = 200/ACRE (100 TREES/200 = 0.50 AC.)
WHIPS w/shelters = 350/ACRE = 350 x 0.94 AC. = 329 WHIPS
3.5 Planting units = 1 - 1" Cal. Tree
2 Planting units = 1 Whip

PRELIMINARY FOREST CONSERVATION PLAN

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

ZONED: RC-DEO
TAX MAP No. 7 GRID No. 19 & TAX MAP No. 8 GRID No. 13 PARCEL No. 5
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JANUARY 25, 2018
SHEET 10 of 14

SP-17-003

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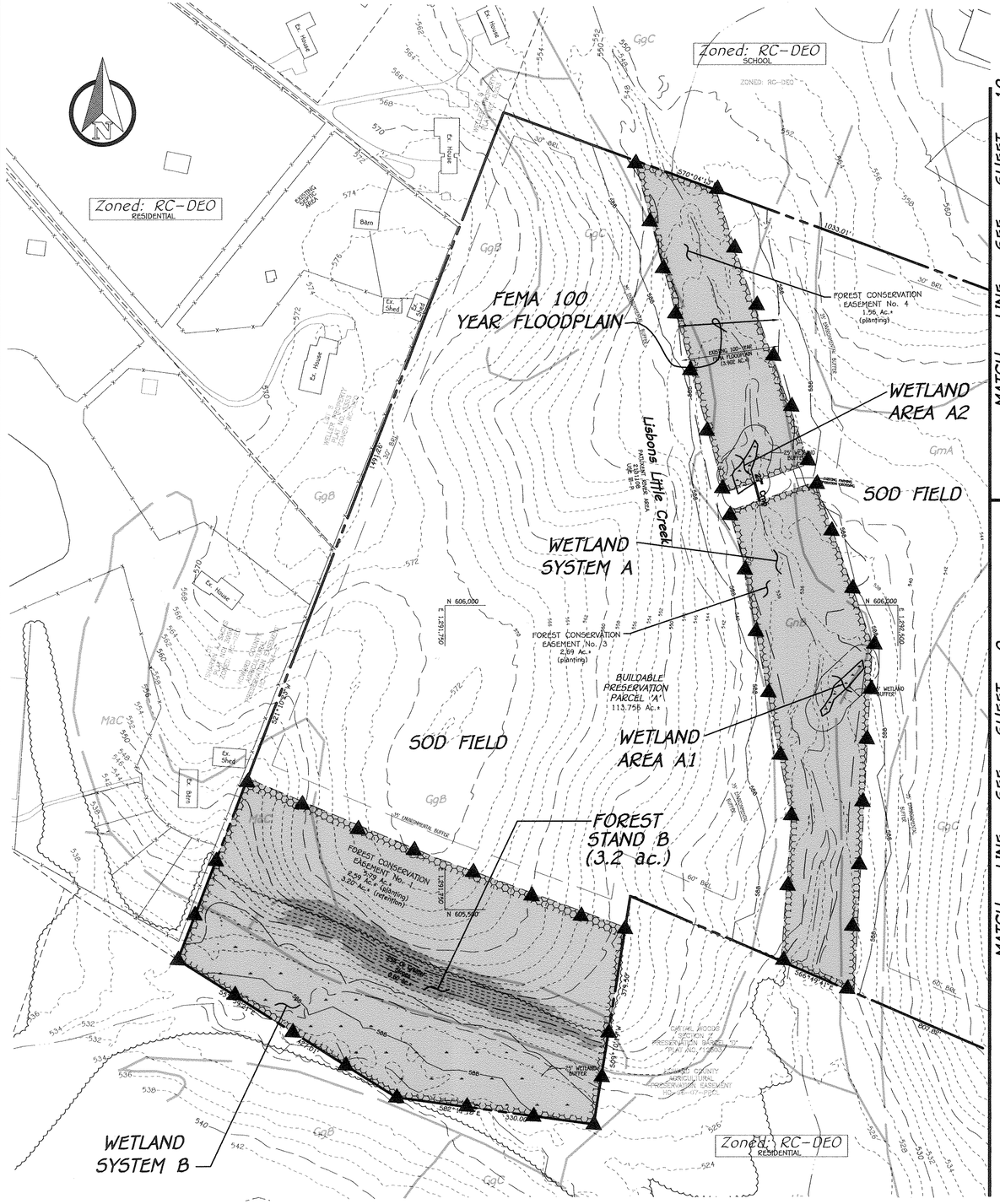


FOREST CONSERVATION WORKSHEET

NET TRACT AREA	ACRES
A. TOTAL TRACT AREA	176.68
B. DEDUCTIONS (CRITICAL AREA, AREA RESTRICTED BY LOCAL OR PROGRAM) (FLOODPLAIN AREA)	6.20
C. NET TRACT AREA - NET TRACT AREA = TOTAL TRACT (A) - DEDUCTIONS (B)	80.23
C.1. FARMABLE AREA - (80.25 ac. outside floodplain)	80.25
LAND USE CATEGORY: MEDIUM DENSITY RESIDENTIAL	
D. AFFORESTATION THRESHOLD (NET TRACT AREA (C) x 20%) 82.23 ACRES REMAINING	16.45
E. CONSERVATION THRESHOLD (NET TRACT AREA (C) x 25%) 82.23 ACRES REMAINING	20.56
EXISTING FOREST COVER	
F. EXISTING FOREST COVER WITHIN THE NET TRACT AREA	4.30
G. AREA OF FOREST ABOVE CONSERVATION TRESHOLD	0
IF THE EXISTING FOREST COVER (F) IS GREATER THAN THE CONSERVATION TRESHOLD (E), THEN G = F - E; OTHERWISE G = 0.	
BREAKEVEN POINT	
H. BREAKEVEN POINT (AMOUNT OF FOREST THAT MUST BE RETAINED SO THAT NO MITIGATION IS REQUIRED)	4.30
(1) IF THE AREA OF FOREST ABOVE CONSERVATION TRESHOLD (G) IS GREATER THAN 0, THEN H = (0.2 x THE AREA OF FOREST ABOVE CONSERVATION TRESHOLD (G)) + THE CONSERVATION TRESHOLD (E);	
(2) IF THE AREA OF FOREST ABOVE CONSERVATION TRESHOLD (G) IS EQUAL TO 0, THEN H = EXISTING FOREST COVER (F)	
I. FOREST CLEARING PERMITTED WITHOUT MITIGATION	0
I = EXISTING FOREST COVER (F) - BREAKEVEN POINT (H)	
PROPOSED FOREST CLEARING	
J. TOTAL AREA OF FOREST TO BE CLEARED	0.06
K. TOTAL AREA OF FOREST TO BE RETAINED	4.24
K = EXISTING FOREST COVER (F) - FOREST TO BE CLEARED (J)	
PLANTING REQUIREMENTS	
IF THE TOTAL AREA OF FOREST TO BE RETAINED (K) IS AT OR ABOVE THE BREAKEVEN POINT (H), NO PLANTING IS REQUIRED, AND NO FURTHUR CALCULATIONS ARE NECESSARY (L=0, M=0, N=0, P=0, Q=0, R=0).	
OTHERWISE, CALCULATE THE PLANTING REQUIREMENT(S) AS FOLLOWS:	
L. REFORESTATION FOR CLEARING ABOVE THE CONSERVATION TRESHOLD	0
(1) IF THE TOTAL AREA OF FOREST TO BE RETAINED (K) IS GREATER THAN THE CONSERVATION TRESHOLD (E), THEN L = THE AREA OF FOREST TO BE CLEARED (J) x 0.25;	
(2) IF THE FOREST TO BE RETAINED (K) IS LESS THAN OR EQUAL TO THE CONSERVATION TRESHOLD (E), THEN L = AREA OF FOREST ABOVE CONSERVATION TRESHOLD (G) x 0.25	
M. REFORESTATION FOR CLEARING BELOW THE CONSERVATION TRESHOLD	0
(1) IF EXISTING FOREST COVER (F) IS GREATER THAN THE CONSERVATION TRESHOLD (E) AND THE FOREST TO BE RETAINED (K) IS LESS THAN OR EQUAL TO THE CONSERVATION TRESHOLD (E), THEN M = 2.0 x (CONSERVATION TRESHOLD (E) - FOREST TO BE RETAINED (K)	
(2) IF EXISTING FOREST COVER (F) IS LESS THAN OR EQUAL TO THE CONSERVATION TRESHOLD (E), THEN M = 2.0 x FOREST TO BE CLEARED (J)	
N. CREDIT FOR RETENTION ABOVE THE CONSERVATION TRESHOLD	0
IF THE AREA OF FOREST TO BE RETAINED (K) IS GREATER THAN THE CONSERVATION TRESHOLD (E), THEN N = E - F; OTHERWISE N = 0	
P. TOTAL REFORESTATION REQUIRED P = L + M - N	0
Q. TOTAL AFFORESTATION REQUIRED	
IF EXISTING FOREST COVER (F) IS LESS THAN THE AFFORESTATION TRESHOLD (D), THEN Q = AFFORESTATION TRESHOLD (D) - EXISTING FOREST COVER (F)	12.27
R. TOTAL PLANTING REQUIREMENT R = P + Q	12.27

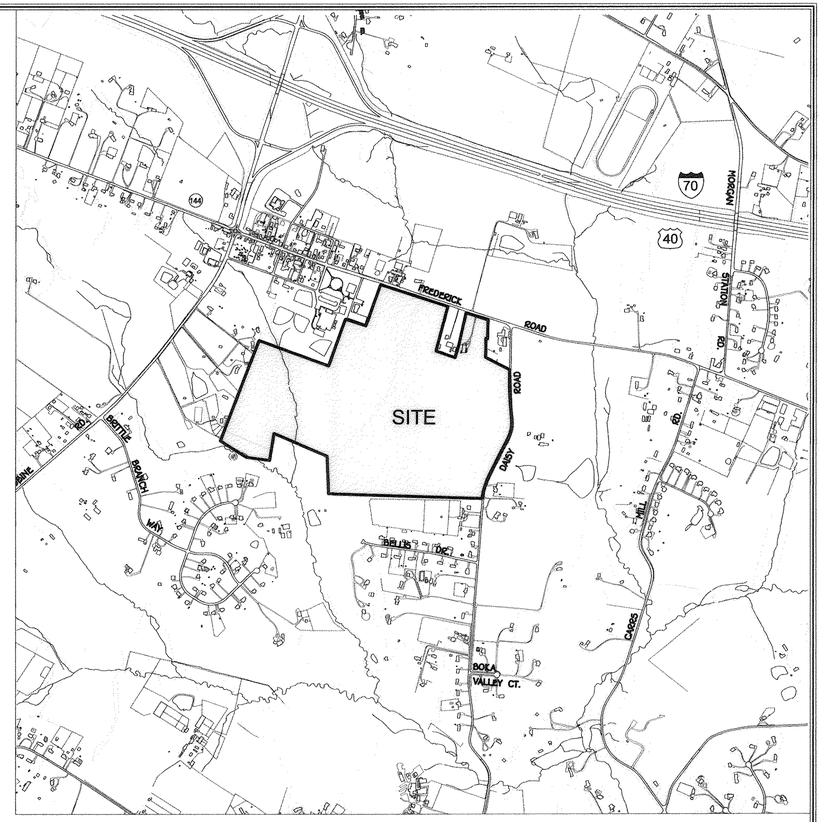
NOTE:

THE FOLLOWING DEDUCTIONS ARE ALLOWED WITHIN THE CALCULATION OF THE FOREST CONSERVATION WORKSHEET:

1) *FLOODPLAIN = 6.20 Ac.±*
2) *FARMABLE AREA = 88.25 Ac.±*
3) *TOTAL DEDUCTIONS = 94.45 Ac.±*
4) *NET TRACT AREA = 82.23 Ac.±*
5) *FOREST RETENTION = 4.24 Ac. ±*
6) *FOREST CONSERVATION PLANTING = 12.27 Ac.±*

LEGEND

SYMBOL	DESCRIPTION
	PROPOSED STORM DRAIN LINE
	PROPOSED DRYWELL (M-5)
	BOUNDARY/RIGHT OF WAY LINE
B.R.L.	BUILDING RESTRICTION LINE
	PROPOSED CURB
	DRYWELL (M-5)
W	PROPOSED WELL
	PROPOSED WELL BOX
	EXISTING 10 FT. CONTOUR
	EXISTING 2 FT. CONTOUR
	PROPOSED SEPTIC FIELD
	25% OR GREATER SLOPES
	15% - 24.99% SLOPES
	EXISTING/PROPOSED TREELINE



VICINITY MAP

0' 1000' 1500' 2000'
Scale: 1" = 1000'

FOREST CONSERVATION EASEMENT

UNAUTHORIZED DISTURBANCE OF VEGETATION IS PROHIBITED. VIOLATORS SUBJECT TO PENALTIES UNDER THE HOWARD COUNTY FOREST CONSERVATION ACT OF 1991.

TREES FOR YOUR FUTURE

15" MINIMUM

11" MINIMUM

ON-SITE SIGNAGE

SIGNS SHALL BE IN PLACE FOR PERPETUITY

NOTES:

1. No rare, threatened or endangered species, or their habitats, were observed on the property.
2. Surrounding land use is primarily low density residential development and agriculture. Commercial development and high density residential is present in the nearby town of Lisbon.
3. The site is located within the Lisbons Little Creek/Cattail Creek drainage of the Patuxent River watershed (02-13-11). This section of the watershed is classified as a Use III-P.
4. No historic elements or cemeteries are known to occur on the property.
5. 100 year floodplain is present on the property. Per the FEMA mapping & floodplain study, floodplain occupies 6.204 acres of the site.
6. Steep slopes (25% and greater) are present on the site.
7. A total of 4.3 acres of forest is present on the net tract area of the property. this forest is within and adjacent to steep slopes and is a high priority for retention. Approximately 2 acres of forest is present within 100 feet of the site.
8. No specimen trees are present outside of the existing forest limits. Because no forest clearing is proposed, specimen tree data was not collected.
9. An underground gas transmission line easement is present on the site. This easement occupies approximately 4.9 acres of the property.
10. The Forest Conservation Requirements Per Section 16.1200 Of The Howard County Code And Forest Conservation Manual For This Subdivision Will Be Fulfilled By 4.24 Ac.± Of On-site Credited Retention And 12.27 Ac.± Of On-site Afforestation. There Is No Surety For Forest Retention. Surety For On-site Planting Is $267,241.00, (12.27 Ac. X 43,560 Sq.ft. X $0.50).

Forest Stand Delineation Narrative

The subject property is located in the southwest corner of the intersection of Frederick and Daisy Roads in the Lisbon section of Howard County, Maryland. The property is shown on tax map 8 as parcel 5. The property encompass 176.68 acres of land
The majority of the site is maintained as crop field. At the time of our visit the site the fields were being used to grow soybeans and sod. An underground gas transmission line bisects the property.
Forest resources on the property are limited. A small successional forest community, Stand A, is present in a swale located in the northern eastern corner of the site and a larger mature community, Stand B, is present along steep slopes and stream valley in the southwest corner of the property.
Stand A is dominated by silver maple, red maple, mulberry and black cherry. The canopy trees are mixed age. The shrub layer includes a high percentage of invasive species including Japanese barberry and multiflora rose. Poison ivy, Japanese honeysuckle and Virginia creeper are also present in the area. This isolated patch of forest occupies approximately 1.1 acres of the site. This forest is associated with a wetland/stream system and associated buffers.
Stand B is a tulip poplar dominated community that includes black cherry, red maple as common canopy associates. Black gum is present in the understory. The shrub layer is heavily influenced by invasive species including barberry, multiflora rose, but also contains spicebush, arrowwood and blackhaw. The canopy trees are generally 10-20 inch diameter with scattered larger individuals. This community occurs along steep slopes and into a stream valley along the property boundary. In wetland and stream areas in the valley bottom red maple is the most common canopy species. This stand occupies approximately 3.2 acres onsite. This community does extend offsite but is the overall forest patch is isolated within the agricultural and

As indicated, the site also contains wetland and stream resources. Three distinct resource areas were identified during our field review. All of these areas are within the Lisbons Little Creek watershed which is part of the Use III-P watershed of Cattail Creek.. This system is part of the Brighton Dam/Patuxent

System A is the mainstem of Lisbons Little Creek. This stream cuts across the western end of the property. The perennial stream is deeply incised but does have some adjacent wetland development along seeps that have not been disturbed by past agricultural practices. Wetland Area A1 is dominated by reed canary grass. Though native, this species overwhelms riparian areas and wetlands, particularly areas disturbed by agriculture and other land uses. Jewelweed was also noted in the wetland. A stone foundation was present at the head of the system, this may suggest that a springhouse was once present in this area. Wetland Area A2 has developed within a depression behind a farm crossing of the stream. It appears that floodflows back up into this area causing extended innundation. Reed canary grass, false nettle, jewelweed and arrowwood are present in this portion of the system.
System B includes a stream and wetland complex in the southwestern corner of the site, associated with forest stand B. A broad wetland terrace is present along the base of the steep slopes The wetlands occupy most of the streamside terrace. Red maple, spicebush, winterberry and arrowwood are common woody plants in the wetland. Skunk cabbage, false nettle, and jewelweed are common herbaceous species. This system was field flag with flag line 1-37.
System C is a small headwater wetland seep located within forest stand A in the northeast corner of the site. A deeply incised stream channel has developed as the result of bed and heddcut erosion caused by concentrated surface water flows through the area. The stream channel was flowing at the time of our field review. Though the weak flow would suggest that it could be intermittent in nature, we have defined it as a perennial stream for the purpose of this report. Additional monitoring may prove it to be intermittent. Adjacent wetland development is present around the stream head and on terraces above the stream channel. In these areas jewelweed is common. Silver maple is also present along the streambanks. An upland drainageway extends upslope from the groundwater fed stream channel. this drainageway received substantial flows from the adjacent farm fields. A culvert passes the flows under Daisy Road.

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE 3-22-18

FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTENNIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE
ELLICOTT CITY, MARYLAND 21042
(410) 461 - 2855

Eco-Science Professionals, Inc.
CONSULTING ECOLOGISTS

MD DNR Qualified Professional
USACOE Wetland Delineator
Certification # WD-93MD06100448
JOHN P. CANOLES 3/23/18

OWNER & DEVELOPER:
HERITAGE LAND DEVELOPMENT
15950 NORTH AVENUE
LISBON, MARYLAND 21765
410-489-7900

STATE OF MARYLAND — ALDO MICHAEL VITUCCI — No. 20748 — REGISTERED PROFESSIONAL ENGINEER

Aldo M. Vitucci, P.E. — Date 4/26/18

"Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly Licensed Professional Engineer under the laws of the State of Maryland, License No. 20748, Expiration Date 2-22-19."

PRELIMINARY FOREST CONSERVATION PLAN

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

ZONED: RC-DEO
TAX MAP No. 7 GRID No. 18 &
TAX MAP No. 8 GRID No. 13 PARCEL No. 5
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JANUARY 25, 2018
SHEET 11 of 14

SP-17-003

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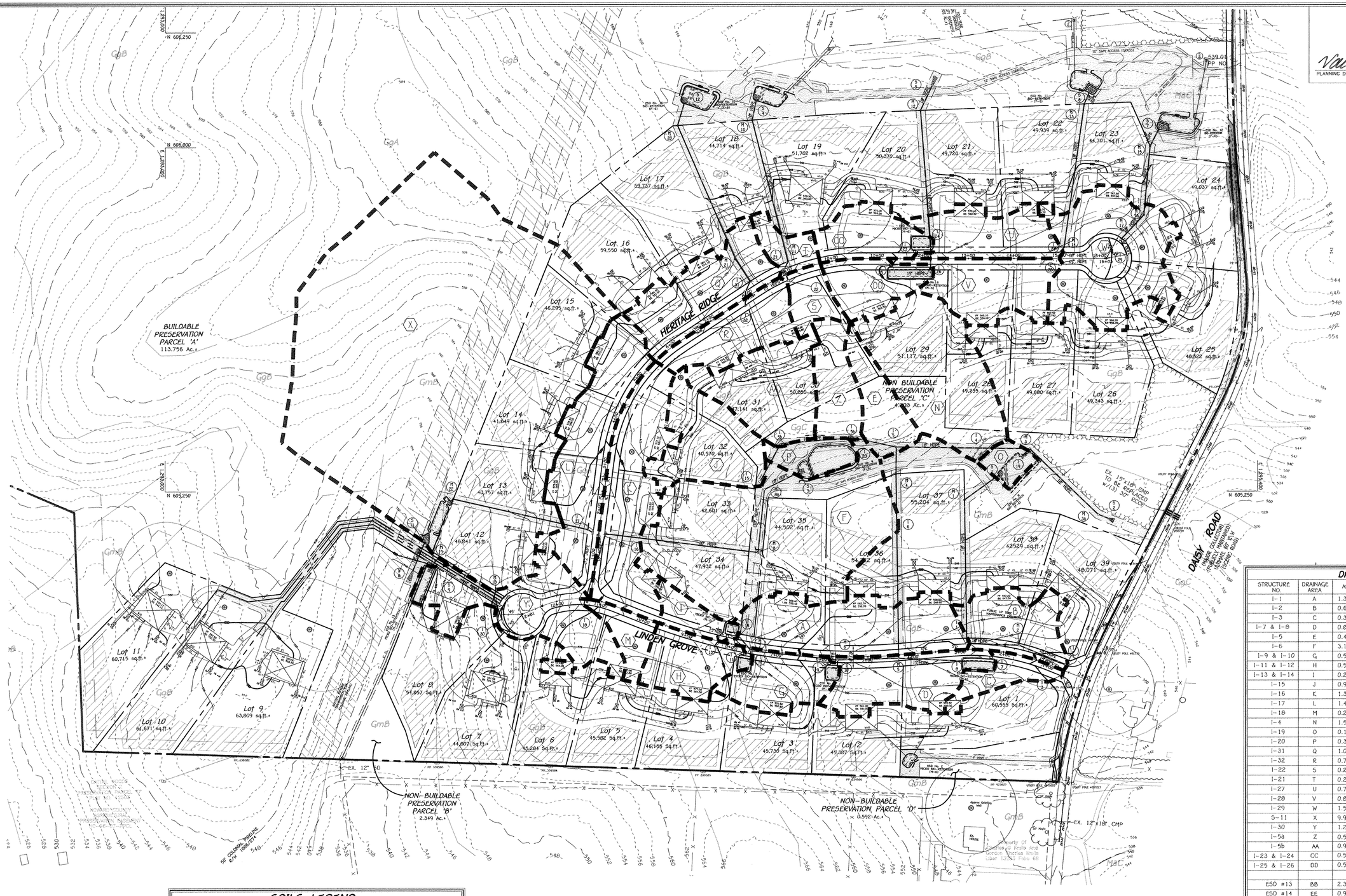

SOILS LEGEND

SOIL	NAME	CLASS	K.w
BrD	Brinklow channery loam, 15 to 25 percent slopes	B	.20
GgA	Glenelg loam, 0 to 3 percent slopes	B	.20
GgB	Glenelg loam, 3 to 8 percent slopes	B	.20
GgC	Glenelg loam, 8 to 15 percent slopes	B	.20
*GmA	Glenville silt loam, 0 to 3 percent slopes	C	.37
*GmB	Glenville silt loam, 3 to 8 percent slopes	C	*** .37
*GnB	Glenville-Baile silt loams, 0 to 8 percent slopes	C	*** .37
MaC	Manor loam, 8 to 15 percent slopes	B	.24

NOTES:
- * Hydric soils and/or contains hydric inclusions
- ** May contain hydric inclusions
- † Generally only within 100-year floodplain areas
- *** Denotes Erodible Soils

DRAINAGE AREA DATA

STRUCTURE NO.	DRAINAGE AREA	AREA	ZONED	"C" FACTOR	TIME (Min.)	REMARKS
I-1	A	1.35 AC.	RC-DEO	0.46	5.00	D-4.03
I-2	B	0.67 AC.	RC-DEO	0.49	5.00	D-4.03
I-3	C	0.30 AC.	RC-DEO	0.41	5.00	D-4.03
I-7 & I-8	D	0.84 AC.	RC-DEO	0.45	5.00	D-4.22 & MD-374.60
I-5	E	0.47 AC.	RC-DEO	0.25	5.00	D-4.10
I-6	F	3.13 AC.	RC-DEO	0.25	5.00	D-4.10
I-9 & I-10	G	0.59 AC.	RC-DEO	0.42	5.00	D-4.22 & MD-374.60
I-11 & I-12	H	0.59 AC.	RC-DEO	0.52	5.00	D-4.22 & MD-374.60
I-13 & I-14	I	0.26 AC.	RC-DEO	0.43	5.00	D-4.22 & MD-374.60
I-15	J	0.93 AC.	RC-DEO	0.27	5.00	D-4.14
I-16	K	1.34 AC.	RC-DEO	0.48	5.00	D-4.03
I-17	L	1.43 AC.	RC-DEO	0.47	5.00	D-4.03
I-18	M	0.28 AC.	RC-DEO	0.39	5.00	D-4.03
I-4	N	1.59 AC.	RC-DEO	0.45	5.00	D-4.10
I-19	O	0.18 AC.	RC-DEO	0.25	5.00	D-4.22
I-20	P	0.30 AC.	RC-DEO	0.30	5.00	D-4.22
I-31	Q	1.00 AC.	RC-DEO	0.44	5.00	D-4.03
I-32	R	0.70 AC.	RC-DEO	0.50	5.00	D-4.03
I-22	S	0.28 AC.	RC-DEO	0.44	5.00	D-4.22 & MD-374.60
I-21	T	0.24 AC.	RC-DEO	0.41	5.00	D-4.22 & MD-374.60
I-27	U	0.70 AC.	RC-DEO	0.47	5.00	D-4.03
I-28	V	0.80 AC.	RC-DEO	0.47	5.00	D-4.03
I-29	W	1.53 AC.	RC-DEO	0.49	5.00	D-4.03
5-11	X	9.92 AC.	RC-DEO	0.64	5.00	CULVERT
I-30	Y	1.29 AC.	RC-DEO	0.64	5.00	D-4.03
I-5a	Z	0.52 AC.	RC-DEO	0.94	5.00	D-4.14
I-5b	AA	0.97 AC.	RC-DEO	0.95	5.00	D-4.14
I-23 & I-24	CC	0.54 AC.	RC-DEO	0.64	5.00	D-4.22 & MD-374.60
I-25 & I-26	DD	0.51 AC.	RC-DEO	0.64	5.00	D-4.22 & MD-374.60
ESD #13	BB	2.34 AC.	RC-DEO	0.89	5.00	BIO-RETENTION
ESD #14	EE	0.99 AC.	RC-DEO	0.91	5.00	MICRO BIO-RETENTION

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STATE OF MARYLAND — ALDO MICHAEL VITUCCI — No. 20748

Aldo M. Vitucci, P.E. — Date 1/26/18

"Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly Licensed Professional Engineer under the laws of the State of Maryland, License No. 20748, Expiration Date 2-22-19."

STORM DRAIN DRAINAGE AREA MAP

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

ZONED: RC-DEO

TAX MAP No. 7 GRID No. 18 & TAX MAP No. 8 GRID No. 13 PARCEL No. 5
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JANUARY 25, 2018
SHEET 12 of 14

SP-17-003

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TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE 3-22-18

SOILS LEGEND

SOIL	NAME	CLASS	K w
BrD	Brinklow channery loam, 15 to 25 percent slopes	B	.20
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GgC	Glenelg loam, 8 to 15 percent slopes	B	.20
*GmA	Glenville silt loam, 0 to 3 percent slopes	C	.37
*GmB	Glenville silt loam, 3 to 8 percent slopes	C	*** .37
*GnB	Glenville-Baile silt loams, 0 to 8 percent slopes	C	*** .37
MaC	Manor loam, 8 to 15 percent slopes	B	.24

NOTES:

- * Hydric soils and/or contains hydric inclusions
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- † Generally only within 100-year floodplain areas
- *** Denotes Erodible Soils

FISHER, COLLINS & CARTER, INC.
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STATE OF MARYLAND — ALDO MICHAEL VITUCCI — No. 20748 — REGISTERED PROFESSIONAL ENGINEER

Aldo M. Vitucci, P.E. — 1/26/18 Date

"Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly Licensed Professional Engineer under the laws of the State of Maryland, License No. 20748, Expiration Date 2-22-19."

STORM DRAIN DRAINAGE AREA MAP

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

ZONED: RC-DEO

TAX MAP No. 7 GRID No. 10 &
TAX MAP No. 8 GRID No. 13 PARCEL No. 5
4TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JANUARY 25, 2018
SHEET 13 of 14

SP-17-003

I:\2012\12026\dwg\Sketch Preliminary\12026 Sheet 12-13 SP drainage area map.dwg, SHEET 13, 1/25/2018 12:37:05 PM, 1:1

B.4.C Specifications for Micro-Bioretention, Rain Gardens, Landscape Infiltration & Infiltration Berms

1. Material Specifications

The allowable 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 prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.08.01.05.

The planting soil shall be tested and shall meet the following criteria:

Soil Component – Loamy Sand or Sandy Loam (USDA Soil Textural Classification)

Organic Content – Minimum 10% by dry weight (ASTM D 2974). In general, this can be met with a mixture of loamy sand (60%-65%) and compost (35% to 40%) or sandy loam (30%), coarse sand (30%), and compost (40%).

Clay Content – Media shall have a clay content of less than 5%.

pH Range Should be between 5.5 – 7.0. Amendments (e.g., lime, iron sulfate plus sulfur) may be mixed into the soil to increase or decrease pH.

There shall be at least one soil test per project. Each test shall consist of both the standard soil test for pH, and additional tests of organic matter, and soluble salts. A textural analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall 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 a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high-pressure tires will cause excessive compaction resulting in reduced infiltration rates and is not acceptable. Compaction will significantly contribute to design failure.

Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as a chisel plow, ripper, or subsoiler. These tilling operations are to refracture the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment.

Rototill 2 to 3 inches of sand into the base of the bioretention facility before backfilling the optional sand layer. Pump any ponded water before preparing (rototilling) base.

When backfilling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rototill the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.

When backfilling the bioretention facility, place soil in lifts 12" to 18". Do not use heavy equipment within the bioretention basin. 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 A.2.3.

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 accepted 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 1/8 th 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 braced using 2" by 2" stakes only as necessary and for the first growing season only. Stakes are to be equally spaced on the outside of the tree ball.

Grasses and legume seed should be drilled into the soil to a depth of at least one inch. Grass and legume plugs shall be planted following the non-grass ground cover planting specifications.

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

6. Underdrains

Underdrains should meet the following criteria:

Pipe- Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTMF 758, Type PS 28, or AASHTO-M-278) in a gravel layer. The preferred material is slotted, 4 rigid pipe (e.g., PVC or HDPE).

Perforations – If perforated pipe is used, perforations should be 3/8" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a 1/4"(No. 4 or 4x4) galvanized hardware cloth.

Gravel –The gravel layer (No. 57 stone preferred) shall be at least 3" thick above and below the underdrain.

The main collector pipe shall be at a minimum 0.5% slope.

A rigid, non-perforated observation well must be provided (one per every 1,000 square feet) to provide a clean-out port and monitor performance of the filter.

A 4" layer of pea gravel (1/4" to 3/8" stone) shall be located between the filter media and underdrain to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 24".

The main collector pipe for underdrain 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 area has been stabilized

Infiltration and Filter System Construction Specifications

Infiltration and filter systems either take advantage of existing permeable soils or create a permeable medium such as sand for WQ, and Re v. In some instances where permeability is great, these facilities may be used for Qp as well. The most common systems include infiltration trenches, infiltration basins, sand filters, and organic filters.

When properly planted, vegetation will thrive and enhance the functioning of these systems. For example, pre-treatment buffers will trap sediments that often are bound with phosphorous and metals. Vegetation planted in the facility will aid in nutrient uptake and water storage. Additionally, plant roots will provide arteries for stormwater to permeate soil for groundwater recharge. Finally, successful plantings provide aesthetic value and wildlife habitat making these facilities more desirable to the public.

Design Constraints:

> Planting buffer strips of at least 20 feet will cause sediments to settle out before reaching the facility, thereby reducing the possibility of clogging.
> Determine areas that will be saturated with water and water table depth so that appropriate plants may be selected (hydrology will be similar to bioretention facilities, see figure A.3 and Table A.4 for planting material guidance).
> Plants known to send down deep taproots should be avoided in systems where filter fabric is used as part of facility design.
> Test soil conditions to determine if soil amendments are necessary.
> Plants shall be located so that access is possible for structure maintenance.
> Stabilize heavy flow areas with erosion control mats or sod.
> Temporarily divert flows from seeded areas until vegetation is established.
> See Table A.5 for additional design considerations.

Bio-retention

Soil Bed Characteristics

The characteristics of the soil for the bioretention facility are perhaps as important as the facility location, size, and treatment volume. The soil must be permeable enough to allow runoff to filter through the media, while having characteristics suitable to promote and sustain a robust vegetative cover crop. In addition, much of the nutrient pollutant uptake (nitrogen and phosphorus) is accomplished through absorption and microbial activity within the soil profile. Therefore, soils must balance their chemical and physical properties to support biotic communities above and below ground.

The planting soil should be a sandy loam, loamy sand, loam (USDA), or a loam/sand mix (should contain a minimum 35 to 60% sand, by volume). The clay content for these soils should be less than 25% by volume (Environmental Quality Resources (EQR), 1996; Engineering Technology Inc. and Biohabitats, Inc. (ETAB), 1993). Soils should fall within the SM, ML, SC classifications or the Unified Soil Classification System (USCS). A permeability of at least 1.0 feet per day (0.5"/hr) is required (a conservative value of 0.5 feet per day is used for design). The soil should be free of stones, stumps, roots, or other woody material over 1" in diameter. Brush or seeds from noxious weeds (e.g., Johnson Grass, Mugwort, Nutsedge, and Canada Thistle or other noxious weeds as specified under COMAR 15.08.01.05.) should not be present in the soils. Placement of the planting soil should be in 12 to 18 lifts that are loosely compacted (tamped lightly with a backhoe bucket or traversed by dozer tracks). The specific characteristics are presented in Table A.3.

Table A.3 Planting Soil Characteristics

Parameter	Value
pH range	5.2 to 7.00
Organic matter	1.5 to 4.0% (by weight)
Magnesium	35 lbs. per acre, minimum
Phosphorus (phosphate – P205)	75 lbs. per acre, minimum
Potassium (potash -I(K20)	85 lbs. per acre, minimum
Soluble salts	500 ppm
Clay	0 to 5%
Silt	30 to 55%
Sand	35 to 60%

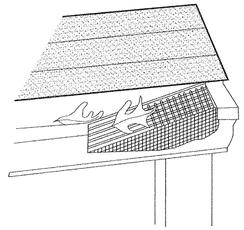
Mulch Layer

The mulch layer plays an important role in the performance of the bioretention system. The mulch layer helps maintain soil moisture and avoids surface sealing, which reduces permeability. Mulch helps prevent erosion, and provides a microenvironment suitable for soil biota at the mulch/soil interface. It also serves as a pretreatment layer, trapping the finer sediments, which remain suspended after the primary pretreatment.

The mulch layer should be standard landscape style, single or double shredded hardwood mulch or chips. The mulch layer should be well aged (stockpiled or stored for at least 12 months), uniform in color, and free of other materials, such as weed seeds, soil, roots, etc. The mulch should be applied to a maximum depth of three inches. Grass clippings should not be used as a mulch material.

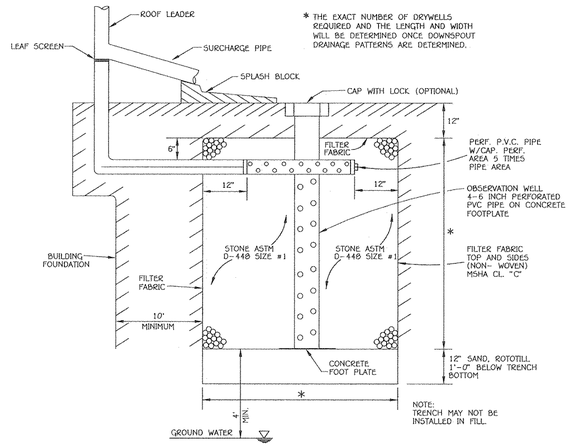
Planting Guidance

Plant material selection should be based on the goal of simulating a terrestrial forested community of native species. Bioretention simulates an upland-species ecosystem. The community should be dominated by trees, but have a distinct community of understory trees, shrubs and herbaceous materials. By creating a diverse, dense plant cover, a bioretention facility will be able to treat stormwater runoff and withstand urban stresses from insects, disease, drought, temperature, wind, and exposure.
The proper selection and installation of plant materials is key to a successful system. There are essentially three zones within a bioretention facility (Figure A.5). The lowest elevation supports plant species adapted to standing and fluctuating water levels. The middle elevation supports plants that like drier soil conditions, but can still tolerate occasional inundation by water. The outer edge is the highest elevation and generally supports plants adapted to dryer conditions. For appropriate plant materials for bioretention facilities, Refer To MAA Approved Species List. The layout of plant material should be flexible, but should follow the general principals described in Table A.5. The objective is to have a system, which resembles a random, and natural plant layout, while maintaining optimal conditions for plant establishment and growth. For a more extensive bioretention plan, consult ETAB, 1993 or Claytor and Schueler, 1997.



GUTTER DRAIN FILTER DETAIL

NOT TO SCALE

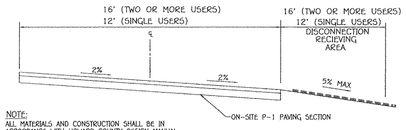


DRY WELL DETAIL (M-5)

NOT TO SCALE

Operation And Maintenance Schedule For Drywells (M-5)

1. The owner shall inspect the monitoring wells and structures on a quarterly basis and after every heavy storm event.
2. The owner shall record the water levels and sediment build up in the monitoring wells over a period of several days to insure trench drainage.
3. The owner shall maintain a log book to determine the rate at which the facility drains.
4. When the facility becomes clogged so that it does not drain down within a seventy two (72) hour time period, corrective action shall be taken.
5. The maintenance log book shall be available to Howard County for inspection to insure compliance with operation and maintenance criteria.
6. Once the performance characteristics of the infiltration facility have been verified, the monitoring schedule can be reduced to an annual basis unless the performance data indicates that a more frequent schedule is required.



NOTE:
ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH HOWARD COUNTY DESIGN MANUAL VOLUME IV, STANDARD SPECIFICATION AND DETAILS FOR CONSTRUCTION.

TYPICAL PRIVATE DRIVE CROSS SLOPE SECTION (N-2)

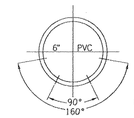
NOT TO SCALE

Operation & Maintenance Schedule For Privately Owned And Maintained Disconnection Of Non-rooftop Runoff (N-2)

1. Maintenance Of Areas Receiving Disconnection Runoff Is Generally No Different Than That Required For Other Lawn Or Landscaped Areas. The Areas Receiving Runoff Should Be Protected From Future Compaction Or Development Of Impervious Area. In Commercial Areas, Foot Traffic Should Be Discouraged As Well.

MICRO BIO-RETENTION NOTES:

1. ONLY THE SIDES OF MICRO BIO-RETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYER OR AT THE BOTTOM OF THE MICROBIORETENTION WILL CAUSE THE MBR TO FAIL AND THEREFORE SHALL NOT BE INSTALLED.
2. WRAP THE PERFORATED MBR UNDERDRAIN PIPE WITH ¼" MESH (4X4) OR SMALLER GALVANIZED HARDWARE CLOTH.
3. PROVIDE 5' MINIMUM SPACING BETWEEN UNDER DRAIN AND PERFORATED PIPE THROUGH STONE RESERVOIR OR SPACE PIPE EQUALLY ACROSS BOTTOM FOR SMALL BIOS. (SEE PLANS)



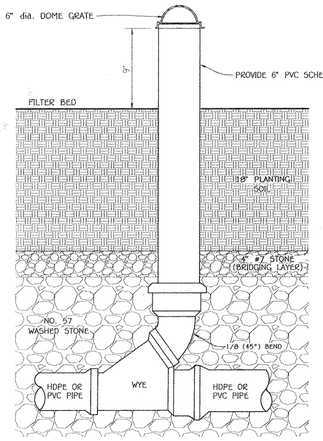
PIPE SIZE: 6"
HOLE SIZE: 3/8"
CENTER TO CENTER: 3"
ROWS OF HOLES: 2 @ 90°
2 @ 160° (+/-3°)

SCH40 PVC PERFORATED UNDERDRAIN PIPE DETAIL FOR HORIZONTAL DRAIN PIPE

NO SCALE

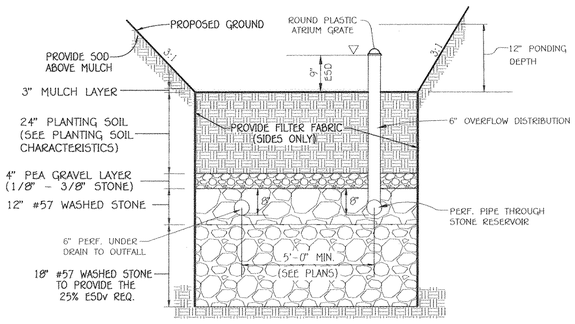
TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE 3-22-18



TYPICAL CLEAN-OUT DETAIL

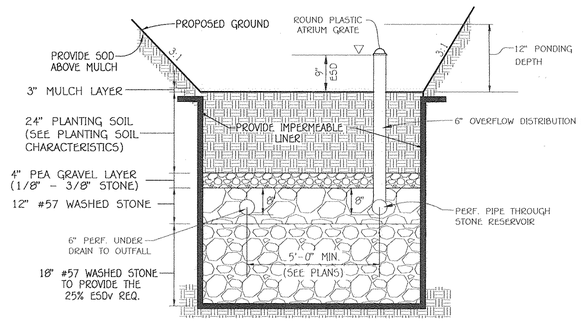
NO SCALE



(FACILITY Nos. 2, 8 THRU 15)

MICRO BIO-RETENTION SECTION WITH 6" OVERFLOW DISTRIBUTION PIPE

NO SCALE



(FACILITY Nos. 1, 3 THRU 7)

MICRO BIO-RETENTION SECTION WITH 6" OVERFLOW DISTRIBUTION PIPE (w/ IMPERMEABLE LINER)

NO SCALE

Operation And Maintenance Schedule For Bio-retention Areas (M-6)

1. The owner shall maintain the plant material, mulch layer and soil layer annually. maintenance of mulch and soil is limited to correcting areas of erosion or wash out. Any mulch replacement shall be done in the spring. Plant material shall be checked for disease and insect infestation and maintenance will address dead material and pruning. Acceptable replacement plant material is limited to the following: 2000 Maryland stormwater design manual volume II, table A.4.1 and 2.
2. The owner shall perform a plant in the spring and in the fall each year. during the inspection, the owner shall remove dead and diseased vegetation considered beyond treatment, replace dead plant material with acceptable replacement plant material, Treat diseased trees ans shrubs and replace all deficient stakes and wires.
3. The owner shall inspect the mulch each spring. The mulch shall be replaced every two to three years. The previous mulch layer shall be removed before the new layer is applied.
4. The owner shall correct soil erosion on an as needed basis, with a minimum of once per month and after each heavy storm.

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STORMWATER MANAGEMENT NOTES & DETAILS

LINDEN GROVE

LOTS 1 THRU 44, BUILDABLE PRESERVATION PARCEL 'A' & NON-BUILDABLE PRESERVATION PARCELS 'B' THRU 'D'

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