APPLICATION ACCEPTED: September 24, 2009
APPLICATION AMENDED: May 8, 2012
PLANNING COMMISSION: October 3, 2013
BOARD OF SUPERVISORS: Not yet scheduled

County of Fairfax, Virginia

September 19, 2013

STAFF REPORT ADDENDUM

APPLICATIONS RZ 2009-PR-022

PROVIDENCE DISTRICT

APPLICANT:	James Hollingsworth
PRESENT ZONING:	R-1 (Residential, One Dwelling Unit per Acre)
REQUESTED ZONING:	R-4 (Residential, Four Dwelling Units per Acre)
PARCEL:	49-1 ((4)) 16A
ACREAGE:	1.45 acres
DENSITY:	2.07 du/ac
PLAN MAP:	Residential; 3-4 du/ac
PROPOSAL:	Rezone from the R-1 District to the R-4 District to allow the construction of three single-family detached dwellings.

STAFF RECOMMENDATIONS:

Staff recommends approval of RZ 2009-PR-022, subject to executed proffers consistent with those contained in Appendix 1.

Staff recommends approval of a modification of the Comprehensive Plan Trail requirement to allow an 8-foot wide trail.

St.Clair Williams

Department of Planning and Zoning
Zoning Evaluation Division
12055 Government Center Parkway, Suite 801
Fairfax, Virginia 22035-5509
Phone 703-324-1290 FAX 703-324-3924
www.fairfaxcounty.gov/dpz/

It should be noted that it is not the intent of staff to recommend that the Board, in adopting any conditions proffered by the owner, relieve the applicant/owner from compliance with the provisions of any applicable ordinances, regulations, or adopted standard.

It should be further noted that the content of this report reflects the analysis and recommendations of staff; it does not reflect the position of the Board of Supervisors.

The approval of this application does not interfere with, abrogate or annul any easements, covenants, or other agreements between parties, as they may apply to the property subject to this application.

For information, contact the Zoning Evaluation Division, Department of Planning and Zoning, 12055 Government Center Parkway, Suite 801, Fairfax, Virginia 22035-5505, (703) 324-1290.

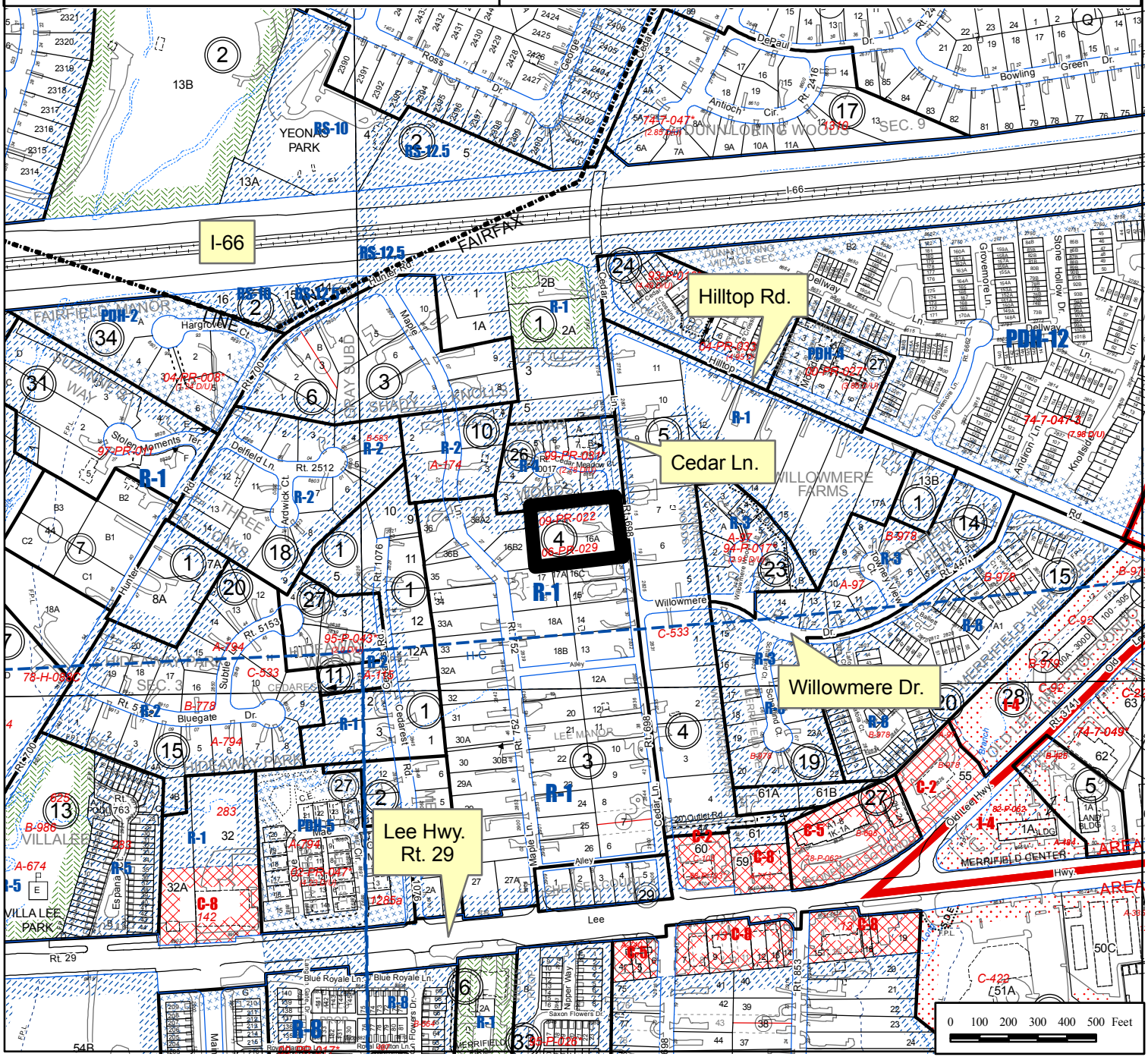
O:\SWILLI\RZ\RZ 2009-PR-022 James Hollingsworth\Staff Report\Staff Report Addendum.doc

Americans with Disabilities Act (ADA): Reasonable accommodation is available upon 48 hours advance notice. For additional information on ADA call (703) 324-1334 or TTY 711 (Virginia Relay Center).

Rezoning Application

RZ 2009-PR-022

Applicant:	JAMES M. HOLLINGSWORTH
Accepted:	09/24/2009; AMENDED 5/8/2012
Proposed:	RESIDENTIAL
Area:	1.45 AC OF LAND; DISTRICT - PROVIDENCE ZIP - 22180
Located:	WEST SIDE OF CEDAR LANE APPROXIMATELY 150 FEET NORTH OF ITS INTERSECTION WITH WILLOWMERE DRIVE
Zoning:	FROM R- 1 TO R- 4
Map Ref Num:	049-1- /04/ /0016A



GENERALIZED DEVELOPMENT PLAN

ON THE PROPERTY OF

JAMES HOLLINGSWORTH

PROVIDENCE DISTRICT

FAIRFAX COUNTY, VIRGINIA

GENERAL NOTES

1. THE PROPERTY DELINEATED HEREIN IS LOCATED ON TAX MAP 49-1 ((4)) PARCEL 16A AND IS ZONED R-1.

2. OWNER/APPLICANT:
   JAMES HOLLINGSWORTH
   2818 CEDAR LANE
   VIENNA, VA 22180

3. TOTAL LAND AREA IS 1.4535 ACRES OR 63,315 SQ.FT.

4. PROPOSED ZONING IS R-4.
   MINIMUM YARD REQUIREMENTS;
   FRONT 30'
   SIDE 10'
   REAR 25'

5. PUBLIC SEWER AND WATER SERVE THIS SITE.

6. STORM WATER MANAGEMENT, AS SHOWN ON THIS GDP, IS PROVIDED BY BIO-RETENTION FACILITIES AND IS SUBJECT TO CHANGE WITH FINAL ENGINEERING.

7. THERE ARE NO SCENIC ASSETS OR NATURAL FEATURES ON THIS SITE DESERVING PROTECTION OR PRESERVATION OTHER THAN SHOWN HEREIN ON THE TREE PRESERVATION PLAN.

8. THERE ARE TWO EXISTING STRUCTURES LOCATED ON THIS PROPERTY. AN EXISTING HOUSE BUILT IN 1920 AND EXISTING SHED OF UNKNOWN CONSTRUCTION DATE. ALL EXISTING STRUCTURES WILL BE DEMOLISHED.

9. UNLESS SHOWN.THERE ARE NO EXISTING UTILITY EASEMENTS HAVING A WIDTH OF TWENTY-FIVE (25) FEET OR MORE.

10. DEVELOPMENT SCHEDULE 2 YEARS.

11. PER FEMA FIRM PANEL 515525 0079D. THIS SITE LIES WITHIN ZONE "X", AN AREA DETERMINED TO BE OUTSIDE THE 500 YEAR FLOODPLAIN. PER FAIRFAX COUNTY MAPPING THERE ARE NO RPAS OR ENVIRONMENTAL QUALITY CORRIDORS IN ASSOCIATION WITH THIS PROPERTY. THERE IS NO FLOORPLAIN, OR RPA WITHIN THE LIMITS OF DEVELOPMENT ON THIS PLAN. THE ENTIRE LOT LIES WITHIN THE COUNTY RMA.

12. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO KNOWN GRAVES OR MARKERS DESIGNATING A PLACE OF BURIAL ON THE SUBJECT PROPERTY

13. TO THE BEST OF KNOWLEDGE. THERE ARE NO KNOWN HAZARDOUS OR TOXIC SUBSTANCES AS SET FORTH IN TITLE 40, CODE OF FEDERAL REGULATIONS PARTS 116.4, 302.3 AND 355 BEING GENERATED, UTILIZED, STORED OR DISPOSED OF ON THIS PROPERTY.

14. THIS PROJECT IS IN NO OVERLAY DISTRICTS.

SHEET INDEX

J2 Engineers, Inc.
4080 Lafayette Center Drive
Suite 330
Chantilly, Virginia

703.361.1550 (office)
703.361.1566 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
JAMES C. BISHOFF
Lic. No. 031721
PROFESSIONAL ENGINEER
08-21-13

PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= N/A
SCALE: AS SHOWN

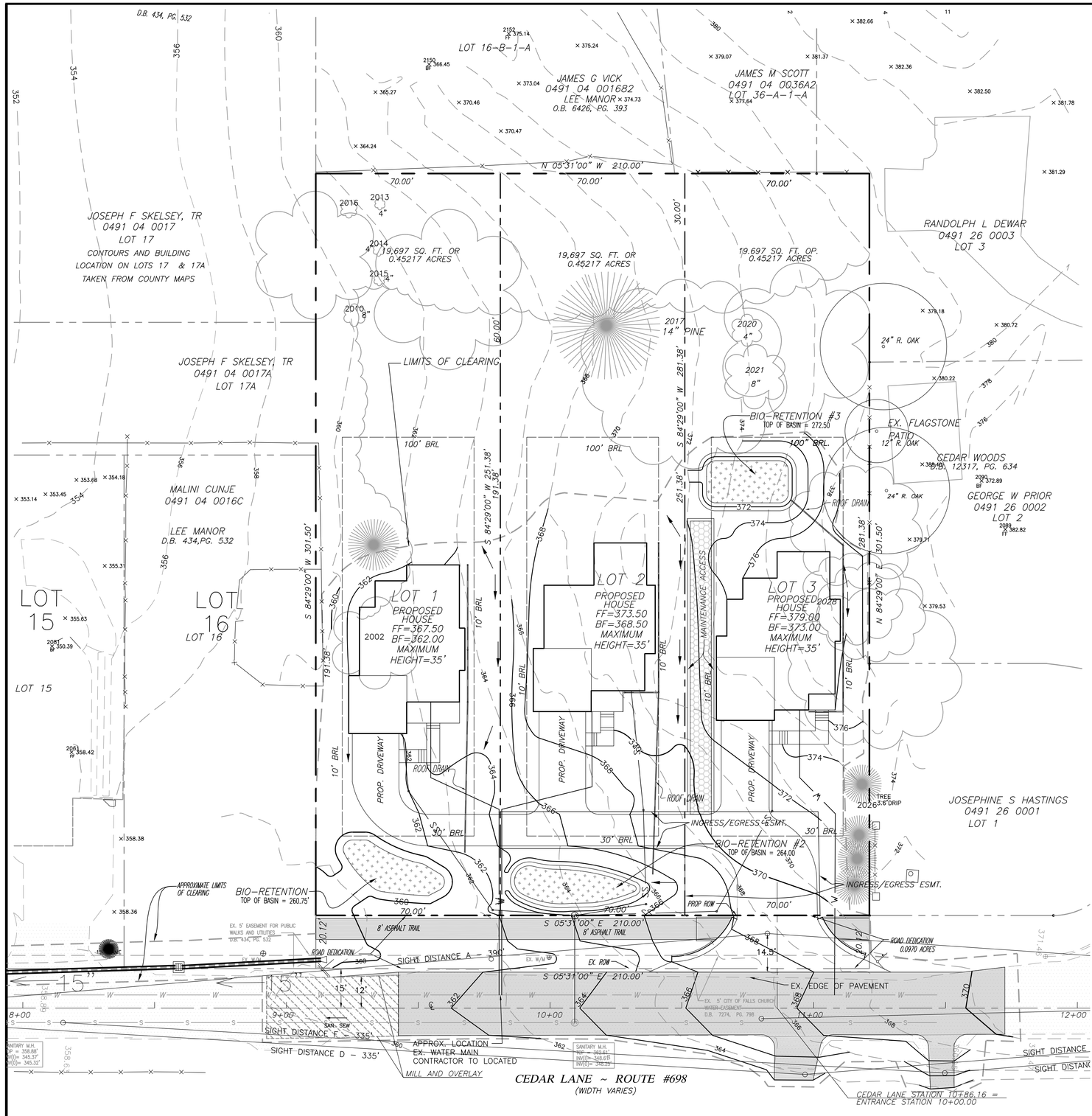
PLAN DATE
05/14/2009
11/22/2011
3/12/12
4/25/12
5/08/12
3/29/13
07/16/13
08/21/13

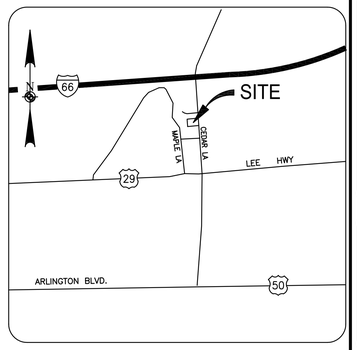
COVER SHEET
GENERALIZED DEVELOPMENT PLAN
HOLLINGSWORTH PROPERTY
PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

REVISIONS

No.	DATE	DESCRIPTION
1.	11/21/11	NEW ENGINEER
2.	3/12/12	Address Staff comments for resubmission
3.	4/25/12	Address Staff Comments for resubmission
4.	5/08/12	Address Staff Comments for resubmission
5.	3/29/13	Revised Outfall Narrative
6.	7/16/13	Revised limits of clearing, revised outfall analysis and narrative, added soil test information.
6.	8/21/13	Revised canopy calculations on sheet 4A

SHEET
1
OF
10





DENSITY CALCULATIONS

3 LOTS / 1.3565 ACRES= 2.21 UNITS / ACRE
MAXIMUM DENSITY PERMITTED (R-4) = 4 UNITS / ACRE
(OR 0.9347 x 4 = 3.7 TOTAL UNITS)

DENSITY IS PROFFERED AT 2.21 UNITS/ACRE

DEVELOPMENT TABULATION

GROSS SITE AREA	1.4535 ACRES
RIGHT-OF-WAY DEDICATION	0.0970 ACRES
AREA OF LOTS	59,089 SF/ 1.3565 ACRES
AVERAGE LOT AREA	19,697 SF/ 0.4522 ACRES
MAX. NO. OF DWELLING UNITS PROPOSED = 3	

LOT AREAS

LOT 1	19,697 SF / 0.45 ACRES
LOT 2	19,697 SF / 0.45 ACRES
LOT 3	19,697 SF / 0.45 ACRES

ALL AREAS ARE APPROXIMATE AND SUBJECT TO CHANGE WITH FINAL ENGINEERING.

LEGEND

- LIMITS OF CLEARING & GRADING
- 451.8 EXISTING ELEVATION
- EXISTING CONTOUR
- PROPOSED ASPHALT
- PROPOSED PERMEABLE PAVERS

GENERAL NOTES:

1. ALL UTILITIES ARE PRELIMINARY AND SUBJECT TO FINAL DESIGN.
2. REFER TO SHEET 3 FOR EXISTING BUILDING AND STRUCTURES.
3. REFER TO SHEET 5 & 6 FOR BIO-RETENTION DESIGN/PLANTING
4. BIO-RETENTION DESIGN IS PRELIMINARY AND SUBJECT TO CHANGE WITH FINAL PLANS.
5. STREET IMPROVEMENTS PROPOSED WITH THIS PLAN RAISING THE GRADE OF CEDAR LANE.
6. THERE ARE NO MAJOR OPEN SPACE OR COMMUNITY OR PUBLIC FACILITIES PROPOSED WITH THIS PROJECT.
7. THERE ARE NO SANITARY SEWER IMPROVEMENTS PROPOSED WITH THIS PLAN EXCEPT SEWER LATERALS.
8. TOPOGRAPHIC INFORMATION, FIELD RUN,PROVIDED BY VIKA,INC AS SUPPLIMENTED BY THIS FIRM IN APRIL, 2006.
9. PARKING WILL BE PROVIDED IN ACCORDANCE WITH ARTICLE 11. FOR SINGLE FAMILY DETACHED PARKING IS 2 PARKING SPACES PER UNIT.
10. THIS REZONING IS FOR RESIDENTIAL USE.
11. THIS PLAN IN FULL COMPLIANCE WITH THE RESIDENTIAL DEVELOPMENT CRITERIA OF THE ADOPTED COMPREHENSIVE PLAN OF THE COUNTY.
12. THIS PROPOSED DEVELOPMENT CONFORMS TO THE PROVISIONS OF ALL APPLICABLE ORDINANCES, REGULATIONS AND ADOPTED STANDARDS OF FAIRFAX COUNTY, VIRGINIA.
13. THERE IS NO WAIVER REQUEST FOR YARD REGULATIONS FOR YARD ABUTTING CERTAIN PRINCIPAL ARTERIAL HIGHWAYS AND RAILROAD TRACKS PURSUANT TO SECTION 2-414 OF THE ZONING ORDINANCE. ALL STRUCTURES WILL BE MORE THAN 200 FEET FROM INTERSTATE 66.
14. THE APPROXIMATE LIMITS OF CLEARING AND GRADING ARE SHOWN ON THE GDP. EXISTING TREES WILL BE SAVED WHERE POSSIBLE TO PROVIDE THE NECESSARY 25% TREE COVER. SEE TREE COVER CALCULATION. IF THE EXISTING TREES DO NOT EQUAL OR EXCEED THE REQUIRED TREE COVER, THEN ADDITIONAL TREES WILL BE PLANTED TO FULFILL THE REQUIREMENT.
15. NO STRUCTURES WILL BE CONSTRUCTED WITHIN THE TREE PRESERVATION AREA.
16. BIO-RETENTION FACILITIES TO BE MAINTAINED BY THE RESPECTIVE LOT OWNERS.
17. A WAIVER FOR CURB AND GUTTER ALONG CEDAR LANE IS REQUESTED.
16. A MODIFICATION OF THE TRAIL REQUIREMENT TO AN EIGHT FOOT TRAIL MAINTAINED BY PROPERTY OWNERS IS REQUESTED.

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COMMONWEALTH OF VIRGINIA
JAMES C. BISHOFF
Lic. No. 031721
PROFESSIONAL ENGINEER
08-21-13

PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= 2'
SCALE: 1"= 20'

PLAN DATE
05/14/2008
11/22/2011
3/12/12
4/25/12
5/08/12
3/29/13
07/16/13
08/21/13
08/21/13

GDP LAYOUT

GENERALIZED DEVELOPMENT PLAN
HOLLINGSWORTH PROPERTY

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

No.	DATE	REVISIONS DESCRIPTION
1.	11/21/11	NEW ENGINEER
2.	3/12/12	Address Staff comments for resubmission
3.	4/25/12	Address Staff Comments for resubmission
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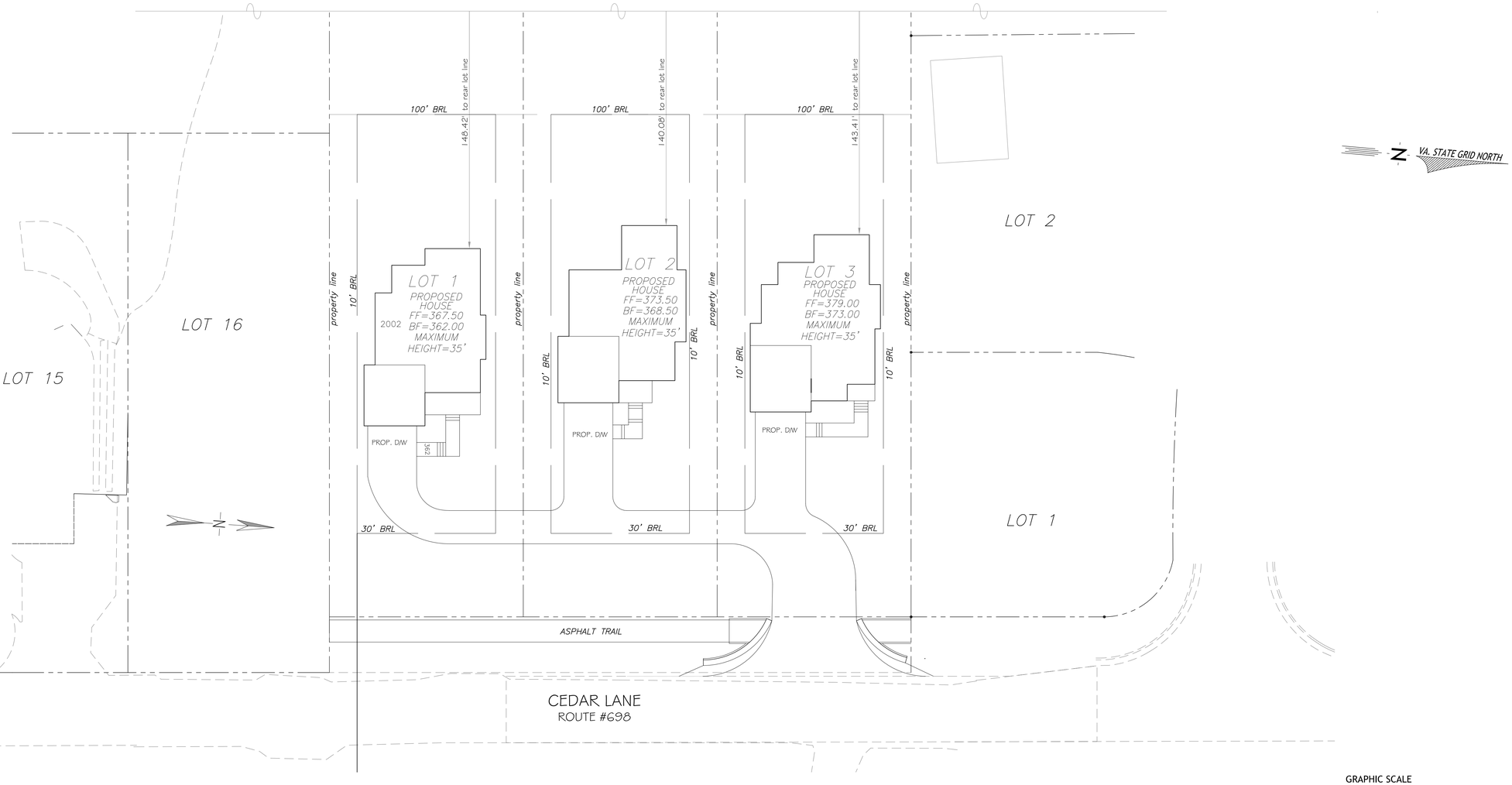
5.	3/29/13	Revised Outfall Narrative
6.	7/16/13	Revised limits of clearing, revised outfall analysis and narrative, added soil test information.
6.	8/21/13	Revised canopy calculations on sheet 4A

SHEET
2
OF
10

PROPOSED HOME DESIGNS

SCALE: 1" = 10'

GRAPHIC SCALE
0 5 10 20
(IN FEET)
1 INCH = 10 FEET



PROPOSED HOUSE LOCATIONS

SCALE: 1" = 20'

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 INCH = 20 FEET

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08-21-13

PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= NA
SCALE: AS SHOWN

PLAN DATE
05/14/2009
11/22/2011
3/12/12
4/25/12
5/08/12
3/29/13
7/16/13
8/21/13

CEDAR LANE PROPOSED HOME DESIGNS & SITINGS

GENERALIZED DEVELOPMENT PLAN
HOLLINGSWORTH PROPERTY

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

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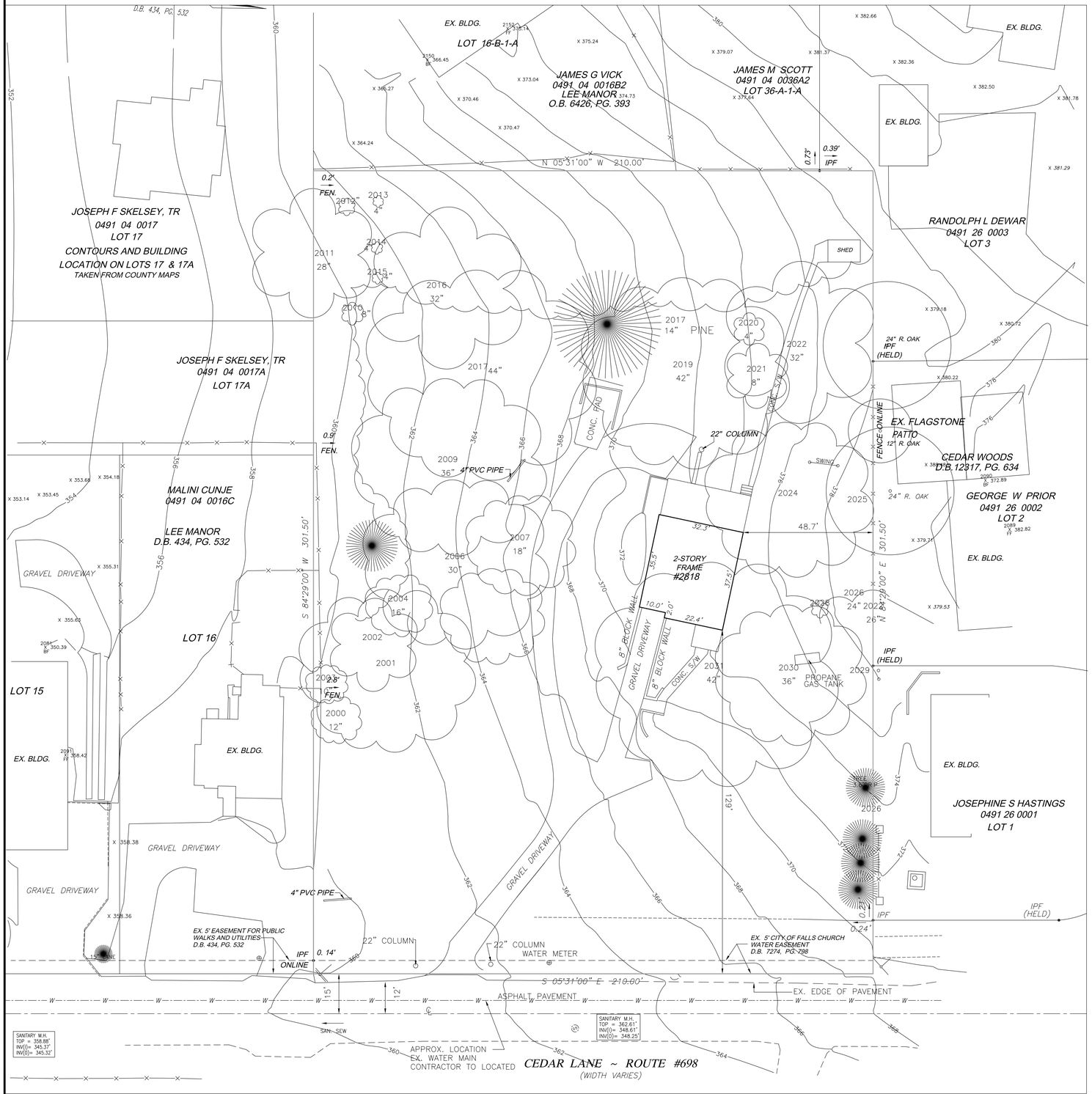
SHEET
2A
OF
10



VA. STATE GRID NORTH

GRAPHIC SCALE

0 10 20 40

(IN FEET)

1 INCH = 20 FEET

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Lic. No. 031721
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08-21-13

PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= 2'
SCALE: 1"=20'

PLAN DATE
05/14/2025
11/22/2011
3/12/12
4/25/12
5/29/12
5/08/12
3/29/13
7/16/13
8/21/13

EXISTING CONDITIONS PLAN

GENERALIZED DEVELOPMENT PLAN
HOLLINGSWORTH PROPERTY

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

No.	DATE	REVISIONS DESCRIPTION
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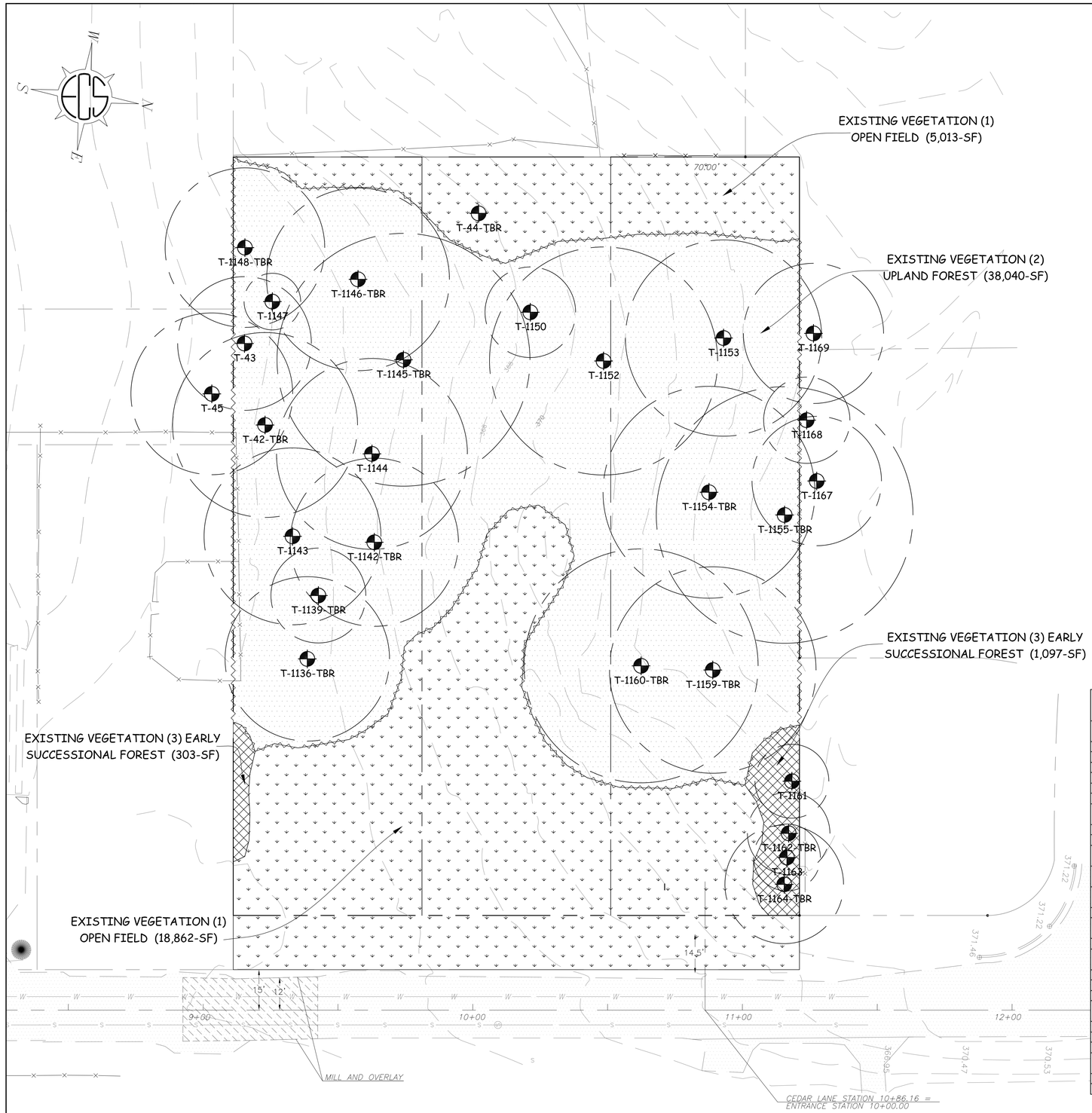
SHEET
3
OF
10



LEGEND

- TREELINE
- EXISTING CANOPY (2) UPLAND FOREST (38,040-SF) LONGTERM SUCCESSIONAL FOREST
- EXISTING CANOPY (3) EARLY SUCCESSIONAL FOREST (1,400-SF)
- EXISTING VEGETATION (1) OPEN FIELD (23,875-SF)
- CRITICAL ROOT ZONE (CRZ)
- T-16 TREE LOCATION

Tree Number	Common Name	Scientific Name	Size (inches DBH)	Critical Root Zone (feet)	Condition (%)	Remove	Notes
42	Northern Red Oak	*Quercus rubra*	34.3	34.3	37.5%	x	Severe root and trunk growths, many dead limbs, one-sided, English ivy
43	White Oak	*Quercus alba*	24.8	24.8	53.1%		Large dead limbs, trunk and root damage--***prune dead limbs, mulch***
44	Dead	-	15.3	-	0.0%	x	Dead- to be removed
45	Black Cherry	*Prunus serotina*	30.0	30.0	59.4%		Offsite Tree- many dead limbs, restricted canopy
1136	Pignut Hickory	*Carya glabra*	30.5	30.5	75.0%	x	English ivy, moss
1139	Mockernut Hickory	*Carya tomentosa*	17.6	17.6	81.3%	x	English ivy, mulch piled on one side
1142	White Oak	*Quercus alba*	31.2	31.2	62.5%	x	Prune dead limbs, some trunk growths, one-sided
1143	American Holly	*Ilex opaca*	32.8	32.8	46.9%		Double trunk, poor connection, included growth, girdling roots, English ivy, poorly pruned
1144	White Oak	*Quercus alba*	35.4	35.4	71.9%		Some dead limbs, some trunk growths--***prune dead limbs, mulch***
1145	White Oak	*Quercus alba*	46.9	46.9	46.9%	x	Trunk cavity, disease in branches and high trunk, large dead limbs, English
1146	White Oak	*Quercus alba*	33.9	33.9	50.0%	x	Severe English Ivy, large dead limbs, one-sided, trunk damage, dirt piled on one side
1147	Red Maple	*Acer rubrum*	10.5	10.5	53.1%		Lichen, poorly pruned, trunk damage, small dead limbs--***prune dead limbs, mulch***
1148	Northern Red Oak	*Quercus rubra*	29.6	29.6	34.4%	x	Severe trunk and root disease, large dead limbs, English ivy, significant lean toward neighbor, earth movement around tree
1150	White Pine	*Pinus strobus*	16.8	16.8	71.9%		Some poor pruning, large much pile by trunk--***evenly spread mulch 3-4"***
1152	Northern Red Oak	*Quercus rubra*	42.3	42.3	46.9%		Root and trunk bark damage, large dead limbs, earth movement around tree, ****TBS but not counted towards canopy credit***
1153	Northern Red Oak	*Quercus rubra*	36.4	36.4	59.4%		Girdling roots, root growths, slighly one-sided, prune dead limbs
1154	Northern Red Oak	*Quercus rubra*	39.3	39.3	34.4%	x	Girdling roots, root growths and damage, disease on branches/twigs, some dead limbs, slight lean
1155	Northern Red Oak	*Quercus rubra*	47.6	47.6	59.4%	x	Double trunk, poor connection, root growths, some dead limbs
1159	Northern Red Oak	*Quercus rubra*	38.3	38.3	62.5%	x	Severe English ivy, some root growths, prune dead limbs
1160	Northern Red Oak	*Quercus rubra*	43.4	43.4	37.5%	x	Severe root disease, trunk growths, poor prune, large dead limbs
1161	Red Cedar	*Juniperus virginiana*	13.7	13.7	53.1%		Severe chlorosis, broken limbs, slight lean--***prune dead limbs, mulch***
1162	Red Cedar	*Juniperus virginiana*	15.3	15.3	46.9%	x	Severely pruned, small canopy, dead limbs
1163	Red Cedar	*Juniperus virginiana*	12.4	12.4	59.4%		Some trunk damage, small vines, chlorosis--***remove vines, mulch***
1164	Red Cedar	*Juniperus virginiana*	22.0	22.0	43.8%	x	Severely pruned, English ivy, dead/broken limbs
1167	Northern Red Oak	*Quercus rubra*	24.0	24.0	50.0%		Offsite Tree- Significant lean towards neighbor, lichen, poorly pruned, one-sided, large dead limbs
1168	Northern Red Oak	*Quercus rubra*	16.0	16.0	46.9%		Offsite Tree- Top missing (potentially storm damage)
1169	Northern Red Oak	*Quercus rubra*	26.0	26.0	53.1%		Offsite Tree- One-sdied, missing large sacffold branches, root disease

NOTES:

-SHARED TREES SHALL NOT BE REMOVED WITHOUT WRITTEN PERMISSION FROM AFFECTED ADJACENT PROPERTY OWNERS.

-MULCH SHALL BE APPLIED TO SPECIFIED TREES WITHIN THE TREE PROTECTION AREA IN A 3-4" DEEP LAYER FROM THE TRUNK TO THE EDGE OF THE DRIPLINE OR TO THE LIMITS OF CLEARING IF THE DRIPLINE EXTENDS WITHIN THE LIMITS.

-PRUNING SHALL BE PERFORMED BY A KNOWLEDGABLE TREE CARE SPECIALIST. TREES TO BE PRESERVED SHALL BE PRUNED FOR CLEARANCE OR HEALTH & SAFETY REASONS ONLY. TREES TO BE PRESERVED SHALL NOT BE 'LION-TAILED' OR TOPPED.

SCALE (IN FEET)
10 20
20 0

ECS - MID-ATLANTIC, LLC
14026 THUNDERBOLT PLACE
SUITE 100
CHANTILLY, VA 20151
1-800-822-3489
703-471-8400
(FAX) 703-834-5527

CELEBRATING 20 YEARS OF EXCELLENCE

SETTING THE STANDARD FOR SERVICE

ECS LLC MID-ATLANTIC

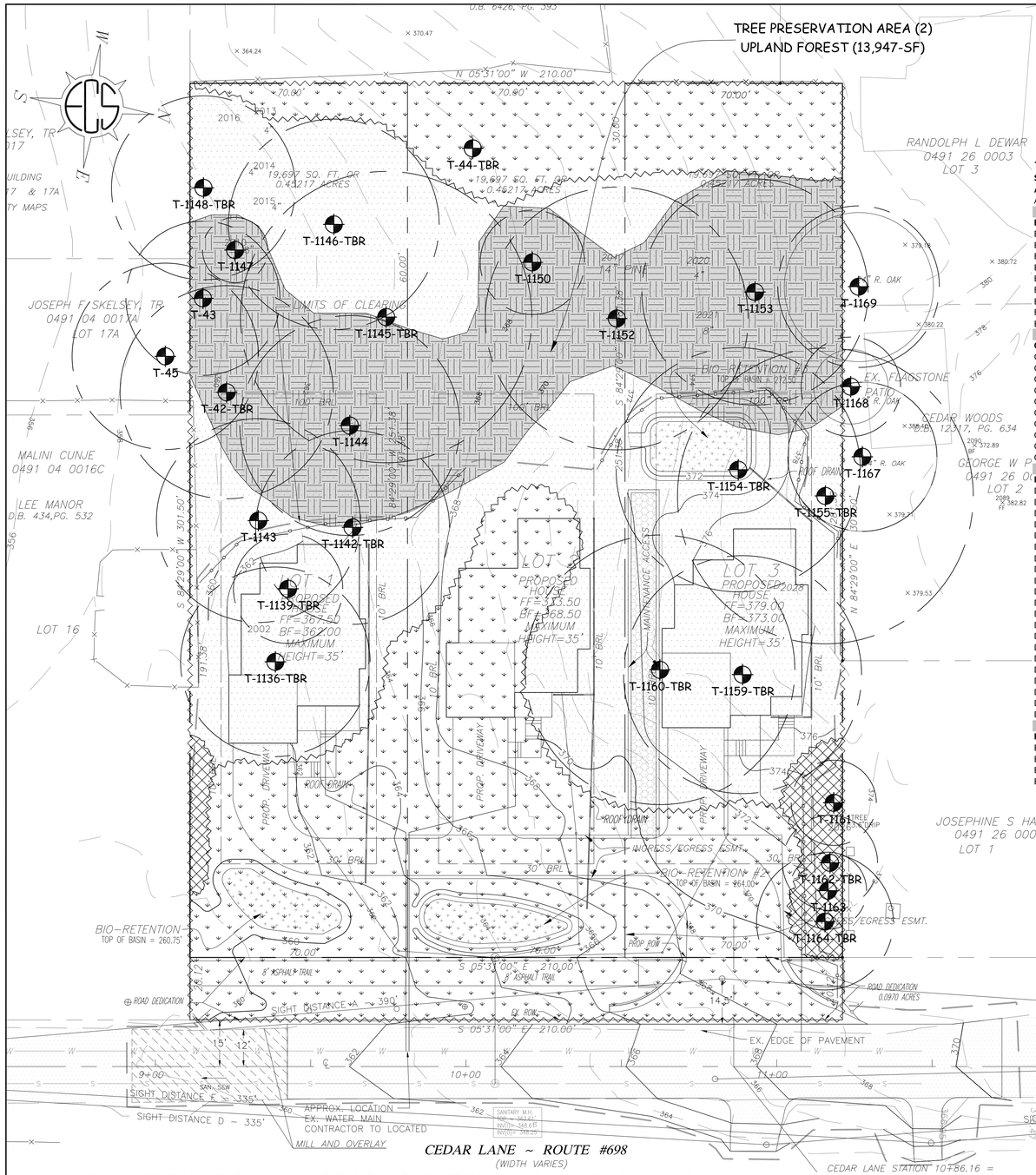
2818 CEDAR LANE
VIENNA, VIRGINIA
FAIRFAX COUNTY

EXISTING VEGETATION MAP
MR. JAMES HOLLINGSWORTH

ECS REVISIONS
2/20/12 - AEA
5/4/12 - AEA
8/21/13

ENGINEER	DRAFTING
AMS	AEA

SCALE 1" - 20'
PROJECT NO. 01:19192
SHEET 4 OF 10
DATE 2/10/12



TREE PRESERVATION & CANOPY CALCULATIONS

GROSS SITE AREA	1.45- AC	63,162 SF
ADJUSTED SITE AREA (TOTAL-ROAD DEDICATION)		58,937 SF
MULTIPLY PERCENT REQUIRED (ZONED R4)		25%
EQUALS TREE COVER TO BE PROVIDED		14,734 SF
EXISTING TREES TO BE PRESERVED		13,947 SF
PROPOSED CREDIT BY PLANTING		1,215 SF
HAS THE TREE PRESERVATION TARGET BEEN MET?		YES
ADJUSTED CANOPY COVER PER SECTION 12-0200		17,434 SF
TOTAL TREE COVER PROVIDED	31.6%	18,649 SF

Table 12.3 - Tree Preservation Target Calculations & Statement

A	Pre-development area (sf) of existing tree canopy (From Existing Vegetation Map) =	39,440.0
B	Percentage of gross site area covered by existing tree canopy =	59.8%
C	Percentage of 10-year tree canopy required for site per zoning =	25%
D	Percentage of the 10-year tree canopy requirement that should be met through preservation =	59.8%
E	Proposed percentage of canopy requirement that will be met through tree preservation =	198.0%
F	Has the Tree Preservation Target minimum been met?	YES
G	If no for line F, provide sheet number where deviation request is located	N/A
H	If step G requires a narrative it shall be prepared and attached	N/A

Table 12.10 - 10-Year Tree Canopy Calculation Worksheet

Step		Totals
A. Tree Preservation Target & Statement		
A1	Tree Preservation Target calculations and statement	
B. Tree Canopy Requirement		
B1	Gross Site Area =	63,162.0
B2	Subtract area dedicated to parks, road frontage (road dedication) =	4,225.0
B3	Subtract area of exemptions =	0.0
B4	Adjusted gross site area =	58,937.0
B5	Identify site's zoning and/or use =	R-4
B6	Percentage of 10-year canopy required =	25%
B7	Area of 10-year canopy required =	14,734
B8	Modification of 10-year Tree Canopy Requirement Requested?	No
B9	If B8 is yes, list plan sheet where modification is located	N/A
C. Tree Preservation		
C1	Tree Preservation Target Area =	8,803.8
C2	Total canopy area meeting standards of § 12-0400 =	13,947.0
C3	C2 x 1.25 =	17,433.8
C4	Total canopy area provided by unique or valuable forest/woodland communities =	0.0
C5	C4 x 1.5 =	0.0
C6	Total of canopy area provide by Heritage, Memorial, Specimen, or Street Trees =	0.0
C7	C6 x 1.5 to 3.0 =	0.0
C8	Canopy area of trees within Resource Protection Areas and 100-year floodplains =	0.0
C9	C8 x 1.0 =	0.0
C10	Total of C3, C5, C7, and C9 =	17,434
D. Tree Planting		
D1	Area of canopy to be met through tree planting =	1,215.0
D2	Area of canopy planted for air quality benefits =	0.0
D3	D2 x 1.5 =	0.0
D4	Area of canopy planted for energy conservation =	0.0
D5	D4 x 1.5 =	0.0
D6	Area of canopy planted for water quality benefits =	0.0
D7	D6 x 1.25 =	0.0
D8	Area of canopy planted for wildlife benefits =	0.0
D9	D8 x 1.5 =	0.0
D10	Area of canopy provided by native trees =	0.0
D11	D10 x 1.5 =	0.0
D12	Area of canopy provided by improved cultivars and varieties =	0.0
D13	D12 x 1.5 =	0.0
D14	Area of canopy provided through tree seedlings =	1,215.0
D15	Area of canopy provided through native shrubs or woody seed mix =	0.0
D16	Percentage of 14 represented by D15 (must be less than 33%) =	0.0%
D17	Total of canopy area provided through tree planting =	1,215
D18	Is an offsite planting relief requested?	No
D19	Tree Bank or Tree Fund?	No
D20	Canopy area requested to be provided through offsite banking or tree fund?	No
D21	Amount to be desposited into the Tree Preservation and Planting Fund =	$0.0
E. Total of 10-year Tree Canopy Provided		
E1	Total of canopy area provided through tree preservation =	17,434
E2	Total of canopy area provided through tree planting =	1,215
E3	Total of canopy area provided through offsite mechanism =	0
E4	Total of 10-year Tree Canopy Provided =	18,649

LEGEND

- TREELINE
- EXISTING CANOPY (2) UPLAND FOREST (38,040-SF) LONGTERM SUCCESSIONAL FOREST
- EXISTING CANOPY (3) EARLY SUCCESSIONAL FOREST (1,400-SF)
- EXISTING VEGETATION (1) OPEN FIELD (23,875-SF)
- TREE PRESERVATION AREA (2) UPLAND FOREST (13,947-SF) LONGTERM SUCCESSIONAL FOREST
- MULCH, 3-4" DEEP BARK OR HARDWOOD CHIPS
- CRITICAL ROOT ZONE (CRZ)
- T-16 TREE LOCATION
- TREE PROTECTION FENCING & ROOT PRUNING

INVASIVE SPECIES CONTROL NARRATIVE:

1. ANY APPLICATION OF ENVIRONMENTALLY SENSITIVE APPROVED HERBICIDES SHALL BE APPLIED BY A VIRGINIA CERTIFIED APPLICATOR OR REGISTERED TECHNICIAN.

2. ENGLISH IVY: REMOVE FROM TREES BY CUTTING ALL VINES AT GROUND LEVEL. VINES SHOULD BE CUT AGAIN SEVERAL FEET UP THE TRUNK. PEAL THE CUT SECTION OF IVY OFF BUT CARE SHOULD BE TAKEN NOT TO STRIP THE BARK OF THE TREE. PULL GROUND IVY BACK A FEW FEET FROM THE BASE OF THE TREE TO SLOW REGROWTH UP THE TREE TRUNK. REMOVE GROUND IVY BY HAND PULLING, CUTTING AND MULCHING OVER TOP, AND/OR APPLYING A SYSTEMIC HERBICIDE LIKE TRICLOPYR TO LEAVES OR FRESHLY CUT LARGE STEMS. RETREATMENT MAY BE NECESSARY FOR COMPLETE ERADICATION.

3. JAPANESE HONEYSUCKLE: SHALL BE REMOVED BY HAND TO MINIMIZE SITE DISTURBANCE. IN THE GROWING SEASON, AN APPLICATION OF AN ENVIRONMENTALLY SENSITIVE APPROVED HERBICIDE MAY BE APPLIED BY A VIRGINIA CERTIFIED APPLICATOR. TO REDUCE DAMAGE TO NON-TARGET PLANTS, HERBICIDES SUCH AS GLYPHOSATE AND TRICLOPYR MAY BE APPLIED TO FOLIAGE BY A CERTIFIED APPLICATOR IN AUTUMN, SINCE JAPANESE HONEYSUCKLE CONTINUES TO PHOTOSYNTHESIZE AFTER MANY OTHER SPECIES LOSE THEIR LEAVES.

4. THE ENGLISH IVY REMNANTS SHALL BE BAGGED AND REMOVED FROM THE PROJECT SITE.

5. INVASIVE SPECIES CONTROL SHALL BE CONDUCTED UNTIL THE PLANTS NOTED ABOVE ARE NO LONGER IN ABUNDANCE OR UNTIL BOND RELEASE, WHICHEVER IS LATER.

Tree Number	Common Name	Scientific Name	Size (inches DBH)	Critical Root Zone (feet)	Condition (%)	Remove	Notes
42	Northern Red Oak	*Quercus rubra*	34.3	34.3	37.5%	x	Severe root and trunk growths, many dead limbs, one-sided, English ivy
43	White Oak	*Quercus alba*	24.8	24.8	53.1%		Large dead limbs, trunk and root damage--***prune dead limbs, mulch***
44	Dead	-	15.3	-	0.0%	x	Dead- to be removed
45	Black Cherry	*Prunus serotina*	30.0	30.0	59.4%		Offsite Tree- many dead limbs, restricted canopy
1136	Pignut Hickory	*Carya glabra*	30.5	30.5	75.0%	x	English ivy, moss
1139	Mockernut Hickory	*Carya tomentosa*	17.6	17.6	81.3%	x	English ivy, mulch piled on one side
1142	White Oak	*Quercus alba*	31.2	31.2	62.5%	x	Prune dead limbs, some trunk growths, one-sided
1143	American Holly	*Ilex opaca*	32.8	32.8	46.9%		Double trunk, poor connection, included growth, girdling roots, English ivy, poorly pruned
1144	White Oak	*Quercus alba*	35.4	35.4	71.9%		Some dead limbs, some trunk growths--***prune dead limbs, mulch***
1145	White Oak	*Quercus alba*	46.9	46.9	46.9%	x	Trunk cavity, disease in branches and high trunk, large dead limbs, English
1146	White Oak	*Quercus alba*	33.9	33.9	50.0%	x	Severe English Ivy, large dead limbs, one-sided, trunk damage, dirt piled on one side
1147	Red Maple	*Acer rubrum*	10.5	10.5	53.1%		Lichen, poorly pruned, trunk damage, small dead limbs--***prune dead limbs, mulch***
1148	Northern Red Oak	*Quercus rubra*	29.6	29.6	34.4%	x	Severe trunk and root disease, large dead limbs, English ivy, significant lean toward neighbor, earth movement around tree
1150	White Pine	*Pinus strobus*	16.8	16.8	71.9%		Some poor pruning, large much pile by trunk--***evenly spread mulch 3-4"***
1152	Northern Red Oak	*Quercus rubra*	42.3	42.3	46.9%		Root and trunk bark damage, large dead limbs, earth movement around tree, ****TBS but not counted towards canopy credit***
1153	Northern Red Oak	*Quercus rubra*	36.4	36.4	59.4%		Girdling roots, root growths, slighly one-sided, prune dead limbs
1154	Northern Red Oak	*Quercus rubra*	39.3	39.3	34.4%	x	Girdling roots, root growths and damage, disease on branches/twigs, some dead limbs, slight lean
1155	Northern Red Oak	*Quercus rubra*	47.6	47.6	59.4%	x	Double trunk, poor connection, root growths, some dead limbs
1159	Northern Red Oak	*Quercus rubra*	38.3	38.3	62.5%	x	Severe English ivy, some root growths, prune dead limbs
1160	Northern Red Oak	*Quercus rubra*	43.4	43.4	37.5%	x	Severe root disease, trunk growths, poor prune, large dead limbs
1161	Red Cedar	*Juniperus virginiana*	13.7	13.7	53.1%		Severe chlorosis, broken limbs, slight lean--***prune dead limbs, mulch***
1162	Red Cedar	*Juniperus virginiana*	15.3	15.3	46.9%	x	Severely pruned, small canopy, dead limbs
1163	Red Cedar	*Juniperus virginiana*	12.4	12.4	59.4%		Some trunk damage, small vines, chlorosis--***remove vines, mulch***
1164	Red Cedar	*Juniperus virginiana*	22.0	22.0	43.8%	x	Severely pruned, English ivy, dead/broken limbs
1167	Northern Red Oak	*Quercus rubra*	24.0	24.0	50.0%		Offsite Tree- Significant lean towards neighbor, lichen, poorly pruned, one-sided, large dead limbs
1168	Northern Red Oak	*Quercus rubra*	16.0	16.0	46.9%		Offsite Tree- Top missing (potentially storm damage)
1169	Northern Red Oak	*Quercus rubra*	26.0	26.0	53.1%		Offsite Tree- One-sdied, missing large sacffold branches, root disease

NOTES:

-SHARED TREES SHALL NOT BE REMOVED WITHOUT WRITTEN PERMISSION FROM AFFECTED ADJACENT PROPERTY OWNERS.

-BARK OR HARDWOOD CHIP MULCH SHALL BE APPLIED TO SPECIFIED TREES WITHIN THE TREE PROTECTION AREA IN A 3-4" DEEP LAYER FROM THE TRUNK TO THE EDGE OF THE DRIPLINE OR TO THE LIMITS OF CLEARING IF THE DRIPLINE EXTENDS WITHIN THE LIMITS.

-PRUNING SHALL BE PERFORMED BY A KNOWLEDGABLE TREE CARE SPECIALIST. TREES TO BE PRESERVED SHALL BE PRUNED FOR CLEARANCE OR HEALTH & SAFETY REASONS ONLY. TREES TO BE PRESERVED SHALL NOT BE 'LION-TAILED' OR TOPPED.

SCALE (IN FEET)
10 20
20 0

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ECS LLC MID-ATLANTIC

2818 CEDAR LANE
VIENNA, VIRGINIA
FAIRFAX COUNTY

TREE PRESERVATION & PROTECTION PLAN
MR. JAMES HOLLINGSWORTH

ECS REVISIONS
2/20/12 - AEA
5/4/12 - AEA
8/21/13

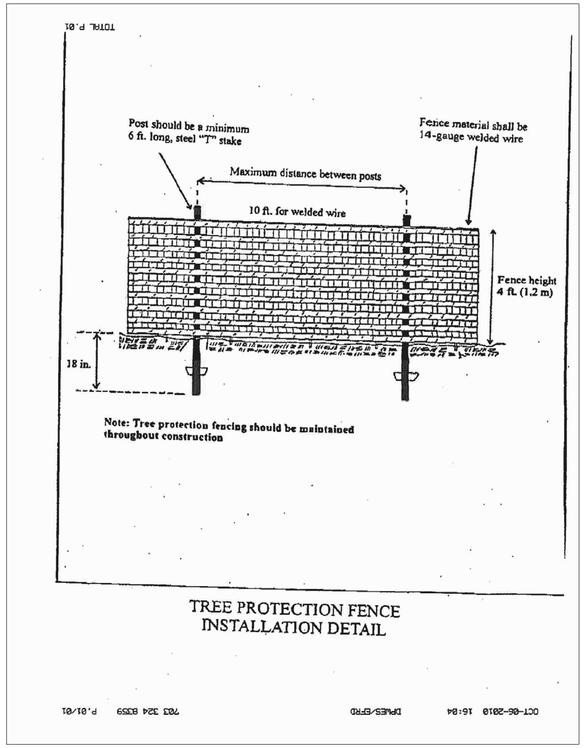
ENGINEER	DRAFTING
AMS	AEA

SCALE 1" - 20'

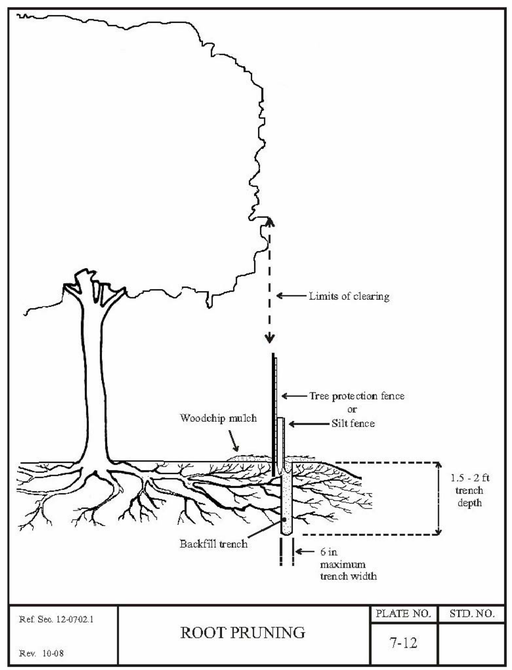
PROJECT NO. 01:19192

SHEET 4A OF 10

DATE 2/10/12



TREE PROTECTION FENCE
INSTALLATION DETAIL



TREE CONDITION ANALYSIS

ECS Mid-Atlantic, LLC (ECS) conducted a site reconnaissance to evaluate the wooded habitat on the project site in February 2012. The undeveloped portions of the site are comprised primarily of Upland Hardwoods (i.e. Oak and Hickory species) and Softwoods (i.e. White Pine) in the Upland Forest (2) cover type, Red Cedar and evergreen shrubs in the Early Successional Forest (3) cover type, and lawn grass in the Open Field (1) cover type. The species of trees assessed near the limits of clearing are listed in the Tree Table on the Existing Vegetation Map. In addition to those species, Flowering Dogwood and Crepe Myrtle were also observed onsite.

Based on our site reconnaissance, invasive and/or noxious species (i.e.: English Ivy) are present throughout wooded areas of the project site. Invasive species located within the areas to be preserved should be removed by hand wherever practicable to minimize site disturbance. The trees onsite are in Fair/Good condition, except where otherwise noted on the EVM (i.e.: Poor or Dead). Onsite trees within 150-feet of the proposed limits of clearing meet the standards for structural integrity and health identified in § 12-0403.2A and 12-0403.2B and are identified on the Existing Vegetation Map. At the time of inspection there were poor and dead trees located within 150-feet of the proposed limits of clearing, which are identified on the Existing Vegetation Map.

In accordance with § 12-0507.E2(1), trees designated for preservation shall be protected during construction.

TREE PRESERVATION NARRATIVE

§ 12-0509.3B: Dead or potentially hazardous trees shall be removed upon their discovery if they are located within 100-feet of the proposed limits of clearing. Dead trees not within this area shall be left in place to serve as wildlife habitat. Dead or potentially hazardous trees will be removed by hand (i.e.: chainsaw) wherever practical and will be conducted in a manner that incurs the least amount of damage to surrounding trees and vegetation proposed for preservation. Felled trees shall be left in place and brush should be removed by hand. No heavy equipment shall be used within tree preservation areas.

§ 12-0509.3C: Based on the current condition of the existing wooded areas, no adverse human health risks are anticipated provided that trees which pose a hazard to human health and safety are properly removed from areas where they could pose such a risk

§ 12-0509.3D: Invasive and/or noxious species (i.e.: English Ivy) are present throughout wooded areas of the site. Invasive species located within the areas to be preserved should be removed by hand wherever practicable to minimize site disturbance. See the previous sheet for species-specific control measures. Most of the forested areas within the tree preservation area do not contain invasive plant species at levels that endanger the long-term ecological functionality, health, and regenerative capacity of any native plant communities present onsite.

§ 12-0509.3E: The Applicant is not requesting official Specimen Tree designation for any of the large trees located onsite and is not using a multiplier for tree canopy calculations.

§ 12-0509.3F: Non-impacted Specimen trees located on and off-site shall be protected throughout all phases of construction by utilizing tree protection fencing as required by §12-0506.2D(1).

§ 12-0509.3G: Root pruning shall be conducted along the proposed limits of clearing and grading adjacent to the wooded habitat to be preserved and along property boundaries where the CRZ of off-site trees will be impacted. Locations of root pruning and tree protection fencing are shown on the Tree Preservation & Protection Plan.

§ 12-0509.3H: No trees will be transplanted as part of the proposed construction activities.

§ 12-0509.3I: Tree protection fencing and signage shall be placed subsequent to the staking of the limits of clearing in the field prior to construction in accordance with current Fairfax County ordinances.

§ 12-0509.3J: No work shall occur within the areas to be protected. Onsite trees within the limits of clearing and grading will be removed. No trees outside this area shall be removed unless indicated on the plan. Trees in preservation areas indicated on the plan to be removed shall be removed by hand. Dead or hazardous trees within this area may be limbed or topped, rather than removing the entire tree and left as snags.

§ 12-0509.3K: There are no known proffer conditions which would require a tree inventory, tree condition, tree valuation or tree bonding information.

MONITORING SCHEDULE:

-ALL REMOVAL OF VEGETATION AND DEMOLITION OF STRUCTURES SHALL BE PREFORMED IN THE PRESENCE OF A CERTIFIED ARBORIST REPRESENTING THE APPLICANT

-THE PROJECT ARBORIST SHALL MONITOR THE SITE WEEKLY DURING PHASE I OF CONSTRUCTION TO ENSURE THAT TREE PRESERVATION FENCING REMAINS INTACT AND TREES TO BE PRESERVED REMAIN UNDAMAGED AND DO NOT DECLINE IN HEALTH DUE TO CONSTRUCTION ACTIVITIES. THE PROJECT ARBORIST SHALL PROVIDE MONTHLY MONITORING AFTER THE COMPLETION OF PHASE I OF CONSTRUCTION THROUGH PROJECT COMPLETION.

-THE PROJECT ARBORIST SHALL INFORM UFMD, DPWES, OF THE OBSERVED CONDITIONS DURING MONITORING ACTIVITIES BY LETTER FOLLOWING EACH VISIT.

PROFFERED CONDITIONS

TREE PRESERVATION

The Applicant shall submit a Tree Preservation Plan and Narrative as part of the first and all subsequent site plan submissions. The preservation plan and narrative shall be prepared by a Certified Arborist or a Registered Consulting Arborist, and shall be subject to the review and approval of the Urban Forest management Division, DPWES.

The tree preservation plan shall include a tree inventory that identifies the location, species, critical root zone, size, crown spread and condition analysis percentage rating for all individual trees to be preserved, as well as all on and off-site trees, living or dead with trunks 12 inches in diameter and greater (measured at 4.5 feet from the base of the trunk or as otherwise allowed in the latest edition of the Guide for Plant Appraisal published by the International Society of Arboriculture) located within 25 feet to either side of the limits of clearing and grading. The tree preservation plan shall provide for the preservation of those areas shown for tree preservation, those areas outside the limits of clearing and grading shown on the GDP and those additional areas in which trees can be preserved as a result of final engineering. The tree preservation plan and narrative shall include al items specified in PFM 12-0507 and 12-0509. Specific tree preservation activities that will maximize the survivability of any tree identified to be preserved, such as: crown pruning, root pruning, mulching, fertilization, and others as necessary, shall be included in the plan.

TREE PRESERVATION WALK-THROUGH

The Applicant shall retain the services of a certified arborist or Registered Consulting Arborist, and shall have the limits of clearing and grading marked with a continuous line of flagging prior to the walk-through meeting. During the tree-preservation walk-through meeting, the Applicant's certified arborist or landscape architect shall walk the limits of clearing and grading with an UFMD, DPWES, representative to determine where adjustments to the clearing limits can be made to increase the area of tree preservation and/or to increase the survivability of trees at the edge of the limits of clearing and grading, and such adjustment shall be implemented. Trees that are identified as dead or dying may be removed as part of the clearing operation. Any tree that is so designated shall be removed using a chain saw and such removal shall be accomplished in a manner that avoids damage to surrounding trees and associated understory vegetation. If a stump must be removed, this shall be done using a stump grinding machine in a manner causing as little disturbance as possible to the adjacent trees and associated understory vegetation and soil conditions.

LIMITS OF CLEARING AND GRADING

The Applicant shall conform strictl to the limits of clearing and grading as shown on the GDP, subject to allowances specified in these proffered conditions and for the installation of utilities and/or trails as determined necessary by the Director of DPWES, as described herein. If it is determined necessary too install utilites and/or trails in the areas protected by the limits of celaring and grading as shown on the GDP they shall be located in the least disruptive manner necessary as determined by the UFMD, DPWES. A replanting plan shall be developed and implemented, subject to approcal by the UFMD, DPWES, for areas protected by the limits of learing and grading that must be disturbed for such trails or utilities.

TREE PRESERVATION FENCING

All trees shown to be preserved on the tree preservation plan shall be protected by tree protection fence. Tree protection fencing in the form of four (4) foor high, fourteen (14) gauge welded wire attached to six (6) foot steel posts driven eighteen (18) inches into the ground and placed no further than ten (10) feet apart or, super silt fence to the extent that required trenching for super silt fence does not sever or wound compression roots which can lead to structural failure and/or uprooting of trees shall be erected at the limits of clearing and grading as shown on the demolition, and phase I & II erosion and sediment control sheets, as may be modified by the "Root Pruning" proffer below.

All tree protection fencing shall be installed after the tree preservation walk-through meeting but prior to any clearing and grading activities, including the demolition of any existing structures. The installation of all tree protection fencing shall be performed under the supervision of a certified arborist, and accomplisted in a manner that does not harm existing vegetation that is to be preserved. Three (3) days prior to the commencement of any clearing, grading or demolition activities, but subsequent to the installation of the tree protection devices, the UFMD, DPWES, shall be notified and given the opportunity to inspect the site to ensure that all tree protection devices have been correctly installed. If it is determined that the fencing has not been installed correctly, no grading or construction activities shall occur until the fencing is installed correctly, as determined by the UFMD, DPWES.

ROOT PRUNING

The Applicant shall root prune, as needed to comply with the tree preservation requirements of these proffers. All treatments shall be clearly identified, labeled, and detailed on the erosion and sediment control sheets of the subdivision plan submission. The details for these treatments shall be reviewed and approved by the UFMD, DPWES, accomplished in a manner that protects affected and adjacent vegetation to be preserved, and may include, but not be limited to the following:
--Root pruning shall be done with a trencher or vibratory plow to a depth of 18 inches
--Root pruning shall take place prior to any clearing and grading, or demolition of structures.
--Root pruning shall be conducted under the supervision of a certified arborist.
--An UFMD, DPWES, representative shall be informed when all root pruning and tree protection fence installation is complete.

DEMOLITION OF EXISTING STRUCTURES

The demolition of all existing features and structures within areas protected by the limits of clearing and grading areas shown on the GDP shall be done by hand without heavy equipment and conducted in a manner that does not impact individual tree and/or groups of trees that are to be preserved as reviewed and approved by the UFMD, DPWES.

SITE MONITORING

During any clearing or tree/vegetation/structure removal on the Applicant Property, a representative of the Applicant shall be present to monitor the process and ensure that the activities are conducted as proffered and as approved by the UFMD. The Applicant shall retain the services of a certified arborist or Registered Consulting Arborist to monitor all construction and demolition work and tree preservation efforts in order to ensure conformance with all tree preservation proffers, and UFMD approvals. The monitoring schedule shall be described and detailed in the Landscaping and Tree Preservation Plan, and reviewed and approved by the UFMD, DPWES.

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ECS LLC MID-ATLANTIC

2818 CEDAR LANE
VIENNA, VIRGINIA
FAIRFAX COUNTY

TREE PRESERVATION NARRATIVES

MR. JAMES HOLLINGSWORTH

ECS REVISIONS
2/20/12 - AEA
5/4/12 - AEA
8/21/13

ENGINEER	DRAFTING
AMS	AEA

SCALE: NTS

PROJECT NO.: 01:19192

SHEET: 4B OF 10

DATE: 2/10/12

Schedule A Plant Schedule

HOLLINGSWORTH PROPERTY, FAIRFAX COUNTY, VIRGINIA

Evergreen Trees

Code	Quantity	Category	Projected Tree Canopy Area (sqft)	Caliper in inches at planting
II	13	II - Evergreen	75	1
I	6	I - Evergreen	40	1
	19	**Subtotal**		

Shrubs Recommended for Sheet Flow to Conservation

Code	Quantity		Size Caliper or Height
S	26		18" Min.
	26	**Subtotal**	

CATEGORY II (CAT 2)

CATEGORY I (CAT I)

SHRUBS

VA. STATE GRID NORTH

GRAPHIC SCALE

0 10 20 40

(IN FEET)

1 INCH = 20 FEET

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Suite 330
Chantilly, Virginia

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703.361.1566 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
JAMES C. BISHOFF
Lic. No. 031721
PROFESSIONAL ENGINEER
08-21-13

PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= 2'
SCALE: 1"= 20'

PLAN DATE
05/14/2008
11/22/2011
3/12/12
4/25/12
5/08/12
3/29/13
7/16/13
8/21/13

LANDSCAPE PLAN

GENERALIZED DEVELOPMENT PLAN
HOLLINGSWORTH PROPERTY

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

No.	DATE	DESCRIPTION
		REVISIONS
1.	11/21/11	NEW ENGINEER
2.	3/12/12	Address Staff comments for resubmission
3.	4/25/12	Address Staff Comments for resubmission
4.	5/08/12	Address Staff Comments for resubmission
5.	3/29/13	Revised Outfall Narrative
6.	7/16/13	Revised limits of clearing, revised outfall analysis and narrative, added soil test information.
6.	8/21/13	Revised canopy calculations on sheet 4A

SHEET
4C
OF
10

BIO–RETENTION FACILITY NOTES:

1. Soil infiltration rates have been performed by Robinson Environmental Group.

2. Observation wells and Cleanouts. There shall be a minimum of one observation well or cleanout per 1,000 square feet(93 m2) of surface area. Observation wells and cleanouts shall be a minimum of 6 inches(152mm) in diameter with a lockable cap extending above the 10–year water surface elevation. Cleanouts shall be provided at the end of all pipe runs. Cleanouts and observation wells shall be solid pipe except for the portion below the planting soil bed which must be perforated. Observation wells that are not connected to underdrain piping shall be anchored to a footplate at the bottom of the facility.

3. The bioretention soil media shall be composed of a mixture of 50–60% washed sand, 20–30%leaf compost, and 20–30%topsoil. Topsoil shall be a sandy loamy sand, orloam per USDA textural classification. The textural class of the topsoil shall be verified by a laboratory analysis. Topsoil shall be of uniform composition, containing no more than 5% day, free of stones, stumps, brush, roots,or similar objects larger than 2 inches. Topsoil shall be free of Bermuda Grass,Quackgrass, Johnson Grass, Mugwort, Nutsedge, Poison Ivy, Canadian Thistle, Tearthub, or other noxious weeds. Sand shall meet AASHTO M–6, ASTM C–33, or VDOT Section 202 Grade "A" fine Aggregate specifications. Sand shall be clean and free of deleterious materials. The final soil mixture shall not contain any material or substance that may be harmful to plant growth, or a hindrance to plant growth or maintenance. The final soil mixture shall meet the requirements in Table 6–37.
pH5.5–6.5Total Organic Matter by Loss on Ignition (ASTM F1647, Method A)1.5–3.0% (dry weight) Soluble Salts ≤ 500 ppm

4. Each bioretention area shall have a minimum of one soil test performed on the final soil mixture. Test results and materials certifications shall be submitted to DPWES prior to inspection.
9B Mulch shall be double shredded hardwood mulch, well aged, uniform in color,and free of foreign material including plant material. Well aged mulch is that has been stockpiled or stored for 6–12 months.

5. Underdrains. Underdrains are not required since infilteration rates are sufficient.

6. Filter fabric. Filter fabric shall be a needled, non–woven,polypropylene geotextile meeting the requirements listed. Heat–set or heat–calendared fabrics are not permitted' Filter Fabric Specifications: Grab Tensile strength (ASTM D4632)≥120lbs (533 N) Mullen Brust Strength (ASTM d3786)≥225lbs/in2(1550 kpa)UV Resistance (ASTM D4355)70% Strength after 500 hours Flow Rate (ASTM D4491)≥125 gal/min/ft2 (5093 l/min/m2)Apparent Opening size(AOS)(ASTM D4751)US #70 or #80 sieve (0.212 or 0.180mm)

7. Bioretention planting plans and specifications shall be prepared by a certified landscape architect, horticulturalist, or other qualified individual who has knowledge of the environmental tolerance, ecological functions, and ecological impacts of plant species. Planting plans shall be prepared in accordance with the requirements of § 12–0700.

8. Depending on the bioretention planting plan type and application as detailed in § 6–1311.10F, a mixture of trees, shrubs, and perennial herbaceous plants with a high density of fibrous roots is required. Selected plants must be able to tolerate highly variable moisture conditions, generally dry with brief periods of inundation. Depending on site conditions, selected plants also must be able to tolerate exposure to wind and sun, as well as salt and toxins in runoff from roads, parking lots, and driveways. The use of native plant species is preferred. The acceptability of proposed plant materials will be determined by the Director. Guidance on the use and selection of plants for bioretention facilities is available from the Urban Forest Management Division.

9. All plants shall conform to the latest version of American Standard for Nursery Stock published by the American Nursery and Landscape Association (ANSI Z60.1) for quality and sizing. Trees and shrubs shall be nursery grown unless otherwise approved and shall be healthy and vigorous, free from defects, decay, disfiguring roots, sun–scald, injuries, abrasions, diseases, insects pests, and all forms of infestations or objectionable disfigurements as determined by the Director.

10. Trees shall be a minimum of 1 inch (25.4mm) caliper. Shrubs shall be a minimum of 2 gallon (7.58L) container size and herbaceous plants shall be a minimum of 6 inch (152 mm) diameter container size. Variations in size may be approved by the Director, based on the requirements of the specific plants listed in the schedule.

11. The planting plan shall provide for plant community diversity and should consider aesthetics from plant form, color, and texture year–round. The bioretention facility design and selection of plant material shall serve to visually link the facility into the surrounding landscape. If trees and shrubs are part of the design, woody plant species shall not be placed directly within the inflow section of the bioretention facility.

12. Wooded planing plans. Wooded bioretention facilities are appropriate where the facility is located at wooded edges, in the rear of residential lots, or where a wooded buffer is required. Design guidelines include: A density of ten (10) trees per 1,000 square feet of basin shall be used. A minimum of three species of trees and three species of shrubs shall be painted, with trees located on the perimeter to maximize shading of the bioretention area; Of the three species of trees, at a minimum one shall be a mid or understory species; 30–50% of the total quantity of trees planted shall be mid or understory trees; Two to three shrubs shall be planted for each tree (2:1 to 3:1 ratio of shrubs to trees); At least 3 species of perennial herbaceous ground cover shall be planted;

Where the basin is planted at the specified density, Interior and peripheral parking lot landscaping and tree cover credit.

Trees planted in wooded bioretention facilities may also fulfill the requirements of transitional screening if the planting conforms to the provisions of Article 13–300 of the Zoning Ordinance.

Ornamental garden planting plans. Ornamental garden bioretention facilities are appropriate on commercial sites, as a focal point within residential developments or located in the front yard of an individual residential lot. Design guidelines include:

The facility should be considered as a mass planting bed with plants that have ornamental characteristics linking it to the surrounding landscape;

The facility should contain a variety of plant species which will add interest to the facility with each changing season;

A mixture of trees, shrubs and perennial herbaceous groundcover at an approximate ratio of 10% trees, 20% shrubs and 70% perennials shall be planted;

When the size or location of the facility precludes the use of large shade trees, use of small ornamental trees shall be considered. Alternatively a mixture of shrubs and perennials at an approximate ratio of 40% shrubs, 60% perennials may be used;

Spacing of plant material as species specific and will be subject to review and approval of the Director. In general the facility shall be planted at a density that the vegetation will cover 80–90% of the facility after the second growing season.

Meadow garden planting plans. Meadow garden bioretention facilities lack woody material and are appropriate for smal facilities, either on commercial or residential sites. Design guidelines include: Plant material shall consists of a variety of grasses and wildflowers. Other groundcovers, rushes and sedges may be part of the mixture as well; Species of different heights, texture, as well as flowering succession shall be selected; Spacing of plant material is species specific and will be subject to review and approval of the Director. In general the facility shall be planted at a density that the perennial herbaceous vegetation will cover 80–90% of the facility after the second growing season.

Construction Specifications.

Bioretention facilities shall be constructed after the drainage area to the facility is completely stabilized. Erosion and sediment controls for construction of the facility shall be installed as specified in the ersion and sediment control plan.

All materials shall be inspected by the contractor and compared to the plan specifications prior to installation. Any materials not meeting plan specifications shall be rejected and replaced with suitable materials.

The components of the soil media shall be thoroughly mixed until a homogeneous mixture is obtained. it is preferable that hte components of the soil media be mixed at a batch facility prior to deliver to the site. The soil media shall be moistened, as necessary, to prevent separation during installation.

The soil media shall be tested for pH, organic matter, and soluble salts prior to installation. If the results of the tests indicate that the required specifications are not met, the soil represented by such tests shall be amended or corrected as required and retested until the soil meets the required specifications. If the pH is low, it may be raised by adding lime. if the pH is too high, it may be lowered by adding iron sulfate plus sulfur.

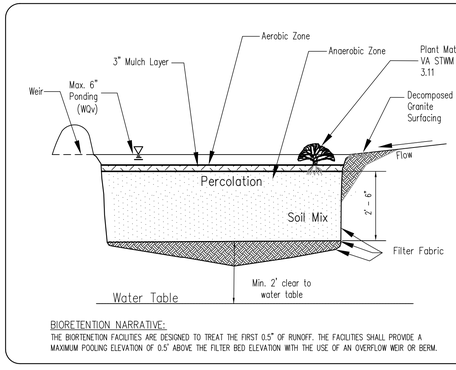
For bioretention basins, the floor of the facility shall be scarified or tilled to reduce soil compaction and raked to level it before the filter fabric, stone, and soil media are placed.

The soil media may be placed by mechanical methods with minimal compaction in order to maintain the porosity of the media. spreading shall be by hand. The soil media shall be placed in 8–12 inch (205–305mm) lifts with no machinery allowed over the soil media during or after construction. The soil media should be overfilled above the proposed surface elevation as needed to allow for natural settlement. Lifts may be lightly watered to encourage settlement. After the final lift is placed, the soil media shall be raked to level it, saturated, and allowed to settle for at least one week prior to installation of plant materials.

Fill for the berm and overflow weir shall consist of clean material free of organic matter, rubbish, frozen soil, snow, ice, particles with sizes larger that 2 inches (75 mm), or other deleterious material. Fill shall be plaed in 8–12inch (205–305 mm) lifts and compacted to prevent settlement. Compaction equipment shall not be allowed within the facility on the soil bed. The top of the berm and the invert of the overflow weir shall be constructed level at the design elevation.

TYPICAL BIORETENTION BASIN CROSS SECTION

NOT TO SCALE

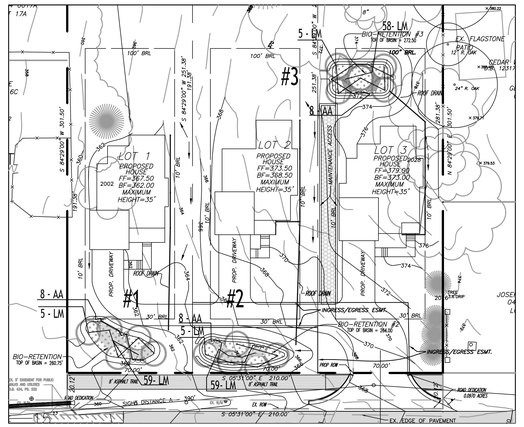


BIORETENTION NARRATIVE:
THE BIORTENETION FACILITIES ARE DESIGNED TO TREAT THE FIRST 0.5" OF RUNOFF. THE FACILITIES SHALL PROVIDE A MAXIMUM POOLING ELEVATION OF 0.5' ABOVE THE FILTER BED ELEVATION WITH THE USE OF AN OVERFLOW WEIR OR BERM.

BIO–RETENTION FACILITY SCALE 1"=40':

GRAPHIC SCALE
0 20 40 80
(IN FEET)
1 INCH = 40 FEET

VA. STATE GRID NORTH



STORMWATER MANAGEMENT NARRATIVE

Additional storage has been provided above the ponding depth for the WQv to provide additional stormwater management. Per section 6–0203.4C of the Fairfax County PFM, the required 1–year volume shall be detained. The total storage for water quality and quantity provided for each bioretention facility is shown below. An emergency overflow weir (set 0.5' above the WQv elevation) has been provided to release the 2, 10, and 100– year flows.

As mentioned above, the bioretention facility serves two purposes, water quality and quantity. The post–development drainage areas have been broken up Points of analysis. See sheet 6 for overall Outfall Analysis at these points for both the pre– and post–development conditions. Point A represents the runoff from the site which flowing to the southeast quadrant of the site. Point B represents the remainder of the runoff leaving the site on the south west half of the site. BMP, Stormwater Management, and outfall analysis are subject to change with final engineering.

BIO–RETENTION DESIGN, FACILITY #1:

GIVEN:
Drainage area to the facility = 0.13 AC,
impervious area (Ai) = 0.06 AC.
Depth of filter (df) = 2.5 ft
Maximum ponding depth (hf) = 0.5 ft
Coefficient of permeability of filter bed (kf) = 1.5 in/hr
Design infiltration rate of in situ soils (Ks) = 0.35 in/hr (one–half of field measured rate of 0.7 in/hr);
Porosity of gravel (ng) = 0.40

REQUIRED AREA OF THE FILTER BED:
Determine the required area of the filter bed (Af) for a water quality volme (WQv) of 0.5 inch per impervious acre (1,815 ft3).
1. REQUIRED AREA = Af =WQv / hf
WHERE
WQv= WATER QUALITY VOLUME (CU.FT.)
hf= MAXIMUM PONDING DEPTH must have underdrain
The water quality volume is:
WQv = 1815 CUFT (0.06 AC.) = 100.58 CUFT
The area of the filter bed is:
Af (required) = WQv/hf = 100.58/0.5 = 201.17 ft2
Af (provided)=472 ft2 (Additional area for 1–yr volume).

COMPUTE DRAIN TIME THROUGH THE FILTER
Compute the drain time through the filter for a filter area of 472 ft2 (Must be less that 24 hrs.).
tf = (WQv) (df)/[(kf/12)(0.5hf+df)Af]
= (100.58)(2.5)/[(1.5/12)(0.5(0.5)+2.5)472]
= 1.55 hrs ≤ 24 hrs. OK

COMPUTE LANDSCAPE COMPUTATIONS
Trees and shrubs shall be provided at a rate of 10 trees & shrubs per 1,000 square feet of basin area.
For plant locations and schedule, see this sheet.
*REQUIRED: 472 SF * 10/1000 = 5 TREES & SHRUBS*
PROVIDED: SEE PLANT SCHEDULE BELOW

BIO–RETENTION DESIGN, FACILITY #2:

GIVEN:
Drainage area to the facility = 0.27 AC,
impervious area (Ai) = 0.13 AC.
Depth of filter (df) = 2.5 ft
Maximum ponding depth (hf) = 0.5 ft
Coefficient of permeability of filter bed (kf) = 1.5 in/hr
Design infiltration rate of in situ soils (Ks) = 0.35 in/hr (one–half of field measured rate of 0.7 in/hr);
Porosity of gravel (ng) = 0.40

REQUIRED AREA OF THE FILTER BED:
Determine the required area of the filter bed (Af) for a water quality volme (WQv) of 0.5 inch per impervious acre (1,815 ft3).
1. REQUIRED AREA = Af =WQv / hf
WHERE
WQv= WATER QUALITY VOLUME (CU.FT.)
hf= MAXIMUM PONDING DEPTH must have underdrain
The water quality volume is:
WQv = 1815 CUFT (0.13 AC.) = 235.95 CUFT
The area of the filter bed is:
Af (required) = WQv/hf = 235.95/0.5 = 471.90 ft2
Af (provided)=472 ft2

COMPUTE DRAIN TIME THROUGH THE FILTER
Compute the drain time through the filter for a filter area of 472 ft2 (Must be less that 24 hrs.).
tf = (WQv) (df)/[(kf/12)(0.5hf+df)Af]
= (235.95)(2.5)/[(1.5/12)(0.5(0.5)+2.5)472]
= 3.64 hrs ≤ 24 hrs. OK

COMPUTE LANDSCAPE COMPUTATIONS
Trees and shrubs shall be provided at a rate of 10 trees & shrubs per 1,000 square feet of basin area.
For plant locations and schedule, see this sheet.
*REQUIRED: 472 SF * 10/1000 = 5 TREES & SHRUBS*
PROVIDED: SEE PLANT SCHEDULE BELOW

BIO–RETENTION DESIGN, FACILITY #3:

GIVEN:
Drainage area to the facility = 0.21 AC,
impervious area (Ai) = 0.08 AC.
Depth of filter (df) = 2.5 ft
Maximum ponding depth (hf) = 0.5 ft
Coefficient of permeability of filter bed (kf) = 1.5 in/hr
Design infiltration rate of in situ soils (Ks) = 0.35 in/hr (one–half of field measured rate of 0.7 in/hr);
Porosity of gravel (ng) = 0.40

REQUIRED AREA OF THE FILTER BED:
Determine the required area of the filter bed (Af) for a water quality volme (WQv) of 0.5 inch per impervious acre (1,815 ft3).
1. REQUIRED AREA = Af =WQv / hf
WHERE
WQv= WATER QUALITY VOLUME (CU.FT.)
hf= MAXIMUM PONDING DEPTH must have underdrain
The water quality volume is:
WQv = 1815 CUFT (0.08 AC.) = 145.2 CUFT
The area of the filter bed is:
Af (required) = WQv/hf = 145.2/0.5 = 290.4 ft2
Af (provided)=485 ft2 (Additional area for 1–yr volume).

COMPUTE DRAIN TIME THROUGH THE FILTER
Compute the drain time through the filter for a filter area of 472 ft2 (Must be less that 24 hrs.).
tf = (WQv) (df)/[(kf/12)(0.5hf+df)Af]
= (145.2)(2.5)/[(1.5/12)(0.5(0.5)+2.5)485]
= 2.18 hrs ≤ 24 hrs. OK

COMPUTE LANDSCAPE COMPUTATIONS
Trees and shrubs shall be provided at a rate of 10 trees & shrubs per 1,000 square feet of basin area.
For plant locations and schedule, see this sheet.
*REQUIRED: 485 SF * 10/1000 = 5 TREES & SHRUBS*
PROVIDED: SEE PLANT SCHEDULE BELOW

PLANT SCHEDULE

SYMBOL	QUANTITY LOT #1	LOT #2	LOT #3	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION
TREES – DECIDUOUS CANOPY							
QU	5	5	5	Quercus Phellos	Willow Oak	2–2 1/2" Caliper	B&B
SHRUBS/GRASSES							
LM	59	59	58	LIRIOPE MUSCARI	Big Blue Lilytirf Liriope	1 Gal. or 30" Ht. Minimum	Cont.
AA	8	8	8	Aronia Arbutifolia	Red Choke Berry	1 Gal. or 30" Ht. Minimum	Cont.

MINIMUM STORMWATER INFORMATION FOR REZONING, SPECIAL EXCEPTION, SPECIAL PERMIT AND DEVELOPMENT PLAN APPLICATIONS

The following information is required to be shown or provided in all zoning applications, or a waiver request of the submission requirement with justification shall be attached. Note: Waivers will be acted upon separately. Failure to adequately address the required submission information may in a delay in processing this application.

This information is required under the following Zoning Ordinance paragraphs:

Special permits(8–0112J&2L)	Special Exceptions (9–011 2J & 2L)
Cluster Subdivision(9–615 1G & 1N)	Commercial Revitalization Districts (9–622 2a (12) & (14))
Development plans PRC district(16–302 3&4L)	PRC Plan (18–303 1E & 10)
FDP P Districts (exept PRC)(16–502 1F & 10)	Amendments (18–202 10F & 10I)

1. Plat is at a minimum scale af 1"=50'(unless it is depicted on one sheet with a minimum scale of 1"=100')
2. A graphic depicting the stormwater management facility(ies) and limits of cleaning and grading accommodate the stormwater management facility(ies),storm drainage pipe systems and outlet protection, pond spilways, access roads, site outfalls, energy dissipation devices,and stream stabilization measures as shown on Sheet 2,5,6 .
3. Provide:

Facility Name/ Type & No.	On–site area served(acres)	Off–site area served(acres)	Drinage area (acres)	Footprint area (sft)	Storage Volume (cf)	if pond, dem height (ft)
BIORETENTION FACILITY #1	0.13 ACRES	0.00 ACRES	0.13 ACRES	472 SF	272 CF	
BIORETENTION FACILITY #2	0.18 ACRES	0.09 ACRES	0.27 ACRES	472 SF	275 CF	
BIORETENTION FACILITY #3	0.21 ACRES	0.00 ACRES	0.21 ACRES	485 SF	276 CF	
Totals						

4. Onsite drainage channels, outfalls and pipe system are shown on sheet N/A . Pond inlet and outlet pipe systems are shown on sheet N/A .
5. Maintenance access (road)to stormwater management facility(ies) are shown on sheet N/A Type of maintenance access road surface noted on the plat is N/A (asphalt, geoblock, gravel, etc.) ACCESS ROAD TO BIO–RENTION FACILITY (RAIN GARDEN) NOT REQUIRED
6. Landscaping and tree preservation shown in and near the stormwater management facility is shown on Sheet 4 .
7. A 'stormwater management narriative' which contains a description of detention and best management practices requirements will be met is provided on sheet 5, 6 .
8. A description of the existing conditions of each numbered site outfall extended downstream from the site to a point which is at least 100 times the site area or which has a drainage area of at least one square mile(640 acres) is provided on sheet 6 .
9. A description of how the outfall requirements, including contributing drainage areas of the public Facilities Manual will be satisfied is provided on sheet 5,6 .
10. Existing topography with maximum contour intervals of two (2) feet and a note as to whether it is an air survey or field run is provided on sheets 2 .
11. A submission waiver is required for _____
12. Stormwater management is not required because N/A

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www.j2engineers.com

COMMONWEALTH OF VIRGINIA
JAMES C. BISHOFF
Lic. No. 031721
08-21-13
PROFESSIONAL ENGINEER

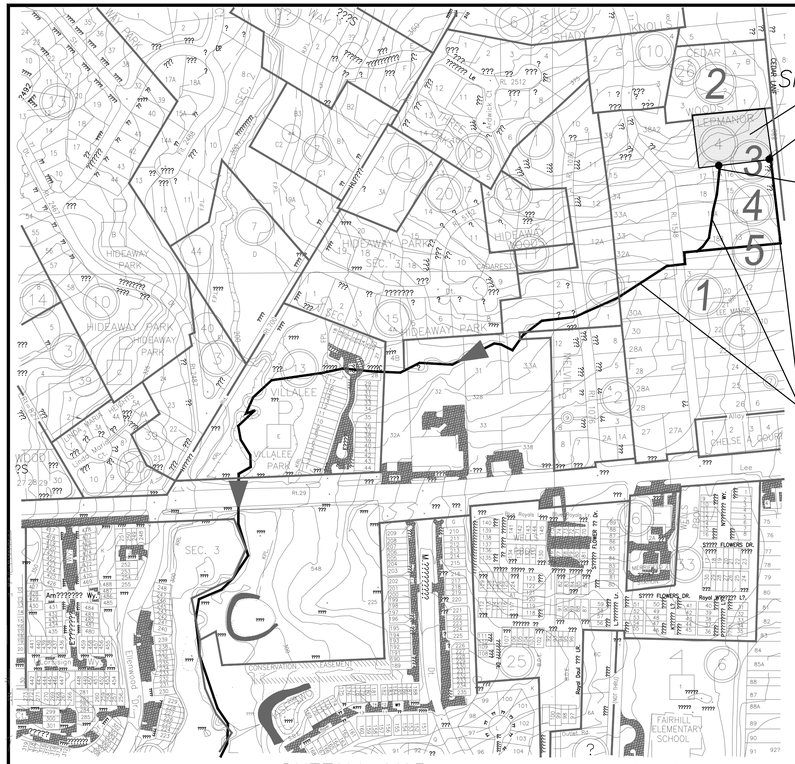
PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= 2'
SCALE: 1"= 40'

PLAN DATE
05/14/2008
11/22/2011
3/1/2012
4/25/12
5/08/12
3/29/13
7/16/13
8/21/13
09/23/13
09/27/13

BIO-RETENTION PLAN
GENERALIZED DEVELOPMENT PLAN
HOLLINGSWORTH PROPERTY
PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

No.	DATE	REVISIONS
1.	11/21/11	NEW ENGINEER
2.	3/12/12	Address Staff comments for resubmission
3.	4/25/12	Address Staff Comments for resubmission
4.	5/08/12	Address Staff Comments for resubmission
5.	3/29/13	Revised Outfall Narrative
6.	7/16/13	Revised limits of clearing, revised outfall analysis and narrative, added soil test information.
6.	8/21/13	Revised canopy calculations on sheet 4A

SHEET 5 OF 10



OUTFALL MAP:
SCALE 1"=300'

GRAPHIC SCALE
0 150 300 600
(IN FEET)
1 INCH = 300 FEET

OUTFALL NARRATIVE:

The proposed development's outfall points collect runoff from 3 proposed bio-retention facilities as well as uncontrolled areas on and off site. The bioretention facitilities were designed to provide water quality as well as water quantity (storm water management). The analysis for the site has been broken into 2 analysis points (Point A and B). Each point represents a location where runoff leaves the site and flows south. Runoff from these 2 points flow south and converge. The Post-Development improvements will decrease the 2 and 10-year storm events from the Pre-Development condition at each Point. Stormwater management and adequate outfall analysis is subject to change with final engineering.

Point A
The flow leaving the site from point A is collected by proposed closed storm sewer system running adjacent to Cedar Lane. This closed storm sewer system travels approx. 350 feet south, turns west running on the north side of Emil Way., and outfalls into an existing 34.5" concrete ditch. Approximately 350' along the concrete ditch, runoff from Point B and offsite area converge and travels southwest (The existing 34.5" concrete ditch and details downstream are described more in depth below).

Point B: Downstream of the property is a non defined swale which drains in the rear of parcels 13, 14, 15, 16C, 18 and 18C (Lee Manor Subdivision) This area is marked with several sheds, yard storage areas. The flow is obstructed by fences, wood piles. Various improvements to the downstream properties have regraded the swale and added significant impervious areas draining to the outfall.

As mentioned above, flow from both Point A and Point B converge in a existing 34.5" concrete ditch along Emil Way south of parcel 18B at the corner of Maple Lane (Rt. 1546). The concrete ditch drians to a box inlet at the corner of the alley and Maple Lane. It crosses maple in a closed system (30" pipe) and is outfalled into a wide swale through Lot 1 of "Melville". The flow is picked up in a culvert crossing Cedarest Road. The flow outfalls into a meandering channel approximately 3 feet wide by 3 feet deep through lot 9 of Melville. The channel runs north of a new single family project. This area has been designated as an RPA area as per Fairfax County RPA Map 49-3.

Flow is conveyed by a channel through a commercial development (8810-8902 Lee Highway) and is conveyed to a closed system through a Townhouse development- Villa Lee and conveyed to the flood plain.

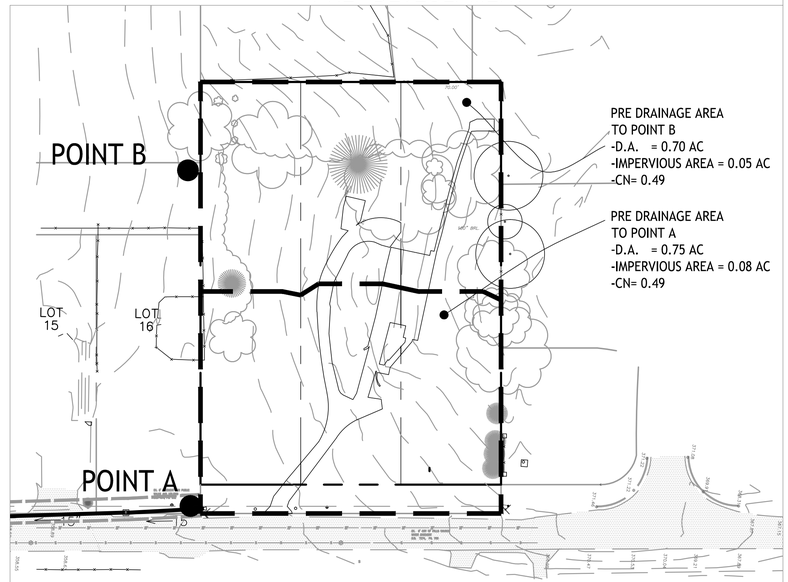
The Bio-Retention facilties have been designed to reduce the peak flows leaving the site for the 2 and 10 yr events. Berms have been sized to pass the 100 year event.

An example of an open/closed proposed stormwater drainage system will accompany the revised GDP. This proposed drainage system and it's location may be subject to modification during final engineering.

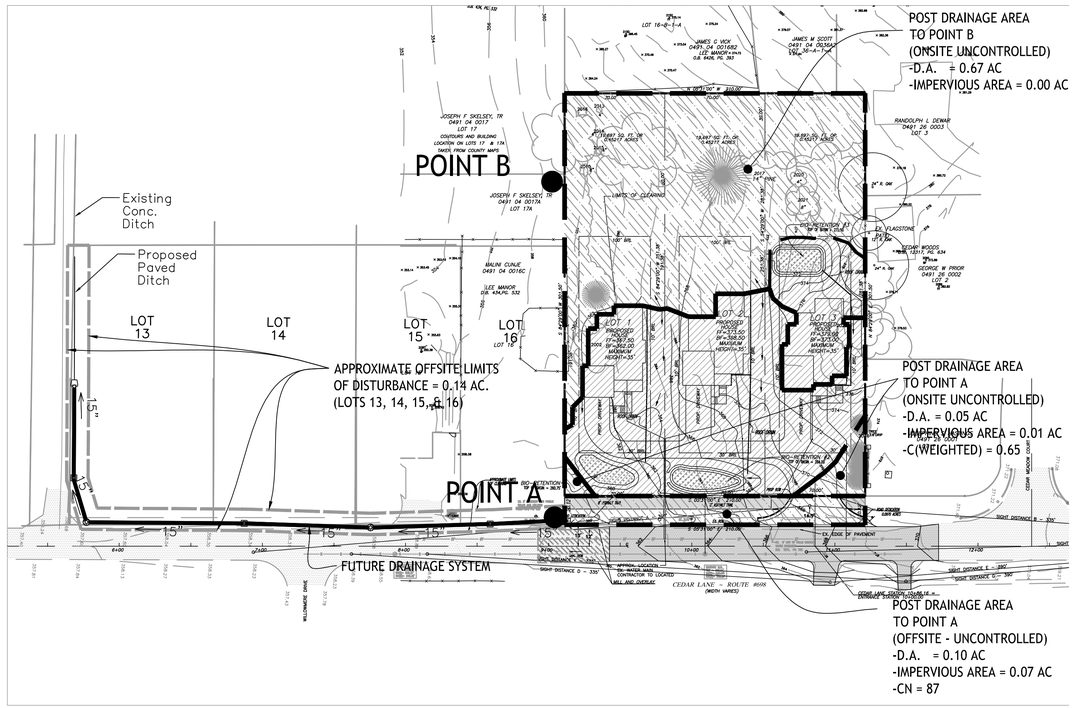
Notarized letters from property owners of Lots 13, 14, 15 and 16 that grant Applicant permission to apply for all necessary permits with VDOT and Fairfax County to install a proposed stormwater drainage system on their respective properties will accompany this revised GDP.

VA. STATE GRID NORTH

PRE-DEVEOLPMENT



POST-DEVEOLPMENT

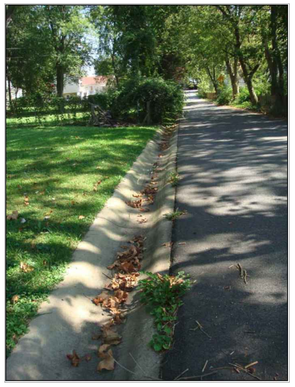


DRAINAGE DIVIDES:
SCALE 1"=50'

GRAPHIC SCALE
0 25 50 100
(IN FEET)
1 INCH = 50 FEET

LEGEND

- DIVIDE
- CONTROLLED
- UNCONTROLLED

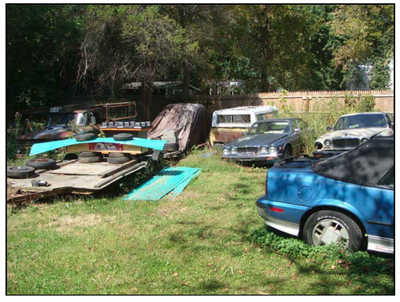


SWALE AREA IS COLLECTED BY CONCRETE DITCH AT EMIL WAY

3 NEW CONSTRUCTION DOWNSTREAM WITHOUT DEFINED SWALES OR HONORING OUTFALLS

2 LARGE AMOUNTS OF IMPERVIOUS AREAS ADDED TO DRAINAGE SHED, AND A CHANGE OF EXISTING DIVIDES

4 PAVED IMPERVIOUS AREAS DOWNSTREAM HAVE INCREASED AMOUNT OF OVERLAND FLOW



5 LARGE AMOUNTS OF OBSTRUCTIONS TO EXISTING OUTFALL, STRUCTURES (SHEDS) COMMON IN SWALE AREA

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COMMONWEALTH OF VIRGINIA
JAMES C. BISHOFF
Lic. No. 031721
PROFESSIONAL ENGINEER
08-21-13

PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= 2'
SCALE: AS SHOWN

PLAN DATE
05/14/2006
11/22/2011
3/12/12
4/25/12
5/09/12
03/29/13
07/16/13
08/21/13

STORMWATER MANAGEMENT - OVERALL
GENERALIZED DEVELOPMENT PLAN
HOLLINGSWORTH PROPERTY
PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

No.	DATE	REVISIONS
1.	11/21/11	NEW ENGINEER
2.	3/12/12	Address Staff comments for resubmission
3.	4/25/12	Address Staff Comments for resubmission
4.	5/08/12	Address Staff Comments for resubmission
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6.	8/21/13	Revised canopy calculations on sheet 4A

SHEET
6
OF
10

BMP ANALYSIS CALCULATIONS
LOT #1

Determine the applicable area (A) and the post-developed impervious cover (I_{post})

STEP 1

Applicable area (A) = 0.45 acres SITE AREA LOT #1

Post-development impervious cover:

structures = 0.05 acres

sidewalk/roadway = 0.03 acres

other = 0.00 acres

Total = 0.08 acres

I_{post} = (total post-development impervious cover ÷ A) x 100 = 17.78 %

Determine the average land cover condition ($I_{watershed}$) or the existing impervious cover ($I_{existing}$).

Average land cover condition ($I_{watershed}$):
If the locality has determined land cover conditions for individual watersheds within its jurisdiction, use the watershed specific value determined by the locality as $I_{watershed}$.

STEP 2 **Determine the relative post-development pollutant load (L_{post})**

L_{post} = [0.05 + (0.009 x I_{post})] x A x 2.28 **(Equation 5-21)**

where: L_{post} = relative post-development total phosphorous load (pounds per year)
I_{post} = post-development percent impervious cover (percent expressed in whole numbers)
A = applicable area (acres)

L_{post} = [0.05 + (0.009 x 17.78)] x 0.45 x 2.28

= 0.215 pounds per year

STEP 3 **Determine the relative pollutant removal requirement (RR).**

RR = 40% of L_{post}

RR = _____ * _____
40% 0.215

= _____ pounds per year
0.09

STEP 4 **Identify best management practice (BMP) for the site.**

1. Select BMP(s) and locate on the site:

BMP #1 : BIORETENTION BASIN #1 (50% REMOVAL FOR 1ST 1/2" REMOVED)
BMP #2 : _____

2. Determine the pollutant load entering the proposed BMP(s)

L_{BMP} = [0.05 + (0.009 x I_{BMP})] x A x 2.28 **(Equation 5-23)**

where: L_{BMP} = relative post-development total phosphorous load entering proposed BMP (pounds per year)
I_{BMP} = post-development percent impervious cover of BMP drainage area (percent expressed in whole numbers)
A = drainage area of proposed BMP (acres)

L_{BMP1} = [0.05 + (0.009 x 44.44)] x 0.18 x 2.28

= 0.18 pounds per year

L_{BMP2} = [0.05 + (0.009 x _____)] x _____ x 2.28

= _____ pounds per year

3. Calculate the pollutant load removed by the proposed BMP(s)

$L_{removed}$ = Eff_{BMP} x L_{BMP} **(Equation 5-24)**

where: $L_{removed}$ = Post development pollutant load removed by proposed BMP (pounds per year)
Eff_{BMP} = pollutant removal efficiency of BMP (expressed in decimal form)
L_{BMP} = relative post-development total phosphorous load entering proposed BMP (pounds per year)

$L_{removed/BMP1}$ = 0.50 x 0.18 = 0.09 pounds per year
$L_{removed/BMP2}$ = _____ x _____ = _____ pounds per year

4. Calculate the total pollutant load removed by the BMP(s):

$L_{removed/total}$ = $L_{removed/BMP1}$ + $L_{removed/BMP1}$ + $L_{removed/BMP1}$ +.. **(equation 5-25)**

where: $L_{removed/total}$ = total pollutant load removed by proposed BMPs
$L_{removed/BMP1}$ = Pollutant load removed by proposed BMP NO. 1

$L_{removed/total}$ = 0.09 + _____

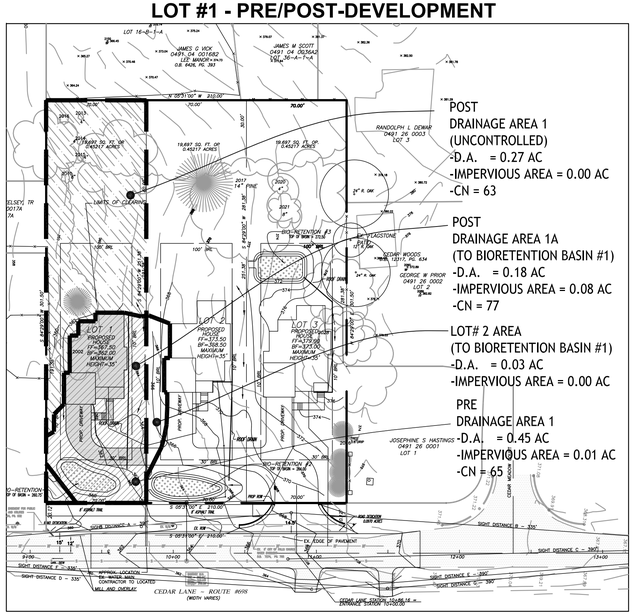
= 0.09 pounds per year

5. Verify compliance

$L_{removed/total}$ >= RR

0.09 <= 0.09 ∴ ADEQUATE

LOT #1 - PRE/POST-DEVELOPMENT



BMP ANALYSIS CALCULATIONS
LOT #2

Determine the applicable area (A) and the post-developed impervious cover (I_{post})

STEP 1

Applicable area (A) = 0.45 acres SITE AREA LOT #2

Post-development impervious cover:

structures = 0.05 acres

sidewalk/roadway = 0.04 acres

other = 0.00 acres

Total = 0.09 acres

I_{post} = (total post-development impervious cover ÷ A) x 100 = 20.00 %

Determine the average land cover condition ($I_{watershed}$) or the existing impervious cover ($I_{existing}$).

Average land cover condition ($I_{watershed}$):
If the locality has determined land cover conditions for individual watersheds within its jurisdiction, use the watershed specific value determined by the locality as $I_{watershed}$.

STEP 2 **Determine the relative post-development pollutant load (L_{post})**

L_{post} = [0.05 + (0.009 x I_{post})] x A x 2.28 **(Equation 5-21)**

where: L_{post} = relative post-development total phosphorous load (pounds per year)
I_{post} = post-development percent impervious cover (percent expressed in whole numbers)
A = applicable area (acres)

L_{post} = [0.05 + (0.009 x 20.00)] x 0.45 x 2.28

= 0.236 pounds per year

STEP 3 **Determine the relative pollutant removal requirement (RR).**

RR = 40% of L_{post}

RR = [40% * 0.236] + 0.03 (NOT TREATED WITHIN LOT #3)

= 0.12 pounds per year

STEP 4 **Identify best management practice (BMP) for the site.**

1. Select BMP(s) and locate on the site:

BMP #1 : BIORETENTION BASIN #2 (50% REMOVAL FOR 1ST 1/2" REMOVED)
BMP #2 : _____

2. Determine the pollutant load entering the proposed BMP(s)

L_{BMP} = [0.05 + (0.009 x I_{BMP})] x A x 2.28 **(Equation 5-23)**

where: L_{BMP} = relative post-development total phosphorous load entering proposed BMP (pounds per year)
I_{BMP} = post-development percent impervious cover of BMP drainage area (percent expressed in whole numbers)
A = drainage area of proposed BMP (acres)

L_{BMP1} = [0.05 + (0.009 x 48.15)] x 0.27 x 2.28

= 0.30 pounds per year

* INCLUDES 0.09 AC. (0.04 IMP. AC.) FROM LOT #3.

L_{BMP2} = [0.05 + (0.009 x _____)] x _____ x 2.28

= _____ pounds per year

3. Calculate the pollutant load removed by the proposed BMP(s)

$L_{removed}$ = Eff_{BMP} x L_{BMP} **(Equation 5-24)**

where: $L_{removed}$ = Post development pollutant load removed by proposed BMP (pounds per year)
Eff_{BMP} = pollutant removal efficiency of BMP (expressed in decimal form)
L_{BMP} = relative post-development total phosphorous load entering proposed BMP (pounds per year)

$L_{removed/BMP1}$ = 0.50 x 0.30 = 0.15 pounds per year
$L_{removed/BMP2}$ = _____ x _____ = _____ pounds per year

4. Calculate the total pollutant load removed by the BMP(s):

$L_{removed/total}$ = $L_{removed/BMP1}$ + $L_{removed/BMP1}$ + $L_{removed/BMP1}$ +.. **(equation 5-25)**

where: $L_{removed/total}$ = total pollutant load removed by proposed BMPs
$L_{removed/BMP1}$ = Pollutant load removed by proposed BMP NO. 1

$L_{removed/total}$ = 0.15 + _____

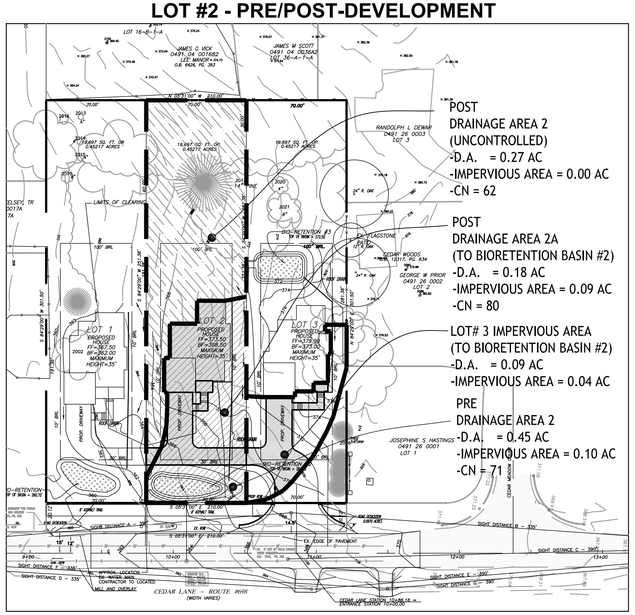
= 0.15 pounds per year

5. Verify compliance

$L_{removed/total}$ >= RR

0.15 <= 0.12 ∴ ADEQUATE

LOT #2 - PRE/POST-DEVELOPMENT



BMP ANALYSIS CALCULATIONS
LOT #3

Determine the applicable area (A) and the post-developed impervious cover (I_{post})

STEP 1

Applicable area (A) = 0.45 acres SITE AREA LOT #3

Post-development impervious cover:

structures = 0.05 acres

sidewalk/roadway = 0.05 acres

other = 0.00 acres

Total = 0.10 acres

I_{post} = (total post-development impervious cover ÷ A) x 100 = 22.22 %

Determine the average land cover condition ($I_{watershed}$) or the existing impervious cover ($I_{existing}$).

Average land cover condition ($I_{watershed}$):
If the locality has determined land cover conditions for individual watersheds within its jurisdiction, use the watershed specific value determined by the locality as $I_{watershed}$.

STEP 2 **Determine the relative post-development pollutant load (L_{post})**

L_{post} = [0.05 + (0.009 x I_{post})] x A x 2.28 **(Equation 5-21)**

where: L_{post} = relative post-development total phosphorous load (pounds per year)
I_{post} = post-development percent impervious cover (percent expressed in whole numbers)
A = applicable area (acres)

L_{post} = [0.05 + (0.009 x 22.22)] x 0.45 x 2.28

= 0.256 pounds per year

STEP 3 **Determine the relative pollutant removal requirement (RR).**

RR = 40% of L_{post}

RR = 40% * 0.256

= 0.10 pounds per year

STEP 4 **Identify best management practice (BMP) for the site.**

1. Select BMP(s) and locate on the site:

BMP #1 : BIORETENTION BASIN #3 (50% REMOVAL FOR 1ST 1/2" REMOVED)
BMP #2 : _____

2. Determine the pollutant load entering the proposed BMP(s)

L_{BMP} = [0.05 + (0.009 x I_{BMP})] x A x 2.28 **(Equation 5-23)**

where: L_{BMP} = relative post-development total phosphorous load entering proposed BMP (pounds per year)
I_{BMP} = post-development percent impervious cover of BMP drainage area (percent expressed in whole numbers)
A = drainage area of proposed BMP (acres)

L_{BMP1} = [0.05 + (0.009 x 46.15)] x 0.13 x 2.28

= 0.14 pounds per year

L_{BMP2} = [0.05 + (0.009 x _____)] x _____ x 2.28

= _____ pounds per year

3. Calculate the pollutant load removed by the proposed BMP(s)

$L_{removed}$ = Eff_{BMP} x L_{BMP} **(Equation 5-24)**

where: $L_{removed}$ = Post development pollutant load removed by proposed BMP (pounds per year)
Eff_{BMP} = pollutant removal efficiency of BMP (expressed in decimal form)
L_{BMP} = relative post-development total phosphorous load entering proposed BMP (pounds per year)

$L_{removed/BMP1}$ = 0.50 x 0.14 = 0.07 pounds per year
$L_{removed/BMP2}$ = _____ x _____ = _____ pounds per year

4. Calculate the total pollutant load removed by the BMP(s):

$L_{removed/total}$ = $L_{removed/BMP1}$ + $L_{removed/BMP1}$ + $L_{removed/BMP1}$ +.. **(equation 5-25)**

where: $L_{removed/total}$ = total pollutant load removed by proposed BMPs
$L_{removed/BMP1}$ = Pollutant load removed by proposed BMP NO. 1

$L_{removed/total}$ = 0.07 + _____

= 0.07 pounds per year

5. Verify compliance

$L_{removed/total}$ >= RR

0.07 <= 0.10 ∴ ADDITIONAL REMOVAL HAS BEEN PROVIDED BY LOT #2

GRAPHIC SCALE
0 25 50 100
(IN FEET)
1 INCH = 50 FEET

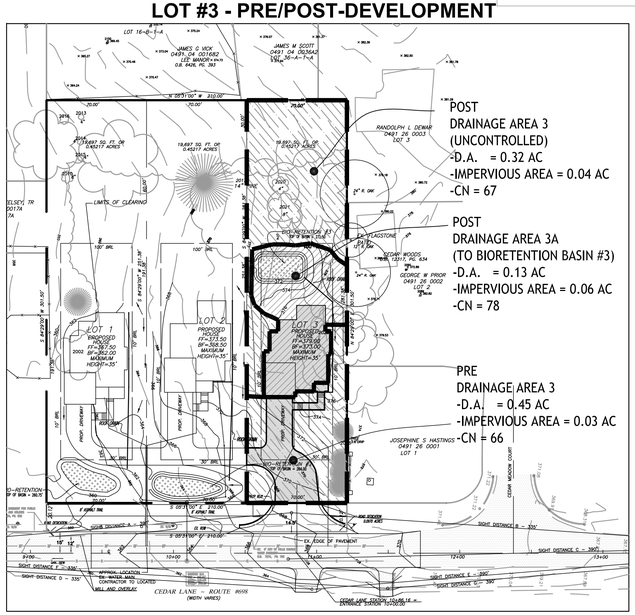
LEGEND

DIVIDE

CONTROLLED

UNCONTROLLED

LOT #3 - PRE/POST-DEVELOPMENT



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Chantilly, Virginia

703.361.1550 (office)
703.361.1566 (fax)
www.j2engineers.com

COMMONWEALTH OF VIRGINIA
JAMES C. BISHOFF
Lic. No. 031721
08-21-13
PROFESSIONAL ENGINEER

PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= 2'
SCALE: 1"=50'

PLAN DATE
05/14/2008
11/22/2011
3/12/12
4/25/12
5/08/12
3/29/13
07/16/13
08/21/13

BMP CALCULATIONS
GENERALIZED DEVELOPMENT PLAN
PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA
HOLLINGSWORTH PROPERTY

No.	DATE	DESCRIPTION
		REVISIONS
1.	11/21/11	NEW ENGINEER
2.	3/12/12	Address Staff comments for resubmission
3.	4/25/12	Address Staff Comments for resubmission
4.	5/08/12	Address Staff Comments for resubmission
5.	3/29/13	Revised Outfall Narrative
6.	7/16/13	Revised limits of clearing, revised outfall analysis and narrative, added soil test information.
6.	8/21/13	Revised canopy calculations on sheet 4A

SHEET
6A
OF
10

The SOIL CONSULTANTS INC. Companies
Soil Consultants, Inc.
www.soilconsultants.net
SINCE 1960

CONSULTING ENGINEERS | BUILDING OFFICIALS
CONSTRUCTION PROFESSIONALS | SOIL SCIENTISTS & GEOLOGISTS

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PRESIDENT

LAWRENCE C. RUDIL, PH.D., P.E.
SENIOR VICE PRESIDENT

9303 CENTER STREET
MANASSAS, VA 20110-5547

(703) 366-3000
FAX: (703) 366-3400

February 12, 2008

Mr. James Hollingsworth
104 Yeonas Drive, SW
Vienna, Virginia 22180

Re: Report of Findings
2818 Cedar Lane
Fairfax County, Virginia

Dear Mr. Hollingsworth,

As you requested, Soil Consultants Inc. conducted three (3) infiltration studies at the above referenced site. Infiltration tests were preformed in the areas of the property designated for the proposed infiltration facilities. The procedure included three hand auger borings at each of the infiltration areas: one to provide a description of the soil profile and two for the actual infiltration tests. As required by Fairfax County, certified laboratory testing in the form of grain-size sieve analysis and a hydrometer tests were preformed at each site to confirm the soil type on the USDA Textural Triangle.

SOIL PROFILES

The subsurface exploration consisted of advancing one hand auger boring at each of the proposed infiltration facilities. The depth of the profile borings were approximately 96 inches. No water table indications were identified in any of the profile borings.

We tested within the designated area, and the approximate locations are illustrated on the enclosed "Profile Boring and Infiltration Test Location Sketch". We completed visual identification tests in accordance with standard USDA profile descriptions. These observations and the USDA descriptions are presented in the appendix.

INFILTRATION TEST PROCEDURES

Infiltration tests were preformed in 2 areas within each of the designated infiltration areas. At each location, we placed a 4-inch diameter PVC pipe into the percolation hole to a depth of 72 inches, and saturated the soil with 24 inches of water. After 24 hours, we added another 24 inches of water and recorded the water level every hour for 4 hours.

LABORATORY TEST RESULTS

The soil samples for the certified laboratory testing were taken at the proposed bottom of the infiltration facilities. Only one soil layer was identified 4 feet below the bottom of each infiltration facility. Therefore, only one hydrometer and one grain-size sieve analysis was required for each of the proposed facilities. The grain-size sieve analysis and hydrometer tests classified the soil as a silt loam at Sites #1 and #2 and a Sandy Loam at Site # 3 on the USDA Textural Triangle.

SUMMARY OF INFILTRATION TEST RESULTS

The results for the site are summarized in Table I. The average infiltration rate for Site #1 is 11.17 inches per hour, the average infiltration rate for Site #2 is 25.06 inches per hour, and the average infiltration rate for Site #3 is 13.37 inches per hour.

TABLE I.

Boring	Test Depth (in)	Incremental Measured Drop in Water Elevation (in) {Infiltration Rate} First hour	Second	Third	Fourth
Site 1					
A	72	12¼	7½	6⅝	4⅜
B	72	17¼	16⅛	11⅛	13
Site 2					
C	72	28¼	20¼	25¼	23⅜
D	72	31¼	24⅛	29⅝	17⅞
Site 3					
E	72	24¼	12⅞	11⅛	10⅛
F	72	28⅜	9	7⅞	2⅛

Soil Consultants Inc. thanks you for the opportunity to perform this work. If you have any questions regarding this letter or additional field work is required, please do not hesitate to contact us.

Sincerely,

Markham D. Smith
Vice President of Soil Science

COMMONWEALTH OF VIRGINIA
DAVID F. JOHNS
No. T5450
David F. Johns, P.E. 2/12/08
President
PROFESSIONAL ENGINEER

For: Soil Consultants Engineering, Inc.
SCE Job No. T0213

Enclosures: Test Boring & Infiltration Test Location Sketch
Soil Profile Description Report (USDA)
Laboratory Test Results

LIKE PEOPLE - SOILS ARE DIFFERENT

LIKE PEOPLE, SOILS ARE DIFFERENT

Profiles for 2818 Cedar Lane

Profile 1

Horizon	Depth (in)	Text Class	Soil Description
A	0-3	II	Reddish Brown (5 YR 4/4) Loam, granular, moist, non sticky, non plastic, friable, many fine roots
Bt	3-34	III	Reddish Yellow (5 YR 6/8) Clay Loam, sub-angular blocky, moist, slightly sticky, slightly plastic, few fine roots
C	34-96	II	Light Red (2.5 YR 6/6) Fine Sandy Loam, massive, dry, non sticky, non plastic, few fine roots, original rock controlled colors of white and red, micaceous, 5% poorly weathered schist

Profile 2

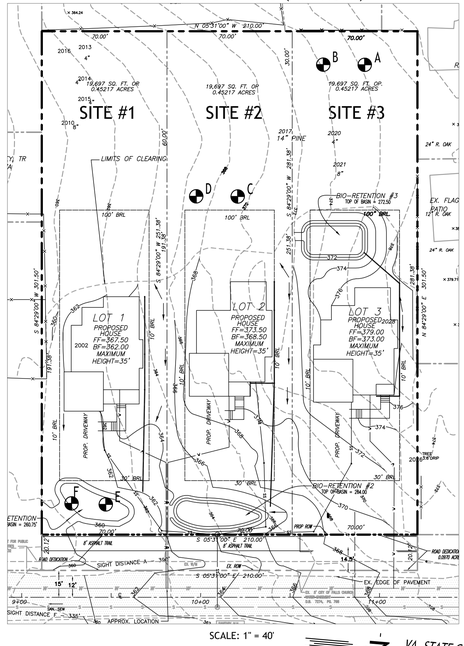
Horizon	Depth (in)	Text Class	Soil Description
A	0-3	II	Dark Brown (7.5 YR 3/4) Loam, granular, moist, non sticky, non plastic, friable, many fine roots
E	3-9	II	Brown (7.5 YR 5/4) Loam, sub-angular blocky, moist, non sticky, non plastic, few fine roots
Bt	9-31	III	Strong Brown (7.5 YR 5/8) Clay Loam, sub-angular blocky, moist, slightly sticky, slightly plastic, few fine roots
C2	31-96	II	Reddish Yellow (7.5 YR 7/6) Fine Sandy Loam, massive, dry, non sticky, non plastic, few fine roots, micaceous

Profile 3

Horizon	Depth (in)	Text Class	Soil Description
A	0-3	II	Reddish Brown (5 YR 4/4) Loam, granular, moist, non sticky, non plastic, friable, many fine roots
Bt	3-34	III	Reddish Yellow (5 YR 6/6) Clay Loam, sub-angular blocky, moist, slightly sticky, slightly plastic, few fine roots
C	34-96	II	Reddish Yellow (7.5 YR 7/8) Fine Sandy Loam, massive, dry, non sticky, non plastic, few fine roots, original rock controlled colors of white, yellow, and red, micaceous

LIKE PEOPLE - SOILS ARE DIFFERENT

BORING LOCATIONS (APPROX.)



SCALE: 1" = 40'

VA. STATE GRID NORTH

SITE #1

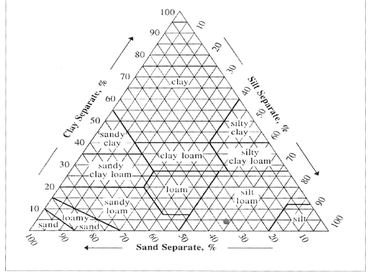
Enter your data into the highlighted cells

Sand		Clay		Silt	
% Sand	32%	% Clay	4%	% Silt	64%

Optional	
% Very Coarse	0%
% Coarse	0%
% Medium	0%
% Fine	0%
% Very Fine	0%

USDA Texture
SILT LOAM

Soil Texture Triangle



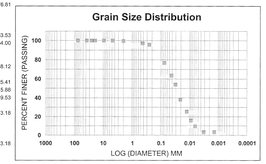
DATE: 02/07/2008
PROJECT: 2818 CEDAR LANE
PROJECT NO. T0213
LAB ID NO.: 25515
CLIENT:
0

SAMPLE DESCRIPTION: 0
Sp Gr = 2.7
pH: N/A
ORGANIC MATTER CONTENT %: N/A
SOLUBLE SALTS (MS/CM): N/A

USDA PARTICLE SIZE PERCENTAGE:

SIEVE ANALYSIS:	DIAMETER:	PERCENT PASSING:		Full Gradation	USDA Adjusted
3 in.	75.000	100.00			
1.5 in.	37.500	100.00			
1 in.	**25.400**	100.00			
3/4 in.	19.050	100.00			
3/8 in.	9.520	100.00			
No. 4	4.750	99.91	GRAVEL (>2.0 MM)	1.0	
No.10	2.000	99.50	SAND (>2.0<+0.05MM):	32.0	32.3
No. 40	0.425	97.16	SILT (>0.05<+0.002MM):	63.0	63.6
No. 60	0.250	95.64	CLAY (>0.002MM):	4.0	4.0
No. 200	0.075	76.81			
HYDROMETER ANALYSIS:	0.04227	63.53			
	0.03106	54.00			
	0.02082	38.12			
	0.01244	25.41			
	0.00892	15.88			
	0.00638	9.53			
	0.00318	3.18			
	0.00137	3.18			

Grain Size Distribution



USDA CLASSIFICATION: SILT LOAM

SITE #2

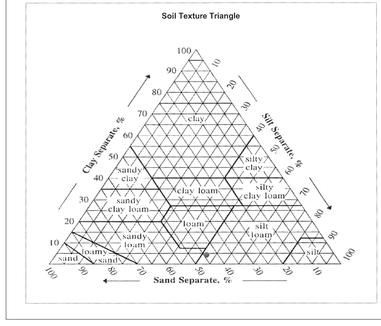
Enter your data into the highlighted cells

Sand		Clay		Silt	
% Sand	44%	% Clay	4%	% Silt	52%

Optional	
% Very Coarse	0%
% Coarse	0%
% Medium	0%
% Fine	0%
% Very Fine	0%

USDA Texture
SILT LOAM

Soil Texture Triangle



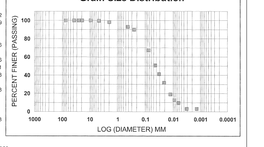
DATE: 02/07/2008
PROJECT: 2818 CEDAR LANE
PROJECT NO. T0213
LAB ID NO.: 25516
CLIENT:
0

SAMPLE DESCRIPTION: 0
Sp Gr = 2.7
pH: N/A
ORGANIC MATTER CONTENT %: N/A
SOLUBLE SALTS (MS/CM): N/A

USDA PARTICLE SIZE PERCENTAGE:

SIEVE ANALYSIS:	DIAMETER:	PERCENT PASSING:		Full Gradation	USDA Adjusted
3 in.	75.000	100.00			
1.5 in.	37.500	100.00			
1 in.	**25.400**	100.00			
3/4 in.	19.050	100.00			
3/8 in.	9.520	100.00			
No. 4	4.750	99.66	GRAVEL (>2.0 MM)	2.0	
No.10	2.000	98.16	SAND (>2.0<+0.05MM):	43.0	43.9
No. 40	0.425	93.00	SILT (>0.05<+0.002MM):	52.0	52.0
No. 60	0.250	89.92	CLAY (>0.002MM):	4.0	4.1
No. 200	0.075	67.34			
HYDROMETER ANALYSIS:	0.04392	50.82			
	0.03218	41.29			
	0.02104	31.76			
	0.01257	19.06			
	0.00892	12.71			
	0.00632	9.53			
	0.00315	3.18			
	0.00135	3.18			

Grain Size Distribution



USDA CLASSIFICATION: SILT LOAM

SITE #3

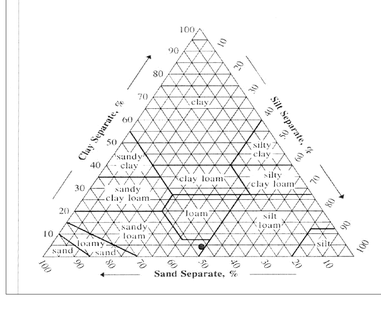
Enter your data into the highlighted cells

Sand		Clay		Silt	
% Sand	47%	% Clay	4%	% Silt	49%

Optional	
% Very Coarse	0%
% Coarse	0%
% Medium	0%
% Fine	0%
% Very Fine	0%

USDA Texture
SANDY LOAM

Soil Texture Triangle



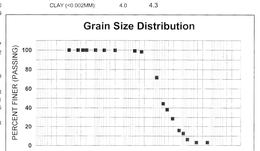
DATE: 02/05/2008
PROJECT: 2818 CEDAR LANE
PROJECT NO.: T0213
LAB ID NO.: 25517
CLIENT:
0

SAMPLE DESCRIPTION: 0
Sp Gr = 2.7
pH: N/A
ORGANIC MATTER CONTENT %: N/A
SOLUBLE SALTS (MS/CM): N/A

USDA PARTICLE SIZE PERCENTAGE:

SIEVE ANALYSIS:	DIAMETER:	PERCENT PASSING:		Full Gradation	USDA Adjusted
3 in.	75.000	100.00			
1.5 in.	37.500	100.00			
1 in.	**25.400**	100.00			
3/4 in.	19.050	100.00			
3/8 in.	9.520	100.00			
No. 4	4.750	99.90	GRAVEL (>2.0 MM)	6.0	
No.10	2.000	99.81	SAND (>2.0<+0.05MM):	44.0	45.8
No. 40	0.425	99.25	SILT (>0.05<+0.002MM):	46.0	48.9
No. 60	0.250	98.30	CLAY (>0.002MM):	4.0	4.3
No. 200	0.075	71.69			
HYDROMETER ANALYSIS:	0.04517	44.47			
	0.03267	38.12			
	0.02133	28.59			
	0.01281	15.88			
	0.00914	12.71			
	0.00659	6.35			
	0.00326	3.18			
	0.00135	3.18			

Grain Size Distribution



USDA CLASSIFICATION: SANDY LOAM

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www.j2engineers.com

COMMONWEALTH OF VIRGINIA
JAMES C. BISHOFF
Lic. No. 031721
08-21-13
PROFESSIONAL ENGINEER

PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= 2'
SCALE: 1"=40'

PLAN DATE
05/14/2008
11/22/2011
3/12/12
4/25/12
5/08/12
3/29/13
07/16/13
08/21/13

SOIL TESTS - FOR INFORMATIONAL PURPOSES ONLY

GENERALIZED DEVELOPMENT PLAN
HOLLINGSWORTH PROPERTY

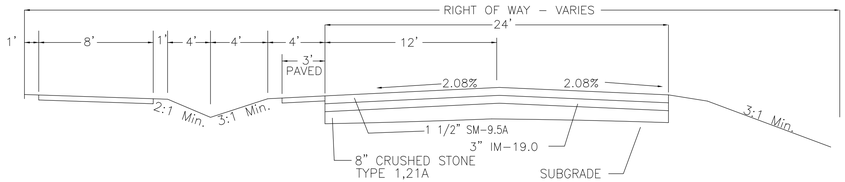
PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

No.	DATE	DESCRIPTION
1.	11/21/11	NEW ENGINEER
2.	3/12/12	Address Staff comments for resubmission
3.	4/25/12	Address Staff Comments for resubmission
4.	5/08/12	Address Staff Comments for resubmission
5.	3/29/13	Revised Outfall Narrative
6.	7/16/13	Revised limits of clearing, revised outfall, analysis and narrative, added soil test information.
6.	8/21/13	Revised canopy calculations on sheet 4A

REVISIONS

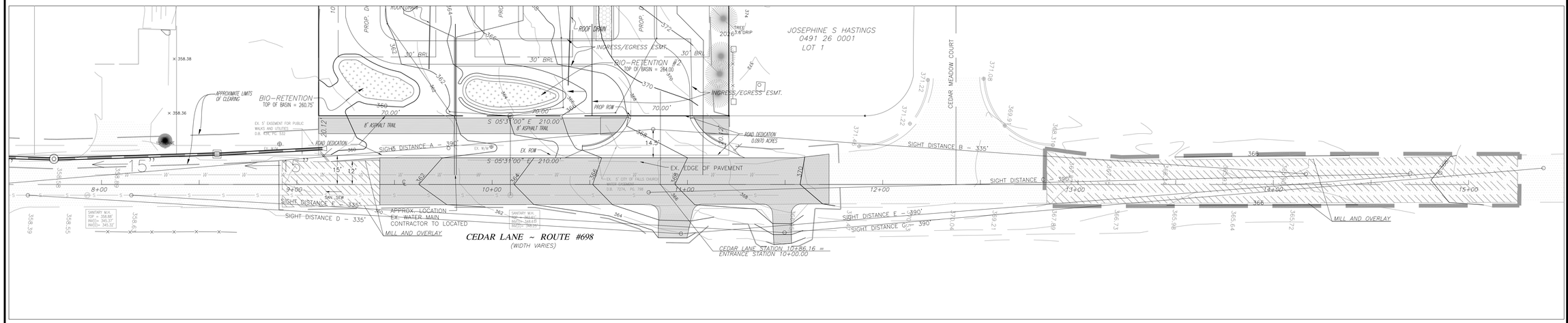
SHEET
7
OF
10

TYPICAL SECTION
NOT TO SCALE



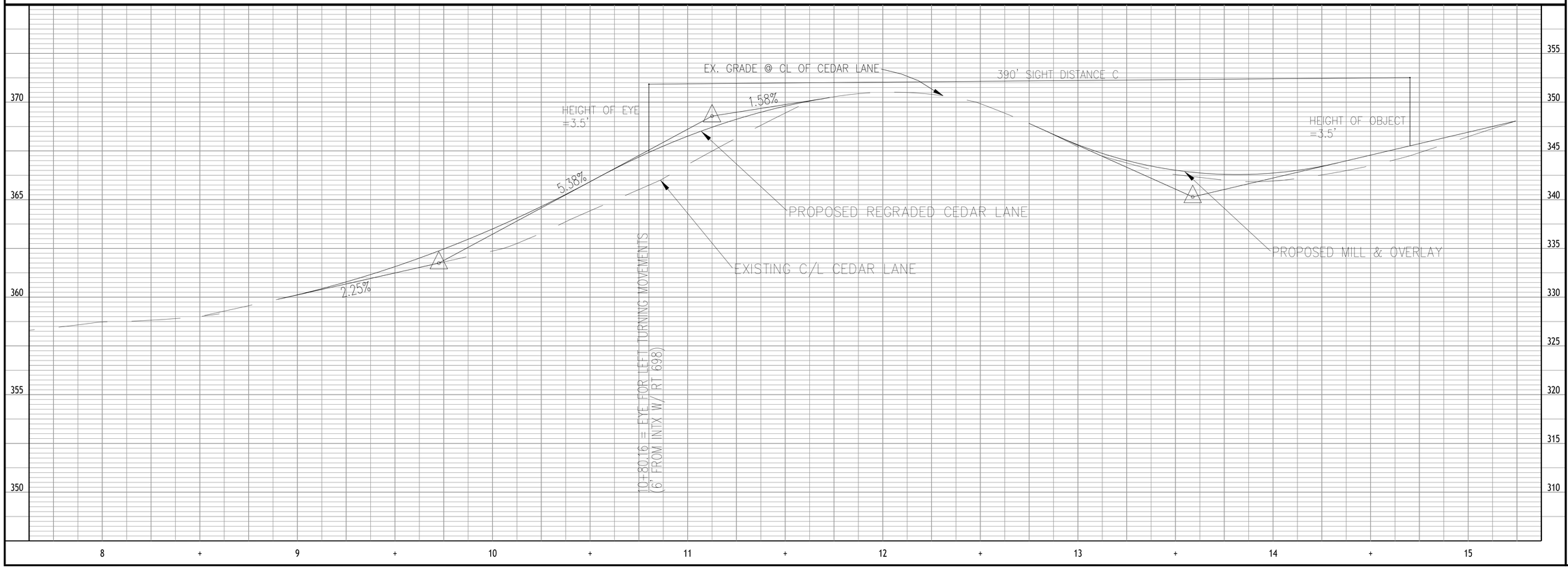
NOTES
1. THESE SECTIONS ARE MINIMUM SECTIONS TO BE UTILIZED WHEN THE ACTUAL CALIFORNIA BEARING RATIO (CBR) OF THE PAVEMENT SUBGRADE IS 6 OR MORE. SOILS TESTS OF THE SUBGRADE SHALL BE PERFORMED FOR ACTUAL DETERMINATION OF REQUIRED PAVEMENT THICKNESS PRIOR TO PLACEMENT. ALL FINAL PAVEMENT AND BASE COURSE THICKNESSES SHALL BE DESIGNED USING AN APPROPRIATE METHOD, AND SHALL BE BASED ON A SUFFICIENT NUMBER OF CBR TESTS TO DETERMINE THE TRUE SUPPORT VALVES OF THE VARIOUS SOILS IN THE SUBGRADE. FINAL PAVEMENT DESIGN SHALL BE SUBMITTED DURING CONSTRUCTION AND PRIOR TO PLACEMENT.
2. A SMOOTHING GRADE SHALL BE MAINTAINED FROM THE CENTERLINE OF THE EXISTING ROADWAY TO THE CURB AND GUTTER, TO PRECLUDE THE FORMING OF ANY FALSE GUTTERS AND/OR PONDING OF ANY WATER ON THE ROADWAY.
3. THE APPROVAL OF THESE PLANS SHALL IN NO WAY RELIEVE THE OWNER OF COMPLYING WITH OTHER LOCAL, STATE AND FEDERAL REQUIREMENTS
4. METHODS AND MATERIALS SHALL CONFORM TO VDOT STANDARDS.

N VA. STATE GRID NORTH



CEDAR LANE ROUTE 653
Posted Speed 30 MPH, Design Speed = 35 MPH

GRAPHIC SCALE
0 12.5 25 50
(IN FEET)
1 INCH = 25 FEET



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Suite 330
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www.j2engineers.com

COMMONWEALTH OF VIRGINIA
JAMES C. BISHOFF
Lic. No. 031721
PROFESSIONAL ENGINEER
08-21-13

PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= N/A
SCALE: (H) 1"=25' (V) 1"=2.5'

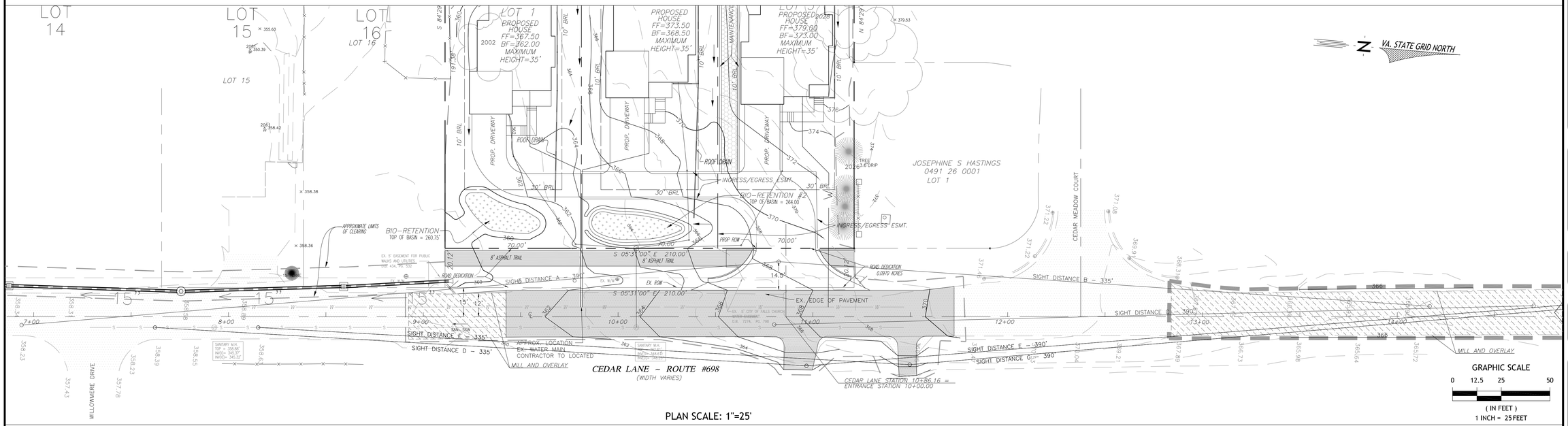
PLAN DATE
09/14/2009
11/22/2011
4/25/12
5/09/12
03/28/13
07/16/13
08/21/13

STOPPING SIGHT DISTNCE PROFILES

GENERALIZED DEVELOPMENT PLAN
HOLLINGSWORTH PROPERTY
PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

No.	DATE	REVISIONS
1.	11/21/11	NEW ENGINEER
2.	3/12/12	Address Staff comments for resubmission
3.	4/25/12	Address Staff Comments for resubmission
4.	5/08/12	Address Staff Comments for resubmission
5.	3/29/13	Revised Outfall Narrative
6.	7/16/13	Revised limits of clearing, revised outfall analysis and narrative, added soil test information.
6.	8/21/13	Revised canopy calculations on Sheet 4A

SHEET
8
OF
10



PLAN SCALE: 1"=25'

GRAPHIC SCALE
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(IN FEET)
1 INCH = 25 FEET

CEDAR LANE ROUTE 653

Posted Speed 30 MPH, Design Speed = 35 MPH

GRAPHIC SCALE
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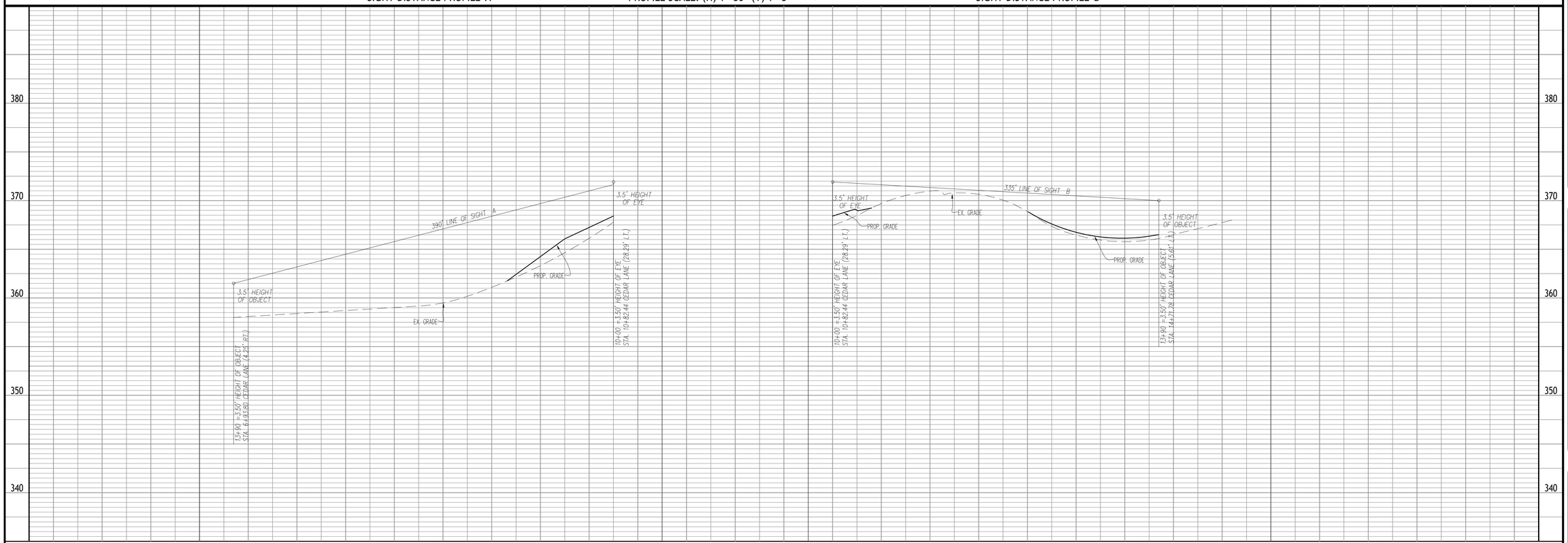
(IN FEET)
1 INCH = 50 FEET

SIGHT DISTANCE PROFILE 'A' PROFILE SCALE: (H) 1"=50' (V) 1"=5' SIGHT DISTANCE PROFILE 'B'



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JAMES C. BISHOFF
Lic. No. 031721
08-21-13
PROFESSIONAL ENGINEER

PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= N/A
SCALE: AS SHOWN

PLAN DATE
05/14/2008
11/22/2011
3/12/12
4/25/12
5/08/12
3/29/13
07/16/13
08/21/13

SIGHT DISTNCE PROFILES

GENERALIZED DEVELOPMENT PLAN
HOLLINGSWORTH PROPERTY

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

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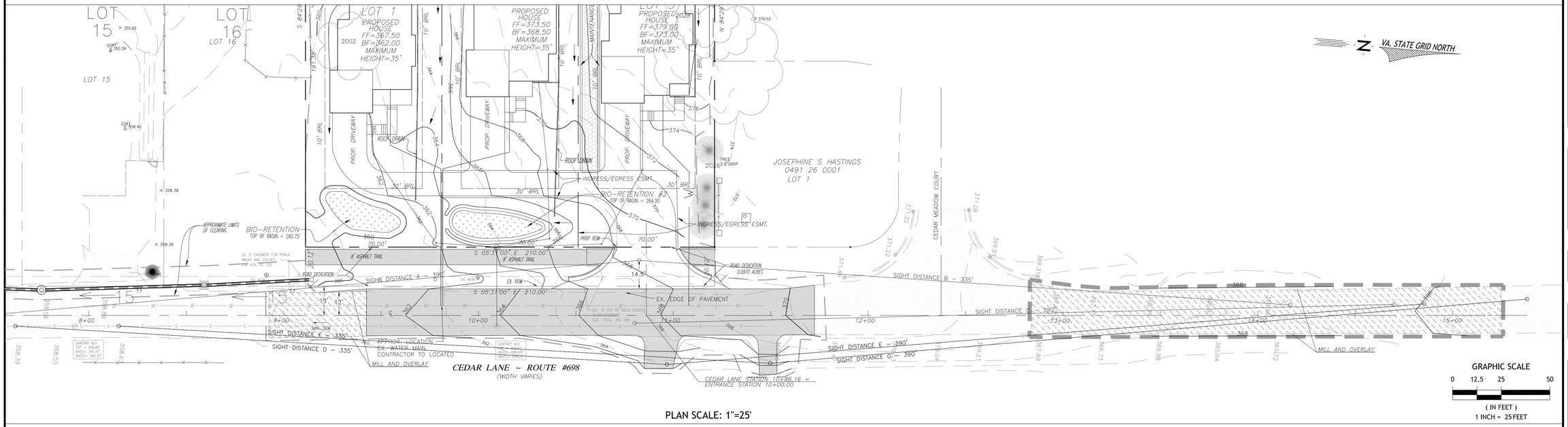
SHEET 9 OF 10



PLAN SCALE: 1"=25'

CEDAR LANE ROUTE 653

Posted Speed 30 MPH, Design Speed = 35 MPH

GRAPHIC SCALE
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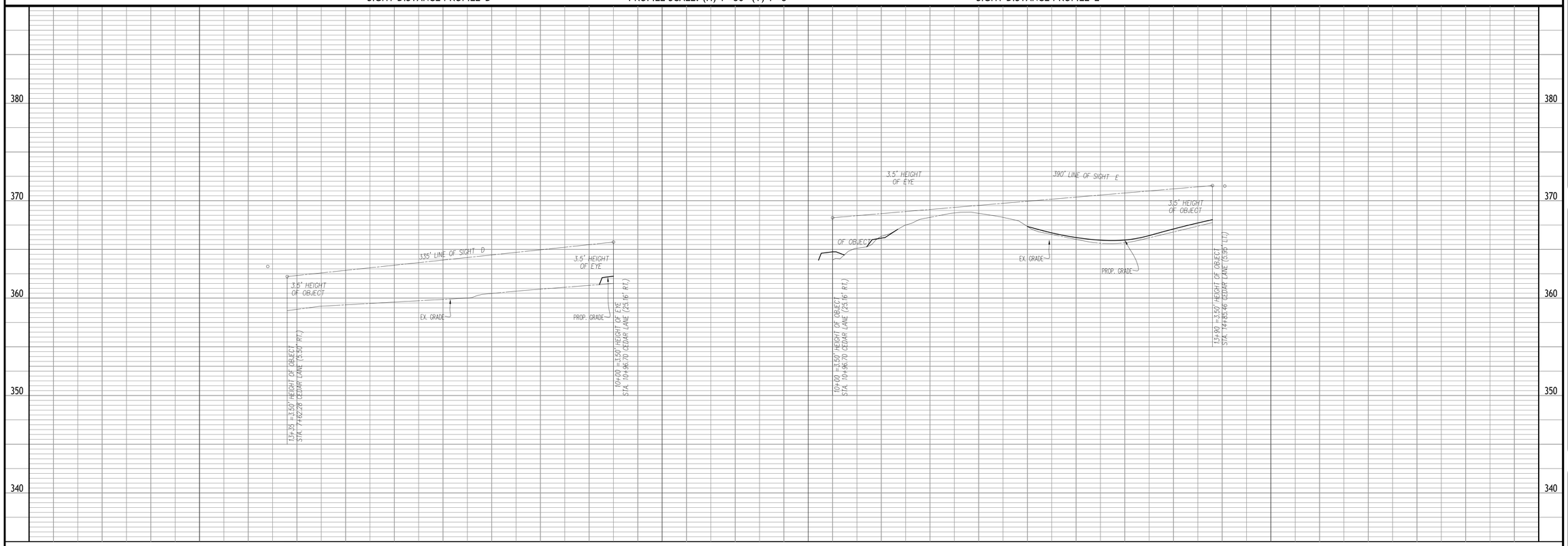
(IN FEET)
1 INCH = 50 FEET

SIGHT DISTANCE PROFILE 'D' — PROFILE SCALE: (H) 1"=50' (V) 1"=5' — SIGHT DISTANCE PROFILE 'E'



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3/29/13
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GENERALIZED DEVELOPMENT PLAN

HOLLINGSWORTH PROPERTY

PROVIDENCE DISTRICT
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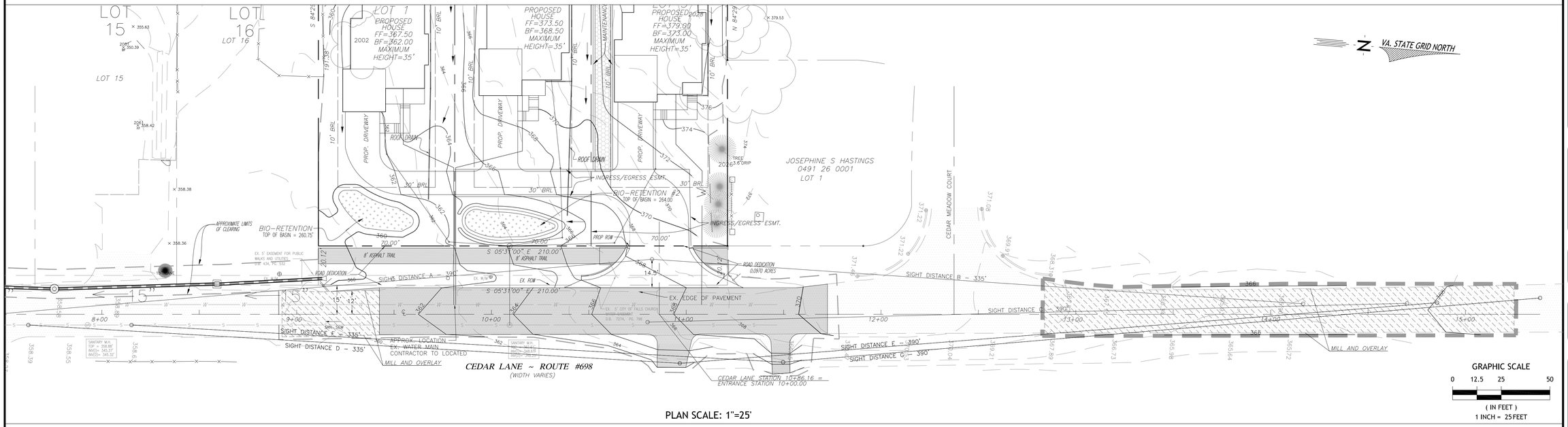
SHEET
9A
OF
10



PLAN SCALE: 1"=25'

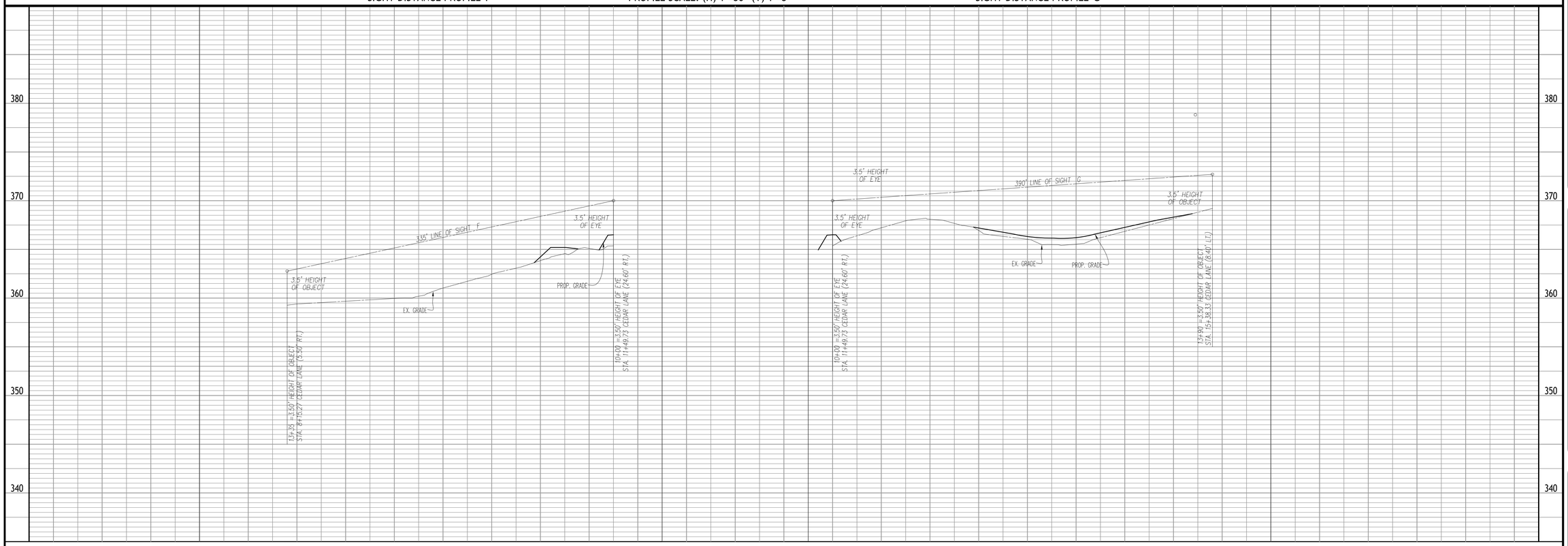
GRAPHIC SCALE
0 12.5 25 50
(IN FEET)
1 INCH = 25 FEET

CEDAR LANE ROUTE 653

Posted Speed 30 MPH, Design Speed = 35 MPH

GRAPHIC SCALE
0 25 50 100
(IN FEET)
1 INCH = 50 FEET

SIGHT DISTANCE PROFILE 'F' PROFILE SCALE: (H) 1"=50' (V) 1"=5' SIGHT DISTANCE PROFILE 'G'



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PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= N/A
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05/14/2008
11/22/2011
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SIGHT DISTNCE PROFILES

GENERALIZED DEVELOPMENT PLAN

HOLLINGSWORTH PROPERTY

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

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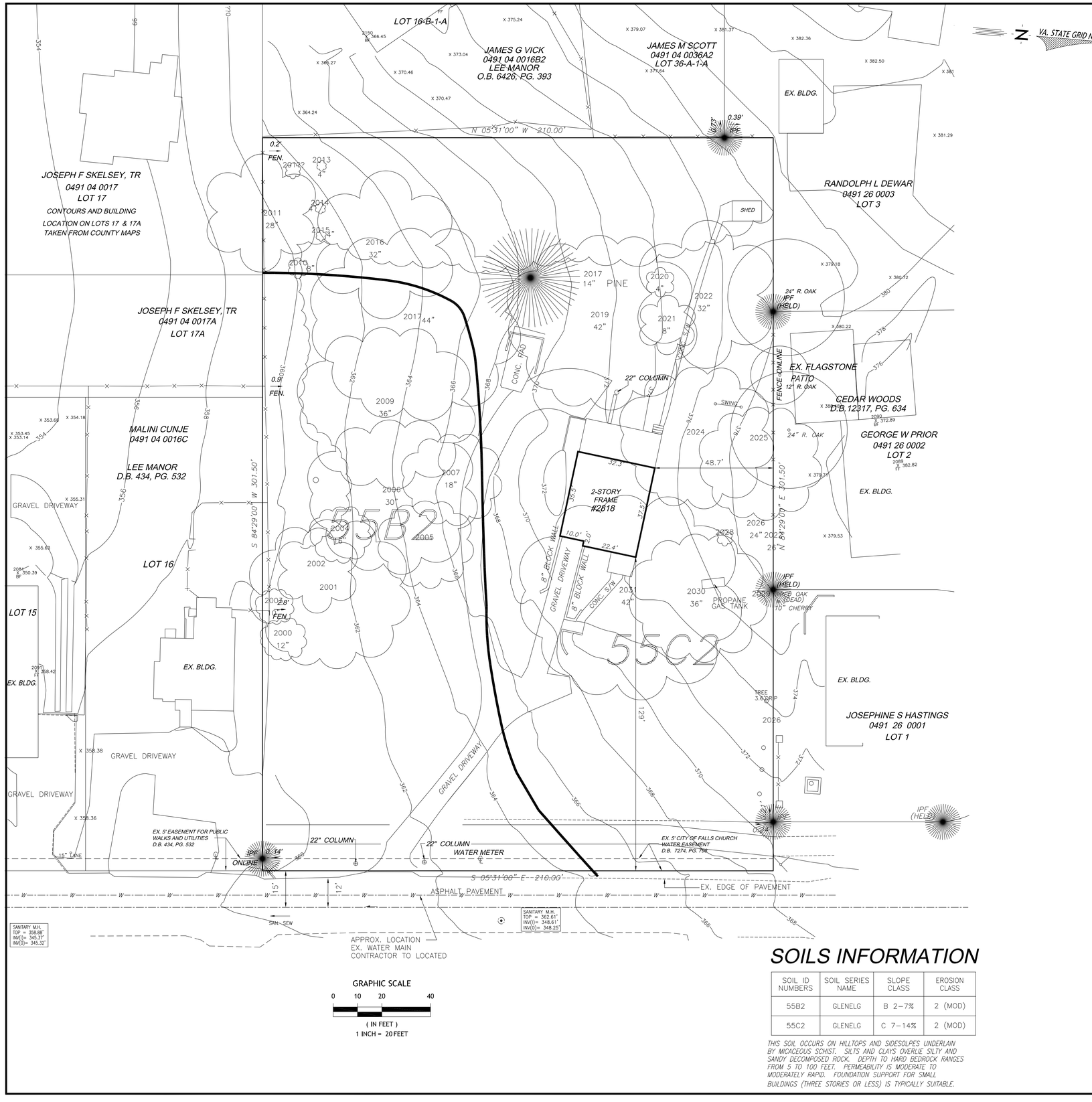
REVISIONS

SHEET
9B
OF
10



SOILS INFORMATION

SOIL ID NUMBERS	SOIL SERIES NAME	SLOPE CLASS	EROSION CLASS
55B2	GLENELG	B 2–7%	2 (MOD)
55C2	GLENELG	C 7–14%	2 (MOD)

THIS SOIL OCCURS ON HILLTOPS AND SIDESOLPES UNDERLAIN BY MICACEOUS SCHIST. SILTS AND CLAYS OVERLIE SILTY AND SANDY DECOMPOSED ROCK. DEPTH TO HARD BEDROCK RANGES FROM 5 TO 100 FEET. PERMEABILITY IS MODERATE TO MODERATELY RAPID. FOUNDATION SUPPORT FOR SMALL BUILDINGS (THREE STORIES OR LESS) IS TYPICALLY SUITABLE.

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COMMONWEALTH OF VIRGINIA
JAMES C. BISHOFF
Lic. No. 031721
PROFESSIONAL ENGINEER
08-21-13

PLAN#
DATE: NOVEMBER 2011
CONTOUR INT.= 2'
SCALE: 1"= 20'

PLAN DATE
05/14/2008
11/22/2011
3/12/12
4/25/12
5/29/12
6/28/13
07/16/13
08/21/13

SOILS MAP

GENERALIZED DEVELOPMENT PLAN
HOLLINGSWORTH PROPERTY

PROVIDENCE DISTRICT
FAIRFAX COUNTY, VIRGINIA

No.	DATE	REVISIONS DESCRIPTION
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SHEET
10
OF
10

BACKGROUND

The applicant, James Hollingsworth, is seeking approval of a rezoning of approximately 1.45 acres from the R-1 District to the R-4 District. The purpose of the application is to allow subdivision of the existing land area into three lots for the development of three single family detached dwelling units, at an overall density of 2.07 dwelling units per acre (du/ac). The subject property is located at 2818 Cedar Lane, which is on the west side of Cedar Lane and is bounded by the Cedar Woods subdivision to the north, and the Lee Manor subdivision to the south and west. To the east are single family detached houses as part of the Willowmere Woods subdivision. The site is currently developed with one single family detached structure and one accessory structure, both of which are proposed to be demolished as a part of this application.

Aerial View of the Subject Site Source: Fairfax County GIS

The staff report, which was published on July 12, 2012, recommended approval of the rezoning application, and a public hearing before the Planning Commission was scheduled for July 26, 2012. Prior to the public hearing Department of Public Works and Environmental Services (DPWES) staff visited the site and discovered that due to the lack of culverts in the driveways for the four lots to the south, between the subject property and Emil Way, and the existing grading along the Cedar Drive frontage of Lot 13 there was no existing outfall issue for the subject property. Because of this

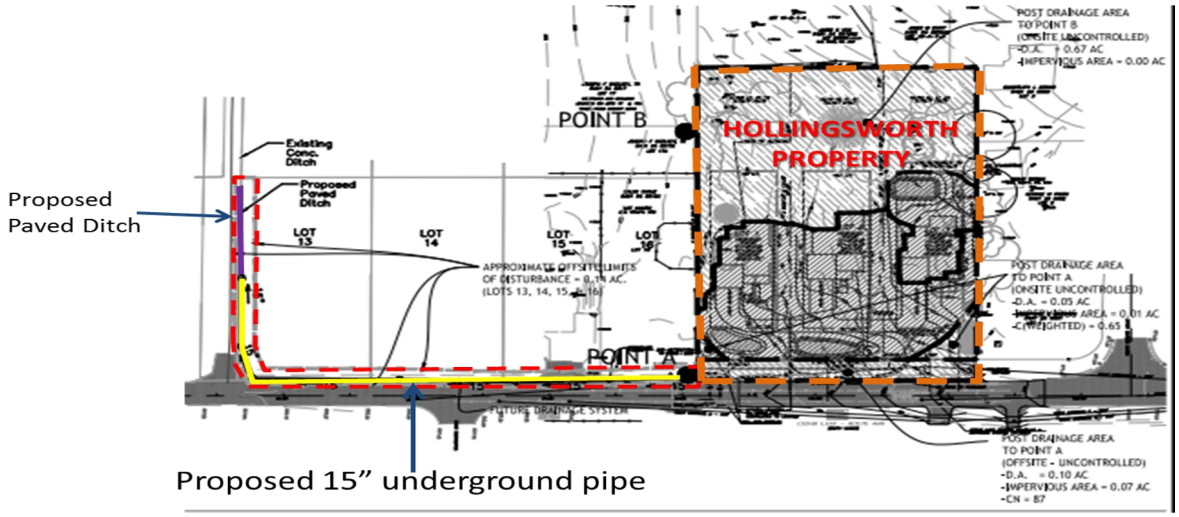
discovery, the public hearing was deferred to allow sufficient time for the applicant to address the outfall associated with the proposed development.

Subsequently, the applicant has submitted a revised Generalized Development Plan (GDP), which is contained in the front of this staff report addendum and dated November 22, 2011, as revised through August 21, 2013.

ANALYSIS

No changes have been made to the on-site layout previously proposed and described in the original staff report. Additionally, no changes have been proposed to the Cedar Lane Road improvements previously shown on the GDP and described in the proposed proffers.

The applicant has revised Sheet 6 of the GDP to depict an open and closed stormwater drainage system that is to be installed along the Cedar Lane frontages of Lots 13 through 16 to the south of the subject property and along the southern frontage (Emil Way) of Lot 13. A 15-inch underground pipe is shown to be installed along Cedar Lane from the boundary of the subject site and adjacent Lot 16, to the intersection of Cedar Lane and Emil Way. The 15-inch underground pipe installation is shown to continue along Emil Way, along a portion of the frontage of Lot 13 where it will connect to a proposed paved ditch along the remainder of the frontage of Lot 13. At the western border of Lot 13 the proposed paved ditch will connect to an exisitng concrete ditch along Emil Way which drains to a box inlet at the corner of Emil Way and Maple Lane and to a 30-inch pipe. The applicant has obtained notarized letters from the property owners of Lots 13, 14, 15, and 16 that grant the applicant permission to apply for all the necessary permits with VDOT and Fairfax County to install the proposed drainage system.



DPWES staff has reviewed the revised GDP and noted that curent outfall on the site is inadequate, and the applicant intends to meet the Public Facilities Manual (PFM) adequate outfall requirements through the Detention Method and by constructing a storm drainage system along Cedar Lane and Emil Way. DWES staff states that easements and VDOT construction access approval will be required for Lots 13, 14, 15, and 16, as well as construction access approval from Fairfax County. Additionally, at the subdivision construction stage, permanent maintenance easments are likely to be required for any stormwater conveyance facility constructed, particularly from the owner of Lot 13, and that it must be demonstated that any increase in non-concentrated runoff will have no adverse impact upon downstream properties even during a 100-yr storm.

As was noted in the original staff report, while additional stormwater management related information may be required at the subdivision plan review, the final determination regarding the adequacy of the proposed SWM/BMP facilities and the proposed off-site drainage system will be made at the time of subdivision plan review when more detailed engineering data will be required for DPWES review and analysis. In the event the final design of the SWM facility does not meet the PFM and/or the SWM/BMP facilities or drainage system required are not in substantial conformance with the GDP, then a Proffered Condition Amendment (PCA) and revised GDP would be necessary.

CONCLUSIONS AND RECOMMENDATIONS

Staff Conclusions

The revisions made to the GDP were provided to address the outfall issue identified by DPWES staff to address the outfall issue in accordance with PFM and Zoning Ordinance standards. While the final determination on the proposed stormwater management measures and adequate outfall cannot be made until the time of subdivision plan review, in staff's evaluation, the current proposal continues to be in harmony with the intent of the Comprehensive Plan and meets all applicable provisions of the Zoning Ordinance.

Recommendations

Staff recommends approval of RZ 2009-PR-022, subject to executed proffers consistent with those contained in Attachment 1.

Staff recommends approval of a modification of the Comprehensive Plan Trail requirement to allow an 8-foot wide trail.

It should be noted that it is not the intent of staff to recommend that the Board, in adopting any conditions proffered by the owner, relieve the applicant/owner from

compliance with the provisions of any applicable ordinances, regulations, or adopted standards.

It should be further noted that the content of this report reflects the analysis and recommendations of staff; it does not reflect the position of the Board of Supervisors.

The approval of this application does not interfere with, abrogate or annul any easements, covenants, or other agreements between parties, as they may apply to the property subject to this application.

ATTACHMENTS

1. Draft Proffers
2. Stormwater Management Analysis

PROFFERS - RZ 2009-PR-022
James M. Hollingsworth
2818 Cedar Lane, Vienna, VA 22180
September 11, 2013

Pursuant to Section 15.2-2303(A) of the 1950 Code of Virginia, as amended, the Applicant, for himself and his successors or assigns (herein collectively referred to as the "Applicant") in this rezoning application filed on property identified on the Fairfax County Tax Map 49-1 ((4)), Parcel 16A (hereinafter referred to as the "Application Property"), agrees to the following proffers, provided that the Fairfax County Board of Supervisors (hereinafter referred to as the "Board") approves the rezoning of the Application Property from the R-1 zoning district to the R-4 district.

1. Development Plan

a. Subject to the provisions of Section 18-204 of the Fairfax County Zoning Ordinance ("the Ordinance"), development of the portion of the Application Property identified on the Fairfax County Tax Map 49-1 ((4)), Parcel 16A shall be in substantial conformance with the Generalized Development Plan ("GDP") containing 10 sheets and prepared by J2 Engineers, dated November 22, 2011 and revised through August 21, 2013.

b. Pursuant to Paragraph 2 of Section 18-204 of the Zoning Ordinance, minor modifications to the GDP may be permitted as determined by the Zoning Administrator and shall be in substantial conformance with the GDP. These modifications may include the locations of utilities, minor adjustment of property lines, and the general location and size of dwellings on the proposed lots provided that the total area of open space is not decreased from that shown hereon, the building setbacks outlined on the GDP are honored, and the limits of clearing and grading are adhered to.

2. Homeowners Association

The applicant shall establish a Homeowner's Association (HOA) for the proposed development to own, manage and maintain the area in the easement for the shared portion on the driveway (noted per easement), eight (8) foot asphalt trail, and tree save areas noted in the Tree Preservation Area and maintain all other community land and improvements. Restrictions placed on the use of the open space/buffer areas, tree preservation easement, minimum setbacks and the maintenance responsibilities of the bioretention facilities and Homeowner's Association shall be disclosed to all prospective homeowners in a disclosure memorandum recorded in the Land Records prior to entering into a contract of sale and included in the HOA documents.

3. Garages

A minimum of two parking spaces shall be provided within the garage of each dwelling unit. Any conversion of garages that will preclude the parking of vehicles within the garage is prohibited. A covenant setting forth this restriction shall be recorded among the Land Records of Fairfax County in a form approved by the County Attorney prior to the sale of any lots, and shall run to the benefit of the Board of Supervisors and this restriction shall be included in the subdivision documents. All sales literature and information to prospective purchasers shall notify purchasers of this restriction prior to or simultaneous with entering into a contract of sale for a lot on the property.

4. Architecture:

The houses constructed on the property shall be single-family detached residences similar in style and presentation to the houses shown on page 2A of the Generalized Development Plan dated August 21, 2013 or of comparable quality as determined by Zoning Administration; provided, however, Applicant shall be permitted to vary the exterior design of the house to meet purchasers' desires as long as each house remains generally similar in style and presentation to the other houses constructed on the property. The exterior of the houses shall be constructed of brick, stone, cedar shingles or "Hardiplank" (or comparable cementitous siding), the proportion of which used for each house being reserved to the Applicant.

5. Building Restriction Line (BRL) Restrictions:

Notwithstanding the BRL set forth in Zoning Ordinance Section 3-407, 2.A(1)(c), in order to effect the overall intent of the approved GDP, the Applicant hereby proffers to and shall establish a rear BRL set at 100 feet from the rear lot line on each proposed lot on the GDP (herein the “proffered rear BRL”). The proffered rear building restriction line established by the Applicant shall be in lieu of the BRL set forth in the R-4 District. Establishment of the proffered rear BRL shall be set forth in a covenant approved as to form and content by the Fairfax County Attorney, and recorded among the Land Records with the subdivision plat. All sales literature and information to prospective purchasers shall notify purchasers of restrictions relating to this proffered rear BRL prior to or simultaneous with entering into a contract of sale for a lot on the property.

6. Right of Way Dedication:

Right of Way: Applicant shall dedicate and convey in fee simple with no encumbrances to the Board of Supervisors, right of way for public street purposes (together with all ancillary easements), 35 feet from the centerline of Cedar Lane as shown on the GDP, and additional dedication of 3 feet if required by VDOT at the time of subdivision approval, and construct public improvements as shown thereon. In addition, Applicant shall improve shared driveway entrance to be in similar and substantial conformity to the entrance of the adjacent subdivision, RZ-1999-PR-031.

Dedication of right of way shall be made at time of first subdivision plan approval or upon demand from Fairfax County, whichever shall first occur.

Frontage Improvements: Applicant shall provide a justification statement and analysis to VDOT and FCDOT to support the front ditch and shoulder improvement of the property's frontage adjacent to Cedar Lane in lieu of curb and gutter as shown on the GDP dated August 21, 2013. If this ditch and shoulder frontage improvement is not authorized by VDOT/FCDOT then Applicant shall either:

1. Escrow funds with Fairfax County DPWES per published unit prices for the construction of curb and gutter improvements along the property's Cedar Lane frontage; or
2. Construct the curb and gutter improvements.

If the request for frontage improvements for ditch and shoulder is not approved by VDOT and it is determined that curb and gutter frontage improvements shall be made, the frontage improvements shall be made whereby the face of curb shall be 20 ft from the centerline of Cedar Lane.

FCDOT and VDOT will make the determination on the measures to be provided if the ditch and shoulder plan is not approved. Such improvements will be limited to the frontage immediately in front of the subject property and will not extend onto adjacent properties to the north or south of the subject property, except as shown on the GDP dated August 21, 2013, and will not include the relocation of any utility poles on the north and south part of the subject property. Dedication of right of way shall be made at time of first subdivision plan approval or upon demand from Fairfax County, whichever shall first occur.

Cedar Lane Road Improvement: Applicant shall commit to closing one half of Cedar Lane at a time, and at times outside the daily peak hours specific to Cedar Lane. The maintenance and protection of traffic shall be provided according to strict regulations stated in the Federal Manual on Uniform Traffic Control Devices. If neighboring driveways are blocked by construction time over-runs or by overnight road disrepair, the applicant shall provide the cost for lodging for the family homes affected. The Applicant shall submit road closure plans at submission of site plans. All neighboring driveway and entrances shall be restored in-kind and in accordance with the GDP dated August 21, 2013 when the final construction of the improvement is completed. The applicant shall submit a Cedar Lane driveway photo-log to the Providence District Supervisor's office before any construction begins.

Notwithstanding the foregoing, funds may be reallocated at the discretion of the Providence District Supervisor toward construction of other transportation related improvements, including pedestrian facilities, in the vicinity of the application property, as determined by the Fairfax County Department of Transportation (FCDOT).

7. Maintenance of Bio Retention Facilities (Rain Gardens):

The rain gardens shown on the subject property will be designed and constructed as determined by DPWES, and shall be maintained by the owners of the respective lots on which the rain gardens are located. All sales literature and information will detail that a maintenance agreement that shall be signed by prospective purchasers prior to or simultaneous with entering into a contract of sale for a lot on the property. The maintenance agreement shall detail how the rain gardens are to be maintained and will include a mulching schedule and details on plantings permitted within the rain gardens. The maintenance agreement shall be an agreement that runs with the land to protect the rain gardens by future and/or subsequent property owners.

If stormwater management measures required by DPWES at site plan are not in substantial conformance with that shown on the GDP, a proffered condition amendment (PCA) and GDPA shall be required.

8. Common Driveway Maintenance:

The common driveway providing access to Cedar Lane for each of the lots on the property shall be maintained by the homeowners pursuant to a joint maintenance agreement which Applicant shall set forth as a covenant, recording the same with the subdivision documents at the time of recordation of the subdivision plat. The covenant for common driveway maintenance shall be in a form approved by the County Attorney. All sales literature and information to prospective purchasers shall notify purchasers of this covenant prior to or simultaneous with entering into a contract of sale for a lot on the property.

9. Park Authority Contribution:

At the time of subdivision plan approval, the Applicant will contribute the sum of $5,358.00 to the Fairfax County Park Authority for development of recreational facilities at one or more of the FCPA sites located within the service area of the subject property.

10. School Board Contribution:

At the time of subdivision plan approval the applicant shall contribute the sum of $24,800.00 for capital improvements to the public schools served by the subdivision. Said contribution shall be deposited with DPWES for transfer to Fairfax County Public Schools.

11. Contribution to Housing Trust Fund:

To assist the County in its goal to provide affordable dwellings elsewhere in the County, prior to the issuance of the first Building Permit, the Applicant shall

contribute to the Fairfax County Housing Trust Fund a sum equal to one-half of one percent (0.5%) of the projected sales price of each of the new residential units to be built on-site, as determined by the Department of Housing and Community Development (HCD) and DPWES in consultation with the Applicant.

12. Tree Preservation/ Landscape Design: Tree Preservation:

The Applicant shall submit a Tree Preservation plan and Narrative as part of the first and all subsequent subdivision plan submissions. The preservation plan and narrative shall be prepared by a Certified Arborist or a Registered Consulting Arborist with experience in the preparation of tree preservation plans, and shall be subject to the review and approval of the Urban Forest Management Division (UFMD), DPWES.

Tree Preservation: The tree preservation plan shall include a tree inventory that identifies the location, species, critical root zone, size, crown spread and condition analysis percentage rating for all individual trees to be preserved as well as all on and off-site trees, living or dead with trunks 12 inches in diameter and greater (measured at 4 ½ - ft from the base of the trunk or as otherwise allowed in the latest addition of the Guide for Plant Appraisal published by the International Society of Arboriculture) located within 25 feet to either side of the limits of clearing and grading shown on the GDP for the entire site. The tree preservation plan shall provide for the preservation of those areas shown for tree preservation, those areas outside of the limits of clearing and grading shown on the GDP and those additional areas in which trees can be preserved as a result of final engineering. The tree preservation plan and narrative shall include all items specified in PFM 12-0507 and 12-0509. Specific tree preservation activities that will maximize the survivability of any tree identified to be preserved, such as: crown pruning, root pruning, mulching, fertilization and others as necessary shall be included in the plan. Condition analysis ratings shall be prepared using methods outlined in the latest edition of the Guide for Plant Appraisal published by the International Society of Arboriculture.

Tree Preservation Walk-Through: The Applicant shall retain the services of a certified arborist or Registered Consulting Arborist, and shall have the limits of clearing and grading marked with a continuous line of flagging prior to the walk-through meeting. During the tree-preservation walk-through meeting, the Applicant's certified arborist or landscape architect shall walk the limits of clearing and grading with an UFMD, DPWES, representative to determine where adjustments to the clearing limits can be made to increase the area of tree preservation and/or to increase the survivability of trees at the edge of the limits of clearing and grading, and such adjustment shall be implemented. Trees that are identified as dead or dying may be removed as part of the clearing operation. Any tree that is so designated shall be removed using a chain saw and such removal shall be accomplished in a manner that avoids damage to surrounding trees and associated under story vegetation. If a stump must be removed this shall be done using a stump-grinding machine in a manner causing as little disturbance as possible to adjacent trees and associated under story vegetation and soil conditions.

Limits of Clearing and Grading. The Applicant shall conform strictly to the limits of clearing and grading as shown on the GDP, subject to allowances specified in these proffered conditions and for the installation of utilities and/or trails or supplemental planting as determined necessary by the Director of DPWES, as described herein. If it is determined necessary to install utilities and/or trails in areas protected by the limits of clearing and grading as shown on the GDP, they shall be located in the least disruptive manner necessary as determined by UFMD, DPWES. A replanting plan shall be developed and implemented, subject to approval by UFMD, DPWES, for any areas protected by the limits of clearing and grading that must be disturbed for such replanting, trails or utilities.

Tree Preservation Fencing: All trees shown to be preserved on the tree preservation plan shall be protected by tree protection fence. Tree protection fencing in the form of four (4) foot high, fourteen (14) gauge welded wire attached to six (6) foot steel posts driven eighteen (18) inches into the ground and placed no further than ten (10) feet apart or, super silt fence to the extent that required trenching for super silt fence does not sever or wound compression roots which can lead to structural failure and/or uprooting of trees shall be erected at the limits of clearing and grading as shown on the demolition, and phase I and II erosion and sediment control sheets, as may be modified by the "Root Pruning" proffer below.

All tree protection fencing shall be installed after the tree preservation walk-through meeting but prior to any clearing and grading activities, including the demolition of any existing structures. The installation of all tree protection fencing shall be performed under the supervision of a certified arborist, and accomplished in a manner that does not harm existing vegetation that is to be preserved. Three (3) days prior to the commencement of any clearing, grading or demolition activities, but subsequent to the installation of the tree protection devices, the UFMD, DPWES, shall be notified and given the opportunity to inspect the site to ensure that all tree protection devices have been correctly installed. If it is determined that the fencing has not been installed correctly, no grading or construction activities shall occur until the fencing is installed correctly, as determined by UFMD, DPWES.

Root Pruning: The Applicant shall root prune, as needed to comply with the tree preservation requirements of these proffers. All treatments shall be clearly identified, labeled, and detailed on the erosion and sediment control sheets of the subdivision plan submission. The details of these treatments shall be reviewed and approved by UFMD, DPWES, accomplished in a manner that protects affected and adjacent vegetation to be preserved, and may include, but not be limited to the following:

1. Root pruning shall be done with a trencher or vibrating plow to a depth of 18 inches.
2. Root pruning shall take place prior to any clearing and grading, or demolition of structures.
3. Root pruning shall be conducted with the supervision of a certified arborist.

4. An UFMD, DPWES, representative shall be informed when all root pruning and tree protection fence installation is complete.

Demolition of Existing Structures: The demolition of any existing features and structures within areas protected by the limits of clearing and grading areas shown on the GDP shall be done by hand without heavy equipment and conducted in a manner that does not impact individual trees and/or groups of trees that are to be preserved as reviewed and approved by UFM, DPWES.

Site Monitoring: During any clearing or tree/vegetation/structure removal on the Applicant Property, a representative of the Applicant shall be present to monitor the process and ensure that the activities are conducted as proffered and as approved by UFMD, DPWES. The Applicant shall retain the services of a certified arborist or Registered Consulting Arborist to monitor all construction and demolition work and tree preservation efforts in order to ensure conformance with all tree preservation proffers, and UFMD, DPWES approvals. The monitoring schedule shall be described and detailed in the Landscaping and Tree Preservation Plan, and reviewed and approved by UFMD, DPWES.

Monetary Value of Trees: The Applicant shall retain a professional arborist with experience in plant appraisal, to determine the replacement value of all trees 12 inches in diameter or greater located on the Application Property, or those that are shown to be saved on the Tree Preservation Plan. These trees and their value shall be identified on the Tree Preservation Plan at the time of the first submission of the respective public improvement/site plan(s). The replacement value shall take into consideration the age, size and condition of these trees and shall be determined by the so-called "Trunk Formula Method" contained in the latest edition of the Guide for Plan Appraisal published by the International Society of Arboriculture, subject to review and approval by UFMD, DPWES.

Tree Bond: At the time of the respective public improvement/site plan approvals, the Applicant shall both post a cash bond or a letter of credit payable to the County of Fairfax to ensure preservation and/or replacement of the trees for which a tree value has been determined in accordance with the Proffer above (the "Bonded Trees") that die or are dying due to unauthorized construction activities. The letter of credit or cash deposit shall be equal to 50% of the replacement value of the Bonded Trees. At any time prior to final bond release, should any bonded Trees die, be removed, or are determined to be dying by UFMD, DPWES, due to unauthorized construction activities, the Applicant shall replace such trees at its expense. The replacement trees shall be of equivalent size, species and/or canopy cover as approved by UFMD, DPWES. In addition to this replacement obligation, the Applicant shall also make a payment to Fairfax County equal to the value of any Bonded Tree that is dead or dying or improperly removed due to unauthorized activity. This payment shall be determined based on the Trunk Formula Method and paid to a fund established by the County for furtherance of tree preservation objectives. Upon release of the bond any amount remaining in the tree bonds required by this proffer shall be returned/released to the Applicant.

Privacy Screening: Homes to the north, west and south will have privacy screening trees in substantial conformity as shown on the Generalized Development Plan dated August 21, 2013.

13. Heritage Resources:

Prior to subdivision plan approval, the Applicant shall conduct a Phase I archaeological study on those areas of the Property identified by Cultural Resource Management and Protection Section (CRMPS) of the Fairfax County Park Authority and provide the results of such study for the review and approval of CRMPS. The study shall be conducted by a qualified archaeological professional. If the Phase I study concludes that a Phase II study of the Property is warranted, the Applicant shall complete said study and provide the results to CRMPS; however, submission of the Phase II study to CRMPS shall not be a pre-condition of subdivision plan approval. If the Phase II study concludes that additional Phase III evaluation and/or recovery is warranted, the Applicant shall also complete said work in consultation and coordination with CRMPS; however, any such Phase III work shall not be a pre-condition of subdivision plan approval.

14. Interior Noise Abatement:

In order to achieve a maximum interior noise level of approximately 45dBA Ldn, residential units on Lots 1 to 3 located within one hundred and six (106) feet from the existing centerline of Cedar Lane that may experience noise levels between 65 and 70 dBA Ldn as determined by the DPWES, will be constructed with the following measures to mitigate the impact of highway noise:

(i) Construction materials and techniques known to have physical properties or characteristics suitable to achieve a Sound Transmission Classification (STC) of at least 45 for exterior walls of residential buildings; and
(ii) Doors and glazing shall have a laboratory STC rating of at least 37 unless glazing constitute more than 20 percent of any façade exposed to noise levels of DNL 65 dBA or above. If doors, windows and other glazed areas constitute more than 20 percent of an exposed façade, then the glazing of such features shall have an STC rating of at least 45.
(iii) Measures to seal and caulk between surfaces should follow methods approved by the American Society for Testing and Materials to minimize sound transmission.

15. Lighting and Signs:

a. All exterior lighting shall be in conformance with Part 9 of Article 14 of the Zoning Ordinance.

b. No temporary signs (including "Popsicle" style paper or cardboard signs), which are prohibited by Article 12 of the Zoning Ordinance, and no signs

which are prohibited by Chapter 7 of Title 33.1 or Chapter 8 of Title 46.2 of the Code of Virginia shall be placed on or off-site by the Applicant or at the Applicant's direction to assist in the initial marketing and sale of homes on the Property. Furthermore, the Applicant shall direct its agents and employees involved in the marketing and/or home sales for the Property to adhere to this Proffer.

16. Energy Saver Program:

All homes constructed on the Property shall meet the thermal guidelines of the CABO Model Energy Program for energy-efficient homes or its equivalent, as determined by the DPWES for either electric or gas energy systems, as applicable. Additionally, prospective homeowners will have the option to have their home constructed in accordance with the EarthCraft House Program as demonstrated through documentation provided to DPWES and DPZ prior to the issuance of the residential use permit (RUP) for each new home.

17. Telecommuting:

All dwellings shall be pre-wired with broadband, high capacity data/network connections in multiple rooms, in addition to standard phone lines.

18. Other:

During the development of the subject site, the telephone number of the site superintendent that shall be present on-site during construction shall be posted for all surrounding residents to obtain throughout the development of the Property.

Outdoor construction activity shall be limited to between the hours of 7:00 a.m. and 7:00 p.m., Monday through Friday and 8:00 a.m. and 5:00 p.m. on Saturdays. No outdoor construction activities shall be permitted on Sundays or on Federal holidays. The site superintendent shall notify all employees and subcontractors of these hours of operation and shall ensure that the hours of operation are respected by all employees and subcontractors. Construction hours shall be posted on-site in both English and Spanish. This proffer applies to the original construction only and not to future additions and renovations by homeowners.

19. Off Site Drainage Improvement:

An offsite drainage improvement is proffered along lots 13, 14, 15 and 16 adjacent to the subject Property and annotated on sheet 6 of the GDP dated August 21, 2013. The four property owners of lots 13-16 have each signed notarized letters of permission granting the Applicant permission to apply for the necessary permits to construct the offsite drainage improvement with VDOT and FCDOT. These notarized letters also grant the Applicant permission to obtain any necessary easements for the purpose of installing the proposed offsite drainage system.

PROFFERS - RZ 2009-PR-022
APPLICANT:

_____
James Hollingsworth
Owner

County of Fairfax, Virginia

MEMORANDUM

DATE: August 12, 2013

TO: St.Clair Williams, Staff Coordinator
Zoning Evaluation Division
Department of Planning and Zoning

FROM: Beth Forbes, Engineer IV, for the
Site Code Research & Development Branch
Department of Public Works and Environmental Services

SUBJECT: Stormwater Comments on Rezoning Application #RZ 2009-PR-022, Hollingsworth Property, Generalized Development Plan dated July 17, 2013, LDS Project #24745-ZONA-002-3, Tax Map #49-1-04-0016A, Providence District

We have reviewed the subject application and offer the following stormwater management comments.

Chesapeake Bay Preservation Ordinance (CBPO)
There is no Resource Protection Area (RPA) on this site.

Water quality controls are required for this development (Public Facilities Manual [PFM] 6-0401.2A). A bioretention facility is depicted on each of the 3 lots. The construction of the facility on lot 3 will impact tree #1152.

At the subdivision construction plan stage:

- a modification may be required to locate the facilities on an individual lots (PFM 6-1307.2) -- such a modification is likely to be conditionally approved;
- the BMP calculations will be required to use either the Occoquan Method (PFM 6-0401.2A) or the Virginia Runoff Reduction Method;
- the filter depth must be greater than 2.5 feet to accommodate trees, if trees are selected to be a part of the planting plan notwithstanding the diagram on Sheet 5 (PFM 6-1307.4N);
- the type of planting plan must be specified; and
- the planting plan must meet the PFM requirements in §6-1307.10G and §12-0515.1L.

Floodplain
There are no regulated floodplains on the property.

Downstream Drainage Complaints
Yard flooding has been reported downstream at 2837, 2839, 2843 and 2844 Maple Lane in the past. Basement flooding at 2840 Maple Lane has also been reported. All the downstream flooding complaints on file have been caused by blockages.

Department of Public Works and Environmental Services
Land Development Services, Site Development and Inspections Division
12055 Government Center Parkway, Suite 535
Fairfax, Virginia 22035-5503
Phone 703-324-1720 • TTY 711 • FAX 703-324-8359

At the subdivision construction plan stage:

- detention of the 100-year storm's runoff, or a proportional reduction, may be required if downstream structures have flooded in the past or may be flooded in the future (PFM 6-0202.4 and -0203.5).

Stormwater Detention

The detention requirements are to be met by 3 bioretention basins. Since the outfall is inadequate, the applicant states that the Detention Method (PFM 6-0203.4) will be used to meet the outfall requirements of the Public Facilities Manual.

At the subdivision construction plan stage:

- new infiltration tests may be necessary to meet current PFM requirements (PFM 4-0700),
- there is likely to be stone underneath the filters to a depth of about 8 feet, notwithstanding the diagram on Sheet 5 (PFM 6-1307.6);
- the volume of the 1-year storm from the entire site must be detained for 24 hours as part of the Detention Method requirements (PFM 6-0203.4C(1)(i)), and
- it must be demonstrated the bioretention facilities have the detention volume necessary to meet the requirements of the detention method and, if necessary, to meet the requirements of PFM 6-0203.5 as mentioned above.

Site Outfall

An outfall narrative has been provided. The outfall is inadequate. The applicant intends to meet the PFM's adequate outfall requirements through the Detention Method (PFM 6-0203.4C and 6-0203.5) and by constructing a storm drain system along Cedar Lane and Emil Way. Easements and construction access approval will be required of 4 lots along Cedar Lane. Construction access approval from Fairfax County will also be required.

At the subdivision construction plan stage:

- permanent maintenance easements are likely to be required for any stormwater conveyance facility constructed, particularly from the owner of lot 13, and
- it must be demonstrated that any increase in non-concentrated runoff will have no adverse impact upon downstream properties even during a 100-year storm (PFM 6-0202.6 and -0202.7).

These comments are based on the 2011 version of the PFM. As a result of changes to state code, a new stormwater ordinance and updates to the PFM's stormwater requirements are in the approval process, (see 4VAC50-60 adopted May 24, 2011). The subdivision plan for this application may be required to conform to the updated PFM and the new ordinance.

Please contact me at 703-324-1720 if you require additional information.

BF/

cc: Fred Rose, Chief, Watershed Planning & Assessment Branch, Stormwater Planning Division, DPWES
Durga Kharel, Branch Chief Central, Site Development & Inspections Division, DPWES
Zoning Application File