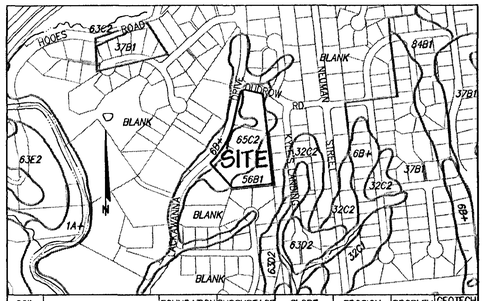
CONCEPTUAL / FINAL DEVELOPMENT PLAN

LACKAWANNA DRIVE

LEE DISTRICT

FAIRFAX COUNTY, VIRGINIA

RZ 2006-LE-026



SOIL #	SERIES NAME	FOUNDATION SUPPORT	SUBSURFACE DRAINAGE	SLOPE STABILITY	EROSION POTENTIAL	PROBLEM CLASS	GEOTECH REPORT REQ'D
6B+	HYATTSVILLE	FAIR	MARGINAL	GOOD	LOW	B	NO
56B1	KEMPSVILLE	GOOD	FAIR	GOOD	MODERATE	B	NO
65C2	COLFAX	MARGINAL	MARGINAL	GOOD	MODERATE	B	NO

SOILS MAP/DATA

SCALE : 1" = 500'

DENSITY TABULATIONS

ACCOTINK BLUFF

	# LOTS	AREA	DENSITY
SECTION ONE			
CURRENT CONFIGURATION (LOTS 1, 2, 5-10)	8	12.00 Ac	0.67 DU/AC
AREA OF REZONING (LOTS 6, 7 & 8)	3	4.14 Ac	0.72 DU/AC
RESIDUAL OF SECTION ONE (LOTS 1, 2, 5, 9 & 10)	5	7.86 Ac	0.636 DU/AC
SECTION TWO			
CURRENT CONFIGURATION (LOTS 17, 18A1, 18A2, 18B)	4	10.29 Ac	0.39 DU/AC
TOTAL	9	18.15 Ac	0.495 DU/AC

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

☒ 1. Plat is at a minimum scale of 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 clearing and grading accommodate the stormwater management facility(ies), storm drainage pipe systems and outlet protection, pond spillways, access roads, site outfalls, energy dissipation devices, and stream stabilization measures as shown on Sheet 2.

☒ 3. Provide :

Facility Name/ Type & No.	On-site area served (acres)	Off-site area served (acres)	Drainage area (acres)	Footprint area (sf)	Storage Volume (cf)	If pond, dam height (ft)
Dry Pond	3.03±	0.55±	3.58±	5,700±	36,900±	10±

☒ 4. Onsite drainage channels, outfalls, and pipe systems are shown on Sheet 2. Pond inlet and outlet pipe systems are shown on Sheet 2.

☒ 5. Maintenace access (road) to stormwater management facility is shown on Sheet 2. Type of maintenance access road surface noted on the plat is asphalt.

☒ 6. Landscaping and tree preservation shown in and near the stormwater management facility is shown on Sheet 2.

☒ 7. A 'stormwater management narrative' which contains a description of how detention and best management practices requirements will be met is provided on Sheet 4.

☒ 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 5.

☒ 9. A description of how the outfall requirements, including known changes to contributing drainage areas (i.e. drainage diversions), of the Public Facilities Manual will be satisfied is provided on Sheet 4.

☒ 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 1 & 2.

☒ 11. A submission waiver is requested for N/A

☒ 12. Stormwater management is not required because N/A

NOTES

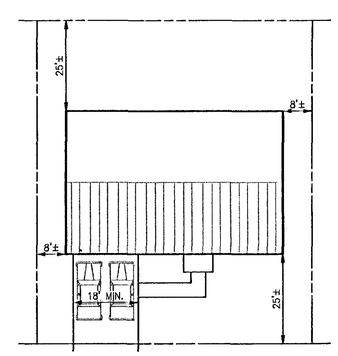
1. THE PROPERTY DELINEATED ON THIS PLAN IS LOCATED ON FAIRFAX COUNTY TAX ASSESSMENT MAP NUMBER 90-3((3)) LOTS 6, 7, & 8. THE SITE IS CURRENTLY ZONED R-1. THE PROPOSED ZONING IS PDH-2.
2. THE PROPERTY HEREON IS CURRENTLY IN THE OWNERSHIP OIF :
   LOT 6 - CLIFFORD F. LINDSAY, TR. AND JOYCE F. LINDSAY REVOCABLE TRUST IN DEED BOOK 18205 AT PAGE 383
   LOT 7 - JOSEPH A. GILLESPIE, TR. IN WILL BOOK 461 AT PAGE 483, AND DEED BOOK 9341 AT PAGE 231
   LOT 8 - NANCY J. & RICHARD M. VALENTINE, TRS. IN DEED BOOK 10240 AT PAGE 140
3. BOUNDARY AND TOPOGRAPHIC INFORMATION TAKEN FROM A FIELD RUN SURVEY PREPARED BY CHARLES P. JOHNSON & ASSOCIATES, DATED MARCH 2006. CONTOUR INTERVAL EQUALS TWO FEET USGS NGVD 1929.
4. THERE IS NO 100-YEAR FLOODPLAIN ON-SITE. NO FLOODPLAIN OR DRAINAGE STUDIES ARE REQUIRED FOR THIS PROJECT.
5. THERE ARE NO RESOURCE PROTECTION AREAS (RPAs) OR EINVIRONMENTAL QUALITY CORRIDORS (EQCs) ON-SITE. A WATER QUALITY IMPACT ASSESSMENT WILL NOT BE IREQUIRED.
6. TO THE BEST OF OUR KNOWLEDGE, THE SITE HAS NO SCENIC ASSETS OR NATURAL FEATURES DESERVING OF PROTECTION AND PRESERVATION.
7. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO KNOWN GRAVES, OBJECTS, OR STRUCTURES MARKING A PLACE OF BURIAL.
8. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITY EASEMENTS HAVING A WIDTH OF 25 FEET OR GREATER, NOR ANY MAJOR UNDERGROUND UTILITY EASEMENTS LOCATED WITHIN THE SITE.
9. ALL EXISTING WELLS AND DRAINFIELDS ON-SITE ARE TO BE CAPPED AND ABANDONED IN ACCORDANCE WITH HEALTH DEPARTMENT REGULATIONS.
10. SEE SHEET 6 FOR A DESCRIPTION OF EXISTING VEGETATION.
11. EXISTING STRUCTURES ARE TO BE REMOVED. DATES OF CONSTRUCTION FOR THE EXISTING DWELLINGS :
    LOT 6 - 1958 LOT 7 - 1960 LOT 8 - 1959
12. THERE ARE NO ZONING OVERLAY DISTRICTS ON THIS SITE.
13. NO DENSITY REDUCTIONS ARE REQUIRED BY ZONING ORDINANCE SECTION 2-308.
14. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO HAZARDOUS OR TOXIC SUBSTANCES AS SET FORTH IN TITLE 40, CODE OF FEDERAL REGULATIONS PART 116.4, 302.4, AND 355; HAZARDOUS WASTE AS SET FORTH IN COMMONWEALTH OF VIRGINIA / DEPARTMENT OF WASTE MANAGEMENT VR 672-10-1 - VIRGINIA HAZARDOUS WASTE MANAGEMENT REGULATION; AND/OR PETROLEUM PRODUCTS AS DEFINED IN TITLE 40, CODE OF FEDERAL REGULATIONS PART 280; TO BE GENERATED, UTILIZED, STORED, TREATED, AND/OR DISPOSED OF ON-SITE.
15. THERE ARE NO AFFORDABLE DWELLING UNITS (ADUs) REQUIRED FOR THIS PROJECT.
16. IN ACCORDANCE WITH THE ADOPTED COMPREHENSIVE PLAN, THE PROPOSED DEVELOPMENT WILL PROVIDE RESIDENTIAL DEVELOPMENT AT 1.94 DWELLING UNITS PER ACRE AND WILL CONFORM TO ALL APPLICABLE ORDINANCES, REGULATIONS, AND ADOPTED STANDARDS EXCEPT AS NOTED BELOW :
    - A MODIFICATION OF PFM 2-0103.2 TO ALLOW PIPESTEM LOTS IN EXCESS OF 20% OF THE TOTAL NUMBER OF LOTS
    - A MODIFICATION OF PFM 7-0902 TO ALLOW A 30' RADIUS TURN AROUND.
    - A MODIFICATION OF THE TYPICAL SECTION OF A PIPESTEM DRIVEWAY (PS-2) TO ALLOW THE PIPESTEM SHOWN
17. PROPOSED PUBLIC IMPROVEMENTS :
    A. WATER SERVICE TO BE PROVIDED BY EXISTING 8" MAINS LOCATED IN LACKAWANNA DRIVE AND DUDROW DRIVE
    B. SANITARY SERVICE TO BE PROVIDED BY AN EXISTING 8" MAIN LOCATED IN LACKAWANNA DRIVE
18. THERE ARE NO RECREATIONAL FACILITIES PROPOSED WITH THIS DEVELOPMENT.
19. SPECIAL AMENITIES ARE NOT PROPOSED WITH THIS PLAN.
20. A DEVELOPMENT SCHEDULE HAS NOT BEEN DETERMINED AT THIS TIME.
21. SEE SHEET 5 FOR ARCHITECTURAL SKETCHES.
22. A TRAIL IS NOT REQUIRED FOR THIS PROJECT PER THE FAIRFAX COUNTY TRAILS PLAN.
23. PARCEL "A" WILL BE CONVEYED TO A HOMEOWNERS ASSOCIATION FOR OWNERSHIP AND MAINTENANCE.
24. MINOR MODIFICATIONS TO THE BUILDING FOOTPRINTS, LOT AREAS, DIMENSIONS, UTILITY LAYOUT, AND LIMITS OF CLEARING AND GRADING MAY OCCUR WITH THE FINAL ENGINEERING DESIGN, IN SUBSTANTIAL CONFORMANCE WITH THE CDP/FDP, PROVIDED SUCH ARE IN ACCORDANCE WITH THE MINOR MODIFICATIONS PROVISION IN SECTION 16-403 OF THE ZONING ORDINANCE.

SITE TABULATIONS

SITE AREA :	
LOT AREA	119,317 ∅ (2.739 Ac)
PARCEL "A"	58,877 ∅ (1.352 Ac)
RIGHT-OF-WAY DEDICATION	1,868 ∅ (0.043 Ac)
TOTAL	180,062 ∅ (4.134 Ac)

PDH-2 ZONE

	REQUIRED	PROVIDED
NUMBER OF UNITS	---	8 SINGLE-FAMILY DETACHED
DENSITY	2 DU/AC (MAX.)	1.94 DU/AC
MINIMUM LOT AREA	N/R	13,000 ∅ ±
AVERAGE LOT AREA	N/R	14,500 ∅ ±
MAXIMUM BUILDING HEIGHT	N/R	35'
OPEN SPACE	20%	25%±
PARKING	2 SPACES/ UNIT	2 SPACES/ UNIT (16 TOTAL)



TYPICAL LOT LAYOUT

SCALE : 1" = 20'

VICINITY MAP

SCALE : 1" = 2000'

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Application No. 2(FDP 2006-LE-026 Staff L. Genis
APPROVED DEVELOPMENT PLAN
(DPA) (GDP) (CDP) (FDP)
SEE PROFFERS DATED 3-29-07
Date of (BOS) (FC) approval 4-30-07
Sheet 1 of 8

COMMONWEALTH OF VIRGINIA
PAUL B. JOHNSON
No. 018450
3.14.07
PROFESSIONAL ENGINEER

DEVELOPER

EASTWOOD PROPERTIES
3050 CHAIN BRIDGE ROAD
SUITE 103
FAIRFAX, VIRGINIA 22030
(703) 383-6111

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1 COVER SHEET
2 CONCEPTUAL/FINAL DEVELOPMENT PLAN
3 CONCEPTUAL LANDSCAPE PLAN
4 CROSS-SECTION
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6 EXISTING VEGETATION MAP
7 PRELIMINARY OUTFALL ANALYSIS & ONSITE DRAINAGE DIVIDE MAP
8 OFFSITE DRAINAGE DIVIDE MAP & OFFSITE CROSS-SECTION ANALYSIS

CPJ Associates
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SILVER SPRING, MD FAX(703)273-8595

DATE : JUNE 9, 2006
REVISED: AUGUST 2, 2006
AUGUST 10, 2006
OCTOBER 16, 2006
OCTOBER 31, 2006
FEBRUARY 20, 2007
FEBRUARY 28, 2007
MARCH 14, 2007

Department of Planning & Zoning RECEIVED

LACKAWANNA DRIVE

FILE # 06-505-201

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VIRGINIA STATE GRID NORTH (NAD83)

MEYER'S SUBDIVISION

DUDROW CT. ROUTE #7688 (50' R/W)

DUDROW ROAD – ROUTE #1297 (50' R/W)

LACKAWANNA DRIVE – ROUTE #1296 (50' R/W)

LAUREL CREEK LANE (44' R/W)

LAUREL CREEK

ACCOTINK BLUFF

LOT 18 N/F KWON Y. & CHONG H. CHONG (D.B. 7870, PG. 1525) ZONE R-2C USE : RESIDENTIAL

LOT 17 N/F IAN & BETTY F. BAIN (D.B. 7846, PG. 1107) ZONE : R-2C USE : RESIDENTIAL

LOT 16 N/F EDWARD A. & PATRICIA A. WALLACE (D.B. 8154, PG. 1092) ZONE : R-2C USE : RESIDENTIAL

LOT 15 N/F WILLIAM S. & YEON S. NAM (D.B. 7989, PG. 1453) ZONE : R-2C USE : RESIDENTIAL

LOT 14 N/F OAK H. CHOI (D.B. 8154, PG. 1092) ZONE : R-2C USE : RESIDENTIAL

EX. 10' SAN. SEW. EMT D.B. 7631 PG. 1292

EX. 15' NATURAL STATE BUFFER D.B. 7631, PG. 1292

EX. BARBWIRE FENCE

EX. WOOD FENCE

N06°10'41"W 623.08'

RETAINING WALL

PARCEL "A" 58,877 ± SF

PROPOSED CONSERVATION EASEMENT

EX. LOT 6

EX. LOT 7

EX. LOT 8

1 15,148 ± SF

2 13,174 ± SF

3 14,698 ± SF

4 15,381 ± SF

5 15,196 ± SF

6 15,234 ± SF

7 15,643 ± SF

8 14,843 ± SF

EX. 1-STORY DWELLING TO BE REMOVED #7688

EX. 1-STORY DWELLING TO BE REMOVED #7698

EX. GARAGE TO BE REMOVED

EMERGENCY TURNAROUND (GRASS PAVERS)

WOOD CHIP TRAIL W/TIMBER EDGING

PIPESTEM DRIVEWAY

PROP. STORM/BMP DRY POND

ASPHALT POND ACCESS

PARCEL "A1"

PARCEL B1 N/F CORNE G. SCOTT, TRS. (D.B. 11583, PG. 340) ZONE : PDH-2 USE : VACANT

BELDON D. & CORNE G. SCOTT, TRS. LOT 4 N/F CORNE G. SCOTT, TRS. (D.B. 10792, PG. 820) ZONE : R-1 USE : RESIDENTIAL

LOT 9 N/F FULGENCIO L. ANGEL & DULCE M. GUZMAN (D.B. 2363, PG. 188) (W.B. 210, PG. 342) (D.B. 15265, PG. 1626) ZONE : R-1 USE : RESIDENTIAL

LOT 8 N/F HOWARD A. ESSAY & FORZA H. ESSE (D.B. 13287, PG. 1603) ZONE : R-2C USE : RESIDENTIAL

LOT 9 N/F JOAN J. & ROSALINDA S. GIL, TRS. (D.B. 15281, PG. 801) ZONE : R-2C USE : RESIDENTIAL

LOT 1 N/F MARK TOWELL & MICHAEL E. GREENE (D.B. 9724, PG. 1151) ZONE : R-1 USE : RESIDENTIAL

LOT 2 N/F EARL WILLIAM & SUZANNE M. RINE (D.B. 6457, PG. 1795) ZONE : R-1 USE : RESIDENTIAL

LOT 4 N/F DUDROW HOA & PROSPECT DEV. CO. INC. (D.B. 8738, PG. 1425) ZONE : R-2 USE : SWM POND

PARCEL "A1" N/F DUDROW HOA (D.B. 12086, PG. 1022) ZONE : R-2 USE : RESIDENTIAL

R-1 ZONE PDH-2 ZONE

R-2 ZONE R-1 ZONE

MATCHLINE – SEE THIS SHEET

VIRGINIA STATE GRID NORTH (NAD83)

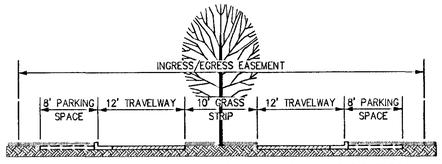
LACKAWANNA DRIVE – ROUTE #1296 (50' R/W)

EX. 27" R.C.P.

EX. 8" SAN. SEWER

EX. 10" SAN. LAT. EMT D.B. 11283 PG. 1650

MATCHLINE – SEE THIS SHEET



PIPESTEM DRIVEWAY–TYPICAL SECTION

SCALE : 1" = 10'

LEGEND

EXISTING TREELINE	PROPOSED TREELINE
EXISTING UTILITY LINE & POLE	LIMITS OF CLEARING & GRADING
EX. SAN. SEWER & EASEMENT	PROPOSED SANITARY SEWER
EX. STORM DRAIN & EASEMENT	PROPOSED STORM DRAIN
EX. WATERMAIN & EASEMENT	PROPOSED WATERMAIN

Application No. RZ/FDP 2006-LE-026 Staff C. Lewis
APPROVED DEVELOPMENT PLAN
(RZ) (SE) (CDP) (FDP)
SEE PROFFERS DATED 3-29-07
Date of BOS (PC) approval 4-30-07
Sheet 2 of 8

GRAPHIC SCALE
30 0 15 30 60
SCALE : 1" = 30'

NO.	DATE	REVISION	PRIOR TO APPROVAL
8.	3-14-07	REVISED LAYOUT FOR LOTS 5-8 (KJV)	
7.	2-28-07	REVISED LAYOUT-PIPESTEM (KJV)	
6.	1-2-07	REVISED LANDSCAPING, BORD GAZEBO & ENTRANCE FEATURE (KJV)	
5.	1-2-07	REVISED LANDSCAPING, BORD GAZEBO & ENTRANCE FEATURE (KJV)	
4.	10-31-06	REVISED PIPESTEM (KJV)	
3.	10-16-06	COUNTY COMMENTS (KJV)	
2.	8-10-06	COUNTY COMMENTS (KJV)	
1.	8-2-06	COUNTY COMMENTS (KJV)	

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SILVER SPRING, MD FAX(703)273-8595

CONCEPTUAL / FINAL DEVELOPMENT PLAN

LACKAWANNA DRIVE

LEE DISTRICT
FAIRFAX COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
PAUL B. JOHNSON
No. 018450
PROFESSIONAL ENGINEER
3-14-07

NO.	DESCRIPTION REVISIONS	BY	APPROV.	DATE

DESIGN KJV | DRAFT KJV | APPROVED

DATE MARCH 2006 | SCALE HORIZ: 1" = 30' VERT: ---

SHEET 2 OF 8

FILE NO.: 06-505-202

RZ 2006-LE-026

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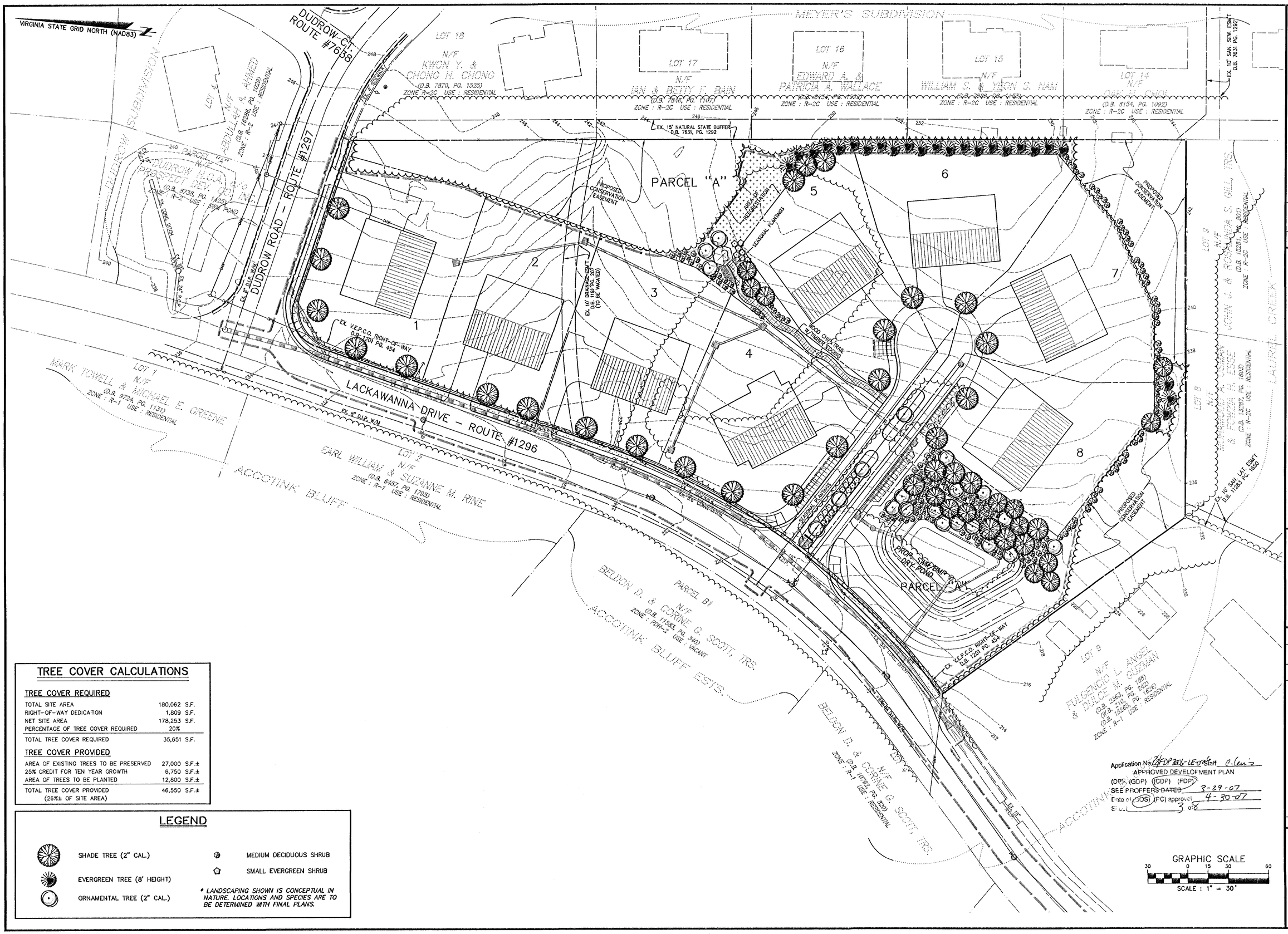

Application No. 2/FDP 2006-LE-026 Staff O. Lewis
APPROVED DEVELOPMENT PLAN
(DP) (GDP) (CDP) (FDP)
SEE PROFFERS DATED 3-29-07
Date of (BOS) (PC) approval 4-30-07
Sheet 3 of 8

TREE COVER CALCULATIONS

TREE COVER REQUIRED	
TOTAL SITE AREA	180,062 S.F.
RIGHT-OF-WAY DEDICATION	1,809 S.F.
NET SITE AREA	178,253 S.F.
PERCENTAGE OF TREE COVER REQUIRED	20%
TOTAL TREE COVER REQUIRED	35,651 S.F.
TREE COVER PROVIDED	
AREA OF EXISTING TREES TO BE PRESERVED	27,000 S.F.±
25% CREDIT FOR TEN YEAR GROWTH	6,750 S.F.±
AREA OF TREES TO BE PLANTED	12,800 S.F.±
TOTAL TREE COVER PROVIDED (26%± OF SITE AREA)	46,550 S.F.±

LEGEND

- SHADE TREE (2" CAL.)
- EVERGREEN TREE (8' HEIGHT)
- ORNAMENTAL TREE (2" CAL.)
- MEDIUM DECIDUOUS SHRUB
- SMALL EVERGREEN SHRUB

** LANDSCAPING SHOWN IS CONCEPTUAL IN NATURE. LOCATIONS AND SPECIES ARE TO BE DETERMINED WITH FINAL PLANS.*

NO.	DATE	REVISION	PRIOR TO APPROVAL
2.	3-14-07	REVISED LANDSCAPING (KJV)	
1.	2-26-07	REVISED LANDSCAPING (KJV)	

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CONCEPTUAL LANDSCAPE PLAN
LACKAWANNA DRIVE
LEE DISTRICT
FAIRFAX COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
PAUL B. JOHNSON
No. 018450
3-14-07
PROFESSIONAL ENGINEER

NO.	DESCRIPTION	BY	APPROV.	DATE
	REVISIONS			

DESIGN KJV | DRAFT KJV | APPROVED
DATE MARCH 2006 | SCALE HORIZ.1" = 30' VERT: ---

SHEET 3 OF 8

FILE NO.: 06-505-203

RZ 2006-LE-026

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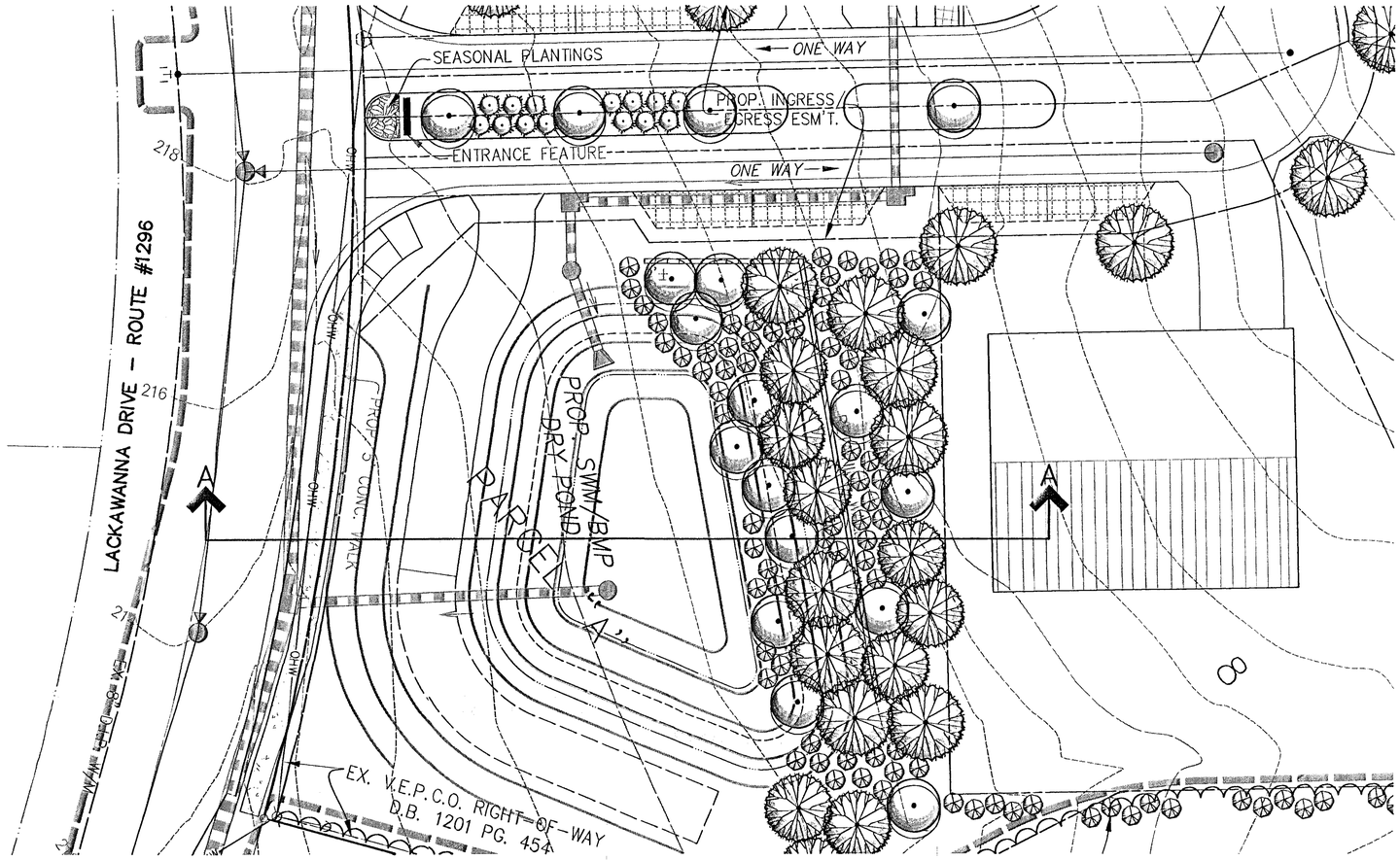

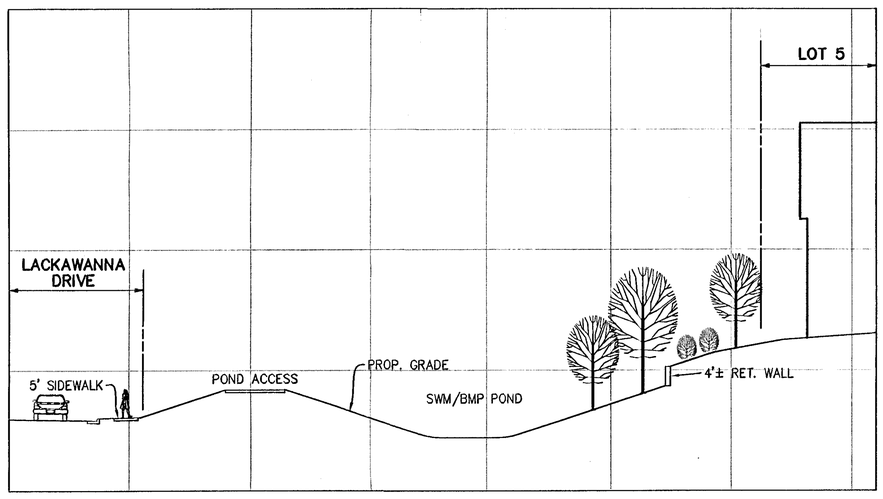

SECTION A–A

SCALE : 1" = 15'

Application No. RZ/FDP 2006-LE-026 Staff C. Lewis
APPROVED DEVELOPMENT PLAN
(DP) (GDP) (CDP) (FDP)
SEE PROFFERS DATED 3-29-07
Date of (BOS) (FC) approval 4-30-07
Sheet 4 of 8

CROSS-SECTION

LACKAWANNA DRIVE

LEE DISTRICT
FAIRFAX COUNTY, VIRGINIA

NO.	DATE	REVISION PRIOR TO APPROVAL
1.	3-14-07	REVISED CROSS-SECTION WALL (KJV)

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COMMONWEALTH OF VIRGINIA
PAUL B. JOHNSON
No. 018450
3-14-07
PROFESSIONAL ENGINEER

NO.	DESCRIPTION REVISIONS	REVIEW BY	APPROV.	DATE

DESIGN KJV	DRAFT KJV	DATE FEB. 2007	SCALE HORIZ.: 1" = 15' VERT.: 1" = 15'
APPROVED			

SHEET 4 OF 8

FILE NO.: 06-505-204

RZ 2006-LE-026

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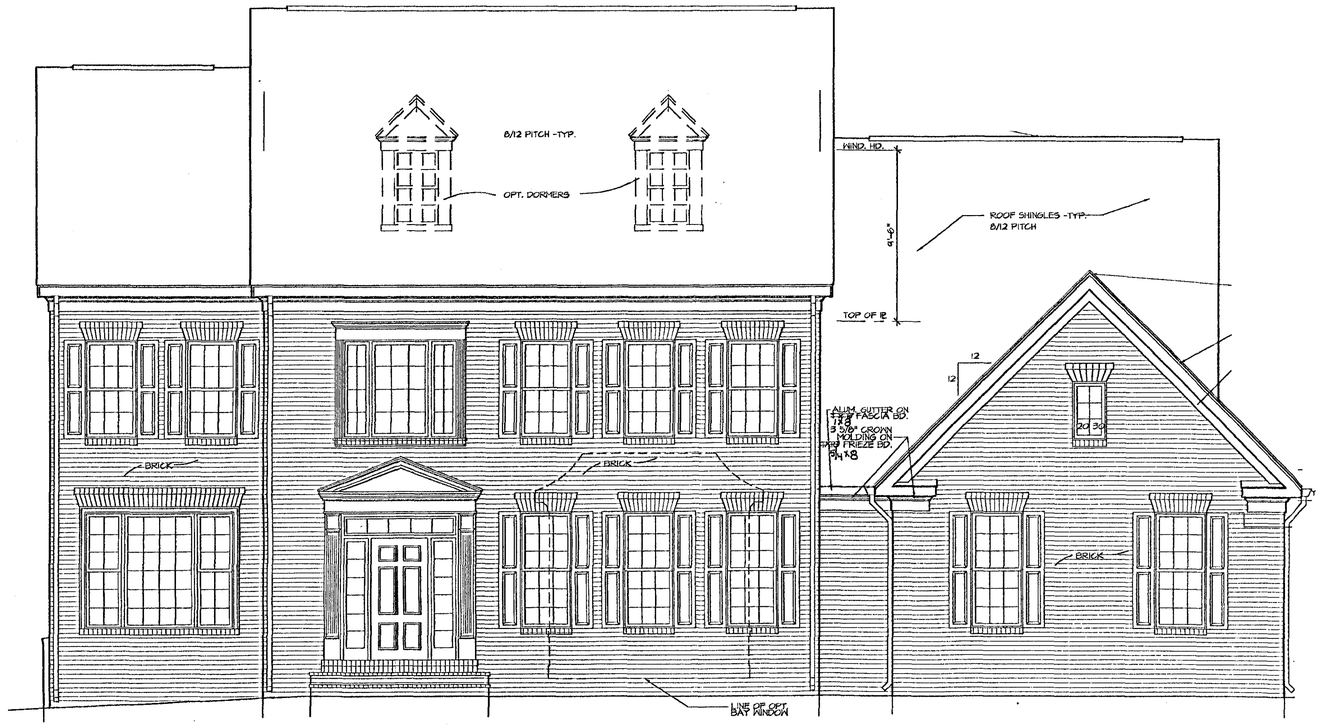

Application No. 2/FDP 2006-LE-028/Staff C. Lewis
APPROVED DEVELOPMENT PLAN
(DP) (GDP) (CDP) (FDP)
SEE PROFFERS DATED 3-29-07
Date of (BOS) (PC) approval 4-30-07
Sheet 5 of 8

ARCHITECTURAL ELEVATIONS

LACKAWANNA DRIVE

LEE DISTRICT
FAIRFAX COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
PAUL B. JOHNSON
No. 018450
PROFESSIONAL ENGINEER
2-28-07

NO.	DATE	REVISION PRIOR TO APPROVAL

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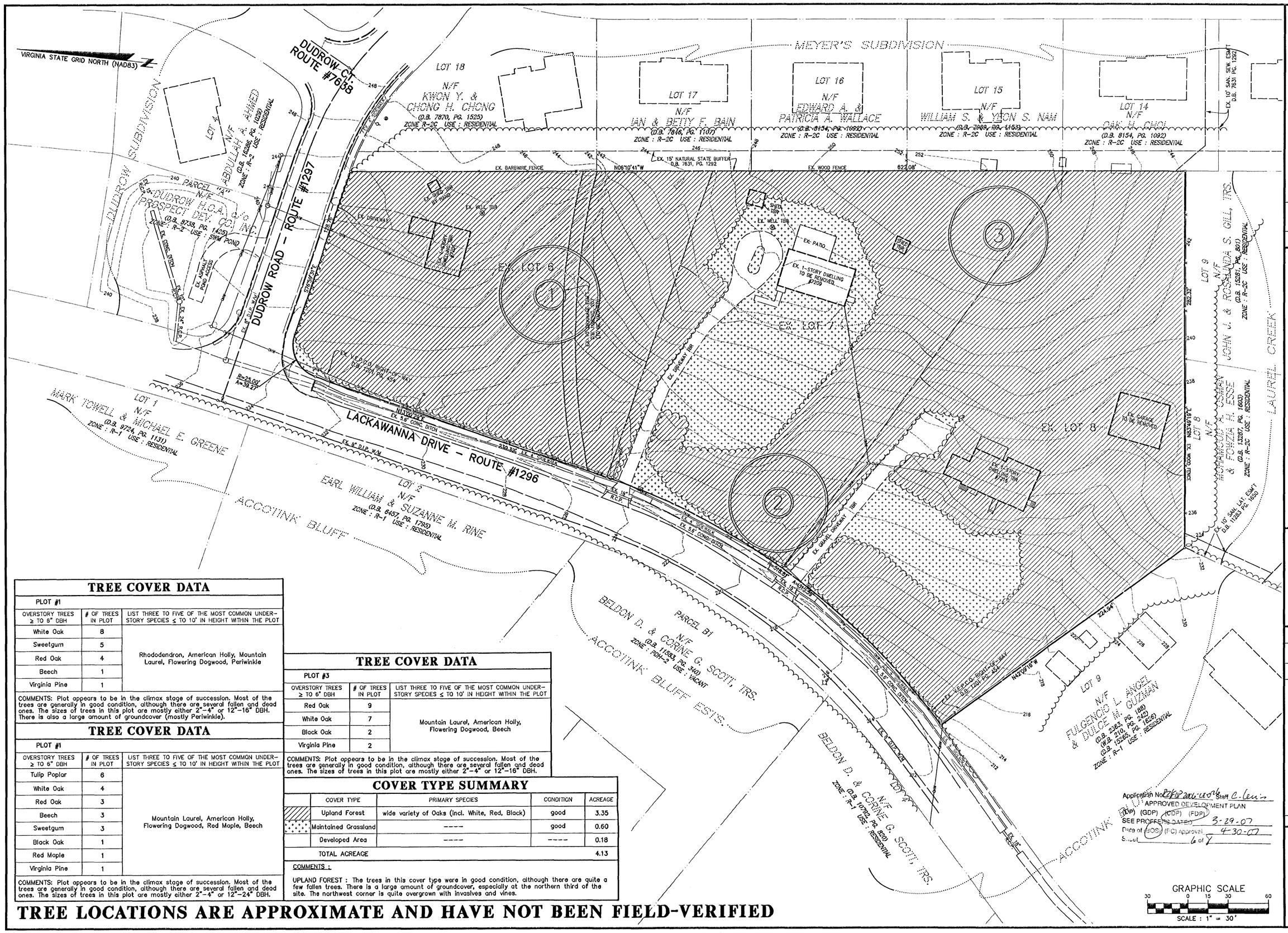
3959 PENDER DRIVE SUITE 210 FAIRFAX, VIRGINIA 22030 (703)385-7555
SILVER SPRING, MD FAX(703)273-8595

NO.	DESCRIPTION	REVIEW BY	APPROV.	DATE
	REVISIONS			

DESIGN	DRAFT	APPROVED	DATE	SCALE
KJV	KJV		FEB. 2007	HORIZ: ---- VERT: ----

SHEET 5 OF 8

FILE NO.: 06-505-205



TREE COVER DATA

PLOT #1

OVERSTORY TREES ≥ TO 6" DBH	# OF TREES IN PLOT	LIST THREE TO FIVE OF THE MOST COMMON UNDER-STORY SPECIES ≤ TO 10' IN HEIGHT WITHIN THE PLOT
White Oak	8	Rhododendron, American Holly, Mountain Laurel, Flowering Dogwood, Periwinkle
Sweetgum	5	
Red Oak	4	
Beech	1	
Virginia Pine	1	

COMMENTS: Plot appears to be in the climax stage of succession. Most of the trees are generally in good condition, although there are several fallen and dead ones. The sizes of trees in this plot are mostly either 2"-4" or 12"-16" DBH. There is also a large amount of groundcover (mostly Periwinkle).

TREE COVER DATA

PLOT #1

OVERSTORY TREES ≥ TO 6" DBH	# OF TREES IN PLOT	LIST THREE TO FIVE OF THE MOST COMMON UNDER-STORY SPECIES ≤ TO 10' IN HEIGHT WITHIN THE PLOT
Tulip Poplar	6	Mountain Laurel, American Holly, Flowering Dogwood, Red Maple, Beech
White Oak	4	
Red Oak	3	
Beech	3	
Sweetgum	3	
Black Oak	1	
Red Maple	1	
Virginia Pine	1	

COMMENTS: Plot appears to be in the climax stage of succession. Most of the trees are generally in good condition, although there are several fallen and dead ones. The sizes of trees in this plot are mostly either 2"-4" or 12"-24" DBH.

TREE COVER DATA

PLOT #3

OVERSTORY TREES ≥ TO 6" DBH	# OF TREES IN PLOT	LIST THREE TO FIVE OF THE MOST COMMON UNDER-STORY SPECIES ≤ TO 10' IN HEIGHT WITHIN THE PLOT
Red Oak	9	Mountain Laurel, American Holly, Flowering Dogwood, Beech
White Oak	7	
Black Oak	2	
Virginia Pine	2	

COMMENTS: Plot appears to be in the climax stage of succession. Most of the trees are generally in good condition, although there are several fallen and dead ones. The sizes of trees in this plot are mostly either 2"-4" or 12"-16" DBH.

COVER TYPE SUMMARY

	COVER TYPE	PRIMARY SPECIES	CONDITION	ACREAGE
	Upland Forest	wide variety of Oaks (incl. White, Red, Black)	good	3.35
	Maintained Grassland	----	good	0.60
	Developed Area	----	----	0.18
	TOTAL ACREAGE			4.13

COMMENTS :

UPLAND FOREST : The trees in this cover type were in good condition, although there are quite a few fallen trees. There is a large amount of groundcover, especially at the northern third of the site. The northwest corner is quite overgrown with invasives and vines.

TREE LOCATIONS ARE APPROXIMATE AND HAVE NOT BEEN FIELD-VERIFIED

NO.	DATE	REVISION PRIOR TO APPROVAL

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LACKAWANNA DRIVE

EXISTING VEGETATION MAP

LEE DISTRICT
FAIRFAX COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
No. 018450
PAUL B. JOHNSON
PROFESSIONAL ENGINEER
2-28-07

NO.	DESCRIPTION	REVISIONS	REVISION APPROVED BY	DATE

DESIGN KJV | DRAFT KJV | APPROVED HMF | DATE MARCH 2006 | SCALE HORIZ: 1" = 30' VERT: ---

SHEET 6 OF 8

FILE NO.: 06-505-206

STORMWATER MANAGEMENT AND BMP NARRATIVE

The Site consists of approximately 4.13 acres on which eight single-family detached lots are proposed, along with the related private street and utilities. The Site is mostly wooded with mature trees. The slopes vary, and range from 5% to 30%. There are three single-family dwellings and driveways on the property.

The major portion of the site (approximately 3.843 acres) sheet flows from east to west into an existing roadside concrete ditch along Lackawanna Drive. And a small portion of the site (approximately 0.29 acres) sheet flows to the east towards Lot 9.

PRE-DEVELOPMENT FLOWS:

A1: AREA= 3.843 Ac. ; C=0.35
Q_2 = 0.35 X 3.843 X 5.45 = 7.33 C.F.S.
Q_{10} = 0.35 X 3.843 X 7.27 = 9.78 C.F.S.

A2: AREA= 0.291 Ac. ; C=0.20
Q_2 = 0.20 X 0.291 X 5.45 = 0.32 C.F.S.
Q_{10} = 0.20 X 0.291 X 7.27 = 0.42 C.F.S.

After the development, the Site will maintain the same drainage pattern. The area that flows onto adjacent Lot 9 will be reduced to 0.1 acres (see this sheet for computations). Most of the Site's developed runoff is to be collected in a closed storm sewer system and taken to a proposed onsite dry BMP/SWM facility at the southwest corner of the property. Approximately 3.03 acres of developed onsite area and 0.54 acres of the offsite area are to be captured by the pond. Approximately 1.1 acres of onsite area will be uncontrolled. The pond will then discharge into a closed storm sewer system and then into an existing concrete ditch along Lackawanna Drive.

POST-DEVELOPMENT FLOWS:

A1: AREA= 1.0 Ac. ; C=0.42
Q_2 = 1.0 X 0.42 X 5.45 = 2.29 C.F.S.
Q_{10} = 1.0 X 0.42 X 7.27 = 3.05 C.F.S.

A2: AREA= 0.10 Ac. ; C=0.20
Q_2 = 0.10 X 0.20 X 5.45 = 0.11 C.F.S.
Q_{10} = 0.10 X 0.20 X 7.27 = 0.15 C.F.S.

A3 (ONSITE TO POND): AREA= 3.03 Ac. ; C=0.40
Q_2 = 3.03 X 0.40 X 5.45 = 6.61 C.F.S.
Q_{10} = 3.03 X 0.40 X 7.27 = 8.81 C.F.S.

THE DEVELOPMENT OF THE SITE WILL RESULT IN REDUCED FLOW OFFSITE FROM A1 AND A2. A1 WILL SHEET FLOW TO THE PROPOSED CLOSED CONDUIT STORM SEWER SYSTEM WHICH IS PART OF THE OUTFALL FROM THE ONSITE POND. A3 WILL DRAIN TO THE PROPOSED ONSITE SWM/BMP POND.

Per PFM 6-020.4, detention method has been used to provide proportional improvement and no adverse impact to the downstream drainage system. Therefore, the subject pond will reduce the post development peak flows from the site for the 2-year and 10-year storms below the relative peak flows from the site in a "good forested" condition. SCS hydrology has been used to route the pond. Additionally, the pond will detain the 1-year onsite storm for a minimum of 24 hours. This will satisfy the PFM adequate outfall requirements.

There is an existing dry detention pond located in Dudrow Subdivision just upstream of the subject site. This existing offsite pond will drain into a proposed storm sewer system running along the east side of Lackawanna Drive. The outflow from this offsite existing pond, 10.27 cfs, added to the total overland flow to the storm sewer system, approximately 16.49 cfs and the 10-year discharge from the proposed onsite pond, 9 cfs, at Structure #2 combine to create a maximum total flow through the pipe of 38.2 cfs. Based on this, a 30 inch pipe running at a slope of 1.0% has a capacity of 41 cfs and is adequate to handle the flows entering the system and ultimately draining into the existing roadside ditch.

The existing concrete ditch has been analyzed for the 10-year flow of 35.76 cfs. Considering this flow volume, the depth of flow through the existing concrete channel will be approximately 0.94 feet deep, which is less than the channel's overall depth of 1.25 feet. Therefore, the existing concrete ditch is adequate to handle the flow.

The existing concrete ditch drains into an existing offsite closed conduit storm sewer system at existing structure #30, located along the east side of Lackawanna Drive, that has been analyzed for the 10-year storm. The existing storm sewer has been analyzed by using Manning's Equation to find the pipe capacity and comparing this capacity to the approximate flows entering the existing storm sewer system. As demonstrated in the computations shown below, the existing pipe sizes of the offsite closed conduit storm sewer system are adequate to handle the 10-year flows after the development of the site.

The existing closed storm sewer system described above outfalls into an existing riprap lined channel at the end of Lackawanna Drive. The existing riprap channel has been analyzed at Section C-C for the 10-year storm (See cross-section computations and map on Sheet 5). The riprap channel has adequate capacity to convey the 10-year flow through this section.

The existing riprap channel flows to the southwest and discharges into a natural channel. The natural channel outfalls into Accotinc Creek where the subject site is then less than 1% of the overall drainage shed. Sections A-A and B-B have been taken through the natural channel and have been analyzed for the 2 year storm. See outfall analysis and map on Sheet 5.

The subject site area at Point Z is less than 1.0% of the total watershed drainage to Accotinc Creek. The existing outfall has been analyzed up to Point Z (see Sheet 5 for outfall map) to satisfy zoning requirements.

OFFSITE STORM SEWER SYSTEM ANALYSIS

STRUCTURE FROM	STRUCTURE TO	PIPE SIZE (in.)	PIPE SLOPE (%)	PIPE CAPACITY (C.F.S.)	APPROXIMATE FLOW THRU PIPE (C.F.S)
EX.30	Ex.31	27"	15.32	121.00	44.19
EX.31	EX.33	24"	7.26	61.00	44.75
EX.33	EX.35	30"	5.33	95.00	63.45
EX.35	EX.37	30"	7.75	114.00	65.13
EX.37	EX.36	30"	2.84	69.00	67.80
EX.36	EX.38	30"	2.92	70.00	69.13

NOTE: ALL FLOWS ARE APPROXIMATE. PIPE SLOPES TAKEN FROM FFX. CO. LAUREL CREEK STORM DRAINAGE IMPROVEMENTS PLAN, LAND DESIGN CONSULTANTS AS-BUILT PLANS.

STORMWATER MANAGEMENT AND BMP SUMMARY

Stormwater Management is provided via an onsite dry pond. The subject pond will reduce the post development peak flows from the site and offsite for the 2-year and 10-year storms below the relative peak flows from the site in a "good forested" condition. Additionally, the pond will detain the 1-year onsite storm for a minimum of 24-hours.

Total Site Area = 4.133 acres
Onsite Area to Pond = 3.03 acres
Offside Area to Pond = 0.543 acres
Onsite Uncontrolled Area = 1.10 acres
2 Year Reduction = 20%
2 Year Allowable Release Rate = 2.7 cfs
2 Year Routing = 0.5 cfs
2 Year Volume = 12,200 cf
10 Year Reduction = 5%
10 Year Allowable Release Rate = 10.8 cfs
10 Year Routing = 9 cfs
10 Year Volume = 17,700 cf

BMPs will be provided via this dry detention pond, and onsite qualified undisturbed open space. The total phosphorus removal for the site is approximately 40.25%, which is greater than the required 40%. Therefore, the BMP requirements have been satisfied.

BMP COMPUTATIONS

Part 1: List all of the Subareas and "C" Factors used in the BMP Computations

Subarea Designation and Description (1)	"C" (2)	Acres (3)
A1 - Onsite to Pond	0.43	2.700
A2 - Onsite Uncontrolled	0.45	0.951
A3 - Offsite to Pond	0.40	0.543
A4 - Onsite Open Space to Pond	0.20	0.333
A5 - Onsite Open Space uncontrolled	0.20	0.149

Part 2: Compute the Weighted Average "C" Factor for the Site

(A) Area of the site (a) 4.133 acres

(B) Subarea Designation

Subarea Designation (1)	"C" (2)		Acres (3)		Product (4)
A1 - Onsite to Pond	0.43	X	2.700	=	1.16
A2 - Onsite Uncontrolled	0.45	X	0.951	=	0.43
A3 - Offsite to Pond	0.00	X	0.000	=	0.00
A4 - Onsite Open Space to Pond	0.20	X	0.333	=	0.07
A5 - Onsite Open Space uncontrolle	0.20	X	0.149	=	0.03

(b) Total = 1.69

(C) Weighted Average "C" factor (b) / (a) = (c) 0.41

Part 3: Compute the Total Phosphorus Removal for the Site

Subarea Designation (1)	BMP Type (2)	Removal Eff. (%) (3)		Area Ratio (4)		"C" Factor Ratio (5)		Product (6)
A1	Dry Pond	40	X	0.65	X	1.05	=	27.56
A2	Uncontrolle	0	X	0.23	X	1.10	=	0.00
A3	Offsite	40	X	0.03	X	0.98	=	1.03
A4	Open Space	100	X	0.08	X	1.00	=	8.06
A5	Open Space	100	X	0.04	X	1.00	=	3.61

(a) Total = 40.25

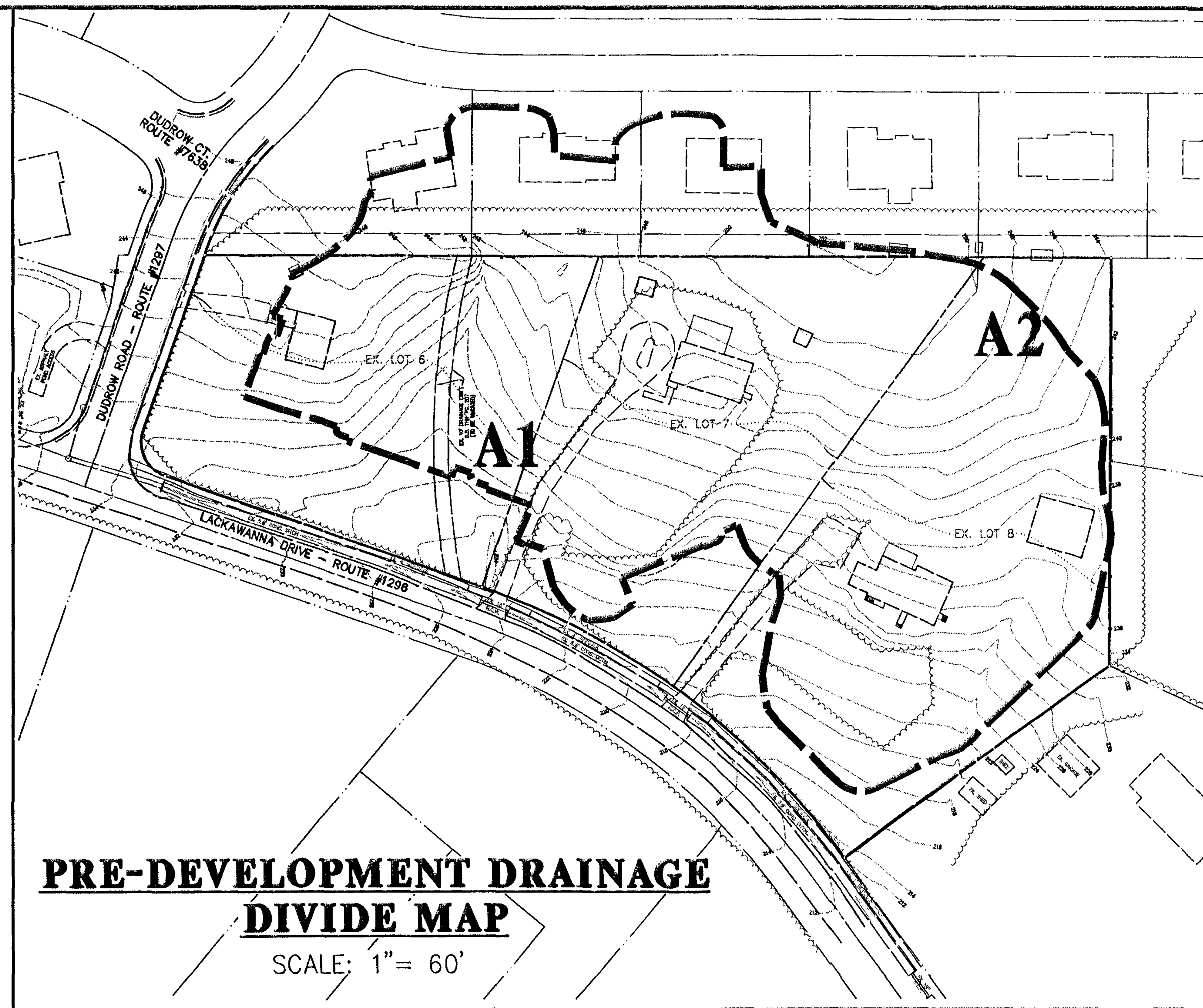
BMP STORAGE = 2,800 CF

10 YEAR POST-DEVELOPMENT OFFSITE STORM SEWER FLOW COMPUTATIONS

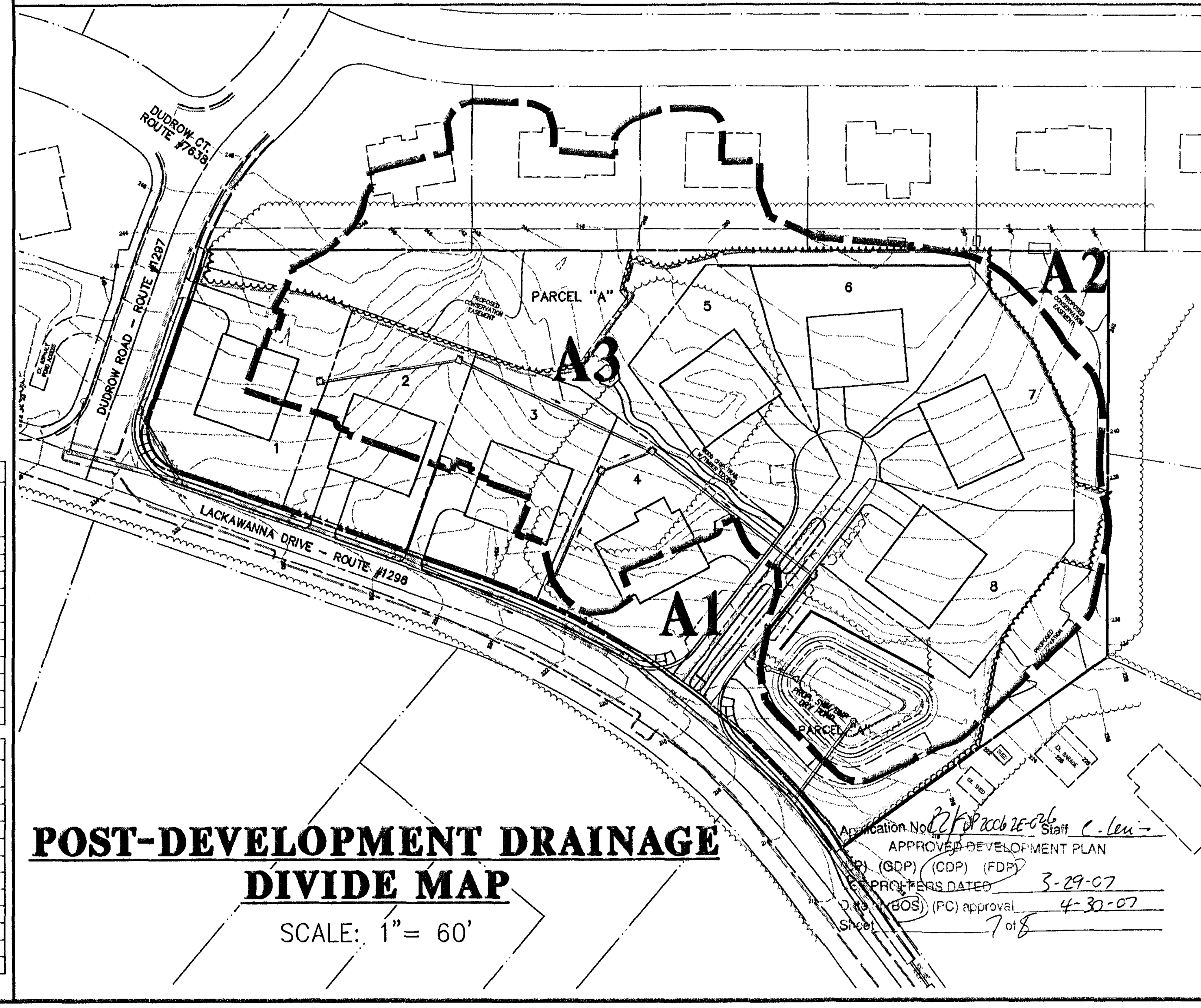
	10-YR OUTFLOW FROM EX.POND (CFS) DUDROW SUBDIVISION	10-YR OUTFLOW FROM PROP.POND (CFS) LACKAWANNA DRIVE	10-YR OUTFLOW FROM EX.POND (CFS) LAUREL CREEK PLANS	OVERLAND FLOW AREA (AC)	C	I	TOTAL OVERLAND FLOW (CFS)	TOTAL 10-YR FLOW (CFS)
TO PROP.STM.STR #2	10.7	9.00		3.78	0.60	7.27	16.49	36.19
TO EX STM. STR. #30				2.75	0.40	7.27	8.00	44.19
TO EX STM. STR. #31				0.22	0.35	7.27	0.56	44.75
TO EX STM. STR. #33				7.90	0.40	5.92	18.71	63.45
TO EX STM. STR. #35				0.71	0.40	5.92	1.68	65.13
TO EX STM. STR. #37				1.00	0.45	5.92	2.66	67.80
TO EX STM. STR. #36				0.50	0.45	5.92	1.33	69.13
TO EX CULVERT (LOT 38)				0.77	0.50	5.92	2.28	71.41
TO SECTION C-C			17.59	2.73	0.35	5.10	4.87	93.87
TO SECTION B-B				2.00	0.30	5.10	3.06	96.93
TO SECTION A-A				0.12	0.20	5.10	0.12	97.05

2 YEAR POST-DEVELOPMENT FLOW COMPUTATIONS

	2-YR OUTFLOW FROM EX.POND (CFS)	2-YR OUTFLOW FROM PROP.POND (CFS)	2-YR OUTFLOW FROM EX.POND (CFS)	OVERLAND FLOW AREA	C	I	TOTAL OVERLAND	TOTAL 10-YR FLOW (CFS)
TO PROP.STM.STR #2	5.5	0.50		3.78	0.60	5.45	12.36	18.36
TO EX STM. STR. #30				2.75	0.40	5.45	6.00	24.36
TO EX STM. STR. #31				0.22	0.35	5.45	0.42	24.78
TO EX STM. STR. #33				7.90	0.40	4.60	14.54	39.31
TO EX STM. STR. #35				0.71	0.40	4.60	1.31	40.62
TO EX STM. STR. #37				1.00	0.45	4.60	2.07	42.69
TO EX STM. STR. #36				0.50	0.45	4.60	1.04	43.72
TO EX CULVERT (LOT 38)				0.77	0.50	4.60	1.77	45.49
TO SECTION C-C			4.11	2.73	0.35	3.90	3.73	53.33
TO SECTION B-B				2.00	0.30	3.90	2.34	55.67
TO SECTION A-A				0.12	0.20	3.90	0.09	55.76



PRE-DEVELOPMENT DRAINAGE DIVIDE MAP
SCALE: 1"= 60'



POST-DEVELOPMENT DRAINAGE DIVIDE MAP
SCALE: 1"= 60'

PRELIMINARY OUTFALL ANALYSIS
& ONSITE DRAINAGE DIVIDE MAP

LACKAWANNA DRIVE

LEE DISTRICT
FAIRFAX COUNTY, VIRGINIA

RZ 2006-LE-026

NO.	DATE	REVISION PRIOR TO APPROVAL

CPJ Associates
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SILVER SPRING, MD

COMMONWEALTH OF VIRGINIA
PAUL B. JOHNSON
No. 018450
3/14/07
PROFESSIONAL ENGINEER

NO.	DESCRIPTION REVISIONS	REVIEW BY	APPRVD.	DATE

DESIGN	DRAFT	APPROVED	DATE	SCALE
IA	IA	RLG	MARCH 2006	HORIZ: 1" = 60' VERT: ---

SHEET 7 OF 8

FILE NO.: 06-505-207

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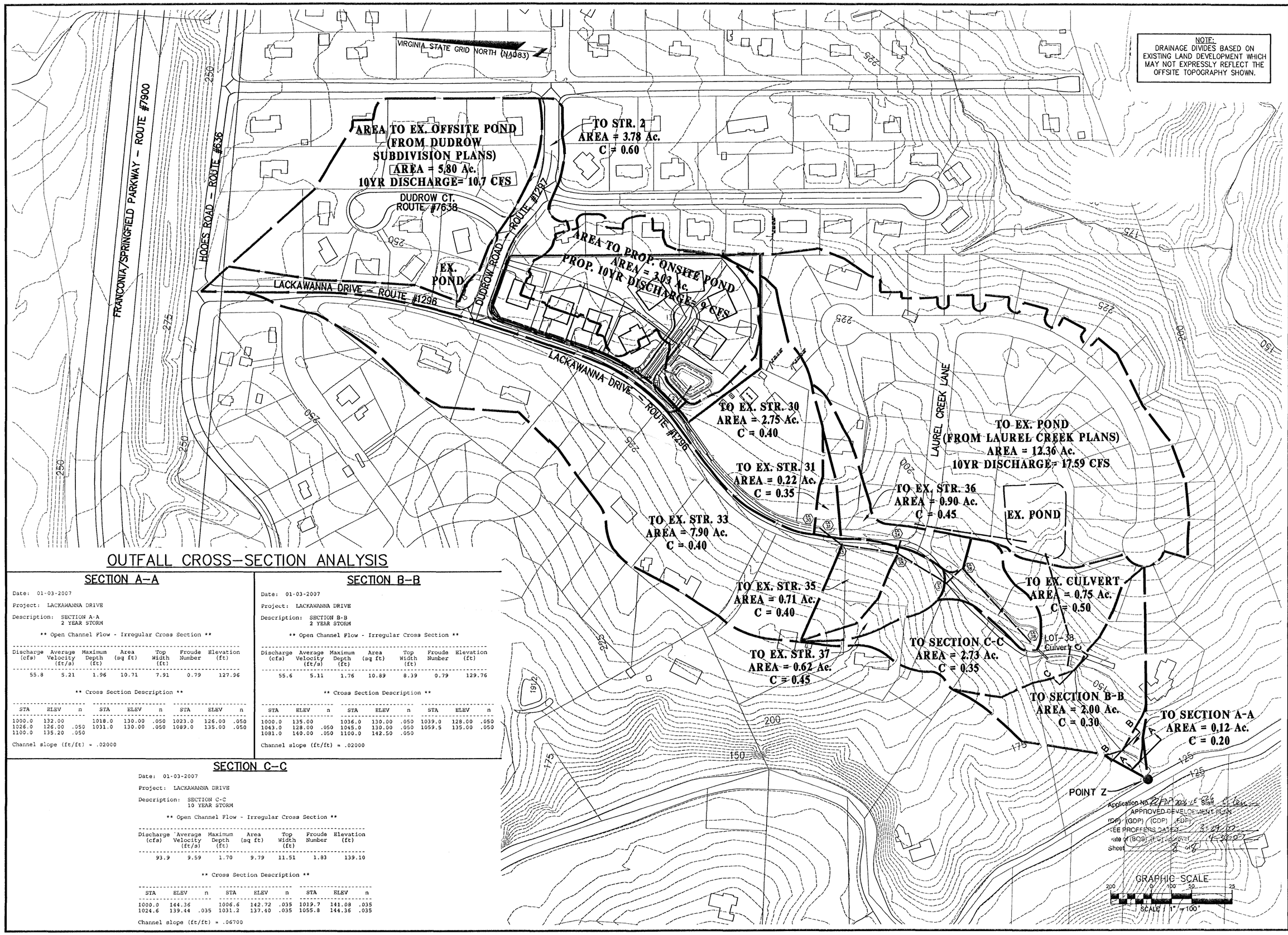

OUTFALL CROSS-SECTION ANALYSIS

SECTION A-A

Date: 01-03-2007

Project: LACKAWANNA DRIVE

Description: SECTION A-A
2 YEAR STORM

** Open Channel Flow - Irregular Cross Section **

Discharge (cfs)	Average Velocity (ft/s)	Maximum Depth (ft)	Area (sq ft)	Top Width (ft)	Froude Number	Elevation (ft)
55.8	5.21	1.96	10.71	7.91	0.79	127.96

** Cross Section Description **

STA	ELEV	n	STA	ELEV	n	STA	ELEV	n
1000.0	132.00		1018.0	130.00	.050	1023.0	126.00	.050
1026.0	126.00	.050	1031.0	130.00	.050	1089.0	135.00	.050
1100.0	135.20	.050						

Channel slope (ft/ft) = .02000

SECTION B-B

Date: 01-03-2007

Project: LACKAWANNA DRIVE

Description: SECTION B-B
2 YEAR STORM

** Open Channel Flow - Irregular Cross Section **

Discharge (cfs)	Average Velocity (ft/s)	Maximum Depth (ft)	Area (sq ft)	Top Width (ft)	Froude Number	Elevation (ft)
55.6	5.11	1.76	10.89	8.39	0.79	129.76

** Cross Section Description **

STA	ELEV	n	STA	ELEV	n	STA	ELEV	n
1000.0	135.00		1036.0	130.00	.050	1039.0	128.00	.050
1043.0	128.00	.050	1045.0	130.00	.050	1059.5	135.00	.050
1081.0	140.00	.050	1100.0	142.50	.050			

Channel slope (ft/ft) = .02000

SECTION C-C

Date: 01-03-2007

Project: LACKAWANNA DRIVE

Description: SECTION C-C
10 YEAR STORM

** Open Channel Flow - Irregular Cross Section **

Discharge (cfs)	Average Velocity (ft/s)	Maximum Depth (ft)	Area (sq ft)	Top Width (ft)	Froude Number	Elevation (ft)
93.9	9.59	1.70	9.79	11.51	1.83	139.10

** Cross Section Description **

STA	ELEV	n	STA	ELEV	n	STA	ELEV	n
1000.0	144.36		1006.6	142.72	.035	1019.7	141.08	.035
1024.6	139.44	.035	1031.2	137.40	.035	1055.8	144.36	.035

Channel slope (ft/ft) = .06700

NO.	DATE	REVISION PRIOR TO APPROVAL

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OFFSITE DRAINAGE DIVIDE MAP & OFFSITE CROSS-SECTION ANALYSIS

LACKAWANNA DRIVE

LEE DISTRICT
FAIRFAX COUNTY, VIRGINIA

RZ 2006-LE-026

COMMONWEALTH OF VIRGINIA
PAUL B. JOHNSON
No. 018450
PROFESSIONAL ENGINEER
3-14-07

NO.	DESCRIPTION	REVISIONS	REVIEW APPROVED BY	DATE

DESIGN KJV | DRAFT KJV | APPROVED | DATE MARCH 2006 | SCALE HORIZ: 1" = 100' VERT: ---

SHEET 8 OF 8

FILE NO.: 06-505-208

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