SHEET INDEX

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4	SUBDIVISION UTILITIES & LAYOUT
5	DRY SWALE CROSS SEC. & DETAILS
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7	BOIRETENTION BASIN & DRY SWALE SPECIFICATIONS
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9	CHURCH LANE RD IMPROVEMENTS
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PRELIMINARY EQUIVALENT SKETCH PLANS

SHAMS SUBDIVISION

LOTS 1 THRU 5, OPEN SPACE LOTS 6 & 7

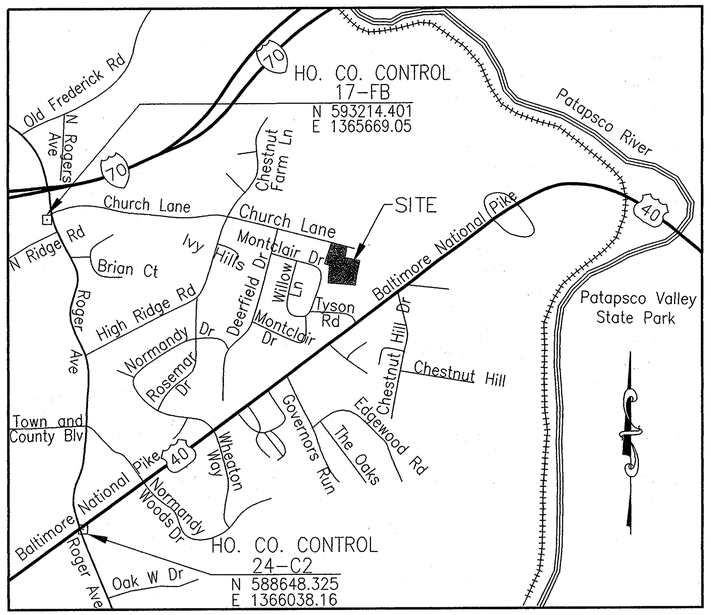
(A SUBDIVISION OF PARCEL 237)

DISTRICT TWO, TAX MAP #18, GRID 14, PARCEL 237

SITE ANALYSIS DATA CHART			
TOTAL PROJECT AREA 201,256 SF (4.62 AC)	AREA OF PLAN SUBMISSION 201,256 SF (4.62 AC)	LIMIT OF DISTURBED AREA 128458.44 SF	PRESENT ZONING R-20
PROPOSED USE RESIDENTIAL	TYPE OF UNIT SINGLE FAMILY DETACHED	TOTAL UNITS ALLOWED 9	PROPOSED USE RESIDENTIAL 5
OPEN SPACE REQUIRED 12,075 SF (0.277 AC)	OPEN SPACE PROVIDED 83,376 SF (1.91 AC)	RECREATION OPEN SPACE REQUIRED N/A	RECREATION OPEN SPACE PROVIDED N/A
DPZ FILE REF:		DEED REF.: 740/351	

PERMIT IMFORMATION CHART					
SUBDIVISION NAME SHAMS SUBDIVISION		SECTION / AREA N/A			PARCEL NUMBER 371
LIBER / FOLIO 740/351	TAX MAP 18	GRID NO. 14	ZONE R-20	ELECT. DIST. 2nd	CENSUS TR. 6026
WATER CODE: F02			SEWER CODE: 1451500		

LOT TABULATION			
LOT NO	NET LOT AREA (SF)	PIPESTEM AREA (SF)	TOTAL AREA (SF)
1	20,019.80	N/A	20,019.80
2	20,116.86	657.92	20,774.78
3	21,054.01	N/A	21,054.01
4	24,618.33	2,035.10	26,653.43
5	20,580.89	1,931.98	22,512.87
6 (OPEN SPACE)	69,161.00	842.91	70,003.91
7 (OPEN SPACE)	10,691.81	884.68	11,576.49
DEDICATION AREA			8,660.71
		TOTAL AREA	201,256.00



VICINITY MAP

ADC MAP NO.12 - 5G

SCALE: 1" = 1000'

GENERAL NOTES

1. THE SUBJECT PROPERTY IS ZONED R-20 IN ACCORDANCE WITH THE 02/02/2004 COMPREHENSIVE ZONING PLAN AND THE "COMP LITE" ZONING AMENDMENTS DATED 07/28/2006. THIS PLAN IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS EFFECTIVE 10/2/03 PER COUNCIL BILL 75-2003.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARD AND SPECIFICATIONS IF APPLICABLE.
3. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS / BUREAU OF ENGINEERING / CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST (7) WORKING DAYS PRIOR TO THE START OF WORK.
4. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
5. TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
6. COORDINATES AND NORTH SHOWN HEREON REFER TO THE NAD83/91 HORIZONTAL DATUM. BASED ON GPS OBSERVATION ON MAY 10, 2005 USING THE FOLLOWING PROVIDED BY HOWARD COUNTY :

DESIGNATION	NORTHING(sFT)	EASTING(sFT)	ELEVATION(sFT)
24-C2	588648.325	1366038.16	354.089
17-FB	593214.401	1365669.05	456.316

7. FILE NO. WP-08-083 IS AN ASSOCIATED FILE.
8. WATER IS PUBLIC BY CONTRACT NUMBER: 70-W
9. SEWER IS PUBIC BY CONTRACT NUMBER: 20 W & S
10. THE SUBJECT PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
11. EXISTING UTILITIES SHOWN HEREON ARE TAKEN FROM CURRENT HOWARD COUNTY CONTRACT DRAWINGS.
12. THE BOUNDARY AND TOPOGRAPHIC INFORMATION IS BASED ON FIELD RUN SURVEY BY AB CONSULTANTS ON OR ABOUT MAY 10,2005.
13. THE STEEP SLOPES WITH CONTINUOUS AREAS OF 63,939 SQ FT. EXISTS ON THIS SITE. THE AREA OF DISTURBED STEEP SLOPES = 26,610 SQ FT.
14. WETLANDS AND FOREST STAND DELINEATION INFORMATION WAS TAKEN FROM REPORTS PREPARED BY JEFFREY A. WOLINSKI, CONSULTING ECOLOGIST ON 1/27/06 & 1/31/07.
15. SOILS INFORMATION TAKEN FROM SOILS MAP NO.16. "SOILS SURVEY", HOWARD COUNTY, MARYLAND JULY 1968 ISSUE.
16. FOR FLAG OR PIPE STEM LOTS, REFUSE COLLECTION, SNOW REMOVAL AND ROAD MAINTENANCE IS TO BE PROVIDED AT THE JUNCTION OF THE FLAG OR PIPE STEM AND THE ROAD RIGHT-OF-WAY AND NOT ONTO THE FLAG OR PIPE STEM DRIVEWAY.
17. THERE ARE NO FLOODPLAIN FOR THIS SITE.
18. TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT AND WAS PERFORMED BY MARS GROUP.
19. NOISE STUDY IS REQUIRED FOR THE DEVELOPMENT AND WAS PERFORMED BY MARS GROUP.
20. THE GEOTECHNICAL REPORT FOR THIS PROJECT WAS PREPARED BY MAFI ASSOCIATES, INC. ON JUNE 2007.
21. OPEN SPACE CALCULATIONS:
    BASED ON ZONING R-20, AND MINIMUM LOT SIZE OF 20,000 SQ FT, 6% OPEN SPACE REQUIRED.
    4.62 ACRES X 6% = 0.277 ACRES REQUIRED.
    57,132 SQ FT = 1.31 ACRES PROVIDED.
22. STORMWATER MANAGEMENT WILL BE PROVIDED IN ACCORDANCE WITH HOWARD COUNTY AND MARYLAND 378 SPECIFICATIONS. RECHARGE VOLUME WILL BE PROVIDED THROUGH THE USE OF DRY SWALE AND BIORETENTION BASIN. WATER QUALITY VOLUME WILL BE PROVIDED BY DRY SWALE & BIORETENTION BASIN. ACCORDING OT MDE SWM DESIGN MANUAL, SINCE Cpv IS LESS THAN 2 CFS, CHANNEL PROTECTION IS NOT REQUIRED. OVERBANK FLOOD PROTECTION VOLUME AND EXTREME FLOOD VOLUME ARE NOT REQUIRED FOR THIS SITE.
23. THE OPEN SPACE LOT 6 AND LOT 7 ARE BEING DEDICATED TO HOMEOWNERS ASSOCIATION.
24. THERE ARE NO KNOWN CEMETERIES, GRAVE SITES OR HISTORIC STRUCTURES LOCATED ON THE SUBJECT PROPERTY.
25. NO GRADING, REMOVAL OF VEGETATIVE COVER AND TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN WETLANDS, STREAMS OR REQUIRED BUFFERS.
26. THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
27. THERE SHALL BE 95% COMPACTION PER AASHTO T-180 SPECIFICATIONS UNDER ALL IMPROVEMENTS.
28. LANDSCAPE IS PROVIDED IN ACCORDANCE WITH HOWARD COUNTY LANDSCAPE MANUAL. SEE LANDSCAPING PLAN, SHEET 11.
29. FOREST CONSERVATION PLAN WAS PREPARED BY JEFFREY A. WOLINSKI, CONSULTING ECOLOGIST ON 1/27/06 & 1/31/07, AND REVISED ON 01/28/2008. SUFFICIENT FOREST HAS BEEN RETAINED. NO REFORESTION IS REQUIRED.
30. PER SECTION 16.134(a)(1)(ii) OF THE SUBDIVISION REGULATIONS, A FEE-IN-LIEU OF $3,680 (115 SY x $32/SY) WILL BE PAID BY THE DEVELOPER FOR NOT CONSTRUCTING SIDEWALKS.
31. THE FOREST CONSERVATION OBLIGATION INCURRED BY THIS PROJECT HAS BEEN SATISFIED WITH THE RETENTION OF 1.10 ACRES CREDITED EASEMENT AND 0.14 ACRE OF NON-CREDITED EASEMENT WHICH MEETS THE BREAK-EVEN POINT OBLIGATION OF 1.10 ACRES FOR THIS SITE. FOREST CONSERVATION SURETY IN THE AMOUNT OF $9,583 WILL BE POSTED FOR THIS PROJECT.
32. THE FOREST CONSERVATION EASEMENT HAS BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE AND THE FOREST CONSERVATION MANUAL. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT, HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.
33. THE LANDSCAPING SURETY AMOUNT OF $ 8,850 FOR TOTAL OF 47 TREES (SEE LANDSCAPING PLANT LIST ON SHEET 11) WILL BE POSTED WITH THE DEVELOPER'S AGREEMENT AT THE FINAL PLAN STAGE.
34. NO GRAVITY SEWER SERVICE IS PROVIDED FOR LOT 4 CELLER (CNS).
35. PRIVATE USE-IN-COMMON DRIVEWAY SHALL BE FOR THE BENEFIT OF LOTS 2,4,5, OPEN SPACE LOTS 6,7, AND THE POTENTIAL FUTURE USE FOR PARCEL 281.

STORMWATER MANAGEMENT FACILITY: (PRIVATE)
TYPE - DRY SWALE & BIORETENTION BASIN
OWNER - HOMEOWNER'S ASSOCIATION
MAINTENANCE - HOMEOWNER'S ASSOCIATION

OWNER/DEVELOPER
PIRZADEH A. SHAMS
GITI SHAMS
805 STAGES HEAD ROAD
TOWSON, MD 21286
(410) 419-9229

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR _____ DATE 10/22/08

"PROFESSIONAL CERTIFICATION"

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.

LICENSE NO. 17248, EXPIRATION DATE: 02/11/2009

SECOND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

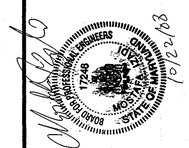
Advanced Engineering Consultants, PC.
Engineers & Planners
P.O.BOX129 RIDERWOOD,MD 21139
TEL.: 410-382-9180 FAX: 410-296-0505
mizadi@aec-engineers.biz

AEC

REVISIONS

DESCRIPTION	BY	DATE

TITLE: COVER SHEET
PRELIMINARY EQUIVALENT SKETCH PLANS
SHAMS SUBDIVISION
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.



DRAWN BY: TH
CHECKED BY: MI
SCALE: AS SHOWN

DATE: 09-18-2008

SHEET 1 OF 14

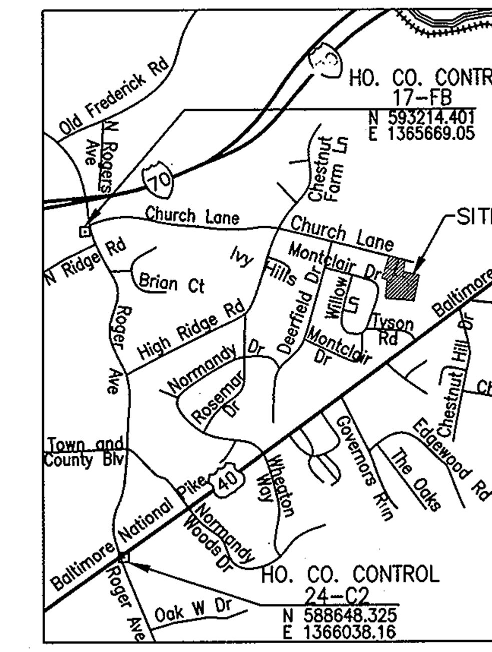
HOWARD CO. FILE NO. SP-08-007

EXISTING CONDITION
SCALE: 1"= 40

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY
PLANNING DIRECTOR — DATE 10/23/08

LEGEND

- 15% ~ 24% SLOPES
- 25% OR GREATER SLOPES
- GIC2 — SOIL TYPES BOUNDARY
- STREAM CENTER LINE
- TREE LINE



VICINITY MAP
ADC MAP NO.12 - 5G
SCALE: 1" = 2000'

EX.PROPERTY CONERS COORDINATE TABLE		
1	592917.3192	1369889.6504
2	592594.7476	1369803.4925
3	592576.4365	1369872.5505
4	592330.3765	1369862.9740
5	592314.0977	1370242.8000
6	592384.1794	1370249.9797
7	592658.1845	1370291.3889
8	592692.3504	1370081.1811
9	592857.8523	1370098.0297
10	592819.0141	1370311.0413
11	592834.0089	1370312.4319

NOTES:

SAID PROPERTY SUBJECT TO THE FOLLOWING ITEMS:

1. PROPERTY DATA:

   RECORDED AMONG THE LAND RECORDS OF HOWARD COUNTY, MARYLAND
   MAP 18 PARCEL 237
   PROPERTY AREA = 201,256 SQ. FT. OR 4.62 ACRES.
   CURRENT OWNER: PIRZADEH A. SHAMS & WF
   CURRENT DEED: LIBER 740, FOLIO 351
   PROPERTY ADDRESS: 8213 CHURCH LANE ELLICOTT CITY, MARYLAND 21043

2. THIS SURVEY WAS CONDUCTED IN ACCORDANCE WITH AN "URBAN SURVEY" AS IDENTIFIED BY THE MARYLAND DEPARTMENT OF LABOR, LICENSING AND REGULATIONS, BOARD OF PROFESSIONAL LAND SURVEYORS IN COMAR 09.13.06.03.

3. SUBJECT TO THE USE IN COMMON WITH OTHERS OF A 15 FOOT WIDE RIGHT-OF-WAY ADJACENT TO THE SOUTH SIDE OF CHURCH LANE AS MORE FULLY DESCRIBED IN A DEED DATED SEPTEMBER 21, 1960 AND RECORDED AMONG THE LAND RECORDS OF HOWARD COUNTY IN LIBER R.H.M. 359 FOLIO 239.

4. SUBJECT TO A ROAD 20 FOOT WIDE REFERRED TO IN A DEED DATED JUNE 4, 1962 AND RECORDED AMONG THE LAND RECORDS OF HOWARD COUNTY IN LIBER W.H.H. LIBER 386 FOLIO 455.

5. NO ENCROACHMENTS EXIST, EXCEPT AS SHOWN ON THIS DRAWING.

6. THE FIELD SURVEY WORK WAS PERFORMED BY AB CONSULTANTS BETWEEN THE DATES OF 5/01/2005 AND 12/20/2007.

HORIZONTAL DATUM

COORDINATES AND NORTH SHOWN HEREON REFER TO THE NAD83/91 HORIZONTAL DATUM. BASED ON GPS OBSERVATION ON MAY 10, 2005 USING THE FOLLOWING PROVIDED BY HOWARD COUNTY :

DESIGNATION	NORTHING(sFT)	EASTING(sFT)	ELEVATION(sFT)
24-C2	588648.325	1366038.16	354.089
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OWNER/DEVELOPER

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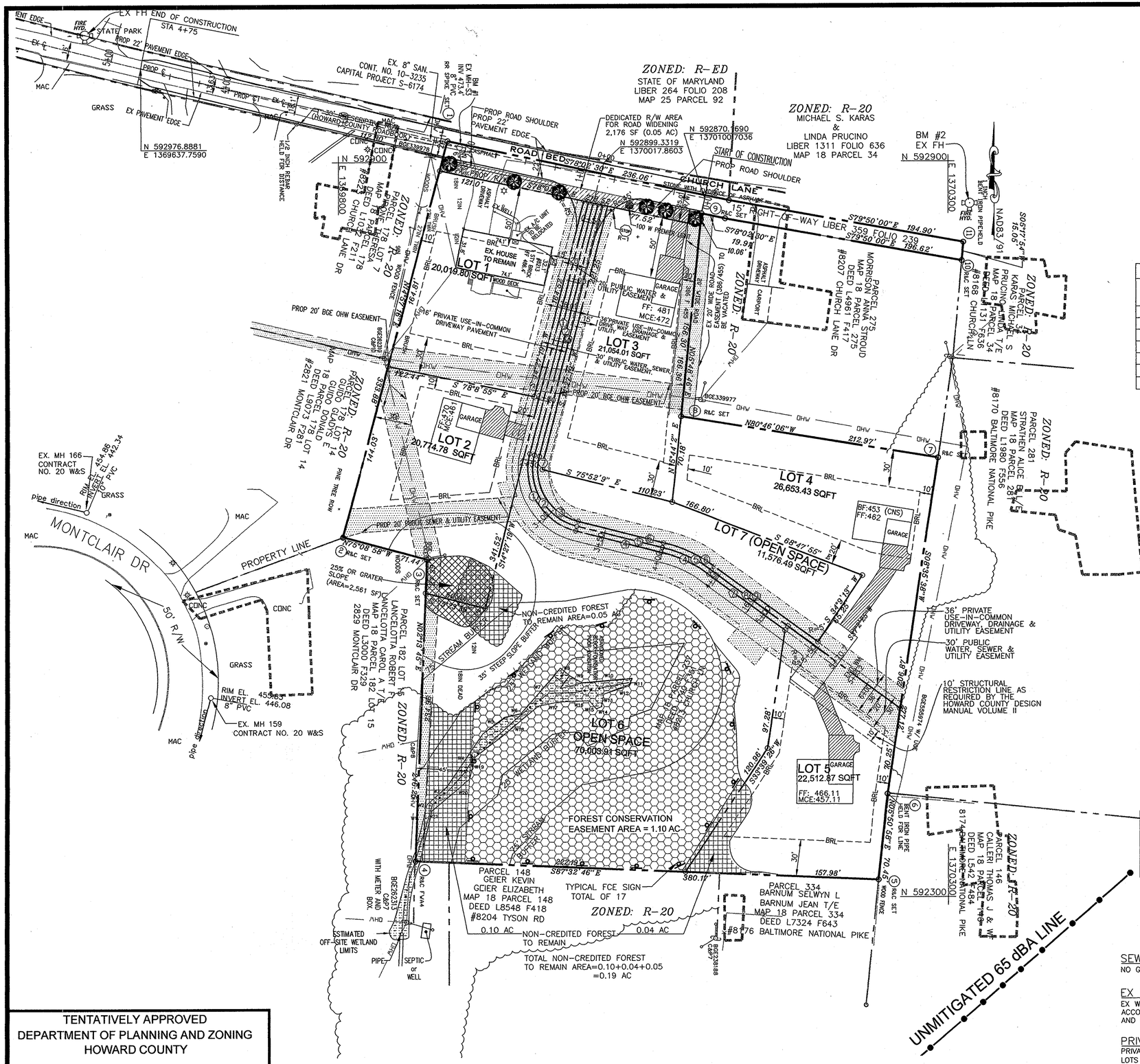
AEC

REVISIONS		
DESCRIPTION	BY	DATE

TITLE: EXISTING CONDITION
PRELIMINARY EQUIVALENT SKETCH PLANS
SHAMS SUBDIVISION
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

9/18/08

DRAWN BY: TH
CHECKED BY: MI
SCALE: 1"=40'
DATE: 09-18-2008
SHEET 2 OF 14
HOWARD CO. FILE NO. SP-08-007



LEGEND

- EXISTING PROPERTY LINE
- EXISTING CONTOUR
- TREE LINES
- EXISTING TREES
- EX STRUCTURES WITHIN 50'
- FOREST TO BE CLEARED
- FOREST TO REMAIN
- NON-CREDITED FOREST TO REMAIN
- FCE SIGN
- (LOD) LIMITS OF DISTURBANCE —LOD—
- TREE PROTECTION FENCE

CURVE TABLE

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
①	51.70'	81.90'	N31°09'42"W	73.74'
②	47.67'	75.52'	N31°09'42"W	68.00'
③	43.67'	59.32'	N31°09'42"W	62.24'
④	112.00'	42.8'	S64°54'54"E	42.56'
⑤	116.00'	44.35'	S64°54'54"E	44.08'
⑥	120.00'	45.88'	S64°54'54"E	45.71'
⑦	42.99'	10.00'	S7°13'50"W	9.82'

LINE TABLE

NO.	BEARING	LENGTH
①	N14°27'19"E	210.82'
②	N14°27'19"E	210.98'
③	N14°27'19"E	211.15'
④	N75°52'11"W	80.00'
⑤	N75°52'11"W	80.14'
⑥	N75°52'11"W	80.28'
⑦	N53°57'44"W	77.63'
⑧	N53°57'44"W	191.61'
⑨	N53°57'44"W	104.89'

LOT TABULATION

LOT NO.	NET LOT AREA (SF)	PIPESTEM AREA (SF)	TOTAL AREA (SF)
1	20,019.80	N/A	20,019.80
2	20,116.86	657.92	20,774.78
3	21,054.01	N/A	21,054.01
4	24,618.33	2,035.10	26,653.43
5	20,580.89	1,931.98	22,512.87
6 (OPEN SPACE)	69,161.00	842.91	70,003.91
7 (OPEN SPACE)	10,691.81	884.68	11,576.49
DEDICATION AREA			8,660.71
		TOTAL AREA	201,256.00

WETLAND TABLE

LINE	DIRECTION	DISTANCE
W1	S02°45'02"W	8.05
W2	S48°56'35"W	10.50
W3	S48°07'47"W	21.87
W4	S34°14'01"W	52.34
W5	S54°04'33"W	22.78
W6	S77°25'51"W	13.21
W7	S41°07'59"W	49.27
W8	N50°25'09"W	9.79
W9	N58°21'55"W	11.91
W10	S85°04'18"W	41.66
W11	N22°53'31"E	6.39
W12	N72°28'45"E	22.29
W13	N10°11'56"E	10.24
W14	N66°51'56"E	4.53
W15	S40°58'59"E	8.64
W16	N87°56'52"E	25.57
W17	N79°05'08"E	16.41
W18	N51°30'11"E	66.62
W19	N13°50'56"E	18.47
W20	N49°59'15"E	40.47
W21	N51°23'58"E	15.82

ZONING TABULATION

ZONED: R-20
MIN LOT SIZE: 20,000 SF
FRONT SET BACK: 40'
REAR SET BACK: 30'
SIDE SET BACK: 10'

STREET TREE SCHDULE

QTY.	SYMBOL	BOTANICAL AND COMMON NAME	SIZE	COMMENTS
6		ACER RUBRUM 'OCTOBER GLORY' (OCTOBER RED MAPLE)	2 1/2" – 3" CALIPER FULL CROWN, B&B	50' APART ON PUBLIC R/W

FINANCIAL SURETY FOR THE 6 REQUIRED STREET TREES HAS BEEN POSTED AS PART OF THE DEVELOPER'S AGREEMENT IN THE AMOUNT OF $1,800.

SEWER NOTE:
NO GRAVITY SEWER SERVICE IS PROVIDED FOR LOT 4 CELLAR (CNS).

EX WELL AND SEPTIC NOTES:
EX WELL AND EX SEPTIC SYSTEM MUST BE ABANDONED/REMOVED IN ACCORDANCE WITH BUREAU OF ENVIRONMENT HEALTH GUIDE LINES AND REGULATIONS.

PRIVATE USE-IN-COMMON NOTE:
PRIVATE USE-IN-COMMON DRIVEWAY SHALL BE FOR THE BENEFIT OF LOTS 2,4,5, OPEN SPACE LOTS 6,7, AND (THE POTENTIAL FUTURE USE FOR PARCEL 281).

OWNER/DEVELOPER
PIRZADEH A. SHAMS
GITI SHAMS
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TOWSON, MD 21286
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TENTATIVELY APPROVED
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PLANNING DIRECTOR — DATE 10/22/08

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AEC

REVISIONS

DESCRIPTION	BY	DATE

TITLE: SUBDIVISION PLAN
PRELIMINARY EQUIVALENT SKETCH PLANS

SHAMS SUBDIVISION

PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

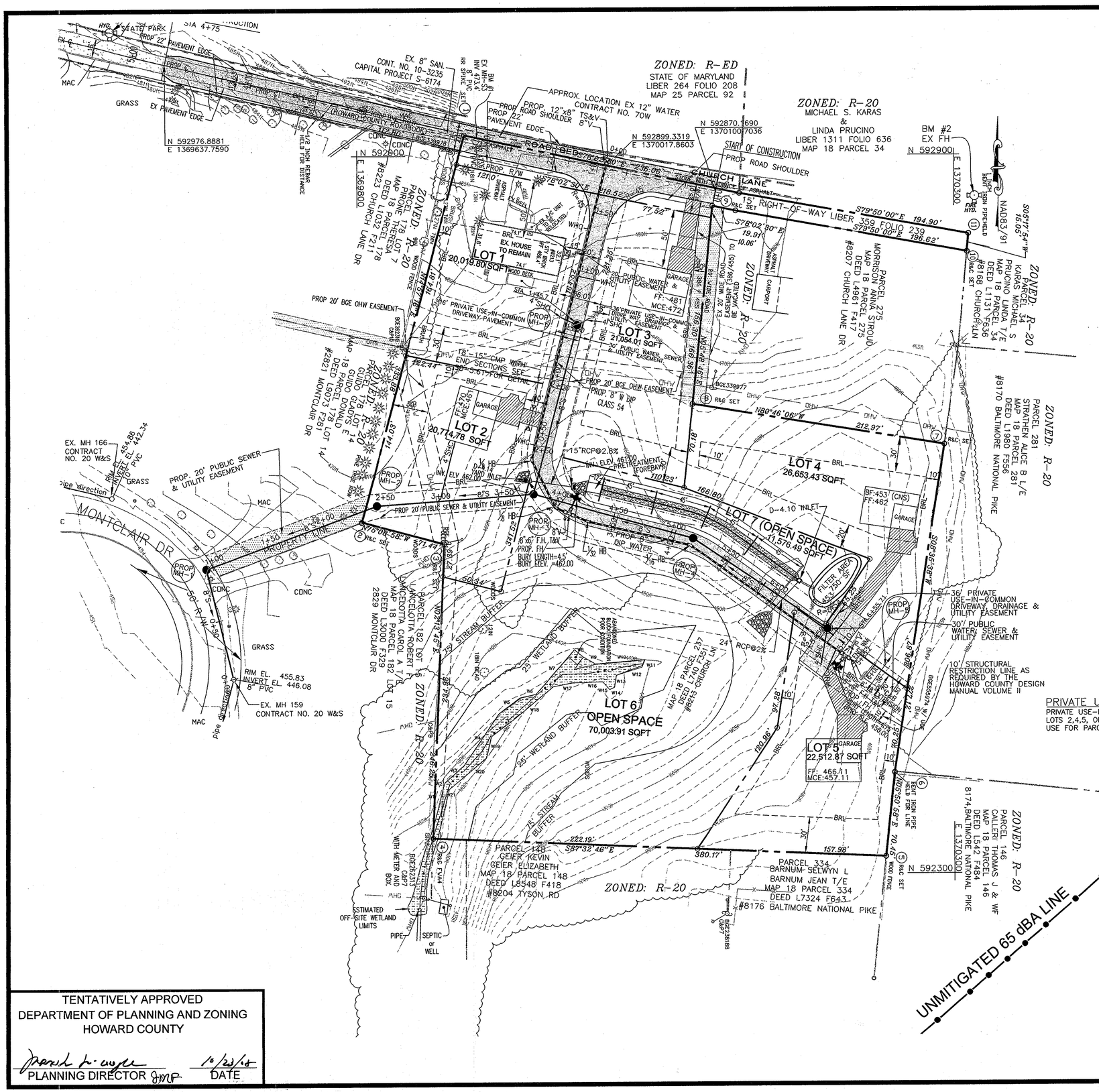
MOSTAFA MIRZADI — 17248 — STATE OF MARYLAND — PROFESSIONAL ENGINEER — 10/22/08

DRAWN BY: TH
CHECKED BY: MI
SCALE: 1"=40'

DATE: 09-18-2008

SHEET 3 OF 14

HOWARD CO. FILE NO. SP-08-007



PRIVATE USE-IN-COMMON NOTE:
PRIVATE USE-IN-COMMON DRIVEWAY SHALL BE FOR THE BENEFIT OF LOTS 2,4,5, OPEN SPACE LOTS 6,7, AND THE POTENTIAL FUTURE USE FOR PARCEL 281.

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE 10/23/08

OWNER/DEVELOPER
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REVISIONS

DESCRIPTION	BY	DATE

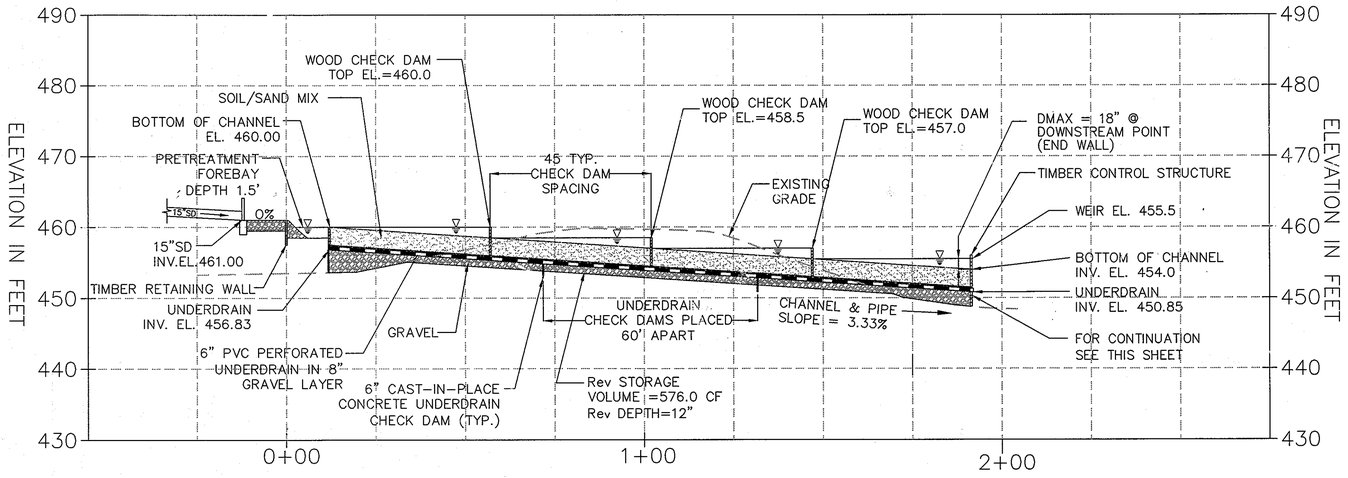
TITLE: SUBDIVISION UTILITIES & LAYOUT
PRELIMINARY EQUIVALENT SKETCH PLANS
SHAMS SUBDIVISION
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

DRAWN BY: TH
CHECKED BY: MI
SCALE: 1"=40'

DATE: 09-18-2008

SHEET 4 OF 14

HOWARD CO. FILE NO. SP-08-007

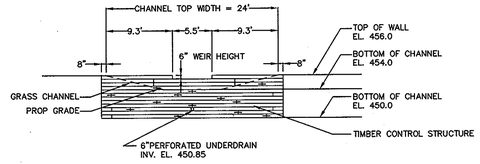


PROFILE – DRY SWALE

HORIZ. 1"=20'

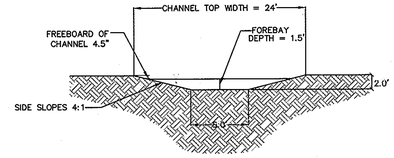
VERT. 1"=10'

BMP LIST	Rev REQUIRED	Rev PROVIDED	WQv REQUIRED	WQv PROVIDED	Cpv REQUIRED
DRY SWALE	545.0 ft³	576.0 ft³	2,091 ft³	2,925 ft³	NOT REQUIRED
BIORETENTION BASIN	232.87 ft³	249.0 ft³	895.67 ft³	1,169 ft³	NOT REQUIRED

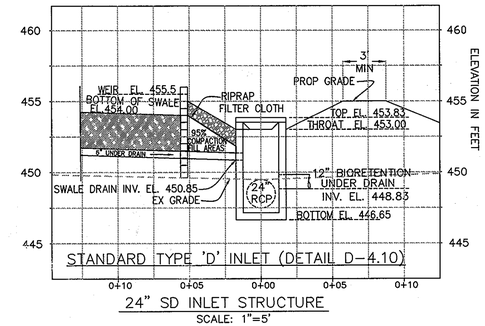


ELEVATION
CONTROL STRUCTURE
SCALE: 1" = 10'

NOTE:
CONSTRUCTION DETAILS OF CONTROL STRUCTURE WILL BE PROVIDED WITH THE FINAL PLANS.

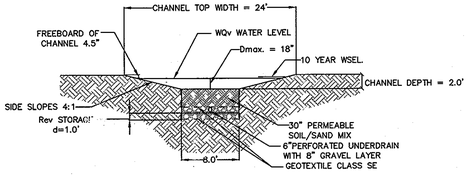


CROSS SECTION
PRETREATMENT FOREBAY
SCALE: 1" = 10'

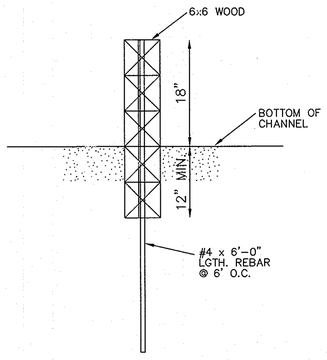


STANDARD TYPE 'D' INLET (DETAIL D-4.10)

24" SD INLET STRUCTURE
SCALE: 1"=5'

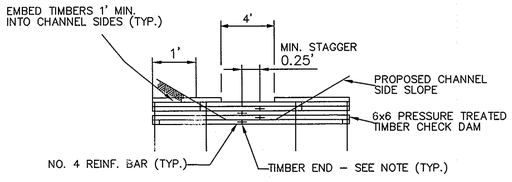


CROSS SECTION
DRY SWALE DESIGN DETAIL
SCALE: 1" = 10'



TYPICAL WOOD CHECK DAM SECTION

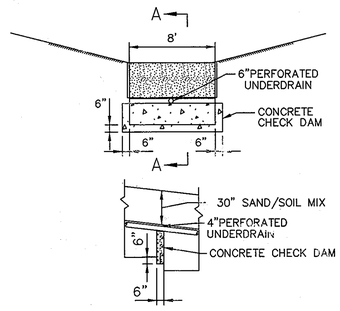
NOT TO SCALE



NOTE – CONTRACTOR SHALL BUTT TIMBER ENDS AS NECESSARY IN ORDER TO PROVIDE REQUIRED WOODEN CHECK DAM WIDTH.

ELEVATION – TYPICAL WOOD CHECK DAM

NOT TO SCALE



GRAVEL UNDERDRAIN CHECK DAM DETAIL

NOT TO SCALE

NOTES:

1. CHECK DAMS SHALL BE 6x6 PRESSURE TREATED WOOD AWPA STD. C6.
2. SOIL/SAND MIX SHALL BE 50% ASTM C-33 FINE AGGREGATE CONCRETE SAND (0.02" – 0.04"), AND 50% PLANTING SOIL (SAND 35-60%, SILT 30-55%, CLAY LESS THAN 10%).
3. UNDERDRAIN GRAVEL SHALL BE AASHTO M-43 (¼" –¾").
4. UNDERDRAIN SHALL BE AASHTO M-278, 6" RIGID SCHEDULE 40 PVC,⅜" PERF. @ 6" O.C., 4 HOLES PER FOW
5. PERFORATED PORTION OF UNDERDRAIN SHALL BE WRAPPED WITH A SINGLE LAYER OF ½" GALVANIZED HARDWARE CLOTH.
6. WHERE NECESSARY, BACKFILL MUST BE PLACED AT SWALE PERIMETER TO ENSURE MINIMUM CHANNEL DEPTH IS CONSTRUCTED.

OPERATION AND MAINTENANCE SCHEDULE FOR DRY SWALE

1. THE DRY-SWALE SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE FACILITY IS FUNCTIONING PROPERLY.
2. THE DRY SWALE SHALL BE MOWED A MINIMUM OF AS NEEDED DURING THE GROWING SEASON TO MAINTAIN A MAXIMUM GRASS HEIGHT OF LESS THAN 6 INCHES.
3. DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATION AND AS NEEDED.
4. VISIBLE SIGNS OF EROSION IN THE DRY SWALE SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
5. REMOVES SILT IN THE SWALE WHEN IT EXCEEDS 25% OF THE ORIGINAL WQv.

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PLANNING DIRECTOR — DATE 10/22/08

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REVISIONS

DESCRIPTION	BY	DATE

TITLE: DRY SWALE CROSS SEC. & DETAILS
PRELIMINARY EQUIVALENT SKETCH PLANS

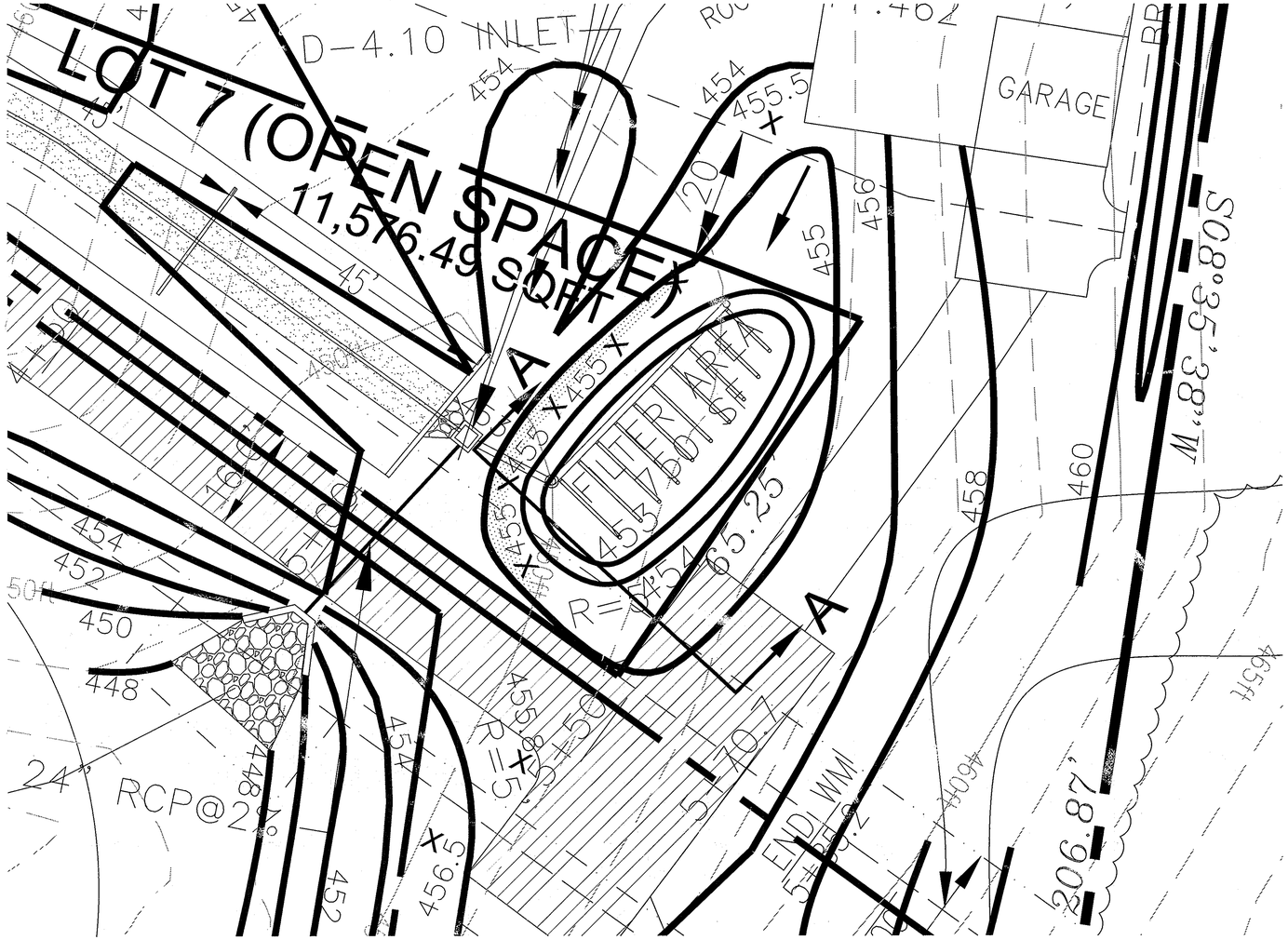
SHAMS SUBDIVISION
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

DRAWN BY: TH
CHECKED BY: MI
SCALE: AS SHOWN

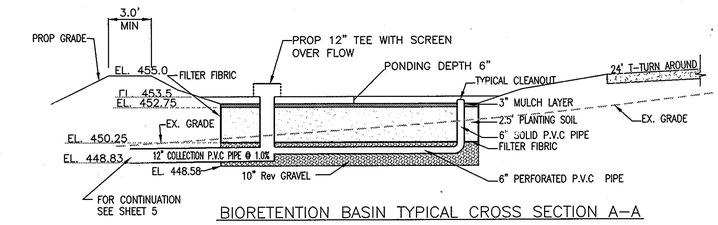
DATE: 09-18-2008

SHEET 5 OF 14

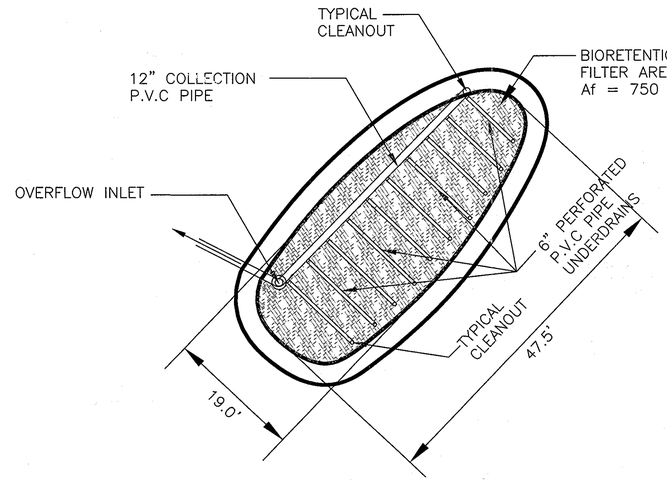
HOWARD CO. FILE NO. SP-08-007



BIORETENTION BASIN PLAN
SCALE: 1" = 10'

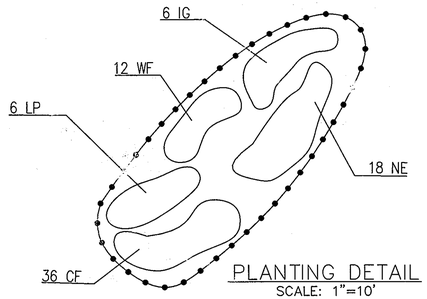


BIORETENTION BASIN TYPICAL CROSS SECTION A–A
SCALE: 1" = 5'



BIORETENTION BASIN PLAN VIEW
SCALE: 1" = 10'

BIORETENTION BASIN PLANT LIST (750 SF)				
SYMBOL	QTY.	BOTINICAL NAME	COMMON NAME	SIZE
LP	6	PLATANUS X ACERIFOLIA	LONDON PLANE TREE	2 1/2" – 3" Cal.
IG	6	ILEX GLABRA	INK BERRY	2' – 3' HT.
CF	36	LOBELEA CARDINALIS	CARDINAL FLOWER LOBELIA	1 GAL. CONTAINER
WF	24	DRYOPTERIS SP.	WOOD FERN	1 GAL. CONTAINER
NE	18	ASTER NOVAE – ANGLIAE	NEW ENGLAND ASTER	1 GAL. CONTAINER
———	224	LIRIOPE APICATA	CREEPING LILY TURF	2" POT



PLANTING DETAIL
SCALE: 1"=10'

OPERATION AND MAINTENANCE SCHEDULE FOR BIO–RETENTION FILTER

1. ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING.
2. SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFICIENT STAKES AND WIRES.
3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
4. SOILS EROSION TO BE ADDRESSED ON AN AS DEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR gmf — DATE 10/23/08

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REVISIONS

DESCRIPTION	BY	DATE

TITLE: BIORETENTATION BASIN & DETAILS
PRELIMINARY EQUIVALENT SKETCH PLANS
SHAMS SUBDIVISION
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

DRAWN BY: TH
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DATE: 09-18-2008

SHEET 6 OF 14

HOWARD CO. FILE NO. SP-08-007

Appendix B.3. Construction Specifications for Sand Filters, Bioretention and Open Channels

B.3.B Specifications for Bioretention

1. Material Specifications

The allowable materials to be used in bioretention area are detailed in Table B.3.2.

2. Planting Soil

The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the bioretention area that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.08.01.05.

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

pH range 5.2 - 7.0
organic matter 1.5 - 4% (by weight)
magnesium 35 lb./ac
phosphorus (phosphate - P2O5) 75 lb./ac
potassium (potash - K2O) 85 lb./ac
soluble salts not to exceed 500 ppm

All bioretention areas shall have a minimum of one test. Each test shall consist of both the standard soil test for pH, phosphorus, and potassium and additional tests of organic matter, and soluble salts. A textural analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the top soil was excavated.

Since different labs calibrate their testing equipment differently, all testing results shall come from the same testing facility.

Should the pH fall out of the acceptable range, it may be modified (higher) with lime or (lower) with iron sulfate plus sulfur.

3. Compaction

It is very important to minimize compaction of both the base of the bioretention area and the required backfill. When possible, use excavation hoes to remove original soil. If bioretention areas are excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high pressure tires will cause excessive compaction resulting in reduced infiltration rates and is not acceptable. Compaction will significantly contribute to design failure.

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

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

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

When backfilling the bioretention facility, place soil in lifts 12" to 18". Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bioretention materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.

4. Plant Material

Recommended plant material for bioretention areas can be found in Appendix A, Section A.2.3.

5. Plant Installation

Mulch should be placed to a uniform thickness of 2" to 3". Shredded hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.

Root stock of the plant material shall be kept moist during transport and on-site storage. The plant root ball should be planted so 1/8th of the ball is above final grade surface. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation.

Trees shall be braced using 2" by 2" stakes only as necessary and for the first growing season only. Stakes are to be equally spaced on the outside of the tree ball.

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

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

6. Underdrains

Underdrains are to be placed on a 3'-0" wide section of filter cloth. Pipe is placed next, followed by the gravel bedding. The ends of underdrain pipes not terminating in an observation well shall be capped.

The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. Observation wells and/or clean-out pipes must be provided (one minimum per every 1000 square feet of surface area).

7. Miscellaneous

The bioretention facility may not be constructed until all contributing drainage area has been stabilized.

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE 10/23/08

B.3.C Specifications for Open Channels and Filter Strips

1. Material Specifications

The recommended construction materials for open channels and filter strips are detailed in Table B.3.3.

2. Dry Swales

Permeable soil mixture (20" to 30" deep) should meet the bioretention "planting" soil specifications.

Check dams, if required, shall be placed as specified.

System to have 6" of freeboard, minimum above 2 year water surface elevation.

Side slopes to be 3:1 maximum; (4:1 or flatter is preferred).

No gravel or perforated pipe is to be placed under driveways.

Bottom of facility to be above the seasonally high water table per Table 2 of Appendix D.1.

Seed with flood/drought resistant grasses; see Appendix A, Section 2.4.

Longitudinal slope to be 4%, maximum.

Bottom width to be 8' maximum to avoid braiding; larger widths may be used if proper berming is supplied. Width to be 2' minimum.

3. Filter Strips

Construct pea gravel diaphragms 12" wide, minimum, and 24" deep minimum.

Pervious berms to be a sand/gravel mix [sand (35-60%), silt (30-55%), and gravel (10-25%)]. Berms to have overflow weirs with 6 inch minimum head.

Slope range to be 2% minimum to 6% maximum.

BIO-RETENTION BASIN

A. DESCRIPTION

THE SYSTEM CONSISTS OF A GRASS FILTER, RAIN GARDEN, LANDSCAPING UNDERDRAIN PIPING.

B. GENERAL NOTES

1. THE CONSTRUCTION, INSTALLATION, AND MAINTENANCE OF THE BIO-RETENTION FACILITY (RAIN GARDEN) SHALL BE IN ACCORDANCE WITH THE MDE DESIGN MANUAL.

2. CONTINUOUS OR FREQUENT FLOWS (SUCH AS BASEMENT SUMP PUMP DISCHARGES, COOLING WATER, CONDENSATE WATER, ARTESIAN WATER, ARTESIAN WELLS, ETC.) AND FLOWS CONTAINING SWIMMING POOL AND SAUNA CHEMICALS MUST BE EXCLUDED FROM ROUTING THROUGH BIO-RETENTION FILTER BMPS SINCE FLOWS WILL CAUSE THE BMP TO MALFUNCTION.

3. BIO-RETENTION BASINS OR BIO-RETENTION FILTERS SHOULD BE CONSTRUCTED ONLY AFTER THE SITE WORK IS COMPLETE AND STABILIZATION MEASURES HAVE BEEN IMPLEMENTED. EXPERIENCE WITH BIO-RETENTION BASINS AND SOIL MEDIA FILTERS HAS DEMONSTRATED THAT BIO-RETENTION FILTERS MUST BE PROTECTED FROM ALL SEDIMENT LOADS.

C. CONTROL OF SEDIMENTS ON THE DRAINAGE SHED

CARE MUST BE TAKEN TO PROTECT THE BIO-RETENTION BASIN FROM EXCESSIVE SEDIMENTS FROM THE DRAINAGE SHED. WHENEVER ADDITIONAL LAND DISTURBING ACTIVITY TAKES PLACE IN THE AREA DRAINING TO THE BASIN, EFFECTIVE EROSION AND SEDIMENT CONTROL MEASURES MUST FIRST BE PUT IN PLACE TO EXCLUDE SEDIMENTS FROM ENTERING THE BASIN. PERFORMANCE BASED SPECIAL MEASURES OVER AND ABOVE THOSE SPECIFIED IN THE BALTIMORE COUNTY SOIL CONSERVATION DISTRICT HANDBOOK, 1999 EDITION, MAYBE REQUIRED TO ASSURE THAT THE BIO-RETENTION BASIN IS NOT DAMAGED BY SUCH LAND DISTURBANCE. WHEN SAND OR OTHER STREET ABRASIVES ARE USED DURING THE SNOW OR ICING CONDITIONS TO PROVIDE TRACTION ON ROADWAYS OR PARKING LOTS DRAINING TO BIO-RETENTION BASINS, THE PAVEMENT SHOULD BE POWER/VACUUM SWEPT AS SOON AS FREEZING WEATHER ABATES TO PREVENT DAMAGE TO THE BASINS.

D. SEQUENCE OF CONSTRUCTION

THE SEQUENCE OF VARIOUS PHASES OF BASIN CONSTRUCTION MUST BE COORDINATED WITH THE OVERALL PROJECT CONSTRUCTION. AS WITH OTHER INFILTRATION PRACTICES, ROUGH EXCAVATION OF THE BASIN MAY BE SCHEDULED WITH THE ROUGH GRADING OF THE PROJECT TO PERMIT USE OF THE EXCAVATED MATERIAL AS FILL ELSEWHERE ON THE SITE. HOWEVER, THE BIO-RETENTION BASIN MUST NOT BE CONSTRUCTED OR PLACED IN SERVICE UNTIL THE ENTIRE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED. RUNOFF FROM UNTREATED, RECENTLY CONSTRUCTED AREAS WITHIN THE DRAINAGE AREA MAY OTHERWISE LOAD THE NEWLY FORMED BASIN WITH A LARGE LOAD OF FINE SEDIMENT, SERIOUSLY IMPAIRING THE NATURAL INFILTRATION BIO-RETENTION BASINS MUST NOT BE USED FOR SEDIMENT BASINS FOR EROSION AND SEDIMENT PROTECTION DURING SITE CONSTRUCTION. THE SEQUENCE OF CONSTRUCTION SHALL BE AS FOLLOWS:

1. INSTALL PHASE I EROSION AND SEDIMENT CONTROL MEASURES FOR THE SITE.

2. GRADE EACH SITE TO ELEVATIONS SHOWN ON THE PLAN. INITIALLY, THE BASIN FLOOR MAY BE EXCAVATION TO FINISHED GRADE SHALL BE DEFERRED UNTIL ALL DISTURBED AREAS WITHIN THE WATERSHED HAVE BEEN STABILIZED AND PROTECTED. CONSTRUCT STORM SEWER, FLOW DIVERTER AS SPECIFIED ON THE PLAN. THE FLOW DIVERTER SHALL BE BLOCKED OR OTHER MEASURES TAKEN TO PROHIBIT DRAINAGE FROM ENTERING THE CONSTRUCTION AREA.

3. COMPLETE CONSTRUCTION ON THE WATERSHED AND STABILIZE ALL AREAS DRAINING TO THE BIO-RETENTION BASIN.

4. INSTALL PHASE II EROSION AND SEDIMENT CONTROL MEASURES FOR THE BIO-RETENTION AREA.

5. REMOVE ALL ACCUMULATED SEDIMENT AND EXCAVATE THE BIO-RETENTION AREA TO THE PROPOSED DEPTH. USE RELATIVELY LIGHT, TRACKED EQUIPMENT TO AVOID COMPACTION OF THE BASIN FLOOR. AFTER FINAL GRADING IS COMPLETED, DEEPLY TILL THE BASIN FLOOR WITH ROTARY TILLERS OR DISC HARROWS TO PROVIDE A WELL-AERATED, HIGHLY POROUS SURFACE TEXTURE.

6. AFTER CONFIRMATION THAT SOIL MEETS SPECS BY PERFORMING THE REQUISITE GRADATION AND CHEMICAL TESTS (SEE BELOW), FILL THE BIO-RETENTION AREA WITH PLANTING SOIL AND SAND, AS SHOWN IN THE PLANS AND DETAILED IN THE SPECIFICATIONS.

7. INSTALL VEGETATION AND GROUND COVER SPECIFIED IN THE PLANTING PLAN FOR THE BIO-RETENTION AREA. INSTALL MULCH LAYER IF CALLED FOR IN THE DESIGN.

8. UPON AUTHORIZATION FROM THE DESIGNATED INSPECTOR, REMOVE ALL SEDIMENT CONTROLS AND STABILIZE ALL DISTURBED AREAS. UNBLOCK THE FLOW DIVERTER AND PROVIDE DRAINAGE TO THE BIO-RETENTION AREA.

GRASS CLIPPINGS ARE UNSUITABLE FOR MULCH, PRIMARILY DUE TO THE EXCESSIVE QUANTITIES OF NITROGEN BUILT UP IN THE MATERIAL. ADDING LARGE SOURCES OF NITROGEN WOULD LIMIT THE CAPABILITY OF BIO-RETENTION AREAS TO FILTER THE NITROGEN ASSOCIATED WITH RUNOFF.

F. MAINTENANCE AND AGREEMENT REQUIREMENTS

A MAINTENANCE AGREEMENT WITH THE COUNTY CONCERNING THE SITE STORMWATER QUALITY MANAGEMENT FACILITIES MUST BE EXECUTED BY THE DEVELOPER/OWNER BEFORE THE FINAL SITE PLAN FOR THE CONSTRUCTION WILL BE APPROVED.

G. BIO-RETENTION FACILITY CONSTRUCTION NOTES

SEDIMENT REMOVED FROM THE BASINS AS A RESULT OF MAINTENANCE MAY BE DISPOSED OF ON-SITE IF PROPERLY STABILIZED ACCORDING TO THE PRACTICES OUTLINED IN THE VIRGINIA EROSION AND SEDIMENT CONTROL MANUAL AND IF PERMITTED UNDER THE ZONING ORDINANCE. AN OFF-SITE DISPOSAL SITE MUST EITHER BE AN APPROVED LANDFILL OR BE ISSUED A PERMIT THROUGH THE DEPARTMENT OF PUBLIC WORKS.

DESIGN SHOULD MINIMIZE SUSCEPTIBILITY TO VANDALISM BY USE OF STRONG MATERIALS FOR EXPOSED PIPING AND ACCESSORIES.

SIDE SLOPES FOR EARTHEN EMBANKMENT STRUCTURES SHALL NOT EXCEED 3:1 TO FACILITATE MOWING.

THE TEMPORARY EROSION AND SEDIMENTATION CONTROL PLAN MUST BE CONFIGURED TO PERMIT CONSTRUCTION OF THE POND WHILE MAINTAINING EROSION AND SEDIMENTATION CONTROL.

THE TOP OF THE BIO-RETENTION FACILITY MUST BE COMPLETELY THE LEVEL. NO GRADE IS ALLOWABLE.

Table B.3.2 Materials Specifications for Bioretention

Material	Specification	Size	Notes
Plantings	see Appendix A, Table A.4	n/a	plantings are site-specific
planting soil [2.5' to 4' deep]	sand 35 - 60% silt 30 - 55% clay 10 - 25%	n/a	USDA soil types loamy sand, sandy loam or loam
mulch	shredded hardwood		aged 6 months, minimum
pea gravel diaphragm and curtain drain	pea gravel: ASTM-D-448 ornamental stone: washed cobbles	pea gravel: No. 6 stone: 2" to 5"	
geotextile	Class "C" - apparent opening size (ASTM-D-4751), grab tensile strength (ASTM-D-4632), puncture resistance (ASTM-D-4833)	n/a	for use as necessary beneath underdrains only
underdrain gravel	AASHTO M-43	0.375" to 0.75"	
underdrain piping	F 758, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
poured in place concrete (if required)	MSHA Mix No. 3; f'c = 3500 psi @ 28 days, normal weight, air-entrained; reinforcing to meet ASTM-615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) not using previously approved State or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
sand [1' deep]	AASHTO-M-6 or ASTM-C-33	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.

Table B.3.3 Open Channel Systems and Filter Strip Materials Specifications

Material	Specification	Size	Notes
dry swale soil	USCS; ML, SM, SC	n/a	soil with a higher percent organic content is preferred
dry swale sand	ASTM C-33 fine aggregate concrete sand	0.02" to 0.04"	
check dam (pressure treated)	AWPA Standard C6	6" by 6" or 8" by 8"	do not coat with creosote; embed at least 3' into side slopes
check dam (natural wood)	Black Locust, Red Mulberry, Cedars, Catalpa, White Oak, Chestnut Oak, Black Walnut	6" to 12" diameter; notch as necessary	do not use the following, as these species have a predisposition towards rot: Ash, Beech, Birch, Elm, Hackberry, hemlock, Hickories, Maples, Red and Black Oak, Pines, Poplar, Spruce, Sweetgum, Willow
filter strip sand/gravel pervious berm	sand: per dry swale sand gravel; AASHTO M-43	sand: 0.02" to 0.04" gravel: ½" to 1"	mix with approximately 25% loam soil to support grass cover crop; sand (35-60%), silt (30-55%), and gravel (10-25%) see Bioretention planting soil notes for more detail.
pea gravel diaphragm and curtain drain	ASTM D 448	varies (No. 6) or (1/8" to 3/8")	use clean bank-run gravel
underdrain gravel	AASHTO M-43	0.25" to 0.75"	
underdrain	F 758 Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
geotextile	Class "C" - apparent opening size (ASTM-D-4751), grab tensile strength (ASTM-D-4632), puncture resistance (ASTM-D-4833)	n/a	
rip rap	per county criteria; if none given, use MSHA Standards and Specs Section 905	size per county DOT requirements based on 10-year design flows	

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REVISIONS

DESCRIPTION	BY	DATE

TITLE: BOIRETENTION BASIN & DRY SWALE SPECIFICATIONS
PRELIMINARY EQUIVALENT SKETCH PLANS
SHAMS SUBDIVISION
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

DRAWN BY: TH
CHECKED BY: MI
SCALE:

DATE: 09-18-2008

SHEET 7 OF 14

HOWARD CO. FILE NO. SP-08-007

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR 10/23/08 DATE

LEGEND

EXISTING PROPERTY LINE	
PROP PROPERTY LINE	
EXISTING CONTOUR	
TREE LINES	
EXISTING TREES	
PROPOSED CONTOUR	470
SPOT ELEVATION	+ 463.5
15% ~ 24% SLOPES	
25% OR GREATER SLOPES	
STREAM CENTER LINE	
TEMPORARY STONE OUTLET STRUCTURE (PER MDE PAGE C-11-2)	TSOS
SILT FENCE	SF SF
SUPER SILT FENCE	SSF SSF
(LOD) LIMITS OF DISTURBANCE	LOD
TREE PROTECTION FENCE	

DRAWING NOTES

1- ONLY THE MINIMUM CLEARING AREA NECESSARY TO INSTALL THE PERIMETER CONTROL DEVICES SHALL BE CLEARED IN PHASE I .

2- THE DEMOLITION OF EXISTING FEATURES AND STRUCTURES SHALL BE CONDUCTED IN A MANNER THAT MINIMIZES THE IMPACT ON INDIVIDUAL TREES AND GROUPS OF TREES TO BE PRESERVED.

3- TREES TO BE PRESERVED ON THIS SITE WILL REQUIRE PROTECTION AND CARE THROUGHOUT THE CONSTRUCTION PHASE. THE TREE PROTECTION FENCE SHALL CONSIST OF FOUR-FOOT HEIGHT, 14-GUAGE WELDED WIRE ATTACHED TO A SIX FOOT STEEL POST, DRIVEN 18" INTO THE GROUND AND PLACE NO MORE THAN 10' APART. THIS FENCE SHALL BE ERECTED AT THE LIMITS OF CLEARING AND GRADING.

PRIVATE USE-IN-COMMON NOTE:
PRIVATE USE-IN-COMMON DRIVEWAY SHALL BE FOR THE BENEFIT OF LOTS 2,4,5, OPEN SPACE LOTS 6,7, AND THE POTENTIAL FUTURE USE FOR PARCEL 281.

OWNER/DEVELOPER
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AEC

REVISIONS		
DESCRIPTION	BY	DATE

TITLE: GRADING PLAN
PRELIMINARY EQUIVALENT SKETCH PLANS
SHAMS SUBDIVISION
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

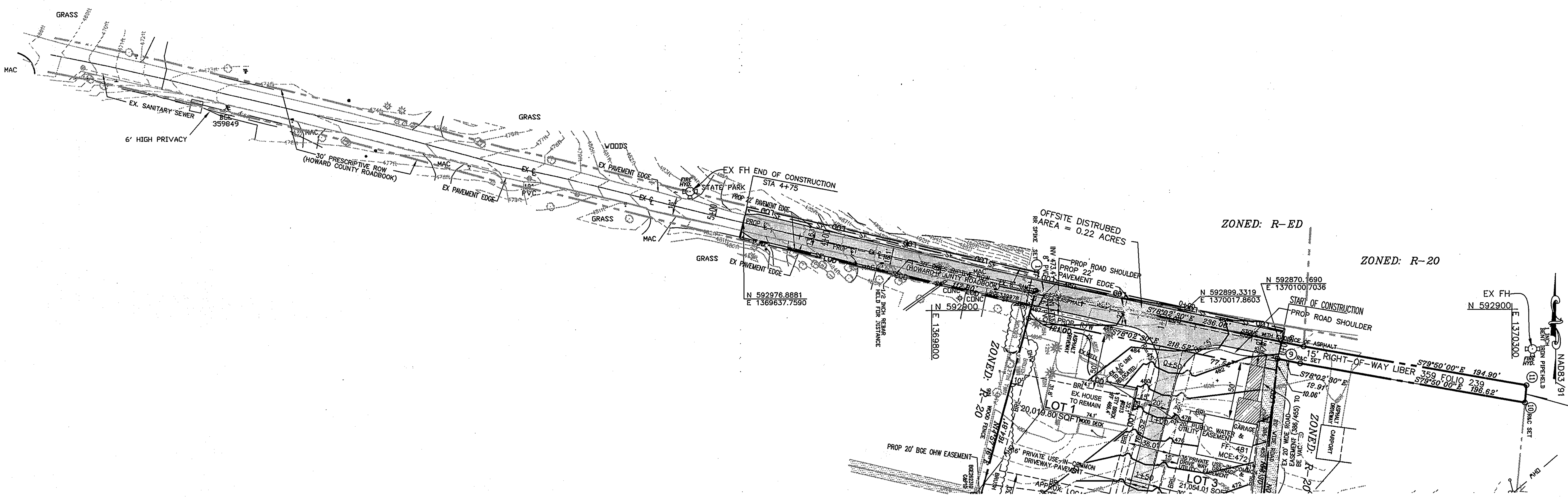
PROFESSIONAL ENGINEERS STATE OF MARYLAND MOSTAFA IZADI 17248
10/22/08

DRAWN BY: TH
CHECKED BY: MI
SCALE: 1"=40'

DATE: 09-18-2008

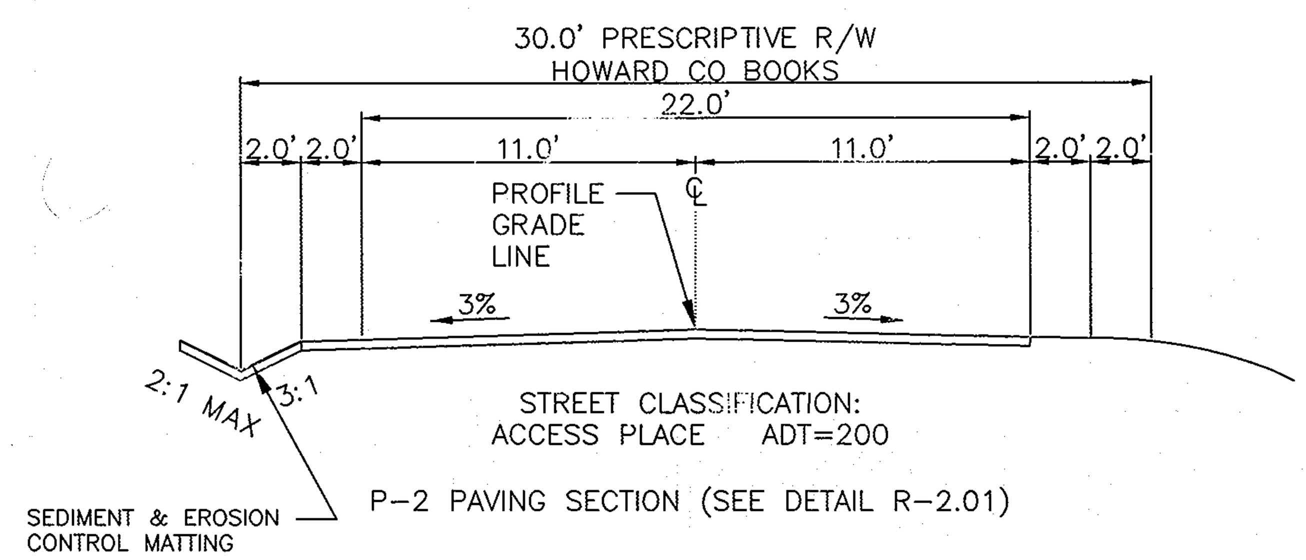
SHEET 8 OF 14

HOWARD CO. FILE NO. SP-08-007



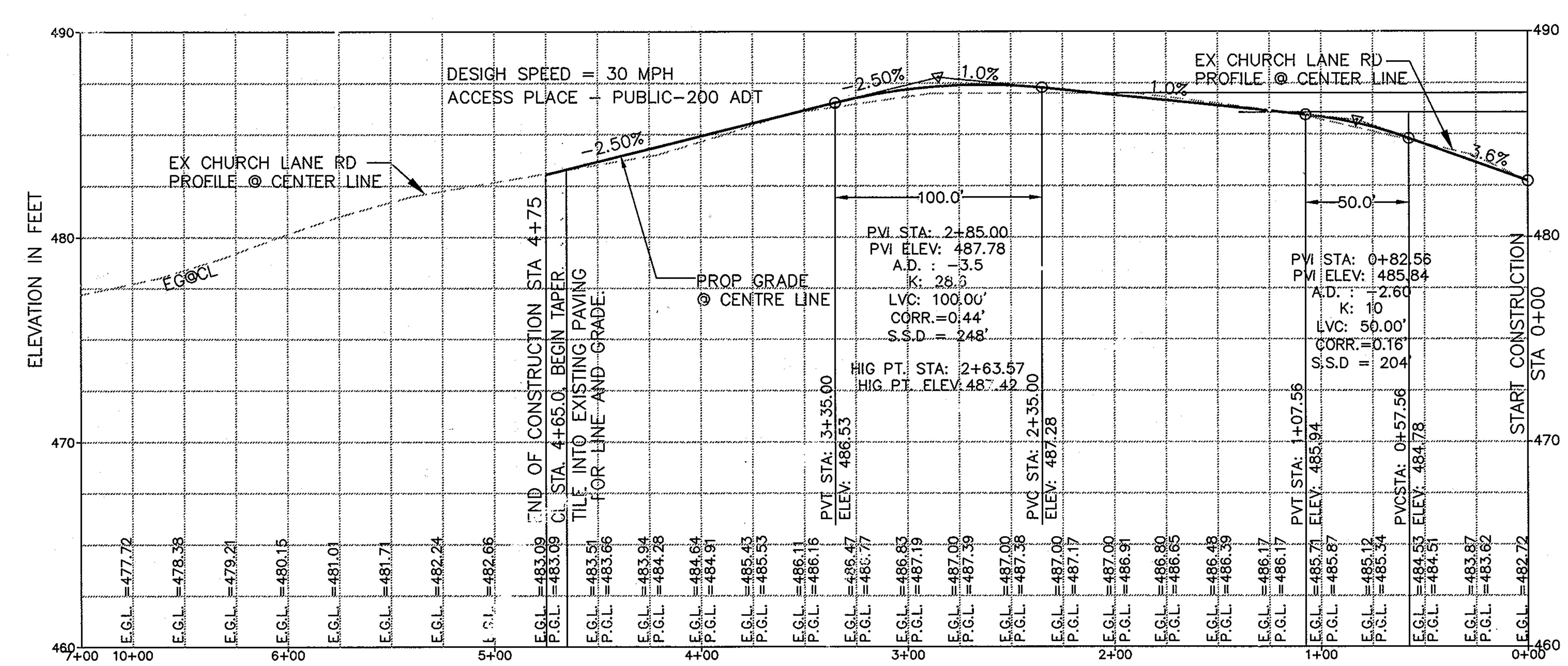
CHURCH LANE RD PLAN IMPROVEMENTS

SCALE: 1" = 50'



TYPICAL CROSS SECTION

SCALE: 1" = 5'



CHURCH LANE ROAD PROFILE

SCALE: H: 1"=50' V: 1"=5'

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR 10/23/08 DATE

OWNER/DEVELOPER

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REVISIONS		
DESCRIPTION	BY	DATE

TITLE: CHURCH LANE RD PLAN & PROFILE

PRELIMINARY EQUIVALENT SKETCH PLANS

SHAMS SUBDIVISION

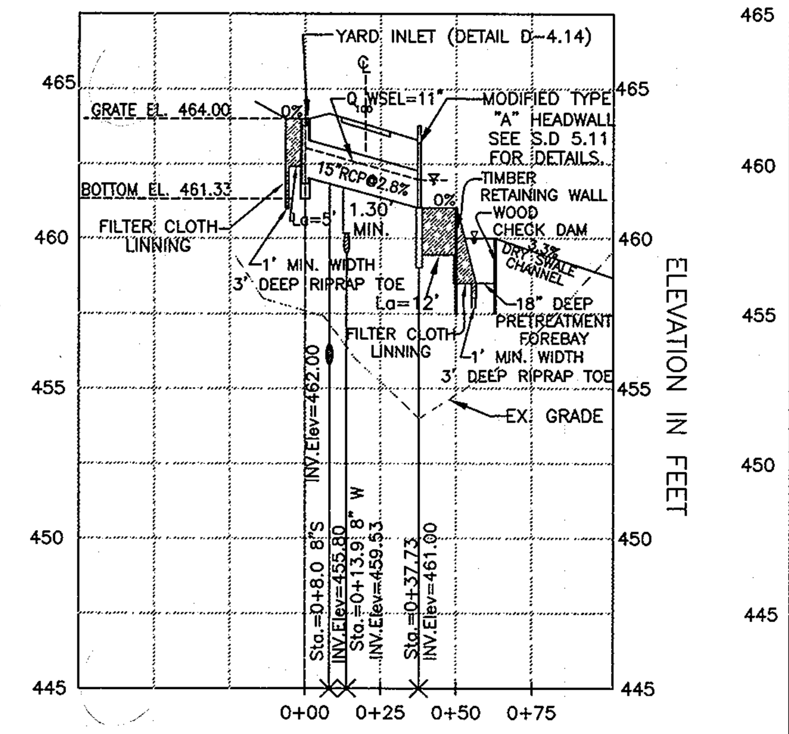
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

DRAWN BY: TH
CHECKED BY: MI
SCALE: AS SHOWN

DATE: 09-18-2008

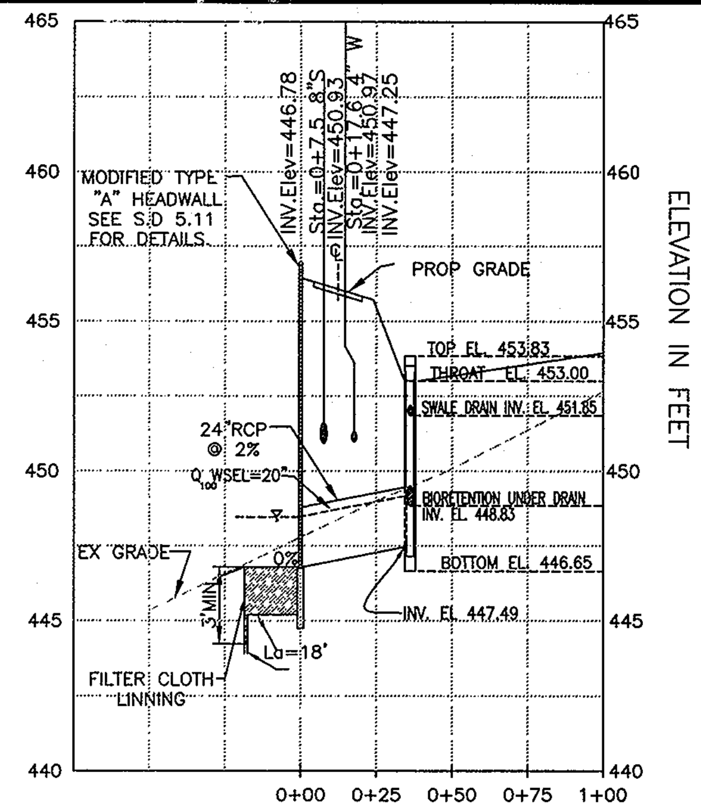
SHEET 9 OF 14

HOWARD CO. FILE NO. SP-08-007



15" SD PROFILE

SCALE: H: 1"=50'
V: 1"=5'



24" SD PROFILE

SCALE: H: 1"=50'
V: 1"=5'

LEGEND

ADRESS SIGNS

GENERAL NOTES:

1. ALL SIGNS NUMBERING SHALL BE A MIN. OF 3" PLAIN BLOCK LETTERS.
2. PRIVATE USE-IN-COMMON DRIVEWAY SHALL BE FOR THE BENEFIT OF LOTS 2,4,5, OPEN SPACE LOTS 6,7, AND PARCEL 281.

$$Q = \frac{1.49}{n} A R^{2/3} S^{1/2}$$

$$R = \frac{A}{P}$$

Q=Discharge [CFS]

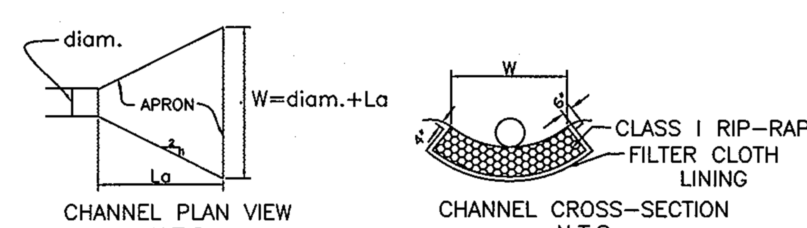
R=Hydraulic Radius Of the flow cross-section [ft]

A=Flow cross-section Area [ft^2]

P=Wetted perimeter [ft]

n=Manning's Roughness Coefficients, 0.013 for concrete lining

S=Slope of Energy Gradient

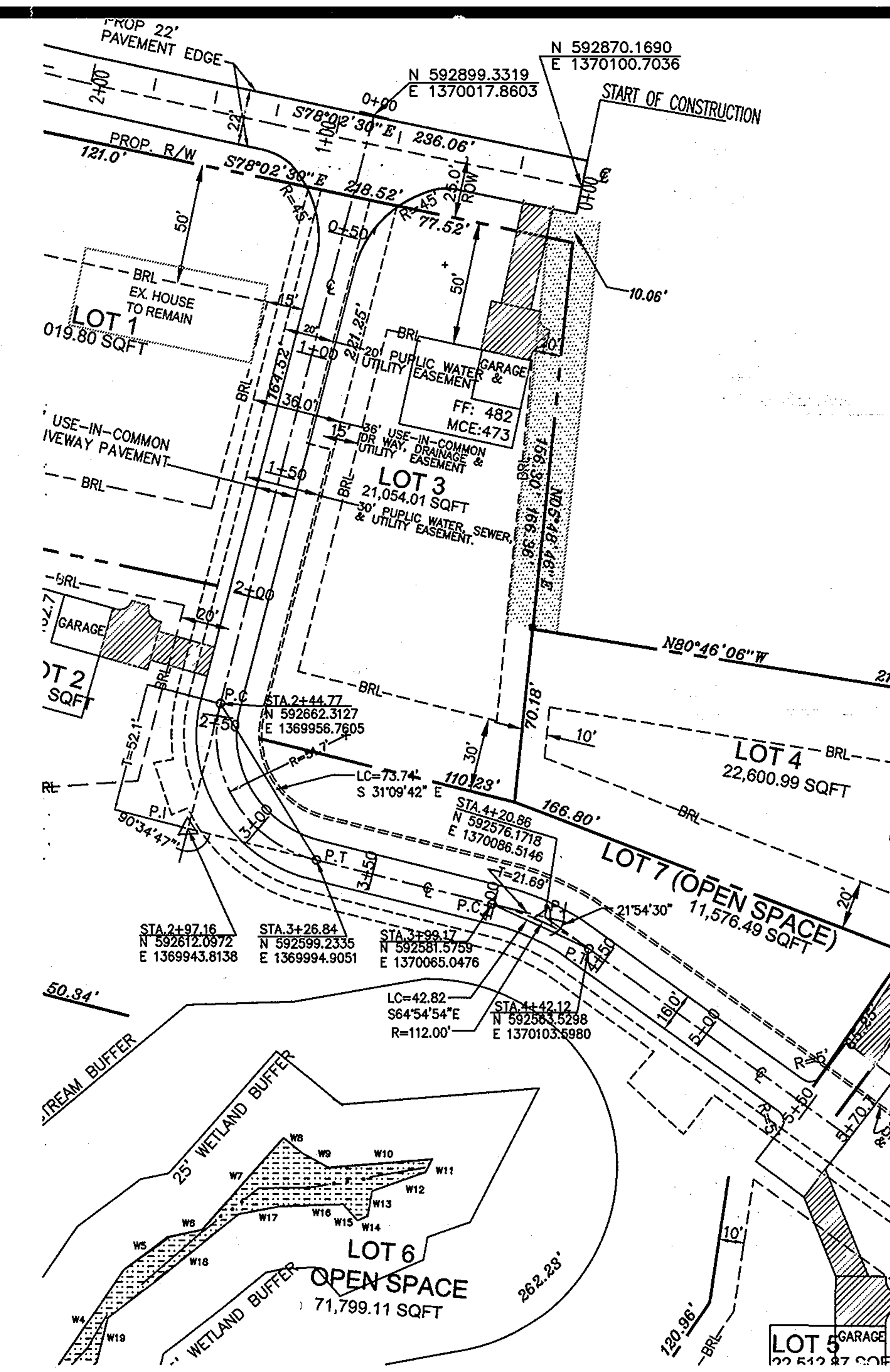


PIPE SIZE	Q (CFS)	V (ft/sec)	La (ft)	W (ft)	D(ft)	d_{50}(in)
24" PIPE	32	10.2	18'	20'	1.6'	9"
15" PIPE	11	8.8	12'	14'	1.6'	9"

La, D, & W WERE OBTAINED FROM MDE MANUAL, TABLE 19, PAGE F-18-6

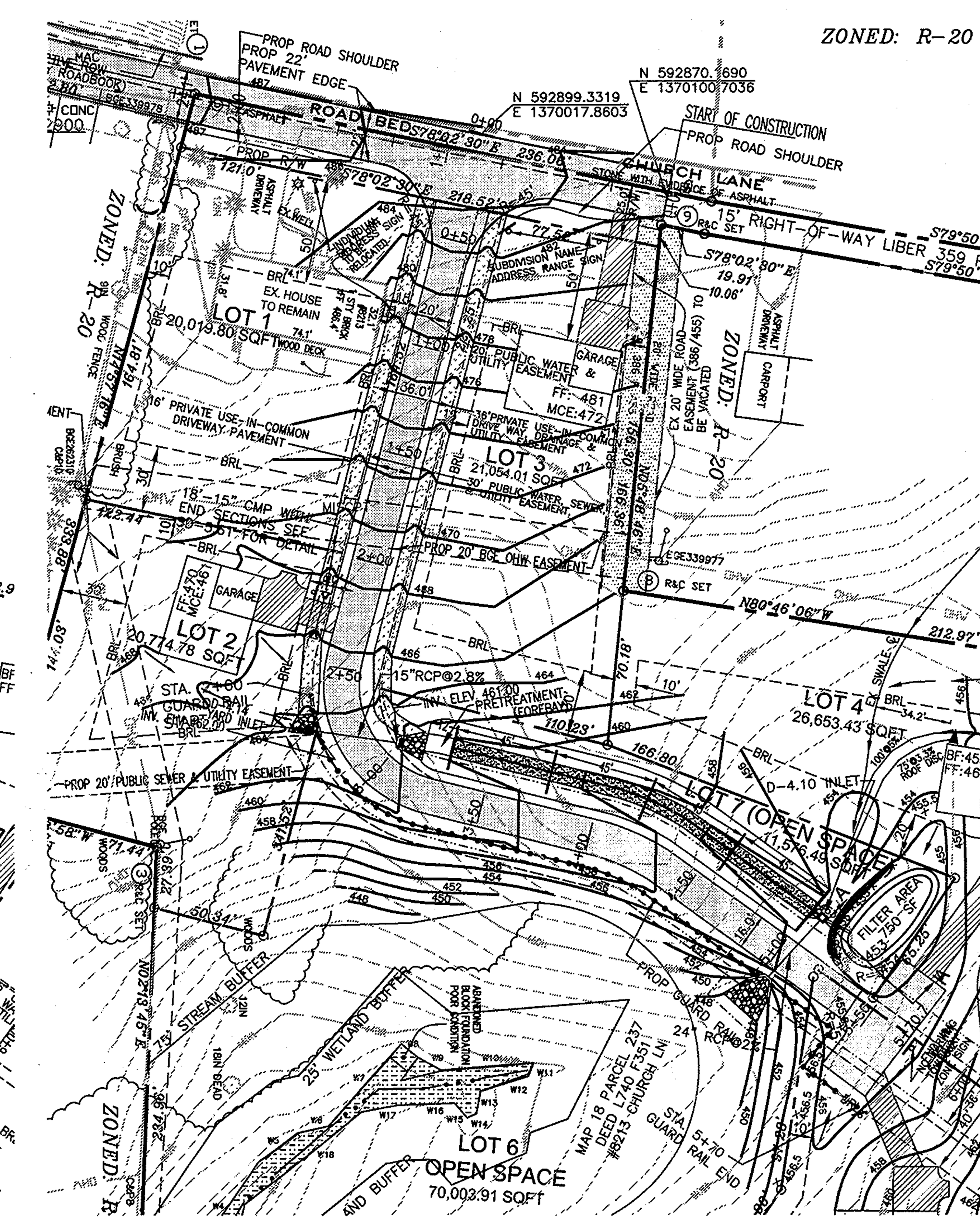
Q_{24}= 1.49/0.013 x 3.141 x $(3.141/6.283)^{2/3}$ x $(.020)^{1/2}$ = 32.08 CFS > Q_{100}=19.90 CFS
V_{100}=5.64 FPS
d_{100}=20"

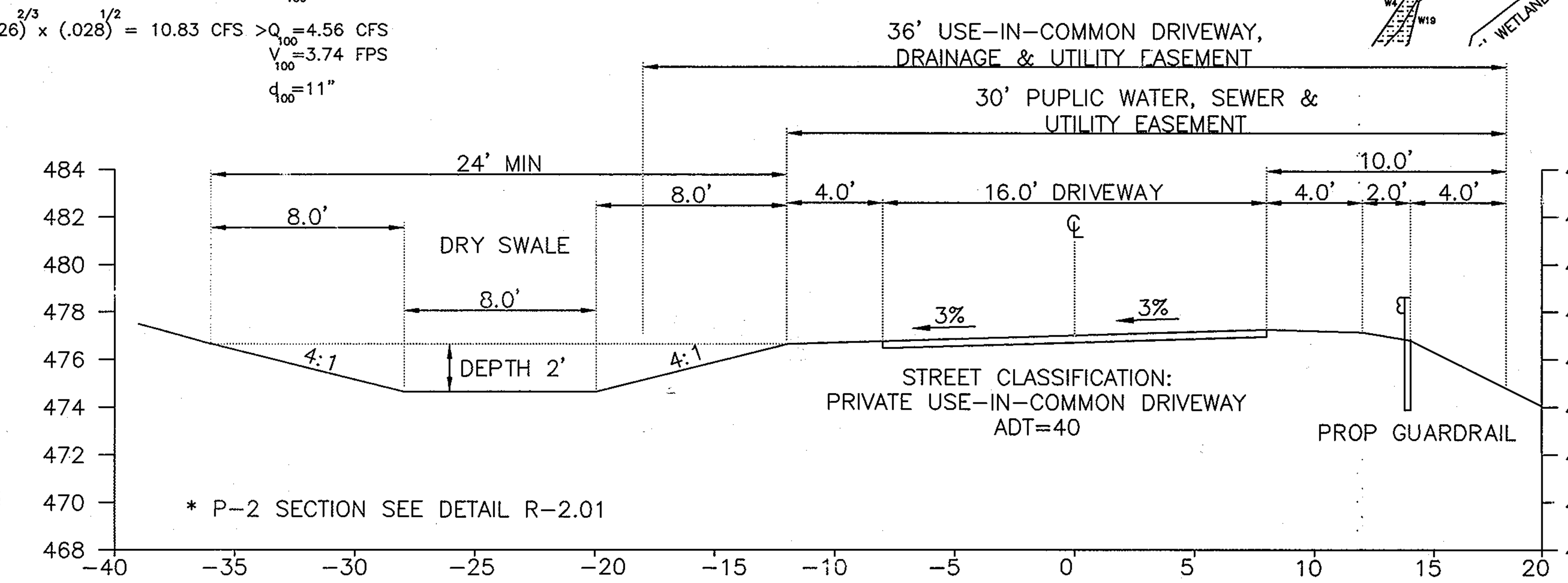
Q_{15}= 1.49/0.013 x 1.227 x $(1.227/3.926)^{2/3}$ x $(.028)^{1/2}$ = 10.83 CFS >Q_{100}=4.56 CFS
V_{100}=3.74 FPS
d_{100}=11"



HORIZONTAL CURVE PLAN

SCALE: 1" = 50'



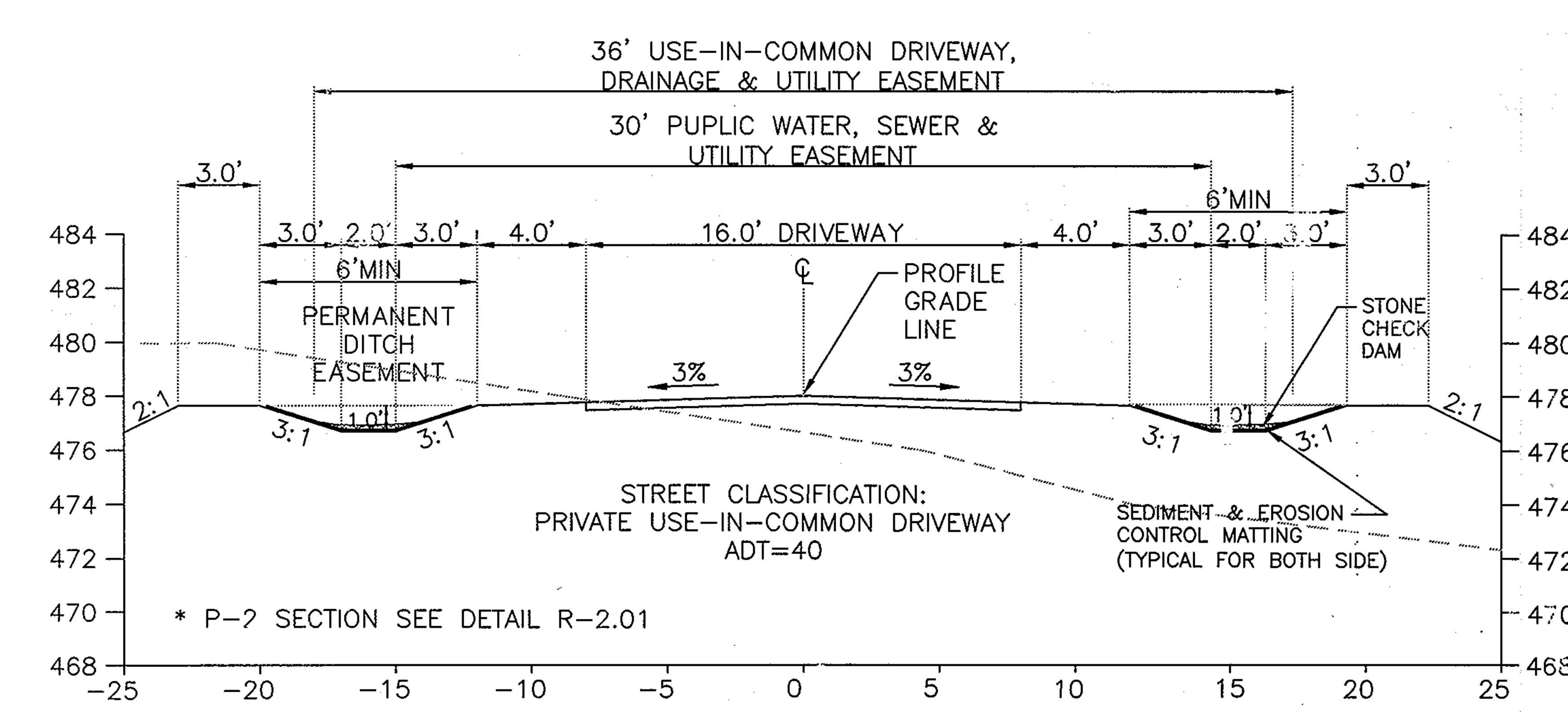


ROADWAY CROSS SECTION (TYPICAL B): STAT 2+80 - 5+41.62

SCALE: 1" = 5'

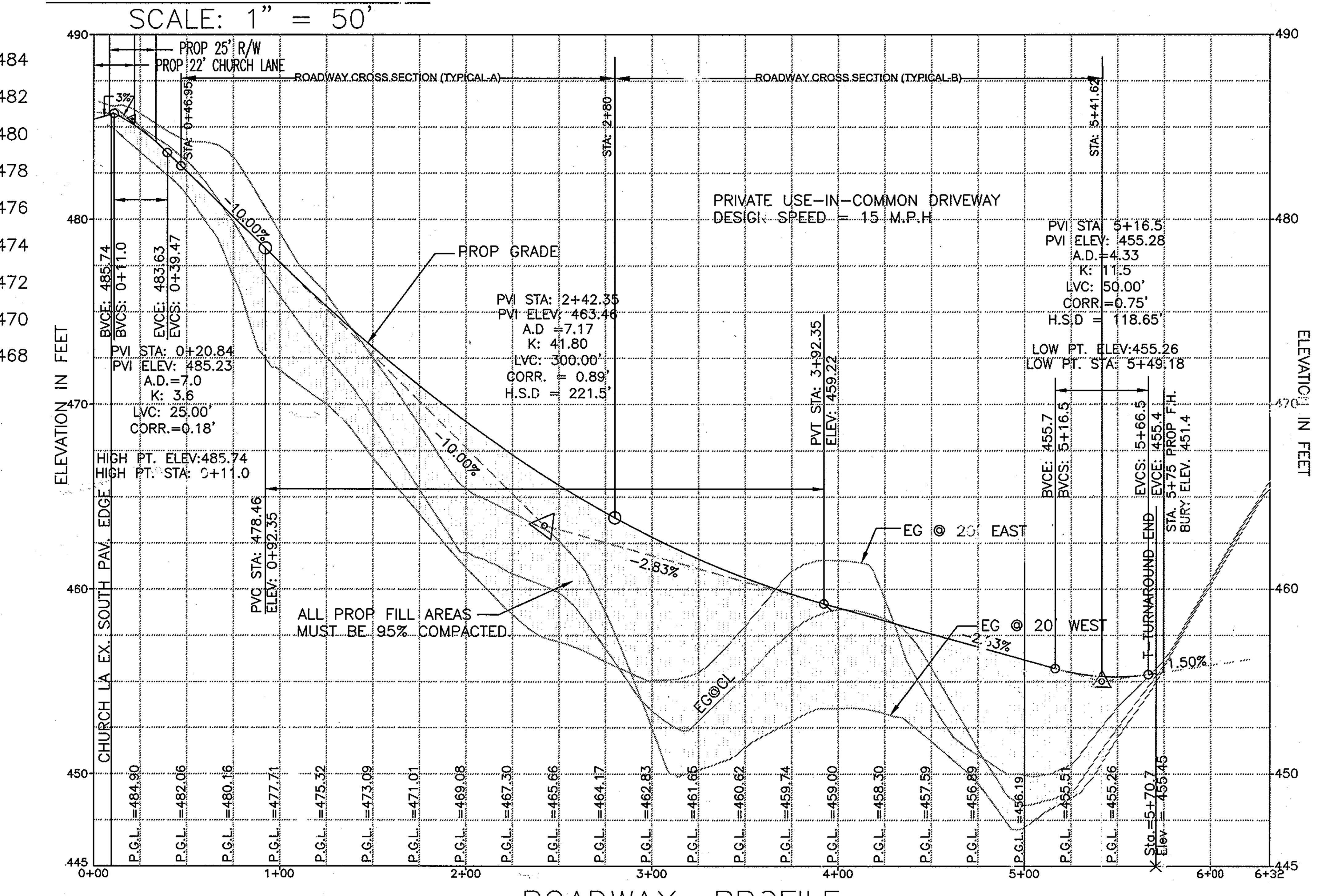
CONSTRUCTION SPECIFICATIONS FOR RIP-RAP OUTFALLS

1. THE SUBGARDE FOR THE FILTER, RIPRAP OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
2. THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIPRAP OR FILTER.
3. FILTER CLOTH SHALL BE PROTECTED FROM PUNCHING, CUTTING OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL HOLE SHALL BE REPAIRED BY PLACING ANOTHER PIECE OF CLOTH OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE CLOTH. ALL OVERLAPS WHETHER FOR REPAIRSOR FOR JOINING TWO PIECES OF CLOTH SHALL BE A MINIMUM OF ONE FOOT.
4. STONE FOR THE RIPRAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. BOTH SHALL EACH BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR RIPRAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL INSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIPRAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR FILTER CLOTH. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.



ROADWAY CROSS SECTION (TYPICAL A): STAT 0+46.95 - 2+80

SCALE: 1" = 5'



ROADWAY PROFILE

SCALE: H: 1"=50' V: 1"=5'

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR gmf — DATE 10/23/08

OWNER/DEVELOPER
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AEC

REVISIONS		
DESCRIPTION	BY	DATE

TITLE: ROADWAY SECTIONS & PROFILE
PRELIMINARY EQUIVALENT SKETCH PLANS
SHAMS SUBDIVISION
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

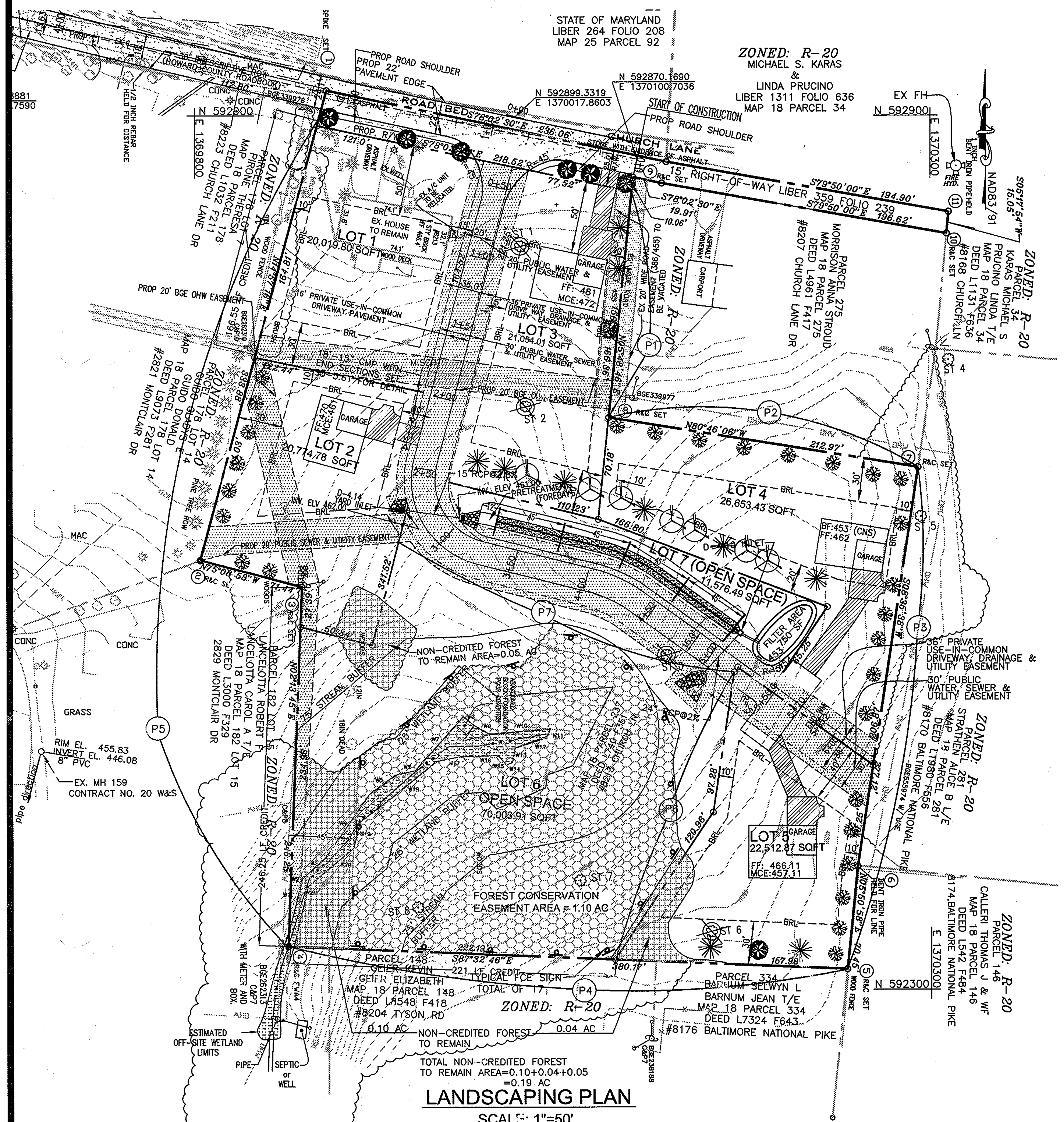
MOSTAFA IZADI — STATE OF MARYLAND — PROFESSIONAL ENGINEERS — 17248

DRAWN BY: TH
CHECKED BY: MI
SCALE: AS SHOWN

DATE: 09-18-2008

SHEET 10 OF 14

HOWARD CO. FILE NO. SP-08-007



LANDSCAPING PLAN

SCALE: 1"=50'

SPECIMEN TREE(ST)#	COMMON NAME	BOTANICAL NAME	SIZE DBH	CONDITION	
1	BLACK WALNUT	JUGLANS NIGRA	32.5"	GOOD	TO BE REMOVED
2	BLACK WALNUT	JUGLANS NIGRA	33.5"	GOOD	TO BE REMOVED
3	BLACK WALNUT	JUGLANS NIGRA	43.5"	GOOD	TO BE REMOVED
4	GREEN ASH	FRAXINUS PENNSYLVANICUS	35"	FAIR	TO REMAIN
5	TULIPTREE	LIRIODENDRON TULIPIFERA	35"	FAIR	TO REMAIN
6	BLACK WALNUT	BLACK WALNUT	35.5"	GOOD	TO BE REMOVED
7	TULIPTREE	LIRIODENDRON TULIPIFERA	40"	GOOD	TO REMAIN
8	RED OAK	QUERCUS RUBRA	47"	GOOD	TO REMAIN

STREET TREE SCHDULE

QTY.	SYMBOL	BOTANICAL AND COMMON NAME	SIZE	COMMENTS
6		ACER RUBRUM 'OCTOBER GLORY' (OCTOBER RED MAPLE)	2 1/2" - 3" CALIPER FULL CROWN, B&B	50' APART ON PUBLIC R/W

FINANCIAL SURETY FOR THE 6 REQUIRED STREET TREES HAS BEEN POSTED AS PART OF THE DEVELOPER'S AGREEMENT IN THE AMOUNT OF $1,800.

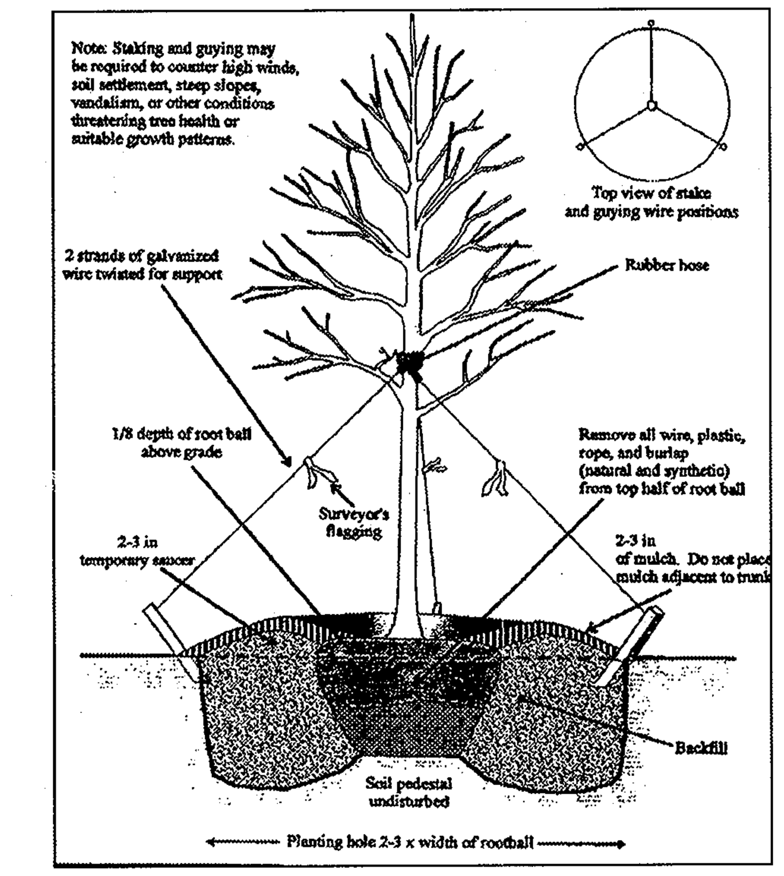
SCHEDULE D STORMWATER MANAGEMENT AREA LANDSCAPING

LINEAR FEET OF PERIMETER	277.03'
NUMBER OF TREE REQUIRED SHADE TREES EVERGREEN TREES	 6 7
CREDIT FOR EXISTING VEGETATION (YES, NO AND %)	NO
CREDIT FOR OTHER LANDSCAPING (YES, NO AND %)	NO
NUMBER OF TREES PROVIDED SHADE TREES EVERGEEN TREES OTHER TREES (2:1 SUBSTITUTION) ORNOMENTAL TREES (DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)	 6 7 0 0

LANDSCAPING PLANT LIST

QTY.	KEY	NAME	SIZE
2		ACER RUBRUM 'OCTOBER GLORY' (OCTOBER RED MAPLE)	2 1/2" - 3" CALIPER FULL CROWN, B&B
10		PLATANUS x ACERIFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANE	2 1/2" - 3" CALIPER FULL CROWN, B&B
7		PINUS STROBUS EASTERN WHITE PINE	6' - 8' HT
28		FLOWERING CRABAPPLE MALUS (PRAIRIFIRE)	2 1/2" - 3" CALIPER FULL CROWN, B&B

"THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.



TREE GUYING FOR 3 INCHES IN CLIPER AND GREATER WHEN REQUIRED

PLANTING SPECIFICATIONS

PLANTS, RELATED MATERIAL, AND OPERATIONS SHALL MEET THE DETAILED DESCRIPTION AS GIVEN ON THE PLANS AND AS DESCRIBED HEREIN. ALL PLANT MATERIAL, UNLESS OTHERWISE SPECIFIED, SHALL BE NURSERY GROWN, UNIFORMLY BRANCHED, HAVE A VIGOROUS ROOT SYSTEM, AND SHALL CONFORM TO THE SPECIES, SIZE, ROOT AND SHAPE SHOWN ON THE PLANT LIST AND THE AMERICAN ASSOCIATION OF NURSERYMEN(AAN) STANDARDS. PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, FREE FROM DEFECTS, DECAY, DISFIGURING ROOTS, SUN SCALD INJURIES, ABRASIONS OF THE BARK, PLANT DISEASE, INSECT PEST EGGS, BORERS AND ALL FORMS OF INSECT INFESTATIONS OR OBJECTIONABLE DISFIGUREMENTS. PLANT MATERIAL THAT IS WEAK OR WHICH HAS BEEN CUT BACK FROM LARGER GRADES TO MEET SPECIFIED REQUIREMENTS WILL BE REJECTED. TREES WITH FORKED LEADERS WILL NOT BE ACCEPTED. ALL PLANTS SHALL BE FRESHLY DUG, NO HEALED-IN PLANTS FROM COLD STORAGE WILL BE ACCEPTED.

UNLESS OTHERWISE SPECIFIED, ALL GENERAL CONDITIONS, PLANTING OPERATIONS, DETAILS AND PLANTING SPECIFICATION SHALL CONFORM TO "LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE-WASHINGTON METROPOLITAN AREAS" ,(HEREINAFTER "LANDSCAPE GUIDELINES") APPROVED BY THE LANDSCAPE CONTRACTORS ASSOCIATION OF METROPOLITAN WASHINGTON AND THE POTOMAC CHAPTER OF THE AMERICAN SOCIETY OF LANDSCAPE ARCHITECT, LATEST EDITION, INCLUDING ALL AGENDA.

CONTRACTOR SHALL BE REQUIRED TO GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF ONE YEAR AFTER DATE OF ACCEPTANCE IN ACCORDANCE WITH THE APPROPRIATE SECTION OF THE LANDSCAPE GUIDELINES CONTRACTOR'S ATTENTIONS IS DIRECTED TO THE MAINTENANCE REQUIREMENTS FOUND WITHIN THE ONE YEAR SPECIFICATIONS INCLUDING WATERING AND REPLACEMENT OF SPECIFIED PLANT MATERIAL.

CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UTILITY COMPANIES, UTILITY CONTRACTORS AND "MISS UTILITY" MINIMUM OF 48 HOURS PRIOR TO BEGINNING ANY WORK. CONTRACTOR MAY MAKE MINOR ADJUSTMENTS IN SPACING AND LOCATION OF PLANT MATERIAL TO AVOID CONFLICTS WITH UTILITIES. DAMAGE TO EXISTING STRUCTURE AND UTILITIES SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR.

PROTECTION OF EXISTING VEGETATION TO REMAIN SHALL BE ACCOMPLISHED BY THE TEMPORARY INSTALLATION OF 4 FOOT HIGH SNOW FENCE OR BLAZE ORANGE SAFETY FENCE AT THE DRIP LINE.

CONTRACTOR ID RESPONSIBLE OF INSTALLING ALL MATERIAL IN THE PROPER PLANTING SEASON FOR EACH PLANT TYPE. ALL PLANTING IS TO BE COMPLETED WITHIN THE GROWING SEASON OF COMPLETION OF SITE CONSTRUCTION.

BID SHALL BE BASE ON ACTUAL SITE CONDITIONS. NO EXTRA PAYMENT SHALL BE MADE FOR WORK ARISING FROM SITE CONDITIONS DIFFERING FROM THOSE INDICATED ON DRAWINGS AND SPECIFICATIONS.

PLANTS QUANTITIES ARE PROVIDED FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. IF DISCREPANCIES EXIST BETWEEN QUANTITIES SHOWN ON PLAN AND THOSE SHOWN ON THE PLANT LIST, THE QUANTITIES ON THE PLAN TAKE PRECEDENCE.

ALL SHRUBS SHALL BE PLANTED IN CONTINUOUS TRENCHES OR PREPARED PLANTING BEDS AND MULCHED WITH COMPOSTED HARDWOOD MULCH AS DETAILS AND SPECIFIED EXCEPT WHERE NOTED ON PLANS.

POSITIVE DRAINAGE SHALL BE MAINTAINED IN PLANTING BEDS 2 PERCENT SLOPE.

PLANTING MIX SHALL BE AS FALLOWS: DECIDUOUS PLANTS - TWO PARTS TOPSOIL, ONE PART WELL-ROTTED COW OR HORSE MANURE. ADD 3 LBS. OF STANDARD FERTILIZER PER CUBIC YARD OF PLANTING MIX. EVERGREEN PLANTS-TWO PARTS TOPSOIL, ONE PART HUMUS OR OTHER APPROVED ORGANIC MATERIAL. ADD 3 LBS. OF EVERGREEN (ACLDLC) FERTILIZER PER CUBIC YARD OF PLANTING MIX. TOPSOIL SHALL CONFORM TO THE LANDSCAPE GUIDELINES.

WEED CONTROL, INCORPORATE A PRE-EMERGENT HERBICIDE INTO THE PLANTING BED FOLLOWING RECOMMENDED RATES ON THE LABEL. CAUTION: BE SURE TO CAREFULLY CHECK THE CHEMICAL USED TO ASSURE ITS ADAPTABILITY TO THE SPECIFIC GROUND COVER TO BE TREATED.

ALL AREAS WITHIN CONTRACT LIMITS DISTURBED DURING OR PRIOR TO CONSTRUCTION NOT DESIGNATED TO RECEIVE PLANTS AND MULCH SHALL BE FINE GRADED AND SEEDED.

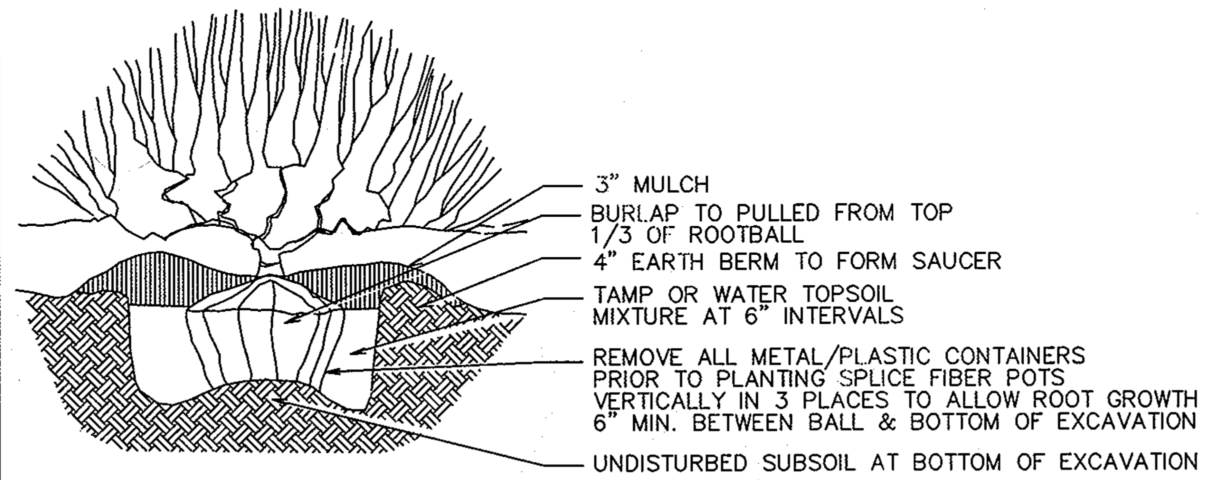
THIS PLAN IS INTENDED FOR LANDSCAPE USE ONLY. SEE OTHER PLAN SHEETS FOR MORE INFORMATION ON GRADING, SEDIMENT CONTROL, LAYOUT, ETC.

AT THE TIME OF PLANT INSTALLATION, ALL SHRUBS AND TREES LISTED AND APPROVED ON THE LANDSCAPE PLAN, SHALL COMPLY WITH THE PROPER HEIGHT REQUIREMENT IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF THE REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEWING AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THE APPROVED LANDSCAPE PLAN MAY BE RESULT IN DENIAL OR DELAY IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISION ARE MADE TO THE APPLICABLE PLANS.

THE OWNER TENANTS AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.

THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL WITH - SHADE TREES, -ORNAMENTAL TREES, - EVERGREEN TREES AND - SHRUBS PROVIDED WITH LANDSCAPE SURETY IN THE AMOUNT OF $ 8,850 - WITH THE DPW, DEVELOPER'S AGREEMENT. (THE UNIT PRICE TO BE USED FOR ESTABLISHING SURETY REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE ADOPTED COUNTY FEE SCHEDULE WHICH IS $300.00 PER SHADED TREES, $150.00 PER EVERGREEN/ORNAMENTAL TREE, $30.00 PER SHRUB, $10.00 PER LINEAR FEET OF FENCING AND $20.00 PER LINEAR FEET OF WALL.)

THE LANDSCAPING SURETY AMOUNT OF $ 8,850 FOR TOTAL OF 47 TREES (SEE LANDSCAPING PLANT LIST ON THIS SHEET) WILL BE POSTED WITH THE DEVELOPER'S AGREEMENT AT THE FINAL PLAN STAGE.



SHRUB PLANTING DETAIL

NOT TO SCALE

SCHEDULE A PERIMETER LANDSCAPE EDGE

CATEGORY	PERIMETER P1	PERIMETER P2	PERIMETER P3	PERIMETER P4	PERIMETER P5	PERIMETER P6	PERIMETER P7
LANDSCAPE TYPE	TYPE 'A'	TYPE 'A'	TYPE 'A'	TYPE 'A'	TYPE 'A'	TYPE 'A'	TYPE 'A'
LINEAR FEET OF PERIMETER	161'	213'	348'	380'	632'	218'	251'
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	YES* 221	YES* 413'	YES* 218'	YES* 251'
CREDIT FOR WALL, RENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	NO	NO
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGEEN TREES ORNOMENTAL TREES	 3 0 0	 4 0 0	 6 0 0	 3 0 0	 4 0 0	 0 0 0	 0 0 0
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGEEN TREES OTHER TREES (2:1 SUBSTITUTION) ORNOMENTAL TREES (DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)	 3 0 0 0	 0 0 8 0	 0 0 12 0	 3 0 0 0	 0 0 8 0	 0 0 0 0	 0 0 0 0

DEVELOPER'S/OWNER'S LANDSCAPE CERTIFICATE

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

SIGNATURE: A. Shams

NAME: PIRZADEH A. SHAMS

OWNER/DEVELOPER

PIRZADEH A. SHAMS
GITI SHAMS
805 STAGES HEAD ROAD
TOWSON, MD 21286
(410) 419-9229

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE 10/23/08

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Engineers & Planners
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TEL.: 410-382-9180 FAX: 410-296-0505
mizadi@aec-engineers.biz

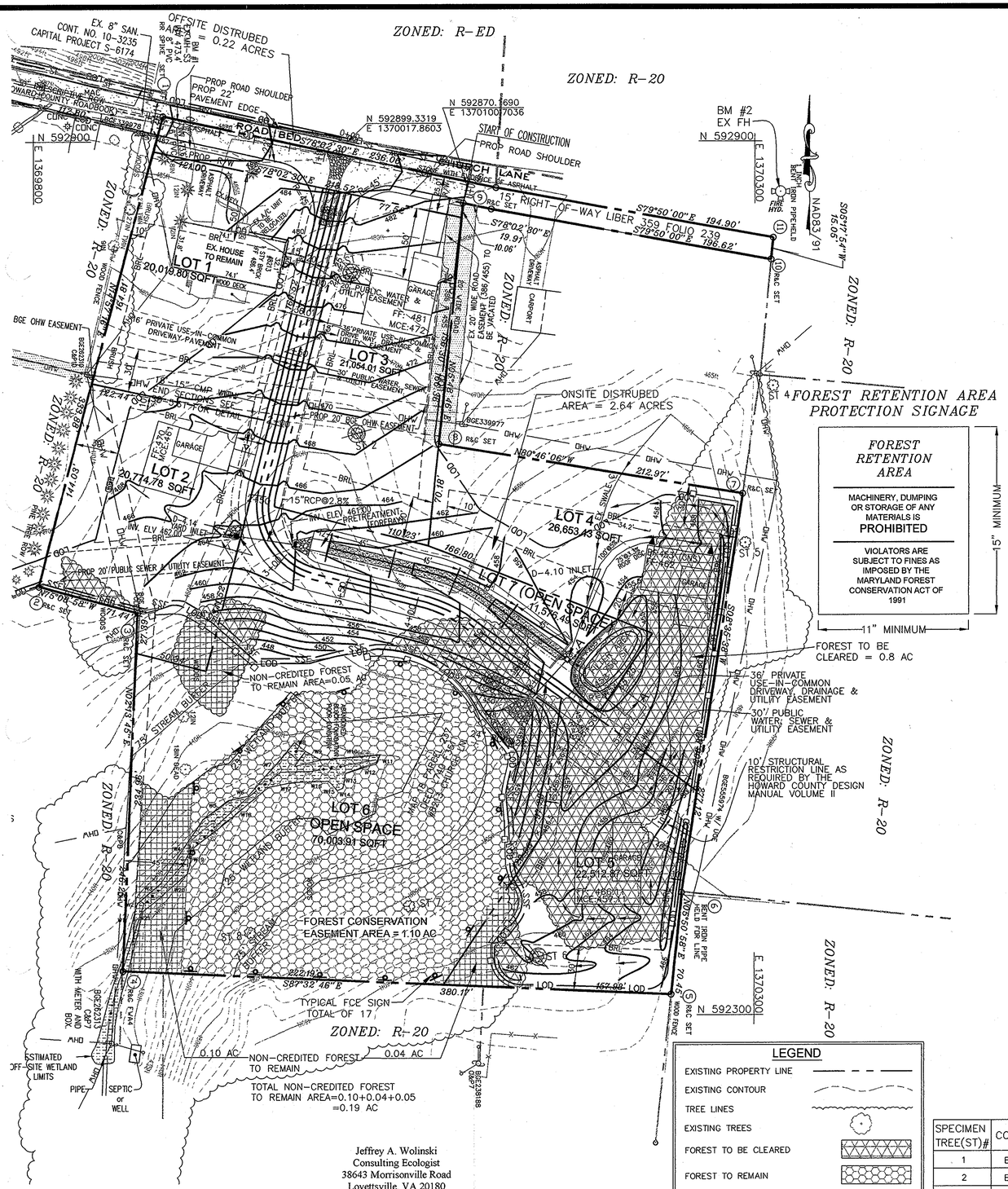
REVISIONS		
DESCRIPTION	BY	DATE

TITLE: LANDSCAPING PLAN AND DETAILS
PRELIMINARY EQUIVALENT SKETCH PLANS
SHAMS SUBDIVISION
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

DRAWN BY: TH
CHECKED BY: MI
SCALE: 1" = 50'

DATE: 09-18-2008

HOWARD CO. FILE NO. SP-08-007



LEGEND

- EXISTING PROPERTY LINE
- EXISTING CONTOUR
- TREE LINES
- EXISTING TREES
- FOREST TO BE CLEARED
- FOREST TO REMAIN
- NON-CREDITED FOREST TO REMAIN
- FCE SIGN
- PROPOSED CONTOUR (470)
- (LOD) LIMITS OF DISTURBANCE (LOD)
- TREE PROTECTION FENCE

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE 10/20/14

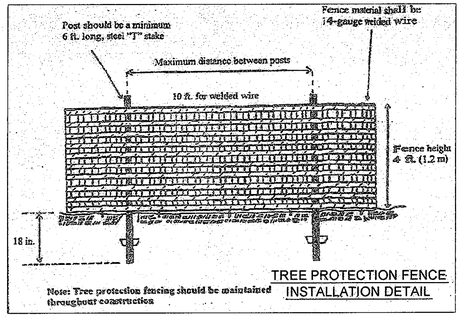
Jeffrey A. Wolinski
Consulting Ecologist
38643 Morrisonville Road
Lovettsville, VA 20180
Phone: (540) 882-4947
Fax: (540) 882-4965
MD Phone: (410) 274-7678

Jeffrey A. Wolinski
MDFCA Qualified Professional

Forest Conservation Worksheet 2.1

Note: Use 0 for all negative numbers that result from the calculations.

Net Tract Area		
A.	*Total Tract Area*	A= 4.6
B.	*Deductions* (Critical Area, area restricted by local ordinance or program)	B= 0.0
C.	*Net Tract Area* Net Tract Area = Total Tract (A) - Deductions (B)	C= 4.6
Land Use Category R-20		
D.	*Afforestation Threshold* (Net Tract Area [C] x 15 %)	D= 0.7
E.	*Conservation Threshold* (Net Tract Area [C] x 20 %)	E= 0.9
Existing Forest Cover		
F.	*Existing Forest Cover within the Net Tract Area*	F= 2.0
G.	*Area of Forest Above Conservation Threshold* If the Existing Forest Cover (F) is greater than the Conservation Threshold (E), then G = F – E; Otherwise G = 0.	G= 1.1
Breakeven Point		
H.	*Breakeven Point* (Amount of forest that must be retained so that no mitigation is required) (1) If the Area of Forest Above the Conservation Threshold (G) is greater than 0, then H = (0.2 x the Area of Forest Above Conservation Threshold (G) + the Conservation Threshold (E); (2) If the Area of Forest Above the Conservation Threshold (G) is equal to 0, then H = Existing Forest Cover (F).	H= 1.1
I.	*Forest Clearing Permitted Without Mitigation* I = Existing Forest Cover (F) – Breakeven point (H)	I= 0.9
Proposed Forest Clearing		
J.	*Total Area of Forest to be Cleared*	J= 0.8
K.	*Total Area of Forest to be Retained* K = Existing Forest Cover (F) – Forest to be Cleared (J)	K= 1.1
Planting Requirements		
	If the Total Area of Forest to be Cleared (K) is at or above the Breakeven Point (H), no planting is required and no further calculations are necessary (L=0, M=0, N=0, P=0); Otherwise, calculate the planting requirement(s) as follows:	
L.	*Reforestation for Clearing Above the Conservation Threshold* (1) If the Total Area of Forest to be Retained (K) is greater than the Conservation Threshold (E), then L = the Area of Forest to be Cleared (J) x 0.25; (2) If the Forest to be Retained (K) is less than or equal to the Conservation Threshold (E), then L = Area of Forest Above Conservation Threshold (G) x 0.25	L= 0
M.	*Reforestation for Clearing Below the Conservation Threshold* (1) If Existing Forest Cover (F) is greater than the Conservation Threshold (E) and the Forest to be Retained (K) is less than or equal to the Conservation Threshold (E), then M = 2.0 x (Conservation Threshold (E) – Forest to be Retained (K)) (2) If Existing Forest Cover (F) is less than or equal to the Conservation Threshold (E), then M = 2.0 x Forest to be Cleared (J).	M=0
N.	*Credit for Retention Above the Conservation Threshold* If the area of Forest to be Retained (K) is greater than the Conservation Threshold (E), Then N = K – E	N= 0
P.	*Total Reforestation Required* P = L + M – N	P= 0
Q.	*Total Afforestation Required* If Existing Forest Cover (F) is less than the Afforestation Threshold (D), then Q = Afforestation Threshold (D) – Existing Forest Cover (F)	Q= 0
R.	*Total Planting Requirement* R = P + Q	R= 0
Forest Conservation Worksheet		C:5



GENERAL NOTES:

1. FCE SIGNS MUST BE PLACED EVERY 50' AROUND THE ENTIRE LIMIT OF THE FCE.
2. THERE ARE NO RARE, THREATENED, OF ENDANGERED SPECIES RECORDED ON THIS SITE.
3. ALL LOTS WILL BE SERVED BY PUBLIC WATER AND PUBLICSEWER.
4. DUE TO SITE TOPOGRAPHY AND OTHER CONSTRAINTS, THE PROPOSED CLEARED AREAS OF THE FOREST CANNOT BE SAVED.
5. OVERALL AN AREA OF 1.10 ACRES OF FOREST IS PROTECTED AND WILL NOT BE DISTURBED.
6. THE RETAINED AREA OF FOREST CONSERVATION IS SUFFICIENT AND NO ADDITIONAL PLANTING IS REQUIRED (SEE FOREST CONSERVATION WORK SHEET).
7. THE FOREST CONSERVATION OBLIGATION INCURRED BY THIS PROJECT HAS BEEN SATISFIED WITH THE RETENTION OF 1.10 ACRE CREDITED EASEMENT AND 0.14 ACRE OF NON-CREDITED EASEMENT WHICH MEETS THE BREAK-EVEN POINT OBLIGATION OF 1.10 ACRES FOR THIS SITE. FOREST CONSERVATION SURETY IN THE AMOUNT OF $9,583 WILL BE POSTED FOR THIS PROJECT.
8. THE FOREST CONSERVATION EASEMENT HAS BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE AND THE FOREST CONSERVATION MANUAL. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT, HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.

SPECIMEN TREE(ST)#	COMMON NAME	BOTANICAL NAME	SIZE DBH	CONDITION	
1	BLACK WALNUT	JUGLANS NIGRA	32.5"	GOOD	TO BE REMOVED
2	BLACK WALNUT	JUGLANS NIGRA	33.5"	GOOD	TO BE REMOVED
3	BLACK WALNUT	JUGLANS NIGRA	43.5"	GOOD	TO BE REMOVED
4	GREEN ASH	FRAXINUS PENNSYLVANICUS	35"	FAIR	TO REMAIN
5	TULIPTREE	LIRIODENDRON TULIPIFERA	35"	FAIR	TO REMAIN
6	BLACK WALNUT	BLACK WALNUT	35.5"	GOOD	TO BE REMOVED
7	TULIPTREE	LIRIODENDRON TULIPIFERA	40"	GOOD	TO REMAIN
8	RED OAK	QUERCUS RUBRA	47"	GOOD	TO REMAIN

CONSTRUCTION PERIOD PRACTICES

The construction period extends from final approval of the development proposal until the release of all required guarantees specified for forest conservation requirements in the developers agreement.

Construction Period Supervision

As part of the construction period management and planting program, the developer shall designate an individual or firm to be fully responsible for implementing the requirements of the approved forest conservation plan or requesting modifications of previously approved requirements concerning planting techniques, species or maintenance needs. Those responsible for implementation of the approved forest conservation plan during the construction period shall conform to the professional qualifications cited in *Chapter VI* of this manual.

Protecting and Managing Forest Retention Areas

Forest retention stands are extremely vulnerable to damage, long term decline, and death stemming from improper design and construction practices. Saving forests and specimen trees during the construction process requires site planning, engineering practices and construction methods that respect the biological needs of trees. A few fundamental horticultural principals are the basis of the protection guidelines and requirements cited in this manual:

- A tree's root system can be large, extending well beyond the dripline of the crown. Typically, root systems are very shallow, in most cases being only 12" - 18" deep.
- Trees generally do not have tap roots.
- There are about as many roots as there are twigs and branches. If roots die, branches will die to keep the tree in balance.
- Tree roots need a balance of water and air in the soil. Air only penetrates 12" - 18" into the soil. Stress and decline in tree health results when soil is piled on top of existing roots or roots are suddenly forced to sit in waterlogged soil or overly dry soils due to topography changes during construction.
- Soil compacted to bulk densities of 1.7 gram/cubic centimeters or greater cannot support root growth. Existing roots in heavily compacted soils usually die.
- Trees growing in disturbed or tilled soils usually die back in proportion to the root area disturbed. Even minor disturbances such as tilling within the root zone for lawn installation will cause harm.
- Trees, especially large trees, may take a long time to show the effects of construction damage. Trees may die 5 or even 10 years after being weakened by construction activity. Secondary stresses such as insects, disease, or drought may kill weakened trees while the same stress would not have affected a healthy tree.

Soil Protection Zone

The soil protection zone must be protected from construction activity and other stresses (e.g. flooding) to protect the forest stand from damage. The forest retention practices for a development must address the specific needs and stresses the proposal may cause. Nevertheless, the need to define the soil protection zone (critical root area) for forest areas is the one factor common to all retention efforts.

The extent of the root system is quite large. The ratio of root expansion to crown spread can be 2:1 or larger on open grown specimen trees and can be significantly larger (up to 5:1) for trees growing in the interior of forest stands. Furthermore, the minimum requirement for root protection varies from species to species and from soil type to soil type. For open grown trees, it is generally accepted that protecting the soil within the dripline of the tree is adequate to save the tree in most cases. For trees that have been part of forest communities, however, the soil protection zone may have to be modified to reflect a more complex relationship between crown spread and root growth.

Techniques for management of the soil protection zone are described in detail in *Appendix G*.

Best Management Practices During Construction

Many of the construction period measures cited in the manual are for areas that should not be disturbed. The desire to protect areas within the limit of disturbance can be easily nullified by poor construction site management. The required construction period management program must therefore specify how construction activities will be managed to protect forest retention areas. The following should be depicted on site construction documents and/or forest conservation plans; they shall also be itemized in the developers agreement.

- storage of equipment and materials
- disposal of construction debris
- washing of equipment, disposal of wastewater from concrete operations, etc.
- employee parking
- temporary structures such as trailers, sanitary facilities, etc.

Unless specifically exempted by the approved forest conservation plan, any use of forest retention areas for these activities or other intrusions shall be a violation of the approved forest conservation plan.

Because reforestation and afforestation typically may involve disturbances greater than 5,000 square feet, proper sediment and erosion controls may be required. Developers should refer to the Howard County Soil Conservation District for current standards, specifications and requirements. It may be necessary to protect forest retention areas from erosion and sedimentation caused by implementation of reforestation or afforestation plantings.

Certification of Completion

At the end of the construction period, the designated qualified professional shall convey to the Department of Planning And Zoning certification that all forest retention areas have been preserved, all reforestation and afforestation plantings have been installed as required by the forest conservation plan, and that all protection measures required for the post-construction period have been put in place. *Appendix J* contains a sample format for such certification. Planting must occur before June 30th to be credited toward the current growing season.

Upon review of the certification document for completeness and accuracy, the Department will notify the developer of the beginning of the post-construction management period.

PRIVATE USE-IN-COMMON NOTE:
PRIVATE USE-IN-COMMON DRIVEWAY SHALL BE FOR THE BENEFIT OF LOTS 2,4,5, OPEN SPACE LOTS 6,7, AND THE POTENTIAL FUTURE USE FOR PARCEL 281.

OWNER/DEVELOPER
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TEL.: 410-382-9180 FAX: 410-296-0505
mirzadi@aceengineers.biz

REVISIONS

DESCRIPTION	BY	DATE

TITLE: FOREST CONSERVATION PLAN
PRELIMINARY EQUIVALENT SKETCH PLANS
SHAMS SUBDIVISION
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

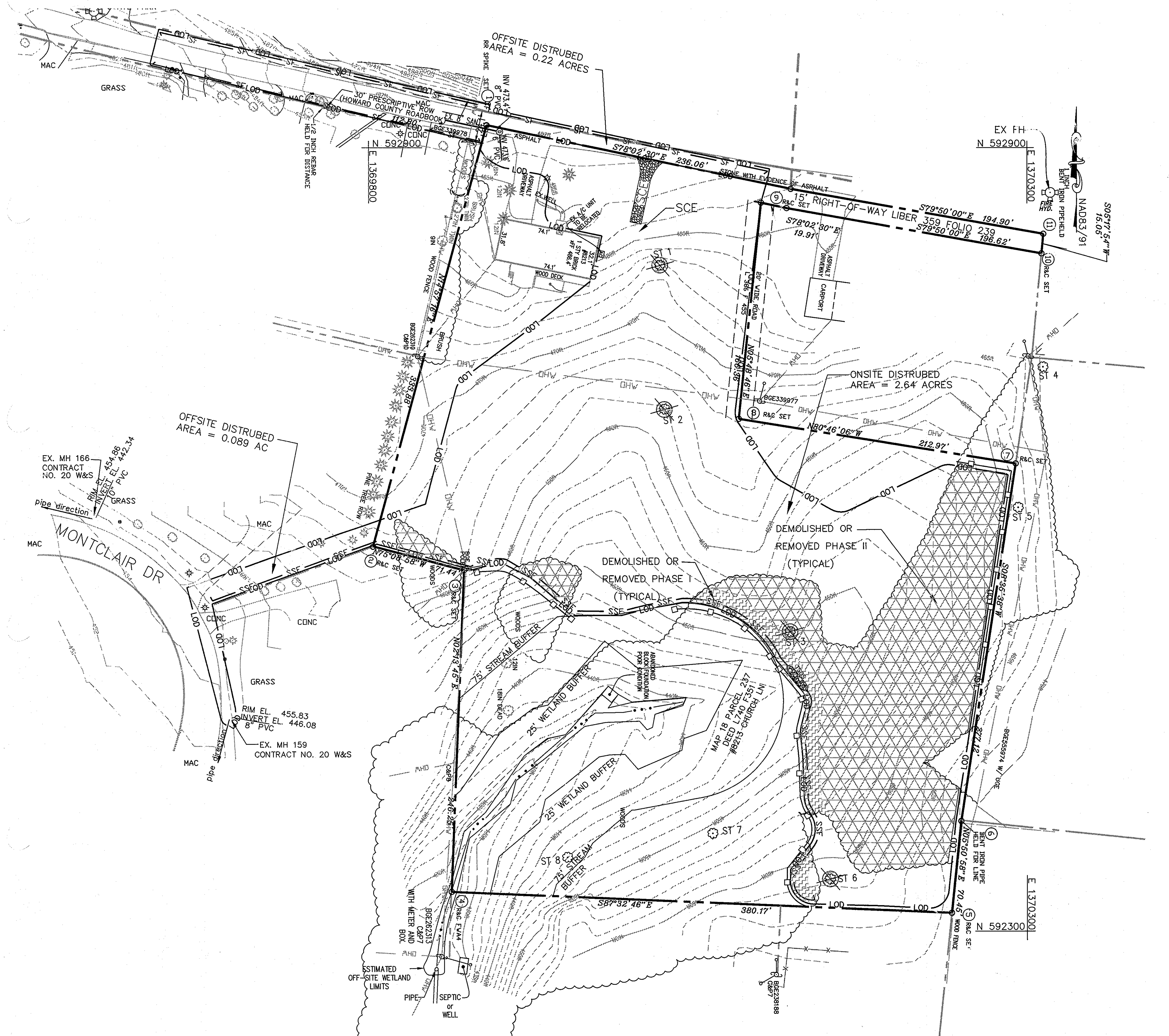
10/22/08

DRAWN BY: TH
CHECKED BY: MI
SCALE: 1"=40'

DATE: 09-18-2008

SHEET 12 OF 14

HOWARD CO. FILE NO. SP-08-007

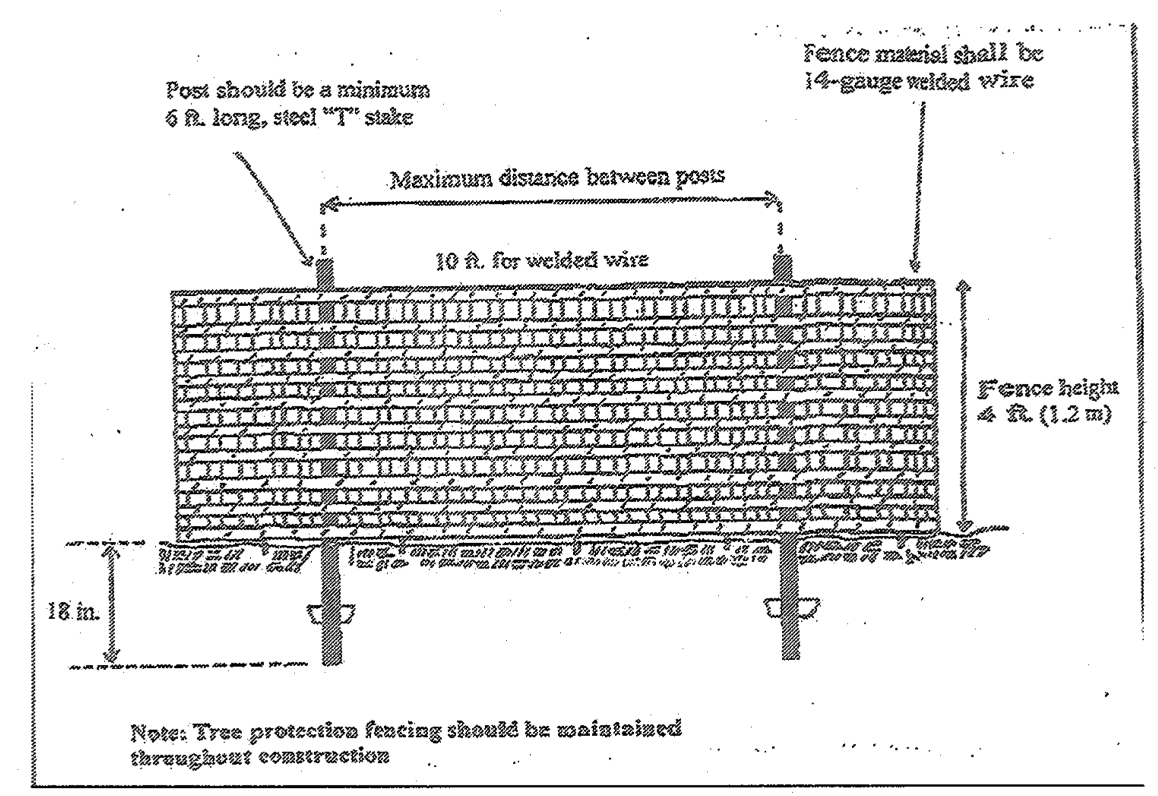


LEGEND

- EXISTING PROPERTY LINE
- PROP PROPERTY LINE
- EXISTING CONTOUR
- PROP CONTOUR (456)
- SPOT ELEVATION (X 456)
- TREE LINES
- EXISTING TREES
- DEMOLISHED OR REMOVED PHASE I
- DEMOLISHED OR REMOVED PHASE II
- EROSION CONTROL MATTING
- TEMPORARY STONE OUTLET STRUCTURE (PER MDE PAGE C-11-2) (TSOS)
- STONE CHECKDAM
- SILT FENCE (SF)
- SUPER SILT FENCE (SSF)
- STABILIZED CONSTRUCTION ENTRANCE
- (LOD) LIMITS OF DISTURBANCE
- TREE PROTECTION FENCE

DRAWING NOTES

1. ONLY THE MINIMUM CLEARING AREA NECESSARY TO INSTALL THE PERIMETER CONTROL DEVICES SHALL BE CLEARED AT THIS PHASE. (PHASE I DEMOLITION)
2. THE DEMOLITION OF EXISTING FEATURES AND STRUCTURES SHALL BE CONDUCTED IN A MANNER THAT MINIMIZES THE IMPACT ON INDIVIDUAL TREES AND GROUPS OF TREES TO BE PRESERVED.
3. AFTER COMPLETION OF PHASE I DEMOLITION, INSTALL PERIMETER CONTROL DEVICES. PHASE II DEMOLITION SHALL BE PERFORM AFTER PERIMETER CONTROL DEVICES OR INSTALLED AND APPROVED BY HOWARD COUNTY INSPECTOR.
4. TREES TO BE PRESERVED ON THIS SITE WILL REQUIRE PROTECTION AND CARE THROUGHOUT THE CONSTRUCTION PHASE. THE TREE PROTECTION FENCE SHALL CONSIST OF FOUR-FOOT HEIGHT, 14-GUAGE WELDED WIRE ATTACHED TO A SIX FOOT STEEL POST, DRIVEN 18" INTO THE GROUND AND PLACE NO MORE THAN 10' APART. THIS FENCE SHALL BE ERECTED AT THE LIMITS OF CLEARING AND GRADING.
5. SEE SEQUENCE OF CONSTRUCTION ON NEXT SHEET.



TREE PROTECTION FENCE
INSTALLATION DETAIL

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR (signed) 10/23/08 DATE

OWNER/DEVELOPER

PIRZADEH A. SHAMS
GITI SHAMS
805 STAGES HEAD ROAD
TOWSON, MD 21286
(410) 419-9229

THIS SHEET IS FOR EROSION AND SEDIMENT CONTROL PURPOSES ONLY

Advanced Engineering Consultants, PC.
Engineers & Planners
P.O.BOX129 RIDERWOOD,MD 21139
TEL.: 410-382-9180 FAX: 410-296-0505
mizadi@aec-engineers.biz

AEC

REVISIONS		
DESCRIPTION	BY	DATE

TITLE: SEDIMENT & EROSION CONTROL PHASE I
PRELIMINARY EQUIVALENT SKETCH PLANS
SHAMS SUBDIVISION
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

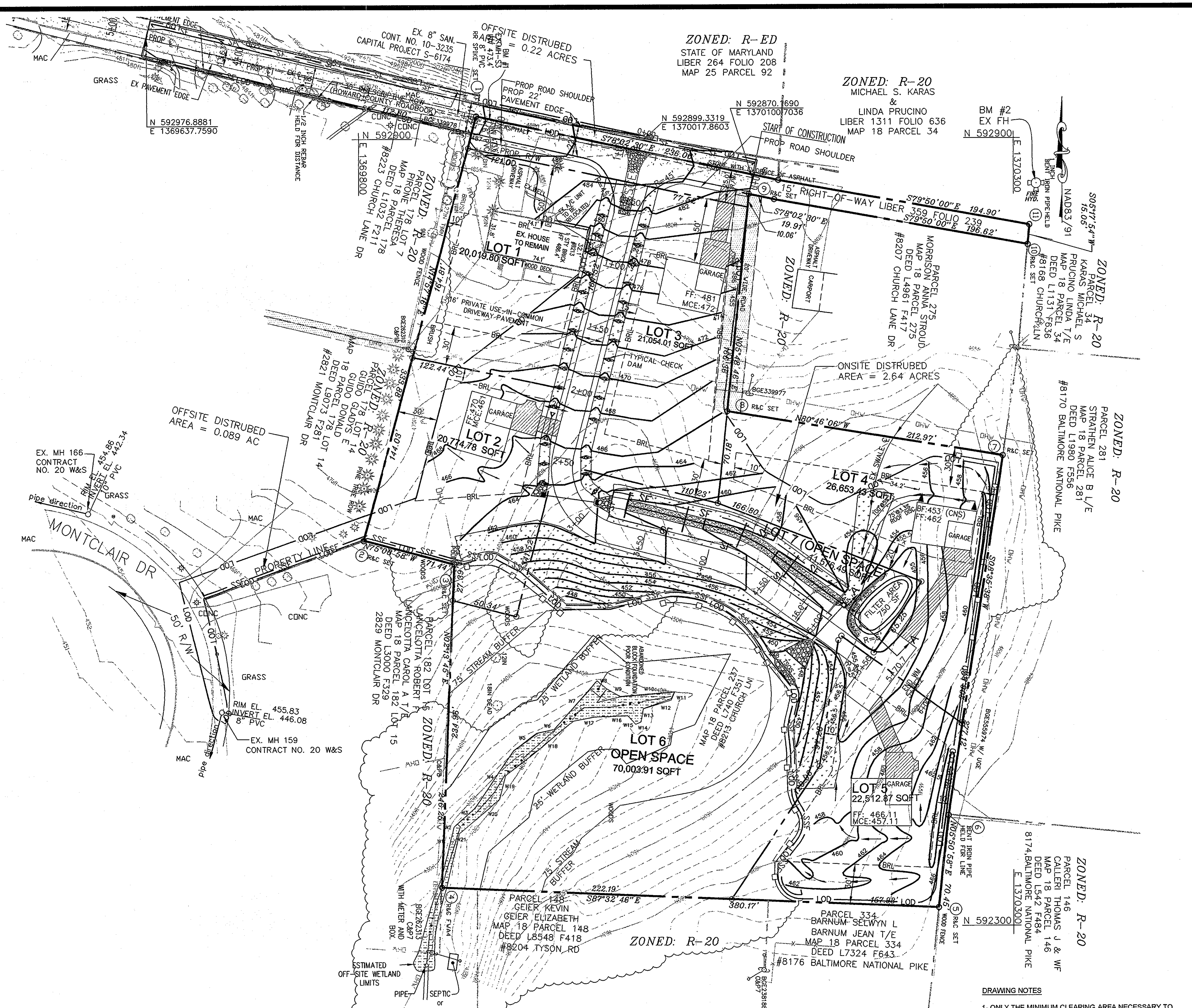
(Seal: STATE OF MARYLAND, MOSTAFA IZADI, PROFESSIONAL ENGINEER 17243) 9/18/08

DRAWN BY: TH
CHECKED BY: MI
SCALE: 1"=40'

DATE: 09-18-2008

SHEET 13 OF 14

HOWARD CO. FILE NO. SP-08-007



LEGEND

EXISTING PROPERTY LINE	
PROP PROPERTY LINE	
EXISTING CONTOUR	
PROP CONTOUR	456
SPOT ELEVATION	X 456
TREE LINES	
EXISTING TREES	
DEMOLISHED OR REMOVED PHASE I	
DEMOLISHED OR REMOVED PHASE II	
EROSION CONTROL MATTING	
TEMPORARY STONE OUTLET STRUCTURE (PER MDE PAGE C-11-2)	TSOS
STONE CHECKDAM	
SILT FENCE	SF
SUPER SILT FENCE	SSF
STABILIZED CONSTRUCTION ENTRANCE	SCE
(LOD) LIMITS OF DISTURBANCE	LOD
TREE PROTECTION FENCE	

CONSTRUCTION NOTES:

1. EROSION AND SEDIMENT CONTROL WILL BE PLACED ON THE DOWNHILL SIDE OF THE L.O.D. AT THE END OF EACH WORK DAY AROUND ANY AREA THAT HAS BEEN GRADED BUT NOT ROLLED.
2. THE RECYCLED CONCRETE – 6 (RC–6) CAN CONTAIN NO METAL.

SEQUENCE OF CONSTRUCTION:

1. OBTAIN A GRADING PERMIT.
2. NOTIFY "MISS UTILITY" AT LEAST 48 HOURS BEFORE BEGINNING ANY WORK AT 1-800-257-7777. NOTIFY THE HOWARD COUNTY OFFICE OF CONSTRUCTION/INSPECTION AT 410-313-1330 24 HOURS BEFORE STARTING WORK.
3. INSTALL CONSTRUCTION ENTRANCE(SCE).
4. INSTALL ALL TREE PROTECTION FENCE FOR TREES TO BE UNDISTURBED AS INDICATED ON THE PLANS (2 DAYS). CLEAR AND GRUB ONLY FOR INSTALLATION OF STABILIZED CONSTRUCTION ENTRANCE AND THE PRIMETER SEDIMENT AND EROSION CONTROL DIVISES. (2 WEEKS)
5. INSTALL SUPER SILT FENCE AND ASSOCIATED SILT FENCE AS INDICATED ON THE PLANS. NO BLASTING WILL BE PERMITTED FOR THE EXCAVATION OF SEDIMENT BASIN/SWM POND EMBANKMENT. WHERE NECESSARY, RIPPING AND JACK HAMMERING SHOULD BE UTILIZED IN THE EXCAVATION OF THE FACILITY. (2 WEEKS)
6. RECEIVE PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR PRIOR TO PROCEEDINGS. CLEAR AND GRUB FOR REMAINING SEDIMENT CONTROL MEASURES. INSTALL REMAINING SEDIMENT CONTROL MEASURES, EARTH DIKES, SILT FENCE, AND THE DRAINAGE SWALES ALONG THE PROPERTY BOUNDARY AS INDICATED ON THE PLANS. (1 WEEKS)
7. RECEIVE PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR PRIOR TO PROCEEDINGS. CLEAR AND GRUB THE REMAINDER OF THE SITE. (3 DAYS)
8. GRADE SITE TO THE PROPOSED SUB-GRADE AND INSTALL THE SEWER AND WATER ALONG WITH THE STORM DRAIN SYSTEM AND BMP FACILITIES. STABILIZE ALL SLOPES IMMEDIATELY UPON COMPLETION OF GRADING. (6 WEEKS)
9. THE PRIMETER SILT FENCE AROUND BMP FACILITIES CANNOT BE REMOVED UNTIL THE SITE IS FULLY STABILIZED AND GRASS IS GROWING AND THERE IS NO CHANCE OF SEDIMENT ENTERING THE FACILITIES.
10. CONSTRUCT THE ROAD BASE COURSE. (2 WEEKS)
11. WHEN ALL CONTRIBUTION AREAS TO THE SEDIMENT CONTROL DEVICES AND THE BMP FACITILIES HAVE BEEN STABILIZED AND WITH THE PERMISSION OF THE SEDIMENT CONTROL INSPECTOR. THE DEVICES MAY BE REMOVED AND/OR BACKFILLED AND THE REMAINING AREAS BROUGHT TO FINAL DESIGN GRADE. STABILIZE ALL REMAINING AREAS IN ACCORDANCE WITH PERMANENT SEEDING NOTES. (2 WEEKS)
12. NOTIFY HOWARD COUNTY OFFICE OF INSPECTIONS AND PERMITS FOR FINAL INSPECTION OF THE COMPLETED PROJECT.

DRAWING NOTES

1- ONLY THE MINIMUM CLEARING AREA NECESSARY TO INSTALL THE PERIMETER CONTROL DEVICES SHALL BE CLEARED IN PHASE I .

2- THE DEMOLITION OF EXISTING FEATURES AND STRUCTURES SHALL BE CONDUCTED IN A MANNER THAT MINIMIZES THE IMPACT ON INDIVIDUAL TREES AND GROUPS OF TREES TO BE PRESERVED.

3- TREES TO BE PRESERVED ON THIS SITE WILL REQUIRE PROTECTION AND CARE THROUGHOUT THE CONSTRUCTION PHASE. THE TREE PROTECTION FENCE SHALL CONSIST OF FOUR-FOOT HEIGHT, 14-GUAGE WELDED WIRE ATTACHED TO A SIX FOOT STEEL POST, DRIVEN 18" INTO THE GROUND AND PLACE NO MORE THAN 10' APART. THIS FENCE SHALL BE ERECTED AT THE LIMITS OF CLEARING AND GRADING.

TENTATIVELY APPROVED
DEPARTMENT OF PLANNING AND ZONING
HOWARD COUNTY

PLANNING DIRECTOR — DATE 10/23/08

OWNER/DEVELOPER
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REVISIONS		
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TITLE: SEDIMENT & EROSION CONTROL PHASE II
PRELIMINARY EQUIVALENT SKETCH PLANS
SHAMS SUBDIVISION
PARCEL NO 237
ELECTION DISTRICT 02
TAX MAP #18, GRID 14
HOWARD COUNTY, MARYLAND.

BOARD FOR PROFESSIONAL ENGINEERS — MOSTAFA IZADI — 17248 — STATE OF MARYLAND
10/22/08

DRAWN BY: TH
CHECKED BY: MI
SCALE: 1"=40'

DATE: 09-18-2008

SHEET 14 OF 14

HOWARD CO. FILE NO. SP-08-007