FINAL PLAN
FOR
SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"

GENERAL NOTES

1. THIS PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
2. ZONING: SITE IS BEING DEVELOPED UNDER THE AMENDED 5TH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS FOR RA-15 (INCLUDING THE SUPPLEMENTARY REGULATIONS FOR TRADITIONAL RESIDENTIAL NEIGHBORHOODS), B-1, POR. THIS PLAN IS SUBJECT TO THE AMENDED ZONING REGULATIONS PER CB-75-2003.
4. WETLAND DELINEATION BY EXPLORATION RESEARCH, INC. JURISDICTIONAL DETERMINATION AND VERIFICATION OF DELINEATION OF WATERS OF THE U.S. BY U.S. ARMY CORPS OF ENGINEERS ON 3/28/03. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN WETLANDS, STREAMS OR THEIR REQUIRED BUFFERS, AND THE FLOODPLAIN UNLESS APPROVED BY DPZ AS NECESSARY DISTURBANCES OR WAIVERS HAVE BEEN APPROVED. THE DEPARTMENT OF PLANNING AND ZONING HAS DETERMINED THAT THE PROPOSED ROAD CROSSING LOCATED WITHIN THE ENVIRONMENTAL FEATURES AND BUFFERS ARE CONSIDERED NECESSARY ROAD DISTURBANCES IN ACCORDANCE WITH SECTION 16.116(C) OF THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. SEE WP 04-105 FOR PERMITTED DISTURBANCES..
5. INFORMATION CONCERNING UNDERGROUND UTILITIES WAS OBTAINED FROM BEST AVAILABLE RECORDS. THE CONTRACTOR MUST DETERMINE THIS EXACT LOCATION AND ELEVATION OF THE MAINS BY DIGGING TEST PITS BY HAND AT ALL CROSSINGS WELL IN ADVANCE OF CONSTRUCTION. ANY DISCREPANCIES MUST BE COMMUNICATED TO THE ENGINEER AT ONCE.
6. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY AND MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
7. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS / DIVISION OF CONSTRUCTION INSPECTION AT 1 (410) 313-1880 AT LEAST (5) DAYS PRIOR TO THE START OF WORK.
8. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST (5) WORKING DAYS BEFORE STARTING WORK SHOWN ON THE PLANS.

MISS UTILITY	1-800-257-7777
VERIZON	1-800-446-5266
HOWARD COUNTY BUREAU OF UTILITIES	400-313-4900
AT&T CABLE LOCATION DIVISION	393-3553
BALTIMORE GAS & ELECTRIC	410-850-4620 & 410-787-9068

9. TRENCH COMPACTION FOR STORM DRAINS WITHIN ROADS AND STREET RIGHT-OF-WAYS LIMITS SHALL BE IN ACCORDANCE WITH "HOWARD COUNTY DESIGN MANUAL", VOL. IV STANDARD G-2.01.
10. SEDIMENT CONTROL SHALL BE PROVIDED IN ACCORDANCE WITH "1994 MARYLAND STANDARDS AND SPECIFICATION FOR SOILS EROSION AND SEDIMENT CONTROL."
11. COMPACTION FILL AREAS SHALL BE IN ACCORDANCE WITH AASHTO T-180 OR AS APPROVED IN THE DESIGN MANUAL VOLUME IV.
12. LANDSCAPING HAS BEEN PROVIDED FOR STORMWATER MANAGEMENT FACILITIES B & C IN ACCORDANCE WITH SCHEDULE A MDE 2000.
13. A FOREST STAND DELINEATION PLAN WAS SUBMITTED AND APPROVED FOR THE AREA COVERED BY THIS PLAN UNDER S-04-09. FOREST CONSERVATION PLANS ARE BEING SUBMITTED UNDER THIS PLAN SEE SHEETS 22 & 23.
14. A SIGHT DISTANCE ANALYSIS WAS PROVIDED AND APPROVED WITH THE SKETCH PLAN S-04-09.
15. TRAFFIC STUDY HAS BEEN SUBMITTED AS PART OF THE PRELIMINARY PLAN FOR PHASE I.
16. THIS PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
17. THE CEMETERY INVENTORY MAPS DO NOT SHOW ANY CEMETERIES WITHIN THE PROJECT LIMITS. HOWEVER, A CEMETERY DOES EXIST ON THE NORTHERN CORNER OF THE ADJACENT CURTIS PROPERTY.
18. THE SCENIC ROADS MAP DOES NOT INDICATE ANY SCENIC ROADS WITHIN OR ADJACENT TO THE PROJECT LIMITS.
19. AERIAL TOPOGRAPHY BY MCKENZIE SNYDER, INC. ON 3/23/03. TOPOGRAPHY NW OF MD ROUTE 108 PROVIDED BY HO. CO.
20. BOUNDARY INFORMATION IS FROM BOUNDARY SURVEYS BY GUTSCHICK, LITTLE, AND WEBER, P.A., DATED MAY, 2003.
21. EXISTING UTILITIES WERE TAKEN FROM AVAILABLE HOWARD COUNTY RECORDS.
22. THIS PROPERTY IS WITHIN THE METROPOLITAN DISTRICT.
23. PUBLIC WATER AND SEWER TO BE UTILIZED.
24. THE COORDINATES SHOWN HEREON ARE BASED UPON HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON MARYLAND STATE PLANE, NAD '83, MARYLAND-1900, U.S. SURVEY FT. COORDINATE SYSTEM. HOWARD COUNTY MONUMENT Nos. 31GA AND 37A4 WERE USED FOR THIS PROJECT.
25. INFORMATION FOR THE 100-YEAR FLOODPLAIN TAKEN FROM THE FLOOD PLAIN STUDY PREPARED BY GUTSCHICK, LITTLE, AND WEBER, P.A. IN JULY, 2005.
26. THE HYDRAULIC PARAMETERS OF STORMWATER MANAGEMENT POND 'A' HAVE BEEN DESIGNED UNDER THIS PLAN TO ENABLE STUDY POINT EVALUATION AND THE DESIGN OF POND 'C'. THE DESIGN AND DETAILS FOR POND 'A' ARE TO BE FINALIZED UNDER THE PHASE I PLANS FOR THIS SITE. POND 'A' IS TO PROVIDE WQv AND Cpv IN ADDITION TO ASSISTING POND 'C' WITH 1-YR ATTENUATION AT STUDY POINT 2. THE Rev REQUIREMENT FOR POND 'A' IS TO MEET OR EXCEED THE VALUE AS DESCRIBED IN GENERAL NOTE 27. POND 'A' IS TO BE A NON-MD378 FACILITY. POND 'A' IS TO BE PRIVATELY OWNED AND MAINTAINED.

   STORMWATER MANAGEMENT POND 'B' IS A WET EXTENDED DETENTION POND (TYPE P-4). POND 'B' HAS BEEN DESIGNED TO PROVIDE WQv, Cpv, 1-YR ATTENUATION, AND SAFE PASSAGE OF THE 100-YR STORM. POND 'B' IS A MD-378 HAZARD CLASS A POND. POND 'B' IS TO BE PUBLICLY OWNED. POND 'B' IS TO BE MAINTAINED JOINTLY BY HOWARD COUNTY AND THE HOA.

   STORMWATER MANAGEMENT POND 'C' IS A POCKET WETLAND (TYPE W-4). POND 'C' HAS BEEN DESIGNED TO PROVIDE WQv, Cpv, 1-YR ATTENUATION, AND SAFE PASSAGE OF THE 100-YR STORM. POND 'C' IS A MD-378 HAZARD CLASS A FACILITY. POND 'C' IS TO BE PUBLICLY OWNED. POND 'C' IS TO BE MAINTAINED JOINTLY BY HOWARD COUNTY AND THE HOA.
27. THE RECHARGE (Rev) REQUIREMENT FOR SHIPLEY'S GRANT PARCELS A, B, & C IS TO BE PROVIDED BY INFILTRATION TRENCHES LOCATED ON EACH RESPECTIVE PARCEL. THE DESIGN AND DETAILS OF THE INFILTRATION TRENCHES ARE TO BE FINALIZED UNDER THE FUTURE PHASED PLANS FOR THIS SITE. THE INFILTRATION TRENCH STORAGE VOLUME IS TO BE SIZED TO PROVIDE A MINIMUM OF 703 CU-FT PER ACRE OF DEVELOPED AREA.
28. PARCELS 'A' AND 'C' ARE NON-BUILDABLE PARCELS THAT MEET THE INTENT OF SUBDIVISION REGULATIONS SECTION 16 EXCEPT SECTION 16.119(f)(1) WHICH REQUIRES ACCESS TO AN ARTERIAL ROADWAY BY A LOWER CLASSIFICATION ROAD (WAIVER SUBMITTED). PARCELS 'B', AND 'E' ARE PARCELS THAT MEET THE INTENT OF THE SUBDIVISION REGULATION SECTION 16 EXCEPT SECTION 16.120(c)(1) WHICH REQUIRES MINIMUM FRONTAGE ON LOTS ON AN APPROVED PUBLIC ROADWAY (WAIVER SUBMITTED) AND SECTION 16.131(b) WHICH REQUIRES COMMUNITY SEWERAGE AND WATER SUPPLY SYSTEMS BE PROVIDED. PARCEL 'D' IS A NON-BUILDABLE PARCEL THAT MEETS THE INTENT OF SUBDIVISION REGULATIONS SECTION 16 EXCEPT SECTION 16.131(b) WHICH REQUIRES COMMUNITY SEWERAGE SYSTEMS BE PROVIDED. ALL REQUIRED ACCESS AND WATER AND SEWER SERVICES WILL BE PROVIDED BY PLANS PROCESSED BY EACH ANNUAL PHASE. NON-BUILDABLE PARCELS WILL BE CONVERTED TO BUILDABLE PARCELS WHEN THESE PUBLIC IMPROVEMENTS ARE PROVIDED.
29. (2) TO FULFILL THE FOREST CONSERVATION REQUIREMENTS OF THIS SITE, AT LEAST 1.48 ACRES OF RETENTION AND 7.04 ACRES OF AFFORESTATION ARE REQUIRED. THIS REQUIREMENT IS ADDRESSED BY PROVIDING 1.48 ACRES OF NET TRACT FOREST RETENTION, 1.57 ACRES OF NON-CREDITED FOREST RETENTION WITHIN THE FLOODPLAIN AND 5.74 ACRES OF ON-SITE FOREST PLANTING. THE OUTSTANDING FOREST CONSERVATION OBLIGATION OF 1.30 ACRES OF AFFORESTATION SHALL BE MET BY PROVIDING 1.30 ACRES OF OFF-SITE AFFORESTATION OR 2.60 ACRES OF OFF-SITE RETENTION BEFORE THE LAST PHASE OF THE PROJECT CAN OBTAIN APPROVAL BY THE DPZ.
30. THE REQUIRED IMPROVEMENTS TO MARYLAND ROUTE 108 (INCLUDING STREET TREES AND SIDEWALKS) SHALL BE PROCESSED, APPROVED AND BONDED THROUGH THE APPROPRIATE STATE AGENCIES IN ACCORDANCE WITH THE APPROVED PHASING INDICATED IN THE TRAFFIC IMPACT ANALYSIS AND THE REQUIRED SUBSEQUENT RESUBDIVISION PLANS/PLATS.
31. EXECUTED SEWER, GRADING, STORM WATER MANAGEMENT, DIRECTIONAL BORING AND SIGNAGE EASEMENT AGREEMENT DATED 7/17/06 BETWEEN BA WATERLOO TOWNHOMES, LLC AND DEEP RUN PROPERTY MANAGEMENT, LLC ALLOWS GRADING ACROSS PARCEL B AND PARCEL E (PHASE TWO PROPERTY) AS SHOWN ON THESE PLANS. ADDITIONALLY, GRADING WITHIN THE 20-FOOT PRIVATE REVERTIBLE GRADING EASEMENTS INDICATED ON THE LOIS LUCILLE REVOCABLE TRUST PROPERTY IS ALLOWED BY AN EXECUTED RETAINING WALL AND REVERTIBLE GRADING EASEMENT AGREEMENT DATED 7/17/06. EXECUTED AGREEMENT OF SALE DATED 10/13/05 AND AMENDED ON 7/17/06 BETWEEN BOZZUTO HOMES, INC. AND BAVAR PROPERTIES GROUP, LLC ALLOWS GRADING ACROSS PARCEL AS SHOWN ON THESE PLANS.
32. FOREST CONSERVATION SURETY IN THE AMOUNT OF $137,910.96 FOR THE FIVE FOREST CONSERVATION EASEMENTW WILL BE POSTED AS A PART OF THE DEVELOPER'S AGREEMENTS.
33. LANDSCAPE SURETY IN THE AMOUNT OF $18,450.00 WILL BE POSTED AS A PART OF THE DEVELOPER'S AGREEMENTS.

The 5.74 ac. of on-site afforestation is hereby reduced to 5.68 ac. as a result of a revision to reduce the area of Forest Conservation easement No. 2A (currently easement 2E), reduce the area of Forest Conservation easement No. 4 (Currently Easement 4A, 4B, 4C & 4D) and correct the afforestation area within forest conservation easement No. 7. An abandonment fee was required for the 0.06 ac. of abandoned afforestation in the existing forest conservation easement. No abandonment fee was required for the 0.01 ac. of noncredited retention removed from easement No. 4. The abandonment fee of $7,267 was paid with F-10-060 to the Howard County Forest Conservation Fund. The 5.68 ac. on-site afforestation is hereby reduced to 5.60 ac. as a result of a revision to reduce the area of forest conservation easement No. 5. An abandoment fee was required for the 0.08 ac. of abandonment afforestation in the existing forest conservation easement. The abandoment fee of $4,275 was paid with a resubdivision F-14-0XX to the Howard County Forest Conservation Fund. The 1.70 ac. of off-site afforestation is provided by an approved forest conservation plan and plat of forest conservation easement (F-11-026 FC) entitled Hobart Mullineaux Property and recorded as Plat No. 21723. Surety in the amount of $28,714 has been posted as a part of the F-11-026 DPW Developer's agreement for off-site 1.70 ac. afforestation: FCE #7 located on Hobart Mullineaux Property, TM Par. 15, TM 6, Grid 8 as shown on F-11-126 (FC)

SITE OVERVIEW

SCALE: 1" = 400'

*ON JULY 14, 2004, WP 04-105, A WAIVER OF SECTION 16.120.C.(4) WAS GRANTED WHICH REQUIRES SINGLE FAMILY ATTACHED LOTS TO HAVE AT LEAST 15' OF FRONTAGE ONTO A PUBLIC ROAD RIGHT-OF-WAY; SECTION 16.119.E.(5), WHICH REQUIRES TRUNCATION OF PUBLIC ROAD RIGHT-OF-WAY BOUNDARIES WHERE PUBLIC ROADS INTERSECT (AT CORNER LOTS); AND SECTION 16.116.A.2.(1) WHICH PROHIBITS DISTURBANCE TO STREAMS AND STREAM BUFFERS, TO ALLOW CONSTRUCTION OF TWO PEDESTRIAN BRIDGES TO CROSS THE STREAMS. SUBJECT TO THE FOLLOWING 2 CONDITIONS IN THE APPROVAL LETTER:
1. THE DISTURBANCE TO THE STREAM AND STREAM BUFFER RELATED TO THE PEDESTRIAN BRIDGES SHALL BE MINIMIZED. THE PRELIMINARY PLAN SHALL SHOW THE LIMIT OF DISTURBANCE AND PROPOSED GRADING ASSOCIATED WITH THE BRIDGES, AND SHALL BE SUBJECT TO REVIEW AND APPROVAL BY THE SUBDIVISION REVIEW COMMITTEE.
2. IF IT IS DETERMINED BY THE DED THAT SIGHT DISTANCE IS INADEQUATE AT THE INTERSECTIONS FOR WHICH TRUNCATION AS WAVED, THEN THE APPROPRIATE EASEMENTS MUST BE ADDED TO THE PLAN/PLAT.

(**) ON MARCH 23, 2006, WP-06-45, APPROVED THE WAIVERS FOR THE FOLLOWING: SECTION 16.116(a)(1) REQUEST TO BE PERMITTED TO GRADE WITHIN 25 FEET OF A WETLAND; SECTION 16.116(a)(2)(ii), REQUEST TO BE PERMITTED TO GRADE WITHIN 75 FEET OF A PERENNIAL STREAM; SECTION 16.119(f)(1), REQUEST TO BE PERMITTED TO OBTAIN VEHICULAR ACCESS FROM MINOR ARTERIAL ROAD INSTEAD OF A LESSER CLASSIFICATION ROAD FOR A PROPOSED SUBDIVISION THAT FRONTS ON MINOR AND PRINCIPLE ARTERIAL ROADS AND LOCAL ROAD; SECTION 16.120(c)(1), REQUEST TO BE PERMITTED TO CREATE COMMERCIAL AND APARTMENT/MULTIFAMILY PARCELS WITHOUT A MINIMUM OF 60 FEET OF FRONTAGE ON AN APPROVED PUBLIC ROAD, AND SECTION 16.114.(f) REQUEST TO BE PERMITTED TO NOT SUBMIT AND OBTAIN APPROVAL OF THE REQUIRED PRELIMINARY PLAN FOR A MAJOR SUBDIVISION BEFORE SUBMITTING THE REQUIRED FINAL PLAN/PLAT. SUBJECT TO THE FOLLOWING 4 CONDITIONS IN THE APPROVAL LETTER:
1. COMPLIANCE WITH THE DED COMMENTS OF 2/14/06
2. THE STREAM AND WETLAND BUFFERS SHALL BE AFFORESTED IN ACCORDANCE WITH THE FOREST CONSERVATION PLAN FOR FINAL PLAN/PLAT, F-06-19.
3. THE APPLICANT MUST OBTAIN ALL REQUIRED STATE/COE PERMITS.
4. THE STREAM AND WETLAND BUFFER DISTURBANCES SHALL NOT EXCEED THE ONE SHOWN ON THE WP-06-45 EXHIBIT OF 2/2/06.

OWNER PARCELS B, D and E
Deep Run Property Management, LLC.
191 Miller Hollow Lane
Lake City, Tennessee 37769
Attn: Robert L. Curtis, Jr.
865-494-0016

OWNER PARCEL A
Shipley's grant Office, LLC
c/o Bavar Properties Group, LLC
1966 Greenspring Drive
Lutherville Timonium, MD 21093
Attn: Rob Bavar
410-560-0300

HOWARD COUNTY CONTROL STATIONS

31GA ELEV. = 511.65
STANDARD DISC ON CONCRETE MONUMENT
N 564,925.75, E 1,367,067.65

37A4 ELEV. = 437.28
STANDARD DISC ON CONCRETE MONUMENT
N 563,835.91, E 1,367,971.65

VICINITY MAP

SCALE: 1" = 2,000'

SHEET INDEX

1. COVER SHEET
2. MASS GRADING PLAN
3. MASS GRADING PLAN
4. MASS GRADING PLAN
5. SEDIMENT CONTROL PLAN
6. SEDIMENT CONTROL PLAN
7. SWALE STABILIZATION PLAN
8. SWALE STABILIZATIION PLAN
9. EXISTING CONDITIONS SEDIMENT CONTROL DRAINAGE AREA MAP
10. INTERIM CONDITIONS SEDIMENT CONTROL DRAINAGE AREA MAP
11. SEDIMENT CONTROL BASIN 'B' & 'C' DETAILS
12. SEDIMENT CONTROL TRAP 'A' & 'D' DETAILS
13. SEDIMENT CONTROL NOTES & STANDARD DETAILS
14. STORMWATER MANAGEMENT DRAINAGE AREA MAP - EXISTING CONDITION
15. STORMWATER MANAGEMENT DRAINAGE AREA MAP - PROPOSED CONDITION
16. STORMWATER MANAGEMENT DETAILS - FACILITY B
17. STORMWATER MANAGEMENT DETAILS - FACILITY B
18. STORMWATER MANAGEMENT DETAILS - FACILITY C
19. STORMWATER MANAGEMENT DETAILS - FACILITY C
20. SOIL BORING DETAILS
21. SOIL BORING DETAILS
22. FOREST CONSERVATION PLAN
23. FOREST CONSERVATION NOTES, SCHEDULES, & DETAILS
24. LANDSCAPE PLAN FOR STORMWATER MANAGEMENT FACILITIES 'B' & 'C'
25. LANDSCAPE NOTES AND DETAILS

SITE ANALYSIS

1. GENERAL SITE DATA
   ZONING: 'B-1', R-A-15 & POR PER THE 2-2-04 COMPREHENSIVE ZONING PLAN.
   PROPOSED USE OF SITE: VACANT MEADOW
   PROPOSED WATER AND SEWER SYSTEMS: N/A
   APPLICABLE DPZ FILE REFERENCE: S 04-09, WP 04-105*, WP 06-045** and F 07-001.
   PLAT REFERENCE: PLAT Nos. 18428 THROUGH 18431
2. AREA TABULATION
   GROSS AREA OF SITE = 58.6 ACRES.
   GROSS AREA OF R-A-15 ZONE SITE = 47.8 ACRES.
   AREA OF POR ZONE = 6.6 ACRES.
   AREA OF B-1 ZONE PARCELS = 4.2 ACRES.
   LIMIT OF DISTURBANCE = 30.92 ACRES.
   TOTAL NUMBER OF LOTS AND PARCELS = 5
   TOTAL NUMBER OF BUILDABLE LOTS = 0
   TOTAL AREA OF BUILDABLE LOTS = 0 ACRES.
   TOTAL NUMBER OF NON-BUILDABLE PARCELS = 5
   TOTAL AREA OF NON-BUILDABLE PARCELS = 58.6061 ACRES
   TOTAL NUMBER OF BUILDABLE PARCEL = 0
   TOTAL AREA OF BUILDABLE PARCEL = 0 ACRES
   TOTAL AREA OF ROADWAYS = 0
   TOTAL AREA OF SUBDIVISION = 58.6061 ACRES
   TOTAL AREA OF 100 YEAR FLOODPLAIN EASEMENT ON R-A-15 ZONED LAND = 1.93 ACRES.
   TOTAL AREA OF STEEP SLOPES ON R-A-15 ZONED LAND = 0.4 ACRES (STEEP SLOPES ARE DEFINED IN THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SECTION 16.180(b)(55) AS A SLOPE THAT AVERAGES 25% OR GREATER WITH A VERTIAL RISE OF 10 FEET OR MORE.
   TOTAL NET AREA OF R-A-15 ZONED LAND = 45.5 ACRES (NET AREA IS DEFINED IN THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS SECTION 16.180(32.1) AS THE GROSS AREA MINUS ALL STEEP SLOPES EXISTING AT THE TIME OF SUBDIVISION AND THE AREA WITHIN THE THE 100-YEAR FLOODPLAIN)

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
Chief, Bureau of Highways — Date 9/8/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
Chief, Division of Land Development — Date 9/19/06
Chief, Development Engineering Division — Date 9/14/06

STATE OF MARYLAND — MICHAEL JAMES TRAPREN — No. 14931 — REGISTERED — PROFESSIONAL ENGINEER

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

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DATE	REVISION	BY	APP'R.
9-5-17	Rev. Note 29 (2)	9+	

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suilte 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

COVER SHEET

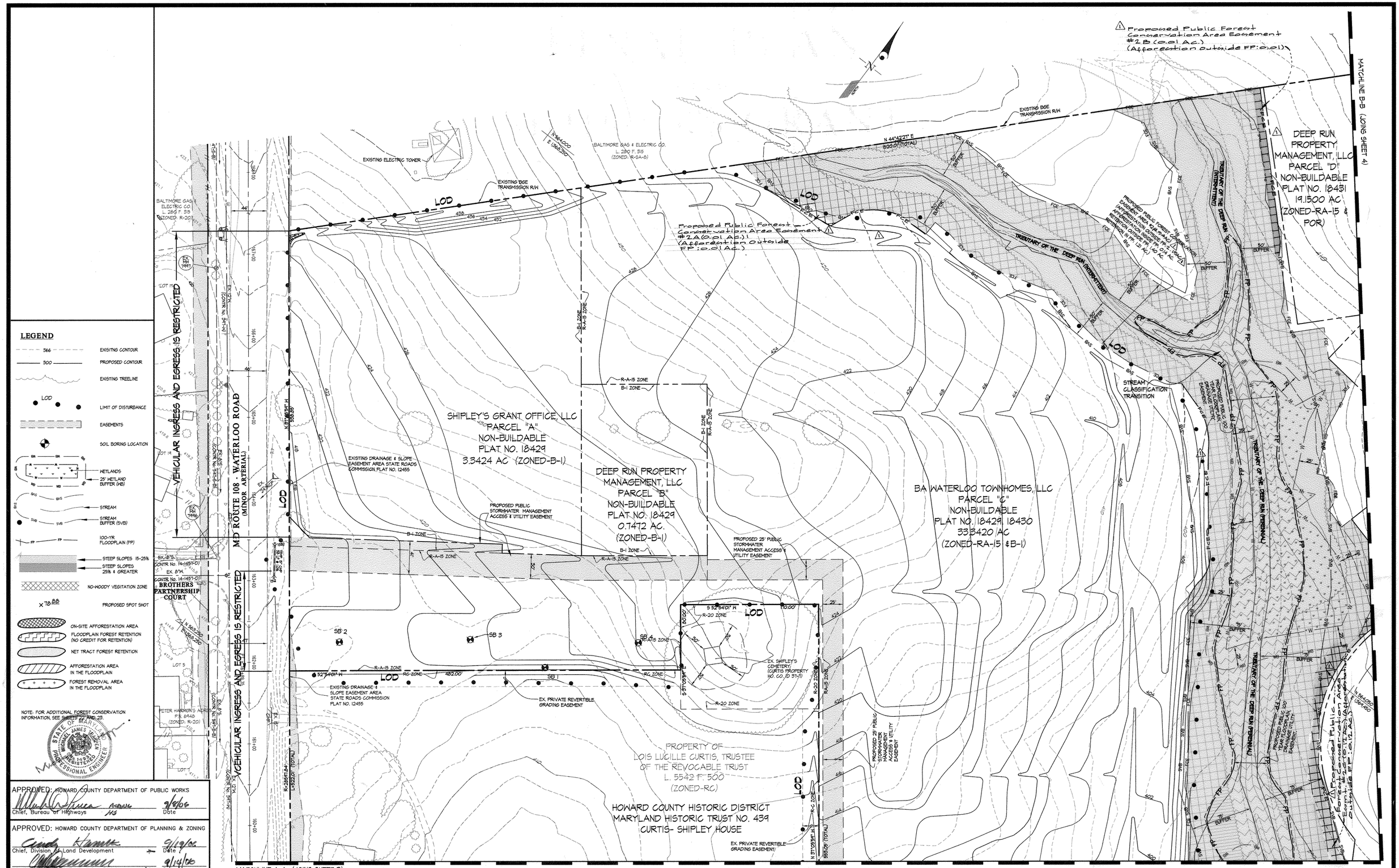
SEE ASBUILT SET 09/08/2016

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
AS SHOWN	R-A-15/B-1/POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	1 OF 25

F-06-019



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 9/8/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/9/06

Chief, Development Engineering Division — Date 9/14/06

GLW GUTSCHICK LITTLE & WEBER, P.A.

CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
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BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

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DATE	REVISION	BY	APP'R.
2/6/08	Rev. FCE #2 & Added FCE #2A, 2B & 2C	WGL	MJT

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

MASS GRADING PLAN

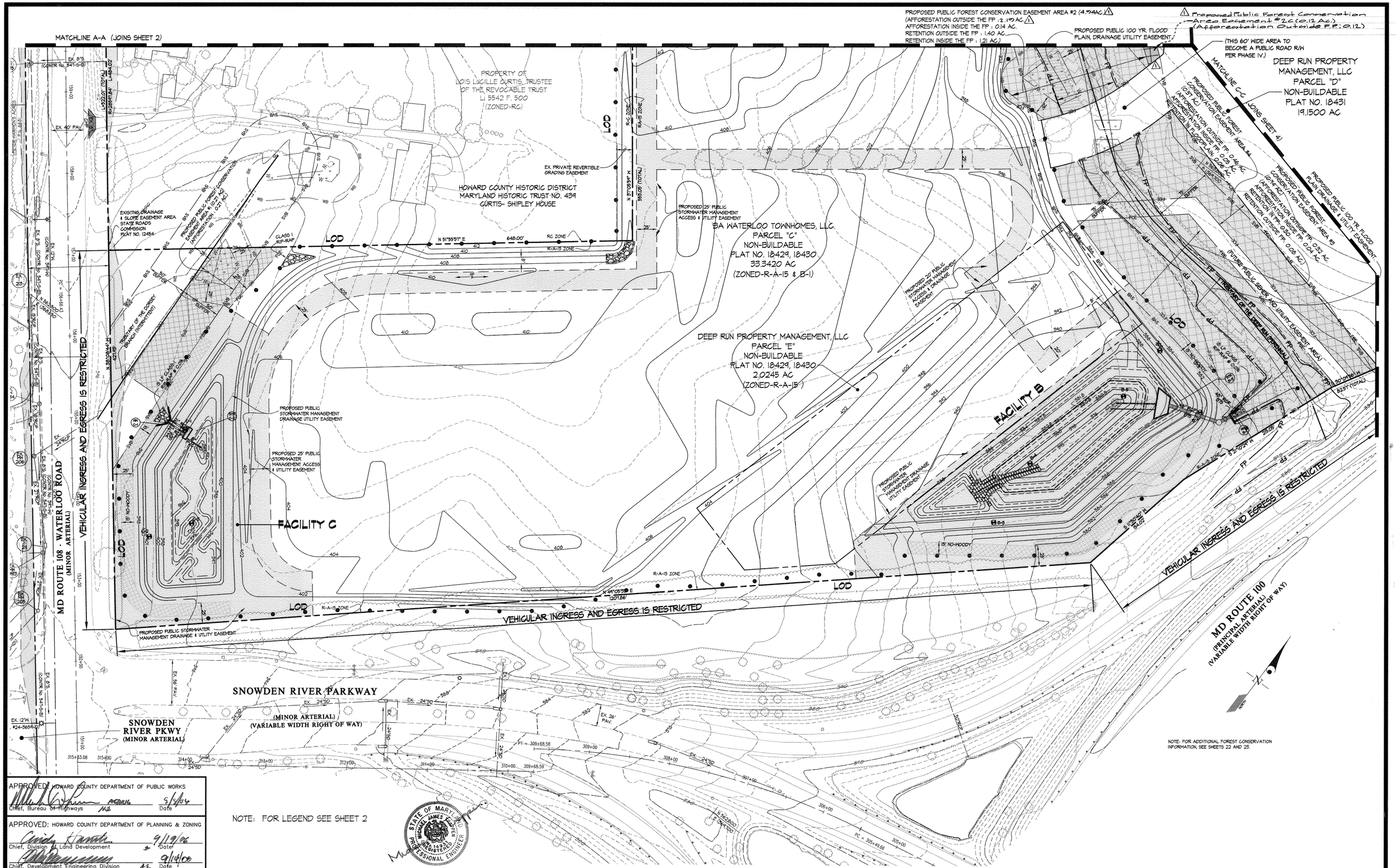
SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

NO ASBUILT INFORMATION 09/08/2016

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
1"=50'	R-A-15/B-1/ POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	2 OF 25

F-06-019



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 9/5/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/19/06

Chief, Development Engineering Division — Date 9/14/06

NOTE: FOR LEGEND SEE SHEET 2

STATE OF MARYLAND — MICHAEL JAMES TROJAN — No. 14923 — REGISTERED PROFESSIONAL ENGINEER

GLW GUTSCHICK LITTLE & WEBER, P.A.

CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE – SUITE 250 – BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

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DATE	REVISION	BY	APP'R.
2/6/08	Rev. FCE #2 Tabulation & Added FCE 2C	WGJ	MJT

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

MASS GRADING PLAN

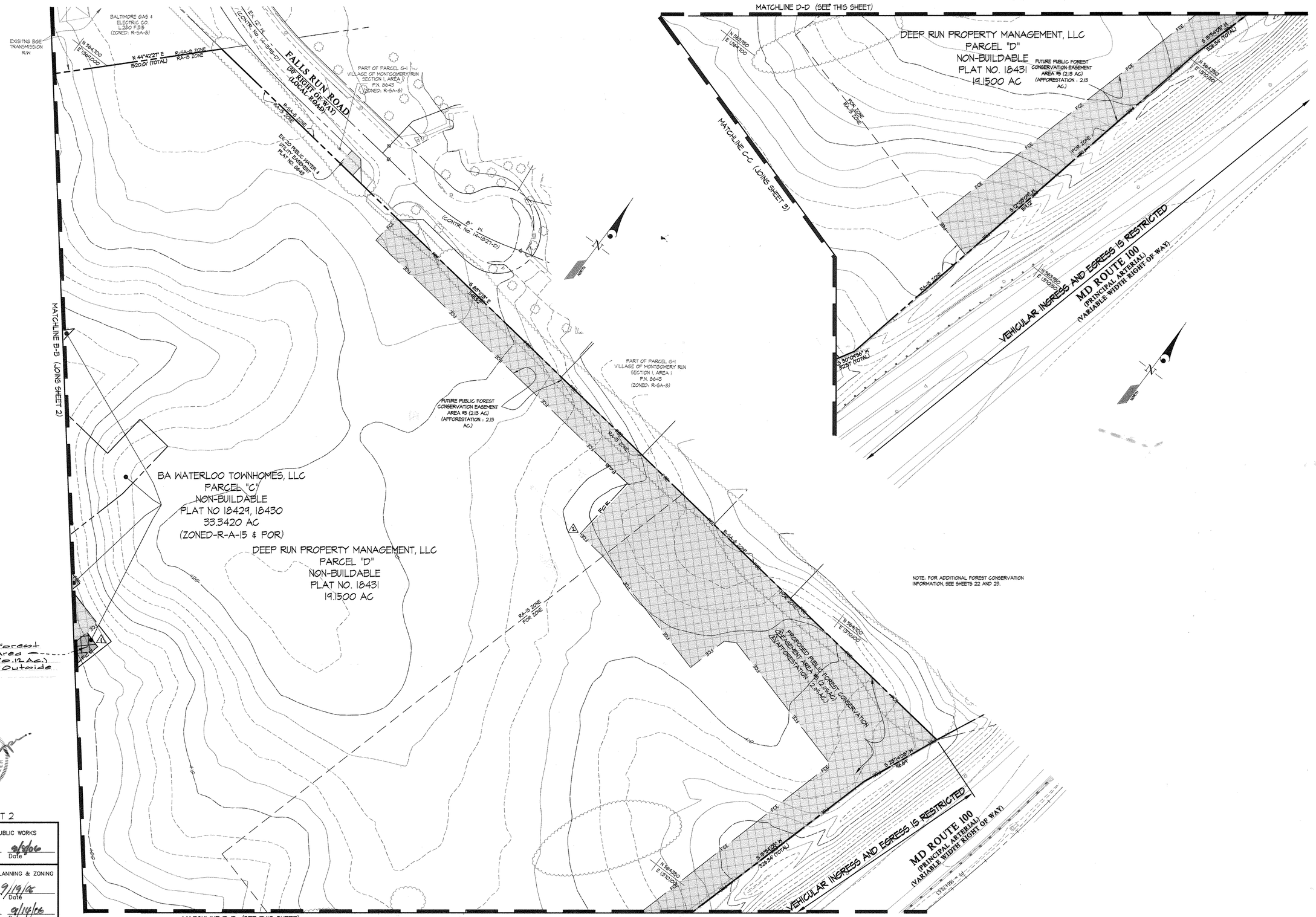
SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

NO ASBUILT INFORMATION 09/08/2010

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
1"=50'	R-A-15/B-1/ POR	03006
DATE	TAX MAP – GRID	SHEET
JULY, 2006	37-1&2	3 OF 25

F-06-019



⚠ Proposed Public Forest Conservation Area Easement # 2 (2.12 Ac.) (Afforestation Outside F.P.: 0.12 Ac.)

NOTE: FOR LEGEND SEE SHEET 2

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 9/5/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/9/06

Chief, Development Engineering Division — Date 9/14/06

GLW GUTSCHICK LITTLE & WEBER, P.A.

CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
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\DRAWINGS\03006\SPMG\03006SPMG.dwg | DES. bjm | DRN. klp | CHK. CKG

DATE	REVISION	BY	APP'R.
9.5.06	Revise FCE 5 Per abandonment Approval letter ⚠	gt	MJT
2.6.08	Added FCE 2C Information ⚠	WGJ	MJT

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncon Slidell
301-623-1525

MASS GRADING PLAN — 09/08/2006 NO ASBUILT INFORMATION

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
1"=50'	R-A-15/B-1/POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	4 OF 25

F-06-019

SEDIMENT CONTROL LEGEND

- 366 — EX. CONTOUR
- 300 — PROP CONTOUR
- LOD — LIMIT OF DISTURBANCE
- SF — PROPOSED SILT FENCE
- SSF — PROPOSED SUPER SILT FENCE
- GM — GABION MATTRESS INFLOW PROTECTION
- S.C.E. — STABILIZED CONSTRUCTION ENTRANCE
- TEMPORARY DIKE / SWALE
- ×78.82 — PROPOSED SPOT SHOT
- WETLANDS
- 25' WETLAND BUFFER (WB)
- STREAM
- STREAM BUFFER (SVB)
- FCE — FOREST CONSERVATION EASEMENT
- x x — HIGHLY VISIBLE FENCE

SEDIMENT AND EROSION CONTROL SEQUENCE OF CONSTRUCTION

1. OBTAIN GRADING PERMIT AND ARRANGE PRE-CONSTRUCTION MEETING WITH SEDIMENT CONTROL INSPECTOR. (1 DAY).
2. INSTALL THE STABILIZED CONSTRUCTION ENTRANCE AND SILT FENCE/SUPER SILT FENCE (ONE WEEK).
3. CONSTRUCT SEDIMENT TRAPS 'A' & 'D' AND SEDIMENT BASINS 'B' & 'C' AND ASSOCIATED PERIMETER EARTH DIKES AND SWALES. INSTALL CLEAN WATER DIVERSIONS AND ASSOCIATED STABILIZATION (2 MONTHS).
4. ONCE PERMISSION HAS BEEN GRANTED BY THE SEDIMENT CONTROL INSPECTOR, MASS GRADE THE SITE (3 MONTHS). PROVIDE DUST CONTROL PER SPECIFICATIONS ON SHEET 15.
5. GRADE AND STABILIZE THE INTERIOR SWALES ONCE THE AREAS DRAINING TO THEM HAS BEEN STABILIZED (2 WEEKS).
6. ONCE AREAS DRAINING TO SEDIMENT CONTROLS HAS BEEN STABILIZED AND PERMISSION HAS BEEN OBTAINED FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE/ BACKFILL AND STABILIZE SEDIMENT TRAPS, TEMPORARY EARTH DIKES AND SILT FENCE/SUPER SILT FENCE (TWO WEEKS)
7. ONCE PERMISSION HAS BEEN GRANTED FROM THE SEDIMENT CONTROL INSPECTOR, CONVERT BASINS 'B' AND 'C' TO THE FINAL STORMWATER MANAGEMENT CONFIGURATION. REGRADE PONDS 'B' AND 'C' TO THE FINAL GRADING SPECIFIED. (1 MONTH)
8. REMOVE ANY REMAINING SEDIMENT CONTROLS AND STABILIZE ANY REMAINING DISTURBED AREAS.

STATE OF MARYLAND — MICHAEL JAMES TROPPAN — No. 14951 — REGISTERED PROFESSIONAL ENGINEER

DEVELOPER'S/BUILDER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

Robert C. Anderson — 7/21/06
SIGNATURE OF DEVELOPER/BUILDER

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Michael J. Troppan — 7/21/06
ENGINEER'S SIGNATURE — DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL, MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/31/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

Jim Myerlee — 8/31/06
USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE

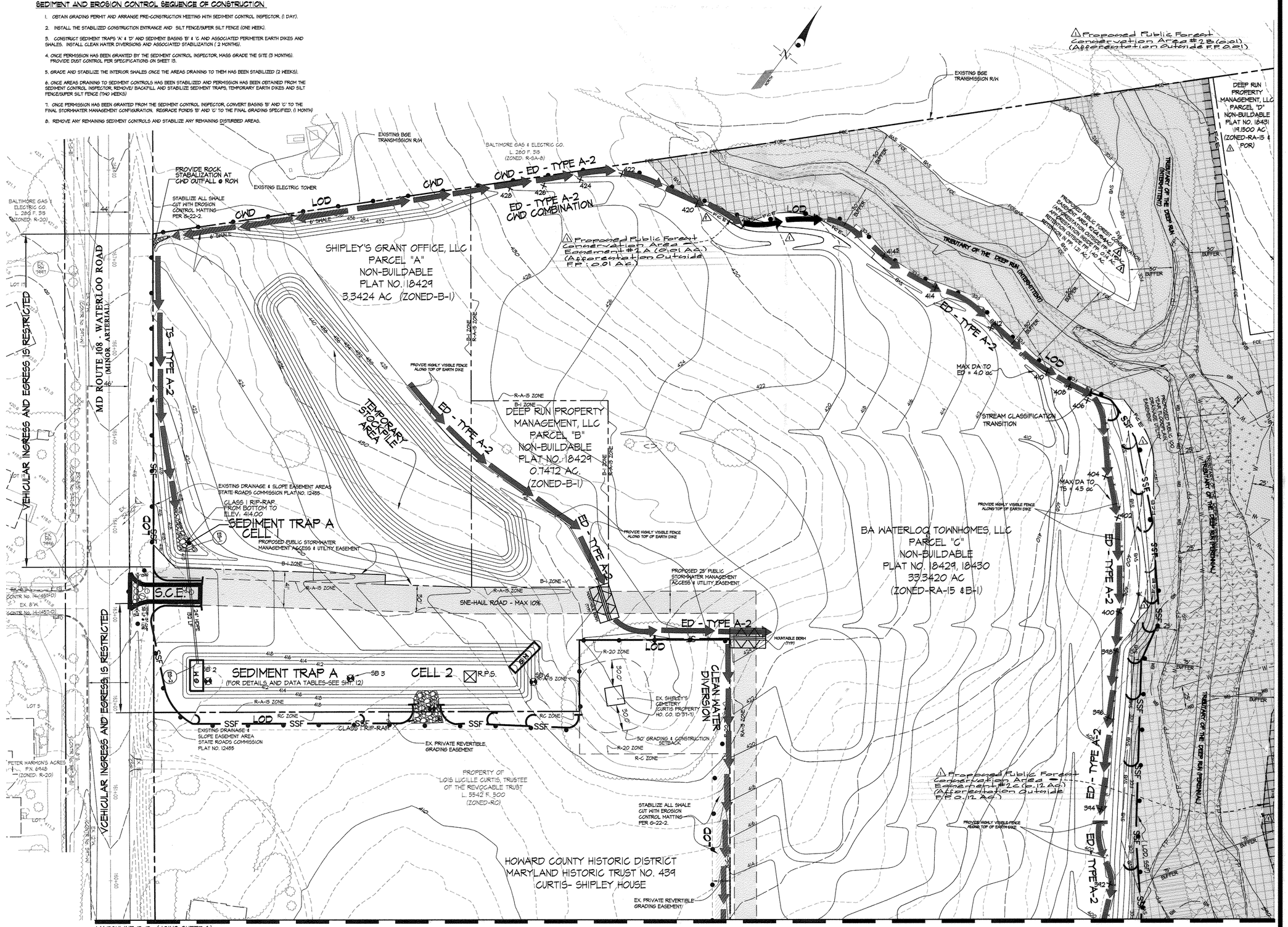
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 9/6/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/19/06

Chief, Development Engineering Division — Date 9/14/06



2/6/08	R&L FCE 2, & Add FCE 2A, 2B & 2C ⚠	WDJ	MJT	
DATE	REVISION	BY	APP'R.	

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE – SUITE 250 – BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

\DRAWINGS\03006\SPMG\03006SNEph1.dwg | DES. bjm | DRN. klp | CHK. CKG

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

SEDIMENT CONTROL PLAN

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

09/08/2016 NO ASBUILT INFORMATION

SCALE	ZONING	G. L. W. FILE No.
1"=50'	R-A-15/B-1/ POR	03006
DATE	TAX MAP - GRID	SHEET
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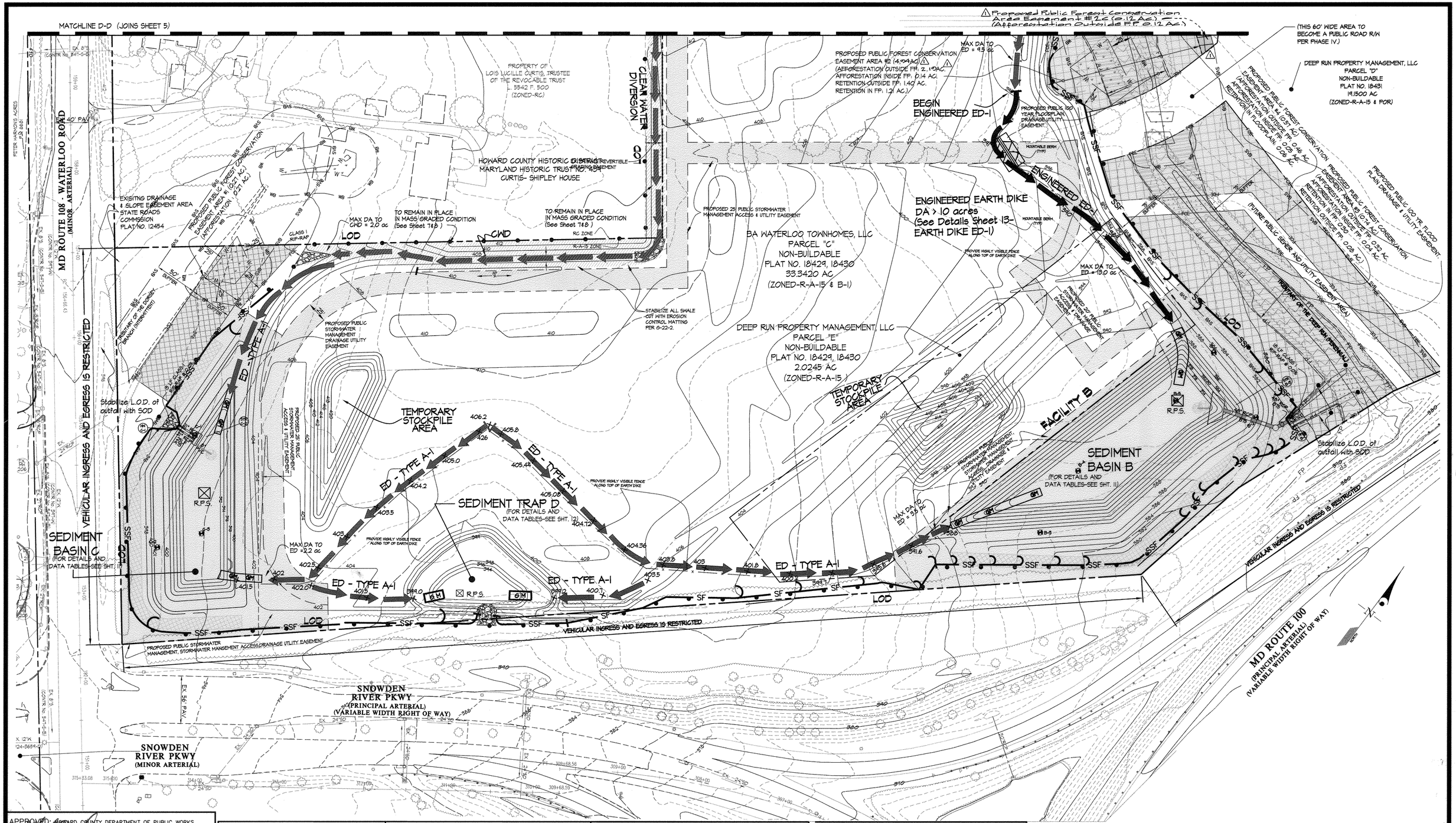
F-06-019



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 7/6/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/19/06

Chief, Development Engineering Division — Date 9/14/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE 8/31/06

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/31/06

DEVELOPER'S/BUILDER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF DEVELOPER/BUILDER — DATE 7/21/06

ENGINEER'S CERTIFICATE

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ENGINEER'S SIGNATURE — DATE 7/21/06

STATE OF MARYLAND — MICHAEL J. TROPP — No. 21427 — REGISTERED PROFESSIONAL ENGINEER

GLW GUTSCHICK LITTLE & WEBER, P.A.

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DATE	REVISION	BY	APP'R.
2/6/08	REV. FCE 2 info. & added FCE 2C	WOJ	MJT

DEVELOPER/OWNER PARCEL C
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c/o Bozzuto Homes, Inc.
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SEDIMENT CONTROL PLAN — 09/08/2016 NO ASBUILT INFORMATION

SHIPLEY'S GRANT

Non-buildable Parcels "A" thru "E"

PLAT NUMBERS 18428 THROUGH 18431

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

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1"=50'	R-A-15/B-1/POR	03006
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F-06-019

SWALE COMPUTATION SUMMARY TABLE

Swale Section	height	Max Slope	Manning's n	MAX DA (acre)	Q10 (cfs)	V10 (fps)	Depth (ft)	Bottom Width(ft)	Width(ft)
1	1	0.11	0.030	0.67	1.15	4.42	0.29	0	6
2	1	0.04	0.030	2.53	4.33	4.22	0.59	0	6
3	1	0.03	0.030	0.92	1.57	2.94	0.42	0	6
4	1	0.05	0.030	1.71	2.92	4.16	0.49	0	6
5	1	0.05	0.030	1.56	2.67	4.06	0.47	0	6
6	1	0.03	0.030	3.09	5.28	3.98	0.67	0	6
7	1	0.03	0.030	4.81	8.23	4.44	0.79	0	6
8	1	0.03	0.030	6.11	10.45	4.72	0.86	0	6
9	1	0.06	0.030	0.68	1.16	3.54	0.33	0	6
10	1.5	0.01	0.030	6.80	11.63	3.21	1.1	0	9.00
11	1.5	0.01	0.030	7.89	13.49	3.67	1.11	0	9.00
12	1	0.08	0.030	0.76	1.30	4.04	0.33	0	6
13	1.5	0.03	0.030	8.64	14.77	5.14	0.98	0	9.00
14	1.5	0.02	0.030	9.49	16.23	4.52	1.09	0	9.00
15	1	0.04	0.030	2.25	3.85	4.09	0.56	0	6
16	1.5	0.02	0.030	11.73	20.06	4.77	1.18	0	9.00
17	1	0.02	0.030	2.45	4.19	3.22	0.66	0	6
18	1	0.03	0.030	4.33	7.40	4.33	0.75	0	6
19	1.5	0.04	0.030	16.36	27.98	5.94	0.57	6.5	15.50
20	1	0.07	0.030	0.91	1.56	4.02	0.35	0	6
21	1	0.05	0.030	2.28	3.90	4.46	0.54	0	6

SEDIMENT CONTROL LEGEND

- 366 — EX. CONTOUR
- 300 — PROP CONTOUR
- LOD — LIMIT OF DISTURBANCE
- ×78.88 — PROPOSED SPOT SHOT
- GRASS MATTING STABILIZATION PER 6.22.2 (SEE SHEET -18)

STATE OF MARYLAND — MICHAEL JAMES TROPPAN — 14982 — REGISTERED PROFESSIONAL ENGINEER

DEVELOPER'S/BUILDER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

Robert C. Anderson — 7/21/06
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Michael J. Troppan — 7/21/06
ENGINEER'S SIGNATURE — DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/21/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

Jim Myers — 8/21/06
USDA NATURAL RESOURCES CONSERVATION SERVICE — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — DATE 9/5/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — DATE 9/19/06

Chief, Development Engineering Division — DATE 9/14/06

NOTE: FOR SWALE SPECIFICATIONS SEE CHART THIS SHEET. FOR SWALE DETAILS SEE SHEET NO. 18

MARYLAND STATE ROUTE 103
MD ROUTE 103 - WATERLOO ROAD (MINOR ARTERIAL)
VEHICULAR INGRESS AND EGRESS IS RESTRICTED
EXISTING BGE TRANSMISSION R/W
EXISTING ELECTRIC TOWER
STABILIZE END OF 6' SWALE W/ CL I RIP-RAP
6' SWALE (TYP)
LOD
EX. UTILITY POLE
EXISTING BUILDING
EX. SIGN
EX. 8"W (CONTR No. 14-1457-D)
EX. 8"S (CONTR No. 54-1-D)
EX. 6"S (CONTR No. 54-1-D)
OTTERS WATCH COURT
SHIPLEY'S GRANT OFFICE, LLC
PARCEL "A"
NON-BUILDABLE
PLAT NO. 18429
3.3424 AC (ZONED-B-1)
EXISTING DRAINAGE & SLOPE EASEMENT AREAS STATE ROADES COMMISSION PLAT NO. 12455
DEEP RUN PROPERTY MANAGEMENT, LLC
PARCEL "B"
NON-BUILDABLE
PLAT NO. 18429
0.7472 AC.
(ZONED-B-1)
PROPOSED PUBLIC STORMWATER MANAGEMENT ACCESS, DRAINAGE & UTILITY EASEMENT
PROPOSED 25' PUBLIC STORMWATER MANAGEMENT ACCESS, DRAINAGE & UTILITY EASEMENT
B-1 ZONE / R-A-15 ZONE
R-A-15 ZONE / B-1 ZONE
R-20 ZONE
RC ZONE
EXISTING DRAINAGE & SLOPE EASEMENT AREA STATE ROADES COMMISSION PLAT NO. 12455
EX. PRIVATE REVERTIBLE GRADING EASEMENT
EX. SHIPLEY'S CEMETERY (CURTIS PROPERTY/ MD. CO. ID 51-7)
30' GRADING & CONSTRUCTION / SETBACK
PROPERTY OF LOIS LUCILLE CURTIS, TRUSTEE OF THE REVOCABLE TRUST L. 5542 F. 500 (ZONED-RC)
HOWARD COUNTY HISTORIC DISTRICT
MARYLAND HISTORIC TRUST NO. 439
CURTIS- SHIPLEY HOUSE
Proposed Public Forest Conservation Area Easement #2A (0.01 Ac.) (Afforestation Outside F.F. 0.01 Ac.)
Proposed Public Forest Conservation Area Easement #2B (0.01 Ac.) (Afforestation Outside F.F. 0.01 Ac.)
Proposed Public Forest Conservation Area Easement #2C (0.12 Ac.) (Afforestation Outside F.F. 0.12 Ac.)
PROPOSED PUBLIC FOREST CONSERVATION AREA EASEMENT #1 (AFFORESTATION OUTSIDE F.F. 0.14 AC.) (REFORESTATION OUTSIDE F.F. 1.10 AC.) (REFORESTATION IN F.F. 1.21 AC.)
DEEP RUN PROPERTY MANAGEMENT, LLC PARCEL "D" NON-BUILDABLE PLAT NO. 18431 19.1500 AC. (ZONED-RA-15 & POR)
TRIBUTARY OF THE DEEP RUN (INTERMITTENT)
STREAM CLASSIFICATION TRANSITION
50' BUFFER
BUFFER
FCE
FCE 2A
FCE 2B
FCE 2C
BAS
FOR
FFP
WB
W
TRANSITION FROM 6' DUAL SWALES TO SINGLE 6' SWALE TO BE STABILIZED W/ CL I RIP-RAP
BA WATERLOO TOWNHOMES, LLC
PARCEL "C"
NON-BUILDABLE
PLAT NO. 18429, 18430
33.3420 AC
(ZONED-RA-15 & B-1)
TRANSITION FROM 6' DUAL SWALES TO SINGLE 9' SWALE TO BE STABILIZED W/ CL I RIP-RAP
TRANSITION FROM 6' & 9' DUAL SWALES TO SINGLE 9' SWALE TO BE STABILIZED W/ CL I RIP-RAP
6' SWALE
9' SWALE (TYP)
PROPOSED PUBLIC STORMWATER MANAGEMENT ACCESS, DRAINAGE & UTILITY EASEMENT
MATCHLINE E-E (JOINS SHEET 8)

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE – SUITE 250 – BURTONSVILLE OFFICE PARK
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\DRAWINGS\03006\SPMG\03006SNEph2.dwg | DES. bjm | DRN. klp | CHK. CKG

DATE	REVISION	BY	APP'R.
2/6/06	Rev. FCE 2 & added FCE 2A, 2B & 2C	WOJ	MJT

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

SWALE STABILIZATION PLAN 09/08/2016

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

NO ASBUILT INFORMATION

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

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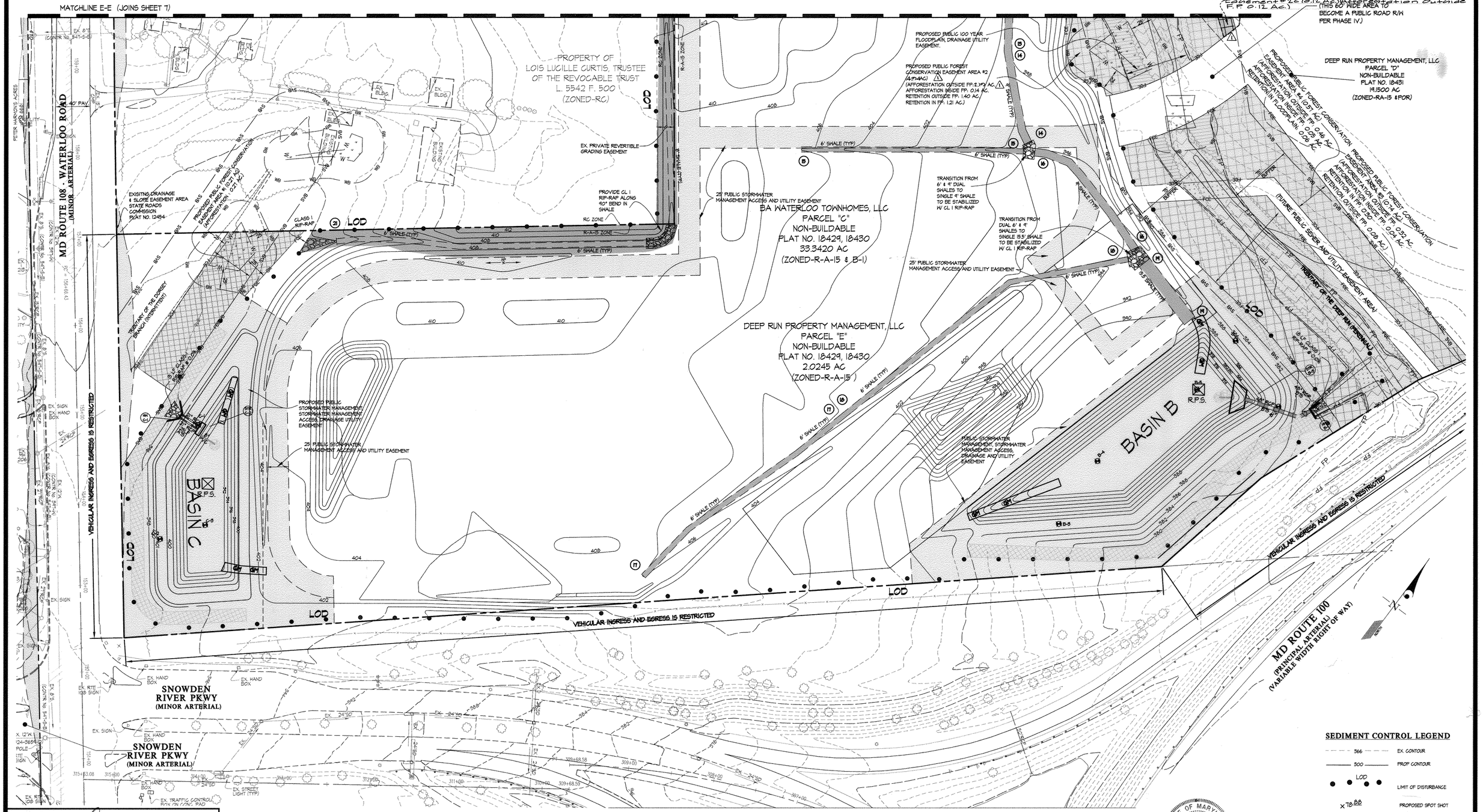

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 9/8/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/14/06

Chief, Development Engineering Division — Date 9/14/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE 8/31/06

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/31/06

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ENGINEER'S SIGNATURE — DATE 7/21/06

STATE OF MARYLAND — MICHAEL JAMES TROPPE — 21436 — REGISTERED PROFESSIONAL ENGINEER

NOTE:
FOR SWALE SPECIFICATIONS SEE CHART ON SHEET NO. 7
FOR SWALE DETAILS SEE SHEET NO. 13

SEDIMENT CONTROL LEGEND

- 366 — EX. CONTOUR
- 300 — PROP CONTOUR
- LOD — LIMIT OF DISTURBANCE
- ×78.88 — PROPOSED SPOT SHOT
- GRASS MATTING STABILIZATION PER G-22-2 (SEE SHEET -18)

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SWALE STABILIZATION PLAN

09/08/2016
NO ASBUILT INFORMATION

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
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F-06-019

LEGEND

SOILS DELINEATION LINE
'B' SOIL

'C' SOIL

'D' SOIL

EXISTING DRAINAGE DIVIDE

TC PATH

DRAINAGE AREA LABEL

EXISTING DISCHARGE SUMMARY

	Q1 (cfs)	Q10 (cfs)
STUDY POINT 1 (TRAP A OUTFALL)	0.11	2.52
STUDY POINT 2	2.33	25.08
BASIN C OUTFALL	0.12	2.88
STUDY POINT 3 (BASIN B OUTFALL)	1.20	21.63
STUDY POINT 4 (BASIN D OUTFALL)	0.15	1.95

DEVELOPER'S/BUILDER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

Robert C. Anders [signature] 7/21/06.

SIGNATURE OF DEVELOPER/BUILDER

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Michael J. Trapp [signature] 7/21/06

ENGINEER'S SIGNATURE — DATE

STATE OF MARYLAND — MICHAEL JAMES TRAPP — No. 14951 — REGISTERED PROFESSIONAL ENGINEER

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

[signature] 8/31/06

HOWARD SOIL CONSERVATION DISTRICT — DATE

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

Jim Myers [signature] 8/31/06

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

[signature] ACTING 9/8/06

Chief, Bureau of Highways — Date

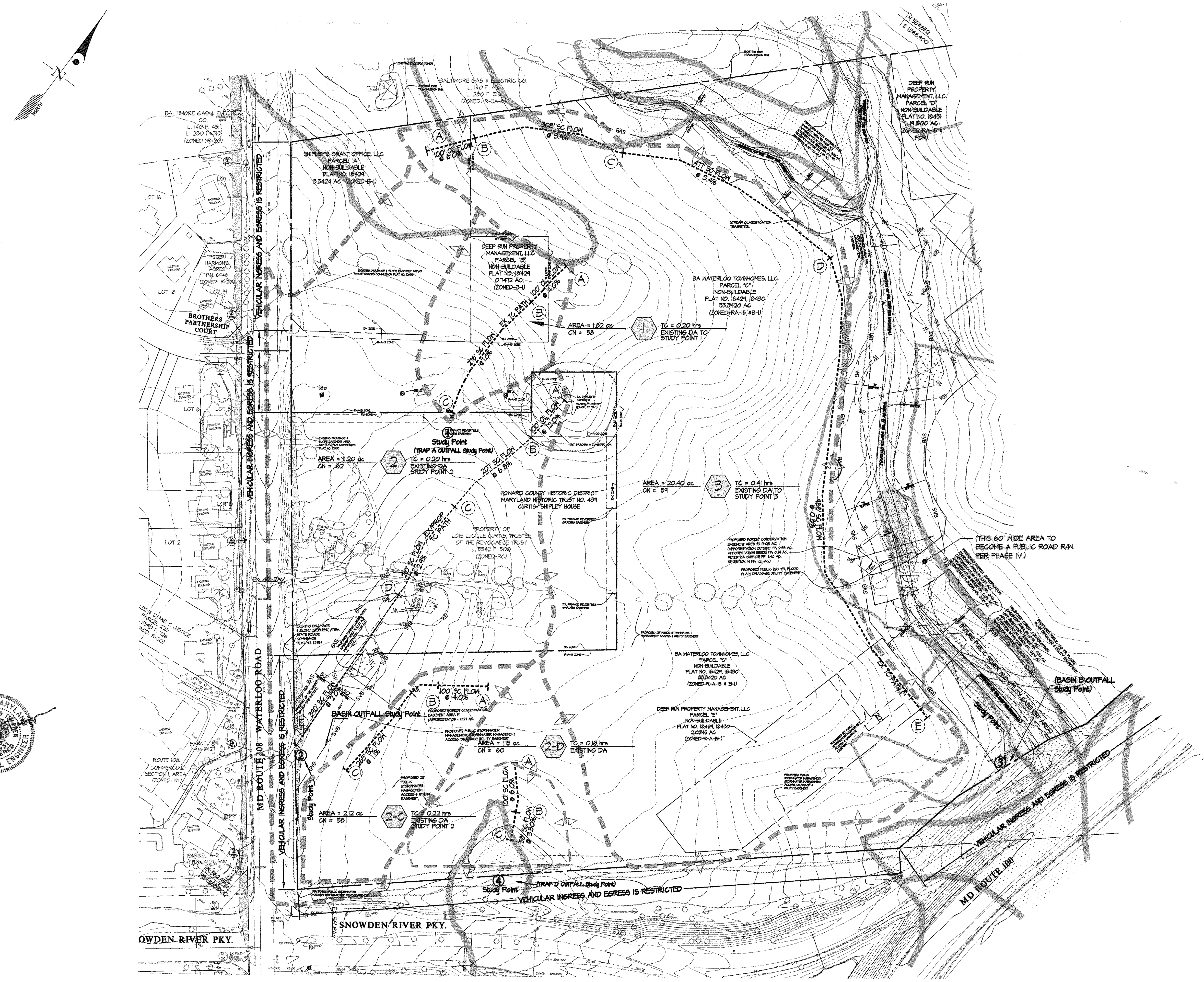
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

[signature] 9/19/06

Chief, Division of Land Development — Date

[signature] 9/14/06

Chief, Development Engineering Division — Date



THIS PLAN IS FOR STORMWATER MANAGEMENT HYDRAULIC ANALYSIS AND DRAINAGE AREA INFORMATION ONLY

FOR PLAN INFORMATION, SEE SHEETS 2 THROUGH 4

GLW GUTSCHICK LITTLE & WEBER, P.A.

CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

\DRAWINGS\03006\SDP\03006SnE-DAM.dwg | DES. bjm | DRN. klp | CHK. CKG

DATE	REVISION	BY	APP'R.

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suilte 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

EXISTING CONDITIONS SEDIMENT CONTROL DRAINAGE AREA MAP

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

NO ASBUILT INFORMATION 09/08/2016

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
1"=100'	R-A-15/B-1/POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	9 OF 25

F-06-019

LEGEND

- SOILS DELINEATION LINE
- 'B' SOIL
- 'C' SOIL
- 'D' SOIL
- INTERIM DRAINAGE DIVIDE
- TC PATH (A)
- EXISTING DRAINAGE AREA LABEL (1)
- INTERIM/WORST-CASE DRAINAGE AREA LABEL (3-B)

PEAK DISCHARGE SUMMARY

		Q1 (cfs)	Q10 (cfs)
STUDY POINT 1 (TRAP A OUTFALL)	EX.	0.11	2.52
	PROP.	0.00	1.28
STUDY POINT 2	EX.	2.33	25.08
	PROP.	0.92	21.44
BASIN C OUTFALL	EX.	0.12	2.88
	PROP.	0.11	2.82
STUDY POINT 3 (BASIN B OUTFALL)	EX.	1.20	21.63
	PROP.	1.16	4.13
STUDY POINT 4 (BASIN D OUTFALL)	EX.	0.15	1.95
	PROP.	0.00	4.41

DEVELOPER'S/BUILDER'S CERTIFICATE

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Robert C. Anderson — 7/21/06
SIGNATURE OF DEVELOPER/BUILDER — DATE

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Michael J. Trepp — 7/21/06
ENGINEER'S SIGNATURE — DATE

STATE OF MARYLAND · MICHAEL JAMES TROPPA · No. 14998 · 07/18/2006 · PROFESSIONAL ENGINEER

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — 8/31/06 DATE

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — 8/31/06 DATE

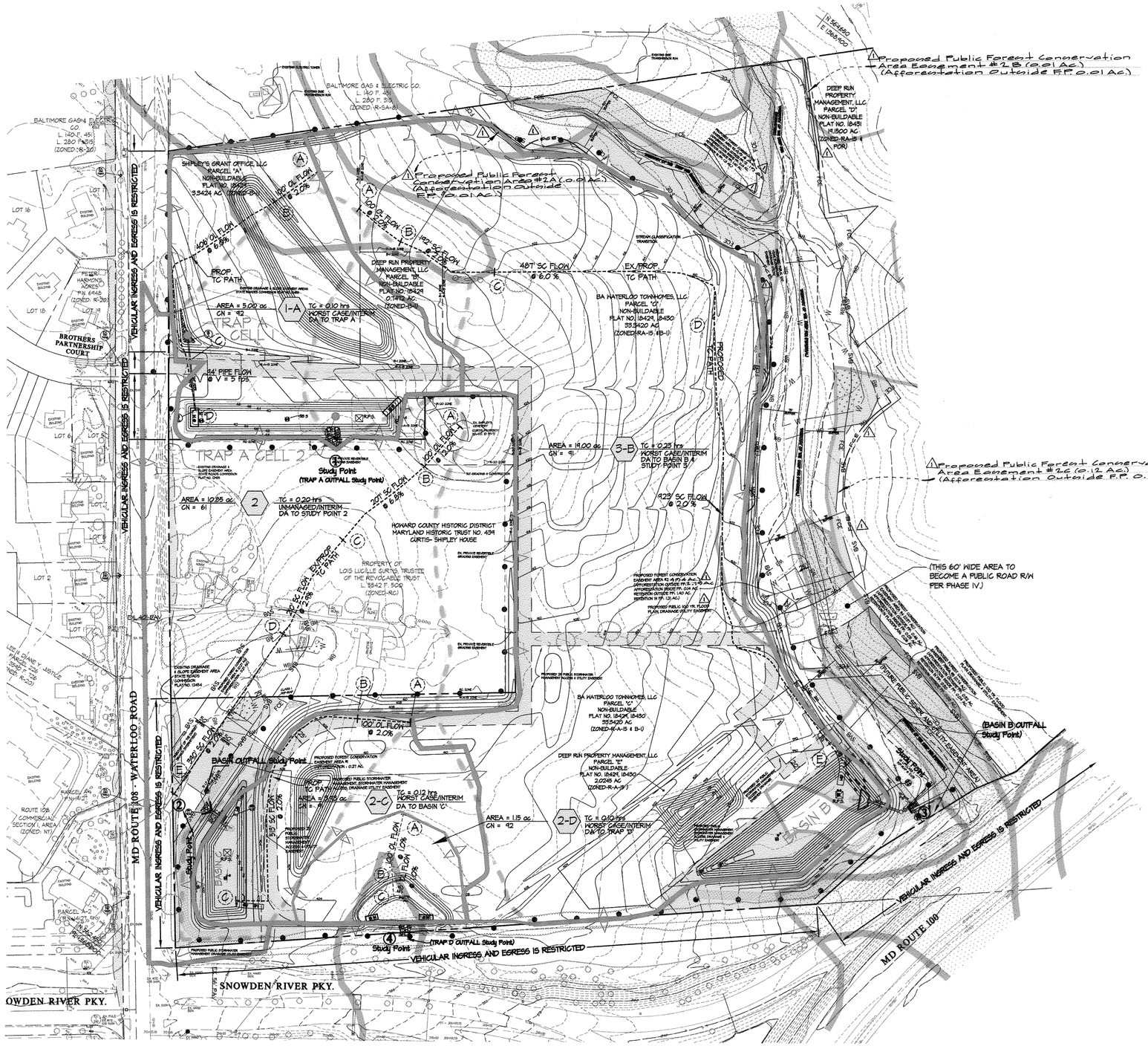
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — 9/14/06 Date

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — 9/13/06 Date

Chief, Development Engineering Division — 9/14/06 Date



THIS PLAN IS FOR STORMWATER MANAGEMENT HYDRAULIC ANALYSIS AND DRAINAGE AREA INFORMATION ONLY

FOR PLAN INFORMATION, SEE SHEETS 2 THROUGH 4

GLW GUTSCHICK LITTLE & WEBER, P.A.

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\DRAWINGS\03006\SDP\03006SnE-DAM.dwg | DES. bjm | DRN. klp | CHK. CKG

DATE	REVISION	BY	APP'R.
2/6/08	REV. FCE 2 & ADD FCE 2A, 2B & 2C	WGJ	MJT

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

INTERIM CONDITION SEDIMENT CONTROL DRAINAGE AREA MAP

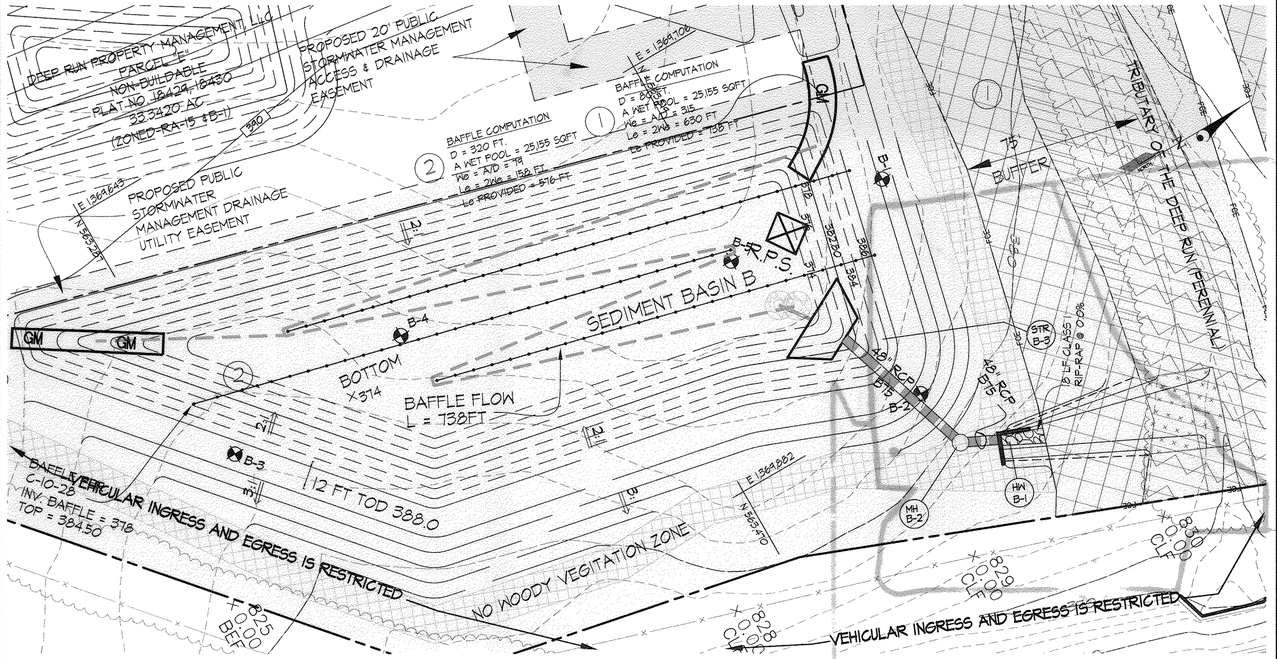
SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

NO ASBUILT INFORMATION 09/08/2016

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
1"=100'	R-A-15/B-1/ POR	03006
DATE	TAX MAP – GRID	SHEET
JULY, 2006	37-1&2	10 OF 25

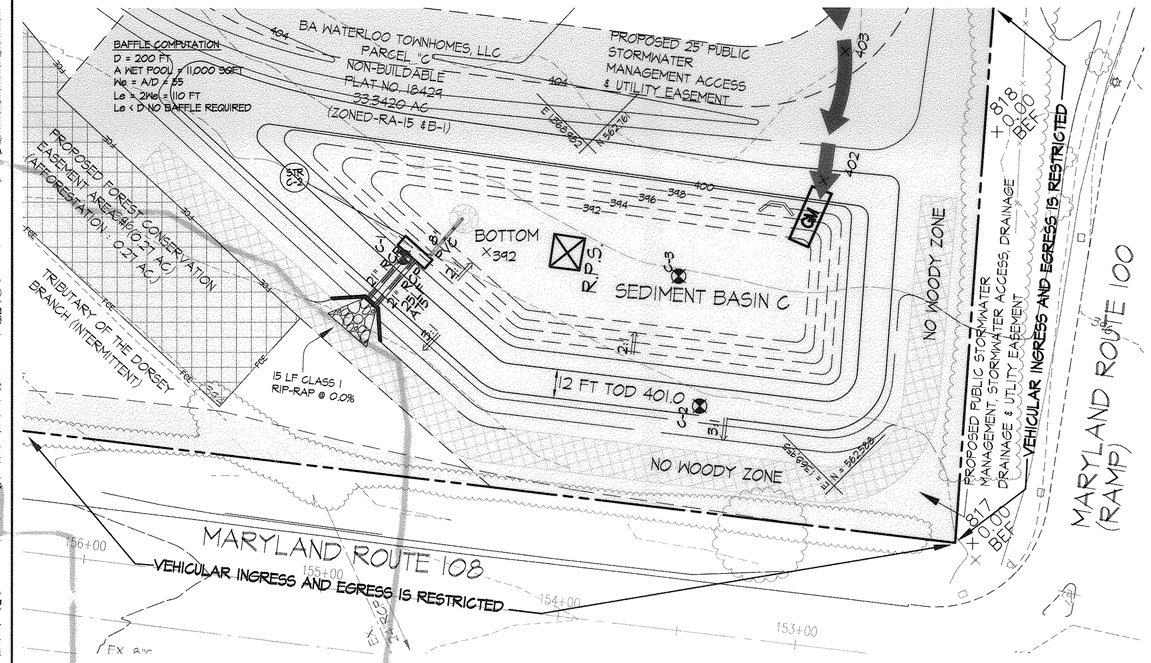
F-06-019



This detail is for Basin B baffel design. For plan information, see sheet 3.

SEDIMENT BASIN 'B' ENLARGEMENT

SCALE: 1" = 30'



This detail is for Basin C baffel design. For plan information, see sheet 3.

SEDIMENT BASIN 'C' ENLARGEMENT

SCALE: 1" = 30'

SEDIMENT BASIN B DATA TABLE

PRECAST RISER OUTLET SEDIMENT BASIN

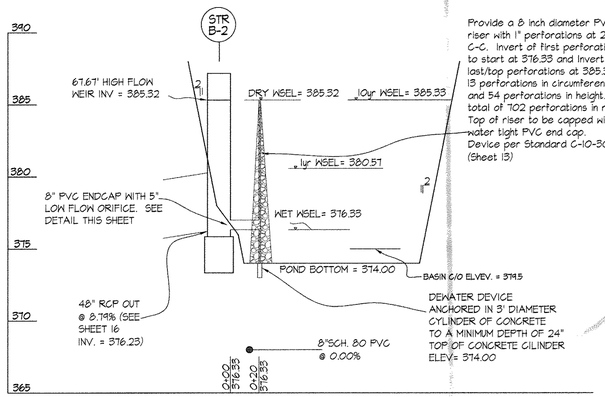
EXISTING DRAINAGE AREA TO STUDY POINT 3 : 20.4 AC (EX-3)
WORST CASE DRAINAGE AREA TO BASIN: 19.0 AC.
INTERIM DRAINAGE AREA : 19.0 AC (INT-3)

WET STORAGE VOL. REQUIRED : 0.79 AC-FT.
WET STORAGE VOL. PROVIDED : 0.82 AC-FT
WET STORAGE ELEV : 376.33
DRY STORAGE REQUIRED: 0.79 AC-FT.
DRY STORAGE PROVIDED = 4.69 AC-FT
DRY STORAGE WSEL = 385.32
EXISTING Q-YR = 1.2 cfs (STUDY POINT 3)
INTERIM Q-YR = 1.16 cfs (STUDY POINT 3)
SAFE PASS OF 10-YR STORM PROVIDED
Q10 = 4.13 cfs
10-YR WSEL = 385.33 ft.
BOTTOM ELEVATION : 374.00
TOP OF EMBANKMENT : 388.00
OUTFALL: 56 LF 48" RCP @ 8.79%
RISER/WEIR DIAMETER = 14.1' x 28.5' PRECAST STR.
RISER WEIR CREST ELEVATION : 385.32
RISER WEIR LENGTH : 67.61
RISER TRASH RACK/ANTIVORTEX: N/A

DEWATERING DEVICE = 8" PERFORATED PVC -WITH 8" PVC BARREL AT 0.0%
DEWATERING INVERT AT 8" RISER = 376.33
INVERT LAST PERFORATION = 385.32
DEWATERING PERFORATION CONFIGURATION:
WITH 1" HOLES @ 2" C-O-C.
13 HOLES PER CIRCUMFERENTIAL ROW.
54 HOLES RUNNING VERTICALLY.
702 HOLES TOTAL.

EMERGENCY SPILLWAY ELEV : NONE
CLEANOUT ELEVATION : 375.00
EMBANKMENT TOP WIDTH: 12'
SIDE SLOPES : 2:1 INTERIOR - 3:1 EXTERIOR

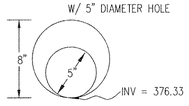
Provide a 8 inch diameter PVC riser with 1" perforations at 2" C-C. Invert of first perforations to start at 376.33 and invert of last/top perforations at 385.32. 13 perforations in circumference and 54 perforations in height. A total of 702 perforations in riser. Top of riser to be capped with water tight PVC end cap. Device per Standard C-10-30. (Sheet 13)



BASIN B PROFILE ALONG 12" LOW FLOW DEWATERING DEVICE

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

8" DIAMETER SCH. 80 THREADED PVC ENDCAP W/ 5" DIAMETER HOLE



8" PVC TO PROTRUDE THROUGH RISER TO ENABLE CAP TO BE SCREWED ON

NOTE: ORIFICE CONFIGURATION DIFFERENT DURING ULTIMATE CONDITION. SEE STORM WATER MANAGMENT DETAILS.

NOTE: FOR DETAILS NOT SHOWN, REFER TO STORMWATER MANAGEMENT POND B DETAILS.

NOTE: FOR SEDIMENT CONTROL PLAN - SEE SHEET 6

SEDIMENT CONTROL BASIN B LOW-FLOW ORIFICE DETAIL

SEDIMENT BASIN C DATA TABLE

PRECAST RISER OUTLET SEDIMENT BASIN

EXISTING DRAINAGE AREA : 2.12 AC (EX-2)
INTERIM DRAINAGE AREA : 3.93 AC (INT-2)

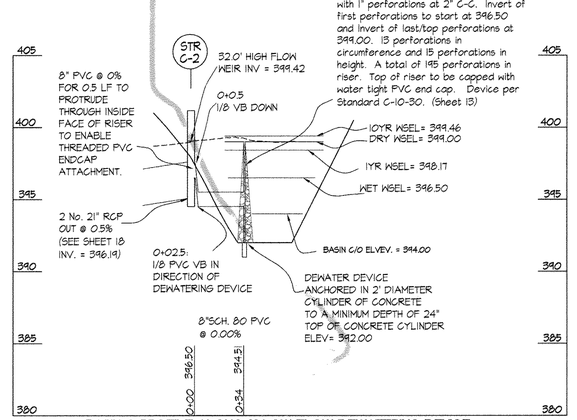
WET STORAGE VOL. REQUIRED : 0.16 AC-FT
WET STORAGE VOL. PROVIDED : 0.90 AC-FT
WET STORAGE ELEV : 396.50
DRY STORAGE REQUIRED: 0.16 AC-FT
DRY STORAGE PROVIDED = 0.23 AC-FT
DRY STORAGE WSEL = 394.00
EXISTING Q-YR = 0.12 cfs
INTERIM Q-YR = 0.11 cfs
SAFE PASS OF 10-YR STORM PROVIDED
Q_{10} = 2.82 cfs
10-YR WSEL = 399.46 ft.
BOTTOM ELEVATION : 392.00
TOP OF EMBANKMENT : 401.00
OUTFALL: 33 LF DUAL 21" RCP @ 0.5%
OUTFALL INVERT AT RISER = 396.19

RISER/WEIR DIAMETER = 3.66' x 13.66' PRECAST STR.
RISER WEIR CREST ELEVATION : 399.42
RISER WEIR LENGTH : 32.0'
RISER TRASH RACK/ANTIVORTEX: N/A

DEWATERING DEVICE = 8" PERFORATED PVC -WITH 8" PVC BARREL AT 0.0%
DEWATERING INVERT AT 8" RISER = 396.50
INVERT LAST PERFORATION = 399.00
DEWATERING PERFORATION CONFIGURATION:
WITH 1" HOLES @ 2" C-O-C.
15 HOLES PER CIRCUMFERENTIAL ROW.
15 HOLES RUNNING VERTICALLY.
195 HOLES TOTAL.

EMERGENCY SPILLWAY ELEV : NONE
CLEANOUT ELEVATION : 394.00
EMBANKMENT TOP WIDTH: 12'
SIDE SLOPES : 2:1 INTERIOR - 3:1 EXTERIOR

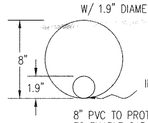
Provide a 8 inch diameter PVC riser with 1" perforations at 2" C-C. Invert of first perforations to start at 396.50 and invert of last/top perforations at 399.00. 13 perforations in circumference and 15 perforations in height. A total of 195 perforations in riser. Top of riser to be capped with water tight PVC end cap. Device per Standard C-10-30. (Sheet 13)



BASIN C PROFILE ALONG 8" LOW FLOW DEWATERING DEVICE

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

8" DIAMETER SCH. 80 THREADED PVC ENDCAP W/ 1.9" DIAMETER HOLE



8" PVC TO PROTRUDE THROUGH RISER TO ENABLE CAP TO BE SCREWED ON.

NOTE: ORIFICE CONFIGURATION DIFFERENT DURING SEDIMENT CONTROL. INTERIM CONDITION. SEE SEDIMENT CONTROL DETAILS.

NOTE: FOR DETAILS NOT SHOWN, REFER TO STORMWATER MANAGEMENT POND C DETAILS.

NOTE: FOR SEDIMENT CONTROL PLAN - SEE SHEET 6

SEDIMENT CONTROL BASIN C LOW-FLOW ORIFICE DETAIL

THIS PLAN IS FOR SEDIMENT CONTROL PURPOSES ONLY!

DEVELOPERS/BUILDERS CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF DEVELOPER/BUILDER — DATE 7/21/06

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

ENGINEER'S SIGNATURE — DATE 7/21/06

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/31/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE 8/31/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 9/5/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/13/06

Chief, Development Engineering Division — Date 9/14/06

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE – SUITE 250 – BURTONSVILLE OFFICE PARK
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\Drawings\03006\SDP\03006SnE-DET.dwg | DES. BJM/MJT | DRN. KLP | CHK. CKG

DATE	REVISION	BY	APP'R.

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

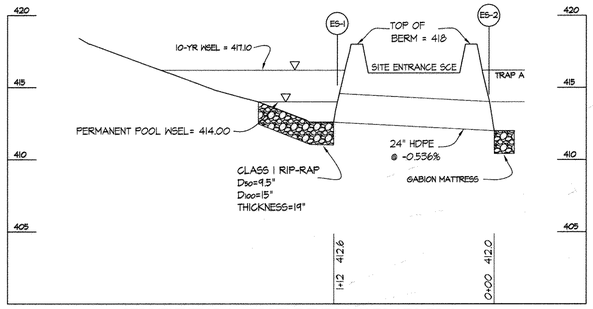
SEDIMENT CONTROL BASIN 'B' & 'C' DETAILS — 09/08/2016 NO ASBUILT INFORMATION

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

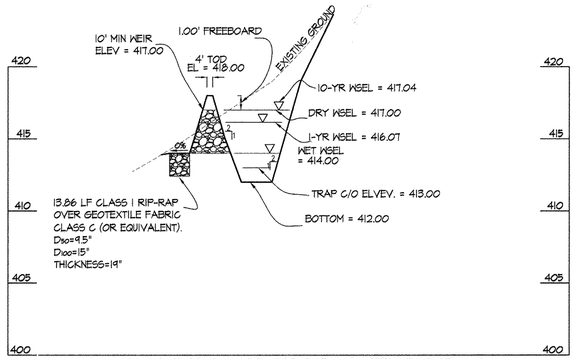
SCALE	ZONING	G. L. W. FILE No.
NO SCALE	R-A-15/B-1/ POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	11 OF 25

F-06-019



SEDIMENT TRAP A - PROFILE THROUGH ES-1 TO ES-2

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



SEDIMENT TRAP A - PROFILE THROUGH PRINCIPLE SPILLWAY

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

SEDIMENT TRAP A DATA TABLE

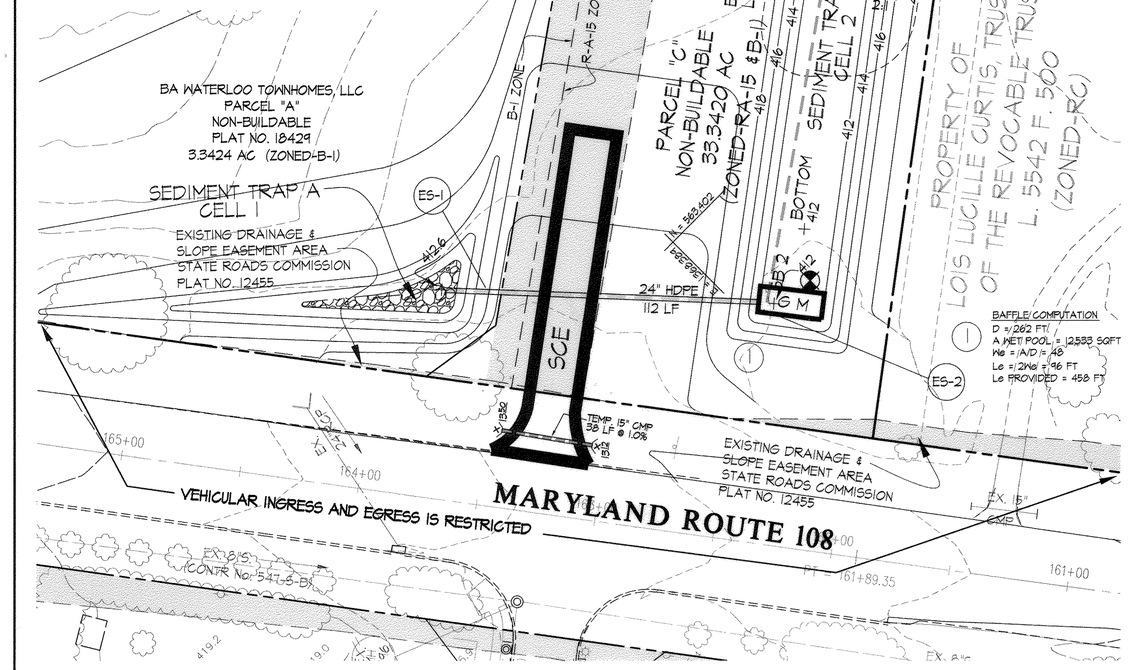
STONE OUTLET SEDIMENT TRAP

EXISTING DRAINAGE AREA : 1.82 AC (EX-1)
INTERIM DRAINAGE AREA : 5.00 AC (INT-1)

WET STORAGE VOL. REQUIRED : 0.21 AC-FT
WET STORAGE VOL. PROVIDED : 0.51 AC-FT
WET STORAGE ELEV : 414.00
DRY STORAGE REQUIRED: 0.21 AC-FT
DRY STORAGE PROVIDED = 1.13 AC-FT
DRY STORAGE WSEL = 417.00
EXISTING Q-1YR = 0.11 cfs (STUDY POINT 1)
INTERIM Q-1YR = 0.00 cfs (STUDY POINT 1)
SAFE PASS OF 10-YR STORM PROVIDED
Q_{10} = 128 cfs
10-YR WSEL = 417.18 ft.
BOTTOM ELEVATION : 412.00
TOP OF EMBANKMENT : 418.00
WEIR CREST ELEVATION : 417.00
WEIR LENGTH : 20'

EMERGENCY SPILLWAY ELEV : NONE
CLEANOUT ELEVATION : 415.00
EMBANKMENT TOP WIDTH: 5'
SIDE SLOPES : 2:1 INTERIOR - 3:1 EXTERIOR

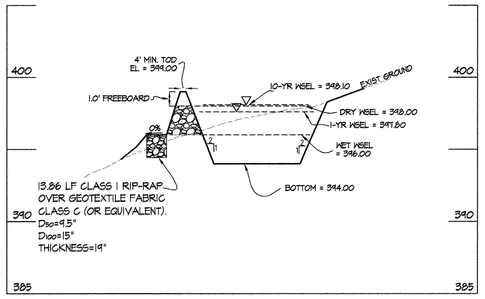
SEDIMENT TRAP A DETAIL



SEDIMENT TRAP 'A' ENLARGEMENT

SCALE: 1" = 30'

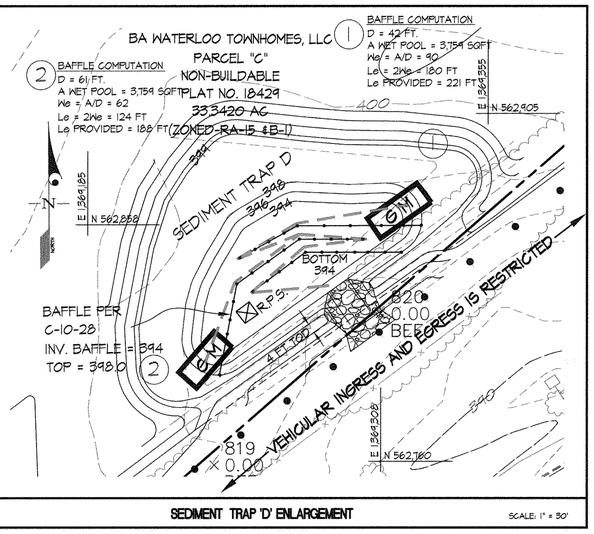
This detail is for Trap A baffel design. For plan information, see sheet 5.



SEDIMENT TRAP D - PROFILE THROUGH PRINCIPAL SPILLWAY

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

NOTE: FOR SEDIMENT CONTROL PLAN - SEE SHEETS 5 AND 6



SEDIMENT TRAP 'D' ENLARGEMENT

SCALE: 1" = 30'

This detail is for Trap D baffel design. For plan information, see sheet 6.

SEDIMENT TRAP D DATA TABLE

STONE OUTLET SEDIMENT TRAP

EXISTING DRAINAGE AREA : 1.15 AC
INTERIM DRAINAGE AREA : 1.15 AC

WET STORAGE VOL REQUIRED : 0.05 AC-FT
WET STORAGE VOL PROVIDED : 0.15 AC-FT
WET STORAGE ELEV : 396.00
DRY STORAGE REQUIRED: 0.05 AC-FT
DRY STORAGE PROVIDED = 0.20 AC-FT
DRY STORAGE WSEL = 398.00
EXISTING Q-1YR = 2.82 cfs
INTERIM Q-1YR = 0 cfs
SAFE PASS OF 10-YR STORM PROVIDED
Q_{10} = 4.41 cfs
10-YR WSEL = 398.10 ft.
BOTTOM ELEVATION : 394.00
TOP OF EMBANKMENT : 399.00
WEIR CREST ELEVATION : 398.00
WEIR LENGTH : 5'

EMERGENCY SPILLWAY ELEV : NONE
CLEANOUT ELEVATION : 395.00
EMBANKMENT TOP WIDTH: 4'
SIDE SLOPES : 2:1 INTERIOR - 3:1 EXTERIOR

DEVELOPERS/BUILDER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF DEVELOPER/BUILDER — DATE 7/21/06

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

ENGINEER'S SIGNATURE — DATE 7/21/06

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/31/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE 8/31/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 8/8/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/19/06

Chief, Development Engineering Division — Date 9/14/06

THIS PLAN IS FOR SEDIMENT CONTROL PURPOSES ONLY!

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE – SUITE 250 – BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

\Drawings\03006\SDP\03006SnE-DET.dwg | DES. BJM/MJT | DRN. KLP | CHK. CKG

DATE	REVISION	BY	APP'R.

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suilte 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

SEDIMENT CONTROL TRAP 'A' & 'D' DETAILS 09/08/2016 NO ASBUILT INFORMATION

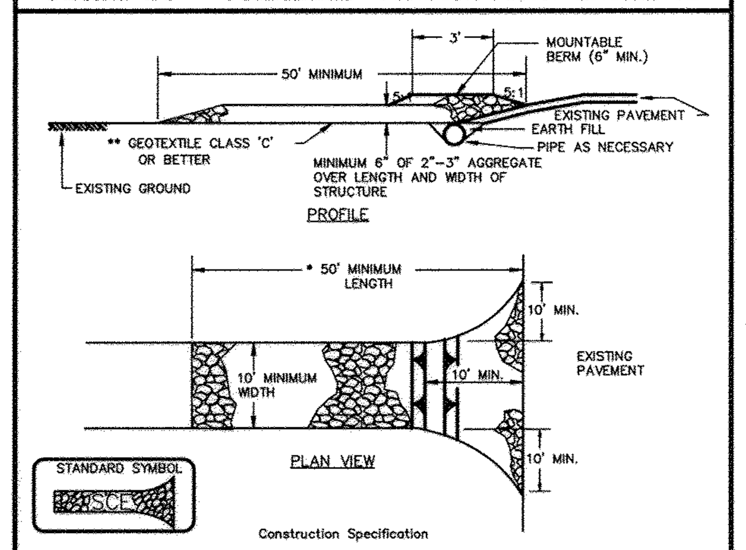
SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
NO SCALE	R-A-15/B-1/POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	12 OF 25

F-06-019

DETAIL 24 – STABILIZED CONSTRUCTION ENTRANCE



Construction Specification

1. Length – minimum of 50' (*30' for single residence lot).

2. Width – 10' minimum, should be flared at the existing road to provide a turning radius.

3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residences to use geotextile.

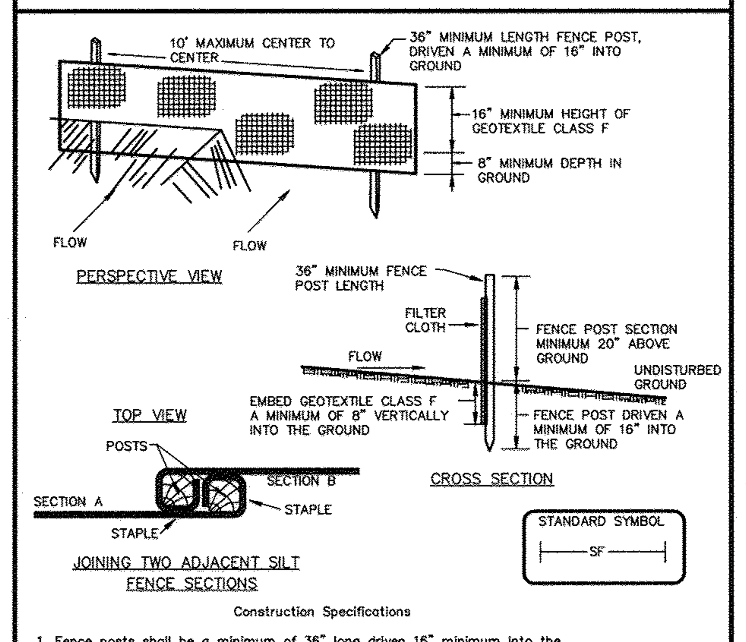
4. Stone – crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

5. Surface Water – all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.

6. Location – A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F – 17 – 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 22 – SILT FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pond per linear foot.

2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid–section and shall meet the following requirements for Geotextile Class F:

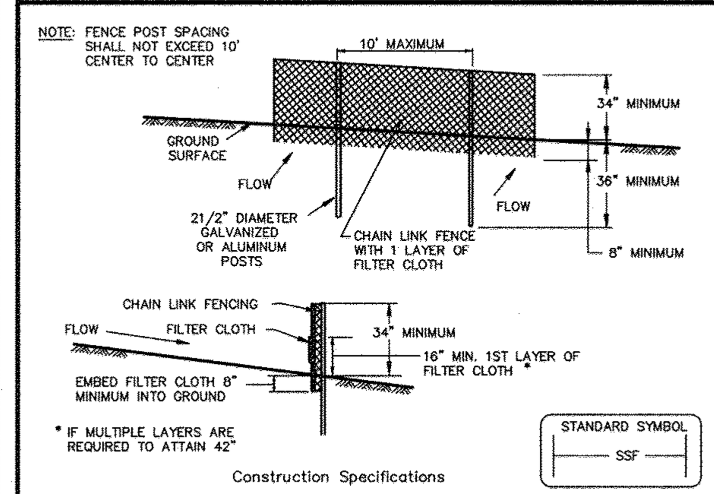
Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft² / minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.

4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E – 15 – 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 33 – SUPER SILT FENCE



Construction Specifications

1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42" fabric and 6' length posts.

2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.

3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.

4. Filter cloth shall be embedded a minimum of 8" into the ground.

5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.

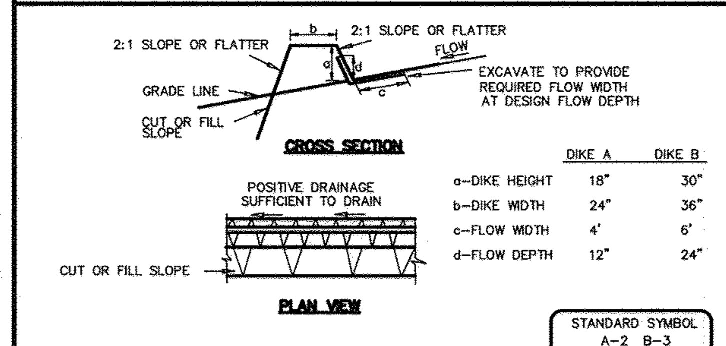
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height

7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft² /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE H – 26 – 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 1 – EARTH DIKE



	DIKE A	DIKE B
a–DIKE HEIGHT	18"	30"
b–DIKE WIDTH	24"	36"
c–FLOW WIDTH	4'	6'
d–FLOW DEPTH	12"	24"

FLOW CHANNEL STABILIZATION
GRADE 0.5% MIN. 10% MAX.

1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4" – 7" stone or recycled concrete equivalent pressed into the soil 7" minimum

Construction Specifications

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.

2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.

3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area at a non–erosive velocity.

4. All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.

5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.

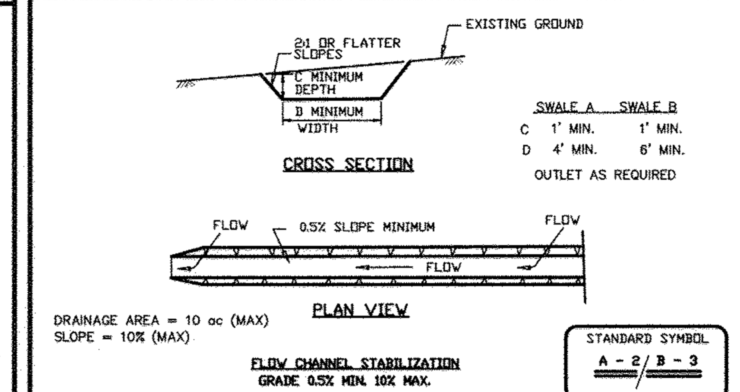
6. Fill shall be compacted by earth moving equipment.

7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.

8. Inspection and maintenance must be provided periodically and after each rain event.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE A – 1 – 6	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 2 – TEMPORARY SWALE



DRAINAGE AREA = 10 ac (MAX)
SLOPE = 10% (MAX)

FLOW CHANNEL STABILIZATION
GRADE 0.5% MIN. 10% MAX.

1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4"–7" stone or recycled concrete equivalent pressed into soil in a minimum 7" layer.

Construction Specifications

1. All temporary swales shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.

2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.

3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed stabilized area at a non–erosive velocity.

4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the swale.

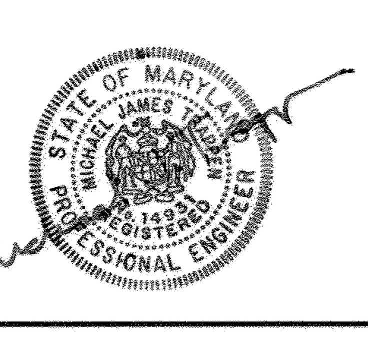
5. The swale shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.

6. Fill, if necessary, shall be compacted by earth moving equipment.

7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the swale.

8. Inspection and maintenance must be provided periodically and after each rain event.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE A – 2 – 4	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



DEVELOPER'S/BUILDER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF DEVELOPER/BUILDER — DATE 7/21/06

ENGINEER'S CERTIFICATE

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Michael J. Trapp — 7/21/06
ENGINEER'S SIGNATURE — DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/31/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE 8/31/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

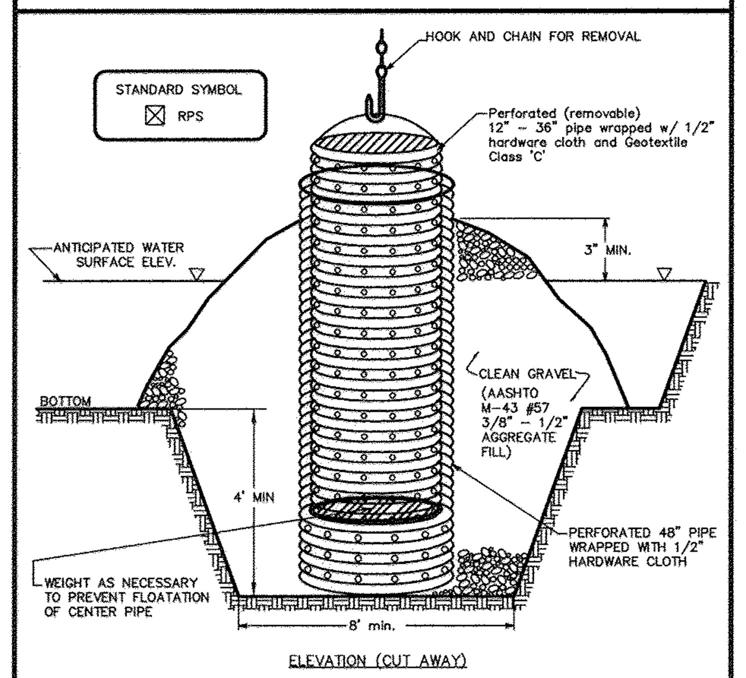
Chief, Bureau of Highways — Date 9/5/16

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/19/06

Chief, Development Engineering Division — Date 9/14/06

DETAIL 20A – REMOVABLE PUMPING STATION



Construction Specifications

1. The outer pipe should be 48" dia. or shall, in any case, be at least 4" greater in diameter than the center pipe. The outer pipe shall be wrapped with 1/2" hardware cloth to prevent backfill material from entering the perforations.

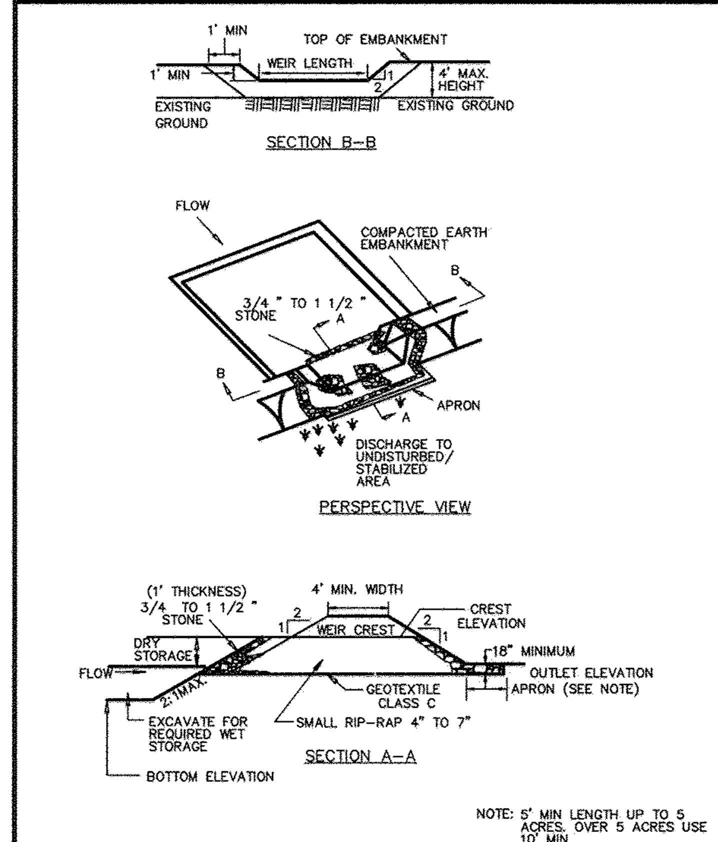
2. After installing the outer pipe, backfill around outer pipe with 2" aggregate or clean gravel.

3. The inside stand pipe (center pipe) should be constructed by perforating a corrugated or PVC pipe between 12" and 36" in diameter. The perforations shall be 1/2" X 6" slits or 1" diameter holes 6" on center. The center pipe shall be wrapped with 1/2" hardware cloth first, then wrapped again with Geotextile Class C.

4. The center pipe should extend 12" to 18" above the anticipated water surface elevation or riser crest elevation when dewatering a basin.

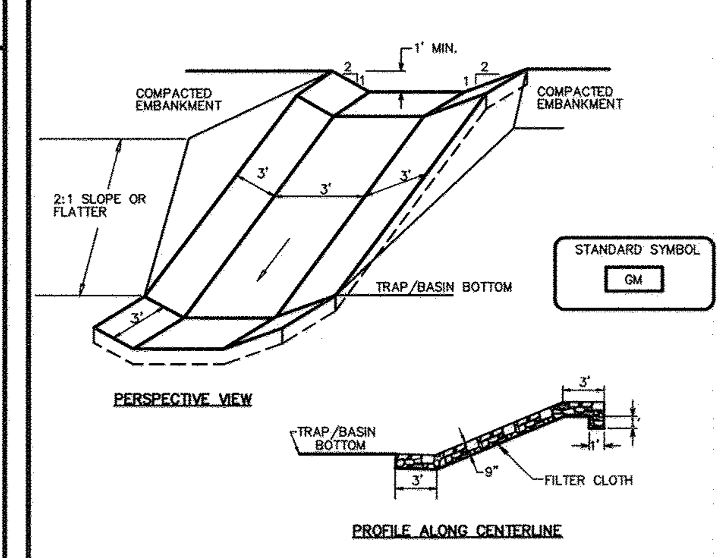
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE D – 12 – 5	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 10A
STONE / RIP–RAP OUTLET SEDIMENT TRAP–ST IV



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C – 9 – 16	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 6 – GABION INFLOW PROTECTION



Construction Specifications

1. Gabion inflow protection shall be constructed of 9' x 3' x 9" gabion baskets forming a trapezoidal cross section 1' deep, with 2:1 side slopes, and a 3' bottom width.

2. Geotextile Class C shall be installed under all gabion baskets.

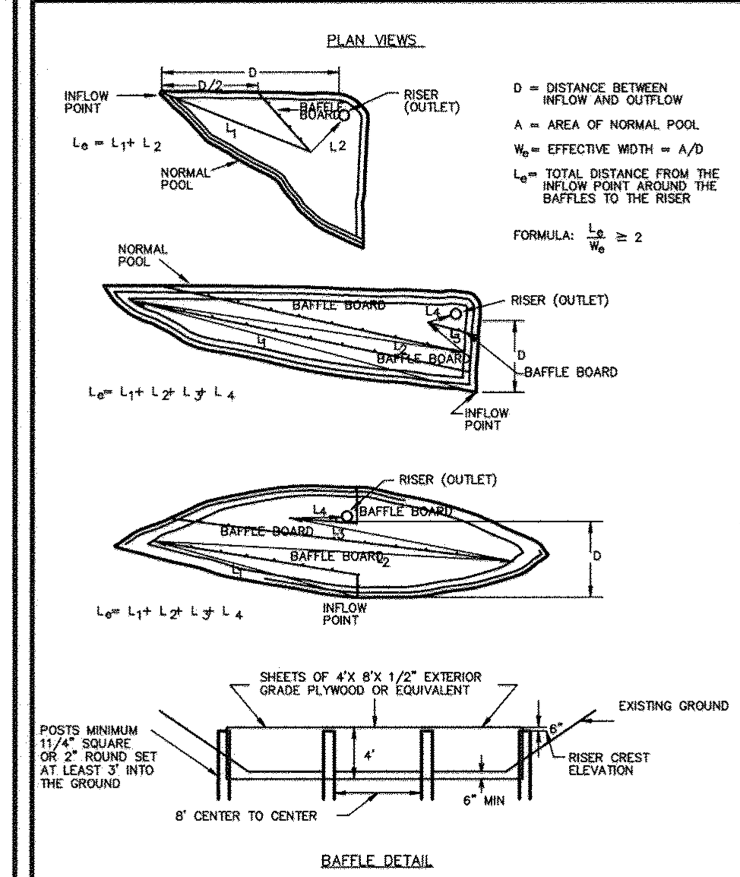
3. The stone used to fill the gabion baskets shall be 4" – 7".

4. Gabions shall be installed in accordance with manufacturers recommendations.

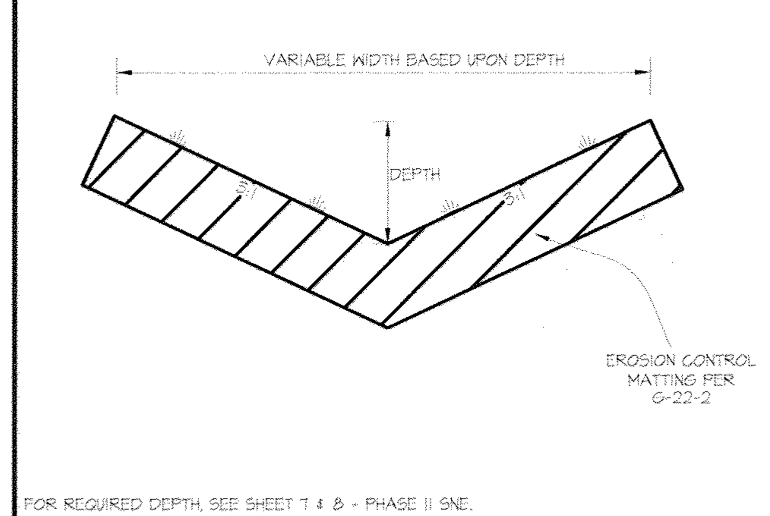
5. Gabion Inflow Protection shall be used where concentrated flow is present on slopes steeper than 4:1.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE B – 7 – 2	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 18 – SEDIMENT BASIN BAFFLES

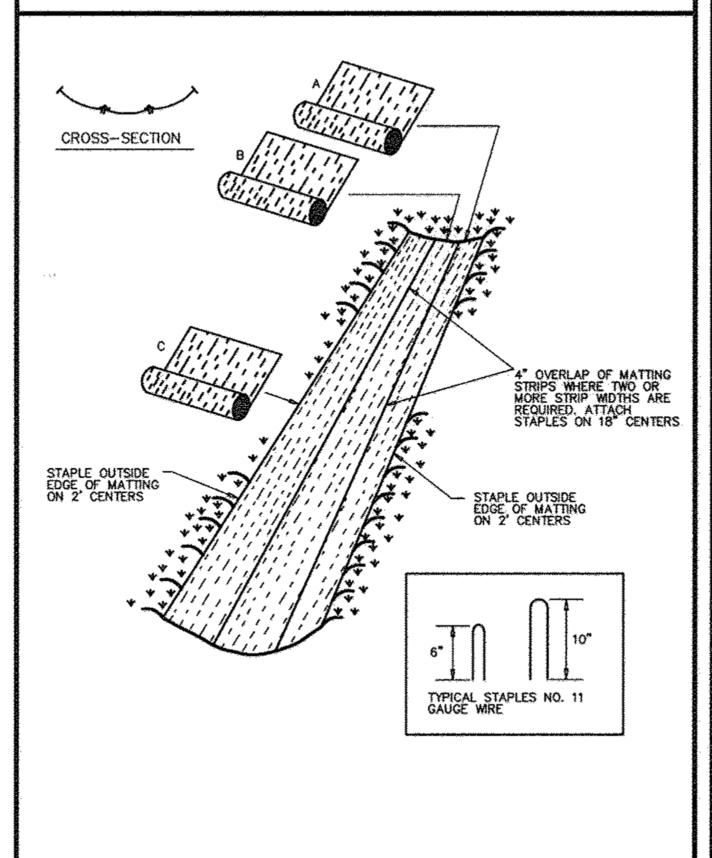


U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C – 10 – 28	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



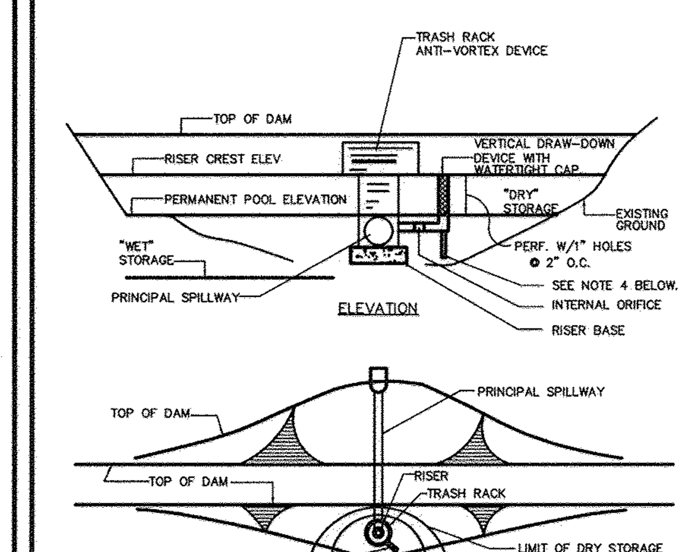
PHASE II INTERNAL SWALES DETAIL — NOT TO SCALE

DETAIL 30 – EROSION CONTROL MATTING



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE G – 22 – 2	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

BASIN DRAWDOWN SCHEMATIC VERTICAL DRAW–DOWN DEVICE



CONSTRUCTION SPECIFICATIONS

1. Perforations in the draw–down device may not extend into the wet storage.

2. The total area of the perforations must be greater than 4 times the area of the internal orifice.

3. The perforated portion of the draw–down device shall be wrapped with 1/2" hardware cloth and geotextile fabric. The geotextile fabric shall meet the specifications for Geotextile Class E.

4. Provide support of draw–down device to prevent sagging and floatation. An acceptable preventative measure is to stake both sides of draw–down device with 1" steel angle, or 1' by 4" square or 2" round wooden posts set 3' minimum into the ground then joining them to the device by wrapping with 12 gauge minimum wire.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C – 10 – 30	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

Dust Control

Definition

Controlling dust blowing and movement on construction sites and roads.

Purpose

To prevent blowing and movement of dust from exposed soil surfaces, reduce on and off–site damage, health hazards, and improve traffic safety.

Conditions Where Practice Applies

This practice is applicable to areas subject to dust blowing and movement where on and off–site damage is likely without treatment.

Specifications

Temporary Methods

1. *Mulches – See standards for vegetative stabilization with mulches only. much should be crimped or tacked to prevent blowing.*
2. *Vegetative Cover – See standards for temporary vegetative cover.*
3. *Tillage – To roughen surface and bring clods to the surface. This is an emergency measure which should be used before soil blowing starts. Begin plowing on windward side of site. Chisel–type plows spaced about 12" apart, spring–toothed harrows, and similar plows are examples of equipment which may produce the desired effect.*
4. *Irrigation – This is generally done as an emergency treatment. Site is sprinkled with water until the surface is moist. Repeat as needed At no time should the site be irrigated to the point that runoff begins to flow.*
5. *Barriers – Solid board fences, silt fences, snow fences, straw bales, and similar material can be used to control air currents and soil blowing. Barriers placed at right angle to prevailing currents at intervals at about ten times their height are effective in controlling soil blowing.*
6. *Calcium Chloride – Apply at rates that will keep surface moist. May need treatment.*

Permanent Methods

1. *Permanent Vegetation – See standards for permanent vegetative cover, and permanent stabilization with sod. Existing trees or large shrubs may afford valuable protection if left in place.*
2. *Topsoiling – Covering with less erosive soil material. See standards for top soil.*
3. *Stone – Cover surface with crushed stone or gravel.*

References

1. *Agriculture Handbook 346. Wind Erosion Forces in the United States and Their Use in Predicting Soil Loss.*
2. *Agriculture Information Bulletin 354. How to Control Wind Erosion, USDA_ARS.*

THIS PLAN IS FOR SEDIMENT CONTROL PURPOSES ONLY!

STANDARD AND SPECIFICATIONS FOR TOPSOIL

DEFINITION

PLACEMENT OF TOPSOIL OVER A PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION.

PURPOSE

TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.

CONDITIONS WHERE PRACTICE APPLIES

I. THIS PRACTICE IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPE WHERE:

A. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.

B. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIED OF MOISTURE AND PLANT NUTRIENTS.

C. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.

D. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.

II. FOR THE PURPOSE OF THESE STANDARDS AND SPECIFICATIONS, AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN FOR ADEQUATE STABILIZATION. AREAS HAVING SLOPES STEEPER THAN 2:1 SHALL HAVE THE APPROPRIATE STABILIZATION SHOWN ON THE PLANS.

CONSTRUCTION AND MATERIAL SPECIFICATIONS

I. TOPSOIL SALVAGED FROM THE EXISTING SITE MAY BE USED PROVIDED THAT IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE RESPECTIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-SCS IN COOPERATION WITH MARYLAND AGRICULTURAL EXPERIMENTAL STATION.

II. TOPSOIL SPECIFICATIONS - SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING:

A. TOPSOIL SHALL BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY A AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. REGARDLESS, TOPSOIL SHALL NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND SHALL CONTAIN LESS THAN 5% BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1 1/2" IN DIAMETER.

B. TOPSOIL MUST BE FREE OF PLANT PARTS SUCH AS BERMUDA GRASS, QUACKGRASS, JOHNSONGRASS, NUTSEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.

C. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, GROUND LIMESTONE SHALL BE SPREAD AT THE RATE IF 4-8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL. LIME SHALL BE DISTRIBUTED UNIFORMLY OVER DESIGNATED AREAS AND WORKED INTO THE SOIL IN CONJUNCTION WITH TILLAGE OPERATIONS AS DESCRIBED IN THE FOLLOWING PROCEDURES.

III. FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES:

A. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION - SECTION I - VEGETATIVE STABILIZATION METHODS AND MATERIALS (OR SEE SEEDING NOTES).

IV. FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES:

A. ON SOIL MEETING TOPSOIL SPECIFICATIONS, OBTAIN TEST RESULTS DICTATING FERTILIZER & LIME AMENDMENTS REQUIRED TO BRING THE SOIL INTO COMPLIANCE WITH THE FOLLOWING:

1. PH FOR TOPSOIL SHALL BE BETWEEN 6.0 AND 7.5. IF THE TESTED SOIL DEMONSTRATES A PH OF LESS THAN 6.0, SUFFICIENT LIME SHALL BE PRESCRIBED TO RAISE THE PH TO 6.5 OR HIGHER.
2. ORGANIC CONTENT OF TOPSOIL SHALL BE NOT LESS THAN 1.5 PERCENT BY WEIGHT.
3. TOPSOIL HAVING SOLUBLE SALT GREATER THAN 500 PARTS PER MILL SHALL NOT BE USED.
4. NO SOD OR SEED SHALL BE PLACED ON SOIL WHICH HAS BEEN WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHOTO-TOXIC MATERIALS.

NOTE: TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.

B. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 2.0 VEGETATIVE STABILIZATION - SECTION I - VEGETATIVE STABILIZATION METHODS AND MATERIALS (OR SEE SEEDING NOTES).

V. TOPSOIL APPLICATION

A. WHEN TOPSOILLING, MAINTAIN NEEDED EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSION, GRADE STABILIZATION STRUCTURES, EARTH DIKES, SLOPE SILT FENCE AND SEDIMENT TRAPS AND BASINS.
B. GRADES ON THE AREAS TO BE TOPSOILED, WHICH HAVE BEEN PREVIOUSLY ESTABLISHED, SHALL BE MAINTAINED, ALBEIT 4"-8" HIGHER IN ELEVATION.

C. TOPSOIL SHALL BE UNIFORMLY DISTRIBUTED IN A 4' -8' LAYER AND LIGHTLY COMPACTED TO A MINIMUM THICKNESS OF 4". SPREADING SHALL BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILLING OR OTHER OPERATIONS SHALL BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER
D. TOPSOIL SHALL NOT BE PLACED WHILE THE TOPSOIL OR SUBSOIL IS FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.

VI. ALTERNATIVE FOR PERMANENT SEEDING - INSTEAD OF APPLYING THE FULL AMOUNTS OF LIME AND COMMERCIAL FERTILIZER, COMPOSTED SLUDGE AND AMENDMENTS MAY BE APPLIED AS SPECIFIED BELOW:

A. COMPOSTED SLUDGE MATERIAL FOR USE AS A SOIL CONDITIONER FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES SHALL BE TESTED TO PRESCRIBE AMENDMENTS AND FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

1. COMPOSTED SLUDGE SHALL BE SUPPLIED BY, OR ORIGINATE FROM, A PERSON OR PERSONS THAT ARE PERMITTED (AT THE TIME OF ACQUISITION OF THE COMPOST) BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT UNDER COMAR 26.04.06.

2. COMPOSTED SLUDGE SHALL CONTAIN AT LEAST 1 PERCENT NITROGEN, 1.5 PERCENT PHOSPHORUS, AND 0.2 PERCENT POTASSIUM AND HAVE A PH OF 7.0 TO 8.0. IF COMPOST DOES NOT MEET THESE REQUIREMENTS, THE APPROPRIATE CONSTITUENTS MUST BE ADDED TO MEET THE REQUIREMENTS PRIOR TO USE.

3. COMPOSTED SLUDGE SHALL BE APPLIED AT A RATE OF 1 TON/1,000 SQUARE FEET.

B. COMPOSTED SLUDGE SHALL BE AMENDED WITH A POTASSIUM FERTILIZER APPLIED AT A RATE OF 4LB/1,000 SQUARE FEET, AND 1/3 THE NORMAL LIME APPLICATION RATE.

REFERENCES: GUIDELINE SPECIFICATIONS, SOIL PREPARATION AND SODDING. MD-VA PUB. #1, COOPERATIVE EXTENSION SERVICE, UNIVERSITY OF MARYLAND AND VIRGINIA POLYTECHNIC INSTITUTES. REVISED 1973.

SEDIMENT CONTROL NOTES

1. A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY OFFICE OF INSPECTION AND PERMITS PRIOR TO THE START OF ANY CONSTRUCTION. (410) 313-1855

2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.

3. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES AND PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. I, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.

5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS, SOD, TEMPORARY SEEDINGS AND MULCHING (SEC. G). TEMPORARY STABILIZATION, WITH MULCH ALONE, CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.

6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.

TOTAL AREA OF SITE	:	58.6 ± ACRES
AREA DISTURBED	:	45.0 ± ACRES
AREA TO BE ROOFED OR PAVED	:	8.6 ± ACRES
AREA TO BE VEGETATIVELY STABILIZED	:	13.6 ± ACRES
TOTAL CUT	:	20,000 ± CU. YDS.
TOTAL FILL	:	20,000 ± CU. YDS.
OFF-SITE WASTE/BORROW AREA LOCATION	:	NONE

8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.

9. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY DPW SEDIMENT CONTROL INSPECTOR.

10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.

11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO 3 PIPE LENGTHS OR THAT WHICH SHALL BE BACKFILLED AND STABILIZED WITHIN 1 WORKING DAY, WHICHEVER IS SHORTER.

PERMANENT SEEDING NOTES

APPLY TO GRADED OR CLEARED AREA NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.
SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING (UNLESS PREVIOUSLY LOOSENED).

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES

1) PREFERRED - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQUARE FEET) AND 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS PER ACRE 30-0-0 UREA-FORM FERTILIZER (9 LBS/1000 SQ FT).
2) ACCEPTABLE - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT) AND 1000 LBS PER ACRE OF 10-10-10 FERTILIZER (23 LBS/1000 SQ FT) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL.

SEEDING: FOR THE PERIODS MARCH 1 THRU APRIL 30, AND AUGUST 1 THRU OCTOBER 15, SEED WITH 60 LBS PER ACRE (1.4 LBS/1000 SQ FT) OF KENTUCKY 31 TALL FESCUE. FOR THE PERIOD MAY 1 THRU JULY 31, SEED WITH 60 LBS KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS PER ACRE (.05 LBS/1000 SQ FT) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 THRU FEBRUARY 28, PROTECT SITE BY: OPTION (1) 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION (2) USE SOD. OPTION (3) SEED WITH 60 LBS/ACRE KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS/ACRE WELL ANCHORED STRAW.

MULCHING: APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ FT) FOR ANCHORING.

MAINTENANCE: INSPECT ALL SEEDED AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

TEMPORARY SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING (UNLESS PREVIOUSLY LOOSENED).

SOIL AMENDMENTS: APPLY 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT).

SEEDING: FOR PERIODS MARCH 1 THRU APRIL 30 AND FROM AUGUST 15 THRU OCTOBER 15, SEED WITH 2-1/2 BUSHEL PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SQ FT.). FOR THE PERIOD MAY 1 THRU AUGUST 14, SEED WITH 3 LBS PER ACRE OF WEEPING LOVEGRASS (.07 LBS/1000 SQ FT). FOR THE PERIOD NOVEMBER 16 THRU FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

MULCHING: APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT) OF UNROTTED, WEED-FREE, SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GAL PER ACRE (5 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES, 8 FT OR HIGHER, USE 348 GAL PER ACRE (8 GAL/1000 SQ FT) FOR ANCHORING.

DEVELOPER'S/BUILDER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF DEVELOPER/BUILDER — DATE

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL, REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

ENGINEER'S SIGNATURE — DATE

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE – SUITE 250 – BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301–421–4024 BALT: 410–880–1820 DC/VA: 301–989–2524 FAX: 301–421–4186

\Drawings\03006\SDP\03006SnE–DET.dwg	DES. BJM/MJT	DRN. KLP	CHK. CKG

DATE	REVISION	BY	APP'R.

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suilte 400
Greenbelt, MD 20770–3203
Attn. Duncan Slidell
301–623–1525

SEDIMENT CONTROL NOTES & DETAILS

09/08/2016
NO ASBUILT INFORMATION

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
NO SCALE	R–A–15/B–1/ POR	03006
DATE	TAX MAP – GRID	SHEET
JULY, 2006	37–1&2	13 OF 25

F-06-019

LEGEND

- SOILS DELINEATION LINE
  - 'B' SOIL
  - 'C' SOIL
  - 'D' SOIL
- EXISTING DRAINAGE DIVIDE
- TC PATH (A)
- 3 DRAINAGE AREA LABEL

STATE OF MARYLAND — MICHAEL JAMES TROPP — No. 14320 — REGISTERED PROFESSIONAL ENGINEER

EXISTING DISCHARGE SUMMARY

	Q1 (cfs)	Q10 (cfs)	Q100 (cfs)
STUDY POINT 1	1.86	6.24	10.21
STUDY POINT 2	13.68	49.12	82.32
STUDY POINT 3	20.38	65.99	107.38

DEVELOPER'S/BUILDER'S CERTIFICATE

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Robert C. Anderson — 7/21/06
SIGNATURE OF DEVELOPER/BUILDER — DATE

ENGINEER'S CERTIFICATE

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Michael J. Tropp — 7/21/06
ENGINEER'S SIGNATURE — DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL, MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/31/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE 8/31/06

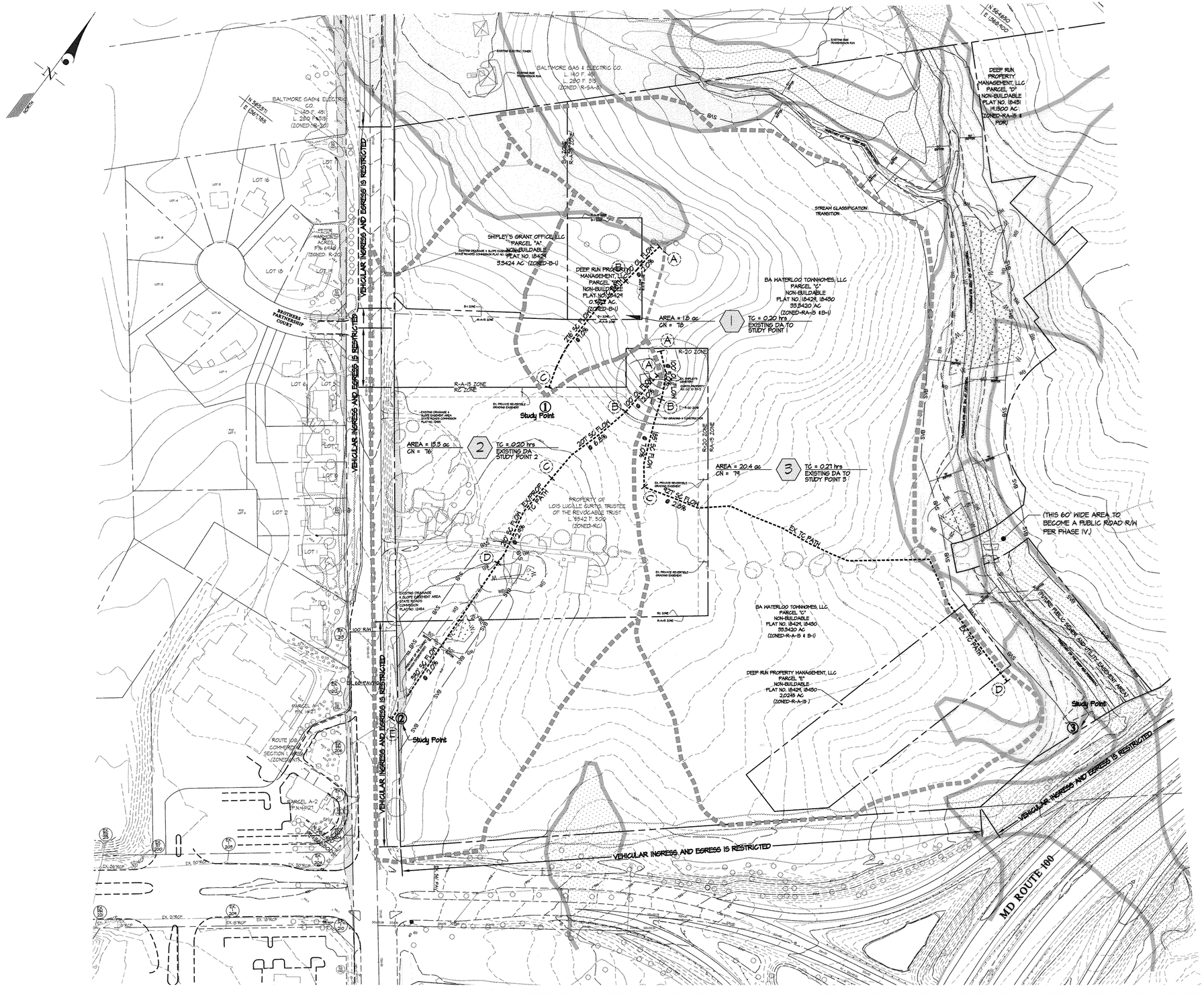
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 9/5/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/19/06

Chief, Development Engineering Division — Date 9/14/06



THIS PLAN IS FOR STORMWATER MANAGEMENT HYDRAULIC ANALYSIS AND DRAINAGE AREA INFORMATION ONLY

FOR PLAN INFORMATION, SEE SHEETS 2 THROUGH 4

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
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\DRAWINGS\03006\SPMG\03006SWM-DAMex.dwg | DES. BJM | DRN. klp | CHK. CKG

DATE	REVISION	BY	APP'R.

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

STORMWATER MANAGEMENT DRAINAGE AREA MAP - EXISTING CONDITIONS

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

NO ASBUILT INFORMATION 09/08/2014

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
1"=100'	R-A-15/B-1/POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	14 OF 25

F-06-019

LEGEND

SOILS DELINEATION LINE
'B' SOIL
'C' SOIL
'D' SOIL
DRAINAGE DIVIDE
TC PATH
(A) DRAINAGE AREA LABEL
(3) DRAINAGE AREA LABEL

NOTES:

1. GRADING, ROADS AND BUILDING PADS SHOWN ARE BASED UPON THE PRELIMINARY CONCEPT DEVELOPED TO THIS POINT AND ARE NOT PROPOSED UNDER THIS PLAN. THESE IMPROVEMENTS HAVE BEEN SHOWN TO CLARIFY THE DRAINAGE AREA FACILITIES B & C HAVE BEEN DESIGNED TO.

2. FACILITY A IS A SEDIMENT TRAP TYPE ST-IV AND WILL REMAIN AS SUCH UNTIL PHASE I OF THE SITES DEVELOPMENT. CELLS 1 & 2 ARE TO REMAIN IN PLACE FOLLOWING STABALIZATION AND UNTIL PHASE I.

3. THE DRAINAGE AREA TO STUDY POINT 5 HAS BEEN TRUNCATED AT THE PROPERTY BOUNDARY FOR THE EXISTING AND PROPOSED CONDITION TO ENABLE AN EQUITABLE COMPARISON.

4. TIME OF CONCENTRATION PATHS FOR THE PROPOSED CONDITION ARE BASED UPON AN ASSUMED STORM DRAIN LAYOUT.

5. LOTS/BUILDINGS/ROADS SHOWN ARE BASED UPON THE FUTURE DEVELOPMENT OF THIS PROJECT, AND ARE SHOWN FOR DRAINAGE AREA AND CURVE NUMBER JUSTIFICATION ONLY. THE LAYOUT SHOWN IS NOT PROPOSED BY THIS PLAN.

6. THE RECHARGE REQUIREMENT IS TO BE MET BY THE USE OF INFILTRATION TRENCHES PLACED THROUGHOUT THE FUTURE SITE.
RECHARGE HAS BEEN ACCOUNTED FOR IN THE DESIGN OF PONDS B & C (DISCOUNTED FROM RGV). IT HAS ALSO BEEN ACCOUNTED FOR IN THE PRELIMINARY DESIGN OF POND A. THE CUMULATIVE RECHARGE REQUIREMENT FOR ALL DRAINAGE AREAS WAS THEN DIVIDED BY THE TOTAL AREA TO PONDS A, B AND C. THE RESULT YIELDS THE RECHARGE REQUIRED PER ACRE OF DEVELOPABLE PARCEL.

DA I-A = 5.3 ACRES REV REQUIRED = 0.10 AC-FT.
DA 2-C = 5.6 ACRES REV REQUIRED = 0.09 AC-FT
DA 3-B = 17.6 ACRES REV REQUIRED = 0.27 AC-FT
TOTAL AREA = 28.5 ACRES TOTAL REV REQUIRED = 0.46 AC-FT

REV REQUIREMENT/ACRE OF DEVELOPABLE PARCEL = 0.46 AC-FT/28.5ACRES = 0.016 AC-FT/ACRE = 705 CU-FT/ACRE

PEAK DISCHARGE SUMMARY

		Q1 (cfs)	Q10 (cfs)	Q100 (cfs)
STUDY POINT 1	EX.	1.86	6.24	10.27
	PROP.	0.30	50.01	54.82
STUDY POINT 2	EX.	13.68	44.12	82.32
	PROP.	2.07	78.19	126.34
STUDY POINT 3	EX.	20.38	65.99	107.36
	PROP.	0.80	84.56	116.70

DEVELOPER'S/BUILDER'S CERTIFICATE

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Robert C. Anderson 7/21/06.
SIGNATURE OF DEVELOPER/BUILDER

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Michael J. Tropp 7/21/06
ENGINEER'S SIGNATURE DATE

STATE OF MARYLAND — MICHAEL JAMES TROPP — No. 11993 — REGISTERED PROFESSIONAL ENGINEER

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT DATE 8/31/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA - NATURAL RESOURCES CONSERVATION SERVICE DATE 8/31/06

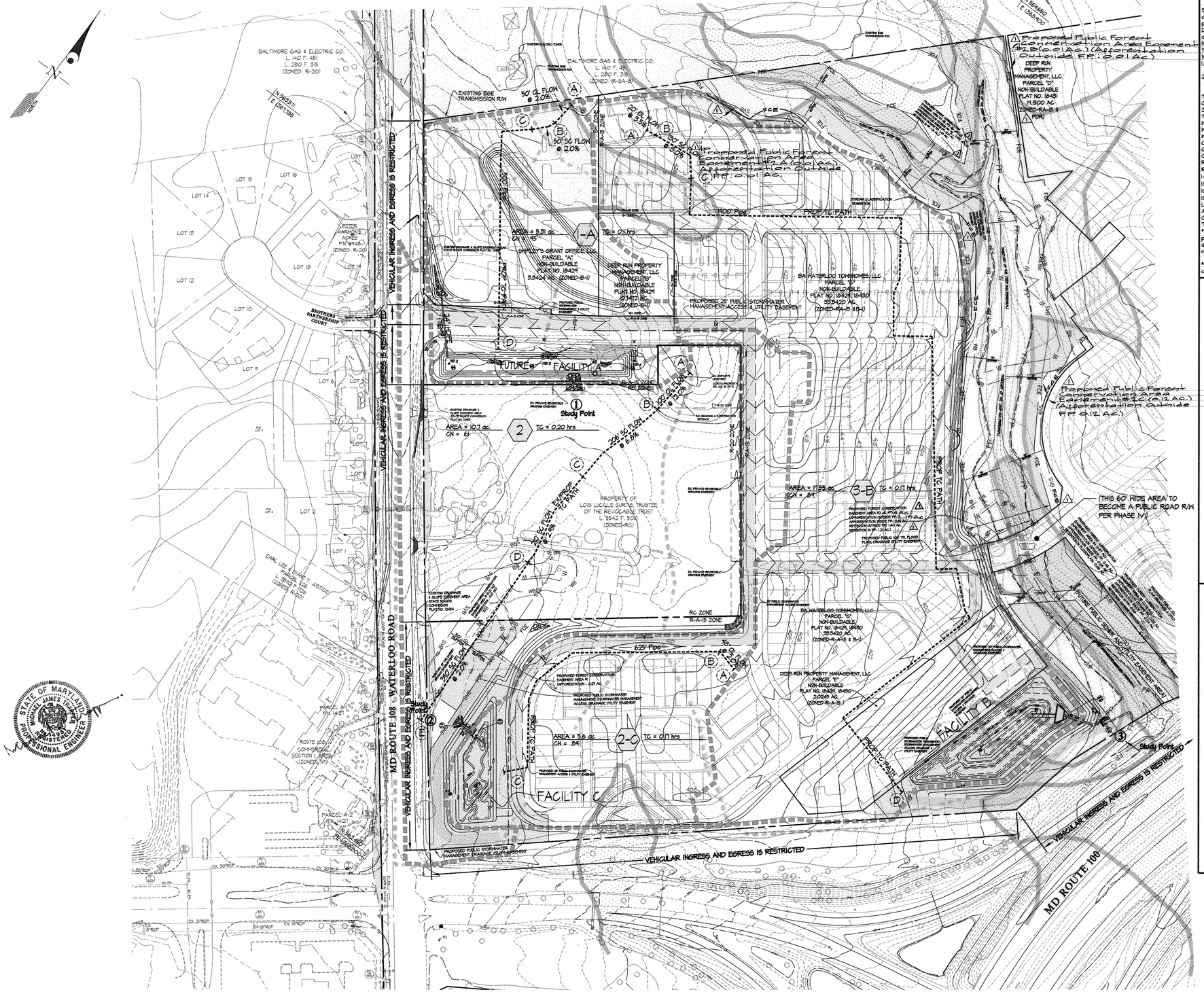
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways Date 9/5/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development Date 9/19/06

Chief, Development Engineering Division A.S. Date 9/14/06



STORMWATER MANAGEMENT POND C

Stormwater Management Pond C provides Quality Control (WQv) and quantity control for 5.6 acres of the proposed development. WQv is provided via a permanent pool. CPv is provided via Extended Detention. Safe passage of the 100-year design storm has been analyzed for the blocked condition and a minimum 1-foot of freeboard has been provided.

Type (per MDE) : Pocket Wetland (P4)
Non-MD-378 Facility Justification.
1.Storage @ 100-YR WSEL = 341.84 cu-ft.
< 40,000 cu-ft.
2.Lowest Invert of Cradle = 335.62
Top of Dam = 401.00
Embankment = 5.4 ft < 6.0 ft
Total Drainage Area To Facility = 5.6 acres (Area 2-C)
CN = 84
Zoning: Townhouse, 76% Impervious
Tc = 0.170 hrs.
WQv Required = 0.25 ac-ft
WQv Provided = 0.25 ac-ft
WQv/Permanent Pool WSEL = 346.5
CPv Required = .47
CPv Provided = .47
CPv WSEL = 348.85
Rev Requirement = 705 cu-ft/acre*
Rev To Be Provided By Infiltration Trenches (See Below)*
1-YR (Qp = 0.20 cfs) (WSEL = 344.03)
10-YR (Qp = 23.56 cfs) (WSEL = 344.71)
100-YR (Qp = 36.93 cfs) (WSEL = 344.97)
100-YR Blocked Flow (WSEL = 344.97)
Lag: 22.1 hours
Aquatic Bench = 346.00
Outfall: Precast Riser Structure to twin 2'-4 RCP to Stream Valley T.O.D. = 401.00
* The recharge requirement for this drainage area (2-C) will be provided by infiltration trenches. These infiltration trenches will be designed under the subdivision plans for this development. See SWM narrative for further explanation.

*See Study Point 2 computations for non-lag related TR-20 computations.

STORMWATER MANAGEMENT POND B

Stormwater Management Pond B provides Quality Control (WQv) and quantity control for 17.6 acres of the proposed development. WQv is provided via a permanent pool. CPv is provided via Extended Detention.
Safe passage of the 100-year design storm has been analyzed for the blocked condition and a minimum
2-feet of freeboard has been provided.

Type (per MDE) : Wet Extended Detention Pond (P3)
MD-378 Hazzard Class A Facility
Total Drainage Area To Facility = 17.55 acres (Area 3-B)
CN = 84
Zoning: Townhouse, 74% Impervious
Tc = 0.170 hrs.
WQv Required = 0.8 ac-ft
WQv Provided = 0.8 ac-ft
WQv/Permanent Pool WSEL = 381.8
CPv Required = 1.48
CPv Provided = 1.49
CPv WSEL = 385.15
Rev Requirement = 705 cu-ft/acre*
Rev To Be Provided By Infiltration Trenches (See Below)*
1-YR (Qp = 0.80 cfs) (WSEL = 385.32)
10-YR (Qp = 84.56 cfs) (WSEL = 385.81)
100-YR (Qp = 116.7 cfs) (WSEL = 385.98)
100-YR Blocked Flow (WSEL = 385.98)
Lag: 18.5 hours
9 Ft. Aquatic Bench = 380.80
12 Ft. Safety/Maintenance Bench = 382.80
Outfall: Precast Riser Structure to 48" RCP to Stream Valley T.O.D. = 388.00

* The recharge requirement for this drainage area (3-B) will be provided by infiltration trenches. These infiltration trenches will be designed under the subdivision plans for this development. See SWM narrative for further explanation.

*See Study Point 3 computations for non-lag related TR-20 computations.

TRAP A (FUTURE POND A)

This pond has been preliminary designed to handle the WQv and the CPv requirements. Larger storms will bypass this facility. Pond 'A' outlets at Study point 1. This pond will be designed to handle proposed drainage area I-A. Under this plan, Pond A will be left in its temporary state. Its final design will come under the Phase I plans.

Total Drainage Area To Facility = 5.31 acres (Area I-A)
CN = 85
Zoning: Commercial, 85% Impervious
Tc = 0.100 hrs.
WQv Required = 0.25 ac-ft
WQv Provided = 0.25 ac-ft
WQv/Permanent Pool WSEL = 5 feet relative to bottom of pool
CPv Required = 0.60
CPv Provided = 0.60
CPv WSEL = 5.0 ft relative to invert of underground pipe manifold
Rev Requirement = 705 cu-ft/acre*
Rev To Be Provided By Infiltration Trenches (See Below)*
1-YR (Qp = 0.50 cfs) (WSEL = 3.42 ft relative to invert of pipe manifold)
10-YR (Qp = 50.01 cfs)
100-YR (Qp = 54.82 cfs)
Lag: 18.0 hours

Design Parameters
Underground Manifold System with above ground water feature.
Manifold Diameter = 48 inch
Total Manifold Length = 2460 ft.
Total Volume = 0.11 ac-ft.
Orifice Diameter = 2.5 inch
High Flow events to be bypassed

* The recharge requirement for this drainage area (1-A) will be provided by infiltration trenches. These infiltration trenches will be designed under the subdivision plans for this development. See SWM narrative for further explanation
*See Study Point 1 computations for non-lag related TR-20 computations.

THIS PLAN IS FOR STORMWATER MANAGEMENT HYDRAULIC ANALYSIS AND DRAINAGE AREA INFORMATION ONLY
FOR PLAN INFORMATION, SEE SHEETS 2 THROUGH 4

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE – SUITE 250 – BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

\DRAWINGS\03006\SPMG\03006SWM-DAMprop.dwg | DES. BJM | DRN. klp | CHK. CKG

DATE	REVISION	BY	APP'R.
2/6/08	Rev. FCE 2 & Added FCE 2A, 2B & 2C	WOJ	MJT

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

STORMWATER MANAGEMENT DRAINAGE AREA MAP - PROPOSED CONDITIONS

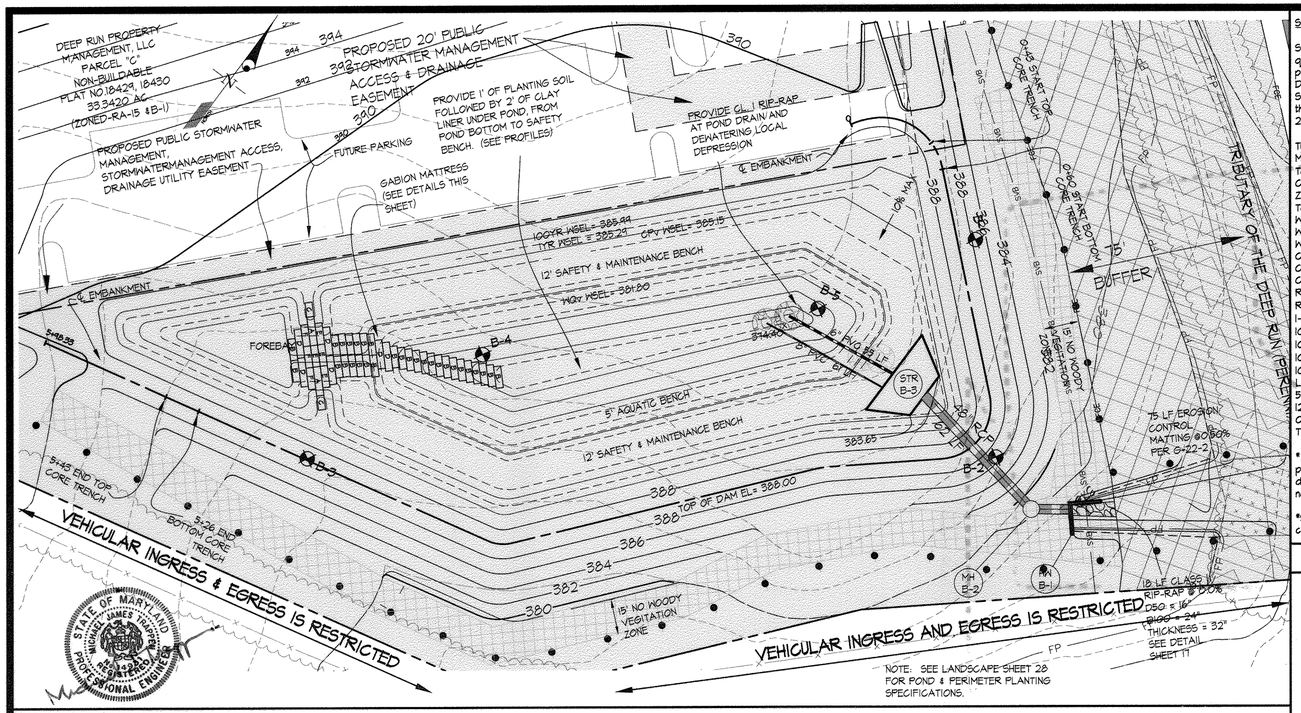
SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

NO ASBUILT INFORMATION 09/08/2016

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
1"=100'	R-A-15/B-1/ POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	15 OF 25

F-06-019



STORMWATER MANAGEMENT FACILITY 'B' ENLARGEMENT SCALE: 1" = 30'

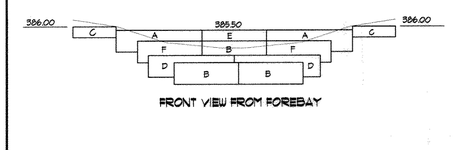
STORMWATER MANAGEMENT POND B

Stormwater Management Pond B provides Quality Control (WQv) and quantity control for 17.6 acres of the proposed development. WQv is provided via a permanent pool. CPv is provided via Extended Detention.
Safe passage of the 100-year design storm has been analyzed for the blocked condition and a minimum 2-feet of freeboard has been provided.

Type (per MDE) : Wet Extended Detention Pond (P3)
MD-378 Hazzard Class A Facility
Total Drainage Area To Facility = 17.60 acres (Area B-B)
CN = 89
Zoning: Townhouse, 74% impervious
Tc = 0.170 hrs.
WQv Required = 0.8 ac-ft
WQv Provided = 0.8 ac-ft
WQv/Permanent Pool WSEL = 381.8
CPv Required = 1.48
CPv Provided = 1.51
CPv WSEL = 385.15
Rev Requirement = 703 cu-ft/acre*
Rev To Be Provided By Infiltration Trenches (See Below)*
1-YR (Qp = 0.73 cfs) (WSEL = 385.24)
10-YR (Qp = 75.84 cfs) (WSEL = 385.15)
10-YR Blocked Flow (WSEL = 385.77)
100-YR (Qp = 116.14 cfs) (WSEL = 385.99)
100-YR Blocked Flow (WSEL = 385.99)
Lag: 18.7 hours
5 ft. Aquatic Bench = 380.80
12 ft. Safety/Maintenance Bench = 382.80
Outfall: Precast Riser Structure to 48" RCP to Stream Valley
T.O.D. = 388.00

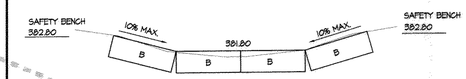
* The recharge requirement for this drainage area (B-B) will be provided by infiltration trenches. These infiltration trenches will be designed under the subdivision plans for this development. See SWM narrative for further explanation.

*See Study Point 3 computations for non-lag related TR-20 computations.

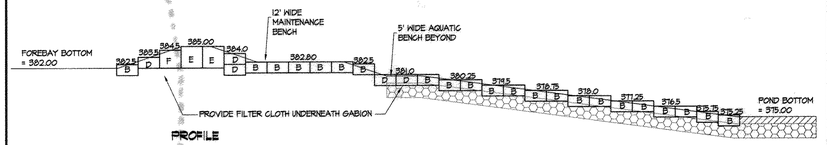


FRONT VIEW FROM FOREBAY

GABION SIZES			
LETTER CODE	LENGTH	WIDTH	HEIGHT
A	12'	3'	3'
B	9'	3'	1'-6"
C	6'	3'	1'-6"
D	12'	3'	1'-6"
E	9'	3'	3'
F	9'	3'	2'-6"

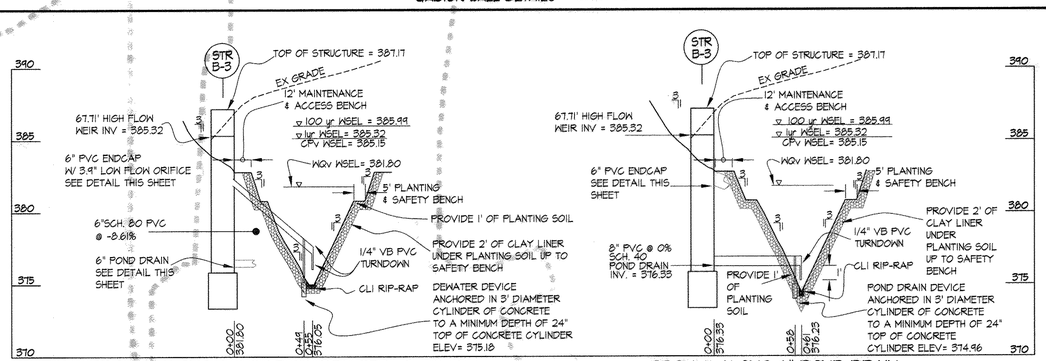


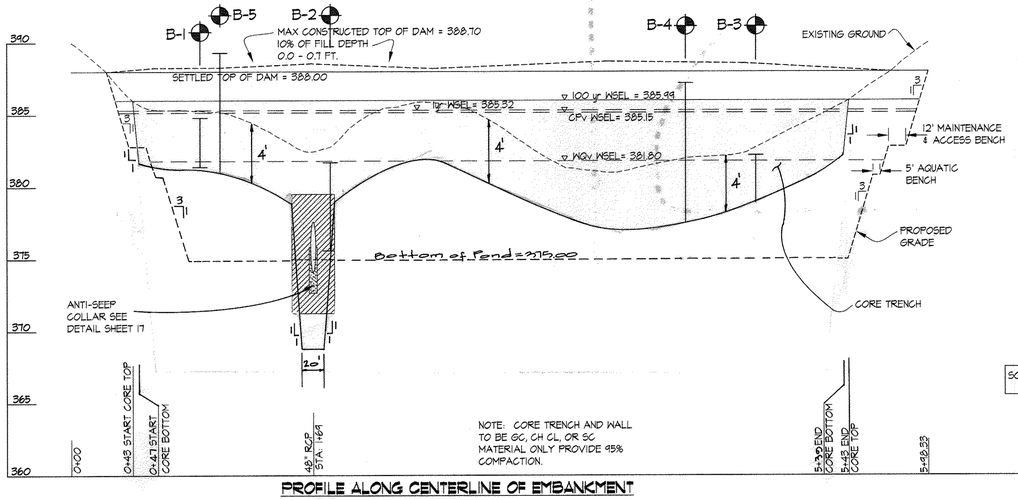
SECTION THRU SAFETY BENCH



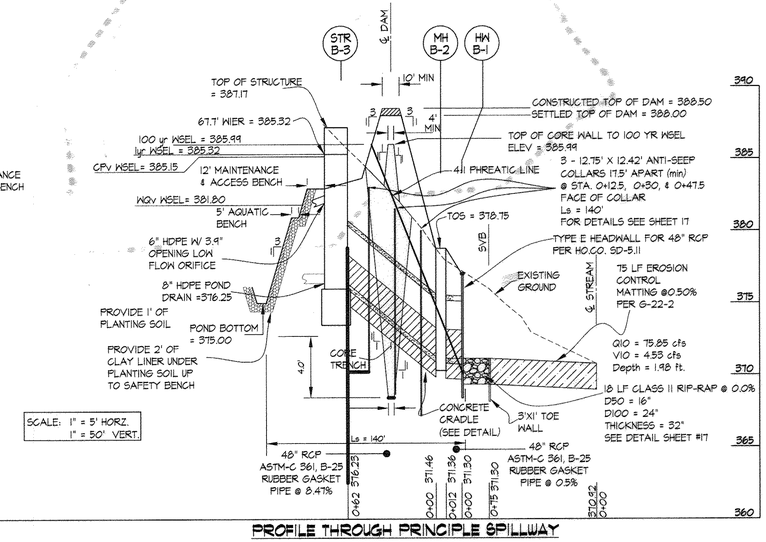
PROFILE

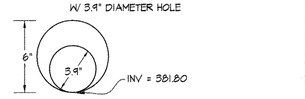
GABION WALL DETAILS SCALE: 1" = 10'





PROFILE ALONG CENTERLINE OF EMBANKMENT



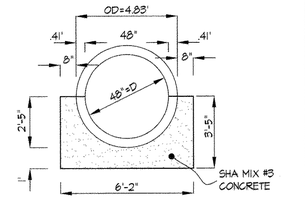


6" PVC TO PROTRUDE THROUGH RISER TO ENABLE CAP TO BE SCREWED ON.

NOTE: ORIFICE TO BE CAPPED DURING SEDIMENT CONTROL

SWM LOW-FLOW ORIFICE DETAIL

SCALE: 1" = 1'



A2 CONCRETE CRADLE DETAIL

SCALE: 1" = 5'

DEVELOPER'S/BUILDER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

Robert C. Anderson — 7/21/06
SIGNATURE OF DEVELOPER/BUILDER — DATE

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Michael J. Tropp — 7/21/06
ENGINEER'S SIGNATURE — DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/31/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE 8/31/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 9/5/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/8/06

Chief, Development Engineering Division — Date 9/14/06

OPERATION AND MAINTENANCE SCHEDULE OF JOINT MAINTAINED STORMWATER MANAGEMENT FACILITY POND B

Routine Maintenance (by HOA)

1. The facility shall be inspected annually and after major storms. Inspections should be performed during wet weather to determine if the pond is functioning properly.

2. Top and side slopes of the embankment shall be mowed a minimum of two (2) times a year, once in June and once in September. Other side slopes, the bottom of the pond, and maintenance access should be mowed as needed.

3. Debris and litter next to the outlet structure shall be removed during regular mowing operations and as needed.

4. Visible signs of erosion in the pond as well as riprap outlet area shall be repaired as soon as it is noticed.

Non-Routine Maintenance (by Howard County)

1. Structural Components of the pond such as the dam, the riser, and the pipes shall be repaired upon detection of any damage. The components should be inspected during routine maintenance operations.

2. Sediment should be removed when its accumulation significantly reduces the design storage, interferes with the function of the riser, when deemed necessary for aesthetic reasons, or when deemed necessary by Howard County's Department of Public Works.

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE – SUITE 250 – BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

\Drawings\03006\SPMG\03006SWM-DET-B.dwg | DES. DDS | DRN. DDS | CHK. BJM

DATE	REVISION	BY	APP'R.
12-5-06	Rev. Core Trench to 4' Below Ex. Ground	WGJ	

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

STORMWATER MANAGEMENT DETAILS - FACILITY B

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431
SEE ASBUILT SET 09/08/2016

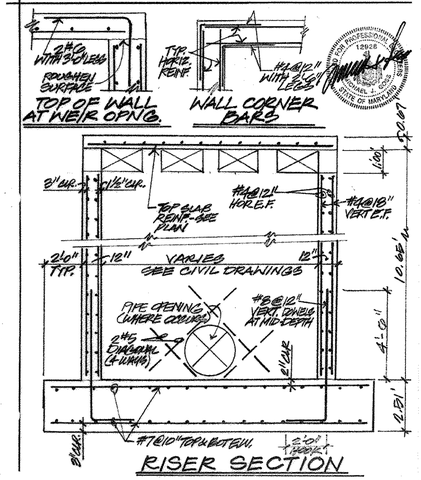
ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
AS SHOWN	R-A-15/B-1/POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	16 OF 25

F-06-019

RATHGEBER/GOSS ASSOCIATES
Consulting Structural Engineers
15871 Crabbs Branch Way, Rockville, Maryland 20855
301/990-0271 Fax: 301/990-0273

PROJECT SHIPLEY'S GRANT
CLIENT GUTSCHICK LITTLE & WEBER
JOB NO. 3014.09 DATE 6-22-05
ENGINEER MJG PAGE 1 OF 4



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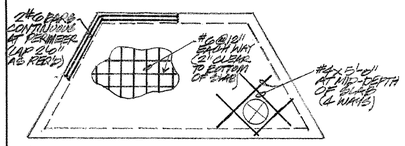
PROJECT SHIPLEY'S GRANT
CLIENT GUTSCHICK LITTLE & WEBER
JOB NO. 3014.09 DATE 6-22-05
ENGINEER MJG PAGE 2 OF 4



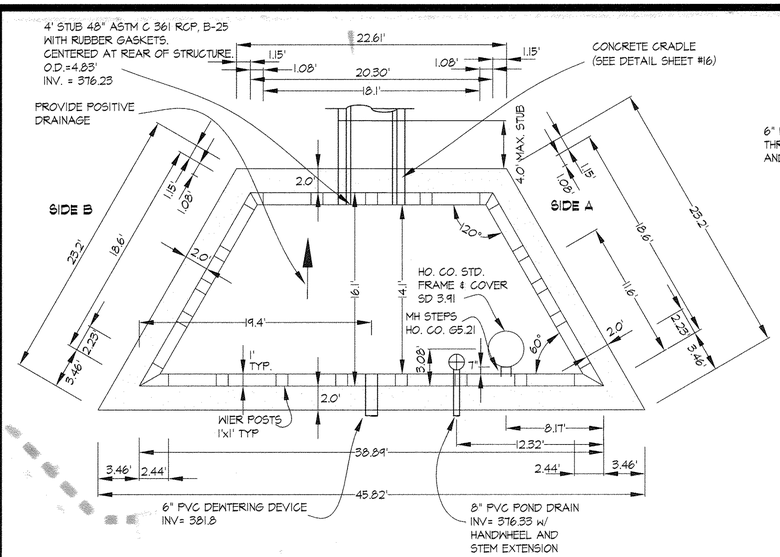
8" TOP SLAB REINFORCEMENT

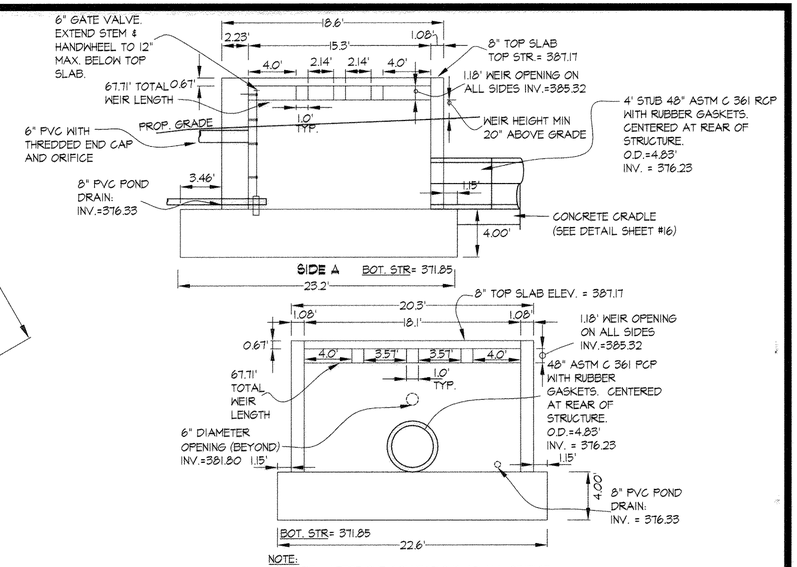
RISER – GENERAL NOTES

A. *REFERENCE STANDARDS*
1. INTERNATIONAL BUILDING CODE.
2. BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, ACI-318.

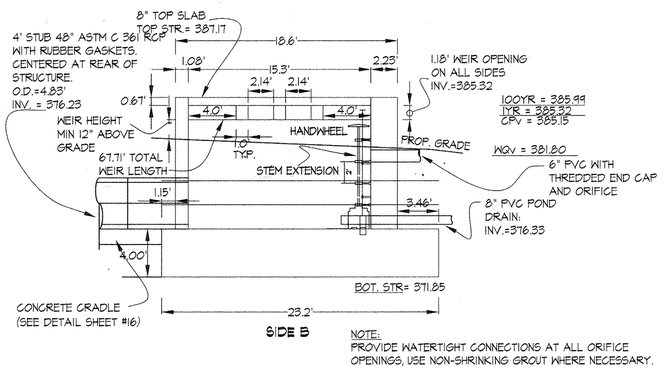
B. *MATERIALS*
1. CONCRETE TO BE NORMALWEIGHT, (150 PCF) WITH A COMPRESSIVE STRENGTH OF 4000 PSI MINIMUM AT 28 DAYS. ALL CONCRETE TO BE AIR ENTRAINED.
2. DEFORMED REINFORCING BARS TO CONFORM TO ASTM A615, GRADE 60.

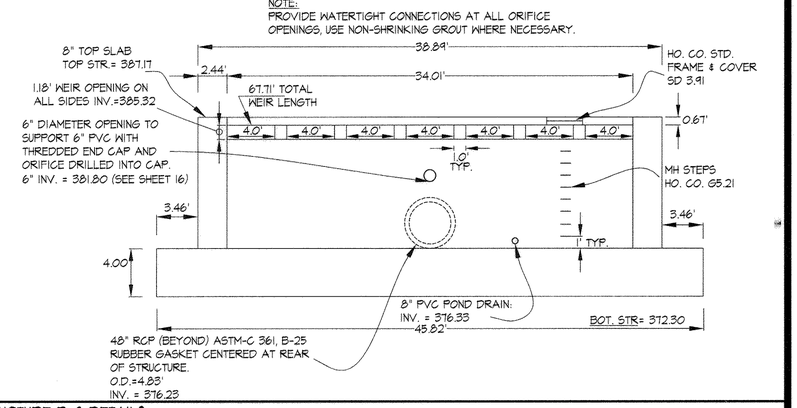
C. *CONSTRUCTION*
1. ALL FOUNDATIONS TO BE PLACED ON UNDISTURBED SOIL OR COMPACTED STRUCTURAL FILL.
2. ASSUMED MINIMUM BEARING CAPACITY = 2000 PSF. ACTUAL CAPACITY TO BE VERIFIED PRIOR TO PLACING CONCRETE.
3. PLACE BACKFILL AGAINST WALLS IN MAXIMUM LIFTS OF EIGHT(8) INCHES.





NOTE:
PROVIDE WATERTIGHT CONNECTIONS AT ALL ORIFICE OPENINGS, USE NON-SHRINKING GROUT WHERE NECESSARY.





RISER B-2 STRUCTURAL REINFORCEMENT DETAILS & NOTES (NTS)

DEVELOPER'S/BUILDER'S CERTIFICATE

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Robert C. Anderson — 7/21/06
SIGNATURE OF DEVELOPER/BUILDER — DATE

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Michael J. Tropp — 7/21/06
ENGINEER'S SIGNATURE — DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/31/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE 8/31/06

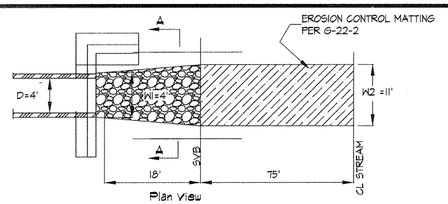
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

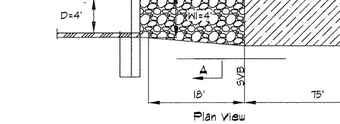
Chief, Bureau of Highways — Date 9/5/06

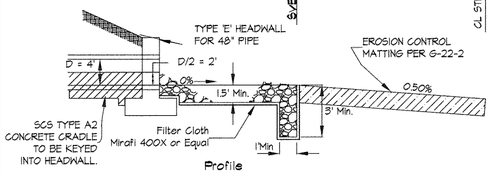
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/9/06

Chief, Development Engineering Division — Date 9/14/06

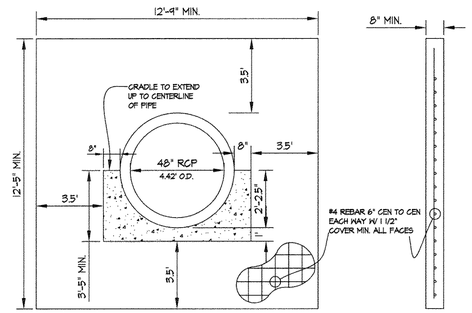






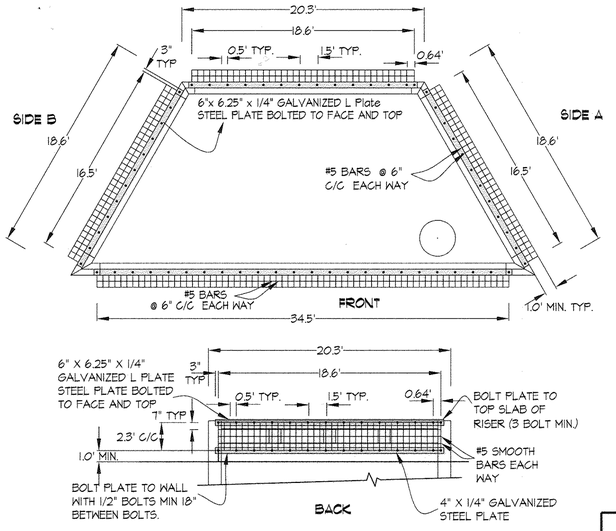
OUTLET PROTECTION DETAIL (NTS)

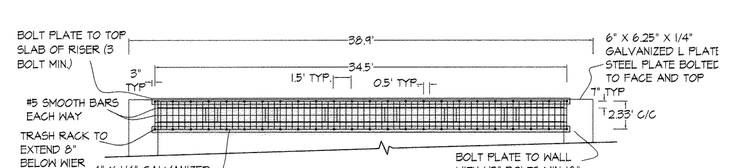
FOR ADDITIONAL INFORMATION, SEE ROCK OUTLET PROTECTION I CONSTRUCTION SPECIFICATIONS ON SHEET 19



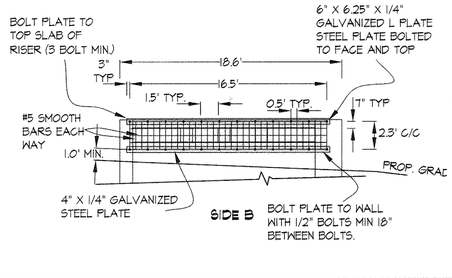
RISER STRUCTURE B-3 DETAILS

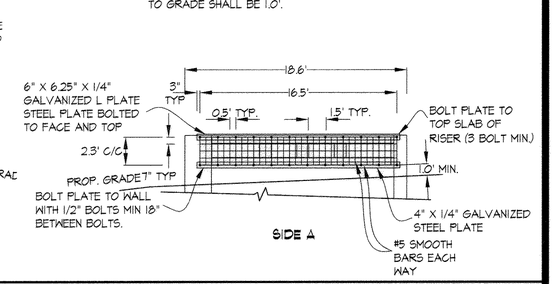
Scale: 1" = 6.0'





NOTE: MINIMUM DISTANCE FROM BOTTOM TRASH RACK TO GRADE SHALL BE 1.0'.





TRASH RACK DETAILS

Scale: 1" = 6.0'

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE – SUITE 250 – BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

\Drawings\03006\SPMG\03006SWM-DET.dwg | DES. BJM | DRN. DDS | CHK. BJM

DATE	REVISION	BY	APP'R.

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

STORMWATER MANAGEMENT DETAILS - FACILITY B

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431
ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SEE AS-BUILT SET 09/08/2016

SCALE	ZONING	G. L. W. FILE No.
AS SHOWN	R-A-15/B-1/ POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	17 OF 25

F-06-019

PROFILE ALONG CENTERLINE OF EMBANKMENT

FRONT VIEW FROM FOREBAY

GABION SIZES			
LETTER CODE	LENGTH	WIDTH	HEIGHT
A	12'	3'	3'
B	9'	3'	1'-6"
C	6'	3'	1'-6"
D	12'	3'	1'-6"
E	9'	3'	3'

GABION WALL DETAILS
SCALE: 1" = 10'

STORMWATER MANAGEMENT POND C

Stormwater Management Pond C provides Quality Control (WQv) and quantity control for 5.6 acres of the proposed development. WQv is provided via a permanent pool. CPv is provided via Extended Detention. Safe passage of the 100-year design storm has been analyzed for the blocked condition and a minimum 1-foot of freeboard has been provided.

Type (per MDE) : Pocket Wetland (W4)
Non-MD-378 Facility Justification:
1.Storage @ 100-YR WSEL = 34,184 cu-ft. < 40,000 cu-ft.
2.Lowest Invert of Cradle = 395.62
Top of Dam = 401.00:
Embankment = 5.4 ft < 6.0 ft

Total Drainage Area To Facility = 5.6 acres (Area 2-C)
CN = 89
Zoning: Townhouse, 76% impervious
Tc = 0.170 hrs.
WQv Required = 0.25 ac-ft
WQv Provided = 0.25 ac-ft
WQv/Permanent Pool WSEL = 396.5
CPv Required = .47
CPv Provided = .47
CPv WSEL = 398.85
Rev Requirement = 703 cu-ft/acre*
Rev To Be Provided By Infiltration Trenches (See Below)*
1-YR (Qp = 0.20 cfs) (WSEL = 399.03)
10-YR (Qp = 23.56 cfs) (WSEL = 399.77)
100-YR (Qp = 36.93 cfs) (WSEL = 399.97)
100-YR Blocked Flow (WSEL = 399.97)
Lag: 22.1 hours
Aquatic Bench = 396.00
Outfall: Precast Riser Structure to twin 21Δ RCP to Stream Valley
T.O.D. = 401.00

* The recharge requirement for this drainage area (2-C) will be provided by infiltration trenches. These infiltration trenches will be designed under the subdivision plans for this development. See SWM narrative for further explanation.

*See Study Point 2 computations for non-lag related TR-20 computations.

NOTE: SEE LANDSCAPE SHEET 24 FOR POND PLANTING SPECIFICATIONS

STORMWATER MANAGEMENT FACILITY 'C' ENLARGEMENT
SCALE: 1" = 30'

FOR INFORMATION NOT SHOWN, SEE SHEETS 2 THROUGH 4

A-2 CONCRETE CRADLE DETAIL

PROFILE THROUGH A-A

PROFILE THROUGH B-B

PROFILE THROUGH C-C

DEVELOPER'S/BUILDER'S CERTIFICATE SCALE: 1" = 2'

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

Robert C. Andrews 7/21/06.
SIGNATURE OF DEVELOPER/BUILDER

DATE

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN 'AS-BUILT' PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Michael J. Trapp 7/21/06
ENGINEER'S SIGNATURE

STATE OF MARYLAND MICHAEL JAMES TRAPPEN REGISTERED 14931 PROFESSIONAL ENGINEER

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. DATE

8/31/06
HOWARD SOIL CONSERVATION DISTRICT

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR ~~SMALL~~ POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

Jim Myers /cs 8/31/06
USDA - NATURAL RESOURCES CONSERVATION SERVICE DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
ACTING 9/8/06
Chief, Bureau of Highways HS Date

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
9/19/06
Chief, Division of Land Development Date
9/14/06
Chief, Development Engineering Division A.S. Date

OPERATION AND MAINTENANCE SCHEDULE OF JOINT MAINTAINED STORMWATER MANAGEMENT FACILITY POND C

Routine Maintenance (by HOA)

1. The facility shall be inspected annually and after major storms. Inspections should be performed during wet weather to determine if the pond is functioning properly.

2. Top and side slopes of the embankment shall be mowed a minimum of two (2) times a year, once in June and once in September. Other side slopes, the bottom of the pond, and maintenance access should be mowed as needed.

3. Debris and litter next to the outlet structure shall be removed during regular mowing operations and as needed.

4. Visible signs of erosion in the pond as well as riprap outlet area shall be repaired as soon as it is noticed.

Non-Routine Maintenance (by Howard County)

1. Structural Components of the pond such as the dam, the riser, and the pipes shall be repaired upon detection of any damage. The components should be inspected during routine maintenance operations.

2. Sediment should be removed when its accumulation significantly reduces the design storage, interferes with the function of the riser, when deemed necessary for aesthetic reasons, or when deemed necessary by Howard County's Department of Public Works.

3. In the event that this pond must be drained, a removable pump station per SCD:D-12-5 shall be required.

PLAN VIEW

SECTION A-A

PROFILE

OUTLET PROTECTION DETAIL (NTS)
FOR ADDITIONAL INFORMATION, SEE ROCK OUTLET PROTECTION I CONSTRUCTION SPECIFICATIONS ON SHEET 19

PROFILE THROUGH PRINCIPLE SPILLWAY

PROFILE ALONG 12" LOW FLOW DEWATERING DEVICE

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

\Drawings\03006\SPMG\03006SWM-DET-C.dwg	DES. DDS	DRN. DDS	CHK. BJM

DATE	REVISION	BY	APP'R.
12-05-06	Rev. Core Trench to 4' Below Ex. Ground	WGJ	

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suilte 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

STORMWATER MANAGEMENT DETAILS - FACILITY C

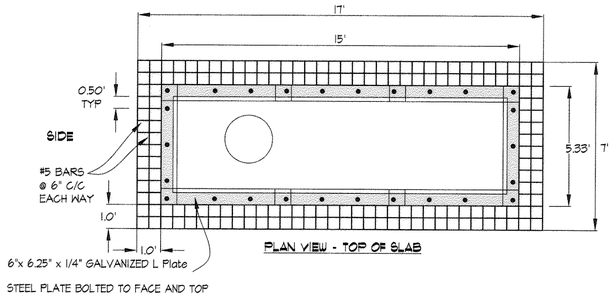
SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

SEE ASBUILT SET 09/08/2016

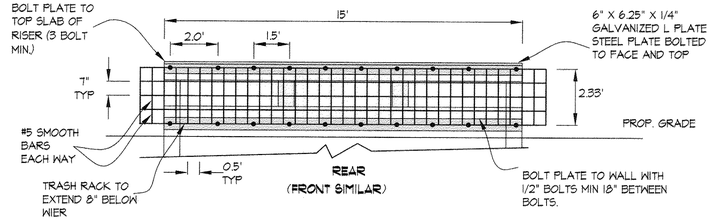
ELECTION DISTRICT No. 1 HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
AS SHOWN	R-A-15/B-1/POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	18 OF 25

F-06-019

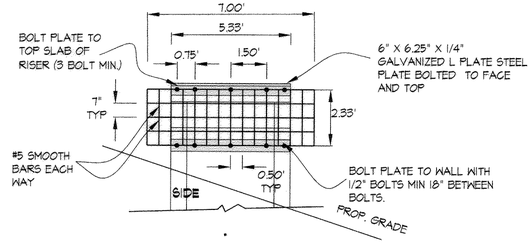


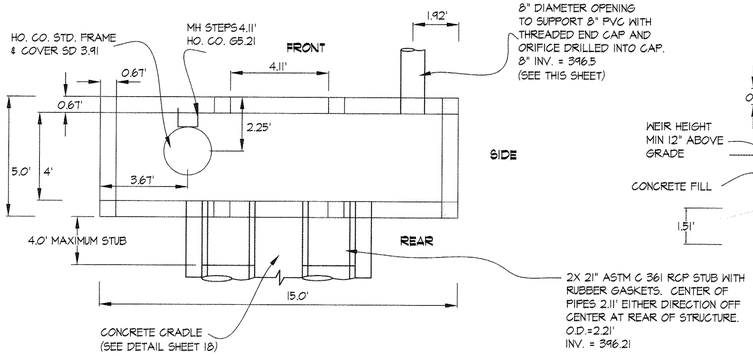
PLAN VIEW - TOP OF SLAB

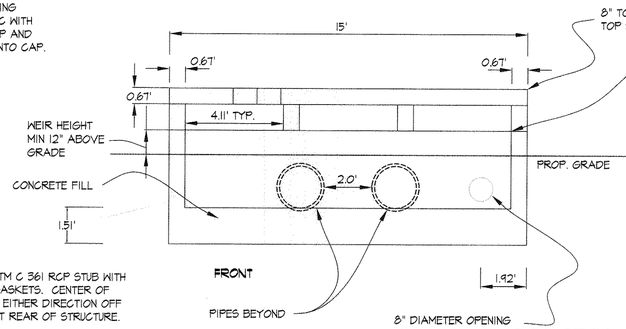


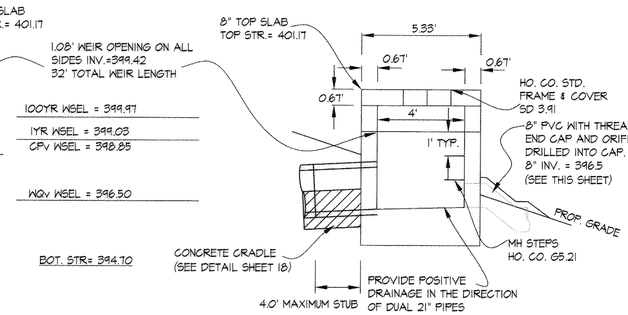
TRASH RACK DETAIL

SCALE: 1" = 3.0'





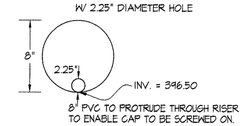




NOTE:
PROVIDE WATERTIGHT CONNECTIONS AT ALL ORIFICE OPENINGS, USE NON-SHRINKING GROUT WHERE NECESSARY.

RISER STRUCTURE C-1 DETAILS

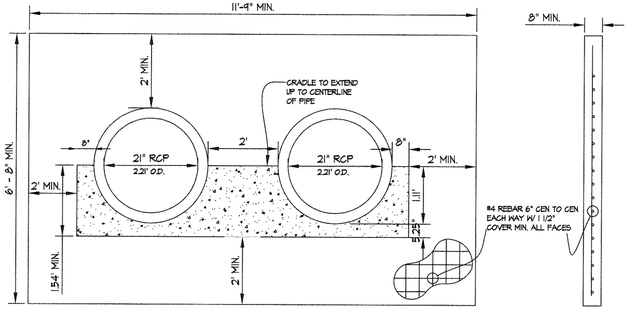
SCALE: 1" = 3.0'
(REAR SIMILAR)



NOTE: ORIFICE CONFIGURATION DIFFERENT DURING SEDIMENT CONTROL INTERIM CONDITION. SEE SEDIMENT CONTROL DETAILS.

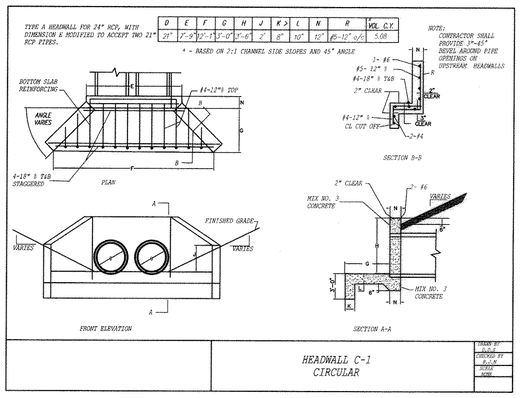
SWM LOW-FLOW ORIFICE DETAIL

SCALE: 1" = 1'



CONCRETE CRADLE & ANTI-SEEP COLLAR DETAIL

NTS



ROCK OUTLET PROTECTION I

Construction Specifications

1. The subgrade for the filter, rip-rap, 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 rip-rap or filter.

3. Geotextile shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile shall be a minimum of one foot.

4. Stone for the rip-rap or gabion outlets may be placed by equipment. They shall 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 rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.

5. The stone shall be placed so that it blends in with the existing ground. If the stone is placed too high then the flow will be forced out of the channel and scour adjacent to the stone will occur.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 18 - 8A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

FOR ADDITIONAL INFORMATION, SEE DETAILS ON SHEET 18

DEVELOPER'S/BUILDER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

Robert C. Anderson — 7/21/06
SIGNATURE OF DEVELOPER/BUILDER — DATE

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

Michael J. Trapp — 7/21/06
ENGINEER'S SIGNATURE — DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — DATE 8/31/06

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE 8/31/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 9/5/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Division of Land Development — Date 9/19/06

Chief, Development Engineering Division — Date 9/14/06

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE – SUITE 250 – BURTONSVILLE OFFICE PARK
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TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

\Drawings\03006\SPMG\03006SWM-DET-C.dwg | DES. DDS | DRN. DDS | CHK. BJM

DATE	REVISION	BY	APP'R.

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

STORMWATER MANAGEMENT DETAILS - FACILITY C

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

SEE ASBUILT SET 09/08/2016

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
AS SHOWN	R-A-15/B-1/ POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	19 OF 25

F-06-019

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — 9/8/06 — Date

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING + ZONING

Chief, Division of Land Development — 9/19/06 — Date

Chief, Development Engineering Division — 9/14/06 — Date

STATE OF MARYLAND — MICHAEL JAMES TRAPPEN — No. 14931 — REGISTERED PROFESSIONAL ENGINEER

5.0 RECOMMENDATIONS

5.1 SITE PREPARATION AND EARTHWORK (BUILDING PADS AND PAVED AREAS)

The following recommendations are intended for the satisfactory performance of the earthwork that may be involved to attain the planned grades within the footprint area of the proposed buildings and paved areas:

- Areas to support the building pads, and paved areas should be stripped of trees and vegetation, topsoil and organics. The depth of this excavation is expected to be approximately 0.2 to 2.0 feet and is expected to differ at the other unexplored areas on the site.

  Within the building pads all encountered uncontrolled fills should be undercut in their entirety, and any moderately to highly plastic or elastic soils that are encountered, with LL>45 or PI>20, within 4.0 feet of the building finished floor elevation, and very loose to loose soil layers should be undercut (minimum of 2 feet), as determined by the Geotechnical Engineer of Record.

  In the pavement areas, soft or loose soils, whenever encountered near the planned grades, and moderately to highly plastic clays and elastic silts with LL>45 or PI>20, if encountered, should be undercut to a suitable undisturbed subgrade as recommended by the Geotechnical Engineer of Record.

- Following the stripping and excavation of all unsuitable materials, grading operations may proceed. Prior to fill placement, the site should be observed by the Geotechnical Engineer of Record or his qualified representative for proper stripping and preparation for receiving the fill.

- The subgrade exposed after stripping should be proofrolled in the presence of the Geotechnical Engineer of Record or his qualified representative, with at least two (2) passes of a loaded dump truck that has a minimum axle load of 20 tons or similar equipment to identify any soft/loose pockets. Any observed loose and soft pockets should be excavated and replaced with fill satisfying the controlled fill requirements detailed later in this section of the report.

- Controlled fill placement required to achieve the planned grades within the building pad should extend laterally on all sides beyond the building footprint a minimum distance of 10 feet at the building pad subgrade elevation. The edge of the fill should be placed at a maximum slope of 1H:1V.

- The building pad should be prepared by excavation or by placing controlled fill to an elevation 8 inches below the floor level of slab-on-grade. The footings should be excavated after the building area has been properly prepared.

- Material satisfactory for controlled fill should include clean soil or bankrun sand and gravel (GW, GM, and SM). GC and SC materials may be used provided that the density and the liquid limit and plasticity index of the finer fraction of the material satisfy the following limitations:

Maximum Dry Density (PCF)	≥105
Liquid Limit (%)	<40
Plasticity Index	<20

  CL and ML materials satisfying the above requirements and limitations may be used with approval of the Geotechnical Engineer of Record. Highly plastic or elastic soils (CH, MH) should not be used in engineered fill. The fill materials should be free from topsoil, organics and rock fragments having a major dimension greater than 3 inches.

- The on-site natural soils, except layers of moderately to highly plastic clays and elastic silts (LL>40 and PI>20), are suitable for use in controlled structural fills, subject to moisture adjustments and the maximum dry density requirement specified above. Any existing man-placed fill soils excavated from the site, except layers of moderately to highly plastic clays and elastic silts (LL>40 and PI>20), may be used selectively, in controlled structural fill subject to moisture adjustments and approval of the Geotechnical Engineer of Record.

- Weathered or blasted rock can be used in engineered fills for the parking areas and utility trenches subject to the following requirements. Rock fills must be carefully constructed with the large rock (maximum boulder size 1 foot in any dimension in parking areas and maximum 6" in utility trenches) placed in the bottom layer with sufficient space to place medium and finer rock materials. The medium and finer rock and soil material should be placed between the large rock and worked into the voids with the tracked construction equipment, or other approved equipment. The rock layer should be compacted with a large sheepsfoot roller until the layer is thoroughly compacted.

  In rock fills, due to the large amount of rock and the variability of the composition of the rock layer, compaction testing of the rock layer is usually very difficult and produces significant variation in test results. It is therefore considered essential that the rock fill construction be very closely monitored and that the contractor respond to any requests and recommendations made by the on-site inspector. The rock fills should terminate at a depth of 3 feet below the proposed finished subgrade elevation. This will allow for proper shallow excavations and grading. Rock fill is not suitable for use in building pads.

- Fill placement should be in a maximum 8-inch thick, loose, horizontal lift compacted uniformly with the proper equipment. Smaller, confined areas may necessitate the use of 4 inch or thinner loose lifts and a walk-behind roller to attain proper compaction. All lift depths, compaction equipment, soil types, and the compactive effort should be monitored and/or approved by the Geotechnical Engineer of Record.

- According to the Howard County code requirements, structural fill in the building pads must be compacted to at least 95 percent of the Modified Proctor maximum dry density as determined by ASTM Designation D-1557 (AASHTO T-180). Additionally, structural fill in pavement areas must be compacted to at least 95 percent of the Modified Proctor maximum dry density as determined by ASTM Designation D-1557 (AASHTO T-180).

The moisture content of the fill should be within plus or minus two (±2) percentage points of the optimum moisture content. However, the Geotechnical Engineer of Record could relax this requirement, in certain circumstances, if the proper percent compaction is achieved.

Recent levels of precipitation have soaked into the ground creating a moist to very moist condition at various locations throughout the site for the near surface soils (top 10 feet). Therefore, the grading should, if at all possible, be done during a dry season. This should minimize the potential moisture related problems although they may not be eliminated. Several acceptable moisture-modifying methods should be considered in order to dry soils with high moisture contents. The moisture modifying methods include the disking and drying of the soils, and chemical modification with the addition of quick lime or Portland cement to the soils.

- The density of the fill should be checked on each lift by a certified soil technician under supervision of the Geotechnical Engineer of Record.

- It will be important to maintain positive site drainage during construction. Storm water runoff should be diverted around the construction areas. The site should be graded at all times such that water is not allowed to pond. If any surface soils become wet due to rains, they should be removed or allowed to dry prior to further site work operations and/or fill placement.

For proper site preparation, the earthwork should be performed under the observation of and to the satisfaction of the Geotechnical Engineer of Record.

5.2 GROUNDWATER AND DRAINAGE

Groundwater was encountered, during and upon completion of the drilling operations, in thirty-four (34) of the fifty-eight (58) test borings drilled at this site. The cave-in depth at the individual test boring locations ranged from 3.0 feet to 25.0 feet below existing surface grades. Any perched water encountered should be controlled with diversion trenches or localized sumps and pumping operations.

It is considered essential that adequate drainage to be provided at the site at all times to minimize any increase in moisture content of the subsurface materials. This is considered to be critical for paved areas due to the potential loss of subgrade strength. All areas should be sloped away from the structures to prevent ponding of water around the buildings. The site drainage should also be such that the run-off onto adjacent properties is properly controlled. Gutters, down spouts and planter areas must be properly designed and maintained so that water is routed away from dwelling and paved areas.

5.7 UTILITY TRENCHES AND MANHOLES

The excavations for the utility trenches should be made with 1H:1V or flatter side slopes in accordance with applicable OSHA excavation standards detailed in 29 CFR, Part 1926 and should be adequately protected against sudden cave-in or sloughing by using steel trench boxes.

The backfill in the utility trenches should conform to the requirements of Howard County, in addition to the recommendations for 'Site Preparation and Earthwork'. The 'cushion lift', at least 1-foot thick, should be compacted with a hand tamper in two (2) 8-inch thick loose layers, to avoid damage to the pipe.

The backfill against the manhole structures should conform to the requirements stated under 'Site Preparation and Earthwork'. The fill material should not have rock fragments with a maximum dimension larger than 3 inches and each lift should be compacted as specified.

Weathered or blasted rock can be used in engineered fills for the utility trenches subject to the following requirements. Rock fills must be carefully constructed with the large rock (maximum boulder size 1 foot in any dimension in parking areas and maximum 6" in utility trenches) placed in the bottom layer with sufficient space to place medium and finer rock materials. The medium and finer rock and soil material should be placed between the large rock and worked into the voids with the tracked construction equipment, or other approved equipment. The rock layer should be compacted with a large sheepsfoot roller until the layer is thoroughly compacted. In rock fills, due to the large amount of rock and the variability of the composition of the rock layer, compaction testing of the rock layer is usually very difficult and produces significant variation in test results. It is therefore considered essential that the rock fill construction be very closely monitored and that the contractor respond to any requests and recommendations made by the on-site inspector. The rock fills should terminate at a depth of 3 feet below the proposed finished subgrade elevation. This will allow for proper shallow excavations and grading. Rock fill is not suitable for use in building pads.

Perched water should be anticipated during the installation of underground utilities, especially if the work is carried out during wetter months or after prolonged periods of heavy precipitation. If groundwater/perched water is encountered, it is our opinion that conventional dewatering systems such as diversion ditches, interceptor drains and/or sump pumps should be adequate. If such measures prove inadequate, Specialized Engineering should be informed immediately to provide alternate recommendations.

5.10 INFILTRATION TESTING

The purpose of the *in-situ* infiltration testing was to define and evaluate the subsurface conditions in the areas of and to the depths of test boring locations A-1 thru A-4, B-1 thru B-5, and C-1 thru C-3 and conduct *in-situ* infiltration testing.

Stormwater management is required for the project site for water quality and water quantity control purposes. To accomplish this, underground holding tanks/pipes, bioretention facilities, and excavated trenches or basins could be considered at various locations of the subject property. It is anticipated that each of the facilities may rely on infiltration to a certain degree.

To establish an approximation (generalization) of the subsurface conditions at the proposed stormwater management areas, a total of twelve (12) test borings were conducted to depths of 3.4 feet to 14.5 feet beneath existing grades. The test borings were drilled at the approximate locations shown on the Test Boring Location Plan attached in APPENDIX B of this report.

Records of Subsurface Exploration, detailing the results of the test borings, are included in APPENDIX C of this report. Descriptions of the subsurface soils encountered at the project site in the areas of and to the depths of the various test boring excavations in the stormwater management areas are included above in Section 3, Subsurface Conditions.

A summary of the results of the laboratory tests performed on representative soil samples from these strata is presented in APPENDIX F.

Groundwater was observed in nine (9) of the twelve (12) test borings during the fieldwork. Howard County and the State of Maryland require that the seasonably high water table and hard rock layers be at least 4 feet below the infiltration elevation. Of course, variations in the presence and the depth to the groundwater can readily occur due to seasonal fluctuations and such possibilities could occur at the project site. The following table lists the infiltration test boring elevations, groundwater elevations (at 24 hours), in-place infiltration rates, and the soil classifications as recorded during the testing operations:

Boring #	Surface Elevation	Bottom Elevation	Water Elevation	Infiltration Rate	U.S.D.A. Class
A-1	414.7	404.7	411.2	NA	Loamy Sand
A-2	418.1	408.1	410.1	11.68"/Hr	Loamy Sand
A-3	417.8	408.8	411.1	7.63"/Hr	Loamy Sand
A-4	422.2	408.2	412.3	1.64"/Hr	Loam
B-1	384.8	381.4*	None	NA	Sandy Loam
B-2	381.7	375.6*	None	NA	Sandy Loam
B-3	382.2	367.7	380.2	NA	Sandy Loam
B-4	387.2	373.3	377.4	0.82"/Hr	Loam
B-5	389.3	380.8	None	9.52"/Hr	Sand
C-1	397.7	388.7	394.5	0.67"/Hr	Loam
C-2	397.9	388.9	392.9	NA	Loam
C-3	399.9	393.9	393.6	8.48"/Hr	Sandy Loam

* Hard rock layer encountered above proposed bottom of structure elevation.

Subsequent to attaining the termination depths of the test borings, a 2-inch diameter PVC pipe was installed to the base level of the test boring for infiltration testing purposes. Following the placement of the pipe, bentonite clay was placed around the pipe as a backfill material. Water was added to the pipe to a minimum height of 30 inches above the base of the pipe for pre-soak purposes.

Slightly prior to or in excess of a 24-hour time interval following the aforementioned fieldwork, infiltration testing was performed at the project site. The testing consisted of adding water to each infiltration pipe to ensure that a 3.0+/- foot head was present at the start of the test. Subsequent to this, the water levels in the pipes were measured over a 4-hour time period and the associated time of the readings recorded in parallelism.

Infiltration test results are presented in tabular format in **Appendix G** to this report. A review of the results will indicate that (residual) infiltration rates ranged from 0.67 inches per hour to approximately 11.68 inches per hour.

It is recommended that during construction of the infiltration structures, a geotechnical engineer examine the exposed subgrade soils during construction to verify that the soil conditions are consistent with the test boring results.

CLAY (CL, SC, CH, GC) soil types, suitable for use in a cut-off trench and embankment core of a SWM pond, were encountered in several of the test borings at the site. If clay soils from the site are not available, and are required for construction, the clay soils would have to be imported from off site.

SWM CONSTRUCTION SPECIFICATIONS

THESE SPECIFICATIONS ARE APPROPRIATE TO ALL PONDS WITHIN THE SCOPE OF THE STANDARD FOR PRACTICE MD-378. ALL REFERENCES TO ASTM AND AASHTO SPECIFICATIONS APPLY TO THE MOST RECENT VERSION.

SITE PREPARATION

AREAS DESIGNATED FOR BORROW AREAS, EMBANKMENT, AND STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL. ALL TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED. CHANNEL BANKS AND SHARP BREAKS SHALL BE SLOPED TO NO STEEPER THAN 1:1. ALL TREES SHALL BE CLEARED AND GRUBBED WITHIN 15 FEET OF THE TOE OF THE EMBANKMENT.

AREAS TO BE COVERED BY THE RESERVOIR WILL BE CLEARED OF ALL TREES, BRUSH, LOGS, FENCES, RUBBISH AND OTHER OBJECTIONABLE MATERIAL UNLESS OTHERWISE DESIGNATED ON THE PLANS. FOR DRY STORMWATER MANAGEMENT PONDS, A MINIMUM OF A 25-FOOT RADIUS AROUND THE INLET STRUCTURE SHALL BE CLEARED.

ALL CLEARED AND GRUBBED MATERIAL SHALL BE DISPOSED OF OUTSIDE AND BELOW THE LIMITS OF THE DAM AND RESERVOIR AS DIRECTED BY THE OWNER OR HIS REPRESENTATIVE. WHEN SPECIFIED, A SUFFICIENT QUANTITY OF TOPSOIL WILL BE STOCKPILED IN A SUITABLE LOCATION FOR USE ON THE EMBANKMENT AND OTHER DESIGNATED AREAS.

EARTH FILL

MATERIAL - THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED DESIGNATED BORROW AREAS. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6", FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE EMBANKMENT, AND CUT OFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION GC, SC, CH, OR CL AND MUST HAVE AT LEAST 30 % PASSING THE #200 SIEVE. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGNED BY A GEOTECHNICAL ENGINEER. SUCH SPECIAL DESIGNS MUST HAVE CONSTRUCTION SUPERVISED BY A GEOTECHNICAL ENGINEER. MATERIALS USED IN THE OUTER SHELL OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION OF THE QUALITY REQUIRED TO PREVENT EROSION OF THE EMBANKMENT.

PLACEMENT - AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8-INCH THICK (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF THE FILL. THE MOST PERMEABLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.

COMPACTION - THE MOVEMENT OF THE HAULING AND SPREADING EQUIPMENT OVER THE FILL SHALL BE CONTROLLED SO THAT THE ENTIRE SURFACE OF EACH LIFT SHALL BE TRAVERSED BY NOT LESS THAN ONE TREAD TRACK OF HEAVY EQUIPMENT OR COMPACTION SHALL BE ACHIEVED BY A MINIMUM OF FOUR COMPLETE PASSES OF A SHEEPSFOOT, RUBBER TIRED OR VIBRATORY ROLLER. FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SUCH THAT THE REQUIRED DEGREE OF COMPACTION WILL BE OBTAINED WITH THE EQUIPMENT USED. THE FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SO THAT IF FORMED INTO A BALL IT WILL NOT CRUMBLE, YET NOT BE SO WET THAT WATER CAN BE SQUEEZED OUT. WHEN REQUIRED BY THE REVIEWING AGENCY THE MINIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 95% OF MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN ±2% OF THE OPTIMUM. EACH LAYER OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY, AND IS TO BE CERTIFIED BY THE ENGINEER AT THE TIME OF CONSTRUCTION. ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99 (STANDARD PROCTOR).

CUT OFF TRENCH - THE CUTOFF TRENCH SHALL BE EXCAVATED INTO IMPERVIOUS MATERIAL ALONG OR PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE BOTTOM WIDTH OF THE TRENCH SHALL BE GOVERNED BY THE EQUIPMENT USED FOR EXCAVATION, WITH THE MINIMUM WIDTH BEING FOUR FEET. THE DEPTH SHALL BE AT LEAST FOUR FEET BELOW EXISTING GRADE OR AS SHOWN ON THE PLANS. THE SIDE SLOPES OF THE TRENCH SHALL BE 1 TO 1 OR FLATTER. THE BACKFILL SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY.

EMBANKMENT CORE - THE CORE SHALL BE PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE TOP WIDTH OF THE CORE SHALL BE A MINIMUM OF FOUR FEET. THE HEIGHT SHALL EXTEND UP TO AT LEAST THE 10-YEAR WATER ELEVATION OR AS SHOWN ON THE PLANS. THE SIDE SLOPES SHALL BE 1 TO 1 OR FLATTER. THE CORE SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY. IN ADDITION, THE CORE SHALL BE PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.

STRUCTURE BACKFILL

BACKFILL ADJACENT TO PIPES OR STRUCTURES SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL MATERIAL. THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL NEEDS TO FILL COMPLETELY ALL SPACES UNDER AND ADJACENT TO THE PIPE. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A CONCRETE STRUCTURE OR PIPE, UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE. STRUCTURE BACKFILL MAY BE FLOWABLE FILL MEETING THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 313 AS MODIFIED. THE MIXTURE SHALL HAVE A 100-200 PSI; 28 DAY UNCONFINED COMPRESSIVE STRENGTH. THE FLOWABLE FILL SHALL HAVE A MINIMUM PH OF 4.0 AND A MINIMUM RESISTIVITY OF 2,000 OHM-CM. MATERIAL SHALL BE PLACED SUCH THAT A MINIMUM OF 6" (MEASURED PERPENDICULAR TO THE OUTSIDE OF THE PIPE) OF FLOWABLE FILL SHALL BE UNDER (BEDDING), OVER AND, ON THE SIDES OF THE PIPE. IT ONLY NEEDS TO EXTEND UP TO THE SPRING LINE FOR RIGID CONDUITS. AVERAGE SLUMP OF THE FILL SHALL BE 7" TO ASSURE FLOWABILITY OF THE MATERIAL. ADEQUATE MEASURES SHALL BE TAKEN (SAND BAGS, ETC.) TO PREVENT FLOATING THE PIPE. WHEN USING FLOWABLE FILL, ALL METAL PIPE SHALL BE BITUMINOUS COATED. ANY ADJOINING SOIL FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL SHALL COMPLETELY FILL ALL VOIDS ADJACENT TO THE FLOWABLE FILL ZONE. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A STRUCTURE OR PIPE UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE. BACKFILL MATERIAL OUTSIDE THE STRUCTURAL BACKFILL (FLOWABLE FILL) ZONE SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE CORE OF THE EMBANKMENT OR OTHER EMBANKMENT MATERIALS.

CARE OF WATER DURING CONSTRUCTION

ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY DIKES, LEVEES, COFFERDAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE, AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE EXCAVATIONS, FOUNDATION, AND OTHER PARTS OF THE WORK FREE FROM WATER AS REQUIRED OR DIRECTED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK. AFTER HAVING SERVED THEIR PURPOSE, ALL EMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION IN ANY DEGREE WHATSOEVER OF THE FLOW OF WATER TO THE SPILLWAY OR OUTLET WORKS AND SO AS NOT TO INTERFERE IN ANY WAY WITH THE OPERATION OR MAINTENANCE OF THE STRUCTURE. STREAM DIVERSIONS SHALL BE MAINTAINED UNTIL THE FULL FLOW CAN BE PASSED THROUGH THE PERMANENT WORKS. THE REMOVAL OF WATER FROM THE REQUIRED EXCAVATION AND THE FOUNDATION SHALL BE ACCOMPLISHED IN A MANNER AND TO THE EXTENT THAT WILL MAINTAIN STABILITY OF THE EXCAVATED SLOPES AND BOTTOM REQUIRED EXCAVATIONS AND WILL ALLOW SATISFACTORY PERFORMANCE OF ALL CONSTRUCTION OPERATIONS. DURING THE PLACING AND COMPACTING OF MATERIAL IN REQUIRED EXCAVATIONS, THE WATER LEVEL AT THE LOCATIONS BEING REFILLED SHALL BE MAINTAINED BELOW THE BOTTOM OF THE EXCAVATION AT SUCH LOCATIONS WHICH MAY REQUIRE DRAINING THE WATER SUMPS FROM WHICH THE WATER SHALL BE PUMPED.

STABILIZATION

ALL BORROW AREAS SHALL BE GRADED TO PROVIDE PROPER DRAINAGE AND LEFT IN A SIGHTLY CONDITION. ALL EXPOSED SURFACES OF THE EMBANKMENT, SPILLWAY, SPOIL AND BORROW AREAS, AND BERMS SHALL BE STABILIZED BY SEEDING, LIMING, FERTILIZING AND MULCHING IN ACCORDANCE WITH THE NATURAL RESOURCES CONSERVATION SERVICE STANDARDS AND SPECIFICATIONS FOR CRITICAL AREA PLANTING (MD-342) OR AS SHOWN ON THE ACCOMPANYING DRAWINGS.

ROCK RIPRAP

ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 311. GEOTEXTILE SHALL BE PLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 921.09, CLASS C.

PIPE CONDUITS

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION.

CORRUGATED METAL PIPE

ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR CORRUGATED METAL PIPE:

1. MATERIALS -(POLYMER COATED STEEL PIPE) - STEEL PIPES WITH POLYMERIC COATINGS SHALL HAVE A MINIMUM COATING THICKNESS OF 0.01 INCH (10 MIL) ON BOTH SIDES OF THE PIPE. THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATIONS M-245 & M-246 WITH WATERTIGHT COUPLING BANDS OR FLANGES.
MATERIALS - (ALUMINUM COATED STEEL PIPE) - THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M-274 WITH WATERTIGHT COUPLING BANDS OR FLANGES. ALUMINUM COATED STEEL PIPE, WHEN USED WITH FLOWABLE FILL OR WHEN SOIL AND/OR WATER CONDITIONS WARRANT THE NEED FOR INCREASED DURABILITY, SHALL BE FULLY BITUMINOUS COATED PER REQUIREMENTS OF AASHTO SPECIFICATION M-190 TYPE A. ANY ALUMINUM COATING DAMAGED OR OTHERWISE REMOVED SHALL BE REPLACED WITH COLD APPLIED BITUMINOUS COATING COMPOUND. ALUMINUM SURFACES THAT ARE TO BE IN CONTACT WITH CONCRETE SHALL BE PAINTED WITH ONE COAT OF ZINC CHROMATE PRIMER OR TWO COATS OF ASPHALT.
MATERIALS - (ALUMINUM PIPE) - THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M-196 OR M-211 WITH WATERTIGHT COUPLING BANDS OR FLANGES. ALUMINUM PIPE, WHEN USED WITH FLOWABLE FILL OR WHEN SOIL AND/OR WATER CONDITIONS WARRANT FOR INCREASED DURABILITY, SHALL BE FULLY BITUMINOUS COATED PER REQUIREMENTS OF AASHTO SPECIFICATION M-190 TYPE A. ALUMINUM SURFACES THAT ARE TO BE IN CONTACT WITH CONCRETE SHALL BE PAINTED WITH ONE COAT OF ZINC CHROMATE PRIMER OR TWO COATS OF ASPHALT. HOT DIP GALVANIZED BOLTS MAY BE USED FOR CONNECTIONS. THE PH OF THE SURROUNDING SOILS SHALL BE BETWEEN 4 AND 9.

2. COUPLING BANDS, ANTI-SEEP COLLARS, END SECTIONS, ETC., MUST BE COMPOSED OF THE SAME MATERIAL AND COATINGS AS THE PIPE. METALS MUST BE INSULATED FROM DISSIMILAR MATERIALS WITH USE OF RUBBER OR PLASTIC INSULATING MATERIALS AT LEAST 24 MILS IN THICKNESS.

3. CONNECTIONS - ALL CONNECTIONS WITH PIPES MUST BE COMPLETELY WATERTIGHT. THE DRAIN PIPE OR BARREL CONNECTION TO THE RISER SHALL BE WELDED ALL AROUND WHEN THE PIPE AND RISER ARE METAL. ANTI-SEEP COLLARS SHALL BE CONNECTED TO THE PIPE IN SUCH A MANNER AS TO BE COMPLETELY WATERTIGHT. DIMPLE BANDS ARE NOT CONSIDERED TO BE WATERTIGHT. ALL CONNECTIONS SHALL USE A RUBBER OR NEOPRENE GASKET WHEN JOINING PIPE SECTIONS. THE END OF EACH PIPE SHALL BE RE-ROLLED AN ADEQUATE NUMBER OF CORRUGATIONS TO ACCOMMODATE THE BANDWIDTH. THE FOLLOWING TYPE CONNECTIONS ARE ACCEPTABLE FOR PIPES LESS THAN 24 INCHES IN DIAMETER: FLANGES ON BOTH ENDS OF THE PIPE WITH A CIRCULAR 3/8 INCH CLOSED CELL NEOPRENE GASKET, PREPUNCHED TO THE FLANGE BOLT CIRCLE, SANDWICHED BETWEEN ADJACENT FLANGES; A 12-INCH WIDE STANDARD LAP TYPE BAND WITH 12-INCH WIDE BY 3/8-INCH THICK CLOSED CELL CIRCULAR NEOPRENE GASKET; AND A 12-INCH WIDE HUGGER TYPE BAND WITH O-RING GASKETS HAVING A MINIMUM DIAMETER OF 1/2 INCH GREATER THAN THE CORRUGATION DEPTH. PIPES 24 INCHES IN DIAMETER AND LARGER SHALL BE CONNECTED BY A 24 INCH LONG ANNULAR CORRUGATED BAND USING A MINIMUM OF 4 (FOUR) RODS AND LUGS, 2 ON EACH CONNECTING PIPE END. A 24-INCH WIDE BY 3/8-INCH THICK CLOSED CELL CIRCULAR NEOPRENE GASKET WILL BE INSTALLED WITH 12 INCHES ON THE END OF EACH PIPE. FLANGED JOINTS WITH 3/8 INCH CLOSED CELL GASKETS THE FULL WIDTH OF THE FLANGE IS ALSO ACCEPTABLE. HELICALLY CORRUGATED PIPE SHALL HAVE EITHER CONTINUOUSLY WELDED SEAMS OR HAVE LOCK SEAMS WITH INTERNAL CAULKING OR A NEOPRENE BEAD.

4. BEDDING - THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, SPONGY OR OTHER UNSTABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

5. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

6. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

REINFORCED CONCRETE PIPE

ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR REINFORCED CONCRETE PIPE:

1. MATERIALS - REINFORCED CONCRETE PIPE SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS AND SHALL EQUAL OR EXCEED ASTM C-361.

2. BEDDING - REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING/CRADLE FOR THEIR ENTIRE LENGTH. THIS BEDDING/CRADLE SHALL CONSIST OF HIGH SLUMP CONCRETE PLACED UNDER THE PIPE AND UP THE SIDES OF THE PIPE AT LEAST 50% OF ITS OUTSIDE DIAMETER WITH A MINIMUM THICKNESS OF 6 INCHES. WHERE A CONCRETE CRADLE IS NOT NEEDED FOR STRUCTURAL REASONS, FLOWABLE FILL MAY BE USED AS DESCRIBED IN THE "STRUCTURE BACKFILL" SECTION OF THIS STANDARD. GRAVEL BEDDING IS NOT PERMITTED.

3. LAYING PIPE - BELL AND SPIGOT PIPE SHALL BE PLACED WITH THE BELL END UPSTREAM. JOINTS SHALL BE MADE IN ACCORDANCE WITH RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL. AFTER THE JOINTS ARE SEALED FOR THE ENTIRE LINE, THE BEDDING SHALL BE PLACED SO THAT ALL SPACES UNDER THE PIPE ARE FILLED. CARE SHALL BE EXERCISED TO PREVENT ANY DEVIATION FROM THE ORIGINAL LINE AND GRADE OF THE PIPE. THE FIRST JOINT MUST BE LOCATED WITHIN 4 FEET FROM THE RISER.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

PLASTIC PIPE

THE FOLLOWING CRITERIA SHALL APPLY FOR PLASTIC PIPE:

1. MATERIALS - PVC PIPE SHALL BE PVC-1120 OR PVC-1220 CONFORMING TO ASTM D-1785 OR ASTM D-2241. CORRUGATED HIGH DENSITY POLYETHYLENE (HDPE) PIPE, COUPLINGS AND FITTINGS SHALL CONFORM TO THE FOLLOWING: 4"-10" INCH PIPE SHALL MEET THE REQUIREMENTS OF AASHTO M252 TYPE S, AND 12" THROUGH 24" INCH SHALL MEET THE REQUIREMENTS OF AASHTO M294 TYPE S.

2. JOINTS AND CONNECTIONS TO ANTI-SEEP COLLARS SHALL BE COMPLETELY WATERTIGHT.

3. BEDDING - THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, SPONGY OR OTHER UNSTABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

DRAINAGE DIAPHRAGMS - WHEN A DRAINAGE DIAPHRAGM IS USED, A REGISTERED PROFESSIONAL ENGINEER WILL SUPERVISE THE DESIGN AND CONSTRUCTION INSPECTION.

CONCRETE

CONCRETE SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 414, MIX NO. 3.

EROSION AND SEDIMENT CONTROL

CONSTRUCTION OPERATIONS WILL BE CARRIED OUT IN SUCH A MANNER THAT EROSION WILL BE CONTROLLED AND WATER AND AIR POLLUTION MINIMIZED. STATE AND LOCAL LAWS CONCERNING POLLUTION ABATEMENT WILL BE FOLLOWED. CONSTRUCTION PLANS SHALL DETAIL EROSION AND SEDIMENT CONTROL MEASURES.

OPERATION AND MAINTENANCE

AN OPERATION AND MAINTENANCE PLAN IN ACCORDANCE WITH LOCAL OR STATE REGULATIONS WILL BE PREPARED FOR ALL PONDS. AS A MINIMUM, THE DAM INSPECTION CHECKLIST LOCATED IN APPENDIX A SHALL BE INCLUDED AS PART OF THE OPERATION AND MAINTENANCE PLAN AND PERFORMED AT LEAST ANNUALLY. WRITTEN RECORDS OF MAINTENANCE AND MAJOR REPAIRS NEEDS TO BE RETAINED IN A FILE. THE ISSUANCE OF A MAINTENANCE AND REPAIR PERMIT FOR ANY REPAIRS OR MAINTENANCE THAT INVOLVES THE MODIFICATION OF THE DAM OR SPILLWAY FROM ITS ORIGINAL DESIGN AND SPECIFICATIONS IS REQUIRED. A PERMIT IS ALSO REQUIRED FOR ANY REPAIRS OR RECONSTRUCTION THAT INVOLVE A SUBSTANTIAL PORTION OF THE STRUCTURE. ALL INDICATED REPAIRS ARE TO BE MADE AS SOON AS PRACTICAL.

NOTE:
APPENDIX A (DAM SAFETY CHECKLIST) IS LOCATED WITHIN THE "USDA NATURAL RESOURCES CONSERVATION SERVICE, MARYLAND, CONSERVATION PRACTICE STANDARD, POND, CODE 378" OR THE "MARYLAND DAM SAFETY MANUAL", DEPT. OF NATURAL RESOURCES WATER RESOURCES ADMINISTRATION.

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\DRAWINGS\03006\SPMG\SOILBORING-DETS.dwg | DES. BJM | DRN. JNG | CHK. CKG

DATE	REVISION	BY	APP'R.

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suilte 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

SOIL BORING DETAILS

SHIPLEY'S GRANT

Non-buildable Parcels "A" thru "E"

Tax Map 37, Grid 1-2, Part of Parcel 4

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

09/08/2016 NO ASBUILT INFORMATION

SCALE	ZONING	G. L. W. FILE No.
NO SCALE	R-A-15/B-1/POR	03006
DATE	TAX MAP - GRID	SHEET
JAN., 2006	37-1&2	20 OF 25

F-06-019

BORING NUMBER A-1

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/26/05 — COMPLETED 4/27/05 — GROUND ELEVATION 414.7 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING Dry
NOTES Cave-in Depth Upon Completion: 6.0 — 24hrs AFTER DRILLING 3.0 ft / Elev 411.7 ft

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
415			**TOPSOIL**	SS 1	0.0 - 1.5	100	1-3-1 (4)		
			SANDY SILT: dark brown, fine sands, trace quartz gravel, moist, very loose to medium dense, (ML)	SS 2	1.5 - 3.0	100	3-3-12 (15)		
410	5		**SILTY SAND:** tan to red brown, fine to coarse, some micas, some quartz gravel, moist to very moist, medium dense, (SM)	SS 3	3.0 - 4.5	100	5-6-7 (13)		
			SANDY SAND: red brown, fine to coarse, moist, dense, (SM)	SS 4	4.5 - 6.0	100	6-13-15 (31)		
405	10		End of boring at 6.0 feet.						

7504 Connelly Drive, Suite G, Hanover, Maryland 21076 (410) 765-6800 / (410) 765-6803 fax

BORING NUMBER A-2

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/21/05 — COMPLETED 4/21/05 — GROUND ELEVATION 419.1 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING Dry
NOTES Installed 4" PVC pipe for infiltration test to 7' — 24hrs AFTER DRILLING 6.5 ft / Elev 412.6 ft

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
415			**TOPSOIL**	SS 1	0.0 - 1.5	100	4-6-3 (9)		
			SILTY CLAY brown, little fine sands, moist to very moist, stiff to very stiff, (CL)	SS 2	2.5 - 4.0	100	3-3-3 (6)		
410	5		**CLAY:** brown to tan, trace fine sands, wet, medium stiff, (CL)	SS 3	5.0 - 6.5	100	2-2-3 (5)		
			SILTY SAND: red brown, fine to coarse, trace quartz gravel, moist, dense, (SM)	SS 4	6.5 - 8.0	100	8-15-22 (37)		
405	10		End of boring at 10.0 feet.						

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BORING NUMBER A-3

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/21/05 — COMPLETED 4/21/05 — GROUND ELEVATION 417.6 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING Dry
NOTES Installed 4" PVC pipe for infiltration test to 7' — 24hrs AFTER DRILLING 6.7 ft / Elev 411.1 ft

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
415			**TOPSOIL**	SS 1	0.0 - 1.5	100	3-3-3 (6)		
			SILTY CLAY: brown to tan, little fine to coarse sands, moist, medium stiff, (CL)	SS 2	2.5 - 4.0	100	3-2-3 (5)		
410	5		**SILTY SAND:** brown to tan, fine to coarse, very moist, medium dense, (SM)	SS 3	5.0 - 6.5	100	4-4-4 (8)		
			End of boring at 9.0 feet.	SS 4	7.5 - 9.0	100	5-6-10 (16)		
405	10								

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BORING NUMBER A-4

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/21/05 — COMPLETED 4/21/05 — GROUND ELEVATION 422.1 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING 12.5 ft / Elev 409.6 ft
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING 10.5 ft / Elev 411.6 ft
NOTES Installed 4" PVC pipe for infiltration test to 12' — 24hrs AFTER DRILLING 9.8 ft / Elev 412.3 ft

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
420			**TOPSOIL**	SS 1	0.0 - 1.5	100	2-2-4 (6)		
			SANDY CLAY: tan to red brown, fine to medium sands, moist, medium stiff, (CL)	SS 2	2.5 - 4.0	100	3-4-4 (8)		
415	5			SS 3	5.0 - 6.5	100	4-4-4 (8)		
			SILTY SAND: brown to tan, fine to coarse, very moist, medium dense, (SM)	SS 4	7.5 - 9.0	100	2-2-3 (5)		
410	10		End of boring at 14.0 feet.						

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BORING NUMBER B-01

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/27/05 — COMPLETED 4/27/05 — GROUND ELEVATION 384.8 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING Dry
NOTES Cave-in Depth Upon Completion: 3.0 — 24hrs AFTER DRILLING Dry

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
385			**TOPSOIL**	SS 1	0.0 - 1.5	80	3-2-6 (8)		
			SILTY SAND: dark brown, trace fine to medium sand, trace mica, moist, medium dense, (SM)	SS 2	2.5 - 4.0	100	7-13-22 (35)		
380	5		**DECOMPOSING ROCK:** dark brown, sand, fine to coarse, trace mica, very moist, dense, (SM) Auger Refusal @ 6.7	SS 3	5.0 - 6.5	40	18-50/0"		
			End of boring at 6.7 feet.						

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BORING NUMBER B-02

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/27/05 — COMPLETED 4/27/05 — GROUND ELEVATION 389.7 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING Dry
NOTES Cave-in Depth Upon Completion: 6.0 — 24hrs AFTER DRILLING Dry

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
390			**TOPSOIL**	SS 1	0.0 - 1.5	80	3-3-3 (6)		
			SILT: dark brown, trace fine to medium sand, trace mica, moist, medium stiff to stiff, (ML)	SS 2	2.5 - 4.0	100	3-4-6 (10)		
385	5		**SILTY SAND:** grey, brown to tan, fine to medium, trace mica, moist, loose to medium dense, (SM)	SS 3	5.0 - 6.5	100	3-3-5 (8)		
			End of boring at 13.0 feet.	SS 4	7.5 - 9.0	100	3-3-4 (7)		
380	10								

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BORING NUMBER RW-09

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/28/05 — COMPLETED 4/28/05 — GROUND ELEVATION 389.7 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY Oscar Gomez — CHECKED BY L. Benford — AT END OF DRILLING 5.5 ft / Elev 383.8 ft
NOTES Cave-in Depth Upon Completion: 5.0 — 24hrs AFTER DRILLING 3.0 ft / Elev 383.2 ft

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
390			**TOPSOIL**	SS 1	0.0 - 1.5	100	2-2-1 (3)		
			SILTY CLAY: brown, trace fine sands, moist, medium stiff, (CL)	SS 2	2.5 - 4.0	100	3-3-3 (6)		
385	5		**SILTY SAND:** brown, fine, very moist, loose, (SM)	SS 3	5.0 - 6.5	100	3-4-6 (10)		
			SILTY SAND: gray, brown to tan, fine to medium, trace mica, very moist, loose, (SM)	SS 4	7.5 - 9.0	100	3-2-4 (6)		
380	10		End of boring at 13.0 feet.						

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BORING NUMBER B-03

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/26/05 — COMPLETED 4/26/05 — GROUND ELEVATION 392.2 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING 10.5 ft / Elev 381.7 ft
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING 10.5 ft / Elev 381.7 ft
NOTES Cave-in Depth Upon Completion: 4.5 — 24hrs AFTER DRILLING 2.9 ft / Elev 389.3 ft

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
390			**TOPSOIL**	SS 1	0.0 - 1.5	100	1-1-1 (2)		
			CLAYEY SILT: brown, trace fine sands, trace mica, moist, medium stiff to very stiff, (ML)	SS 2	2.5 - 4.0	100	2-3-4 (7)		
385	5			SS 3	5.0 - 6.5	100	6-8-11 (19)		
			SANDY CLAYEY SILT: brown to black, fine to coarse sands, little mica, trace quartz fragments, moist, very stiff, (ML-CL)	SS 4	7.5 - 9.0	100	6-13-13 (27)		
380	10		**DECOMPOSING ROCK** Spoon Refusal @ 14.5	SS 5	12.5 - 13.5	100	50/5.0"		
			End of boring at 14.5 feet.						

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BORING NUMBER B-04

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/26/05 — COMPLETED 4/26/05 — GROUND ELEVATION 397.7 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING 13.5 ft / Elev 384.2 ft
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING 13.5 ft / Elev 384.2 ft
NOTES Installed 4" PVC pipe for infiltration test to 12' — 24hrs AFTER DRILLING 12.8 ft / Elev 384.9 ft

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
395			**TOPSOIL**	SS 1	0.0 - 1.5	100	3-3-4 (7)		
			SILTY SAND: tan to red brown, fine to coarse, trace quartz gravel, moist, medium dense, (SM)	SS 2	2.5 - 4.0	100	5-5-6 (11)		
390	5		**SILTY SAND:** brown, fine to medium, trace mica, moist, medium dense, (SM)	SS 3	5.0 - 6.5	100	5-6-7 (13)		
			COMPOSING ROCK Auger Refusal @ 13.5'	SS 4	7.5 - 9.0	100	3-3-3 (6)		
385	10		End of boring at 13.5 feet.						

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BORING NUMBER B-05

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/26/05 — COMPLETED 4/26/05 — GROUND ELEVATION 395.1 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING Dry
NOTES Installed 4" PVC pipe for infiltration test to 7' — 24hrs AFTER DRILLING Dry

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
395			**TOPSOIL**	SS 1	0.0 - 1.5	78	2-3-3 (6)		
			SANDY SILT: brown, fine to medium sand, trace gravel, moist, loose to medium dense, (ML)	SS 2	2.5 - 4.0	100	3-4-4 (8)		
390	5		**SANDY SILT:** red brown, fine to medium sands, trace mica, moist, medium dense, (ML)	SS 3	5.0 - 6.5	100	4-5-5 (10)		
			SANDY CLAY: red brown to tan, fine to medium, very moist, stiff, (SC)	SS 4	7.5 - 9.0	100	2-3-5 (8)		
385	10		End of boring at 9.5 feet.						

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BORING NUMBER C-01

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/19/05 — COMPLETED 4/19/05 — GROUND ELEVATION 397.7 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING Dry
NOTES Installed 4" PVC pipe for infiltration test to 7' — 24hrs AFTER DRILLING 12.7 ft / Elev 384.9 ft

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
395			**TOPSOIL**	SS 1	0.0 - 1.5	78	4-3-1 (7)		
			SILTY CLAY: brown to tan, trace fine sands, trace micas, moist, medium stiff, (CL)	SS 2	2.5 - 4.0	48	4-5-5 (10)		
390	5		**SAND:** brown, grey and white, little micas, little quartz fragments, trace clay, moist, medium dense, (SP-SC)	SS 3	5.0 - 6.5	67	9-5-5 (10)		
			SANDY SILT: tan to red brown, fine to medium sands, trace clay, trace micas, very moist, very soft, (ML)	SS 4	7.5 - 9.0	89	6-48-12 (60)		
385	10		End of boring at 9.0 feet.						

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BORING NUMBER C-02

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/19/05 — COMPLETED 4/19/05 — GROUND ELEVATION 397.9 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING Dry
NOTES Installed 4" PVC pipe for infiltration test to 7' — 24hrs AFTER DRILLING 12.6 ft / Elev 385.3 ft

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
395			**TOPSOIL**	SS 1	0.0 - 1.5	100	1-2-3 (5)		
			SILTY CLAY: brown-tan, trace fine sands, trace micas, trace quartz fragments, moist to very moist, stiff, (CL)	SS 2	2.5 - 4.0	100	3-5-7 (12)		
390	5			SS 3	5.0 - 6.5	100	5-6-7 (13)		
			SILT: brown on black, dark clay, little micas, trace fine to medium sands, very moist, very loose, (ML)	SS 4	7.5 - 9.0	100	5-12-14 (26)		
385	10		End of boring at 9.0 feet.						

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BORING NUMBER C-03

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/19/05 — COMPLETED 4/19/05 — GROUND ELEVATION 393.5 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING Dry
NOTES Installed 4" PVC pipe for infiltration test to 7' — 24hrs AFTER DRILLING 12.9 ft / Elev 380.6 ft

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
395			**TOPSOIL**	SS 1	0.0 - 1.5	100	3-2-4 (6)		
			CLAYEY SILT: red brown, trace fine to medium sand, trace quartz fragments, trace mica, moist to very moist, medium stiff to stiff, (ML)	SS 2	2.5 - 4.0	100	3-4-5 (9)		
390	5			SS 3	5.0 - 6.5	100	3-4-7 (11)		
			End of boring at 7.0 feet.						

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BORING NUMBER RW-10

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/28/05 — COMPLETED 4/28/05 — GROUND ELEVATION 426.0 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY Oscar Gomez — CHECKED BY L. Benford — AT END OF DRILLING Dry
NOTES Cave-in Depth Upon Completion: 6.0 — 24hrs AFTER DRILLING Dry

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
425			**TOPSOIL**	SS 1	0.0 - 1.5	100	4-4-5 (9)		
			SILTY CLAY: brown, trace fine sand, trace gravel, moist, medium stiff, (CL)	SS 2	2.5 - 4.0	100	3-4-5 (9)		
420	5		**SILTY SAND:** brown, fine to coarse, moist, loose to medium dense, (SM) Trace Gravel @ 7.5-10'	SS 3	5.0 - 6.5	100	4-7-8 (15)		
			Trace Clay @ 8.5-13.0'	SS 4	7.5 - 9.0	100	4-5-8 (13)		
415	10								
			End of boring at 15.0 feet	SS 5	12.5 - 13.5	100	3-3-4 (7)		

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BORING NUMBER RW-13

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/20/05 — COMPLETED 4/20/05 — GROUND ELEVATION 411.5 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY R. Bollinger — CHECKED BY L. Benford — AT END OF DRILLING Dry
NOTES Cave-in Depth Upon Completion: 6.0 — 24hrs AFTER DRILLING Dry

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
410			**TOPSOIL**	SS 1	0.0 - 1.5	100	3-3-2 (5)		
			SILTY CLAY: brown, trace fine sand, trace quartz gravel, moist, stiff to very stiff, (CL)	SS 2	2.5 - 4.0	100	3-4-5 (9)		
405	5		**SANDY SILT:** brown, fine to coarse, trace quartz gravel, moist to very moist, medium dense, (ML)	SS 3	5.0 - 6.5	100	7-11-12 (23)		
			SANDY SAND: brown, fine to coarse, trace quartz gravel, moist, dense, (SM)	SS 4	7.5 - 9.0	100	9-13-15 (28)		
400	10		End of boring at 10.6 feet.						

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BORING NUMBER RW-01

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/20/05 — COMPLETED 4/20/05 — GROUND ELEVATION 421.1 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY Oscar Gomez — CHECKED BY L. Benford — AT END OF DRILLING 14.5 ft / Elev 414.7 ft
NOTES Cave-in Depth Upon Completion: 10.0 — 24hrs AFTER DRILLING 0.03 / Elev 421.1 ft

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
420			**TOPSOIL**	SS 1	0.0 - 1.5	100	4-3-3 (6)		
			SANDY SILT: brown, fine to medium, trace gravel, moist to very moist, loose to medium dense, (ML)	SS 2	2.5 - 4.0	100	3-3-5 (8)		
415	5		**SILTY SAND:** red brown, fine to coarse, trace quartz gravel, moist, dense, (SM)	SS 3	5.0 - 6.5	100	7-11-17 (28)		
			SILTY SAND: dark grey to black, trace fine sand, wet, very loose, (SM)	SS 4	7.5 - 9.0	100	3-3-1 (4)		
410	10		End of boring at 13.0 feet.						

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BORING NUMBER RW-02

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/20/05 — COMPLETED 4/20/05 — GROUND ELEVATION 425.5 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING Dry
LOGGED BY Oscar Gomez — CHECKED BY L. Benford — AT END OF DRILLING 14.5 ft / Elev 424.7 ft
NOTES Cave-in Depth Upon Completion: 9.5 — 24hrs AFTER DRILLING Dry

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
425			**TOPSOIL**	SS 1	0.0 - 1.5	89	4-5-5 (10)		
			SILTY SAND: red brown to brown, fine to coarse, some quartz gravel, moist, medium dense, (SM)	SS 2	2.5 - 4.0	89	7-11-17 (28)		
420	5		Thin Clay Layers @ 5.75-6'	SS 3	5.0 - 6.5	63	10-13-13 (26)		
			SILTY SAND: red brown, fine to medium sands, trace mica, trace clay, moist to very moist, medium stiff to stiff, (ML)	SS 4	7.5 - 9.0	139	3-7-8 (15)		
415	10		End of boring at 15.0 feet.						

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BORING NUMBER RW-03

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/26/05 — COMPLETED 4/26/05 — GROUND ELEVATION 392.5 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING 14.5 ft / Elev 377.7 ft
LOGGED BY Oscar Gomez — CHECKED BY L. Benford — AT END OF DRILLING 14.5 ft / Elev 377.7 ft
NOTES Cave-in Depth Upon Completion: 14.0 — 24hrs AFTER DRILLING 13.5 ft / Elev 378.7 ft

ELEVATION	DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH	RECOVERY %	BLOWS (N VALUE)	% +4 #200 SIEVE	SPT N VALUE: 5% 10% 20% 40% 60% 80%
395			**TOPSOIL**	SS 1	0.0 - 1.5	100	4-7-9 (16)		
			SANDY SILT: brown to tan, fine to medium, little gravel, moist, stiff to very stiff, (ML)	SS 2	2.5 - 4.0	100	6-7-9 (16)		
390	5			SS 3	5.0 - 6.5	100	13-17-9 (26)		
			SILTY SAND: red brown, fine to medium, trace gravel, some mica, trace clay, moist, loose, (SM)	SS 4	7.5 - 9.0	100	6-6-6 (12)		
385	10		**SANDY CLAY:** red brown to tan, fine to medium, very moist, loose, (SC) End of boring at 13.0 feet.	SS 5	12.5 - 13.5	100	2-2-3 (5)	100.0	78.4

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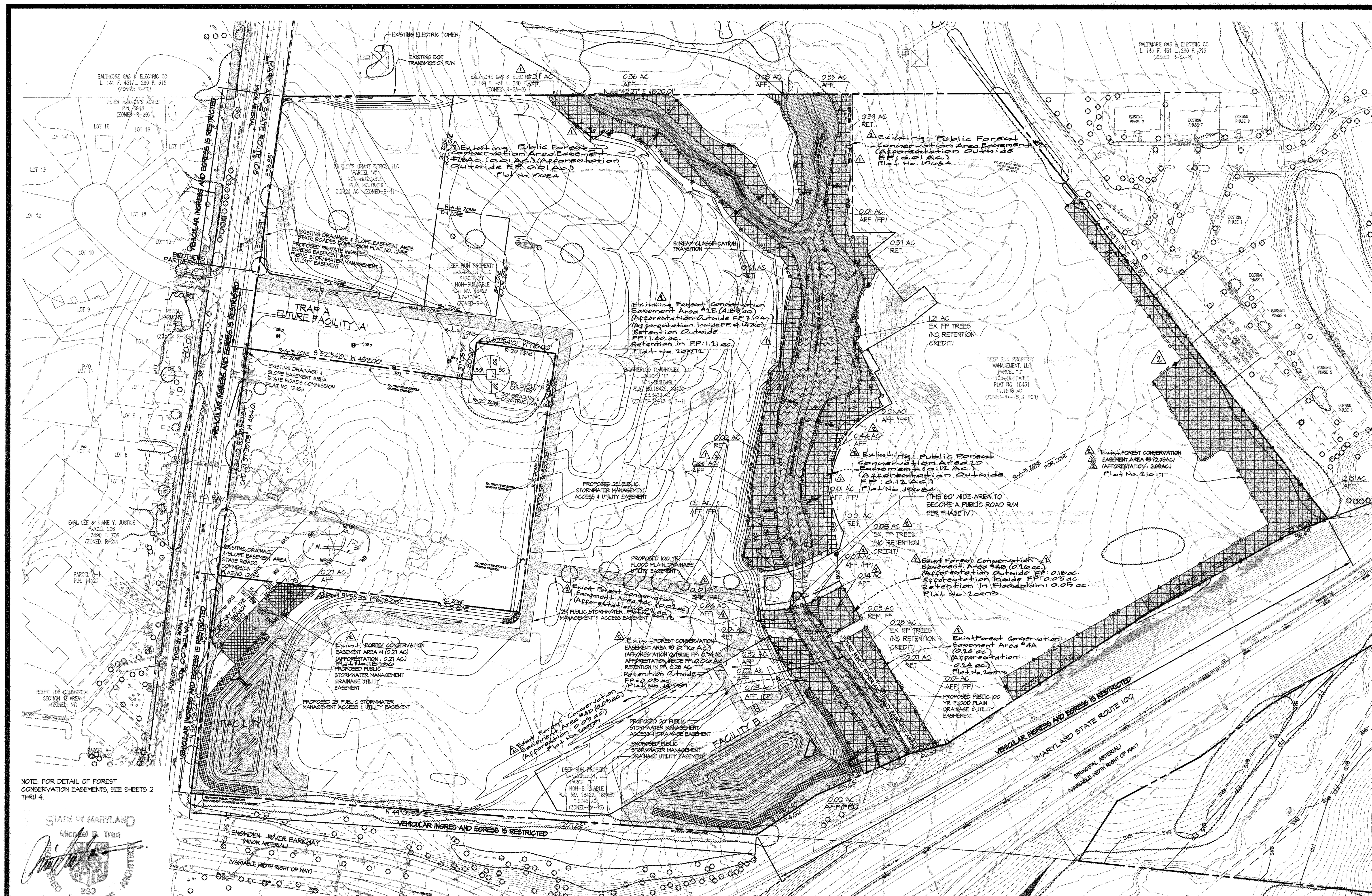
BORING NUMBER RW-04

PAGE 1 OF 1

SPECIALIZED ENGINEERING

CLIENT Bozzuto Homes — PROJECT NAME Shipley's Grant
PROJECT NUMBER 031863 — PROJECT LOCATION Waterloo Road
DATE STARTED 4/26/05 — COMPLETED 4/26/05 — GROUND ELEVATION 402.8 ft — HOLE SIZE 7" in.
DRILLING CONTRACTOR Connelly and Associates Inc. — GROUND WATER LEVELS:
DRILLING METHOD HSA — AT TIME OF DRILLING 14.5 ft / Elev 417.7 ft
LOGGED BY Oscar Gomez — CHECKED BY L. Benford — AT END OF DRILLING 14.5 ft / Elev 417.7 ft
NOTES Cave-in Depth Upon Completion: 14.0 — 24hrs AFTER DRILLING 13.9 ft / Elev 414.7 ft

| ELEVATION | DEPTH | GRAPHIC LOG | MATERIAL DES



NOTE: FOR DETAIL OF FOREST CONSERVATION EASEMENTS, SEE SHEETS 2 THRU 4.

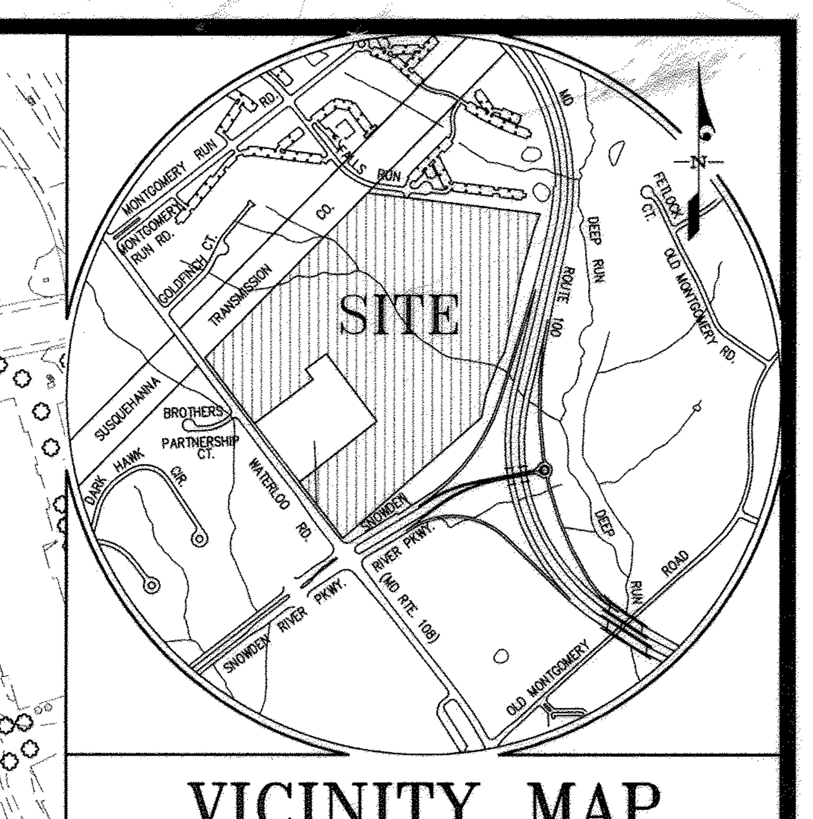
STATE OF MARYLAND
Michael B. Tran
REGISTERED LANDSCAPE ARCHITECT 933

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
Chief, Bureau of Highways — Date 9/14/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
Chief, Division of Land Development — Date 9/19/06
Chief, Development Engineering Division — Date 9/14/06

SCALE: 1" = 100'
0' 25' 50' 100' 200' 400'

The purpose of Revision 2 is to abandon the existing Forest Conservation Area Easement #2A and to create new Public Forest Conservation Area Easement #2E (Result of a net deletion of 0.09 acre) and to abandon the existing Forest Conservation Area #4 and to create new Public Forest Conservation Area Easements #4A, 4B, 4C and 4D (Result of a net deletion of 0.02 acre), & Revise existing Public Forest Conservation Area #3 Afforestation and Retention Areas.



VICINITY MAP

SCALE: 1" = 1,000'

FOREST STAND DELINEATION NARRATIVE

THIS SITE IS CURRENTLY IN AGRICULTURAL USE. EXCEPT FOR A FEW CLUMPS OF ISOLATED TREES, HEDGER ROW ALONG THE FENCED PERIMETER AND THE BAND OF FOREST (F1) ALONG THE PERENNIAL STREAM, THE REST OF SITE IS EXTENSIVELY CULTIVATED (TO WITHIN A FEW YARDS OF THE STREAM IN MOST CASES).

THE BAND OF FOREST (F1) ALONG THE PERENNIAL STREAM IS APPROXIMATELY 2.9 ACRES, OF WHICH 1.3± AC IS WITHIN THE FLOODPLAIN. THIS RIPARIAN FOREST IS A YOUNG, MIXED HARDWOOD FOREST (RED MAPLE, BLK CHEERY, ASH, SASSAFRAS, AND TULIP POPLAR) IN FAIR CONDITION WITH AN AVERAGE DBH OF 6"-8". POISON IVY, MULTIFLORA ROSE AND BRAMBLES ARE ABUNDANT AT GROUND LEVEL WHICH IS NOT FULLY SHADED.

SINCE THE EXISTING FOREST IS LOCATED WITHIN ENVIRONMENTALLY SENSITIVE AREAS, ITS RETENTION IS A VERY IMPORTANT. THESE ENVIRONMENTAL AREAS (FLOODPLAIN, STREAM AND WETLAND BUFFERS) ARE ALSO HIGH PRIORITY LOCATIONS FOR AFFORESTATION AND IMPROVEMENT WHEN THIS SITE IS DEVELOPED.

LEGEND

- EXISTING BUILDINGS
- TOPOGRAPHY
- TREE LINES
- SOILS
- SLOPES 15-25%
- SLOPES 25% AND STEEPER
- STREAM
- SVB — STREAM VALLEY BUFFER
- LIMIT OF DISTURBANCE
- WETLAND
- WB — 25' WETLAND BUFFER
- W — WETLANDS
- FP — 100-YR FLOOD PLAIN
- FCE — FOREST CONSERVATION EASEMENT
- TPF — TREE PROTECTION FENCE
- ON-SITE AFFORESTATION AREA
- FLOODPLAIN FOREST RETENTION (NO CREDIT FOR RETENTION)
- NET TRACT FOREST RETENTION
- AFFORESTATION AREA IN THE FLOODPLAIN
- NATURAL FOREST REGENERATION AREA AND FOREST REMOVAL AREA IN THE FLOODPLAIN
- FOREST CONSERVATION SIGN

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE – SUITE 250 – BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

L:\CADD\DRAWINGS\03006\SPMG\Bound O's\FCP1.dwg	DES. JRS	DRN. JRS	CHK. CKG

DATE	REVISION	BY	APP'R.
9-5-17	Rev. FCE 5 per abandonment approval letter ⚠2	gt	MJT
4/21/2010	⚠2 abandoned FCE 2A & 4. added FCE 2E, 4A, 4B, 4C, 4D	KLP	MJT
2/6/08	Rev. FCE 2 & Added FCE 2A, 2B & 2C ⚠1	WSJ	MJT
1.12.2006	REVISED PER DPZ COMMENTS.	JRS	
10.27.2005	REVISED PER DPZ COMMENTS.	JRS	

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suilte 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

FOREST CONSERVATION PLAN

09/08/2016 NO ASBUILT INFORMATION

SHIPLEY'S GRANT

Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
1"=100'	R-A-15/B-1/POR	03006
DATE	TAX MAP – GRID	SHEET
JULY, 2006	37-1&2	22 OF 25

F-06-019

FOREST CONSERVATION WORKSHEET
HDR (RESIDENTIAL ZONE)

NET TRACT AREA:
A. Total tract area .... = 47.82
B. Area within 100 year floodplain .... = 1.82
C. Area within WSSC R/W or road R/W constructed by public fund... = 0.00
D. Net tract area .... = 46.00

LAND USE CATEGORY: (from table 3.2.1, page 40, Manual)
Input the number "1" under the appropriate land use zoning, and limit to only one entry.

ARA	MDR	IDA	HDR	MPD	CIA
0	0	0	1	0	0

E. Afforestation Threshold .... 15% x D = 6.90
F. Conservation Threshold .... 20% x D = 9.20

EXISTING FOREST COVER:
G. Existing forest cover (excluding floodplain) .... = 1.48
H. Area of forest above afforestation threshold .... = 0.00
I. Area of forest above conservation threshold .... = 0.00

BREAK EVEN POINT:
J. Forest retention above threshold with no mitigation .... = 0.00
K. Clearing permitted without mitigation .... = 0.00

PROPOSED FOREST CLEARING:
L. Total area of forest to be cleared .... = 0.00
M. Total area of forest to be retained .... = 1.48

PLANTING REQUIREMENTS:
N. Reforestation for clearing above conservation threshold .... = 0.00
O. Reforestation for clearing below conservation threshold .... = 0.00
P. Credit for retention above conservation threshold .... = 0.00
Q. Total reforestation required .... = 0.00
R. Total afforestation required .... = 5.42
S. Total reforestation and afforestation required .... = 5.42 ⚠2
T. Total afforestation proposed (on-site) .... = 4.00*
U. Proposed forest conservation banking .... = 1.30

*An abandonment fee of $3,267.00 was required for the 0.06 Ac. of abandoned afforestation. That fee was paid at the time the Phase V plat mylars were submitted to Howard County for signatures and recordation.

FOREST CONSERVATION WORKSHEET
CIA (COMMERCIAL ZONE)

NET TRACT AREA:
A. Total tract area .... = 10.79
B. Area within 100 year floodplain .... = 0.00
C. Area within WSSC R/W or road R/W constructed by public fund... = 0.00
D. Net tract area .... = 10.79

LAND USE CATEGORY: (from table 3.2.1, page 40, Manual)
Input the number "1" under the appropriate land use zoning, and limit to only one entry.

ARA	MDR	IDA	HDR	MPD	CIA
0	0	0	0	0	1

E. Afforestation Threshold .... 15% x D = 1.62
F. Conservation Threshold .... 15% x D = 1.62

EXISTING FOREST COVER:
G. Existing forest cover (excluding floodplain) .... = 0.00
H. Area of forest above afforestation threshold .... = 0.00
I. Area of forest above conservation threshold .... = 0.00

BREAK EVEN POINT:
J. Forest retention above threshold with no mitigation .... = 0.00
K. Clearing permitted without mitigation .... = 0.00

PROPOSED FOREST CLEARING:
L. Total area of forest to be cleared .... = 0.00
M. Total area of forest to be retained .... = 0.00

PLANTING REQUIREMENTS:
N. Reforestation for clearing above conservation threshold .... = 0.00
O. Reforestation for clearing below conservation threshold .... = 0.00
P. Credit for retention above conservation threshold .... = 0.00
Q. Total reforestation required .... = 0.00
R. Total afforestation required .... = 1.62
S. Total reforestation and afforestation required .... = 1.62
T. Total afforestation proposed (on-site) .... = 1.62

FOREST CONSERVATION SURETY ⚠2

FOREST RETENTION AT $0.20/SF X (1.48 AC X 43,560 SF/AC) = $12,893.76
RE/AFFORESTATION AT $0.50/SF X (5.68AC X 43,560 SF/AC) = $123,710.40
TOTAL FOREST CONSERVATION SURETY = $136,604.16

FOREST CONSERVATION EASEMENT AREA TABULATION ⚠2

	⚠2	⚠2 ⚠1	⚠2	⚠2	⚠2	⚠2
FOREST CONSERVATION EASEMENT (FCE) AREA	1	2B,2C, 2D&2E	3	4A,4B 4C&4D	5	
PARCEL WHERE FCE IS LOCATED	C	C	C	C	D	TOTAL
CREDITED FOREST RETENTION AREA ON NET TRACT (IN AC.)	N/A	1.40	0.08	N/A	N/A	1.48
NON-CREDITED FOREST RETENTION AREA IN FLOODPLAIN (IN AC.)	N/A	1.21	0.28	0.05	N/A	1.54
FOREST PLANTING AREA OUTSIDE THE FLOODPLAIN (IN AC.)	0.27	2.24	0.34	0.47	2.05	5.37
FOREST PLANTING AREA WITHIN THE FLOODPLAIN (IN AC.)	N/A	0.14	0.06	0.03	N/A	0.23
TOTAL ACRAGE OF AFFORESTATION PROVIDED (IN AC.)	0.27	2.38	0.40	0.50	2.05	5.60
NATURAL REGENERATION AREA (IN AC.)	N/A	N/A	N/A	N/A	N/A	N/A
MINIMUM TOTAL AREA IN CONSERVATION EASEMENT (IN AC.)	0.27	4.99	0.76	0.55	2.05	8.62

FOREST CONSERVATION PLANTING QUANTITY SCHEDULE ⚠2

		⚠2 ⚠1	⚠2	⚠2	⚠2	⚠2
FOREST CONSERVATION LOCATION	1	2B,2C, 2D&2E	3	4A,4B, 4C&4D	5	TOTAL
FOREST PLANTING AREA OUTSIDE THE FLOODPLAIN (IN AC.)	0.27	2.24	0.34	0.47	2.05	5.37
FOREST PLANTING AREA WITHIN THE FLOODPLAIN (IN AC.)	N/A	0.14	0.06	0.03	N/A	0.23
TOTAL ACRAGE OF AFFORESTATION PROVIDED (IN AC.)	0.27	2.38	0.40	0.50	2.05	5.60
BASE QUANTITY OF 2" CAL. TREES REQUIRED (AT 100 TREES/AC.)	27	238	40	50	205	560
REQUIRED QUANTITY OF 2" CAL. TREES TO BE PLANTED*	27	238	40	50	205	560

* FOR PLANTING WITH 1" CAL. TREES, THE REQUIRED QUANTITY SHALL BE DOUBLED.

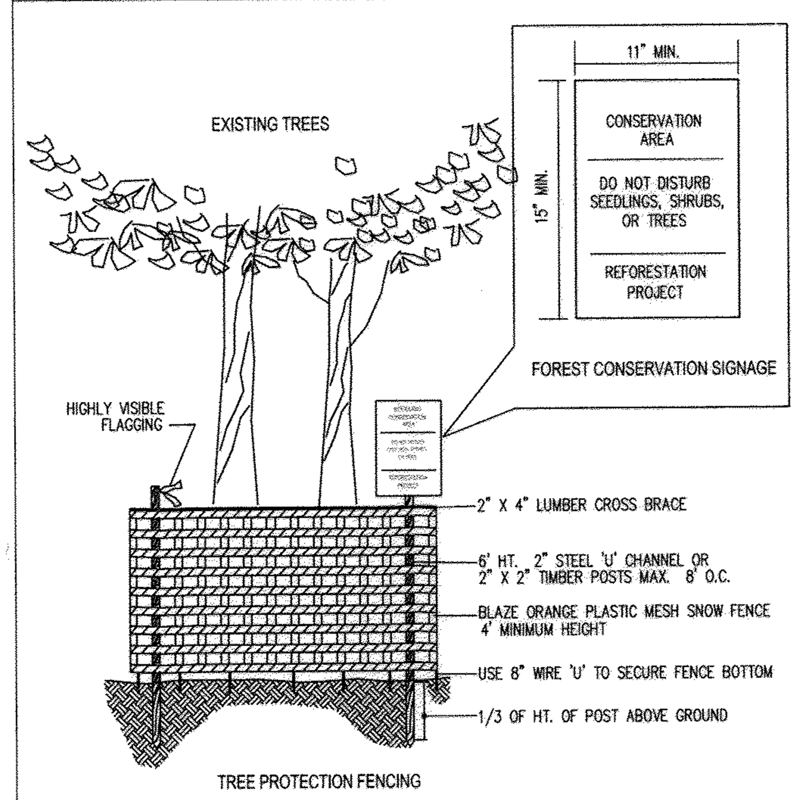
NOTE: THE QUANTITY SHOWN ABOVE IS FOR PLANTING WITH 2" CAL. TREES AT 20' X 20' SPACING.

FOREST CONSERVATION PLANT LIST

FOREST CONSERVATION EASEMENT AREA ⚠2

⚠1 Plant Name (Botanical/Common)	1	2B,2C 2D&2E	⚠1 3 ⚠2	⚠2 4A,4B, 4C&4D	5 ⚠2	TOTAL
⚠1 Acer Rubrum/Red Maple	6	⚠2 47	8	10	41	112
⚠1 Liquid Amber styraciflua/Sweet Gum	6	47	8	10	41	112
⚠1 Liriodendron Tulipfera Tulip Tree	5	48	8	10	41	112
⚠1 Quercus Palostria/Pin Oak	5	48	8	10	41	112
⚠1 Quercus Rubrum/Red Oak	5	48	8	10	41	112
⚠1 Total	27	238	40	50	205	560
⚠1 ⚠2						

TREE PROTECTION FENCE & FOREST CONSERVATION SIGNAGE
NOT TO SCALE

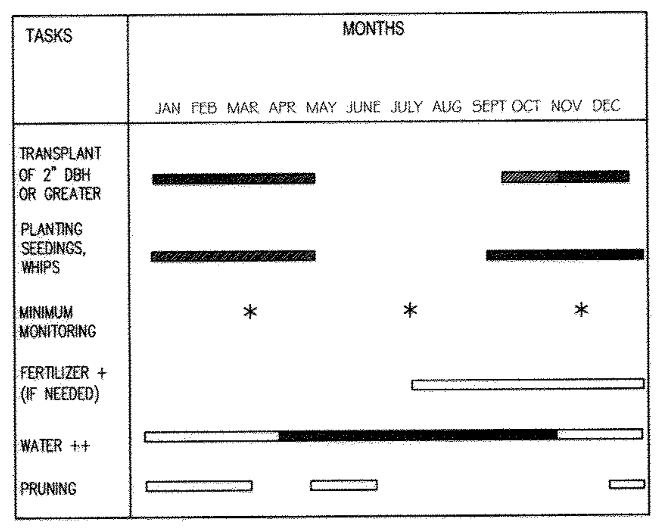


NOTES:

1. THE TREE PROTECTION FENCING SHOWN ON THESE PLANS IS TEMPORARY AND SHALL REMAIN IN PLACE DURING CONSTRUCTION ACTIVITY, BUT THE FOREST CONSERVATION SIGNAGE IS PERMANENT AND SHALL REMAIN IN PLACE AROUND THE FOREST CONSERVATION EASEMENTS AFTER THE REMOVAL OF THE TREE PROTECTION FENCING.
2. FOREST CONSERVATION SIGNAGE SHALL BE INSTALLED ALONG THE PERIMETER OF THE CONSERVATION EASEMENT AT 50' TO 100' APART.
3. ATTACHMENT OF SIGNS TO TREES IS PROHIBITED.

SOURCE: PRINCE GEORGE'S COUNTY, MARYLAND: WOODLAND CONSERVATION MANUAL ADAPTED FROM THE MARYLAND STATE FOREST CONSERVATION MANUAL

TREE PLANTING AND MAINTENANCE CALENDAR



KEY

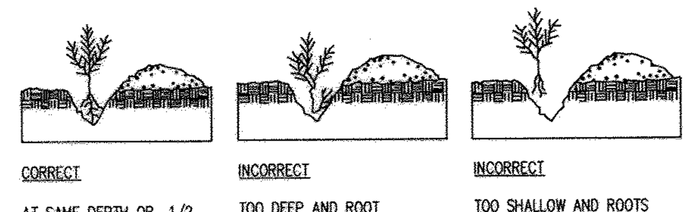
- * ACTIVITIES DURING THESE MONTHS ARE DEPENDENT UPON GROUND CONDITIONS
- GREATLY RECOMMENDED
- RECOMMENDED WITH ADDITIONAL CARE
- RECOMMENDED
- \+ DEPENDANT UPON SITE CONDITIONS
- ++ DEPENDANT UPON SITE CONDITIONS; WEEKLY WATERING IS GREATLY RECOMMENDED FROM MAY THROUGH OCTOBER UNLESS WEEKLY RAINFALL EQUALS 1"

NOTE:
THE PLANTING AND CARE OF TREES IS MOST SUCCESSFUL WHEN COORDINATED WITH THE LOCAL CLIMATIC CONDITIONS. THIS CALENDAR SUMMARIZES SOME OF THE RECOMMENDED TIME FRAMES FOR BASIC REFORESTATION AND STRESS REDUCTION ACTIVITIES.

SOURCE: ADAPTED FROM THE MARYLAND STATE FOREST CONSERVATION MANUAL

HANDLING AND PLANTING OF SEEDLING(4)

CORRECT AND INCORRECT PLANTING DEPTH

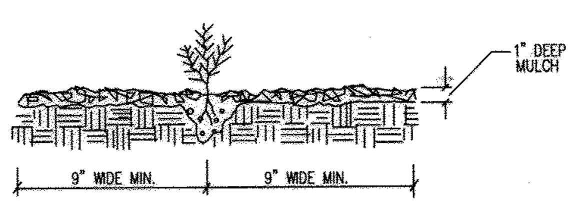


CORRECT — AT SAME DEPTH OR 1/2 DEEPER THAN SEEDLING GREW IN NURSERY

INCORRECT — TOO DEEP AND ROOT BENT

INCORRECT — TOO SHALLOW AND ROOTS EXPOSED

SEEDLING AND WHIP PLANTING SPECIFICATION



NOTE:
MULCHING NEWLY PLANTED SEEDLINGS HELPS THE SOIL RETAIN MOISTURE AND IT PROTECTS THE SEEDLING FROM COMPACTION AND STEM INJURIES.

SOURCE: ADAPTED FROM THE MARYLAND STATE FOREST CONSERVATION MANUAL

FOREST CONSERVATION PROGRAM SEQUENCE
(TO BE PERFORMED AT FINAL PLAN STAGE)

1. OBTAIN ALL NECESSARY PERMITS.
2. STAKEOUT LIMITS OF DISTURBANCE.
3. FIELD MEETING TO REVIEW AND VERIFY LIMIT OF DISTURBANCE FOR THE SITE GRADING AND CONSTRUCTION.
4. INSTALL FOREST CONSERVATION SIGNS AND FOREST PROTECTION DEVICES (FENCES) ALONG THE PORTION OF THE LIMIT OF DISTURBANCE (THAT INVOLVES CLEARING AND/OR RETENTION OF TREES).
5. COMMENCE SITE CONSTRUCTION.
6. INSTALL FOREST PLANTING AND THE REMAINDER OF THE CONSERVATION SIGNS ALONG THE EDGE OF THE CONSERVATION EASEMENT. MOVE CONSERVATION SIGNS INSTALLED IN #4 (ABOVE) TO THE EDGE OF THE CONSERVATION EASEMENT.
7. INSPECTION AND CERTIFICATION FOR THE RELEASE OF THE CONSTRUCTION PERIOD OBLIGATIONS; START OF POST-CONSTRUCTION MANAGEMENT PERIOD.
8. POST-CONSTRUCTION MANAGEMENT FOR A PERIOD OF 2 YEARS (MIN.).
9. FINAL INSPECTION AND CERTIFICATION FOR THE RELEASE OF THE OWNER'S FOREST CONSERVATION SURETY.

(TO BE PERFORMED AT FINAL PLAN STAGE)

CONSTRUCTION PERIOD PROTECTION PROGRAM

1. THE LIMIT OF FOREST RETENTION SHALL BE STAKED AND FLAGGED.
2. A PRE-CONSTRUCTION MEETING AT THE SITE SHOULD BE HELD TO CONFIRM THE LIMITS OF CLEARING SPECIFIED. THE MEETING SHOULD INCLUDE THE OWNER OR THE OWNER'S REPRESENTATIVE, THE ON-SITE FOREMAN IN CHARGE OF LAND DISTURBANCE, THE ENVIRONMENTAL CONSULTANT AND THE APPROPRIATE HOWARD COUNTY INSPECTORS.
3. FOREST PROTECTION DEVICES AND SIGNS (SEE DETAILS) SHALL BE INSTALLED PRIOR TO ANY CLEARING OR GRADING. THE PROTECTION DEVICES AND SIGNS SHALL BE MAINTAINED DURING THE ENTIRE CONSTRUCTION PERIOD. NONE OF THE DEVICES SHALL BE ANCHORED OR ATTACHED IN ANY WAY TO THE TREES TO BE SAVED.
4. EQUIPMENT, VEHICLES AND BUILDING MATERIALS SHALL NOT BE WITHIN THE PROTECTED AREA. ACTIVITIES STRICTLY TO IMPLEMENT ANY REFORESTATION PLANTING AND MAINTENANCE (I.E. WATERING, FERTILIZING THINNING, PRUNING, REMOVAL OF DEAD AND DISEASED TREES WHERE NECESSARY, ETC.) OF THE CONSERVATION AREA ARE PERMITTED. CLEARING FOR THE PURPOSE OF SODDING OR PLANTING GRASS IS NOT PERMITTED WITHIN THE FOREST CONSERVATION AREAS ONCE THEY'RE ESTABLISHED.
5. AT THE END OF THE CONSTRUCTION PERIOD, THE DESIGNATED QUALIFIED PROFESSIONAL SHALL CONVEY TO THE ADMINISTRATOR OF THE HOWARD COUNTY FOREST CONSERVATION PROGRAM CERTIFICATION THAT ALL FOREST RETENTION AREAS HAVE BEEN PRESERVED, ALL REFORESTATION AND/OR AFFORESTATION PLANTINGS (IF APPLICABLE) HAVE BEEN INSTALLED AS REQUIRED BY THE FOREST CONSERVATION PLAN, AND THAT ALL PROTECTION MEASURES REQUIRED FOR THE POST-CONSTRUCTION PERIOD HAVE BEEN INSTALLED. UPON REVIEW OF THE FINAL CERTIFICATION DOCUMENT FOR COMPLETENESS AND ACCURACY, THE PROGRAM COORDINATOR WILL NOTIFY THE OWNER OF RELEASE FROM THE CONSTRUCTION PERIOD OBLIGATIONS. THE 2-YEAR (MIN.) POST-CONSTRUCTION MANAGEMENT AND PROTECTION PERIOD THEN COMMENCES.

GENERAL NOTES

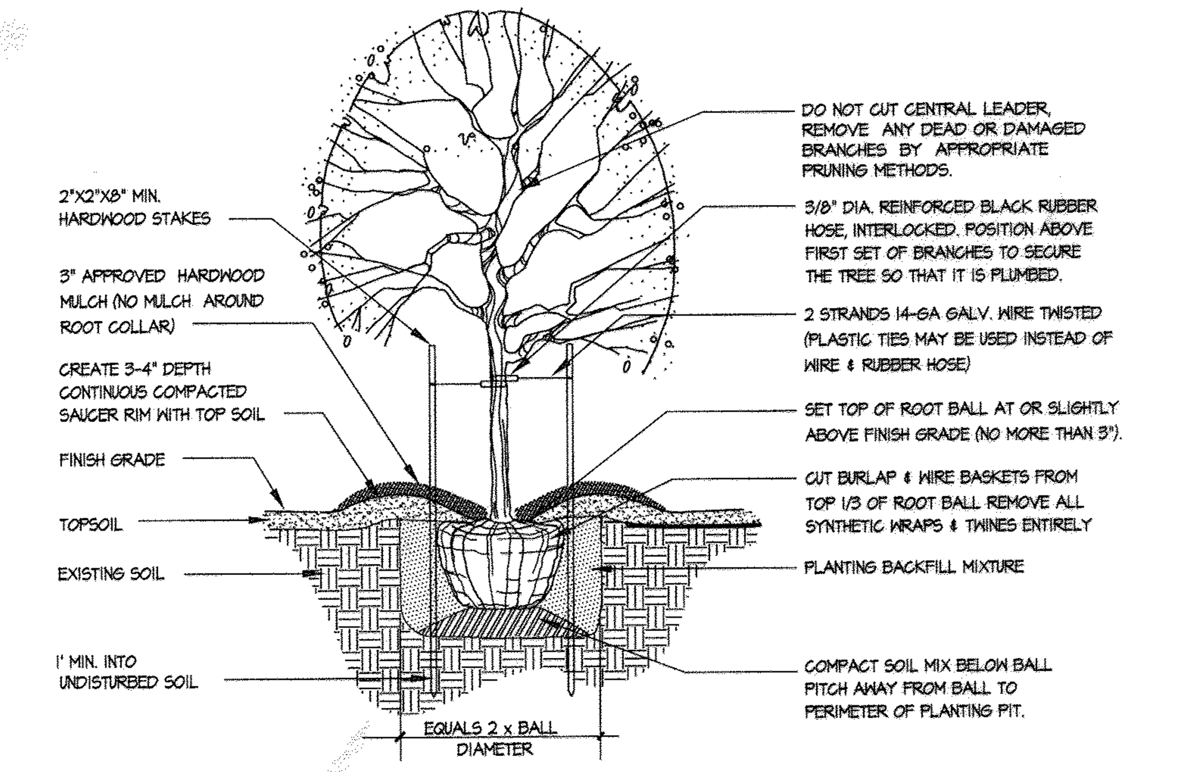
1. THIS REFORESTATION PLAN IS PROVIDED IN ACCORDANCE WITH THE REQUIREMENTS OF SUBTITLE 12 "FOREST CONSERVATION" OF THE HOWARD COUNTY CODE.
2. IMPLEMENTATION OF THIS PLAN MUST BE PERFORMED BY A CONTRACTOR THAT IS KNOWLEDGEABLE AND EXPERIENCED IN AFFORESTATION/REFORESTATION TECHNIQUES AND PRACTICES.
3. AT FINAL PLAN STAGE, THE OWNER IS RESPONSIBLE FOR A 2-YEAR (MIN.) POST-CONSTRUCTION MAINTENANCE PERIOD WHICH INVOLVES ACTIVITIES NECESSARY TO ENSURE SURVIVAL AND GROWTH OF THE CONSERVATION AREA. TWO INSPECTIONS PER YEAR BY A QUALIFIED PROFESSIONAL AT BEGINNING AND END OF THE GROWING SEASON, ARE RECOMMENDED IN ORDER TO TAKE REMEDIAL STEPS AS NECESSARY. IF, AFTER ONE YEAR, THE POSSIBILITY EXISTS THAT THE ORIGINAL PLANTING (IF APPLICABLE) WILL NOT MEET SURVIVAL RATE STANDARDS, THE APPLICANT MAY CHOOSE TO ESTABLISH REINFORCEMENT PLANTINGS.
4. AT THE END OF THE POST-CONSTRUCTION MANAGEMENT AND PROTECTION PERIOD, CERTIFICATION BY A QUALIFIED CONSULTANT WILL BE REQUIRED BEFORE TO THE OWNER CAN BE RELEASED FROM HIS/HER FOREST CONSERVATION OBLIGATION TO THE ADMINISTRATOR OF THE HOWARD COUNTY FOREST CONSERVATION PROGRAM.
5. THE DEVELOPER/BUILDER SHALL (IN WRITING) NOTIFY ALL LOT OWNERS OF THIS DEVELOPMENT OF THE EXISTENCE OF FOREST CONSERVATION AREAS AND THAT DISTURBANCE TO THE FOREST CONSERVATION AREAS OR THE REMOVAL OF FOREST CONSERVATION SIGNAGE IS PROHIBITED.
6. THE PROPOSED FOREST CONSERVATION EASEMENTS (FCE) SHOWN ON THESE PLANS HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE, FOREST CONSERVATION ACT. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FCE; HOWEVER, THE INITIAL GRADING TO DEVELOP THE SITES (AT SUBSEQUENT PLAN STAGES) AND FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.

TO FULFILL THE THE FOREST CONSERVATION OBLIGATION FOR THE DEVELOPMENT OF THIS SITE, AT LEAST 8.79± ACRES OF ON-SITE FOREST CONSERVATION EASEMENTS WHICH ARE COMPRISED OF 1.48± AC. OF NET TRACT RETENTION, 1.57± AC. OF NON-CREDITED FOREST RETENTION WITHIN THE FLOODPLAIN, AND 5.74± AC. OF AFFORESTATION PLANTING. FOREST CONSERVATION EASEMENTS NUMBER ONE THROUGH FOUR SHALL BE RECORDED ON FINAL PLAT F 06-019.

RECORDATION AND PLANTING OF FOREST CONSERVATION EASEMENT NUMBER FIVE SHALL BE DELAYED UNTIL PARCEL D IS MASS GRADED IN CONJUNCTION WITH THE PHASE IV FINAL DEVELOPMENT PLANS AND PLATS.

THE OUTSTANDING FOREST CONSERVATION OBLIGATION OF 1.30 ACRES OF OFF-SITE AFFORESTATION FOR THIS SUBDIVISION SHALL BE MET BY PROVIDING 1.30 ACRES OF OFF-SITE AFFORESTATION OR 2.60 ACRES OF OFF-SITE RETENTION BEFORE THE LAST PHASE OF THIS PROJECT CAN OBTAIN APPROVAL BY THE DPZ.

7. FOREST CONSERVATION SURETY IN THE AMOUNT OF $137,910.96 FOR THE FIVE ON-SITE FOREST CONSERVATION EASEMENTS WILL BE POSTED AS A PART OF THE DEVELOPER'S AGREEMENTS



NOTE: ALL SUPPORTING DEVICES (STAKES, WIRES, ETC.) SHALL BE REMOVED AFTER 2 GROWING SEASONS.

DECIDUOUS TREE PLANTING DETAIL
FOR PLANTING MATERIAL UP TO 3 1/2" CALIPER — NTS

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
Chief, Bureau of Highways — Date 9/6/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
Chief, Division of Land Development — Date 9/19/06
Chief, Development Engineering Division — A.S. — Date 9/14/06

STATE OF MARYLAND — Michael B. Tran — REGISTERED LANDSCAPE ARCHITECT — 933

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

\DRAWINGS\03006\SPMG\03006FCP2.dwg | DES. JRS | DRN. JRS | CHK. CKG

DATE	REVISION	BY	APP'R.
9-5-13	Rev. FC tab to update per note on cs ⚠2	gt	MJT
4/21/2010	⚠1 abandoned FCE 2A & 4. added FCE 2E, 4A, 4B, 4C, 4D ⚠2	WGJ	MJT
2/6/08	Rev. FC Tab. charts to incorporate FCE 2A, 2B, & 2C. corrected FC Plant List ⚠1	WGJ	MJT
1.12.2006	REVISED PER DPZ COMMENTS.	JRS	
10.27.2005	REVISED PER DPZ COMMENTS.	JRS	

OWNER
Deep Run Property Management, LLC.
191 Miller Hollow Lane
Lake City, Tennessee 37769
Attn: Robert L. Curtis, Jr.
865-494-0016

DEVELOPER/CONTRACT PURCHASER
Bozzuto Homes, Inc.
7850 Walker Drive
Suite 400
Greenbelt, MD 20770-3203
Attn. John Burnham
301-623-1511

FOREST CONSERVATION NOTES, SCHEDULES AND DETAILS 09/08/2016

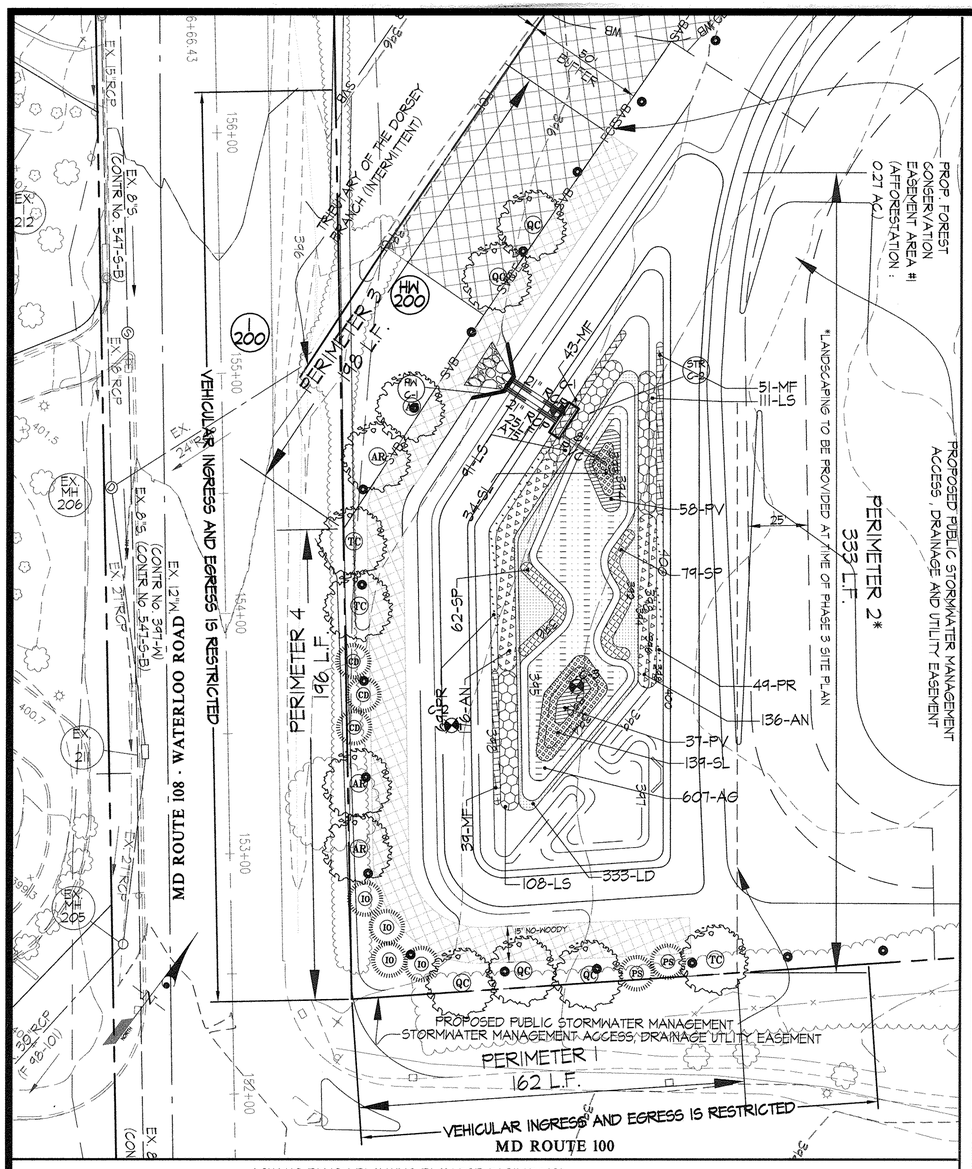
SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
Tax Map 37, Grid 1-2, Part of Parcel 4

NO ASBUILT INFORMATION

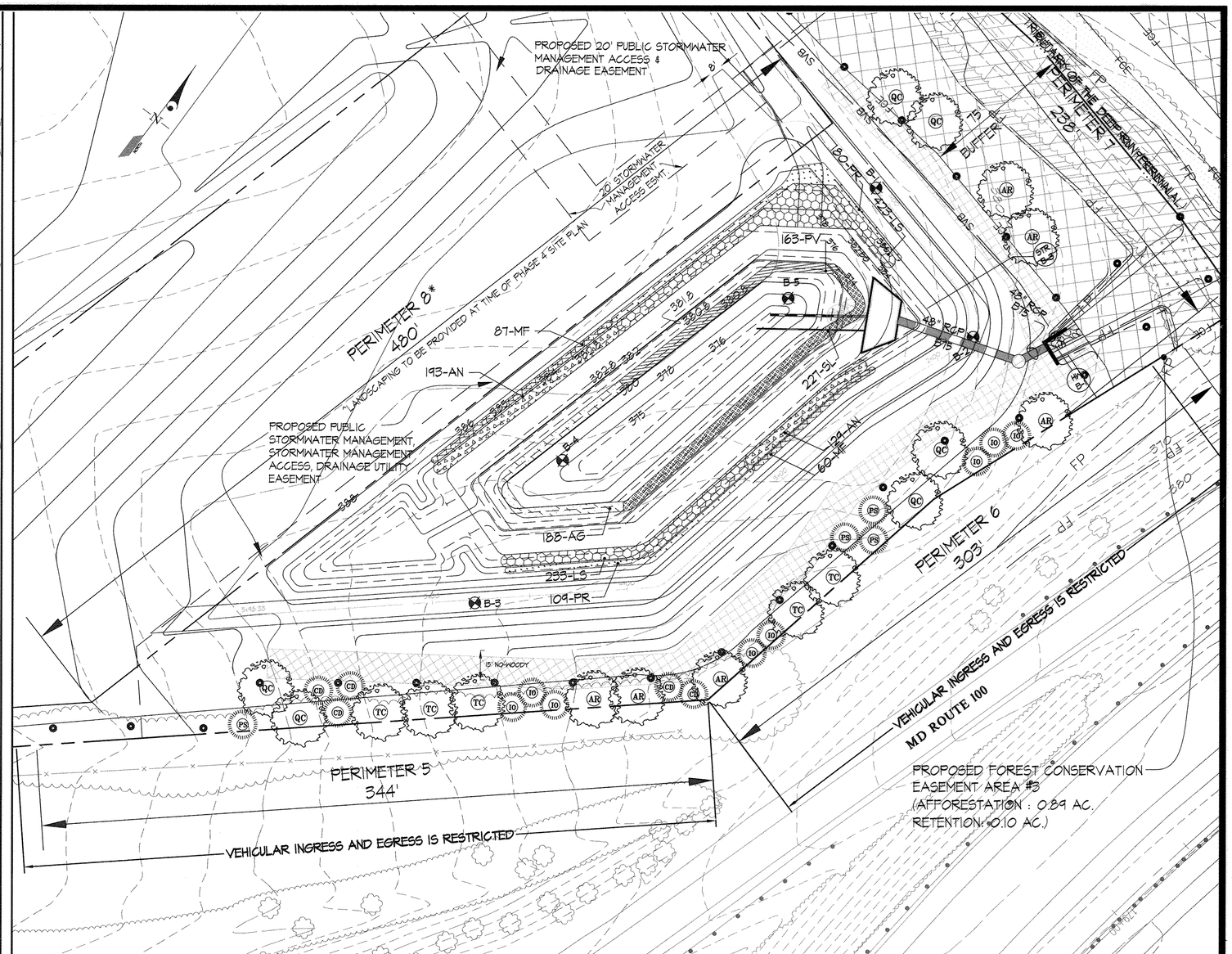
ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
NTS	R-A-15/B-1/POR	03006
DATE	TAX MAP - GRID	SHEET
JAN., 2006	37-1&2	23 OF 25

F-06-019



AQUATIC BENCH PLANTING PLAN FOR FACILITY 'C' SCALE: 1" = 30'



AQUATIC BENCH PLANTING PLAN FOR FACILITY 'B' SCALE: 1" = 30'

NOTE: EASEMENT SHADING HAS BEEN OMITTED FOR CLARITY. FOR INFORMANTION NOT SHOWN, SEE SHEETS 2 THROUGH 4.

NOTE: STORMWATER MANAGEMENT POND PLANTINGS ARE PER MDE 2000 REQUIREMENTS

PLANT LIST FOR STORMWATER MANAGEMENT PONDS

SYMBOL	QTY.	NAMES (BOTANICAL / SCIENTIFIC)	SIZE	NOTES
PERENNIALS/GROUNDCOVER				
AG	795	Andropogon glomeratus Bushy Beardgrass	1 gal. cont.	18" o.c. ZONE 1
AN	634	Aster novi-belgii New York Aster	1 gal. cont.	18" o.c. ZONE 3
LD	333	Lobelia dortmanna Water Lobelia	1 gal. cont.	18" o.c. ZONE 2
LS	966	Lobelia siphilitica Great Blue Lobelia	1 gal. cont.	18" o.c. ZONE 3
MF	237	Monarda fistulosa Wild Bergamot	1 gal. cont.	18" o.c. ZONE 4
SL	400	Sagittaria latifolia Duck Potato	1 gal. cont.	18" o.c. ZONE 1
SP	141	Scirpus pungens Three-Square Bulrush	1 gal. cont.	18" o.c. ZONE 2
PR	407	Polemonium reptans Jacob's Ladder	1 gal. cont.	18" o.c. ZONE 4
PV	258	Peltandra virginica Arrow Arum	1 gal. cont.	18" o.c. ZONE 1

NOTE: EASEMENT SHADING HAS BEEN OMITTED FOR CLARITY. FOR INFORMANTION NOT SHOWN, SEE SHEETS 2 THROUGH 4.

THE REQUIRED IMPROVEMENTS TO MARYLAND ROUTE 108 (INCLUDING STREET TREES AND SIDEWALKS) SHALL BE PROCESSED, APPROVED AND BONDED THROUGH THE APPROPRIATE STATE AGENCIES IN ACCORDANCE WITH THE APPROVED PHASING INDICATED IN THE TRAFFIC IMPACT ANALYSIS.

SCALE: 1" = 30'

0' 15' 30' 60' 120'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 9/8/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING + ZONING

Chief, Division of Land Development — Date 9/13/06

Chief, Development Engineering Division — Date 9/14/06

STATE OF MARYLAND
Michael B. Tran
REGISTERED LANDSCAPE ARCHITECT
933

THIS PLAN IS FOR PLANTING PURPOSES ONLY!

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE – SUITE 250 – BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

L:\CADD\DRAWINGS\03006\SPMG\Bound O's\LS.dwg | DES. JRS | DRN. JRS | CHK. KAF

DATE	REVISION	BY	APP'R.
10.21.05	REVISED PER DPZ COMMENTS.	JRS	

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

LANDSCAPE PLAN - STORMWATER MANAGEMENT 09/08/2016

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

NO ASBUILT INFORMATION

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
AS SHOWN	R-A-15/B-1/POR	03006
DATE	TAX MAP – GRID	SHEET
JULY, 2006	37-1&2	24 OF 25

F-06-019

PLANT LIST

SYMBOL	QTY.	NAMES (BOTANICAL / SCIENTIFIC)	SIZE	NOTES
SHADE TREES				
AR	10	Acer rubrum 'October Glory' October Glory Red Maple	2 1/2"-3" Cal. B&B 12' - 14' height 6' min. branching ht	
TC	8	Tilia cordata 'Greenspire' Greenspire Littleleaf Linden	2 1/2"-3" Cal. B&B 12' - 14' height 6' min. branching ht	
QC	9	Quercus coccinea Scarlet Oak	2 1/2"-3" Cal. B&B 12' - 14' height 6' min. branching ht	
EVERGREEN TREES				
CD	8	Cedrus deodara Deodar Cedar	8'-10' height	
IO	12	Ilex opaca American Holly	7'-8' height 16 male and 31 female plants (1 male to 3 females)	
PS	6	Pinus strobus White Pine	8'-10' height	

PLANT MATERIALS AND PLANTING METHODS

A. PLANT MATERIALS

THE LANDSCAPE CONTRACTOR SHALL FURNISH AND INSTALL AND/OR DIG, BALL, BURLAP AND TRANSPLANT ALL OF THE PLANT MATERIALS CALLED FOR ON DRAWINGS AND/OR LISTED IN THE PLANT SCHEDULE.

1. PLANT NAMES

PLANT NAMES USED IN THE PLANT SCHEDULE SHALL CONFORM WITH "STANDARDIZED PLANT NAMES," LATEST EDITION.

2. PLANT STANDARDS

ALL PLANT MATERIAL SHALL BE EQUAL TO OR BETTER THAN THE REQUIREMENTS OF THE "USA STANDARD FOR NURSERY STOCK" LATEST EDITION, AS PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN (HEREAFTER REFERRED TO AS AAN STANDARDS). ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES AND VARIETY, SHALL HAVE A NORMAL HABIT OF GROWTH AND SHALL BE FIRST QUALITY, SOUND, VIGOROUS, WELL-BRANCHED AND WITH HEALTHY, WELL-FURNISHED ROOT SYSTEMS. THEY SHALL BE FREE OF DISEASE, INSECT PESTS AND MECHANICAL INJURIES.

ALL PLANTS SHALL BE NURSERY GROWN AND SHALL HAVE BEEN GROWN UNDER THE SAME CLIMATIC CONDITIONS AS THE LOCATION OF THIS PROJECT FOR AT LEAST TWO YEARS BEFORE PLANTING. NEITHER HEELED-IN PLANTS NOR PLANTS FROM COLD STORAGE WILL BE ACCEPTED.

3. PLANT MEASUREMENTS

ALL PLANTS SHALL CONFORM TO THE MEASUREMENTS SPECIFIED IN THE PLANT SCHEDULE AS APPROVED BY THE ARC.

A. CALIPER MEASUREMENTS SHALL BE TAKEN SIX INCHES (6") ABOVE GRADE FOR TREES UNDER FOUR-INCH (4") CALIPER AND TWELVE (12") ABOVE GRADE FOR TREES FOUR INCHES (4") IN CALIPER AND OVER.

B. MINIMUM BRANCHING HEIGHT FOR ALL TREES SHALL BE SIX FEET (6'), MAXIMUM EIGHT FEET (8').

C. MINIMUM SIZE FOR PLANTING SHADE TREES SHALL BE 3-3?" CALIPER, 14'-16' IN HEIGHT.

D. MINIMUM SIZE FOR PLANTING MINOR OR INTERMEDIATE FOCUS TREES (PINES, CRABAPPLES, ETC.) SHALL BE 3"-3?" CALIPER, 10'-12' IN HEIGHT.

E. MINIMUM SIZE FOR PLANTING SHRUBS SHALL BE 18" - 24" SPREAD UNLESS NOTED OTHERWISE.

F. CALIPER, HEIGHT, SPREAD AND SIZE OF BALL SHALL BE GENERALLY AS FOLLOWS:

CALIPER	HEIGHT	SPREAD	SIZE OF BALL
3" - 3.5"	14'-16'	6'-8'	32" DIAMETER
3.5"- 4"	14'-16'	8'-10'	36" DIAMETER
4" - 4.5"	16'-18'	8'-10'	40" DIAMETER
4.5"- 5"	16'-17'	10'-12'	44" DIAMETER
5" - 5.5"	16'-20'	10'-12'	48" DIAMETER
5.5"- 6"	18'-20'	12'-14'	52" DIAMETER

ALL PLANT MATERIAL SHALL GENERALLY AVERAGE THE MEDIAN FOR THE SIZE RANGES INDICATED ABOVE AS INDICATED IN THE "AAN STANDARDS".

4. PLANT IDENTIFICATION

LEGIBLE LABELS SHALL BE ATTACHED TO ALL SHADE TREES, MINOR TREES, SPECIMEN SHRUBS AND BUNDLES OR BOXES OF OTHER PLANT MATERIAL GIVING THE BOTANICALSHIP AND COMMON NAMES, SIZE AND QUANTITY OF EACH. EACH SHIPMENT OF PLANTS SHALL BEAR CERTIFICATES OF INSPECTION AS REQUIRED BY FEDERAL, STATE AND COUNTY AUTHORITIES.

5. PLANT INSPECTION

THE ARC MAY, UPON REQUEST BY THE BUILDER OR DEVELOPER, AT LEAST TEN (10) DAYS PRIOR TO THE INSTALLATION OF ANY PROPOSED PLANT MATERIAL, INSPECT ALL PROPOSED PLANT MATERIAL AT THE SOURCE OF ORIGIN.

B. PLANTING METHODS

ALL PROPOSED PLANT MATERIALS THAT MEET THE SPECIFICATIONS IN SECTION A ARE TO BE PLANTED IN ACCORDANCE WITH THE FOLLOWING METHODS DURING THE PROPER PLANTING SEASONS AS DESCRIBED IN THE FOLLOWING:

1. PLANTING SEASONS

THE PLANTING OF DECIDUOUS TREES, SHRUBS AND VINES SHALL BE FROM MARCH 1ST TO JUNE 15TH AND FROM SEPTEMBER 15TH TO DECEMBER 15TH. PLANTING OF DECIDUOUS MATERIAL MAY BE CONTINUED DURING THE WINTER MONTHS PROVIDING THERE IS NO FROST IN THE GROUND AND FROST-FREE TOPSOIL PLANTING MIXTURES ARE USED.

THE PLANTING OF EVERGREEN MATERIAL SHALL BE FROM MARCH 15TH TO JUNE 15TH AND FROM AUGUST 15TH TO DECEMBER 1ST. NO PLANTING SHALL BE DONE WHEN GROUND IS FROZEN OR EXCESSIVELY MOIST. NO FROZEN OR WET TOPSOIL SHALL BE USED AT ANY TIME.

2. DIGGING

ALL PLANT MATERIAL SHALL BE DUG, BALLED AND BURLAPPED (B+B) IN ACCORDANCE WITH THE "AAN STANDARDS".

3. EXCAVATION OF PLANT PITS

THE LANDSCAPING CONTRACTOR SHALL EXCAVATE ALL PLANT PITS, VINE PITS, HEDGE TRENCHES AND SHRUB BEDS IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:

A. LOCATIONS OF ALL PROPOSED PLANT MATERIAL SHALL BE STAKED AND APPROVED IN THE FIELD BY THE LANDSCAPE ARCHITECT BEFORE ANY OF THE PROPOSED PLANT MATERIAL IS INSTALLED BY THE LANDSCAPE CONTRACTOR.

B. ALL PITS SHALL BE GENERALLY CIRCULAR IN OUTLINE, VERTICAL SIDES; DEPTH SHALL NOT BE LESS THAN 6" DEEPER THAN THE ROOT BALL; DIAMETER SHALL NOT BE LESS THAN TWO TIMES THE DIAMETER OF THE ROOT BALL AS SET FORTH IN THE FOLLOWING SCHEDULE.

C. IF AREAS ARE DESIGNATED AS SHRUB BEDS OR HEDGE TRENCHES, THEY SHALL BE EXCAVATED TO AT LEAST 18" DEPTH MINIMUM. AREAS DESIGNATED FOR GROUND COVERS AND VINES SHALL BE EXCAVATED TO AT LEAST 12" IN DEPTH MINIMUM.

D. DIAMETER AND DEPTH OF TREE PITS SHALL GENERALLY BE AS FOLLOWS:

PLANT SIZE	ROOT BALL	PIT DIAMETER	PIT DEPTH
3" - 3.5"CAL.	32"	64"	28"
3.5"- 4" CAL.	36"	72"	32"
4" - 4.5"CAL.	40"	80"	36"
4.5"- 5" CAL.	44"	88"	40"
5" - 5.5"CAL.	48"	96"	44"
5.5"- 6" CAL.	52"	104"	48"

A 20% COMPACTION FIGURE OF THE SOIL TO BE REMOVED IS ASSUMED AND WILL BE ALLOWED IN CALCULATION OF EXTRA TOPSOIL. THE TABULATED PIT SIZES ARE FOR PURPOSES OF UNIFORM CALCULATION AND SHALL NOT OVERRIDE THE SPECIFIED DEPTHS BELOW THE BOTTOMS OF THE ROOT BALLS.

4. STAKING, GUYING AND WRAPPING

ALL PLANT MATERIAL SHALL BE STAKED OR GUYED, AND WRAPPED IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:

A. STAKES: SHALL BE SOUND WOOD 2" X 2" ROUGH SAWN OAK OR SIMILAR DURABLE WOODS, OR LENGTHS, MINIMUM 7'-0" FOR MAJOR TREES AND 5'-0" MINIMUM FOR MINOR TREES.

B. WIRE AND CABLE: WIRE SHALL BE #10 GA. GALVANIZED OR BETHANIZED ANNEALED STEEL WIRE. FOR TREES OVER 3" CALIPER, PROVIDE 5/16" TURN BUCKLES, EYE AND EYE WITH 4" TAKE-UP. FOR TREES OVER 5" CALIPER, PROVIDE 3/16", 7 STRAND CABLE CADMIUM PLATED STEEL, WITH GALVANIZED "EYE" THIMBLES OF WIRE AND HOSE ON TREES UP TO 3" IN CALIPER.

C. HOSE: SHALL BE NEW, 2 PLY REINFORCED RUBBER HOSE, MINIMUM 1/2" I.D. "PLASTIC LOCK TIES" OR "PAUL'S TREES BRACES" MAY BE USED IN PLACE OF WIRE AND HOSE ON TREES UP TO 3" IN CALIPER.

D. ALL TREES UNDER 3" IN CALIPER ARE TO BE PLANTED AND STAKED IN ACCORDANCE WITH THE ATTACHED "TYPICAL TREE STAKING DETAIL". ALL TREES OVER 3" IN CALIPER ARE TO BE PLANTED AND GUYED IN ACCORDANCE WITH THE ATTACHED "TYPICAL TREE GUYING DETAIL".

5. PLANT PRUNING, EDGING AND MULCHING

A. EACH TREE, SHRUB OR VINE SHALL BE PRUNED IN AN APPROPRIATE MANNER TO ITS PARTICULAR REQUIREMENTS, IN ACCORDANCE WITH ACCEPTED STANDARD PRACTICE. BROKEN OR BRUISED BRANCHES SHALL BE REMOVED WITH CLEAN CUTS FLUSH WITH THE ADJACENT TRUNK OR BRANCHES. ALL CUTS OVER 1" IN DIAMETER SHALL BE PAINTED WITH AN APPROVED ANTISEPTIC TREE WOUND DRESSING.

B. ALL TRENCHES AND SHRUB BEDS SHALL BE EDGED AND CULTIVATED TO THE LINES SHOWN ON THE DRAWING. THE AREAS AROUND ISOLATED PLANTS SHALL BE EDGED AND CULTIVATED TO THE FULL DIAMETER OF THE PIT. SOD WHICH HAS BEEN REMOVED AND STACKED SHALL BE USED TO TRIM THE EDGES OF ALL EXCAVATED AREAS TO THE NEAT LINES OF THE PLANT PIT SAUCERS, THE EDGES OF SHRUB AREAS, HEDGE TRENCHES AND VINE POCKETS.

C. AFTER CULTIVATION, ALL PLANT MATERIALS SHALL BE MULCHED WITH A 2" LAYER OF FINE, SHREDDED PINE BARK, PEAT MOSS, OR ANOTHER APPROVED MATERIAL OVER THE ENTIRE AREA OF THE BED OR SAUCER.

6. PLANT INSPECTION AND ACCEPTANCE

THE ARC SHALL BE RESPONSIBLE FOR INSPECTING ALL PLANTING PROJECTS ON A PERIODIC BASIS TO ASSURE THAT ALL WORK IS PROCEEDING IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS.

7. PLANT GUARANTEE

ALL PLANT MATERIAL SHALL BE GUARANTEED FOR THE DURATION OF ONE FULL GROWING SEASON, AFTER FINAL INSPECTION AND ACCEPTANCE OF THE WORK IN THE PLANTING PROJECT. PLANTS SHALL BE ALIVE AND IN SATISFACTORY GROWING CONDITION AT THE END OF THE GUARANTEE PERIOD.

A. FOR THIS PURPOSE, THE "GROWING SEASON" SHALL BE THAT PERIOD BETWEEN THE END OF THE "SPRING" PLANTING SEASON, AND THE COMMENCEMENT OF THE "FALL" PLANTING SEASON.

B. GUARANTEE FOR PLANTING PERFORMED AFTER THE SPECIFIED END OF THE "SPRING" PLANTING SEASON, SHALL BE EXTENDED THROUGH THE END OF THE NEXT FOLLOWING "SPRING" PLANTING SEASON.

SODDING

ALL SODDING SHALL BE IN ACCORDANCE TO THE "LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE-WASHINGTON METROPOLITAN AREAS" LATEST EDITION, APPROVED BY THE LANDSCAPE CONTRACTORS ASSOCIATION OF METROPOLITAN WASHINGTON AND THE AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS.

ALL SOD SHALL BE STRONGLY ROOTED SOD, NOT LESS THAN TWO YEARS OLD AND FREE OF WEEDS AND UNDESIRABLE NATIVE GRASSES. PROVIDE ONLY SOD CAPABLE OF GROWTH DEVELOPMENT WHEN PLANTED AND IN STRIPS NOT MORE THAN 18" WIDE X 4" LONG. PROVIDE SOD COMPOSED PRINCIPALLY OF IMPROVED STRAIN KENTUCKY BLUEGRASS, SUCH AS, COLUMBIA, VICTA, OR ESCORT.

STORM WATER MANAGEMENT AREA LANDSCAPING - SCHEDULE D

PERIMETER	SWMF	ADJACENT LAND USE	LINEAR FEET OF PERIMETER	LANDSCAPE BUFFER TYPE	CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET)	# OF PLANTS REQUIRED SHADE TREES	# OF PLANTS REQUIRED EVERGREEN TREES	# OF PLANTS REQUIRED ORN. TREES	# OF PLANTS PROVIDED SHADE TREES	# OF PLANTS PROVIDED EVERGREEN TREES	# OF PLANTS PROVIDED ORN. TREES	CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET)
"P"- 1	POND 'C'	ROADWAY	162'	B	NO	4	4	—	4	4	—	NO
"P" - 2*	POND 'C'	ROADWAY	338'	B	NO	7	9	—	0	0	—	NO
"P" - 3	POND 'C'	OPEN SPACE	198'	A	NO	4	0	—	4	0	—	NO
"P" - 4	POND 'C'	ROADWAY	196'	B	NO	4	5	—	4	5	—	NO
"P" - 5	POND 'B'	ROADWAY	344'	B	NO	7	9	—	7	9	—	NO
"P" - 6	POND 'B'	RESIDENTIAL	303'	B	NO	6	8	—	6	8	—	NO
"P" - 7	POND 'B'	OPEN SPACE	238'	A	NO	4	0	—	4	0	—	NO
"P" - 8^	POND 'B'	PARKING LOT	480'	A	NO	8	0	—	0	0	—	NO

SCHEDULE D REQUIRED SURETY: 44 SHADE TREES @ $300/TREE = $13,200.00
35 EVG. TREES @ $150.00 = $5,250.00
TOTAL = $18,450.00

* NOTE: LANDSCAPING TO BE PROVIDED AT TIME OF PHASE 3 SITE PLAN.
^ NOTE: LANDSCAPING TO BE PROVIDED AT TIME OF PHASE 4 SITE PLAN.

THE LANDSCAPE SURETY WILL BE INCLUDED IN THE DEVELOPER'S AGREEMENT

LANDSCAPING NOTES:

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

2. CONTRACTOR SHALL NOTIFY ALL UTILITIES AT LEAST (5) FIVE DAYS BEFORE STARTING WORK. ALL GENERAL NOTES, ESPECIALLY THOSE REGARDING UTILITIES, ON SHEET 1 SHALL APPLY.

3. FIELD VERIFY UNDERGROUND UTILITY LOCATIONS AND EXISTING CONDITIONS BEFORE STARTING PLANTING WORK. CONTACT ENGINEER / LANDSCAPE ARCHITECT IF ANY RELOCATIONS ARE REQUIRED.

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

5. ALL PLANT MATERIAL SHALL BE FULL HEAVY, WELL FORMED, AND SYMMETRICAL, AND CONFORM TO THE A.A.N. SPECIFICATIONS, AND BE INSTALLED IN ACCORDANCE WITH PROJECT SPECIFICATIONS.

6. NO SUBSTITUTION SHALL BE MADE WITHOUT WRITTEN CONSENT OF THE OWNER OR HIS REPRESENTATIVE.

7. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES BUT NOT OTHERWISE PLANTED, PAVED, OR MULCHED SHALL BE SEEDED OR SODDED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.

8. THE CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING IF HE/SHE ENCOUNTERS SOIL DRAINAGE CONDITIONS WHICH MAY BE DETRIMENTAL TO THE GROWTH OF THE PLANTS.

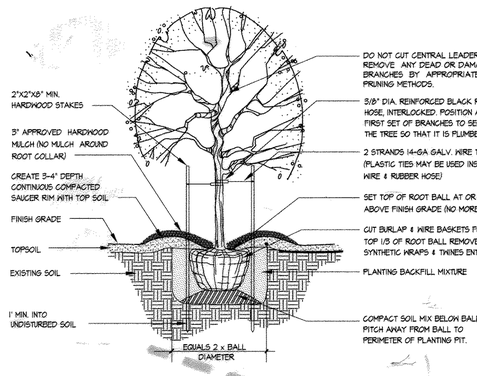
9. ALL EXPOSED EARTH WITHIN LIMITS OF PLANTING BEDS SHALL BE MULCHED WITH SHREDDED HARDWOOD MULCH PER PLANTING DETAILS.

10. THE OWNER, TENANT, 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 AND REPLACED.

11. "SCHEDULE D - STORMWATER MANAGEMENT AREA LANDSCAPING" IS PROVIDED FOR LANDSCAPE SURETY CALCULATION PURPOSES ONLY. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING SHALL BE POSTED WITH THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF $18,450.00 FOR:

44 SHADE TREES @ $300/TREE= $13,200.00
35 EVG. TREES @ $150/TREE = $5,250.00

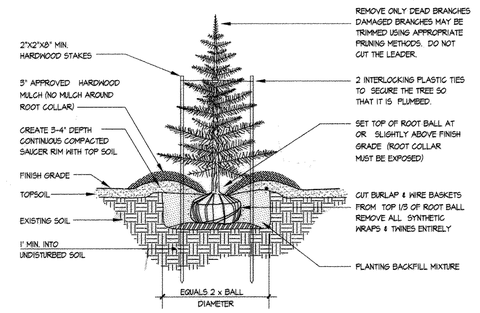
12. NO LANDSCAPING WILL BE ALLOWED WITHIN STORMDRAIN EASEMENTS.



NOTE: ALL SUPPORTING DEVICES (STAKES, WIRES, ETC.) SHALL BE REMOVED AFTER 2 GROWING SEASONS.

DECIDUOUS TREE PLANTING DETAIL

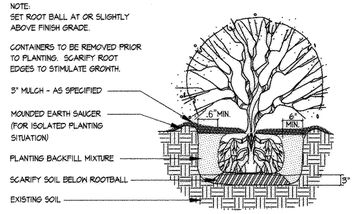
FOR PLANTING MATERIAL UP TO 3 1/2" CALIPER — NTS



NOTE: ALL SUPPORTING DEVICES (STAKES, TIES, ETC.) SHALL BE REMOVED AFTER 2 GROWING SEASONS.

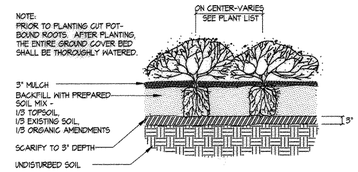
EVERGREEN TREE PLANTING DETAIL

NTS



SHRUB PLANTING DETAIL

NTS



GROUNDCOVER PLANTING DETAIL

NTS

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

Chief, Bureau of Highways — Date 9/5/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING + ZONING

Chief, Division of Land Development — Date 9/13/06

Chief, Development Engineering Division — Date 9/14/06

STATE OF MARYLAND
Michael J. Tran
REGISTERED LANDSCAPE ARCHITECT
933

GLW GUTSCHICK LITTLE & WEBER, P.A.
CIVIL ENGINEERS, LAND SURVEYORS, LAND PLANNERS, LANDSCAPE ARCHITECTS
3909 NATIONAL DRIVE - SUITE 250 - BURTONSVILLE OFFICE PARK
BURTONSVILLE, MARYLAND 20866
TEL: 301-421-4024 BALT: 410-880-1820 DC/VA: 301-989-2524 FAX: 301-421-4186

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DATE	REVISION	BY	APP'R.
10.21.05	REVISED PER DPZ COMMENS.	JRS	

DEVELOPER/OWNER PARCEL C
BA Waterloo Townhomes, LLC
c/o Bozzuto Homes, Inc.
7850 Walker Drive, Suite 400
Greenbelt, MD 20770-3203
Attn. Duncan Slidell
301-623-1525

LANDSCAPE NOTES & DETAILS

09/08/2016 NO ASBUILT INFORMATION

SHIPLEY'S GRANT
Non-buildable Parcels "A" thru "E"
PLAT NUMBERS 18428 THROUGH 18431

ELECTION DISTRICT No. 1 — HOWARD COUNTY, MARYLAND

SCALE	ZONING	G. L. W. FILE No.
AS SHOWN	R-A-15/B-1/ POR	03006
DATE	TAX MAP - GRID	SHEET
JULY, 2006	37-1&2	25 OF 25

F-06-019