

Justification for type of system used based on ESD to the MEP.
 The proposed system uses bioswales, grass swales, microbioretention and non rooftop disconnect to address channel protection volumes and recharge volumes for the site. The use of microbioretention for parking areas provides optimum removal of metals and phosphorous, and allows time for infiltration to groundwater. The design uses existing and proposed grass median islands to grade the microbioretention devices with a minimum of disturbance. The proposed grass channel designs are used along existing paving with minimal impact to the site but still providing some water quality treatment and infiltration. Bioswales are used at low points along trails to provide optimum removal of metals and phosphorous, and allows time for infiltration to groundwater and are also minimize impacts to the site. The location of the trail and bioswale are in existing meadow and lawn areas minimizing environmental impacts. Non rooftop disconnect is used adjacent to trails in flat areas of less than 5% slope. ESD techniques are used to the maximum extent possible for the project and provide ESD volumes for the project.

Soils for the site are Gladstone loam and Glenelg loam with a small area of Hatboro-Codorus silt loam. The hydrologic class is C,C, and D respectively.

Methodology/ analysis used for design.

The initial site assessment used to determine if the site is classified as redevelopment or new development show the site was less than 40% existing impervious and was evaluated as new development. The entire site drains to the upper reaches of the Little Patuxent river. ESDv volume required for the site was based on the limit of disturbance, proposed impervious area and soil types and resulted in a storage volume required of 10,063 CF and a target Pe=1.79". Drainage areas and impervious areas to each ESD device were determined. The ESDv and Pe for each device were based on actual volumes stored in device temporarily stored above the surface and in the stone above the drain invert. This volume is divided by .75 to represent 75% temporary storage to provide ESDv. Microbioretention devices temporarily store 12" depth of water, and bioswales were placed at 0.5% slope and averaged 0.7' depth. Storm drains are provided to convey overflow from microbioretention and larger storms and connect underdrains. Bioswales have a berm to contain water, and an underdrain to convey the ESDv to a stable outfall. Grass swales ESDv is based on bottom area. Grassed swales are designed at minimal slopes and provide less than 4" flow depth and velocities less than 1FPS for the one year storm. Non rooftop disconnect was used for trail areas where runoff will sheet flow for 10" at less than 5% slope. The Pe values vary for each drainage area, but do not exceed the runoff received by the practice.

Conclusion:
 The site provides ESDv to the MEP and safely conveys runoff in a non erosive manner.

Natural Resource Protection:
 The Natural Resources for the project include wetlands, stream buffers, floodplain, wooded areas, and some steep slopes. No seeps or springs were discovered onsite. No critical area or highly erodible soils are located onsite. The proposed project resulted in no impacts to steep slopes, wetlands, wetland buffers, stream buffers, critical areas, major waterways, stream buffers; springs, seeps, or highly erodible soils. The proposed improvements are located in existing grass, meadow and scrub areas and are located to avoid tree disturbance.

Maintenance of Natural Flow Patterns:
 Existing swales are maintained. Small drainage areas (<1.0 acre) are diverted to ESD devices and then discharged in a non-erosive manner. A floodplain on site is not impacted by the project.

Reduction in Impervious Areas through better site design, alternative surfaces, and non structural practices;
 The trail impervious is the minimum required for safety. Non structural practices include non rooftop disconnect where possible. Parking layout minimizes impervious. All paved areas drain directly to pervious areas. Alternative surfaces were not considered due to slow infiltration in fill areas where work is proposed.

Integration of Erosion and Sediment Control Measures:
 Offsite drainage areas will be diverted around work areas for sediment control. Sediment controls will be in accordance with MDE requirements. ESDv measures will be installed after all upstream areas are stabilized.

Implementation of ESD planning techniques and practices to the MEP.
 Bioswales, grass swales, microbioretention and non rooftop disconnect are all used to address channel protection volumes and recharge volumes for the site. The site meets ESDv by treating an area of impervious equivalent to 100% of the impervious within the limit of disturbance. Pollutant removal is enhanced by treating existing untreated parking areas to compensate for untreated trail areas.

ALPHA RIDGE

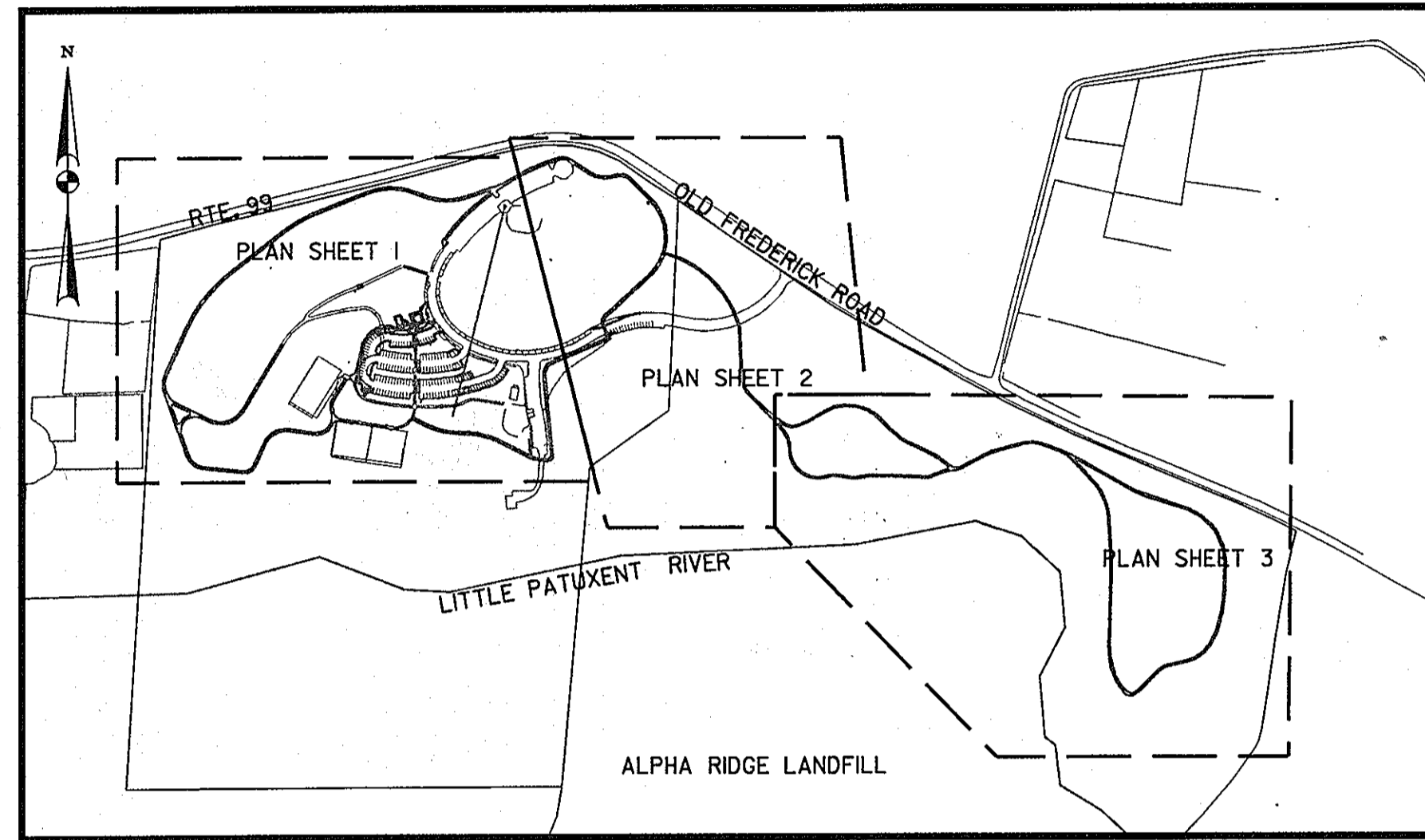
ENVIRONMENTAL CONCEPT PLAN

HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS

CAPITAL PROJECT NO.: N-3964

SITE DEVELOPMENT PLAN 90-18



LOCATION MAP

SCALE: 1" = 500'

ESDv, Rev Summary Table

SUBAREA#	DA (AC)	Imp. (SF)	SWM DEVICE	AREA	ESDV(CF)	Pe(IN)
1	1.0	9533	M-6 MICROBIORETENTION	859	1452	2.06
2	0.309	10,528	M-6 MICROBIORETENTION	303	512	2.35
3	0.687	21,280	M-6 MICROBIORETENTION	1028	1738	1.01
4	0.277	9168	M-6 MICROBIORETENTION		512	1.66
5	0.37	7500	M-8 GRASS SWALE		404	0.64
6	0.57	3440	M-8 BIOSWALE		650	1.79
7	0.50	3160	M-8 BIOSWALE		625	1.91
8	0.81	9215	M-8 GRASS SWALE		1164	1.39
9	0.17	2020	M-8 BIOSWALE		198.5	2.68
10	0.93	4850	M-8 BIOSWALE		718	1.35
11	0.57	3660	M-8 BIOSWALE		715	1.90
12	0.49	4670	M-8 BIOSWALE		170	219
13	0.23	8280	M-8 BIOSWALE		1136	1.56
		5680	N-2 NON-ROOFTOP DISCONNECT		450	1.0
TOTAL	6.913	105,308*			10445**	1.35

- *105,308SF= 2.417 AC treated is greater than the impervious area within LOD= 1.46 acres.
- **In accordance with MDE 5.19 "Cpv shall be based on the runoff from the 1-year 24 hour storm calculated using the reduced RCN(see table 5.3). If the reduced RCN for a drainage area reflects "woods in good condition", then Cpv has been satisfied for that drainage area. Site meets ESDv to MEP and Cpv by meeting a reduced RCN of 56.

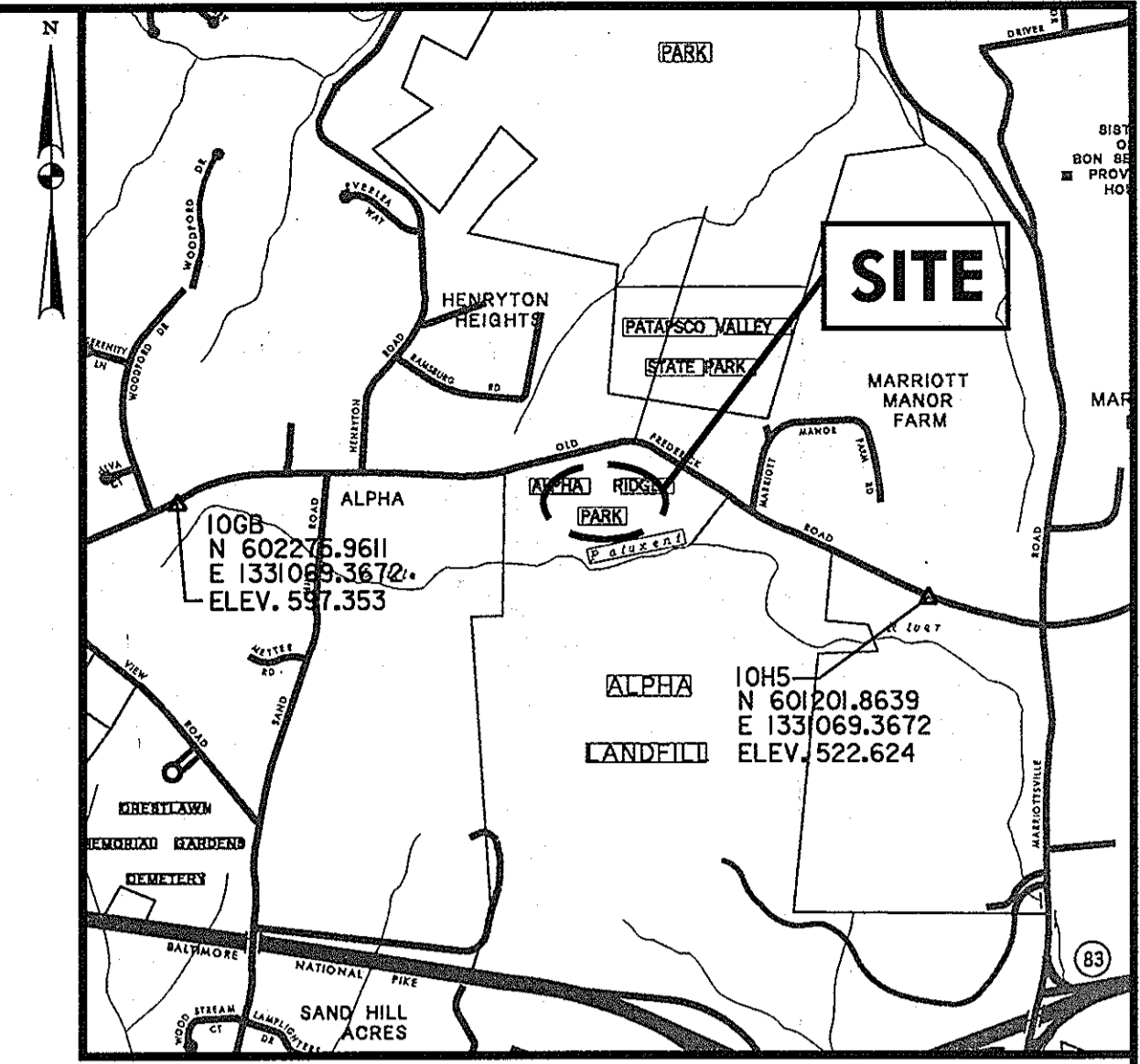
Rev
 Recharge will be provided by storage in gravel trench below underdrain.

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1	Title Sheet
2	Existing Conditions Site Plan
3	Environmental Concept Plan Sheet One
4	Environmental Concept Plan Sheet Two
5	Environmental Concept Plan Sheet Three

SITE ANALYSIS DATA CHART

TOTAL PROPERTY AREA: 171.5 AC.
 AREA OF PLAN SUBMISSION: 4.72 AC.
 LIMIT OF DISTURBED AREA: 4.72 AC.
 PRESENT ZONING DESIGNATION: RC-DEO
 PROPOSED USES: ATHLETIC FIELD, PICNIC AREAS, ROLLER HOCKEY
 FLOOR SPACE: RESTROOM FACILITY: 1ST FLOOR: 915 SF
 APPLICABLE DPZ FILE NUMBERS: SDP 90-18
 AREA OF PROPOSED IMPERVIOUS: 5.91ACRES
 AREA OF WETLANDS: 15.05 ACRES
 AREA OF WETLAND BUFFERS: 6.13 ACRES
 AREA OF 100 YEAR FLOODPLAIN: 18.83 ACRES
 FORESTED AREA: 73.2 ACRES
 AREA OF STEEP SLOPES >15%: 20.9 ACRES
 AREA OF STEEP SLOPES >25%: 3.4 ACRES
 AREA OF ERODIBLE SOILS: 1.2 acres
 AREA OF GREEN OPEN AREA: 92.4 ACRES
 AREA OF PROPOSED SITE USE: 4.72 ACRES



VICINITY MAP

SCALE: 1" = 2000'
 ADC MAP 4694, GRID C9, D9, E9
 C10, D10, E10

LEGEND

EX. CONTOURS	400
EX. TREES	(Symbol)
EX. UTILITY POLE	(Symbol)
EX. FIRE HYDRANT	(Symbol)
EX. SANITARY MAIN	(Symbol)
EX. STORM DRAIN PIPE	(Symbol)
EX. STORM DRAIN STRUCTURE	(Symbol)
EX. WATER MAIN	(Symbol)
PROPOSED CONTOURS	400
PROPOSED STORM DRAIN PIPE	(Symbol)
PROPOSED STORM DRAIN STRUCTURE	(Symbol)
PROPOSED ASPHALT SURFACE	(Symbol)
PROPOSED WOOD CHIP TRAIL	(Symbol)
STORMWATER MANAGEMENT DEVICE	(Symbol)
EXISTING TREE LINE	(Symbol)
PROPERTY LINE	(Symbol)
EX. 2' CONTOURS	400
STREAM CENTER LINE	(Symbol)
75' STREAM BUFFER	(Symbol)
WETLAND	(Symbol)
WETLAND BUFFER	(Symbol)
FLOODPLAIN	(Symbol)
FOREST CONSERVATION AREA	(Symbol)
STEEP SLOPES 15-25%	(Symbol)
STEEP SLOPES >25%	(Symbol)
SILT FENCE	SF
SUPER SILT FENCE	SSF

NOTE:
 1. APPROVAL OF THIS ECP DOES NOT CONSTITUTE AN APPROVAL OF ANY SUBSEQUENT AND ASSOCIATED SUBDIVISION PLAN, SITE DEVELOPMENT PLAN, OR GRADING OR BUILDING PERMIT. REVIEW OF THIS PROJECT FOR COMPLIANCE WITH THE HOWARD COUNTY SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE HOWARD COUNTY ZONING REGULATIONS SHALL OCCUR AT THE SUBDIVISION, SITE PLAN, OR GRADING AND BUILDING PERMIT STAGES.
 2. THE FOREST CONSERVATION FOR THIS SITE WAS PREVIOUSLY ADDRESSED UNDER SDP-97-128FC.

APPROVED: DEPARTMENT OF PLANNING AND ZONING	
<i>(Signature)</i> CHIEF-DEVELOPMENT ENGINEERING DIVISION	1/30/12 DATE
<i>(Signature)</i> CHIEF-DIVISION OF LAND DEVELOPMENT	1/27/12 DATE

ADDRESS CHART

PARCEL #	STREET ADDRESS
23	11685 OLD FREDERICK ROAD/MD 99 MARRIOTTVILLE, MD 21104

OWNER: HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS 7120 OAKLAND MILLS ROAD COLUMBIA, MD 21046 ATTN: MR. RAUL DELERME VOICE 410-313-4689 FAX 410-313-4646	DEVELOPER: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS 9250 BENDIX ROAD COLUMBIA, MD 21046 ATTN: MR. MARK KOVACH VOICE 410-313-6153 FAX 410-313-6144	PERMIT INFORMATION CHART			
WATER CODE: PUBLIC	SEWER CODE: PUBLIC	BUILDING: N/A	STREET ADDRESS: N/A		
PROJECT NAME: ALPHA RIDGE PARK		SECTION/AREA: N/A	PARCEL: 23		
L/F: 847/606	GRID#: 20-21	ZONING: RC-DEO	TAX MAP: 10	ELEC. DIST.: 3 CENSUS TRACT: 6030	

Professional Certification:
 I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the state of Maryland license No. 19916, Expiration Date: 01/14/2013.

GPI GREENMAN-PEDERSEN, INC.
 ENGINEERS, ARCHITECTS, PLANNERS, CONSTRUCTION ENGINEERS & INSPECTORS
 10977 GULFORD ROAD, ANNAPOLIS, MARYLAND, 20710
 WASH. (301) 470-2772 BALT. (410) 880-3055
 FAX (301) 400-2540 www.gpi.net.com

DES: L.M.
DRN: W.K.T.
CHK: M.S.Z.
DATE: Jan., 2012

Environmental Concept Plan Title Sheet

ALPHA RIDGE PARK ADDITIONS DESIGN
 HOWARD COUNTY, MARYLAND
 CAPITAL PROJECT NO. N-3964

SCALE: AS SHOWN
 SHEET 1 OF 5

REVISION: BY NO DATE

SCALE MAP NO. BLOCK NO.



SOILS CHART

MAP SYMBOL AND SOIL NAME	HYDROLOGIC GROUP	Kf	EROSION HAZARD RATING
BaA - Balle silt loam, 0 to 3 percent slopes	D	.37	SLIGHT
GbA - Gladstone loam, 0 to 3 percent slopes	D	.24	SLIGHT
GbB - Gladstone loam, 3 to 8 percent slopes	B	.24	MODERATE
GbC - Gladstone loam, 8 to 15 percent slopes	B	.24	MODERATE
GgB - Glenelg loam, 3 to 8 percent slopes	B	.28	MODERATE
GmB - Glenville silt loam, 3 to 8 percent slopes	C	.28	MODERATE
Ha - Hatboro-Codorus silt loams, 0 to 3 percent slopes	D	.37	SLIGHT
McD - Manor loam, 15 to 25 percent slopes, very rocky	B	.28	SEVERE
Ubf - Udarthents, Refuse, 0 to 65 percent slopes	B	N/A	NOT RATED

APPROVED: DEPARTMENT OF PLANNING AND ZONING

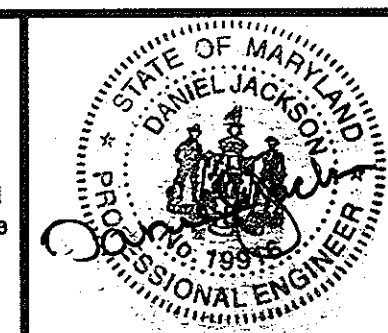
[Signature] 1/30/12
 CHIEF-DEVELOPMENT ENGINEERING DIVISION & DATE

[Signature] 1/27/12
 CHIEF-DIVISION OF LAND DEVELOPMENT & DATE

200 100 0 200 400FT
 SCALE: 1" = 200'



Professional Certification:
 I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the state of Maryland license No. 18916, Expiration Date: 01/14/2013.



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DRN: W.K.T.					
CHK: M.S.Z.					
DATE: Jan., 2012	BY: NO	REVISION	DATE	SCALE MAP NO.	BLOCK NO.

Existing Conditions Site Plan

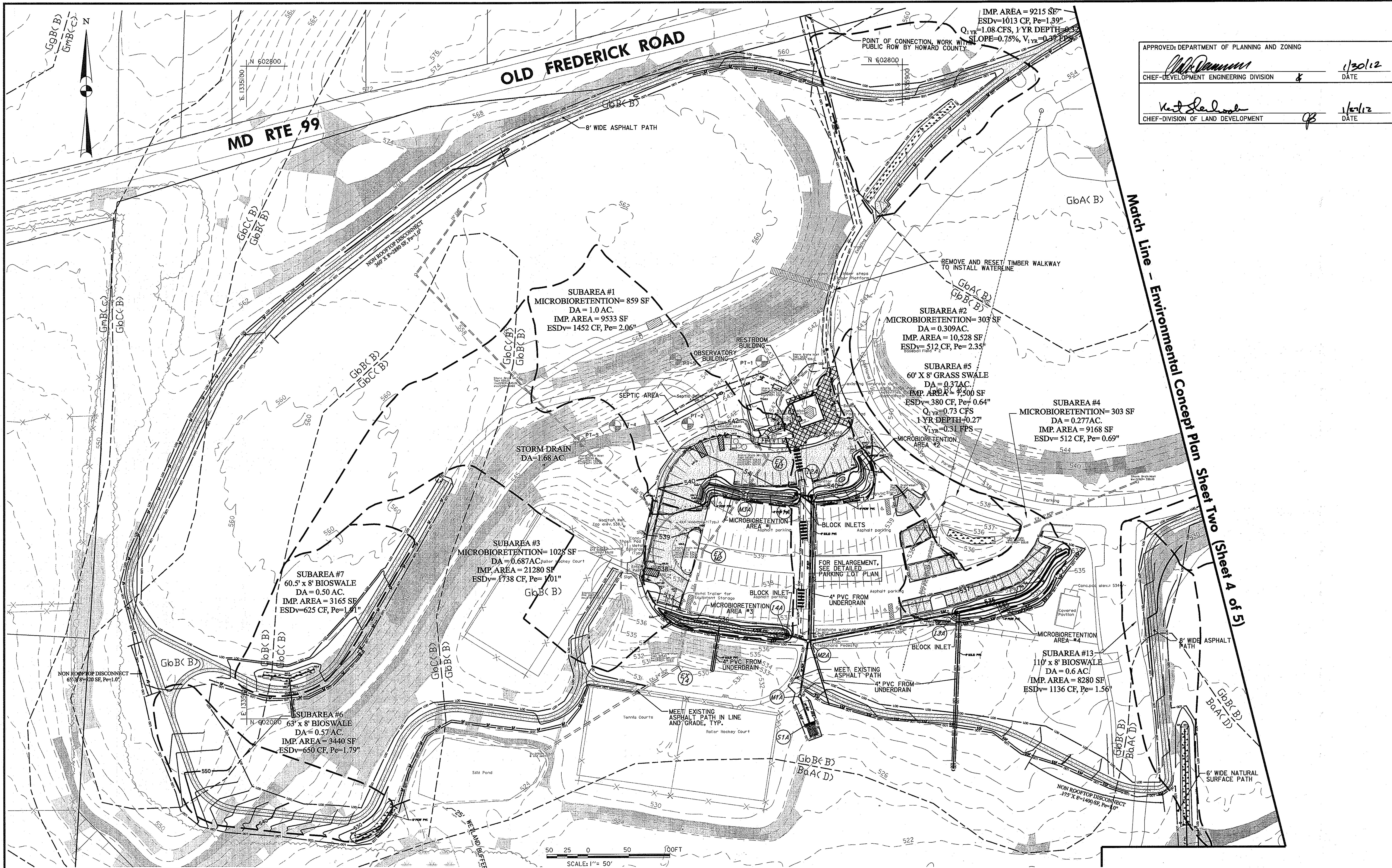
ALPHA RIDGE PARK ADDITIONS DESIGN

HOWARD COUNTY, MARYLAND
 CAPITAL PROJECT NO. N-3964

SCALE: AS SHOWN

SHEET 2 OF 5

ECP-12-002



IMP. AREA = 9215 SF
 ESDv=1013 CF, Pe=1.39"
 Q_{1YR}=1.08 CFS, 1 YR DEPTH=0.32"
 SLOPE=0.75%, V_{1YR}=0.37 FPS

POINT OF CONNECTION, WORK WITHIN PUBLIC ROW BY HOWARD COUNTY.

APPROVED: DEPARTMENT OF PLANNING AND ZONING
W.D. Dammann 1/30/12
 CHIEF-DEVELOPMENT ENGINEERING DIVISION & DATE
W. St. Lawrence 1/27/12
 CHIEF-DIVISION OF LAND DEVELOPMENT & DATE

SUBAREA #1
 MICROBIORETENTION= 859 SF
 DA = 1.0 AC.
 IMP. AREA = 9533 SF
 ESDv= 1452 CF, Pe= 2.06"

SUBAREA #2
 MICROBIORETENTION= 303 SF
 DA = 0.309 AC.
 IMP. AREA = 10,528 SF
 ESDv= 512 CF, Pe= 2.35"

SUBAREA #5
 60' X 8' GRASS SWALE
 DA = 0.37 AC.
 IMP. AREA = 7,500 SF
 ESDv= 380 CF, Pe= 0.64"
 Q_{1YR}= 0.73 CFS
 1 YR DEPTH= 0.27"
 V_{1YR}= 0.31 FPS

SUBAREA #4
 MICROBIORETENTION= 303 SF
 DA = 0.277 AC.
 IMP. AREA = 9168 SF
 ESDv= 512 CF, Pe= 0.69"

SUBAREA #3
 MICROBIORETENTION= 1025 SF
 DA = 0.687 AC
 IMP. AREA = 21280 SF
 ESDv= 1738 CF, Pe= 1.01"

SUBAREA #7
 60.5' X 8' BIOSWALE
 DA = 0.50 AC.
 IMP. AREA = 3165 SF
 ESDv= 625 CF, Pe= 1.91"

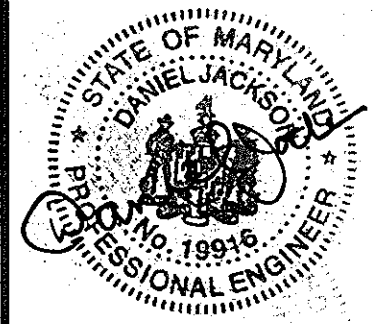
SUBAREA #6
 63' X 8' BIOSWALE
 DA = 0.57 AC.
 IMP. AREA = 3440 SF
 ESDv= 650 CF, Pe= 1.79"

SUBAREA #13
 110' X 8' BIOSWALE
 DA = 0.6 AC.
 IMP. AREA = 8280 SF
 ESDv= 1136 CF, Pe= 1.56"

SCALE: 1" = 50'
 0 25 50 100 FT

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Professional Certification:
 I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the state of Maryland license No. 19916, Expiration Date: 01/14/2013.



DES: L.M.					
DRN: W.K.T.					
CHK: M.S.Z.					
DATE: Jan., 2012	BY: NO	REVISION	DATE	SCALE MAP NO.	BLOCK NO.

**Environmental Concept Plan
 Sheet One**

**ALPHA RIDGE PARK
 ADDITIONS DESIGN**
 HOWARD COUNTY, MARYLAND
 CAPITAL PROJECT NO. N-3964

SCALE:
 AS SHOWN
 SHEET
 3 OF 5

Match Line - Environmental Concept Plan Sheet One (Sheet 3 of 5)

SUBAREA #12
85' x 2' BIOSWALE
DA = 0.49 AC.
IMP. AREA = 4670 SF
ESDv=219 CF, Pe=0.50"

SUBAREA #11
67' x 8' BIOSWALE
DA = 0.57 AC.
IMP. AREA = 3660 SF
ESDv=715 CF, Pe=1.9"

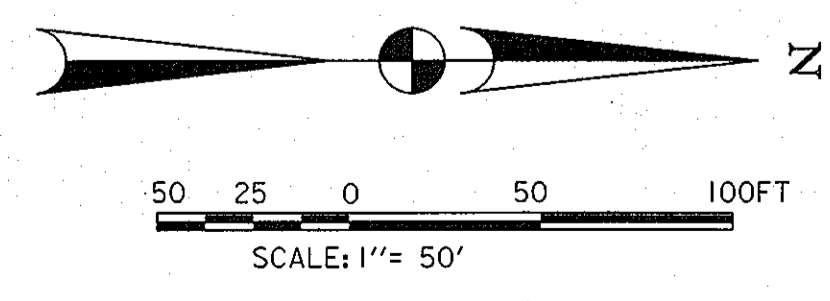
SUBAREA #10
89' x 8' BIOSWALE
DA = 0.93 AC.
IMP. AREA = 4850 SF
ESDv=718 CF, Pe=1.35"

SUBAREA #9
37.5' x 8' BIOSWALE
DA = 0.17 AC.
IMP. AREA = 2020 SF
ESDv=198.5 CF, Pe=2.68"

NOTE: FINAL PATH LOCATIONS WILL BE IDENTIFIED ON SITE BY PARKS AND RECREATION PRIOR TO CONSTRUCTION.

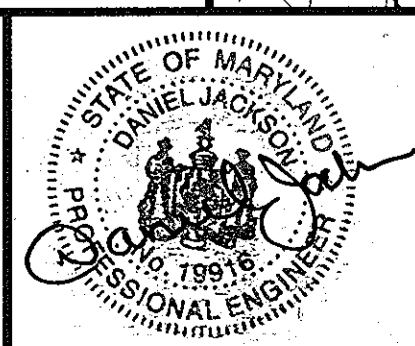
Match Line - Environmental Concept Plan Sheet Three (Sheet 5 of 5)

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 1/27/12
 CHIEF-DEVELOPMENT ENGINEERING DIVISION DATE
 [Signature] 1/27/12
 CHIEF-DIVISION OF LAND DEVELOPMENT DATE



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Professional Certification:
 I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the state of Maryland license No. 15916, Expiration Date: 01/14/2015.



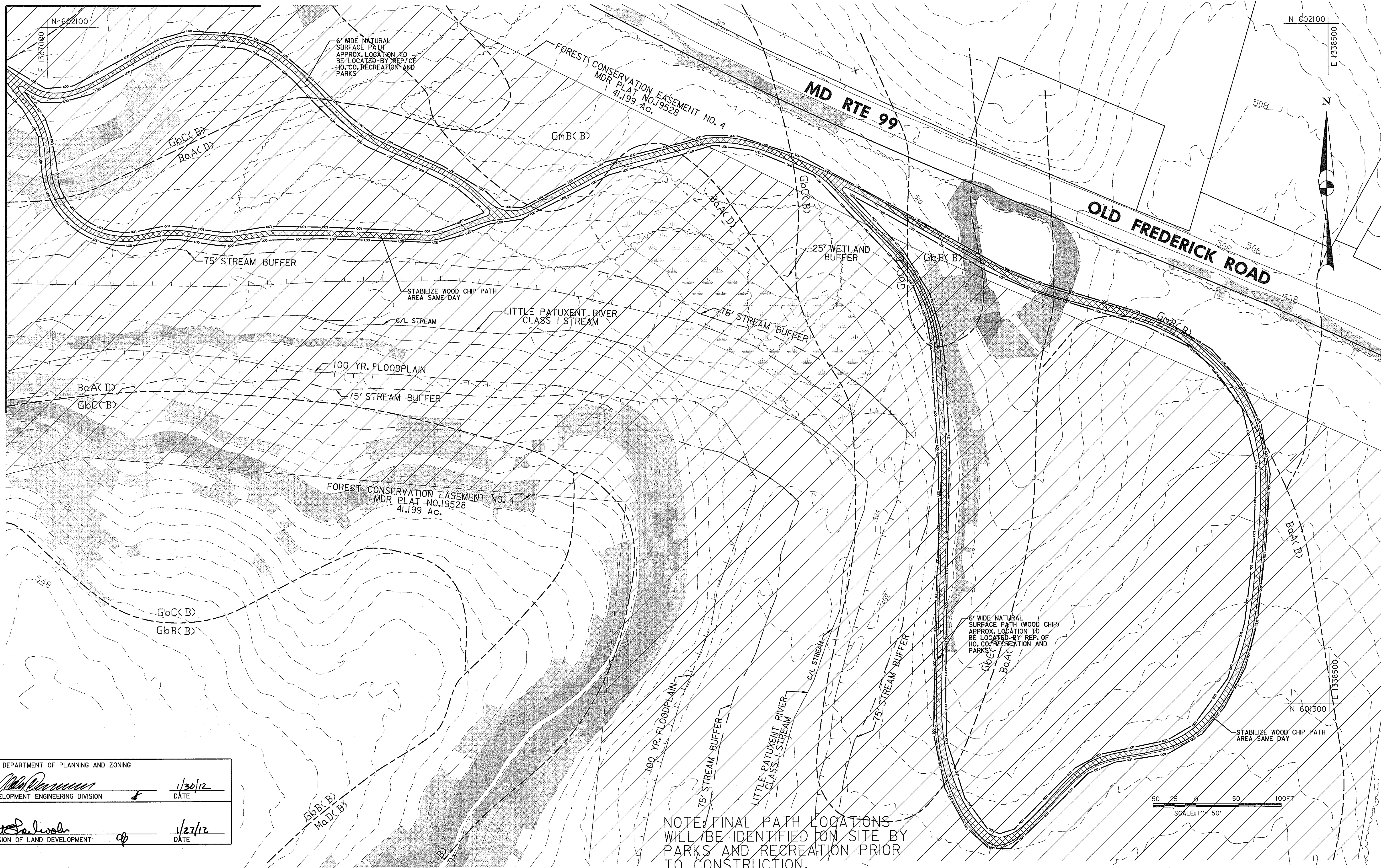
DES: L.M.					
DRN: W.K.T.					
CHK: M.S.Z.					
DATE: Jan., 2012	BY: NO	REVISION	DATE	SCALE MAP NO.	BLOCK NO.

Environmental Concept Plan Sheet Two

ALPHA RIDGE PARK ADDITIONS DESIGN
 HOWARD COUNTY, MARYLAND
 CAPITAL PROJECT NO. N-3964

SCALE: AS SHOWN
 SHEET 4 OF 5

Match Line - Environmental Concept Plan Sheet Two (Sheet 4 of 5)



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[Signature] 1/30/12
 CHIEF-DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 1/27/12
 CHIEF-DIVISION OF LAND DEVELOPMENT DATE

NOTE: FINAL PATH LOCATIONS WILL BE IDENTIFIED ON SITE BY PARKS AND RECREATION PRIOR TO CONSTRUCTION.

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Professional Certification:
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STATE OF MARYLAND
 DANIEL JACKSON
 PROFESSIONAL ENGINEER
 No. 19316

DES: L.M.					
DRN: W.K.T.					
CHK: M.S.Z.					
DATE: Jan., 2012	BY	NO	REVISION	DATE	

Environmental Concept Plan Sheet Three

SCALE MAP NO. _____ BLOCK NO. _____

ALPHA RIDGE PARK ADDITIONS DESIGN

HOWARD COUNTY, MARYLAND
 CAPITAL PROJECT NO. N-3964

SCALE: AS SHOWN

SHEET 5 OF 5