DRAWING NO.	SHEET NO.	SHEET TITLE
A-01	2.	GENERAL NOTES
A-02	3.	PROJECT LOCATION PLAN
B-01	4.	EXISTING CONDITIONS AND WETLAND DELINEATION SITE PLAN KEY
B-02	5.	EXISTING CONDITIONS AND WETLAND DELINEATION PLAN AREA 01
B-03	6.	EXISTING CONDITIONS AND WETLAND DELINEATION PLAN AREA 02
B-04	7.	EXISTING CONDITIONS AND WETLAND DELINEATION PLAN AREA 03
C-01	8.	PROPOSED SEDIMENT CONTROL AND DREDGING PLAN KEY
C-02	9.	PROPOSED SEDIMENT CONTROL AND DREDGING PLAN AREA 01
C-03	10.	PROPOSED SEDIMENT CONTROL AND DREDGING PLAN AREA 02
C-04	11.	PROPOSED SEDIMENT CONTROL AND DREDGING PLAN AREA 03
C-05	12.	AREA 01 - CROSS-SECTIONS (1 OF 2)
C-06	13.	AREA 01 - CROSS-SECTIONS (2 OF 2)
C-07	14.	AREA 02 - CROSS-SECTIONS
C-08	15.	AREA 03 - CROSS-SECTIONS (1 OF 2)
C-09	16.	AREA 03 - CROSS-SECTIONS (2 OF 2)
D-01	17.	PIPELINE ROUTING
D-02	18.	PIPELINE ROUTING
E-01	19.	STAGING AREA
F-01	20.	WETLAND CREATION AREAS
F-02	21.	WETLAND CREATION AREAS
F-03	22.	PLANTING PLAN
F-04	23.	PLANTING PLAN
F-05	24.	PLANTING DETAILS AND NOTES
G-01	25.	SECTION AND DETAILS
G-02	26.	TYPICAL DETAILS
H-01	27.	ISTHMUS ACCESS ROAD - PLAN & PROFILE
H-02	28.	ISTHMUS ACCESS ROAD - PLAN & PROFILE
H-03	29.	ISTHMUS ACCESS ROAD - PLAN & PROFILE
H-04	30.	ISTHMUS ACCESS ROAD - PLAN & PROFILE
I-01	31.	TEMPORARY EROSION & SEDIMENT CONTROL PLAN - INITIAL PHASE STAGING AREA
I-02	32.	TEMPORARY EROSION & SEDIMENT CONTROL PLAN - FINAL PHASE STAGING AREA
I-03	33.	TEMPORARY EROSION & SEDIMENT CONTROL PLAN - ISTHMUS ACCESS ROAD INITIAL AND FINAL DESIGN
I-04	34.	TEMPORARY EROSION & SEDIMENT CONTROL PLAN - ISTHMUS ACCESS ROAD INITIAL AND FINAL DESIGN
I-05	35.	TEMPORARY EROSION & SEDIMENT CONTROL - DETAILS & NOTES
I-06	36.	TEMPORARY EROSION & SEDIMENT CONTROL - DETAILS & NOTES
I-07	37.	TEMPORARY EROSION & SEDIMENT CONTROL - DETAILS & NOTES

2

J-01	38.	DAM REPAIR - TITLE SHEET
J-02	39.	DAM REPAIR - GENERAL NOTES
J-03	40.	DAM REPAIR - EXISTING CONDITION PLAN
J-04	41.	DAM REPAIR - PROPOSED SITE PLAN
J-05	42.	DAM REPAIR - SECTIONS AND DETAILS
J-06	43.	DAM REPAIR - TEMPORARY EROSION & SEDIMENT CONTROL PLAN - INITIAL PHASE
J-07	44.	DAM REPAIR - TEMPORARY EROSION & SEDIMENT CONTROL PLAN - FINAL PHASE
J-08	45.	DAM REPAIR - TEMPORARY EROSION & SEDIMENT CONTROL - DETAILS & NOTES
J-09	46.	DAM REPAIR - SOIL BORING LOGS

CERTIFICATION FOR REVISION 4 ONLY

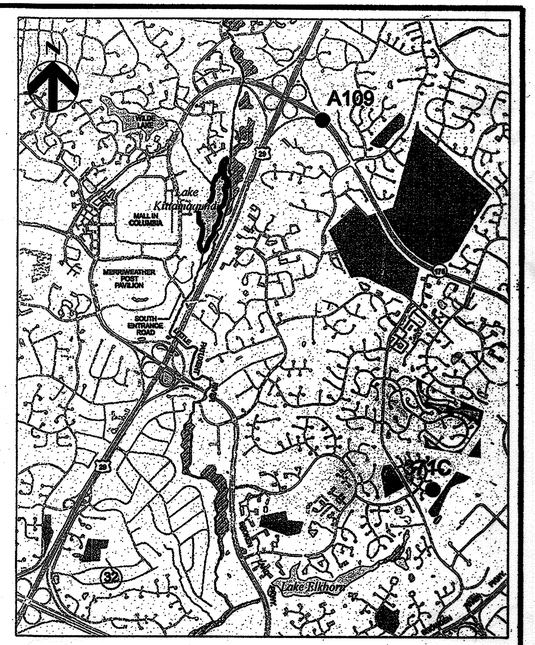
PROFESSIONAL CERTIFICATION
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND
LICENSE NO: 54378
EXPIRATION DATE: 5/14/25

STATE OF MARYLAND · DANIEL D SWERDON · 54378 · PROFESSIONAL ENGINEER

7/18/24

Lake Kittamaqundi Restoration Project Columbia, Maryland

Columbia Association Construction Services Project No. 040107DK



LOCATION PLAN
NTS

SITE ANALYSIS DATA CHART

a. TOTAL PROJECT AREA				
LAKE	28.3	ACRES	1232748	FT²
STAGING AREA	1.06	ACRES	46153	FT²
ISTHMUS	0.66	ACRES	28892	FT²
b. AREA OF PLAN SUBMISSION - SEE ITEM a				
c. LIMIT OF DISTURBED AREA				
LAKE	22.3	ACRES	970174	FT²
STAGING AREA	1.93	ACRES	84251	FT²
ISTHMUS	1.17	ACRES	50815	FT²

d. PRESENT ZONING NT

e. NA, TEMPORARY MAINTENANCE EMPLOYEES

3

K-01	47.	MULTIUSE TRAIL - COVER SHEET
K-02	48.	MULTIUSE TRAIL - KEY SHEET
K-03	49.	MULTIUSE TRAIL - DESIGN PLANS
K-04	50.	MULTIUSE TRAIL - DESIGN PLANS
K-05	51.	MULTIUSE TRAIL - DESIGN PLANS
K-06	52.	MULTIUSE TRAIL - DESIGN PLANS
K-07	53.	MULTIUSE TRAIL - DESIGN PLANS
K-08	54.	MULTIUSE TRAIL - CROSS SECTIONS & DETAILS
K-09	55.	MULTIUSE TRAIL - BOARDWALK DETAILS
K-10	56.	MULTIUSE TRAIL - BOARDWALK DETAILS
K-11	57.	MULTIUSE TRAIL - EROSION & SEDIMENT CONTROL PLAN
K-12	58.	MULTIUSE TRAIL - EROSION & SEDIMENT CONTROL PLAN
K-13	59.	MULTIUSE TRAIL - EROSION & SEDIMENT CONTROL NOTES & DETAILS

4 60 SITE DEVELOPMENT PLAN - BANDSHELL
61 SEDIMENT AND EROSION CONTROL - BANDSHELL
62 LANDSCAPE PLAN - BANDSHELL

REVISIONS			
NO.	DATE	ITEM	BY
3	04/21/14	SHEETS 47 TO 59 TO BE ADDED TO PLAN SET TO INCLUDE TRAIL WORK SHEET 3 OF 59: PLAN VIEW REVISED TO SHOW PROPOSED CONSTRUCTION ACCESS SHEET 4 OF 59: PLAN VIEW REVISED TO SHOW EXISTING PATHS TO BE PAVED	MB

REVISIONS			
NO.	DATE	ITEM	BY
2	01/18/13	SHEETS 38 TO 46 TO BE ADDED TO PLAN SET TO INCLUDE DAM REPAIR SHEET 4 OF 46: PLAN VIEW REVISED TO SHOW DAM SPILLWAY STRUCTURE TO BE REPAIRED	SB

1 PATH WIDENING REDLINE REVISION IS SUBJECT TO WAIVER OF SUBSECTIONS 16.115(c)(2) and 16.116(a)(2)(iii) APPROVED ON NOVEMBER 8, 2012.

REVISIONS			
NO.	DATE	ITEM	BY
1	12/06/12	SHEET 4 OF 37: PLAN VIEW REVISED TO SHOW EXISTING PAVED PATH TO BE WIDENED TO 10 FT WIDE	SB

5 TRAIL PAVING REDLINE REVISION IS SUBJECT TO CONDITIONS OF APPROVAL OF WAIVER PETITION WP-14-079 APPROVED ON FEBRUARY 18, 2014.

PERMIT INFORMATION CHART					
Subdivision Name: COLUMBIA TOWN CENTER			Section/Area: SECTION I		Lot/Parcel No.: LOT 14
Plat # or L/F: PHASE 23 PLAT BOOK 15 FOLIO 19 & 20	Grid #: 20/2	Zoning: NT	Tax Map No.: 30 & 36	Elect. Distr.: 1 A5	Census Tract: 6054.02 609569
Water Code			Sewer Code		

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date: 12/23/09

Chief, Division of Land Development — Date: 1/07/10

Director, DEP. — Date: 1/7/10

REVISIONS			
NO.	DATE	ITEM	BY
4	7/19/24	SHEETS 60 TO 62 TO BE ADDED TO PLAN SET TO INCLUDE BANDSHELL WORK.	MKJ

Maryland Department of the Environment
MDE Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

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. 29997, EXPIRATION DATE: 01-14-2010

THIS PLAN SET HAS BEEN PREPARED BY:

HDR

HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND · PIETER G. DAHMEN · 29997 · REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

COLUMBIA ASSOCIATION
TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING —, SHEET 1 OF 62

SDP-08-108

HOWARD COUNTY GENERAL NOTES:

1. All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA standards and specifications if applicable.
2. The contractor shall notify the Department of Public Works/Bureau of Engineering/Construction Inspection Division at (410) 313-1880 24-hours prior to the start of work.
3. The contractor shall notify "Miss Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
4. Traffic control devices, markings and signing shall be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD). All street and regulatory signs shall be in place prior to the placement of any asphalt.
5. Street light placement and the type of fixture and pole shall be in accordance with the Howard County Design Manual, Volume III (1993) and as modified by "Guidelines for Street Lights in Residential Developments (June 1993)." A minimum spacing of 20' shall be maintained between any streetlight and any tree.
6. All sign posts used for traffic control signs installed in the County right-of-way shall be mounted on a 2" galvanized steel, perforated, square tube post (14 gauge) inserted into a 2-1/2" galvanized steel, perforated, square tube sleeve (12 gauge) - 3" long. A galvanized steel pole cap shall be mounted on top of each post.
7. All plan dimensions are to face of curb unless otherwise noted.
8. The existing topography is taken from aerial survey with (maximum two foot) contour intervals prepared by Mercado Consultants Inc. dated 5-22-06.
9. The coordinates shown hereon are based upon the Howard County Geodetic Control, which is based upon the Maryland State Plane Coordinate System. Howard County Monument Nos. A109, 371C and "Harris AZ Mark" were used for this project.
10. No permanent increse in impervious area.
11. Existing utilities are based on GIS mapping.
12. No floodplain study was prepared for this project.
13. Project background information (unless included in title block):
    - Hydraulically dredging the upper half of the lake to its original depths.
    - Pumping the dredged material to a temporary staging area on the South Entrance Road for mechanical dewatering.
    - Trucking dewatered material to an off-site licensed placement facility.
    - Constructing a penninsula and wetlands in the upper portion of the lake to create a Forebay.
    - Install access road on isthmus with turf reinforced matting and placement of riprap at existing overflow areas on the isthmus to prevent further erosion.
    - Providing imbricated riprap for erosion protection at select spots on the right bank of the Little Patuxent River.
    - Restoration of all disturbed areas, including removal of gravel & paving at the staging area.
14. No grading, removal of vegetative cover or trees, paving or new structures shall be permitted outside the limits of disturbance in wetlands, streams, or their associated buffers, forest conservation easements, or 100-year floodplain without DPZ approval.
15. This subject property is zoned NT per the February 2, 2004 Comprehensive Zoning Plan and per the "Comp Lite" Zoning Amendments effective July 28, 2006.
16. This project is exempt from the requirements of Section 16.124 of the Howard County Code for Landscaping since disturbance resulting from project activities is temporary and no permanent structures are proposed.
17. This project is exempt from the requirements of Section 16.1200 of the Howard County Code for Forest Conservation since it is part of a Planned Unit Development which had preliminary development plan approval and 50% or more of the land was recorded and substantially developed before December 31, 1992.
18. The Contractor shall be responsible for repairs to property damage caused by the Contractor.
19. Project is subject to approval by the U.S. Army Corps of Engineers, Baltimore District, the MDE Nontidal Wetlands and Waterways Division, and the MDE Dam Safety Division. Copies of the applicable permits or authorizations shall be submitted to the DPZ, Division of Land Development. MDE permit tracking number is 200863535.
20. The Contractor shall comply with all applicable Federal, State and Local Laws and Regulations including project permits. Effluent leaving the site shall not exceed Maryland turbidity limits of 150 Ntu at any time or 50 Ntu as a monthly average per COMAR 26.08.02.
21. No wetland areas landward of the ordinary high water are disturbed by the project. Wetlands within the lake (mainly nonpersisteat-emergent and lacustrine unconsolidated bottom wetlands) are subject to disturbance from project activity, refer to JPA 2008-63535.M02.
22. WP-17-110 to allow the installation of five Poster Tree art sculptures within Kennedy Gardens adjacent to Lake Kittamaqundi was approved on May 16, 2017, subjust to these conditions: (1)
    - All Grading and clearing shall be minimized to the extent required to install five proposed tree sculptures. Any disturbed areas must be returned to the existing grade, and stabilized as appropriate.
    - The petitioner shall obtain state and federal authorization of regulated activities, if applicable.
    - The petitioner shall obtain all required permits from the Howard County Department of Inspections, Licenses and Permits.
    - Include the alternative compliance request number, description, and decision on all associated plans, and permits.

HOWARD SOIL CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

1. A minimum of 24 hours notice must be given to the Howard County Department of Inspection, Licenses and Permits, Sediment Control Division prior to the start of any construction (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 most current MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL and revisions thereto.
3. Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within: a) 7 calendar days for all perimeter sediment control structures, dikes, 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 seeding (Sec. 51), sod (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec. 52). 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.
7. Site Analysis: Staging Area

Total Area of Site	1.06 Acres
Area Disturbed	1.91 Acres
Area to be roofed or paved	0.00 Acres
Area to be vegetatively stabilized	.042 Acres
Total Cut	11.09 Cu.Yds.
Total Fill	11.09 Cu.Yds.
Total Dredging Values per 2006 Bathymetric Survey	Cu.Yds.
Offsite waste/borrow area location:	Site with an approved sediment control plan and active permit, as approved by the Inspector and Howard SCD.

Site Analysis: Isthmus Area

Total Area of Site	0.66 Acres
Area Disturbed	1.91 Acres
Area to be roofed or paved	0.00 Acres
Area to be vegetatively stabilized	0.85 Acres
Total Cut	254 Cu.Yds.
Total Fill	252 Cu.Yds.
Offsite waste/borrow area location:	On Site

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 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 three pipe lengths or that which shall be back-filled and stabilized by the end of each work day, whichever is shorter.

HOWARD SOIL CONSERVATION DISTRICT PERMANENT SEEDING NOTES:

Apply to graded or cleared areas 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, disking or other acceptable means before seeding, if not previously loosened.

Soil Amendments: In lieu of soil test recommendations, use one of the following schedules:

1. Preferred —Apply 2 tons/acre dolomitic limestone (92 lbs/1000 sq.ft.) and 600 lbs/acre 10-10-10 fertilizer (14 lbs/1000 sq.ft.) before seeding. Harrow or disk into upper three inches of soil. At time of seeding, apply 400 lbs/acre 30-0-0 ureaform fertilizer (9 lbs/1000 sq.ft.)
2. Acceptable – Apply 2 tons/acre dolomitic limestone (92 lbs/1000 sq.ft.) and 1000 lbs/acre 10-1010 fertilizer (23 lbs/1000 sq.ft.) before seeding. Harrow or disk into upper three inches of soil.

Seeding – For the periods March 1 – April 30, and August 1 – October 15, seed with 60 lbs/acre (1.4 lbs/1000 sq.ft.) of Kentucky 31 Tall Fescue. For the period May 1 – July 31, seed with 60 lbs Kentucky 31 Tall Fescue per acre and 2 lbs/acre (.05 lbs/100() sq.ft.) of weeping lovegrass. During the period of October 16 – February 28, protect site by:

Option 1 – Two 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 30 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 slope 8 feet or higher, use 348 gallons per acre (8 gal/1000 sq.ft.) for anchoring.

Maintenance – Inspect all seeding areas and make needed repairs, replacements and reseedings.

TEMPORARY SEEDING NOTES:

Apply to graded or cleared areas likely to be re-disturbed where a short-term vegetative cover is needed.

Seedbed preparation: – Loosen upper three inches of soil by raking, disking or other acceptable means before seeding, if not previously loosened.

Soil Amendments: – Apply 600 lbs/acre 10-10-10 fertilizer (14 lbs/1000 sq.ft.).

Seeding: – For periods March 1 –April 30 and from August 15 – October 15, seed with 2-1/2 bushel per acre of annual rye (3.2 lbs/1000 sq.ft.). For the period May 1 – August 14, seed with 3 lbs/acre of weeping lovegrass (.07 lbs/1000 sq.ft.). For the period November 16 – February 28, protect site by applying 2 tons/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/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 slope 8 ft. or higher, use 348 gal. per acre (8 gal/1000 sq.ft.) for anchoring.

Refer to the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for additional rates and methods not covered.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 12/23/09
Chief, Division of Land Development	Date 1/07/10
Director, DEP	Date 1/7/10

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

THIS SEAL IS FOR (1) REVISIONS MADE BY SITE RESOURCES, INC.

DATE	No.	REVISION DESCRIPTION
2/24/17	1	RECONSTRUCTION OF BELL TREE/NEW POSTER TREES

GENERAL NOTES

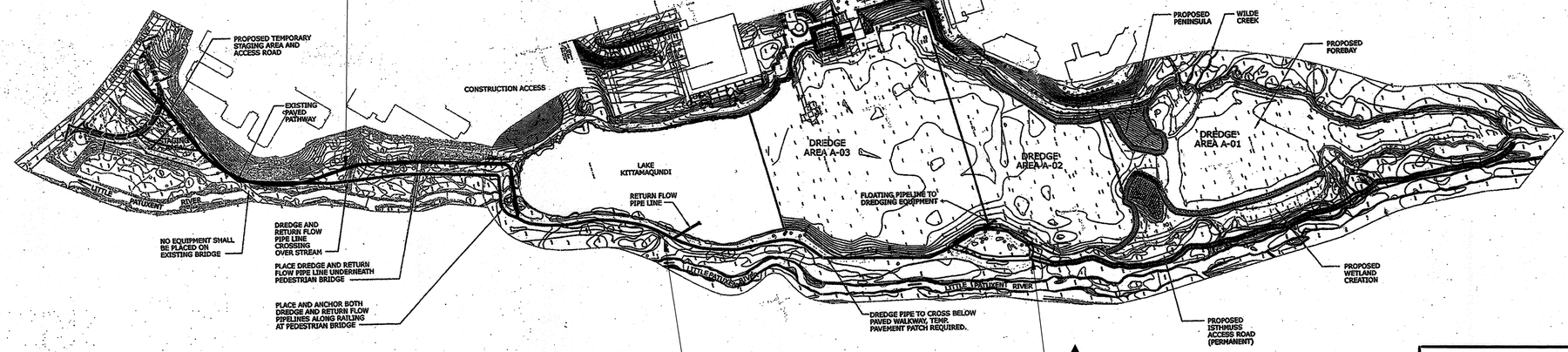
COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION ELECTION DISTRICT 5, HOWARD COUNTY MD. TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING A-01, SHEET 2 OF 62

SDP-08-108



3 PROPOSED ACCESS FROM SOUTH ENTRANCE ROAD. SEE SHEET 57 FOR ALIGNMENT & SECTION.

4 SITE OF PROPOSED BANDSHELL WORK SEE SHEETS 60 TO 62

3 EXISTING 10' WIDE PAVED TRAIL TO BE USED FOR CONSTRUCTION ACCESS.

3 BEGIN REVISION #3 WORK. SEE SHEETS 47-59.

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: 54390
EXPIRATION DATE: 5/14/10
STATE OF MARYLAND · DANIEL D'SWEENEY · NO. 54390 · PROFESSIONAL ENGINEER
2/19/09
CERTIFICATION FOR REVISION 3 ONLY

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09
Chief, Division of Land Development — Date 1/07/10
Director, DED. — Date 1/7/10

Maryland Department of the Environment
MDE Water Management Administration
Dam Safety Division
V.P. Dalal 12/1/09
Vish P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
8700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1900

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION
PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

0 200 400
SCALE IN FEET

PROJECT LOCATION PLAN

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION ELECTION DISTRICT 5, HOWARD COUNTY MD. TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING A-02, SHEET 3 OF 62

SDP-08-108

NOTE: STORMWATER MANAGEMENT SHALL BE ADDRESSED WITH DISCONNECTION OF NON-ROOFTOP RUNOFF CREDIT

LEGEND:

- EXISTING CONTOURS
- EXISTING BATHYMETRY
- DIRECTION OF WATER FLOW
- EDGE OF WATER
- BATHYMETRIC SURVEY LIMITS
- EXISTING WETLANDS
- STREAM BUFFER
- WETLAND BUFFER
- PARCEL LINE
- 100 YEAR FLOOD PLAIN
- 15%-25% SLOPES
- SLOPES > 25%

NOTE:
BATHYMETRIC SURVEY OF LAKE BOTTOM, COMPLETED ON 5/22/2006, IS SUBJECT TO CHANGE.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09
Chief, Division of Land Development — Date 1/07/10
Director, DEP — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Vijay P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

LAKE KITTAMAQUNDI RESTORATION PROJECT EXISTING CONDITIONS AND WETLAND DELINEATION SITE PLAN KEY

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING B-01, SHEET 4 OF 62

SDP-08-108

LAKE KITTAMAQUNDI RESTORATION PROJECT
EXISTING CONDITIONS AND WETLAND DELINEATION PLAN AREA 01

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 12/18/09
Chief, Division of Land Development	Date 1/07/10
Director, DEP.	Date 1/7/10

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

STATE OF MARYLAND
PIETER C. DAHMEN
REGISTERED PROFESSIONAL ENGINEER

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

COLUMBIA ASSOCIATION
TOWN CENTER

MINOR GRADING IN SUPPORT OF
LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING B-02, SHEET 5 OF 62

SDP-08-108

LAKE KITTAMAQUNDI RESTORATION PROJECT
EXISTING CONDITIONS AND WETLAND DELINEATION PLAN AREA 02

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 12/23/09
Chief, Division of Land Development	Date 1/07/10
Director, DEP.	Date 1/7/10

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

STATE OF MARYLAND — PIETER DAHMEN — PROFESSIONAL ENGINEER

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING B-03, SHEET 6 OF 62

SDP-08-108

LAKE KITTAMAQUNDI RESTORATION PROJECT
EXISTING CONDITIONS AND WETLAND DELINEATION PLAN AREA 03

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING B-04, SHEET 7 OF 62

SDP-08-108

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 12/23/09
Chief, Division of Land Development	Date 1/07/10
Director, DEP.	Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

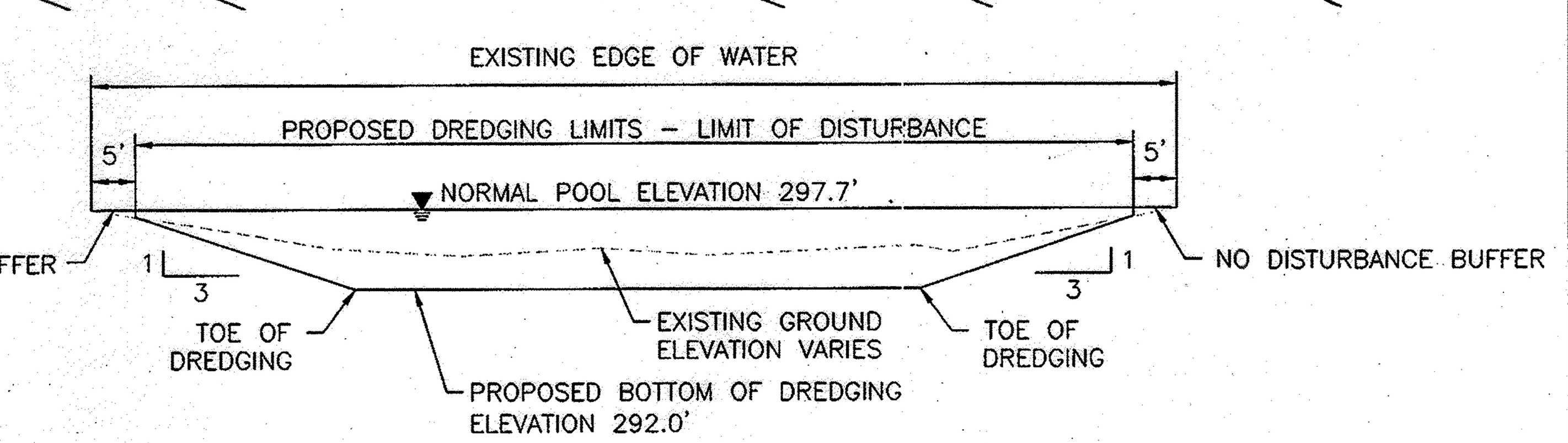
PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

STATE OF MARYLAND
PIETER G. DAHMEN
REGISTERED PROFESSIONAL ENGINEER

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

THIS SEAL IS FOR 1 REVISIONS MADE BY SITE RESOURCES, INC.

DREDGE AREA	NORMAL POOL ELEVATION (FT.)	AVERAGE EXISTING LAKE BOTTOM ELEVATION (FT.)	AVERAGE EXISTING LAKE DEPTH (FT.)	AVERAGE ASSUMED ORIGINAL LAKE BOTTOM ELEVATION (FT.)	AVERAGE ASSUMED ORIGINAL LAKE DEPTH (FT.)	AREA TO BE DREDGED (SQ. FT.)	DREDGE VOLUME TO OBTAIN ASSUMED ORIGINAL LAKE BOTTOM ELEVATION (CU. YD.)
AREA 01	297.7	295.8	1.9	292.0	5.7	265,746	25,699
AREA 02	297.7	294.3	3.4	292.0	5.7	196,852	11,143
AREA 03	297.7	292.7	5.0	292.0	5.7	146,732	3,289
							TOTAL 40,131



NOTE:

1. THE 5' MINIMUM BUFFER, VARIES AT PROPOSED WETLAND CREATION AREAS.

TYPICAL DREDGING SECTION
NTS

SCALE IN FEET: 0 100 200

LEGEND:

- PROPOSED PENINSULA & EXPANDED ISLAND 2 FT ABOVE LAKE ELEVATION
- EXISTNG ISLAND (NOT TO BE DISTURBED)
- PROPOSED RIPRAP
- PROPOSED WETLAND AREA
- PROPOSED PERMANENT ISTHMUS ACCESS ROAD
- PROPOSED CONTOURS
- LIMIT OF DISTURBANCE
- EXISTING CONTOURS
- EXISTING BATHYMETRY
- DIRECTION OF WATER FLOW
- EDGE OF WATER
- TURBIDITY CURTAIN–TYPE II
- 100 YEAR FLOOD PLAIN
- PARCEL LINE
- 15%–25% SLOPES
- SLOPES > 25%

DATE	NO.	REVISION DESCRIPTION
2/24/17	1	RECONSTRUCTION OF BELL TREE/NEW POSTER TREES

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

LAKE KITTAMAQUNDI RESTORATION PROJECT PROPOSED SEDIMENT CONTROL AND DREDGING PLAN KEY

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF
LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING C-01, SHEET 8 OF 62

SDP-08-108

0 50 100
SCALE IN FEET

DREDGE AREA	NORMAL POOL ELEVATION (FT.)	AVERAGE EXISTING LAKE BOTTOM ELEVATION (FT.)	AVERAGE EXISTING LAKE DEPTH (FT.)	AVERAGE ASSUMED ORIGINAL LAKE BOTTOM ELEVATION (FT.)	AVERAGE ASSUMED ORIGINAL LAKE DEPTH (FT.)	AREA TO BE DREDGED (SQ. FT.)	DREDGE VOLUME TO OBTAIN ASSUMED ORIGINAL LAKE BOTTOM ELEVATION (CU. YD.)
AREA 01	297.7	295.8	1.9	292.0	5.7	265,746	25,699

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — No. 29997 — REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

LAKE KITTAMAQUNDI RESTORATION PROJECT PROPOSED SEDIMENT CONTROL AND DREDGING PLAN AREA 01

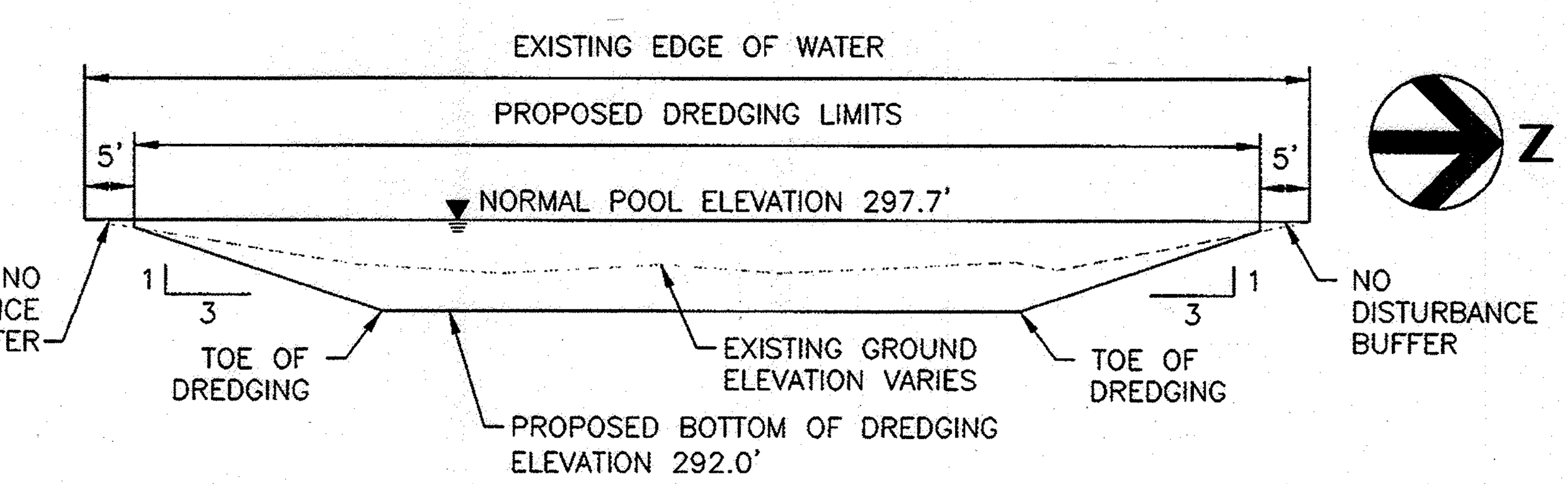
COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING C-02, SHEET 9 OF 62

SDP-08-108

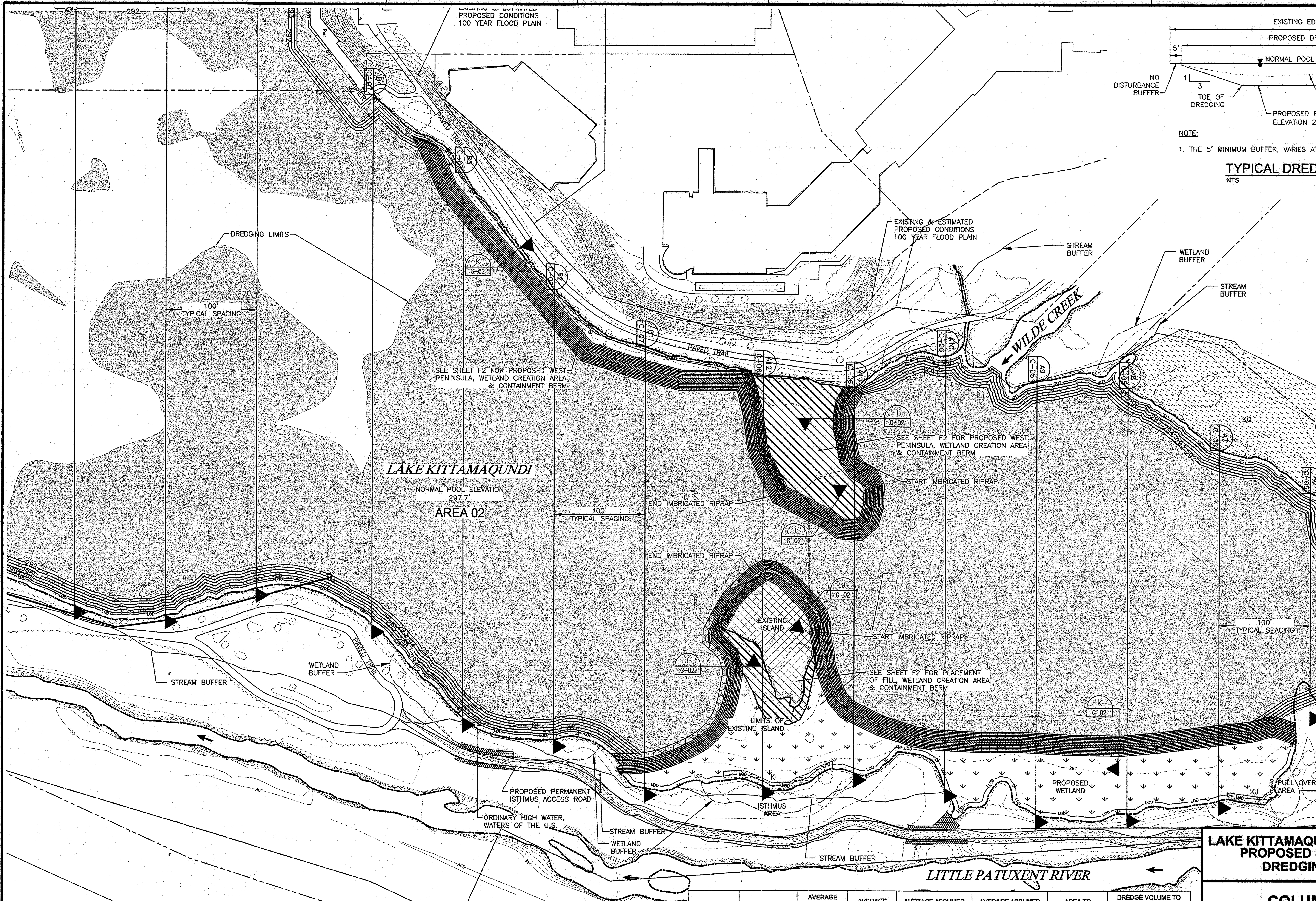


NOTE:

1. THE 5' MINIMUM BUFFER, VARIES AT PROPOSED WETLAND CREATION AREAS.

TYPICAL DREDGING SECTION

NTS



LEGEND:

- PROPOSED PENINSULA & EXPANDED ISLAND 2 FT ABOVE LAKE ELEVATION
- EXISTING ISLAND (NOT TO BE DISTURBED)
- PROPOSED RIPRAP
- PROPOSED WETLAND AREA
- PROPOSED IMBRICATED RIPRAP
- PROPOSED PERMANENT ISTHMUS ACCESS ROAD
- PROPOSED DREDGE AREA
- PROPOSED EROSION CONTROL MATTING
- PROPOSED CONTOURS
- EXISTING CONTOURS
- EXISTING BATHYMETRY
- DIRECTION OF WATER FLOW
- EDGE OF WATER
- LIMIT OF DISTURBANCE
- 100 YEAR FLOOD PLAIN
- PARCEL LINE
- 15%–25% SLOPES
- SLOPES > 25%

NOTES:

1. SIDE SLOPE BASED ON A 3:1 RATIO.
2. CROSS SECTION SPACING IS 100 FEET.

DREDGE AREA	NORMAL POOL ELEVATION (FT.)	AVERAGE EXISTING LAKE BOTTOM ELEVATION (FT.)	AVERAGE EXISTING LAKE DEPTH (FT.)	AVERAGE ASSUMED ORIGINAL LAKE BOTTOM ELEVATION (FT.)	AVERAGE ASSUMED ORIGINAL LAKE DEPTH (FT.)	AREA TO BE DREDGED (SQ. FT.)	DREDGE VOLUME TO OBTAIN ASSUMED ORIGINAL LAKE BOTTOM ELEVATION (CU. YD.)
AREA 02	297.7	294.3	3.4	292.0	5.7	196,852	11,143

LAKE KITTAMAQUNDI RESTORATION PROJECT PROPOSED SEDIMENT CONTROL AND DREDGIND PLAN AREA 02

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] 12/23/09
Chief, Development Engineering Division — Date

Kent Sheubrooks 1/07/10
Chief, Division of Land Development — Date

Thomas E. Butler 1/7/10
Director, DEP — Date

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:

HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

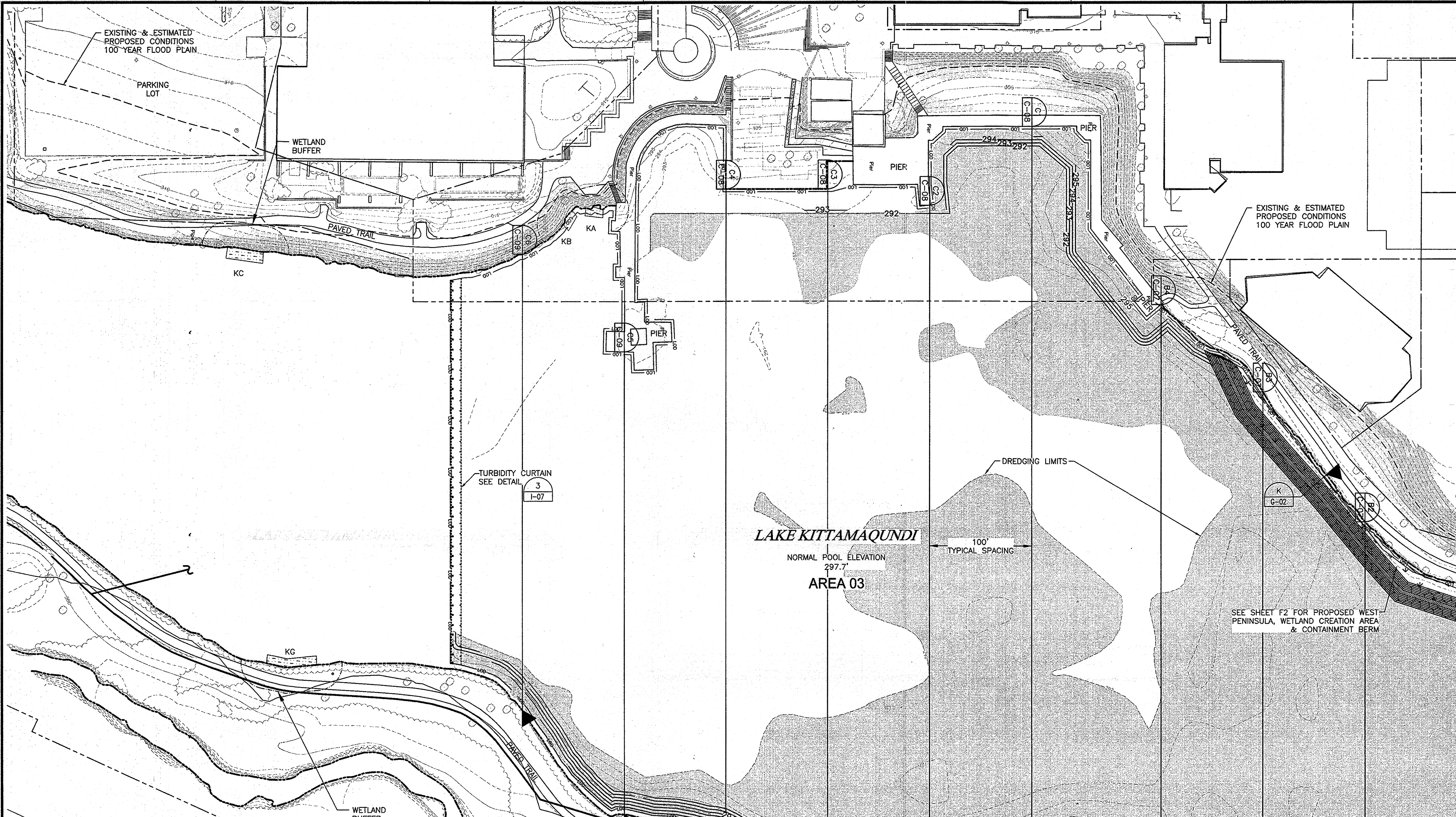
COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION ELECTION DISTRICT 5, HOWARD COUNTY MD. TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING C-03, SHEET 10 OF 62

SDP-08-108



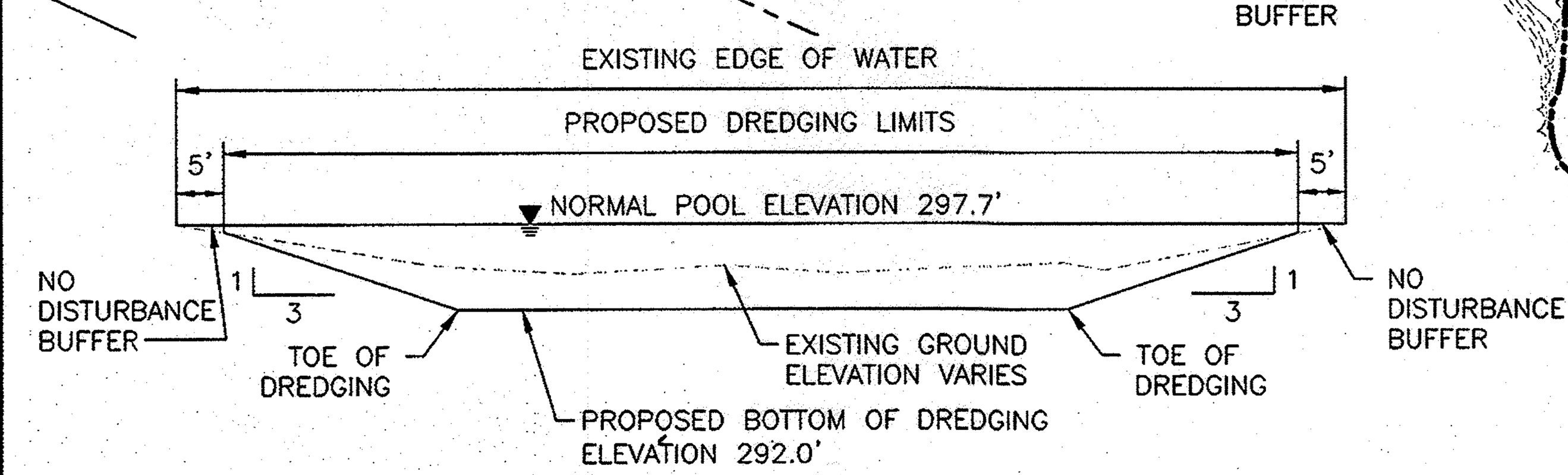
LEGEND:

- PROPOSED PENINSULA & EXPANDED ISLAND 2 FT ABOVE LAKE ELEVATION
- EXISTNG ISLAND (NOT TO BE DISTURBED)
- PROPOSED RIPRAP
- PROPOSED WETLAND AREA
- PROPOSED IMBRICATED RIPRAP
- PROPOSED PERMANENT ISTHMUS ACCESS ROAD
- PROPOSED DREDGE AREA
- PROPOSED EROSION CONTROL MATTING
- PROPOSED CONTOURS
- EXISTING CONTOURS
- EXISTING BATHYMETRY
- DIRECTION OF WATER FLOW
- EDGE OF WATER
- LIMIT OF DISTURBANCE
- PARCEL LINE
- 100 YEAR FLOOD PLAIN
- 15%–25% SLOPES
- SLOPES > 25%

NOTES:

1. SIDE SLOPE BASED ON A 3:1 RATIO.
2. CROSS SECTION SPACING IS 100 FEET.

0 50 100
SCALE IN FEET



NOTE:

1. THE 5' MINIMUM BUFFER, VARIES AT PROPOSED WETLAND CREATION AREAS.

TYPICAL DREDGING SECTION

NTS

DREDGE AREA	NORMAL POOL ELEVATION (FT.)	AVERAGE EXISTING LAKE BOTTOM ELEVATION (FT.)	AVERAGE EXISTING LAKE DEPTH (FT.)	AVERAGE ASSUMED ORIGINAL LAKE BOTTOM ELEVATION (FT.)	AVERAGE ASSUMED ORIGINAL LAKE DEPTH (FT.)	AREA TO BE DREDGED (SQ. FT.)	DREDGE VOLUME TO OBTAIN ASSUMED ORIGINAL LAKE BOTTOM ELEVATION (CU. YD.)
AREA 03	297.7	292.7	5.0	292.0	5.7	146,732	3,289

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:

HDR

HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

11-24-2009

STATE OF MARYLAND — PIETER G. DAHMEN — PROFESSIONAL ENGINEER

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

LAKE KITTAMAQUNDI RESTORATION PROJECT PROPOSED SEDIMENT CONTROL AND DREDGING PLAN AREA 03

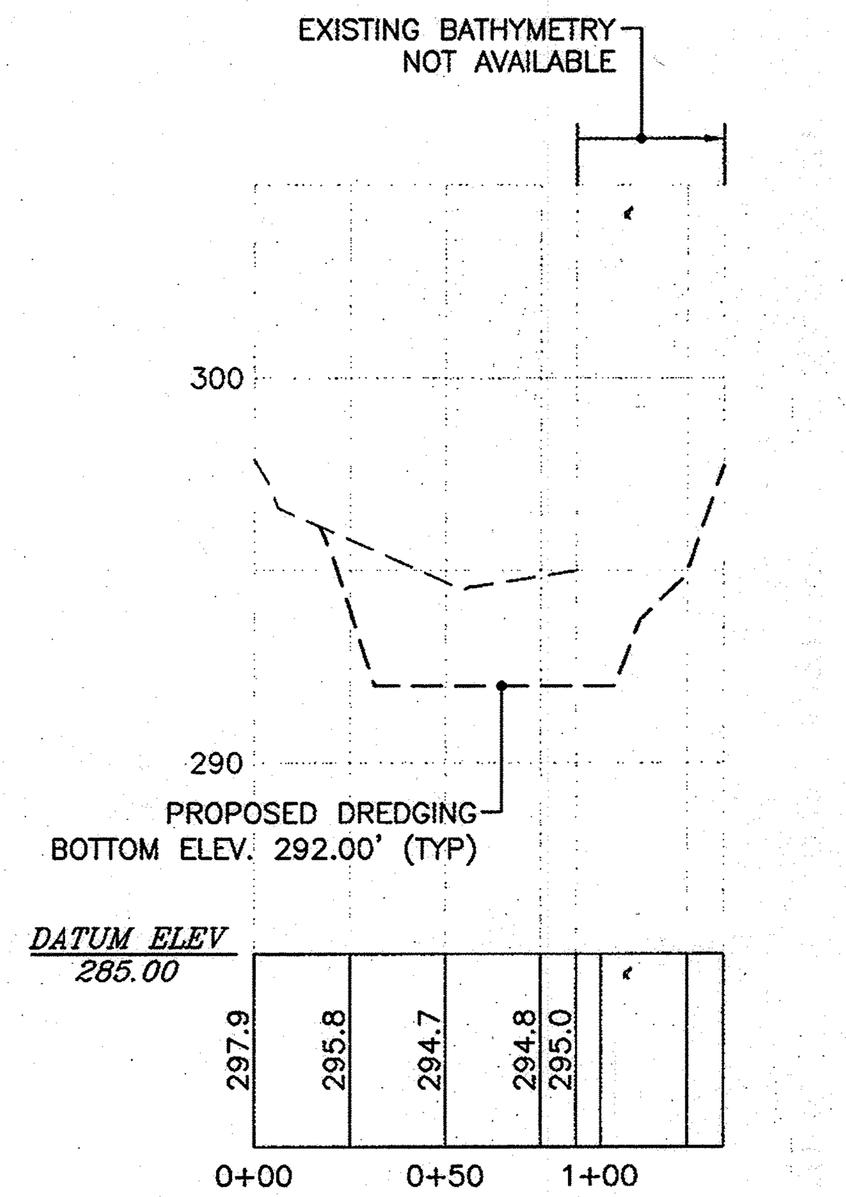
COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

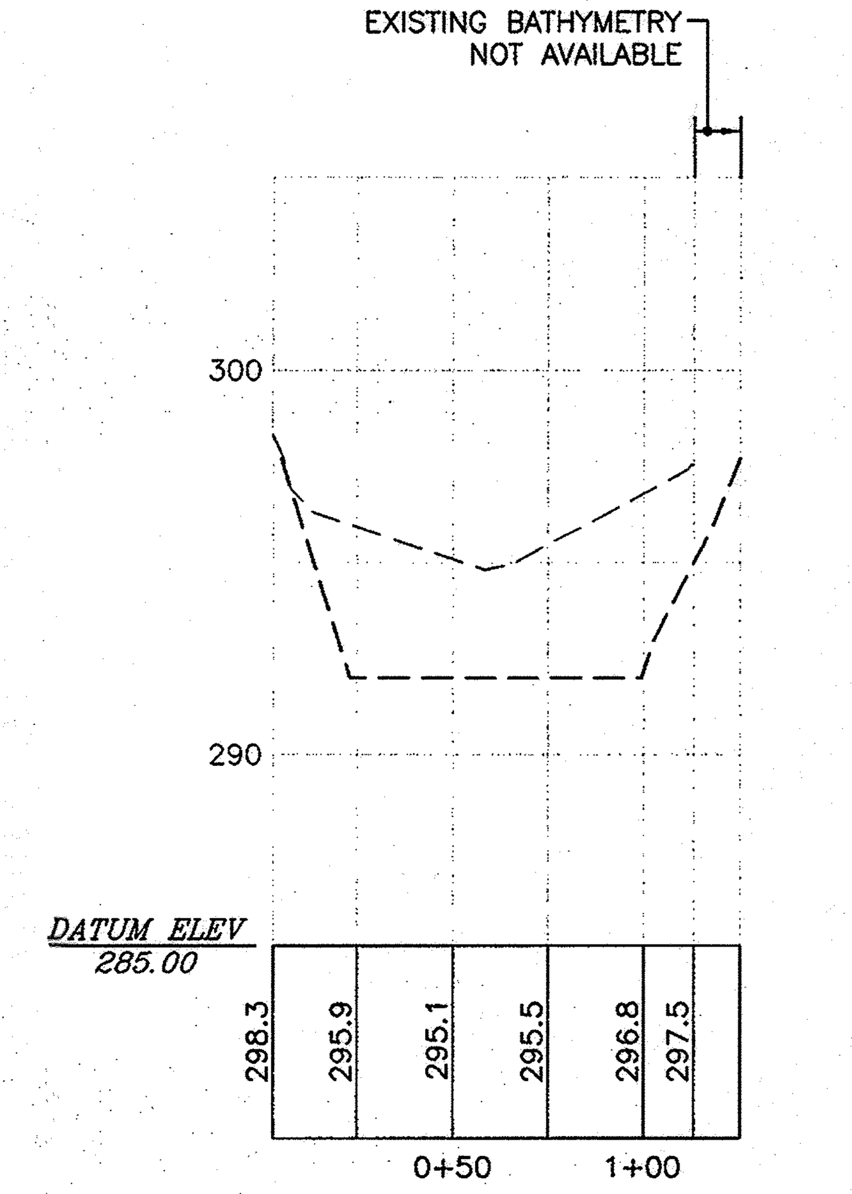
SCALE AS SHOWN
JUNE 18, 2009

DRAWING C-04, SHEET 11 OF 62

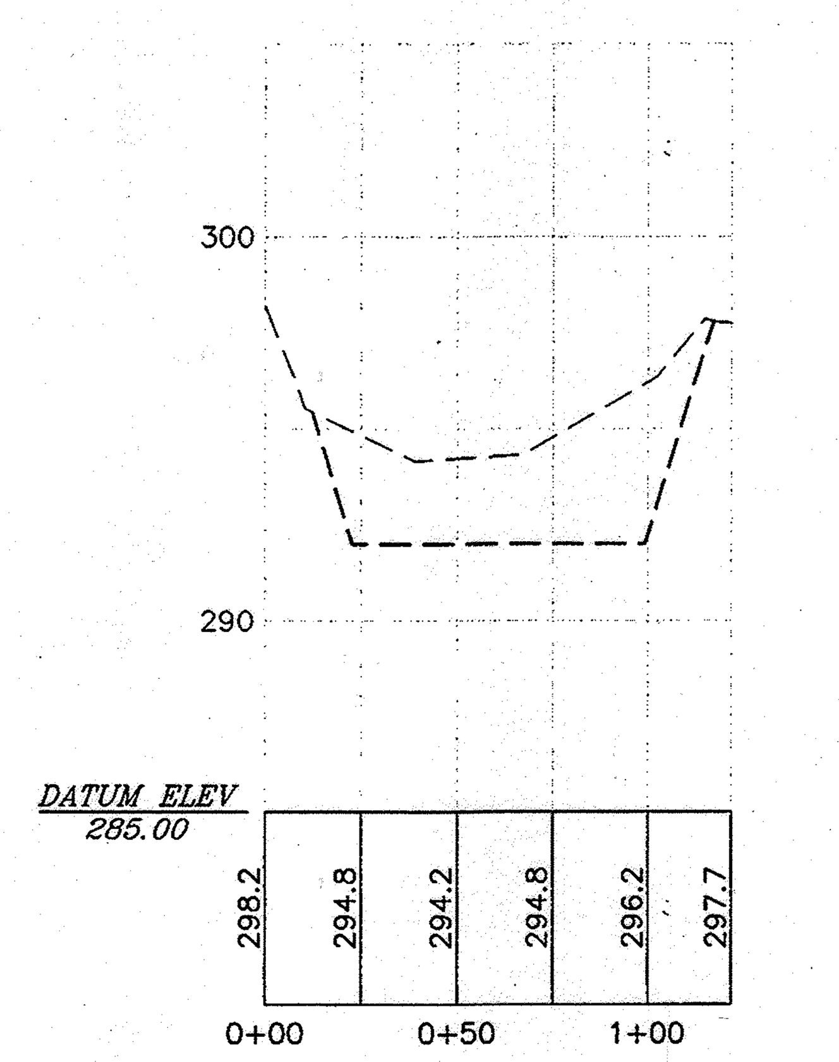
SDP-08-108



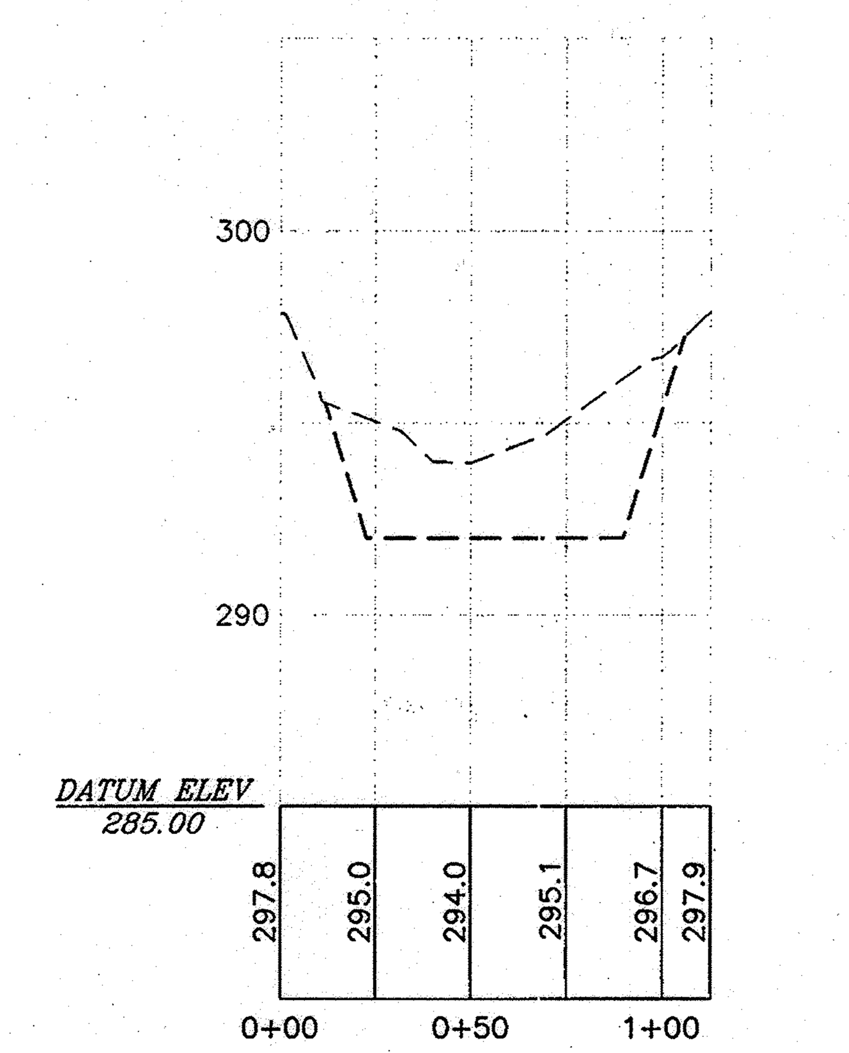
CROSS–SECTION A1 (A1 / C–02)



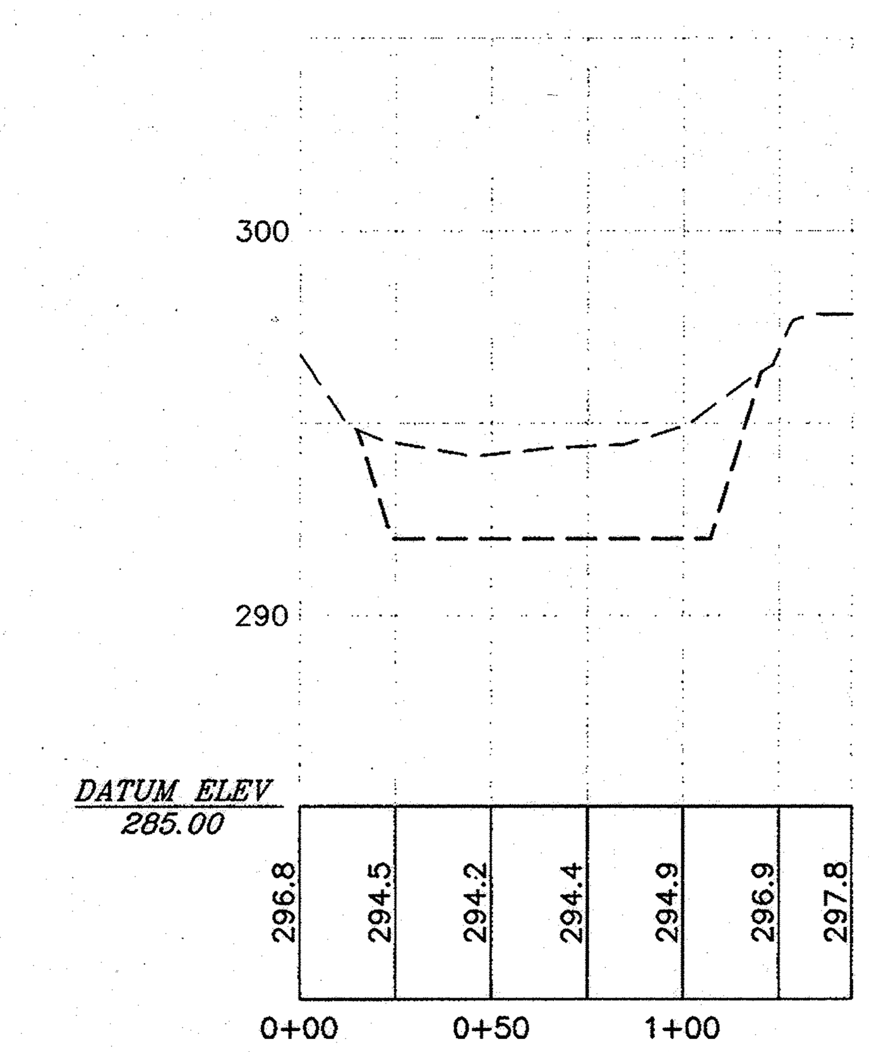
CROSS–SECTION A2 (A2 / C–02)



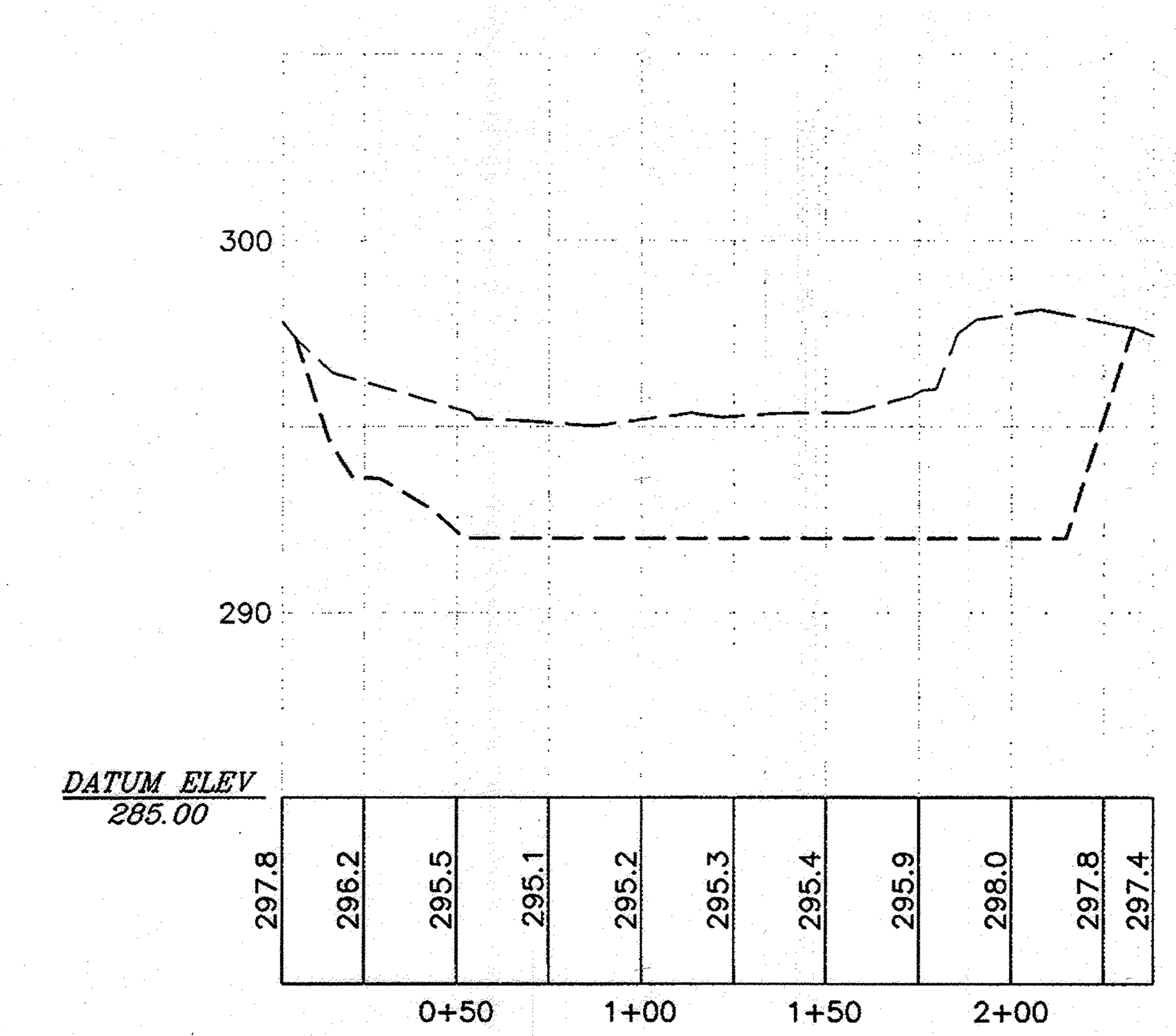
CROSS–SECTION A3 (A3 / C–02)



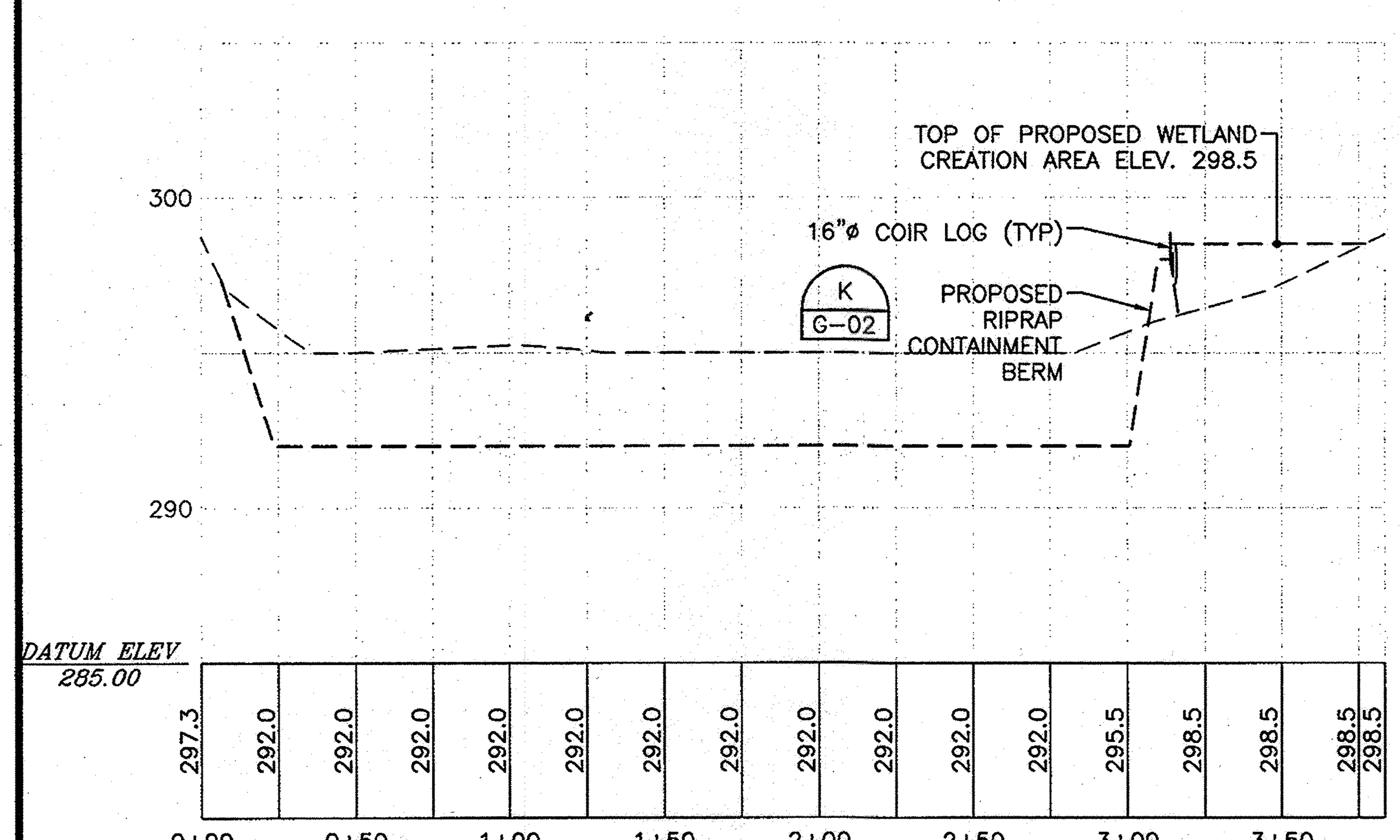
CROSS–SECTION A4 (A4 / C–02)



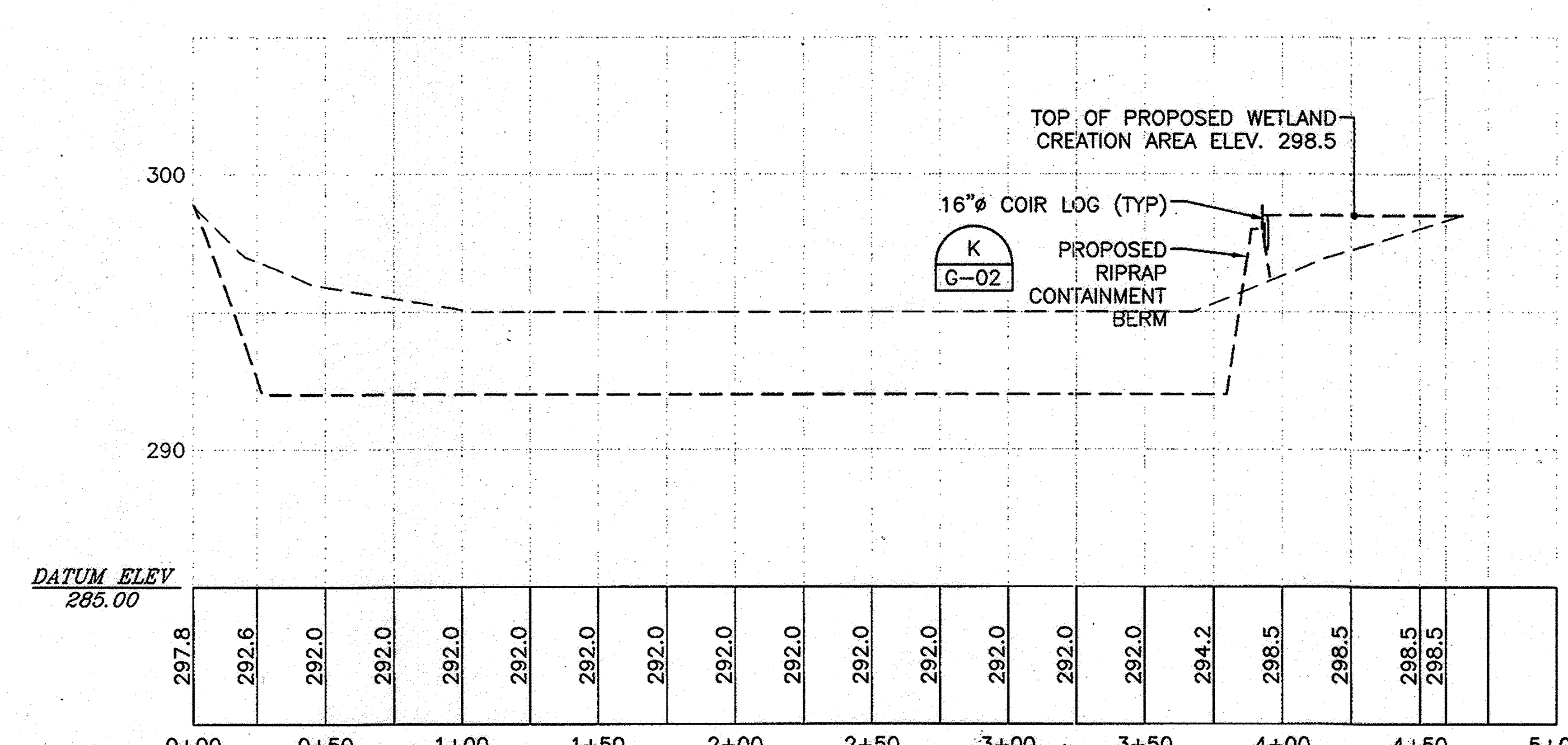
CROSS–SECTION A5 (A5 / C–02)



CROSS–SECTION A6 (A6 / C–02)



CROSS–SECTION A7 (A7 / C–02)



CROSS–SECTION A8 (A8 / C–02)

0 50 100
HORIZONTAL SCALE IN FEET

0 5 10
VERTICAL SCALE IN FEET

LEGEND:
- – – – EXISTING BATHYMETRY
- ——— PROPOSED BATHYMETRY

NOTES:

1. SEE SHEET F2 FOR DETAILS REGARDING PROPOSED PENINSULAS WETLAND CREATION AREA AND CONTAINMENT BERM.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 12/28/09
Chief, Division of Land Development	Date 1/07/10
Director, DEP.	Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

LAKE KITTAMAQUNDI RESTORATION PROJECT
AREA 01
CROSS-SECTIONS (1 OF 2)

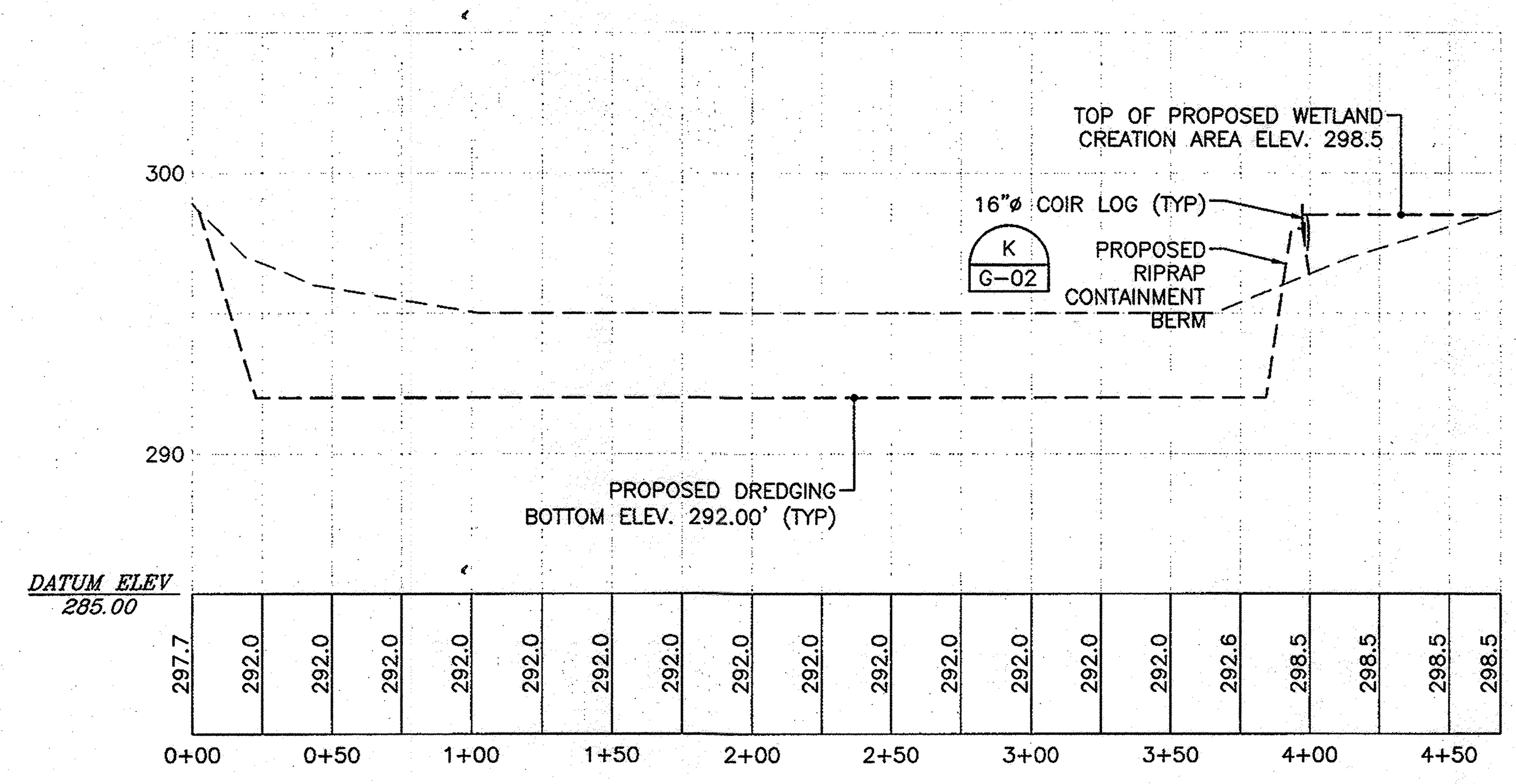
COLUMBIA ASSOCIATION
TOWN CENTER

MINOR GRADING IN SUPPORT OF
LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

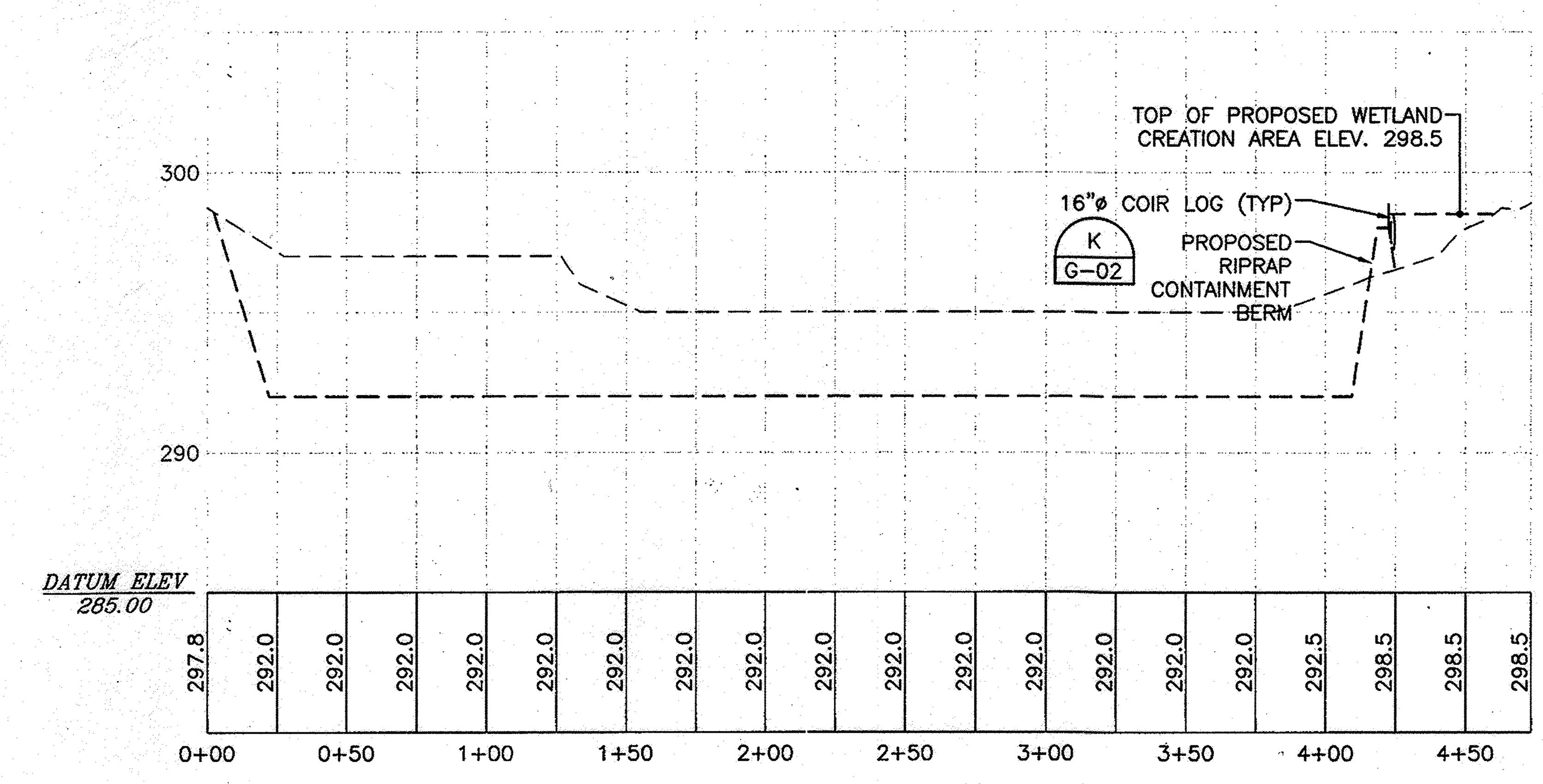
SCALE AS SHOWN
JUNE 18, 2009

DRAWING C-05, SHEET 12 OF 62

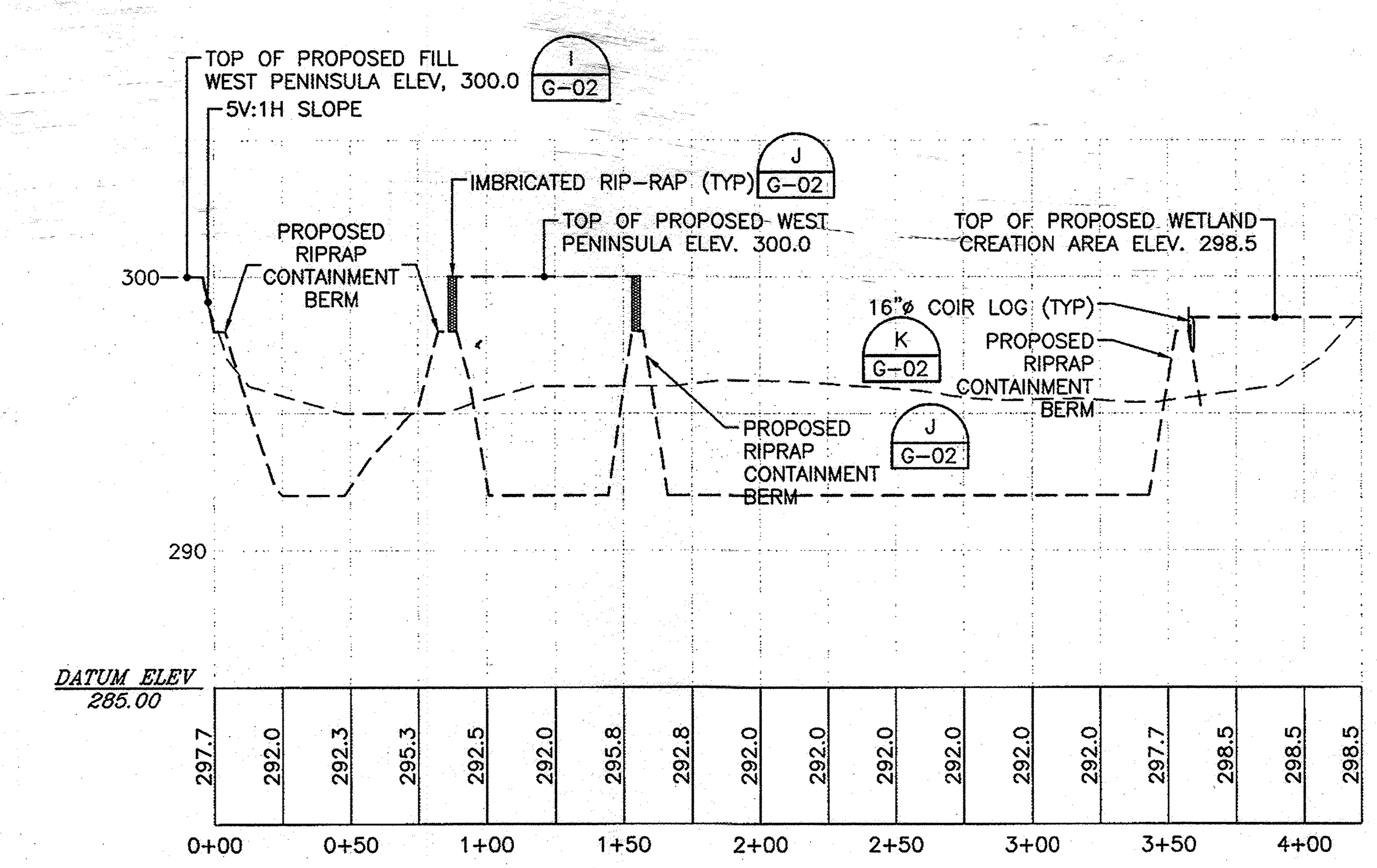
SDP-08-108



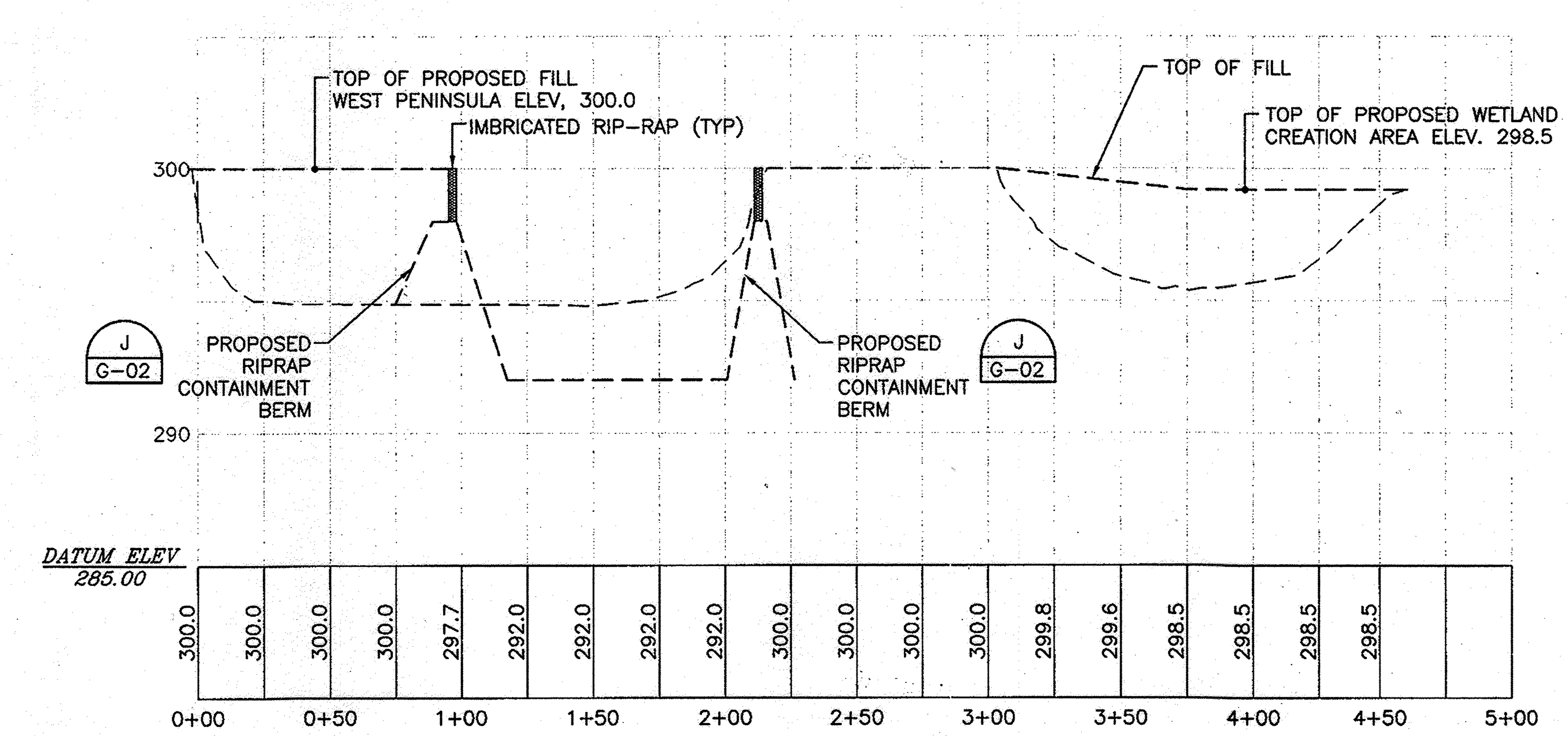
CROSS-SECTION A9 (A9 / C-02)



CROSS-SECTION A10 (A10 / C-02)



CROSS-SECTION A11 (A11 / C-02)



CROSS-SECTION A12 (A12 / C-02)

0 50 100
HORIZONTAL SCALE IN FEET

0 5 10
VERTICAL SCALE IN FEET

LEGEND:

- – – – EXISTING BATHYMETRY
- ——— PROPOSED BATHYMETRY

NOTES:

1. SEE SHEET F2 FOR DETAILS REGARDING PROPOSED PENINSULAS WETLAND CREATION AREA AND CONTAINMENT BERM.

LAKE KITTAMAQUNDI RESTORATION PROJECT
AREA 01
CROSS-SECTIONS (2 OF 2)

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING C-06, SHEET 13 OF 62

SDP-08-108

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 12/23/09
Chief, Division of Land Development	Date 1/07/10
Director, DEP.	Date 1/7/10

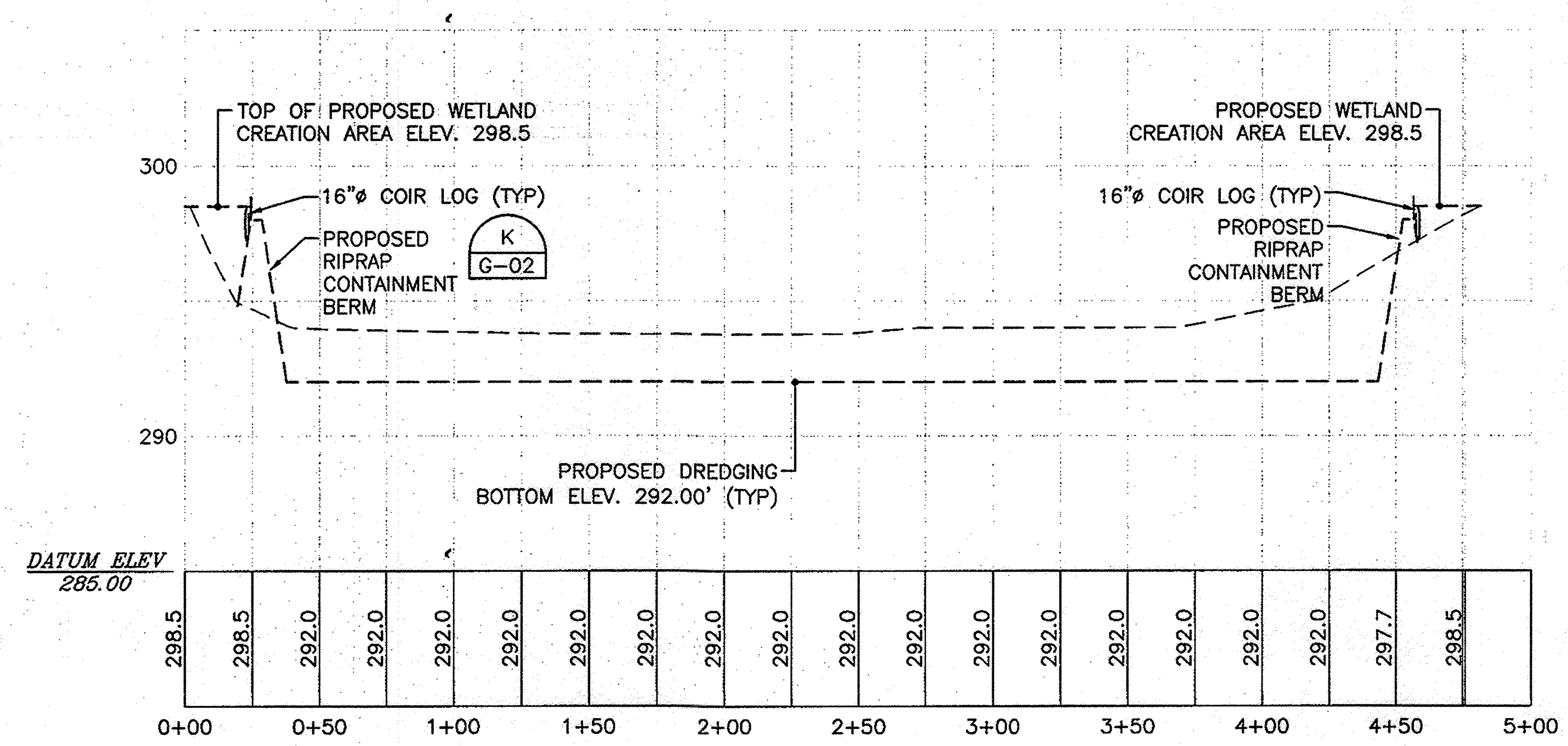
Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

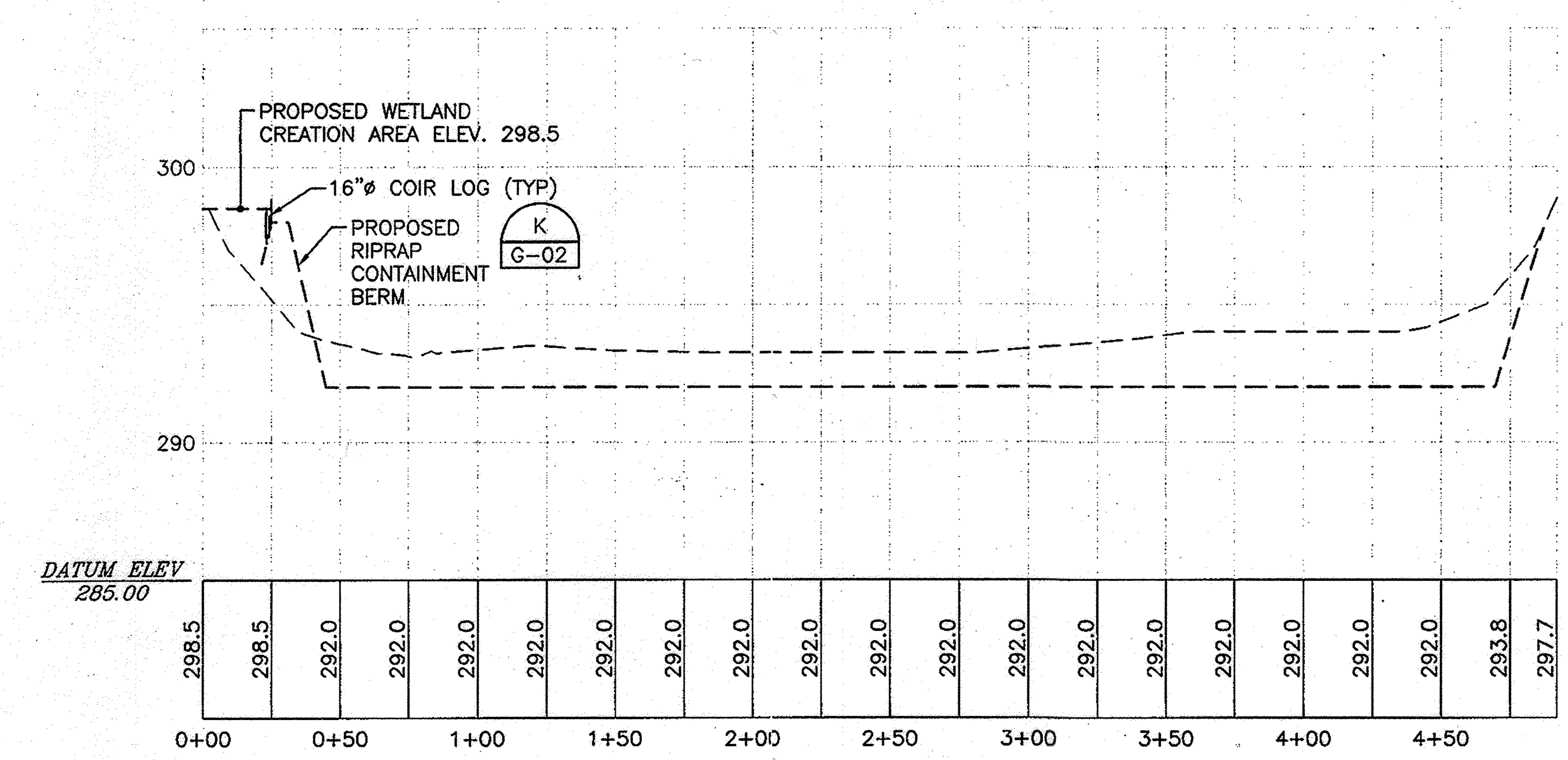
PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

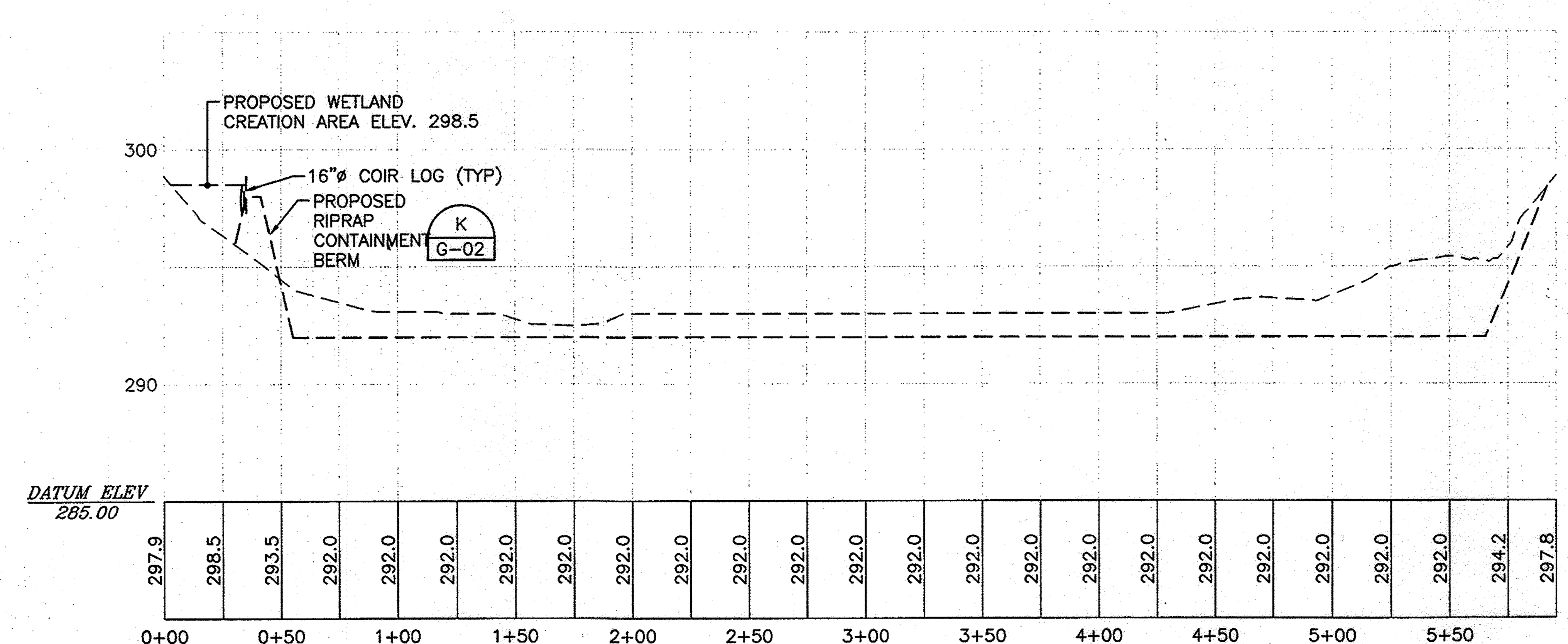
COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947



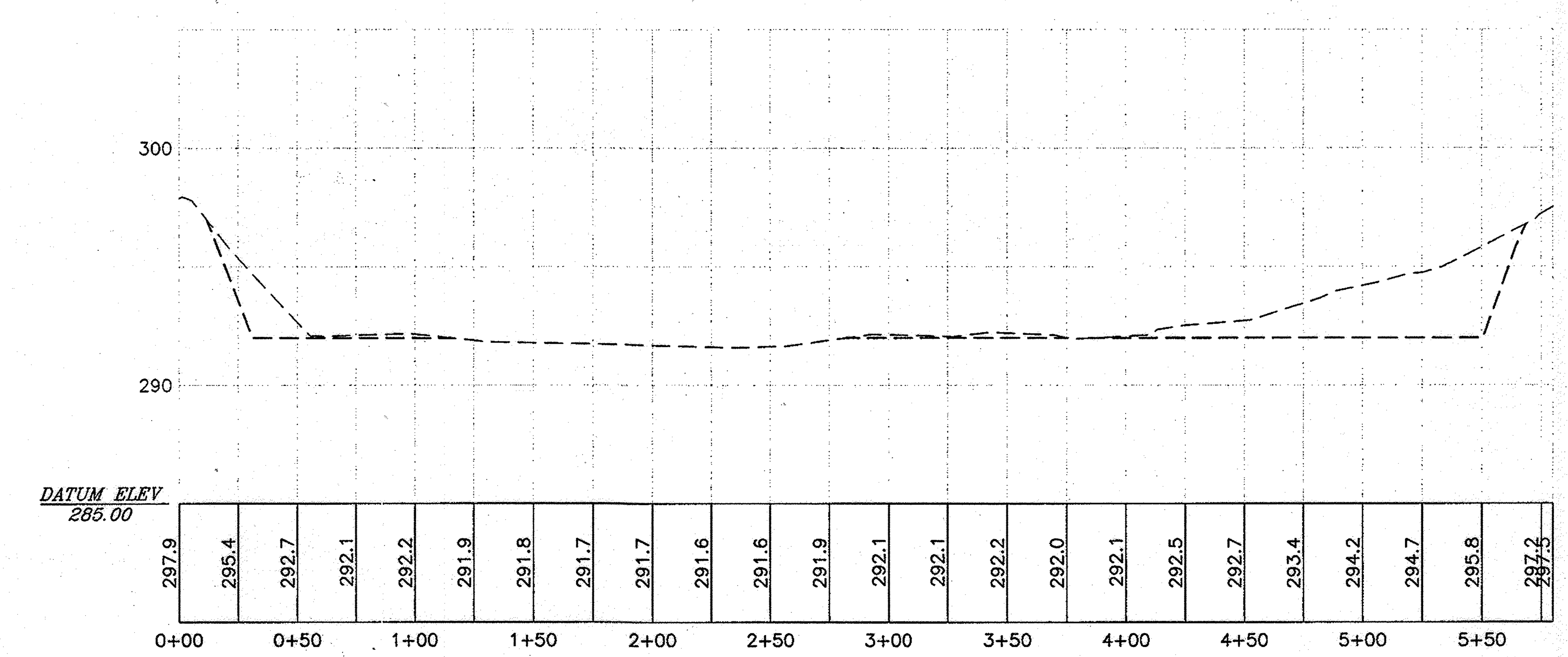
CROSS-SECTION B1 (B1 / C-03)



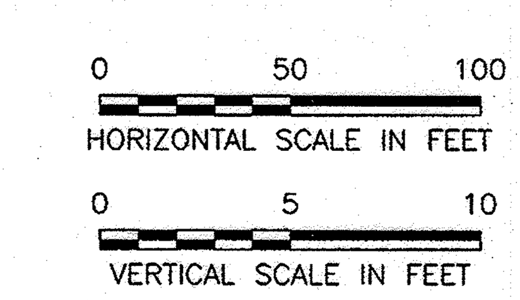
CROSS-SECTION B2 (B2 / C-03)



CROSS-SECTION B3' (B3 / C-03)



CROSS-SECTION B4 (B4 / C-03)



LEGEND:

- – – – EXISTING BATHYMETRY
- ——— PROPOSED BATHYMETRY

NOTES:

1. SEE SHEET F2 FOR DETAILS REGARDING PROPOSED PENINSULAS WETLAND CREATION AREA AND CONTAINMENT BERM.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[signature] 12/23/09	
Chief, Development Engineering Division	Date
[signature] 1/07/10	
Chief, Division of Land Development	Date
[signature] 1/7/10	
Director, DEP.	Date

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

STATE OF MARYLAND — PROFESSIONAL ENGINEER

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

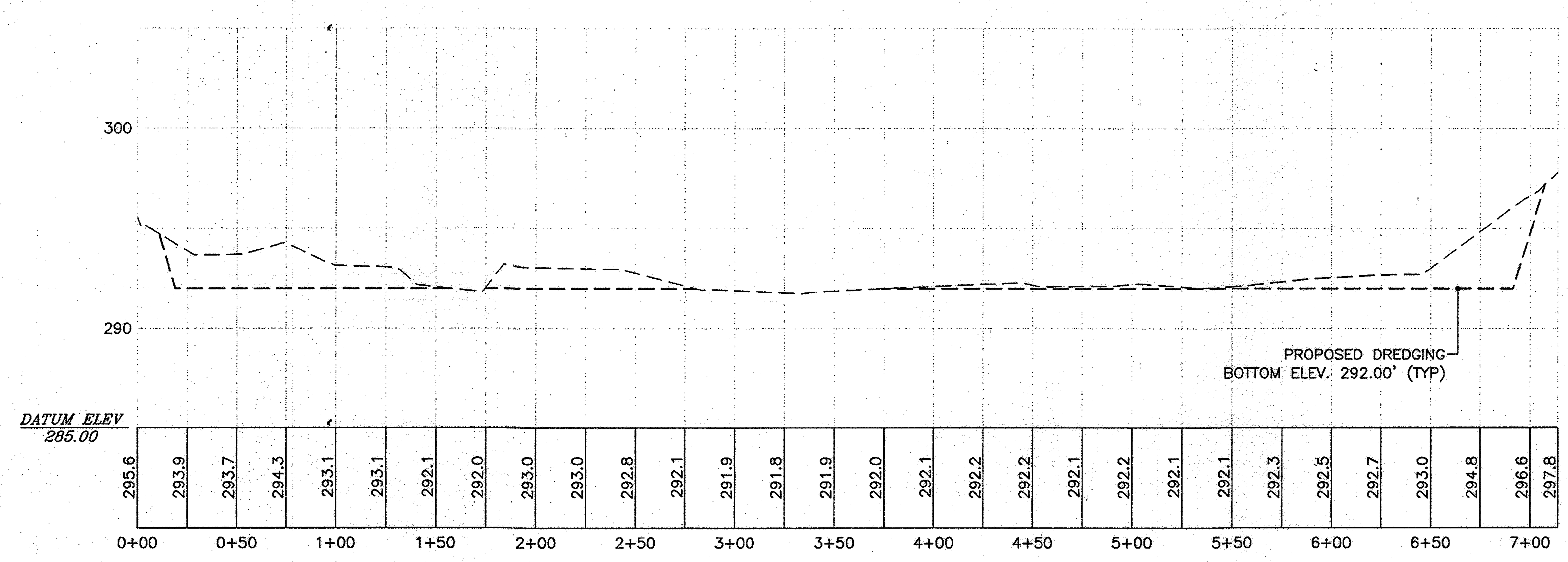
LAKE KITTAMAQUNDI RESTORATION PROJECT
AREA 02
CROSS-SECTIONS

COLUMBIA ASSOCIATION
TOWN CENTER

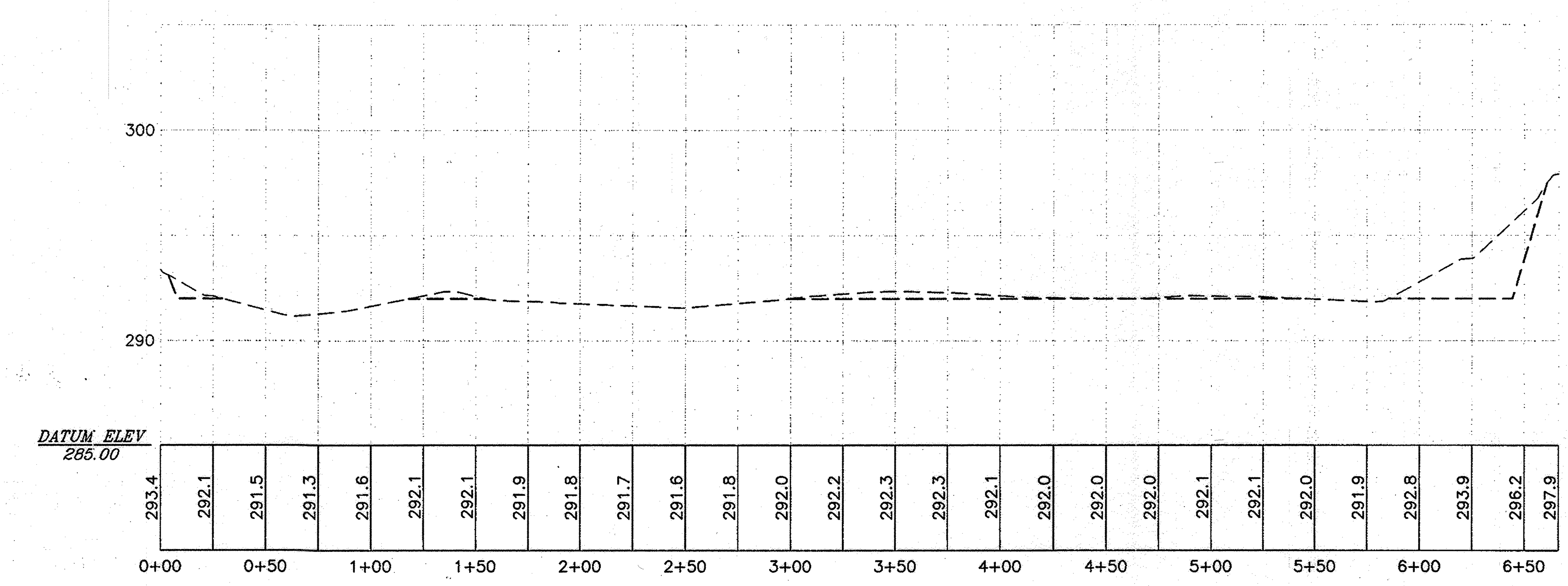
MINOR GRADING IN SUPPORT OF
LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009
DRAWING C-07, SHEET 14 OF 62

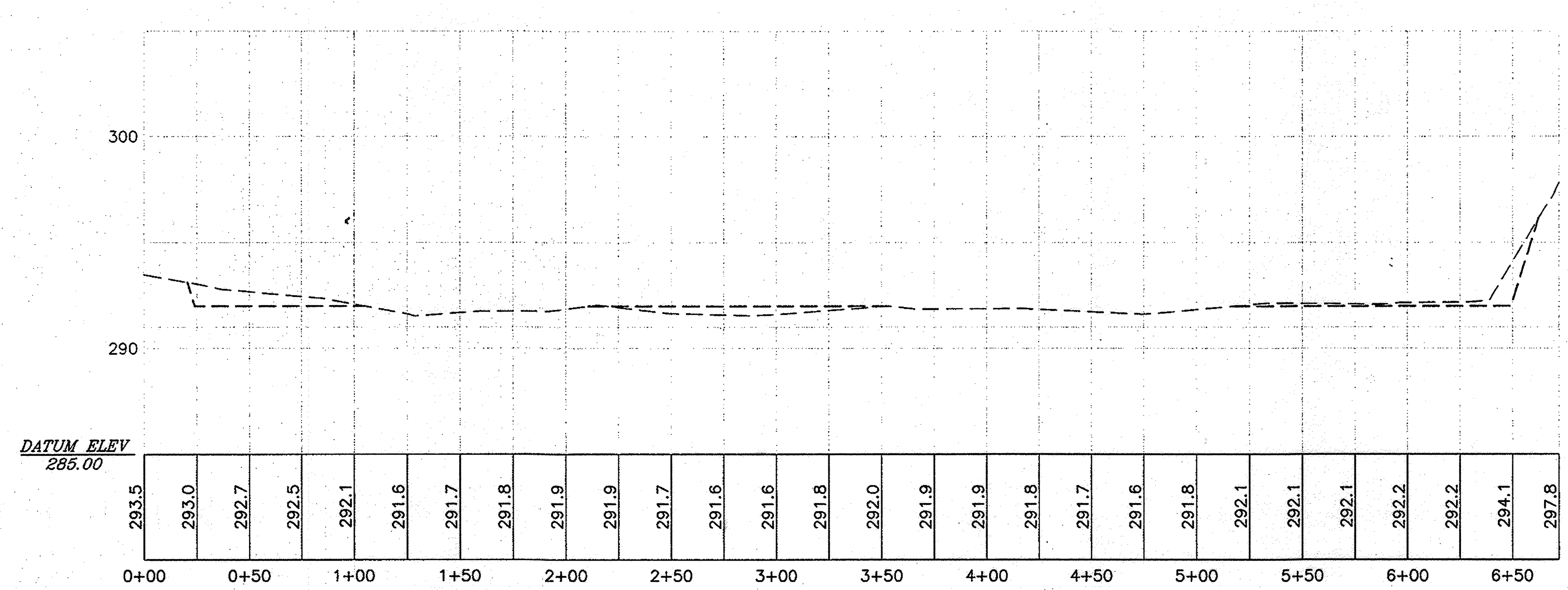
SDP-08-108



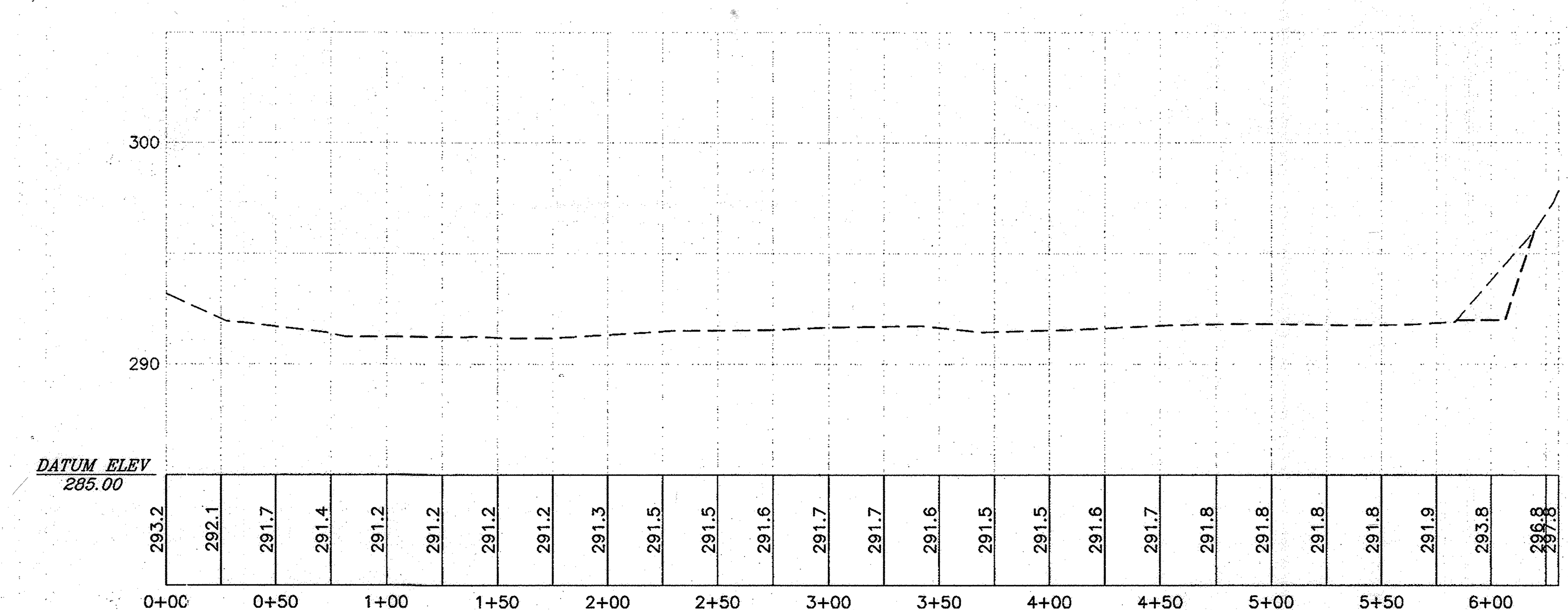
CROSS–SECTION C1 (C1 / C-04)



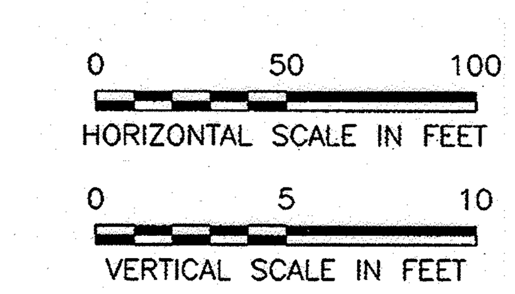
CROSS–SECTION C2 (C2 / C-04)



CROSS–SECTION C3' (C3 / C-04)



CROSS–SECTION C4 (C4 / C-04)



LEGEND:
- – – – EXISTING BATHYMETRY
- ——— PROPOSED BATHYMETRY

NOTES:

1. SEE SHEET F2 FOR DETAILS REGARDING PROPOSED PENINSULAS WETLAND CREATION AREA AND CONTAINMENT BERM.

LAKE KITTAMAQUNDI RESTORATION PROJECT
AREA 03
CROSS-SECTIONS (1 OF 2)

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 12/23/09
Chief, Division of Land Development	Date 1/07/10
Director, DEP.	Date 1/7/10

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

STATE OF MARYLAND REGISTERED PROFESSIONAL ENGINEER

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

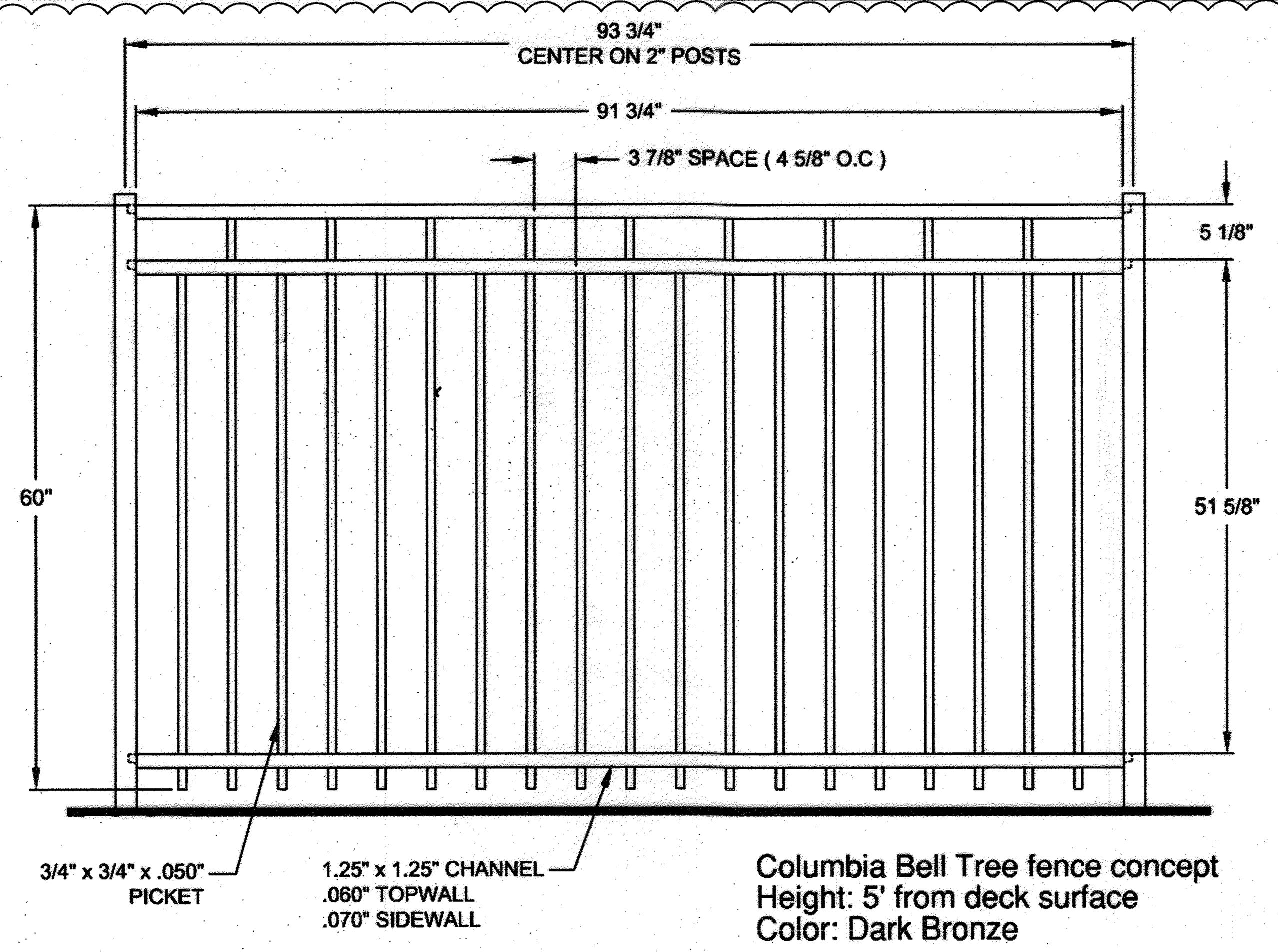
COLUMBIA ASSOCIATION
TOWN CENTER

MINOR GRADING IN SUPPORT OF
LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING C-08, SHEET 15 OF 62

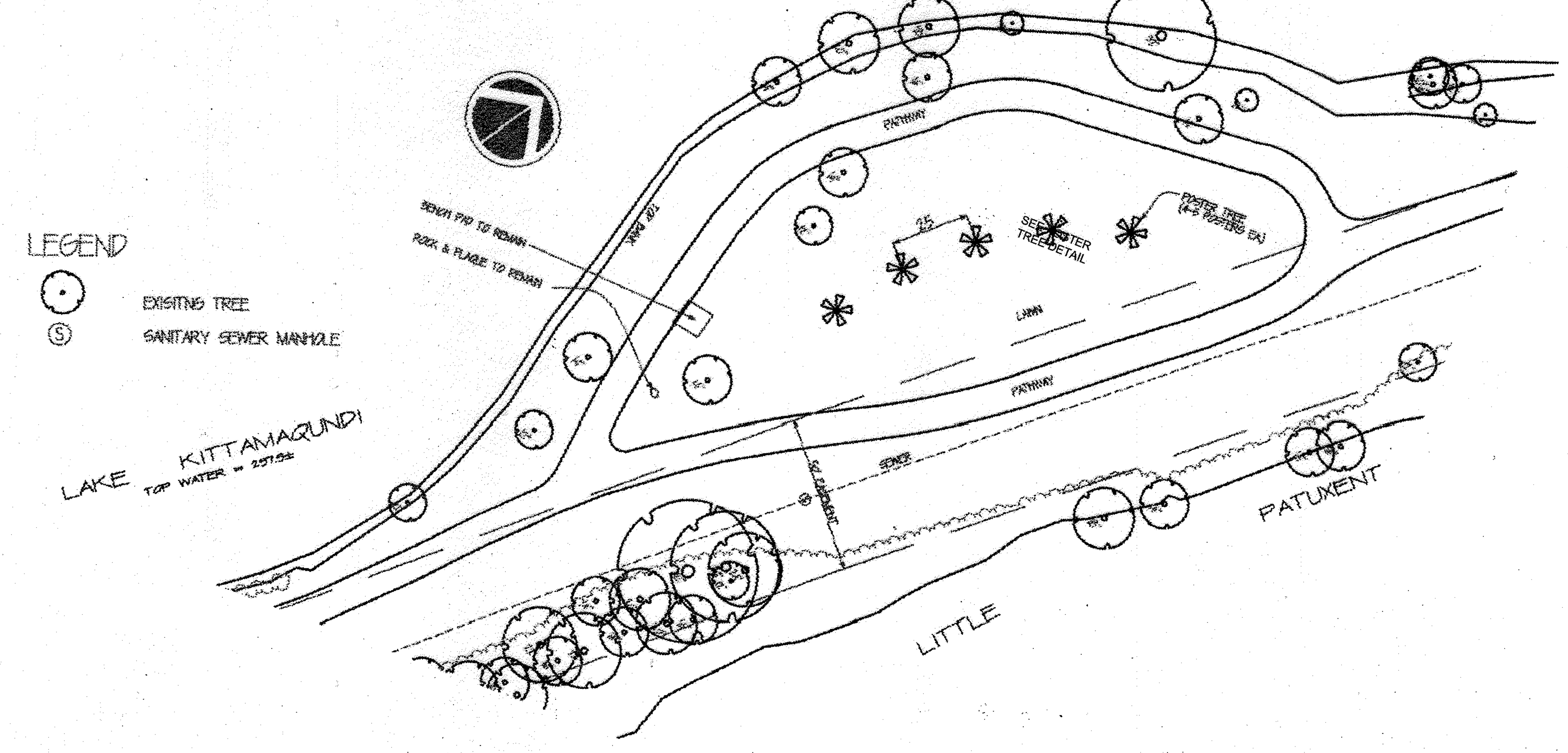
SDP-08-108



Columbia Bell Tree fence concept
Height: 5' from deck surface
Color: Dark Bronze

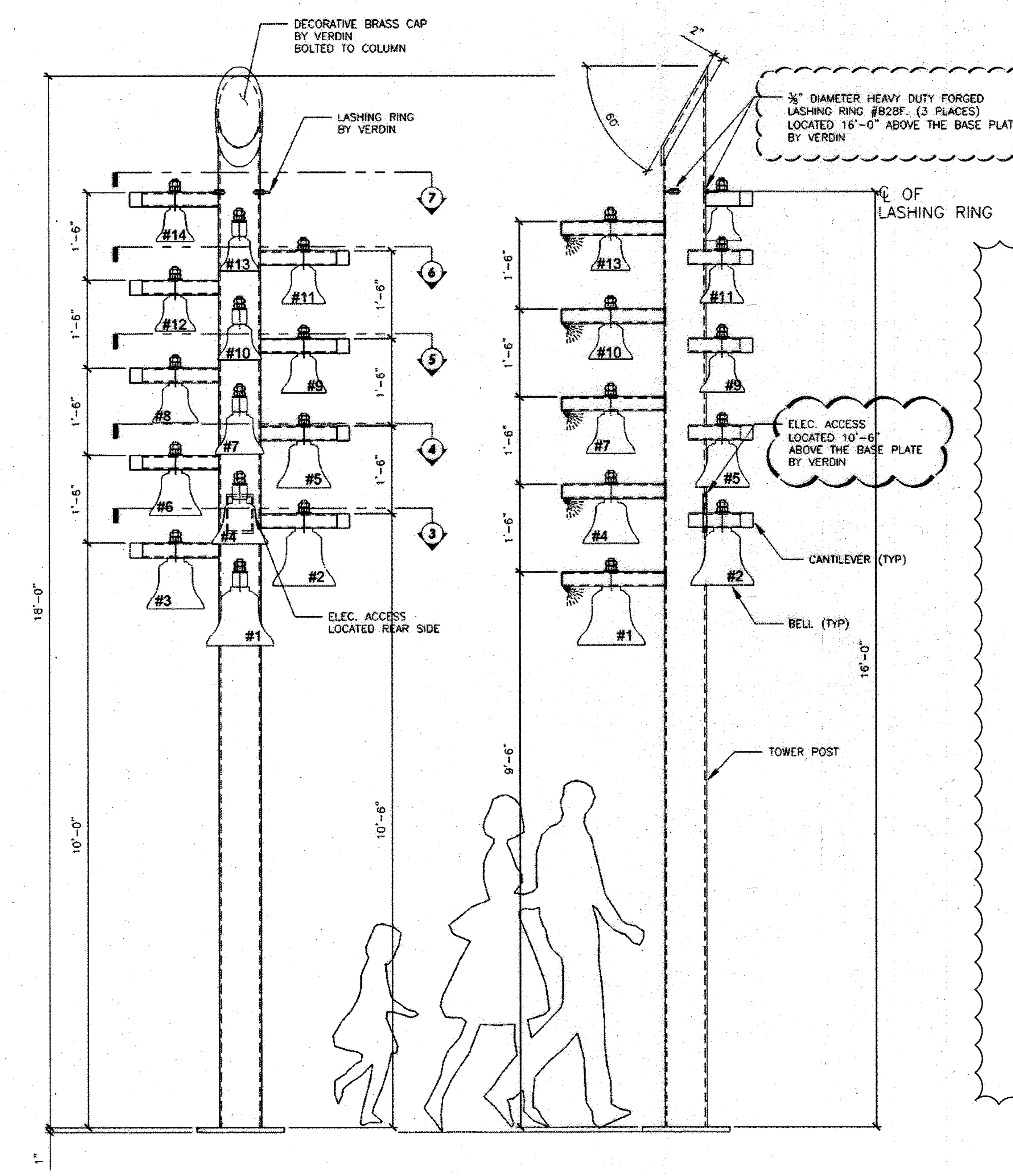
BELL TREE FENCE

NOT TO SCALE



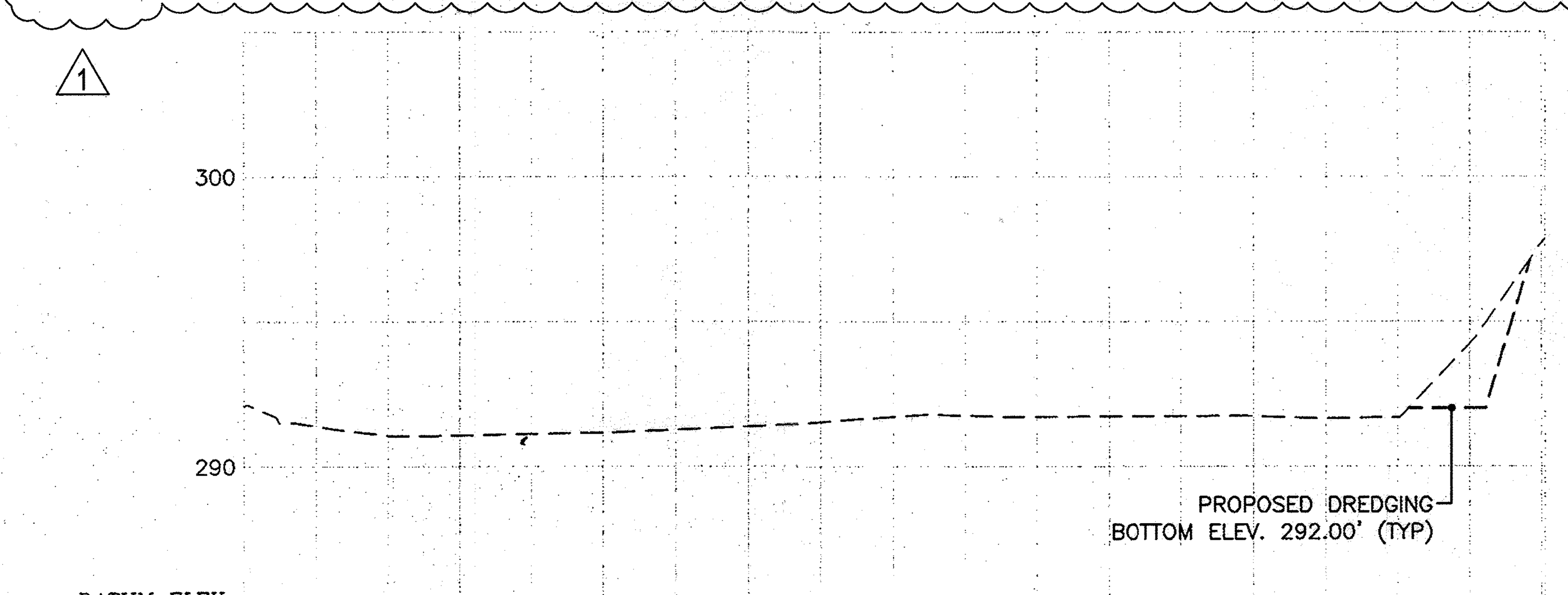
POSTER TREE PLAN

1' = 40'



BELL TREE ELEVATIONS (FRONT & SIDE)

NOT TO SCALE

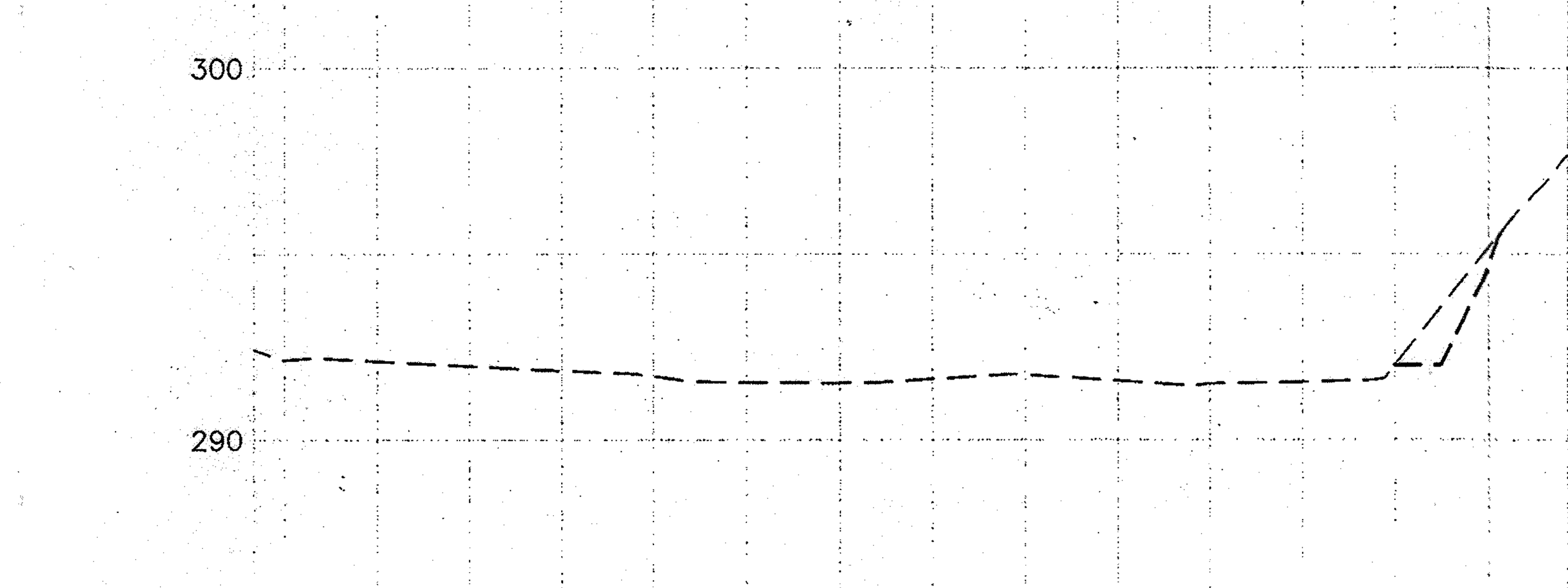


DATUM ELEV 285.00

292.1	291.4	291.1	291.1	291.1	291.2	291.3	291.4	291.5	291.7	291.8	291.7	291.7	291.7	291.7	291.7	294.2	297.8

0+00 0+50 1+00 1+50 2+00 2+50 3+00 3+50 4+00 4+50

CROSS–SECTION C5 (C5 / C-04)

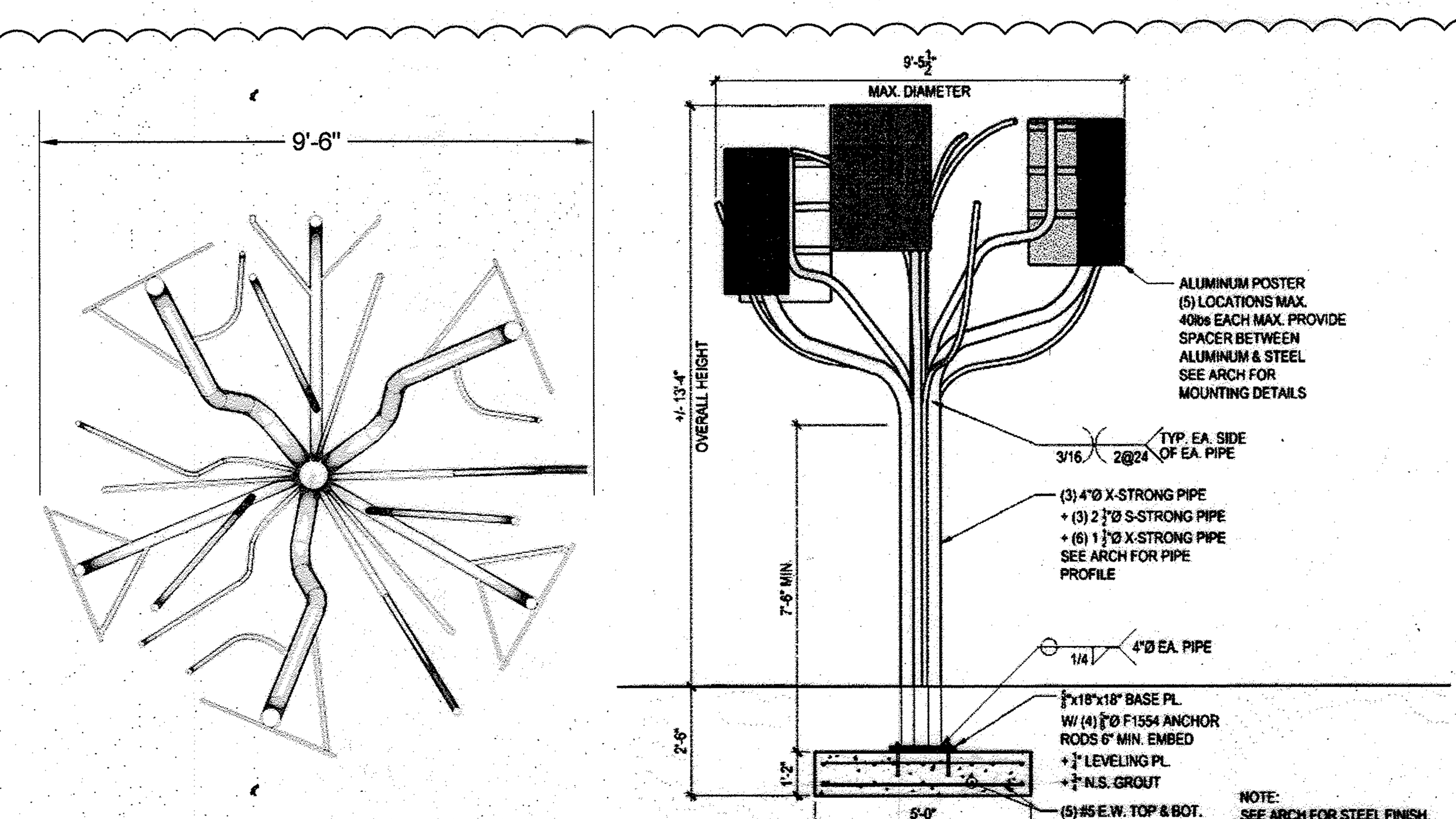


DATUM ELEV 285.00

292.4 / 292.1	292.1	292.0	291.9	291.7	291.5	291.5	291.6	291.7	291.6	291.5	291.5	292.0	295.2	297.7

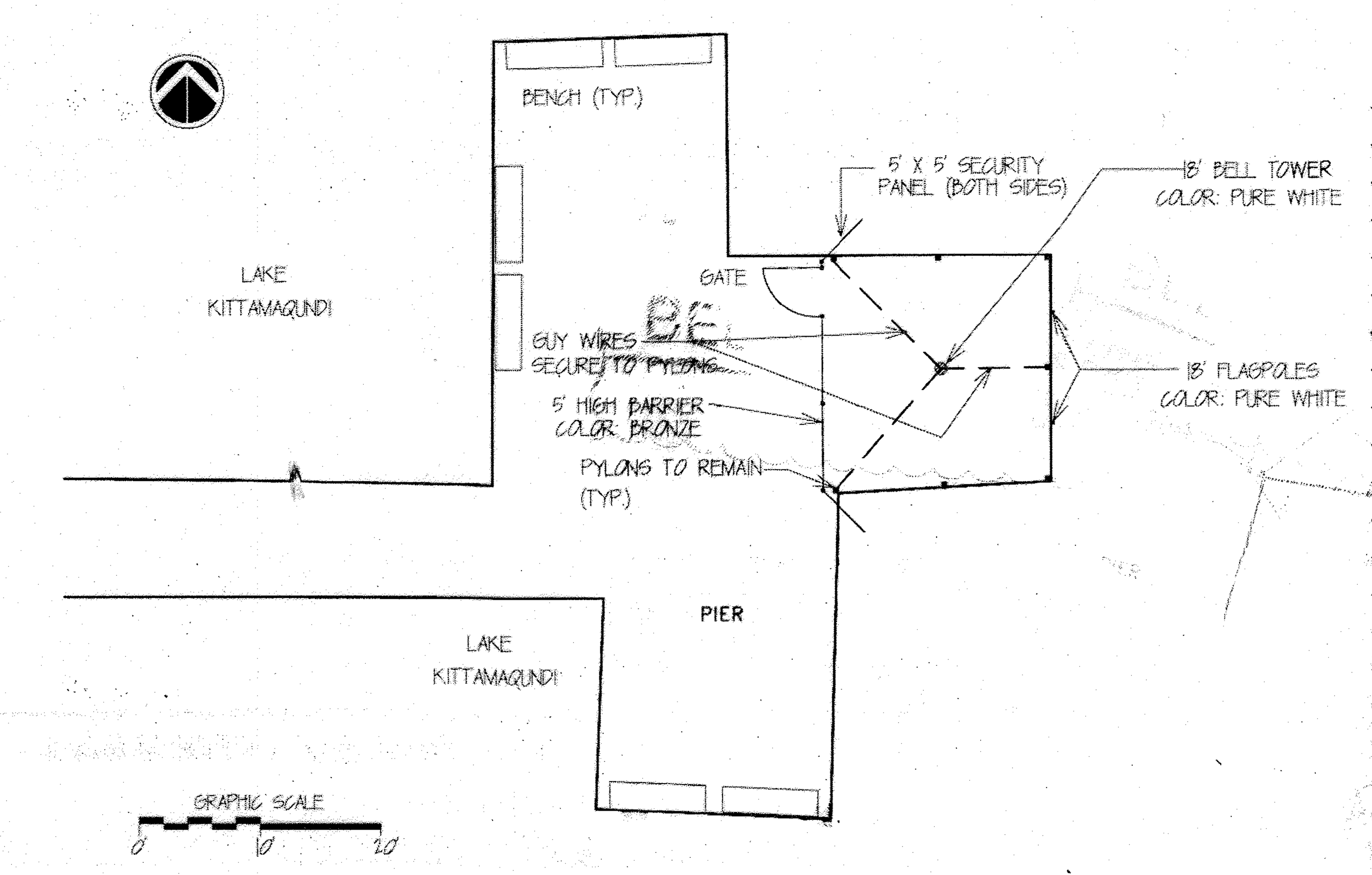
1+00 1+50 2+00 2+50 3+00 3+50 4+00

CROSS–SECTION C6 (C6 / C-04)



POSTER TREE DETAIL

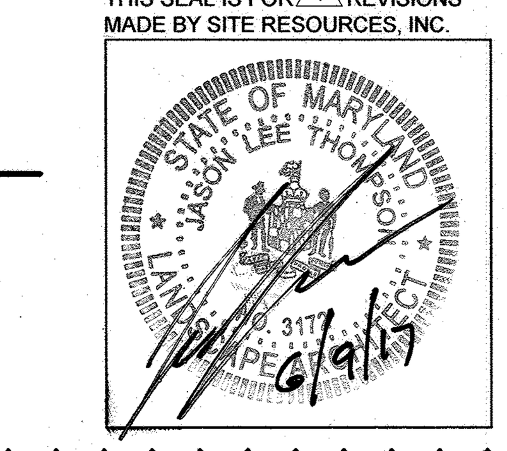
NOT TO SCALE



BELL TREE PLAN

NOT TO SCALE

THIS SEAL IS FOR ⚠1 REVISIONS MADE BY SITE RESOURCES, INC.



0 50 100
HORIZONTAL SCALE IN FEET

0 5 10
VERTICAL SCALE IN FEET

LEGEND:
- – – – EXISTING BATHYMETRY
- ——— PROPOSED BATHYMETRY

NOTES:

1. SEE SHEET F2 FOR DETAILS REGARDING PROPOSED PENINSULAS WETLAND CREATION AREA AND CONTAINMENT BERM.

DATE	NO.	REVISION DESCRIPTION
2/24/17	1	RECONSTRUCTION OF BELL TREE/POSTER TREES

LAKE KITTAMAQUNDI RESTORATION PROJECT AREA 03 CROSS-SECTIONS (2 OF 2)

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION ELECTION DISTRICT 5, HOWARD COUNTY MD. TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING C-09, SHEET 16 OF 62

SDP-08-108

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

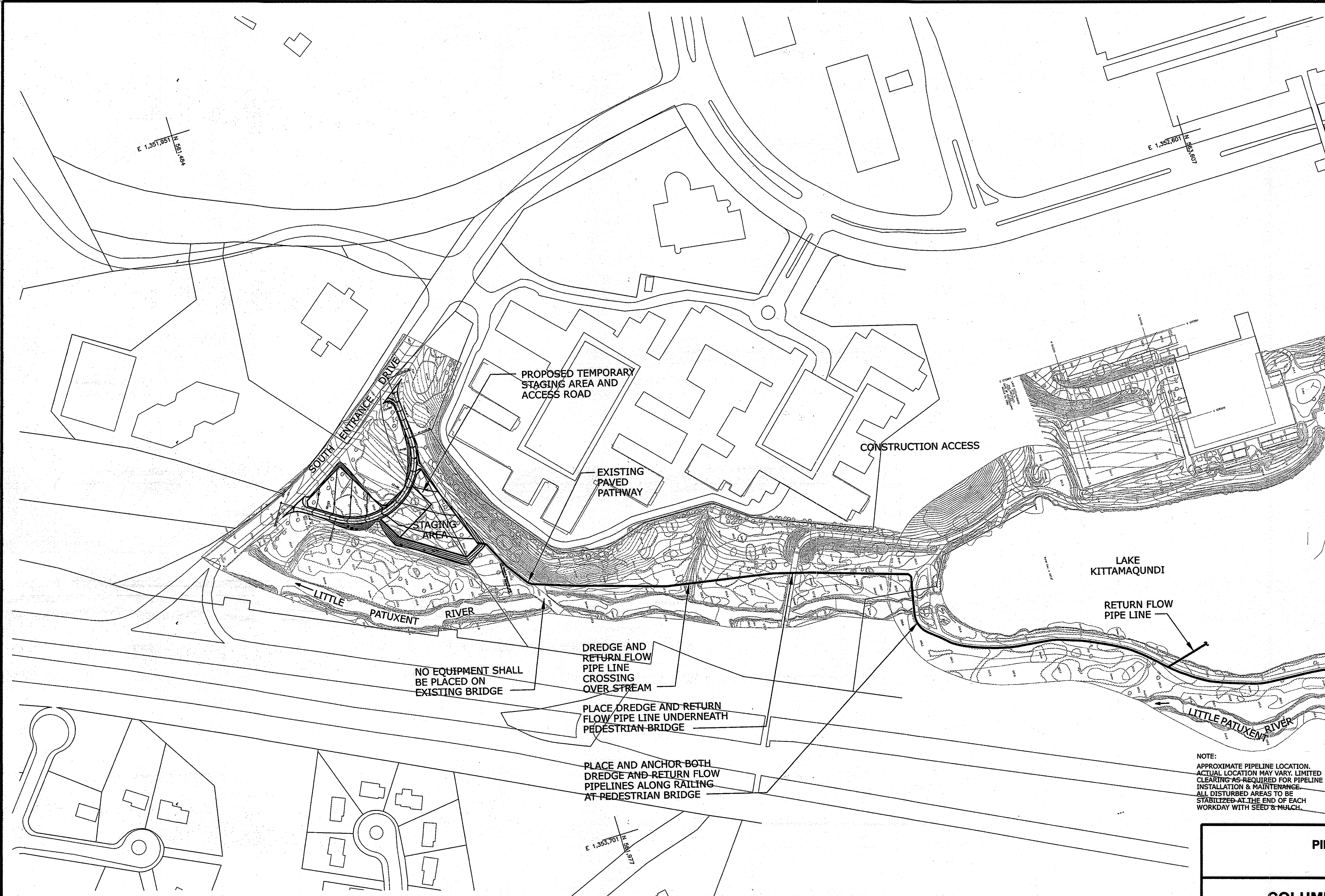
Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947



APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/9/10

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
Visty P. Dalal 12/1/09
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:

HDR

HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

11-24-2009

STATE OF MARYLAND
PIETER G. DAHMEN
PROFESSIONAL ENGINEER

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

PIPELINE ROUTING
SHEET 1 OF 2

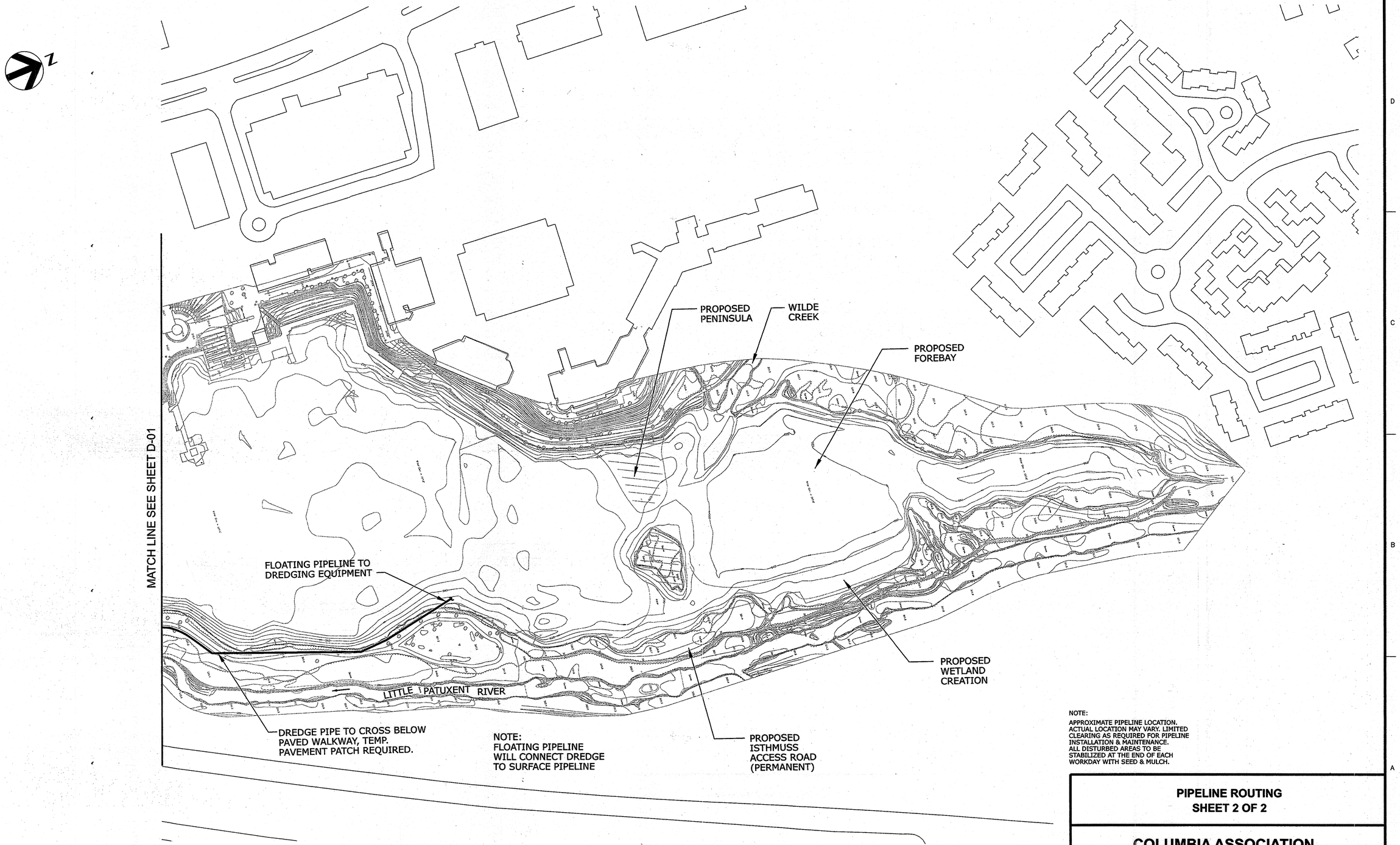
COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF
LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING D-01, SHEET 17 OF 62

SDP-08-108



NOTE:
APPROXIMATE PIPELINE LOCATION. ACTUAL LOCATION MAY VARY. LIMITED CLEARING AS REQUIRED FOR PIPELINE INSTALLATION & MAINTENANCE. ALL DISTURBED AREAS TO BE STABILIZED AT THE END OF EACH WORKDAY WITH SEED & MULCH.

PIPELINE ROUTING
SHEET 2 OF 2

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
MDE Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — No. 29981 — REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

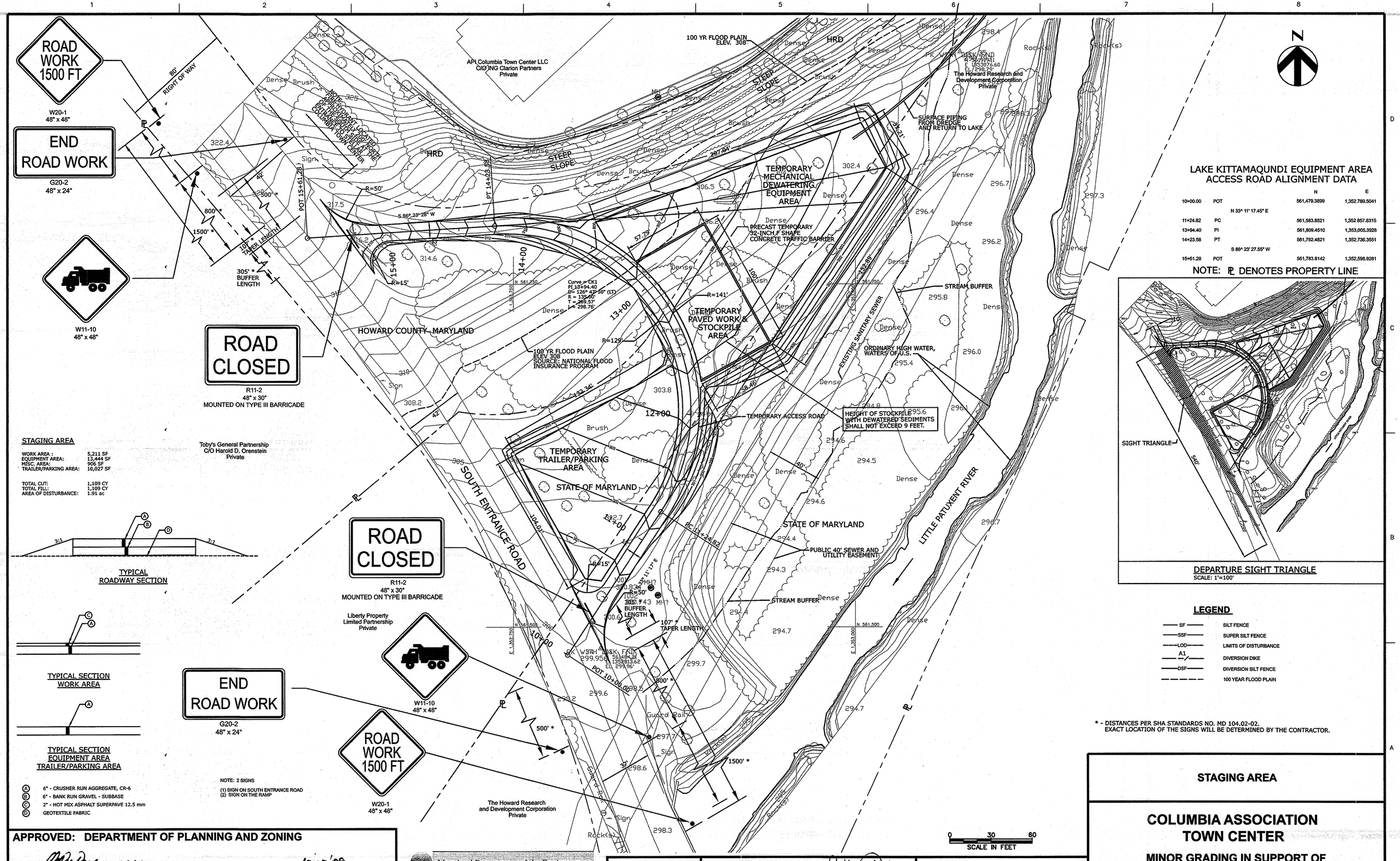
COLUMBIA ASSOCIATION
TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 6, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING D-02, SHEET 18 OF 62

SDP-08-108



LAKE KITTAMAQUNDI EQUIPMENT AREA ACCESS ROAD ALIGNMENT DATA

			N	E
10+00.00	POT		561,479.3899	1,352,789.5041
		N 33^ 11' 17.45" E		
11+24.82	PC		561,583.8521	1,352,857.8315
13+94.40	PI		561,809.4510	1,353,005.3928
14+23.58	PT		561,792.4621	1,352,736.3551
		S 86^ 23' 27.55" W		
15+61.28	POT		561,783.8142	1,352,598.9281

NOTE: ℄ DENOTES PROPERTY LINE

DEPARTURE SIGHT TRIANGLE
SCALE: 1"=100'

STAGING AREA

WORK AREA :	5,211 SF
EQUIPMENT AREA:	13,444 SF
MISC. AREA:	906 SF
TRAILER/PARKING AREA:	10,027 SF
TOTAL CUT:	1,109 CY
TOTAL FILL:	1,109 CY
AREA OF DISTURBANCE:	1.91 ac

TYPICAL ROADWAY SECTION

TYPICAL SECTION WORK AREA

TYPICAL SECTION EQUIPMENT AREA TRAILER/PARKING AREA

- (A) 6" - CRUSHER RUN AGGREGATE, CR-6
- (B) 6" - BANK RUN GRAVEL - SUBBASE
- (C) 2" - HOT MIX ASPHALT SUPERPAVE 12.5 mm
- (D) GEOTEXTILE FABRIC

NOTE: 2 SIGNS

(1) SIGN ON SOUTH ENTRANCE ROAD
(2) SIGN ON THE RAMP

LEGEND

- SF — SILT FENCE
- SSF — SUPER SILT FENCE
- LOD — LIMITS OF DISTURBANCE
- A1 — DIVERSION DIKE
- DSF — DIVERSION SILT FENCE
- 100 YEAR FLOOD PLAIN

* - DISTANCES PER SHA STANDARDS NO. MD 104.02-02.
EXACT LOCATION OF THE SIGNS WILL BE DETERMINED BY THE CONTRACTOR.

0 30 60
SCALE IN FEET

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Vijay P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — NO. 29851 — REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

STAGING AREA

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION

ELECTION DISTRICT 6, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING E-01, SHEET 19 OF 62

SDP-08-108

LAKE KITTAMAQUNDI RESTORATION PROJECT

WETLAND CREATION AREAS

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION ELECTION DISTRICT 5, HOWARD COUNTY MD. TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING F-01, SHEET 20 OF 62

SDP-08-108

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 12/23/09
Chief, Division of Land Development	Date 1/07/10
Director, DEP.	Date 1/7/10

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

STATE OF MARYLAND — PIETER G. DAHMEN — REGISTERED PROFESSIONAL ENGINEER

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

MATCH LINE SHEET F1

N 565,000
E 1,353,500
N 564,500
E 1,353,500
N 565,000
E 1,354,000
N 564,500
E 1,354,000

WILDE CREEK

PROPOSED FOREBAY

PROPOSED WETLAND CREATION AREA

EXISTING EDGE OF WATER

PROPOSED RIPRAP CONTAINMENT BERM

START IMBRICATED RIPRAP

END IMBRICATED RIPRAP

PROPOSED WEST PENINSULA

EXISTING ISLAND VEGETATION TO BE RETAINED

PROPOSED EAST ISLAND EXPANSION

PROPOSED PERMANENT ISTHMUS ACCESS ROAD

STREAM BUFFER

RIVER

PATUXENT

LITTLE

Water

I G-02

J G-02

K G-02

0 40 80
SCALE IN FEET

LEGEND

- PROPOSED PERMANENT ISTHMUS ACCESS ROAD
- DREDGED MATERIAL
- EXISTING ISLAND – AREA NOT TO BE DISTURBED
- PROPOSED WETLAND
- RIPRAP CONTAINMENT BERM

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/22/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:

HDR

HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND
PIETER G. DAHMEN
No. 29961
REGISTERED
PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

LAKE KITTAMAQUNDI RESTORATION PROJECT

WETLAND CREATION AREAS

COLUMBIA ASSOCIATION
TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 6, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING F-02, SHEET 21 OF 62

SDP-08-108

C:\PW\working\PITT\data\78119\Wetland Creation Areas.dwg, WTT-F-02, 11/24/2009 11:14:02 AM, dmorris

LAKE KITTAMAQUNDI RESTORATION PROJECT

PLANTING PLAN

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 12/22/09
Chief, Division of Land Development	Date 1/07/10
Director, DEP.	Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING F-03, SHEET 22 OF 62

SDP-08-108

MATCH LINE SHEET F3

N 565,000
E 1,353,500
N 565,000
E 1,354,000
N 564,500
E 1,353,500
N 564,500
E 1,354,000

EXISTING EDGE OF WATER
PROPOSED WETLAND SEEDING AREA
PROPOSED RIPRAP CONTAINMENT BERM
PROPOSED WEST PENINSULA
START IMBRICATED RIPRAP
PROPOSED EAST ISLAND EXPANSION
END IMBRICATED RIPRAP
EXISTING ISLAND VEGETATION TO BE RETAINED
PROPOSED PERMANENT ISTHMUS ACCESS ROAD
STREAM BUFFER
RIVER
PATUXENT
LITTLE
Water
Dense
Sal
Aln
RM
AS
BE
SM
RB

LEGEND

Sal	Black Willow *(Salix nigra)*
Aln	Smooth Alder *(Alnus serrulata)*
	WETLAND TREES (GROUPS OF 3):
RB	River Birch *(Betula Nigra)*
SM	Silver Maple *(Acer Saccharinum)*
RM	Red Maple *(Acer Rubrum)*
BE	Box Elder *(Acer Negundo)*
AS	American Sycamore *(Platanus Occidentalis)*
	WETLAND SEED MIX
	RIPRAP CONTAINMENT BERM
	IMBRICATED RIPRAP

0 40 80
SCALE IN FEET

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal
Visty P. Dalal 12/1/09
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION
PIETER G. DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — NO. 29951 — REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

LAKE KITTAMAQUNDI RESTORATION PROJECT

PLANTING PLAN

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF
LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 6, HOWARD COUNTY MD.
TAX MAP 30 AND 36

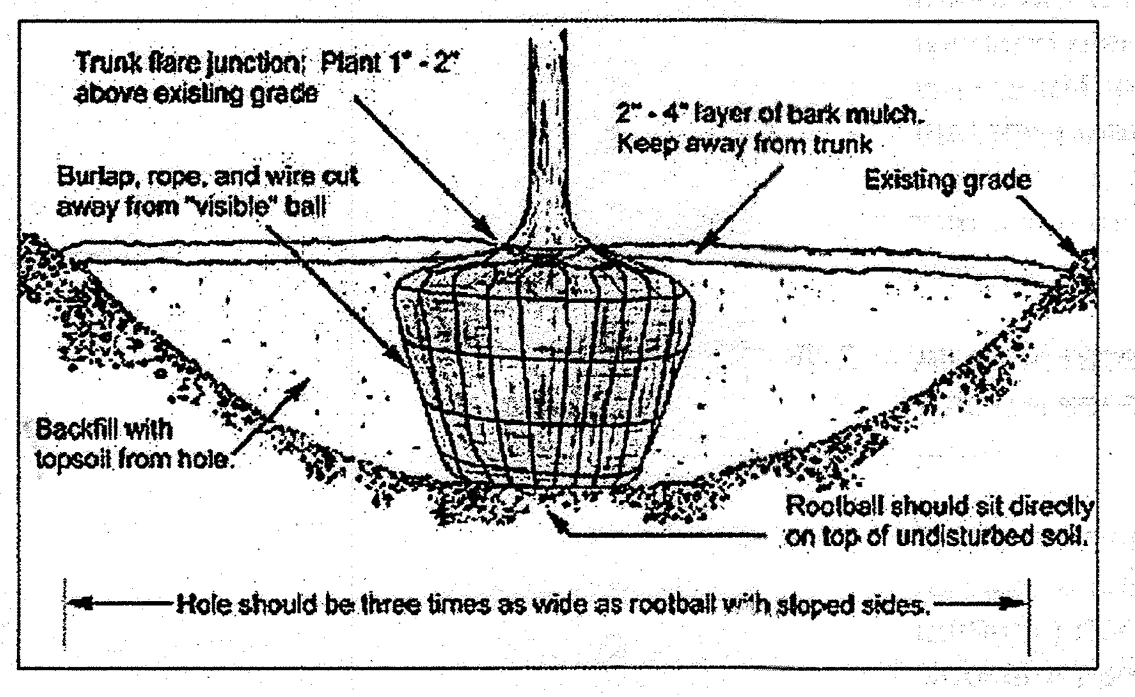
SCALE AS SHOWN
JUNE 18, 2009

DRAWING F-04, SHEET 23 OF 62

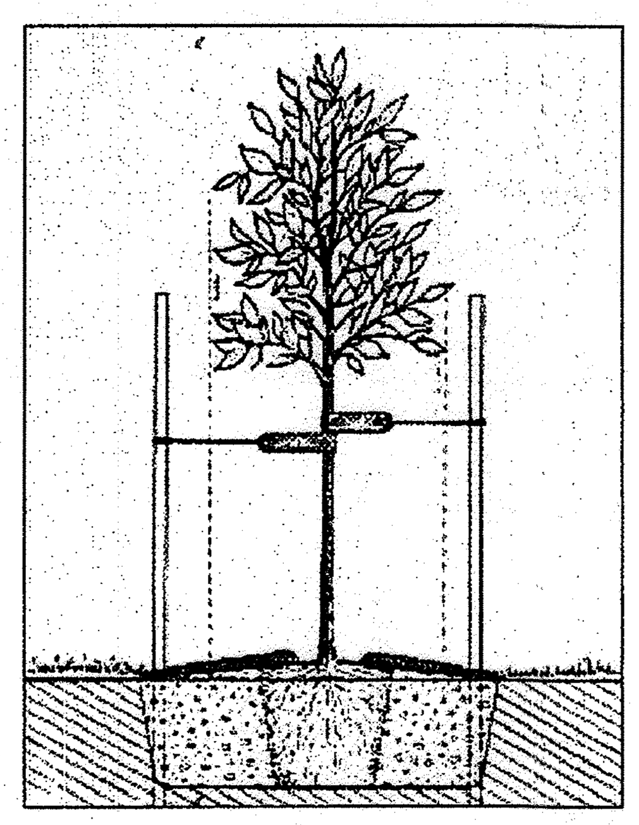
SDP-08-108

C:\PWworking\PITT\kms78119\Planting Plan.dwg, KITT-F-04, 11/24/2009 11:21:01 AM, dwonfs

BALL & BURLAP DETAIL



PLANT STAKING DETAIL



PLANTING NOTES

W-1 Plants and seeds shall be obtained from a commercial supplier. The Contractor shall make arrangements with reliable sources to ensure that an adequate supply of the required plant and seed material is available. A source of supply shall be submitted in writing to the Project Engineer prior to beginning of construction, and shall guarantee that the plant and seed materials are being reserved or grown for the Contractor. If this requirement is not met, the Contractor will be responsible for the additional costs of supplying larger size materials, larger container size, or substitute plants chosen by the Project Engineer.

W-2 All seed received from commercial suppliers shall be as specified in the plans. All wetland seeding shall be seeded at the specified rate in pounds of Pure Live Seed (PLS) per Acre.

W-3 In the event that a seed specified is not commercially available, the Contractor may request a substitution in writing. All requests for substitutions shall be made at least 2 months prior to seeding and be approved by the Project Environmental Inspector. Substitute seed must meet the same testing requirements as the original seed specified.

W-4 All plant material received from commercial suppliers shall conform to the current issue of the American Standard for Nursery Stock, published by the American Association of Nurserymen.

W-5 Substitutions of plant material will be allowed only under the conditions specified in the Special Provision for Wetland Planting. Requests for plant material substitution must be submitted in writing at least two months prior to planting, and the substitution must be approved by the Project Environmental Inspector.

W-6 The Contractor is responsible for installing all plant material in the appropriate season for each plant type. Trees and shrubs shall be planted during the period from November 15 through March 15 (outside the growing season). The herbaceous material shall be planted from April 15 to June 30. Any request for variance from these times of year restrictions must be submitted in writing at least two months prior to planting and must be approved by the Project Environmental Inspector.

W-7 All plant material, unless otherwise specified, shall be uniformly shaped and have a vigorous root system. The plant material shall be healthy, vigorous, and free from defects, decay, abrasions of the bark, plant diseases, insect pest eggs, and all forms of infestations. The plant material must be fresh and free from transplant shock or visible wilt. Unhealthy plant stock and plants from cold storage are unacceptable and will be rejected.

W-8 All container grown stock shall have been propagated in a container large enough for the roots to have developed sufficiently to hold its soil when removed from the container. Container stock with poorly developed roots is unacceptable and will be rejected.

W-9 The Contractor shall verify all final grades prior to beginning planting work. If final grades differ from those depicted on the grading plan, the Contractor shall notify the Project Engineer and Project Environmental Inspector prior to planting in the area of concern.

W-10 After soil preparation and prior to seeding and planting, equipment will not be permitted on the wetland planting zones without prior approval from the Project Engineer.

W-11 Seeding in wetlands areas will not require lime or fertilizer. No seeding shall occur when the soil is frozen or flooded.

W-12 The Contractor shall notify the Project Engineer and Project Environmental Inspector a minimum of 48 hours prior to commencing planting or seeding operations.

W-13 Shrubs (*Alnus serrulata* and *Salix nigra*) shall be planted in cluster arrangements along the western planting area as shown on Planting Plan Sheet 8.

W-14 – Trees (*Betula nigra, Fraxinus pennsylvanica, Acer rubrum, Acer saccharinum, and Platanus occidentalis*) shall be planted as shown on the Planting Plan (Sheets 7 and 8).

W-15 The final location and orientation of all plant material, as well as the location of all planting zones, will be subject to the approval of the Project Environmental Inspector. The Contractor will be responsible for replanting or reseeding any plant material installed without the approval of the Project Environmental Inspector.

W-16 Each plant shall be fertilized with 20-10-5 controlled-release tablets. The formulation specified (20-10-5) is a readily available commercial formulation. Formulations vary considerably by manufacturer, and other formulations are acceptable, provided the tablets are not readily water-soluble. The selection of fertilizer and all application specifications shall be approved by the Project Environmental Inspector prior to planting. The tablets shall be buried within the planting pit near the plant's root system. Plant stock shall be fertilized at the following rates:

Stock	No. of Tablets
# 7 container	3
Ball & Burlap	4

(Approximate number of tablets equals 249. Cost to be included in other pay items.)

W-17 During planting the Contractor shall water each plant with the following minimum quantities of water, unless otherwise directed by the Project Engineer:

Trees	1 gallon per pit
Shrubs	1 gallon per pit

W-18 The Contractor shall be required to guarantee and maintain all plant materials for a period of two consecutive years after date of acceptance of finished planting by the Project Engineer.

FLOOD PLAIN WILDLIFE MIX: ERNMX-154
Seed at 15 pounds per acre

Percentage	Scientific Name	Common Name	Quantity
15.0%	*Carex vulpinoidea*	Fox Sedge	2.75 lbs
15.0%	*Elymus virginicus*	Virginia Wild Rye	2.75 lbs
11.0%	*Elymus canadensis*	Canada Wild Rye	2.00 lbs
10.0%	*Andropogon gerardii, WI Ecotype*	WI Ecotype Big Bluestem	1.75 lbs
7.0%	*Verbena hastata*	Blue Vervain	1.25 lbs
6.0%	*Heliopsis helianthoides*	Ox Eye Sunflower	1.00 lbs
5.0%	*Panicum clandestinum*	Tioga Deer Tongue	1.00 lbs
4.0%	*Carex crinita*	Fringed (Nodding) Sedge	0.75 lbs
4.0%	*Desmodium canadense*	Showy Tick Trefoil	0.75 lbs
3.0%	*Helenium autumnale*	Common Sneezeweed	0.50 lbs
3.0%	*Iris versicolor*	Blue Flag	0.50 lbs
2.0%	*Carex scoparia*	Blunt Broom Sedge	0.25 lbs
2.0%	*Carex stipata*	Awl Sedge	0.25 lbs
2.0%	*Carex vesicaria*	Inflated Sedge	0.25 lbs
2.0%	*Eupatorium perfoliatum*	Boneset	0.25 lbs
2.0%	*Panicum virgatum, Shelter*	Shelter Switch Grass	0.25 lbs
2.0%	*Verbesina alternifolia*	Wingstem	0.25 lbs
2.0%	*Vernonia gigantea*	Giant Ironweed	0.25 lbs
1.0%	*Carex squarrosa*	Squarrose Sedge	0.25 lbs
1.0%	*Carex tribuloides*	Bristlebract Sedge	0.25 lbs
1.0%	*Monarda fistulosa*	Wild Bergamot	0.25 lbs

PLANTING LIST

Common Name	Scientific Name	Indicator Status	Container Type	Minimum Size	Quantity
Silver Maple	*Acer saccharinum*	FACW	Ball & Burlap	2-3" caliper	6
Red Maple	*Acer rubrum*	FAC	Ball & Burlap	2-3" caliper	6
Box Elder	*Acer Negundo*	FACW	Ball & Burlap or #7 container	1-2" caliper	6
River Birch	*Betula nigra*	FACW	Ball & Burlap or #7 container	2-3" caliper	6
American Sycamore	*Platanus occidentalis*	FACW-	Ball & Burlap or #7 container	2-3" caliper	6
Smooth Alder	*Alnus serrulata*	OBL	#7 container	1-2" caliper	28
Black Willow	*Salix nigra*	FACW+	#7 container	1-2" caliper	15

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP — Date 1/7/10

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND PIETER G. DAHMEN No. 29997 REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

LAKE KITTAMAQUNDI RESTORATION PROJECT

PLANTING DETAILS AND NOTES

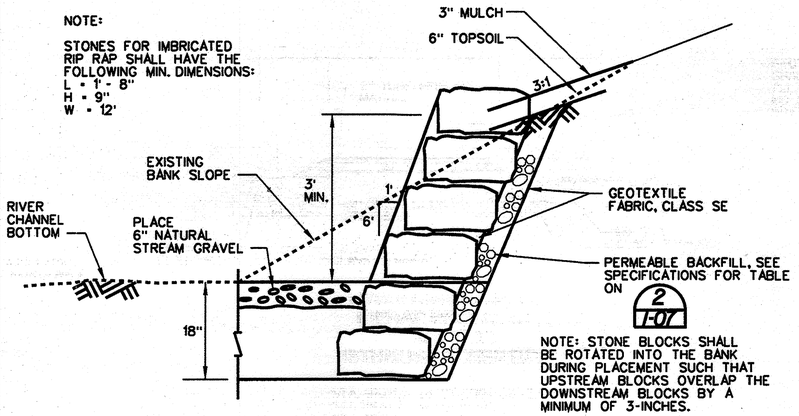
COLUMBIA ASSOCIATION
TOWN CENTER

MINOR GRADING IN SUPPORT OF
LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING F-05, SHEET 24 OF 62

SDP-08-108

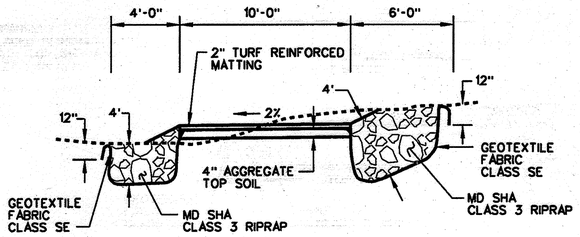


IMBRICATED RIPRAP (RIVER BANK PROTECTION)
WALL SECTION A G-01

N.T.S.

STA. 104+85 to STA. 105+45 Lt.
STA. 105+95 to STA. 106+82 Lt.
STA. 108+65 to STA. 108+95 Lt.
STA. 110+65 to STA. 111+57 Lt.

FOR INSTALLATION & MATERIAL SPECIFICATIONS, SEE 2 I-07

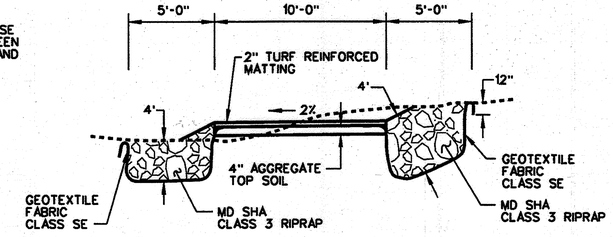


OVERFLOW AREA 1 & 2
RIPRAP PROTECTION
SECTION
ISTHMUS ACCESS ROAD B G-01

N.T.S.

STA. 100+90 to STA. 101+50 (Lt. & Rt.)
STA. 104+75 to STA. 105+25 Lt.
STA. 104+75 to STA. 105+45 Lt.

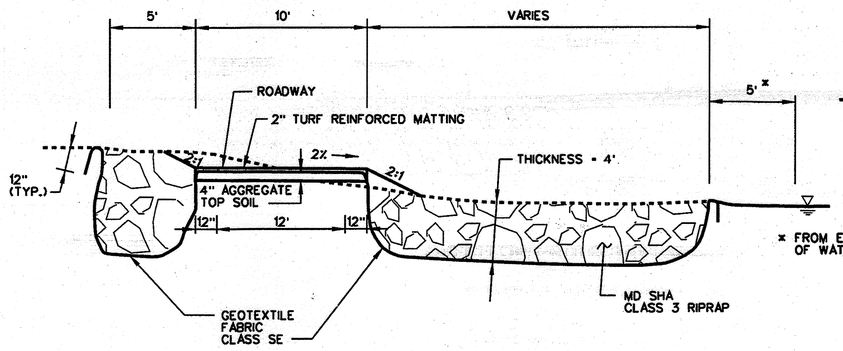
NOTE:
GEOTEXTILE FABRIC CLASS SE SHALL BE PLACED IN BETWEEN ALL AGGREGATE TOP SOIL AND MD SHA CLASS 3 RIPRAP INTERFACES



OVERFLOW AREA 4
RIPRAP PROTECTION
SECTION
ISTHMUS ACCESS ROAD C G-01

N.T.S.

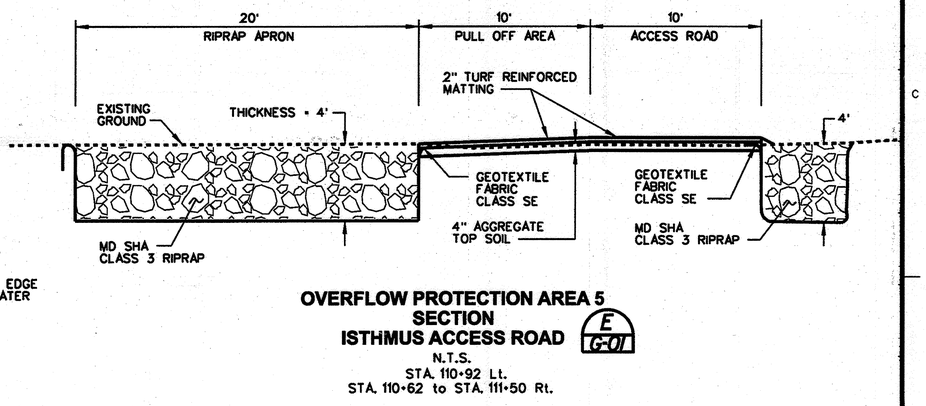
STA. 107+98 to STA. 108+40 Lt.
STA. 107+98 to STA. 108+80 Rt.



OVERFLOW PROTECTION AREA 3 DETAIL
SECTION
ISTHMUS ACCESS ROAD D G-01

N.T.S.

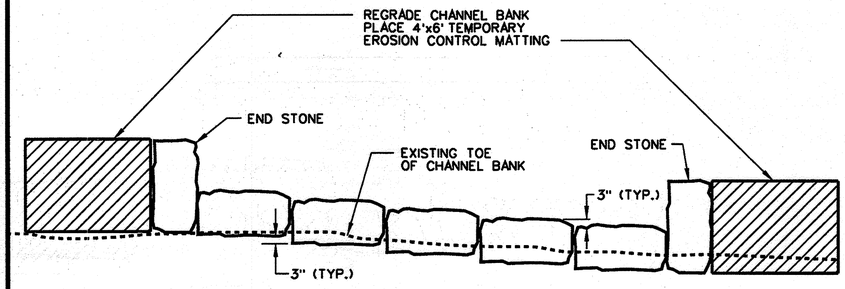
STA. 106+34 Lt.
STA. 106+05 to STA. 106+70 Rt.



OVERFLOW PROTECTION AREA 5
SECTION
ISTHMUS ACCESS ROAD E G-01

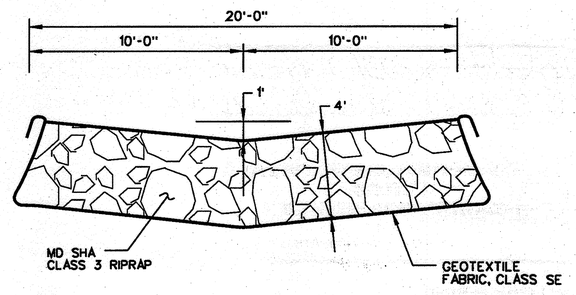
N.T.S.

STA. 110+92 Lt.
STA. 110+62 to STA. 111+50 Rt.



IMBRICATED RIPRAP RIVER BANK PROTECTION
PLAN VIEW SECTION F G-01

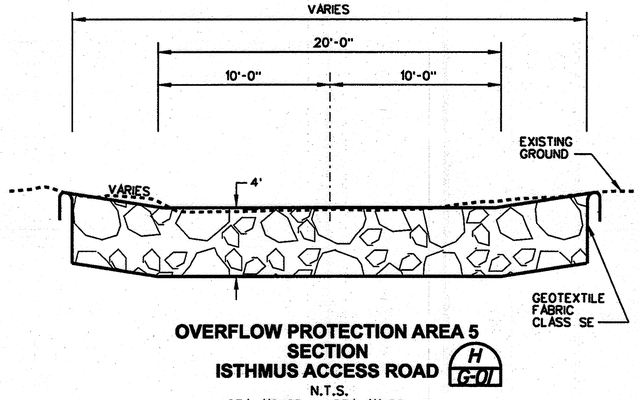
N.T.S.



OVERFLOW PROTECTION AREA 2
SECTION
ISTHMUS ACCESS ROAD G G-01

N.T.S.

STA. 106+05 to STA. 106+65 Lt.



OVERFLOW PROTECTION AREA 5
SECTION
ISTHMUS ACCESS ROAD H G-01

N.T.S.

STA. 110+65 to STA. 111+20 Lt.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
6700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — NO. 29057 — REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

RIVER BANK PROTECTION SECTIONS

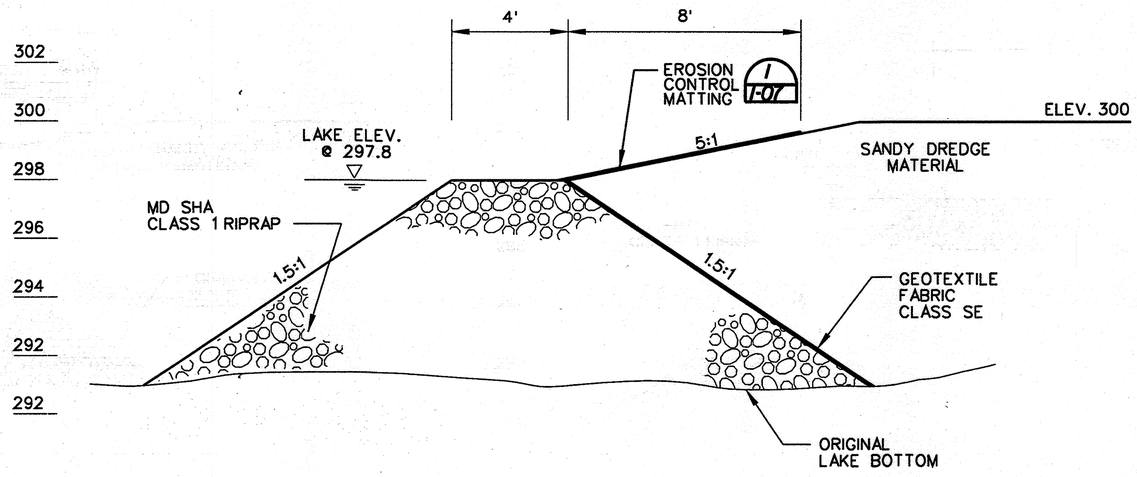
COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF
LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 6, HOWARD COUNTY MD.
TAX MAP 30 AND 36

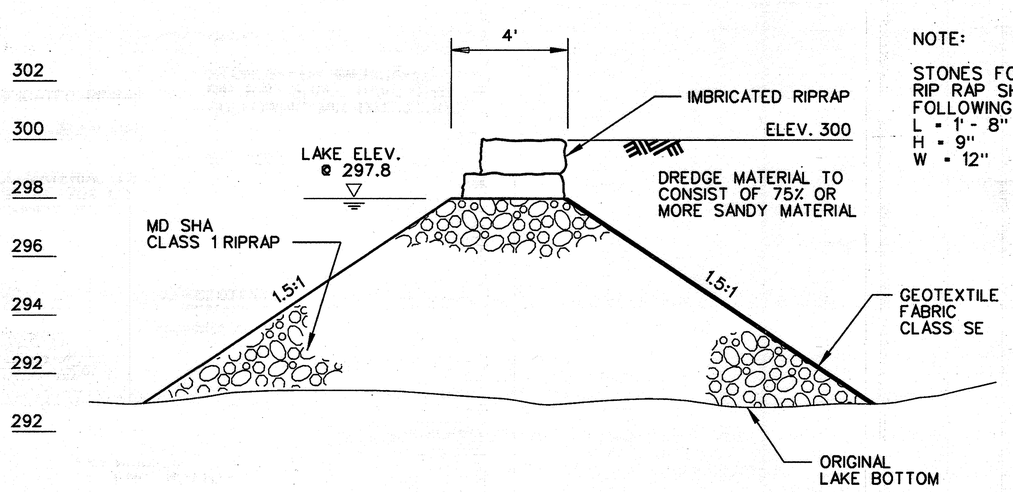
SCALE AS SHOWN
JUNE 18, 2009

DRAWING G-01, SHEET 25 OF 62

SDP-08-108



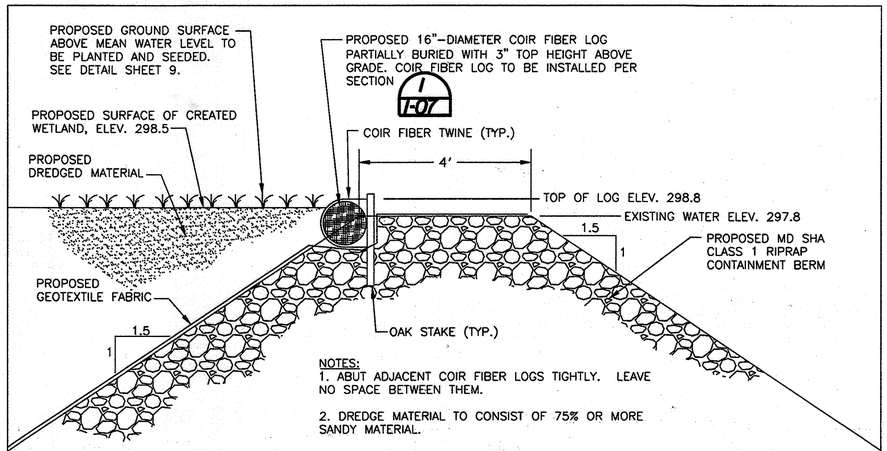
WEST PENINSULA (FOREBAY) IN-LAKE RIPRAP CONTAINMENT BERM
SECTION W/O IMBRICATED RIPRAP
SECTION I G-02
N.T.S.



NOTE:

STONES FOR IMBRICATED RIP RAP SHALL HAVE THE FOLLOWING MIN. DIMENSIONS:
L = 1' - 8"
H = 9"
W = 12"

EAST & WEST PENINSULA (FOREBAY) IN-LAKE RIPRAP CONTAINMENT BERM
SECTION WITH IMBRICATED RIPRAP
SECTION J G-02
N.T.S.



NOTES:
1. ABUT ADJACENT COIR FIBER LOGS TIGHTLY. LEAVE NO SPACE BETWEEN THEM.

2. DREDGE MATERIAL TO CONSIST OF 75% OR MORE SANDY MATERIAL.

COIR LOG MATERIAL SPECIFICATIONS AND INSTALLATION GUIDELINES K G-02

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/22/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
8700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — NO. 29951 — REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

IN-LAKE RIPRAP CONTAINMENT BERM SECTIONS

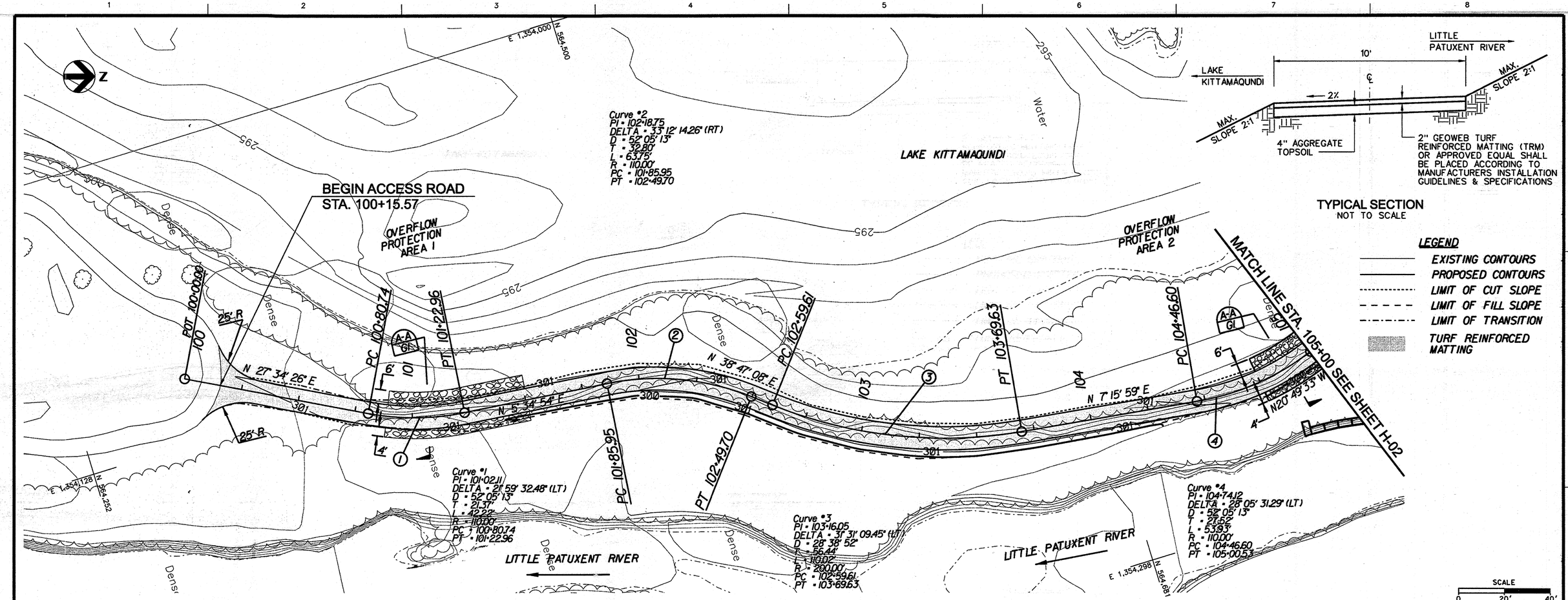
COLUMBIA ASSOCIATION
TOWN CENTER

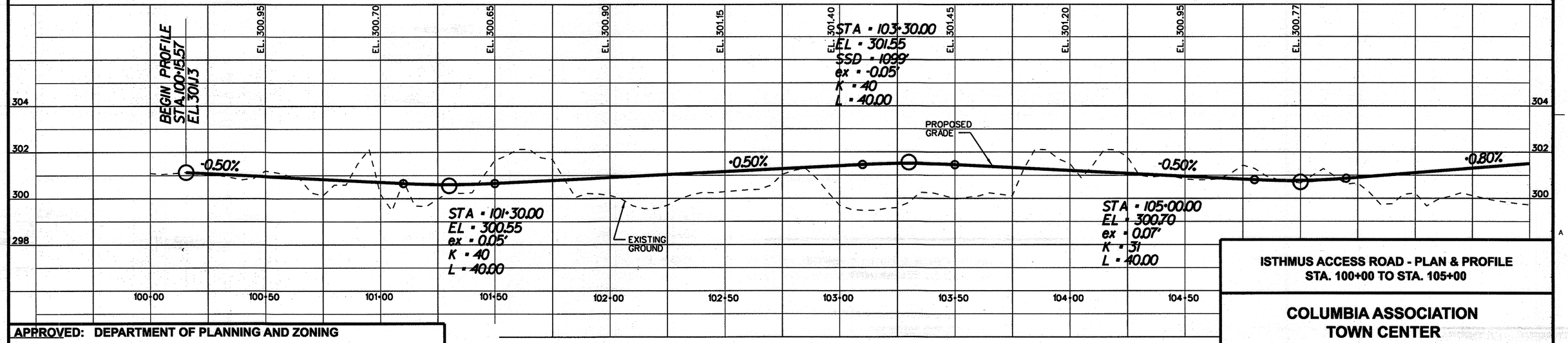
MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 6, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING G-02, SHEET 26 OF 62

SDP-08-108





APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12.23.09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND
PIETER G. DAHMEN
No. 29571
REGISTERED
PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

ISTHMUS ACCESS ROAD - PLAN & PROFILE
STA. 100+00 TO STA. 105+00

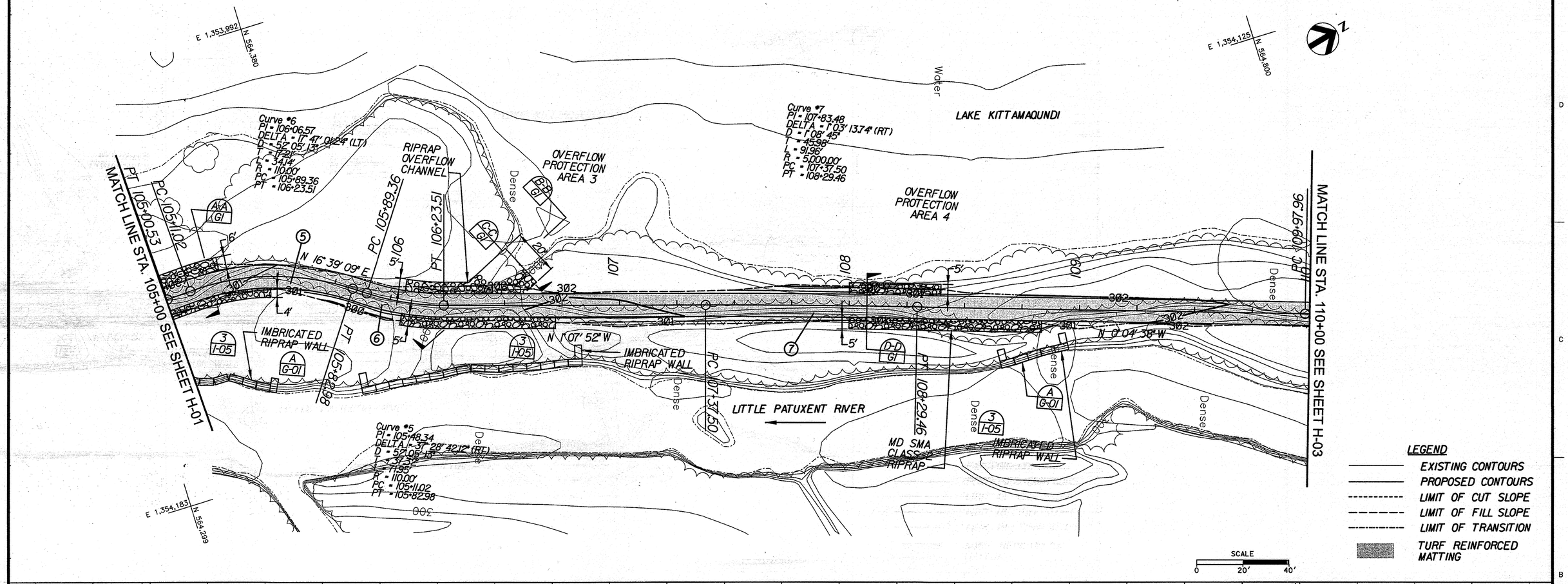
COLUMBIA ASSOCIATION
TOWN CENTER

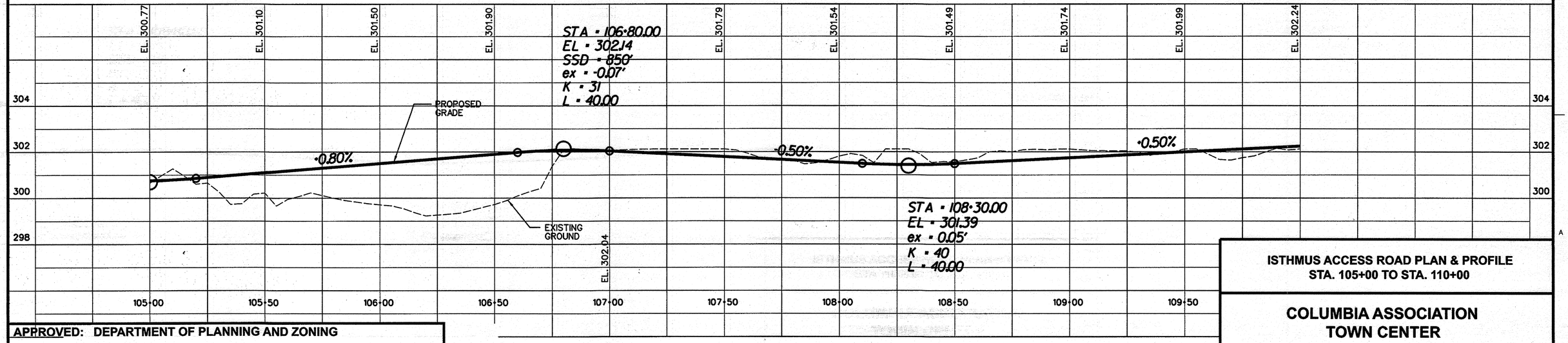
MINOR GRADING IN SUPPORT OF
LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 6, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING H-01, SHEET 27 OF 62

SDP-08-108





APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/28/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
MDE Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — NO. 29951 — REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

ISTHMUS ACCESS ROAD PLAN & PROFILE
STA. 105+00 TO STA. 110+00

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING H-02, SHEET 28 OF 62

SDP-08-108

ISTHMUS ACCESS ROAD PLAN & PROFILE
STA. 110+00 TO STA. 115+00

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, ~~DEP~~ — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION
PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

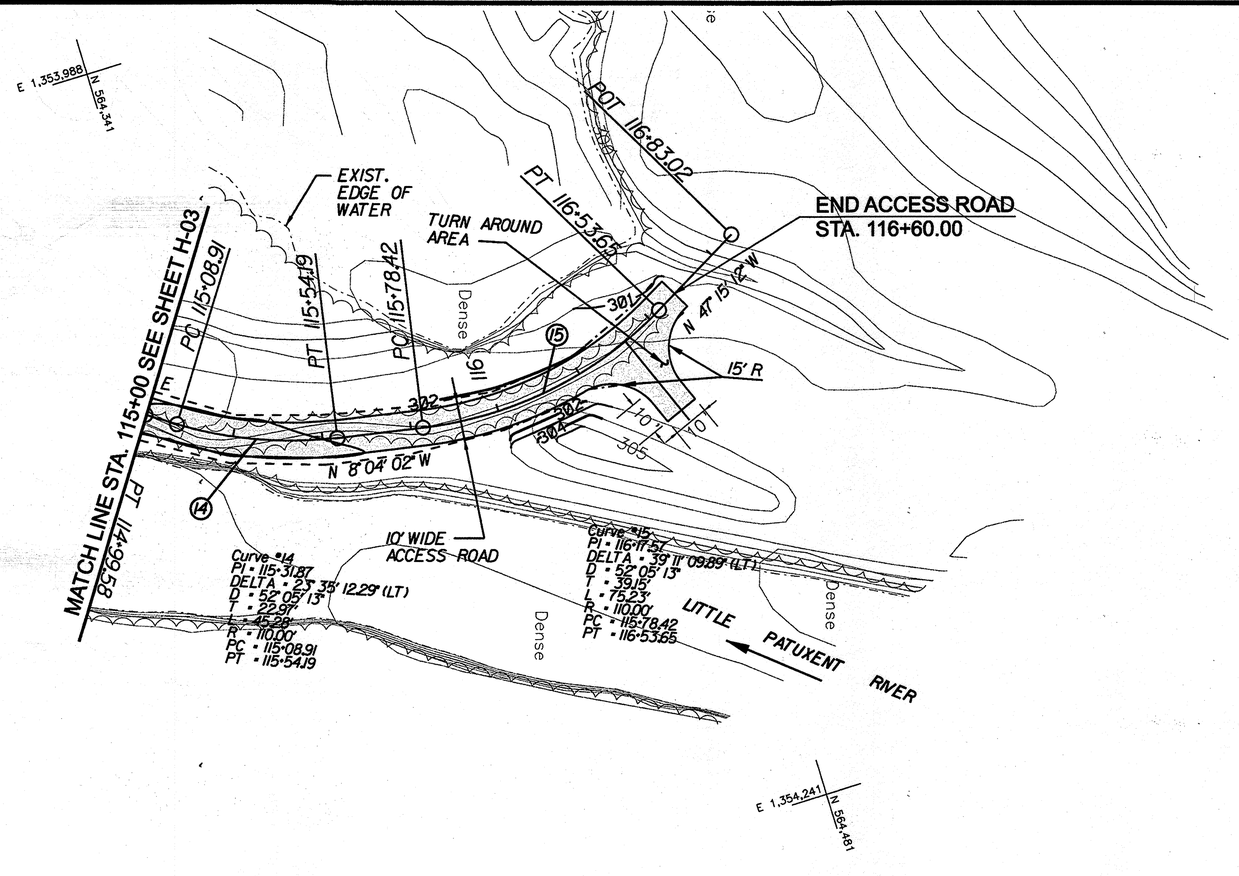
COLUMBIA ASSOCIATION
TOWN CENTER

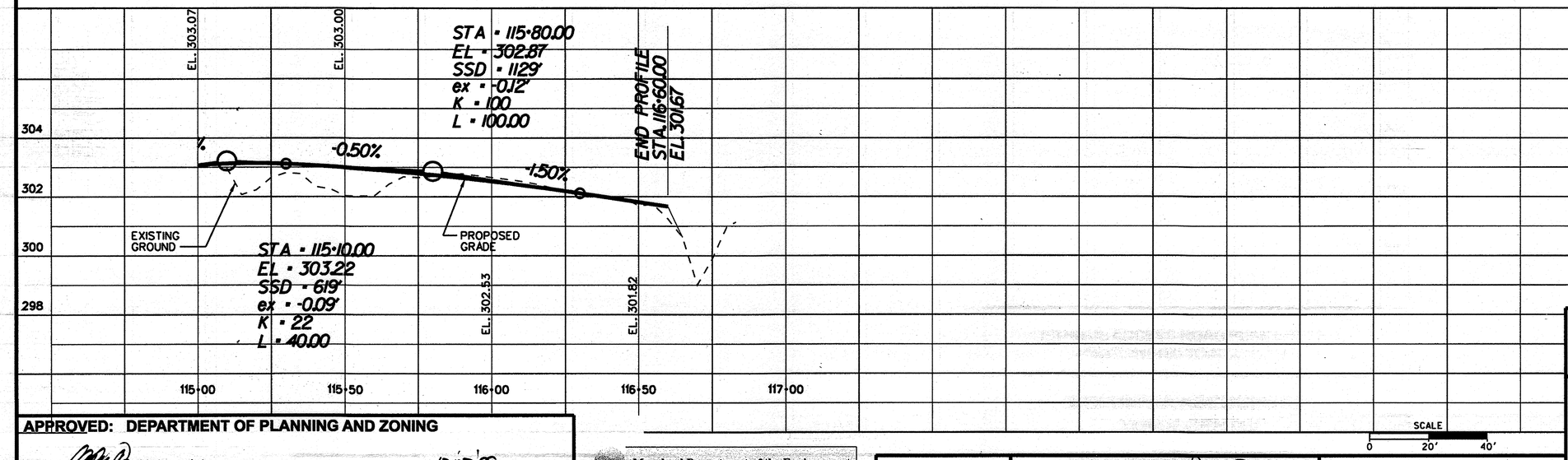
MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING H-03, SHEET 29 OF 62

SDP-08-108





LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- LIMIT OF CUT SLOPE
- LIMIT OF FILL SLOPE
- LIMIT OF TRANSITION
- TURF REINFORCED MATTING

SCALE 0 20' 40'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/22/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION
PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — No. 29981 — REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

ISTHMUS ACCESS ROAD PLAN & PROFILE
STA. 110+00 TO STA. 115+00

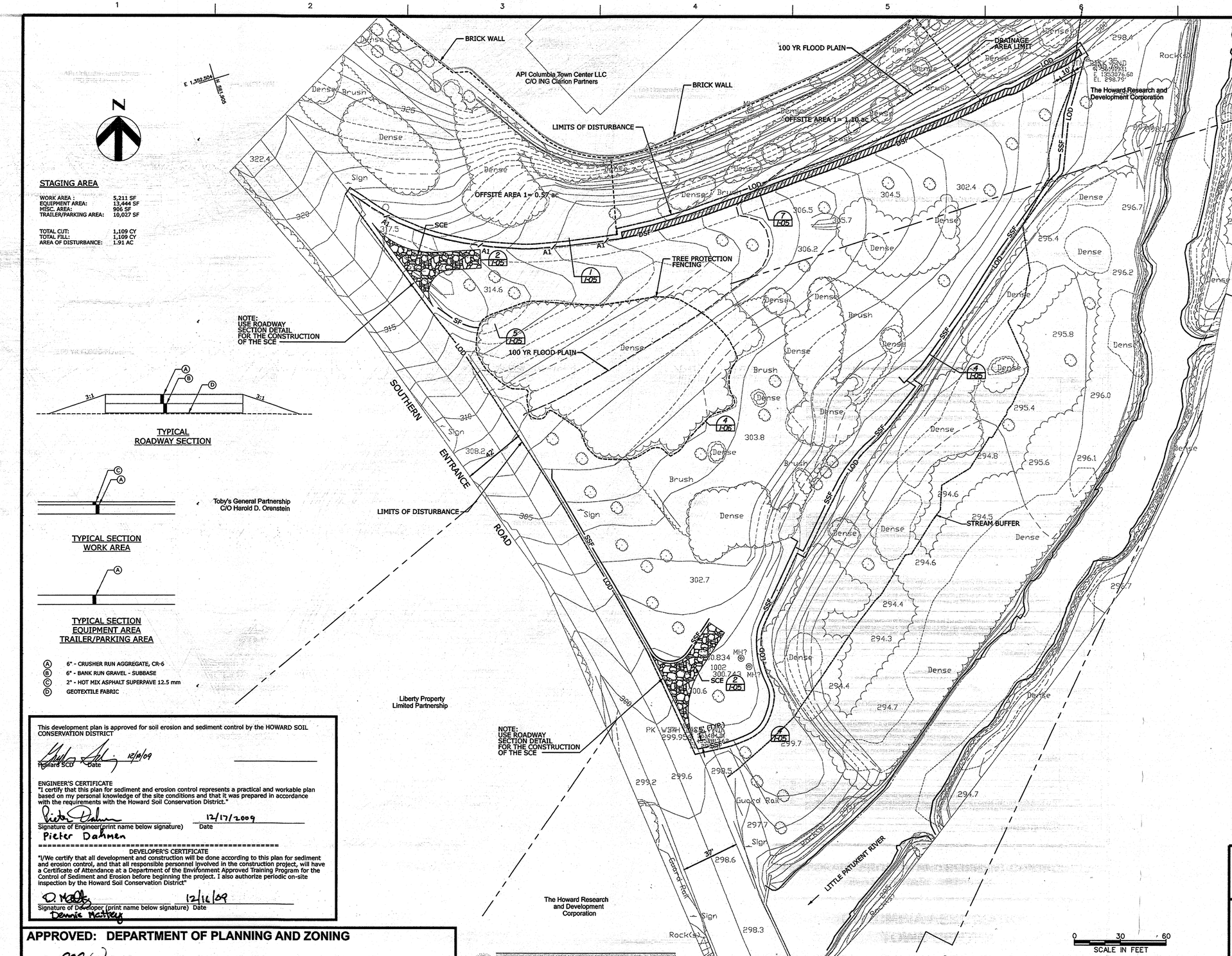
COLUMBIA ASSOCIATION
TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING H-04, SHEET 30 OF 62

SDP-08-108



LEGEND

- SF — SILT FENCE
- SSF — SUPER SILT FENCE
- LOD — LIMITS OF DISTURBANCE
- A1 — DIVERSION DIKE
- DSF — DIVERSION SILT FENCE
- EROSION CONTROL MATTING
- 100 YEAR FLOOD PLAIN

NOTE:
EXTEND END OF SSF UPHILL FOR A DISTANCE OF 5 ft. UNLESS NOTED.

STAGING AREA

WORK AREA :	5,211 SF
EQUIPMENT AREA:	13,444 SF
MISC. AREA:	906 SF
TRAILER/PARKING AREA:	10,027 SF
TOTAL CUT:	1,109 CY
TOTAL FILL:	1,109 CY
AREA OF DISTURBANCE:	1.91 AC

TYPICAL ROADWAY SECTION

TYPICAL SECTION WORK AREA

TYPICAL SECTION EQUIPMENT AREA TRAILER/PARKING AREA

- (A) 6" - CRUSHER RUN AGGREGATE, CR-6
- (B) 6" - BANK RUN GRAVEL - SUBBASE
- (C) 2" - HOT MIX ASPHALT SUPERPAVE 12.5 mm
- (D) GEOTEXTILE FABRIC

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

Howard SCD — Date 12/9/09

ENGINEER'S CERTIFICATE
"I certify that this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements with the Howard Soil Conservation District."

Signature of Engineer (print name below signature) Pieter Dahmen — Date 12/17/2009

DEVELOPER'S CERTIFICATE
"I/We certify that all development and construction will be done according to this plan for sediment and erosion control, and that all responsible personnel involved in the construction project, will have a Certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard Soil Conservation District"

Signature of Developer (print name below signature) Dennis Mattley — Date 12/16/09

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/22/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V.P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — No. 29991 — REGISTERED PROFESSIONAL ENGINEER
4-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

Sediment Control

Sequence of Construction for the construction of the Staging Area for Dredging Lake Kittamaqundi

Task	Phase I	Duration (Days)
1	Contractor is to notify the Howard County Department of Inspections Sediment Control Division 24-hours prior to comencing work at (410) 313-1855 and obtain Grading and MDE permits. Reference MDE Tracking Number 200863535.	2
2	Obtain and bring all required E & S materials for construction to the project site	1
3	Clear and grub for stabilized construction entrances (SCE) and access road. Install SCE's for a minimum distance of 50 ft.	2
4	Install diversion dike, diversion silt fence , super silt fence, tree protection fencing and all other controls.	7
5	After receiving permission of the Howard County Sediment Control Inspector, clear and grub within limits of construction of the Staging Area	5
	Total	17

Task	Phase II	Duration (Days)
6	Construct Staging Area Access Road	5
7	Construct Trailer / Parking Area	5
8	Construct Equipment and Working Area	10
9	Mulch, place standard erosion control matting and seed disturbed and exposed areas not to be paved or covered with gravel	2
10	Provide a copy of the approved sediment control plan or other permit authority for the site(s) receiving dewatered dredged material to the inspector and Howard Soil Conservation District and obtain written permission from inspector to proceed.	7
11	Install Turbidity Curtain in Lake Kittamaqundi	2
12	Commence dredging. Maintain diversion dike, diversion fence and super silt fence during duration of dredging and dewatering, repair perimeter controls as necessary. The Contractor shall comply with all applicable federal, state, and local laws and regulations, including project permits. Effluent leaving the site shall not exceed Maryland turbidity limits of 150 Ntu at any time or 50 Ntu as a monthly average per COMAR 26.08.02	100
13	Remove access road, gravel surface of equipment area and the paved working area. Restore staging area and temporary access road to original contours, place top soil with erosion control matting and seed.	15
14	Stabilize remaining disturbed areas and remove sediment controls upon approval of Howard County Sediment Control Inspectors	5
	Total	151
	Total Initial + Final Phase	168

Sequence of Construction for the construction of the Istmus Access Road of Lake Kittamaqundi

Task	Phase III	Duration (Days)
15	Contractor is to notify the Howard County Department of Inspections Sediment Control Division 24-hours prior to comencing work at (410) 313-1855 and obtain Grading and MDE permits. Reference MDE Tracking Number 200863535.	2
16	Obtain and bring all required E & S materials for construction to the project site	1
17	Clear and grub for stabilized construction entrances (SCE) and access road. Install SCE's for a mimimum distance of 50 ft and install access road	2
18	After receiving permission of the Howard County Sediment Control Inspector, clear and grub within limits of construction of the Istmus Access Road and overflow protection areas	5
	Total	10

Task	Phase IV	Duration (Days)
19	Construct Staging Area Access Road	20
20	Construct Riprap Overflow Area	10
21	Remove debris from channel, construct imbricated channel banks stabilization	15
22	Mulch place standard erosion control matting and seed on disturbed and exposed areas not to be paved or cov	2
23	Stabilize remaining disturbed areas and remove sediment controls upon approval of Howard County Sediment Control Inspectors	5
	Total	52
	Total Initial + Final Phase	62

TEMPORARY EROSION AND SEDIMENT CONTROL PLAN
INITIAL PHASE - STAGING AREA

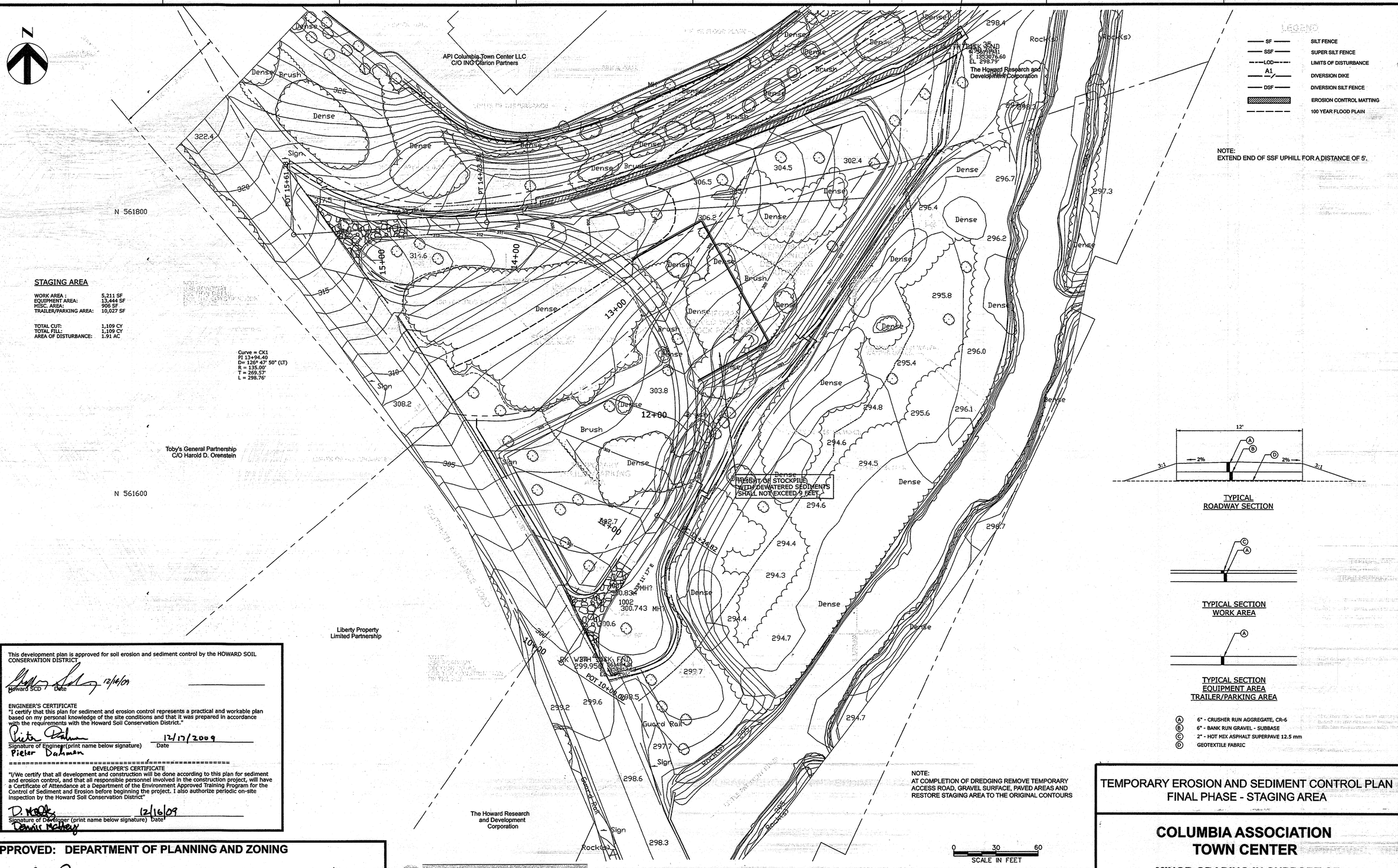
COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 6, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING I-01, SHEET 31 OF 62

SDP-08-108



STAGING AREA

WORK AREA :	5,211 SF
EQUIPMENT AREA:	13,444 SF
MISC. AREA:	906 SF
TRAILER/PARKING AREA:	10,027 SF
TOTAL CUT:	1,109 CY
TOTAL FILL:	1,109 CY
AREA OF DISTURBANCE:	1.91 AC

TYPICAL ROADWAY SECTION

TYPICAL SECTION WORK AREA

TYPICAL SECTION EQUIPMENT AREA TRAILER/PARKING AREA

- (A) 6" - CRUSHER RUN AGGREGATE, CR-6
- (B) 6" - BANK RUN GRAVEL - SUBBASE
- (C) 2" - HOT MIX ASPHALT SUPERPAVE 12.5 mm
- (D) GEOTEXTILE FABRIC

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

Howard SCD — Date 12/4/09

ENGINEER'S CERTIFICATE
"I certify that this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements with the Howard Soil Conservation District."

Signature of Engineer (print name below signature) Pieter Dahmen — Date 12/17/2009

DEVELOPER'S CERTIFICATE
"I/We certify that all development and construction will be done according to this plan for sediment and erosion control, and that all responsible personnel involved in the construction project, will have a Certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard Soil Conservation District"

Signature of Developer (print name below signature) Dennis McNeely — Date 12/16/09

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/28/09

Chief, Division of Land Development — Date 1/09/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
MDE Water Management Administration
Dam Safety Division
V. P. Dalal
Vishy P. Dalal 12/1/09
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION
PIETER G. DAHMEN, PE
HDR ENGINEERING INC.
STATE OF MARYLAND — PIETER G. DAHMEN — No. 29997 — REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

TEMPORARY EROSION AND SEDIMENT CONTROL PLAN
FINAL PHASE - STAGING AREA

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING I-02, SHEET 32 OF 62

SDP-08-108

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

12/14/09
Howard SCD Date

ENGINEER'S CERTIFICATE
"I certify that this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements with the Howard Soil Conservation District."

12/17/2009
Signature of Engineer(print name below signature) Date
Pieter Dahmen

DEVELOPER'S CERTIFICATE
"I/We certify that all development and construction will be done according to this plan for sediment and erosion control, and that all responsible personnel involved in the construction project, will have a Certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard Soil Conservation District"

D. McAfey 12/16/09
Signature of Developer (print name below signature) Date
Dennis McAfey

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09
Chief, Division of Land Development — Date 1/07/10
Director, DPZ — Date 1/7/10

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND
PIETER G. DAHMEN
No. 29997
REGISTERED
PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

EROSION & SEDIMENT CONTROL PLAN
ISTHMUS ACCESS ROAD
INITIAL AND FINAL DESIGN

COLUMBIA ASSOCIATION
TOWN CENTER

MINOR GRADING IN SUPPORT OF
LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING I-03, SHEET 33 OF 62

SDP-08-108

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

12/18/09

Howard SCD Date

ENGINEER'S CERTIFICATE

"I certify that this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements with the Howard Soil Conservation District."

Signature of Engineer (print name below signature) Date 12/17/2009

Pieter Dahmen

DEVELOPER'S CERTIFICATE

"I/We certify that all development and construction will be done according to this plan for sediment and erosion control, and that all responsible personnel involved in the construction project, will have a Certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard Soil Conservation District"

Signature of Developer (print name below signature) Date 12/16/09

Dennis Mattey

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division

V. P. Dalal 12/1/09

Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:

HDR

HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — REGISTERED PROFESSIONAL ENGINEER

11-24-2009

0 25 50
SCALE IN FEET

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

EROSION & SEDIMENT CONTROL
ISTHMUS ACCESS ROAD
INITIAL AND FINAL DESIGN

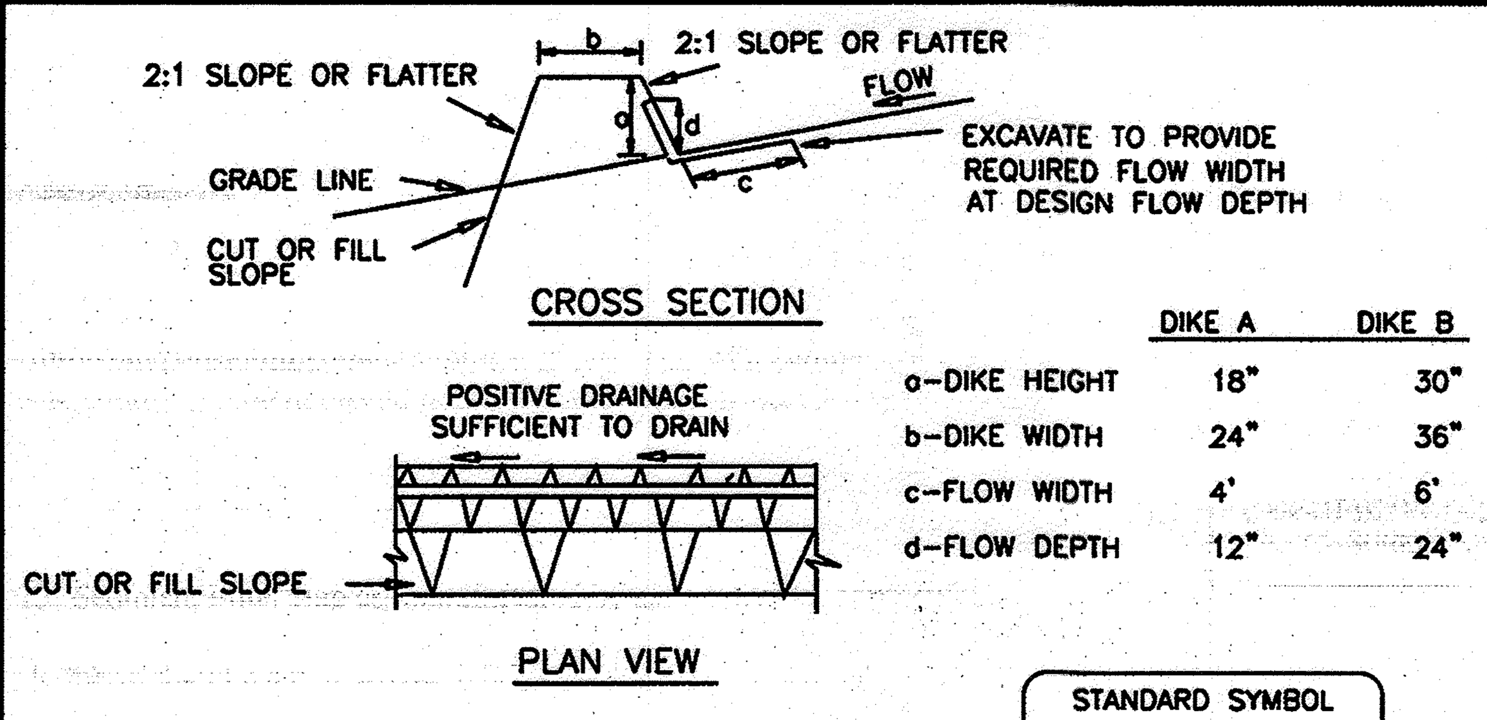
COLUMBIA ASSOCIATION
TOWN CENTER

MINOR GRADING IN SUPPORT OF
LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING I-04, SHEET 34 OF 62

SDP-08-108



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

STANDARD SYMBOL
A-2 B-3
→ – / – →

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 objectional 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.

EARTH DIKE (1 / I-05)

Sediment Filter Bag Specifications

1.0 DESCRIPTION

1.1 This work if furnishing, installing, maintaining, and disposing of a Sediment Filter Bag. The purpose is to control sediment discharge in any dewatering or pumped water application.

2.0 MATERIALS

2.1 FB-3 15' x 15' Sediment Filter Bag as manufactured by an approved manufacturer

2.2 The geotextile fabric shall be a non-woven fabric with the following properties:

Properties	Test Method	Units	MARV
ıb Tensile Strength	ASTM D-4632	lbs.	290
ıb Elongation	ASTM D-4632	%	50
pezoid Tear	ASTM D-4533	lbs.	145
ıcture	ASTM D-4833	lbs.	165
llen Burst	ASTM D-3786	psi	550
mittivity	ASTM D-4491	sec.	0.7
meability	ASTM D-4491	cm/sec	.35
S	ASTM D-4751	U.S. Sieve	100 (.150 mm)
Resistance (500hrs.)	ASTM D-4355	%	70
ter Flow Rate	ASTM D-4491	gpm/ft.	110
ım Strength	ASTM D-4491	lbs.	250

2.3 The Sediment Filter Bag Seams shall be double 401 lock chain stitch seam with a 121 lbs./inch sewn strength, tested in accordance with ASTM D-4884.

2.4 The Sediment Filter Bag shall have a adjustable spout large enough to accommodate a six inch (6") diameter discharge hose.

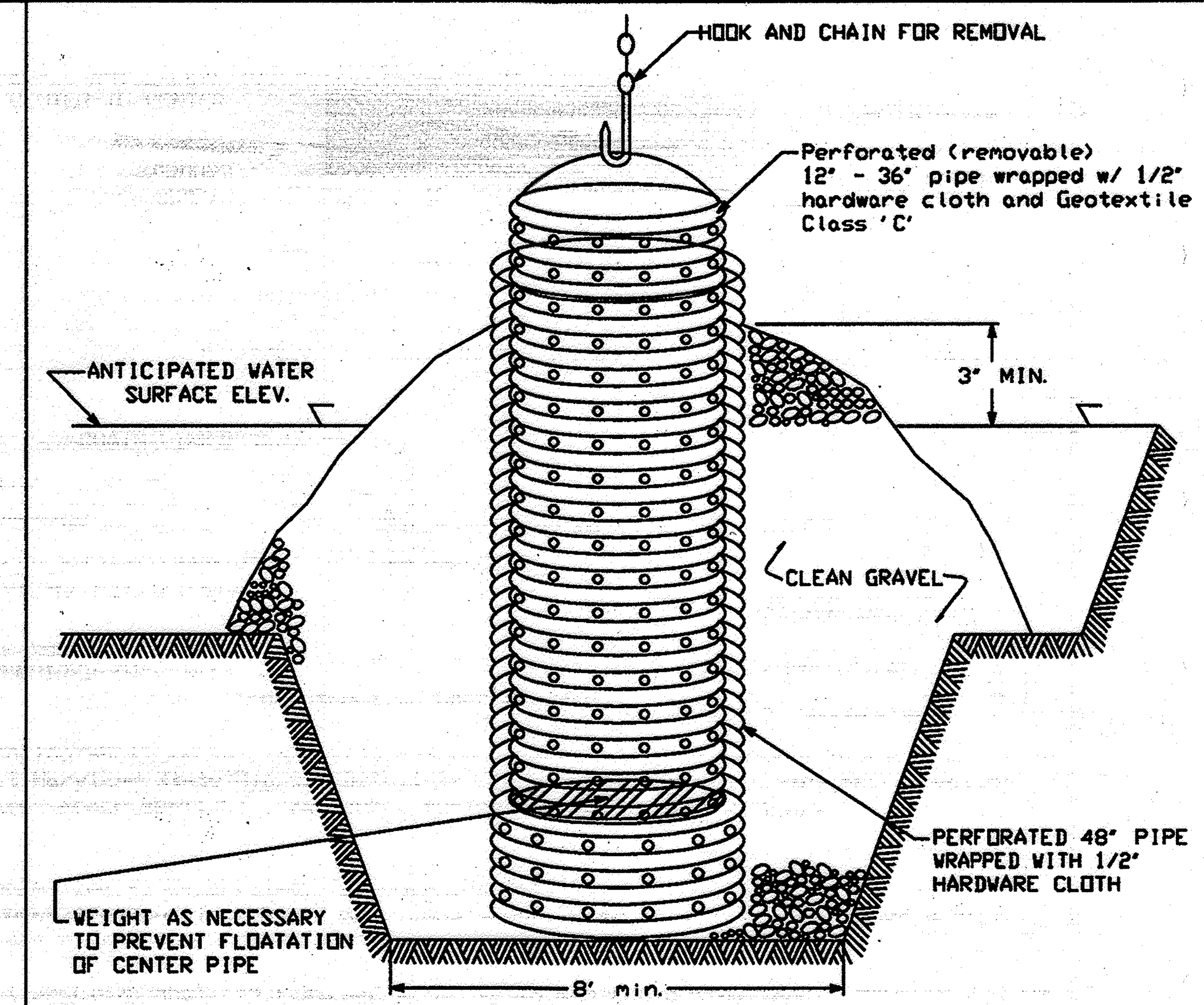
3.0 CONSTRUCTION

3.1 Unfold filter bag on a stabilized area over either a bed of straw evenly distributed at a rate of one (1) bale per square feet, or on a aggregate pad constructed of #57 stone at a minimum depth of three inches (3"). Filter bag should not be placed on bare soil.

3.2 Insert discharge pump hose into the filter bag spout a minimum of six inches (6") and tightly secure the hose with tie wire or pipe clamp.

4.0 MAINTENANCE

TEMPORARY SEDIMENT FILTER BAG (2 / I-05)



ELEVATION

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.

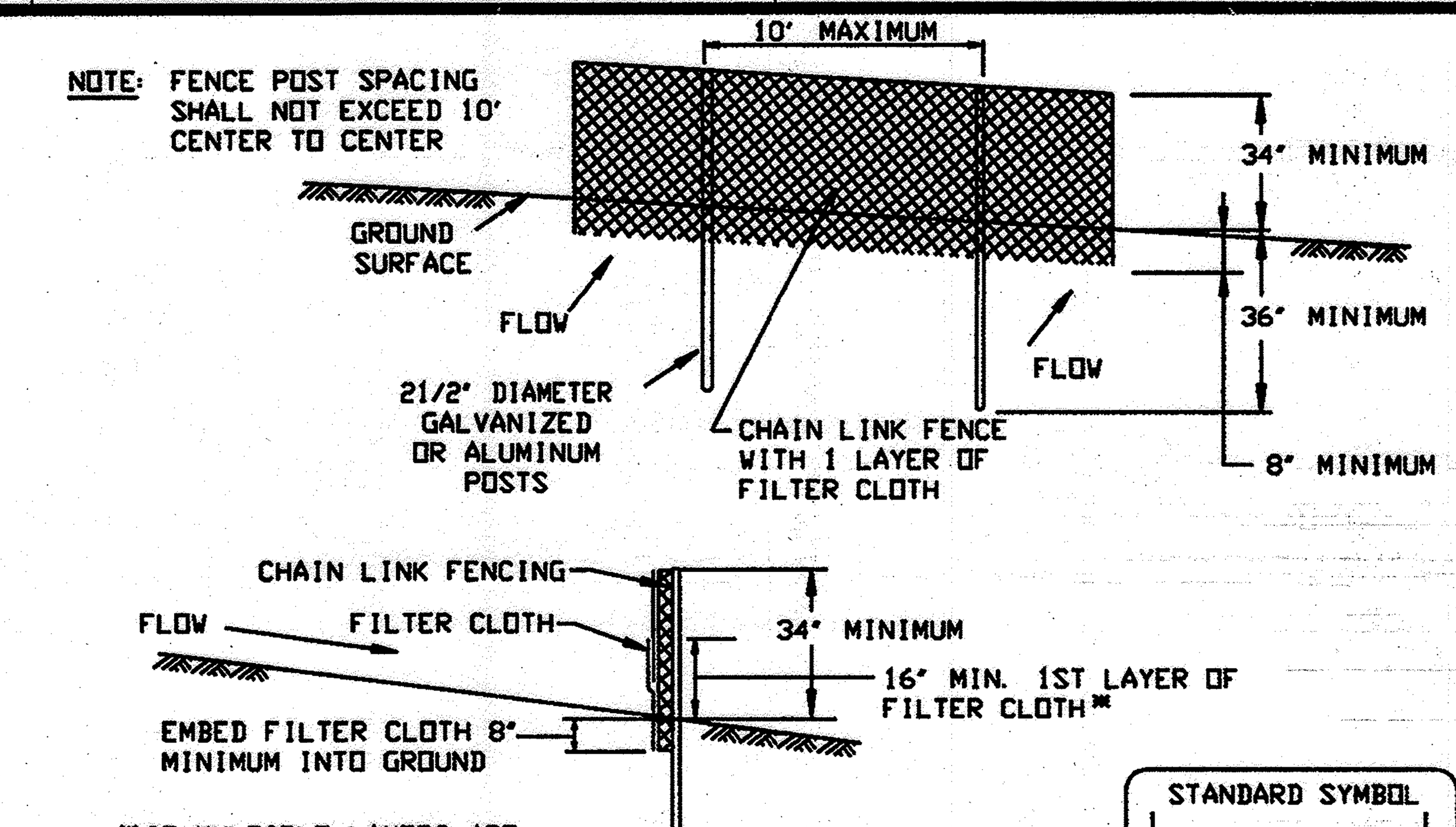
2. After installing the outer pipe, backfill around outer pipe with 2" aggregate or clean gravel.

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.

REMOVABLE PUMPING STATION (RPS) (3 / I-05)

NOTE: FENCE POST SPACING SHALL NOT EXCEED 10' CENTER TO CENTER



*IF MULTIPLE LAYERS ARE REQUIRED TO ATTAIN 42"

STANDARD SYMBOL
—— SSF ——

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

SUPER SILT FENCE (4 / I-05)

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 representative 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:
i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand . Other soils may be used if recommended by an 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'ft" in diameter.
ii. Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistle, or others as specified.
iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 48 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:
i. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization – Section I – Vegetative Stabilization Methods and Materials.

IV. For sites having disturbed areas over 5 acres:
i. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to, bring the soil into compliance with the following:
a. 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 perscribed to raise the pH to 6.5 or higher.
b. Organic content of topsoil shall be not less than 1 .5 percent by weight.
c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.
d. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min .) to permit dissipation of phyto-toxic materials.

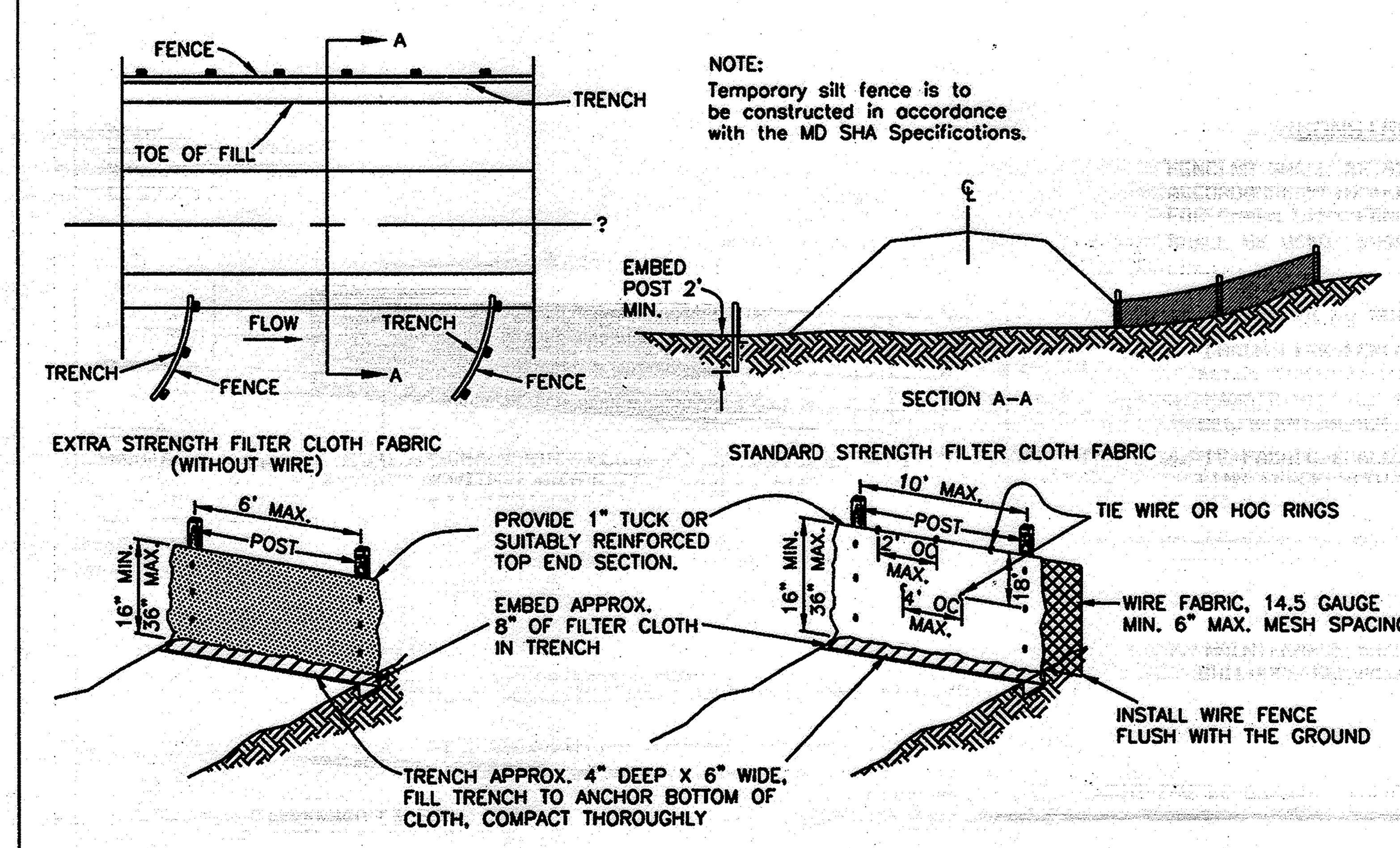
Note: Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appopriate approval authority, may be used in lieu of natural topsoil.

ii. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization – Section I – Vegetative Stabilization Methods and Materials.

V. Topsoil Application
i. When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade Stabilization Structures, Earth Dikes, Slope Silt Fence and Sediment Traps and Basins.
ii. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" – 8" higher in elevation .
iii. 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 ofadditional soil preparation and tillage . Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.
iv. Topsoil shall not be placed while the topsoil or subsoil is in a 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 .

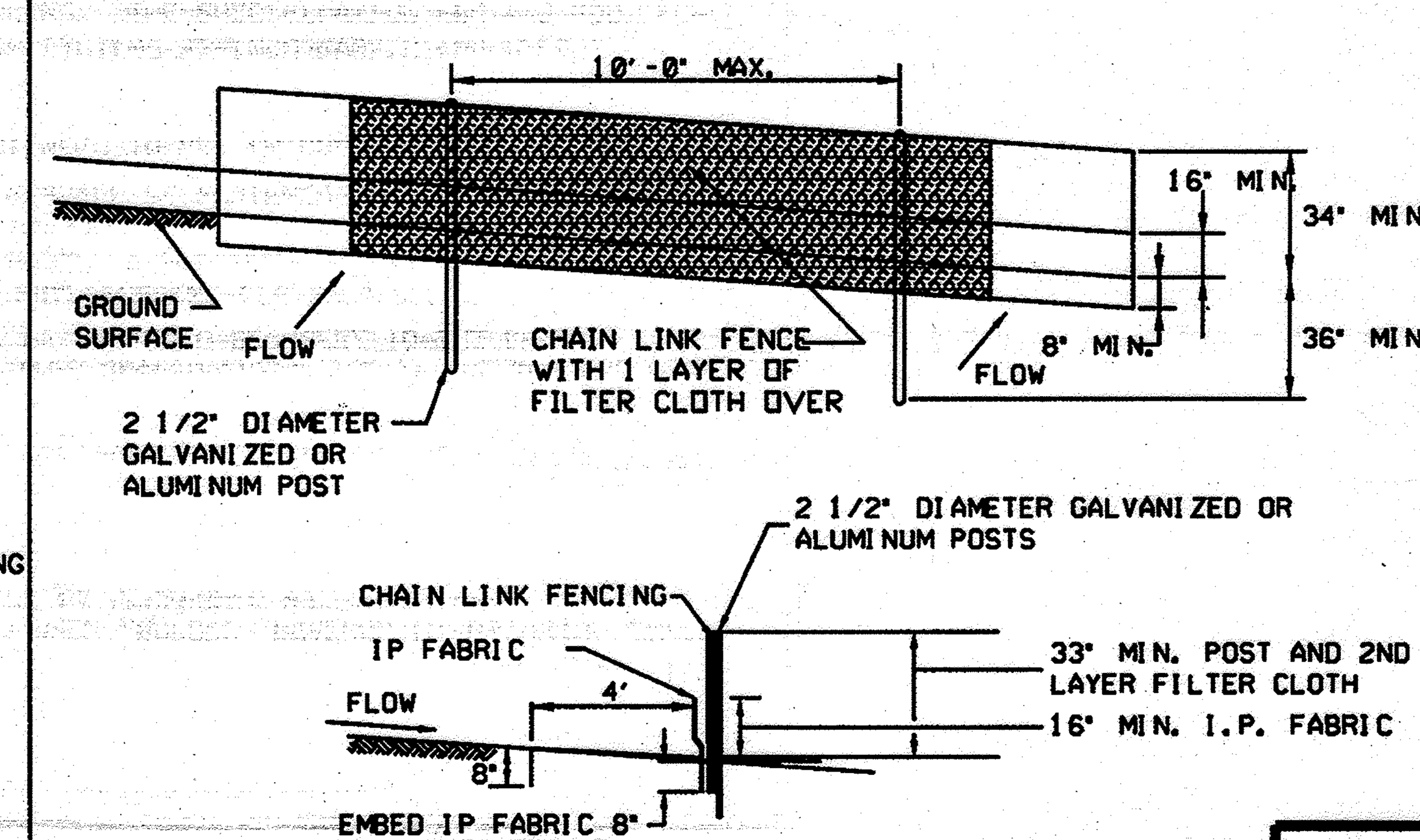
TOPSOILING (5 / I-05)

NOTE:
Temporary silt fence is to be constructed in accordance with the MD SHA Specifications.



TOE OF FILL - INSTALLATION OF SILT FENCE (6 / I-05)

NOTE:
FENCE POST SPACING SHALL NOT EXCEED 10'-0" TO CENTER



CONSTRUCTION SPECIFICATIONS

FENCING SHALL BE 42 INCHES IN HEIGHT AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST MARYLAND STATE HIGHWAY DETAILS FOR CHAIN LINK FENCING. THE SPECIFICATION FOR A 6 FOOT FENCE SHALL BE USED, SUBSTITUTING 42-INCH FABRIC AND 6 FOOT LENGTH POSTS.

1. THE POLES DO NOT NEED TO SET IN CONCRETE.
2. CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES.
3. FABRIC WILL BE DOUBLE 6 MIL MIN. THICKNESS U/V RESISTENT BLACK POYLETHELENE (IP FABRIC).
4. IP FABRIC SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID SECTION.
5. IP FABRIC SHALLL BE EMBEDDED A MINIMUM OF 8" INTO THE GROUND.
6. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.
7. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SILT BUILDUPS REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

NOTE:
IP FABRIC DENOTES IMPERMEABLE GEOTEXTILE FABRIC

SUPER SILT DIVERSION FENCE (DSF) (7 / I-05)

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09
Chief, Division of Land Development — Date 1/07/10
Director, DEP. — Date 1/7/10

Maryland Department of the Environment
MDE Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Visty P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION
PIETER DAHMEN, PE
HDR ENGINEERING INC.
11-24-2009
STATE OF MARYLAND — PROFESSIONAL ENGINEER

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS AND NOTES

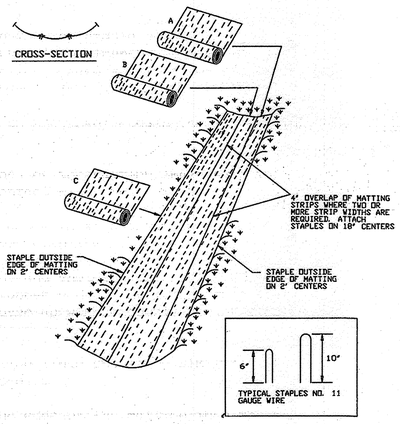
COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 5, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING I-05, SHEET 35 OF 62

SDP-08-108



Construction Specifications

1. Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with a row of staples about 4' down slope from the trench. Spacing between staples is 6'.

2. Staple the 4' overlap in the channel center using an 18" spacing between staples.

3. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.

4. Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.

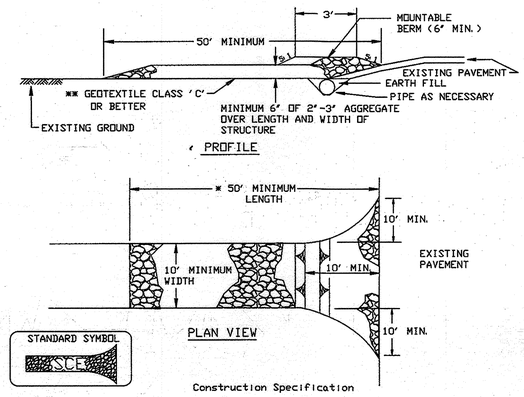
5. Where one roll of matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4', shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.

6. The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

Note: If flow will enter from the edge of the matting then the area effected by the flow must be keyed-in.

EROSION CONTROL MATTING

1
1-06



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.

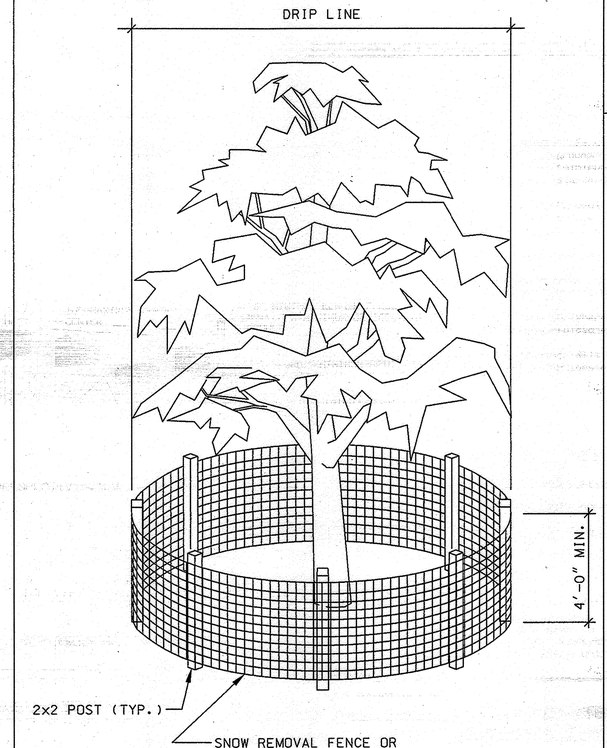
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

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.

STABILIZED CONSTRUCTION ENTRANCE

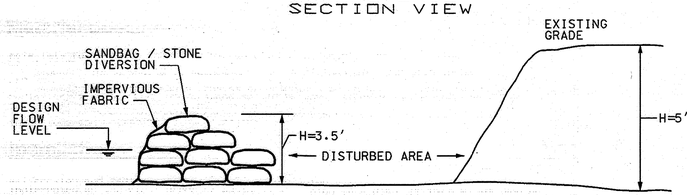
3
1-06



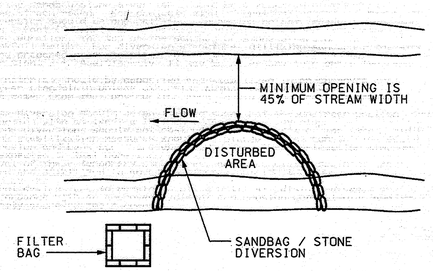
TREE PROTECTION

4
1-06

TRANSVERSE SECTION VIEW



PLAN VIEW



NOTE:
DETAIL FROM MDE MARYLANDS GUIDELINES FOR WATERWAY CONSTRUCTION (DETAIL 1.5)

Material Specifications

Materials for sandbag and stone stream diversions should meet the following requirements:
- Riprap: Riprap should be washed and have a minimum diameter of 6 inches (0.15 meters).
- Sandbags: Sandbags should consist of materials which are resistant to ultra-violet radiation, tearing, and puncture and should be woven tightly enough to prevent leakage of the fill material (i.e., sand, fine gravel, etc.).
- Sheeting: Sheeting should consist of polyethylene or other materials which are impervious and resistant to puncture and tearing.

Installation Guidelines

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Installation should proceed from upstream to downstream during periods of low flow. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.

Sandbag/stone diversions can be used independently or as components of other stream diversion techniques. Installation of this measure should proceed as follows (refer to Detail 1.5):
1. The diversion structure should be installed from upstream to downstream.
2. The height of the sandbag/stone diversion should be a function of the duration of the project in the stream reach. For projects with a duration less than 2 weeks, the height of the diversion should be one half the streambank height, measured from the channel bed, plus 1 foot (0.3 meters) or bankfull height, whichever is greater. For projects of longer duration, the top of the sandbag or stone diversion should correspond to bankfull height. For diversion structures utilizing sandbags, the stream bed should be hand prepared prior to placement of the base layer of sandbags in order to ensure a water tight fit. Additionally, it may be necessary to prepare the bank in a similar fashion.
3. All excavated material should be deposited and stabilized in an approved area outside the 100-year floodplain unless otherwise authorized by the WMA.
4. Sediment-laden water from the construction area should be pumped to a dewatering basin.
5. Sheeting on the diversion should be positioned such that the upstream portion covers the downstream portion with at least a 18-inch (0.45 meters) overlap.
6. Sandbag or stone diversions should not obstruct more than 45% of the stream width. Additionally, bank stabilization measures should be placed in the constricted section if accelerated erosion and bank scour are observed during the construction time or if project tine is expected to last more than 2 weeks.
7. Prior to removal of these temporary structures, any accumulated sediment should be removed, deposited and stabilized in an approved area outside the 100-year floodplain unless authorized by the WMA.
8. Sediment control devices are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspecting authority approves their removal.

SANDBAG / STONE DIVERSION

2
1-06

Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 11/2" x 11/2" square (minimum) cut, or 13/4" 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

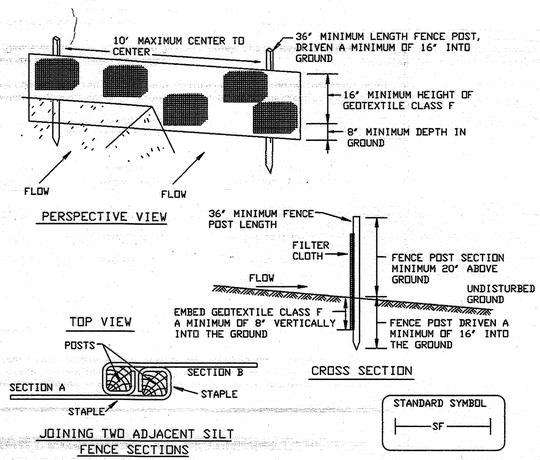
3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.

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.

Silt Fence Design Criteria

Slope Steepness	(Maximum) Slope Length	(Maximum) Silt Fence Length
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	500 feet
3:1 to 2:1	40 feet	250 feet
2:1 and steeper	20 feet	125 feet

Note: In areas of less than 2% slope and sandy soils (USDA general classification system, soil Class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.



SILT FENCE

5
1-06

TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS AND NOTES

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 6, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING I-06, SHEET 36 OF 62

SDP-08-108

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/23/09

Chief, Division of Land Development — Date 1/07/10

Director, DEP. — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 12/1/09
Vishy P. Dalal
Regulatory & Compliance Engineer

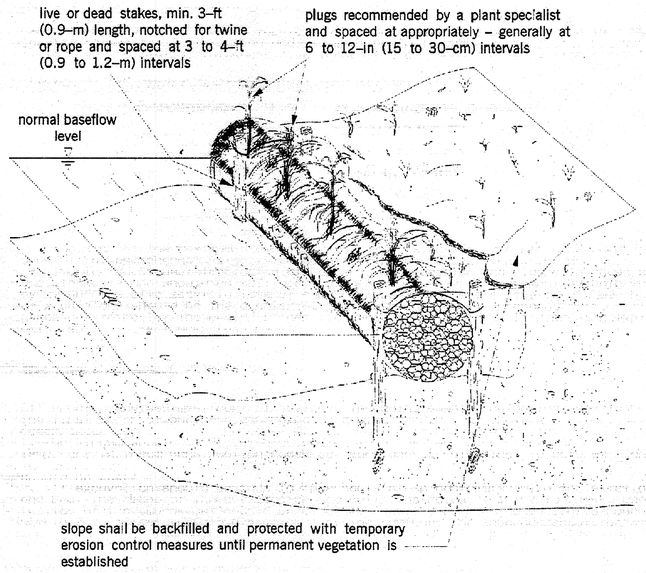
THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — NO. 29951 — REGISTERED PROFESSIONAL ENGINEER
11-27-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947



Material Specifications

- Fiber logs: Natural fiber logs composed of biodegradable materials such as coir fiber are commercially available in 16 or 18-inch (0.40 or 0.45-meter) diameter rolls.
- Plantings: Vegetative plantings should be chosen according to their adaptability to site-specific conditions and objectives by a plant specialist.
- Live stakes: Live stakes should be cut from fresh, green, healthy dormant parent plants which are adapted to the site conditions whenever possible.

Installation Guidelines

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Refer to the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control. The recommended construction procedure for natural fiber
logs should proceed as follows (refer to Detail 2.6):
1. Natural fiber rolls should be installed so that they rest against the bottom of the waterway in ponds or lakes. In streams and rivers, the first row of fiber logs should be placed above any necessary toe stabilization measures. Natural fiber logs should not be used as the primary toe stabilization measure in streams or rivers.
2. Plants should be plugged in an alternating pattern along the top of the fiber log in gaps between the coir fiber netting. Appropriate species and a spacing ranging from 6 to 12 inches (0.15 to 0.3 meters) should be selected by a plant specialist according to site characteristics such as soil properties, anticipated post-construction bank slope, water chemistry, amount of available sunlight, and expected duration of inundation during high stream flows. If water levels are too low for the fiber logs to be submerged ⅓ to 2/3 of their diameter, plants should be plugged inside the soil/log interface where they will receive adequate moisture.

3. Dead or live stakes should be used to anchor the fiber logs in place. Stakes should be notched approximately 5 inches (13 centimeters) from their tops and pounded partially into the ground on either side of the bundle at a spacing of 3 to 4 feet (0.9 to 1.2 meters). Twine should be tied from the notch in one stake to the notch in the stake directly opposite. The stakes should then be driven so that the twine is secured against the top of the roll. Ideally, the top of the stake should be flush with the top of the roll.
4. The ends of adjacent logs should be laced together with twine by making a number of passes in the end netting between the logs and pulling the twine taut. Where a fiber roll does not abut another fiber roll, the end should be bent inward and buried in the bank to prevent water from intruding behind the roll and dislodging it.
5. Successive rows of fiber rolls should be offset 3 to 8 inches (8 to 20 centimeters). Additionally, to ensure that roots extend into the soil, plants should be plugged into the sides of the fiber log near the soil. The need to backfill/contour the soil behind the fiber logs and between successive lifts will depend on the specific aesthetic and physical requirements of the project. The re-contoured soil should be seeded and/or plugged with appropriate vegetative species and covered with an erosion control blanket to prevent slope erosion.

NATURAL FIBER ROLLS (1 / I-07)

Material Specifications

Materials for imbricated riprap construction and installation should meet the following requirements:
- Filters: Synthetic filter fabric may be used cautiously based on the 1994 MD Standards and Specifications for Soil Erosion and Sediment Control. Whenever possible, however, granular filters with a minimum thickness of 6 inches (15 cm) should be used with a gradation as found in Table 2.2.

Table 2.2: Granular Filter Material Grading Specifications

Percent Less Than	U.S. Standard Sieve Size
100	2 1/2 in (64 mm)
85 - 100	1 in (25 mm)
60 - 100	1/2 in (13 mm)
35 - 70	No. 10
20 - 50	No. 40
3 - 20	No. 200

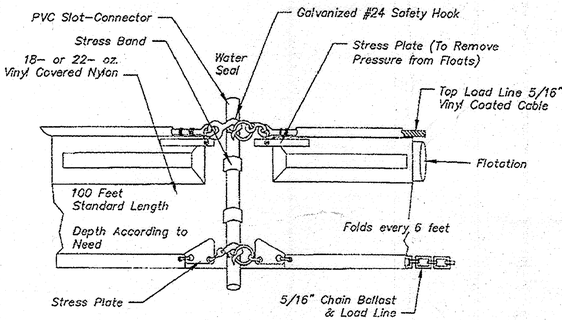
- Toe Riprap: The maximum diameter or weight of stone for toe riprap should be based upon the bankfull stream channel velocity as detailed in the MGWC 2.1: Riprap and Figure 2.1.
- Imbricated Stones: Imbricated riprap should be angular and blocky in shape such that they are stackable and should be sufficiently large to resist displacement by both the design storm event and the site-specific lateral earth stresses. Therefore, the length of the longest axis of each stone should be the greater of 1/3 the height of the proposed wall and the size necessary to resist the design stream flow according to MGWC 2.1: Riprap. A typical minimum axis length is 24 inches (0.6 meters).

Installation Guidelines

All erosion and sediment control devices, including dewatering basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. The recommended construction procedure for imbricated riprap is as follows (refer to Detail 2.2):
1. The stream should be diverted according to a WMA recommended procedure (see Section 1, Temporary Instream Construction Measures, Maryland$_{32}$s Guidelines to Waterway Construction), and the construction area
should be dewatered.
2. All excavation should be made in reasonably close conformity with the existing stream slope and bed. The slope of the cut face should be in the range of 1H:6V to 2H:6V. Loose material at the toe of the embankment should be excavated until a stable foundation is reached, usually within 2 to 3 feet (0.6 to 0.9 meters) of the surface. The subgrade should be smooth, firm, and free from protruding objects or voids that would effect the proper positioning of the first layer of stones.
3. A graded granular filter or filter fabric should be placed on the face of the cut slope to prevent the migration of fine materials through the revetment. If filter fabric is used, it should be carefully and loosely placed on the prepared slope and secured. Adjacent strips should overlap a minimum of 8 inches (0.20 meters). If the filter fabric is torn or damaged, it should be repaired or replaced.
4. The rock layers should be neatly stacked with staggered joints so that each stone rests firmly on two stones in the tier below. Additionally, smaller stones should be used to fill voids so that each rock rests solidly on the previous rock layer with minimal opportunity for movement. Upon completion of the first layer of stone, the toe trench should be filled with Class III riprap sized according to MGWC 2.1: Riprap or additional imbricated stone. Two footer stones should be used where high potential for channel incision exists. The height of the imbricated revetment is dictated by the size of the stone used, and the height should not exceed 3 times the length of the longest axis and should not be greater than 10 feet (3 meters).

5. Placement of the granular backfill should occur concurrently with the stone placement. The backfill slope angle should be 2H:1V or flatter but should be greater than 0 degrees to facilitate drainage. Once all of the backfill is in place, it should be covered with a filter layer and a layer of topsoil sufficient to support a native vegetative cover.
6. The disturbed sections of the channel, including the slopes and stream bed, should be stabilized with methods approved by the WMA.

IMBRICATED RIPRAP (2 / I-07)



TYPE II
Not to Scale

1. Type II is designed for use on rivers and streams, large open lakes, bays, and beaches with moderate currents and wind exposure.

2. When the curtain is no longer required as determined by the Inspector, the curtain and related components shall be removed so as to minimize turbidity. Remaining sediment shall be removed and the original depth or plan elevations restored. Any spoils must be taken to upland area and stabilized.

3. Curtain will be opened as required to accommodate passage of work boats.

TURBIDITY CURTAIN (3 / I-07)

Turbidity Curtain Specifications

Flotation consists of a series of expanded polyethylene logs, 6" in diameter and 55" long. The logs are enclosed in 22 oz./sq. yd. PVC coated nylon or polyester having 400 lbs. minimum tensile strength. Curtain is permanently attached to the bottom of the flotation unit and weighed down with ¼" galvanized chain. The curtain material is monofilament woven polypropylene having 200 lb. or 300 lb. tensile strength.

Woven Curtain Material Specifications:

Property	Test Method	Results	Results	Results
Fabric Code		AEF 200W	AEF 300W	AEF 650W
Fabric Structure		Woven	Woven	Woven
Polymer Composition		Polypropylene	Polypropylene	Polypropylene
Weight	ASTM D-4632	4.2 oz/sq. yd	5.8 oz/sq. yd	6.3 oz/sq. yd
Grab Strength	ASTM D-4632	200 lbs.	300 lbs.	390 x 250 lbs.
Trap Tear Strength	ASTM D-4533	90 lbs.	120 lbs.	115 x 65 lbs.
Burst Strength	ASTM D-3786	400 psi	600 psi	495 psi
Puncture	ASTM D-3787	90 lbs.	150 lbs.	130 lbs.
Elongation	ASTM D-4632	20%	20%	30%
U.V. Resistance	ASTM D-4335	70% (500hrs)	70% (500hrs)	70% (500hrs)
E.O.S.	CW-02215	40	40	70

Maintenance

Inspect turbidity curtain after each major storm event resulting from 3-inches or more of rainfall within a 24-hour period. Repair or replace damaged materials and remove any debris lodged against the turbidity curtain.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 12/28/09
Chief, Division of Land Development — Date 1/07/10
Director, DEP — Date 1/7/10

Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V.P. Dalal 12/1/09
Vistv P. Dalal
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION
PIETER DAHMEN, PE
HDR ENGINEERING INC.
STATE OF MARYLAND — PIETER G. DAHMEN — No. 22881 — REGISTERED PROFESSIONAL ENGINEER
11-24-2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS AND NOTES

COLUMBIA ASSOCIATION TOWN CENTER

MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 6, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009

DRAWING I-07, SHEET 37 OF 62

SDP-08-108

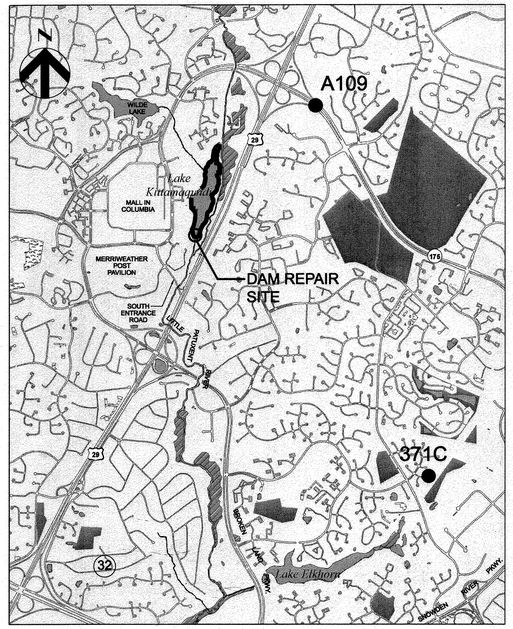
DRAWING NO.	SHEET NO.	SHEET TITLE
~~A-01~~ J-01	~~2.~~ 38	GENERAL NOTES
~~B-01~~ J-03	~~3.~~ 40	EXISTING CONDITIONS PLAN
~~C-01~~ J-04	~~4.~~ 41	PROPOSED SITE PLAN
~~D-01~~ J-05	~~5.~~ 42	SECTIONS AND DETAILS
~~E-01~~ J-06	~~6.~~ 43	TEMPORARY EROSION & SEDIMENT CONTROL PLAN - INITIAL PHASE
~~E-02~~ J-07	~~7.~~ 44	TEMPORARY EROSION & SEDIMENT CONTROL PLAN - FINAL PHASE
~~E-03~~ J-08	~~8.~~ 45	TEMPORARY EROSION & SEDIMENT CONTROL - DETAILS & NOTES
~~F-01~~ J-09	~~9.~~ 46	SOIL BORING LOGS

2

J-01	38.	DAM REPAIR - TITLE SHEET
J-02	39.	DAM REPAIR - GENERAL NOTES
J-03	40.	DAM REPAIR - EXISTING CONDITION PLAN
J-04	41.	DAM REPAIR - PROPOSED SITE PLAN
J-05	42.	DAM REPAIR - SECTIONS AND DETAILS
J-06	43.	DAM REPAIR - TEMPORARY EROSION & SEDIMENT CONTROL PLAN - INITIAL PHASE
J-07	44.	DAM REPAIR - TEMPORARY EROSION & SEDIMENT CONTROL PLAN - FINAL PHASE
J-08	45.	DAM REPAIR - TEMPORARY EROSION & SEDIMENT CONTROL - DETAILS & NOTES
J-09	46.	DAM REPAIR - SOIL BORING LOGS

Lake Kittamaqundi Dam Repair Columbia, Maryland

Columbia Association Construction Services Project No. 040107DK



LOCATION PLAN
NTS

SITE ANALYSIS DATA CHART

a. TOTAL PROJECT AREA
DAM REPAIR AREA .039 ACRES 1,710 FT²

b. AREA OF PLAN SUBMISSION - SEE ITEM a

c. LIMIT OF DISTURBED AREA .161 ACRES 7,040 FT²

d. PRESENT ZONING NT

e. NA, TEMPORARY MAINTENANCE EMPLOYEES

PERMIT INFORMATION CHART					
Subdivision Name: COLUMBIA TOWN CENTER			Section/Area: SECTION 1		Lot/Parcel No.: LOT 14
Plat # or L/F: PHASE 23 PLAT BOOK 16 FOLIO 19 & 20	Grid #:	Zoning: NT	Tax Map No.: 30 & 36	Elect Distr: 4	Census Tract: 605602
Water Code:			Sewer Code:		

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 3/1/13

Chief, Division of Land Development — Date 3/8/13

Director Kathleen McLaughlin — Date 3-12-13

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT
Howard S.C.D. 10/2/12

MDE
Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V.P. Dalal 10/2/12
Visty P. Dalal — Date
Sr. Regulatory & Compliance Engineer

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. 29997, EXPIRATION DATE: 01-14-2014.

THIS PLAN SET HAS BEEN PREPARED BY:

HDR

HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — NO. 29997 — REGISTERED PROFESSIONAL ENGINEER
May 7, 2012

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

GP-12-018

COLUMBIA ASSOCIATION
TOWN CENTER

Revised Site Development Plan
LAKE KITTAMAQUNDI DAM REPAIR
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
FEBRUARY 2011

DRAWING J-01 SHEET 1 OF 62

SDP-08-108

HOWARD COUNTY GENERAL NOTES:

1. All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA standards and specifications if applicable.
2. The contractor shall notify the Department of Public Works/Bureau of Engineering/Construction Inspection Division at (410) 313-1880 24-hours prior to the start of work.
3. The contractor shall notify "Miss Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
4. Traffic control devices, markings and signing shall be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD). All street and regulatory signs shall be in place prior to the placement of any asphalt.
5. Street light placement and the type of fixture and pole shall be in accordance with the Howard County Design Manual, Volume III (1993) and as modified by "Guidelines for Street Lights in Residential Developments (June 1993)." A minimum spacing of 20' shall be maintained between any streetlight and any tree.
6. All sign posts used for traffic control signs installed in the County right-of-way shall be mounted on a 2" galvanized steel, perforated, square tube post (14 gauge) inserted into a 2-1/2" galvanized steel, perforated, square tube sleeve (12 gauge) - 3' long. A galvanized steel pole cap shall be mounted on top of each post.
7. All plan dimensions are to face of curb unless otherwise noted.
8. The existing topography is taken from aerial survey with (maximum two foot) contour intervals prepared by Mercado Consultants Inc. dated 5-22-06.
9. The coordinates shown hereon are based upon the Howard County Geodetic Control, which is based upon the Maryland State Plane Coordinate System. Howard County Monument Nos. A109, 371C and "Harris AZ Mark" were used for this project.
10. No permanent increse in impervious area.
11. Existing utilities are based on GIS mapping.
12. No floodplain study was prepared for this project.
13. Project background information (unless included in title block):
    - Hydraulically dredging the upper half of the lake to its original depths.
    - Pumping the dredged material to a temporary staging area on the South Entrance Road for mechanical dewatering.
    - Trucking dewatered material to an off-site licensed placement facility.
    - Constructing a penninsula and wetlands in the upper portion of the lake to create a Forebay.
    - Install access road on isthmus with turf reinforced matting and placement of riprap at existing overflow areas on the isthmus to prevent further erosion.
    - Providing imbricated riprap for erosion protection at select spots on the right bank of the Little Patuxent River.
    - Restoration of all disturbed areas, including removal of gravel & paving at the staging area.
14. No grading, removal of vegetative cover or trees, paving or new structures shall be permitted outside the limits of disturbance in wetlands, streams, or their associated buffers, forest conservation easements, or 100-year floodplain without DPZ approval.
15. This subject property is zoned NT per the February 2, 2004 Comprehensive Zoning Plan and per the "Comp Lite" Zoning Amendments effective July 28, 2006.
16. This project is exempt from the requirements of Section 16.124 of the Howard County Code for Landscaping since disturbance resulting from project activities is temporary and no permanent structures are proposed.
17. This project is exempt from the requirements of Section 16.1200 of the Howard County Code for Forest Conservation since it is part of a Planned Unit Development which had preliminary development plan approval and 50% or more of the land was recorded and substantially developed before December 31, 1992.
18. The Contractor shall be responsible for repairs to property damage caused by the Contractor.
19. Project is subject to approval by the U.S. Army Corps of Engineers, Baltimore District, the MDE Nontidal Wetlands and Waterways Division, and the MDE Dam Safety Division. Copies of the applicable permits or authorizations shall be submitted to the DPZ, Division of Land Development. MDE permit tracking number is 200863535.
20. The Contractor shall comply with all applicable Federal, State and Local Laws and Regulations including project permits. Effluent leaving the site shall not exceed Maryland turbidity limits of 150 Ntu at any time or 50 Ntu as a monthly average per COMAR 26.08.02.
21. No wetland areas landward of the ordinary high water are disturbed by the project. Wetlands within the lake (mainly nonpersistead-emergent and lacustrine unconsolidated bottom wetlands) are subject to disturbance from project activity, refer to JPA 2008-63535.M02.

HOWARD SOIL CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

1. A minimum of 24 hours notice must be given to the Howard County Department of Inspection, Licenses and Permits, Sediment Control Division prior to the start of any construction (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 most current MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL and revisions thereto.
3. Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within: a) 7 calendar days for all perimeter sediment control structures, dikes, 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 seeding (Sec. 51), sod (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec. 52). 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.
7. Site Analysis: Staging Area

Total Area of Site	1.06 Acres
Area Disturbed	1.91 Acres
Area to be roofed or paved	0.00 Acres
Area to be vegetatively stabilized	.042 Acres
Total Cut	11.09 Cu.Yds.
Total Fill	11.09 Cu.Yds.
Total Dredging Values per 2006 Bathymetric Survey	Cu.Yds.
Offsite waste/borrow area location:	Site with an approved sediment control plan and active permit, as approved by the Inspector and Howard SCD.

Site Analysis: Isthmus Area

Total Area of Site	0.66 Acres
Area Disturbed	1.91 Acres
Area to be roofed or paved	0.00 Acres
Area to be vegetatively stabilized	0.85 Acres
Total Cut	254 Cu.Yds.
Total Fill	252 Cu.Yds.
Offsite waste/borrow area location:	On Site

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 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 three pipe lengths or that which shall be back-filled and stabilized by the end of each work day, whichever is shorter.

HOWARD SOIL CONSERVATION DISTRICT PERMANENT SEEDING NOTES:

Apply to graded or cleared areas 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, disking or other acceptable means before seeding, if not previously loosened.

Soil Amendments: In lieu of soil test recommendations, use one of the following schedules:

1. Preferred —Apply 2 tons/acre dolomitic limestone (92 lbs/1000 sq.ft.) and 600 lbs/acre 10-10-10 fertilizer (14 lbs/1000 sq.ft.) before seeding. Harrow or disk into upper three inches of soil. At time of seeding, apply 400 lbs/acre 30-0-0 ureaform fertilizer (9 lbs/1000 sq.ft.)
2. Acceptable — Apply 2 tons/acre dolomitic limestone (92 lbs/1000 sq.ft.) and 1000 lbs/acre 10-1010 fertilizer (23 lbs/1000 sq.ft.) before seeding. Harrow or disk into upper three inches of soil.

Seeding — For the periods March 1 — April 30, and August 1 — October 15, seed with 60 lbs/acre (1.4 lbs/1000 sq.ft.) of Kentucky 31 Tall Fescue. For the period May 1 — July 31, seed with 60 lbs Kentucky 31 Tall Fescue per acre and 2 lbs/acre (.05 lbs/1000 sq.ft.) of weeping lovegrass. During the period of October 16 — February 28, protect site by:

Option 1 — Two 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 30 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 slope 8 feet or higher, use 348 gallons per acre (8 gal/1000 sq.ft.) for anchoring.

Maintenance — Inspect all seeding areas and make needed repairs, replacements and reseedings.

TEMPORARY SEEDING NOTES:

Apply to graded or cleared areas likely to be re-disturbed where a short-term vegetative cover is needed.

Seedbed preparation: — Loosen upper three inches of soil by raking, disking or other acceptable means before seeding, if not previously loosened.

Soil Amendments: — Apply 600 lbs/acre 10-10-10 fertilizer (14 lbs/1000 sq.ft.).

Seeding: — For periods March 1 —April 30 and from August 15 — October 15, seed with 2-1/2 bushel per acre of annual rye (3.2 lbs/1000 sq.ft.). For the period May 1 — August 14, seed with 3 lbs/acre of weeping lovegrass (.07 lbs/1000 sq.ft.). For the period November 16 — February 28, protect site by applying 2 tons/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/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 slope 8 ft. or higher, use 348 gal. per acre (8 gal/1000 sq.ft.) for anchoring.

Refer to the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for additional rates and methods not covered.

2

22. The Department of Planning and Zoning determined that activities in the floodplain and within 75 feet of the lake and streambank are necessary for completion of the dam repair.

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
Approved: John R. Robertson, Howard S.C.D. Date: 10/2/12

MDE
Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 10/2/12
Vinty P. Dalal Date
Sr. Regulatory & Compliance Engineer

10/04/12

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division (CE)	Date 3/1/13
Chief, Division of Land Development	Date 3/8/13
Director MARSHA McLAUGHLIN	Date 3-12-13

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION
PIETER DAHMEN, PE
HDR ENGINEERING INC.
STATE OF MARYLAND — PIETER G. DAHMEN — NO. 29997 — REGISTERED PROFESSIONAL ENGINEER
MAY 7, 2012

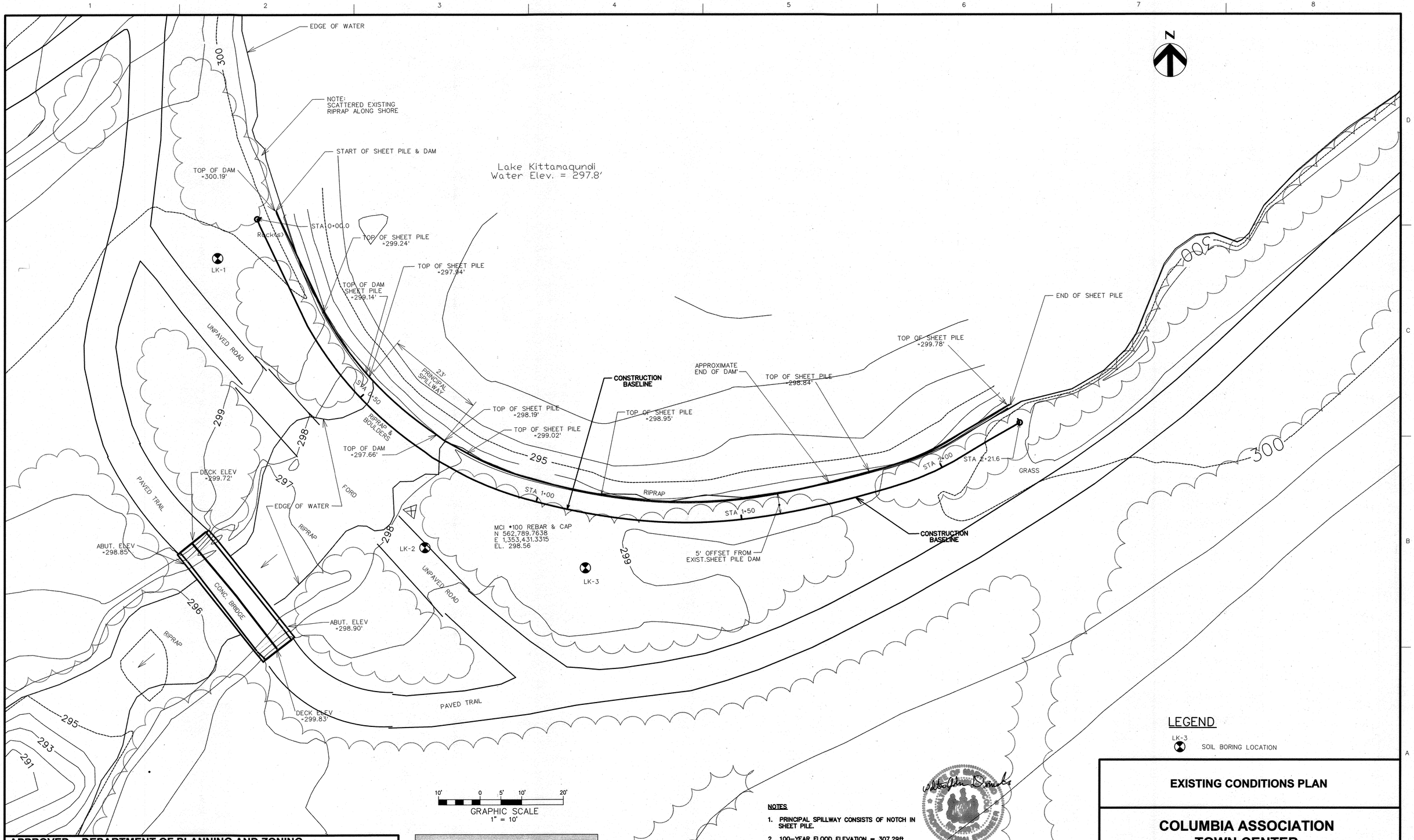
COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

GENERAL NOTES

COLUMBIA ASSOCIATION TOWN CENTER
REVISED SITE DEVELOPMENT PLAN
MINOR GRADING IN SUPPORT OF LAKE KITTAMAQUNDI RESTORATION
ELECTION DISTRICT 4, HOWARD COUNTY MD.
TAX MAP 30 AND 36

SCALE AS SHOWN
JUNE 18, 2009 J-02 39
DRAWING ~~A-01~~, SHEET ~~2~~ OF 62

SDP-08-103



LEGEND

LK-3 SOIL BORING LOCATION

NOTES

1. PRINCIPAL SPILLWAY CONSISTS OF NOTCH IN SHEET PILE.
2. 100-YEAR FLOOD ELEVATION = 307.29ft. NAVD88 DATUM.

10/4/12

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 3/1/13

Chief, Division of Land Development — Date 3/8/13

Director MARTHA McLAUGHLIN — Date 3-10-13

MDE
Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal — 10/2/12
Visty P. Dalal — Date
Sr. Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — 29951 — REGISTERED PROFESSIONAL ENGINEER
May 7, 2012

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

EXISTING CONDITIONS PLAN

COLUMBIA ASSOCIATION
TOWN CENTER

REVISED SITE DEVELOPMENT PLAN
LAKE KITTAMAQUNDI DAM REPAIR
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
FEBRUARY 2011 J-03 40
DRAWING ~~B0-1~~, SHEET ~~3~~ OF 62

SDP-08-108

EDGE OF WATER

APPROXIMATE LIMITS OF BOULDER PLACEMENT AREA

NOTE: SCATTERED EXISTING RIPRAP ALONG SHORE

START OF SHEET PILE & DAM

TOP OF DAM ±300.19'

STA 0+00.0

TOP OF SHEET PILE ±299.24'

TOP OF SHEET PILE ±297.84'

TOP OF DAM SHEET PILE ±299.14'

Lake Kittamaqundi
Water Elev. = 297.8'

REMOVE EXISTING BOULDERS BEHIND EXISTING SHEET PILING AND RELOCATE TO THE BOULDER PLACEMENT AREA AS DIRECTED BY THE OWNER. BOULDERS SHALL BE PLACED ABOVE MEAN HIGH WATER

FURNISH AND INSTALL 2 CONCRETE WHEEL STOPS, SEE DETAIL

SEE EROSION & SEDIMENT CONTROL PLAN, SHEET 7, FOR LIMITS OF CLEARING

PLACE SHA CLASS 2 RIPRAP ON CHANNEL BANK, UNDERLAY WITH GEOTEXTILE/FABRIC, CLASS V SEE DETAIL

UNPAVED ROAD

23' PRINCIPAL SPILLWAY

REPAIR PRINCIPAL SPILLWAY, SEE DETAIL

CONSTRUCTION BASELINE

TOP OF SHEET PILE ±298.19'

TOP OF SHEET PILE ±299.02'

TOP OF SHEET PILE ±298.95'

APPROXIMATE END OF DAM

TOP OF SHEET PILE ±298.84'

TOP OF SHEET PILE ±299.78'

END OF SHEET PILE

RIPRAP & CHANNEL BED BOULDERS

TOP OF DAM ±297.66'

MD SHA CLASS 1 RIPRAP

STA 2+00

STA 2+21.6

GRASS

DECK ELEV ±299.72'

PAVED TRAIL

FORD

EDGE OF WATER

RIPRAP

STA 1+00

STA 1+50

MCI ⌀100 REBAR & CAP
N 562,789.7638
E 1,353,431.3315
EL. 298.56

20' OFFSET FROM EXIST. SHEET PILE DAM

CONSTRUCTION BASELINE

ABUT. ELEV ±298.85

LK-2

LK-3

PLACE SHA CLASS 2 RIPRAP ON CHANNEL BANK, UNDERLAY WITH GEOTEXTILE FABRIC, CLASS V SEE DETAIL

UNPAVED ROAD

RETAIN EXISTING RIVER BED STONES SUPPLEMENT WITH CLASS 2 RIPRAP AT LOCATIONS WITHOUT ADEQUATE COVERAGE AS DIRECTED BY THE OWNER.

CONC. BRIDGE

ABUT. ELEV ±298.90'

FURNISH AND INSTALL 2 CONCRETE WHEEL STOPS, SEE DETAIL

RIPRAP

PAVED TRAIL

DECK ELEV ±299.83'

SEE EROSION & SEDIMENT CONTROL PLAN, SHEET 7, FOR LIMITS OF CLEARING

LEGEND

- ARTICULATED INTERLOCKING CONCRETE BLOCK MATTING
- MD SHA CLASS 1 RIPRAP & CHANNEL BED BOULDERS
- TURF REINFORCEMENT MATTING
- LK-3 SOIL BORING LOCATION

10' 0 5' 10' 20'
GRAPHIC SCALE
1" = 10'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 3/1/13

Chief, Division of Land Development — Date 3/08/13

Director MARSHA MCLAUGHLIN — Date 3-12-13

MDE
Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V.P. Dalaf — 10/2/12
Visty P. Dalaf
Sr. Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION
PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER G. DAHMEN — REG. 29961 — REGISTERED PROFESSIONAL ENGINEER
MAY 7, 2012

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

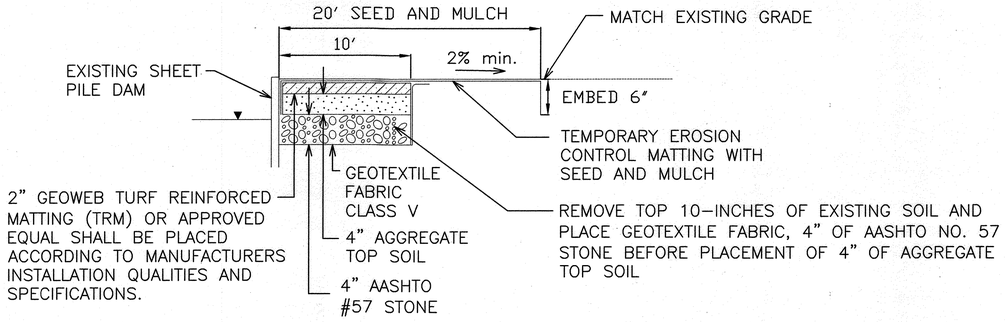
PROPOSED SITE PLAN

COLUMBIA ASSOCIATION TOWN CENTER

REVISED SITE DEVELOPMENT PLAN
LAKE KITTAMAQUNDI DAM REPAIR
HOWARD COUNTY, MARYLAND

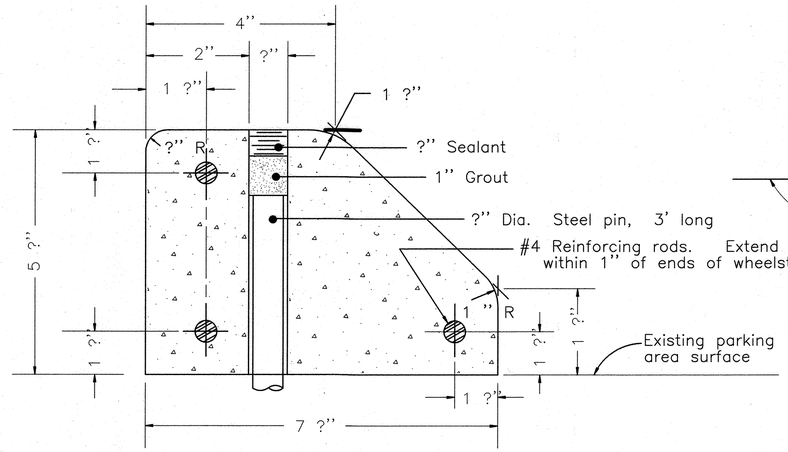
SCALE AS SHOWN
FEBRUARY 2011 J-04 41
DRAWING ~~C-01~~, SHEET 4 OF 62

SDP-08-108

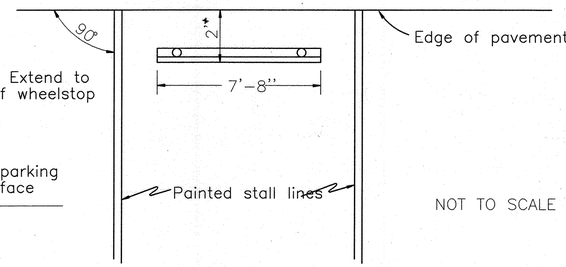


TYPICAL SECTION A/5

N.T.S.



SECTION A-A

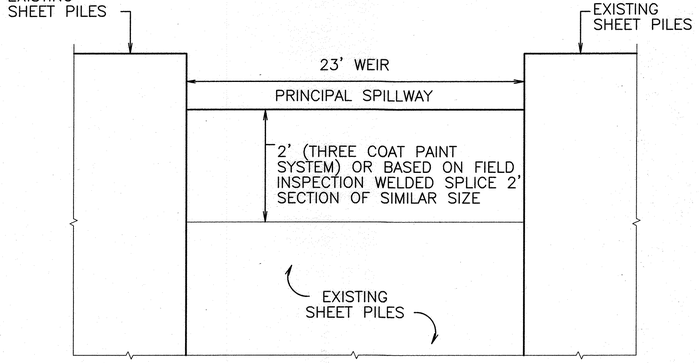


HEAD-ON PARKING

NOT TO SCALE

WHEEL STOP 1/5

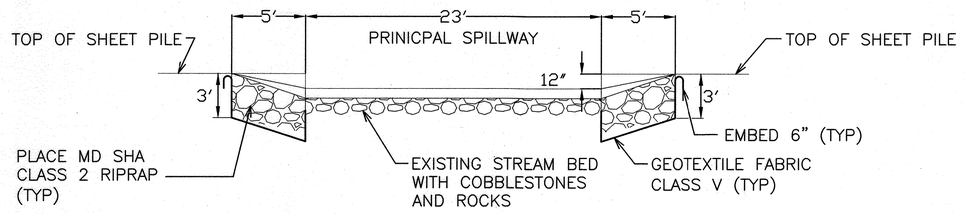
N.T.S.



DETAIL B/5

REPAIR MEASURES FOR PRINCIPAL SPILLWAY

N.T.S.



TYPICAL SECTION C/5

N.T.S.

NOTE:
N.T.S. DENOTES NOT TO SCALE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 3/1/13

Chief, Division of Land Development — Date 3/08/13

Director MARSHA McLAUGHLIN — Date 3-12-13

MDE
Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal — 10/2/12
Visty P. Dalal
Sr. Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND — PIETER S. DAHMEN — No. 29951 — REGISTERED PROFESSIONAL ENGINEER
May 7, 2012

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

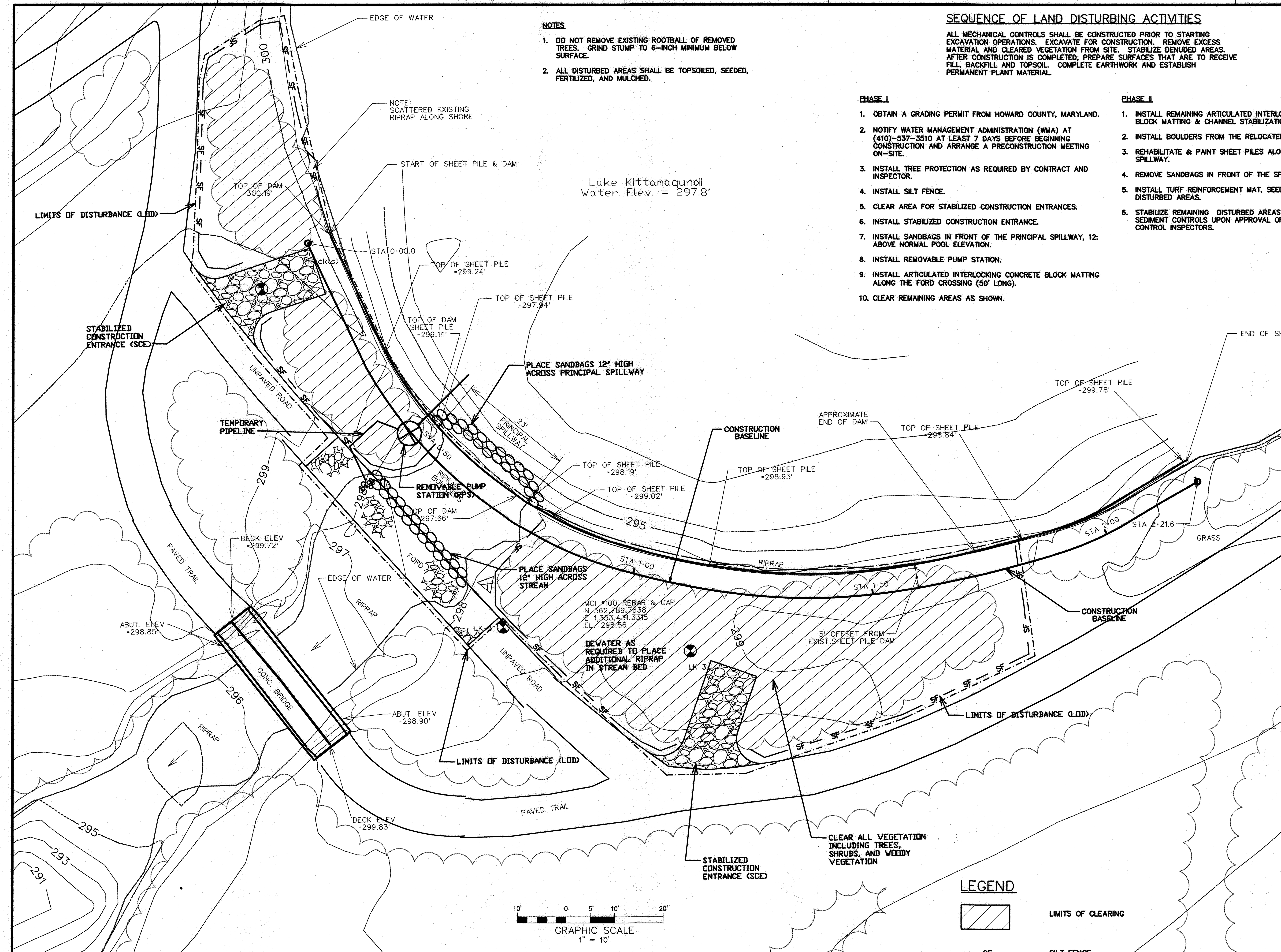
SECTIONS AND DETAILS

COLUMBIA ASSOCIATION TOWN CENTER

REVISED SITE DEVELOPMENT PLAN
LAKE KITTAMAQUNDI DAM REPAIR
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
FEBRUARY 2011 J-05 42
DRAWING ~~D-01~~, SHEET ~~5~~ OF 62

SDP- 08-108



NOTES

1. DO NOT REMOVE EXISTING ROOTBALL OF REMOVED TREES. GRIND STUMP TO 6-INCH MINIMUM BELOW SURFACE.
2. ALL DISTURBED AREAS SHALL BE TOPSOILED, SEEDED, FERTILIZED, AND MULCHED.

SEQUENCE OF LAND DISTURBING ACTIVITIES

ALL MECHANICAL CONTROLS SHALL BE CONSTRUCTED PRIOR TO STARTING EXCAVATION OPERATIONS. EXCAVATE FOR CONSTRUCTION. REMOVE EXCESS MATERIAL AND CLEARED VEGETATION FROM SITE. STABILIZE DENUDED AREAS. AFTER CONSTRUCTION IS COMPLETED, PREPARE SURFACES THAT ARE TO RECEIVE FILL, BACKFILL AND TOPSOIL. COMPLETE EARTHWORK AND ESTABLISH PERMANENT PLANT MATERIAL.

PHASE I

1. OBTAIN A GRADING PERMIT FROM HOWARD COUNTY, MARYLAND.
2. NOTIFY WATER MANAGEMENT ADMINISTRATION (WMA) AT (410)-537-3510 AT LEAST 7 DAYS BEFORE BEGINNING CONSTRUCTION AND ARRANGE A PRECONSTRUCTION MEETING ON-SITE.
3. INSTALL TREE PROTECTION AS REQUIRED BY CONTRACT AND INSPECTOR.
4. INSTALL SILT FENCE.
5. CLEAR AREA FOR STABILIZED CONSTRUCTION ENTRANCES.
6. INSTALL STABILIZED CONSTRUCTION ENTRANCE.
7. INSTALL SANDBAGS IN FRONT OF THE PRINCIPAL SPILLWAY, 12: ABOVE NORMAL POOL ELEVATION.
8. INSTALL REMOVABLE PUMP STATION.
9. INSTALL ARTICULATED INTERLOCKING CONCRETE BLOCK MATTING ALONG THE FORD CROSSING (50' LONG).
10. CLEAR REMAINING AREAS AS SHOWN.

PHASE II

1. INSTALL REMAINING ARTICULATED INTERLOCKING CONCRETE BLOCK MATTING & CHANNEL STABILIZATION MEASURES.
2. INSTALL BOULDERS FROM THE RELOCATED AREA.
3. REHABILITATE & PAINT SHEET PILES ALONG PRINCIPAL SPILLWAY.
4. REMOVE SANDBAGS IN FRONT OF THE SPILLWAY.
5. INSTALL TURF REINFORCEMENT MAT, SEED & MULCH ALL DISTURBED AREAS.
6. STABILIZE REMAINING DISTURBED AREAS AND REMOVE SEDIMENT CONTROLS UPON APPROVAL OF WMA SEDIMENT CONTROL INSPECTORS.

LEGEND

(hatched box)	LIMITS OF CLEARING
— SF —	SILT FENCE
—·—·—	LIMITS OF DISTURBANCE (LOD)

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

John R Robertson 10/2/12
Howard SCD Date

ENGINEER'S CERTIFICATE
"I certify that this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements with the Howard Soil Conservation District."

Walter Dinicola 3/8/13
Signature of Engineer(print name below signature) Date
Walter Dinicola

DEVELOPER'S CERTIFICATE
"We certify that all development and construction will be done according to this plan for sediment and erosion control, and that all responsible personnel involved in the construction project, will have a Certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard Soil Conservation District"

D. Mott 3/8/13
Signature of Developer (print name below signature) Date

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 3/1/13
Chief, Division of Land Development — Date 3/08/13
Director — MARSHA MCLAUGHLIN — Date 3-12-13

MDE
Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 10/2/12
Visty P. Dalal — Date
Sr. Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION
PIETER DAHMEN, PE
HDR ENGINEERING INC.
(Seal: STATE OF MARYLAND, PIETER G. DAHMEN, REGISTERED PROFESSIONAL ENGINEER) May 7, 2012

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

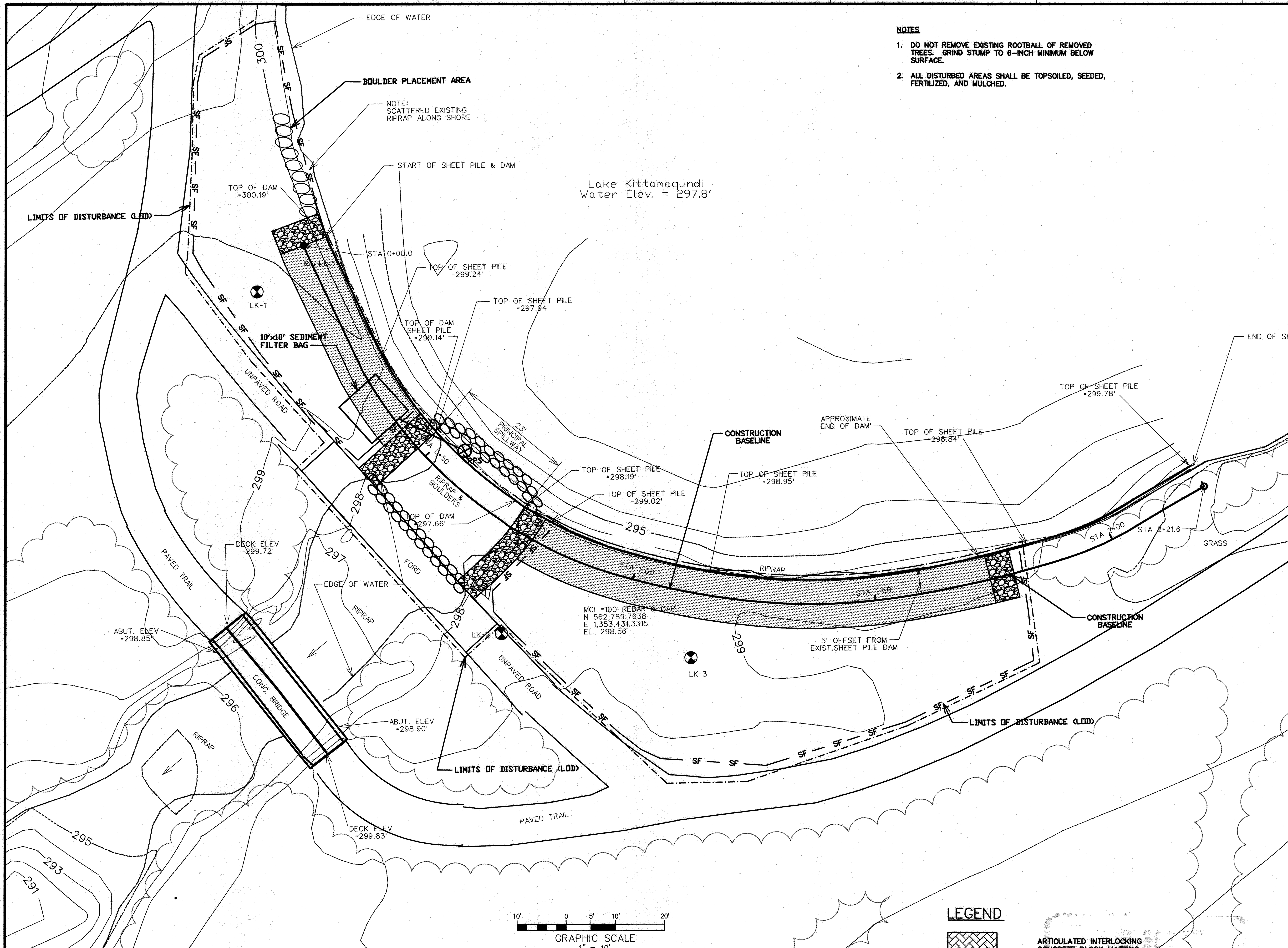
EROSION AND SEDIMENT CONTROL PLAN
INITIAL PHASE

COLUMBIA ASSOCIATION TOWN CENTER

REVISED SITE DEVELOPMENT PLAN
LAKE KITTAMAQUNDI DAM REPAIR
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
FEBRUARY 2011 J-06 43
DRAWING ~~E-01~~, SHEET ~~6~~ OF 62

SDP-08-108



NOTES

1. DO NOT REMOVE EXISTING ROOTBALL OF REMOVED TREES. GRIND STUMP TO 6-INCH MINIMUM BELOW SURFACE.
2. ALL DISTURBED AREAS SHALL BE TOPSOILED, SEEDED, FERTILIZED, AND MULCHED.

LEGEND

(crosshatch)	ARTICULATED INTERLOCKING CONCRETE BLOCK MATTING
— SF —	SILT FENCE
-·-·-·-	LIMITS OF DISTURBANCE (LOD)

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT

John K Robertson 10/2/12
Howard SCD Date

ENGINEER'S CERTIFICATE
"I certify that this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements with the Howard Soil Conservation District."

Walter Dinicola 3/8/13
Signature of Engineer(print name below signature) Date
Walter Dinicola

DEVELOPER'S CERTIFICATE
"I/We certify that all development and construction will be done according to this plan for sediment and erosion control, and that all responsible personnel involved in the construction project, will have a Certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard Soil Conservation District"

D. Mott 3.8.13
Signature of Developer (print name below signature) Date

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 3/1/13
Chief, Division of Land Development	Date 3/08/13
Director MARSHA McLAUGHLIN	Date 3-12-13

MDE
Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal 10/2/12
Visty P. Dalal Date
Sr. Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.
May 7, 2012

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

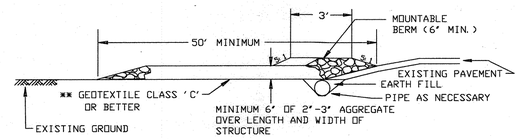
TEMPORARY EROSION AND SEDIMENT CONTROL PLAN FINAL PHASE

COLUMBIA ASSOCIATION TOWN CENTER

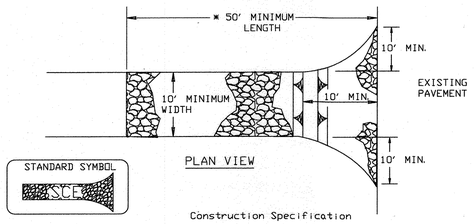
REVISED SITE DEVELOPMENT PLAN
LAKE KITTAMAQUNDI DAM REPAIR
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
FEBRUARY 2011 J-07
DRAWING ~~E-02~~, SHEET 7 OF 62
44

SDP-08-108



PROFILE



PLAN VIEW

Construction Specification

1. Length - minimum of 50', or as shown on plans (**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.

STABILIZED CONSTRUCTION ENTRANCE 1 E-03

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 representative 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:

i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an 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"ft" in diameter.

ii. Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistle, or others as specified.

iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 48 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:

i. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.

IV. For sites having disturbed areas over 5 acres:

i. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to, bring the soil into compliance with the following:

a. 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 perscribed to raise the pH to 6.5 or higher.

b. Organic content of topsoil shall be not less than 1.5 percent by weight.

c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.

d. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.

Note: Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appopriate approval authority, may be used in lieu of natural topsoil.

ii. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.

V. Topsoil Application

i. When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade Stabilization Structures, Earth Dikes, Slope Silt Fence and Sediment Traps and Basins.

ii. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" - 8" higher in elevation.

iii. 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 topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.

iv. Topsoil shall not be placed while the topsoil or subsoil is in a 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.

TOPSOILING 2 E-03

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 13/4" 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

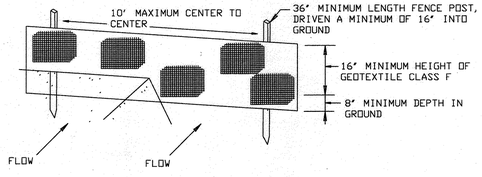
3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.

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.

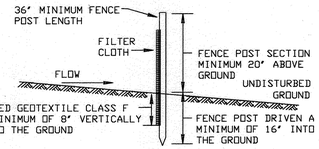
Silt Fence Design Criteria

Slope Steepness	(Maximum) Slope Length	(Maximum) Silt Fence Length
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	500 feet
3:1 to 2:1	40 feet	250 feet
2:1 and steeper	20 feet	125 feet

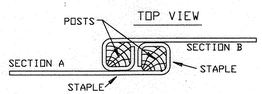
Note: In areas of less than 2% slope and sandy soils (USDA general classification system, soil Class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.



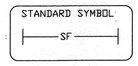
PERSPECTIVE VIEW



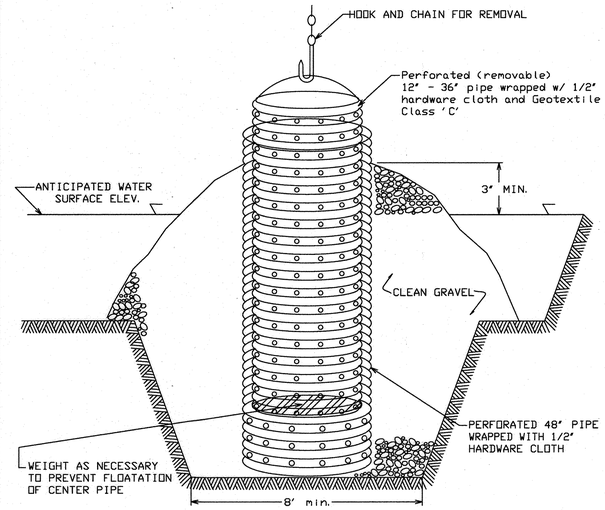
CROSS SECTION



JOINING TWO ADJACENT SILT FENCE SECTIONS



SILT FENCE 3 E-03



ELEVATION

Construction Specifications

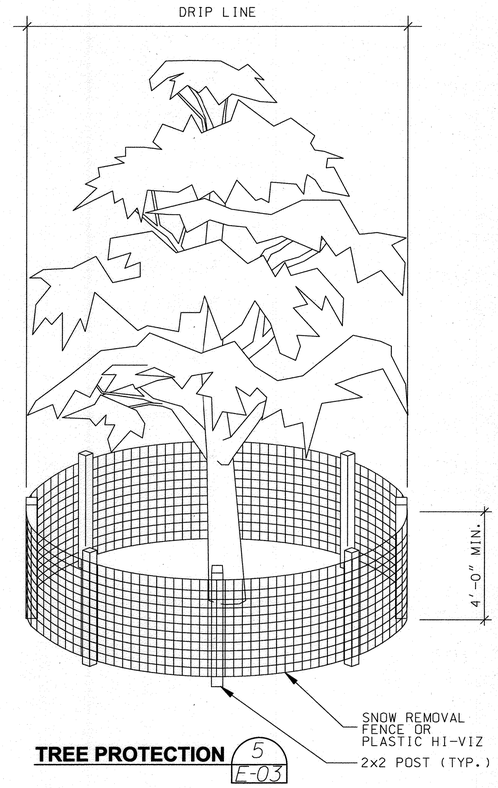
1. The outer pipe should be 48" dia. or shall, in any case, be at least 4" greater in diameter than the center pipe. The outer pipe shall be wrapped with 1/2" hardware cloth to prevent backfill material from entering the perforations.

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.

REMOVABLE PUMPING STATION (RPS) 4 E-03



TREE PROTECTION 5 E-03

Construction Specifications

1. Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with a row of staples about 4" down slope from the trench. Spacing between staples is 6".

2. Staple the 4" overlap in the channel center using an 18" spacing between staples.

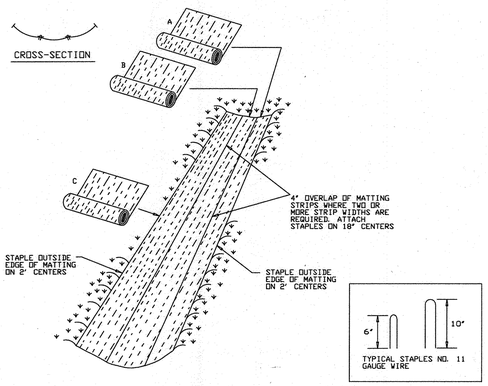
3. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.

4. Staples shall be placed 2" apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.

5. Where one roll of matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4", shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.

6. The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

Note: If flow will enter from the edge of the matting then the area effected by the flow must be keyed-in.



EROSION CONTROL MATTING 6 E-03

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
Howard S.C.D. Date 10/9/12

TEMPORARY EROSION AND SEDIMENT CONTROL DETAILS AND NOTES

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 3/1/13

Chief, Division of Land Development — Date 3/08/13

Director MARSHA McLAUGHLIN — Date 3-12-13

MDE
Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V.P. Dalal 10/2/12
Visty P. Dalal Date
Sr. Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION
PIETER DAHMEN, PE
HDR ENGINEERING INC.
STATE OF MARYLAND — PIETER G. DAHMEN — 22982 — REGISTERED PROFESSIONAL ENGINEER
May 1, 2012

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

COLUMBIA ASSOCIATION TOWN CENTER

REVISED SITE DEVELOPMENT PLAN
LAKE KITTAMAQUNDI DAM REPAIR
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
FEBRUARY 2011 J-08 45
DRAWING ~~E-03~~, SHEET ~~8~~ OF 62

SDP-08-108

LK-1

PROJECT #: 95522
PROJECT: Lake Kittamaqundi
STRUCTURE: West End of Dam

PAGE 1 OF 1

LOCATION:
LATITUDE: °N
OFFSET:
LONGITUDE: °W
SURFACE ELEVATION: 299.6 ft
COORD. DATUM: NAD 83

Date(s) Drilled: 11/5/08 – 11/5/08
Drilling Method(s): Hollow Stem Auger w/SPTs
SPT Method: Automatic Hammer
Other Test(s):
Driller: Andy Bissette/F&R
Logger: Sue Young/HDR
GROUND WATER
8 feet at 0 hrs
NO LONG TERM MEASUREMENTS TAKEN

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	% SOIL RECOVERY	SAMPLE INTERVAL	LIQUID LIMIT LL	PLASTICITY INDEX PI	MOISTURE CONTENT (%)	DESCRIPTION OF STRATA
		3		0				0.0 / 299.6 Topsoil TOPS
		6	80					0.2 / 299.4 Red brown CLAYEY SAND, medium dense, moist, micaceous SC
2		8		1.5				
		9			44	18	15.0	
		10	92					
		11		3				Same, red brown and gray, moist
		4						
4		6	100					
	295	6		4.5				
		2						4.8 / 294.8 Dark gray SILT, trace fine sand, very soft to soft, very moist, micaceous MH
		2	100				0.5	
6		2		6				Lenses of red brown sandy silt below 7.5 feet
		1	100				0.5	
		2		7.5				
								Trace small well rounded pebbles
8		WOH	100		57	25	52.5	0.75
								Wet at 9 feet
		12		9				
	290	40	73					0.25
10		23		10.5				
								10.3 / 289.3 Medium gray, SAND, SILT AND GRAVEL, very dense, wet (saturated) GP-GM
								12.0 / 287.6 DECOMPOSED GRANITE, recovered as tan to pink silt, and rock fragments GRN
12								
		39		13.5				
14		32	53					
	285	50		15				
								Auger refusal at 15.5 feet

REMARKS: RIG TYPE: CME-75 truck mounted rig.
Boring tremie grouted upon completion
Water entering boring when 0 hr water level taken

PAGE 1 OF 1
LK-1

SPT_LOCKCOLUMBIA ASSOCIATION LAKE KITT.GPJ US_1.025d81505;12/4/09

LK-2

PROJECT #: 95522
PROJECT: Lake Kittamaqundi
STRUCTURE: Center of Dam

PAGE 1 OF 1

LOCATION:
LATITUDE: °N
OFFSET:
LONGITUDE: °W
SURFACE ELEVATION: 298.7 ft
COORD. DATUM: NAD 83

Date(s) Drilled: 11/5/08 – 11/5/08
Drilling Method(s): Hollow Stem Auger w/SPTs
SPT Method: Automatic Hammer
Other Test(s):
Driller: Andy Bissette/F&R
Logger: Sue Young/HDR
GROUND WATER
4.7 feet at 0 hrs
NO LONG TERM MEASUREMENTS TAKEN

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	% SOIL RECOVERY	SAMPLE INTERVAL	LIQUID LIMIT LL	PLASTICITY INDEX PI	MOISTURE CONTENT (%)	DESCRIPTION OF STRATA
		13		0				0.0 / 298.7 Leaves, root mat OH
		31	73					0.2 / 298.5 Fill, recovered as tan rock fragments, very dense, dry FL
2		14		1.5				
		10			44	21	18.2	2.75
		4	73					
		5		3				2.5 / 296.2 Brown fine SANDY CLAY, trace gravel, stiff to medium stiff, moist, micaceous CL
4		5						
	295	5	40					1.75
		3		4.5				
		1						4.5 / 294.2 Brown gray CLAY, very soft to medium stiff, moist, micaceous CL
		2	93					
6		1		6				
		3						1.25
		3	27					
		3		7.5				
		2						
8		1	73					
	290	1			34	15	31.8	0.25
		9		9				Trace fine sand and small gravel lenses, wet below 7.5 feet
		12	73					
		10		10.5				9.2 / 289.5 Gray, tan, and brown GRAVEL, SAND, SILT, medium dense, wet GP-GM
12								
								12.0 / 286.7 DECOMPOSED GRANITE, recovered as gray, tan, and brown sand, silt, and rock fragments GRN
				13.5				
14	285	50	100	13.6				Auger refusal at 14.0 feet

REMARKS: RIG TYPE: CME-75 truck mounted rig.
Boring tremie grouted upon completion, boring located adjacent to gravel access road

PAGE 1 OF 1
LK-2

SPT_LOCKCOLUMBIA ASSOCIATION LAKE KITT.GPJ US_1.025d81505;12/4/09

LK-3

PROJECT #: 95522
PROJECT: Lake Kittamaqundi
STRUCTURE: East End of Dam

PAGE 1 OF 1

LOCATION:
LATITUDE: °N
OFFSET:
LONGITUDE: °W
SURFACE ELEVATION: 298.5 ft
COORD. DATUM: NAD 83

Date(s) Drilled: 11/5/08 – 11/5/08
Drilling Method(s): Hollow Stem Auger w/SPTs
SPT Method: Automatic Hammer
Other Test(s):
Driller: Andy Bissette/F&R
Logger: Sue Young/HDR
GROUND WATER
6.6 feet at 1 hr
NO LONG TERM MEASUREMENTS TAKEN

DEPTH (ft)	ELEVATION (ft)	STANDARD PENETRATION TEST HAMMER BLOWS	% SOIL RECOVERY	SAMPLE INTERVAL	LIQUID LIMIT LL	PLASTICITY INDEX PI	MOISTURE CONTENT (%)	DESCRIPTION OF STRATA
		2		0				0.0 / 298.5 Topsoil TOPS
		4	80					0.2 / 298.3 Red brown fine SILTY SAND, some small gravel, medium dense, moist, micaceous ML
2		7		1.5				
		3						2.25
		3	73					1.8 / 296.7 Red brown fine CLAYEY SAND, loose to very loose, moist, micaceous SC
		4		3				
4		2						
	295	2	60		46	20	20.8	
		2		4.5				
								5.5 / 293.0 Red brown fine SILTY SAND, very loose, moist, micaceous SM
		WOH	13					
6				6				
		WOH	67		47	18	28.3	
				7.5				
		WOH	67					0.25
8								
	290	7						8.2 / 290.3 Gray fine SANDY SILT, very soft, wet ML
		7		9				
		9	67					8.8 / 289.7 Gray and tan GRAVEL, SILT, and SAND, medium dense, wet GP-GM
10		10		10.5				
								10.2 / 288.3 DECOMPOSED GRANITE, recovered as gray, dark gray, and tan, sand, silt, and rock fragments GRN
								Top of weathered rock at 10.2 feet
12								
14								
	285	50	100	13.5 14				
16								
								Auger refusal at 19.3 feet
18	280	50	67	18.5 18.8				

REMARKS: RIG TYPE: CME-75 truck mounted rig.
Boring tremie grouted upon completion

PAGE 1 OF 1
LK-3

SPT_LOCKCOLUMBIA ASSOCIATION LAKE KITT.GPJ US_1.025d81505;12/4/09

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 3/1/13

Chief, Division of Land Development — Date 3/08/13

Director MARSHA MCLAUGHLIN — Date 3-12-13

MDE
Maryland Department of the Environment
Water Management Administration
Dam Safety Division
Vinty P. Dalal, Sr. Regulatory & Compliance Engineer — Date 10/2/12

THIS PLAN SET HAS BEEN PREPARED BY:
HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION
PIETER DAHMEN, PE
HDR ENGINEERING INC.
STATE OF MARYLAND — PIETER G. DAHMEN — No. 29951 — REGISTERED PROFESSIONAL ENGINEER
May 7, 2012

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

SOIL BORING LOGS

COLUMBIA ASSOCIATION
TOWN CENTER

REVISED SITE DEVELOPMENT PLAN
LAKE KITTAMAQUNDI DAM REPAIR
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN
FEBRUARY 2011 J-09
46
DRAWING ~~F-01~~, SHEET ~~9~~ OF 62

SDP-08-108

LAKE KITTAMAQUNDI MULTIUSE TRAIL
CONSTRUCTION DRAWINGS
COLUMBIA ASSOCIATION
HOWARD COUNTY, MARYLAND

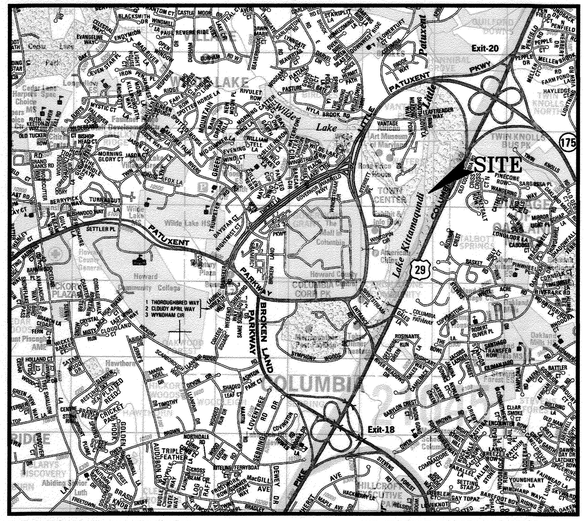
GENERAL NOTES

1. HORIZONTAL AND VERTICAL SURVEY CONTROLS:
   THE COORDINATES SHOWN ON THE DRAWINGS ARE BASED ON MARYLAND STATE REFERENCE SYSTEM NAD 83/91 AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS HOWARD CO. BM 30 BA AND BM 36 EA. ALL VERTICAL CONTROLS ARE BASED NAVD 88. VERTICAL CONTROLS PROVIDED ON THE DRAWINGS ARE BM 30 BA AND BM 36 EA.
2. THE EXISTING UTILITIES, GRADES, AND OBSTRUCTIONS SHOWN ARE FROM THE BEST AVAILABLE RECORDS AND SHALL BE VERIFIED BY THE CONTRACTOR TO HIS SATISFACTION PRIOR TO CONSTRUCTION. NECESSARY PRECAUTIONS SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT EXISTING SERVICES AND MAINS AND ANY DAMAGE TO THEM SHALL BE REPAIRED IMMEDIATELY AT HIS OWN EXPENSE.
3. CONTOURS SHOWN OUTSIDE OF LIMIT OF WORK ARE BASED ON HOWARD COUNTY 2011 GIS TOPOGRAPHY.
4. PROPERTY LINES SHOWN ARE BASED ON HOWARD COUNTY 2012 CADASTRAL DATA.
5. WETLAND DELINEATION WAS PERFORMED BY BAYLAND CONSULTANTS & DESIGNERS, INC. ON JUNE 16TH 2013.
6. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT PERMIT TRACKING NUMBER IS 201460150.
7. FEMA FIRM #24027C0155D EFFECTIVE NOVEMBER 6, 2013 SHOWS THAT THE PROJECT SITE IS LOCATED WITHIN ZONE A.
8. RIPRAP SHOWN IN PLAN VIEW AND PROFILE ARE SYMBOLIC AND DO NOT REPRESENT INDIVIDUAL STONES.
9. THE SITE IS WITHIN THE LITTLE PATUXENT RIVER WATERSHED.
10. FOR DETAILS, MATERIALS, AND CONSTRUCTION METHODS NOT SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL REFER TO HOWARD COUNTY DESIGN MANUAL, VOLUME IV, STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION. THE CONTRACTOR SHALL HAVE A COPY VOLUME IV ON SITE AT ALL TIMES.
11. THIS PLAN IS EXEMPT FROM FOREST CONSERVATION REQUIREMENTS UNDER SUBSECTION 16.1202(b)(1)(iv) SINCE IT IS PART OF A PLANNED UNIT DEVELOPMENT WHICH HAD PRELIMINARY PLAN APPROVAL AND 50% OR MORE OF THE LAND WAS RECORDED AND SUBSTANTIALLY DEVELOPED BEFORE DECEMBER 31, 1992.
12. LANDSCAPING FOR THIS PLAN IS PROVIDED BY ALTERNATIVE COMPLIANCE BASED ON EXISTING SITE CONDITIONS AND VEGETATION.
13. THIS PLAN IS SUBJECT TO WAIVER PETITION WP-14-079, APPROVED ON FEBRUARY 18, 2014. WP-14-079 APPROVES A WAIVER TO SUBSECTIONS 16.115(c)(2), 16.116(a)(1), AND 16.116(a)(2)(iii) WHICH IS SUBJECT TO THE FOLLOWING CONDITIONS:
    a. HOWARD COUNTY APPROVAL OF REDLINE REVISION NO. 3 TO SDP-08-108
    b. STATE AND FEDERAL AUTHORIZATION OF REGULATED ACTIVITIES
    c. OBTAIN ALL REQUIRED PERMITS FROM THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES, AND PERMITS.
    d. OBTAIN ALL NECESSARY PERMISSION AND AGREEMENTS FROM THE MARYLAND STATE HIGHWAY ADMINISTRATION (SHA) FOR THE PORTIONS OF THE PATHWAY LOOP LOCATED WITHIN THE US ROUTE 29 RIGHT-OF-WAY.

STORMWATER MANAGEMENT NOTE

STORMWATER MANAGEMENT REQUIREMENTS WILL BE PROVIDED FOR THE PROPOSED PAVED TRAIL AS SHOWN ON THIS PLAN VIA NON-ROOFTOP DISCONNECTION IN ACCORDANCE WITH THE CURRENT HOWARD COUNTY DESIGN MANUAL, VOLUME I: STORM DRAINAGE, CHAPTER 5: STORMWATER MANAGEMENT. A SIMPLIFIED ENVIRONMENTAL CONCEPT PLAN WAS APPROVED ON JANUARY 13, 2014.

APPROVED
PLANNING BOARD
of HOWARD COUNTY
DATE 6/5/2014



HOWARD COUNTY ADC MAP COORDINATES:
MAP 15 GRID H-5

LOCATION MAP

SCALE: 1"=2000'

LEGEND

TRAVERSE POINT	△	PROP. PATH	
EX. SPOT SHOT	X ELEV		
EX. BOUNDARY		PROP. BOARDWALK	
EX. MINOR CONTOUR		PROP. IMBRICATED ROCK WALL	
EX. MAJOR CONTOUR		PROP. CONSTRUCTION ACCESS	
EX. ROAD		LIMIT OF DISTURBANCE	LOD
EX. TREELINE		SILT FENCE	SF
EX. VEGETATED BUFFER	VB	TURBIDITY CURTAIN	TC
EX. WATERS OF THE U.S.	WUS	TEMPORARY ACCESS BRIDGE	TB
EX. 100-YR FEMA FLOODPLAIN			
EX. 15' NON-TIDAL WETLAND BUFFER			
EX. NON-TIDAL WETLANDS			
EX. IMBRICATED RIPRAP WALL			

PROJECT INFORMATION

1.	OWNER/DEVELOPER:	COLUMBIA ASSOCIATION CONTACT: DENNIS MATTEY
2.	OWNER/DEVELOPER INFORMATION:	9450 GERWIG LANE COLUMBIA, MD 21046 410-381-0591
3.	ENGINEER:	BAYLAND CONSULTANTS AND DESIGNERS, INC.
4.	ENGINEER INFORMATION:	1321 MERCEDES DRIVE, SUITE A HANOVER, MARYLAND 21076 PH: 410-694-9401
5.	TAX MAP:	0036
6.	PARCEL:	0210
7.	DEED REF:	03324/00191
8.	DISTRICT:	15
9.	HO. COUNTY TAX ID NO:	15-010657
10.	USE:	OPEN SPACE
11.	ZONING:	NEW TOWN
12.	PROPERTY AREA:	39.8± ACRES
13.	WATERSHED:	LITTLE PATUXENT RIVER

INDEX OF SHEETS

DRAWING NO.	SHEET NO.	SHEET TITLE
K-01	47	MULTIUSE TRAIL - COVER SHEET
K-02	48	MULTIUSE TRAIL - KEY SHEET
K-03	49	MULTIUSE TRAIL - DESIGN PLANS
K-04	50	MULTIUSE TRAIL - DESIGN PLANS
K-05	51	MULTIUSE TRAIL - DESIGN PLANS
K-06	52	MULTIUSE TRAIL - DESIGN PLANS
K-07	53	MULTIUSE TRAIL - DESIGN PLANS
K-08	54	MULTIUSE TRAIL - CROSS SECTIONS & DETAILS
K-09	55	MULTIUSE TRAIL - BOARDWALK DETAILS
K-10	56	MULTIUSE TRAIL - BOARDWALK DETAILS
K-11	57	MULTIUSE TRAIL - EROSION AND SEDIMENT CONTROL PLAN
K-12	58	MULTIUSE TRAIL - EROSION AND SEDIMENT CONTROL PLAN
K-13	59	MULTIUSE TRAIL - EROSION AND SEDIMENT CONTROL NOTES & DETAILS

SITE ANALYSIS

1.	TOTAL DISTURBED AREA:	2.87 ACRES
2.	TOTAL AREA TO BE STABILIZED:	2.87 ACRES
2.1.	TOTAL EX. IMP AREA:	0.00 ACRES
2.2.	TOTAL PR. IMPERVIOUS AREA:	0.55 ACRES
2.3.	TOTAL STABILIZED CONSTRUCTION ACCESS	0.33 ACRES
2.4.	TOTAL TO BE VEGETATIVELY STABILIZED:	1.99 ACRES
3.	PROPOSED IMPERVIOUS AREA:	0.88 ACRES
4.	ESTIMATED CUT:	620 CY
5.	ESTIMATED FILL:	0 CY

NOTE:
THE EARTHWORK QUANTITIES SHOWN HEREON ARE FOR INFORMATION PURPOSES ONLY. BAYLAND MAKES NO GUARANTEES OF ACCURACY OF QUANTITIES OR BALANCE OF SITE. THE CONTRACTOR SHALL TAKE FULL RESPONSIBILITY OF ACTUAL EARTHWORK QUANTITIES ENCOUNTERED DURING CONSTRUCTION.

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. 21194, EXPIRATION DATE: 04/20/2016.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 5.9.14

Chief, Division of Land Development — Date 6.09.14

Director — Date 6/9/14

REVISED SITE DEVELOPMENT PLAN

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

Bayland Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A Phone: (410)694-9401
Hanover, Maryland 21076 Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com
BAYLAND JOB NO. 8_16202

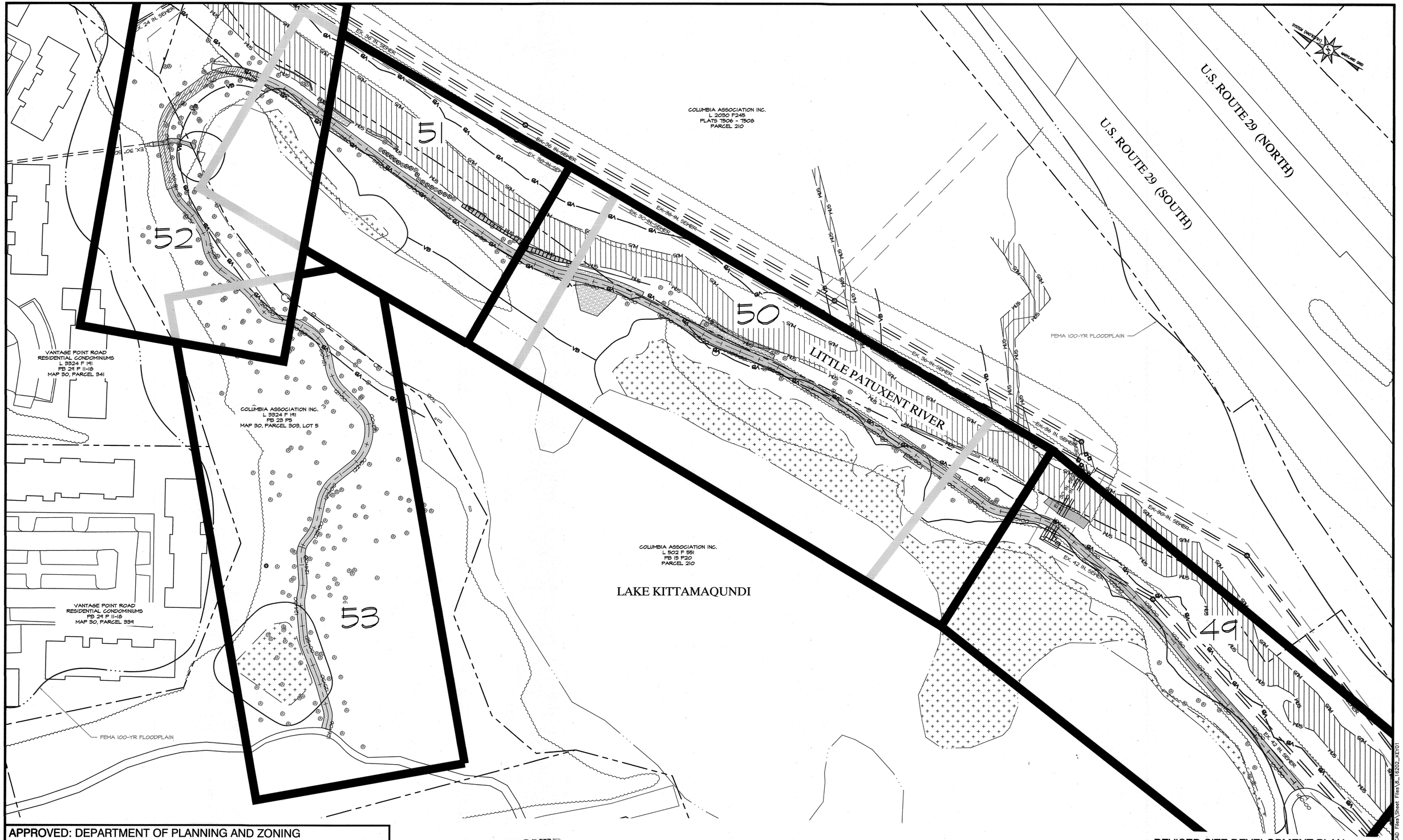
STATE OF MARYLAND · SEPEHR BAHARLOU · No. 21194 · REGISTERED PROFESSIONAL ENGINEER
4/21/14

LAKE KITTAMAQUNDI MULTIUSE TRAIL COVER SHEET

REVISIONS				
DATE	BY	DESCRIPTION		
			SCALE: AS-SHOWN	
			DRAWN BY: MKB	DATE: 04/21/14
			CHECKED BY: SB	DATE: 4/21/2014
			DESIGNED BY: MKB	DATE: 04/21/14
			DRAWING K-01, SHEET NO. 47 OF 62	

SDP-08-108

Z:\8_16202_LAKE_KITT_MULTIUSE_TRAIL\CAD Files\Sheet Files\8_16202_COV01



APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 5.9.14

Chief, Division of Land Development — Date 6.09.14

Director — Date 6/9/14

APPROVED
PLANNING BOARD
of HOWARD COUNTY
DATE 6/5/2014

REVISED SITE DEVELOPMENT PLAN

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A Phone: (410)694-9401
Hanover, Maryland 21076 Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com
BAYLAND JOB NO. 8_16202

STATE OF MARYLAND
SEPEHR BAHARLOU
NO. 21198
REGISTERED
PROFESSIONAL ENGINEER
4/21/14

LAKE KITTAMAQUNDI MULTIUSE TRAIL
KEY SHEET

REVISIONS			
DATE	BY	DESCRIPTION	
			SCALE: 1" = 50'
			DRAWN BY: MKB — DATE: 04/21/14
			CHECKED BY: SB — DATE: 4/21/2014
			DESIGNED BY: MKB — DATE: 04/21/14
			DRAWING K-02, SHEET NO. 48 OF 62

SDP-08-108

N:\8_16202_LAKE_KITT_MULTIUSE_TRAIL\CAD Files\Sheet Files\8_16202_KEY01

COLUMBIA ASSOCIATION INC.
L 502 F 551
PB 15 P20
PARCEL 210

LAKE KITTAMAQUNDI

EXISTING PAVED PATH

EXISTING 25' WETLAND BUFFER

EXISTING WETLANDS

EXISTING EDGE OF WATER (TYP)

EXISTING WETLANDS

EXISTING 25' WETLAND BUFFER

EXISTING TREE LINE (TYP)

KENNEDY GARDENS

BEGIN PROPOSED PAVED PATH
STA. 100+15.57

EXISTING SANITARY SEWER JUNCTION CHAMBER

EXISTING OVERFLOW AREA

EXISTING PAVED PATH

EX. 42 IN. SEWER

EXISTING 30' UTILITY EASEMENT

EXISTING 10' DIRT PATH TO BE PAVED PER FULL DEPTH PAVING DETAIL. SEE SHEET 54.

EX. SMH

EXISTING TREE LINE (TYP)

STA. 105+00, LIMIT OF FULL DEPTH PAVING. BEGIN EXISTING GEOWEB TRAIL & OVERLAY PAVING

MATCHLINE REFER TO SHEET 50

LITTLE PATUXENT RIVER

EXISTING IMBRIGATED RIPRAP WALL

EXISTING 30-IN SANITARY SEWER PIPE PLUS EXISTING SANITARY SEWER JUNCTION CHAMBER

COLUMBIA ASSOCIATION INC.
L 2030 F245
PLATS 7506 - 7508
PARCEL 210

EXISTING WATERS OF U.S. (TYP)

EX. 30 IN. SEWER

EX. 20' EASEMENT

EX. 36 IN. SEWER

EXISTING 40' UTILITY EASEMENT

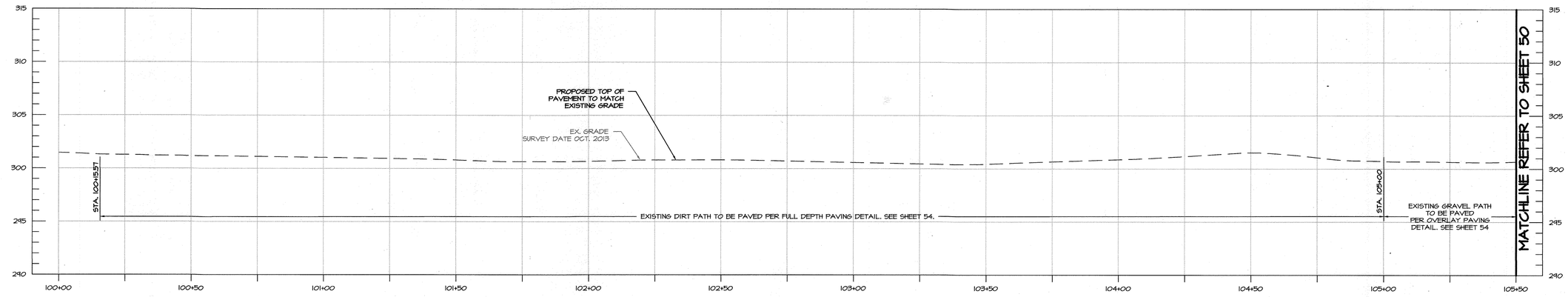
EX. SMH

LINE TABLE				
LINE	LENGTH	DIRECTION	START	END
L1	96.25'	N19°52'58"E	N: 564,302 E: 1,354,109	N: 564,393 E: 1,354,141
L2	64.70'	N18°01'07"E	N: 564,423 E: 1,354,152	N: 564,485 E: 1,354,172
L3	8.16'	N21°10'56"E	N: 564,537 E: 1,354,190	N: 564,544 E: 1,354,193
L4	34.53'	N18°36'14"E	N: 564,555 E: 1,354,197	N: 564,588 E: 1,354,208
L5	29.41'	N10°38'13"E	N: 564,655 E: 1,354,226	N: 564,684 E: 1,354,231
L6	21.08'	N13°06'15"E	N: 564,705 E: 1,354,236	N: 564,726 E: 1,354,240
L7	42.10'	N19°36'21"W	N: 564,762 E: 1,354,238	N: 564,802 E: 1,354,224

CURVE TABLE					
CURVE	RADIUS	LENGTH	CHORD DIRECTION	TANGENT	DELTA
C1	1000'	32.54'	N18°57'02"E	16.27'	1°51'51"
C2	1000'	55.22'	N19°36'01"E	27.62'	3°09'49"
C3	250'	11.25'	N19°53'35"E	5.63'	2°34'42"
C4	500'	69.53'	N14°37'13"E	34.82'	7°58'01"
C5	500'	21.53'	N11°52'14"E	10.77'	2°28'03"
C6	65'	37.11'	N3°15'03"W	19.08'	32°42'36"

PLAN

SCALE: 1" = 20'



PROFILE OF PROPOSED TRAIL STA: 100+00 TO STA: 105+50

HORIZONTAL : 1" = 20'
VERTICAL : 1" = 5'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 5.9.14

Chief, Division of Land Development — Date 6-09-14

Director — Date 6/5/14

APPROVED
PLANNING BOARD
of HOWARD COUNTY
DATE 6/5/2014

0 10 20 40
1 Inch = 20 Feet

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A Phone: (410)694-9401
Hanover, Maryland 21076 Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com
BAYLAND JOB NO. 8_16202

STATE OF MARYLAND — STEPHEN BAYLAND — No. 21193 — REGISTERED PROFESSIONAL ENGINEER — 4/21/14

REVISED SITE DEVELOPMENT PLAN

LAKE KITTAMAQUNDI MULTIUSE TRAIL DESIGN PLANS

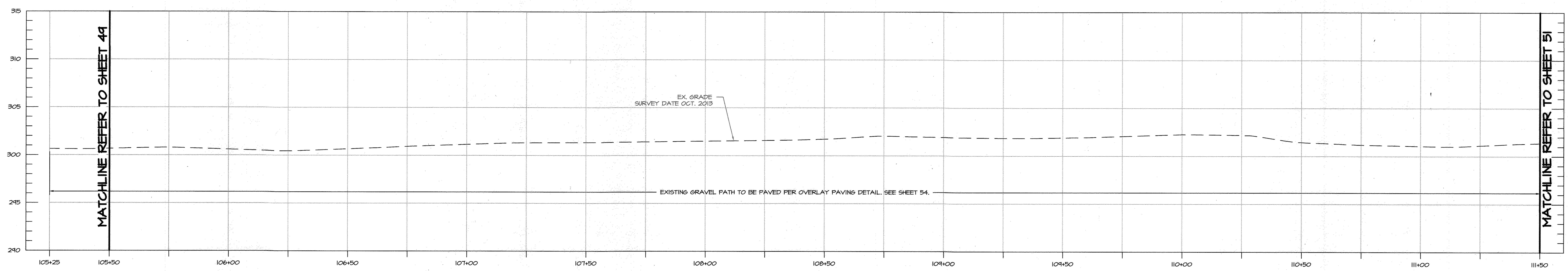
REVISIONS			SCALE: 1" = 20'	
DATE	BY	DESCRIPTION		
			DRAWN BY: MKB	DATE: 04/21/14
			CHECKED BY: SB	DATE: 4/21/2014
			DESIGNED BY: MKB	DATE: 04/21/14
			DRAWING K-03, SHEET NO. 49 OF 62	

SDP-08-108

Z:\8_16202_LAKE_KITT_MULTIUSE_TRAIL\CAD Files\Sheet Files\8_16202_SP01

PLAN

SCALE: 1" = 20'



PROFILE OF PROPOSED TRAIL STA: 105+25 TO STA: 111+50

HORIZONTAL : 1" = 20'
VERTICAL : 1" = 5'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 5-9-14
Chief, Division of Land Development	Date 6-09-14
Director	Date 6/9/14

APPROVED
PLANNING BOARD
of HOWARD COUNTY
DATE 6/5/2014

0 10 20 40
1 Inch = 20 Feet

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A Phone: (410)694-9401
Hanover, Maryland 21076 Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com
BAYLAND JOB NO. 8_16202

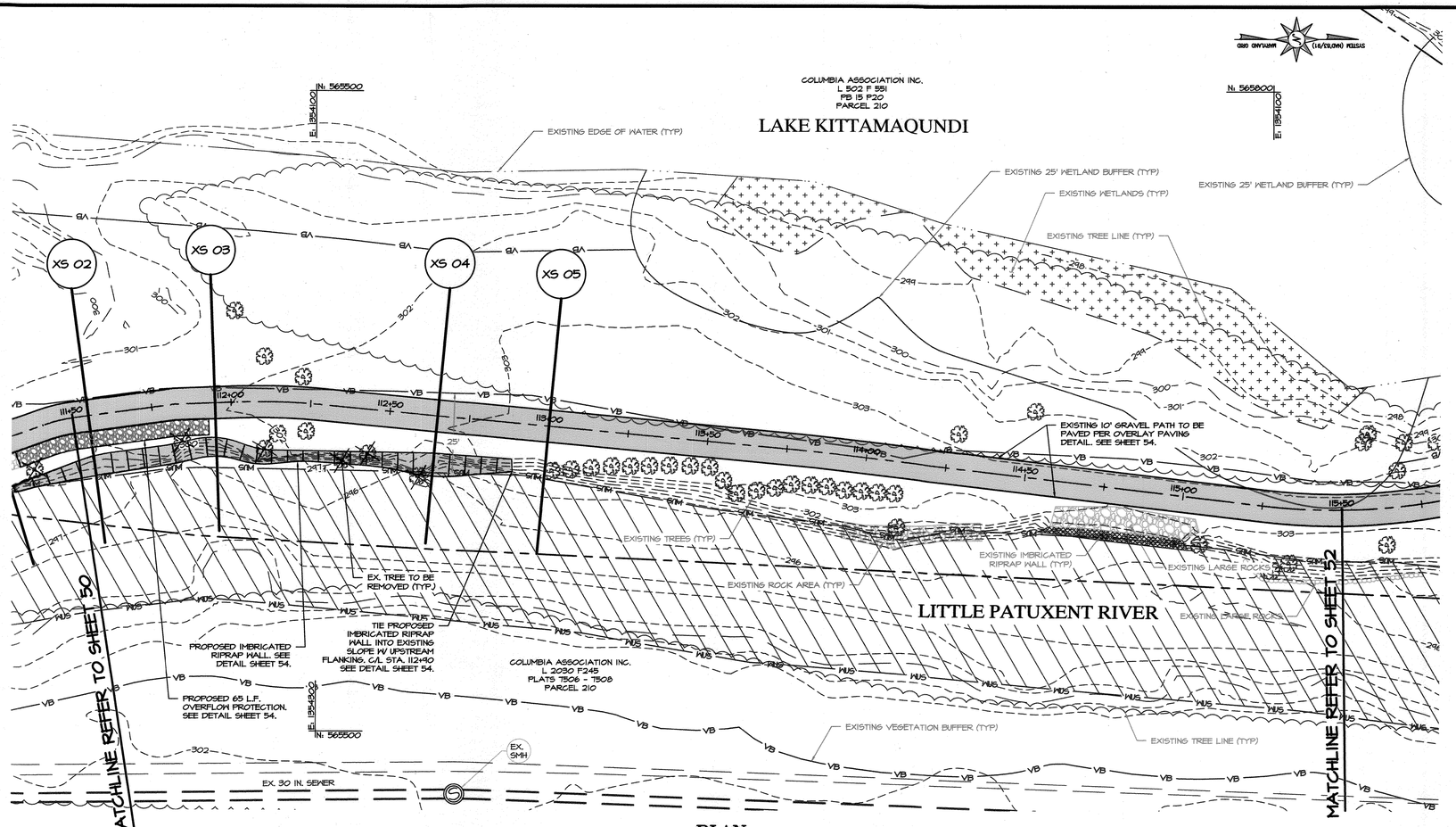
STATE OF MARYLAND — SEPEHR BAHARLOU — REGISTERED PROFESSIONAL ENGINEER — No. 21194
4/21/14

REVISED SITE DEVELOPMENT PLAN

LAKE KITTAMAQUNDI MULTIUSE TRAIL DESIGN PLANS

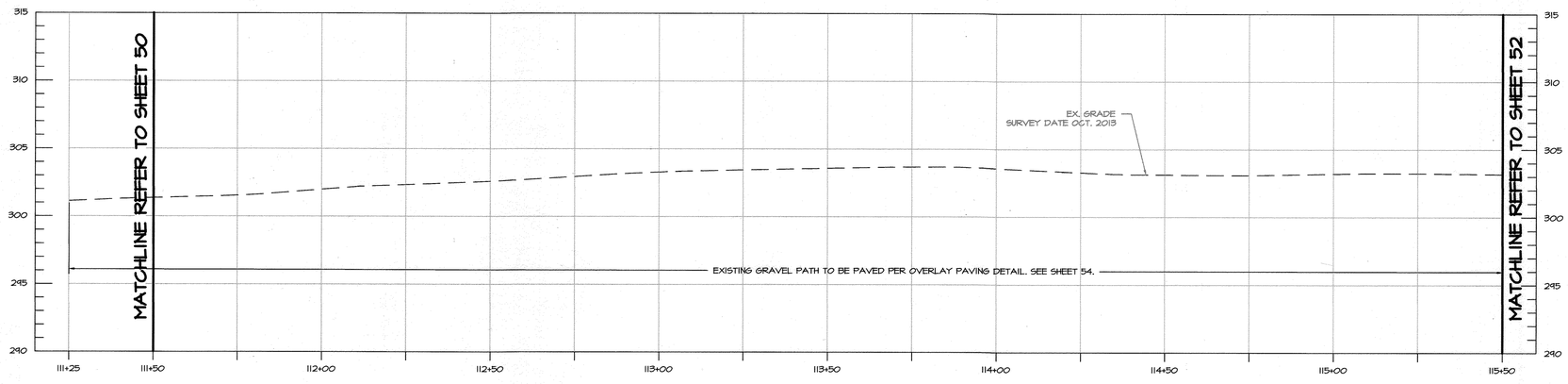
DATE	BY	REVISIONS DESCRIPTION

SCALE: 1" = 20'	
DRAWN BY: MKB	DATE: 04/21/14
CHECKED BY: SB	DATE: 4/21/2014
DESIGNED BY: MKB	DATE: 04/21/14
DRAWING K-04, SHEET NO. 50 OF 62	
SDP-08-108	



PLAN

SCALE: 1" = 20'



PROFILE OF PROPOSED TRAIL STA: 111+25 TO STA: 115+50

HORIZONTAL : 1" = 20'
VERTICAL : 1" = 5'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 5.9.14

Chief, Division of Land Development — Date 6-09.14

Director — Date 6/9/14

APPROVED
PLANNING BOARD
of HOWARD COUNTY
DATE 6/5/2014

0 10 20 40
1 Inch = 20 Feet

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A Phone: (410)694-9401
Hanover, Maryland 21076 Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com
BAYLAND JOB NO. 8_16202

STATE OF MARYLAND
SEPEHR BAHARLOU
No. 21158
PROFESSIONAL ENGINEER
4/21/14

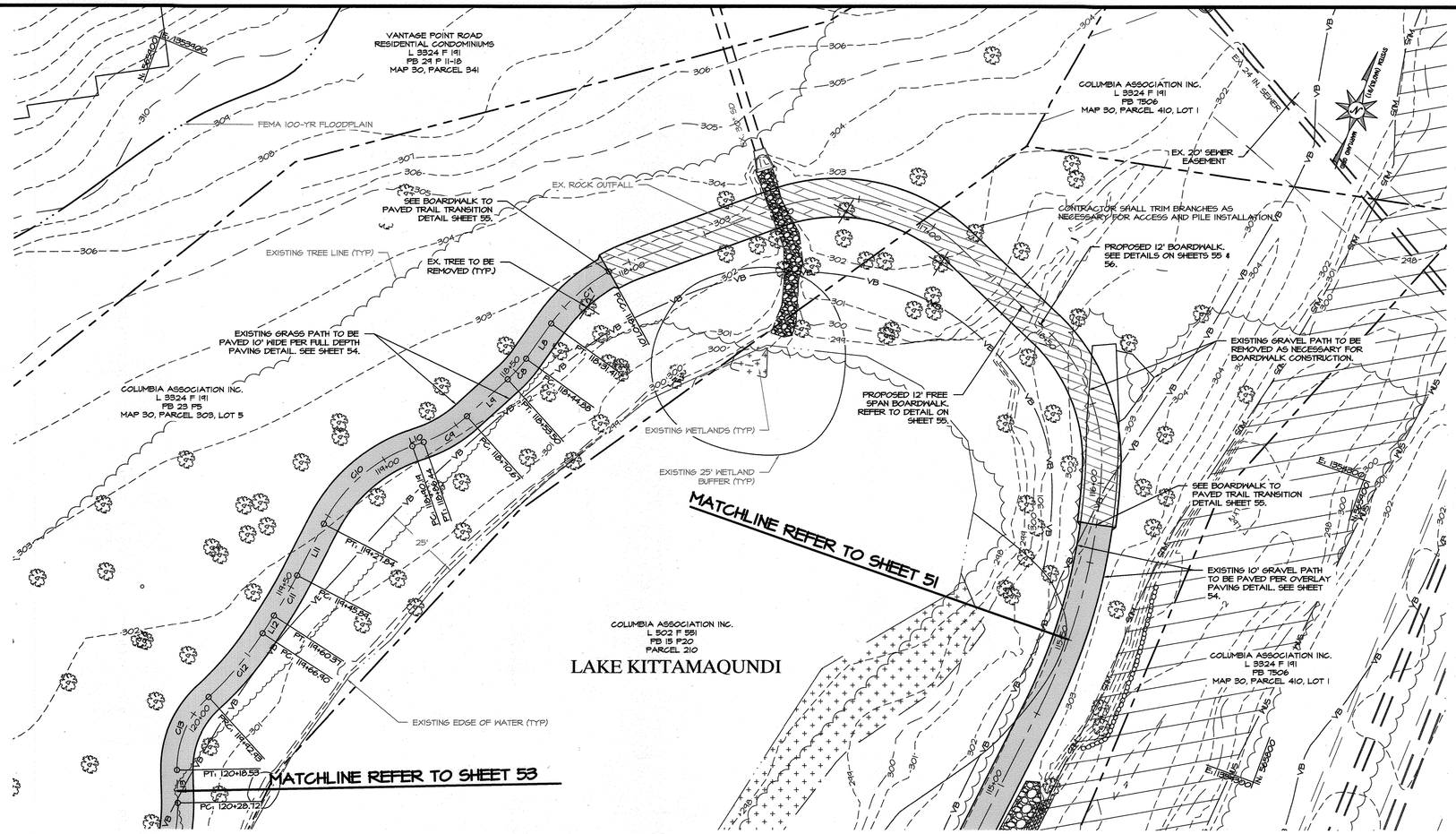
REVISED SITE DEVELOPMENT PLAN

LAKE KITTAMAQUNDI MULTIUSE TRAIL DESIGN PLANS

REVISIONS			SCALE: 1" = 20'	
DATE	BY	DESCRIPTION	DRAWN BY: MKB	DATE: 04/21/14
			CHECKED BY: SB	DATE: 4/21/2014
			DESIGNED BY: MKB	DATE: 04/21/14
			DRAWING K-05, SHEET NO. 51 OF 62	

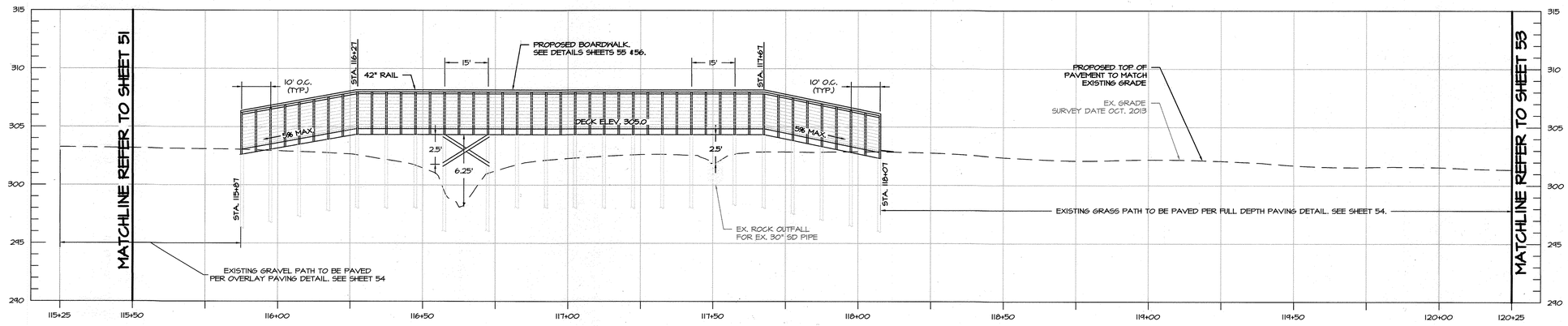
SDP-08-108

Z:\8_16202_LAKE_KITT_MULTIUSE_TRAIL\CAD Files\Sheet Files\8_16202_SP03



PLAN

SCALE: 1" = 20'



PROFILE OF PROPOSED TRAIL STA: 115+25 TO STA: 120+25

HORIZONTAL : 1" = 20'
VERTICAL : 1" = 5'

LINE TABLE				
LINE	LENGTH	DIRECTION	START	END
L8	13.47'	S15°27'27"W	N: 565,859 E: 1,354,045	N: 565,846 E: 1,354,042
L9	17.16'	S27°48'44"W	N: 565,838 E: 1,354,038	N: 565,822 E: 1,354,030
L10	3.75'	S50°24'22"W	N: 565,810 E: 1,354,020	N: 565,808 E: 1,354,018
L11	18.05'	S7°15'41"W	N: 565,776 E: 1,354,000	N: 565,758 E: 1,353,998
L12	6.53'	S12°47'26"W	N: 565,744 E: 1,353,995	N: 565,737 E: 1,353,994
L13	10.18'	S21°11'49"E	N: 565,688 E: 1,353,983	N: 565,679 E: 1,353,987

CURVE TABLE					
CURVE	RADIUS	LENGTH	CHORD DIRECTION	TANGENT	DELTA
C7	55'	24.40'	S28°08'53"W	12.40'	25°18'37"
C8	40'	8.63'	S21°38'06"W	4.33'	12°21'17"
C9	40'	15.77'	S39°06'33"W	7.99'	22°35'38"
C10	50'	37.65'	S28°50'01"W	19.77'	43°08'41"
C11	150'	14.48'	S10°01'33"W	7.24'	5°31'45"
C12	100'	26.03'	S20°14'52"W	13.09'	14°54'52"
C13	30'	25.60'	S3°15'15"W	13.64'	48°54'07"

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 5.9.14

Chief, Division of Land Development — Date 6.09.14

Director — Date 6/5/14

APPROVED
PLANNING BOARD
of HOWARD COUNTY
DATE 6/5/2014

0 10 20 40
1 Inch = 20 Feet

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

Bayland Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A Phone: (410)694-9401
Hanover, Maryland 21076 Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com
BAYLAND JOB NO. 8_16202

STATE OF MARYLAND — STEPHEN BAYARD KOU — No. 21198 — REGISTERED PROFESSIONAL ENGINEER
4/21/14

REVISED SITE DEVELOPMENT PLAN

LAKE KITTAMAQUNDI MULTIUSE TRAIL DESIGN PLANS

REVISIONS			SCALE: 1" = 20'	
DATE	BY	DESCRIPTION		
			DRAWN BY: MKB	DATE: 04/21/14
			CHECKED BY: SB	DATE: 4/21/2014
			DESIGNED BY: MKB	DATE: 04/21/14
			DRAWING K-06, SHEET NO. 52 OF 62	

SDP-08-108

Z:\8_16202_LAKE_KITT_MULTIUSE_TRAIL\CAD Files\Sheet Files\8_16202_SP04

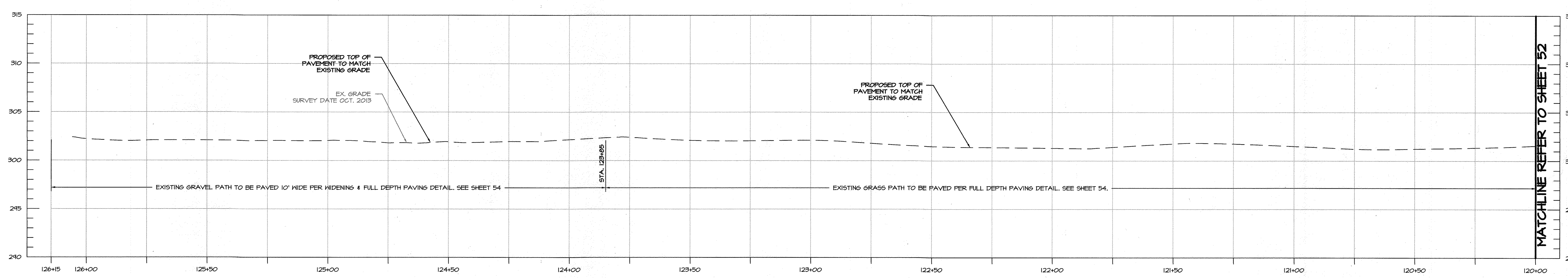
CURVE TABLE					
CURVE	RADIUS	LENGTH	CHORD DIRECTION	TANGENT	DELTA
C14	50'	19.62'	S9°57'19"E	9.94'	22°29'00"
C15	50'	42.36'	S25°33'24"W	22.54'	48°32'27"
C16	50'	33.71'	S30°30'47"W	17.52'	38°37'42"
C17	35'	29.84'	S39°06'04"W	15.89'	48°50'52"
C18	55'	46.53'	S87°45'33"W	24.76'	48°28'06"
C19	50'	34.76'	N87°55'16"W	18.11'	39°49'44"
C20	50'	25.55'	S86°48'13"W	13.06'	29°16'42"
C21	25'	19.93'	S78°36'24"W	10.53'	45°40'21"
C22	50'	15.64'	S62°40'48"W	7.88'	17°55'17"
C23	50'	14.03'	S63°36'06"W	7.06'	16°04'42"
C24	400'	8.66'	S54°54'44"W	4.33'	1°14'25"
C26	250'	25.08'	S41°14'01"W	12.55'	5°44'52"
C25	25'	6.95'	S46°19'33"W	3.50'	15°55'56"
C27	25'	12.91'	S58°54'20"W	6.60'	29°35'46"

LINE TABLE				
LINE	LENGTH	DIRECTION	START	END
L14	12.51'	S1°17'11"W	N: 565,659 E: 1,353,990	N: 565,647 E: 1,353,990
L15	10.82'	S49°49'38"W	N: 565,610 E: 1,353,972	N: 565,603 E: 1,353,964
L16	30.88'	S14°40'38"W	N: 565,574 E: 1,353,947	N: 565,544 E: 1,353,939
L17	2.91'	S63°31'29"W	N: 565,522 E: 1,353,921	N: 565,521 E: 1,353,918
L18	25.00'	N68°00'24"W	N: 565,519 E: 1,353,873	N: 565,528 E: 1,353,850
L19	22.16'	S72°09'52"W	N: 565,529 E: 1,353,816	N: 565,523 E: 1,353,795
L20	2.81'	N78°33'26"W	N: 565,521 E: 1,353,770	N: 565,522 E: 1,353,767

LINE TABLE				
LINE	LENGTH	DIRECTION	START	END
L21	28.93'	S55°46'14"W	N: 565,518 E: 1,353,748	N: 565,502 E: 1,353,724
L22	4.32'	S71°38'26"W	N: 565,495 E: 1,353,710	N: 565,493 E: 1,353,706
L23	4.22'	S55°33'45"W	N: 565,487 E: 1,353,694	N: 565,485 E: 1,353,690
L24	28.14'	S54°17'31"W	N: 565,480 E: 1,353,683	N: 565,463 E: 1,353,660
L25	34.34'	S38°21'35"W	N: 565,458 E: 1,353,655	N: 565,431 E: 1,353,634
L26	24.67'	S44°06'27"W	N: 565,413 E: 1,353,617	N: 565,395 E: 1,353,600
L27	9.86'	S73°42'13"W	N: 565,388 E: 1,353,589	N: 565,386 E: 1,353,580

PLAN

SCALE: 1" = 20'



PROFILE OF PROPOSED TRAIL STA: 120+00 TO STA: 126+15

HORIZONTAL : 1" = 20'
VERTICAL : 1" = 5'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division — Date 5.9.14

Chief, Division of Land Development — Date 6.09.14

Director — Date 6/9/14

APPROVED
PLANNING BOARD
of HOWARD COUNTY
DATE 6/5/2014

0 10 20 40
1 Inch = 20 Feet

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A — Phone: (410)694-9401
Hanover, Maryland 21076 — Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com
BAYLAND JOB NO. 8_16202

STATE OF MARYLAND — REGISTERED PROFESSIONAL ENGINEER
4/21/14

REVISED SITE DEVELOPMENT PLAN

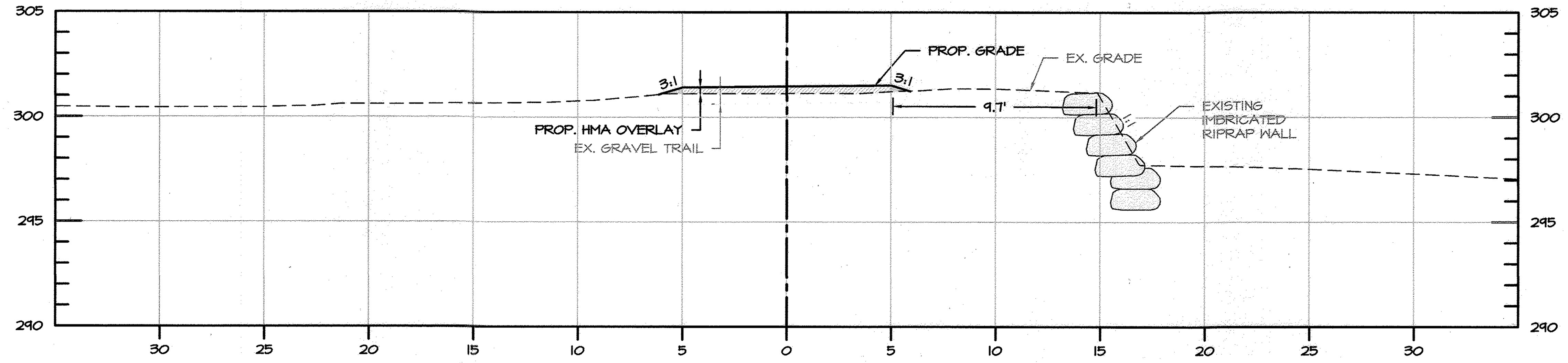
LAKE KITTAMAQUNDI MULTIUSE TRAIL DESIGN PLANS

REVISIONS		
DATE	BY	DESCRIPTION

SCALE: 1" = 20'	
DRAWN BY: MKB	DATE: 04/21/14
CHECKED BY: SB	DATE: 4/21/2014
DESIGNED BY: MKB	DATE: 04/21/14
DRAWING K-07, SHEET NO. 53 OF 62	

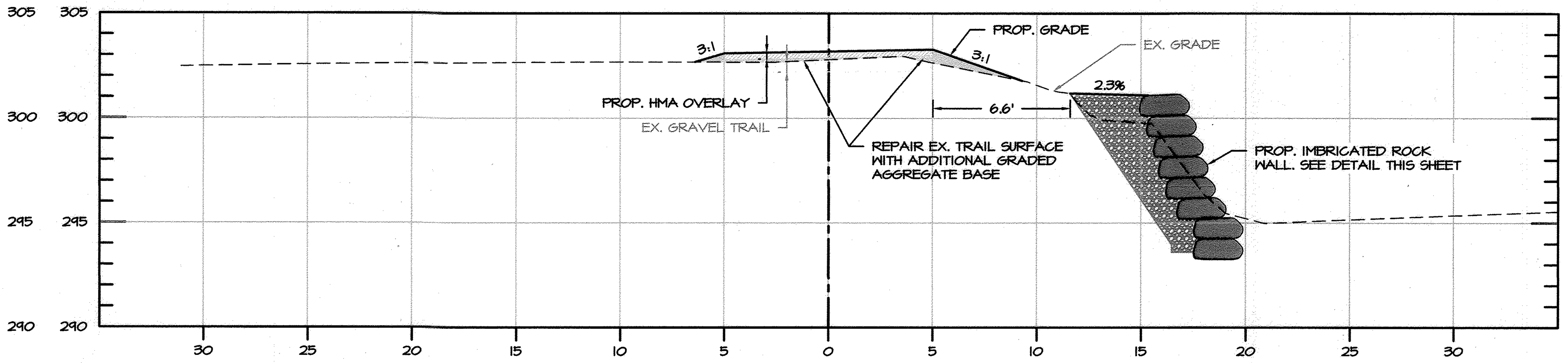
SDP-08-108

Z:\8_16202_LAKE_KITT_MULTIUSE_TRAIL\CAD Files\Sheet Files\8_16202_SP05



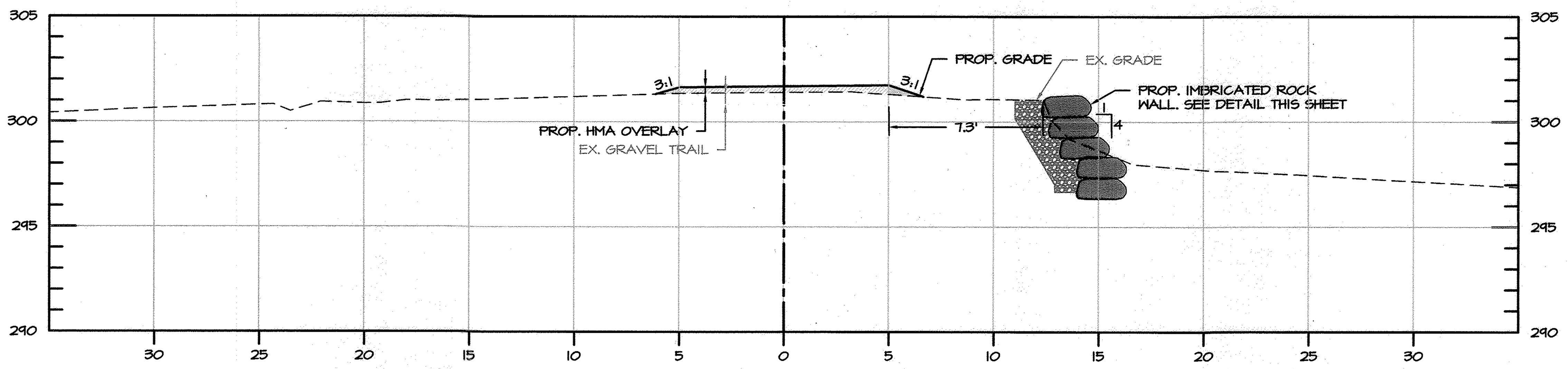
PROP. TRAIL SECTION XS 01 STA 111+25

SCALE: 1" = 5'



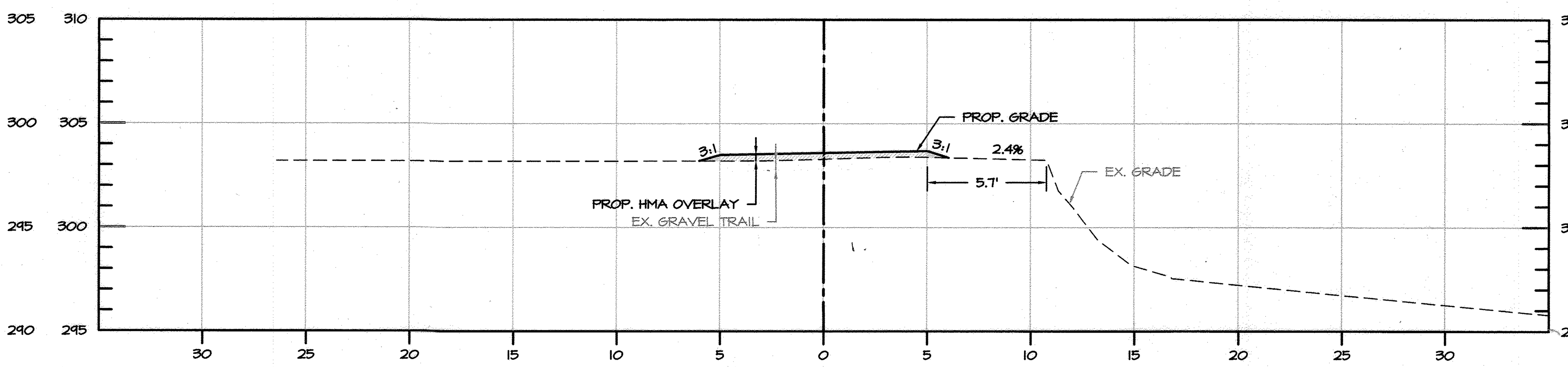
PROP. TRAIL SECTION XS 04 STA 112+65

SCALE: 1" = 5'



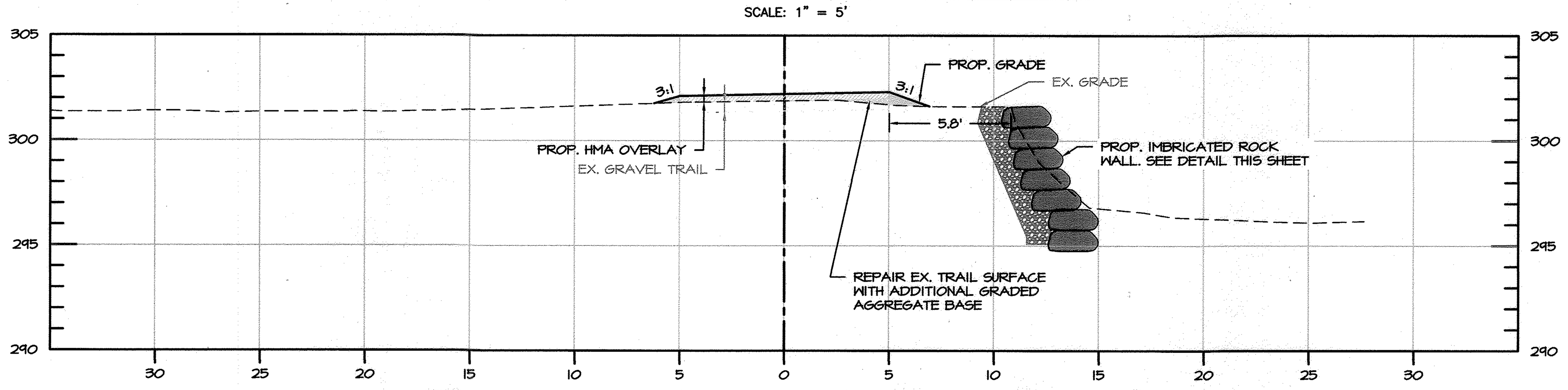
PROP. TRAIL SECTION XS 02 STA 111+55

SCALE: 1" = 5'



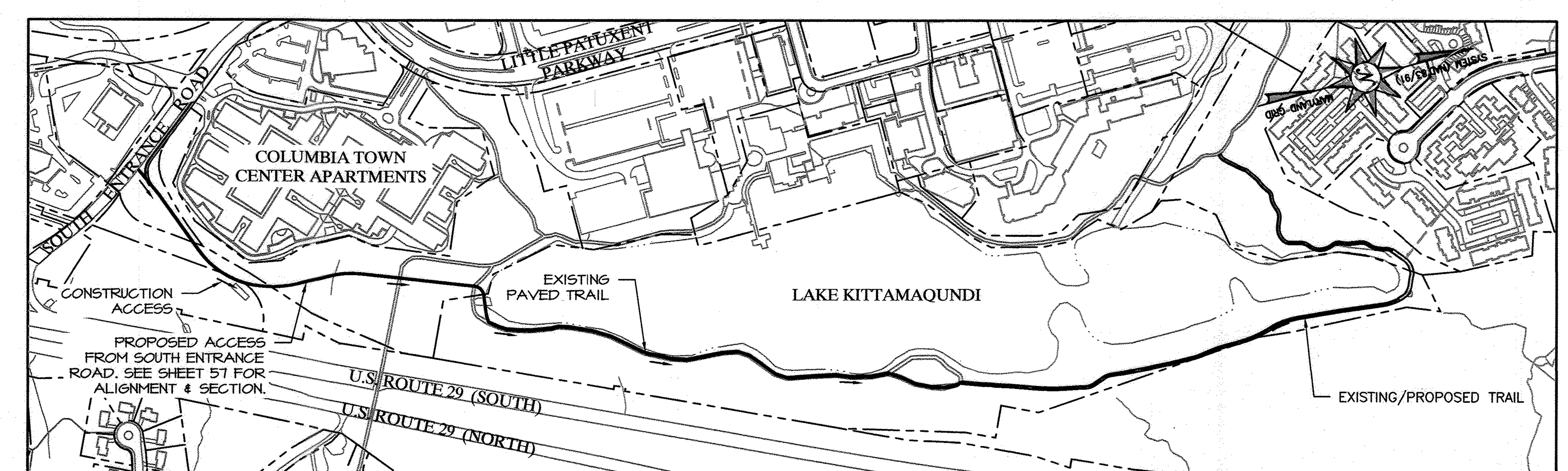
PROP. TRAIL SECTION XS 05 STA 113+00

SCALE: 1" = 5'



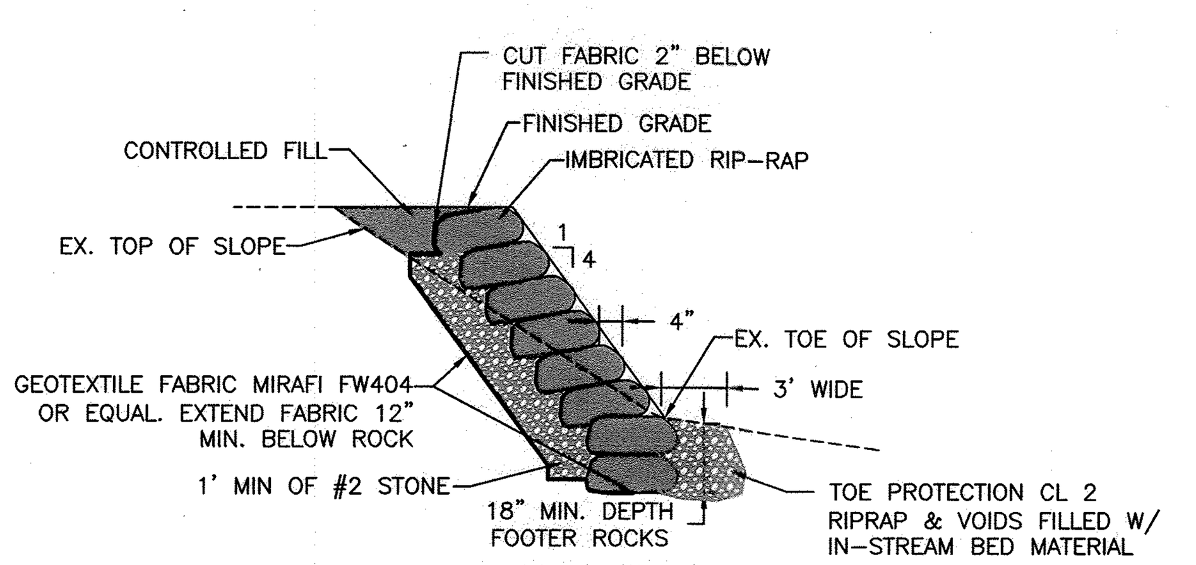
PROP. TRAIL SECTION XS 03 STA 111+95

SCALE: 1" = 5'



CONSTRUCTION ACCESS

NOT TO SCALE



IMBRICATED ROCK WALL DETAIL

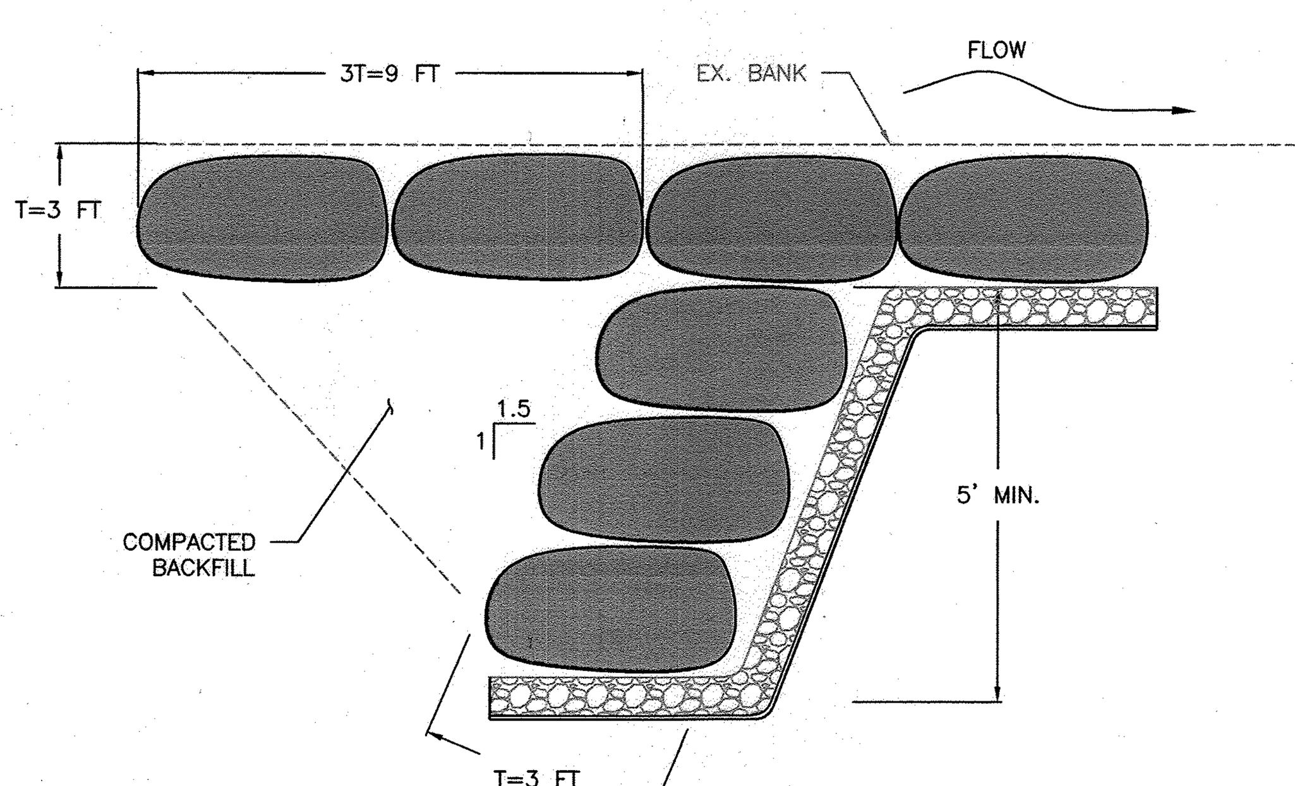
SCALE: NTS

IMBRICATED ROCK WALL NOTES

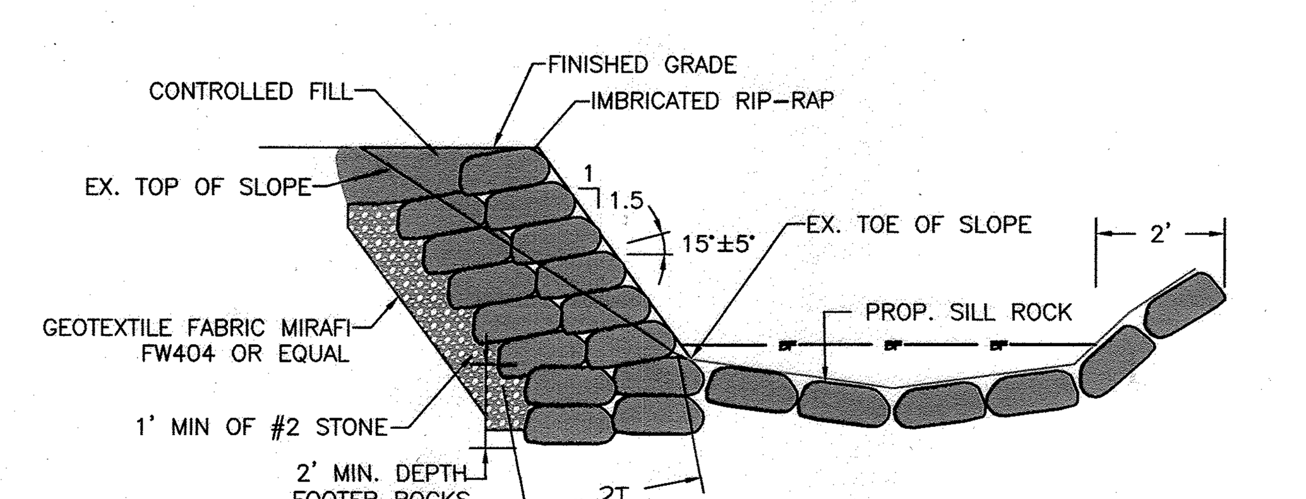
1. ALL MATERIALS SHALL BE UNDERLAIN BY MIRAFI FW404 GEOTEXTILE FABRIC OR EQUAL.
2. WHEN BACKFILLING, ALL MATERIAL SHALL BE COMPACTED FIRMLY IN ALL VOIDS TO SECURE STONE. ALL SOIL SHALL BE COMPACTED TO MD-378 STANDARDS.
3. IMBRICATED ROCK WALL SHALL BE CONSTRUCTED SUCH THAT ALL ROCKS SECURELY INTERLOCK AND SHALL NOT ROCK OR ROTATE IN PLACE. ALL ROCKS EXCEPT BOTTOM FOOTER ROCKS SHALL BE SUPPORTED BY A FOOTER ROCK.
4. IMBRICATED ROCK SHALL BE OBLONG AND FLAT IN APPEARANCE WITH TWO PARALLEL FACES, AND SHALL BE STACKABLE.
5. ALL ROCK SHALL BE GRANITE ROCK THAT IS TAN, DARK BROWN, OR DARK GRAY IN COLOR. ROCKS NOT MEETING SPECIFICATIONS SHALL BE REMOVED AND REPLACED AT NO COST TO THE OWNER.

ROCK SIZE TABLE

ROCK TYPE	SIZE	% BY WEIGHT
IMBRICATED ROCK	GREATER THAN 16" X 18" X 24"	20
	8" X 9" X 12" TO 16" X 18" X 24"	80



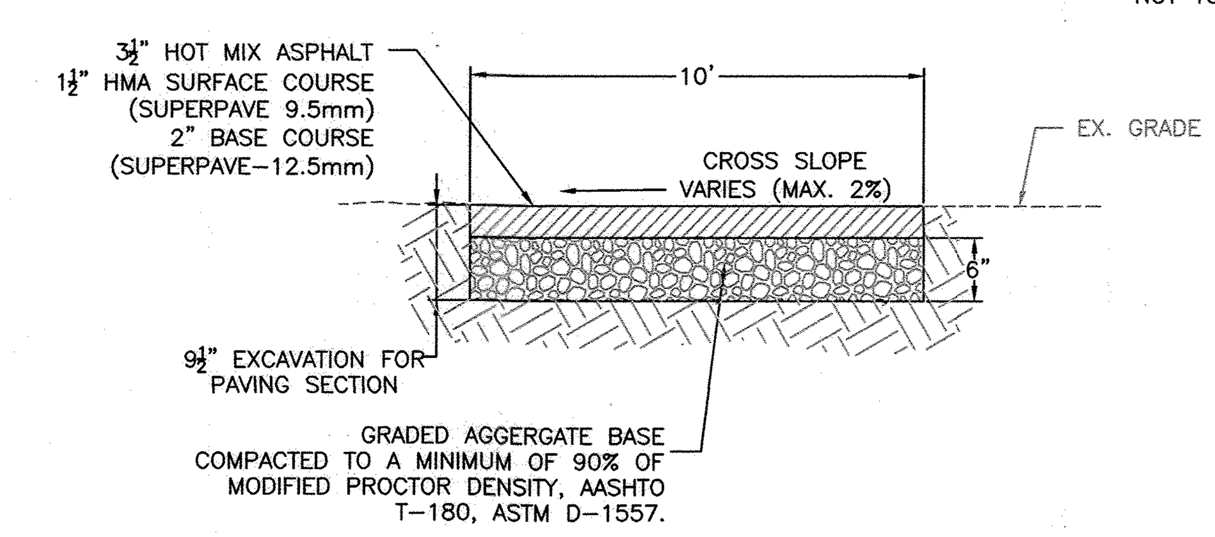
PLAN



SECTION

UPSTREAM FLANK DETAIL

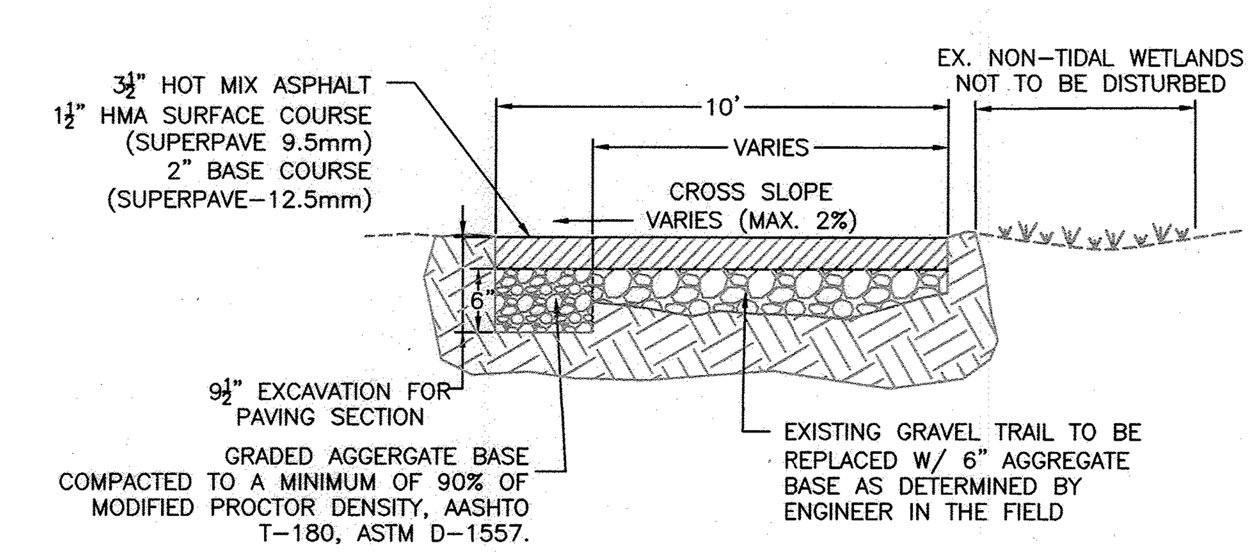
SCALE: NTS



STA. 100+15.57 TO STA. 105+00
STA. 118+07 TO STA. 123+85

FULL DEPTH PAVING PATH DETAIL

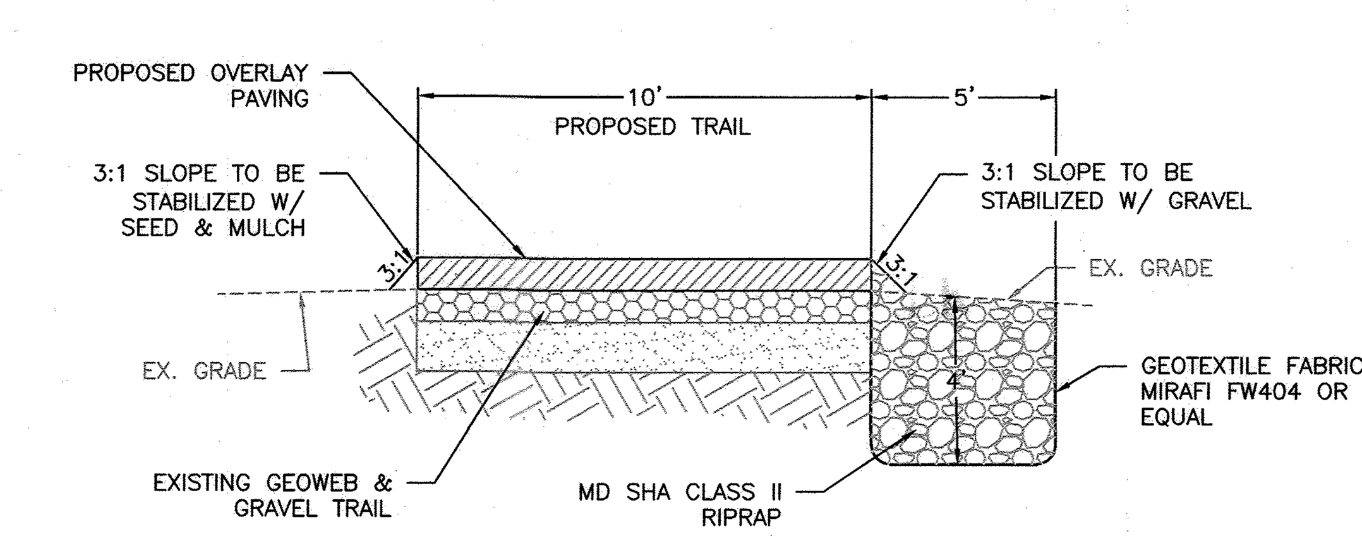
NOT TO SCALE



STA. 123+85 TO STA. 126+06

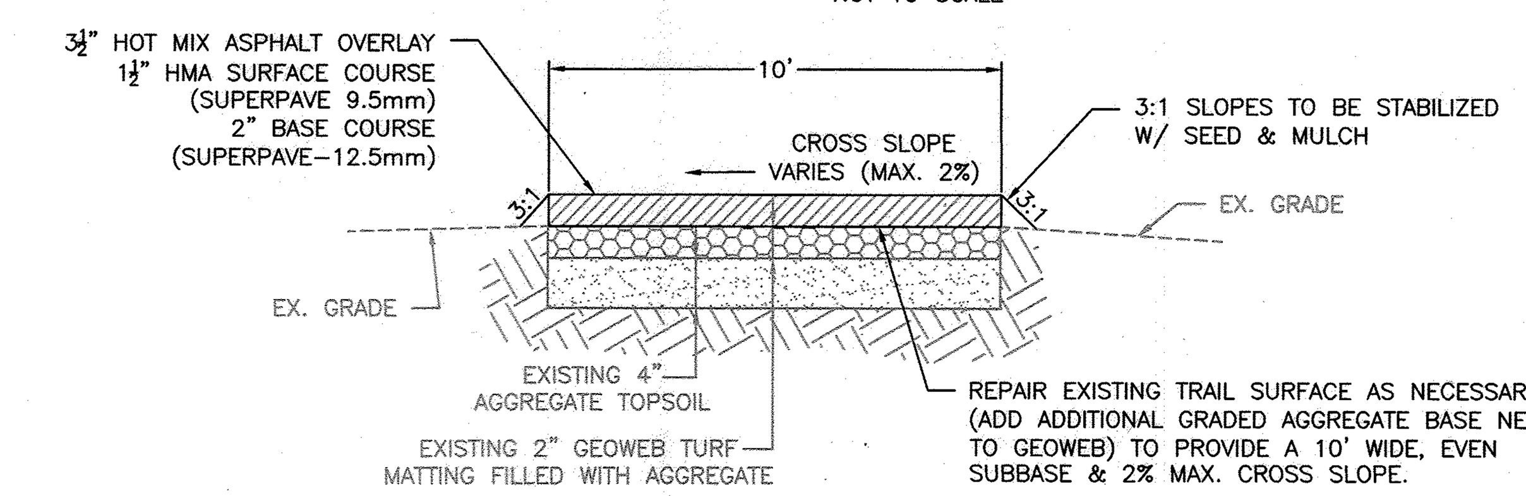
WIDENING & FULL DEPTH PAVING PATH DETAIL

NOT TO SCALE



OVERFLOW PROTECTION DETAIL

NOT TO SCALE



STA. 105+00 TO STA. 115+87

OVERLAY PAVING PATH DETAIL

NOT TO SCALE

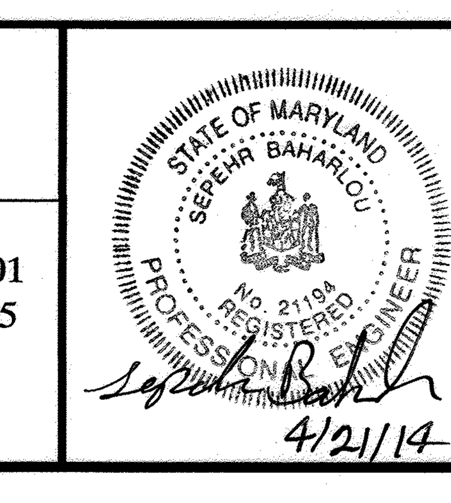
APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 5.9.14
Chief, Division of Land Development	Date 6.09.14
Director	Date 6/9/14

APPROVED
PLANNING BOARD
of HOWARD COUNTY
DATE 6/5/2014

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A Phone: (410)694-9401
Hanover, Maryland 21076 Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com
BAYLAND JOB NO. 8_16202



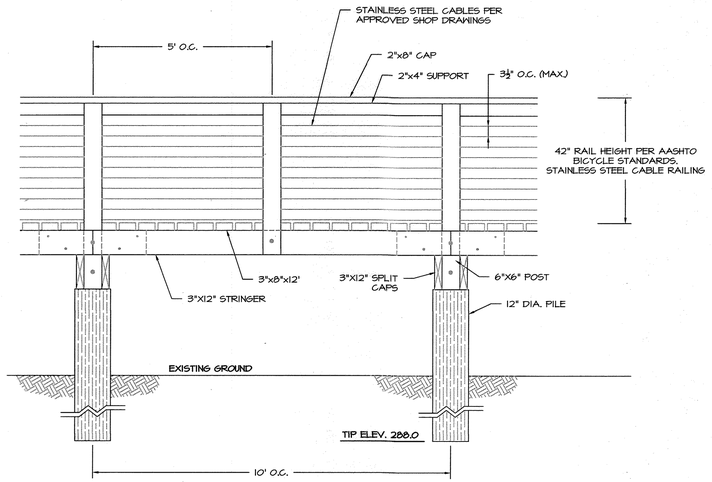
REVISED SITE DEVELOPMENT PLAN

LAKE KITTAMAQUNDI MULTIUSE TRAIL CROSS SECTIONS & DETAILS

DATE	BY	REVISIONS DESCRIPTION		
			SCALE: 1" = 5'	
			DRAWN BY: MKB	DATE: 04/21/14
			CHECKED BY: SB	DATE: 4/21/2014
			DESIGNED BY: MKB	DATE: 04/21/14
			DRAWING K-08, SHEET NO. 54 OF 62	

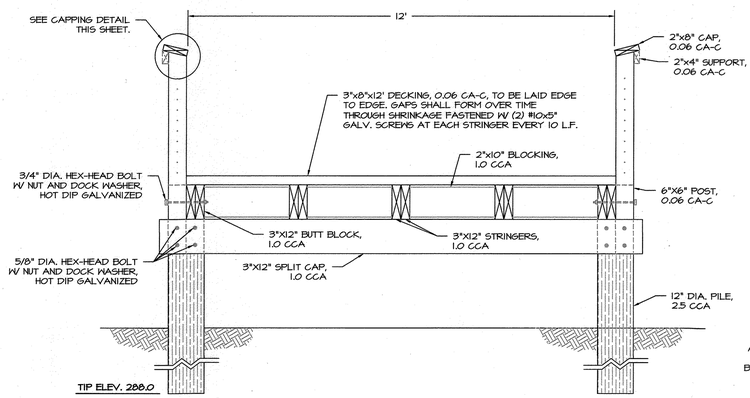
SDP-08-108

Z:\8_16202_LAKE_KITT_MULTIUSE_TRAIL\CAD Files\Sheet Files\8_16202_PROF01



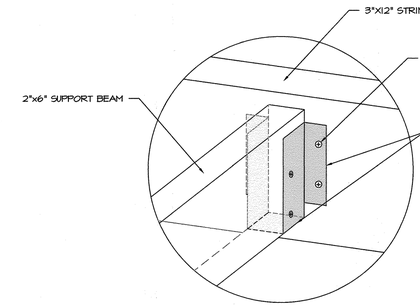
BOARDWALK SIDE VIEW

SCALE: 1" = 2'



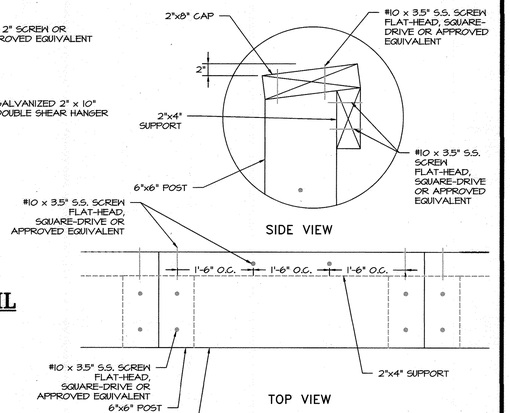
BOARDWALK SECTION VIEW

SCALE: 1" = 2'



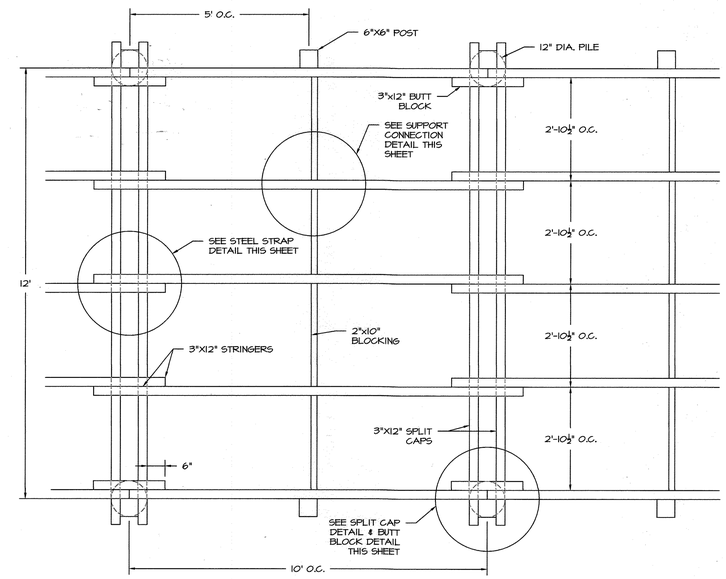
SUPPORT CONNECTION DETAIL

NOT TO SCALE



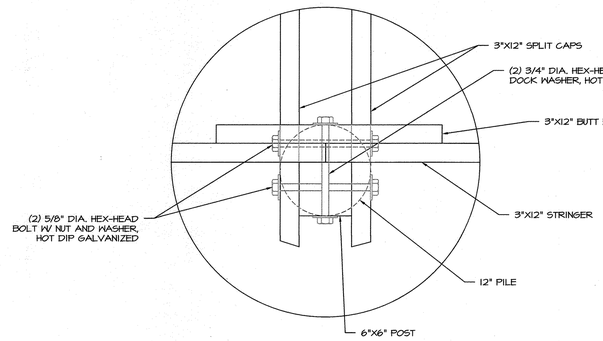
CAPPING DETAIL

NOT TO SCALE



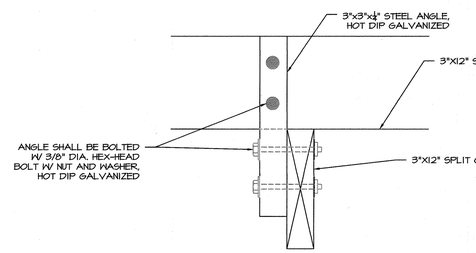
BOARDWALK DECKING PLAN

SCALE: 1" = 2'



SPLIT CAP DETAIL

NOT TO SCALE



STEEL STRAP DETAIL

NOT TO SCALE

PILE DETAILS

SCALE: 1" = 1'

BOARDWALK TO PAVED TRAIL TRANSITION

SCALE 1" = 2'

BUTT BLOCK DETAIL

NOT TO SCALE

STAINLESS STEEL CABLE RAILING NOTE

THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR THE PROPOSED STAINLESS STEEL CABLE RAILING SYSTEM. THE SHOP DRAWINGS MUST BE STAMPED APPROVED BY MARYLAND REGISTERED PROFESSIONAL ENGINEER.

APPROVED
PLANNING BOARD
of HOWARD COUNTY
DATE 6/5/2014

NOTES:

1. ALL PILES SHALL BE 12" DIA. TIMBER TYPE 'B' AND TREATED W/ 2.5 CCA
2. ALL DIMENSIONAL LUMBER SHALL BE NO.1 SYP
   2.1. STRUCTURAL LUMBER SHALL BE TREATED W/ 1.0 CCA
   2.2. DECKING, POSTS, & CAPS SHALL BE TREATED W/ 0.06 CA-C
3. ALL HARDWARE SHALL BE HOT DIPPED GALVANIZED (GALV.) OR 305 STAINLESS STEEL (S.S.) AS NOTES ON PLANS
4. ALL EXPOSED HARDWARE SHALL BE COUNTERSUNK

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division HSP	Date 5.9.14
Chief, Division of Land Development	Date 6.09.14
Director	Date 6/9/14

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A Phone: (410)694-9401
Hanover, Maryland 21076 Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com

STATE OF MARYLAND · SERHIY BAHALOV · No. 21158 · REGISTERED PROFESSIONAL ENGINEER · 4/21/14

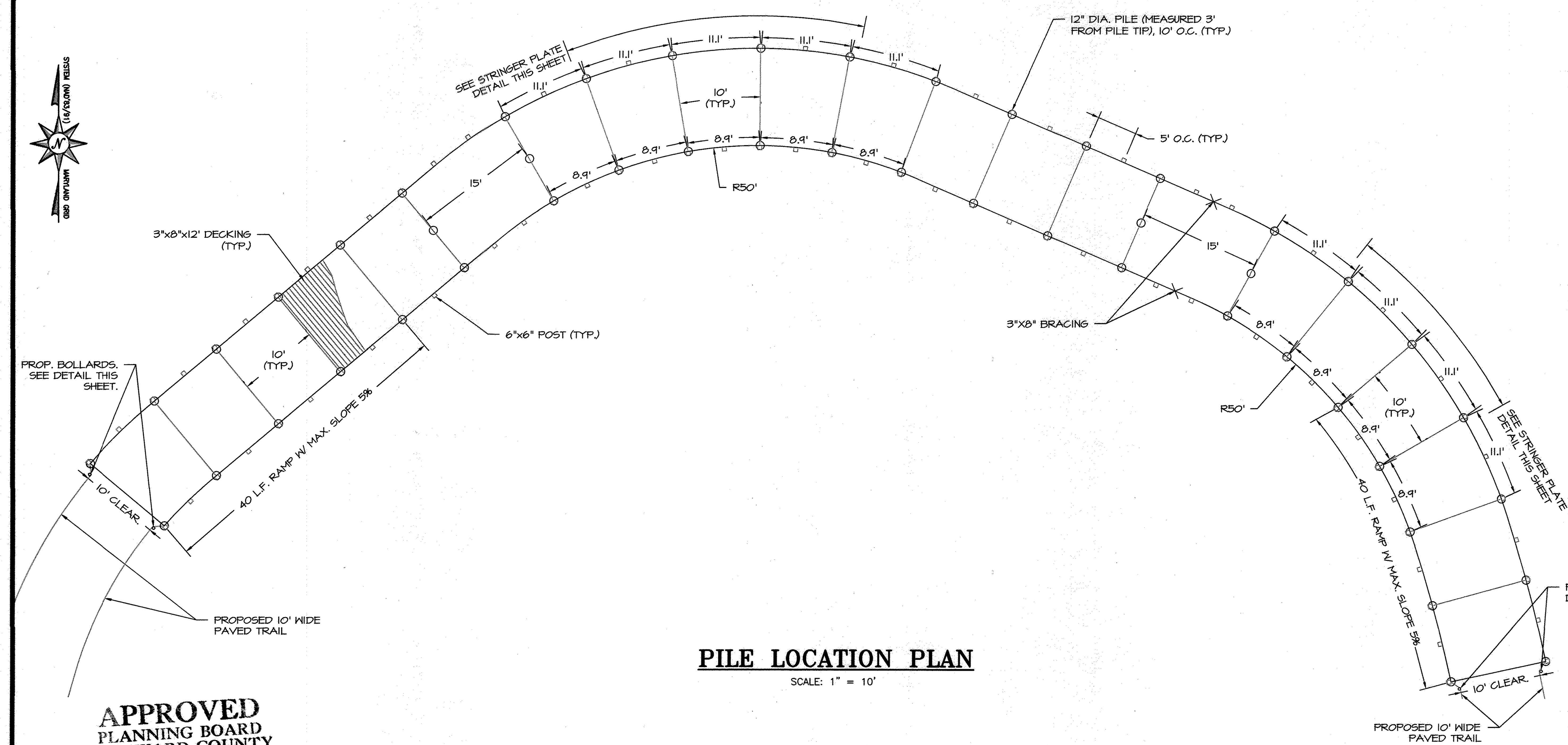
REVISED SITE DEVELOPMENT PLAN

LAKE KITTAMAQUNDI MULTIUSE TRAIL
BOARDWALK DETAILS

REVISIONS DATE	BY	DESCRIPTION	SCALE: AS-SHOWN	
			DRAWN BY: MKB	DATE: 04/21/14
			CHECKED BY: SB	DATE: 4/21/2014
			DESIGNED BY: MKB	DATE: 04/21/14
			DRAWING K-09, SHEET NO. 55 OF 62	

SDP-08-108

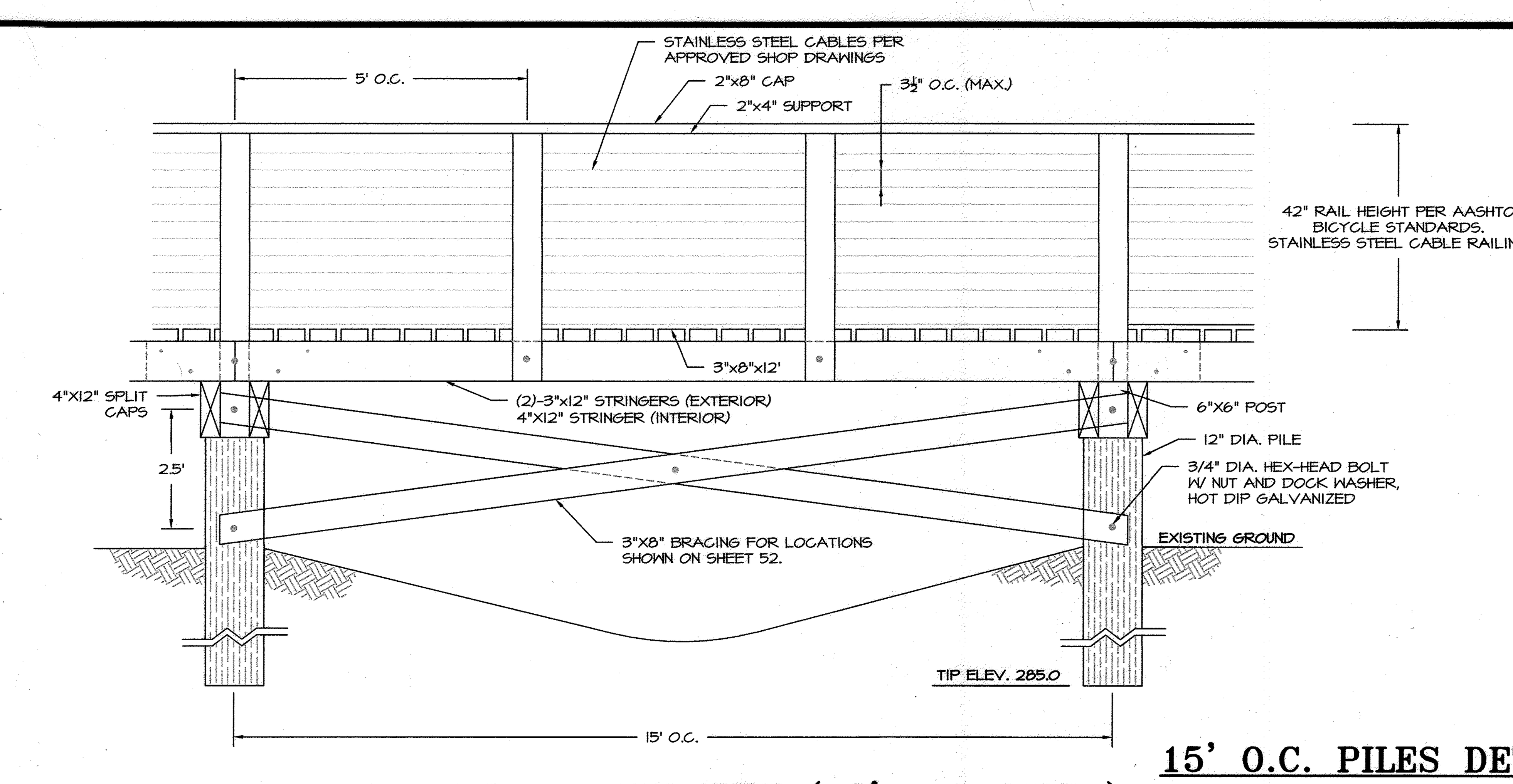
Z:\8_16202_LAKE_KITT_MULTIUSE_TRAIL\CAD Files\Sheet Files\8_16202_DTL01



PILE LOCATION PLAN

SCALE: 1" = 10'

APPROVED PLANNING BOARD of HOWARD COUNTY
DATE 6/5/2014

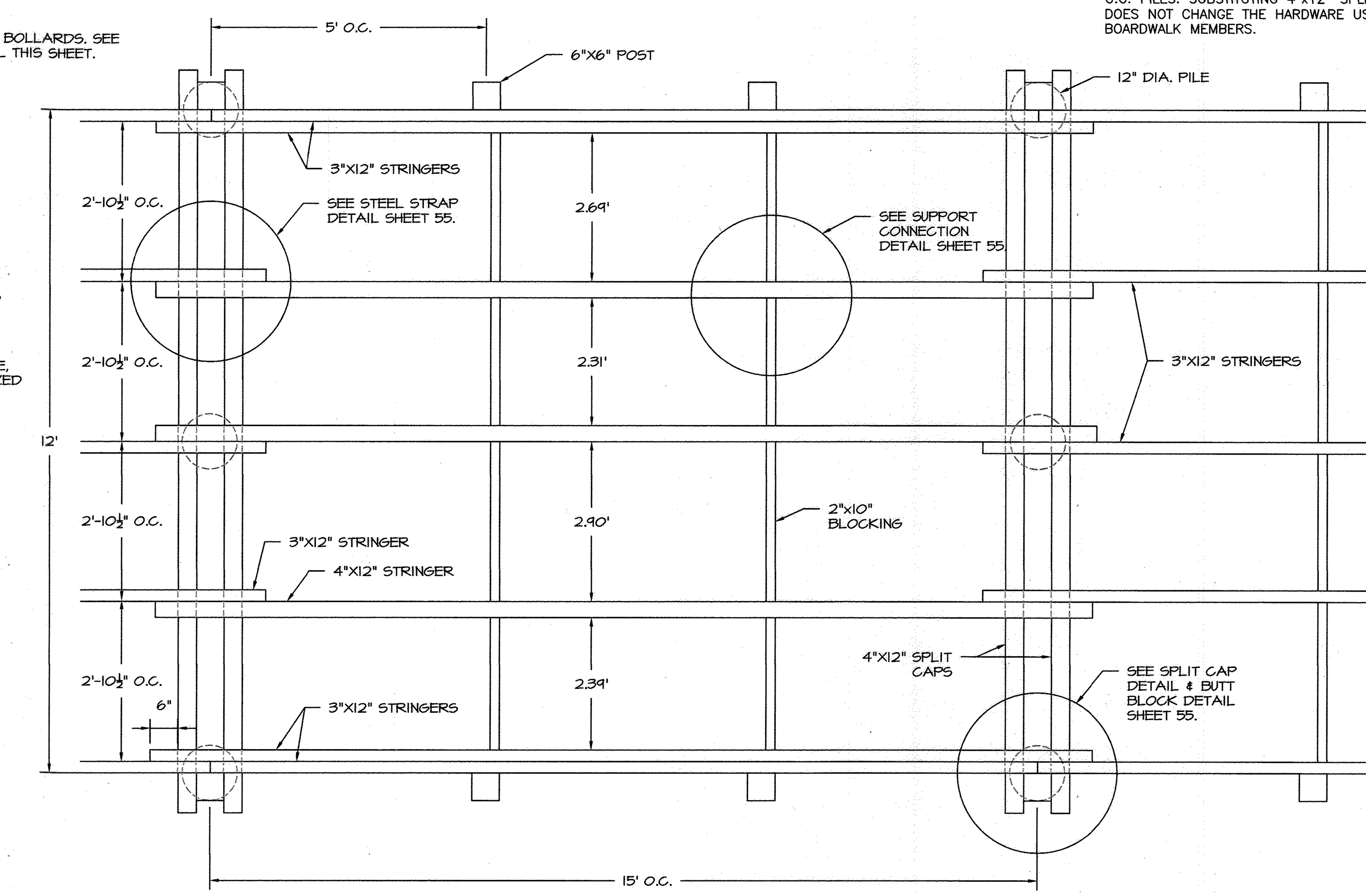


BOARDWALK SIDE VIEW (15' O.C. PILES)

SCALE: 1" = 2'

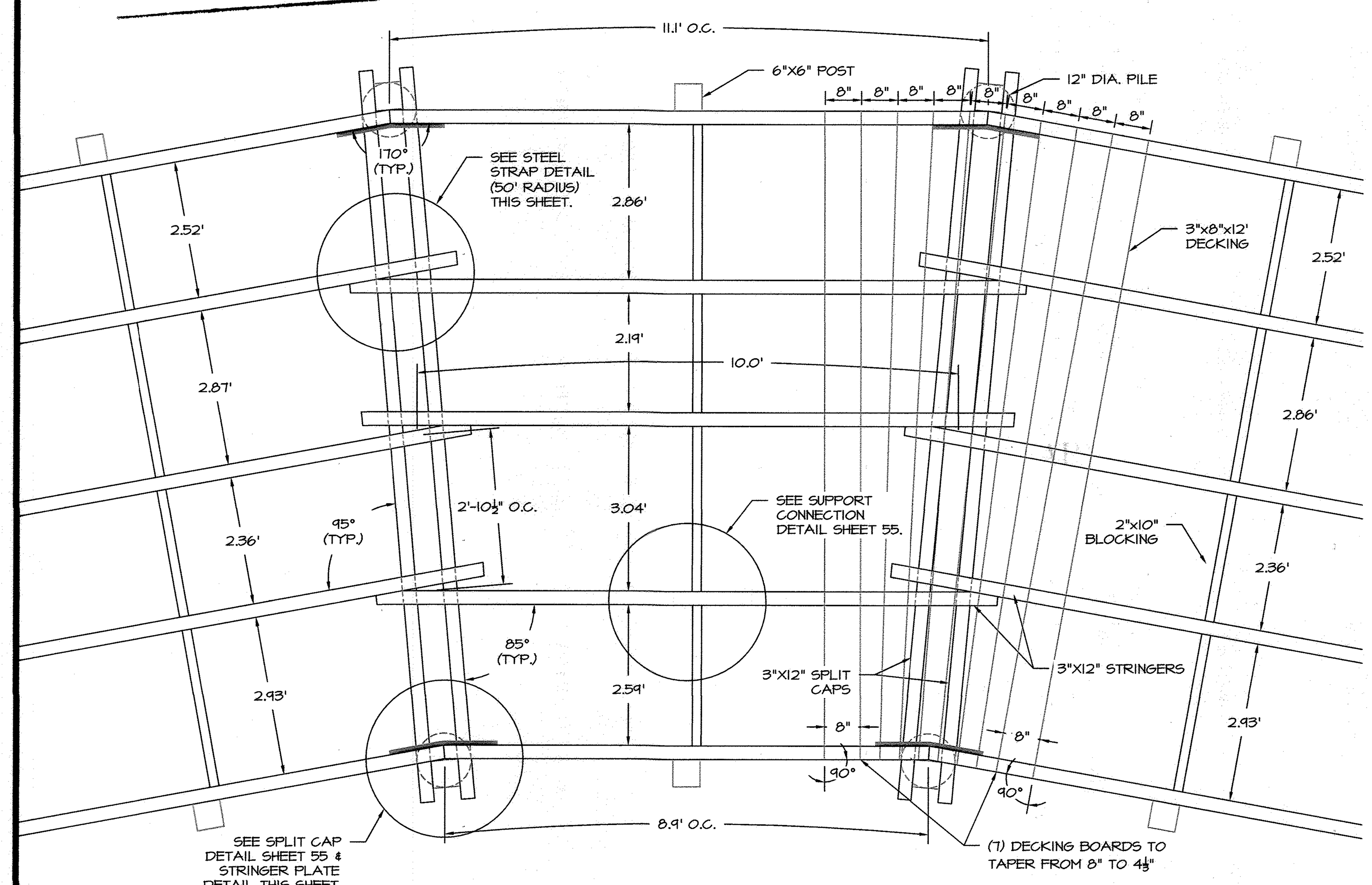
15' O.C. PILES DETAILS

THE SPLIT CAP DETAIL, PILE DETAIL, STEEL STRAP DETAIL, SUPPORT CONNECTION DETAIL, AND CAPPING DETAIL FOR THE 10' O.C. PILES ON SHEET 55 SHALL ALSO BE USED FOR THE 15' O.C. PILES. SUBSTITUTING 4"x12" SPLIT CAPS AND STRINGERS DOES NOT CHANGE THE HARDWARE USED TO CONNECT THE BOARDWALK MEMBERS.



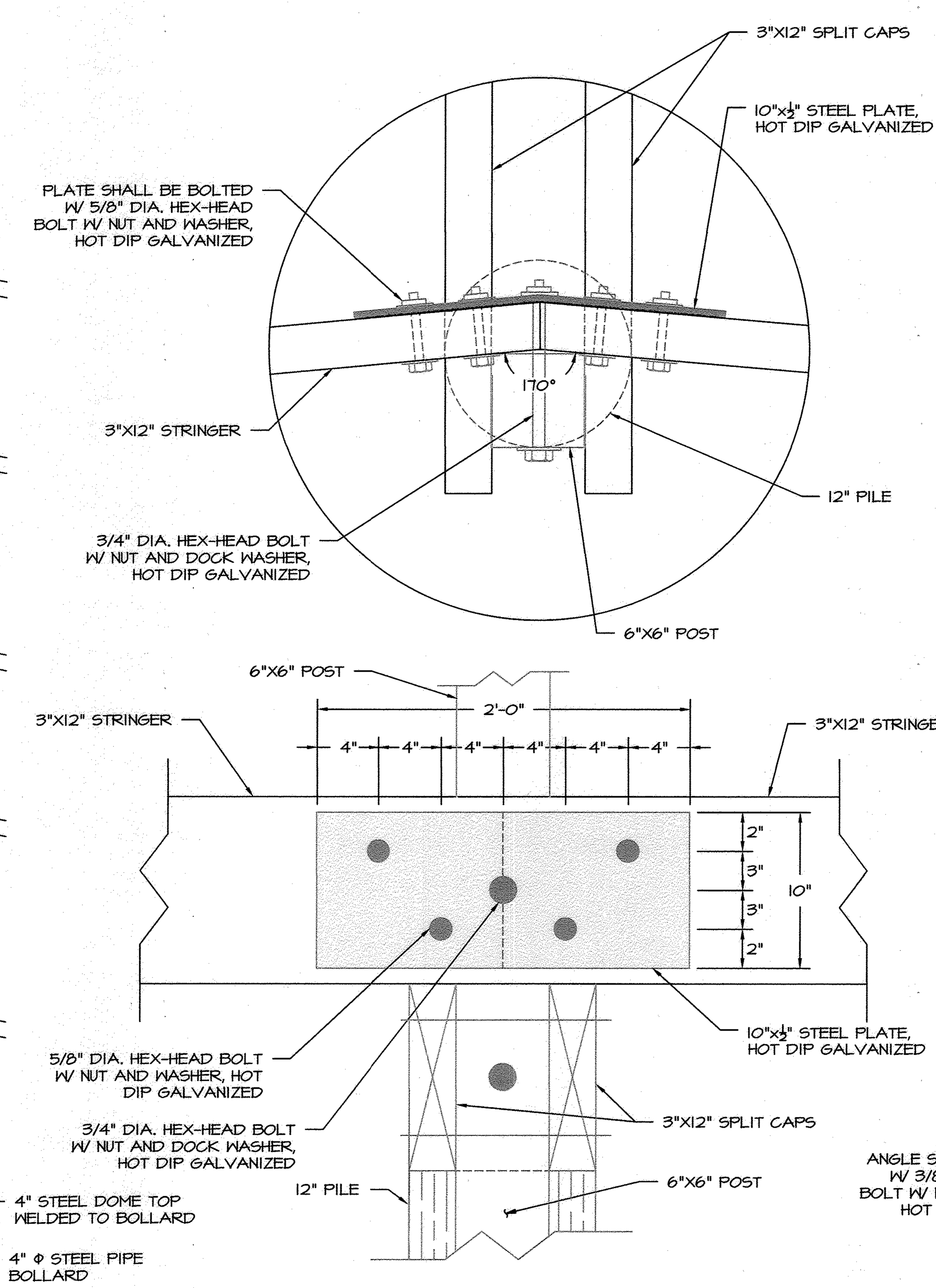
BOARDWALK DECKING PLAN (15' O.C. PILES)

SCALE: 1" = 2'



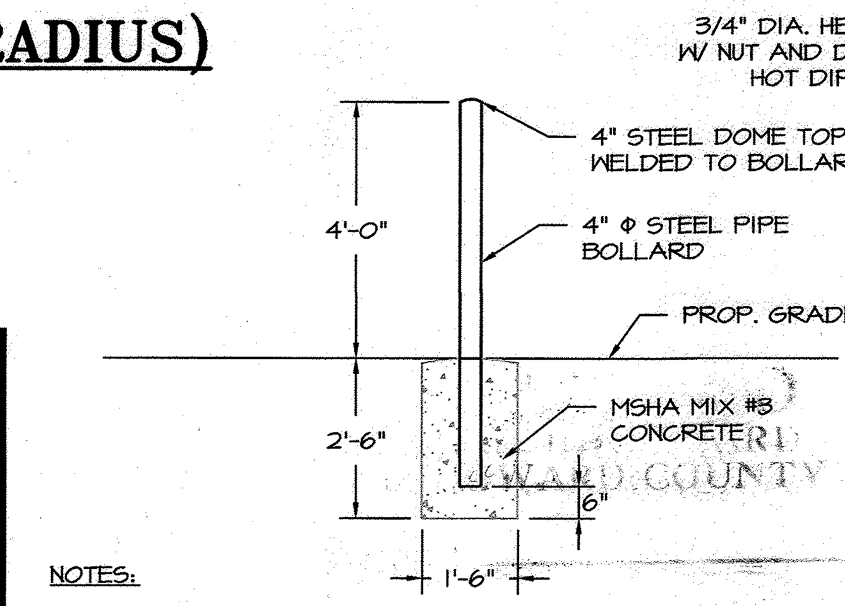
BOARDWALK DECKING PLAN (50' INSIDE RADIUS)

SCALE: 1" = 2'



STRINGER PLATE DETAIL

NOT TO SCALE

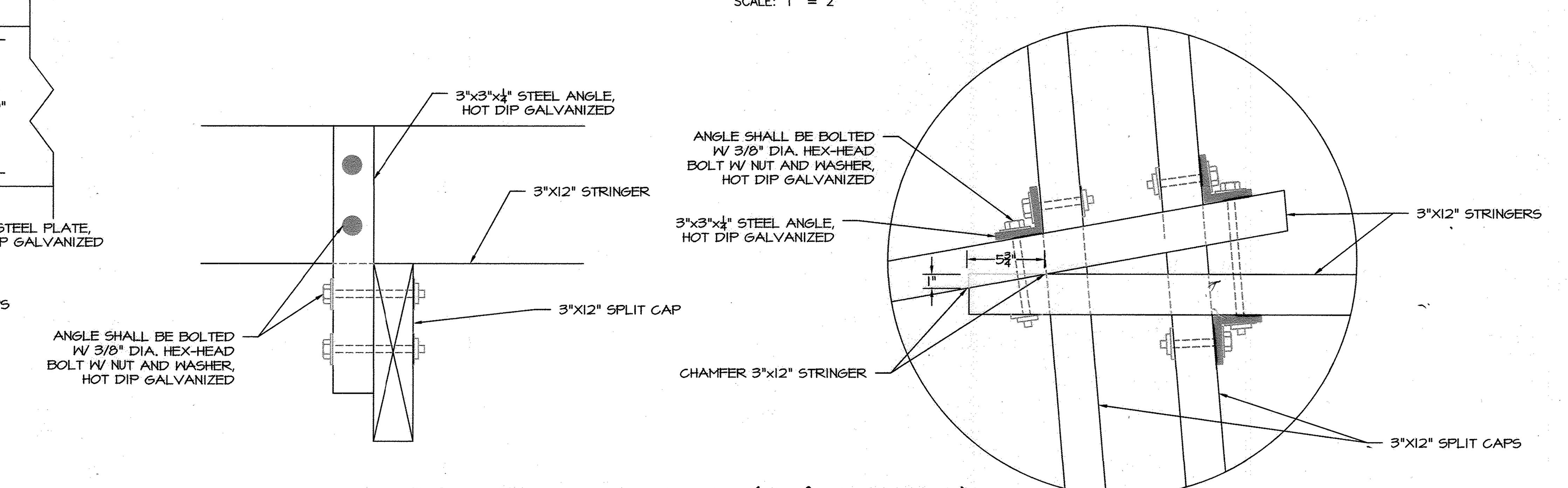


NOTES:

1. ALL PIPE TO BE STANDARD WEIGHT AS PER AISC MANUAL.
2. ALL EXPOSED METAL SURFACES SHALL BE PAINTED WITH GALVANIZED PAINT - ONE COAT METAL PRIMER AND TWO COATS STANDARD SAFETY YELLOW # 4540 METAL ENAMEL.

BOLLARD DETAIL

NOT TO SCALE



STEEL STRAP DETAIL (50' RADIUS)

NOT TO SCALE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division	Date 5.9.14
Chief, Division of Land Development	Date 6.09.14
Director	Date 6/9/14

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A Phone: (410)694-9401
Hanover, Maryland 21076 Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com

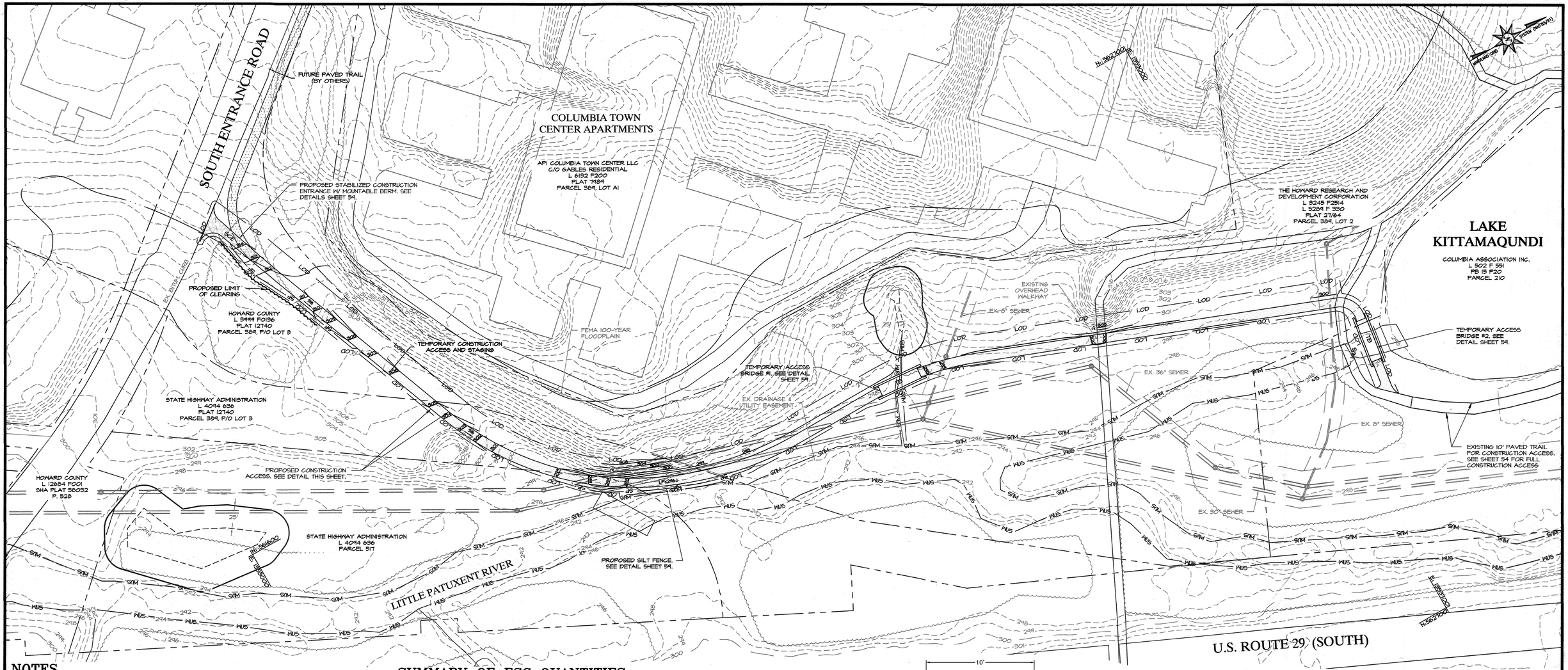
REVISED SITE DEVELOPMENT PLAN

LAKE KITTAMAQUNDI MULTIUSE TRAIL BOARDWALK DETAILS

REVISIONS		
DATE	BY	DESCRIPTION

SCALE: AS-SHOWN	
DRAWN BY: MKB	DATE: 04/21/14
CHECKED BY: SB	DATE: 4/21/2014
DESIGNED BY: MKB	DATE: 04/21/14
DRAWING K-10, SHEET NO. 56 OF 62	

SDP-08-108



NOTES

1. THE ENTIRE LIMITS OF DISTURBANCE ARE WITHIN THE 100-YEAR FLOODPLAIN AND STOCKPILES ARE NOT PERMITTED WITHIN THE 100-YEAR FLOODPLAIN. THEREFORE, THE CONTRACTOR IS RESPONSIBLE FOR HAULING AWAY ALL EXCAVATED MATERIAL BY THE END OF EACH WORKING DAY. FOR DAILY STOCKPILES, THE CONTRACTOR SHALL PILE EXCAVATED MATERIAL WITHIN THE LIMITS OF DISTURBANCE AND THE STOCKPILE SHALL BE PROTECTED WITH SILT FENCE TO ENSURE SEDIMENT LADEN RUNOFF DOES NOT DISCHARGE FROM THE LIMITS OF DISTURBANCE.
2. THE CONTRACTOR SHALL REPLACE SILT FENCE WITH SUPER SILT FENCE AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.
3. THE CONTRACTOR MAY SUBSTITUTE SILT FENCE WITH FILTER LOGS IN THE VICINITY OF WETLAND AND/OR TREE AREAS. THE CONTRACTOR SHALL REPLACE SILT FENCE WITH FILTER LOGS AT THE DIRECTION OF THE SEDIMENT CONTROL INSPECTOR.

SEQUENCE OF CONSTRUCTION

PRE-CONSTRUCTION

1. OBTAIN A GRADING PERMIT FROM HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS.
2. THE CONTRACTOR SHALL NOTIFY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, SEDIMENT CONTROL INSPECTOR AT (410) 901-4020 AT LEAST 48 HOURS BEFORE COMMENCING WORK. WORK MAY NOT COMMENCE UNTIL THE PERMITTEE OR THE RESPONSIBLE PERSONNEL HAVE MET ON SITE WITH THE SEDIMENT AND EROSION CONTROL INSPECTOR TO REVIEW THE APPROVED PLANS.

PHASE I: STABILIZED CONSTRUCTION ACCESS

1. CLEAR AND GRUB FOR THE INSTALLATION OF THE SEDIMENT AND EROSION CONTROL DEVICES.
2. INSTALL THE STABILIZED CONSTRUCTION ENTRANCE AND SILT FENCE.
3. BEGIN EXCAVATION AND GRADING FOR THE CONSTRUCTION ACCESS ROAD AND INSTALL THE STONE BASE. THE CONTRACTOR SHALL ONLY EXCAVATE AND GRADE A LENGTH THAT CAN BE STABILIZED AT THE END OF EACH WORKING DAY. THE SILT FENCE IS A PRECAUTIONARY MEASURE TO ENSURE EXCAVATED MATERIALS DO NOT ENTER THE LITTLE PATUXENT RIVER AND WORK IN THIS AREA SHALL BE STABILIZED AT THE END OF EACH WORKING DAY.
4. AS CONSTRUCTION PROGRESS TOWARD THE EXISTING INTERMITTENT CHANNEL, INSTALL TEMPORARY ACCESS BRIDGE #1 AND CONTINUE EXCAVATION AND STONE BASE INSTALLATION TOWARD LAKE KITTAMAQUNDI.
5. INSTALL TEMPORARY ACCESS BRIDGE #2.
6. COMPLETE CONSTRUCTION ACCESS ROAD STONE BASE INSTALLATION AND TIE INTO EXISTING PAVED TRAIL.
7. WITH SEDIMENT CONTROL INSPECTOR'S APPROVAL, REMOVE THE SILT FENCE AND PERMANENTLY STABILIZE ANY DISTURBED AREAS. THE STABILIZED CONSTRUCTION ENTRANCE AND TEMPORARY ACCESS BRIDGES SHALL REMAIN FOR PHASE II CONSTRUCTION.

PHASE II: LAKE KITTAMAQUNDI MULTIUSE TRAIL

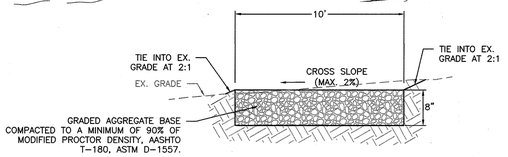
1. CLEAR AND GRUB FOR THE INSTALLATION OF THE SEDIMENT AND EROSION CONTROL DEVICES.
2. INSTALL THE SILT FENCE AND TEMPORARY ACCESS BRIDGE #3 AS SHOWN ON THE APPROVED CONSTRICTION DRAWINGS.
3. INSTALL TURBIDITY CURTAIN AND CONSTRUCT PROPOSED IMBRICATED RIPRAP WALL. FOLLOWING THE CONSTRUCTION AND WITH THE SEDIMENT CONTROL INSPECTOR'S APPROVAL, REMOVE THE TURBIDITY CURTAIN.
4. INSTALL BOARDWALK PILES AND CONSTRUCT THE BOARDWALK AND ASSOCIATED RAILINGS. CONTRACTOR SHALL TRIM TREE BRANCHES AS NECESSARY FOR ACCESS AND CONSTRUCTION.
5. BEGIN PAVING OVERLAY AND FULL DEPTH WIDENING FOR THE EXISTING 8' WIDE TO 10' WIDE GRAVEL TRAIL (STA. 123+85 TO STA. 126+06). ALL NECESSARY TRAIL WIDENING SHALL OCCUR SOUTHEAST SIDE OF THE TRAIL WHICH IS THE FAR SIDE FROM THE WETLANDS. THE CONTRACTOR SHALL USE CAUTION IN THIS AREA AS TO NOT DISTURB THE EXISTING NON-TIDAL WETLAND.
6. BEGIN EXCAVATION FOR THE FULL DEPTH PAVING TRAIL (STA. 100+15.57 TO STA. 105+00 AND STA. 118+07 TO STA 123+85) AND INSTALL PAVING SECTION.
7. BEGIN PAVING OVERLAY THE EXISTING GRAVEL TRAIL (STA. 105+00 TO STA. 115+87). THE CONTRACTOR SHALL ONLY DISTURB AN AREA THAT CAN BE STABILIZED AT THE END OF EACH WORKING DAY.
8. WITH SEDIMENT CONTROL INSPECTOR'S APPROVAL, REMOVE ALL REMAINING SEDIMENT CONTROLS, INCLUDING PHASE I SEDIMENT CONTROLS, AND PERMANENTLY STABILIZE ANY DISTURBED AREAS. THE CONSTRUCTION ACCESS ROAD SHALL REMAIN AND WILL BE BE PAVED BY OTHERS.

SUMMARY OF ESC QUANTITIES

PHASE I

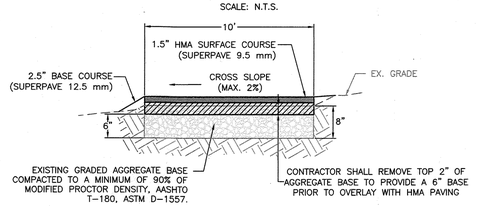
STABILIZED CONSTRUCTION ENTRANCE	1 EA
MOUNTABLE BERM:	1 EA
TEMPORARY ACCESS BRIDGE	2 EA
SILT FENCE	300 L.F.

NOTE: THIS SUMMARY OF SEDIMENT CONTROL QUANTITIES IS FOR USE BY THE HOWARD SOIL CONSERVATION DISTRICT ONLY. THIS SUMMARY IS NOT INTENDED TO BE USED BY THE CONTRACTOR FOR ESTIMATING AND BIDDING PURPOSES.



CONSTRUCTION ACCESS DETAIL

SCALE: N.T.S.



ULTIMATE PAVED TRAIL DETAIL (BY OTHERS)

SCALE: N.T.S.

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Sepehr Baharlou — 4/21/14
SIGNATURE OF ENGINEER — DATE

SEPEHR BAHARLOU
PRINTED NAME

DEVELOPER'S CERTIFICATION

I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT

D Malloy — 4.24.14
SIGNATURE OF DEVELOPER — DATE

Dennis Metley
PRINTED NAME

HOWARD SOIL CONSERVATION DISTRICT

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

John R Robertson — 4/29/14
HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division H&P — Date 5.9.14

Chief, Division of Land Development — Date 6.09.14

Director — Date 6/9/14

APPROVED
PLANNING BOARD
of HOWARD COUNTY
DATE 6/5/2014

0 25 50 100
1 Inch = 50 Feet

REVISED SITE DEVELOPMENT PLAN

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A Phone: (410)694-9401
Hanover, Maryland 21076 Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com
BAYLAND JOB NO. 8_16202

STATE OF MARYLAND SEPEHR BAHARLOU No. 21194 REGISTERED PROFESSIONAL ENGINEER
4/21/14

LAKE KITTAMAQUNDI MULTIUSE TRAIL
EROSION AND SEDIMENT CONTROL PLAN

REVISIONS			
DATE	BY	DESCRIPTION	
			SCALE: 1" = 50'
			DRAWN BY: MKB — DATE: 04/21/14
			CHECKED BY: SB — DATE: 4/21/2014
			DESIGNED BY: MKB — DATE: 04/21/14
			DRAWING K-11, SHEET NO. 57 OF 62

SDP-08-108

Z:\8_16202_LAKE_KITT_MULTIUSE_TRAIL\CAD Files\Sheet Files\8_16202_ESC01

APPROVED
PLANNING BOARD
of HOWARD COUNTY
DATE 6/5/2014

SUMMARY OF ESC QUANTITIES

PHASE II

SILT FENCE	1,310 LF
TURBIDITY CURTAIN	200 LF
TEMPORARY ACCESS BRIDGE	1 EA

NOTE: THIS SUMMARY OF SEDIMENT CONTROL QUANTITIES IS FOR USE BY THE HOWARD SOIL CONSERVATION DISTRICT ONLY. THIS SUMMARY IS NOT INTENDED TO BE USED BY THE CONTRACTOR FOR ESTIMATING AND BIDDING PURPOSES.

Scale bar: 0 25 50 100 — 1 Inch = 50 Feet

DEVELOPER'S CERTIFICATION

I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT

D. Mattey — 4.24.14
SIGNATURE OF DEVELOPER — DATE

Dennis Mattey
PRINTED NAME

HOWARD SOIL CONSERVATION DISTRICT

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

John R Robertson — 4/29/14
HOWARD SOIL CONSERVATION DISTRICT — DATE

ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Sepehr Baharlou — 4/21/14
SIGNATURE OF ENGINEER — DATE

SEPEHR BAHARLOU
SEPEHR BAHARLOU
PRINTED NAME

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division HSF	Date 5-9-14
Chief, Division of Land Development	Date 6-09-14
Director	Date 6/9/14

REVISED SITE DEVELOPMENT PLAN

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A — Phone: (410)694-9401
Hanover, Maryland 21076 — Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com
BAYLAND JOB NO. 8_16202

STATE OF MARYLAND — SEPEHR BAHARLOU — No. 21194 — REGISTERED PROFESSIONAL ENGINEER — 4/21/14

LAKE KITTAMAQUNDI MULTIUSE TRAIL
EROSION AND SEDIMENT CONTROL PLAN

REVISIONS		
DATE	BY	DESCRIPTION

SCALE: 1" = 50'	
DRAWN BY: MKB	DATE: 04/21/14
CHECKED BY: SB	DATE: 4/21/2014
DESIGNED BY: MKB	DATE: 04/21/14
DRAWING K-12, SHEET NO. 58 OF 62	

SDP-08-108

Z:\8_16202_LAKE_KITT_MULTIUSE_TRAIL\CAD Files\Sheet Files\8_16202_ESC02

HOWARD SOIL CONSERVATION DISTRICT STANDARD SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (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 MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.

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

4. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. B-4-5), TEMPORARY SEEDING (SEC. B-4-4) AND MULCHING (SEC.B-4-3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.

5. 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.

6. SITE ANALYSIS:

TOTAL AREA OF SITE AREA DISTURBED	2.87	ACRES
AREA TO BE ROOFED OR PAVED	0.88	ACRES
AREA TO BE VEGETATIVELY STABILIZED	1.99	ACRES
TOTAL CUT	620	CU. YDS.
TOTAL FILL	0	CU. YDS.
OFFSITE WASTE/BORROW LOCATION		

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

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

9. 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.

10. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORKDAY, WHICHEVER IS SHORTER.

11. ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE PLAN APPROVAL AUTHORITY PRIOR TO PROCEEDING WITH CONSTRUCTION.

12. A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM ACREAGE OF 20 AC. PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BE STABILIZED AND APPROVED BY THE ENFORCEMENT AUTHORITY. UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE APPROVAL AUTHORITY, NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.

TOPSOIL SPECIFICATIONS

1. TOPSOIL IS PLACED OVER PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION. THE PURPOSE IS 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.

2. TOPSOIL SALVAGED FROM AN EXISTING SITE MAY BE USED PROVIDED 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 REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-NRCS.

3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES 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 SUPPLIES 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.

4. AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.

5. TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:
   a. TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1½ INCHES IN DIAMETER.
   b. TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
   c. 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.

6. TOPSOIL APPLICATION
   a. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
   b. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO 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 TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
   c. TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A 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.

TEMPORARY SEEDING SUMMARY

HARDINESS ZONE (FROM FIGURE B.3): 6b SEED MIXTURE (FROM TABLE B.1)					FERTILIZER RATE (10-20-20)	LIME RATE
NO.	SPECIES	APPLICATION RATE (lb/ac)	SEEDING DATES	SEEDING DEPTHS		
1	ANNUAL RYEGRASS	40 (1lb/1000 sf)	3/1 - 5/15 8/1 - 10/15	0.5"	436 lb/ac (10 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
2	BARLEY	96 (2.2lb/1000 sf)	3/1 - 5/15 8/1 - 10/15	0.5"		
3	OATS	72 (1.7lb/1000 sf)	3/1 - 5/15 8/1 - 10/15	0.5"		
4	RYE	112 (2.8lb/1000 sf)	3/1 - 5/15 8/1 - 10/15	0.5"		
5	FOXTAIL MILLET	30 (0.7lb/1000 sf)	5/16 - 7/31	0.5"		

NOTES:

1. SEEDING RATES FOR THE WARM-SEASON GRASSES ARE IN POUNDS OF PURE LIVE SEED (PLS). ACTUAL PLANTING RATES SHALL BE ADJUSTED TO REFLECT PERCENT SEED GERMINATION AND PURITY, AS TESTED. ADJUSTMENTS ARE USUALLY NOT NEEDED FOR THE COOL-SEASON GRASSES. SEEDING RATES LISTED ABOVE ARE FOR TEMPORARY SEEDINGS, WHEN PLANTED ALONE. WHEN PLANTED AS A NURSE CROP WITH PERMANENT SEED MIXES, USE 1/3 OF THE SEEDING RATE LISTED ABOVE FOR BARLEY, OATS, AND WHEAT. FOR SMALLER-SEEDED GRASSES (ANNUAL RYEGRASS, PEARL MILLET, FOXTAIL MILLET), DO NOT EXCEED MORE THAN 5% (BY WEIGHT) OF THE OVERALL PERMANENT SEEDING MIX. CEREAL RYE GENERALLY SHOULD NOT BE USED AS A NURSE CROP, UNLESS PLANTING WILL OCCUR IN VERY LATE FALL BEYOND THE SEEDING DATES FOR OTHER TEMPORARY SEEDINGS. CEREAL RYE HAS ALLELOPATHIC PROPERTIES THAT INHIBIT THE GERMINATION AND GROWTH OF OTHER PLANTS. IF IT MUST BE USED AS A NURSE CROP, SEED AT 1/3 OF THE RATE LISTED ABOVE. OATS ARE THE RECOMMENDED NURSE CROP FOR WARM-SEASON GRASSES.

2. FOR SANDY SOILS, PLANT SEEDS AT TWICE THE DEPTH LISTED ABOVE.

3. THE PLANTING DATES LISTED ARE AVERAGES FOR EACH ZONE AND MAY REQUIRE ADJUSTMENT TO REFLECT LOCAL CONDITIONS, ESPECIALLY NEAR THE BOUNDARIES OF THE ZONE.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

(signature) HSP — 5.9.14
Chief, Development Engineering Division — Date

(signature) — 6-09-14
Chief, Division of Land Development — Date

(signature) — 6/9/14
Director — Date

STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

A. SEEDING

1. SPECIFICATIONS

a. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED MUST BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED MUST HAVE BEEN TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF SOWING SUCH MATERIAL ON ANY PROJECT. REFER TO TABLE B.4 REGARDING THE QUALITY OF SEED. SEED TAGS MUST BE AVAILABLE UPON REQUEST TO THE INSPECTOR TO VERIFY TYPE OF SEED AND SEEDING RATE.

b. MULCH ALONE MAY BE APPLIED BETWEEN THE FALL AND SPRING SEEDING DATES ONLY IF THE GROUND IS FROZEN. THE APPROPRIATE SEEDING MIXTURE MUST BE APPLIED WHEN THE GROUND THAWS.

c. INOCULANTS: THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES MUST BE A PURE CULTURE OF NITROGEN FIXING BACTERIA PREPARED SPECIFICALLY FOR THE SPECIES. INOCULANTS MUST NOT BE USED LATER THAN THE DATE INDICATED ON THE CONTAINER. ADD FRESH INOCULANTS AS DIRECTED ON THE PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING. NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75 TO 80 DEGREES FAHRENHEIT CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.

d. SOD OR SEED MUST NOT BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.

2. APPLICATION

a. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.

i. INCORPORATE SEED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON TEMPORARY SEEDING TABLE B.1, PERMANENT SEEDING TABLE B.3, OR SITE-SPECIFIC SEEDING SUMMARIES.

ii. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION. ROLL THE SEEDED AREA WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.

b. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.

i. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH OF SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.

ii. APPLY SEED IN TWO DIRECTIONS, PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.

c. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER).

i. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES SHOULD NOT EXCEED THE FOLLOWING: NITROGEN, 100 POUNDS PER ACRE TOTAL OF SOLUBLE NITROGEN; P205 (PHOSPHOROUS), 200 POUNDS PER ACRE; K20 (POTASSIUM), 200 POUNDS PER ACRE.

ii. LIME: USE ONLY GROUND AGRICULTURAL LIMESTONE (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.

iii. MIX SEED AND FERTILIZER ON SITE AND SEED IMMEDIATELY AND WITHOUT INTERRUPTION.

iv. WHEN HYDROSEEDING DO NOT INCORPORATE SEED INTO THE SOIL.

B. MULCHING

1. MULCH MATERIALS (IN ORDER OF PREFERENCE)

a. STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT, OR BARLEY AND REASONABLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY. NOTE: USE ONLY STERILE STRAW MULCH IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.

b. WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.

i. WCFM IS TO BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.

ii. WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.

iii. WCFM MATERIALS ARE TO BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL MUST FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.

iv. WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.

v. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS, DIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM.

2. APPLICATION

a. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.

b. WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.

c. WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 1500 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.

3. ANCHORING

a. PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE OF THE AREA AND EROSION HAZARD:

i. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD FOLLOW THE CONTOUR.

ii. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.

iii. SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA TAX II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.

iv. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

PERMANENT SEEDING SUMMARY

HARDINESS ZONE (FROM FIGURE B.3): 6b SEED MIXTURE (FROM TABLE B.3)					FERTILIZER RATE (10-20-20)			LIME RATE
NO.	SPECIES	APPLICATION RATE (lb/ac)	SEEDING DATES	SEEDING DEPTHS	N	P_2O_5	K_2O	
1	SWITCHGRASS CREEPING RED FESCUE BUSH CLOVER	10 15 2	3/1 - 5/15 8/1 - 10/15	½" - ¼"	45 lb/ac (1.0 lb/ 1000 sf)	90 lb/ac (2.0 lb/ 1000 sf)	90 lb/ac (2.0 lb/ 1000 sf)	2 tons/ac (90 lb/ 1000 sf)
3	DEERTONGUE SHEEP FESCUE COMMON LESPEDEZA	20 20 10	3/1 - 5/15 8/1 - 10/15	½" - ¼"				

DEVELOPER'S CERTIFICATION

I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT

D. Mattey — 4.24.14
SIGNATURE OF DEVELOPER — DATE

Dennis Mattey
PRINTED NAME

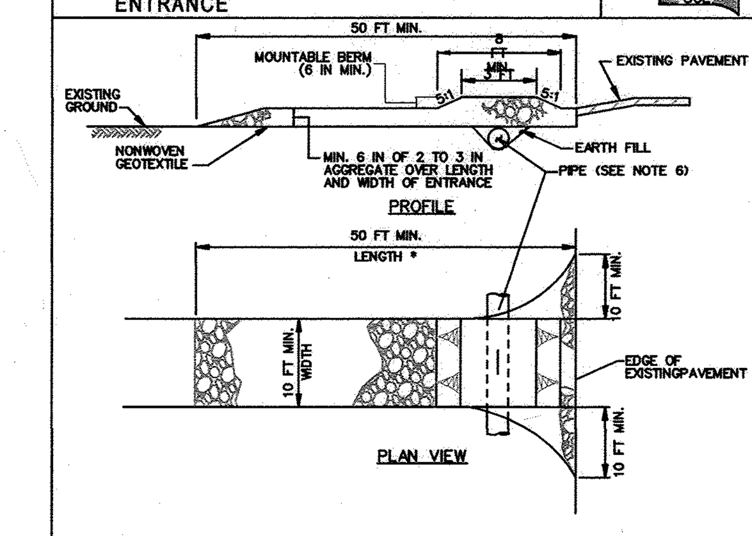
HOWARD SOIL CONSERVATION DISTRICT

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

(signature) — 4/29/14
HOWARD SOIL CONSERVATION DISTRICT — DATE

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.

2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.

3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.

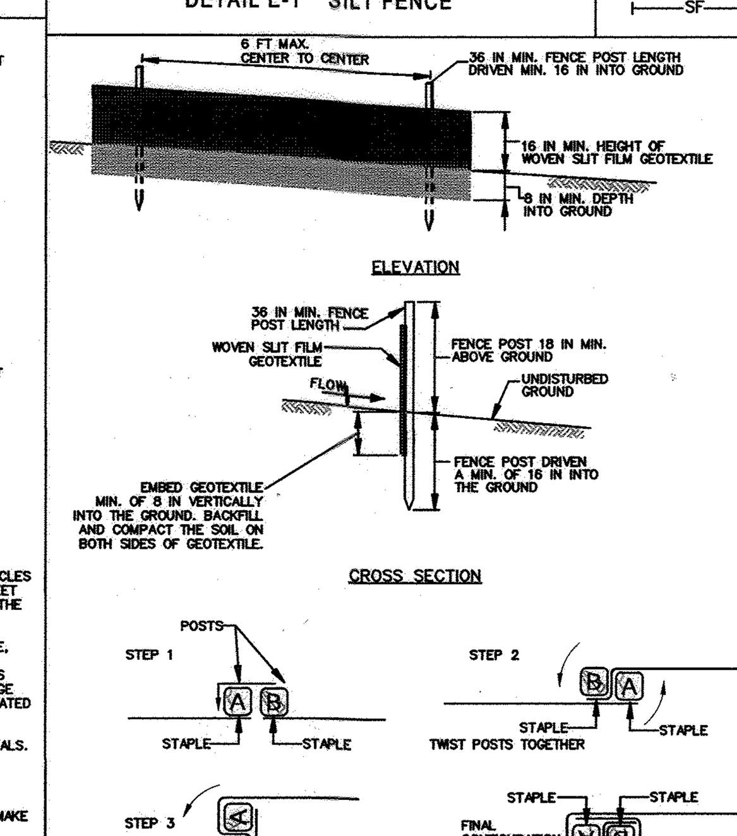
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.

5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF



1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

CONSTRUCTION SPECIFICATIONS

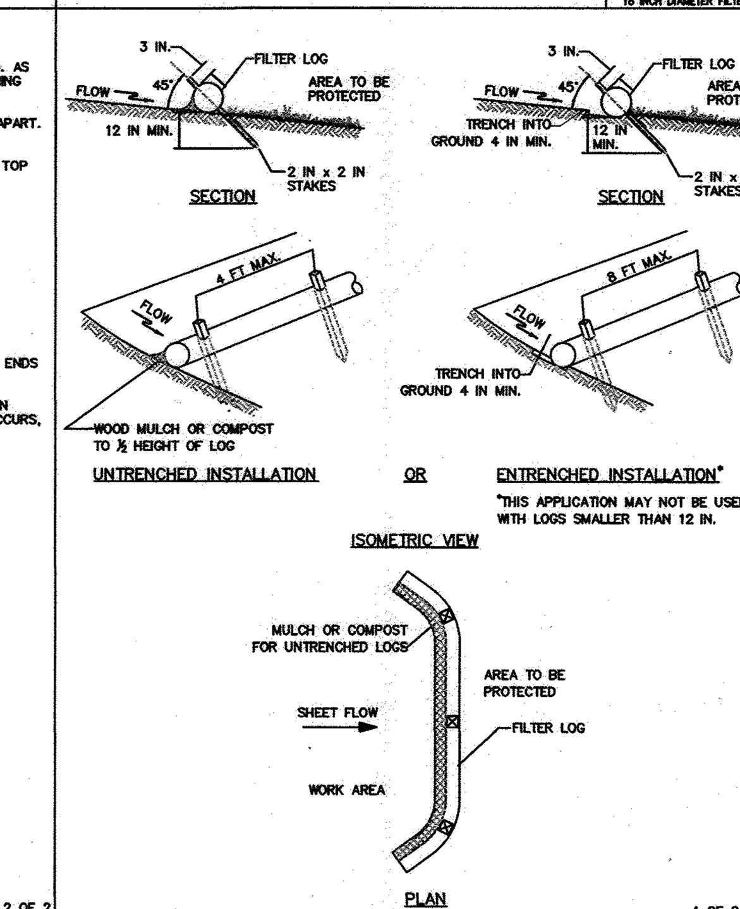
1. USE WOOD POSTS 1¾ X 1¾ ± 1/16 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-6 FILTER LOG

STANDARD SYMBOL: FL-18
DESIGNATION FL-18 REFERS TO 18 INCH DIAMETER FILTER LOG.



1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-6 FILTER LOG

STANDARD SYMBOL: FL-18
DESIGNATION FL-18 REFERS TO 18 INCH DIAMETER FILTER LOG.

CONSTRUCTION SPECIFICATIONS

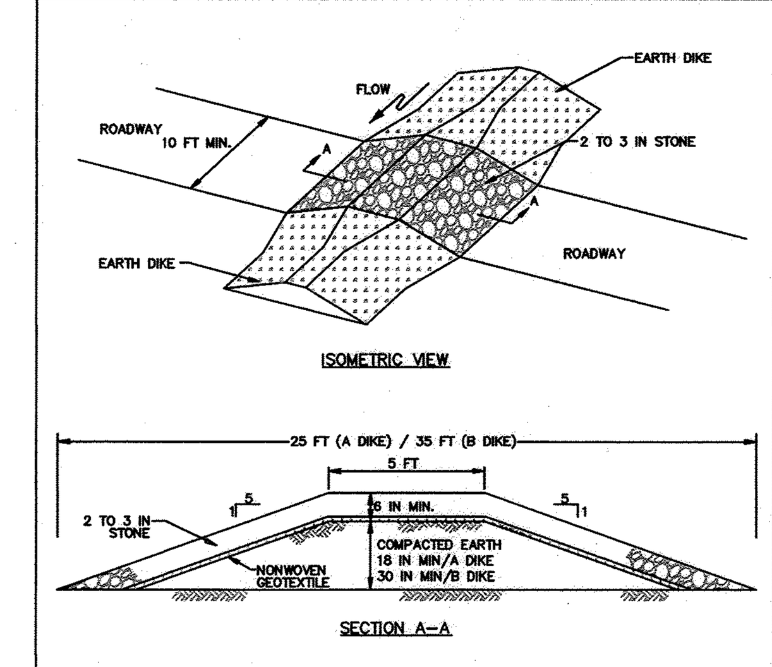
1. PRIOR TO INSTALLATION, CLEAR ALL OBSTRUCTIONS INCLUDING ROCKS, CLODS, AND DEBRIS GREATER THAN ONE INCH THAT MAY INTERFERE WITH PROPER FUNCTION OF FILTER LOG.
2. FILL LOG NETTING UNIFORMLY WITH COMPOST (IN ACCORDANCE WITH SECTION H-1 MATERIALS), OR OTHER APPROVED BIODEGRADABLE MATERIAL TO DESIRED LENGTH SUCH THAT LOGS DO NOT DEFORM.
3. INSTALL FILTER LOGS PERPENDICULAR TO THE FLOW DIRECTION AND PARALLEL TO THE SLOPE WITH THE BEGINNING AND END OF THE INSTALLATION POINTING SLIGHTLY UP THE SLOPE CREATING A "J" SHAPE AT EACH END TO PREVENT BYPASS.
4. FOR UNTRENCHED INSTALLATION BLOW OR HAND PLACE MULCH OR COMPOST ON UPHILL SIDE OF THE SLOPE ALONG LOG.
5. STAKE FILTER LOG EVERY 4 FEET OR CLOSER ALONG ENTIRE LENGTH OF LOG OR TRENCH LOG INTO GROUND A MINIMUM OF 4 INCHES AND STAKE LOG EVERY 8 FEET OR CLOSER.
6. USE STAKES WITH A MINIMUM NOMINAL CROSS SECTION OF 2X2 INCH AND OF SUFFICIENT LENGTH TO ATTAIN A MINIMUM OF 12 INCHES INTO THE GROUND AND 3 INCHES PROTRUDING ABOVE LOG.
7. WHEN MORE THAN ONE LOG IS NEEDED, OVERLAP ENDS 12 INCHES MINIMUM AND STAKE.
8. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO A DEPTH OF ½ THE EXPOSED HEIGHT OF LOG AND REPLACE MULCH. REPLACE FILTER LOG IF TORN. REINSTALL FILTER LOG IF UNDERMINING OR DISLODGING OCCURS. REPLACE CLOGGED FILTER LOGS. FOR PERMANENT APPLICATIONS, ESTABLISH AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-8 MOUNTABLE BERM

STANDARD SYMBOL: MB



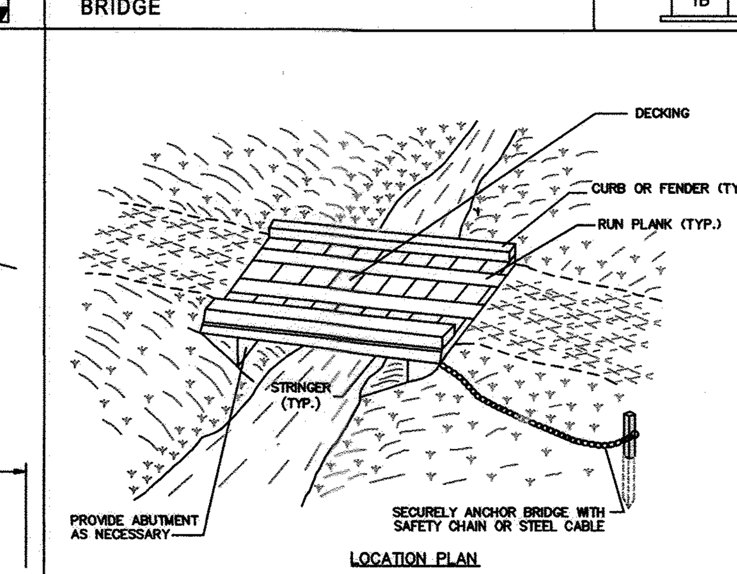
CONSTRUCTION SPECIFICATIONS

1. USE MINIMUM WIDTH OF 10 FEET TO ALLOW FOR VEHICULAR PASSAGE.
2. PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE EARTH MOUND PRIOR TO PLACING STONE.
3. PLACE 2 TO 3 INCH STONE OR EQUIVALENT RECYCLED CONCRETE AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE MOUNTABLE BERM.
4. MAINTAIN LINE, GRADE, AND CROSS SECTION. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN SPECIFIED DIMENSIONS. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB



NOTE:
TIME OF YEAR RESTRICTIONS DO NOT APPLY TO THE CONSTRUCTION OR REMOVAL OF A TEMPORARY ACESS BRIDGE UNLESS THERE IS DISTURBANCE TO THE STREAM CHANNEL.

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB

CONSTRUCTION SPECIFICATIONS

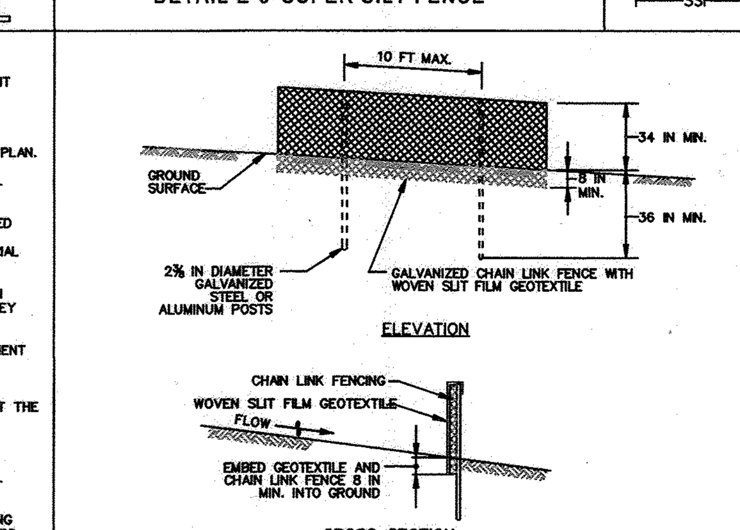
1. CONSTRUCT TEMPORARY BRIDGE STRUCTURE AT OR ABOVE THE BANK ELEVATION TO PREVENT IMPACTS FROM FLOATING MATERIALS AND DEBRIS.
2. PLACE ABUTMENTS PARALLEL TO, AND ON, STABLE BANKS.
3. CONSTRUCT BRIDGE TO SPAN ENTIRE CHANNEL UNLESS OTHERWISE INDICATED ON APPROVED PLAN.
4. USE STRINGERS CONSISTING OF LOGS, SAWN TIMBER, PRESTRESSED CONCRETE BEAMS, METAL BEAMS, OR OTHER APPROVED MATERIALS.
5. SELECT DECKING MATERIALS TO PROVIDE SUFFICIENT STRENGTH TO SUPPORT THE ANTICIPATED LOAD. PLACE ALL DECKING MEMBERS PERPENDICULAR TO THE STRINGERS, BUTT TIGHTLY, AND SECURELY FASTEN. DECKING MATERIALS MUST BE BUTTED TIGHTLY TO PREVENT ANY SOIL MATERIAL TRACKED ONTO THE BRIDGE FROM FALLING INTO THE WATERWAY BELOW.
6. SECURELY FASTEN OPTIONAL RUN PLANKING FOR THE LENGTH OF THE SPAN. PROVIDE A RUN PLANK FOR EACH TRACK OF THE EQUIPMENT WHEELS. ALTHOUGH RUN PLANKS ARE OPTIONAL, THEY MAY BE NECESSARY TO PROPERLY DISTRIBUTE LOADS.
7. INSTALL CURBS THE ENTIRE LENGTH OF THE OUTER SIDES OF THE DECK TO PREVENT SEDIMENT FROM ENTERING THE STREAM CHANNEL.
8. ANCHOR BRIDGE SECURELY AT ONLY ONE END USING STEEL CABLE OR CHAIN. ANCHORING AT ONLY ONE END WILL PREVENT CHANNEL OBSTRUCTION IN THE EVENT THAT FLOODWATERS FLOAT THE BRIDGE. ACCEPTABLE ANCHORS ARE LARGE TREES, LARGE BOULDERS, OR DRIVEN STEEL POSTS. ANCHOR MUST BE SUFFICIENT TO PREVENT THE BRIDGE FROM FLOATING DOWNSTREAM.
9. AREAS DISTURBED DURING BRIDGE INSTALLATION AND\OR REMOVAL MUST NOT BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.
10. STABILIZE APPROACH TO BRIDGE AND KEEP FREE OF EROSION. CLEAN SEDIMENT FROM DECKING AND CURBS DAILY BY SCRAPING, SWEEPING, AND/OR VACUUMING. ENSURE THAT DECKING AND CURBS REMAIN TIGHTLY BUTTED WITHOUT GAPS. REMOVE DEBRIS TRAPPED BY BRIDGE. MAINTAIN AREAS ADJACENT TO CROSSING TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
11. AFTER THE TEMPORARY CROSSING IS NO LONGER NEEDED, REMOVE IT WITHIN 14 CALENDAR DAYS. IF SUBJECT TO THE USE DESIGNATION CLOSURE, REMOVE AT THE END OF CLOSURE PERIOD. PROTECT STREAM BANKS DURING BRIDGE REMOVAL AND STABILIZE ALL DISTURBED AREAS WITH EROSION CONTROL MATTING. ACCOMPLISH REMOVAL OF THE BRIDGE AND CLEAN UP OF THE AREA WITHOUT CONSTRUCTION EQUIPMENT WORKING IN THE WATERWAY CHANNEL. STORE ALL REMOVED MATERIALS IN AN APPROVED STAGING AREA.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

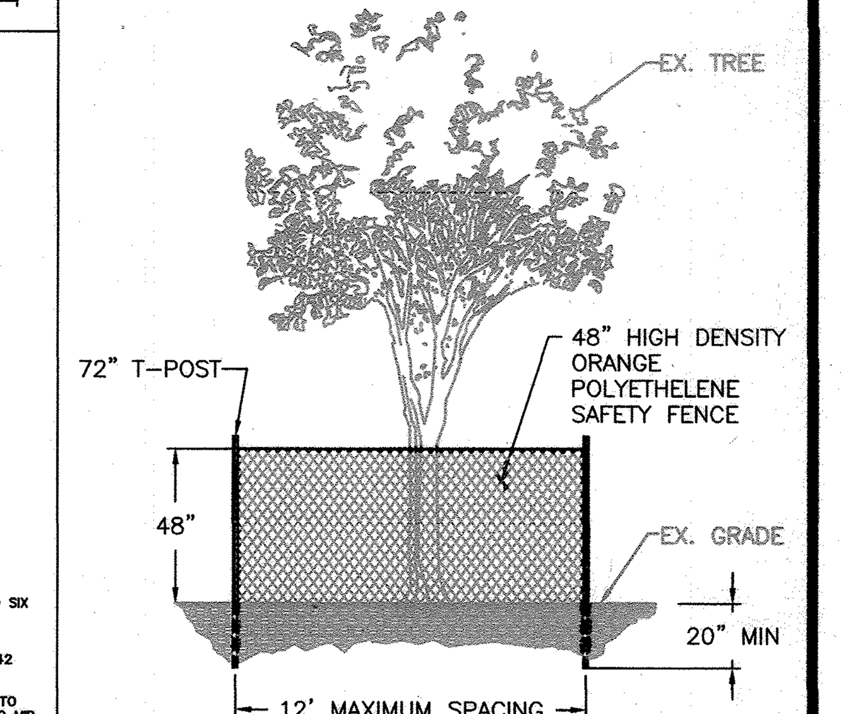
STANDARD SYMBOL: SSF



CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



NOTE: TREE PROTECTION TO BE INSTALLED AS DIRECTED BY COLUMBIA ASSOCIATION.

TREE PROTECTION DETAIL

SCALE: N.T.S.

BEST MANAGEMENT PRACTICES FOR WORKING IN NON TIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS AND 100 YEAR FLOOD PLAINS

1. NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NON TIDAL WETLANDS, NON TIDAL WETLAND BUFFERS, WATERWAYS OR THE 100-YEAR FLOODPLAIN.

2. PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NON TIDAL WETLANDS, NON TIDAL WETLAND BUFFERS, WATERWAYS OR THE 100 YEAR FLOODPLAIN.

3. DO NOT USE EXCAVATED MATERIAL AS BACK FILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACK FILL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.

4. PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NON TIDAL WETLANDS, NON TIDAL WETLAND BUFFERS, OR WATERWAYS OR THE 100 YEAR FLOOD PLAIN.

5. REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NON TIDAL WETLANDS, NON TIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100 YEAR FLOOD PLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.

6. RECTIFY ANY NON TIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS OR 100 YEAR FLOOD PLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.

7. ALL STABILIZATION IN THE NON TIDAL WETLAND AND NON TIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS(LOLIUM MULTIFLORUM), MILLET(SETARIA ITALICA), BARLEY(HORDEUM SP.), OATS (UNIOLA SP), AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NON TIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.

8. AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.

9. TO PROTECT AQUATIC SPECIES, IN STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM: USE IV WATERS.

10. STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.

11. CULVERTS SHALL BE CONSTRUCTED AND ANY RIP RAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

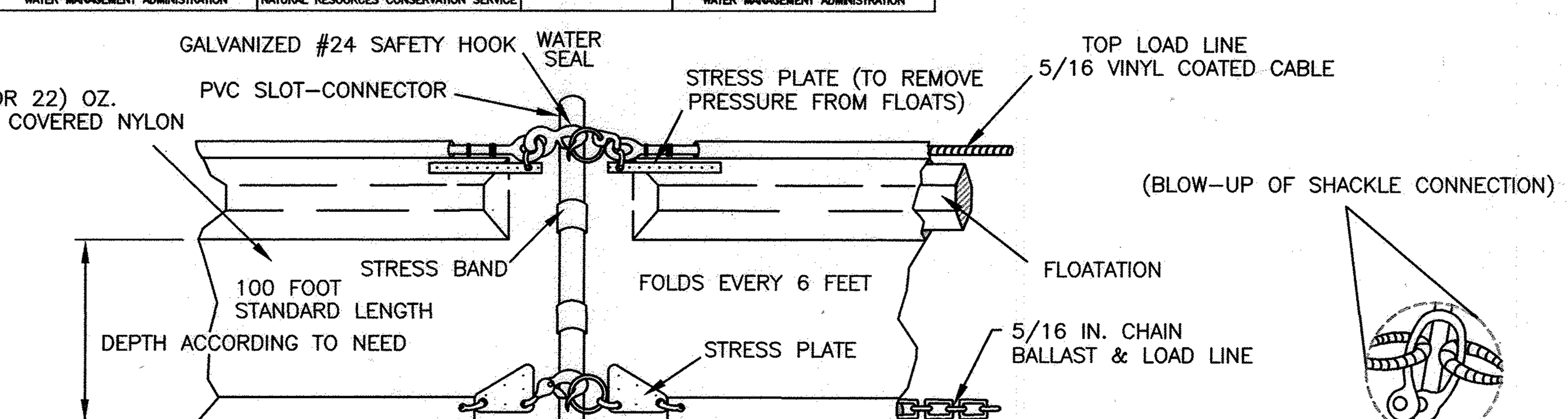
ENGINEER'S CERTIFICATION

I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

(signature) — 4/21/14
SIGNATURE OF ENGINEER — DATE

SEPEHR BAHARLOU
SEPEHR BAHARLOU
PRINTED NAME

APPROVED
PLANNING BOARD
of HOWARD COUNTY
DATE 6/5/2014



1. DESIGNED FOR USE ON RIVERS AND STREAMS, LARGE OPEN LAKES, BAYS, AND BEACHES WITH MODERATE CURRENTS AND WIND EXPOSURE.

2. WHEN THE CURTAIN IS NO LONGER REQUIRED AS DETERMINED BY THE INSPECTOR, THE CURTAIN AND RELATED COMPONENTS SHALL BE REMOVED SO AS TO MINIMIZE TURBIDITY. REMAINING SEDIMENT SHALL BE REMOVED AND THE ORIGINAL DEPTH OR PLAN ELEVATIONS RESTORED. ANY SPOILS MUST BE TAKEN TO UPLAND AREA AND STABILIZED.

3. CURTAIN WILL BE OPENED AS REQUIRED TO ACCOMMODATE PASSAGE OF WORK BOATS.

FLOATATION CONSISTS OF A SERIES OF EXPANDED POLYETHYLENE LOGS, 6" IN DIAMETER AND 55" LONG. THE LOGS ARE ENCLOSED IN 22 OZ./SQ. YD. PVC COATED NYLON OR POLYESTER HAVING 400 LBS. MINIMUM TENSILE STRENGTH. CURTAIN IS PERMANENTLY ATTACHED TO THE BOTTOM OF THE FLOATATION UNIT WEIGHED DOWN WITH ¼" GALVANIZED CHAIN. THE CURTAIN MATERIAL IS MONOFILAMENT WOVEN POLYPROPYLENE HAVING 200 LB. OR 300 LB. TENSILE STRENGTH.

WOVEN CURTAIN MATERIAL SPECIFICATIONS

PROPERTY	TEST METHOD	RESULTS	RESULTS	RESULTS
FABRIC CODE		AEF 200W	AEF 300W	AEF 650W
FABRIC STRUCTURE		WOVEN	WOVEN	WOVEN
POLYMER COMPOSITION		POLYPROPYLENE	POLYPROPYLENE	POLYPROPYLENE
WEIGHT	ASTM D-4632	4.2 OZ/SQ. YD	5.8 OZ/SQ. YD	6.3 OZ/SQ. YD
GRAB STRENGTH	ASTM D-4632	200 LBS.	300 LBS	390 X 250 LBS
TRAP TEAR STRENGTH	ASTM D-4533	90 LBS.	120 LBS	115 X 65 LBS
BURST STRENGTH	ASTM D-3786	400 PSI	600 PSI	495 PSI
PUNCTURE	ASTM D-3787	90 LBS.	150 LBS	130 LBS
ELONGATION	ASTM D-4632	20%	20%	30%
U.V. RESISTANCE	ASTM D-4335	70% (500HRS)	70% (500HRS)	70% (500HRS)
E.O.S.	CW-02215	40	40	70

MAINTENANCE:
INSPECT TURBIDITY CURTAIN AFTER EACH MAJOR STORM EVENT RESULTING FROM 3-INCHES OR MORE OF RAINFALL WITHIN A 24-HOUR PERIOD. REPAIR OR REPLACE DAMAGED MATERIALS AND REMOVE ANY DEBRIS LODGED AGAINST THE TURBIDITY CURTAIN.

FLOATING TURBIDITY BARRIERS

SCALE: N.T.S.

REVISED SITE DEVELOPMENT PLAN

Columbia Association
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21046
(410) 381 - 2947

BayLand Consultants & Designers, Inc.
"Integrating Engineering and Environment"
1321 Mercedes Drive, Suite A — Phone: (410)694-9401
Hanover, Maryland 21076 — Fax: (410)694-9405
Email: bayland@baylandinc.com
Website: http://www.baylandinc.com
BAYLAND JOB NO. 8_16202

STATE OF MARYLAND — SEPEHR BAHARLOU — No. 21194 — REGISTERED PROFESSIONAL ENGINEER
4/21/14

LAKE KITTAMAQUNDI MULTIUSE TRAIL EROSION AND SEDIMENT CONTROL NOTES & DETAILS

REVISIONS		
DATE	BY	DESCRIPTION

SCALE: AS-SHOWN	
DRAWN BY: MKB	DATE: 04/21/14
CHECKED BY: SB	DATE: 4/21/2014
DESIGNED BY: MKB	DATE: 04/21/14
DRAWING K-13, SHEET NO. 59 OF 62	

SDP-08-108

Z:\8_16202_LAKE_KITT_MULTIUSE_TRAIL\CAD Files\Sheet Files\8_16202_ESC03