

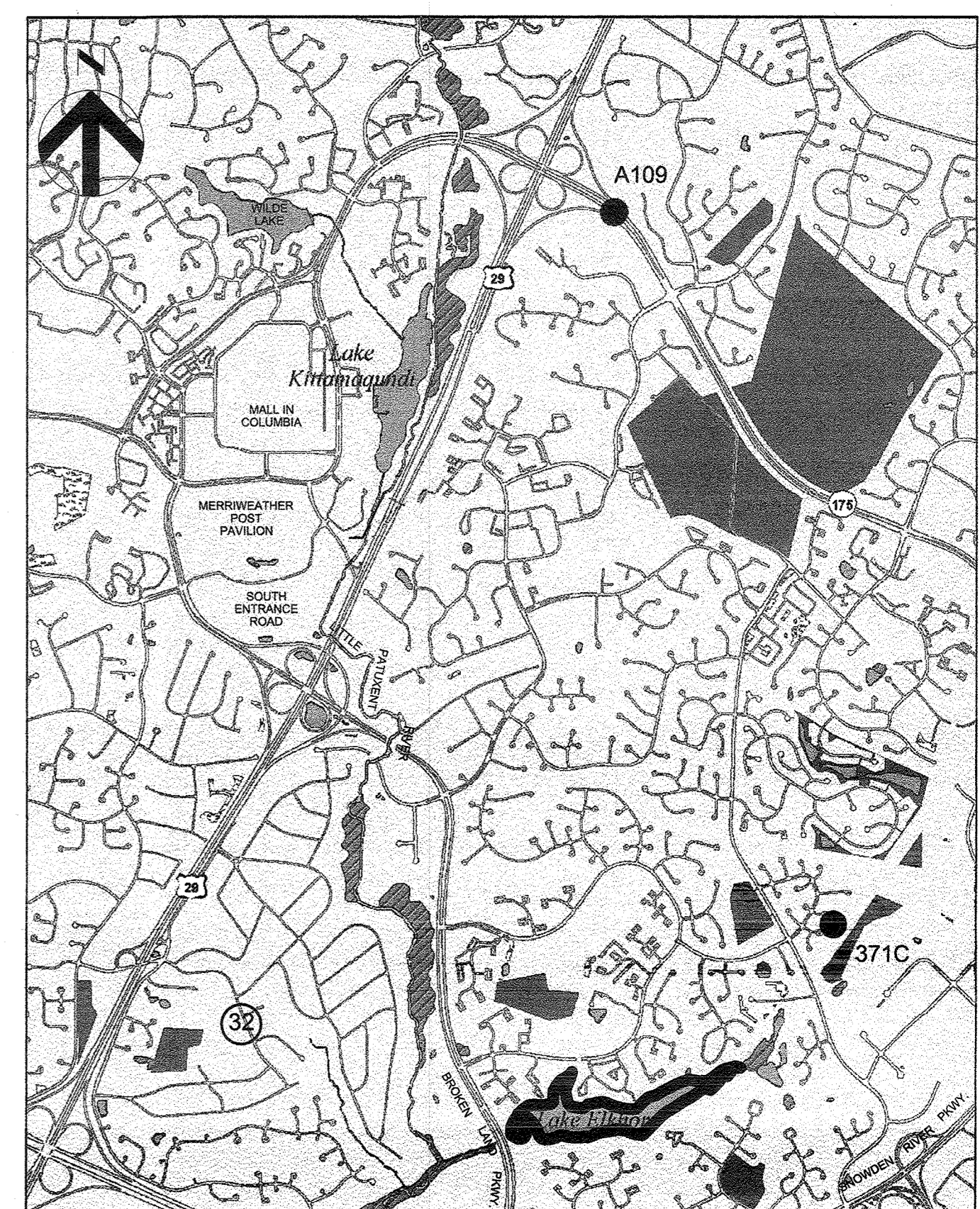
DRAWING SHEET NO.	NO.	SHEET TITLE
A-01	2.	GENERAL NOTES
B-01	3.	EXISTING CONDITIONS SITE PLAN KEY
B-02	4.	EXISTING CONDITIONS PLAN AREA 01
B-03	5.	EXISTING CONDITIONS PLAN AREA 02 & 03
B-04	6.	EXISTING CONDITIONS PLAN AREA 04
B-05	7.	EXISTING CONDITIONS PLAN AREA 05
B-06	8.	EXISTING CONDITIONS PLAN AREA 06
B-07	9.	EXISTING CONDITIONS PLAN AREA 07
B-08	10.	EXISTING CONDITIONS PLAN AREA 08
C-01	11.	PROPOSED DREDGING KEY SITE PLAN
C-02	12.	PROPOSED DREDGING PLAN AREA 01
C-03	13.	PROPOSED DREDGING PLAN AREA 02 & 03
C-04	14.	PROPOSED DREDGING PLAN AREA 04
C-05	15.	PROPOSED DREDGING PLAN AREA 05
C-06	16.	PROPOSED DREDGING PLAN AREA 06
C-07	17.	PROPOSED DREDGING PLAN AREA 07
C-08	18.	PROPOSED DREDGING PLAN AREA 08
C-09	19.	AREA 01 - CROSS SECTIONS
C-10	20.	AREA 02 & 03 - CROSS SECTIONS
C-11	21.	AREA 04 - CROSS SECTIONS
C-12	22.	AREA 05 & 06 - CROSS SECTIONS
C-13	23.	AREA 07 & 08 - CROSS SECTIONS
D-01	24.	PIPELINE ROUTING
E-01	25.	STAGING AREA
F-01	26.	EROSION & SEDIMENT CONTROL PLANS INITIAL PHASE
F-02	27.	EROSION & SEDIMENT CONTROL PLANS FINAL PHASE
F-03	28.	DETAILS & NOTES
F-04	29.	DETAILS & NOTES

- △ 1/29/2020 REDLINE TO ADD SHEETS FOR TRAIL MAINTENANCE
- 30. REVISED SITE DEVELOPMENT PLAN / COVER SHEET & NOTES
- 31. EXISTING CONDITIONS
- 32. PROPOSED CONDITIONS
- 33. PROPOSED PROFILE AND SECTIONS
- 34. TYPICAL STREAM DETAILS
- 35. STREAM STRUCTURE DETAILS
- 36. EROSION AND SEDIMENT CONTROL NOTES
- 37. EROSION AND SEDIMENT CONTROL PLAN
- 38. EROSION AND SEDIMENT CONTROL DETAILS
- 39. EROSION AND SEDIMENT CONTROL DETAILS
- △ 3/10/2020
- 40. ALTERNATE ACCESS TO AREA 1 AND AREA 2 (SP 20-39)
- 41. MAINTENANCE DREDGING AT AREA 1 AND AREA 2 (SP 20-39)



Lake Elkhorn Restoration Project Columbia, Maryland

Columbia Association Construction Services Project No. 043007DK



LOCATION PLAN
NTS

SITE ANALYSIS DATA CHART			
a. TOTAL PROJECT AREA			
LAKE	33.0	ACRES	1,437,480 FT ²
STAGING AREA	0.67	ACRES	29,088 FT ²
b. AREA OF PLAN SUBMISSION - SEE ITEM a			
c. LIMIT OF DISTURBED AREA			
LAKE	14.79	ACRES	644,372 FT ²
STAGING AREA	1.12	ACRES	48,787 FT ²
d. PRESENT ZONING	NT		
e. NA. TEMPORARY MAINTENANCE EMPLOYEES			

PERMIT INFORMATION CHART					
Subdivision Name	VILLAGE OF OWENS BROWN		Section/Area	SECTION 1 OPEN SPACE AREA 1	
Lot/Parcel No.	280				
Plat # or L/F	Grid #	Zoning	Tax Map No.	Elect Distr	Census Tract
PHASE 113 PLAT BOOK 27 FOLIO 55 & 56		NT	30 & 36	3	6067
Water Code	NOT APPLICABLE		Sewer Code	NOT APPLICABLE	

BY	No.	REVISIONS	DATE
JA	△ 1	REVISED SITE DEVELOPMENT PLAN TO ADD SHEETS 30-39	1/29/2020
JA	△ 2	REVISED SDP SHEETS 30-39 APPROVED BY HSCD EP-19-031	1/29/2020
JPH	△ 3	REVISED SDP TO ADD SHEETS 40 & 41 TO PROVIDE ALTERNATE ACCESS FOR MAINTENANCE DREDGING AT AREA 1 AND AREA 2 (SP 20-39)	3/10/2020

APPROVED: DEPARTMENT OF PLANNING AND ZONING

David Edwards
Chief, Development Engineering Division
Date: 6/9/09

Condy Hume
Chief, Division of Land Development
Date: 7/2/09

Mack K. Leighton
Director
Date: 7/2/09

Maryland Department of the Environment
Water Management Administration
Dam Safety Division

V. P. Dalal 4/15/09
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

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
PIETER DAHMEN, PE
HDR ENGINEERING INC.
March 31, 2009

COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #107
COLUMBIA, MD 21044
(410)-381-2947

COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280

MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING SHEET 1 OF 29

SDP-08-107

HOWARD COUNTY
GENERAL NOTES:

- All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA standards and specifications if applicable.
- 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.
- The contractor shall notify "Miss Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
- 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.
- 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.
- 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 (1/4 gauge) inserted into a 2-1/2" galvanized steel, perforated, square tube sleeve (1/2 gauge) - 3' long. A galvanized steel pole cap shall be mounted on top of each post.
- All plan dimensions are to face of curb unless otherwise noted.
- The existing topography is taken from aerial survey with (maximum two foot) contour intervals prepared by Mercuro Consultants Inc. dated 5-22-2006.
- 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.
- No permanent increase in impervious area, no stormwater management required.
- Existing utilities are based on GIS mapping.
- Limits of the 100 year floodplain shown on plans were obtained from Howard County GIS and Flood Insurance Rate Map dated December 4, 1986.
- No wetland areas are affected by the staging area or other areas of disturbance landward of the ordinary high water of the lake. Wetlands within the lake, consisting mainly of non-persistent emergent and lacustrine unconsolidated bottom wetlands are subject to disturbance from planned dredge and fill activity. These "in-lake" wetlands have not been quantified separately as the entire area of the lake being dredged is classified as jurisdictional water of the U.S. (reference JPA #2008-63536-M02).
- No traffic study is required for this project.
- Project background information:
The Lake Elkhorn Restoration Project consists of:
 - Hydraulically dredging portions of Lake Elkhorn to its original depths, including the Forebay Pond, upper third of the main lake, Marina Cove, two inlet areas, and the Tailwater Pond.
 - Pumping the dredged material to a temporary staging area adjacent to Broken Land Parkway for dewatering.
 - Trucking dewatered material off-site to a licensed placement facility.
 - Restoration of all disturbed areas, including removal of the temporary road, gravel & paving materials at the staging area.
- The subject property is zoned NT per the February 2, 2004 Comprehensive Zoning Plan and per the "Comp Lite Zoning Amendments" effective July 28, 2006.
- No grading, removal of vegetative cover or trees, paving or new structures shall be permitted in wetlands, streams or their associated buffers, forest conservation easements, or 100-year flood plains without DPZ approval.
- This project is exempt from the requirements of Section 16J24 of the Howard County Code for Landscaping since disturbance resulting from project activities is temporary and no permanent structures are proposed.
- This project is exempt from the requirements of Section 16J200 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.
- The contractor is responsible for repair of property damage caused by the contractor.
- Project is subject to approval by the U.S. Army Corps of Engineers, Baltimore District, the MDE Non-tidal 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 200863536.
- 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.

HOWARD SOIL CONSERVATION DISTRICT
STANDARD SEDIMENT CONTROL NOTES

- 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).
 - 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.
 - 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.
 - 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.
 - 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. 5), sod (Sec. 5.4), temporary seeding (Sec. 5.0) and mulching (Sec. 5.2). Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
 - 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.
- | Site Analysis: | LAKE | STAGING AREA |
|------------------------------------|----------------|--------------|
| Total Area of Site | 33.0 Acres | 0.67 Acres |
| Area Disturbed | 14.79 Acres | 1.12 Acres |
| Area to be roofed or paved | 0 Acres | 0 Acres |
| Area to be vegetatively stabilized | 0 Acres | 0 Cu.Yds. |
| Total Cut | 53,139 Cu.Yds. | 1029 Cu.Yds. |
| Total Fill | 0 Cu.Yds. | 1029 Cu.Yds. |
| Total Estimated Dredge Value | 0 Cu.Yds. | 0 Cu.Yds. |
- Off-site waste/borrow area location: Site with an approved sediment control plan and active permit as approved by the Howard SCD.
- Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
 - Additional sediment control must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
 - 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.
 - 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.

MDE DAM SAFETY DIVISION NOTES:

- MDE Dam Safety Division should be notified 5-days before the start of the actual dredging work so that MDE Compliance and Dam Safety Division staff can make arrangements to be at the site.
- Before the actual beginning of the project, the "Engineer-in-charge" (EIC) should arrange a "Pre-construction Meeting" with the staff from MDE Dam Safety Compliance Divisions, County Inspectors Office, owner, contractor, and other personnel involved in the work.
- A copy of the MDE Dam Safety Division permit, along with a set of MDE approved plans should be at the site at all times. MDE Compliance Inspectors will require these during their inspection visits.
- Any deviation from the approved plans will require MDE Dam Safety Compliance Division's approval again after they have been accepted by EIC. Any unauthorized work will be deemed illegal and may have to be redone after revisions have been accepted.
- After all the work has been completed, the "as-built" plans with red-lined markings on them should be submitted to MDE Dam Safety Compliance Division within 60 days. The "as-built" plans and reports will include all the weekly progress reports, material tickets, pictures and house drawings available on this project from the beginning until the completion. The as-built submission will be in paper-copy as well as in electronic formats.
- Weekly progress reports should be sent within 24 hours to MDE Dam Safety Division by e-mail to vdalal@mde.state.md.us

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:
- 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.)
 - Acceptable - Apply 2 tons/acre dolomitic limestone (92 lbs/1000 sq.ft.) and 1000 lbs/acre 10-10-10 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 2/8 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 2/8 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.

GENERAL NOTES

**COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280**

**MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42**

SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING A-01, SHEET 2 OF 29

SDP-08-107

APPROVED: DEPARTMENT OF PLANNING AND ZONING

David Edwards
Chief, Development Engineering Division

6/9/09
Date

Cindy Hamner
Chief, Division of Land Development

7/2/09
Date

Marsha M. Leight
Director

7/2/09
Date

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

V. P. Dalal 4/13/09
Visty P. Dalal
Regulatory & Compliance Engineer

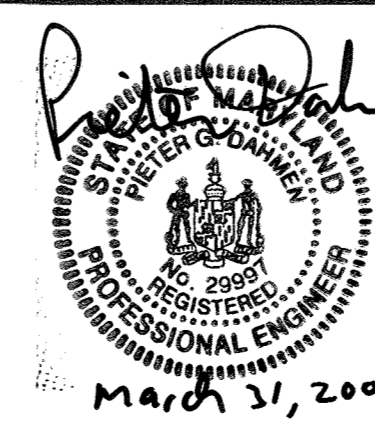
THIS PLAN SET HAS BEEN PREPARED BY:

HDR

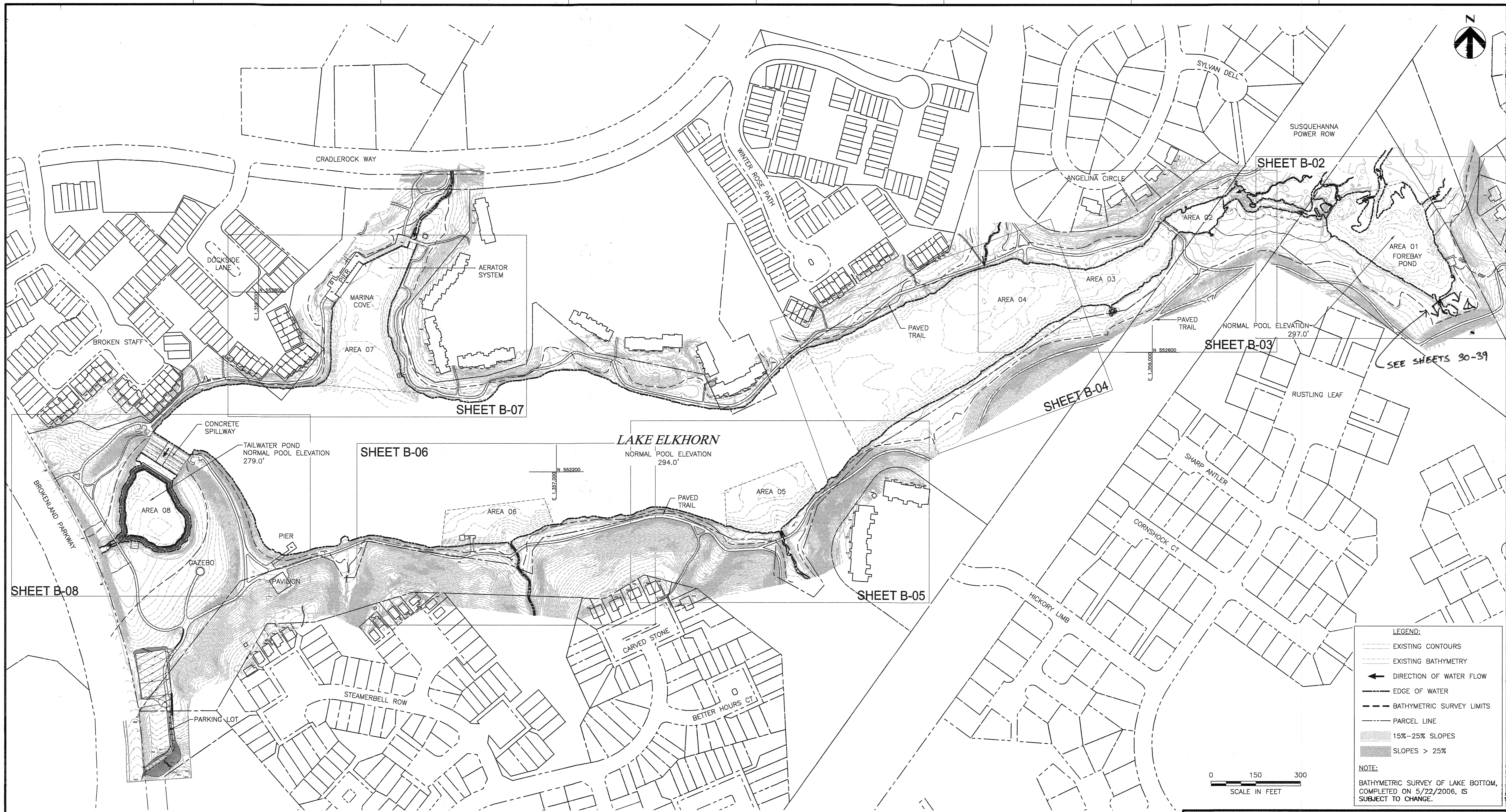
HDR Engineering, Inc.
6700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-222-1500

PLANS HAVE BEEN
DESIGNED UNDER MY
SUPERVISION

PIETER DAHMEN, PE
HDR ENGINEERING INC.



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



By	NO	REVISIONS	DATE
JA	△	REVISED SDP TO ADD SHEETS 30-39	1/29/2020
JA	△	REVISED SDP SHEETS 30-39 APPROVED BY HSCD EP-19-031	1/29/2020

APPROVED: DEPARTMENT OF PLANNING AND ZONING

David Edwards
 Chief, Development Engineering Division
 Date: 6-9-9

Christy Hand
 Chief, Division of Land Development
 Date: 7/6/09

David K. Gough
 Director
 Date: 7/5/09

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

V.P. Dalal 4/13/09
 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
 PIETER DAHMEN, PE
 HDR ENGINEERING INC.
 March 31, 2009

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

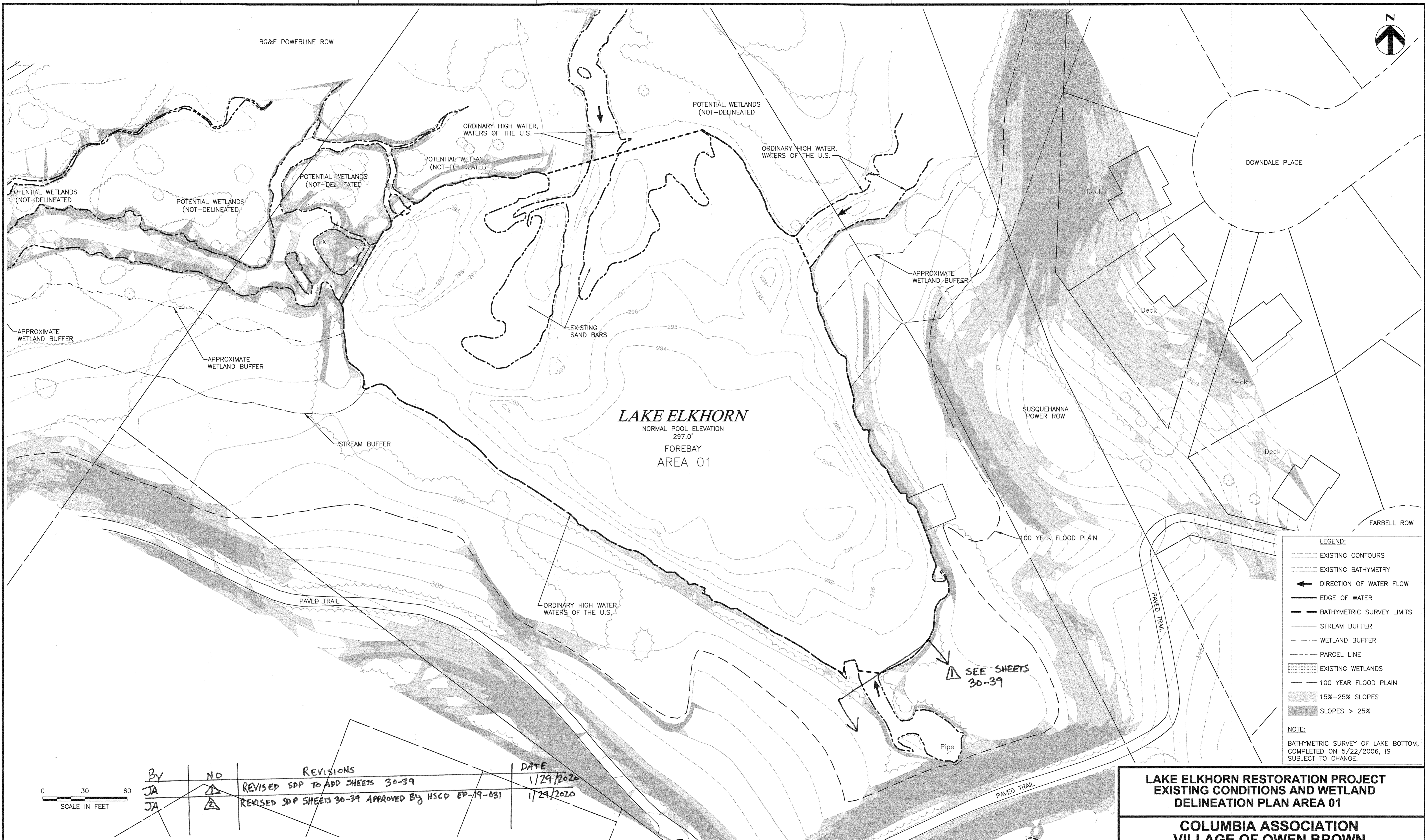
**LAKE ELKHORN RESTORATION PROJECT
 EXISTING CONDITIONS AND WETLAND
 DELINEATION SITE PLAN KEY**

**COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280**

MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

SCALE AS SHOWN
 FEBRUARY 6, 2009

DRAWING B-01, SHEET 3 OF 29
 SDP-08-107

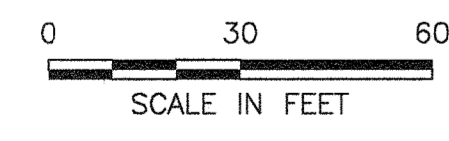


LEGEND:

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

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

By	NO	REVISIONS	DATE
JA	1	REVISED SDP TO ADD SHEETS 30-39	1/29/2020
JA	2	REVISED SDP SHEETS 30-39 APPROVED BY HSCD EP-19-031	1/29/2020



APPROVED: DEPARTMENT OF PLANNING AND ZONING

<i>[Signature]</i> Chief, Development Engineering Division	6-9-9 Date
<i>[Signature]</i> Chief, Division of Land Development	7/2/09 Date
<i>[Signature]</i> Director	7/2/09 Date

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

[Signature]
V. P. Dalal
Regulatory & Compliance Engineer

4/13/09
Date

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

[Signature]
PIETER DAHMEN, PE
HDR ENGINEERING INC.

[Professional Engineer Seal]
March 31, 2009

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

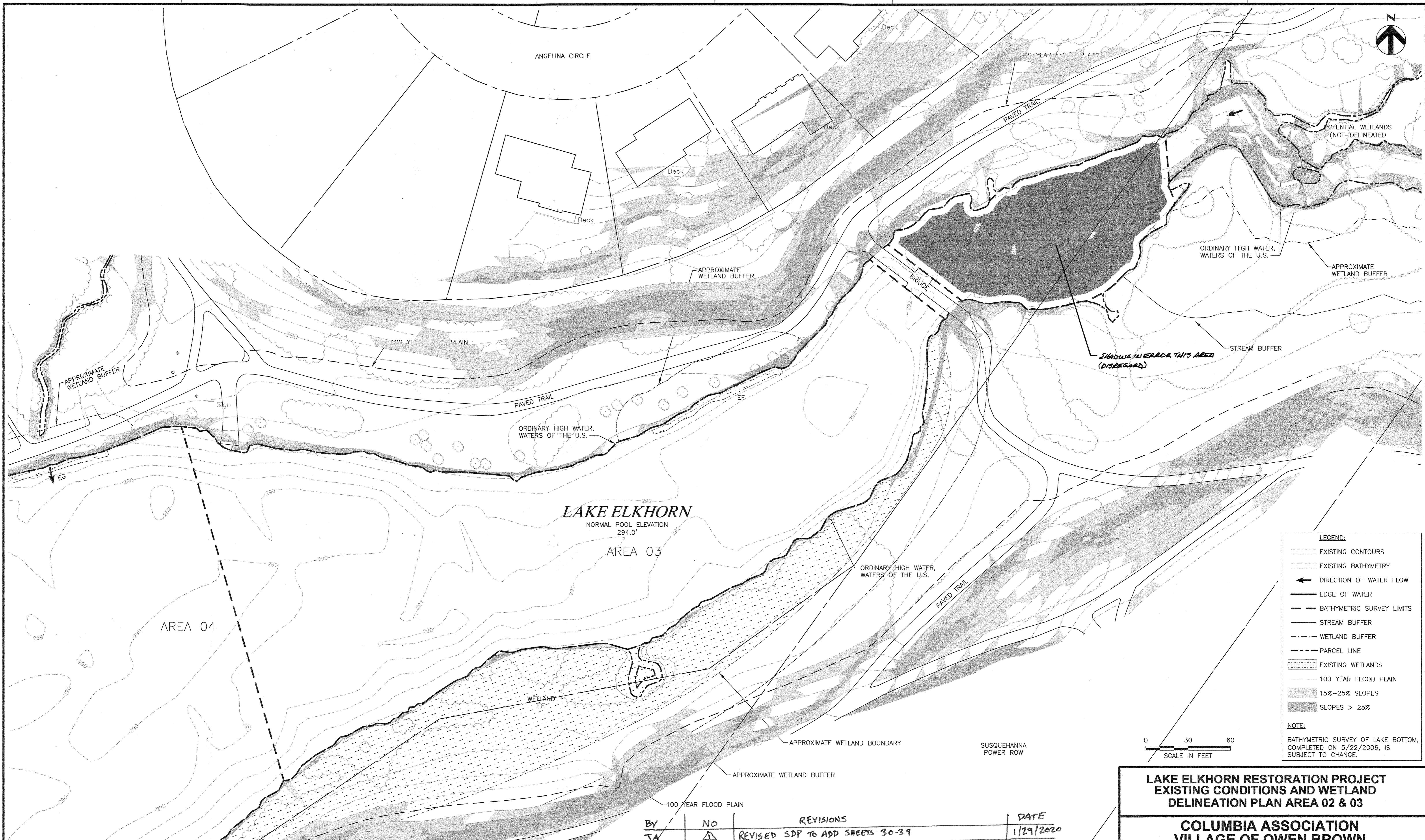
**LAKE ELKHORN RESTORATION PROJECT
EXISTING CONDITIONS AND WETLAND
DELINEATION PLAN AREA 01**

**COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280**

MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

SCALE AS SHOWN
FEBRUARY 6, 2009

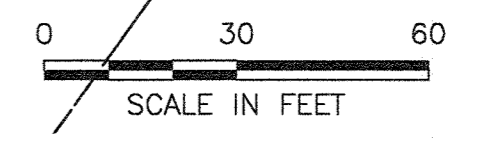
DRAWING B-02, SHEET 4 OF 28
SDP-08-107



LEGEND:

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

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



BY	NO	REVISIONS	DATE
JA	△	REVISED SDP TO ADD SHEETS 30-39	1/29/2020
JA	△	REVISED SDP SHEETS 30-39 APPROVED BY HSCD EP-19-031	1/29/2020

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chad P. ...
 Chief, Development Engineering Division
 Date: 6-9-9

Andie Hammett
 Chief, Division of Land Development
 Date: 7/2/09

Mark J. ...
 Director
 Date: 7/2/09

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

V.P. Dalal 4/3/09
 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.

Pieter Dahmen
 REGISTERED PROFESSIONAL ENGINEER
 No. 20987
 March 31, 2009

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

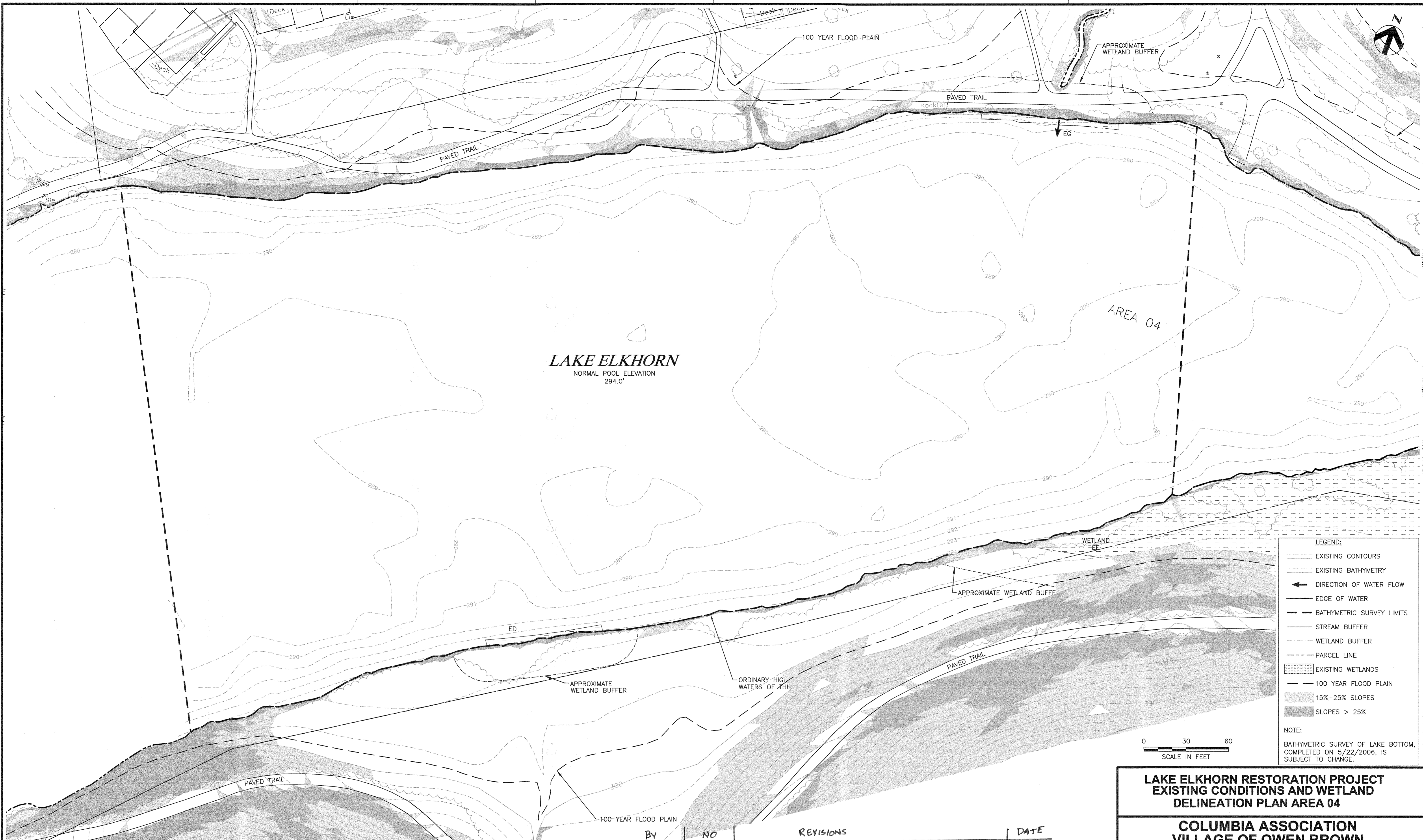
LAKE ELKHORN RESTORATION PROJECT
 EXISTING CONDITIONS AND WETLAND
 DELINEATION PLAN AREA 02 & 03

COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280

MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

SCALE AS SHOWN
 FEBRUARY 6, 2009

DRAWING B-03, SHEET 5 OF 29
 SDP-08-107



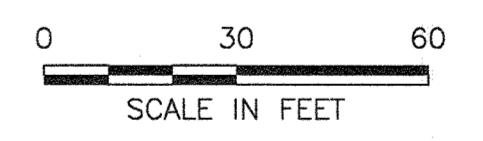
LAKE ELKHORN
 NORMAL POOL ELEVATION
 294.0'

AREA 04

LEGEND:

- - - - - EXISTING CONTOURS
- - - - - EXISTING BATHYMETRY
- ← DIRECTION OF WATER FLOW
- EDGE OF WATER
- - - - - BATHYMETRIC SURVEY LIMITS
- STREAM BUFFER
- - - - - WETLAND BUFFER
- - - - - PARCEL LINE
- [Hatched Box] EXISTING WETLANDS
- - - - - 100 YEAR FLOOD PLAIN
- [Light Gray Box] 15%-25% SLOPES
- [Dark Gray Box] SLOPES > 25%

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



APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chad Edwards
 Chief, Development Engineering Division
 Date: 6-9-09

Cindy Hamdt
 Chief, Division of Land Development
 Date: 7/2/09

Nancy M. Loyl
 Director
 Date: 7/2/09

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

V. P. Dalal
 Visty P. Dalal
 Regulatory & Compliance Engineer
 Date: 4/13/09

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.
 March 31, 2009

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

BY	NO	REVISIONS	DATE
JA	△	REVISED SPP TO ADD SHEETS 30-39	1/29/2020
JA	△	REVISED SPP SHEETS 30-39 APPROVED BY HSCD EP-19-031	1/29/2020

LAKE ELKHORN RESTORATION PROJECT
EXISTING CONDITIONS AND WETLAND
DELINEATION PLAN AREA 04

COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280

MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

SCALE AS SHOWN
 FEBRUARY 6, 2009

DRAWING B-04, SHEET 6 OF 28
 SDP-08-107

LAKE ELKHORN
NORMAL POOL ELEVATION
294.0'

AREA 05

ORDINARY HIGH WATER,
WATERS OF THE U.S.

100 YEAR FLOOD PLAIN

BRIDGE

PAVED TRAIL

PAVED TRAIL

Deck

Deck

Deck

Deck

Deck

HICKORY LIMB

Deck

Deck

Deck

Deck

Deck

Deck

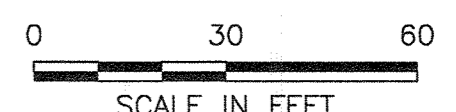
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LEGEND:

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

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



BY	NO	REVISIONS	DATE
JA	Δ	REVISED SPP TO ADD SHEETS 30-39	1/29/2020
JA	Δ	REVISED SPP SHEETS 30-39 APPROVED BY HSCD EP-A-031	1/29/2020

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Clayton Edwards
Chief, Development Engineering Division
Date 6-9-9

Cindy Hamble
Chief, Division of Land Development
Date 7/2/09

Wesley A. Leight
Director
Date 7/2/09

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V.P. Dalal
Visty P. Dalal
Regulatory & Compliance Engineer
Date 4/13/09

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
PIETER DAHMEN, PE
HDR ENGINEERING INC.

Pieter Dahmen
REGISTERED PROFESSIONAL ENGINEER
NOV 2007
MARCH 31, 2009

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

**LAKE ELKHORN RESTORATION PROJECT
EXISTING CONDITIONS AND WETLAND
DELINEATION PLAN AREA 05**

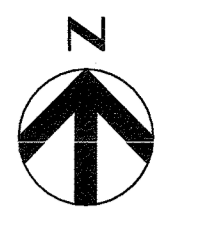
**COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280**

MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

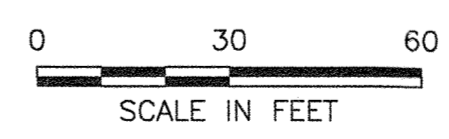
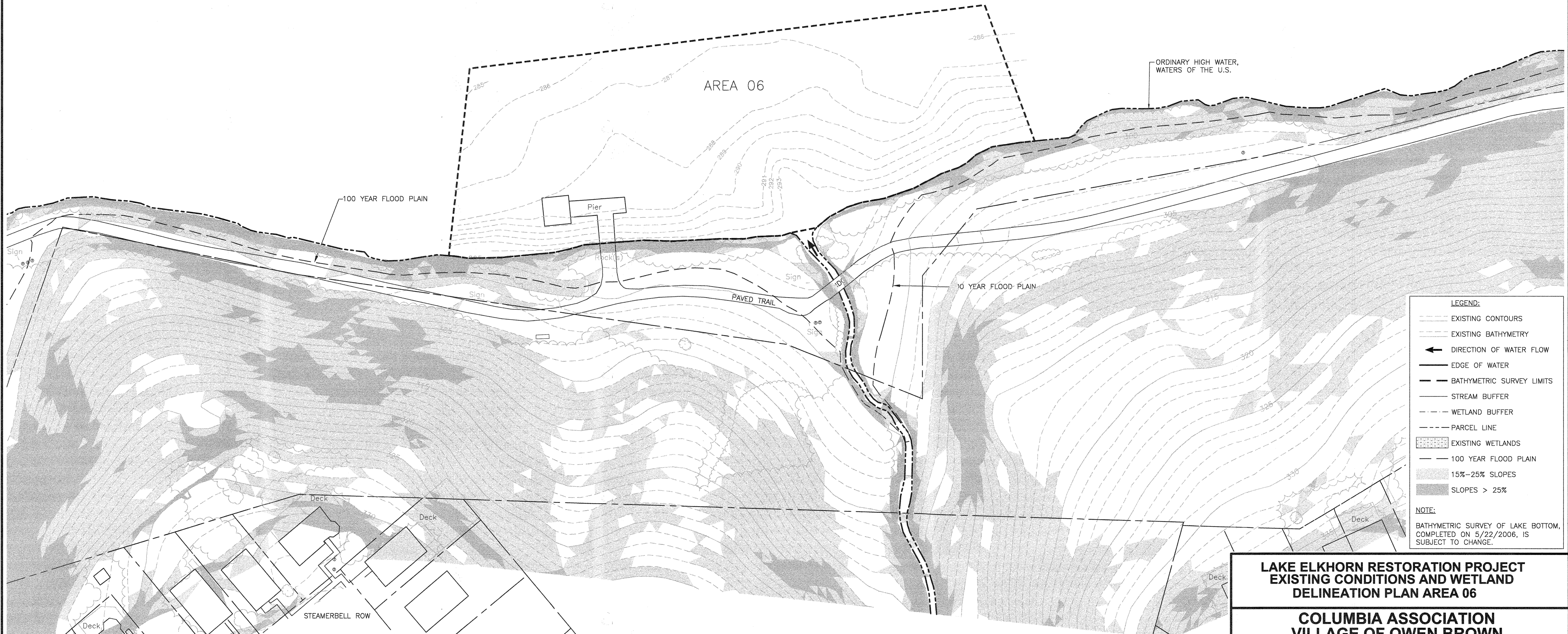
SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING B-05, SHEET 7 OF 29
SDP-08-107

BY	NO	REVISIONS	DATE
JA	△	REVISED SDP TO ADD SHEETS 30-39	1/29/2020
JA	⊠	REVISED SDP SHEETS 30-39 APPROVED BY HSCD EP-19-031	1/29/2020



LAKE ELKHORN
 NORMAL POOL ELEVATION
 294.0'



APPROVED: DEPARTMENT OF PLANNING AND ZONING

<i>Chad Edwards</i>	6-9-9
Chief, Development Engineering Division	Date
<i>Cinda Hamt</i>	7/2/07
Chief, Division of Land Development	Date
<i>Mech L. Leight</i>	7/2/09
Director	Date

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

V. P. Dalal
 Visty P. Dalal
 Regulatory & Compliance Engineer

4/13/07

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
 PIETER DAHMEN, PE
 HDR ENGINEERING INC.

Professional Engineer Seal: State of Maryland, No. 29887, Registered Professional Engineer, March 31, 2009

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

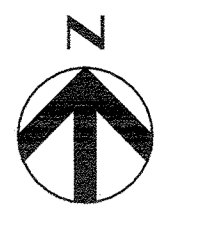
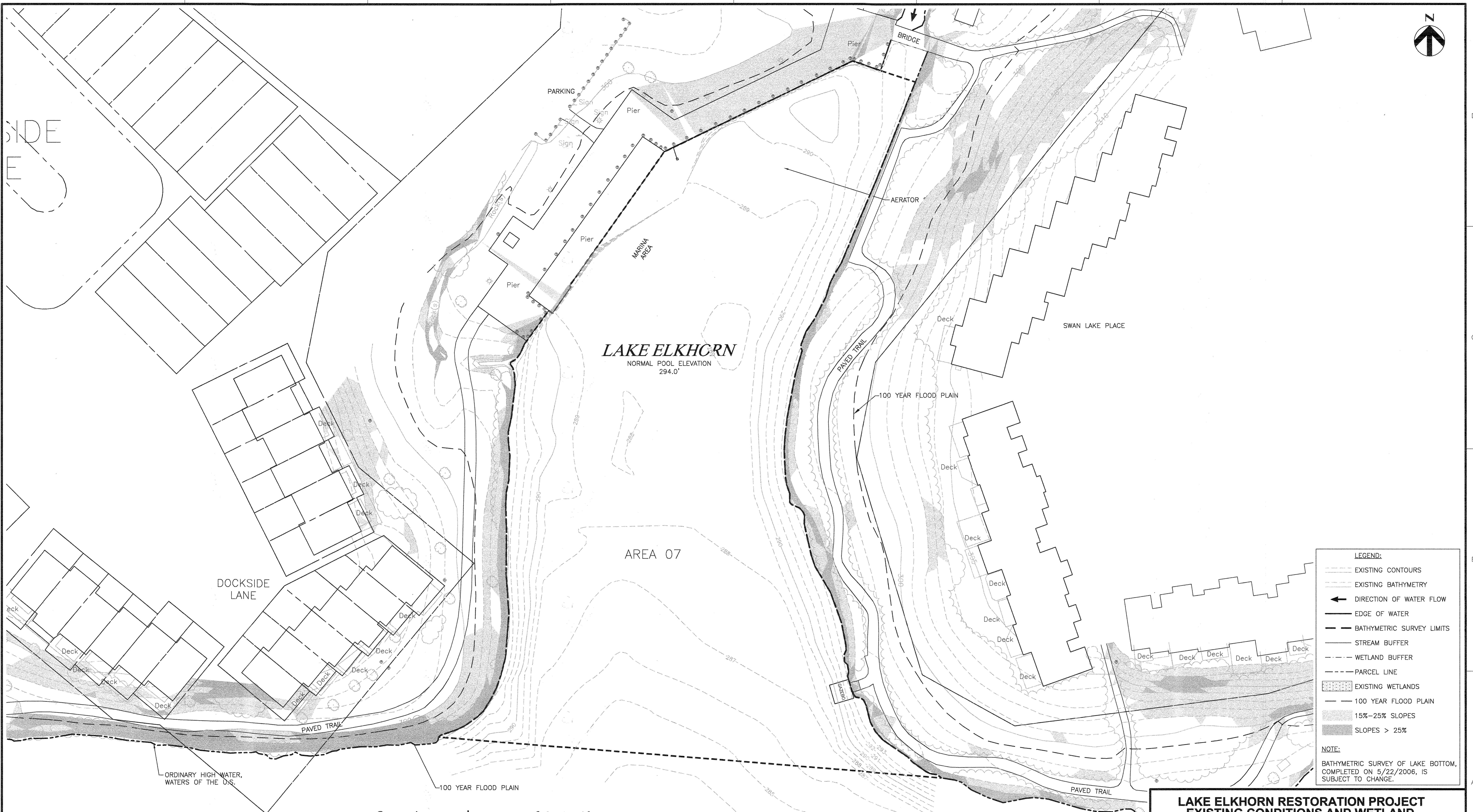
**LAKE ELKHORN RESTORATION PROJECT
 EXISTING CONDITIONS AND WETLAND
 DELINEATION PLAN AREA 06**

**COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280**

MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

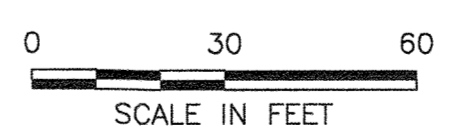
SCALE AS SHOWN
 FEBRUARY 6, 2009

DRAWING B-06, SHEET 8 OF 29
 SDP-08-107



- LEGEND:**
- - - - - EXISTING CONTOURS
 - - - - - EXISTING BATHYMETRY
 - ← DIRECTION OF WATER FLOW
 - EDGE OF WATER
 - - - - - BATHYMETRIC SURVEY LIMITS
 - STREAM BUFFER
 - - - - - WETLAND BUFFER
 - - - - - PARCEL LINE
 - [Hatched Box] EXISTING WETLANDS
 - - - - - 100 YEAR FLOOD PLAIN
 - [Light Gray Box] 15%-25% SLOPES
 - [Dark Gray Box] SLOPES > 25%
- NOTE:**
 BATHYMETRIC SURVEY OF LAKE BOTTOM, COMPLETED ON 5/22/2006, IS SUBJECT TO CHANGE.

BY	NO	REVISIONS	DATE
JA	Δ	REVISED SDP TO ADD SHEETS 30-39	1/29/2020
JA	Δ	REVISED SDP SHEETS 30-39 APPROVED BY HSCD ER-19-031	1/29/2020



APPROVED: DEPARTMENT OF PLANNING AND ZONING

Paul Edwards
 Chief, Development Engineering Division
 Date: 6.9.9

Cinda Hamstra
 Chief, Division of Land Development
 Date: 7/2/09

Frank P. Leffel
 Director
 Date: 7/3/09

Maryland Department of the Environment
 Water Management Administration
 Dam Safety Division
V.P. Datal
 Visty P. Datal
 Regulatory & Compliance Engineer
 Date: 4/13/09

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.
 March 31, 2009

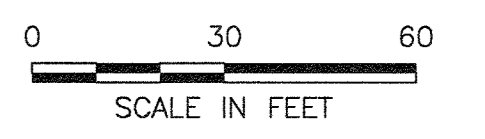
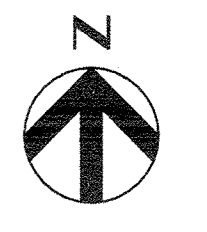
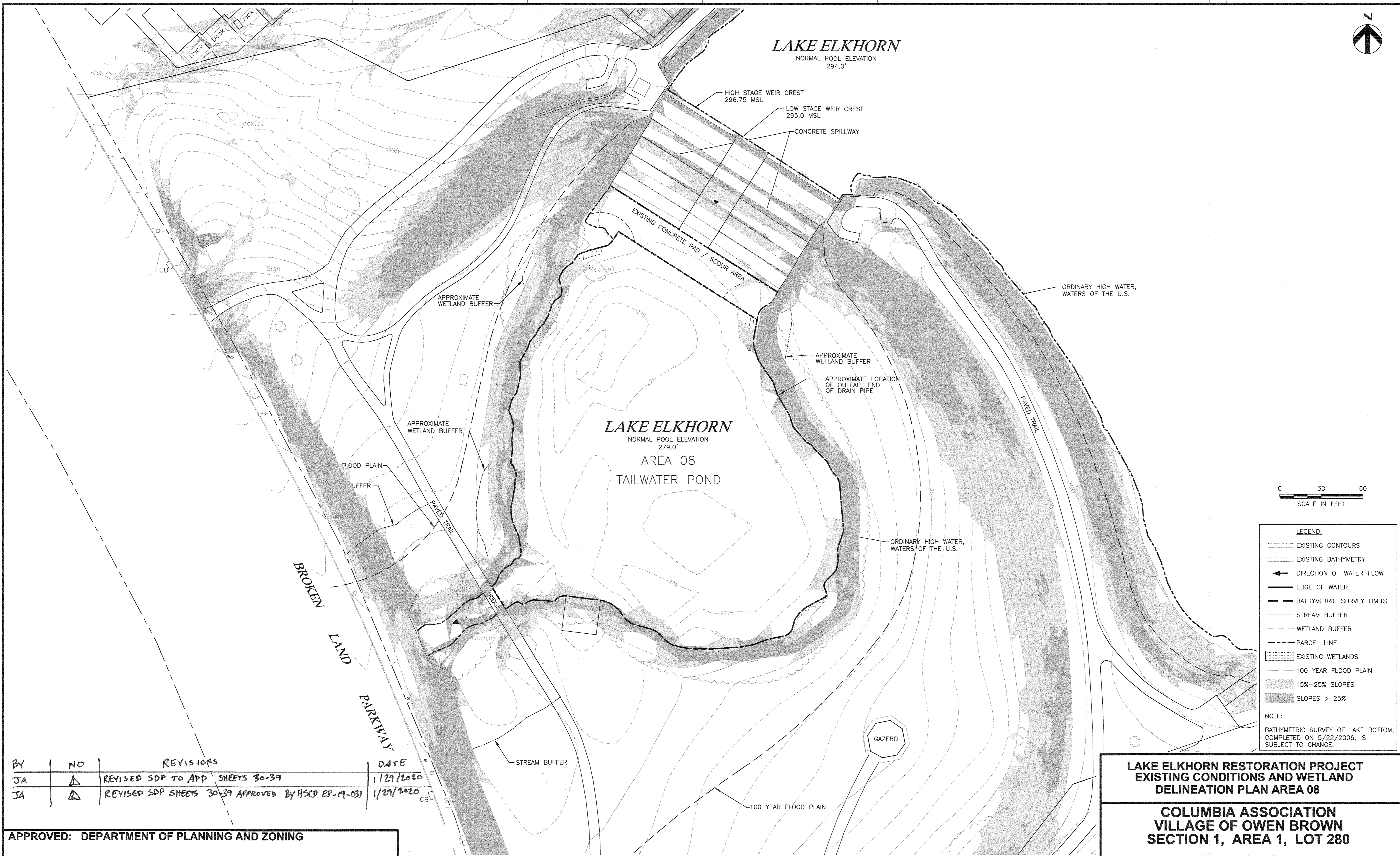


COLUMBIA ASSOCIATION
 10221 WINCOPIN CIRCLE #100
 COLUMBIA, MD 21044
 (410)-381-2947

LAKE ELKHORN RESTORATION PROJECT
EXISTING CONDITIONS AND WETLAND
DELINEATION PLAN AREA 07

COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280

MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42
 SCALE AS SHOWN
 FEBRUARY 6, 2009
 DRAWING B-07, SHEET 9 OF 29
 SDP-08-107



LEGEND:

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

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

BY	NO	REVISIONS	DATE
JA	1	REVISED SDP TO ADD SHEETS 30-39	1/29/2020
JA	2	REVISED SDP SHEETS 30-39 APPROVED BY HSCD EP-19-031	1/29/2020

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chel Almondson
Chief, Development Engineering Division
Date: 6.9.9

Cindy Hammett
Chief, Division of Land Development
Date: 7/2/09

Mark H. Leight
Director
Date: 7/2/09

Maryland Department of the Environment
Water Management Administration
Dam Safety Division

V.P. Dalal
Visty P. Dalal
Regulatory & Compliance Engineer
Date: 4/13/09

THIS PLAN SET HAS BEEN PREPARED BY:

HDR
HDR Engineering, Inc.
5700 LAKE WRIGHT DRIVE
SUITE 300
NORFOLK, VIRGINIA 23502
757-622-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

Pieter Dahmen
PIETER DAHMEN, PE
HDR ENGINEERING INC.
Date: March 31, 2009

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

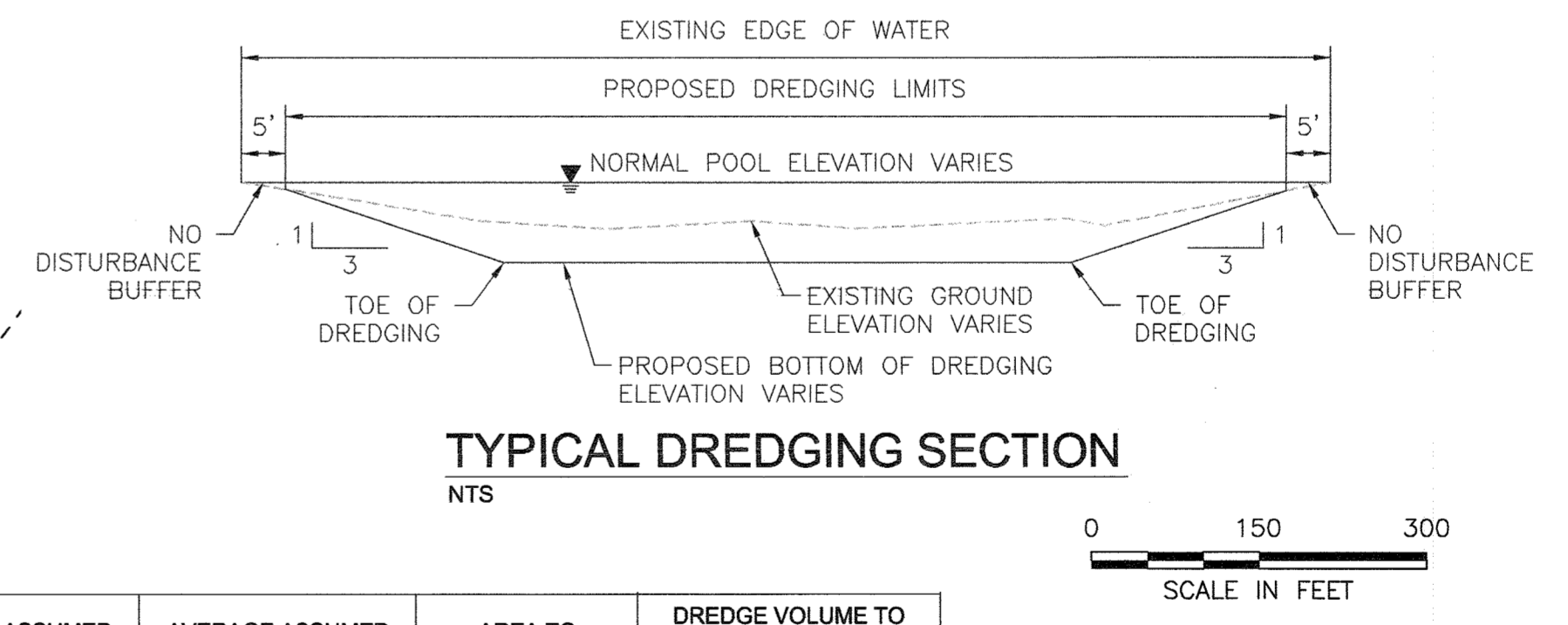
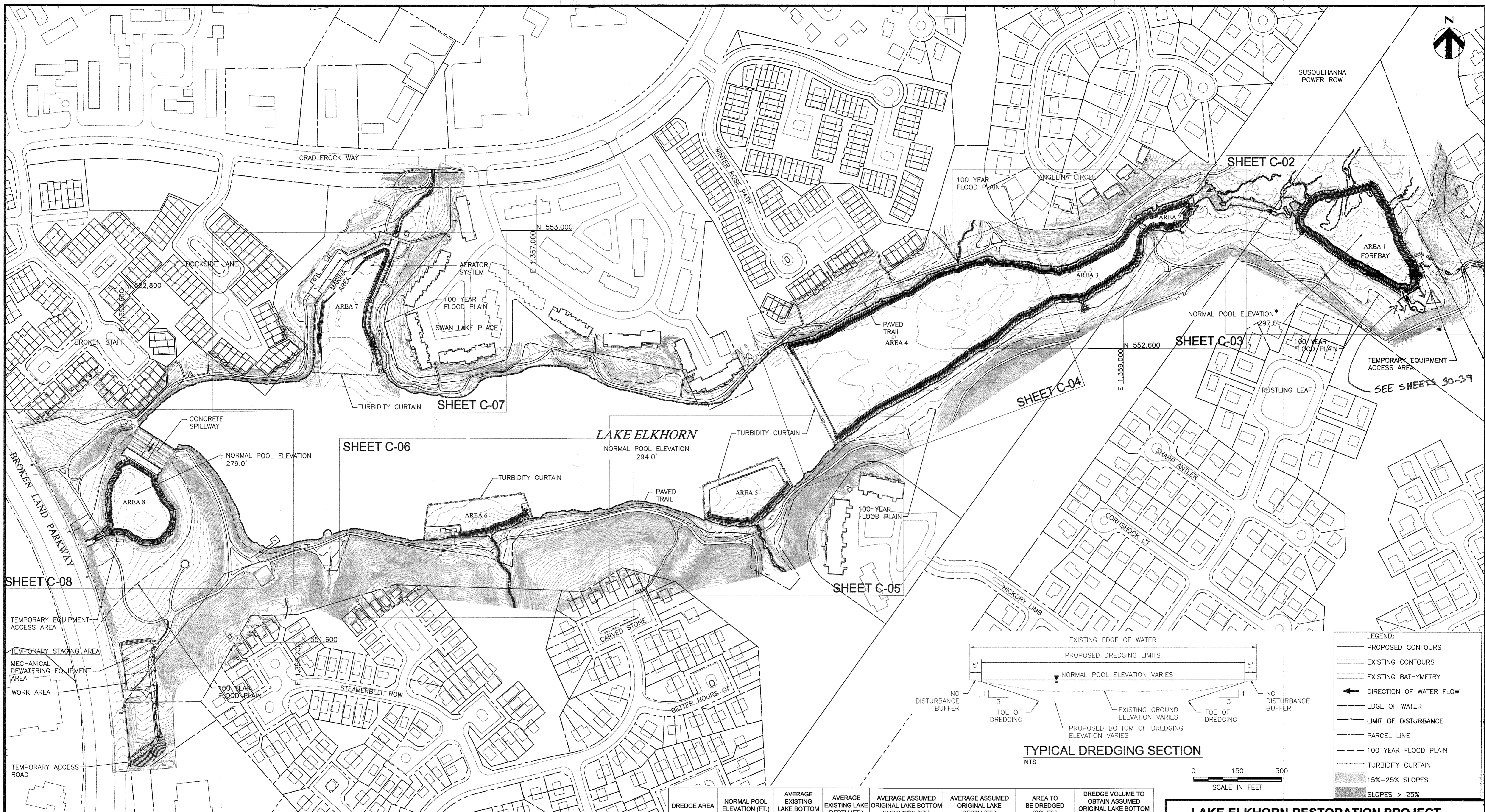
LAKE ELKHORN RESTORATION PROJECT
EXISTING CONDITIONS AND WETLAND DELINEATION PLAN AREA 08

COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280

MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING B-08, SHEET 10 OF 28
SDP-08-107



LEGEND:

- PROPOSED CONTOURS
- EXISTING CONTOURS
- EXISTING BATHYMETRY
- ← DIRECTION OF WATER FLOW
- EDGE OF WATER
- LIMIT OF DISTURBANCE
- PARCEL LINE
- 100 YEAR FLOOD PLAIN
- TURBIDITY CURTAIN
- 15% - 25% SLOPES
- SLOPES > 25%

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	297.0*	295.5	1.5	290.0	7.0	85,199	14,472
AREA 02	294.0	292.2	1.8	287.0	7.0	11,992	1,031**
AREA 03	294.0	292.2	1.8	287.0	7.0	71,305	8,823
AREA 04	294.0	290.0	4.0	287.0	7.0	230,034	20,160
AREA 05	294.0	290.1	3.9	287.0	7.0	45,906	2,844
AREA 06	294.0	289.2	4.8	287.0	7.0	23,568	1,041
AREA 07	294.0	289.3	4.7	287.0	7.0	53,930	2,778
AREA 08	279.0	278.6	2.4	275.0	4.0	44,503	1,990
						TOTAL	53,139

* = PRIOR TO BEAVER DAM BLOWOUT
 ** = DREDGE VOLUME BASED ON DREDGE ELEVATION OF 290.0'

BY	NO	REVISIONS	DATE
JA	1	REVISED SDP TO ADD SHEETS 30-39	1/29/2020
JA	2	REVISED SDP SHEETS 30-39 APPROVED BY HSCD EP-19-031	1/29/2020

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chad Egan
 Chief, Development Engineering Division
 Date: 2/9

Cindy Hamble
 Chief, Division of Land Development
 Date: 7/2/09

Mark P. Lough
 Director
 Date: 7/2/09

Maryland Department of the Environment
 Water Management Administration
 Dam Safety Division
V. P. Dalal
 Vistly P. Dalal
 Regulatory & Compliance Engineer
 Date: 4/13/09

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.
 March 31, 2009

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

**LAKE ELKHORN RESTORATION PROJECT
 PROPOSED SEDIMENT CONTROL AND
 DREDGING PLAN KEY**

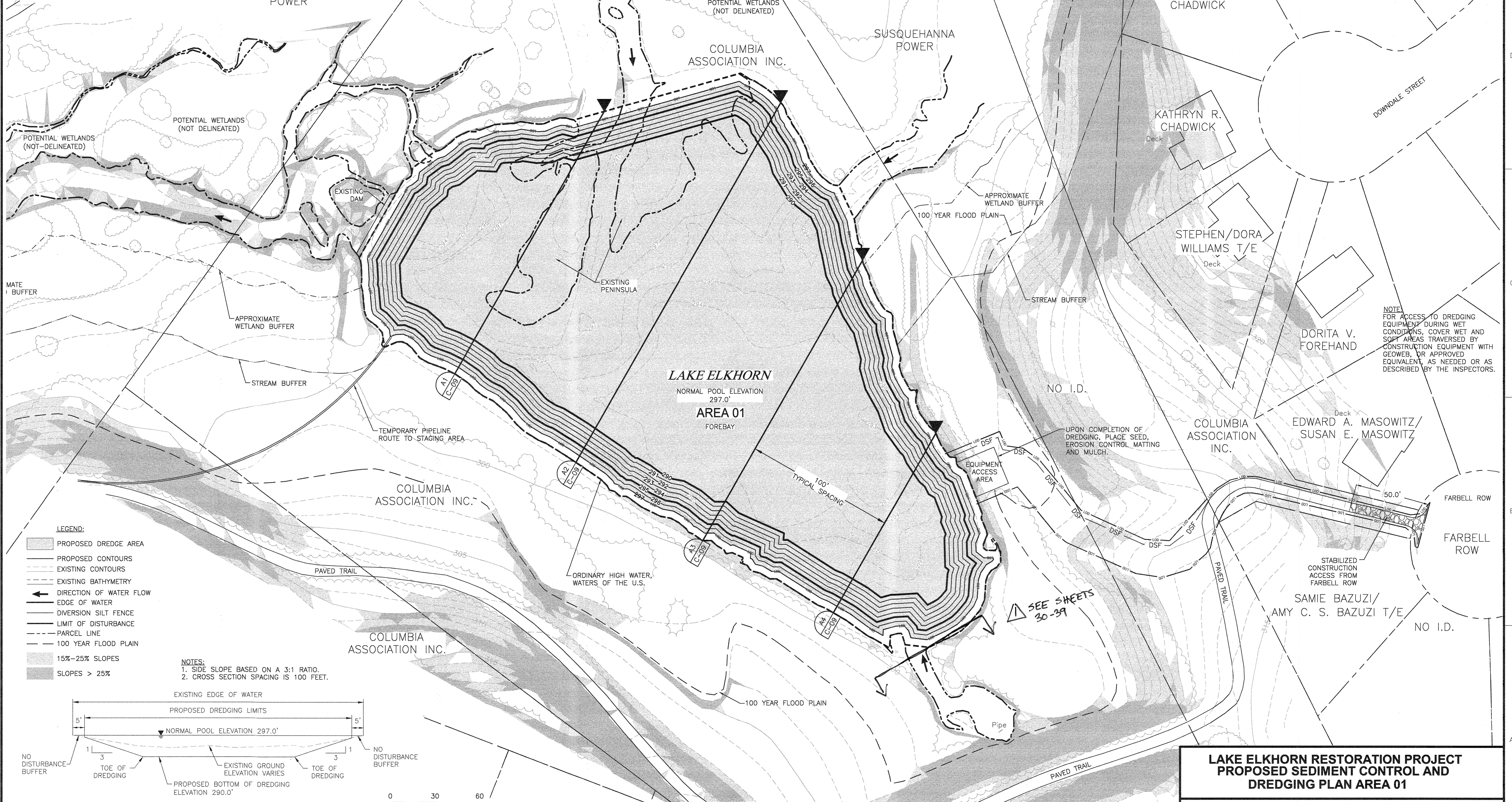
**COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280**

MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

SCALE AS SHOWN
 FEBRUARY 6, 2009

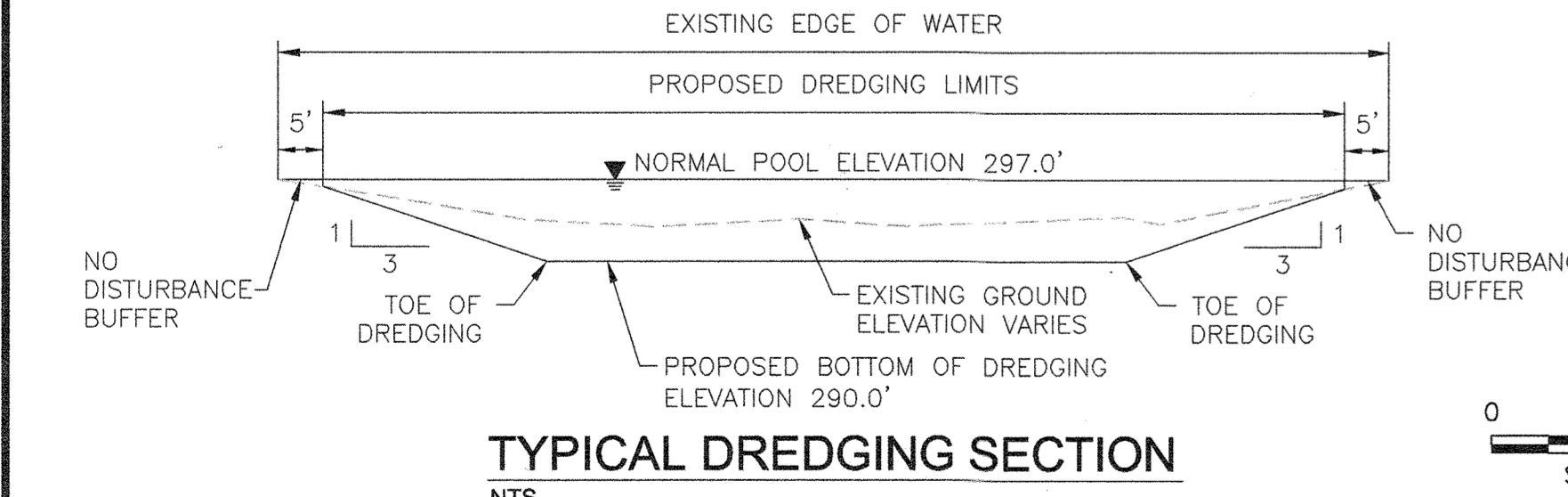
DRAWING C-01, SHEET 11 OF 29
 SDP-08-107

BY	NO	REVISIONS	DATE
JA	△	REVISED SDP TO ADD SHEETS 30-39	1/29/2020
JA	△	REVISED SDP SHEETS 30-39 APPROVED BY HSCD ER19-031 SUSQUEHANNA POWER	1/29/2020



- LEGEND:**
- PROPOSED DREDGE AREA
 - PROPOSED CONTOURS
 - EXISTING CONTOURS
 - EXISTING BATHYMETRY
 - DIRECTION OF WATER FLOW
 - EDGE OF WATER
 - DIVERSION SILT FENCE
 - 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.



APPROVED: DEPARTMENT OF PLANNING AND ZONING

David Edwards
 Chief, Development Engineering Division
 Date: 6-9-9

Carole Hamer
 Chief, Division of Land Development
 Date: 7/8/09

Harsh J. Gough
 Director
 Date: 7/5/09

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

V.P. Dalal
 Visty P. Dalal
 Regulatory & Compliance Engineer
 Date: 4/13/09

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.

March 31, 2009

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

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	297.0*	295.5	1.5	290.0	7.0	85,199	14,472

* = PRIOR TO BEAVER DAM BLOWOUT

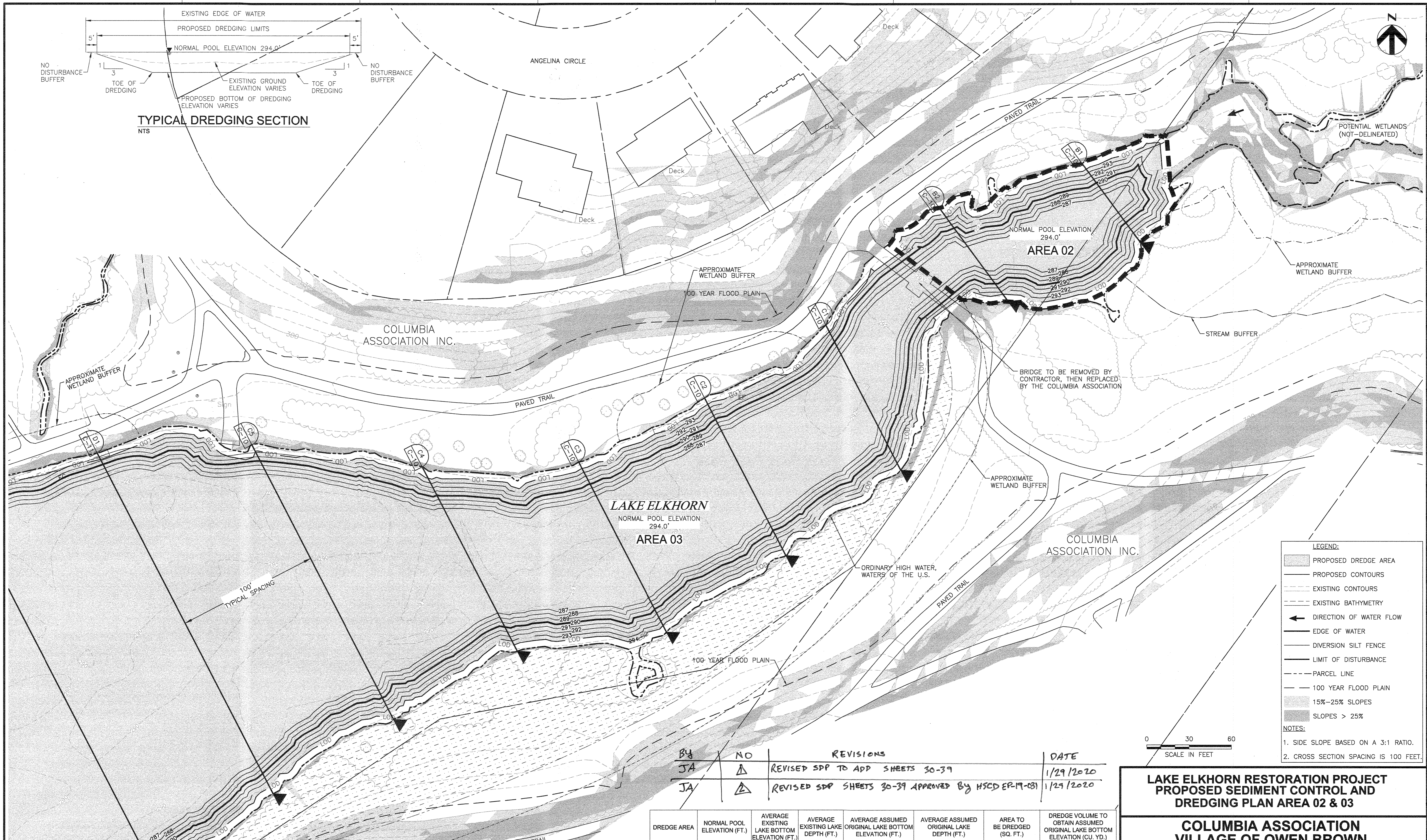
**LAKE ELKHORN RESTORATION PROJECT
 PROPOSED SEDIMENT CONTROL AND
 DREDGING PLAN AREA 01**

**COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280**

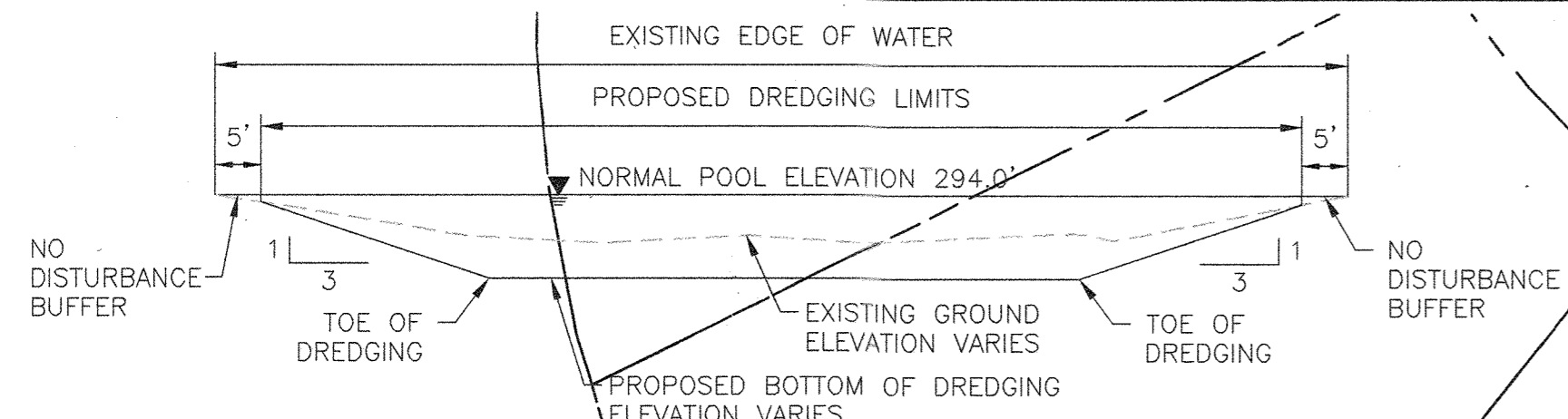
MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

SCALE AS SHOWN
 FEBRUARY 6, 2009

DRAWING C-02, SHEET 12 OF 29
 SDP-08-107



TYPICAL DREDGING SECTION
NTS



LEGEND:

- PROPOSED DREDGE AREA
- PROPOSED CONTOURS
- EXISTING CONTOURS
- EXISTING BATHYMETRY
- DIRECTION OF WATER FLOW
- EDGE OF WATER
- DIVERSION SILT FENCE
- 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.

BY	NO	REVISIONS	DATE
JA	Δ	REVISED SDP TO ADD SHEETS 30-39	1/29/2020
JA	Δ	REVISED SDP SHEETS 30-39 APPROVED BY HSCD ER-19-031	1/29/2020

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	294.0	292.2	1.8	287.0	7.0	11,992	1,031**
AREA 03	294.0	292.2	1.8	287.0	7.0	71,305	8,823

** = DREDGE VOLUME BASED ON DREDGE ELEVATION OF 290.0'

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division
Date 6-9-9

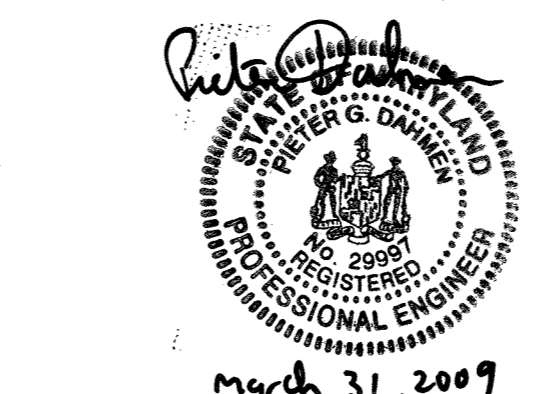
Chief, Division of Land Development
Date 7/2/09

Director
Date 7/5/05

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V. P. Dalal
Visty P. Dalal
Regulatory & Compliance Engineer
Date 4/13/09

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.



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

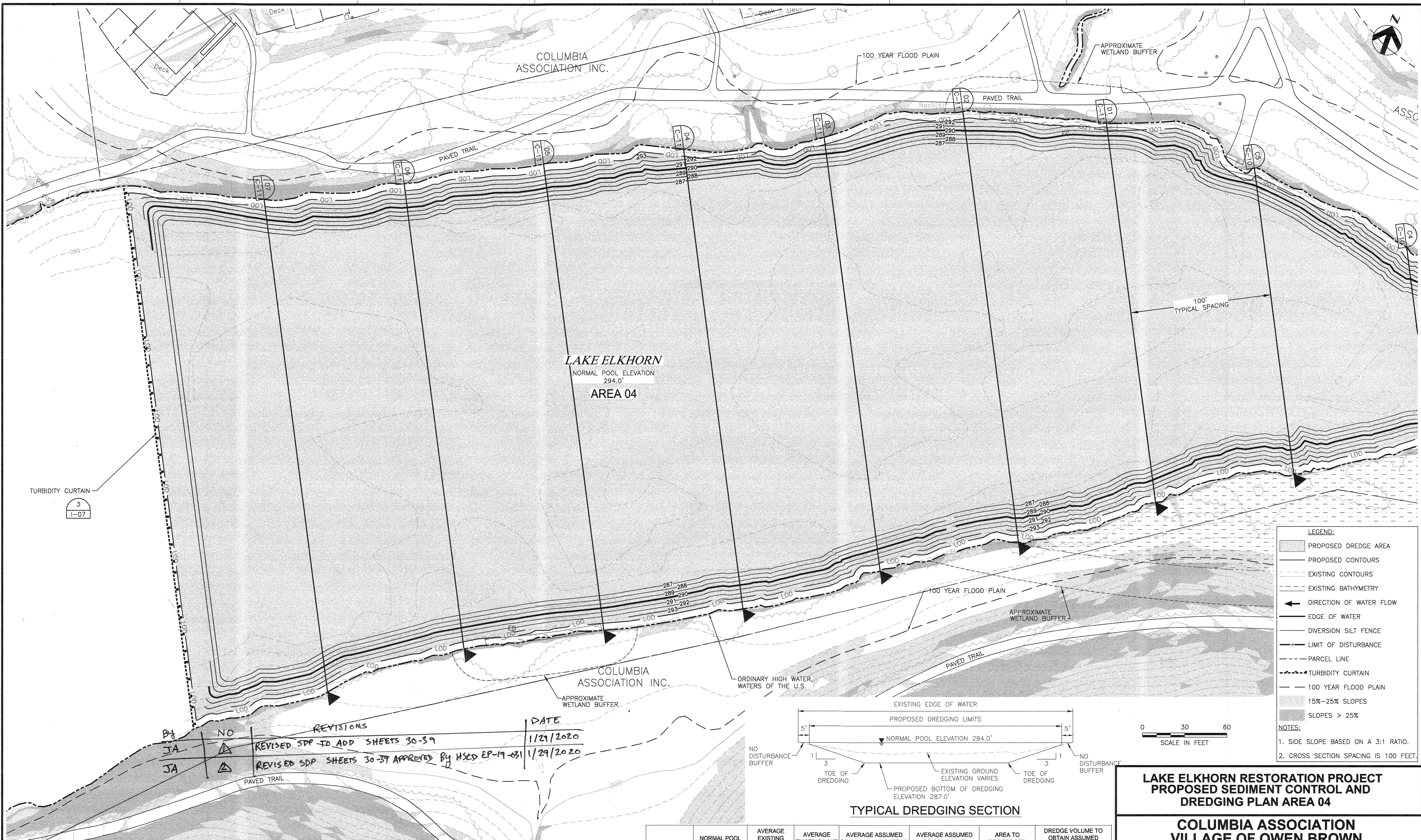
**LAKE ELKHORN RESTORATION PROJECT
PROPOSED SEDIMENT CONTROL AND
DREDGING PLAN AREA 02 & 03**

**COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280**

MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING C-03, SHEET 13 OF 25
SDP-08-107

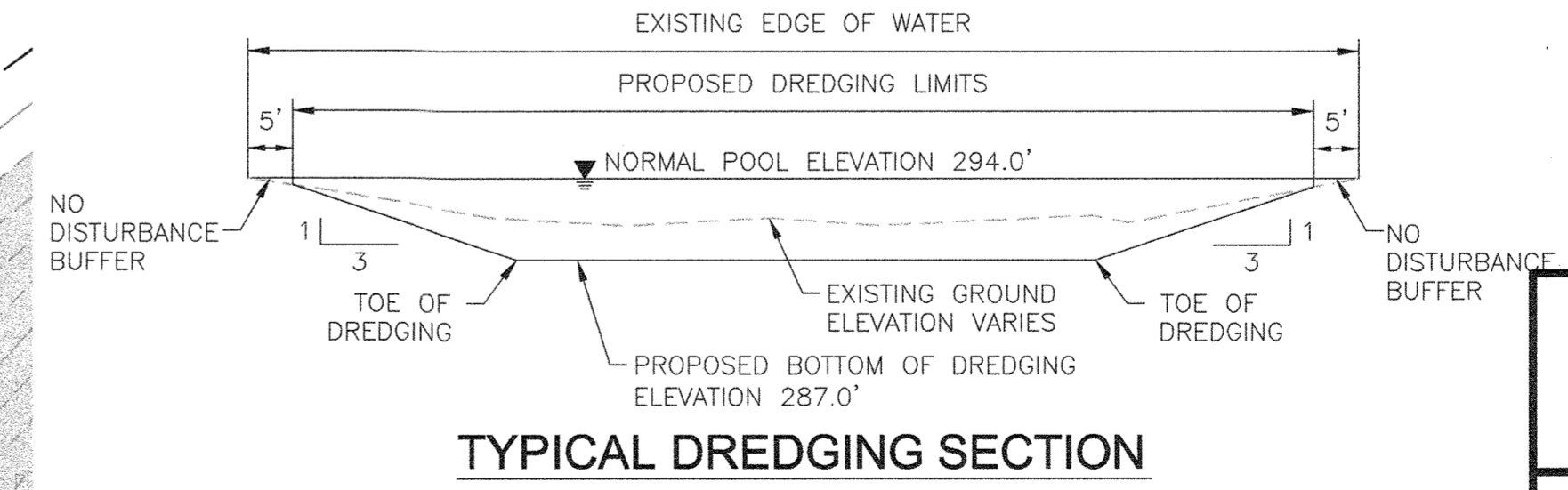


LEGEND:

- PROPOSED DREDGE AREA
- PROPOSED CONTOURS
- EXISTING CONTOURS
- EXISTING BATHYMETRY
- DIRECTION OF WATER FLOW
- EDGE OF WATER
- DIVERSION SILT FENCE
- LIMIT OF DISTURBANCE
- PARCEL LINE
- TURBIDITY CURTAIN
- 100 YEAR FLOOD PLAIN
- 15%-25% SLOPES
- SLOPES > 25%

NOTES:

- SIDE SLOPE BASED ON A 3:1 RATIO.
- 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 04	294.0	290.0	4.0	287.0	7.0	230,034	20,160

REVISIONS

BY	NO	REVISIONS	DATE
JA	1	REVISED SDP TO ADD SHEETS 30-39	1/21/2020
JA	2	REVISED SDP SHEETS 30-39 APPROVED BY HSED EP-19-031	1/29/2020

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Paul Edwards
Chief, Development Engineering Division
Date: 6-9-9

Cindy Hamel
Chief, Division of Land Development
Date: 7/2/09

Mark J. Wright
Director
Date: 7/5/09

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

V. P. Dalal
Visty P. Dalal
Regulatory & Compliance Engineer
Date: 4/13/09

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.

March 31, 2009

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

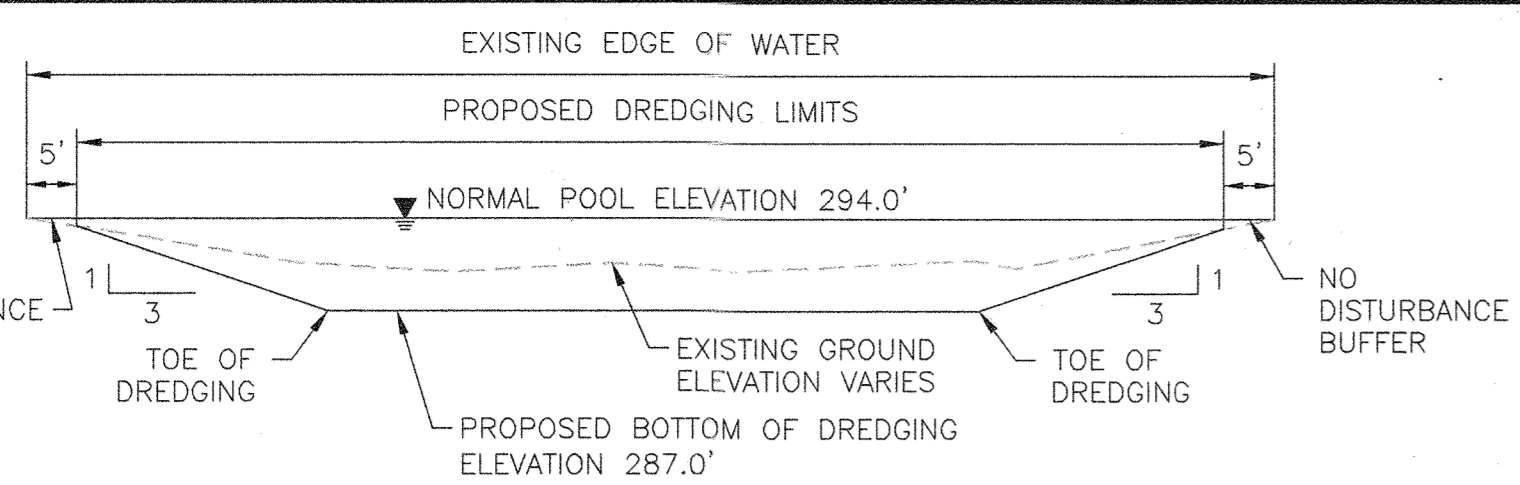
**LAKE ELKHORN RESTORATION PROJECT
PROPOSED SEDIMENT CONTROL AND
DREDGING PLAN AREA 04**

**COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280**

**MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42**

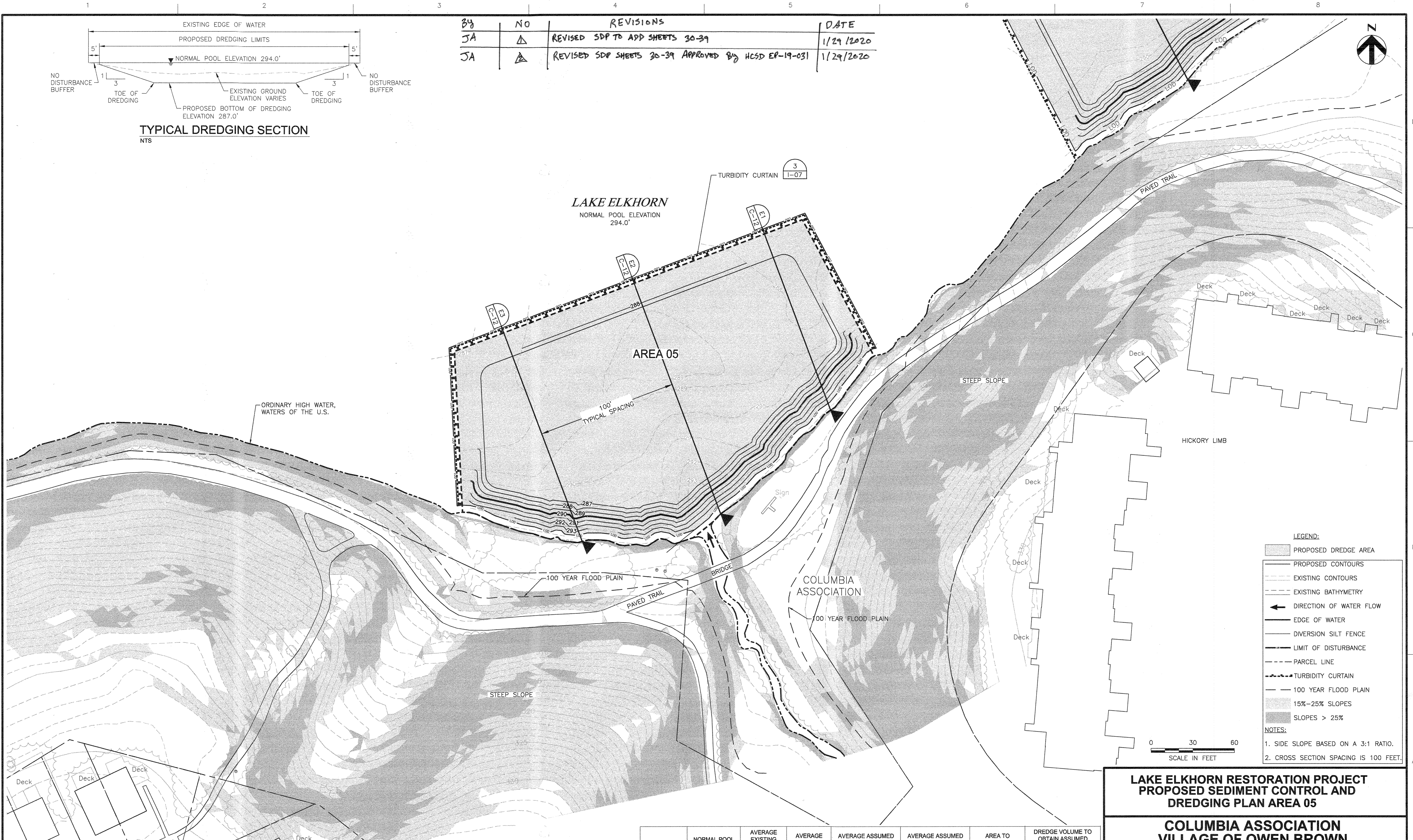
SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING C-04, SHEET 14 OF 29
SDP-08-107



TYPICAL DREDGING SECTION
NTS

By	NO	REVISIONS	DATE
JA	△	REVISED SDP TO ADD SHEETS 30-39	1/29/2020
JA	△	REVISED SDP SHEETS 30-39 APPROVED BY HCSD EP-19-031	1/29/2020



LEGEND:

- PROPOSED DREDGE AREA
- PROPOSED CONTOURS
- EXISTING CONTOURS
- EXISTING BATHYMETRY
- DIRECTION OF WATER FLOW
- EDGE OF WATER
- DIVERSION SILT FENCE
- LIMIT OF DISTURBANCE
- PARCEL LINE
- TURBIDITY CURTAIN
- 100 YEAR FLOOD PLAIN
- 15%-25% SLOPES
- SLOPES > 25%

NOTES:

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

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Paul Edwards
Chief, Development Engineering Division
Date: 6/9/09

Cindy Hamble
Chief, Division of Land Development
Date: 7/2/09

Wesley P. Laughton
Director
Date: 2/1/05

Maryland Department of the Environment
Water Management Administration
Dam Safety Division

V.P. Dalal
Visty P. Dalal
Regulatory & Compliance Engineer
Date: 4/13/09

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.

March 31, 2009

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

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 05	294.0	290.1	3.9	287.0	7.0	45,906	2,844

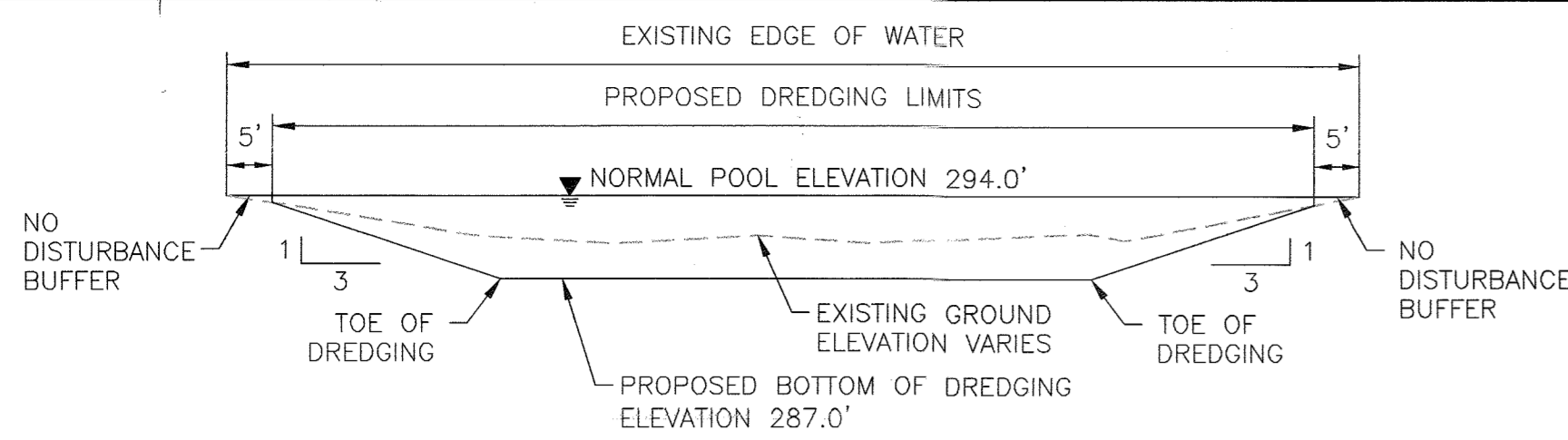
**LAKE ELKHORN RESTORATION PROJECT
PROPOSED SEDIMENT CONTROL AND
DREDGING PLAN AREA 05**

**COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280**

MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

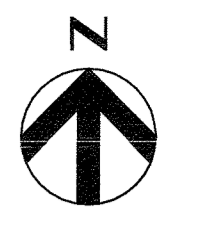
SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING C-05, SHEET 15 OF 29
SDP-08-107

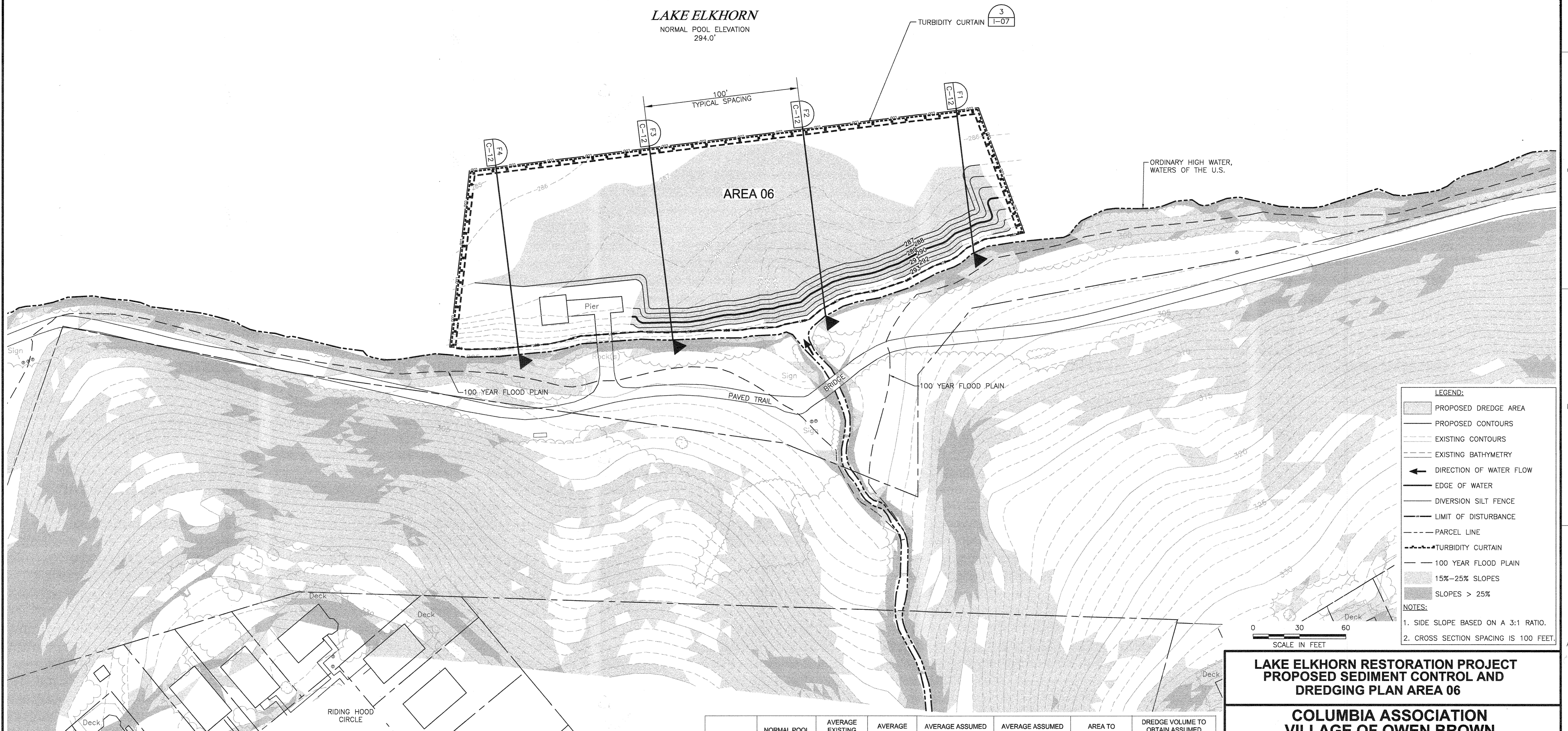


TYPICAL DREDGING SECTION
NTS

BY	NO	REVISIONS	DATE
JA	1	REVISED SDP TO ADD SHEETS 30-39	1/29/2020
JA	2	REVISED SDP SHEETS 30-39 APPROVED BY HSCP EP 19-031	1/29/2020



LAKE ELKHORN
NORMAL POOL ELEVATION
294.0'



LEGEND:

- PROPOSED DREDGE AREA
- PROPOSED CONTOURS
- EXISTING CONTOURS
- EXISTING BATHYMETRY
- DIRECTION OF WATER FLOW
- EDGE OF WATER
- DIVERSION SILT FENCE
- LIMIT OF DISTURBANCE
- PARCEL LINE
- TURBIDITY CURTAIN
- 100 YEAR FLOOD PLAN
- 15%-25% SLOPES
- SLOPES > 25%

NOTES:

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

**LAKE ELKHORN RESTORATION PROJECT
PROPOSED SEDIMENT CONTROL AND
DREDGING PLAN AREA 06**

**COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280**

**MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42**

SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING C-06, SHEET 16 OF 29

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 06	294.0	289.2	4.8	287.0	7.0	23,568	1,041

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chud Edwards
Chief, Development Engineering Division
Date: 6/9/09

Cindy Hammer
Chief, Division of Land Development
Date: 7/2/09

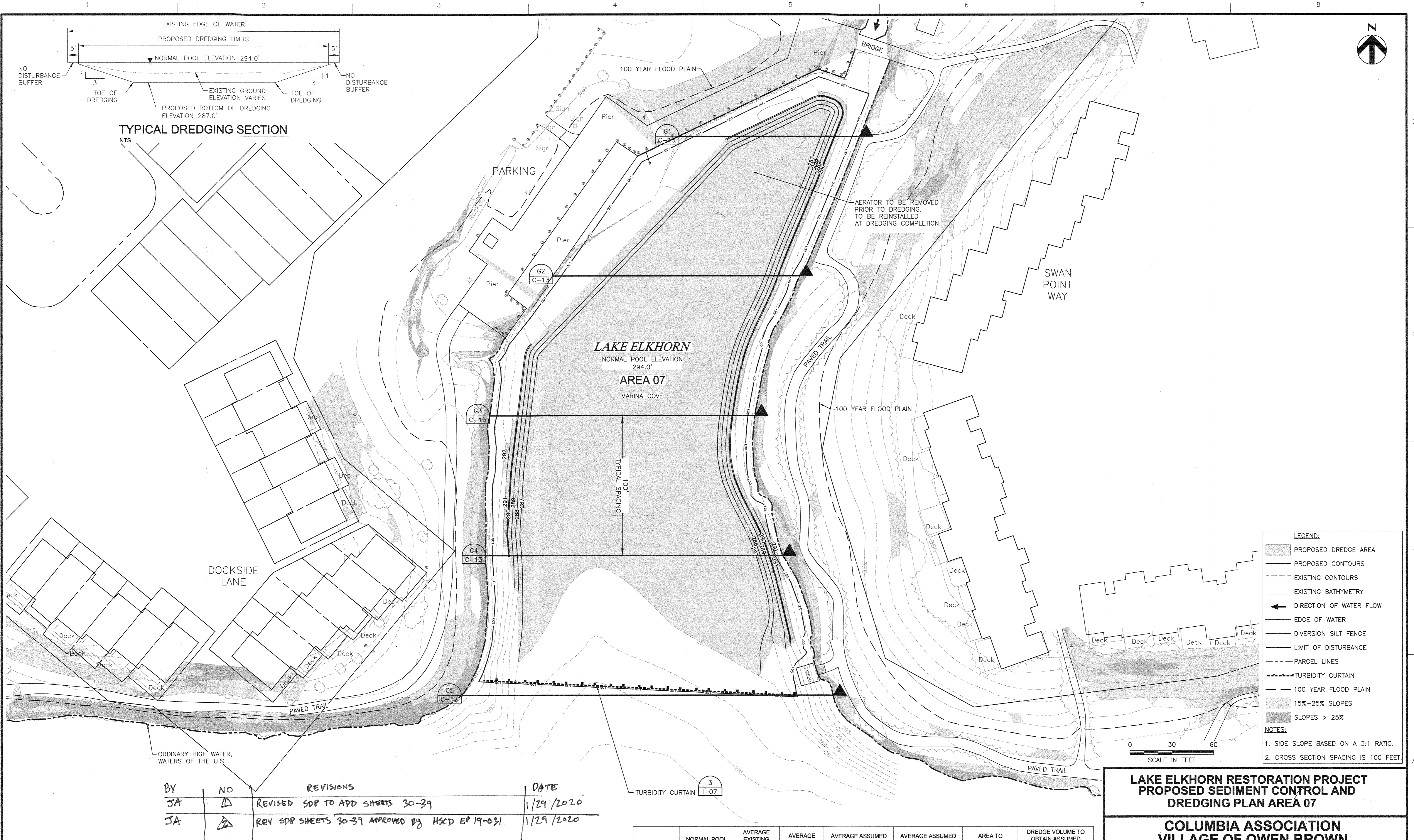
Barbara P. Leight
Director
Date: 7/7/09

MDE Maryland Department of the Environment
Water Management Administration
Dam Safety Division
V.P. Dalal
Visty P. Dalal
Regulatory & Compliance Engineer
Date: 4/13/09

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
PIETER DAHMEN, PE
HDR ENGINEERING INC.
March 31, 2009

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

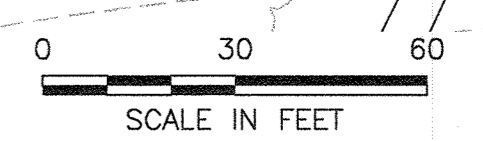


LEGEND:

- PROPOSED DREDGE AREA
- PROPOSED CONTOURS
- EXISTING CONTOURS
- EXISTING BATHYMETRY
- DIRECTION OF WATER FLOW
- EDGE OF WATER
- DIVERSION SILT FENCE
- LIMIT OF DISTURBANCE
- PARCEL LINES
- TURBIDITY CURTAIN
- 100 YEAR FLOOD PLAIN
- 15% - 25% SLOPES
- SLOPES > 25%

NOTES:

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



BY	NO	REVISIONS	DATE
JA	1	REVISED SDP TO ADD SHEETS 30-39	1/29/2020
JA	2	REV SDP SHEETS 30-39 APPROVED BY HSCD EP 19-031	1/29/2020

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 07	294.0	289.3	4.7	287.0	7.0	53,930	2,778

APPROVED: DEPARTMENT OF PLANNING AND ZONING

David Edmondson
Chief, Development Engineering Division
Date: 6-9-9

Cindy Hanner
Chief, Division of Land Development
Date: 7/2/09

Mark D. Lough
Director
Date: 7/5/09

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

V.P. Datal
Visty P. Datal
Regulatory & Compliance Engineer
Date: 4/13/09

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.

March 31, 2009

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

**LAKE ELKHORN RESTORATION PROJECT
PROPOSED SEDIMENT CONTROL AND
DREDGING PLAN AREA 07**

**COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280**

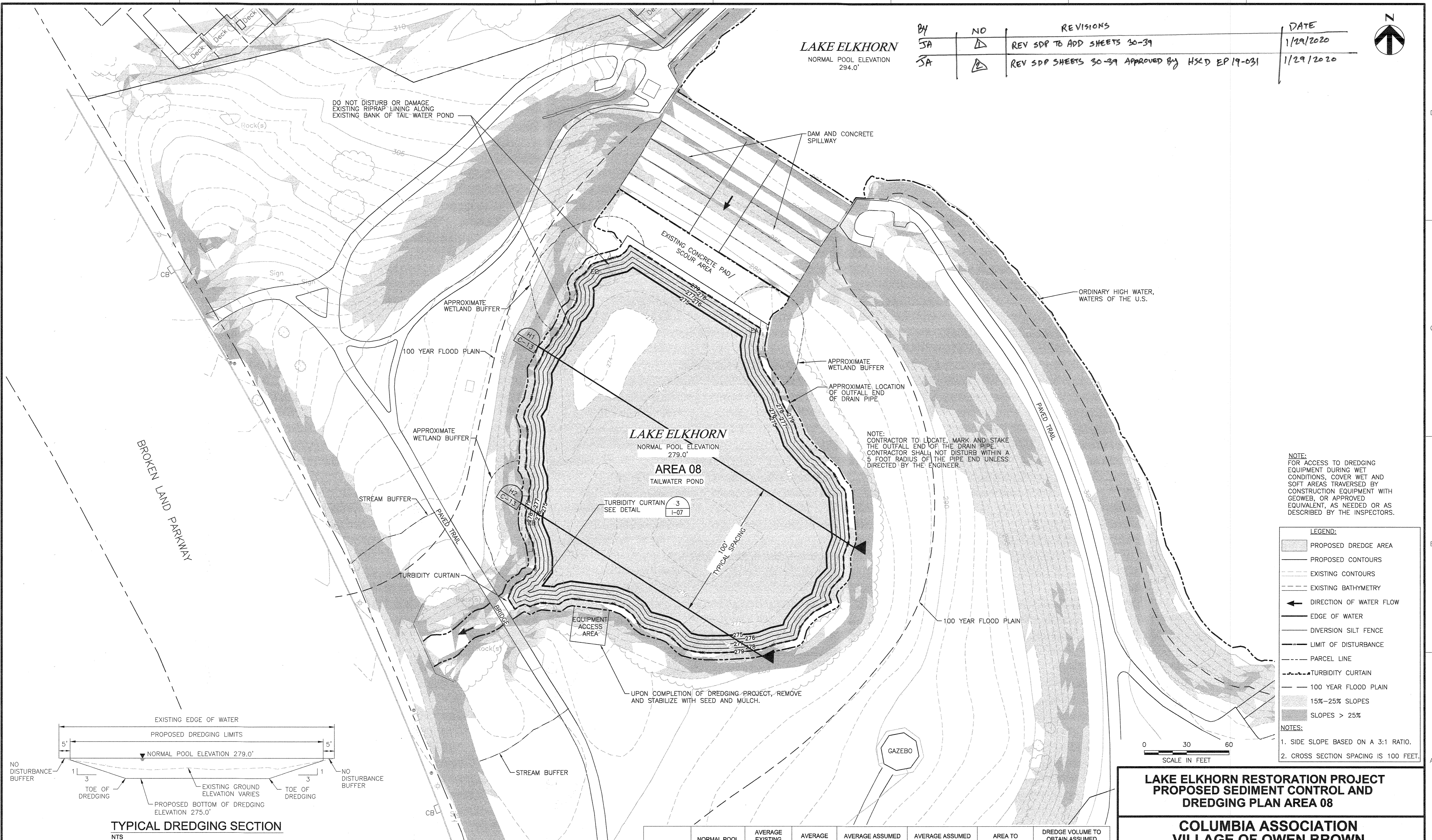
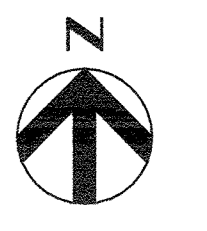
MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING C-07, SHEET 17 OF 29
SDP-08-107

LAKE ELKHORN
NORMAL POOL ELEVATION
294.0'

BY	NO	REVISIONS	DATE
SA	1	REV SDP TO ADD SHEETS 30-39	1/29/2020
SA	2	REV SDP SHEETS 30-39 APPROVED BY H&D EP 19-031	1/29/2020



NOTE:
CONTRACTOR TO LOCATE, MARK AND STAKE THE OUTFALL END OF THE DRAIN PIPE. CONTRACTOR SHALL NOT DISTURB WITHIN A 5' FOOT RADIUS OF THE PIPE END UNLESS DIRECTED BY THE ENGINEER.

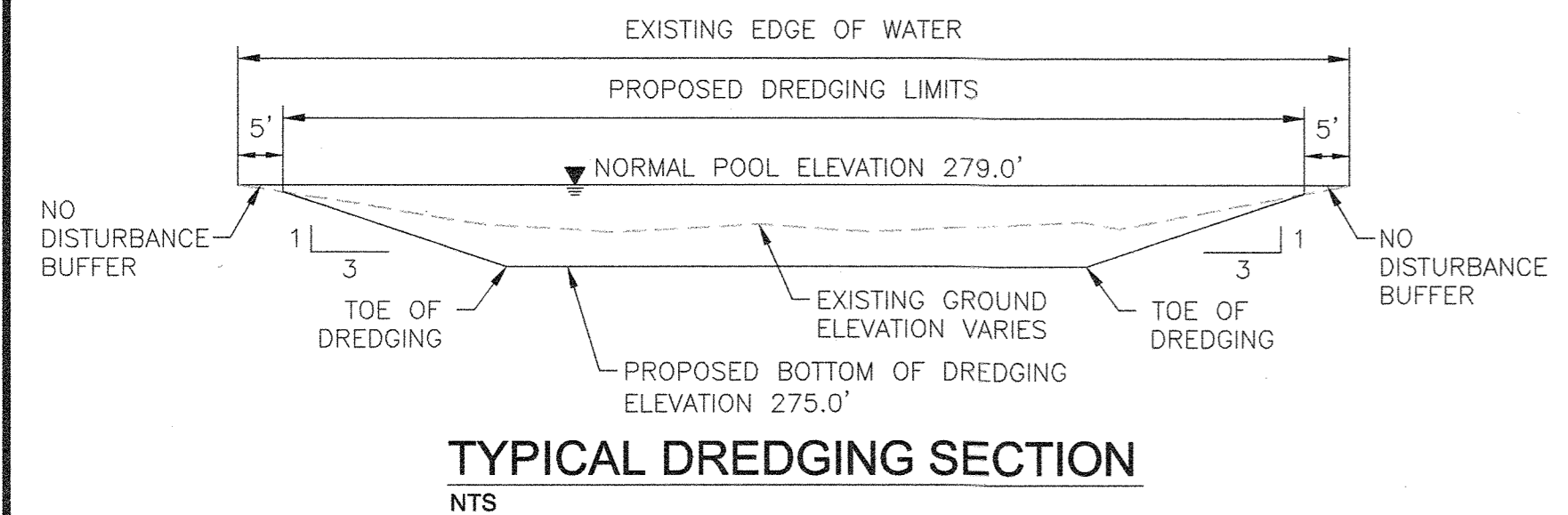
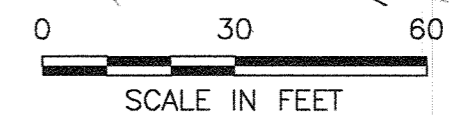
NOTE:
FOR ACCESS TO DREDGING EQUIPMENT DURING WET CONDITIONS, COVER WET AND SOFT AREAS TRAVERSED BY CONSTRUCTION EQUIPMENT WITH GEOWEB, OR APPROVED EQUIVALENT, AS NEEDED OR AS DESCRIBED BY THE INSPECTORS.

LEGEND:

- PROPOSED DREDGE AREA
- PROPOSED CONTOURS
- EXISTING CONTOURS
- EXISTING BATHYMETRY
- DIRECTION OF WATER FLOW
- EDGE OF WATER
- DIVERSION SILT FENCE
- LIMIT OF DISTURBANCE
- PARCEL LINE
- TURBIDITY CURTAIN
- 100 YEAR FLOOD PLAIN
- 15%-25% SLOPES
- SLOPES > 25%

NOTES:

- SIDE SLOPE BASED ON A 3:1 RATIO.
- 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 08	279.0	276.6	2.4	275.0	4.0	44,503	1,990

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chad Edwards
Chief, Development Engineering Division
Date: 6/9/19

Carolee Harwitz
Chief, Division of Land Development
Date: 7/8/19

Marsha M. Leighton
Director
Date: 7/8/19

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

V.P. Dalal
Visty P. Dalal
Regulatory & Compliance Engineer
Date: 4/13/19

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.

March 31, 2019

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

**LAKE ELKHORN RESTORATION PROJECT
PROPOSED SEDIMENT CONTROL AND
DREDGING PLAN AREA 08**

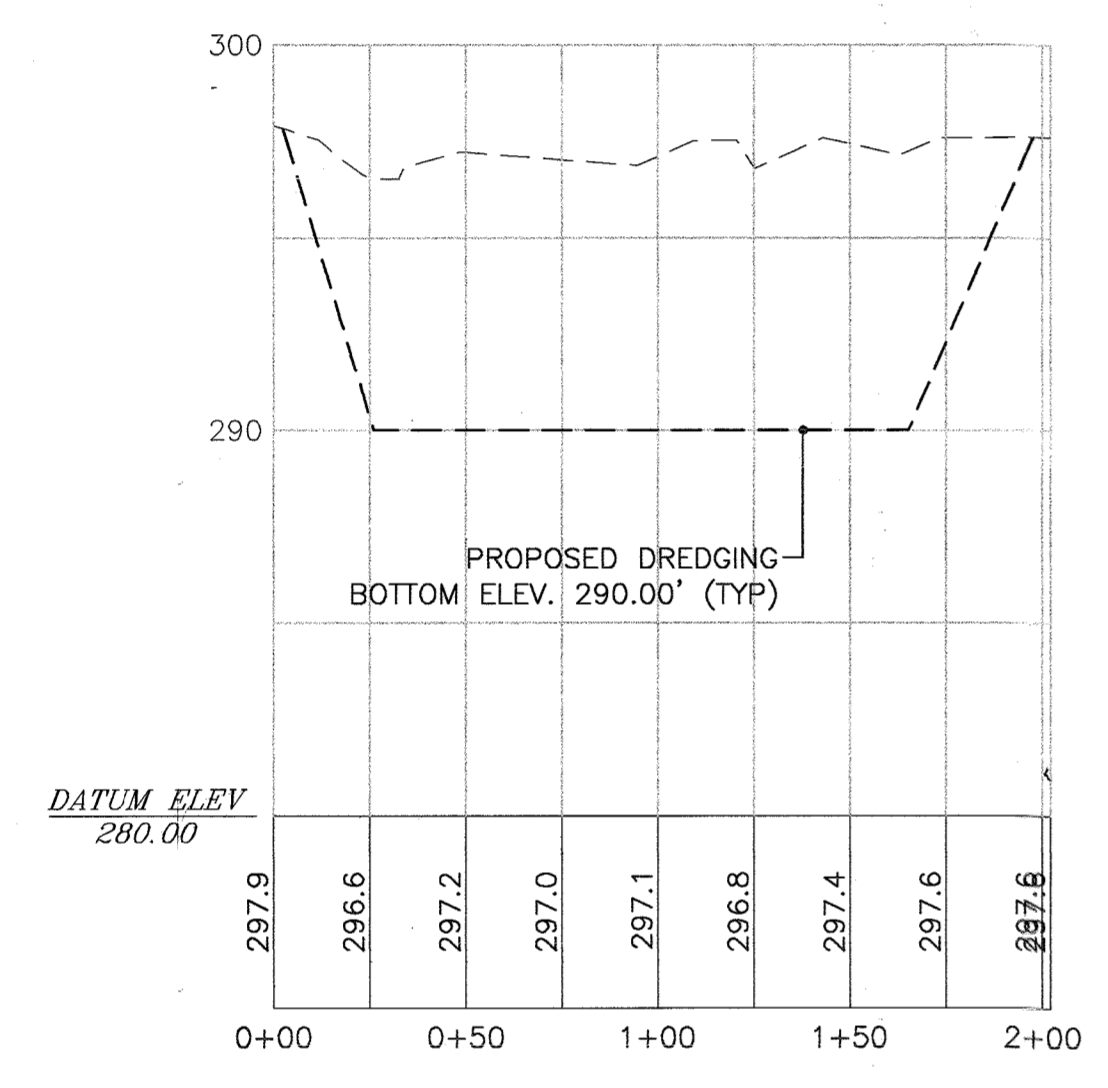
**COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280**

**MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42**

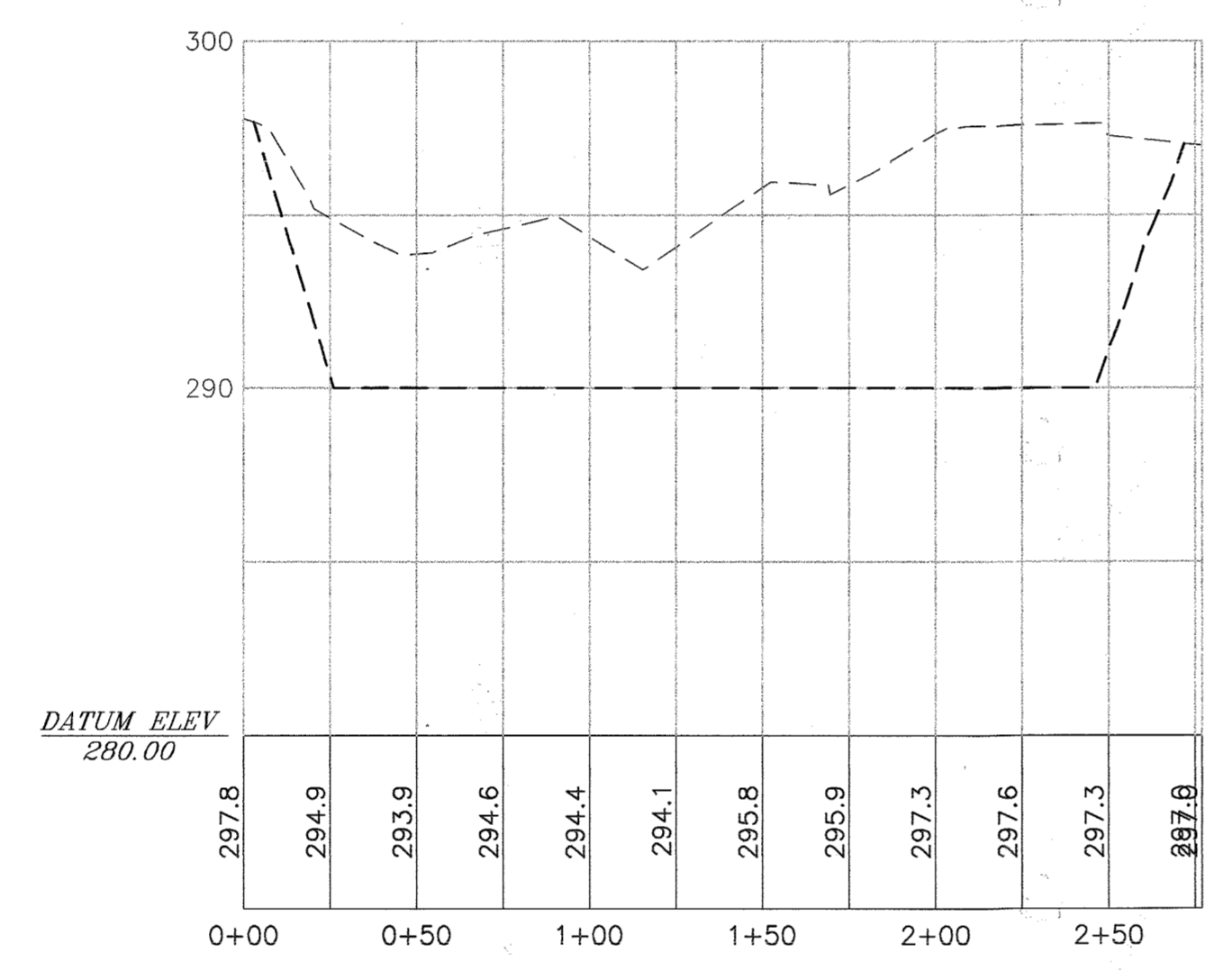
SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING C-08, SHEET 18 OF 29
SDP-08-107

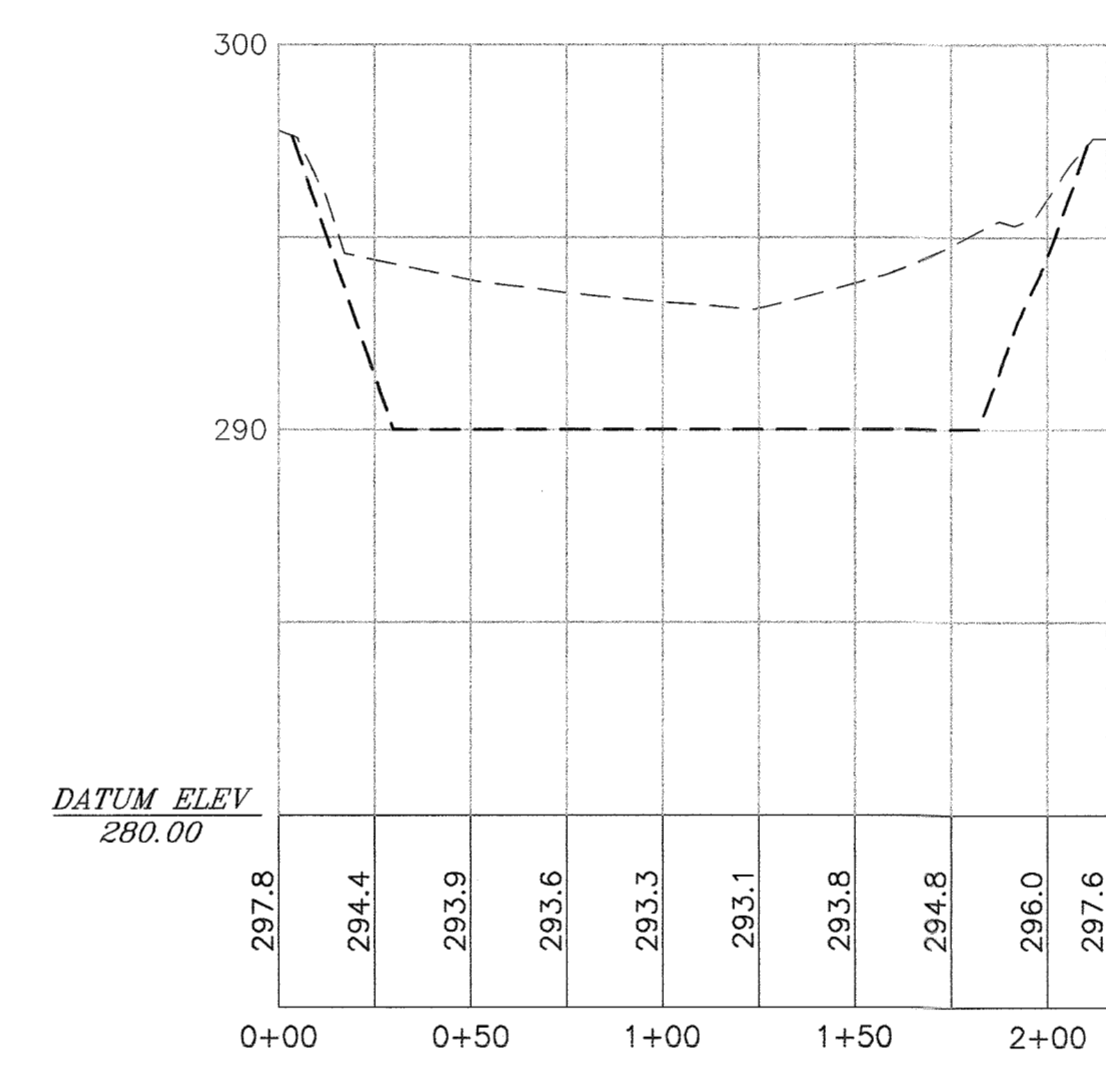
BY	NO	REVISIONS	DATE
JA	Δ	REV SDP TO ADD SH. 30-39	1/29/2020
JA	Δ	REV SDP SHEETS 30-39 APPROVED BY HSCD EP 17-031	1/29/2020



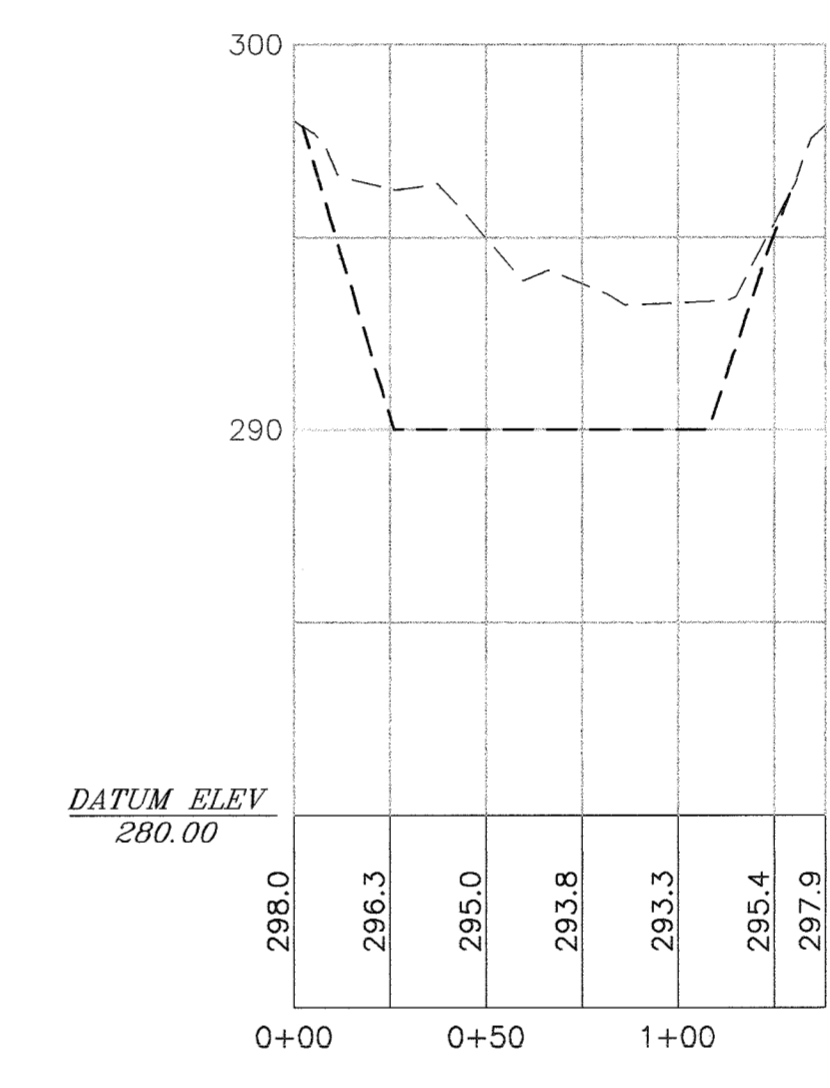
CROSS-SECTION A1 A1
C-02



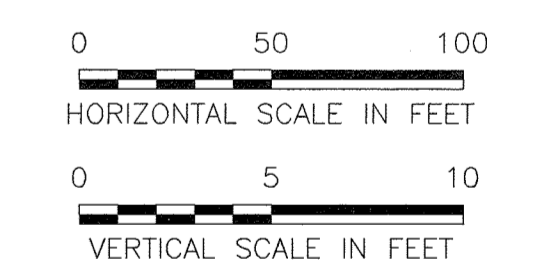
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C-02



CROSS-SECTION A3 A3
C-02



CROSS-SECTION A4 A4
C-02



LEGEND:

---	EXISTING BATHYMETRY
---	PROPOSED BATHYMETRY

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chad Edmond 6.9.9
Chief, Development Engineering Division Date

Cheryl Hamstra 7/2/09
Chief, Division of Land Development Date

Mark L. Coyle 7/2/09
Director Date

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

V. P. Dalal 4/13/09
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
781-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

Pieter Dahmen
PIETER DAHMEN, PE
HDR ENGINEERING INC.

Professional Engineer Seal
March 31, 2009

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

**LAKE ELKHORN RESTORATION PROJECT
AREA 01
CROSS-SECTIONS**

**COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280**

MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

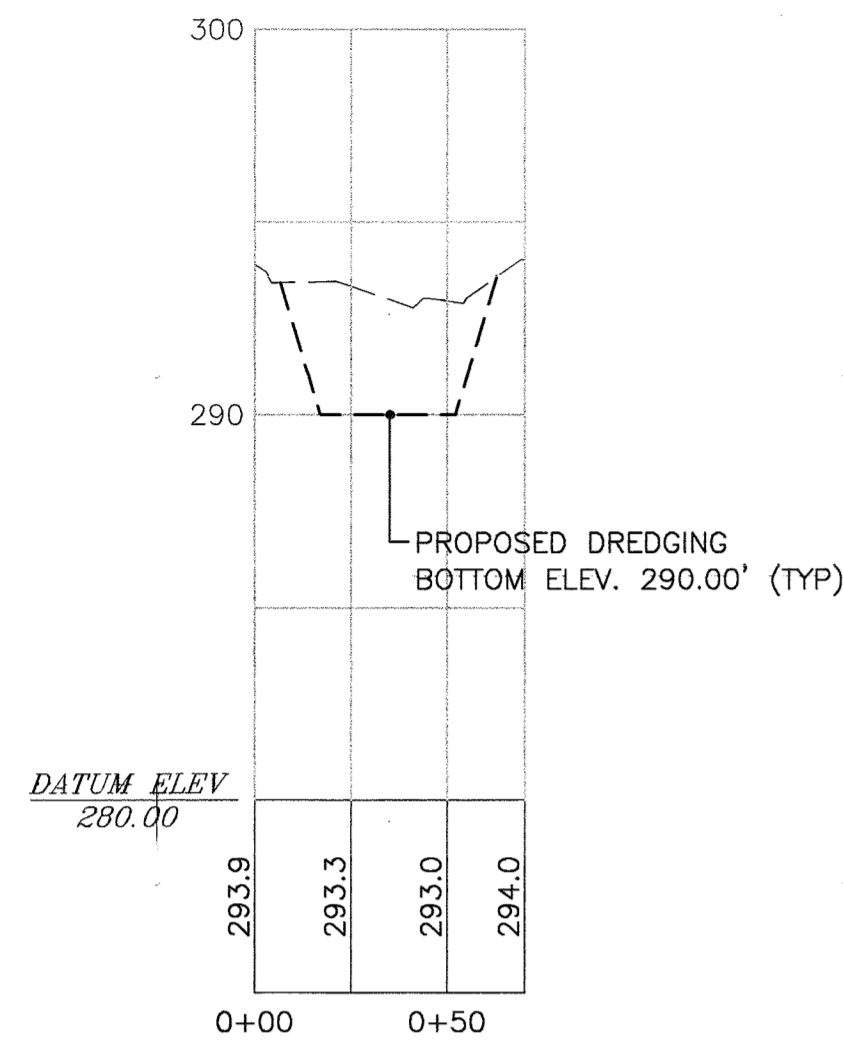
SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING C-09, SHEET 19 OF 29

SDP-08-107

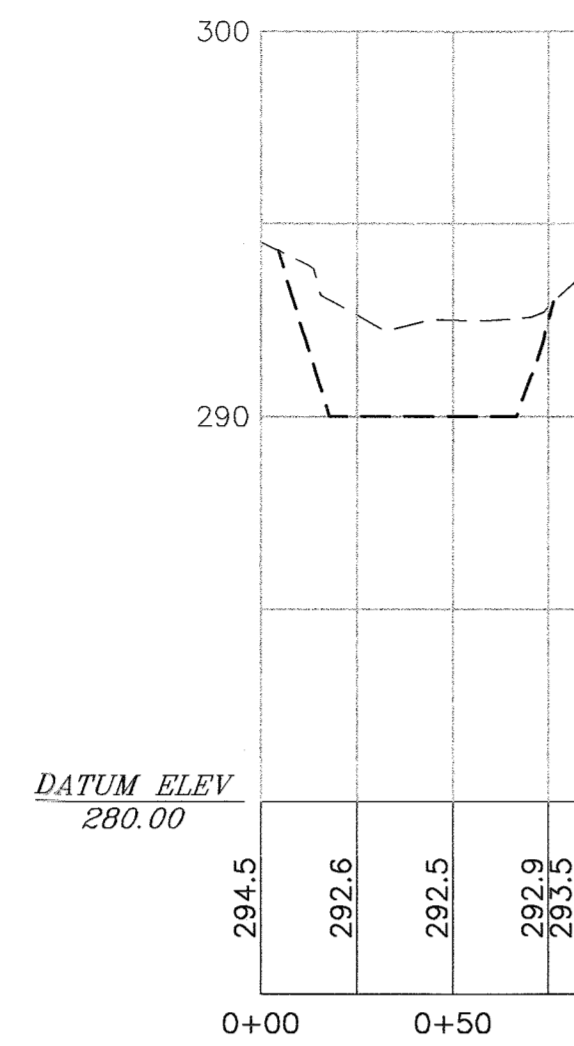
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BY	NO	REVISIONS	DATE
JA	1	REV SDP TO ADD SH. 30-39	1/29/2020
JA	2	REV SDP SH 30-39 APPROVED BY HSCD EP 19-031	1/29/2020



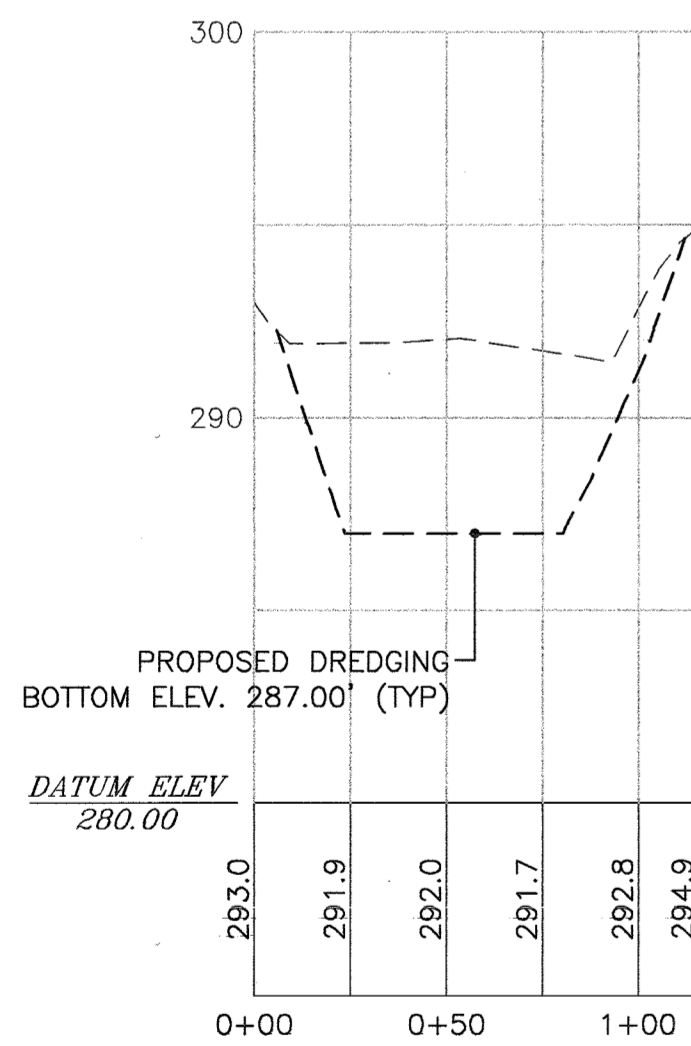
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B1
C-03



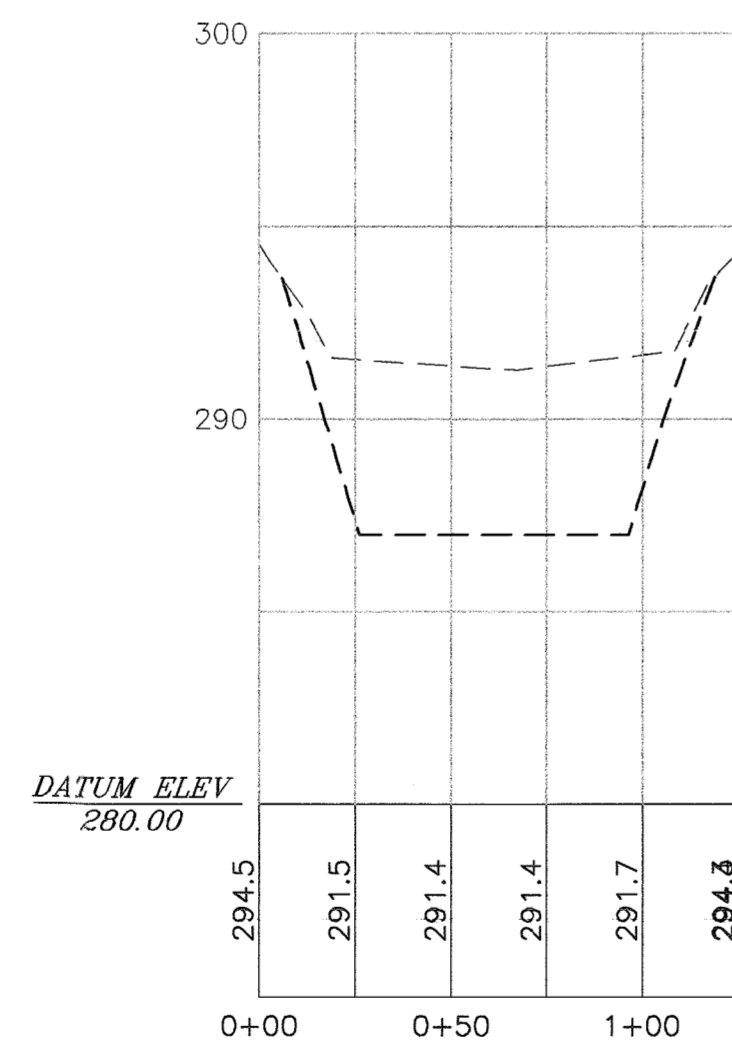
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B2
C-03



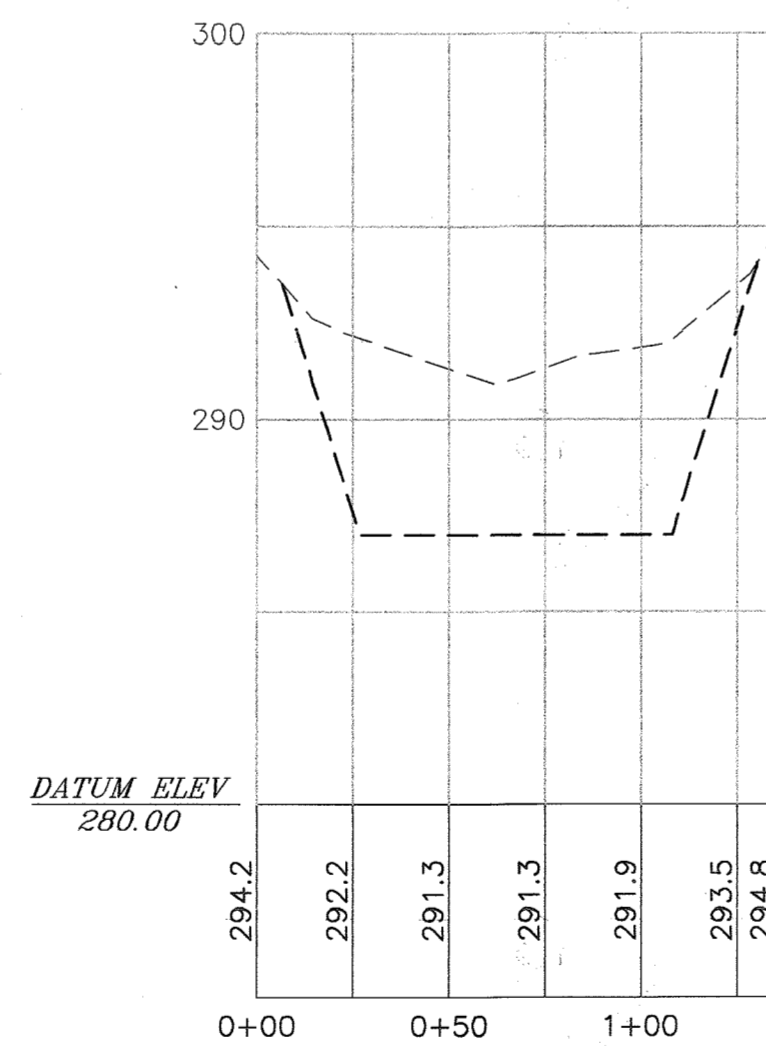
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C-03



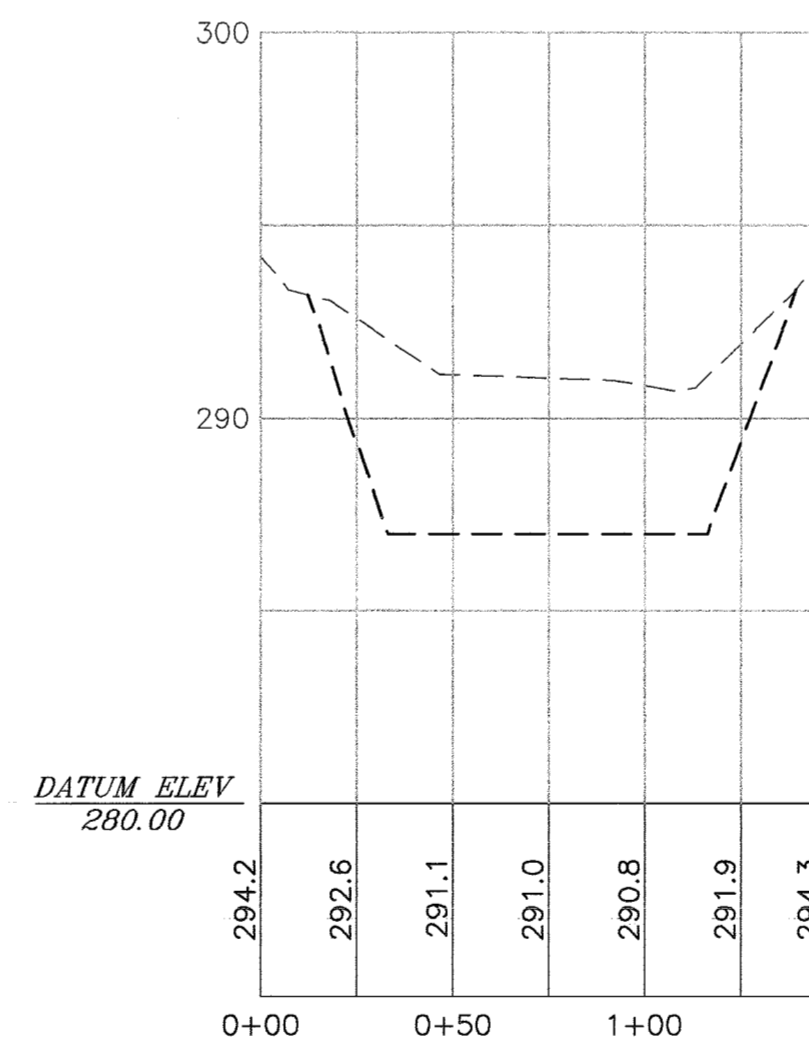
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C2
C-03



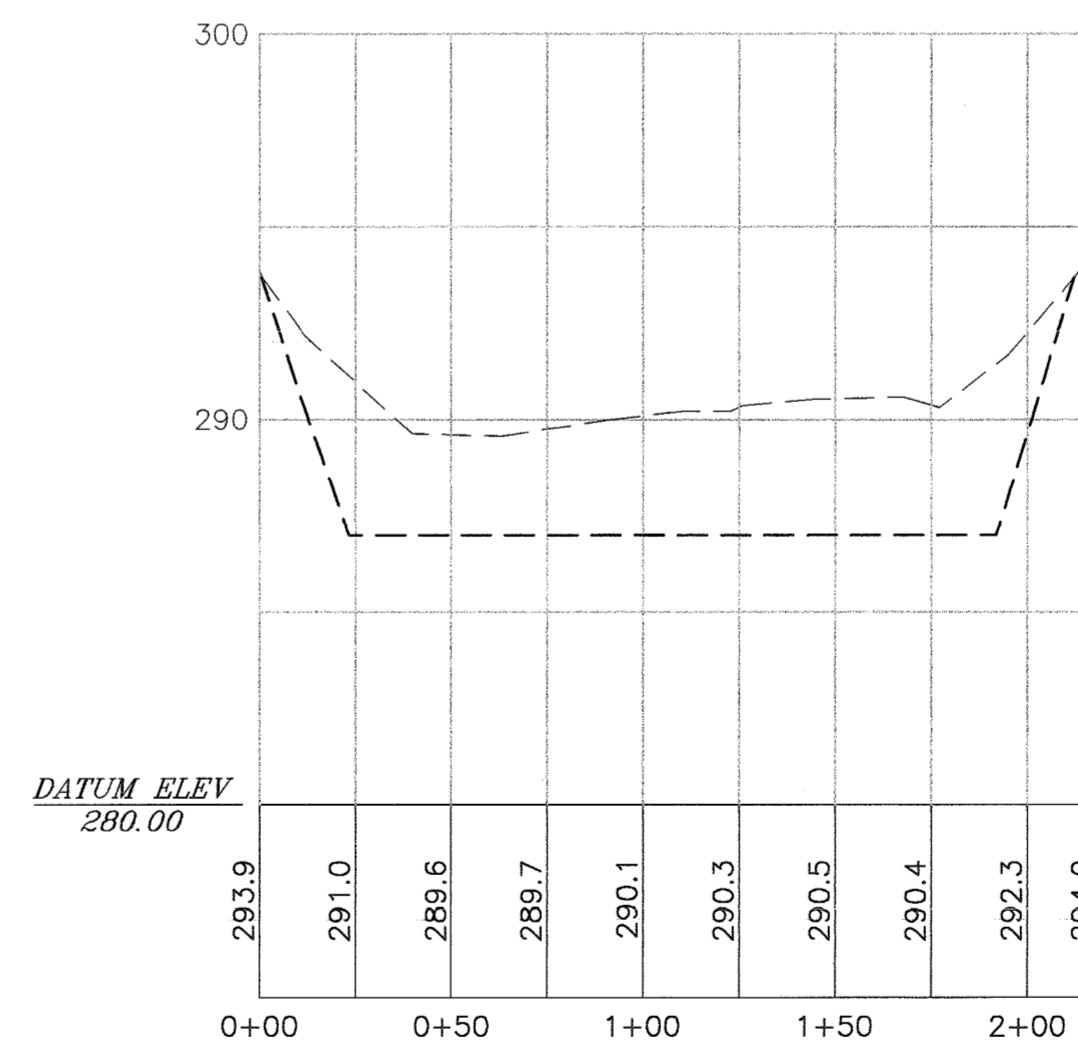
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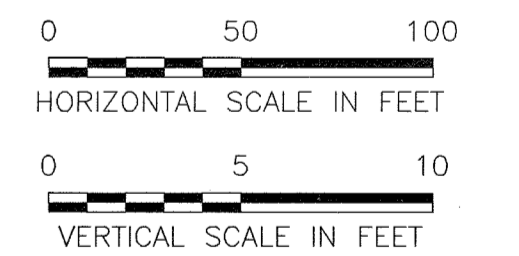
CROSS-SECTION C4

C4
C-03



CROSS-SECTION C5

C5
C-03



LEGEND:
 --- EXISTING BATHYMETRY
 — PROPOSED BATHYMETRY

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chad Edwards 6/9/09
 Chief, Development Engineering Division Date

Cindy Hamster 7/2/09
 Chief, Division of Land Development Date

March K. Legler 7/2/09
 Director Date

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

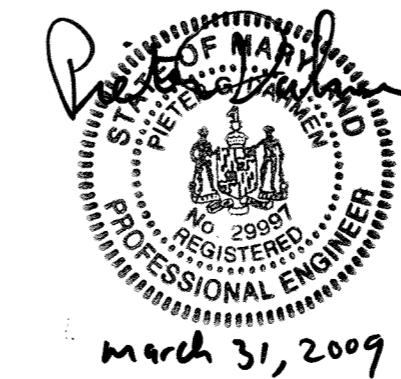
V.P. Dahl 4/13/09
 Visty P. Dahl
 Regulatory & Compliance Engineer

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
 PIETER DAHMEN, PE
 HDR ENGINEERING INC.



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

LAKE ELKHORN RESTORATION PROJECT
 AREA 02 & 03
 CROSS-SECTIONS

COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280

MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

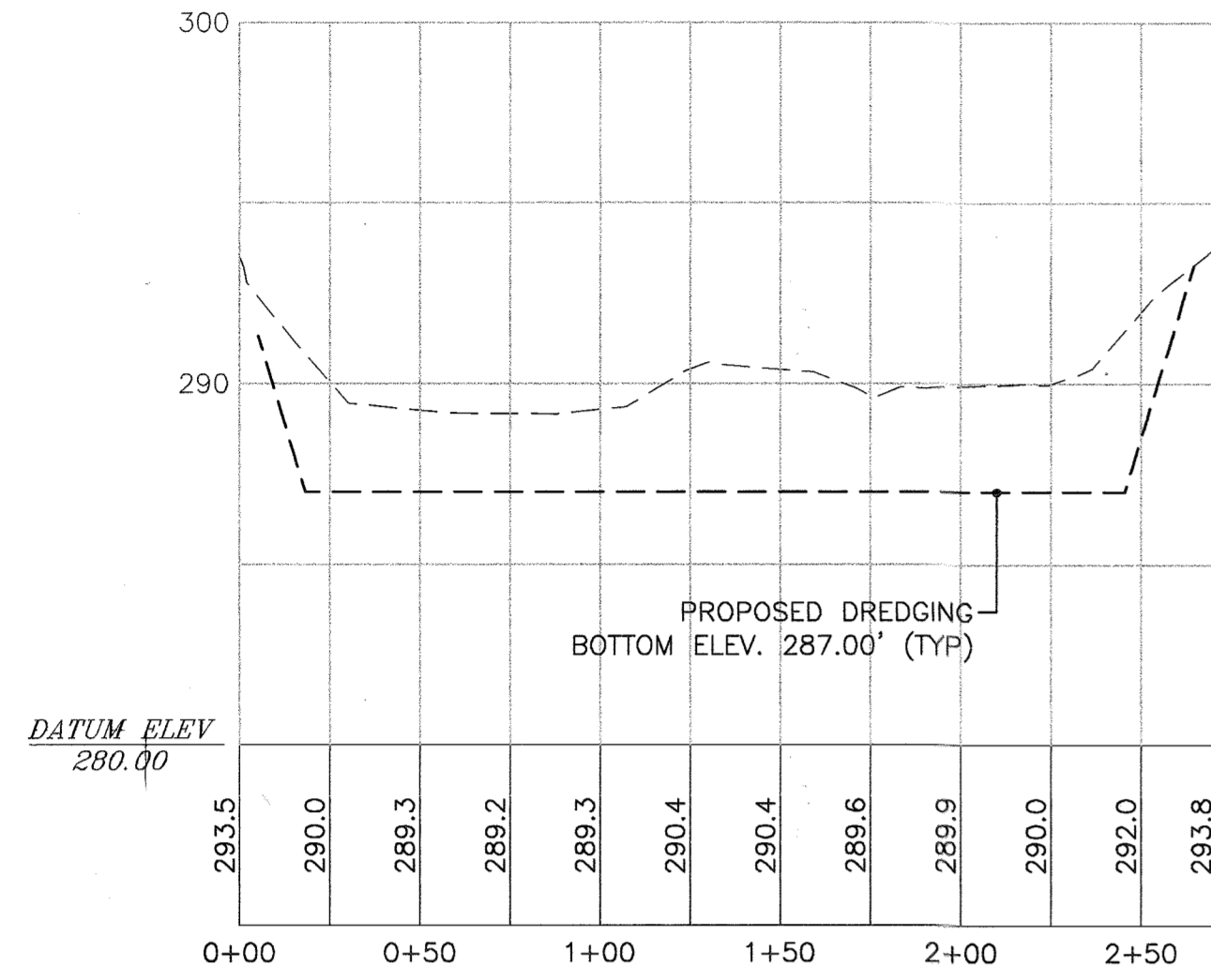
SCALE AS SHOWN
 FEBRUARY 6, 2009

DRAWING C-10, SHEET 20 OF 29

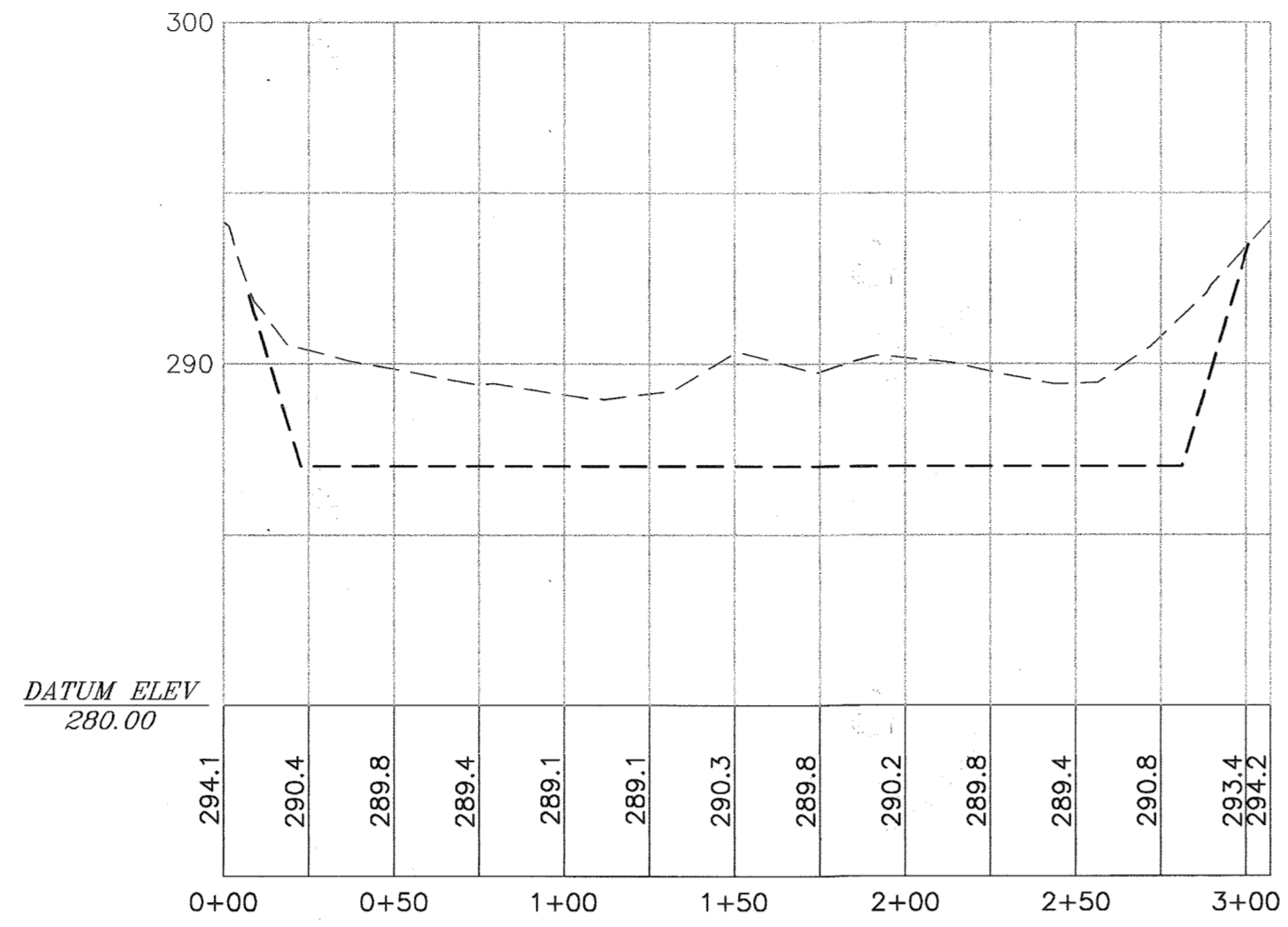
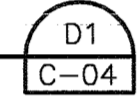
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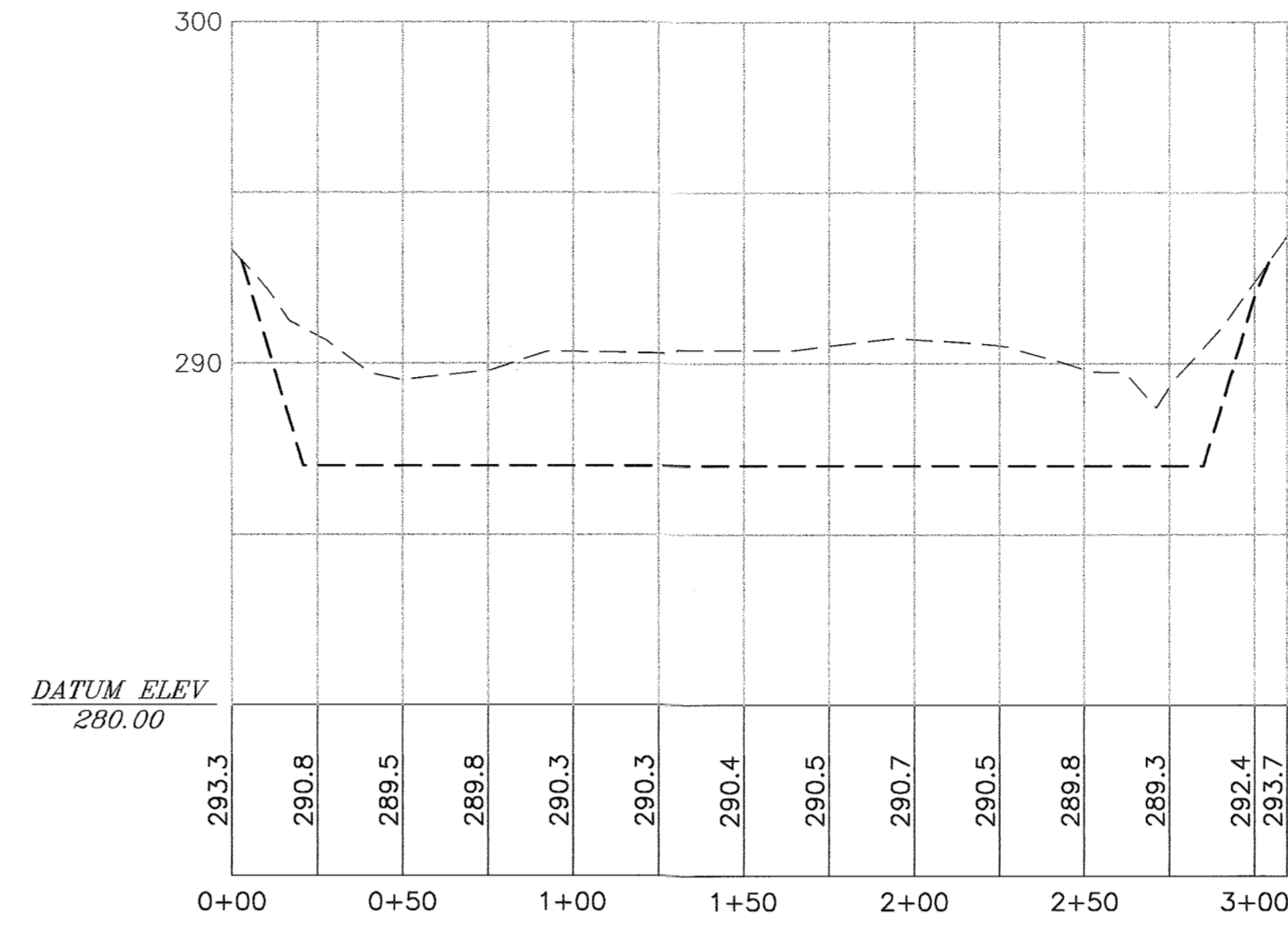
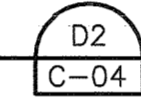
BY	NO	REVISIONS	DATE
JA	1	REV SPP TO ADD SH. 30-39	1/29/2020
JA	2	REV SPP SH 30-39 APPROVED BY HSCD EP 19-031	1/29/2020



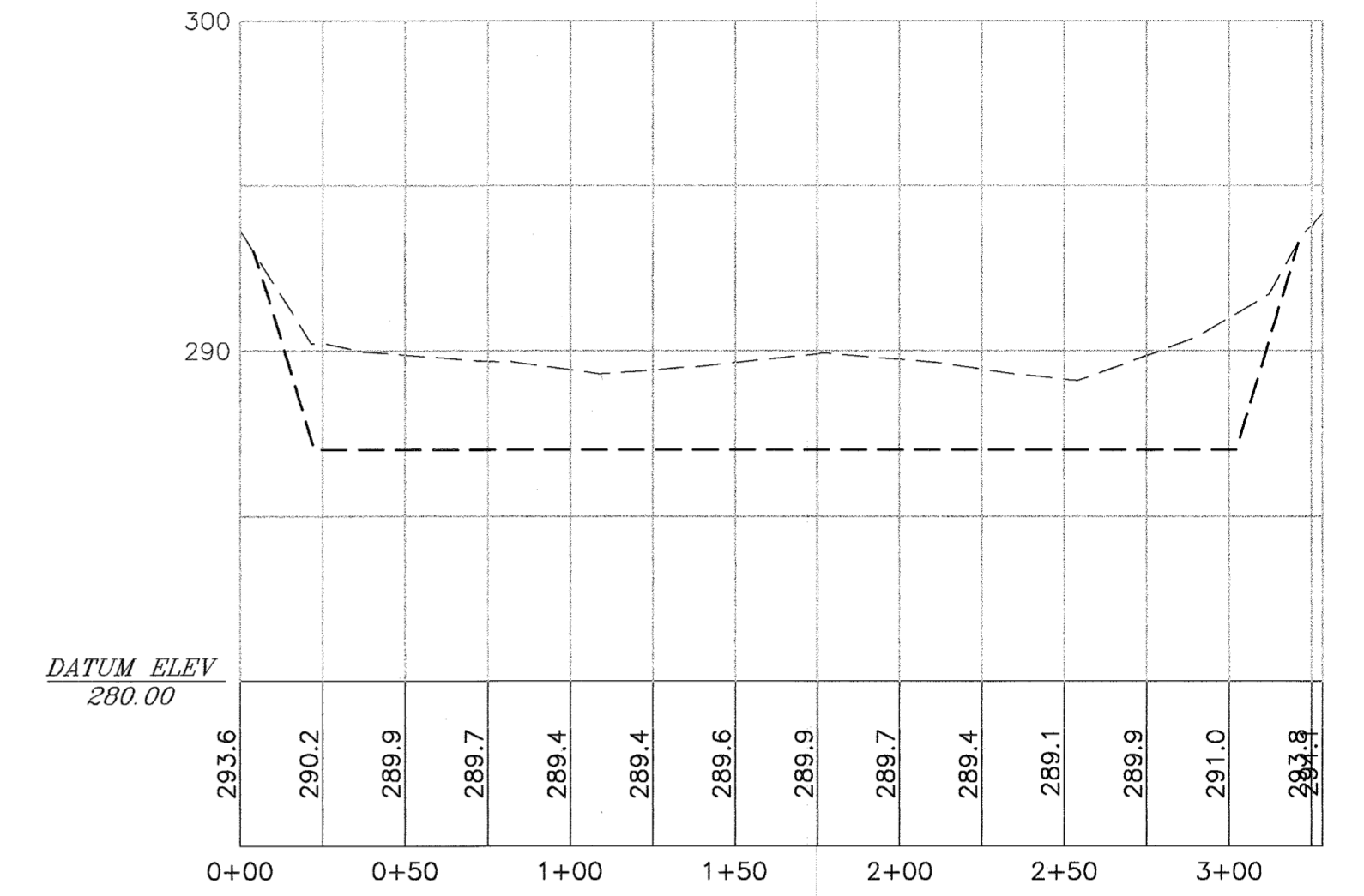
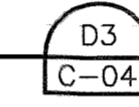
CROSS-SECTION D1



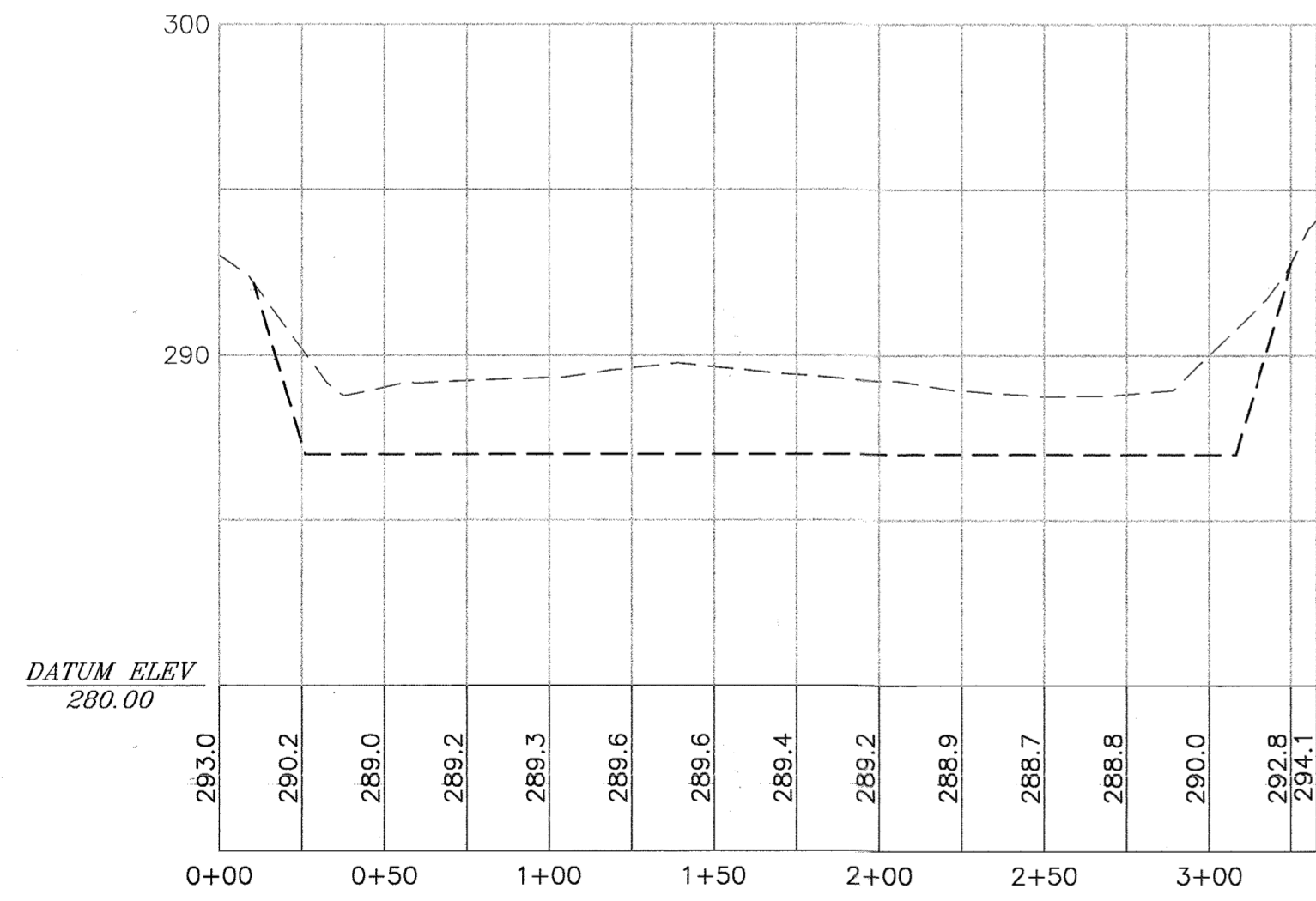
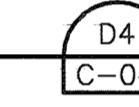
CROSS-SECTION D2



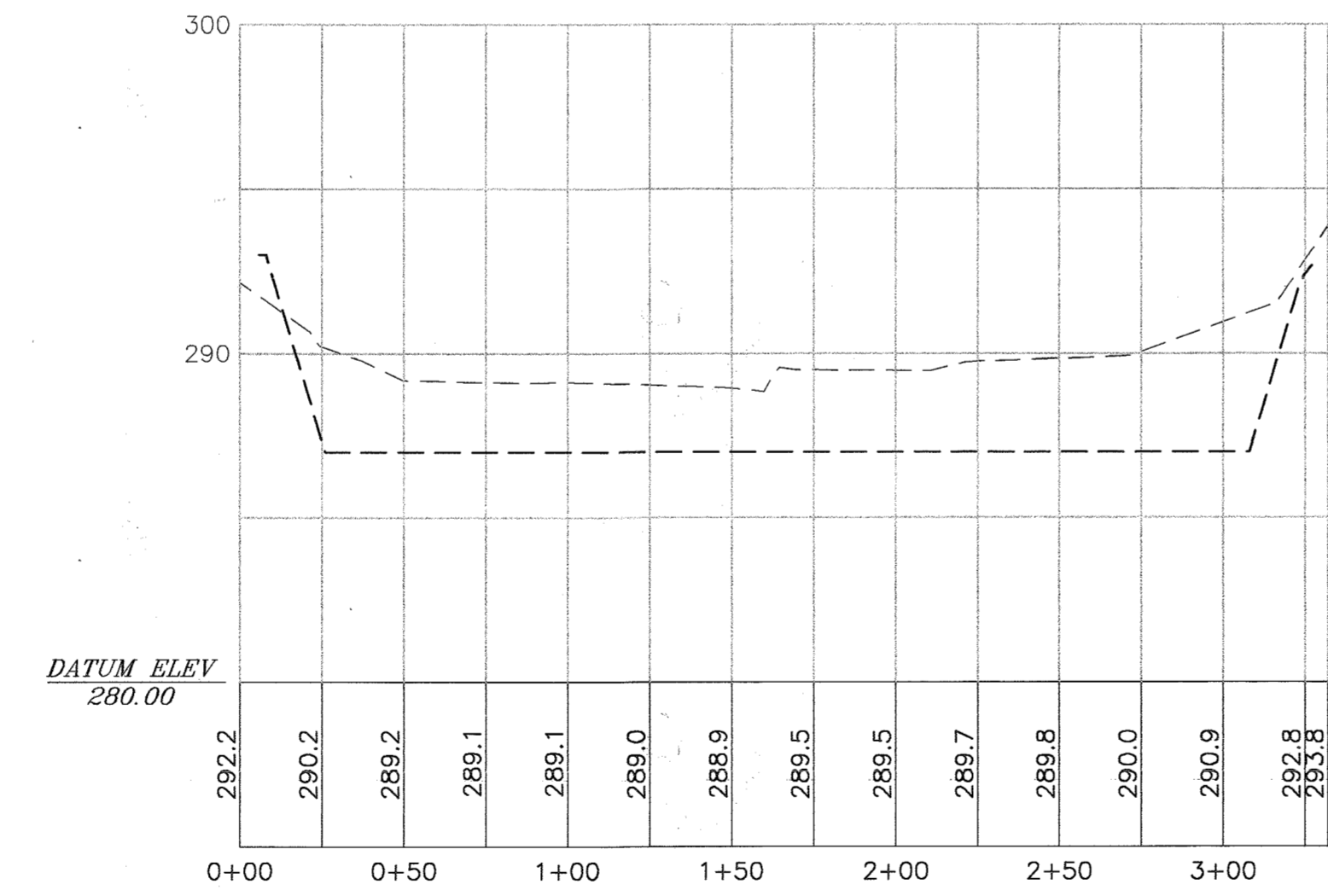
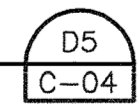
CROSS-SECTION D3



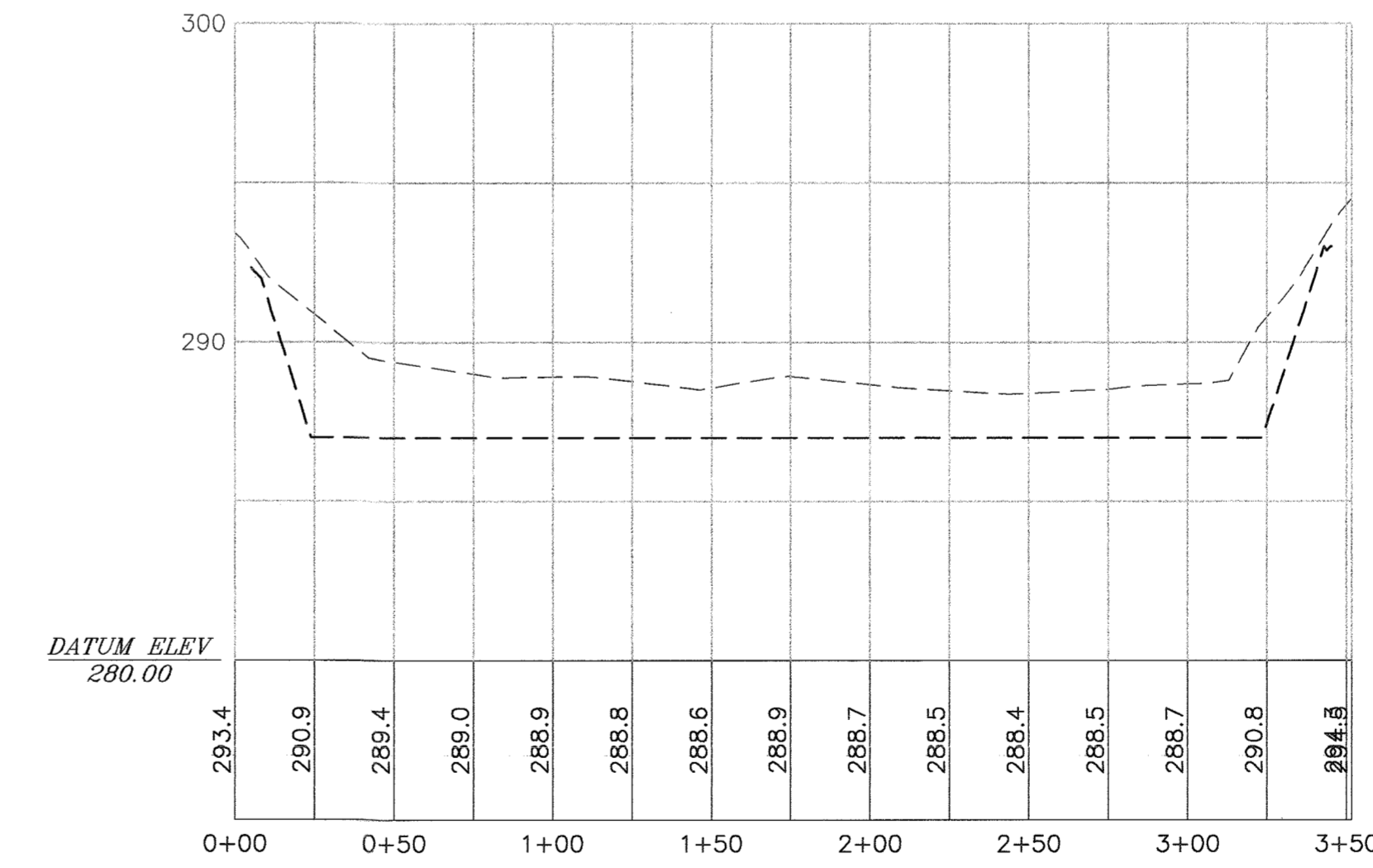
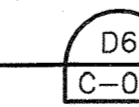
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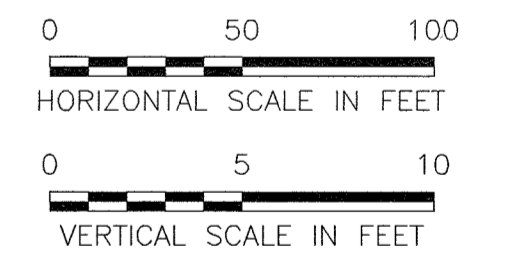
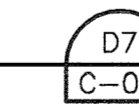
CROSS-SECTION D5



CROSS-SECTION D6



CROSS-SECTION D7



LEGEND:
 --- EXISTING BATHYMETRY
 - - - PROPOSED BATHYMETRY

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chad Edwards
 Chief, Development Engineering Division
 Date: 6-9-9

Tracy Harris
 Chief, Division of Land Development
 Date: 7/2/09

Mark H. Wolfe
 Director
 Date: 7/1/05

Maryland Department of the Environment
 Water Management Administration
 Dam Safety Division
V.P. Dalal
 Visty P. Dalal
 Regulatory & Compliance Engineer
 Date: 4/13/09

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.

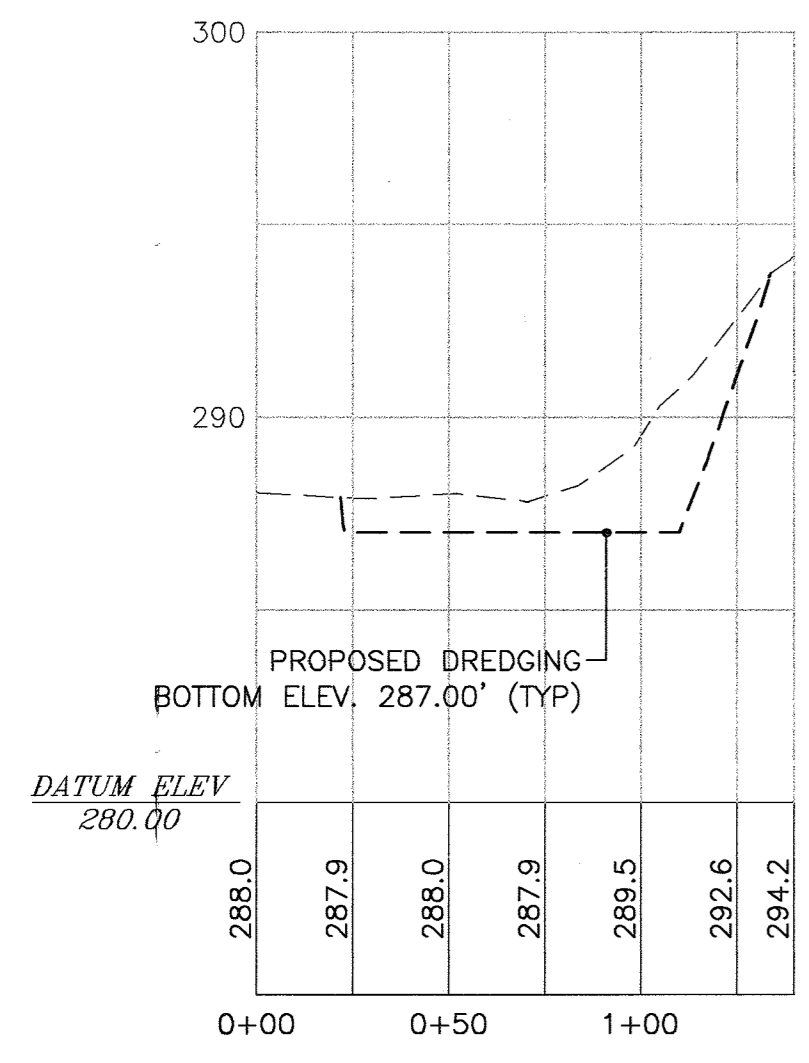


COLUMBIA ASSOCIATION
 10221 WINCOPIN CIRCLE #100
 COLUMBIA, MD 21044
 (410)-381-2947

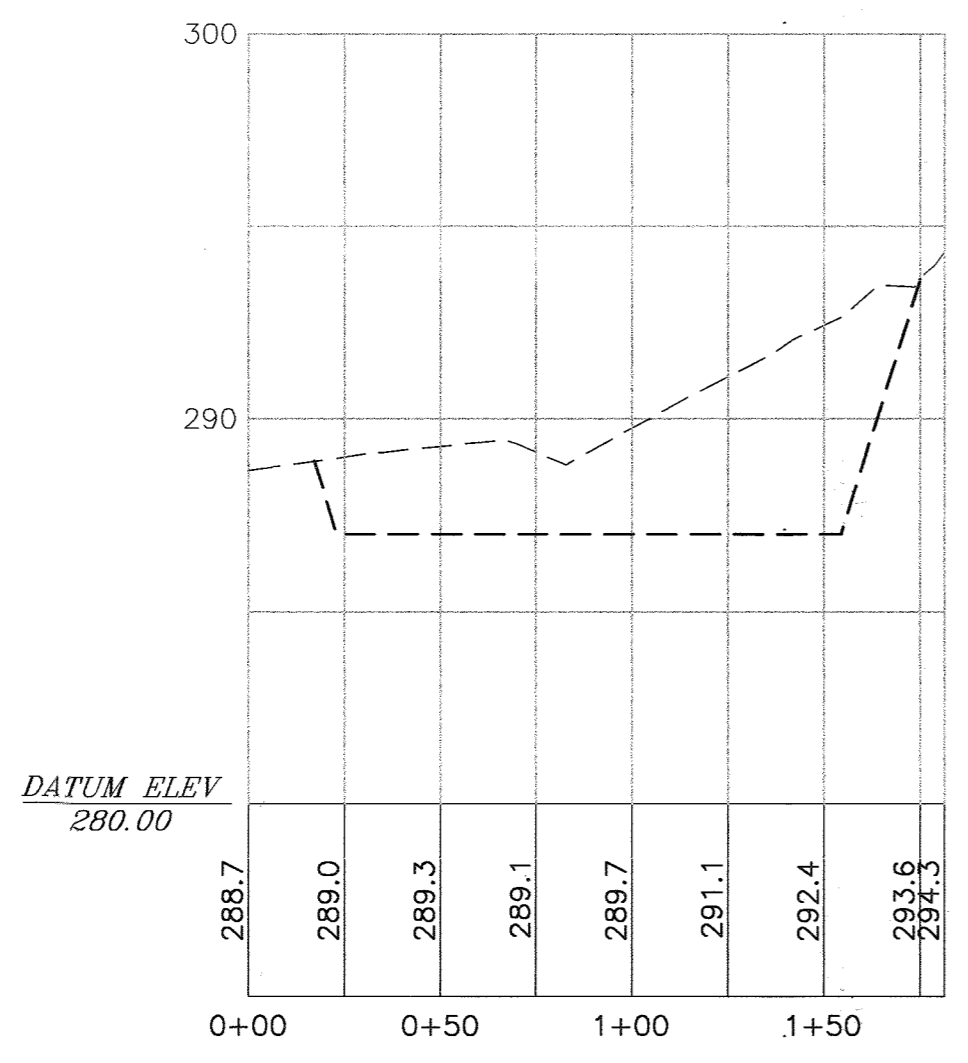
LAKE ELKHORN RESTORATION PROJECT
 AREA 04
 CROSS-SECTIONS
 COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280
 MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42
 SCALE AS SHOWN
 FEBRUARY 6, 2009
 DRAWING C-11, SHEET 21 OF 29
 SDP-08-107

C:\p\working\PTT\11000000\SECTION\SECTION\ANG_ELK-C-11_33102009 9:43:17 AM.dwg

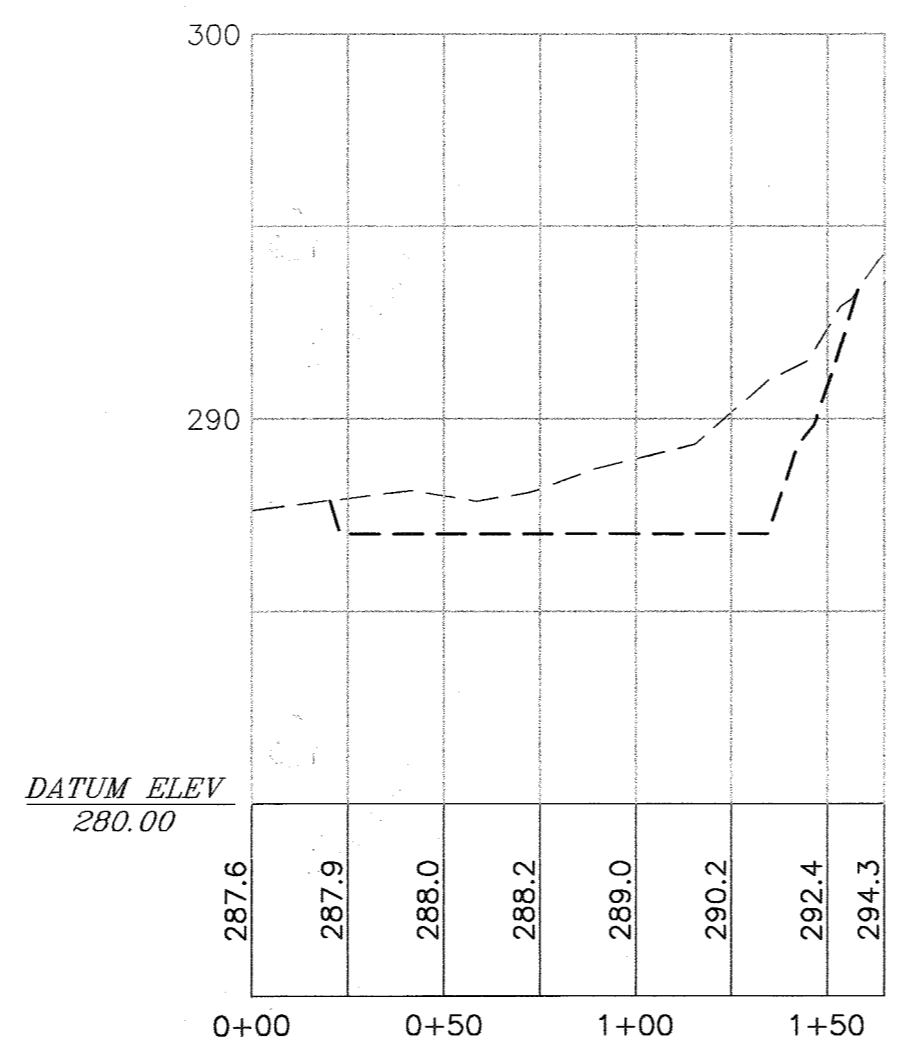
BY	NO	REVISIONS	DATE
JA	△	REV SDP TO ADD SH 30-39	1/29/2020
JA	⊕	REV SDP SH. 30-39 APPROVED By HXCD EP 19-031	1/29/2020



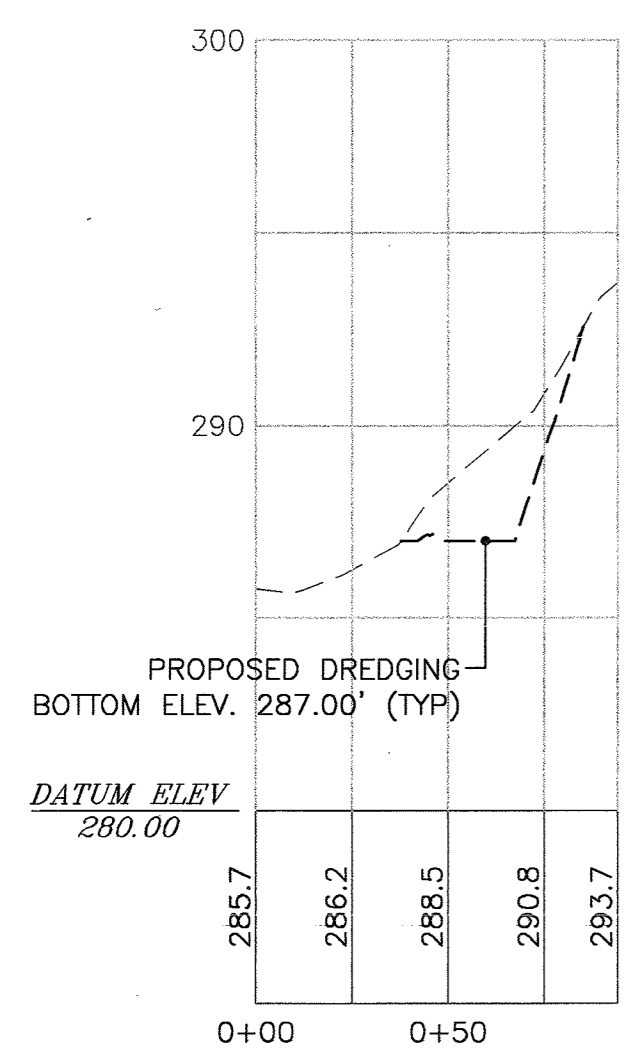
CROSS-SECTION E1 E1
C-05



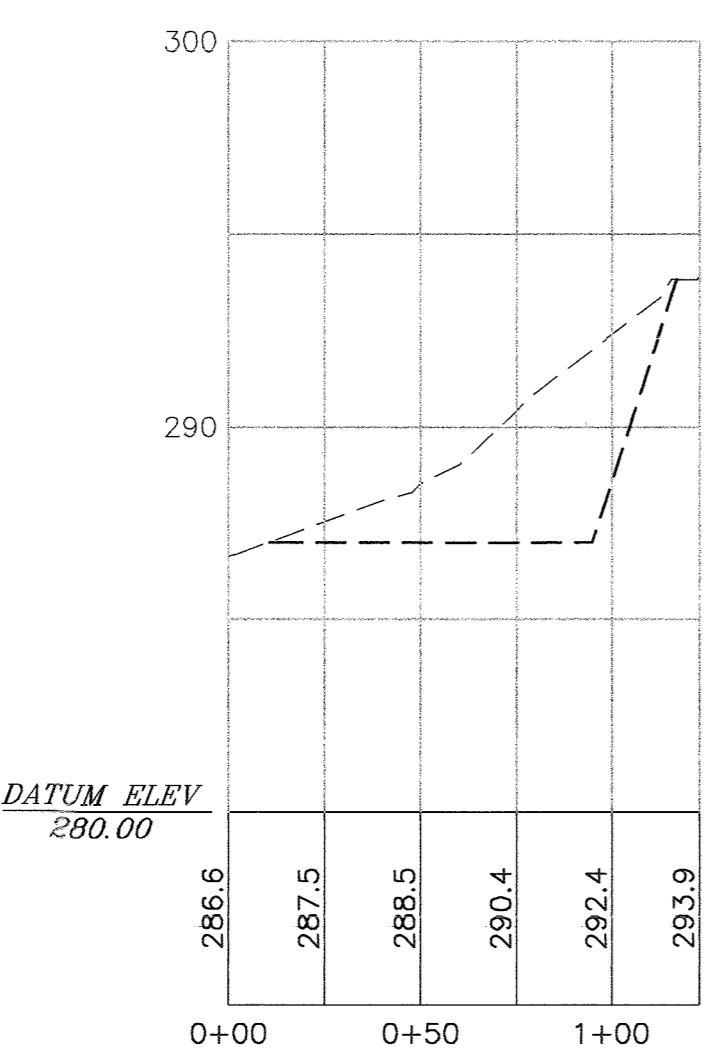
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C-05



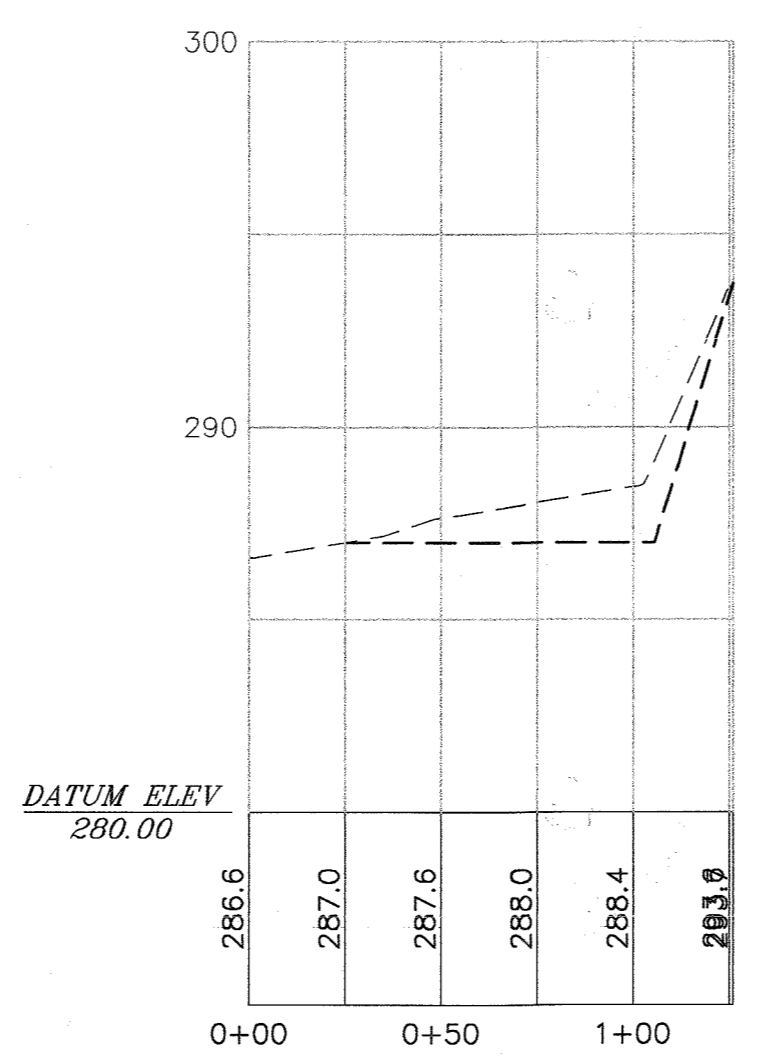
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C-05



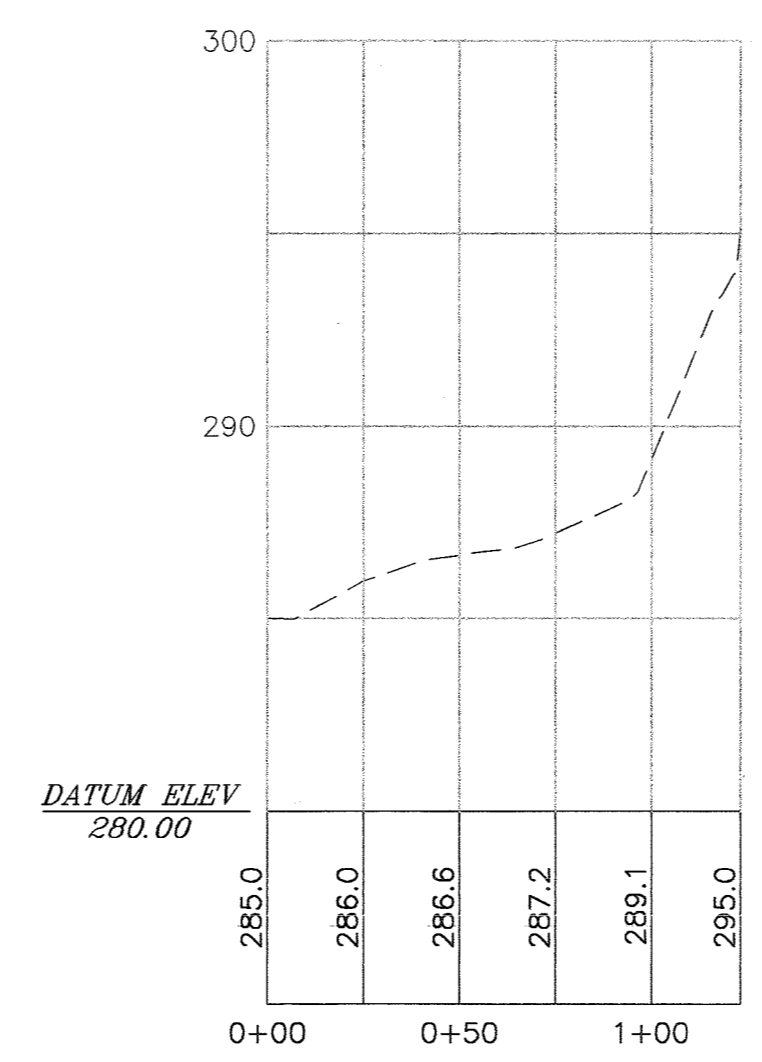
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C-06



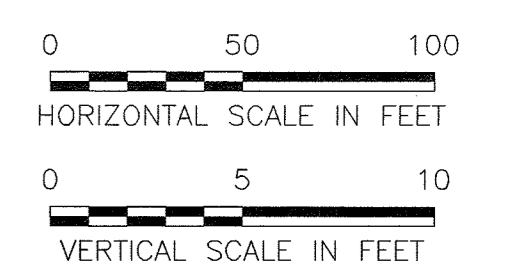
CROSS-SECTION F2 F2
C-06



CROSS-SECTION F3 F3
C-06



CROSS-SECTION F4 F4
C-06



LEGEND:
 --- EXISTING BATHYMETRY
 — PROPOSED BATHYMETRY

**LAKE ELKHORN RESTORATION PROJECT
 AREA 05 & 06
 CROSS-SECTIONS**

**COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280**

**MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42**

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

SCALE AS SHOWN
 FEBRUARY 6, 2009

DRAWING C-12, SHEET 22 OF 29

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chuck Edwards 6.9.9
 Chief, Development Engineering Division Date

Carla Hambs 7/2/09
 Chief, Division of Land Development Date

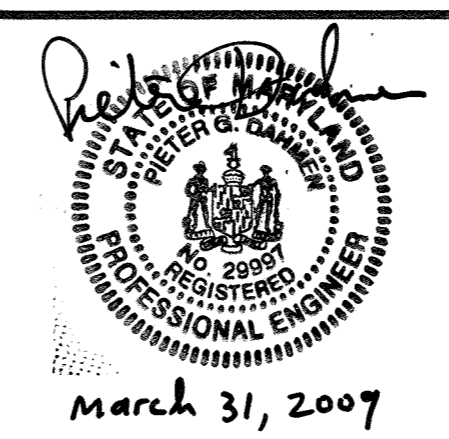
Marsha R. Leight 7/3/09
 Director Date

MDE Maryland Department of the Environment
 Water Management Administration
 Dam Safety Division
V.I. Datal 4/13/09
 Visty P. Datal
 Regulatory & Compliance Engineer

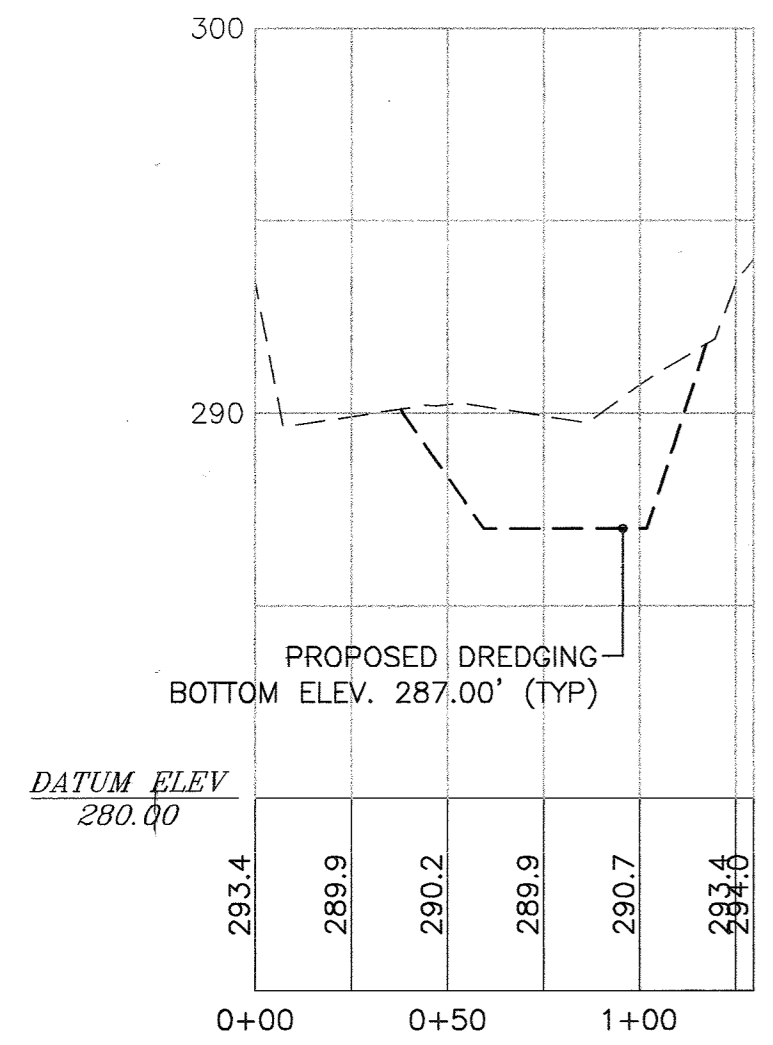
THIS PLAN SET HAS BEEN PREPARED BY:
HDR
 HDR Engineering, Inc.
 5700 LAKE WRIGHT DRIVE
 SUITE 300
 NORFOLK, VIRGINIA 23502
 757-222-1500

PLANS HAVE BEEN
 DESIGNED UNDER MY
 SUPERVISION

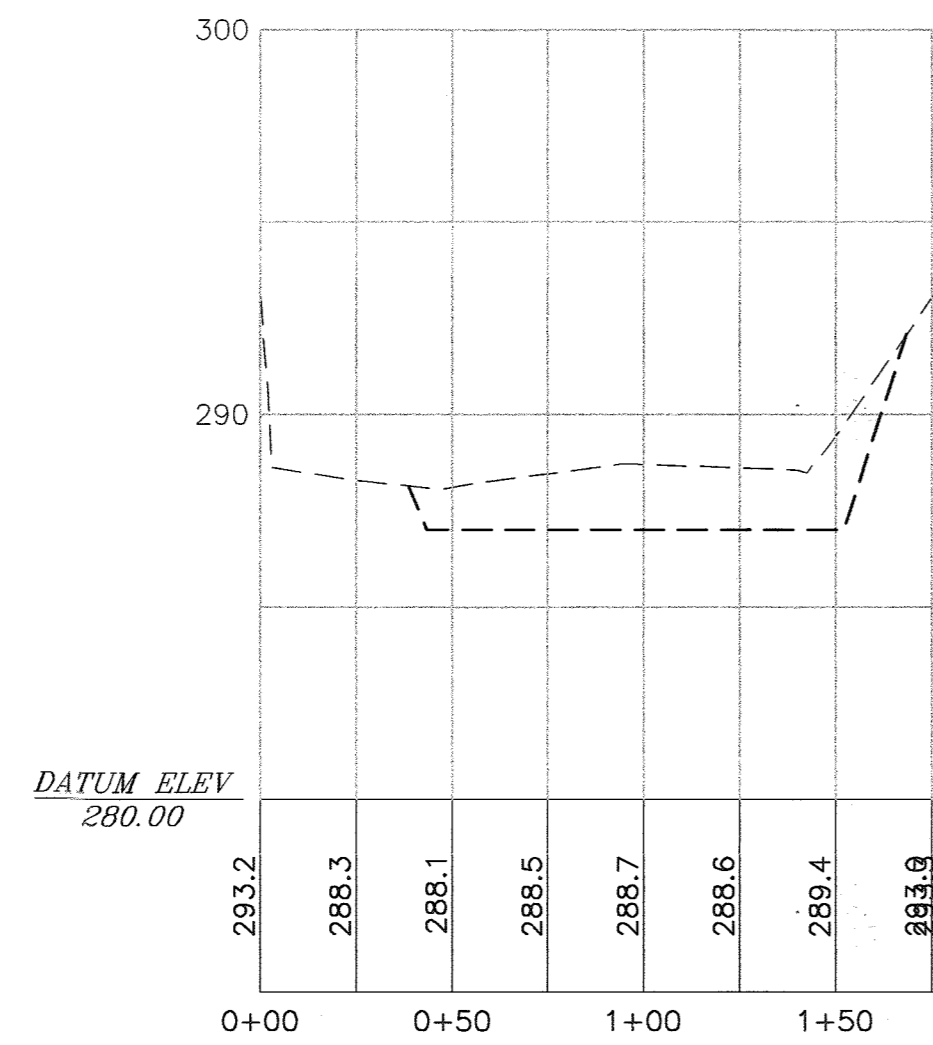
 PIETER DAHMEN, PE
 HDR ENGINEERING INC.



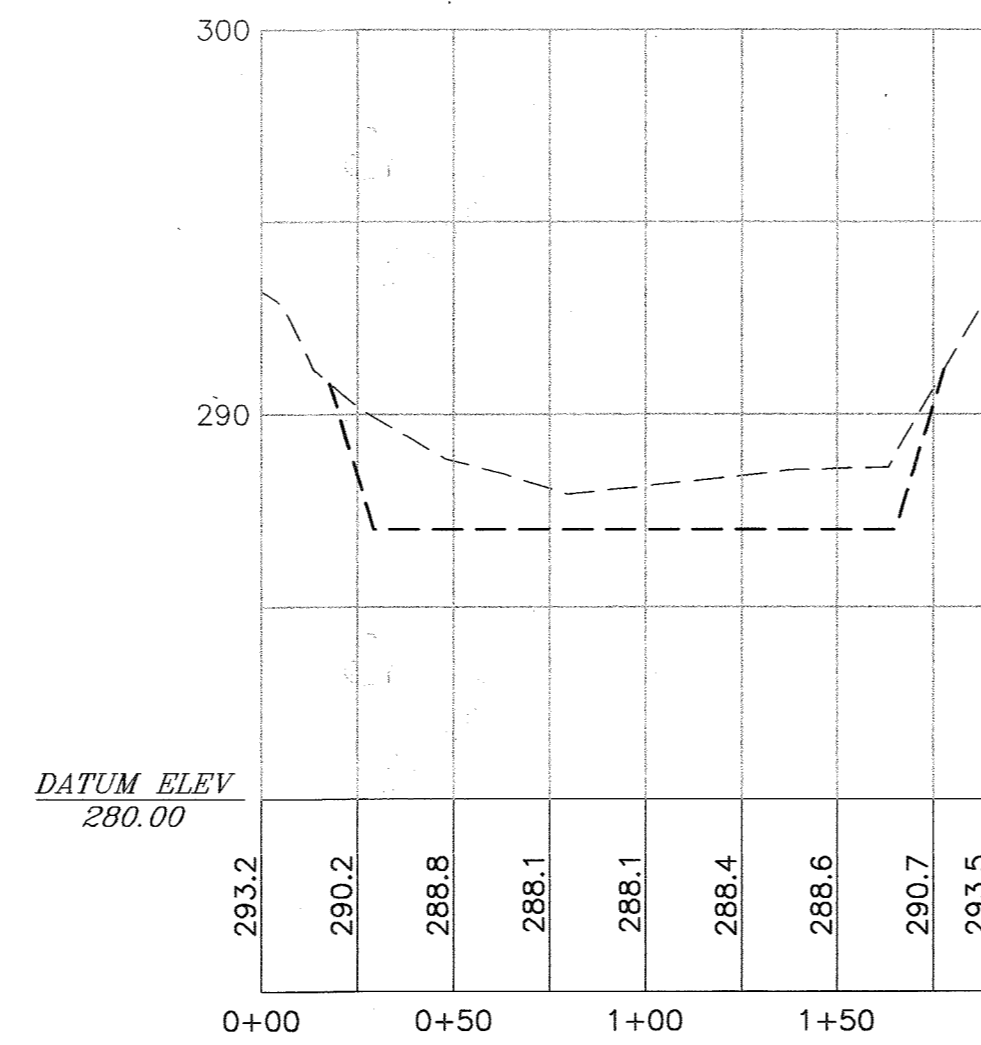
BY	NO	REVISIONS	DATE
JA	1	REV SDP TO ADD SH 30-39	1/29/2020
JA	2	REV SDP SH. 30-39 APPROVED BY H&CD EP 17-031	1/29/2020



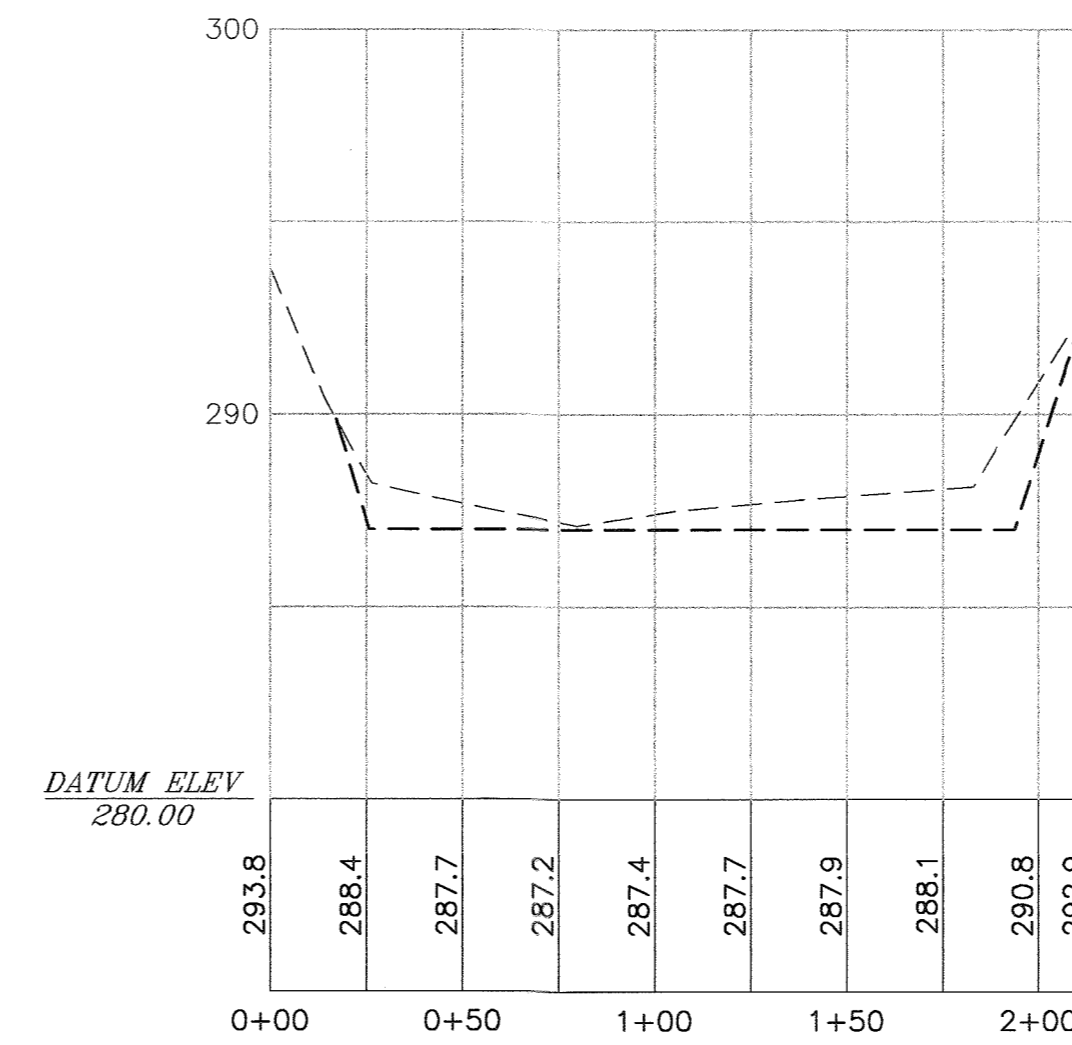
CROSS-SECTION G1



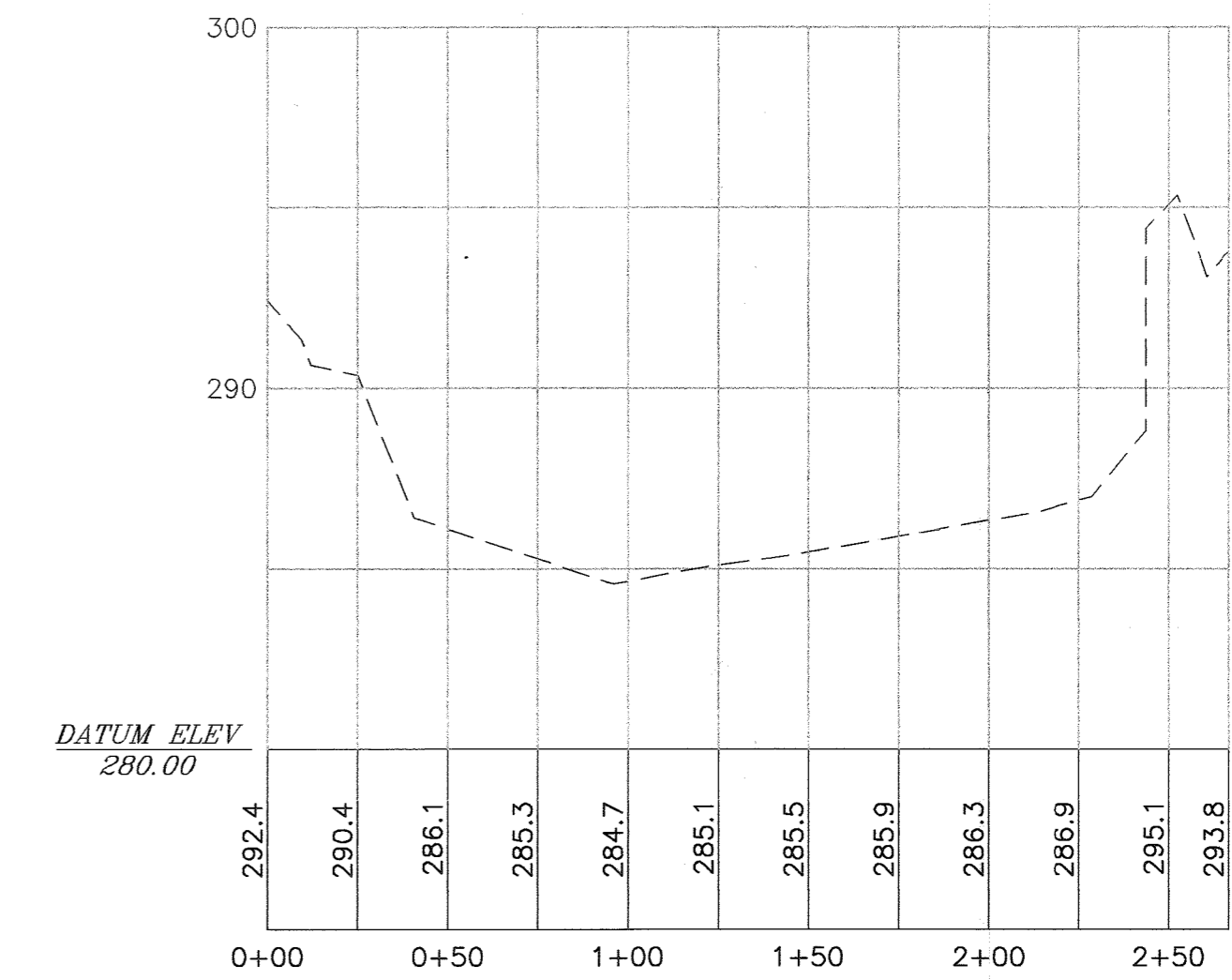
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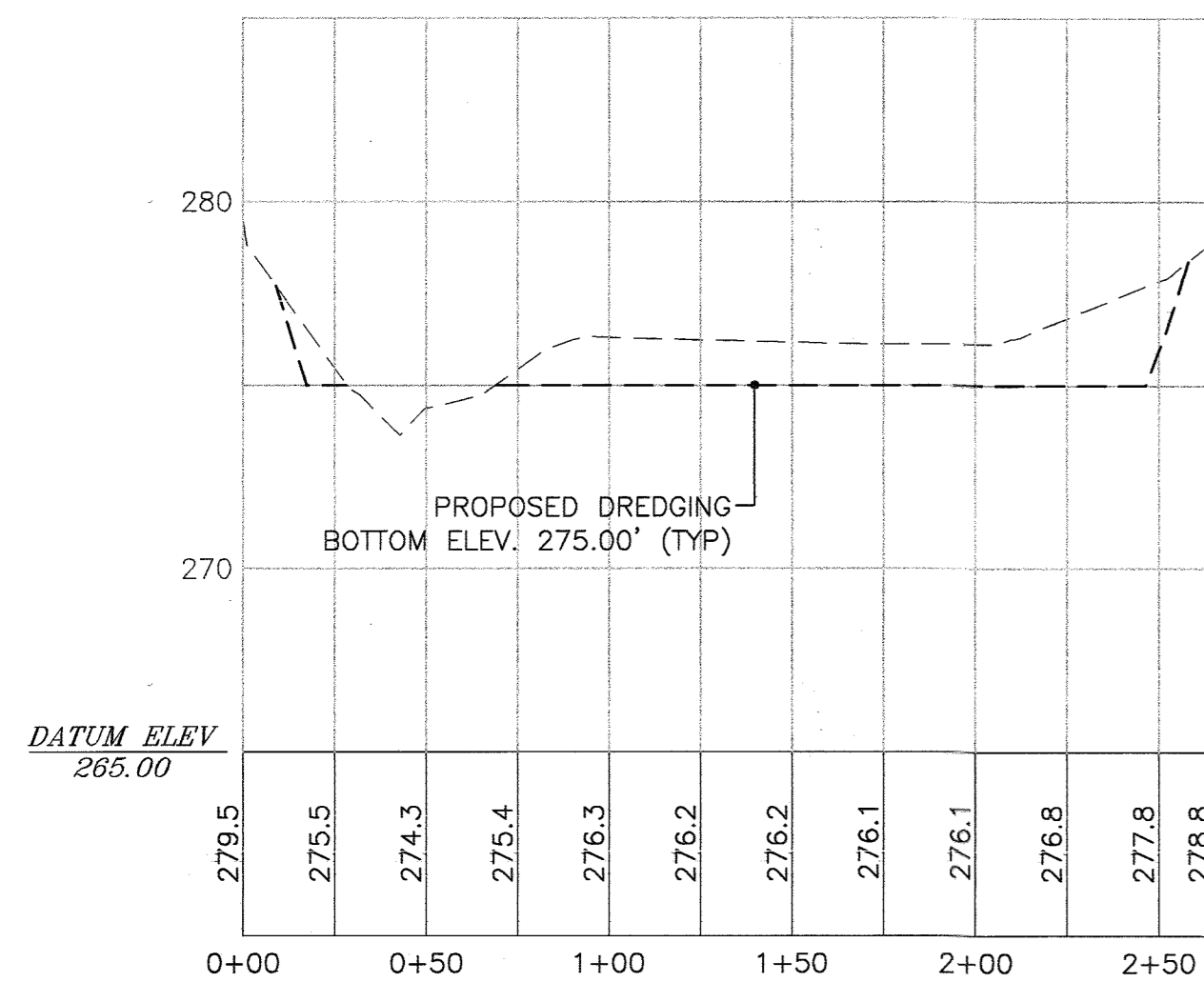
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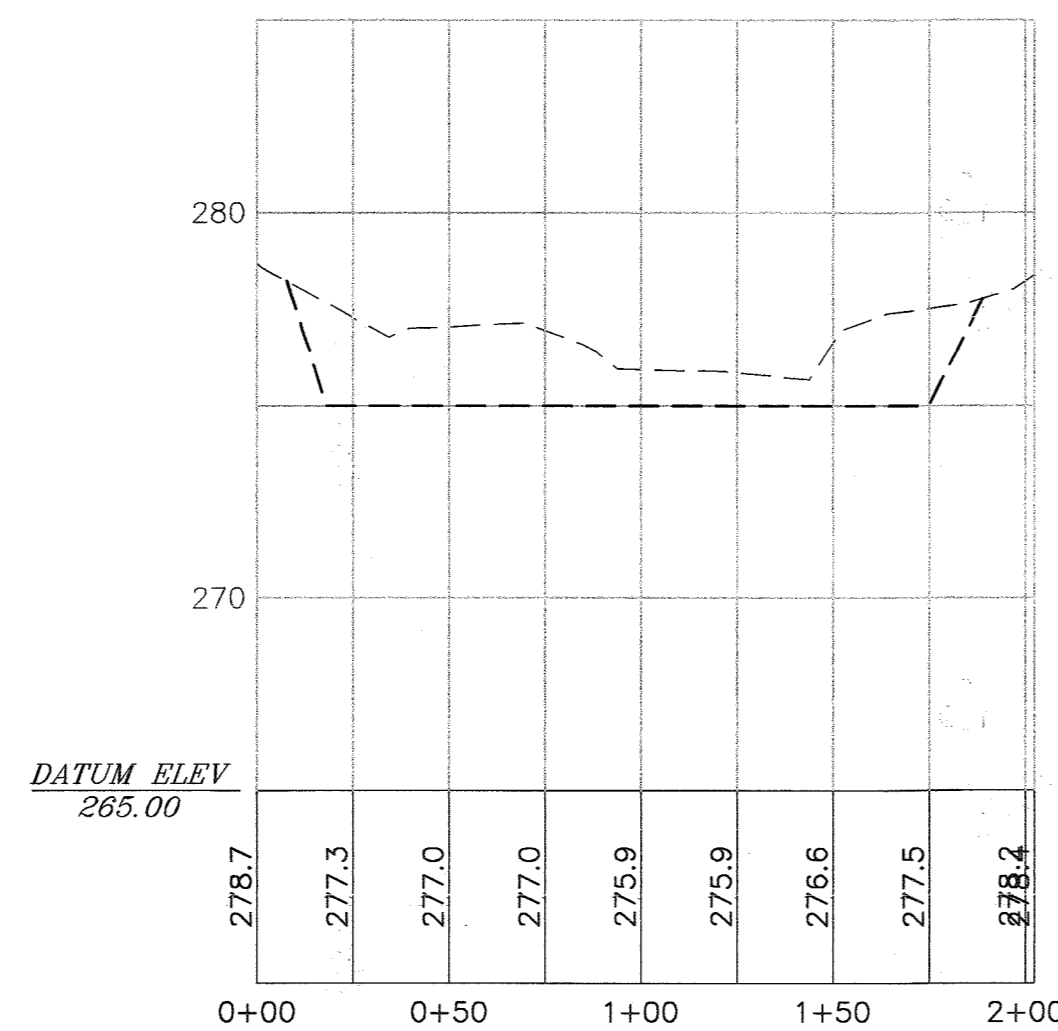
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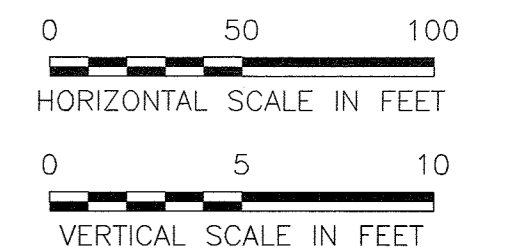
CROSS-SECTION G5



CROSS-SECTION H1



CROSS-SECTION H2



LEGEND:

	EXISTING BATHYMETRY
	PROPOSED BATHYMETRY

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division
Date: 6/9/9

Chief, Division of Land Development
Date: 7/2/09

Director
Date: 2/2/09

Maryland Department of the Environment
Water Management Administration
Dam Safety Division

Visty P. Dalal
Regulatory & Compliance Engineer
Date: 4/13/09

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.
Date: March 2009

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

LAKE ELKHORN RESTORATION PROJECT
AREA 07 & 08
CROSS-SECTIONS

COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280

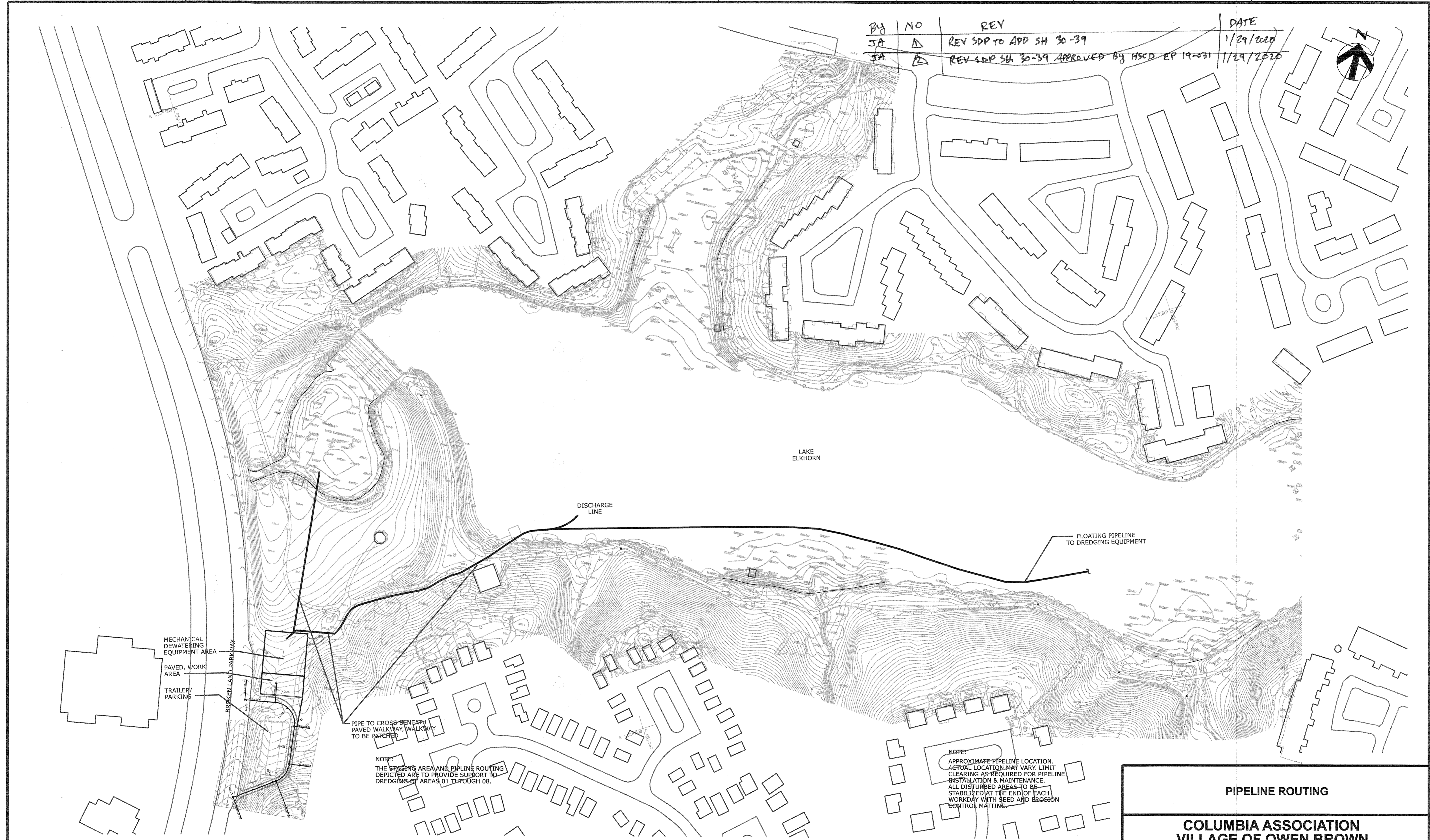
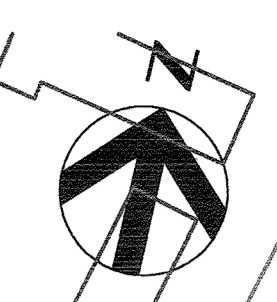
MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING C-13, SHEET 23 OF 29
SDP-08-107

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BY	NO	REV	DATE
JA	A	REV SDP TO ADD SH 30-39	1/29/2010
JA	B	REV SDP SH 30-39 APPROVED BY HSCD EP 19-031	1/29/2010



APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chad Edwards
 Chief, Development Engineering Division
 Date: 6-9-9

Andy Hannon
 Chief, Division of Land Development
 Date: 7/2/09

David J. Cough
 Director
 Date: 7/7/09

Maryland Department of the Environment
 Water Management Administration
 Dam Safety Division

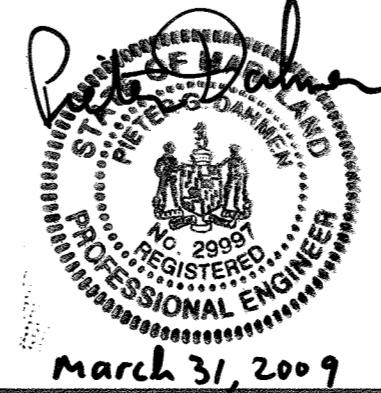
V.P. Dalal
 Visty P. Dalal
 Regulatory & Compliance Engineer
 Date: 4/13/09

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
 PIETER DAHMEN, PE
 HDR ENGINEERING INC.



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

PIPELINE ROUTING

**COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280**

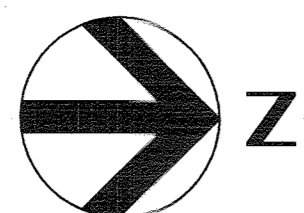
MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

SCALE AS SHOWN
 FEBRUARY 6, 2009

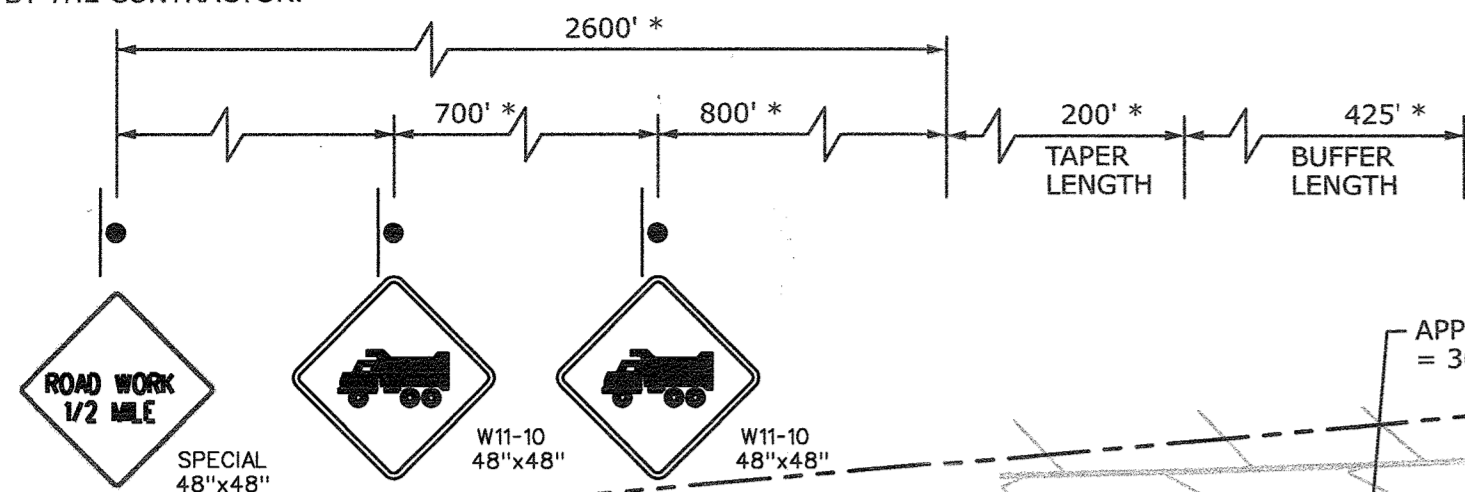
DRAWING D-01, SHEET 24 OF 29

SDP-08-107

NOTE: R DENOTES PROPERTY LINE
 *- DISTANCES PER SHA STANDARDS NO. MD 104.04-01
 SIGNS SHOULD BE PLACED ON BROKEN LAND PARKWAY
 AND THE RAMP OR RIGHT TURN LANE FROM SNOWDEN
 RIVER PARKWAY IN ACCORDANCE WITH THE STANDARD.
 EXACT LOCATION OF THE SIGNS WILL BE DETERMINED
 BY THE CONTRACTOR.



NOTE
 CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING OR REPAIRING ANY DAMAGE
 TO EXISTING FACILITIES INCLUDING BUT NOT LIMITED TO
 CURB, PAVEMENT AND ANY OTHER STRUCTURES.



APPROX. LOCATION SANITARY SEWER
 MANHOLE #8053
 INVERT ELEV. = 301.46 NGVD 29
 INVERT ELEV. = 300.75 NAVD 88
 (NOTE: PER COUNTY AS BUILT 2-16-75)

RIPRAP LEVEL SPREADER DETAIL
 SECTION A-A



END
 ROAD WORK

STAGING AREA
 WORK AREA: 5,000 SF
 EQUIPMENT AREA: 10,000 SF
 MISC. AREA: 1,538 SF
 TRAILER/PARKING AREA: 20,000 SF APPROX. (EXISTING)
 TOTAL CUT: 1.029 CY
 TOTAL FILL: 1.029 CY
 AREA OF DISTURBANCE: 1.12 ac.

WMATA TEAMSTER LOCAL
 922 RETIREMENT PLAN

APPROXIMATE INVERT ELEVATION
 = 303.00 FT NAVD 88

POT 14+04.37

POT 13+32.54

POT 12+51.27

POT 11+61.64

POT 10+00.00

POT 9+00.00

POT 8+00.00

POT 7+00.00

POT 6+00.00

POT 5+00.00

POT 4+00.00

POT 3+00.00

POT 2+00.00

POT 1+00.00

POT 0+00.00

POT -1+00.00

POT -2+00.00

POT -3+00.00

POT -4+00.00

POT -5+00.00

POT -6+00.00

POT -7+00.00

POT -8+00.00

POT -9+00.00

POT -10+00.00

POT -11+00.00

POT -12+00.00

POT -13+00.00

POT -14+00.00

POT -15+00.00

POT -16+00.00

POT -17+00.00

POT -18+00.00

POT -19+00.00

POT -20+00.00

POT -21+00.00

POT -22+00.00

POT -23+00.00

POT -24+00.00

POT -25+00.00

POT -26+00.00

POT -27+00.00

POT -28+00.00

POT -29+00.00

POT -30+00.00

POT -31+00.00

POT -32+00.00

POT -33+00.00

POT -34+00.00

POT -35+00.00

POT -36+00.00

POT -37+00.00

POT -38+00.00

POT -39+00.00

POT -40+00.00

POT -41+00.00

POT -42+00.00

POT -43+00.00

POT -44+00.00

POT -45+00.00

POT -46+00.00

POT -47+00.00

POT -48+00.00

POT -49+00.00

POT -50+00.00

NOTE: PER HOWARD COUNTY
 AS BUILT 2-16-75
 INVERT ELEV. = 300.94 NGVD 29
 INVERT ELEV. = 300.23 NAVD 88

Curve = CE1
 PI 13+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE2
 PI 12+04.08
 Δ = 93° 07' 48" (LT)
 R = 50.00'
 T = 52.81'
 L = 81.27'

Curve = CE3
 PI 11+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE4
 PI 10+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE5
 PI 9+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE6
 PI 8+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE7
 PI 7+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE8
 PI 6+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE9
 PI 5+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE10
 PI 4+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE11
 PI 3+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE12
 PI 2+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE13
 PI 1+04.08
 Δ = 60° 58' 24" (LT)
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 L = 53.21'

Curve = CE14
 PI 0+04.08
 Δ = 60° 58' 24" (LT)
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 Δ = 60° 58' 24" (LT)
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 L = 53.21'

Curve = CE16
 PI -2+04.08
 Δ = 60° 58' 24" (LT)
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 Δ = 60° 58' 24" (LT)
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 Δ = 60° 58' 24" (LT)
 R = 50.00'
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 L = 53.21'

Curve = CE19
 PI -5+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE20
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 L = 53.21'

Curve = CE21
 PI -7+04.08
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 T = 29.44'
 L = 53.21'

Curve = CE22
 PI -8+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE23
 PI -9+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE24
 PI -10+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE25
 PI -11+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE26
 PI -12+04.08
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Curve = CE27
 PI -13+04.08
 Δ = 60° 58' 24" (LT)
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Curve = CE28
 PI -14+04.08
 Δ = 60° 58' 24" (LT)
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 T = 29.44'
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Curve = CE29
 PI -15+04.08
 Δ = 60° 58' 24" (LT)
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 T = 29.44'
 L = 53.21'

Curve = CE30
 PI -16+04.08
 Δ = 60° 58' 24" (LT)
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 T = 29.44'
 L = 53.21'

Curve = CE31
 PI -17+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE32
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Curve = CE33
 PI -19+04.08
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 T = 29.44'
 L = 53.21'

Curve = CE34
 PI -20+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE35
 PI -21+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE36
 PI -22+04.08
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Curve = CE37
 PI -23+04.08
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 T = 29.44'
 L = 53.21'

Curve = CE38
 PI -24+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE39
 PI -25+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE40
 PI -26+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE41
 PI -27+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE42
 PI -28+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE43
 PI -29+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE44
 PI -30+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE45
 PI -31+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE46
 PI -32+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE47
 PI -33+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE48
 PI -34+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE49
 PI -35+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE50
 PI -36+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE51
 PI -37+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE52
 PI -38+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE53
 PI -39+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE54
 PI -40+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE55
 PI -41+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE56
 PI -42+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
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 L = 53.21'

Curve = CE57
 PI -43+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE58
 PI -44+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE59
 PI -45+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE60
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 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE61
 PI -47+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE62
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 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE63
 PI -49+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE64
 PI -50+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE65
 PI -51+04.08
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 R = 50.00'
 T = 29.44'
 L = 53.21'

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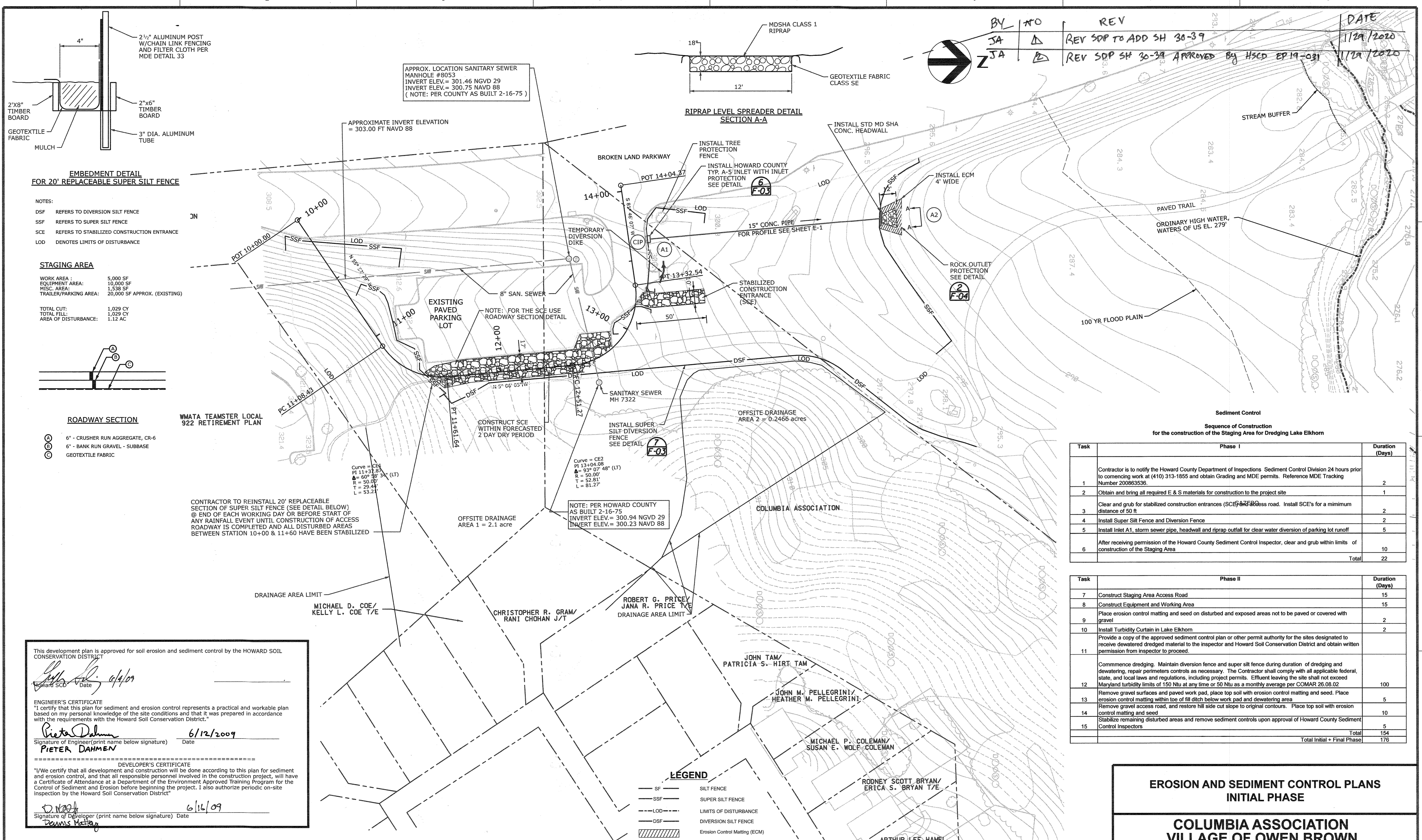
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 PI -54+04.08
 Δ = 60° 58' 24" (LT)
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 T = 29.44'
 L = 53.21'

Curve = CE69
 PI -55+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
 L = 53.21'

Curve = CE70
 PI -56+04.08
 Δ = 60° 58' 24" (LT)
 R = 50.00'
 T = 29.44'
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 Δ = 60° 58' 24" (LT)
 R = 50.00'
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 L = 53.21'

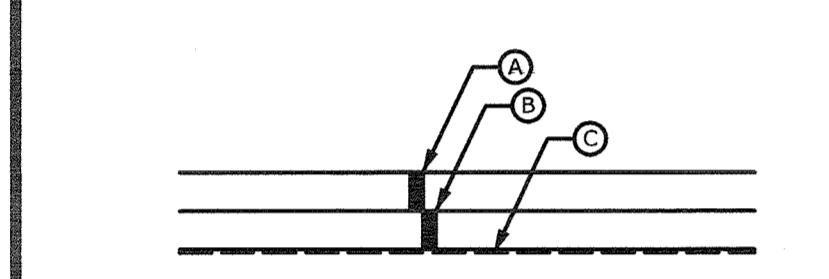


BY	NO	REV	DATE
JA	1	REV SDP TO ADD SH 30-39	1/29/2020
ZJA	2	REV SDP SH 30-39 APPROVED BY HSED EP19-031	1/29/2020

EMBEDMENT DETAIL FOR 20' REPLACEABLE SUPER SILT FENCE

NOTES:
 DSF REFERS TO DIVERSION SILT FENCE
 SSF REFERS TO SUPER SILT FENCE
 SCE REFERS TO STABILIZED CONSTRUCTION ENTRANCE
 LOD DENOTES LIMITS OF DISTURBANCE

STAGING AREA
 WORK AREA: 5,000 SF
 EQUIPMENT AREA: 10,000 SF
 MISC. AREA: 1,538 SF
 TRAILER/PARKING AREA: 20,000 SF APPROX. (EXISTING)
 TOTAL CUT: 1,029 CY
 TOTAL FILL: 1,029 CY
 AREA OF DISTURBANCE: 1.12 AC



ROADWAY SECTION

- A 6" - CRUSHER RUN AGGREGATE, CR-6
- B 6" - BANK RUN GRAVEL - SUBBASE
- C GEOTEXTILE FABRIC

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

[Signature] 6/16/09
 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] 6/12/2009
 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"

[Signature] 6/16/09
 Signature of Developer (print name below signature) Date
DENNIS MERRY

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[Signature] 6-9-9
 Chief, Development Engineering Division Date

[Signature] 7/4/09
 Chief, Division of Land Development Date

[Signature] 7/7/09
 Director Date

Maryland Department of the Environment
 Water Management Administration
 Dam Safety Division

[Signature] 4/13/09
 V. 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

[Signature]
PIETER DAHMEN, PE
 HDR ENGINEERING INC.
 March 31, 2009

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

EROSION AND SEDIMENT CONTROL PLANS INITIAL PHASE

COLUMBIA ASSOCIATION VILLAGE OF OWEN BROWN SECTION 1, AREA 1, LOT 280

MINOR GRADING IN SUPPORT OF LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

SCALE AS SHOWN
 FEBRUARY 6, 2009

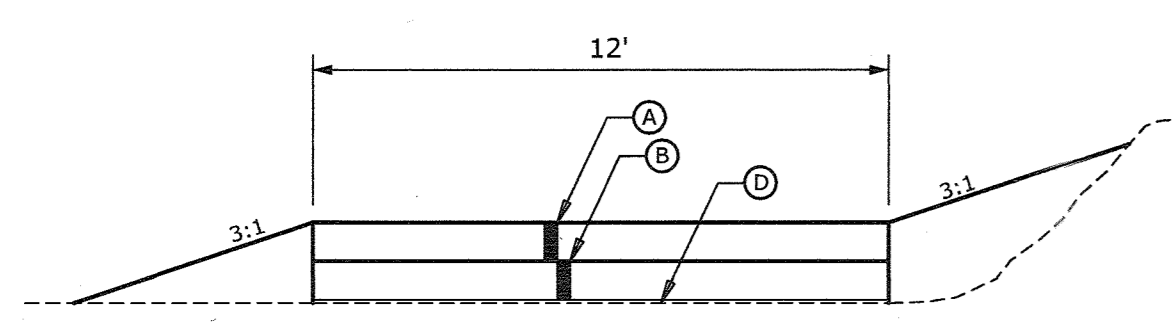
DRAWING F-01, SHEET 26 OF 28

Sediment Control Sequence of Construction for the construction of the Staging Area for Dredging Lake Elkhorn

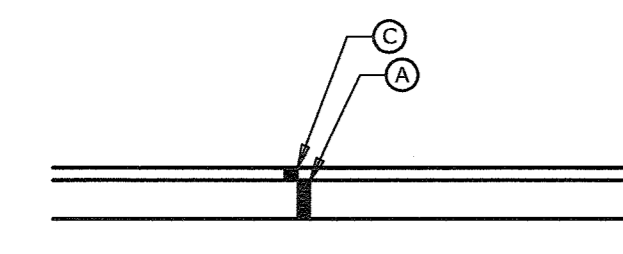
Task	Phase I	Duration (Days)
1	Contractor is to notify the Howard County Department of Inspections Sediment Control Division 24 hours prior to commencing work at (410) 313-1855 and obtain Grading and MDE permits. Reference MDE Tracking Number 200863536.	2
2	Obtain and bring all required E & S materials 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 Super Silt Fence and Diversion Fence	2
5	Install Inlet A1, storm sewer pipe, headwall and riprap outfall for clear water diversion of parking lot runoff	5
6	After receiving permission of the Howard County Sediment Control Inspector, clear and grub within limits of construction of the Staging Area	10
	Total	22

Task	Phase II	Duration (Days)
7	Construct Staging Area Access Road	15
8	Construct Equipment and Working Area	15
9	Place erosion control matting and seed on disturbed and exposed areas not to be paved or covered with gravel	2
10	Install Turbidity Curtain in Lake Elkhorn	2
11	Provide a copy of the approved sediment control plan or other permit authority for the sites designated to receive dewatered dredged material to the inspector and Howard Soil Conservation District and obtain written permission from inspector to proceed.	
12	Commence dredging. Maintain 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 gravel surfaces and paved work pad, place top soil with erosion control matting and seed. Place erosion control matting within toe of fill ditch below work pad and dewatering area	5
14	Remove gravel access road, and restore hill side cut slope to original contours. Place top soil with erosion control matting and seed	10
15	Stabilize remaining disturbed areas and remove sediment controls upon approval of Howard County Sediment Control Inspectors	5
	Total	154
	Total Initial + Final Phase	176

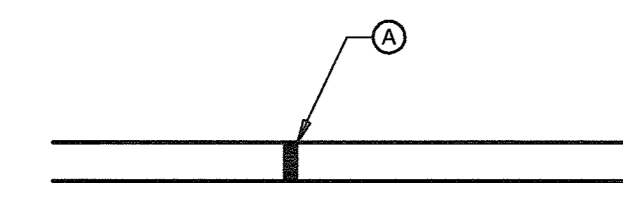
BY	NO	REV	DATE
JA	1	REV SDP TO ADD SH 30-39	1/29/2020
JA	2	REV SDP SH 30-39 APPROVED BY HSCD EP 19-031	1/29/2020



TYPICAL ROADWAY SECTION



TYPICAL SECTION WORK AREA



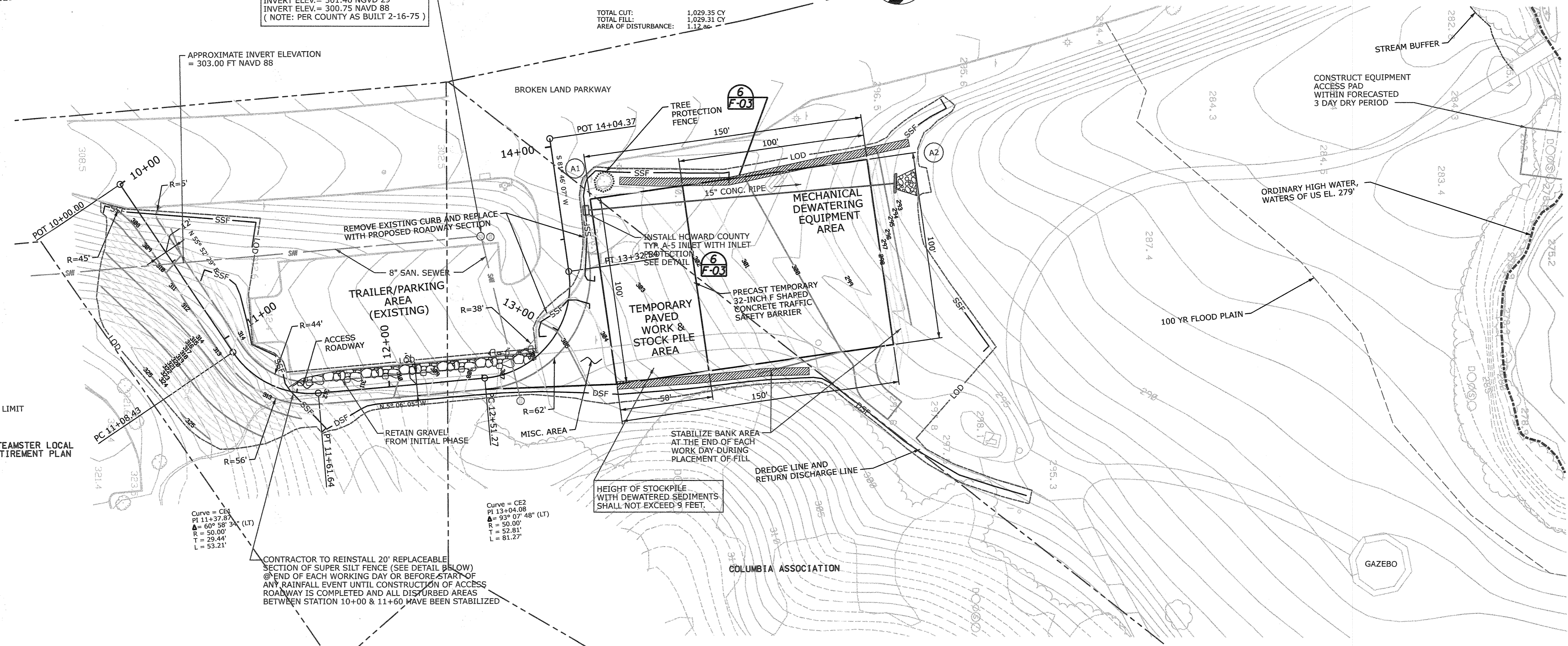
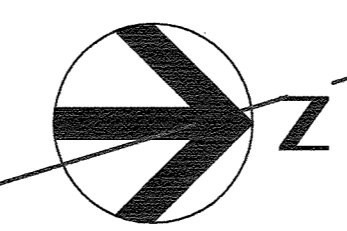
TYPICAL SECTION EQUIPMENT AREA TRAILER/PARKING AREA

- (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

DRAINAGE AREA LIMIT
WMATA TEAMSTER LOCAL 922 RETIREMENT PLAN

APPROX. LOCATION SANITARY SEWER MANHOLE #8053
INVERT ELEV. = 301.46 NAVD 29
INVERT ELEV. = 300.75 NAVD 88
(NOTE: PER COUNTY AS BUILT 2-16-75)

STAGING AREA
WORK AREA: 5,000 SF
EQUIPMENT AREA: 10,000 SF
MISC. AREA: 1,538 SF
TRAILER/PARKING AREA: 20,000 SF APPROX. (EXISTING)
TOTAL CUT: 1,029.35 CY
TOTAL FILL: 1,029.31 CY
AREA OF DISTURBANCE: 1.12 AC



MICHAEL D. COE/
KELLY L. COE T/E

CHRISTOPHER R. GRAM/
RANI CHOHAN J/T

ROBERT G. PRICE/
JANA R. PRICE T/E

NOTE:
FOR ACCESS TO DREDGING EQUIPMENT DURING WET CONDITIONS, COVER WET AND SOFT AREAS USED BY EQUIPMENT WITH GEOWEB (OR APPROVED EQUIVALENT) AS NEEDED OR AS DIRECTED BY THE INSPECTOR.

LEGEND

— SF —	SILT FENCE
— SSF —	SUPER SILT FENCE
--- LOD ---	LIMITS OF DISTURBANCE
— DSF —	DIVERSION SILT FENCE

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

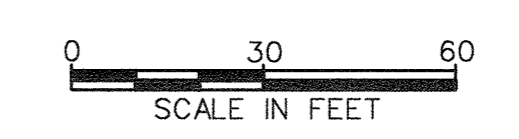
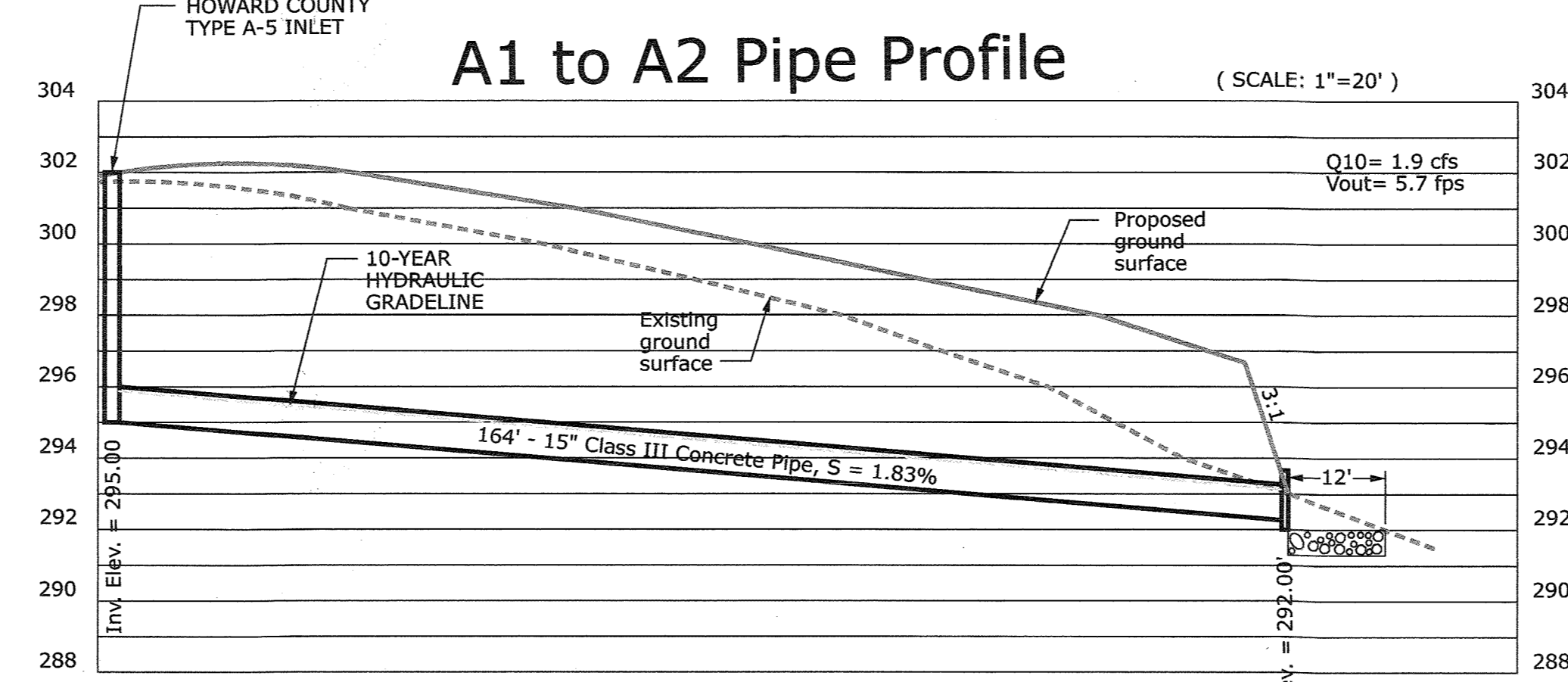
[Signature] 6/11/09
Howard SCD Date

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] 06/12/2009
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."

[Signature] 6/16/09
Signature of Developer (print name below signature) Date
Dennis Weisberg



APPROVED: DEPARTMENT OF PLANNING AND ZONING

[Signature] 6-9-9
Chief, Development Engineering Division Date

[Signature] 7/2/09
Chief, Division of Land Development Date

[Signature] 2/7/05
Director Date

Maryland Department of the Environment
Water Management Administration
Dam Safety Division

[Signature] 4/13/09
V. 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

[Signature]
PIETER DAHMEN, PE
HDR ENGINEERING INC.
March 31, 2009

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

EROSION AND SEDIMENT CONTROL PLANS
FINAL PHASE

COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280

MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING F-02, SHEET 27 OF 29

SDP-08-107

Construction Specifications

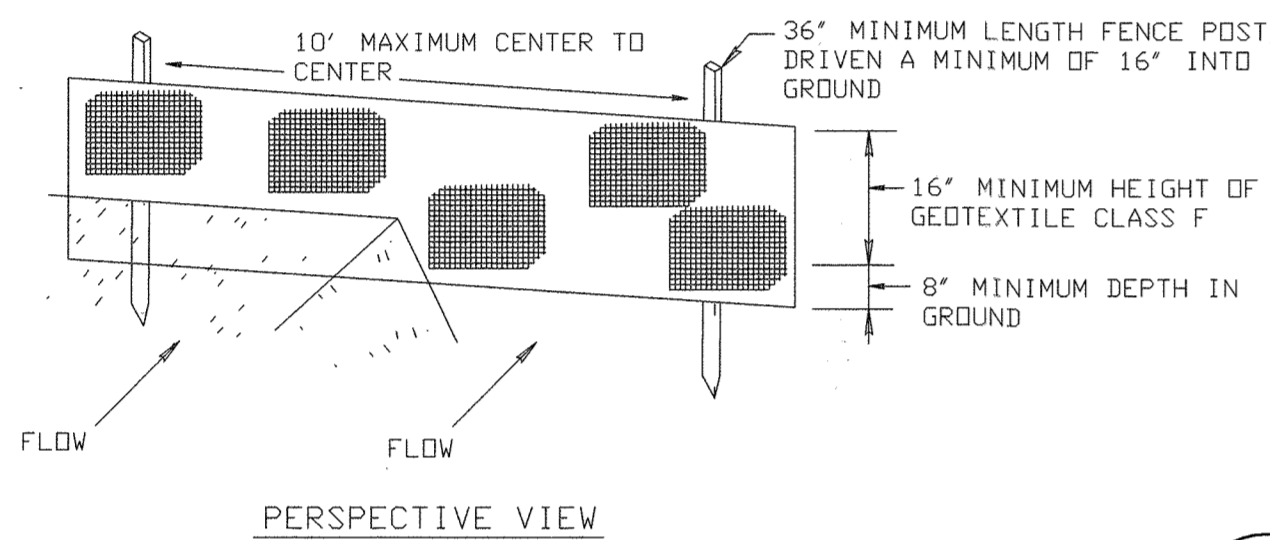
- Fence posts shall be a minimum of 36' long driven 16' minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pound per linear foot.
- 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/ft ² /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322
- Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
- Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

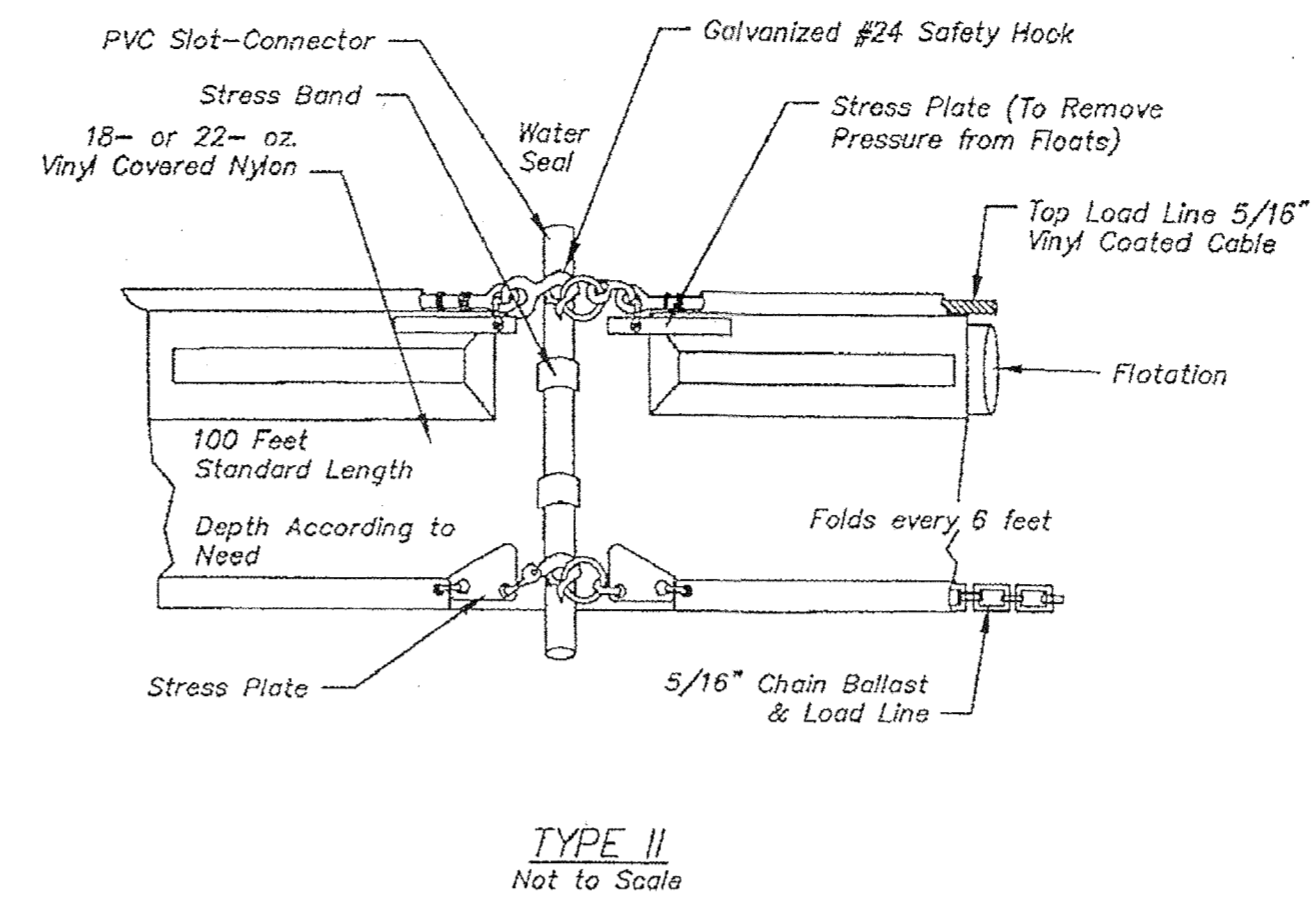
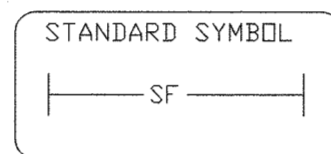
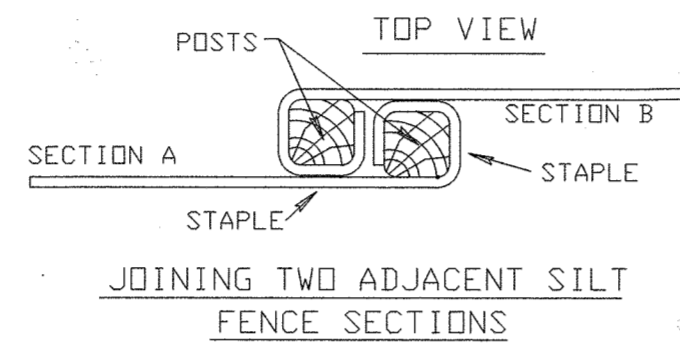
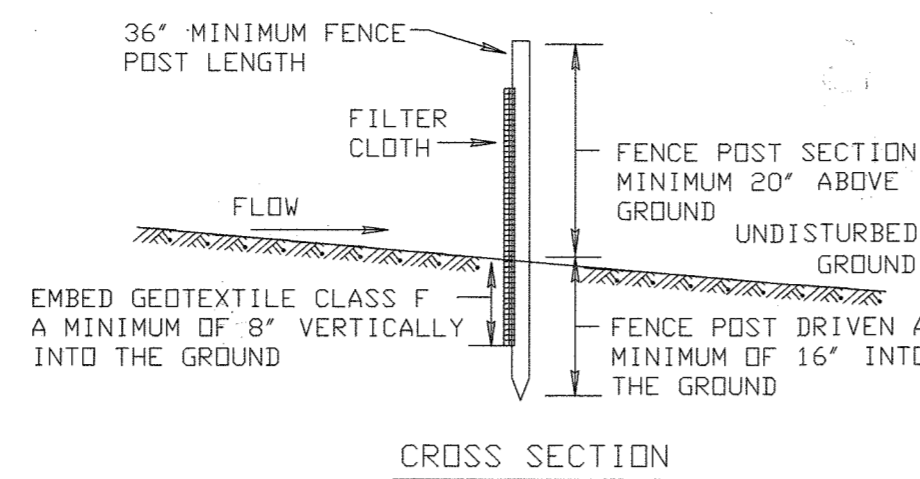
Silt Fence Design Criteria

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.

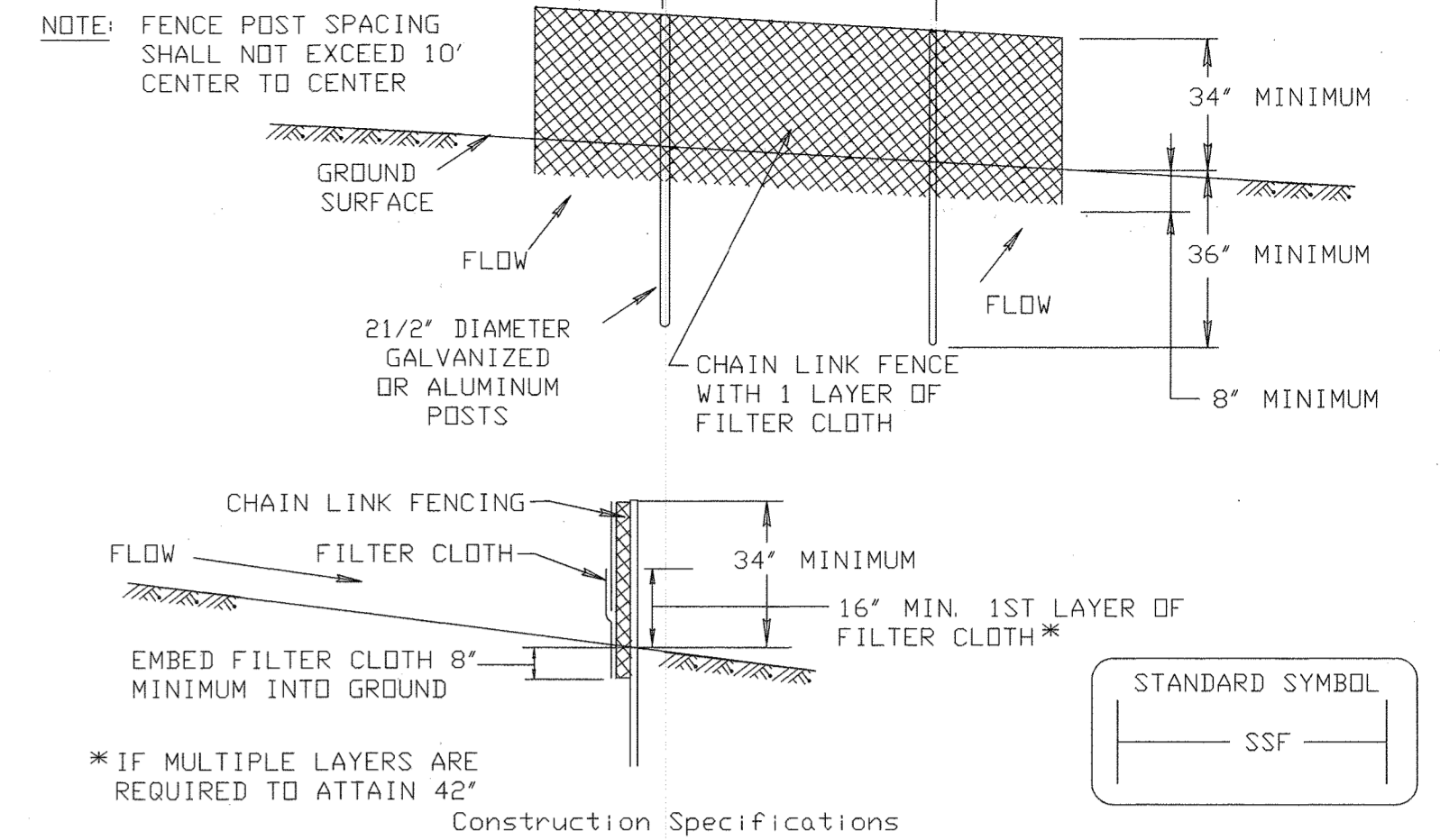


SILT FENCE 5
F-03



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

TURBIDITY CURTAIN 1
F-03



- 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.
- 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.
- Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24' at the top and mid section.
- Filter cloth shall be embedded a minimum of 8' into the ground.
- When two sections of filter cloth adjoin each other, they shall be overlapped by 6' and folded.
- 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.
- 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/ft ² /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

SUPER SILT FENCE 4
F-03

By	NO	REV	DATE
JA	Δ	REV SDP TO ADD SH 30-39	1/29/2020
JA	Δ	REV SDP SH 30-39 APPROVED BY HSCD EP 17-031	1/29/2020

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

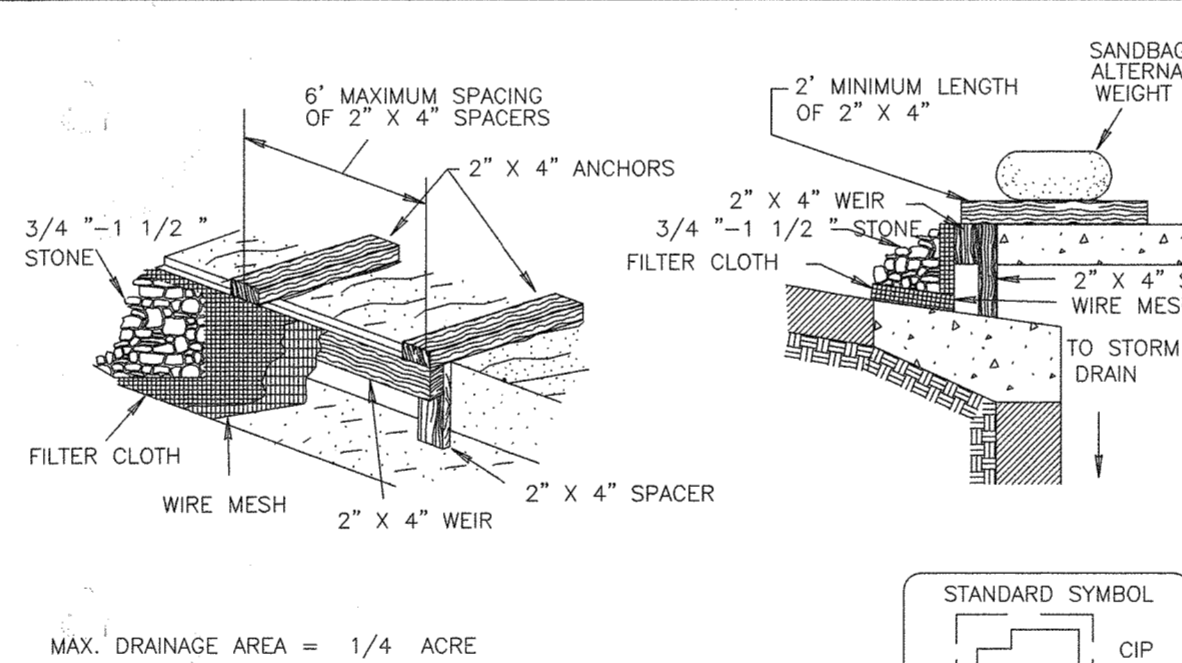
[Signature] 6/4/09
Howard SCD Date

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] 06/12/2009
Signature of Engineer (print name below signature) Date
PIETER DAHMEN

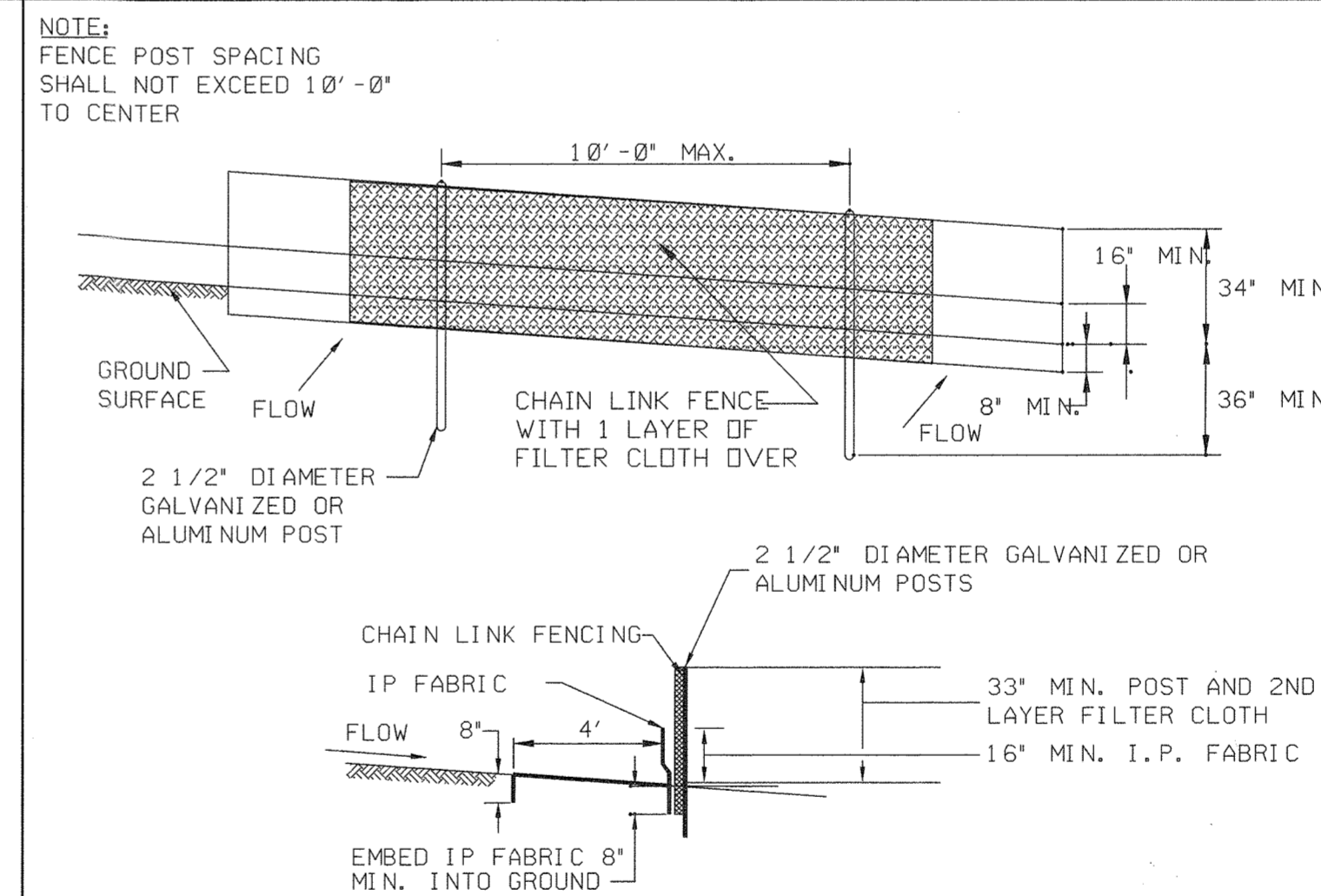
DEVELOPER'S CERTIFICATE
I/we certify that all development and construction will be done according to this plan for sediment and erosion control, and that all responsible personnel involved in the construction project, will have a Certificate of Attendance at a Department of the Environment Approved Training 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.

[Signature] 6/16/09
Signature of Developer (print name below signature) Date
Deanna M. Kelly



- Construction Specifications
- Attach a continuous piece of wire mesh (30" minimum width by throat length plus 4") to the 2" x 4" weir (measuring throat length plus 2") as shown on the standard drawing.
 - Place a continuous piece of Geotextile Class E the same dimensions as the wire mesh over the wire mesh and securely attach it to the 2" x 4" weir.
 - Securely nail the 2" x 4" weir to a 9" long vertical spacer to be located between the weir and the inlet face (max. 4' apart).
 - Place the assembly against the inlet throat and nail (minimum 2" lengths of 2" x 4" to the top of the weir at spacer locations). These 2" x 4" anchors shall extend across the inlet top and be held in place by sandbags or alternate weight.
 - The assembly shall be placed so that the end spacers are a minimum 1' beyond both ends of the throat opening.
 - Form the 1/2" x 1/2" wire mesh and the geotextile fabric to the concrete gutter and against the face of the curb on both sides of the inlet. Place clean 3/4" x 1 1/2" stone over the wire mesh and geotextile in such a manner to prevent water from entering the inlet under or around the geotextile.
 - This type of protection must be inspected frequently and the filter cloth and stone replaced when clogged with sediment.
 - Assure that storm flow does not bypass the inlet by installing a temporary earth or asphalt dike to direct the flow to the inlet.

STORM DRAIN INLET PROTECTION 6
F-03



SUPER SILT DIVERSION FENCE (DSF) 7
F-03

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

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[Signature] 6.9.9
Chief, Development Engineering Division Date

[Signature] 7/3/09
Chief, Division of Land Development Date

[Signature] 2/7/09
Director Date

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

[Signature] 4/13/09
V. 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.

[Professional Engineer Seal]
Professional Engineer
March 31, 2009

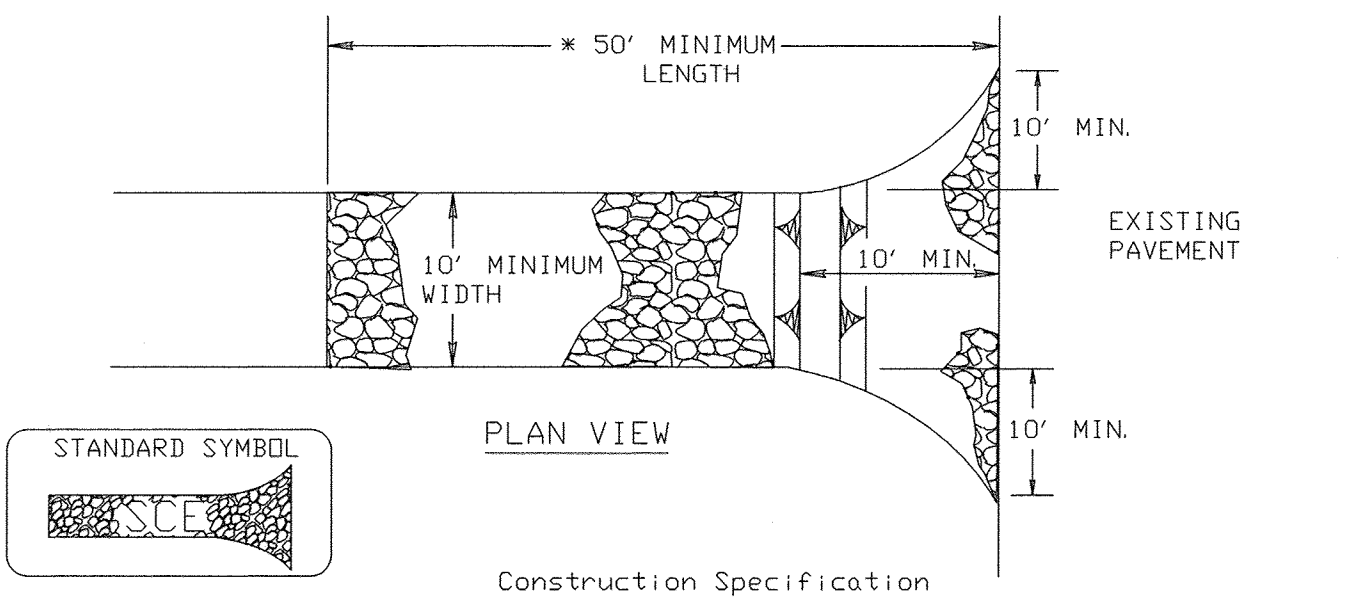
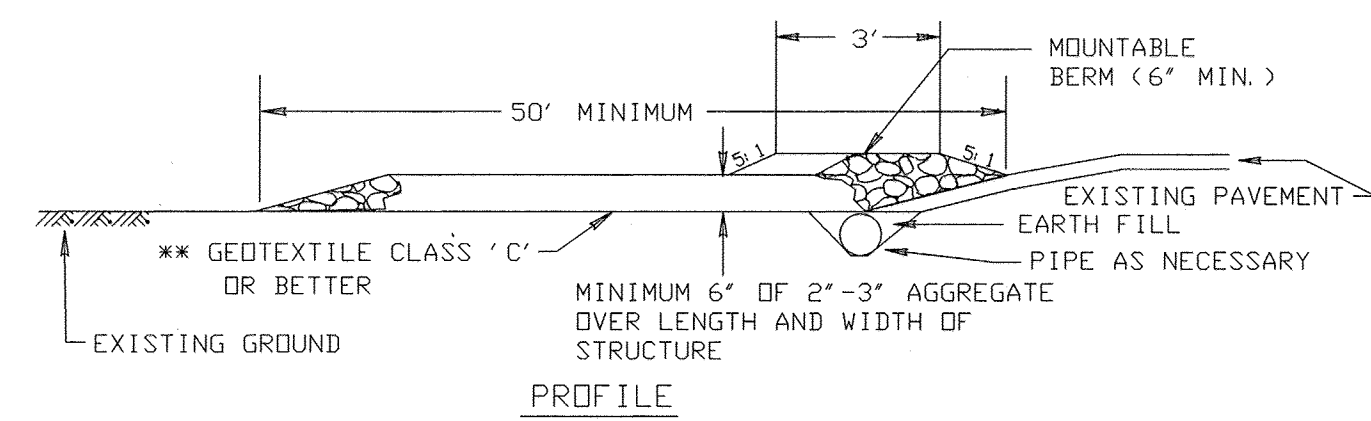
COLUMBIA ASSOCIATION
10221 WINCOPIN CIRCLE #100
COLUMBIA, MD 21044
(410)-381-2947

EROSION AND SEDIMENT CONTROL
DETAILS AND NOTES

COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280

MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

SCALE AS SHOWN
FEBRUARY 6, 2009



- Construction Specification**
- Length - minimum of 50' (*30' for single residence lot).
 - Width - 10' minimum, should be flared at the existing road to provide a turning radius.
 - 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.
 - 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.
 - 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.
 - 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 4
F-04

BY	NO	REV	DATE
JA	1	REV SDP TO ADD SH 30-39	1/29/2020
JA	2	REV SDP SH 30-39 APPROVED BY HXDEP (19-03)	1/29/2020

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

[Signature] Date: 4/6/09
Howard SCD Date

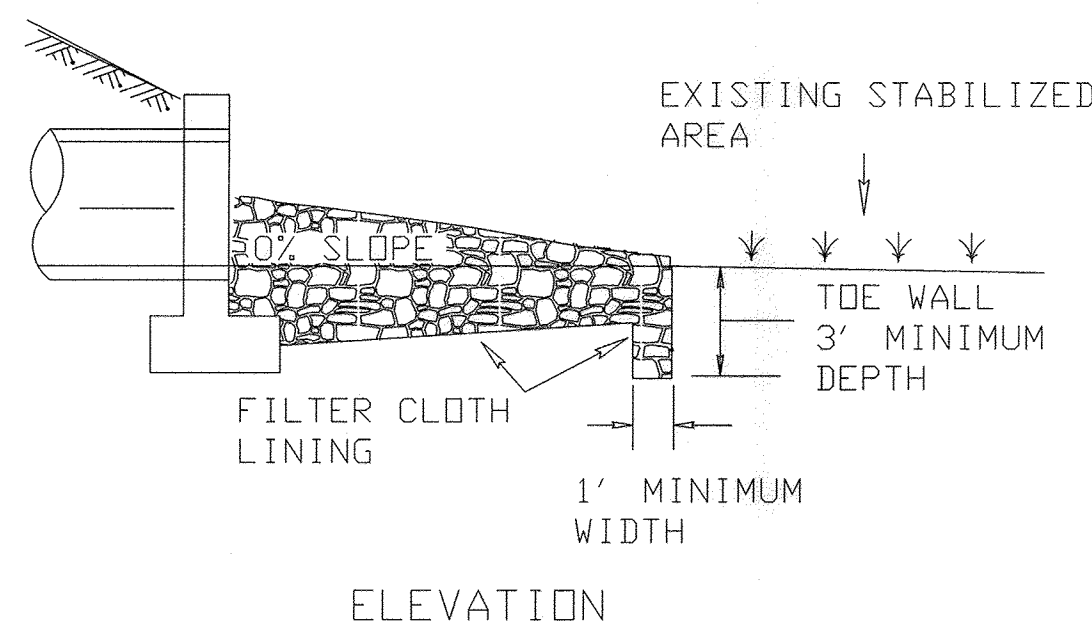
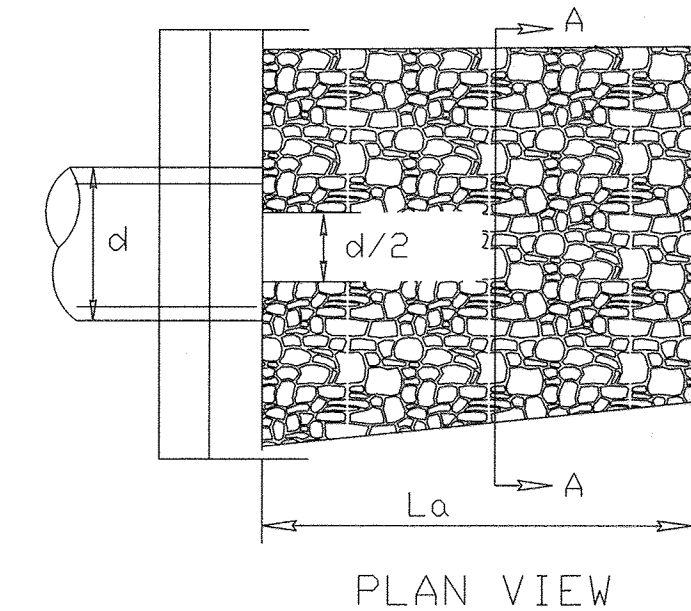
ENGINEER'S CERTIFICATE
I certify that this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements of the Howard Soil Conservation District.

Pieter Dahmen 06/12/2009
Signature of Engineer (print name below signature) Date

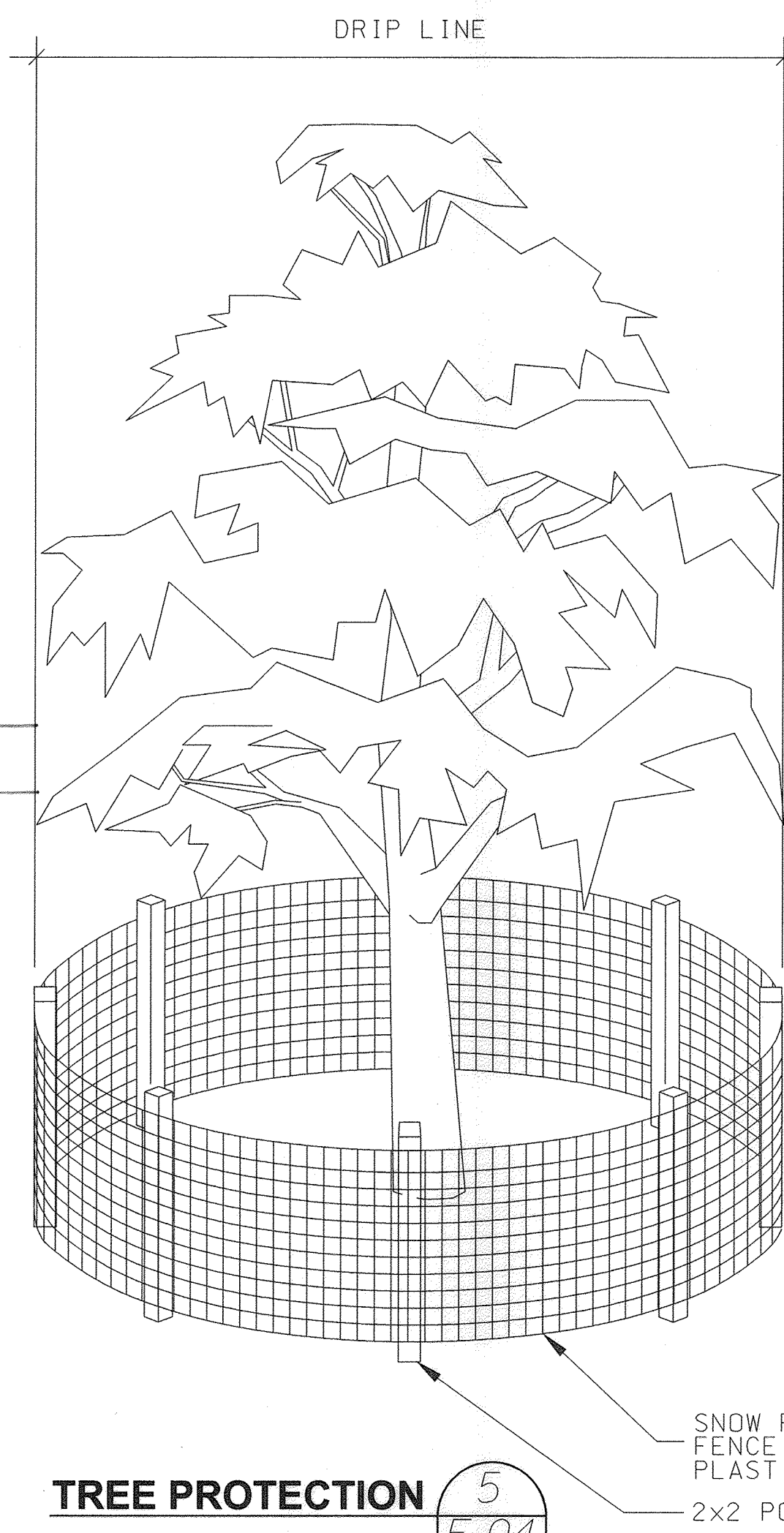
Pieter Dahmen
Signature of Engineer (print name below signature) Date

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.

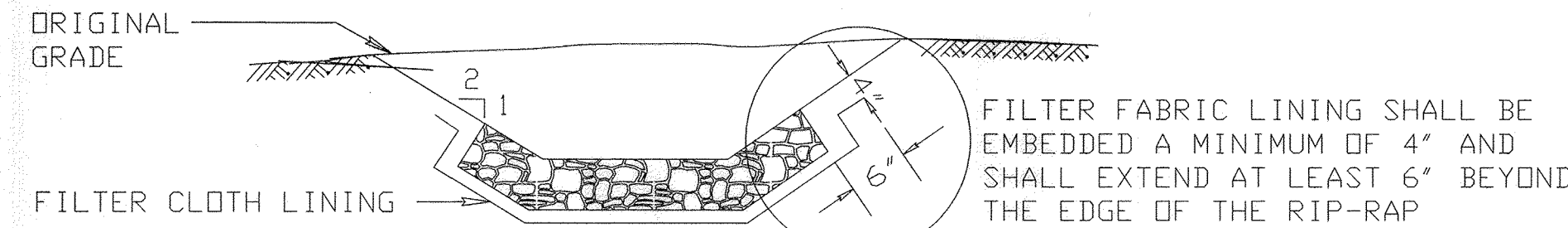
D. Walsh 6/16/09
Signature of Developer (print name below signature) Date



ROCK OUTLET PROTECTION TYPE III 2
F-04

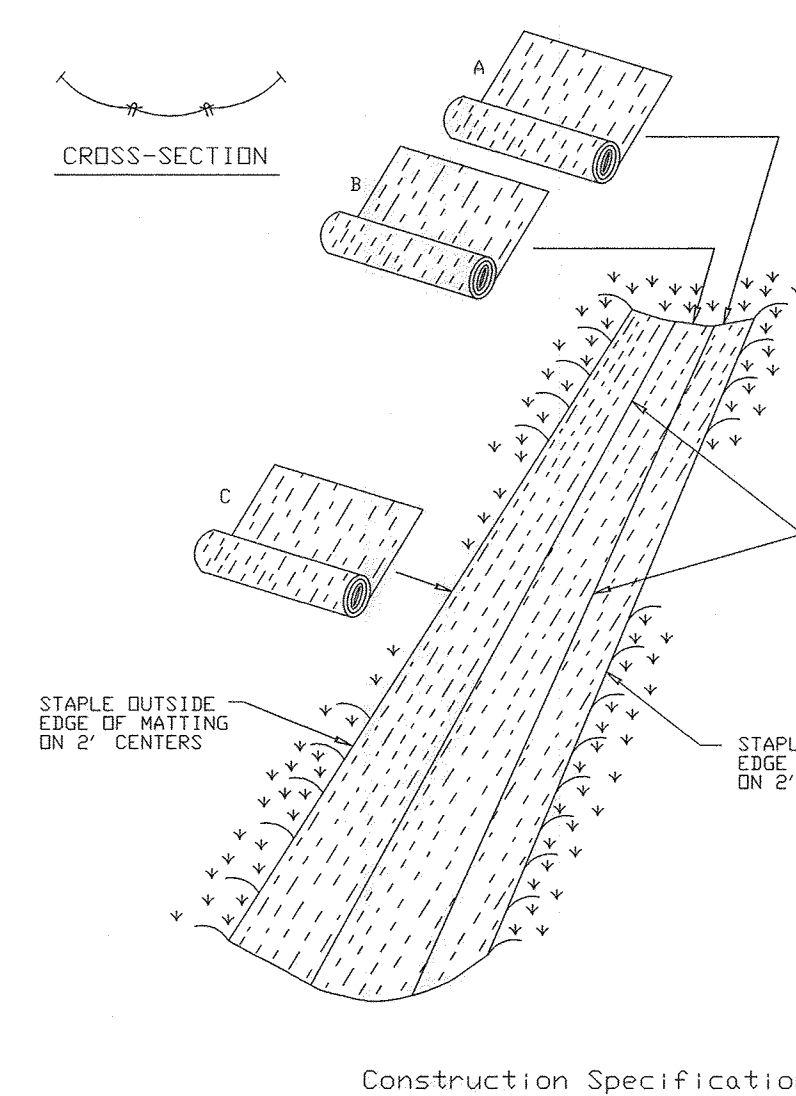


TREE PROTECTION 5
F-04



SECTION A-A NOTE: FILTER CLOTH SHALL BE GEOTEXTILE CLASS C

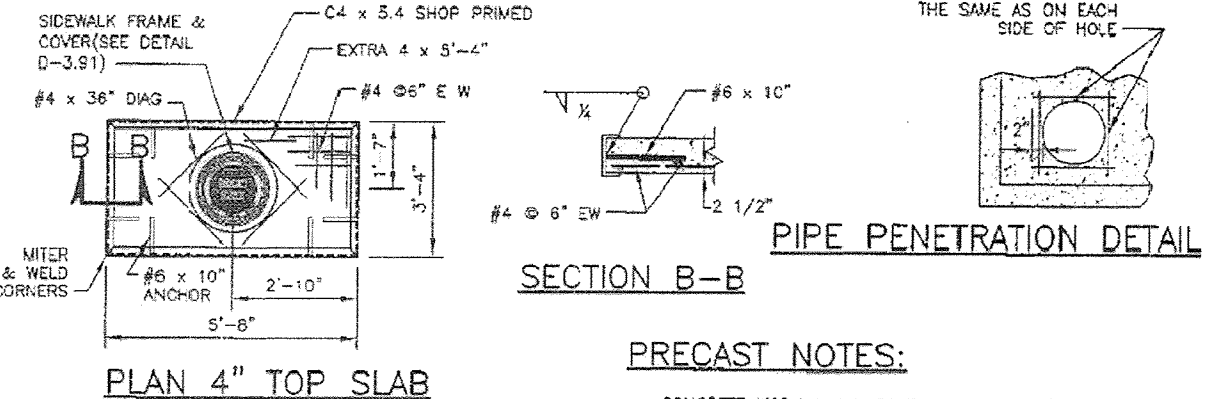
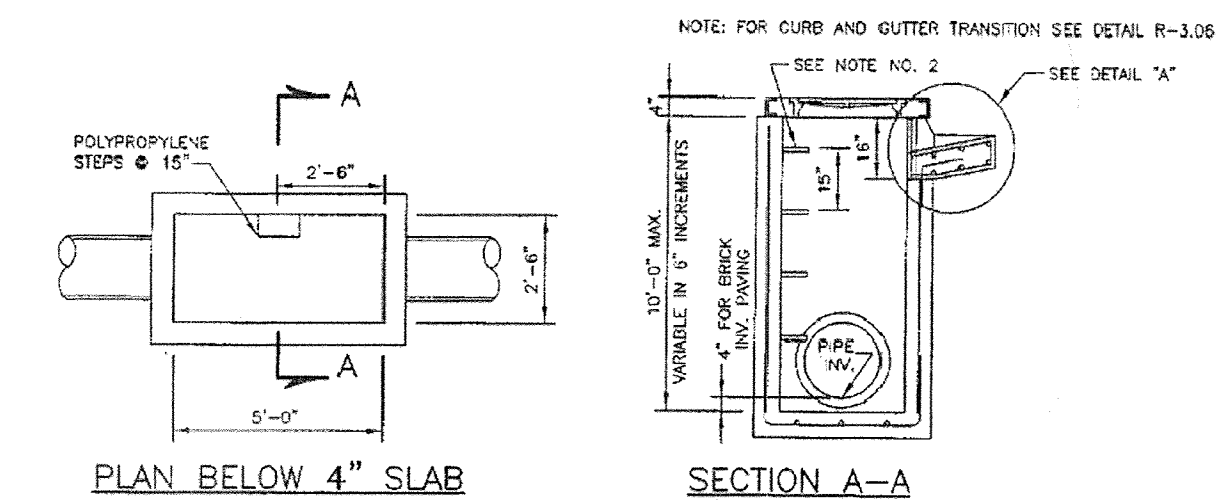
- Construction Specifications**
- The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
 - The rock or gravel shall conform to the specified grading limits when installed respectively in the rip-rap or filter.
 - Geotextile shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile shall be a minimum of one foot.
 - Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spoils filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.
 - The stone shall be placed so that it blends in with the existing ground. If the stone is placed too high, then the flow will be forced out of the channel and scour adjacent to the stone will occur.



- Construction Specifications**
- 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'.
 - Staple the 4' overlap in the channel center using an 18" spacing between staples.
 - Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.
 - Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.
 - 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.
 - The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

EROSION CONTROL MATTING 6
F-04

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



- PRECAST NOTES:**
- CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF LATEST EDITIONS OF ACI 301 AND ACI 318.
 - PRECAST STRUCTURES SHALL BE DESIGNED BY A PRECAST CONCRETE STRUCTURES MANUFACTURER IN ACCORDANCE TO LOADS SPECIFIED IN LATEST EDITIONS OF ASTM C940.
 - PRECAST STRUCTURES SHALL CONFORM TO THE REQUIREMENT OF LATEST EDITIONS OF ASTM C940.
 - RESILIENT CONNECTORS BETWEEN MANHOLE STRUCTURES, PIPES AND LATERALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF LATEST EDITIONS OF ASTM C940.
 - CONCRETE SHALL CONFORM TO LATEST EDITIONS OF THE SIA STANDARD SPECIFICATION FOR CONSTRUCTION & MATERIALS.
 - POLYPROPYLENE STEPS SHALL BE INSTALLED NIKE WHERE SHOWN (SEE 0-21).
 - REFERENCE DRAWING FOR TYPE A-5 INLET IS HOWARD COUNTY STANDARD DRAWING NO. C-4-01.
 - PROVIDE 3" DIA SCHEDULE 40 RUST PROOF STEEL PIPE, PAINTED GRAY AT MID POINT OF THROAT, FILL WITH CONCRETE, INSTALLED THROUGH THE THROAT, FLANGE AT TOP EMBEDDED OR CORDED INTO GUTTER AT BOTTOM.

STORM INLET TYPE A-5 PRECAST <10' DEPTH 3
F-04

- Construction and Material Specifications**
- 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.
 - Topsoil Specifications** - Soil to be used as topsoil must meet the following:
 - 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 soils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2" in diameter.
 - Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, johnsongrass, nutgrass, pigon Ivy, etc., or others as specified.
 - 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.
 - For sites having disturbed areas over 5 acres:
 - Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.
 - For sites having disturbed areas over 5 acres:
 - On soil meeting topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
 - pH For topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.
 - Organic content of topsoil shall be not less than 1.5 percent by weight.
 - Topsoil having soluble salt content greater than 500 parts per million shall not be used.
 - 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 phytotoxic materials.
 - Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.
 - Topsoil Application**
 - 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.
 - Grades on the areas to be topsoiled, which have been previously established, shall be maintained, altered 4" higher in elevation.
 - Topsoil shall be uniformly distributed in a 4" or 6" 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.
 - 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 seeded preparation.

TOPSOILING 1
F-04

EROSION AND SEDIMENT CONTROL DETAILS AND NOTES

COLUMBIA ASSOCIATION VILLAGE OF OWEN BROWN SECTION 1, AREA 1, LOT 280

MINOR GRADING IN SUPPORT OF LAKE ELKHORN RESTORATION ELECTION DISTRICT 3, HOWARD COUNTY MD. TAX MAP 36 AND 42

SCALE AS SHOWN
FEBRUARY 6, 2009

DRAWING F-04, SHEET 29 OF 29

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chad Edwards 6-9-9
Chief, Development Engineering Division Date

Chris Hansen 7/2/09
Chief, Division of Land Development Date

March DeCasper 7/2/09
Director Date

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

V.P. Dalal 4/13/09
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
PIETER DAHMEN, PE
HDR ENGINEERING INC.

STATE OF MARYLAND
REGISTERED PROFESSIONAL ENGINEER
No. 29951
March 21, 2009

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

39
SDP-08-107

STANDARD SYMBOLS

- SAN EXISTING SANITARY LINE AND MANHOLE
- UGE EXISTING UGE LINE
- GAS EXISTING GAS LINE
- W EXISTING WATER LINE
- OHE EXISTING OHE LINE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING GAS UTILITY
- EXISTING TRAVERSE POINT
- BENCHMARK
- EXISTING FENCE
- SD EXISTING STORMWATER PIPE
- PROPERTY BOUNDARY
- EXISTING EASEMENT
- TREELINE
- DECIDUOUS TREE
- CONIFEROUS TREE
- EXISTING STRUCTURE
- EXISTING RIPRAP
- EXISTING EDGE OF PAVEMENT
- EXISTING PATH
- 450- EXISTING 5' MAJOR CONTOUR
- 449 EXISTING 1' MINOR CONTOUR
- EXISTING WOODEN BRIDGE
- WATERWAY CENTERLINE
- WUS SURVEYED WATERS OF THE US
- WL SURVEYED WETLAND
- WB 25' WETLAND BUFFER
- LaC SOIL BOUNDARY
- Ha HYDROLOGIC SOIL GROUP
- CRZ CRITICAL ROOT ZONE
- 10YR WSEL 10 YEAR WATER SURFACE ELEVATION
- 100YR WSEL 100 YEAR WATER SURFACE ELEVATION
- 10YR HGL 10 YEAR HYDRAULIC GRADE LINE
- 25YR HGL 25 YEAR HYDRAULIC GRADE LINE
- 100YR HGL 100 YEAR HYDRAULIC GRADE LINE
- PROPOSED WEIR RIFFLE
- PROPOSED WOODCHIP ACCESS ROAD
- PROPOSED STOCKPILE/STAGING AREA
- OCF PROPOSED ORANGE CONSTRUCTION FENCE
- TPF TREE PROTECTION FENCE
- LOD LIMIT OF DISTURBANCE
- SF SILT FENCE
- 450 PROPOSED MAJOR CONTOURS
- 449 PROPOSED MINOR CONTOURS
- PROPOSED BOULDERS
- PROPOSED CROSS VANE
- PROPOSED SAND BAG DIKE
- HIGHLY ERODIBLE SOILS (>15% SLOPES)
- HIGHLY ERODIBLE SOILS (>5% SLOPES AND K<0.35)
- STEEP SLOPES (20% OR GREATER)
- TYPE D TEMPORARY SOIL STABILIZATION MATTING SLOPE

RUSTLING LEAF STREAM STABILIZATION PROJECT

COLUMBIA ASSOCIATION

COLUMBIA, MD

DESIGN CERTIFICATION:

"I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNATED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

Joseph D. Arrowsmith / 1/29/2020
 DESIGNER'S SIGNATURE DATE

JOSEPH D. ARROWSMITH MD REGISTRATION NO. 44918
 PRINTED NAME R.L.S. OR R.L.A. (CIRCLE ONE)

OWNER/DEVELOPER CERTIFICATION:

"I/WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) APPROVED TRAINING PROGRAM FOR THE CONTROL ON EROSION AND SEDIMENT PRIOR TO BEGINNING THE PROJECT. I CERTIFY RIGHT-OF-ENTRY FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY, THE HOWARD SOIL CONSERVATION DISTRICT AND/OR MDE."

Albert F. Edwards, P.E. / 1-30-2020
 OWNER'S/DEVELOPER'S SIGNATURE DATE

Albert F. Edwards, P.E.
 Asst. Director of D.S. & F.S.
 PRINTED NAME & TITLE

HOWARD SCD SIGNATURE BLOCK:

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

Steph... / 2/5/20
 HOWARD SOIL CONSERVATION DISTRICT DATE

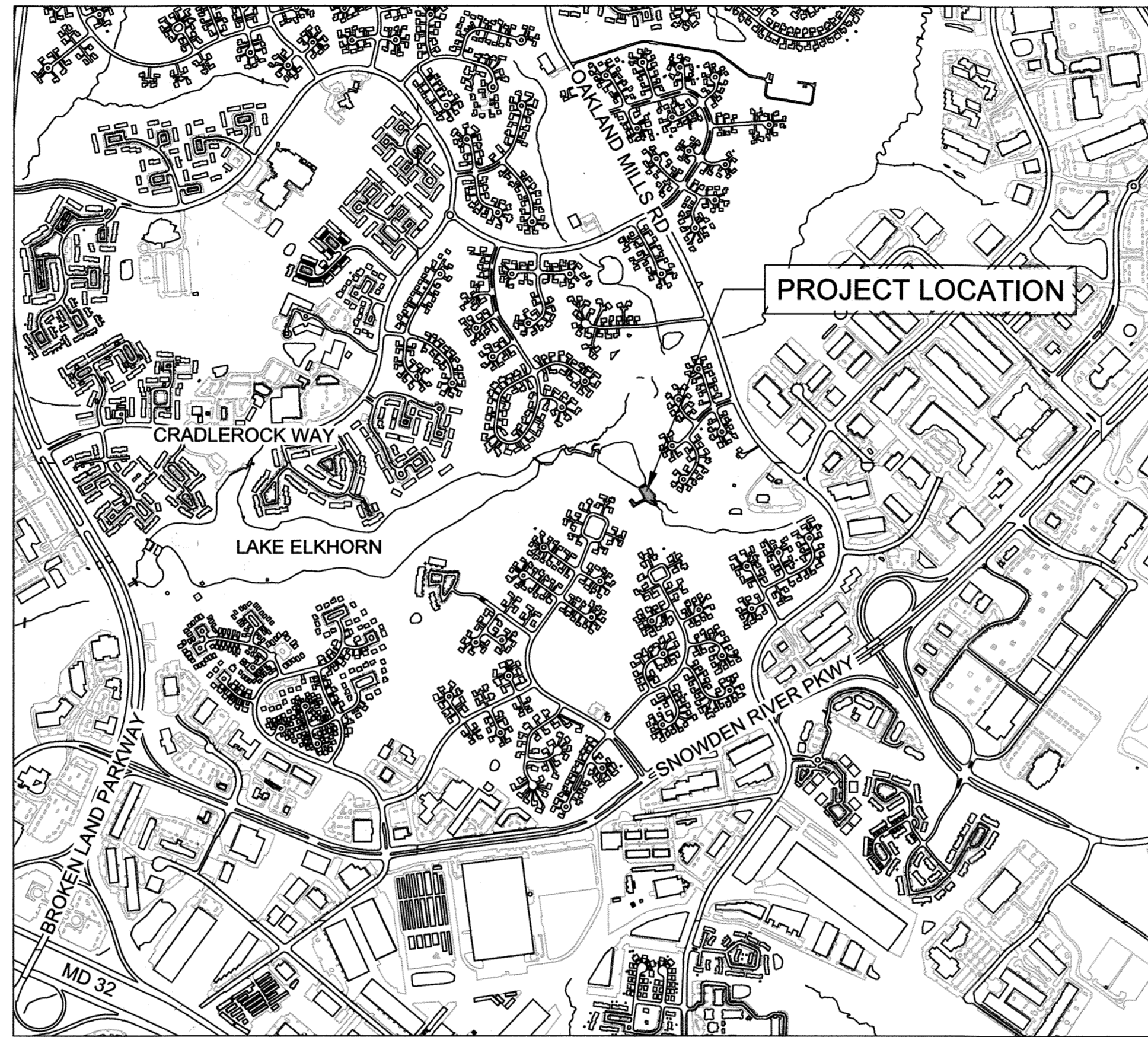
* SEE APPROVAL UNDER EP-19-31

APPROVED: DEPARTMENT OF PLANNING AND ZONING

David... / 2.12.20
 Chief, Development Engineering Division Date

... / 2/16/2020
 Chief, Division of Land Development Date

... / 2/20/2020
 Director Date



SITE ASSESSMENT

TAX MAP/PARCEL/LOT: 36/387/516
 DEED REF: 03324/00191
 DISTRICT: 16
 USE: NEW TOWN
 PROPERTY AREA: 7.98 AC
 WATERSHED: LITTLE PATUXENT
 PROPERTY OWNER: COLUMBIA ASSOCIATION
 SITE ANALYSIS
 LIMIT OF DISTURBANCE: 18,171 SF
 TOTAL VEGETATED AREA: 16,020 SF
 TEMPORARY STAGING AREA: 600 SF
 CUT: 756 CY, FILL: 184 CY (DERIVED FROM AUTOCAD SURFACE)
 OFFSITE WASTE LOCATION: SITE WITH ACTIVE GRADING PERMIT

VICINITY MAP

SCALE: 1"=1000'

GENERAL NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE COLUMBIA ASSOCIATION AT 410-312-6336 AT LEAST FIVE (5) DAYS PRIOR TO STARTING WORK.
2. THE CONTRACTOR SHALL NOTIFY MISS UTILITY AT 1.800.257.7777 AT LEAST FIVE (5) WORKING DAYS BEFORE STARTING WORK.
3. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO STARTING WORK.
4. THE SYSTEM OF COORDINATES USED IS BASED ON THE FOLLOWING DATUMS.
 - 4.1. HORIZONTAL: MARYLAND STATE PLANE NAD OF 1983/2011
 - 4.2. VERTICAL: NORTH AMERICAN VERTICAL DATUM (NAVD) 1988
5. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY.
6. TOPOGRAPHIC SURVEYS WERE PERFORMED BY NJR & ASSOCIATES IN DECEMBER 2018.
7. PROPERTY LINES AND EASEMENTS SHOWN ON THIS PLAN ARE APPROXIMATE AND FOR REFERENCE ONLY.
8. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE COLUMBIA ASSOCIATION IS TO BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT NOTIFYING THE COLUMBIA ASSOCIATION, THEN THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
10. UTILITY LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND TAKEN FROM AVAILABLE PLANS, RECORDS AND/OR FIELD RECONNAISSANCE. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO LOCATE AND PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
 - 10.1. UTILITY CONTACTS:
 - 10.1.1. BALTIMORE GAS AND ELECTRIC - USIC SOUTH AND EAST HOWARD: 443.239.4412
 - 10.1.2. VERIZON CUSTOMER SERVICE: 800.922.0204
 - 10.1.3. COMCAST CUSTOMER SERVICE: 800.934.6489
11. THE WETLAND DELINEATION FOR THIS SITE WAS PERFORMED BY STRAUGHAN ENVIRONMENTAL IN NOVEMBER 2018.
12. ALL SPECIFIED OR PROPRIETARY PRODUCTS SHOWN HEREON MAY BE SUBJECT TO SUBSTITUTION WITH OTHER PRODUCTS RECOMMENDED BY THE CONTRACTOR SUBJECT TO WRITTEN REVIEW AND APPROVAL BY THE COLUMBIA ASSOCIATION.
13. REFER TO HOWARD COUNTY SDP-08-107, SHEET 4 FOR PROJECT SITE, SHEET 4 SHOWS LAKE ELKHORN FOREBAY AND SHOWS EMBANKMENT PIPE AND PAVED TRAIL WITH NO STORMWATER MANAGEMENT PLAN DESIGN.
14. THE PROJECT HAS MDE PERMIT NUMBER 19-NT-3090/201960683.

PROJECT NOTES:

1. THIS WORK TAKES PLACE IN USE IV-P WATERS. IN-STREAM WORK IS PROHIBITED BETWEEN MARCH 1 AND MAY 31 OF ANY CALENDAR YEAR INCLUSIVE.
2. AN AREA OF MINIMAL FLOOD HAZARD, ZONE X, IS LOCATED AT THE PROJECT LOCATION (FEMA FIRM 24027C0165D - EFFECTIVE NOVEMBER 2013).
3. AN AREA OF 1% HAZARD, ZONE AE, IS LOCATED AT THE PROJECT LOCATION (HOWARD COUNTY, 2018)
4. NATURAL RESOURCES DELINEATED ON THIS PLAN WERE FIELD VERIFIED BY STRAUGHAN ENVIRONMENTAL IN NOVEMBER 2018.
5. THE SITE IS LOCATED IN THE LITTLE PATUXENT RIVER WATERSHED. THIS PORTION OF THE WATERSHED IS IMPAIRED BY E. COLI, CHLORIDES, CADMIUM, TOTAL PHOSPHORUS AND TOTAL SUSPENDED SEDIMENTS, AS DEFINED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT. THE RECEIVING WATERS ARE NOT CLASSIFIED UNDER TIER II HIGH QUALITY WATERS.
6. THE CONTRACTOR SHALL CONTINUALLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.
7. THE CONTRACTOR SHALL EXERCISE CARE IN ACTIVITIES THAT INVOLVE CUTTING, FILLING, OR GRADING IN THE VICINITY OF TREES THAT ARE TO REMAIN. THESE ACTIVITIES SHALL BE PERFORMED IN A MANNER THAT DOES NOT DISTURB THE CRITICAL ROOT ZONE WITHIN THE DRIP LINE OF THE TREE. PROTECTIVE ORANGE FENCING SHALL BE INSTALLED ALONG THE LIMITS OF DISTURBANCE FOR MAINTAINED TREES PRIOR TO CONSTRUCTION.
8. THE CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS, AND/OR SUPPLIES BEYOND THE LIMITS OF DISTURBANCE SHOWN ON THE PLANS. UPON COMPLETION OF THE WORK, BUT PRIOR TO DE-MOBILIZATION, THE CONTRACTOR SHALL REMOVE ALL REMNANTS OF CONSTRUCTION MATERIALS FROM THE SITE. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.
9. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, PHOTOGRAPHS OF THE PROPOSED WORK AREA AND ACCESS SHALL BE TAKEN BY THE CONTRACTOR.
10. ALL MATERIAL SHALL BE REMOVED AND DISPOSED OF OFFSITE. REMOVED TREES AND BRUSH MAY BE REDISTRIBUTED ON SITE AT THE DISCRETION OF THE ENGINEER AND COLUMBIA ASSOCIATION REPRESENTATIVE.
11. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN EXITING THE PROJECT SITE AND PAY CLOSE ATTENTION TO PEDESTRIANS WALKING NEAR THE PROJECT SITE.
12. WORKING HOURS ARE 7AM TO 7PM MONDAY THROUGH SATURDAY.
13. THE CONTRACTOR SHALL AVOID TRACKING HEAVY EQUIPMENT OVER THE CRITICAL ROOT ZONE OF SPECIMEN TREES. IF UNAVOIDABLE, SPECIAL PRECAUTIONS SHOULD BE USED WHEN TRACKING OVER THE CRITICAL ROOT ZONES.
14. THE DESIGN AND SPECIFICATION OF THE BRIDGE, FOOTERS, AND ALL APPURTENANT STRUCTURES (AND ANY NECESSARY APPROVALS) ARE OUTSIDE THE SCOPE OF THIS DESIGN AND WILL BE THE RESPONSIBILITY OF THE COLUMBIA ASSOCIATION.

DESIGN NARRATIVE:

THE PROJECT IS ON COLUMBIA ASSOCIATION PROPERTY EAST OF RUSTLING LEAF IN COLUMBIA, MD. THE COLUMBIA ASSOCIATION INTENDS TO VOLUNTARILY REPAIR/RETROFIT AN EXISTING 8-FOOT WIDE PAVED TRAIL EMBANKMENT AND STREAM CROSSING THAT IS IN A STATE OF FAILURE. THE PROJECT WILL INCLUDE REMOVAL OF A CLOGGED EXISTING 54" CMP RISER AND 36" CMP BARREL, AND REPLACEMENT OF PIPED CROSSING WITH A STABLE SURFACE CONVEYANCE. ADDITIONALLY, A FOOT BRIDGE IS PROPOSED TO REPLACE THE EMBANKMENT TRAIL OVER THE STABLE SURFACE CONVEYANCE. THE DESIGN AND SPECIFICATION OF THE BRIDGE, FOOTERS, AND ALL APPURTENANT STRUCTURES (AND ANY NECESSARY APPROVALS) ARE OUTSIDE THE SCOPE OF THIS DESIGN AND WILL BE THE RESPONSIBILITY OF THE COLUMBIA ASSOCIATION. THIS PROJECT WILL ELIMINATE THE SAFETY ISSUE AND PREVENT RELEASE OF SEDIMENT TO DOWNSTREAM WATERS. NO NEW IMPERVIOUS AREA IS PROPOSED.

REVISED SITE DEVELOPMENT PLAN PURPOSE STATEMENT:

SHEETS 30-39 ARE APPENDED TO SITE DEVELOPMENT PLAN SDP-08-107 TO ACCOMMODATE REPAIR OF AN EXISTING PAVED PEDESTRIAN TRAIL EMBANKMENT CROSSING IMMEDIATELY UPSTREAM OF THE FOREBAY TO LAKE ELKHORN. THESE ADDITIONAL SHEETS DOCUMENT THE NATURE OF THE REPAIR AND REVISED TRAIL CROSSING AND WERE PREPARED BY STRAUGHAN ENVIRONMENTAL.



JOSEPH D. ARROWSMITH, P.E.
 PROFESSIONAL CERTIFICATION
 I, JOSEPH D. ARROWSMITH CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 44918. EXPIRATION DATE: DECEMBER 22, 2021

JOSEPH D. ARROWSMITH, P.E.
 10245 OLD COLUMBIA ROAD
 COLUMBIA, MARYLAND 21046
 BUSINESS PH. 443.539.2548



DES:	BY:	NO.:	REVISIONS	DATE
JA/JW	JA	1	REVISED SITE DEVELOPMENT PLAN SDP-08-107 TO ADD SHEETS 30-39	1/20
DRN: JW	JA	2	REVISED SITE DEVELOPMENT PLAN SDP-08-107 SHEETS 30-39 APPROVED BY HSCD UNDER PLAN REF-19-031	1/20
CHK: JA				
DATE: 1/29/20				

100% DESIGN

REVISED SITE DEVELOPMENT PLAN (SDP-08-107)

NAD83/NAVD88

COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280

MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

SCALE
 AS SHOWN

SHEET
 41
 30 OF 38

SDP-08-107



LEGEND

- HYDROLOGIC SOIL GROUP
- LaC SOIL BOUNDARY
- Ha
- HIGHLY ERODIBLE SOILS (>15% SLOPES)
- HIGHLY ERODIBLE SOILS (>5% SLOPES AND K<0.35)
- STEEP SLOPES (20% OR GREATER)

SOIL GROUPS

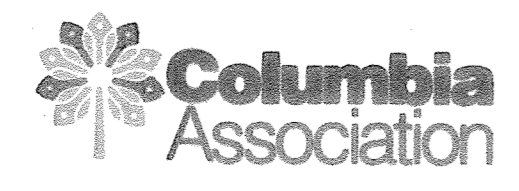
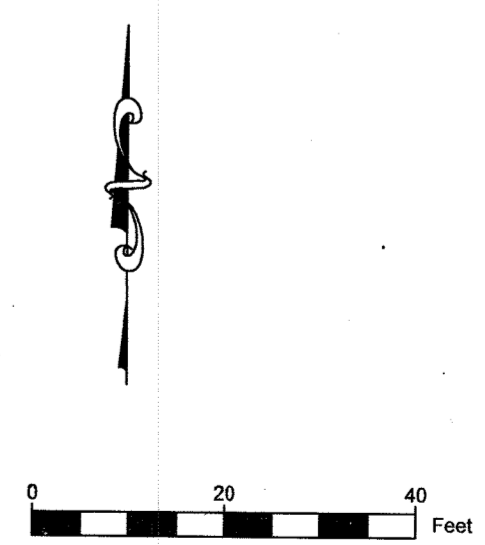
SOIL NAME	SOIL SYMBOL	HSG	K FACTOR
BAILE SILT LOAM	BaA	C/D	0.37
HATBORO-CODORUS SILT LOAMS	Ha	B/D	0.37
MANOR LOAM	McD	B	0.28
LEGORE SILT LOAM	LaC	C	0.00
WATER	W	N/A	0.00

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[Signature] 2.18.20
 Chief, Development Engineering Division Date

[Signature] 2/18/2020
 Chief, Division of Land Development Date

[Signature] 2/20/2020
 Director Date

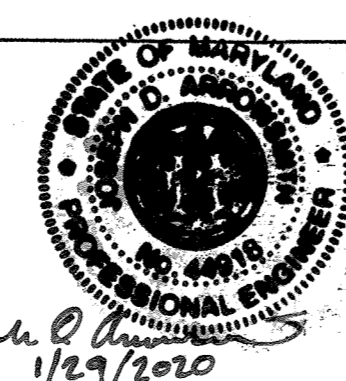


JOSEPH D. ARROWSMITH, P.E.
 PROFESSIONAL CERTIFICATION

JOSEPH D. ARROWSMITH CERTIFIES THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 44918, EXPIRATION DATE: DECEMBER 22, 2021

JOSEPH D. ARROWSMITH, P.E.
 10245 OLD COLUMBIA ROAD
 COLUMBIA, MARYLAND 21046
 BUSINESS PH: 443.538.2948

[Signature] 1/29/2020



DES:	BY:	NO.	REVISIONS	DATE
JA/JW	JA	1	REVISED SITE DEVELOPMENT PLAN SDP-08-107 TO ADD SHEETS 30-39	1/20
DRN:	JW	2	REVISED SITE DEVELOPMENT PLAN SDP-08-107 SHEETS 30-39 APPROVED BY HSGC UNDER PLAN #EP-19-031	1/20
CHK:	JA			
DATE:	1/29/20			1/29/20

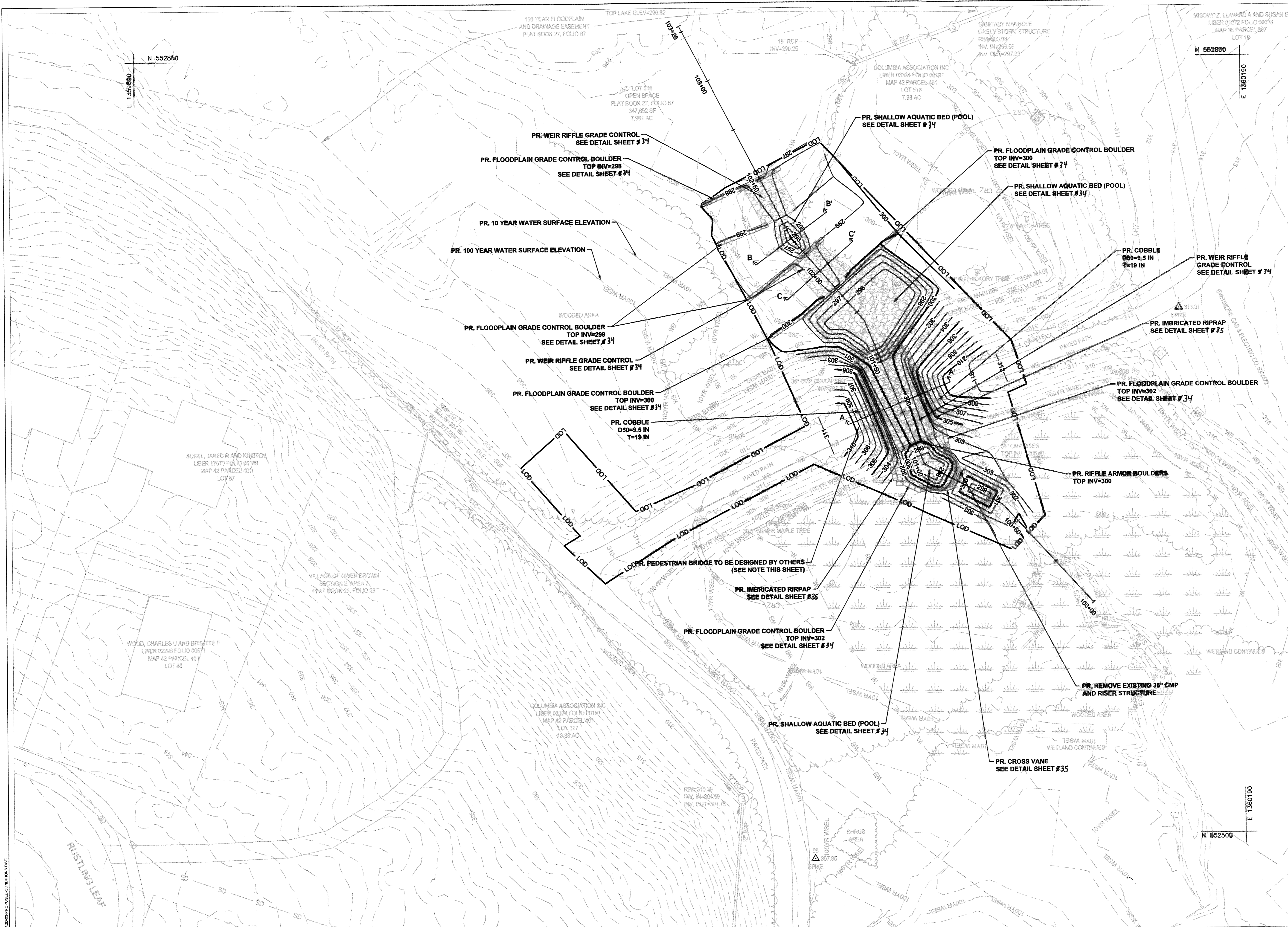
100% DESIGN
 REVISED SITE DEVELOPMENT PLAN
 (SDP-08-107)
 NAD83/NAVD88

COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280
 MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

SCALE
 1"=20'
 SHEET
 31 OF 39

SDP-08-107

NOTE:
THE DESIGN AND SPECIFICATION OF THE BRIDGE, FOOTERS, AND ALL APPURTENANT STRUCTURES (AND ANY NECESSARY APPROVALS) ARE OUTSIDE THE SCOPE OF THIS DESIGN AND WILL BE THE RESPONSIBILITY OF THE COLUMBIA ASSOCIATION.



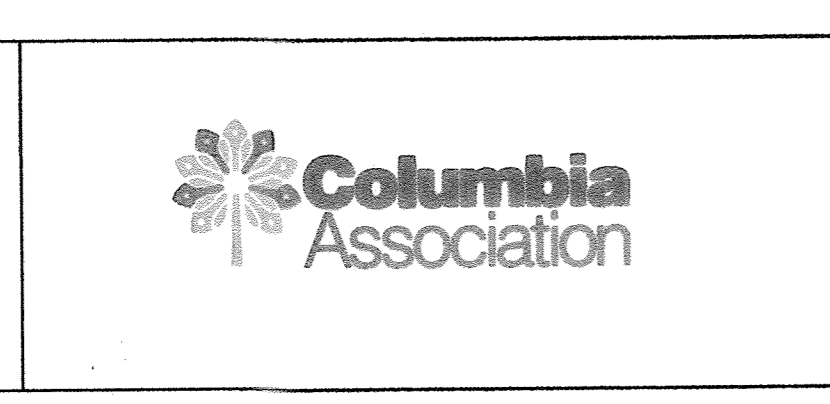
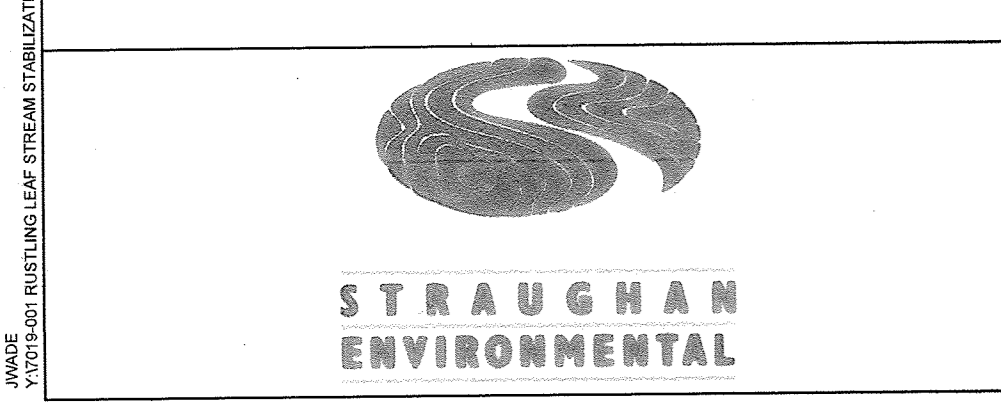
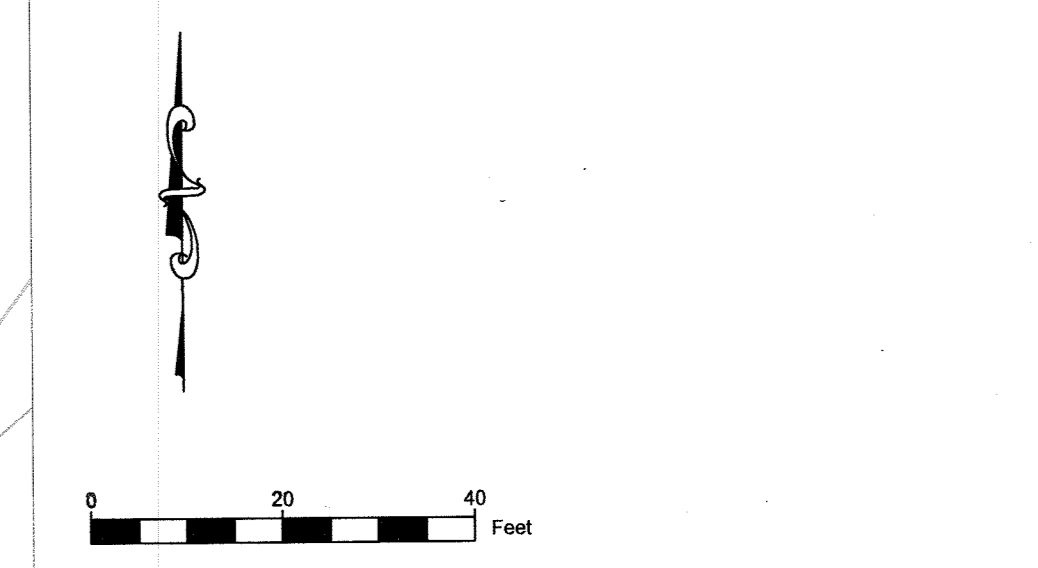
10-YEAR STORM STABILITY COMPUTATIONS			
FEATURE	v ₁₀ , FT/S	d ₁₀ , FT	τ ₁₀ , PSF
CHANNEL	8.33	5.64	3.13
LEFT OVERBANK	4.17	2.71	1.63
RIGHT OVERBANK	3.62	2.12	1.32

SOURCE: 2019, RUSTLING LEAF STREAM STABILIZATION DESIGN MEMORANDUM APPENDIX G HEC-RAS MODEL. STRAUGHAN ENVIRONMENTAL.

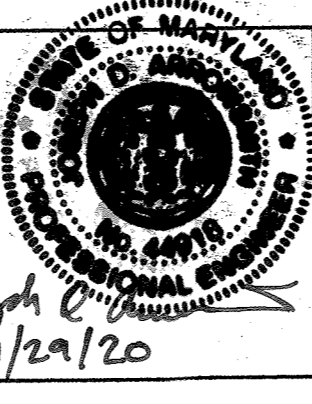
PERMISSIBLE VELOCITY AND SHEAR STRESS		
FEATURE	v, FT/S	τ, PSF
12-INCH COBBLE	5.5 TO 12	4.00
12-INCH RIPRAP	10 TO 13	5.10
LONG NATIVE GRASSES	4 TO 6	1.2 TO 1.7

SOURCE: FISCHENICH, C. (2001). STABILITY THRESHOLDS FOR STREAM RESTORATION MATERIALS. VICKSBURG, MS: US ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER.

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division: *[Signature]* 6.18.20
 Chief, Division of Land Development: *[Signature]* 2/18/20
 Director: *[Signature]* 2/20/2020



JOSEPH D. ARROWSMITH, P.E.
 PROFESSIONAL CERTIFICATION
 I, JOSEPH D. ARROWSMITH CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME, AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 44918. EXPIRATION DATE: DECEMBER 22, 2021
 JOSEPH D. ARROWSMITH, P.E.
 10016 OLD COLUMBIA ROAD
 COLUMBIA, MARYLAND 21046
 BUSINESS PH. 443.539.2548



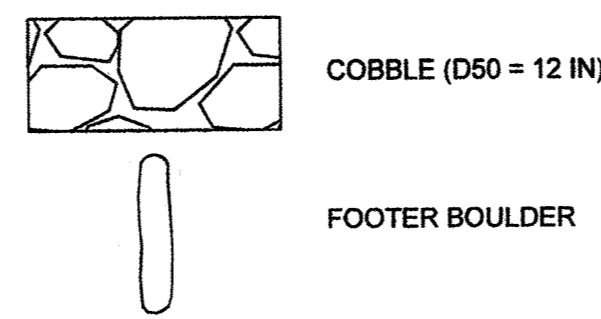
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JAJW	JA			
JAJW	JA			

CHK: JA
 DATE: 1/22/20

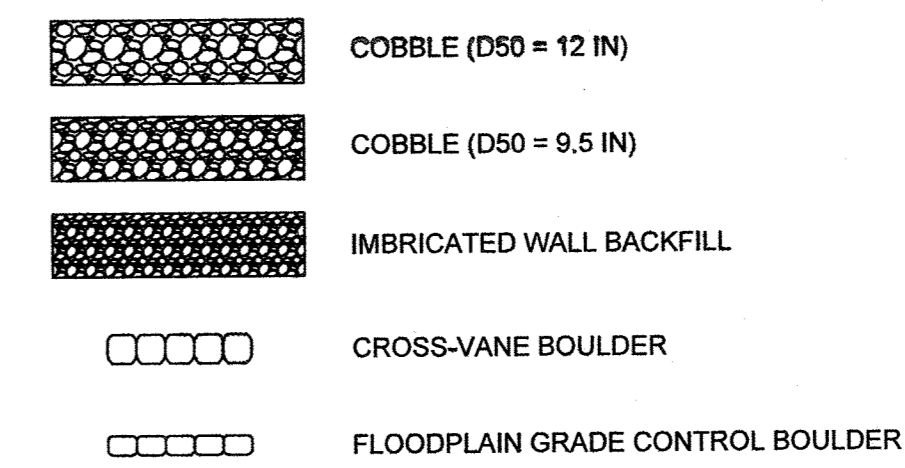
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 NAD83/NAVD88

COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
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 MINOR GRADING IN SUPPORT OF LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42
 SCALE 1"=20'
 SHEET 32 OF 39
 SDP-08-107

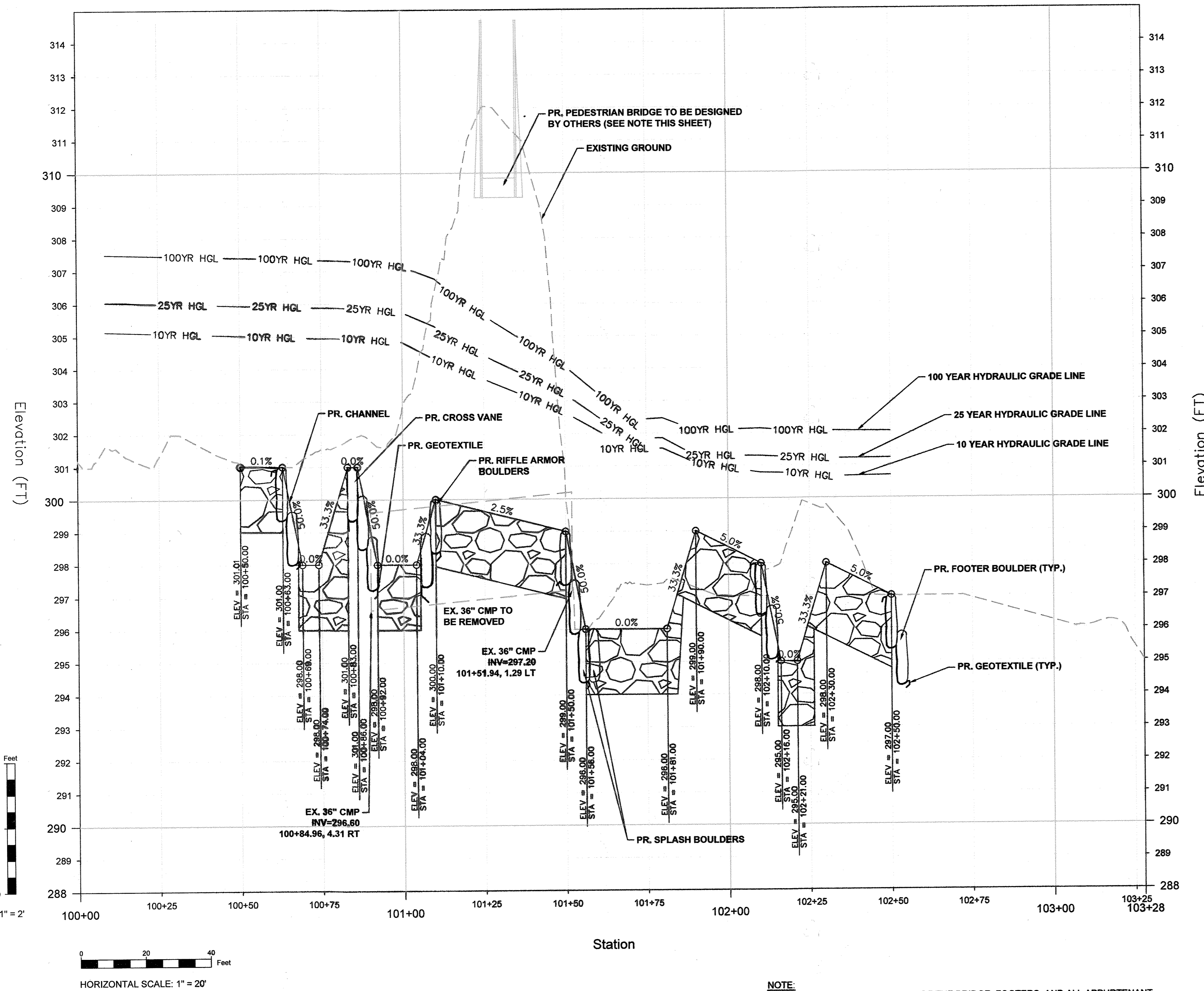
LEGEND



LEGEND

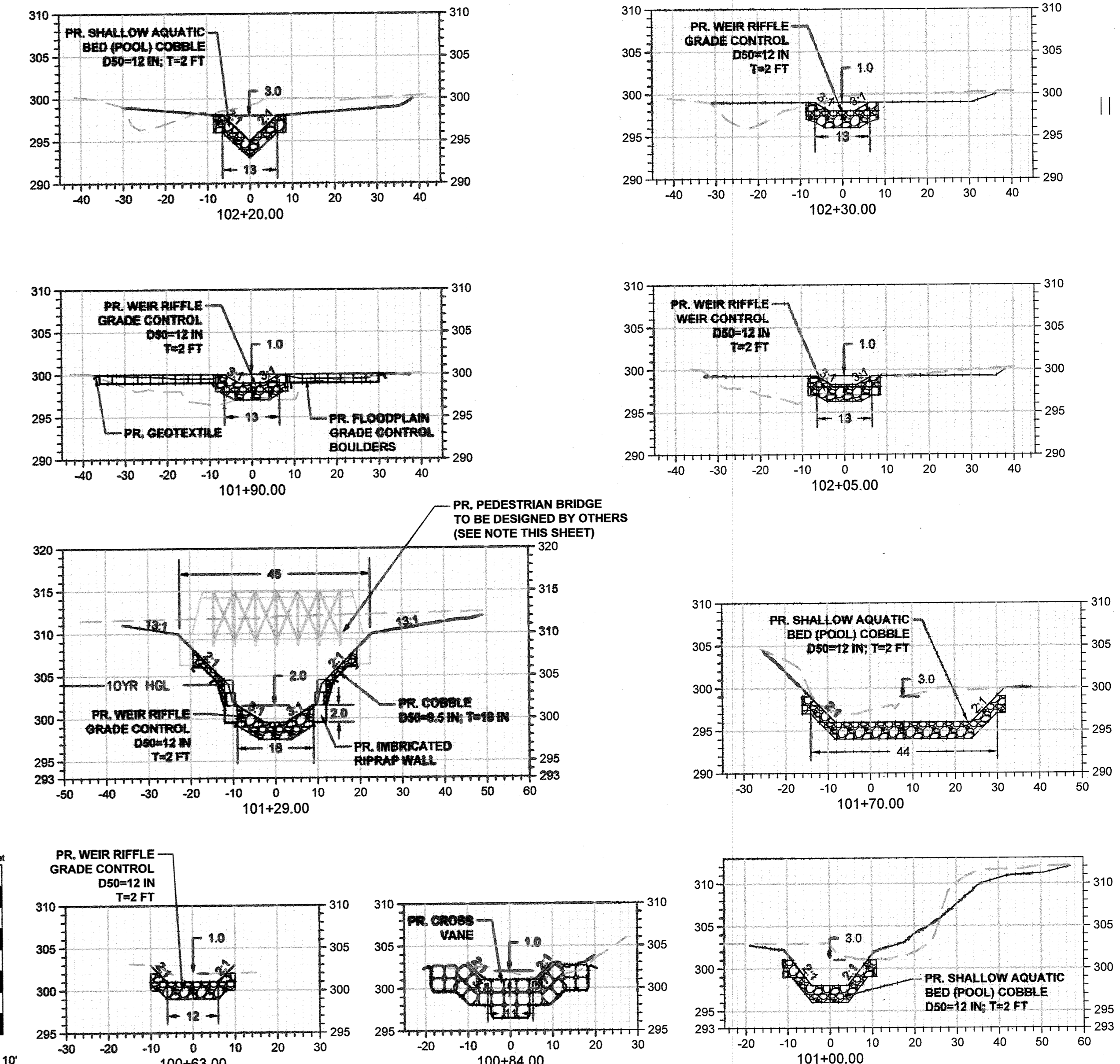


RUSTLING LEAF PROFILE



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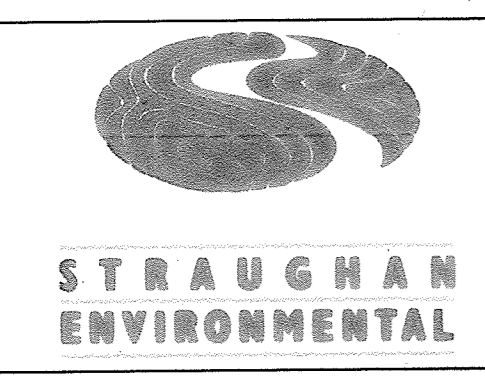
RUSTLING LEAF CROSS SECTIONS



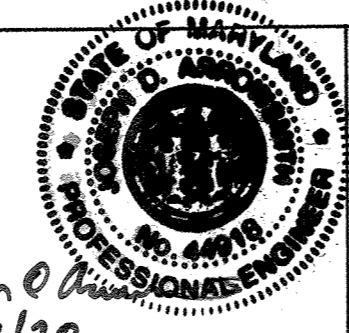
APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division: 2/12/20
 Chief, Division of Land Development: 2/18/2020
 Director: 2-20-2020

VERTICAL SCALE
1" = 2'

HORIZONTAL SCALE: 1" = 20'



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 1695 OLD COLUMBIA ROAD
 COLUMBIA, MARYLAND 21046
 BUSINESS PH. 443.530.2548



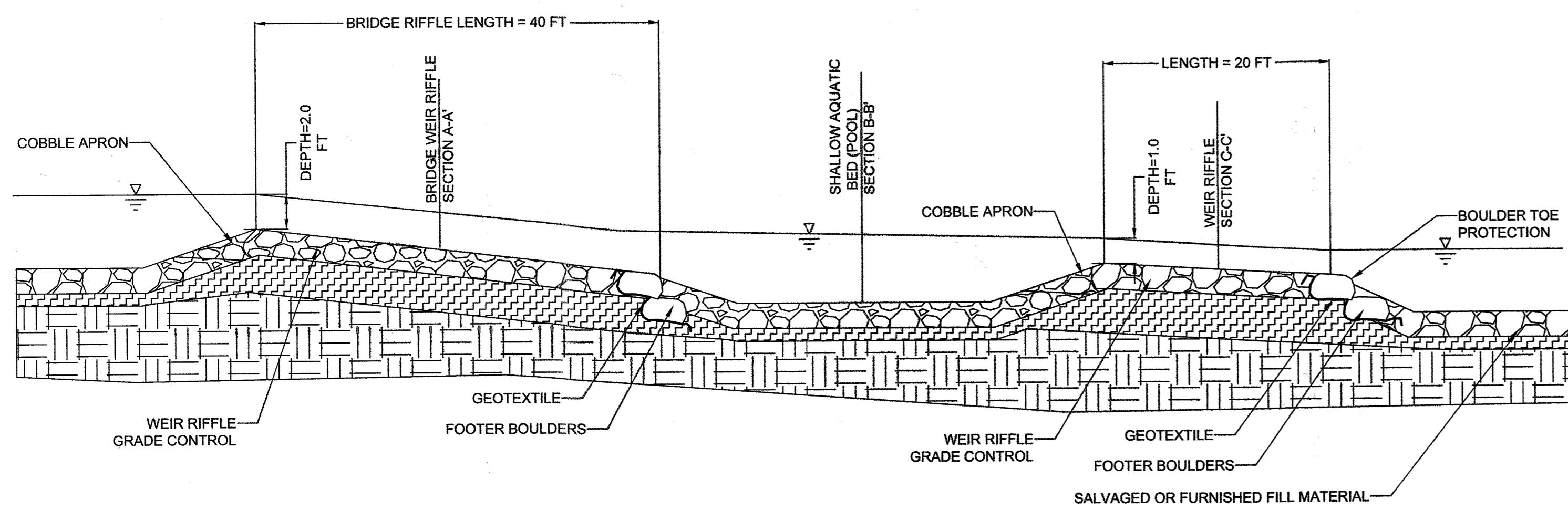
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CHK:	JA			
DATE:	1/24/20			1/24/20

100% DESIGN
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 NAD83/NAVD88

COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280
 MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

SCALE AS SHOWN
 SHEET 41 OF 39

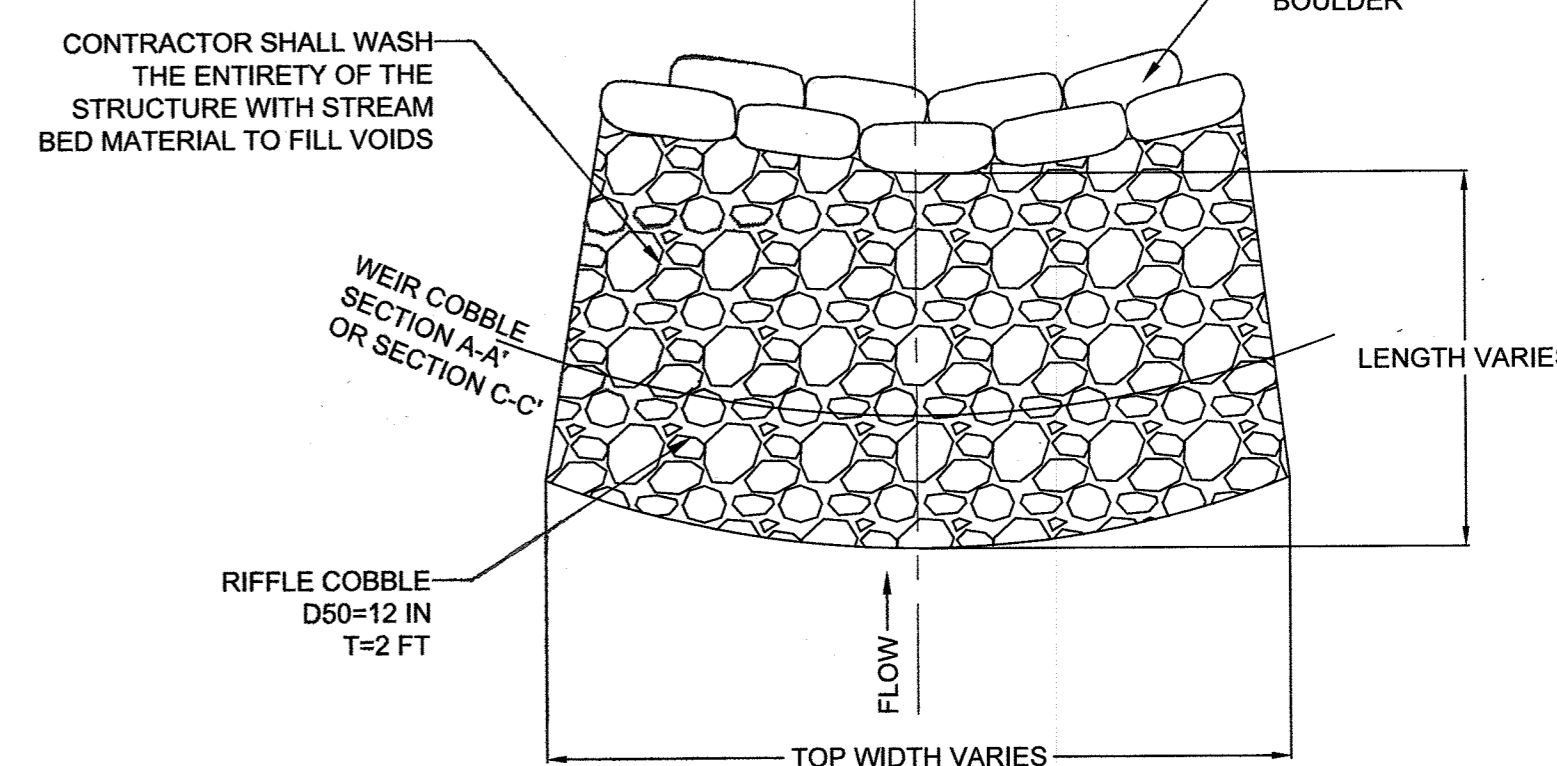
SDP-08-107



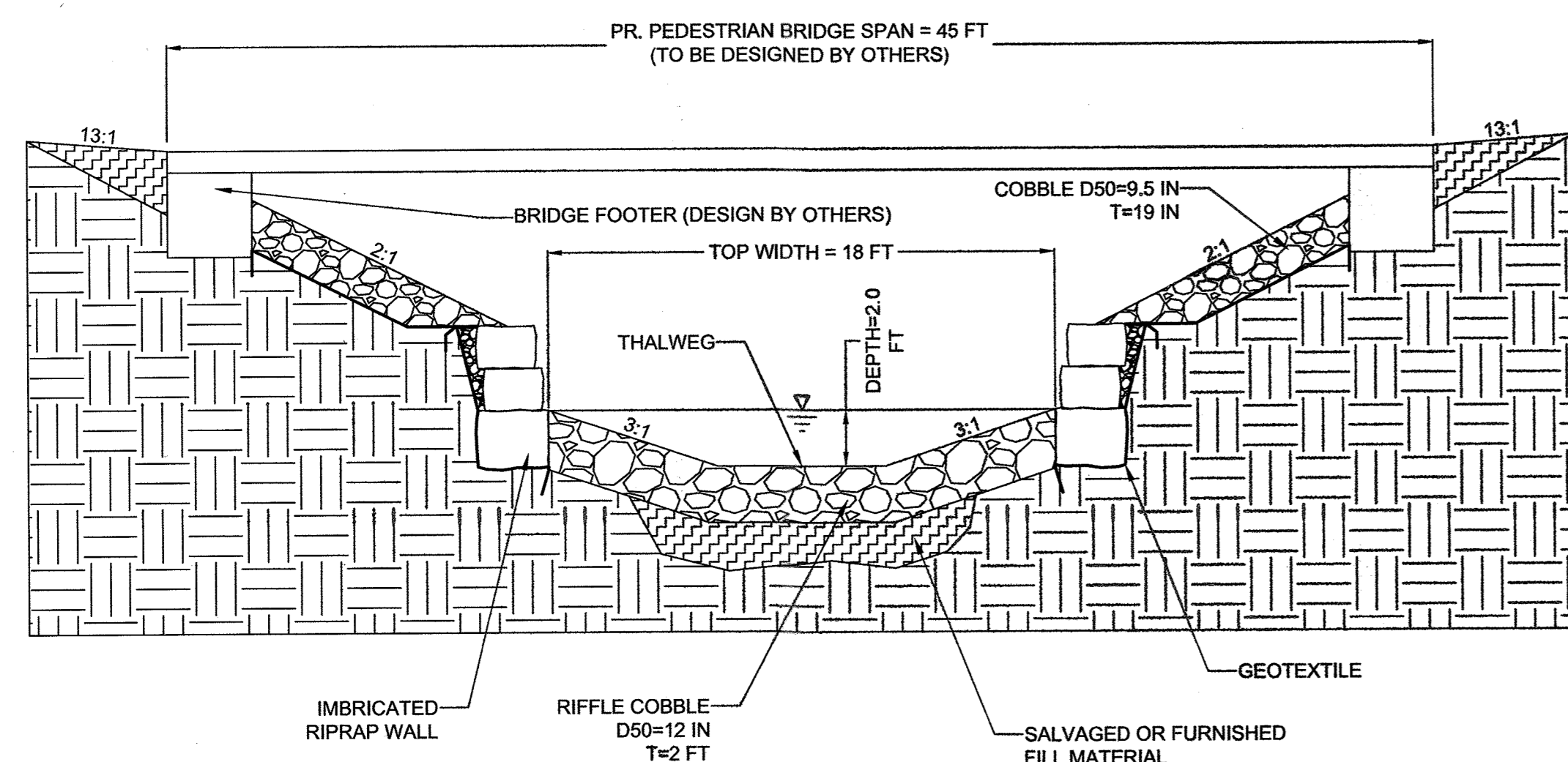
WEIR RIFFLE GRADE CONTROL SEQUENCE
CENTERLINE PROFILE
NOT TO SCALE

RIFFLE DESIGN TABLE			
STATION	101+10 TO 101+50	101+90 TO 102+10	102+30 TO 102+50
TOP WIDTH, FT	18.0	13.0	13.0
DEPTH, FT	2.0	1.0	1.0
D50, IN	12	12	12
THICKNESS, IN	24	24	24
CHANNEL Q10, CFS	505	191	183
CHANNEL V10, FT/S	8.33	6.61	5.91
CHANNEL Q100, CFS	1080	286	274
CHANNEL V100, FT/S	10.44	6.67	5.53

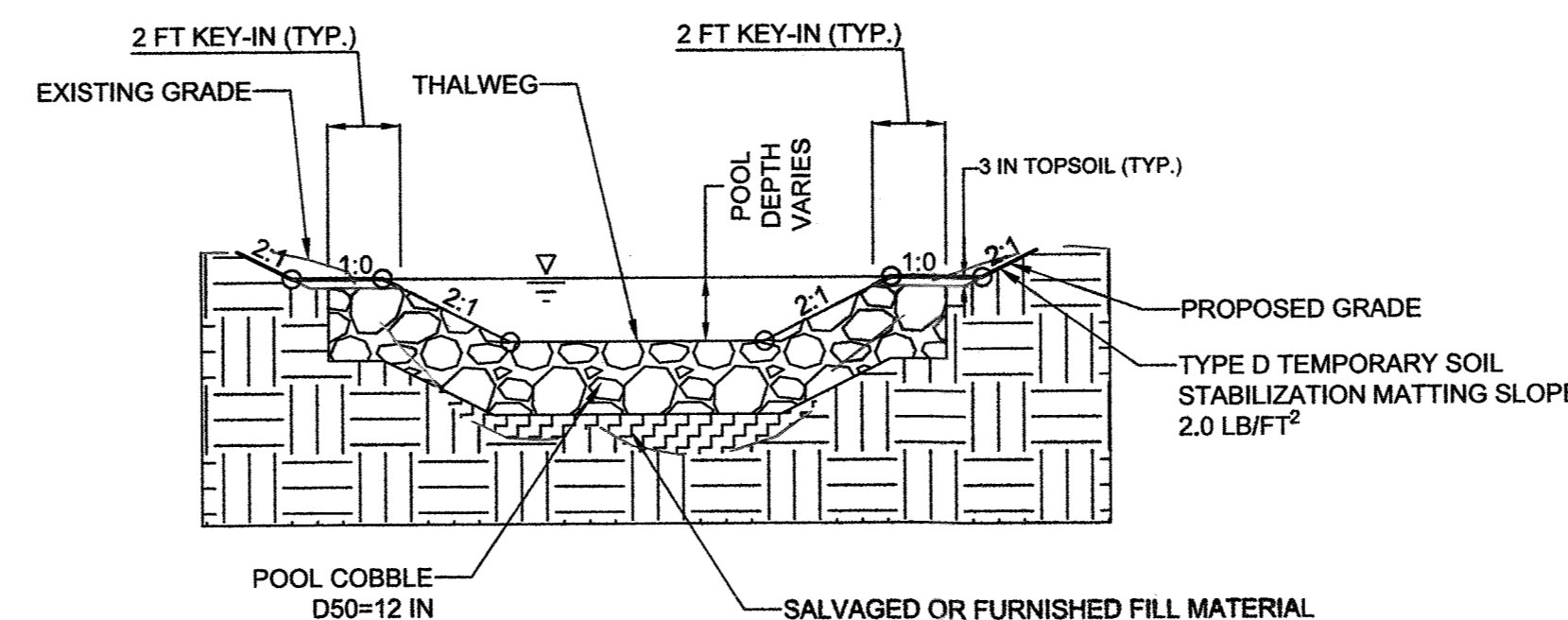
NOTE: ALL COBBLE/STONE LAYERS SHALL HAVE A MINIMUM THICKNESS OF 2 X D50 UNLESS SPECIFICALLY DETAILED OTHERWISE.



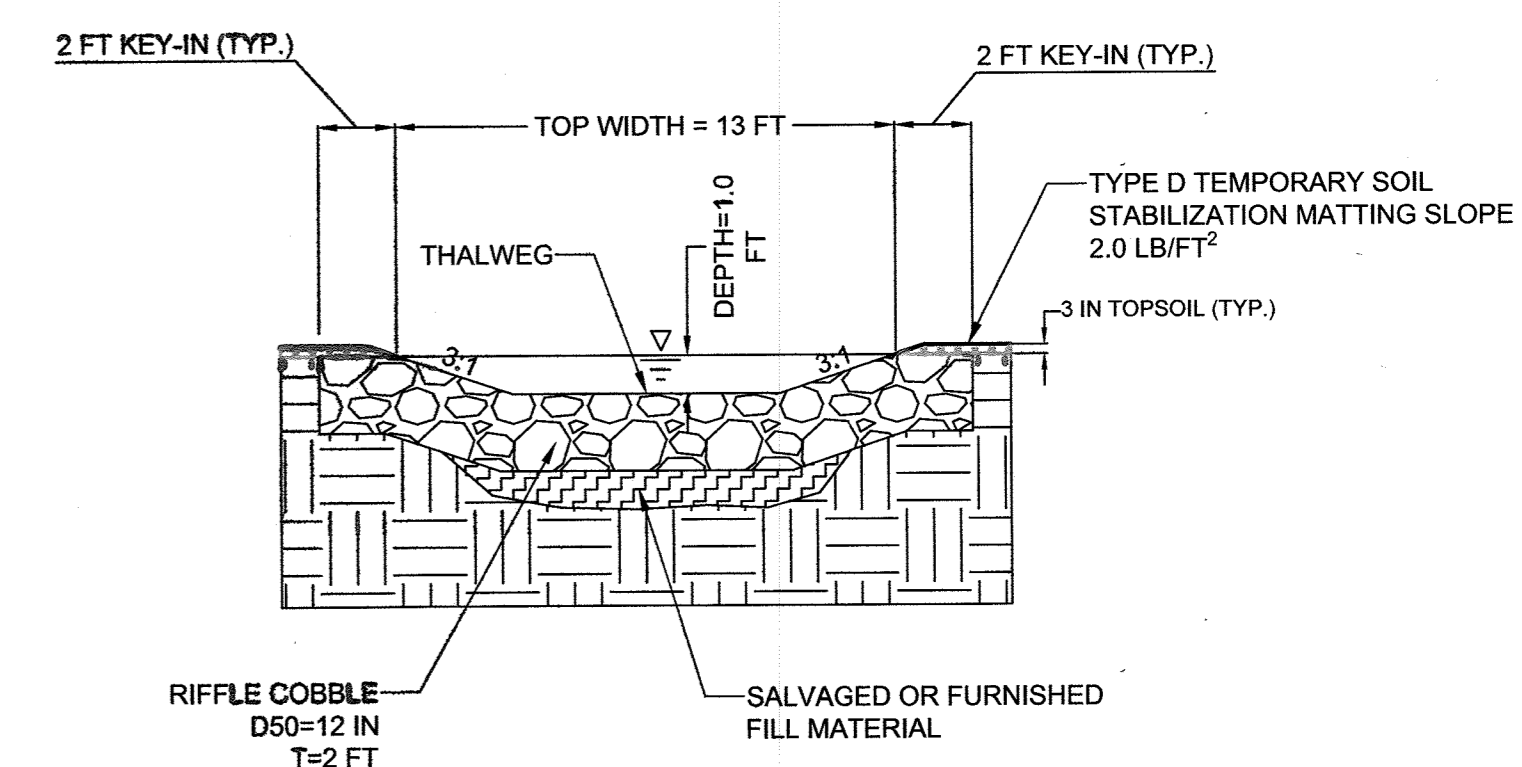
WEIR RIFFLE GRADE CONTROL STRUCTURE
PLAN VIEW
NOT TO SCALE



WEIR RIFFLE GRADE CONTROL STRUCTURE
SECTION A-A'
SCALE: 1"=5'

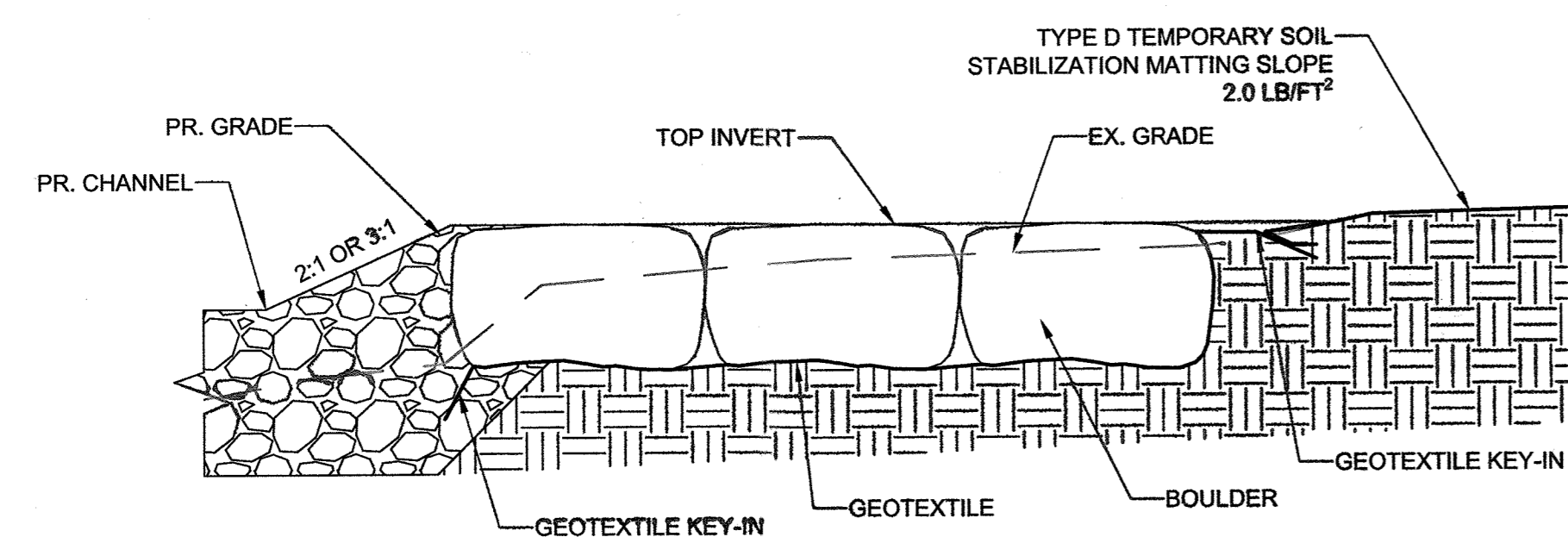


SHALLOW AQUATIC BED (POOL)
SECTION B-B'
SCALE: 1"=5'



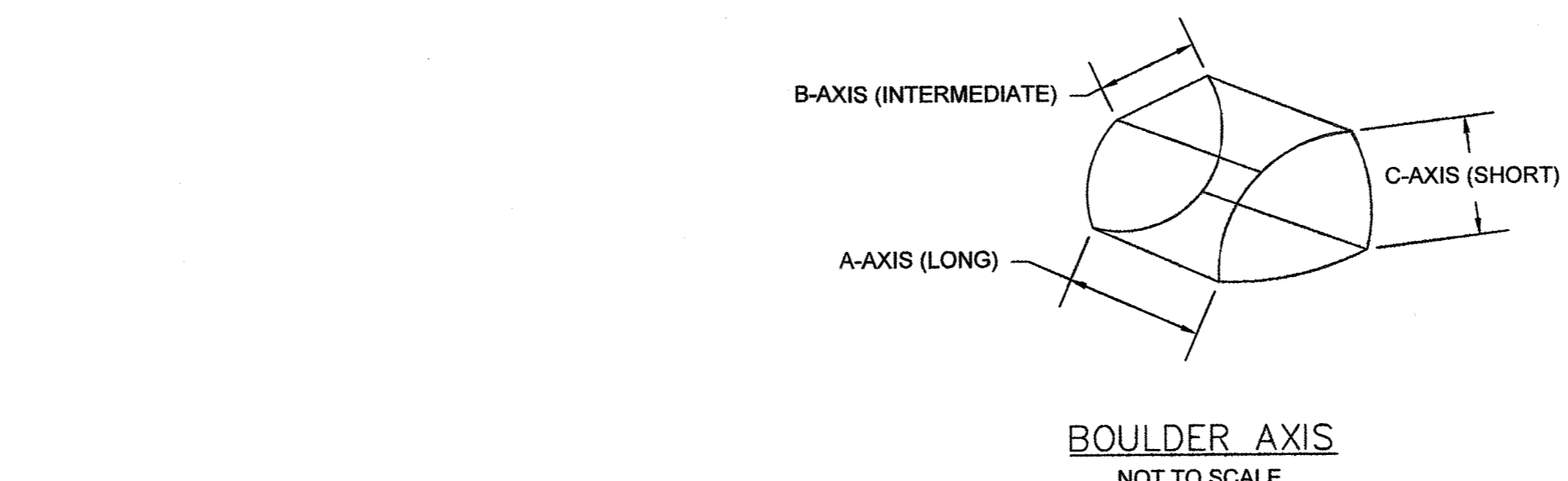
WEIR RIFFLE GRADE CONTROL STRUCTURE
SECTION C-C'
SCALE: 1"=5'

NOTE: THE DESIGN AND SPECIFICATION OF THE BRIDGE, FOOTERS, AND ALL APPURTENANT STRUCTURES AND ANY NECESSARY APPROVALS ARE OUTSIDE THE SCOPE OF THIS DESIGN AND WILL BE THE RESPONSIBILITY OF THE COLUMBIA ASSOCIATION.



FLOODPLAIN GRADE CONTROL BOULDER DETAIL
NOT TO SCALE

CONTRACTOR SHALL USE BOULDERS MATCHING SIZE REQUIREMENTS SHOWN ON SHEET 05. CONTRACTOR TO MAKE BOULDERS FLUSH WITH FINISHED GRADE.



FLOODPLAIN GRADE CONTROL BOULDER TABLE			
STATION	LEFT OFFSET, FT	RIGHT OFFSET, FT	TOP INV, FT
100+88 TO 101+10	-12.3 TO -10.2	N/A	302
101+07 TO 101+10	N/A	12.7 TO 11.4	302
101+90	-6.5 TO -36.5	6.5 TO 39.5	300
102+10	-6.5 TO -33.5	N/A	299
102+30	-6.5 TO -30.5	N/A	299
102+50	-6.5 TO -27.5	N/A	288

	BOULDER DIMENSIONS (IN)		
	A-AXIS	B-AXIS	C-AXIS
IMBRICATED WALL	36" MIN.	24" MIN.	12" MIN.
IMBRICATED WALL FOOTER	36" MIN.	24" MIN.	24" MIN.
FLOODPLAIN GRADE CONTROL	36" MIN.	24" MIN.	12" MIN.
FOOTER	36" MIN.	24" MIN.	12" MIN.
CROSS-VANE	36" MIN.	24" MIN.	12" MIN.
SPLASH BOULDERS	36" MIN.	24" MIN.	12" MIN.

NOTE: BOULDERS SHALL HAVE MINIMUM UNIT WEIGHT OF 165 LBS/CF.

COBBLE GRADATION TABLE	
CUMULATIVE % FINER	STONE SIZE, IN
10	4
50	12
70	18
100	21

NOTE: COBBLE SHALL BE SILICA COBBLE (OR APPROVED SUBSTITUTE) RANGING FROM ROUNDED TO SUB-ANGULAR SHAPE.

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division: 2/18/20
 Chief, Division of Land Development: 2/18/20
 Director: 2/20/2020

SCALE: 1/8"=1'-0" (SEE SHEET 05 FOR TYPICAL DETAIL) DATE: 2/18/20



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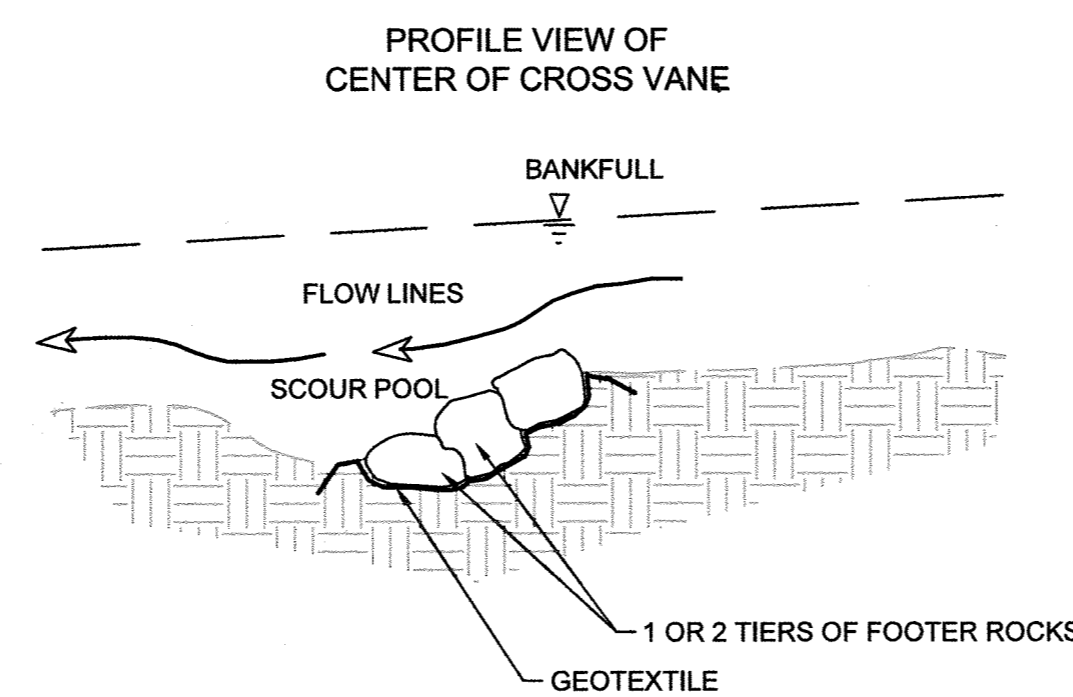
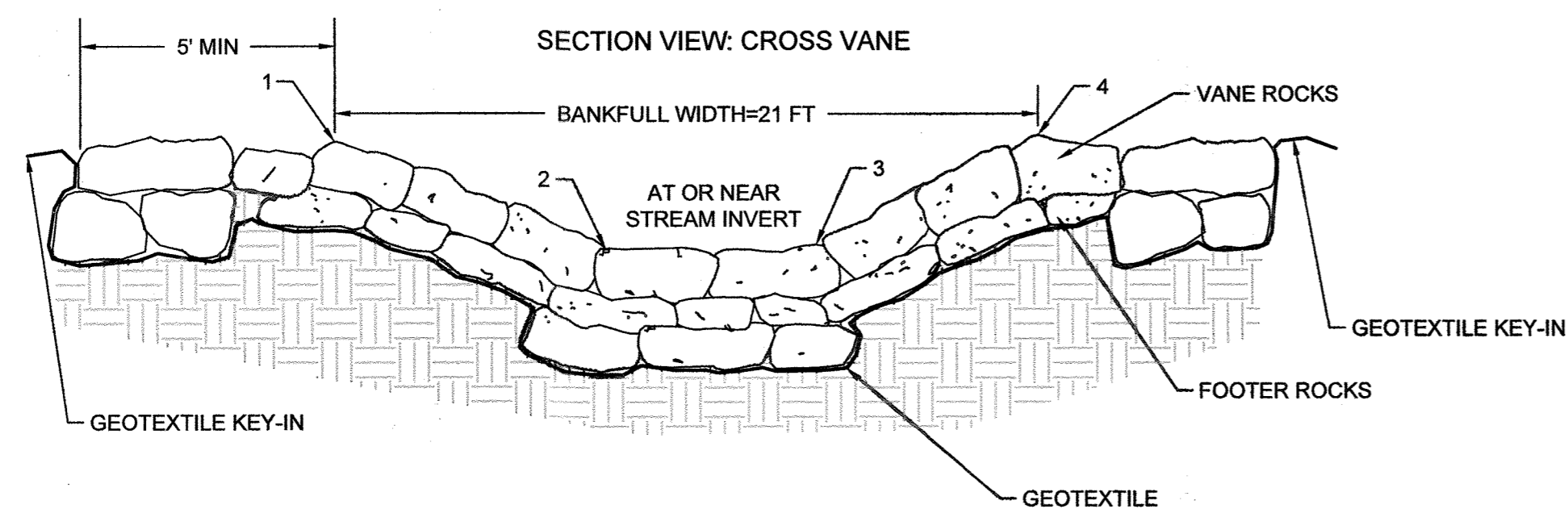
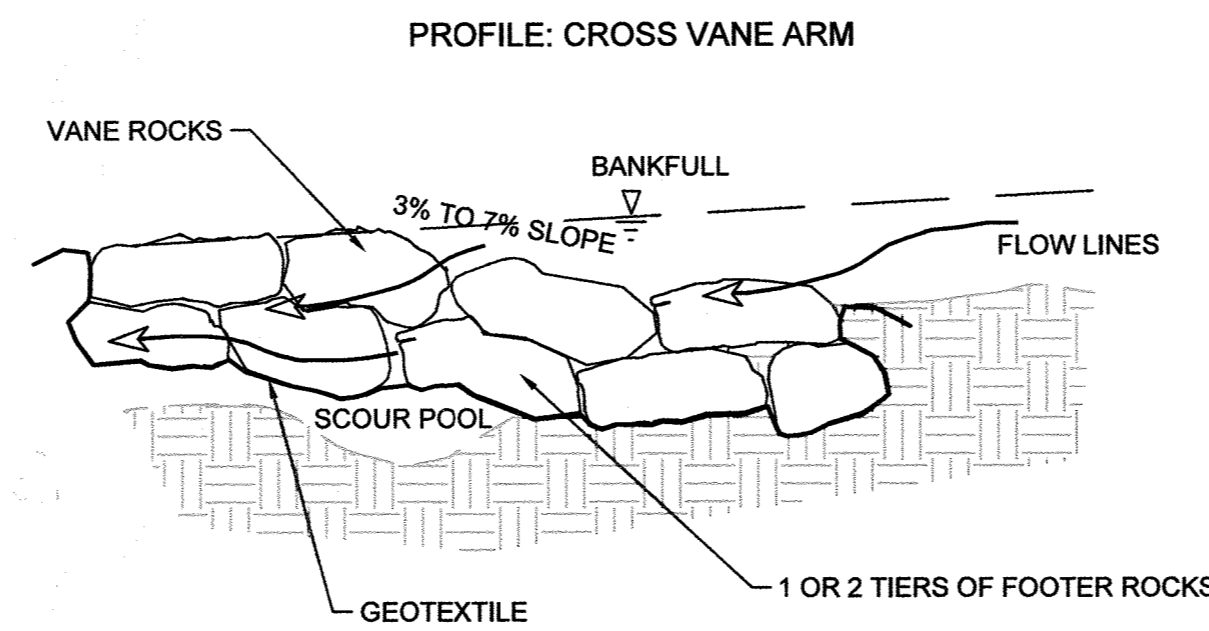
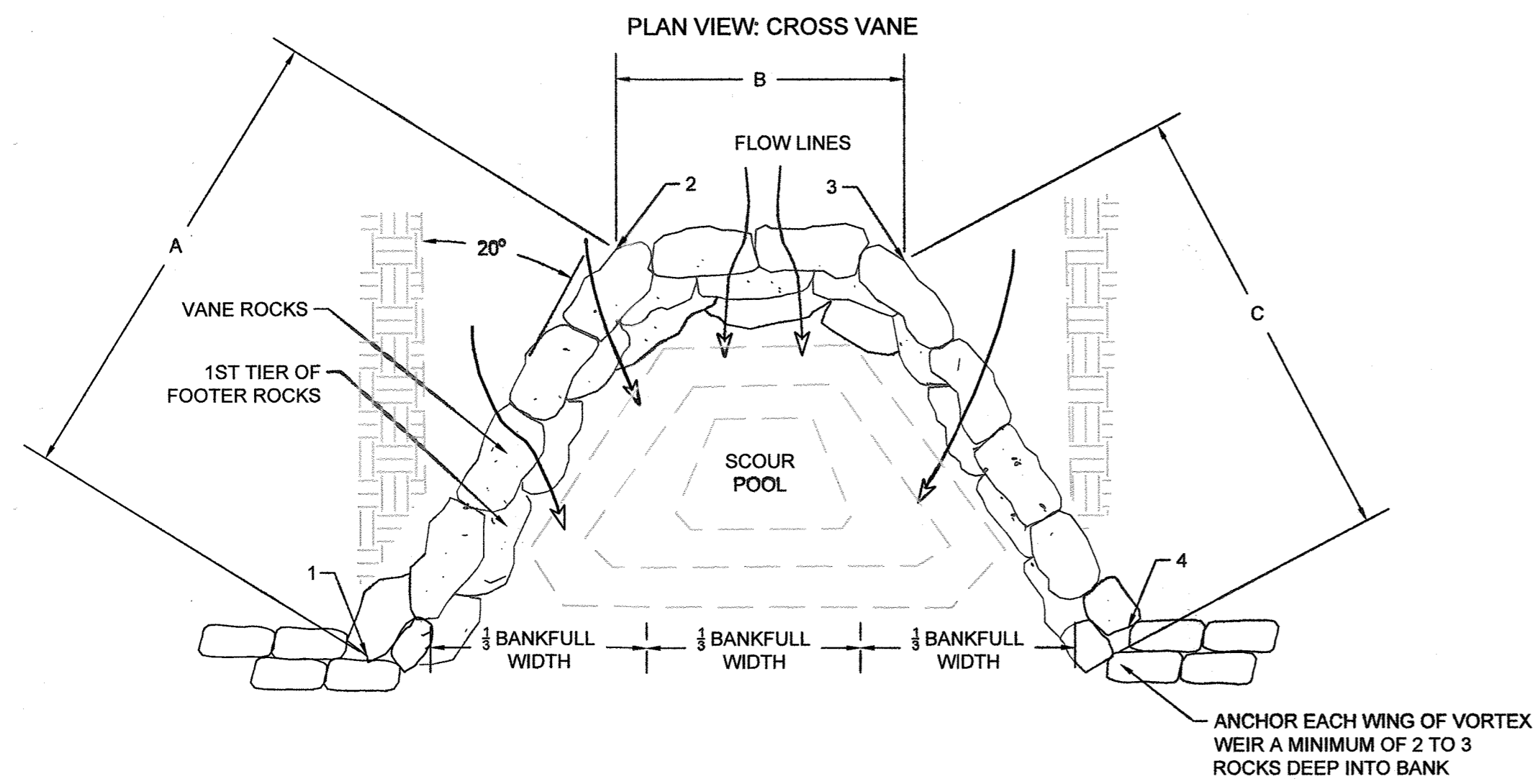
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CHK:	JA			
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100% DESIGN
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 NAD83/NAVD88

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 VILLAGE OF OWEN BROWN
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 MINOR GRADING IN SUPPORT OF LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

SCALE AS SHOWN
 SHEET 34 OF 39

SDP-08-107



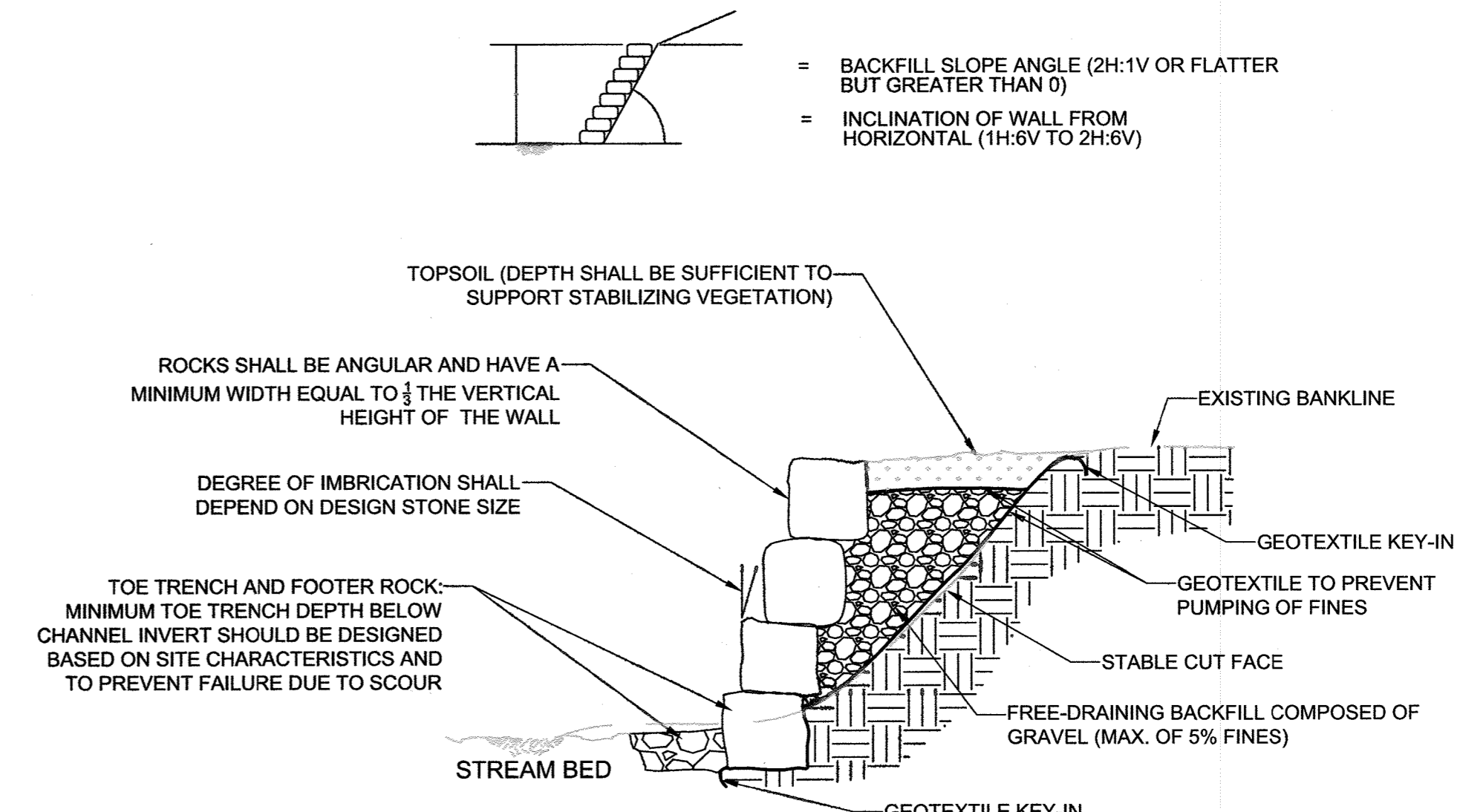
CROSS VANE DETAIL
NOT TO SCALE

Source: Rosgen, 1999

		LENGTHS, FT			INVERT ELEVATIONS, FT				
NAME	STATION	STRUCTURE	A	B	C	1	2	3	4
VANE 1	100+83	CROSS VANE	17.0	7.0	17.0	302.0	301.0	301.0	302.0

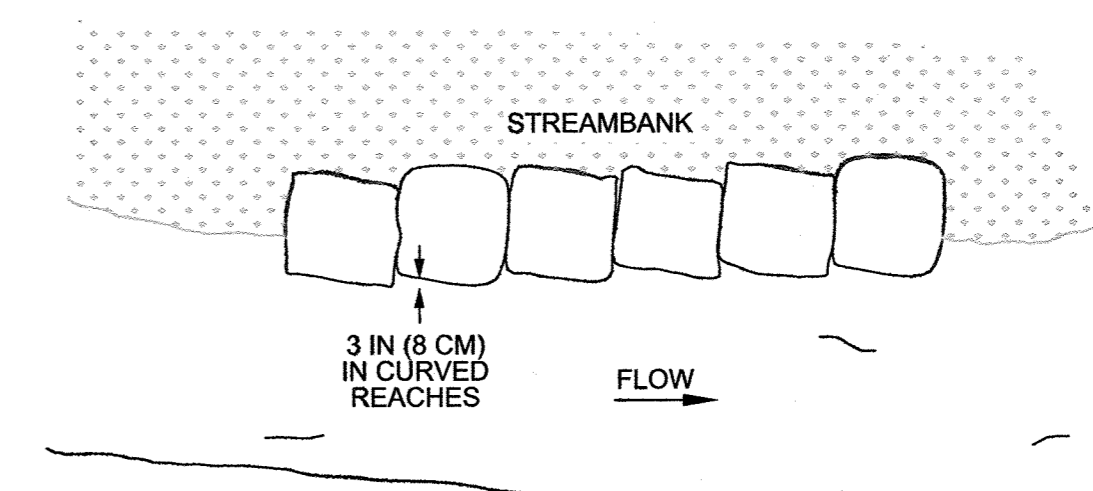
NOTE:

1. NO GAPS OR VOIDS WILL EXIST BETWEEN FOOTER AND VANE ROCKS.
2. STRUCTURE VANE ARMS WILL BE KEYED INTO THE STREAMBANK A MINIMUM OF 5'-0" UNLESS OTHERWISE DIRECTED.
3. FOOTER ROCKS SHALL BE BLOCKY, FLAT, AND TYPICALLY 1.5 TIMES LONGER THAN THE INTERMEDIATE AXIS.
4. VANE STONES SHALL BE ANGULAR, RECTANGULAR, AND BLOCKY IN SHAPE.
5. MINIMUM ROCK SIZE IS 3.0 FT.
6. CROSS VANE ROCKS SHALL HAVE MINIMUM UNIT WEIGHT OF 165 LBS/CF.



IMBRICATED RIPRAP
CROSS-SECTION VIEW
NOT TO SCALE

NOTE:
IMBRICATED WALL HEIGHT SHALL RANGE FROM APPROXIMATELY 3-4 FT.
CONTRACTOR SHALL USE BOULDERS MATCHING SIZE REQUIREMENTS SHOWN ON SHEET 05.



IMBRICATED RIPRAP
PLAN VIEW

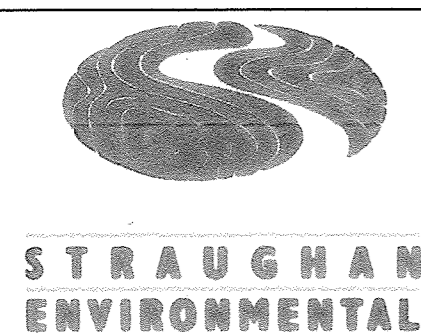
NOTE:
STONE BLOCKS SHALL BE ROTATED INTO THE BANK DURING PLACEMENT SUCH THAT THE UPSTREAM BLOCKS OVERLAP THE DOWNSTREAM BLOCKS BY A MINIMUM OF 3 INCHES (8 CM)

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[Signature] 2/12/20
Chief, Development Engineering Division Date

[Signature] 2/18/2020
Chief, Division of Land Development Date

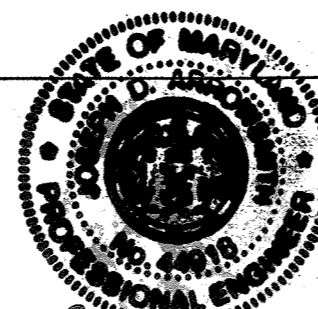
[Signature] 2/20/2020
Director Date



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JOSEPH D. ARROWSMITH, P.E.
10246 OLD COLUMBIA ROAD
COLUMBIA, MARYLAND 21046
BUSINESS PH. 443.539.2548

[Signature]
1/22/20



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100% DESIGN
REVISED SITE DEVELOPMENT PLAN
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COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
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MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

SCALE
AS SHOWN
SHEET
35 OF 39

**HOWARD SOIL CONSERVATION DISTRICT (HSCD)
STANDARD SEDIMENT CONTROL NOTES**

1. A pre-construction meeting must occur with the Howard County Department of Public Works, Construction Inspection Division (CID), 410-313-1855 after the future LOD and protected areas are marked clearly in the field. A minimum of 48 hour notice to CID must be given at the following stages:

- a. Prior to the start of earth disturbance,
- b. Upon completion of the installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading,
- c. Prior to the start of another phase of construction or opening of another grading unit,
- d. Prior to the removal or modification of sediment control practices.

Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made. Other related state and federal permits shall be referenced, to ensure coordination and to avoid conflicts with this plan.

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 2011 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 is required within three (3) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1); and seven (7) calendar days as to all other disturbed areas on the project site except for those areas under active grading.

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 topsoil (Sec. B-4-2), 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 applied between the fall and spring seeding dates if the ground is frozen. Incremental stabilization (Sec. B-4-1) specifications shall be enforced in areas with >15' of cut and/or fill. Stockpiles (Sec. B-4-8) in excess of 20 ft. must be benched with stable outlet. All concentrated flow, steep slope, and highly erodible areas shall receive soil stabilization matting (Sec. B-4-6).

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 CID.

6. Site Analysis:

Total Area of Site:	0.417	Acres
Area Disturbed:	0.517	Acres
Area to be roofed or paved:	0.500	Acres
Area to be vegetatively stabilized:	0.388	Acres
Total Cut:	758	Cu. Yds.
Total Fill:	164	Cu. Yds.
Offsite waste/borrow area location:	SITE WITH ACTIVE GRADING PERMIT	

7. Any sediment control practice which 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 CID. The site and all controls shall be inspected by the contractor weekly; and the next day after each rain event. A written report by the contractor, made available upon request, is part of every inspection and should include:

- Inspection date
- Inspection type (routine, pre-storm event, during rain event)
- Name and title of inspector
- Weather information (current conditions as well as time and amount of last recorded precipitation)
- Brief description of project's status (e.g., percent complete) and/or current activities
- Evidence of sediment discharges
- Identification of plan deficiencies
- Identification of sediment controls that require maintenance
- Identification of missing or improperly installed sediment controls
- Compliance status regarding the sequence of construction and stabilization requirements
- Photographs
- Monitoring/sampling
- Maintenance and/or corrective action performed
- Other inspection items as required by the General Permit for Stormwater Associated with Construction Activities (NPDES, MDE).

9. Trenches for the construction of utilities is limited to three pipe lengths or that which can and shall be back-filled and stabilized by the end of each workday, whichever is shorter.

10. Any major changes or revisions to the plan or sequence of construction must be reviewed and approved by the HSCD prior to proceeding with construction. Minor revisions may be allowed by the CID per the list of HSCD-approved field changes.

11. Disturbance shall not occur outside the L.O.D. 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 been stabilized and approved by the CID. Unless otherwise specified and approved by the HSCD, no more than 30 acres cumulatively may be disturbed at a given time.

12. Wash water from any equipment, vehicles, wheels, pavement, and other sources must be treated in a sediment basin or other approved washout structure.

13. Topsoil shall be stockpiled and preserved on-site for redistribution onto final grade.

14. All Silt Fence and Super Silt Fence shall be placed on-the-contour, and be imbricated at 25' minimum intervals, with lower ends curled uphill by 2' in elevation.

15. Stream channels must not be disturbed during the following restricted time periods (inclusive):

- Use I and IP March 1 - June 15
- Use III and IHP October 1 - April 30
- Use IV March 1 - May 31

16. A copy of this plan, the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and associated permits shall be on-site and available when the site is active.

B-4-5 STANDARDS AND SPECIFICATIONS

**FOR
PERMANENT STABILIZATION**

Definition

To stabilize disturbed soils with permanent vegetation.

Purpose

To use long-lived perennial grasses and legumes to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies

Exposed soils where ground cover is needed for 6 months or more.

Criteria

A. Seed Mixtures

1. General Use

- a. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The Summary is to be placed on the plan.
- b. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 - Critical Area Planting.
- c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
- d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 1/2 pounds per 1000 square feet (150 pounds per acre) at the time of seeding in addition to the soil amendments shown in the Permanent Seeding Summary.

2. Turfgrass Mixtures

- a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
- b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
 - i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - ii. Kentucky Bluegrass/Perennial Rye: Full Sun Mixture: For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
 - iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes: Certified Tall Fescue Cultivars 95 to 100 percent, Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
 - iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes: Certified Kentucky Bluegrass Cultivars 30 to 40 percent and Certified Fine Fescue and 60 to 70 percent. Seeding Rate: 1 1/2 to 3 pounds per 1000 square feet.

Notes:
Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77, "Turfgrass Cultivar Recommendations for Maryland"
Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line.

c. Ideal Times of Seeding for Turf Grass Mixtures

- Western MD:** March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)
- Central MD:** March 1 to May 15, August 15 to October 15 (Hardiness Zone: 6b)
- Southern MD, Eastern Shore:** March 1 to May 15, August 15 to October 15 (Hardiness Zones: 7a, 7b)

- d. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches, level and rake the areas to prepare a proper seedbed. Remove stones and debris over 1 1/2 inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
- e. If soil moisture is deficient, supply new seedlings with adequate water for plant growth (1/2 to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

Permanent Seeding Summary

No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20)			Lime Rate
					N	P ₂ O ₅	K ₂ O	
1	Switch Grass	10	03/01 - 05/15 08/01 - 10/01	1/2 - 1/2 in	45 pounds per acre (1.0 lb/1000 sf)	90 lb/ac (2 lb/1000 sf)	90 lb/ac (2 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
	Creeping Red Fescue	15	03/01 - 05/15 08/01 - 10/01	1/2 - 1/2 in				
	Partridge Pea	4	03/01 - 05/15 08/01 - 10/01	1/2 - 1/2 in				

B. Sod: To provide quick cover on disturbed areas (2:1 grade or flatter).

1. General Specifications

- a. Class of turfgrass sod must be Maryland State Certified. Sod labels must be made available to the job foreman and inspector.
- b. Sod must be machine cut to a uniform soil thickness of 1/4 inch, plus or minus 1/8 inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and torn or uneven ends will not be acceptable.
- c. Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
- d. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
- e. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its installation.

2. Sod Installation

- a. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
- b. Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly wedged against each other. Stagger lateral joints to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
- c. Wherever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, peg or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.
- d. Water the sod immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.

B-4-4 STANDARDS AND SPECIFICATIONS

**FOR
TEMPORARY STABILIZATION**

Definition

To stabilize disturbed soils with vegetation for up to 6 months.

Purpose

To use fast growing vegetation that provides cover on disturbed soils.

Conditions Where Practice Applies


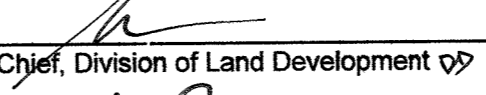
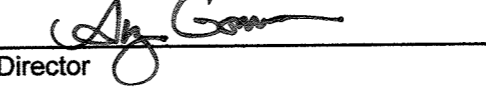
Exposed soils where ground cover is needed for a period of 6 months or less. For longer duration of time, permanent stabilization practices are required.

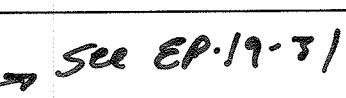
Criteria

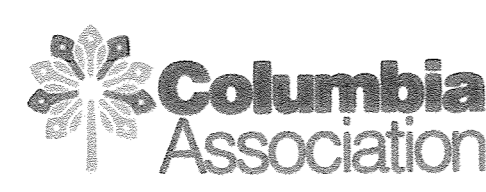
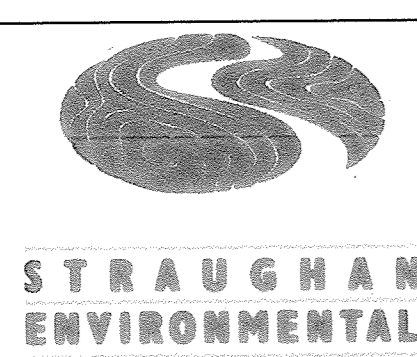
- 1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3), and enter them in the Temporary Seeding Summary below along with application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
- 2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
- 3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3.A.1.b and maintain until the next seeding season.

Temporary Seeding Summary

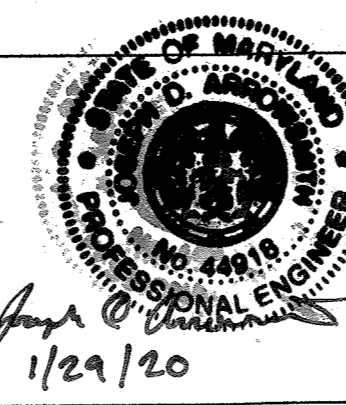
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	Fertilizer Rate (10-20-20)	Lime Rate
1	Annual Ryegrass	40	03/01-05/15 08/01-10/15	1/2 IN	436 lb/ac (10 lb/1000 sf)	2 tons/ac (90 lb/1000 sf)
	Pearl Millet	30	05/16-07/31	1/2 IN		

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 2.12.20
 Chief, Development Engineering Division
 2/18/2020
 Chief, Division of Land Development
 2/23/2020
 Director

HOWARD SCD SIGNATURE BLOCK:
 SEE EP-19-71
 THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
 HOWARD SOIL CONSERVATION DISTRICT DATE



JOSEPH D. ARROWSMITH, P.E.
 PROFESSIONAL CERTIFICATION
 I, JOSEPH D. ARROWSMITH CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 44918. EXPIRATION DATE: DECEMBER 22, 2021
 JOSEPH D. ARROWSMITH, P.E.
 1035 OLD COLUMBIA ROAD
 COLUMBIA, MARYLAND 21046
 BUSINESS PH. 443.530.2548



DES:	BY:	NO.	REVISIONS	DATE
JA/JW	JA	1	REVISED SITE DEVELOPMENT PLAN SDP-08-107 TO ADD SHEETS 30-39	1/20
DRN:	JA	2	REVISED SITE DEVELOPMENT PLAN SDP-08-107 SHEETS 30-39 APPROVED BY HSCD UNDER PLAN #EP-19-01	1/20
CHK:	JA			
DATE:	1/29/20			1/29/20

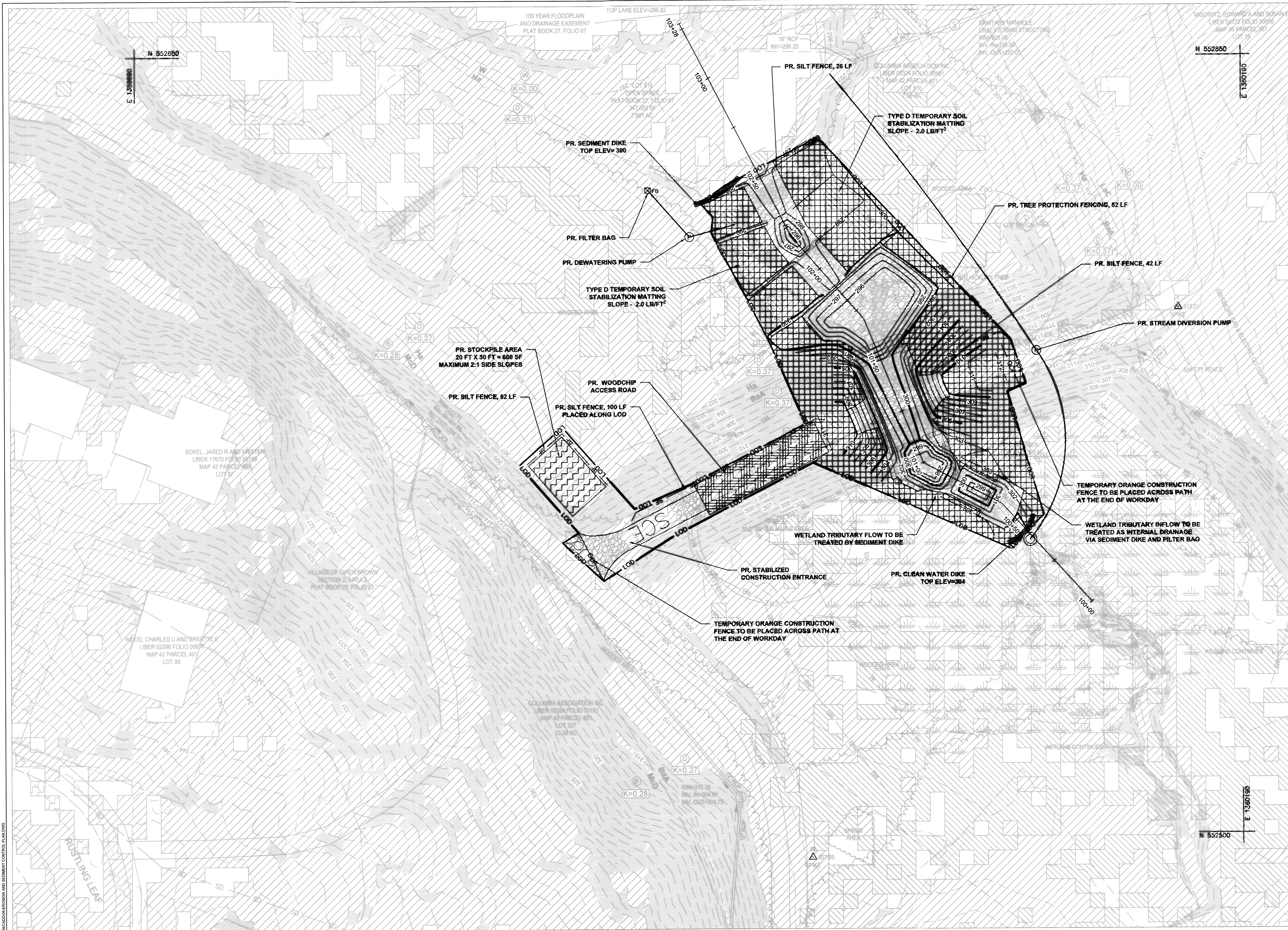
100% DESIGN
 REVISED SITE DEVELOPMENT PLAN
 (SDP-08-107)
 NAD83/NAVD88

COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280
 MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

SCALE
 N/A
 SHEET
 41 OF 49
 36 OF 39

SDP-08-107

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS, CONSTRUCTION INSPECTION DIVISION AND SEDIMENT CONTROL NOTES



LEGEND

- HIGHLY ERODIBLE SOILS (>15% SLOPES)
- HIGHLY ERODIBLE SOILS (>5% SLOPES AND K=0.35)
- STEEP SLOPES (20% OR GREATER)
- PROPOSED WOODCHIP ACCESS ROAD
- PROPOSED STOCKPILE/STAGING AREA
- OCF PROPOSED ORANGE CONSTRUCTION FENCE
- TPF TREE PROTECTION FENCE
- LOD LIMIT OF DISTURBANCE
- PROPOSED SAND DIKE
- TYPE D TEMPORARY SOIL STABILIZATION MATTING SLOPE APPLICATION (BIODEGRADABLE)
- STABILIZED CONSTRUCTION ENTRANCE
- SF SILT FENCE
- FB FILTER BAG
- PUMP

10-YEAR STORM STABILITY COMPUTATIONS

FEATURE	v ₁₀ , FT/S	d ₁₀ , FT	τ ₁₀ , PSF
CHANNEL	8.33	5.64	3.13
LEFT OVERBANK	4.17	2.71	1.63
RIGHT OVERBANK	3.62	2.12	1.32

SOURCE: 2019, RUSTLING LEAF STREAM STABILIZATION DESIGN MEMORANDUM APPENDIX G HEC-RAS MODEL STRAUGHAN ENVIRONMENTAL.
 NOTE: TYPE D TEMPORARY SOIL STABILIZATION MATTING SLOPE MAXIMUM PERMISSIBLE VELOCITY IS 6.0 FT/S AND BIODEGRADABLE (24-36 MONTH LIFESPAN)

PERMISSIBLE VELOCITY AND SHEAR STRESS

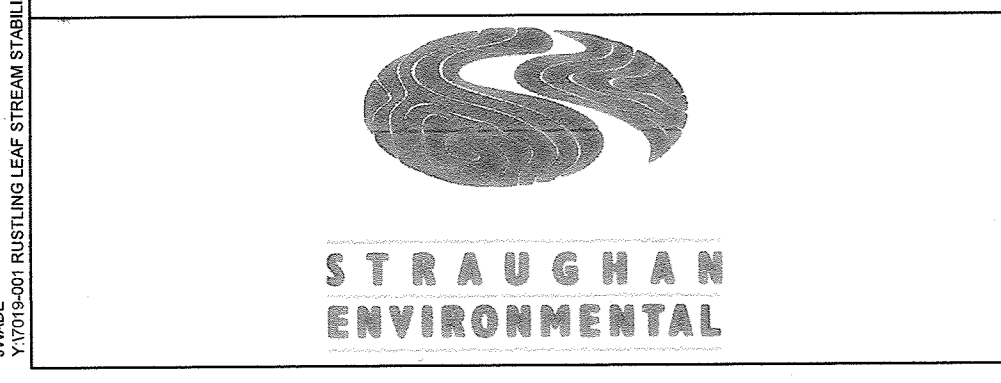
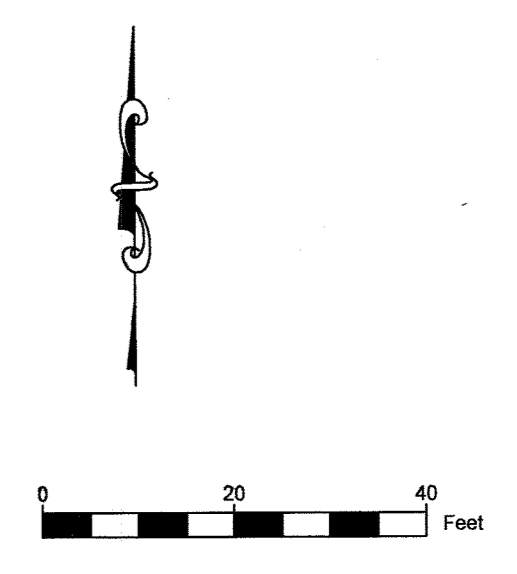
FEATURE	v, FT/S	τ, PSF
12-INCH COBBLE	5.5 TO 12	4.00
12-INCH RIPRAP	10 TO 13	5.10
LONG NATIVE GRASSES	4 TO 6	1.2 TO 1.7

SOURCE: FISCHENICH, C. (2001). STABILITY THRESHOLDS FOR STREAM RESTORATION MATERIALS. VICKSBURG, MS: US ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER.

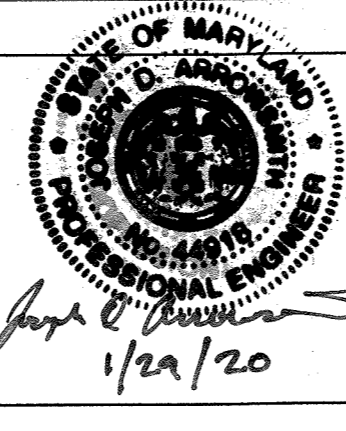
APPROVED: DEPARTMENT OF PLANNING AND ZONING

	4	2/12/20	Date
	40	2/13/2020	Date
		2/20/2020	Date

HOWARD SCD SIGNATURE BLOCK: *See EA-19-31*
 THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
 HOWARD SOIL CONSERVATION DISTRICT DATE



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 COLUMBIA, MARYLAND 21046
 BUSINESS PH. 443.638.2548



DES:	BY:	NO.:	REVISIONS	DATE
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DRN:	JA	1	REVISED SITE DEVELOPMENT PLAN SDP-08-107 SHEETS 30-39 APPROVED BY HSCD UNDER PLAN #EP-19-031	1/20
CHK:	JA			
DATE:				1/22/20

100% DESIGN
 REVISED SITE DEVELOPMENT PLAN
 (SDP-08-107)
 NAD83/NAVD88

COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280
 MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

SCALE
 1"=20'
 SHEET
 41
 37 OF 89

SDP-08-107

B-4.2 STANDARDS AND SPECIFICATIONS

FOR

SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

Definition

The process of preparing the soils to sustain adequate vegetative stabilization.

Purpose

To provide a suitable soil medium for vegetative growth.

Conditions Where Practice Applies

Where vegetative stabilization is to be established.

Criteria

- A. Soil Preparation
- Temporary Stabilization
 - Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
 - Apply fertilizer and lime as prescribed on the plans.
 - Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
 - Permanent Stabilization
 - A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
 - Soil pH between 6.0 and 7.0.
 - Soluble salts less than 500 parts per million (ppm).
 - Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if leucaena will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
 - Soil contains 1.5 percent minimum organic matter by weight.
 - Soil contains sufficient pore space to permit adequate root penetration.
 - Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
 - Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
 - Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
 - Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

- B. Topsoiling
- 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.
 - 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.
 - Topsoiling is limited to areas having 2:1 or flatter slopes where:
 - The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
 - 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.
 - The original soil to be vegetated contains material toxic to plant growth.
 - The soil is so acidic that treatment with limestone is not feasible.
 - Areas having slopes steeper than 2:1 require special consideration and design.
 - Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
 - 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 3 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2 inches in diameter.
 - 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.
 - 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.
 - Topsoil Application
 - Erosion and sediment control practices must be maintained when applying topsoil.
 - 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.
 - 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.
C. Soil Amendments (Fertilizer and Lime Specifications)

- Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
- Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
- Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydrosedding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
- Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
- Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

B-4.3 STANDARDS AND SPECIFICATIONS

FOR

SEEDING AND MULCHING

Definition

The application of seed and mulch to establish vegetative cover.

Purpose

To protect disturbed soils from erosion during and at the end of construction.

Conditions Where Practice Applies

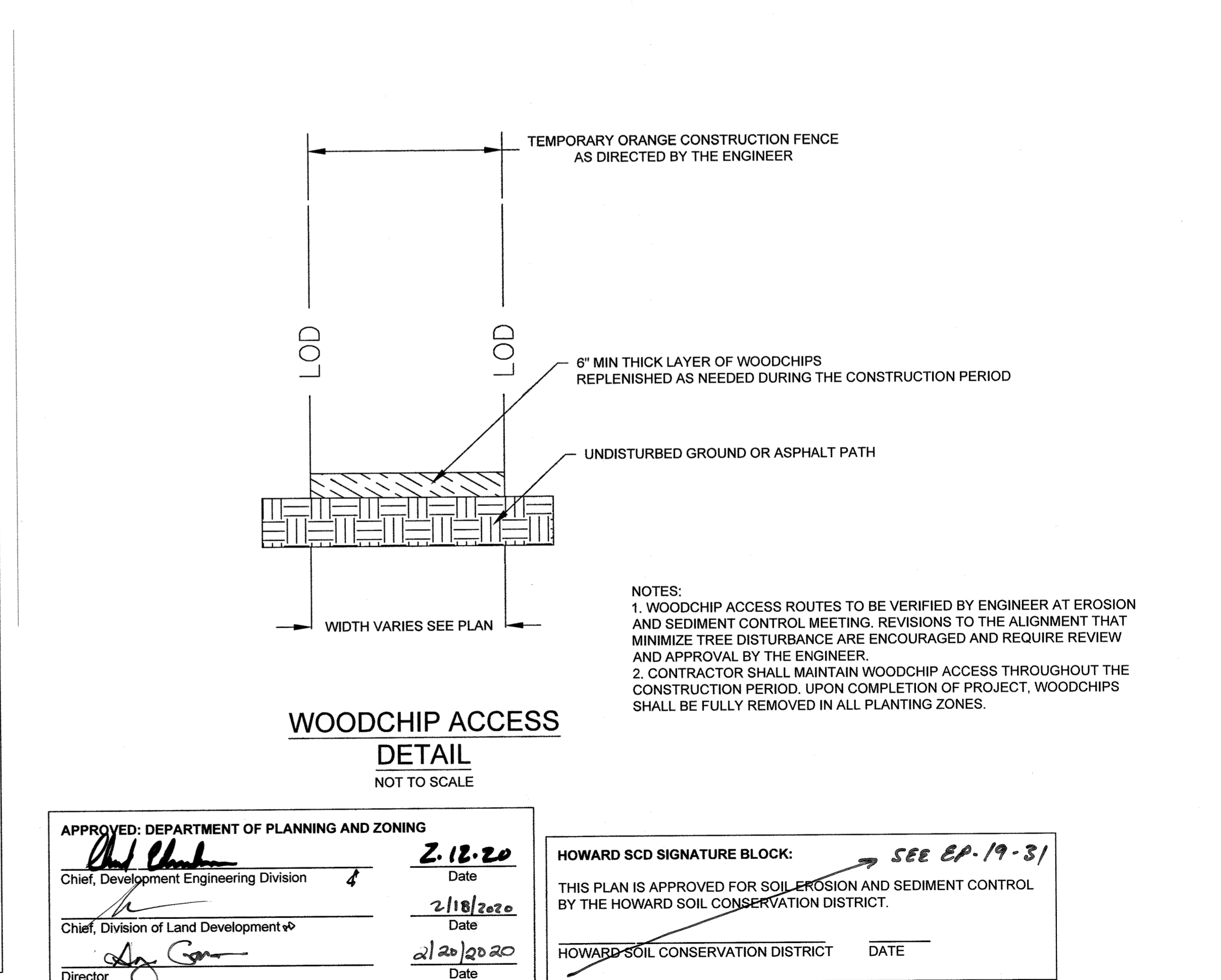
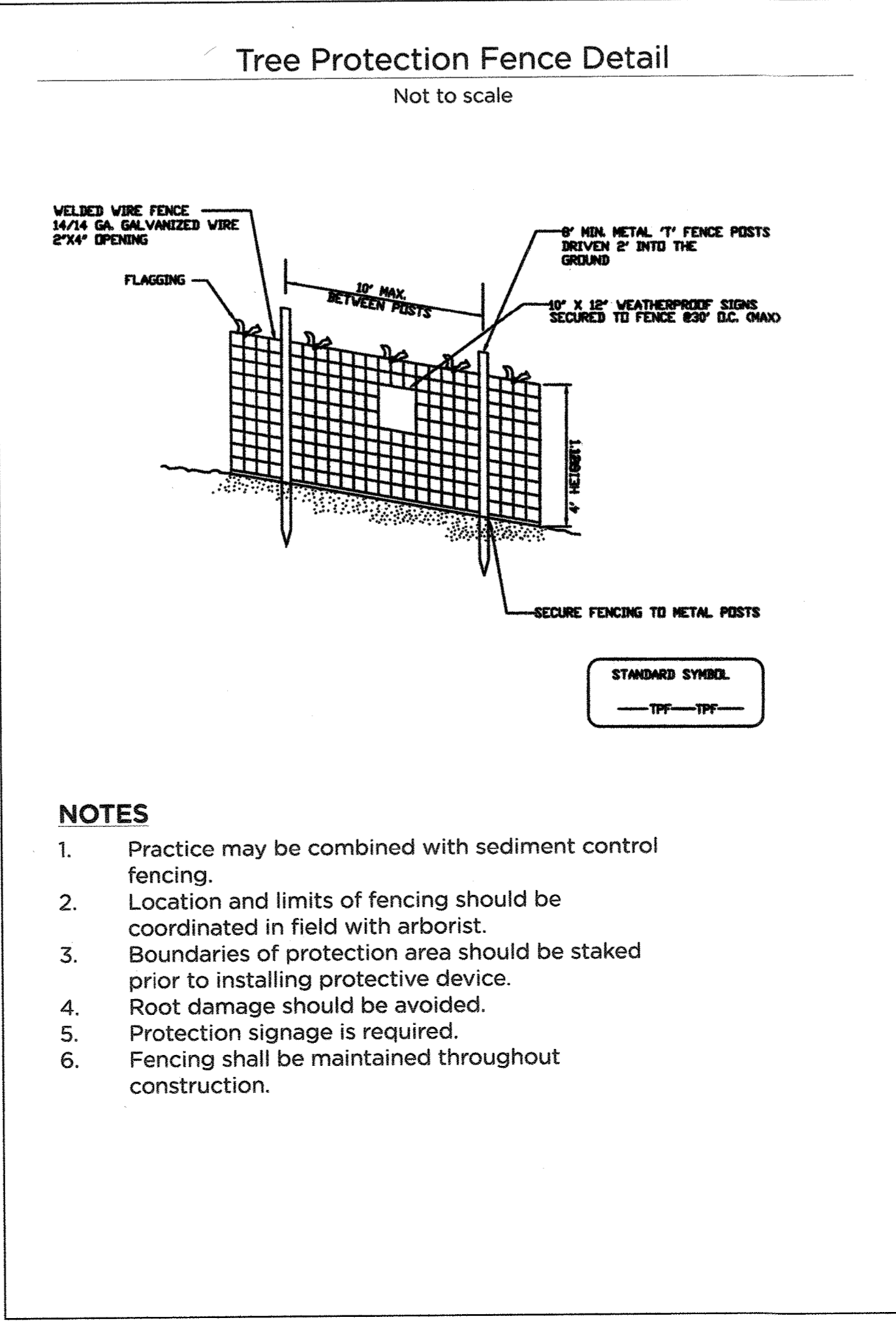
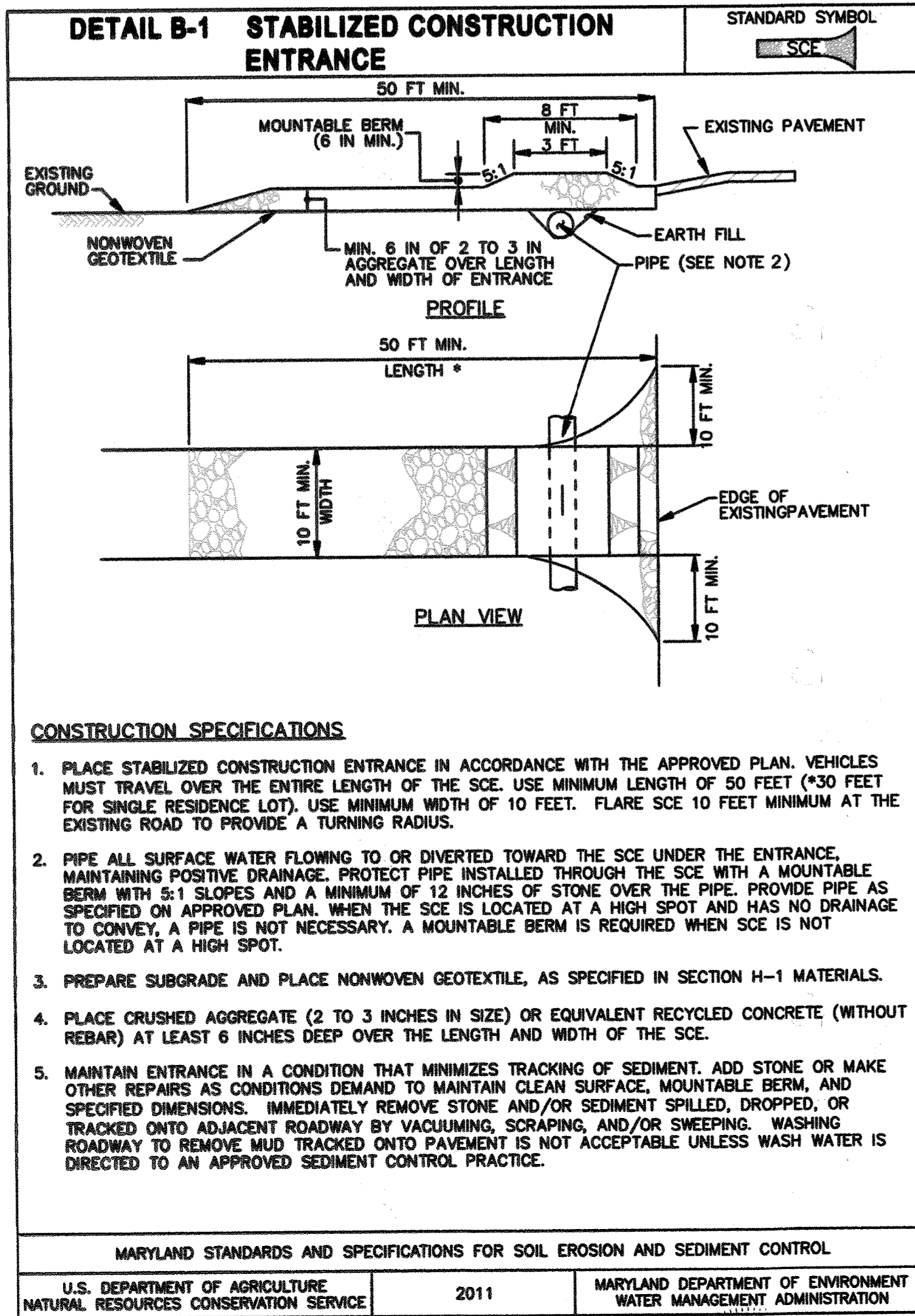
To the surface of all perimeter controls, slopes, and any disturbed area not under active grading.

Criteria

- A. Seeding
- Specifications
 - 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.
 - 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.
 - 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 hydrosedding. 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.
 - 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.
 - Application
 - Dry Seeding: This includes use of conventional drop or broadcast spreaders.
 - 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.
 - 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.

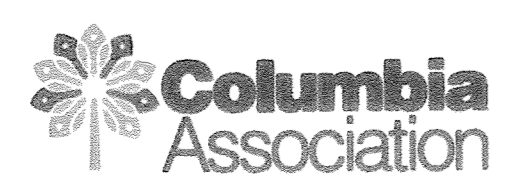
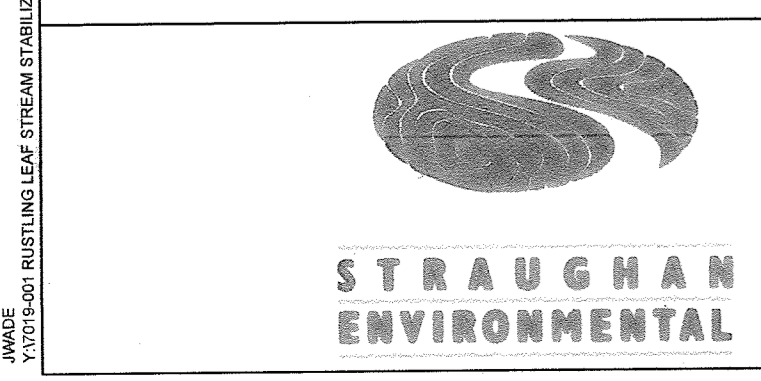
- Drill or Cultivator Seeding: Mechanized seeders that apply and cover seed with soil.
 - Cultivator seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
 - Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
- Hydrosedding: Apply seed uniformly with hydrosedder (slurry includes seed and fertilizer).
 - 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; P₂O₅ (phosphorous), 200 pounds per acre; K₂O (potassium), 200 pounds per acre.
 - Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydrosedding). Normally, not more than 2 tons are applied by hydrosedding at any one time. Do not use burnt or hydrated lime when hydrosedding.
 - Mix seed and fertilizer on site and seed immediately and without interruption.
 - When hydrosedding do not incorporate seed into the soil.

2. Application
- Apply mulch to all seeded areas immediately after seeding.
 - 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.
 - 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
- 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:
 - 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.
 - 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.
 - Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petrosak, 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.
 - 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.

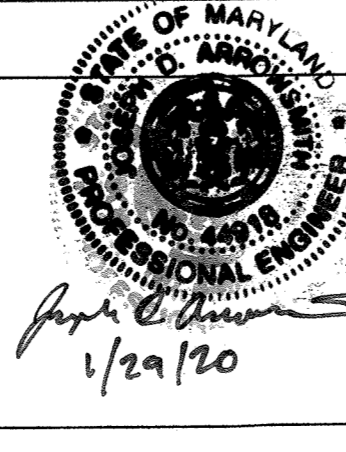


APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division 2-18-20
 Chief, Division of Land Development 2/18/2020
 Director 2/20/2020

HOWARD SCD SIGNATURE BLOCK:
 THIS PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
 SEE EP-19-31
 HOWARD SOIL CONSERVATION DISTRICT DATE



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CHK:	JA			
DATE:	1/29/20			1/29/20

100% DESIGN
 REVISED SITE DEVELOPMENT PLAN
 (SDP-08-107)
 NAD83/NAVDD88

COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280
 MINOR GRADING IN SUPPORT OF LAKE ELKHORN RESTORATION ELECTION DISTRICT 3, HOWARD COUNTY MD. TAX MAP 36 AND 42
 SCALE AS SHOWN
 SHEET 41 OF 49
 SDP-08-107

MGWC 1.2: PUMP-AROUND PRACTICE

Temporary measure for dewatering in-channel construction sites

DESCRIPTION

The work should consist of installing a temporary pump around and supporting measures to divert flow around in-stream construction sites.

IMPLEMENTATION SEQUENCE

Sediment control measures, pump-around practices, and associated channel and bank construction should be completed in the following sequence (refer to Detail 1.2):

- Construction activities including the installation of erosion and sediment control measures should not begin until all necessary easements and/or right-of-ways have been acquired. All existing utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damage at his/her own expense to the county's or utility company's satisfaction.
- The contractor should notify the Maryland Department of the Environment or WMA sediment control inspector at least 5 days before beginning construction. Additionally, the contractor should inform the local environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.
- The contractor should conduct a pre-construction meeting on site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor should stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants will also designate the contractor's staging areas and flag all trees within the limit of disturbance which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the WMA or local authority.
- Construction should not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor should stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.
- Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor should begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events.
- Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity dissipater made of riprap or sandbags.

TEMPORARY INSTREAM CONSTRUCTION MEASURES

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATERWAY CONSTRUCTION GUIDELINES
REVISED NOVEMBER 2009

PAGE 1.2-1

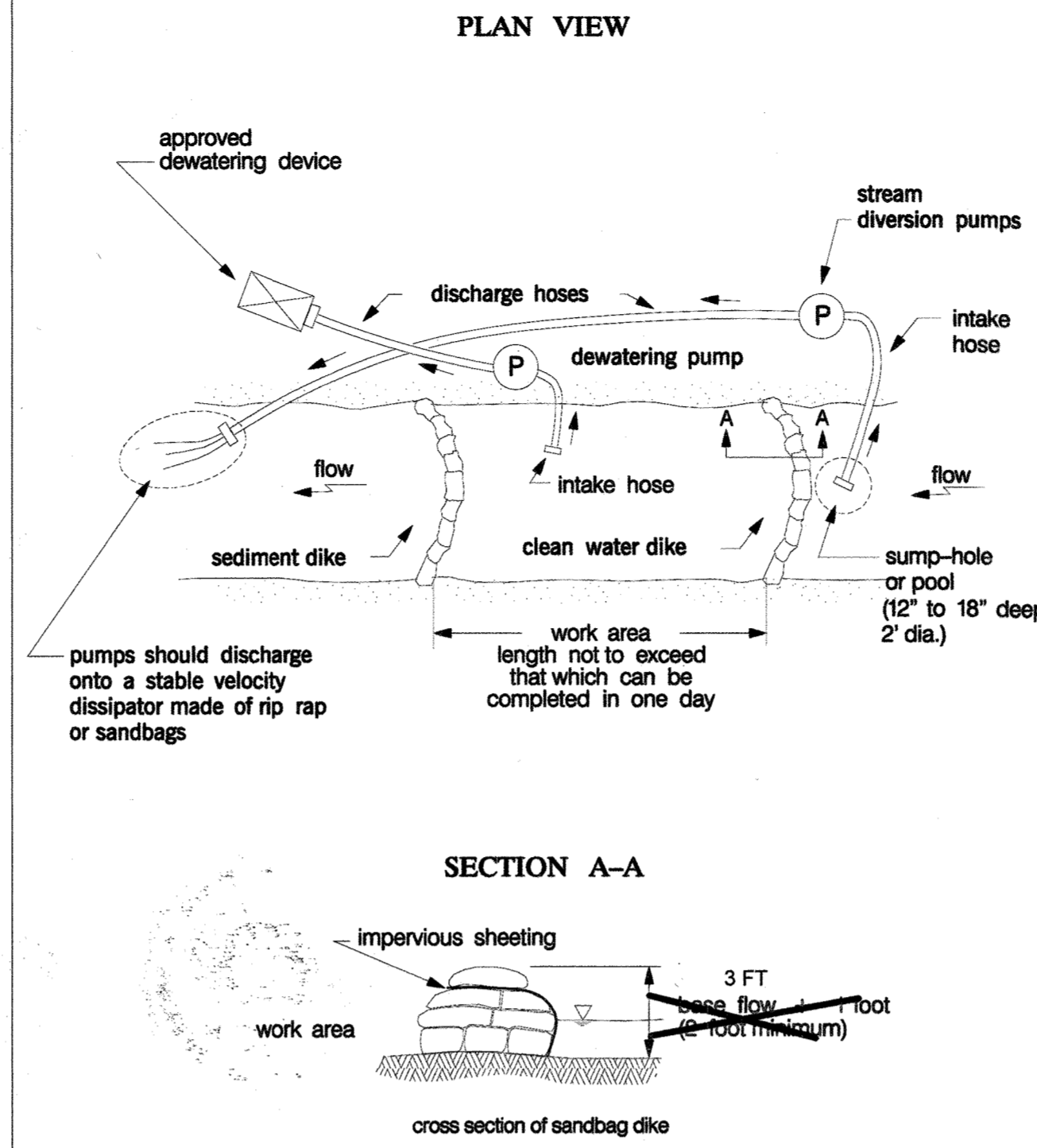
MGWC 1.2: PUMP-AROUND PRACTICE

- Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into the channel below the downstream sandbag dike.
- Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary and only where noted on the plans or specified. (See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction).
- All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross-sections. All grading must be stabilized at the end of each day with seed and mulch or seed and matting as specified on the plans.
- After an area is completed and stabilized, the clean water dike should be removed. After the first sediment flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike should be removed.
- A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm drain outfall and pumping the stream flow around the work area. This water should discharge onto the same velocity dissipater used for the main stem pump around.
- If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem should resume. Water from the tributary should continue to be pumped around the work area in the main stem.
- The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
- After construction, all disturbed areas should be regraded and revegetated as per the planting plan.

TEMPORARY INSTREAM CONSTRUCTION MEASURES

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATERWAY CONSTRUCTION GUIDELINES
REVISED NOVEMBER 2009

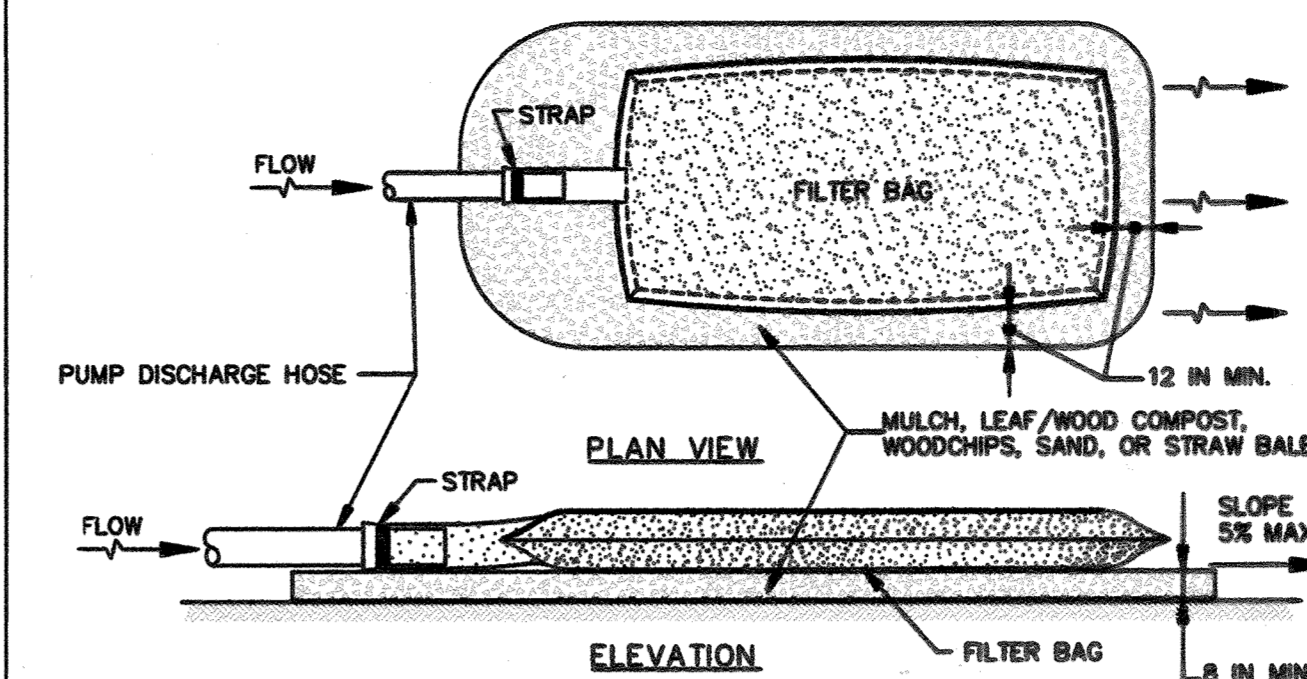
PAGE 1.2-2

**Maryland's Guidelines To Waterway Construction
DETAIL 1.2: PUMP-AROUND PRACTICE**

TEMPORARY INSTREAM CONSTRUCTION MEASURES

REVISED NOVEMBER 2009
PAGE 1.2-3MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION**DETAIL F-4 FILTER BAG**

STANDARD SYMBOL

 FB**CONSTRUCTION SPECIFICATIONS**

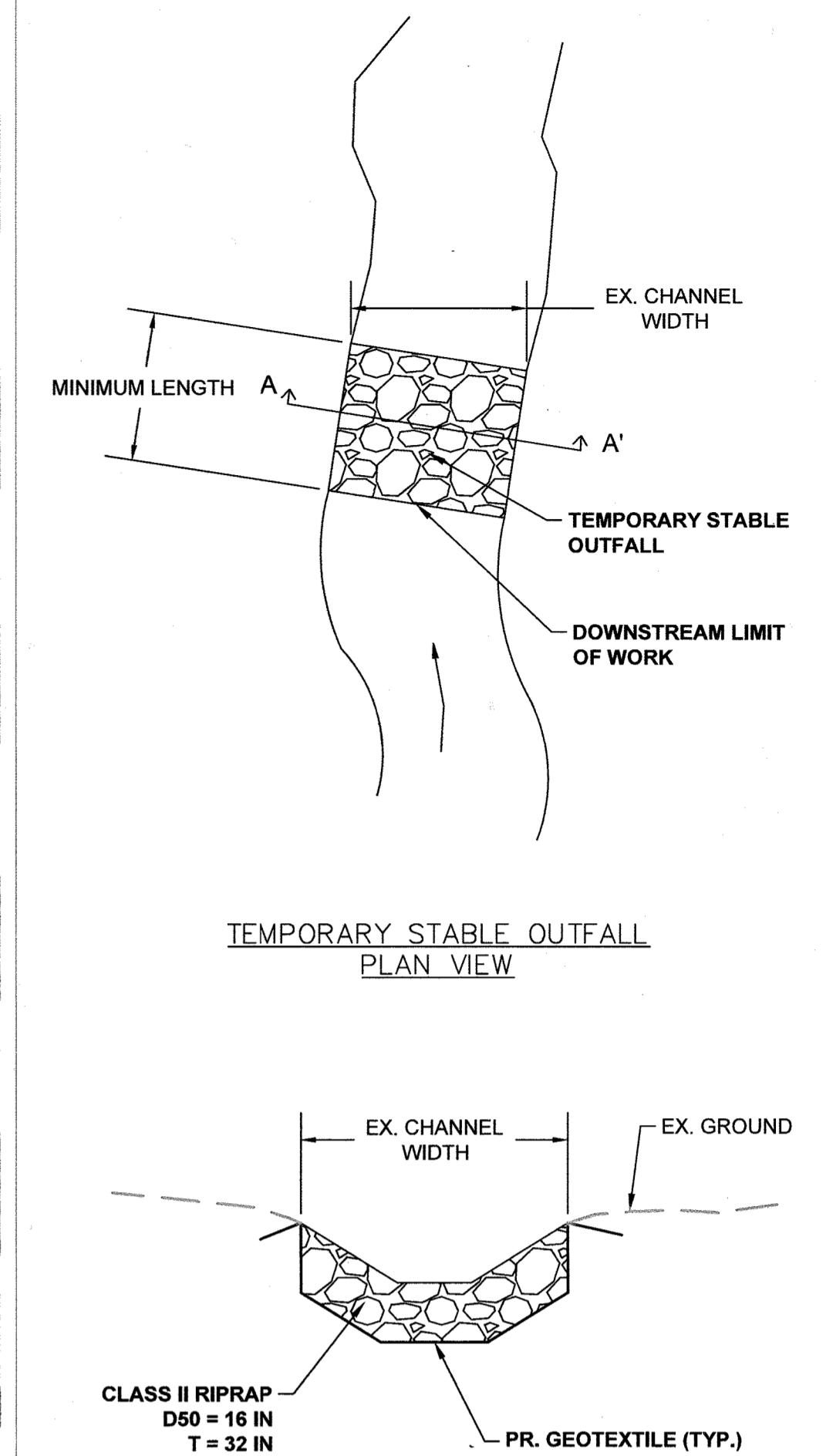
- TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
- PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
- CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
- REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
- USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4 INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4633
FLOW RATE	70 GAL/MIN/FT ²	ASTM D-4491
PERMITTIVITY (SEC ⁻¹)	1.2 SEC ⁻¹	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632
- REPLACE FILTER BAG IF BAG CLOSOS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

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 ADMINISTRATIONTEMPORARY STABLE OUTFALL
PLAN VIEW

EX. CHANNEL WIDTH

EX. GROUND

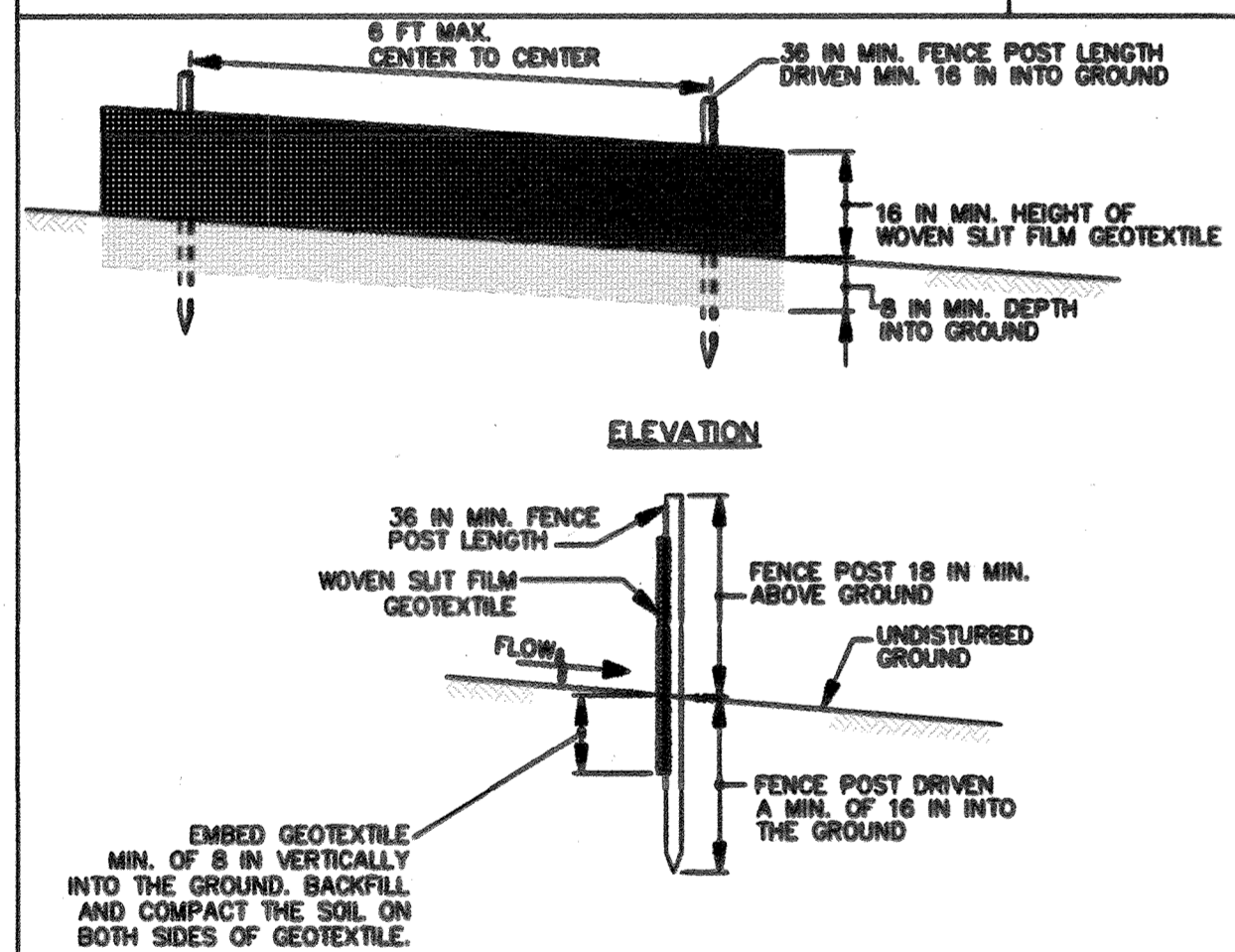
CLASS II RIPRAP
D50 = 16 IN
T = 32 IN

PR. GEOTEXTILE (TYP.)

TEMPORARY STABLE OUTFALL
SECTION A-A'TEMPORARY STABLE OUTFALL
DETAILNOTE:
MAXIMUM SLOPE = 5%
MINIMUM LENGTH = 5 FT**DETAIL E-1 SILT FENCE**

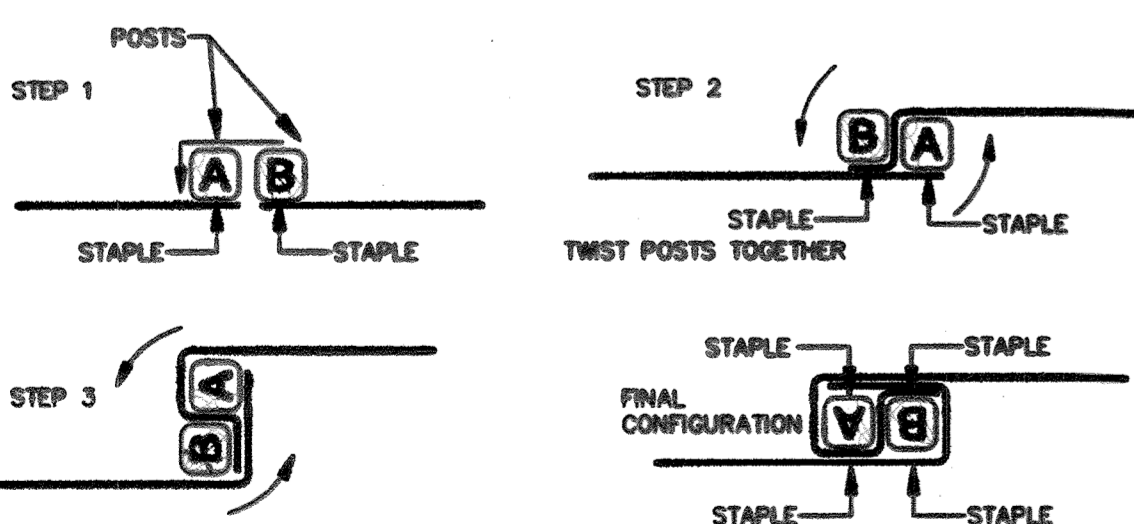
STANDARD SYMBOL

—SF—



ELEVATION

CROSS SECTION

JOINING TWO ADJACENT SILT
FENCE SECTIONS (TOP VIEW)

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

- USE WOOD POSTS 1 1/2 x 1 1/2 x 1/8 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.
- USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
- USE WOVEN SILT 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.
- 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.
- EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
- WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
- 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.
- 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, REINSTATE FENCE.

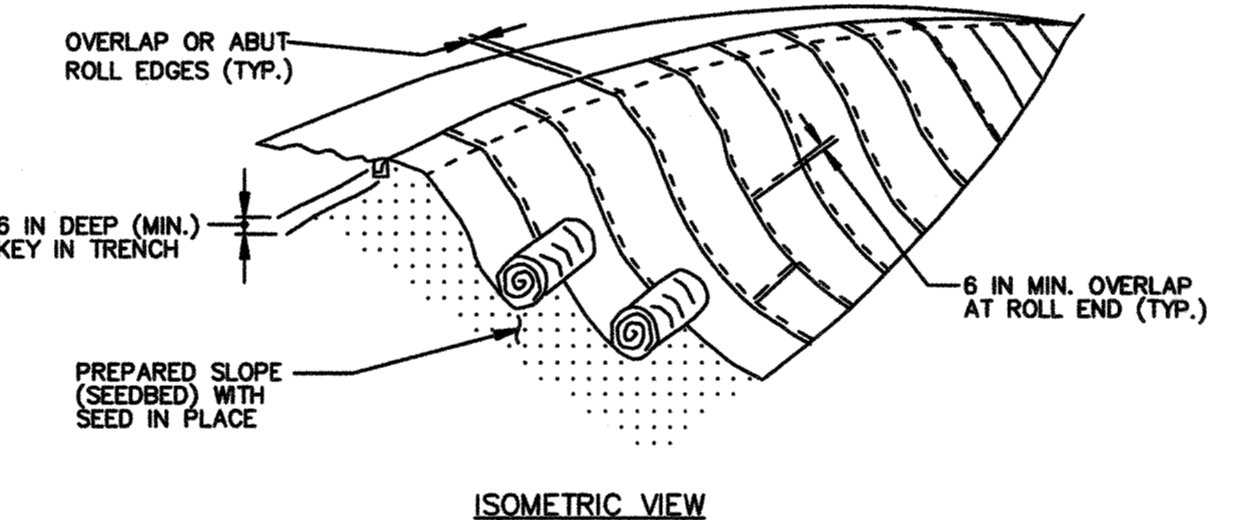
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

2011

MARYLAND DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

2 OF 2

**DETAIL B-4-6-B TEMPORARY SOIL
STABILIZATION MATTING
SLOPE APPLICATION**STANDARD SYMBOL
TSSMS - 2.0 lb/ft²
(* INCLUDE SHEAR STRESS)

ISOMETRIC VIEW

CONSTRUCTION SPECIFICATIONS

- USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
- USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SWELLER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2-2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
- SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 1/2 INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUND-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1 x 3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
- PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
- UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDBED SURFACE. AVOID STRETCHING THE MATTING.
- OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
- KEY IN THE UPSLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
- STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
- ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

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

B-4-8 STANDARDS AND SPECIFICATIONS**FOR
STOCKPILE AREA**

Definition

A mound or pile of soil protected by appropriately designed erosion and sediment control measures.

Purpose

To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies

Stockpile areas are utilized when it is necessary to salvage and store soil for later use.

Criteria

- The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
- The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.
- Runoff from the stockpile area must drain to a suitable sediment control practice.
- Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
- Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
- Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
- If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable sheeting.

Maintenance

The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3 Land Grading.

B.43

100% DESIGN
REVISED SITE DEVELOPMENT PLAN
(SDP-08-107)

NAD83/NAVD88

COLUMBIA ASSOCIATION
VILLAGE OF OWEN BROWN
SECTION 1, AREA 1, LOT 280

MINOR GRADING IN SUPPORT OF
LAKE ELKHORN RESTORATION
ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

SCALE
AS SHOWNSHEET
41 OF 48

SDP-08-107

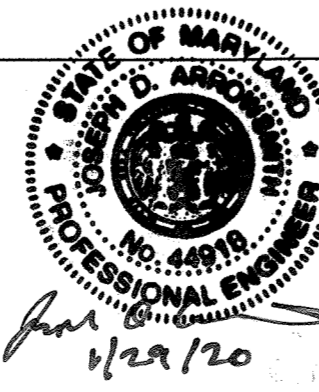
STRAUGHAN
ENVIRONMENTAL

Columbia
Association

JOSEPH D. ARROWSMITH, P.E.
PROFESSIONAL CERTIFICATION

I, JOSEPH D. ARROWSMITH CERTIFY THAT THESE DOCUMENTS WERE PREPARED BY OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 49118. EXPIRATION DATE: DECEMBER 22, 2021

JOSEPH D. ARROWSMITH, P.E.
10245 OLD COLUMBIA ROAD
COLUMBIA, MARYLAND 21046
BUSINESS PH. 443.539.2548



DES:	JA/JW	BY:	NO.	REVISIONS	DATE
DRN:	JW	JA	1	REVISED SITE DEVELOPMENT PLAN SDP-08-107 TO ADD SHEETS 30-39	1/20
CHK:	JA	JA	2	REVISED SITE DEVELOPMENT PLAN SDP-08-107 SHEETS 30-39 APPROVED BY HS/C/D UNDER PLAN #EP-19-31	1/20
DATE:	1/29/20				1/29/20

- WARNING -
 CONTRACTOR SHALL VERIFY CLEARANCE TO OVERHEAD CABLE CROSSINGS AND OTHER OBSTRUCTIONS ALONG THE ACCESS ROAD AS SHOWN ON PLANS

DREDGE VOLUME TABLE		
	DESIGN ELEVATION	DREDGE VOLUME*
AREA 1	285.0'	11,534 CY
AREA 2	287.0'	1,268 CY
TOTAL VOLUME		12,802 CY

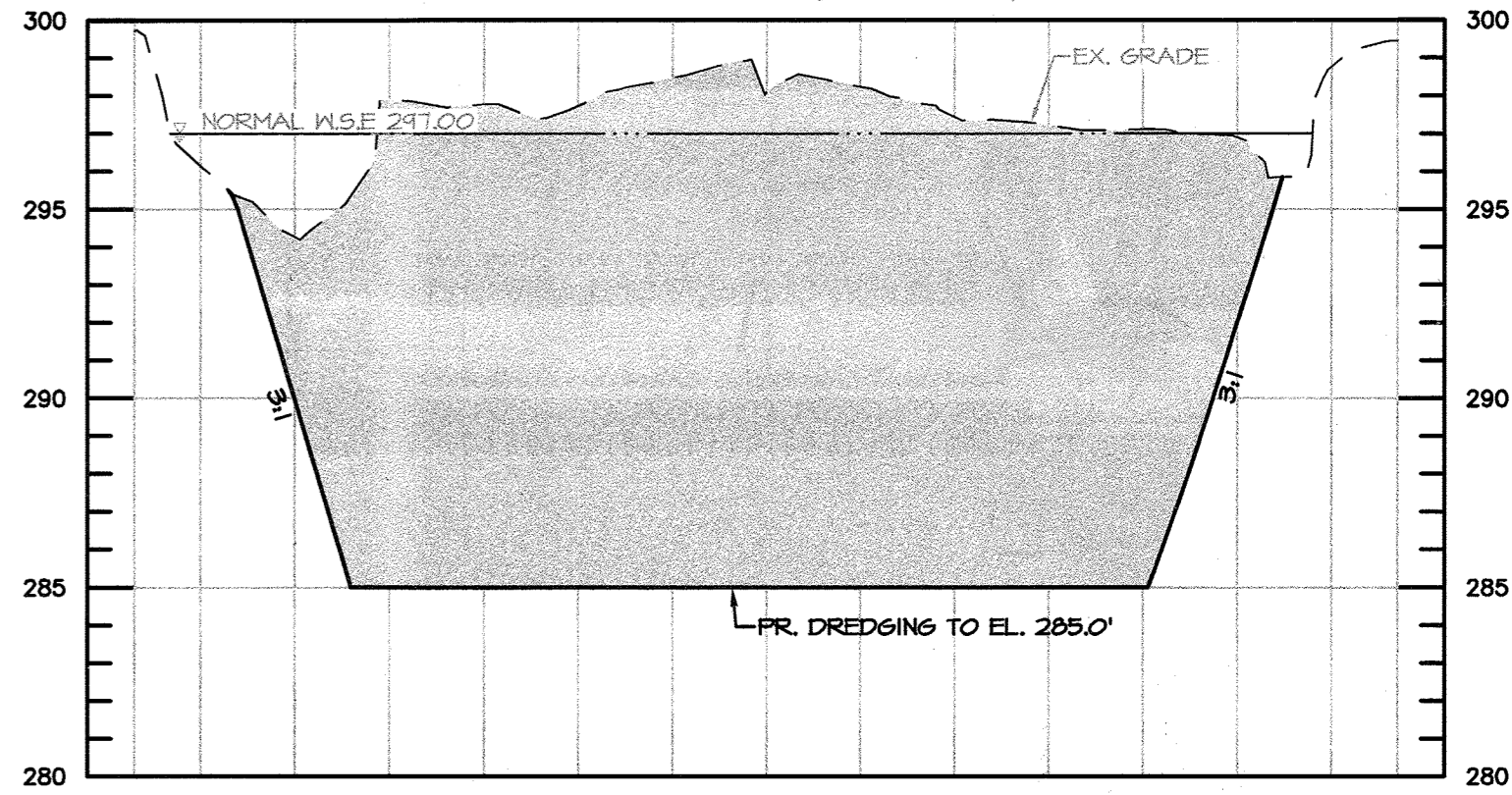
*THE VOLUMES SHOWN ARE THE ESTIMATED MINIMUM DREDGE QUANTITIES TO PROPOSED ELEVATIONS. THIS ESTIMATE IS BASED ON A NEAT TEMPLATE AND DOES NOT INCLUDE ANY OVER DREDGE QUANTITIES THAT MAY BE NECESSARY TO ACHIEVE THE MINIMUM DESIGN SECTION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE CHARACTER, QUALITY, AND QUANTITY OF THE MATERIAL THAT IS TO BE DREDGED. THE ESTIMATED QUANTITY SHOULD IN NO WAY BE USED FOR BIDDING OR PAYMENT CALCULATION. (SEE SPECS)

GENERAL NOTES

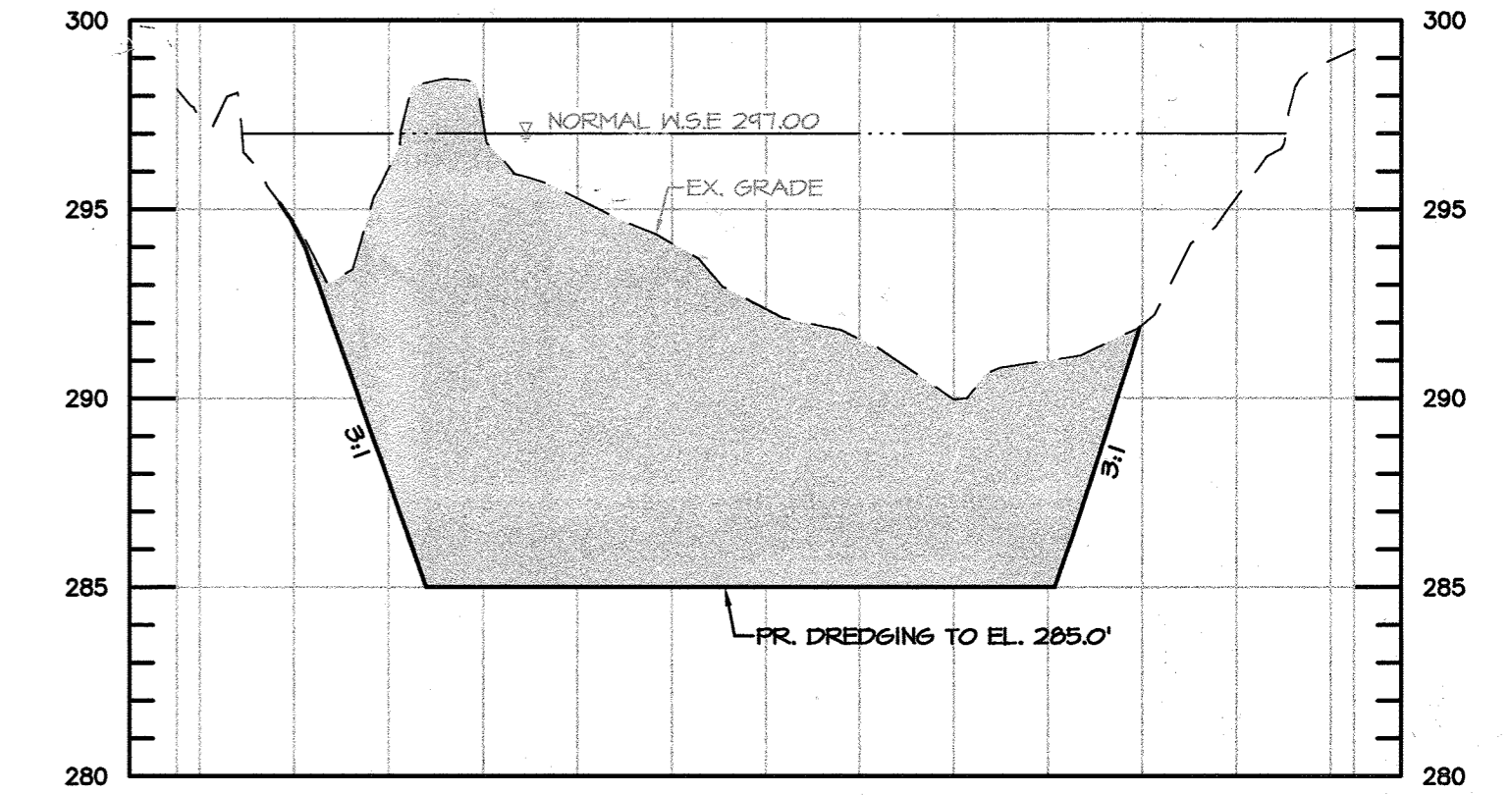
1. THE PRELIMINARY PLANS FOR LAKE ELKHORN FOREBAY AND BRIDGE AREA DREDGING WERE DISCUSSED AT THE OWEN BROWN COMMUNITY ASSOCIATION, INC. BOARD MEETING ON NOVEMBER 6, 2018.
2. ESSENTIAL OR NECESSARY DISTURBANCES TO WETLANDS, 25' WETLAND BUFFER, AND 100-YEAR FEMA FLOODPLAIN IN ACCORDANCE WITH SECTION 16.116(C) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATION HAS BEEN APPROVED AS DETAILED ON APPROVAL LETTER, DATED JANUARY 28, 2020.
3. THE PROJECT ACCESS AND LIMIT OF WORK ALONG ELKHORN BRANCH TRAIL SHALL BE LIMITED TO THE EXISTING PAVED AREAS.
4. ALL DISTURBED AREAS SHALL RE-SEED AFTER CONSTRUCTION IS COMPLETE. ANY AREAS WITHIN THE WETLANDS THAT DO NOT NATURALLY REBOUND AFTER THE REMOVAL OF TEMPORARY CONSTRUCTION MATTING SHALL BE REPLANTED WITH NATIVE WETLAND VEGETATION.

REVISION NOTE:

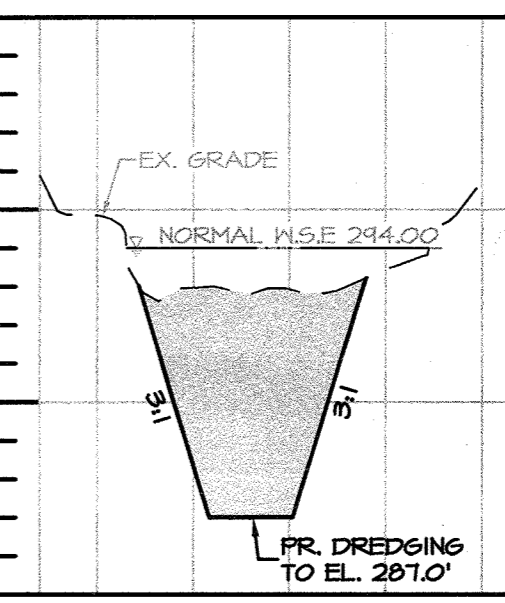
REVISIONS ADDING SHEETS 40 AND 41 WERE MADE TO CREATE AN ALTERNATE ACCESS TO AREAS 1 AND AREAS 2 TO PERFORM MAINTENANCE DREDGING OF ACCUMULATED SEDIMENT. THIS ACCESS WAS SELECTED TO MINIMIZE IMPACTS TO THE SURROUNDING RESIDENCES. TEMPORARY WETLAND IMPACTS WERE APPROVED (MDE TRACKING NUMBER 19-NF-3149/201961079).



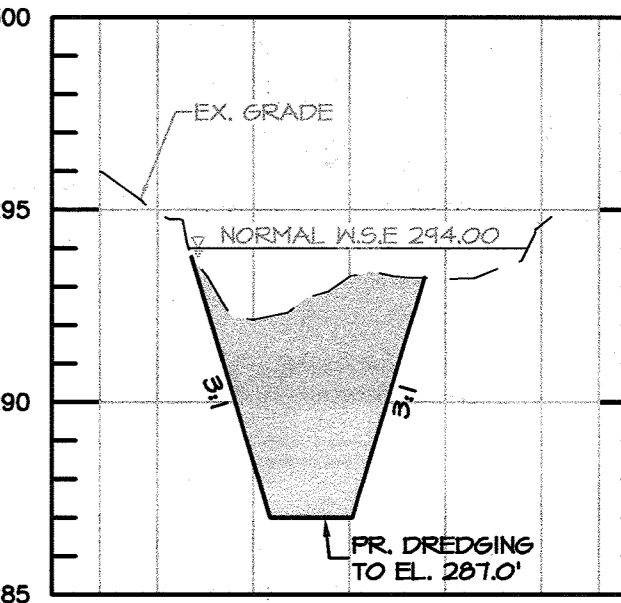
XS-1 AREA 1
 SCALE: HORZ. 1" = 50'
 VERT. 1" = 5'



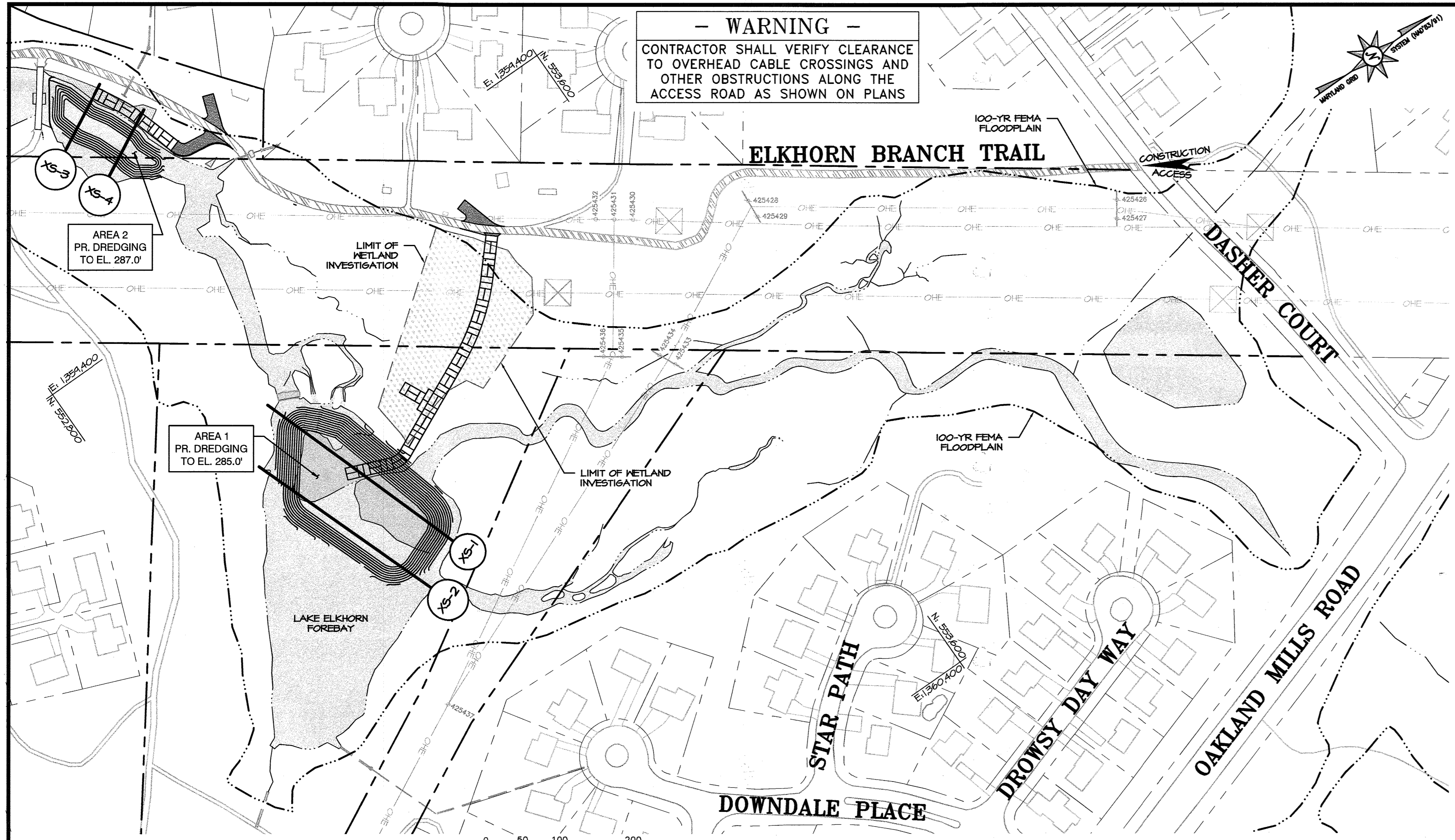
XS-2 AREA 1
 SCALE: HORZ. 1" = 50'
 VERT. 1" = 5'



XS-3 AREA 2
 SCALE: HORZ. 1" = 50'
 VERT. 1" = 5'



XS-4 AREA 2
 SCALE: HORZ. 1" = 50'
 VERT. 1" = 5'



SITE PLAN
 SCALE: 1" = 100'

WETLAND PROTECTION MATTING

STANDARD SYMBOL

GENERAL SPECIFICATIONS

LARGE MAT
 - OVERALL DIMENSIONS: 8' x 14'
 - SURFACE DIMENSIONS: 7' x 13'
 - HEIGHT: VARIABLE (SEE BELOW)

ALL MEASUREMENTS AND WEIGHTS ARE NOMINAL.

EACH MAT IS EQUIPPED WITH A LIP ON TWO SIDES THAT CREATE AN OVERLAPPING JOINT WITH AN ADJOINING MAT. EACH MAT IS ALSO EQUIPPED WITH 16 SLOTS INTO WHICH LOCKING PINS ARE INSERTED AND ENGAGED IN ORDER TO FASTEN MULTIPLE MATS TOGETHER. WETLAND PROTECTION MATTING MUST BE INSTALLED AT RIGHT ANGLES AND JOINED TOGETHER WITH PINS WHEN USED FOR WETLAND PROTECTION.

THE USE OF INTERLOCKING COMPOSITE MATTING IS THE PREFERRED CHOICE FOR ACCESSING WETLANDS. ALL MATTING INSTALLATIONS MUST ADHERE TO AVOIDANCE AND MINIMIZATION PRINCIPLES TO CREATE THE LEAST POTENTIAL IMPACT OF THE PROTECTED RESOURCE WHILE SAFELY ACCOMMODATING THE NECESSARY WORK. THE TYPE OF MATTING, QUANTITY, SIZE AND DESIGN MUST TAKE INTO CONSIDERATION THE WEIGHT, SIZE AND MOVEMENT OF THE EQUIPMENT THAT WILL BE USING THE TEMPORARY ACCESS STRUCTURE. THE CONTRACTOR IS EXPECTED TO FOLLOW MANUFACTURER RECOMMENDATIONS. WHEN CONSIDERING DESIGN LOADING EQUIPMENT WEIGHTS, ONE MUST INCLUDE THE WEIGHT OF MATERIALS THAT THE EQUIPMENT WILL BE HANDLING SUCH AS PILES, STRUCTURES, LOADED CONCRETE TRUCKS, BUCKETS, CRANES AND OTHER APPARENT IMPACTS TO WEIGHT OR STRESSES. THIS GUIDANCE IS BASED UPON THE ENHANCED ABILITY TO OBTAIN PERMISSION FROM THE APPROPRIATE AGENCIES BY UTILIZING THIS TECHNOLOGY TO PERFORM WORK WITHIN ENVIRONMENTALLY SENSITIVE AREAS.

ALL CONSTRUCTION TRAFFIC AND WORK AREAS IN WETLANDS AND WETLAND BUFFERS TO USE COMPOSITE MATTING. APPROVED COMPOSITE MATTING SUPPLIERS INCLUDE:

- DURA BASE	1000 LBS	COMPOSITE CAM LOCKING SYSTEM	4IN HOLLOW REINFORCED CORE
- SURETRAK	800 LBS	ALUMINUM CAM LOCKING SYSTEM	1.5IN SOLID
- RUGGED ROAD	1050 LBS	ALUMINUM CAM LOCKING SYSTEM	4.25IN REINFORCED HOLLOW CORE
- MEGA DECK	1050 LBS	ALUMINUM CAM LOCKING SYSTEM	4.25IN REINFORCED HOLLOW CORE
- MEGA DECK SLP	950 LBS	ALUMINUM CAM LOCKING SYSTEM	1.5IN SOLID

ORANGE BLAZE FENCE DETAIL

STANDARD SYMBOL

NOTES:

1. T-POST SHALL BE SPACED A MAXIMUM OF 12' O/C. AVOID ROOT DAMAGE TO TREES WHEN PLACING THE T-POSTS.
2. THE HIGH VISIBILITY FENCE SHOULD BE FASTENED SECURELY TO THE T-POSTS WITH WIRE OR ZIP TIES.
3. THE FENCING MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION; ANY CHANGE OF THE PROTECTIVE FENCING MUST BE APPROVED.

NOT TO SCALE

TREE PROTECTION DETAIL

NOTES:

1. WHEN PRACTICABLE, INSTALL HIGH VISIBILITY 3 FEET OUTSIDE OF THE DRIP LINE OF THE TREE.
2. T-POST SHALL BE SPACED A MAXIMUM OF 12' O/C. AVOID ROOT DAMAGE WHEN PLACING THE T-POSTS.
3. THE HIGH VISIBILITY FENCE SHOULD BE FASTENED SECURELY TO THE T-POSTS WITH WIRE OR ZIP TIES.
4. THE FENCING MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION; ANY CHANGE OF THE PROTECTIVE FENCING MUST BE APPROVED.

NOT TO SCALE

TYPICAL DREDGING SECTION

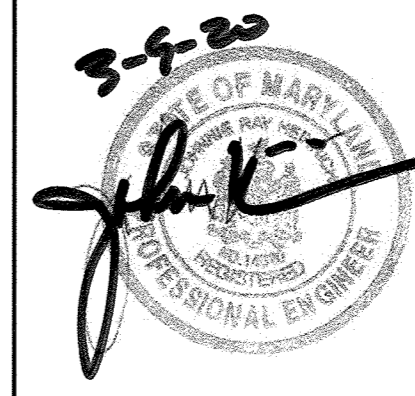
NOT TO SCALE

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. 14920, EXPIRATION DATE: 05/12/2020.

Bayland Consultants & Designers, Inc.
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 BAYLAND JOB NO. 8_17116



**COLUMBIA ASSOCIATION
 VILLAGE OF OWEN BROWN
 SECTION 1, AREA 1, LOT 280**

MINOR GRADING IN SUPPORT OF
 LAKE ELKHORN RESTORATION
 ELECTION DISTRICT 3, HOWARD COUNTY MD.
 TAX MAP 36 AND 42

**LAKE ELKHORN SEDIMENT REMOVAL
 REVISED SITE DEVELOPMENT PLAN (SDP-08-107)**

REVISIONS			SCALE: AS SHOWN	
DATE	BY	DESCRIPTION	DRAWN BY:	DATE:
3/9/2020	JRH	ADD SDP SHEETS 40-41 TO PROVIDE ALTERNATE ACCESS FOR MAINTENANCE DREDGING OF AREA 1 AND AREA 2 (SP-20-20)	DS/KNR	03/09/20
			CHECKED BY: JH	DATE: 03/09/20
			DESIGNED BY: JH	DATE: 03/09/20
SHEET NO. 40 OF 41				

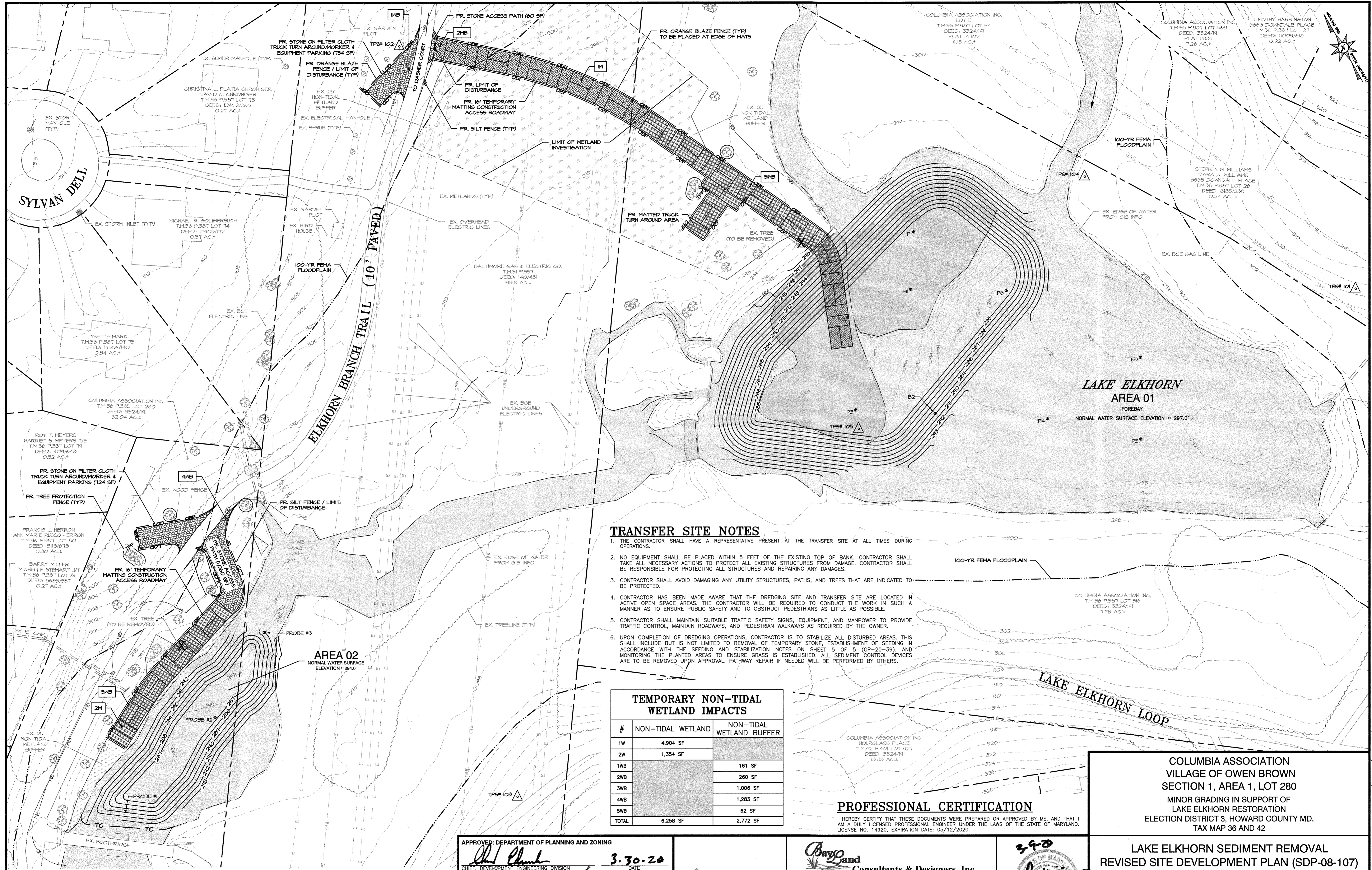
COMPOSITE WETLAND PROTECTION MATTING DETAIL

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[Signature] 3.30.20
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 4/6/2020
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 4-3-2020
 DIRECTOR DATE



TRANSFER SITE NOTES

1. THE CONTRACTOR SHALL HAVE A REPRESENTATIVE PRESENT AT THE TRANSFER SITE AT ALL TIMES DURING OPERATIONS.
2. NO EQUIPMENT SHALL BE PLACED WITHIN 5 FEET OF THE EXISTING TOP OF BANK. CONTRACTOR SHALL TAKE ALL NECESSARY ACTIONS TO PROTECT ALL EXISTING STRUCTURES FROM DAMAGE. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL STRUCTURES AND REPAIRING ANY DAMAGES.
3. CONTRACTOR SHALL AVOID DAMAGING ANY UTILITY STRUCTURES, PATHS, AND TREES THAT ARE INDICATED TO BE PROTECTED.
4. CONTRACTOR HAS BEEN MADE AWARE THAT THE DREDGING SITE AND TRANSFER SITE ARE LOCATED IN ACTIVE OPEN SPACE AREAS. THE CONTRACTOR WILL BE REQUIRED TO CONDUCT THE WORK IN SUCH A MANNER AS TO ENSURE PUBLIC SAFETY AND TO OBSTRUCT PEDESTRIANS AS LITTLE AS POSSIBLE.
5. CONTRACTOR SHALL MAINTAIN SUITABLE TRAFFIC SAFETY SIGNS, EQUIPMENT, AND MANPOWER TO PROVIDE TRAFFIC CONTROL, MAINTAIN ROADWAYS, AND PEDESTRIAN WALKWAYS AS REQUIRED BY THE OWNER.
6. UPON COMPLETION OF DREDGING OPERATIONS, CONTRACTOR IS TO STABILIZE ALL DISTURBED AREAS. THIS SHALL INCLUDE BUT IS NOT LIMITED TO REMOVAL OF TEMPORARY STONE, ESTABLISHMENT OF SEEDING IN ACCORDANCE WITH THE SEEDING AND STABILIZATION NOTES ON SHEET 5 OF 5 (GP-20-39), AND MONITORING THE PLANTED AREAS TO ENSURE GRASS IS ESTABLISHED. ALL SEDIMENT CONTROL DEVICES ARE TO BE REMOVED UPON APPROVAL. PATHWAY REPAIR IF NEEDED WILL BE PERFORMED BY OTHERS.

TEMPORARY NON-TIDAL WETLAND IMPACTS

#	NON-TIDAL WETLAND	NON-TIDAL WETLAND BUFFER
1W	4,904 SF	
2W	1,354 SF	
1WB		161 SF
2WB		260 SF
3WB		1,006 SF
4WB		1,283 SF
5WB		62 SF
TOTAL	6,258 SF	2,772 SF

PROFESSIONAL CERTIFICATION

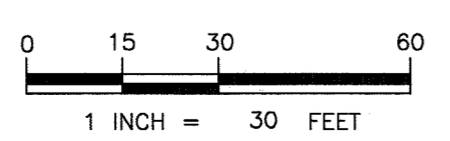
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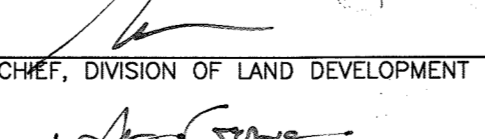
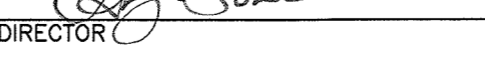
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ELECTION DISTRICT 3, HOWARD COUNTY MD.
TAX MAP 36 AND 42

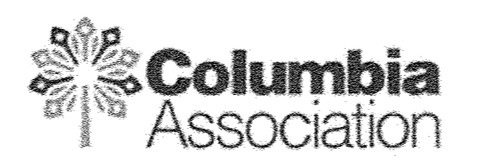
**LAKE ELKHORN SEDIMENT REMOVAL
REVISED SITE DEVELOPMENT PLAN (SDP-08-107)**

DATE	BY	REVISIONS	SCALE: 1" = 30'
3/9/2020	JRH	ADD TO SHEET 40-41 TO PROVIDE ALTERNATE ACCESS FOR WETLANDS (SEE SHEET 40-41 AND SHEET 40-42)	DRAWN BY: DG/KNR DATE: 03/09/20 CHECKED BY: JH DATE: 03/09/20 DESIGNED BY: JH DATE: 03/09/20

REVISION NOTE: Δ
REVISIONS ADDING SHEETS 40 AND 41 WERE MADE TO CREATE AN ALTERNATE ACCESS TO AREAS 1 AND AREAS 2 TO PERFORM MAINTENANCE DREDGING OF ACCUMULATED SEDIMENT. THIS ACCESS WAS SELECTED TO MINIMIZE IMPACTS TO THE SURROUNDING RESIDENCES. TEMPORARY WETLAND IMPACTS WERE APPROVED (MDE TRACKING NUMBER 19-NI-3149/201961079).



APPROVED: DEPARTMENT OF PLANNING AND ZONING

 CHIEF, DEVELOPMENT ENGINEERING DIVISION 3.30.20 DATE

 CHIEF, DIVISION OF LAND DEVELOPMENT 4/1/2020 DATE

 DIRECTOR 4-3-2020 DATE



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