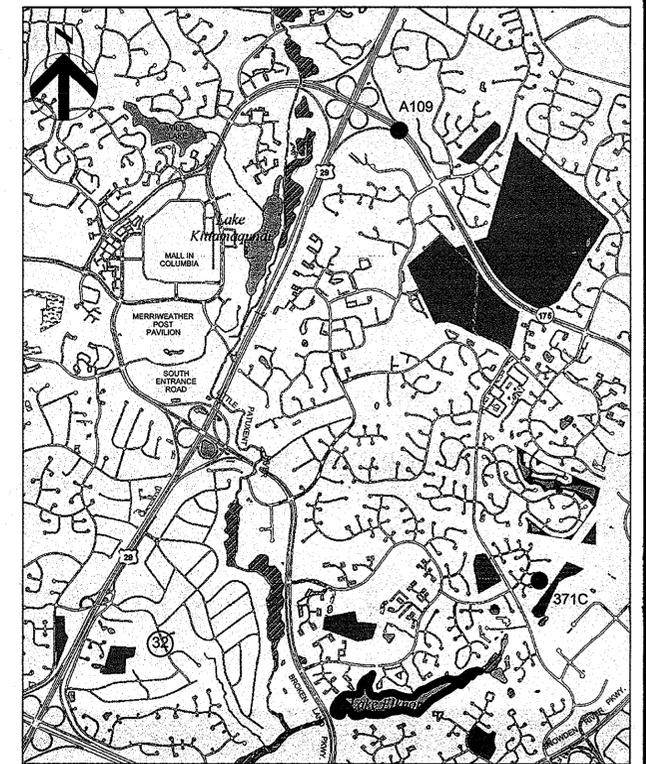


DRAWING SHEET NO.	SHEET NO.	SHEET TITLE
A-01	2.	GENERAL NOTES
B-01	3.	EXISTING CONDITIONS SITE PLAN KEY
B-02	4.	EXISTING CONDITIONS PLAN AREA 01
B-03	5.	EXISTING CONDITIONS PLAN AREA 02 & 03
B-04	6.	EXISTING CONDITIONS PLAN AREA 04
B-05	7.	EXISTING CONDITIONS PLAN AREA 05
B-06	8.	EXISTING CONDITIONS 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



# 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 <sup>2</sup>
STAGING AREA	0.67	ACRES	29,088 FT <sup>2</sup>
b. AREA OF PLAN SUBMISSION - SEE ITEM a			
c. LIMIT OF DISTURBED AREA			
LAKE	14.79	ACRES	644,372 FT <sup>2</sup>
STAGING AREA	1.12	ACRES	48,787 FT <sup>2</sup>
d. PRESENT ZONING	NT		
e. NA, TEMPORARY MAINTENANCE EMPLOYEES			

PERMIT INFORMATION CHART					
Subdivision Name	VILLAGE OF OWEN BROWN		Section/Area	SECTION 1 OPEN SPACE AREA 1	
Lot/Parcel No.	280				
Plot # 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	

APPROVED: DEPARTMENT OF PLANNING AND ZONING

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

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

*Mack H. G. G. G.*  
Director  
Date 7/2/09



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



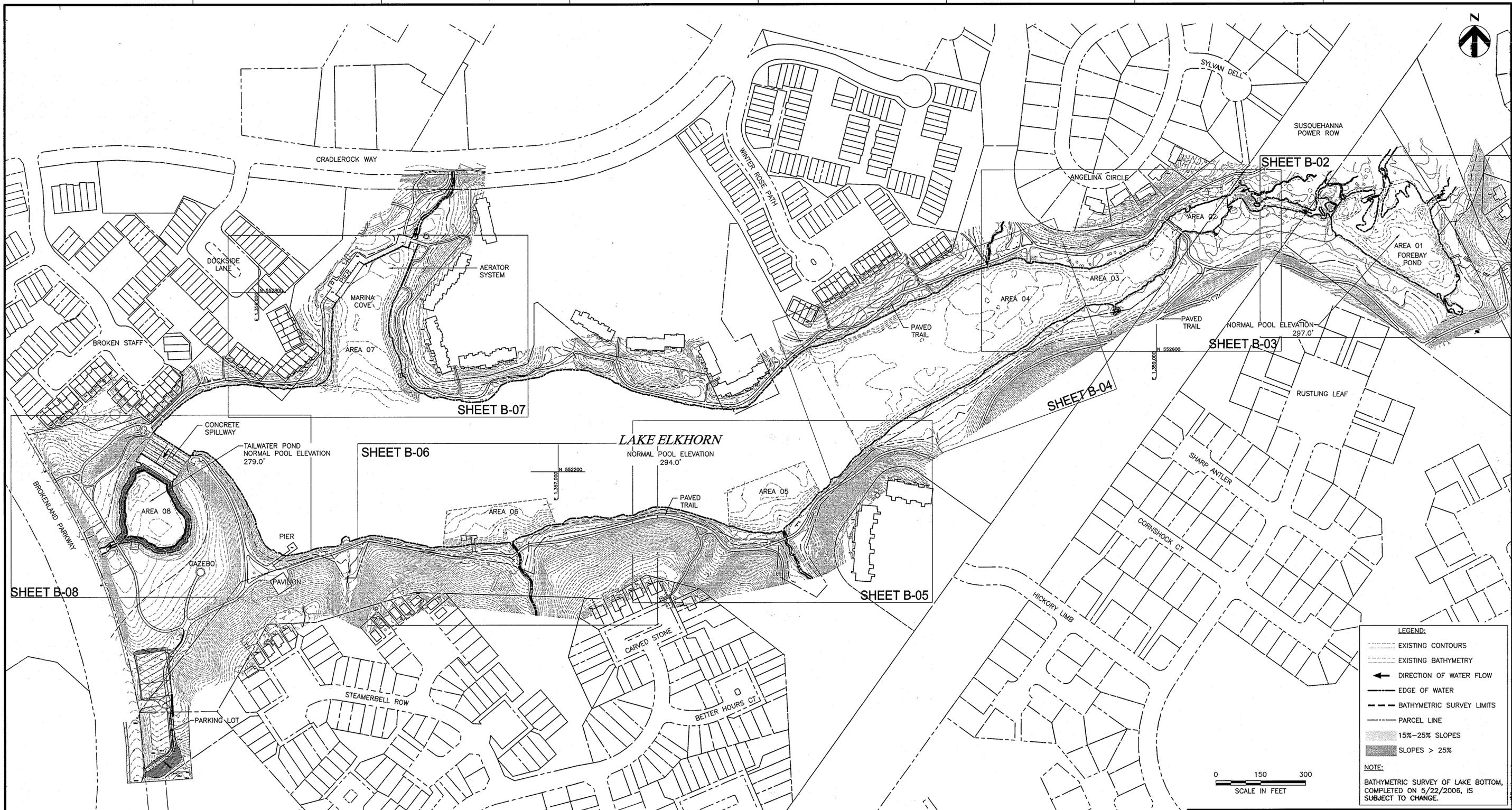
PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION  
PIETER DAHMEN, PE  
HDR ENGINEERING INC.  
March 31, 2009



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

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





**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

*Chris Edwards*  
 Chief, Development Engineering Division  
 Date: 6-9-9

*Chris Hanks*  
 Chief, Division of Land Development  
 Date: 7/6/09

*Mark K. Gault*  
 Director  
 Date: 7/6/09

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, PE  
 HDR ENGINEERING INC.



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

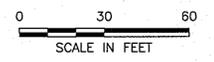
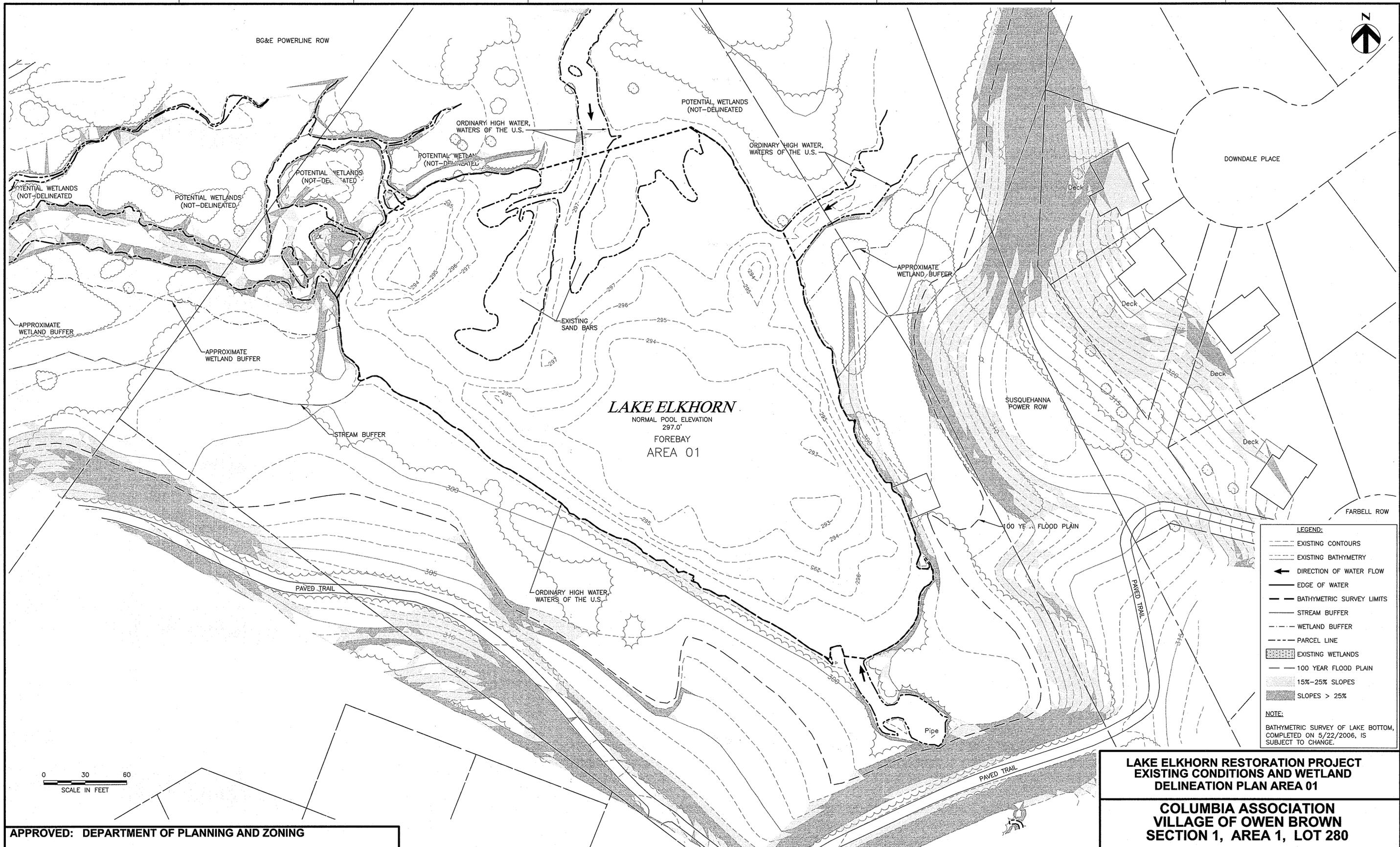
**LAKE ELKHORN RESTORATION PROJECT  
 EXISTING CONDITIONS AND WETLAND  
 DELINEATION SITE PLAN KEY**

**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.

**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

	6-9-9
Chief, Development Engineering Division	Date
	7/2/09
Chief, Division of Land Development	Date
	7/2/09
Director	Date

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

Visty P. Dalal  
 Regulatory & Compliance Engineer

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

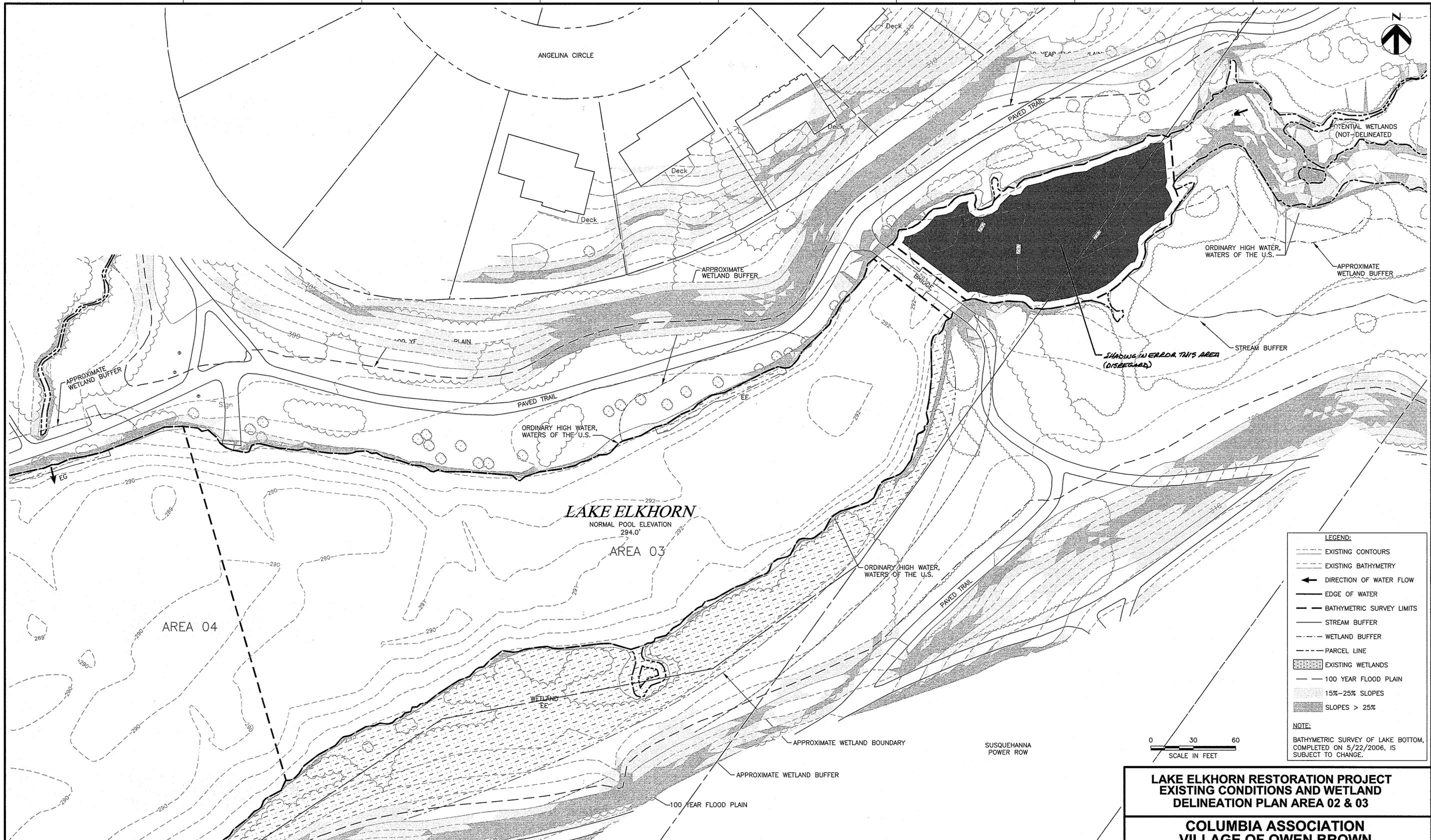
**LAKE ELKHORN RESTORATION PROJECT  
 EXISTING CONDITIONS AND WETLAND  
 DELINEATION PLAN AREA 01**

**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

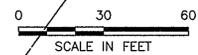
DRAWING B-02, SHEET 4 OF 29  
 SDP-08-107



**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.



**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

**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

*Chad Kinosh*  
 Chief, Development Engineering Division  
 Date 6-9-9

*Cindy Hambr*  
 Chief, Division of Land Development  
 Date 7/6/09

*Mark McCull*  
 Director  
 Date 7/7/09

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:

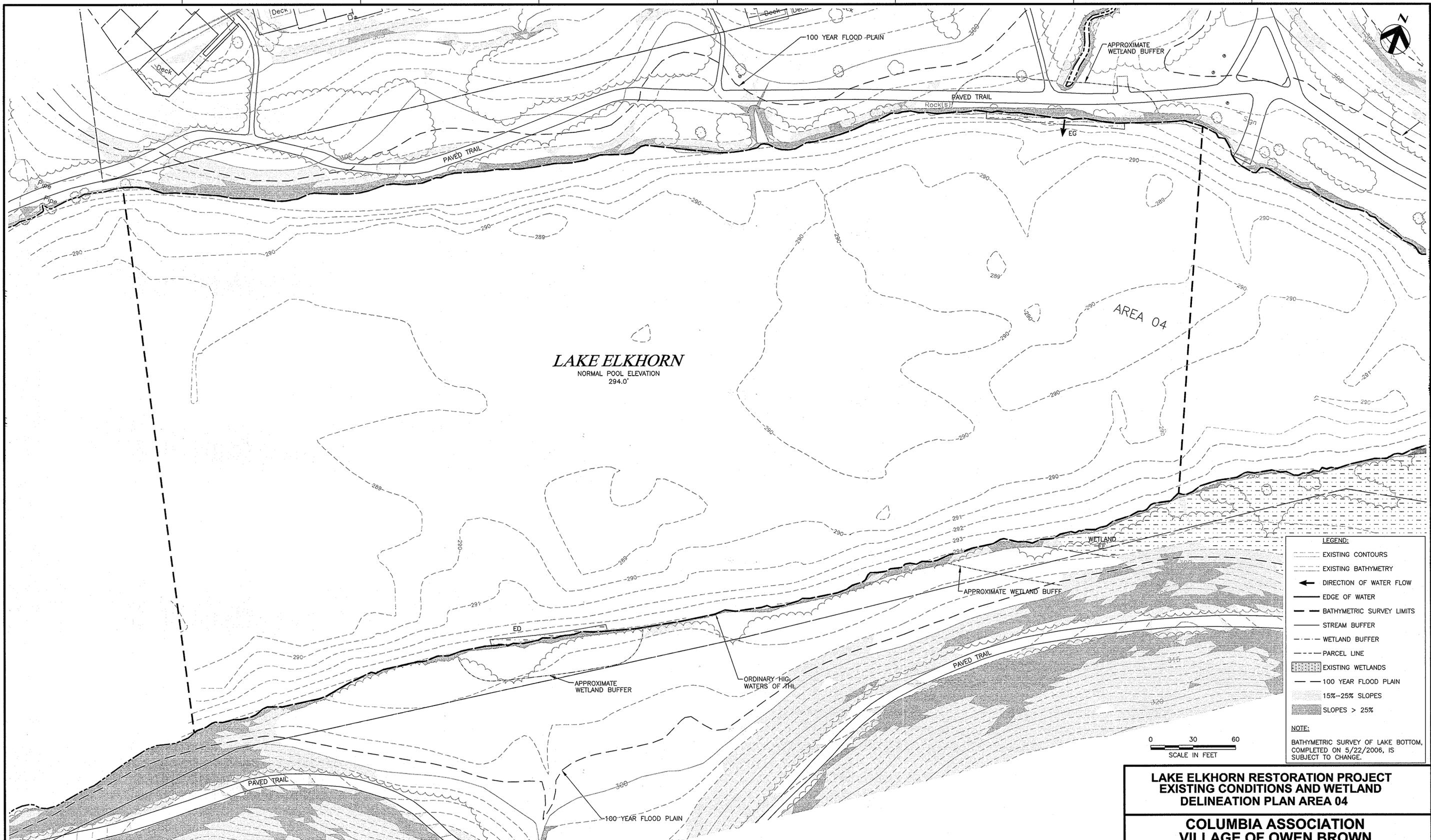
**HDR**  
 HDR Engineering, Inc.  
 5700 LAKE WRIGHT DRIVE  
 SUITE 300  
 NORFOLK, VIRGINIA 23502  
 757-222-1500

PLANS HAVE BEEN  
 DESIGNED UNDER MY  
 SUPERVISION

PIETER DAHMEN, PE  
 HDR ENGINEERING INC.

*Pieter Dahmen*  
 REGISTERED PROFESSIONAL ENGINEER  
 STATE OF MARYLAND  
 No. 20862  
 March 31, 2009

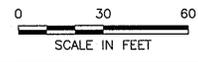
**COLUMBIA ASSOCIATION  
 10221 WINCOPIN CIRCLE #100  
 COLUMBIA, MD 21044  
 (410)-381-2947**



**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 PLAN
- ▨ 15%-25% SLOPES
- ▨ SLOPES > 25%

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



**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

Chad Edwards 6.9.09  
 Chief, Development Engineering Division Date

Cynthia Hammett 7/6/09  
 Chief, Division of Land Development Date

David J. Leight 7/7/09  
 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, PE  
 HDR ENGINEERING INC.



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

**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 29  
 SDP-08-107

**LAKE ELKHORN**  
NORMAL POOL ELEVATION  
294.0'

AREA 05

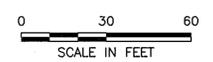
ORDINARY HIGH WATER,  
WATERS OF THE U.S.  
100 YEAR FLOOD PLAIN

HICKORY LIMB

**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

<i>Charles Edwards</i> Chief, Development Engineering Division	6-9-9 Date
<i>Quinn Hamble</i> Chief, Division of Land Development	7/2/09 Date
<i>Debra P. Lytle</i> Director	7/2/09 Date

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

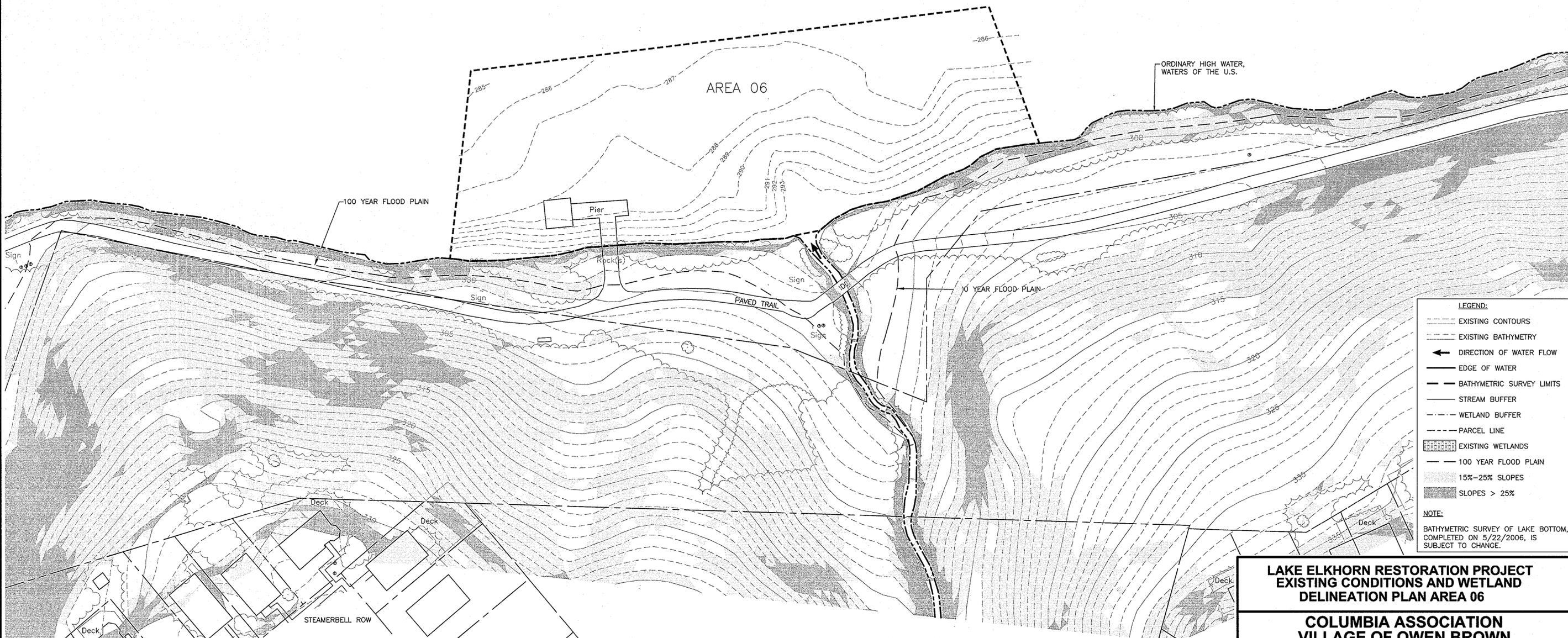
SCALE AS SHOWN  
FEBRUARY 6, 2009

DRAWING B-05, SHEET 7 OF 29

SDP-08-107



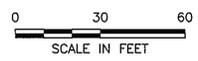
**LAKE ELKHORN**  
 NORMAL POOL ELEVATION  
 294.0'



**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.



**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

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

*Craig Hamt*  
 Chief, Division of Land Development  
 Date 7/2/07

*Mark D. 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 4/13/07

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.

*Pieter Dahmen*  
 REGISTERED PROFESSIONAL ENGINEER  
 STATE OF MARYLAND  
 No. 29991  
 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**

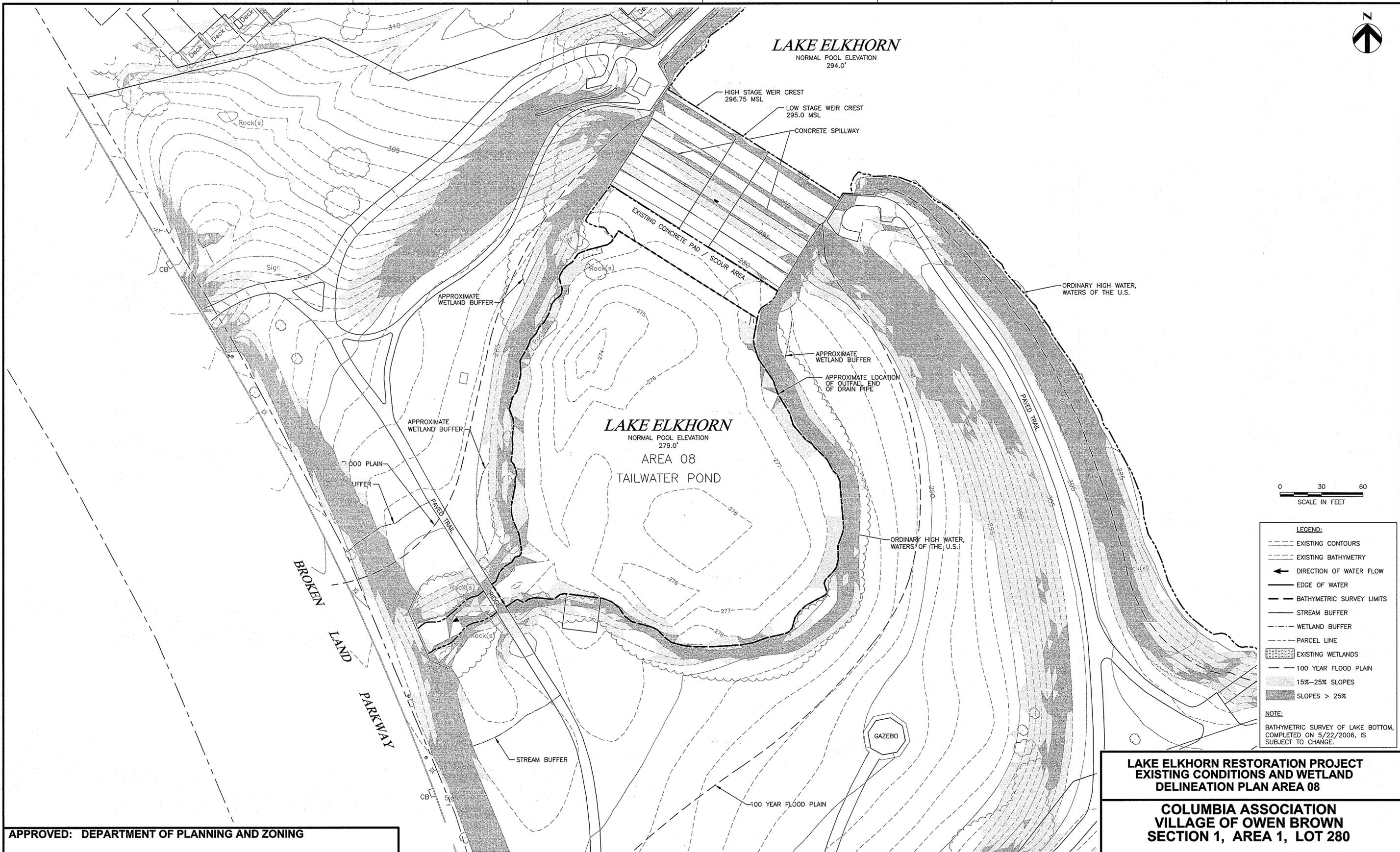
**COLUMBIA ASSOCIATION  
 VILLAGE OF OWEN BROWN  
 SECTION 1, AREA 1, LOT 280**

**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
- [Stippled Area] EXISTING WETLANDS
- - - - - 100 YEAR FLOOD PLAIN
- [Light Gray Area] 15%-25% SLOPES
- [Dark Gray Area] SLOPES > 25%

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

**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

*Chad Edmondson*  
 Chief, Development Engineering Division  
 Date: 6.9.9

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

*David K. 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: 7/13/09

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.  
 Date: March 31, 2009

**COLUMBIA ASSOCIATION**  
 10221 WINCOPIN CIRCLE #100  
 COLUMBIA, MD 21044  
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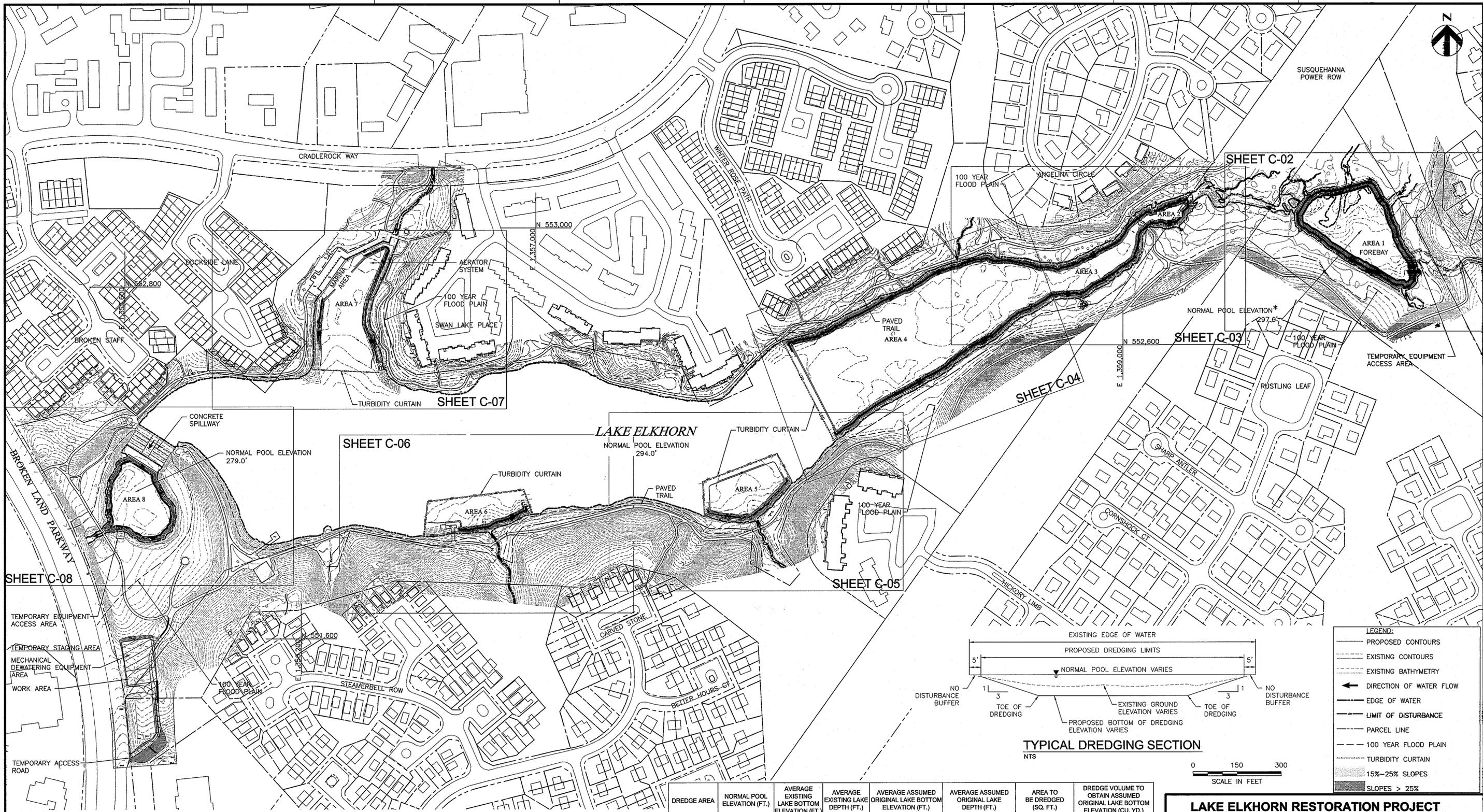
**LAKE ELKHORN RESTORATION PROJECT  
 EXISTING CONDITIONS AND WETLAND  
 DELINEATION PLAN AREA 08**

**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 29  
 SDP-08-107



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	276.6	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'

**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

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

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

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

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

*V. P. Dalal* 4/13/09  
 Vist 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.

March 31, 2009

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

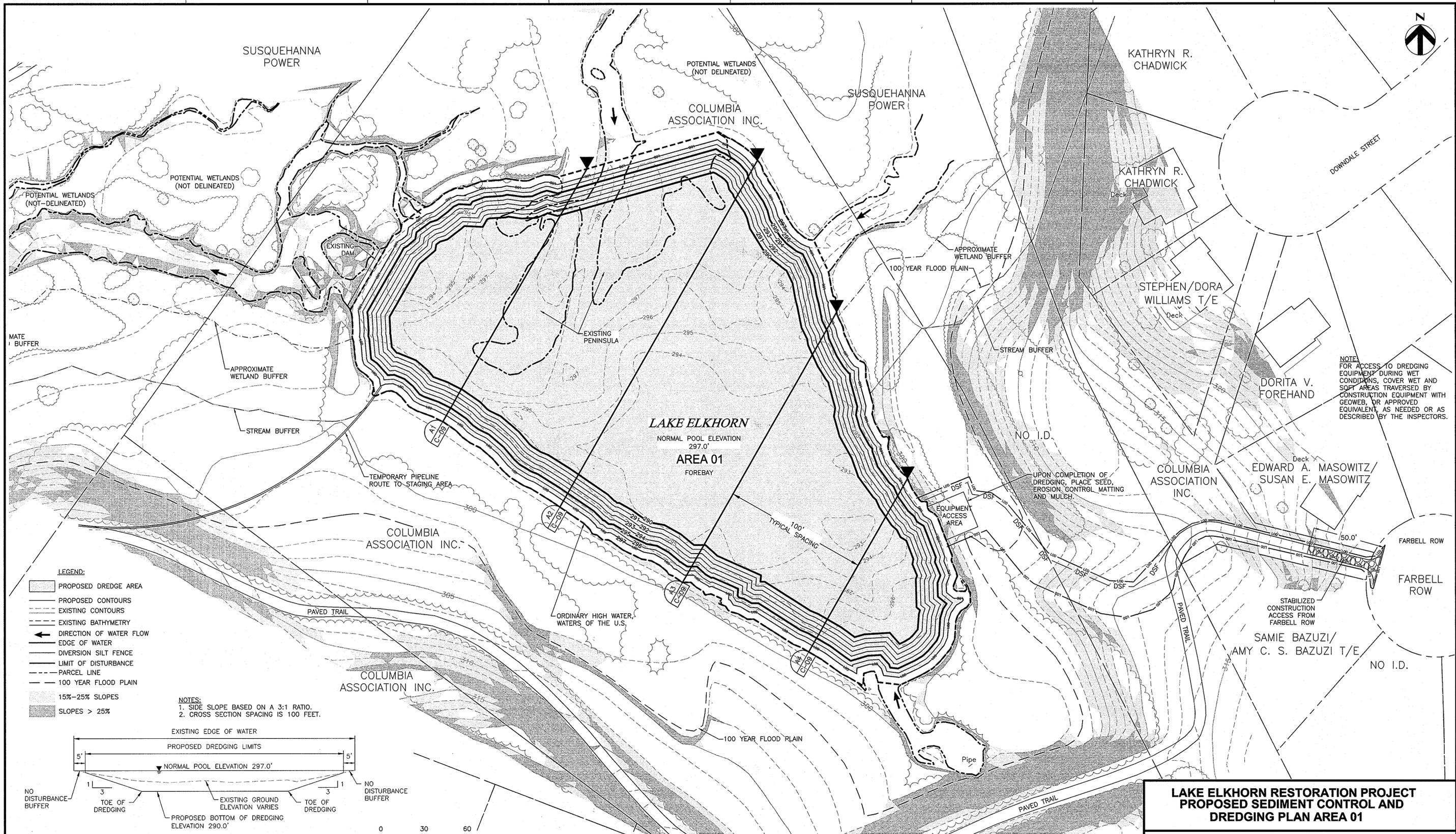
**LAKE ELKHORN RESTORATION PROJECT  
 PROPOSED SEDIMENT CONTROL AND  
 DREDGING PLAN KEY**

**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

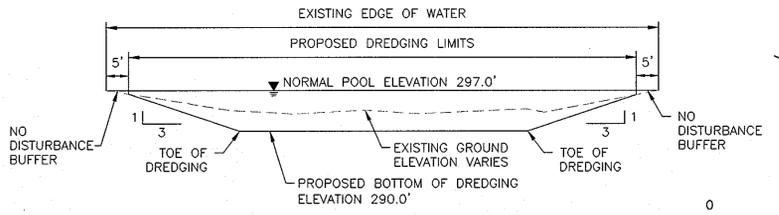
DRAWING C-01, SHEET 11 OF 29  
 SDP-08-107



NOTE:  
FOR ACCESS TO DREDGING EQUIPMENT DURING WET CONDITIONS, COVER WET AND SOFT AREAS TRAVERSED BY CONSTRUCTION EQUIPMENT WITH 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
  - 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.



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

**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

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

*Carole Hammett*  
Chief, Division of Land Development  
Date 7/3/09

*Harsh J. Cavalli*  
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

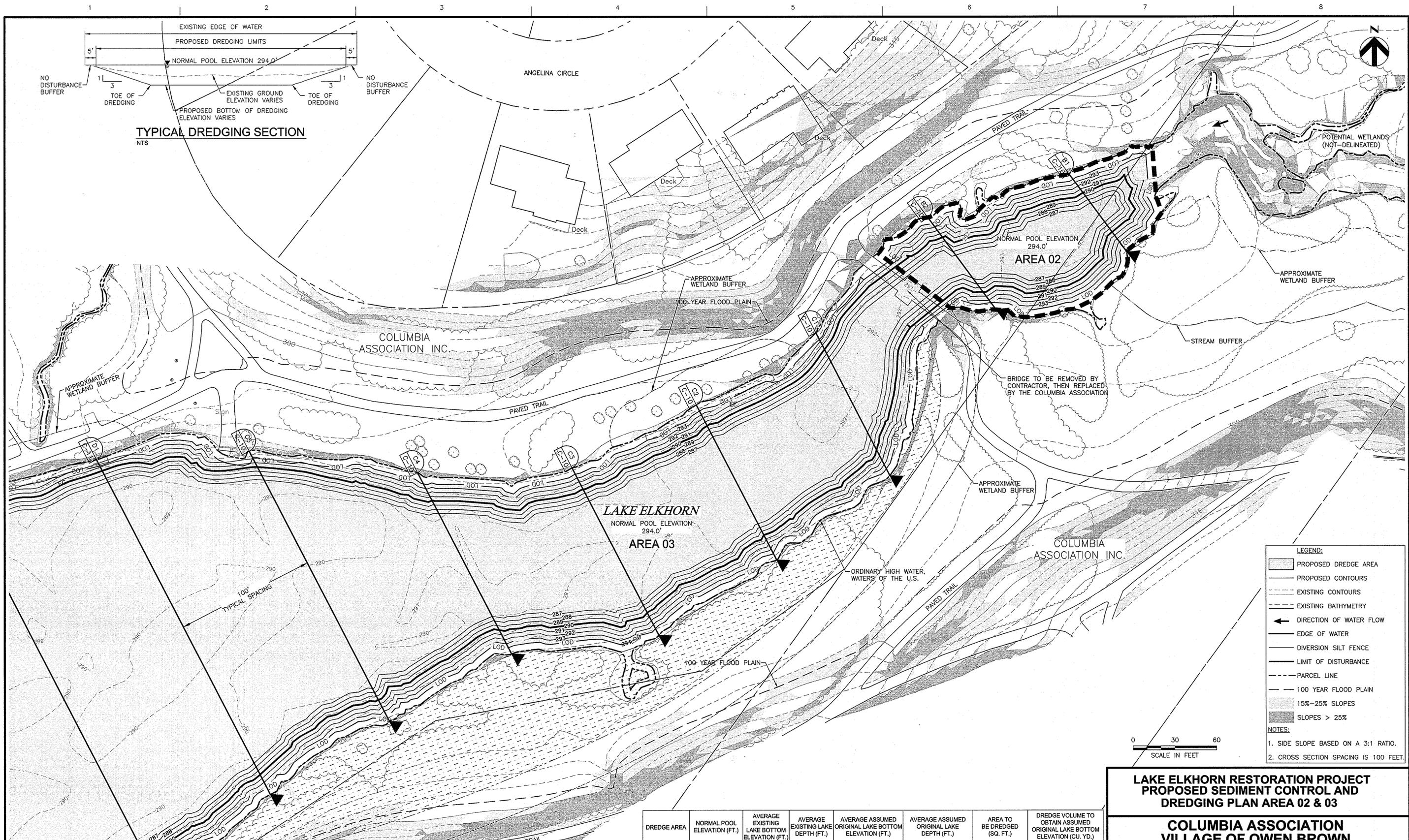
PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION  
**PIETER DAHMEN, PE**  
HDR ENGINEERING INC.  
*March 31, 2009*

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

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

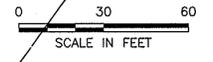


**LEGEND:**

- 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.



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*  
 Chief, Development Engineering Division  
 Date 6-9-9

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

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

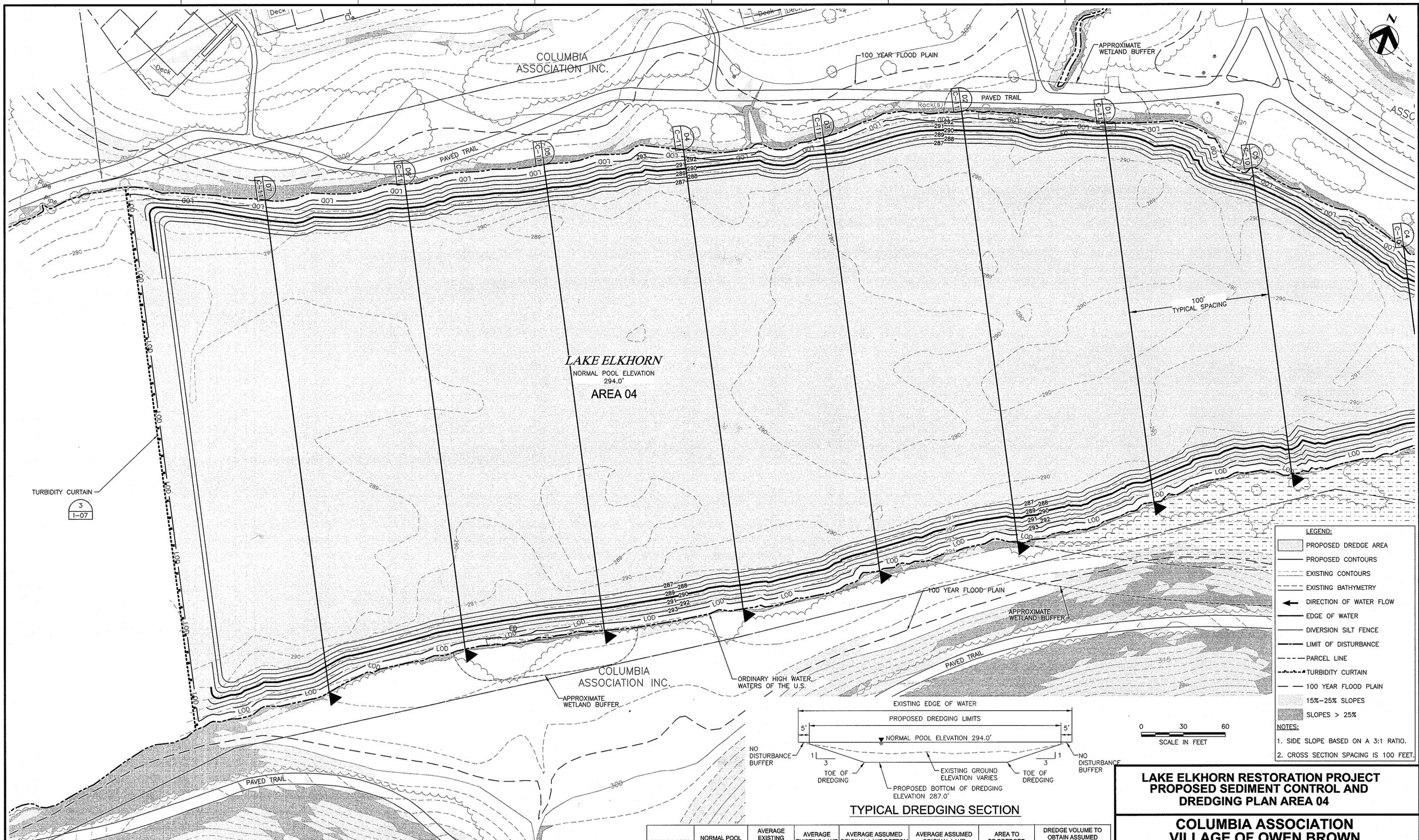
PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION  
**PIETER DAHMEN, PE**  
 HDR ENGINEERING INC.  
  
 March 31, 2009

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

**LAKE ELKHORN RESTORATION PROJECT  
 PROPOSED SEDIMENT CONTROL AND  
 DREDGING PLAN AREA 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 29  
 SDP-08-107

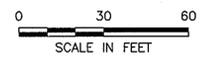
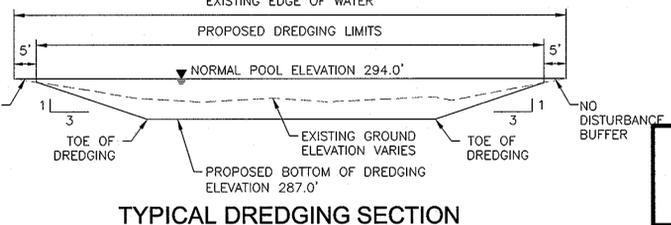


**LEGEND:**

- 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

APPROVED: DEPARTMENT OF PLANNING AND ZONING

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

*Quincy Hamer*  
 Chief, Division of Land Development  
 Date 7/2/09

*Walter P. 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.



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

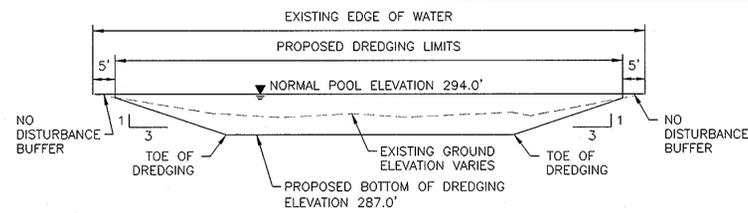
**LAKE ELKHORN RESTORATION PROJECT  
 PROPOSED SEDIMENT CONTROL AND  
 DREDGING PLAN AREA 04**

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

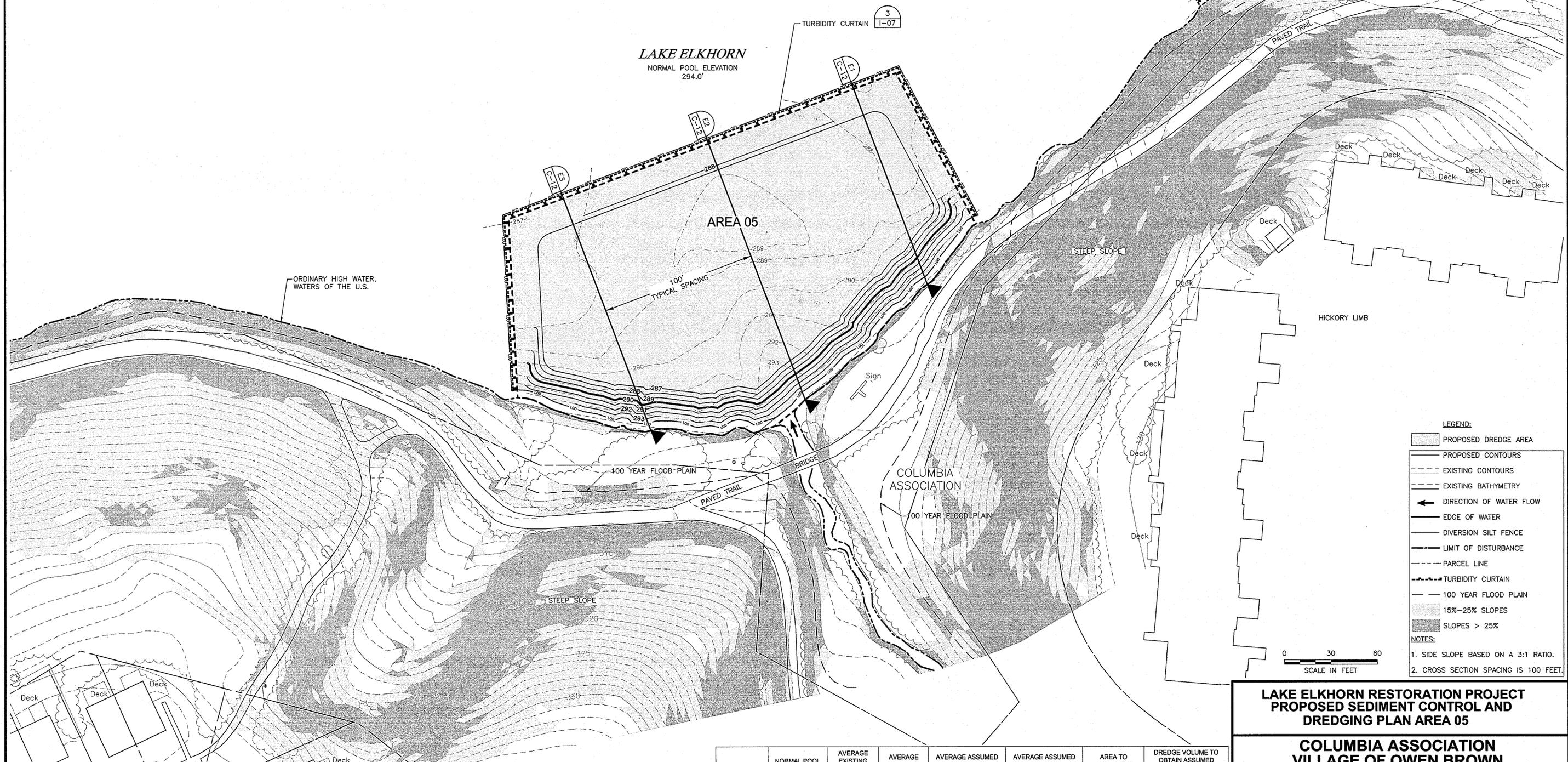
MINOR GRADING IN SUPPORT OF  
 LAKE ELKHORN RESTORATION  
 ELECTION DISTRICT 3, HOWARD COUNTY MD.  
 TAX MAP 36 AND 42

SCALE AS SHOWN  
 FEBRUARY 6, 2009

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



**TYPICAL DREDGING SECTION**  
NTS



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

**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

*Paul Edmunds* 6/9/09  
Chief, Development Engineering Division Date

*Cinda Harter* 7/2/09  
Chief, Division of Land Development Date

*Janice P. Laughton* 7/1/09  
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.  
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.

*March 31, 2009*

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

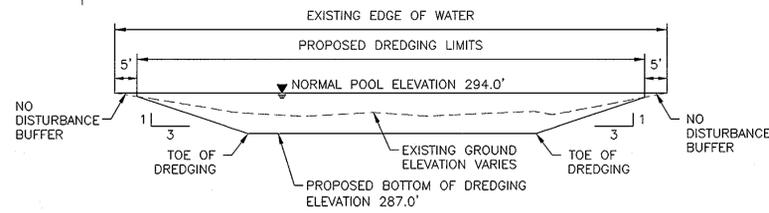
**LAKE ELKHORN RESTORATION PROJECT  
PROPOSED SEDIMENT CONTROL AND  
DREDGING PLAN AREA 05**

**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

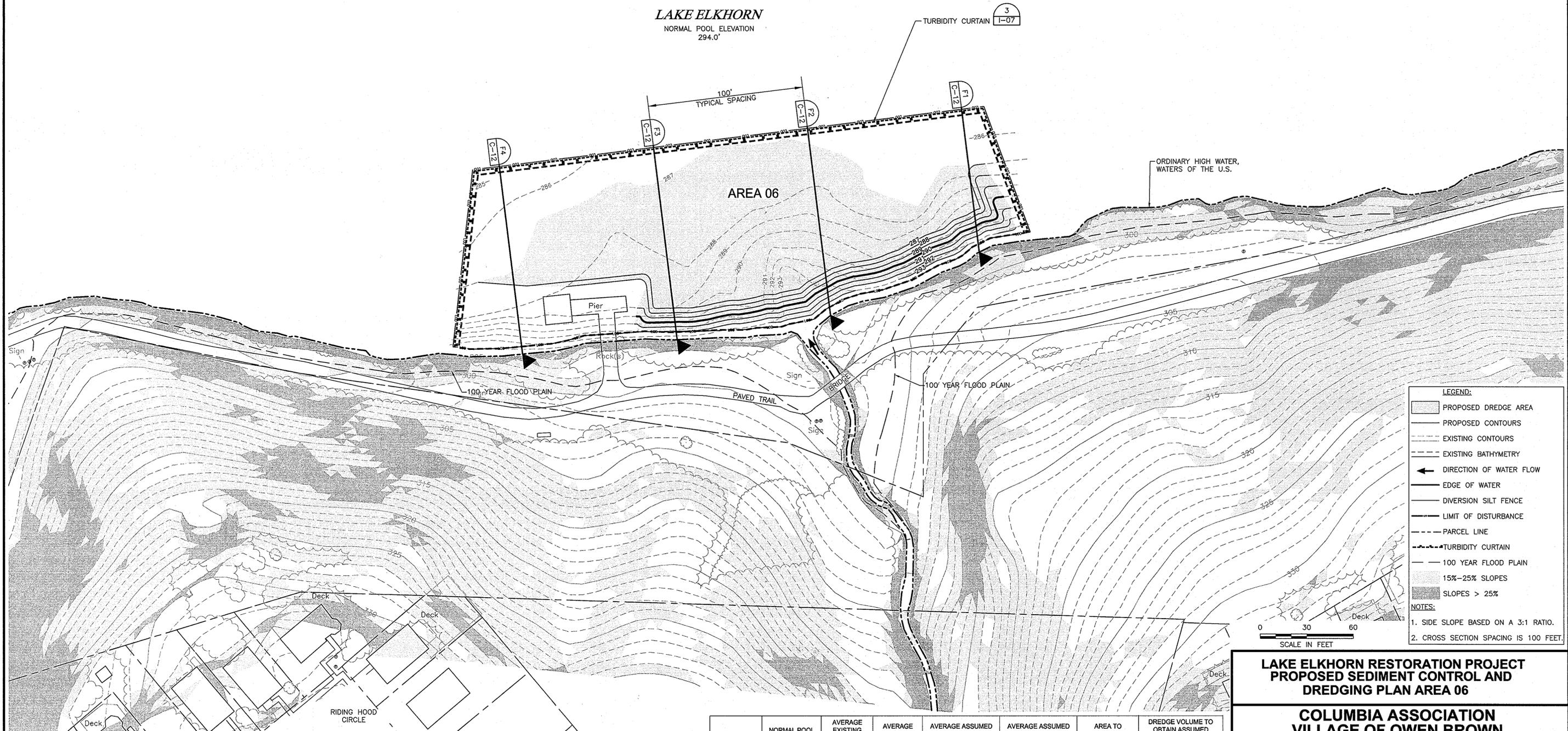
SCALE AS SHOWN  
FEBRUARY 6, 2009

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



**TYPICAL DREDGING SECTION**  
NTS

**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 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**

*Chief, Development Engineering Division* 6-9-9  
Date

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

*Director* 7/2/09  
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**  
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5700 LAKE WRIGHT DRIVE  
SUITE 300  
NORFOLK, VIRGINIA 23502  
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

**PIETER DÄHMEN, 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 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

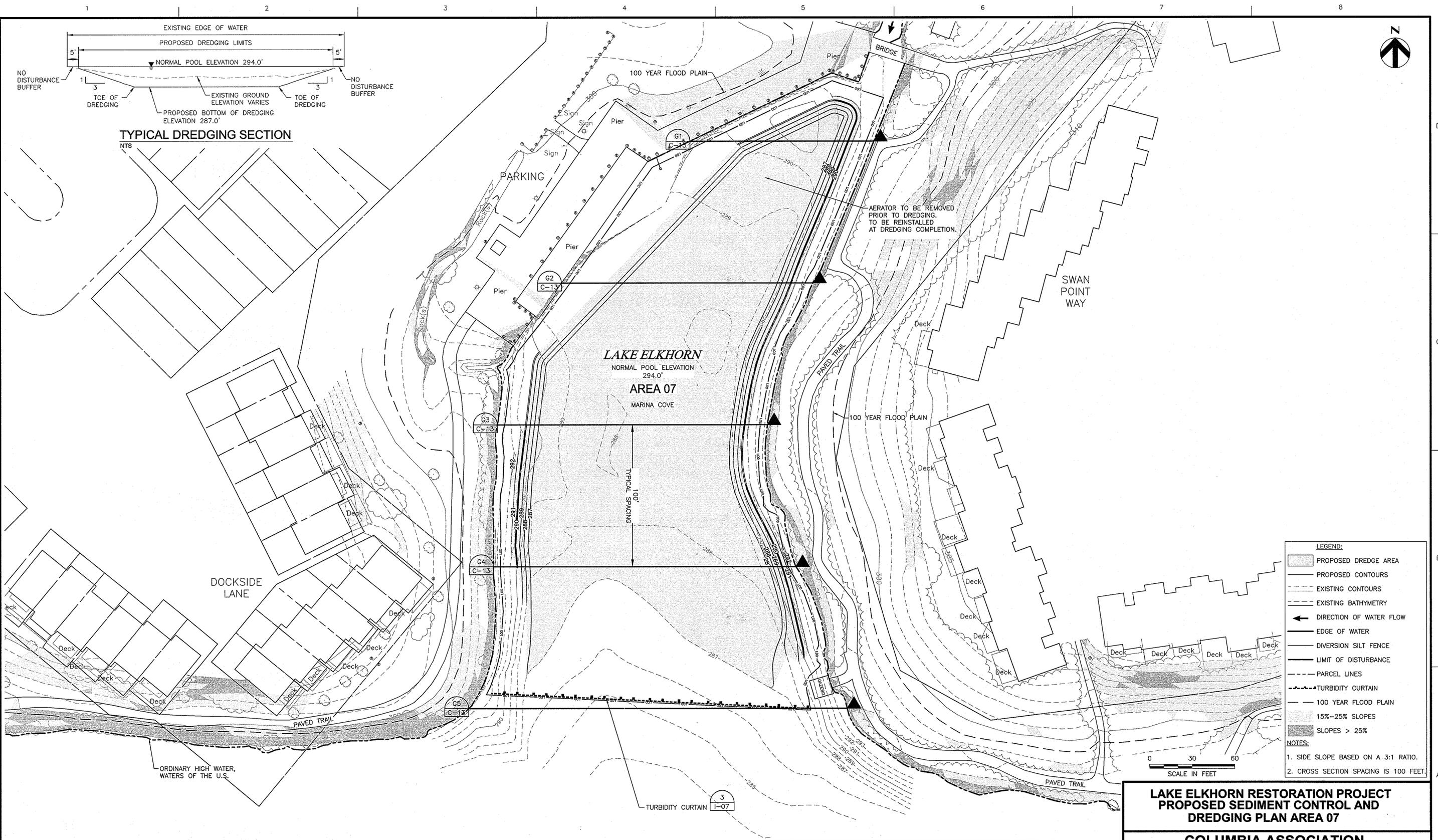
**LAKE ELKHORN RESTORATION PROJECT  
PROPOSED SEDIMENT CONTROL AND  
DREDGING PLAN AREA 06**

**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  
SDP-08-107



**TYPICAL DREDGING SECTION**

**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.

**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

*Phil Edwards*  
 Chief, Development Engineering Division  
 Date 6-9-9

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

*Marvin D. Lough*  
 Director  
 Date 7/5/09

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, PE**  
 HDR ENGINEERING INC.  
 Made 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 07	294.0	289.3	4.7	287.0	7.0	53,930	2,778

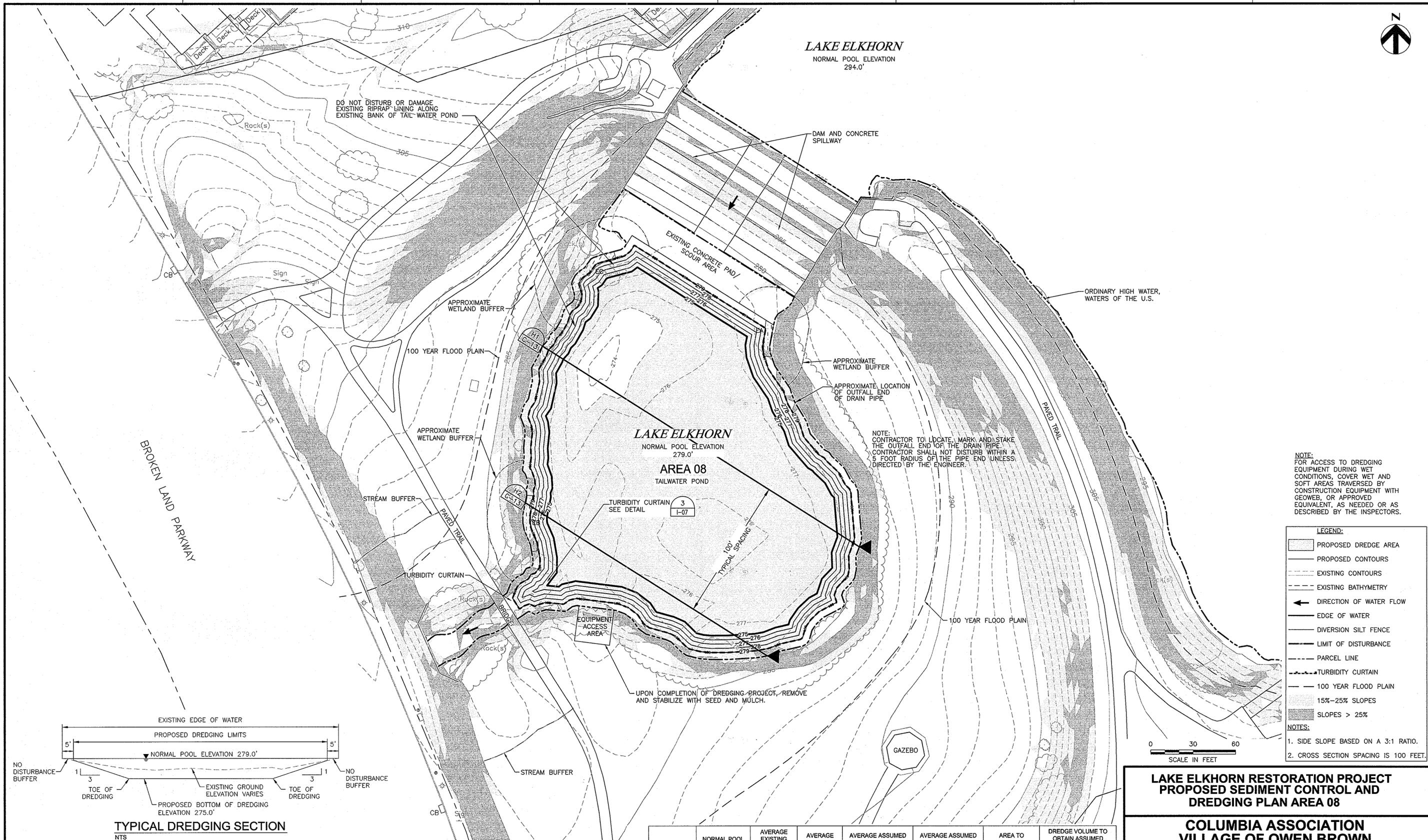
**LAKE ELKHORN RESTORATION PROJECT  
 PROPOSED SEDIMENT CONTROL AND  
 DREDGING PLAN AREA 07**

**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

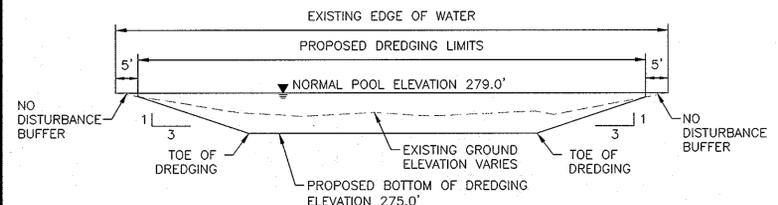
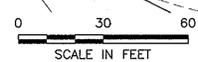


**LAKE ELKHORN**  
NORMAL POOL ELEVATION  
294.0'

**LAKE ELKHORN**  
NORMAL POOL ELEVATION  
279.0'  
**AREA 08**  
TAILWATER POND

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.



**TYPICAL DREDGING SECTION**  
NTS

DREDGE AREA	NORMAL POOL ELEVATION (FT.)	AVERAGE EXISTING LAKE BOTTOM ELEVATION (FT.)	AVERAGE EXISTING LAKE DEPTH (FT.)	AVERAGE ASSUMED ORIGINAL LAKE BOTTOM ELEVATION (FT.)	AVERAGE ASSUMED ORIGINAL LAKE DEPTH (FT.)	AREA TO BE DREDGED (SQ. FT.)	DREDGE VOLUME TO OBTAIN ASSUMED ORIGINAL LAKE BOTTOM ELEVATION (CU. YD.)
AREA 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: 6/9/09

*Cynthia Harvath*  
Chief, Division of Land Development  
Date: 7/6/09

*Marsha M. Lavigne*  
Director  
Date: 7/8/09

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, PE**  
HDR ENGINEERING INC.  
March 31, 2009

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

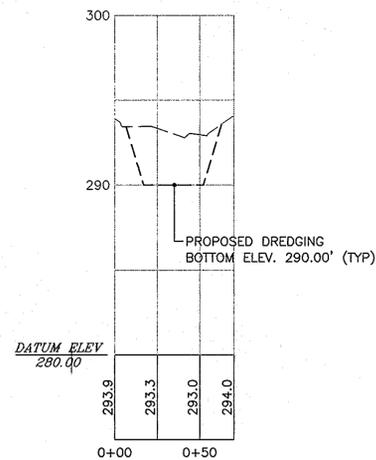
**LAKE ELKHORN RESTORATION PROJECT  
PROPOSED SEDIMENT CONTROL AND  
DREDGING PLAN AREA 08**

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

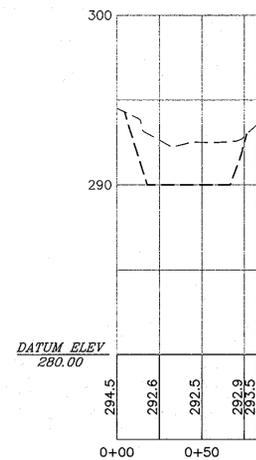
MINOR GRADING IN SUPPORT OF  
LAKE ELKHORN RESTORATION  
ELECTION DISTRICT 3, HOWARD COUNTY MD.  
TAX MAP 36 AND 42

SCALE AS SHOWN  
FEBRUARY 6, 2009

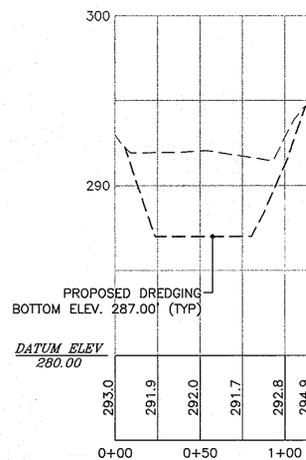




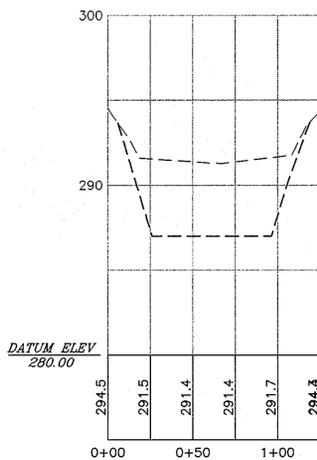
CROSS-SECTION B1 B1  
C-03



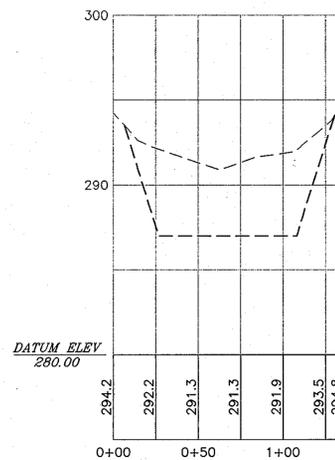
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C-03



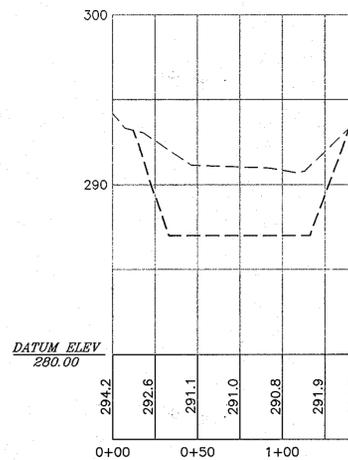
CROSS-SECTION C1 C1  
C-03



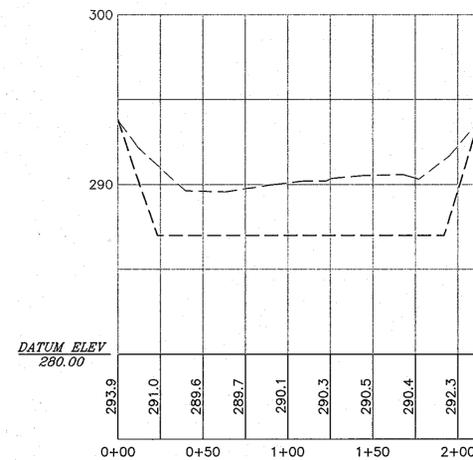
CROSS-SECTION C2 C2  
C-03



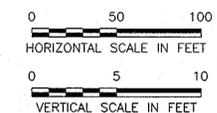
CROSS-SECTION C3 C3  
C-03



CROSS-SECTION C4 C4  
C-03



CROSS-SECTION C5 C5  
C-03



LEGEND:  
 --- EXISTING BATHYMETRY  
 — PROPOSED BATHYMETRY

**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

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chad Edwards 6.9.9  
 Chief, Development Engineering Division  
Cindy Hamito 7/8/09  
 Chief, Division of Land Development  
March L. Legler 7/2/09  
 Director

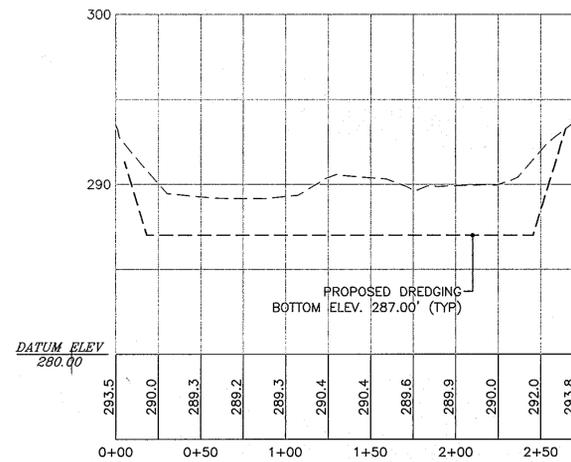
MDE Maryland Department of the Environment  
 Water Management Administration  
 Dam Safety Division  
V. P. Dalal 4/13/09  
 Visty P. Dalal  
 Regulatory & Compliance Engineer

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

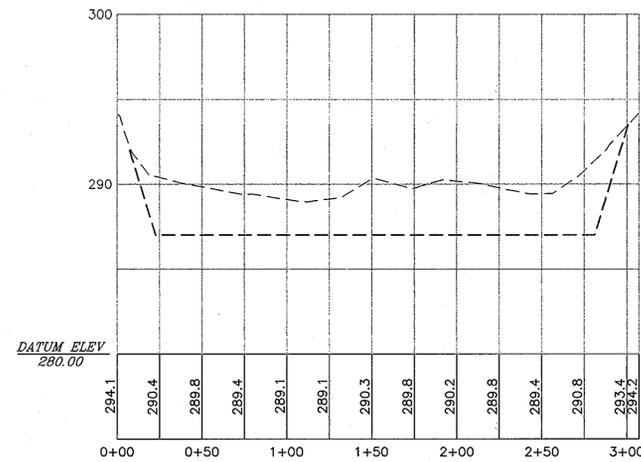
PLANS HAVE BEEN  
 DESIGNED UNDER MY  
 SUPERVISION  
Pieter Dahmen  
 PIETER DAHMEN, PE  
 HDR ENGINEERING INC.



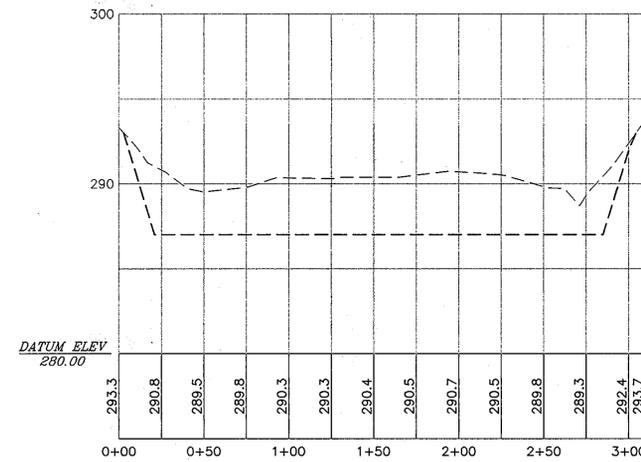
**COLUMBIA ASSOCIATION  
 10221 WINCOPIN CIRCLE #100  
 COLUMBIA, MD 21044  
 (410)-381-2947**



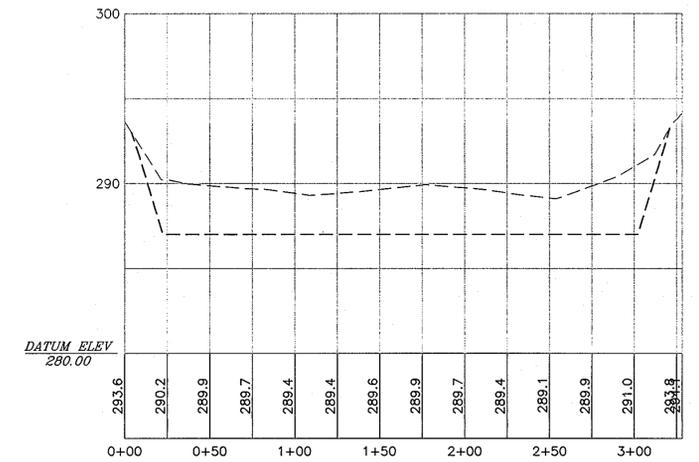
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C-04



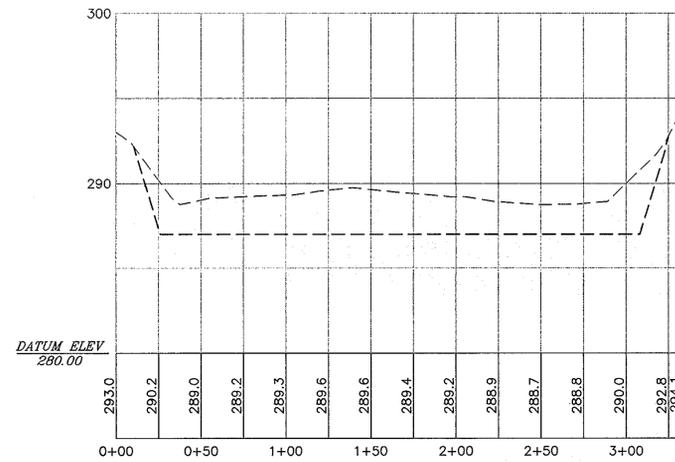
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C-04



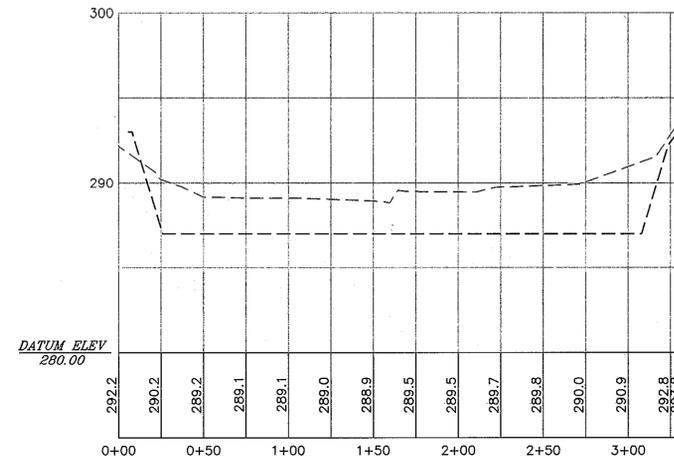
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C-04



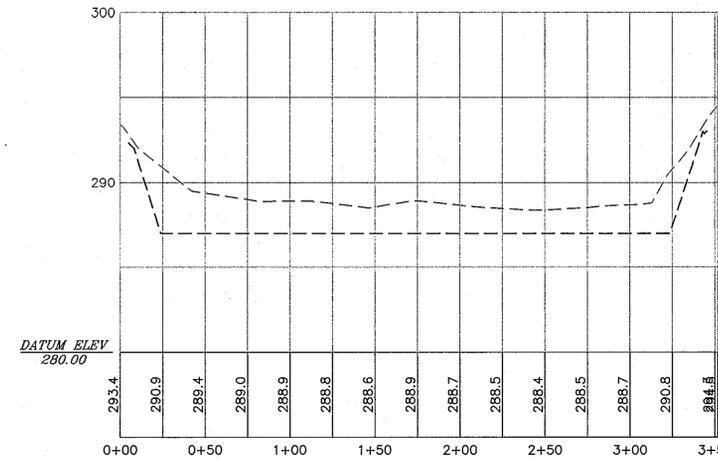
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C-04



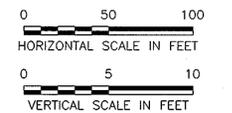
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C-04



CROSS-SECTION D6 D6  
C-04



CROSS-SECTION D7 D7  
C-04



LEGEND:  
 --- EXISTING BATHYMETRY  
 — PROPOSED BATHYMETRY

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*Phil Edwards*  
 Chief, Development Engineering Division  
 Date: 6-9-9

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

*Mark P. Ueffe*  
 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.



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

LAKE ELKHORN RESTORATION PROJECT  
 AREA 04  
 CROSS-SECTIONS

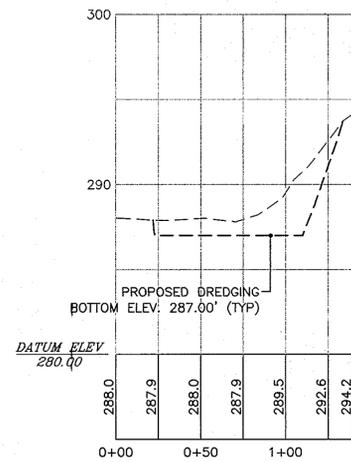
COLUMBIA ASSOCIATION  
 VILLAGE OF OWEN BROWN  
 SECTION 1, AREA 1, LOT 280

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

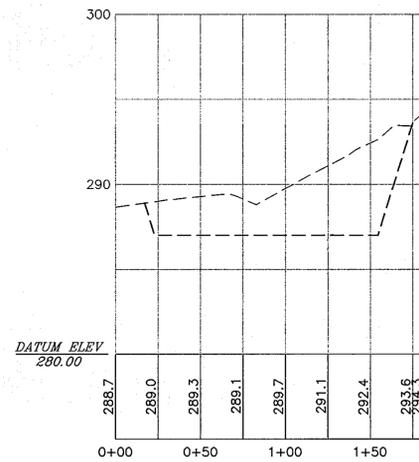
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DRAWING C-11, SHEET 21 OF 29

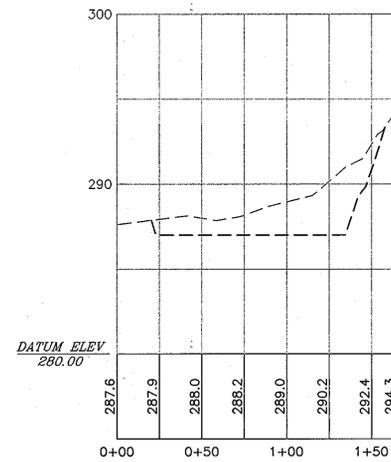
SDP-08-107



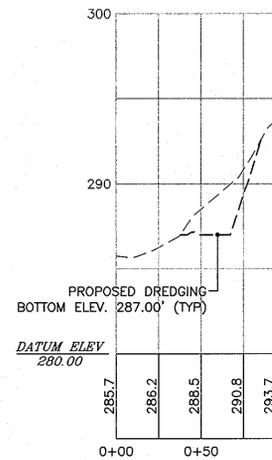
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C-05



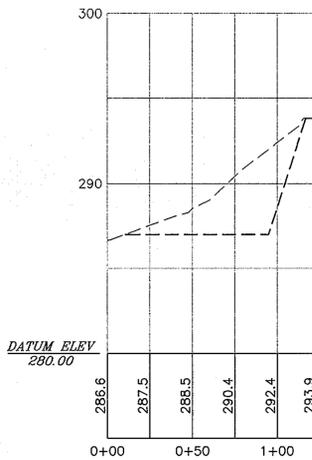
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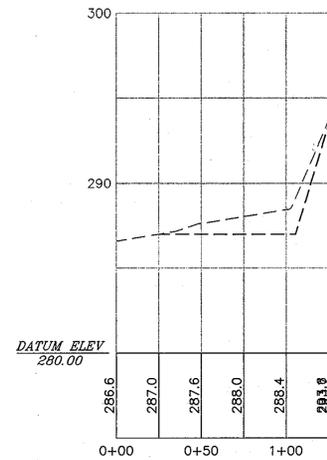
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C-05



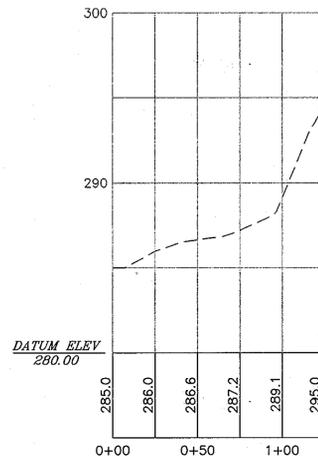
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C-06



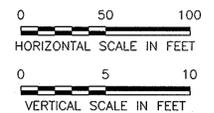
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C-06



CROSS-SECTION F3 F3  
C-06



CROSS-SECTION F4 F4  
C-06



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

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*Chad Edwards*  
 Chief, Development Engineering Division  
 Date: 6.9.9

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

*Marvin R. Leight*  
 Director  
 Date: 2/3/05

MDE Maryland Department of the Environment  
 Water Management Administration  
 Dam Safety Division  
*V.I. 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 05 & 06  
 CROSS-SECTIONS

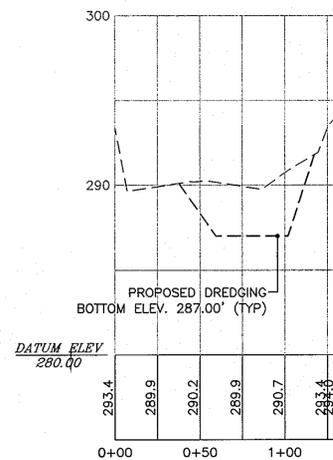
COLUMBIA ASSOCIATION  
 VILLAGE OF OWEN BROWN  
 SECTION 1, AREA 1, LOT 280

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

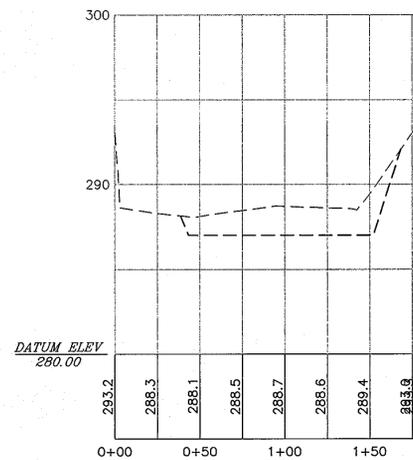
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DRAWING C-12, SHEET 22 OF 29

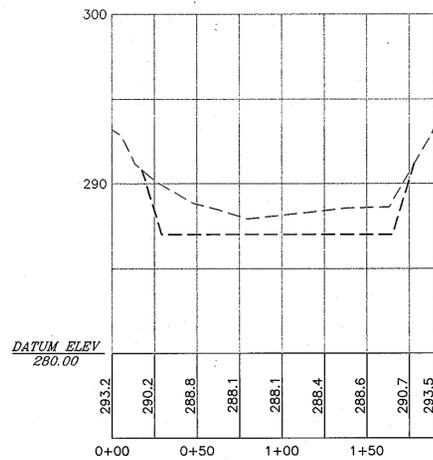
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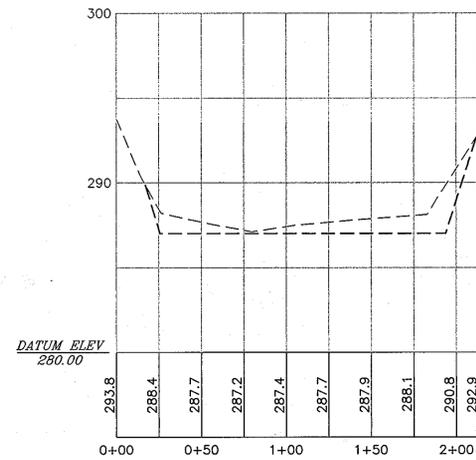
CROSS-SECTION G1 G1  
C-07



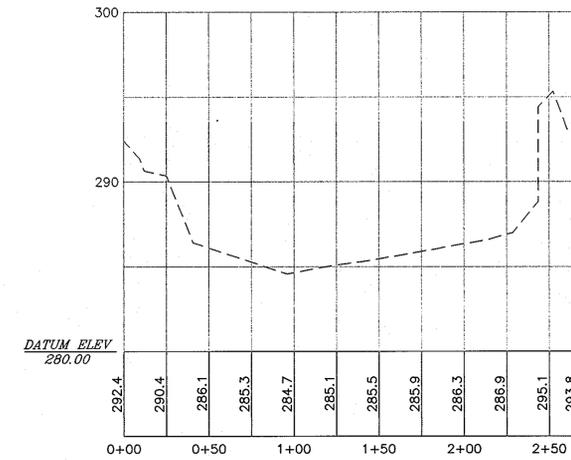
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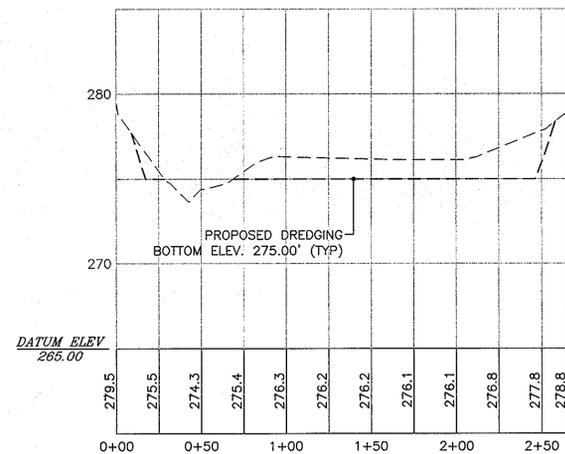
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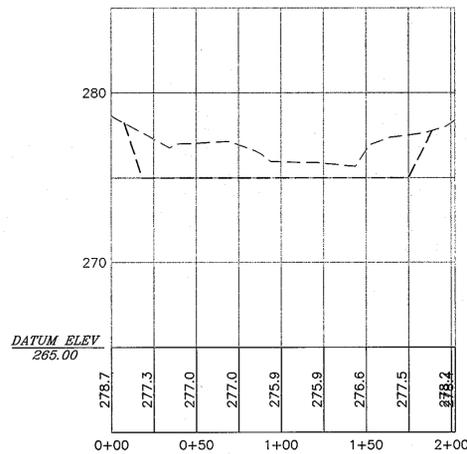
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C-07



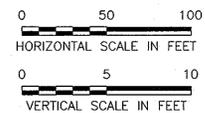
CROSS-SECTION G5 G5  
C-07



CROSS-SECTION H1 H1  
C-08



CROSS-SECTION H2 H2  
C-08



LEGEND:  
 --- EXISTING BATHYMETRY  
 — PROPOSED BATHYMETRY

APPROVED: DEPARTMENT OF PLANNING AND ZONING

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

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

*March P. Lytle*  
 Director  
 Date: 2/2/09

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  
 757-222-1500

PLANS HAVE BEEN  
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 SUPERVISION  
 \_\_\_\_\_  
 PIETER DAHMEN, PE  
 HDR ENGINEERING INC.



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

LAKE ELKHORN RESTORATION PROJECT  
 AREA 07 & 08  
 CROSS-SECTIONS

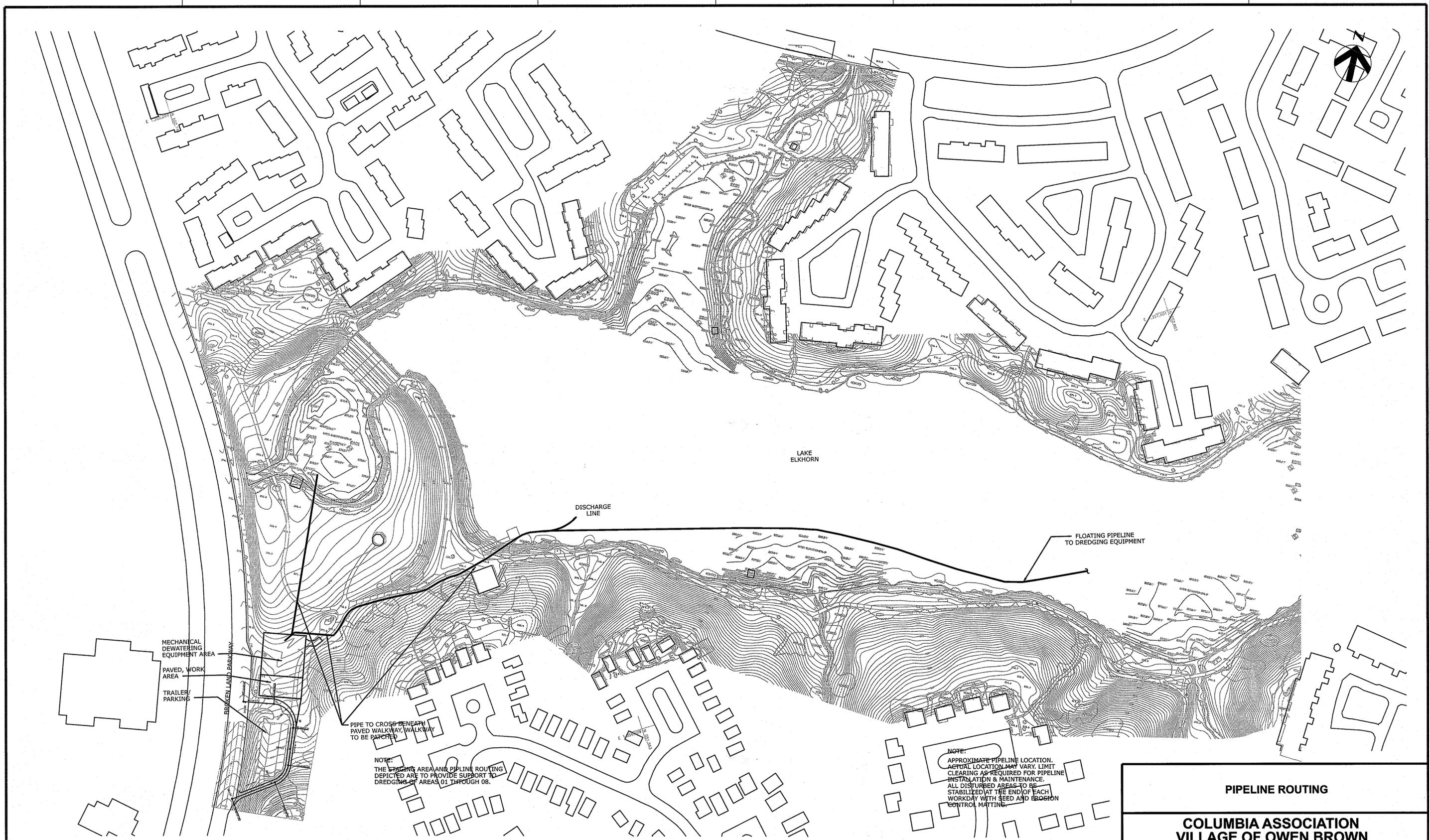
COLUMBIA ASSOCIATION  
 VILLAGE OF OWEN BROWN  
 SECTION 1, AREA 1, LOT 280

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

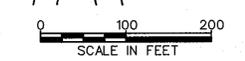
DRAWING C-13, SHEET 23 OF 29

SDP-08-107



NOTE:  
THE STAGING AREA AND PIPELINE ROUTING  
DEPICTED ARE TO PROVIDE SUPPORT TO  
DREDGING OF AREAS 01 THROUGH 08.

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



**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

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

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

*David J. Coyle*  
Director  
Date: 2/7/09

Maryland Department of the Environment  
MDE 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:

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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**

**PIPELINE ROUTING**

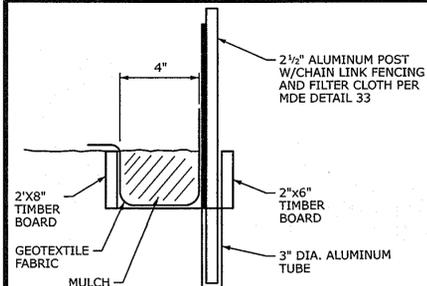
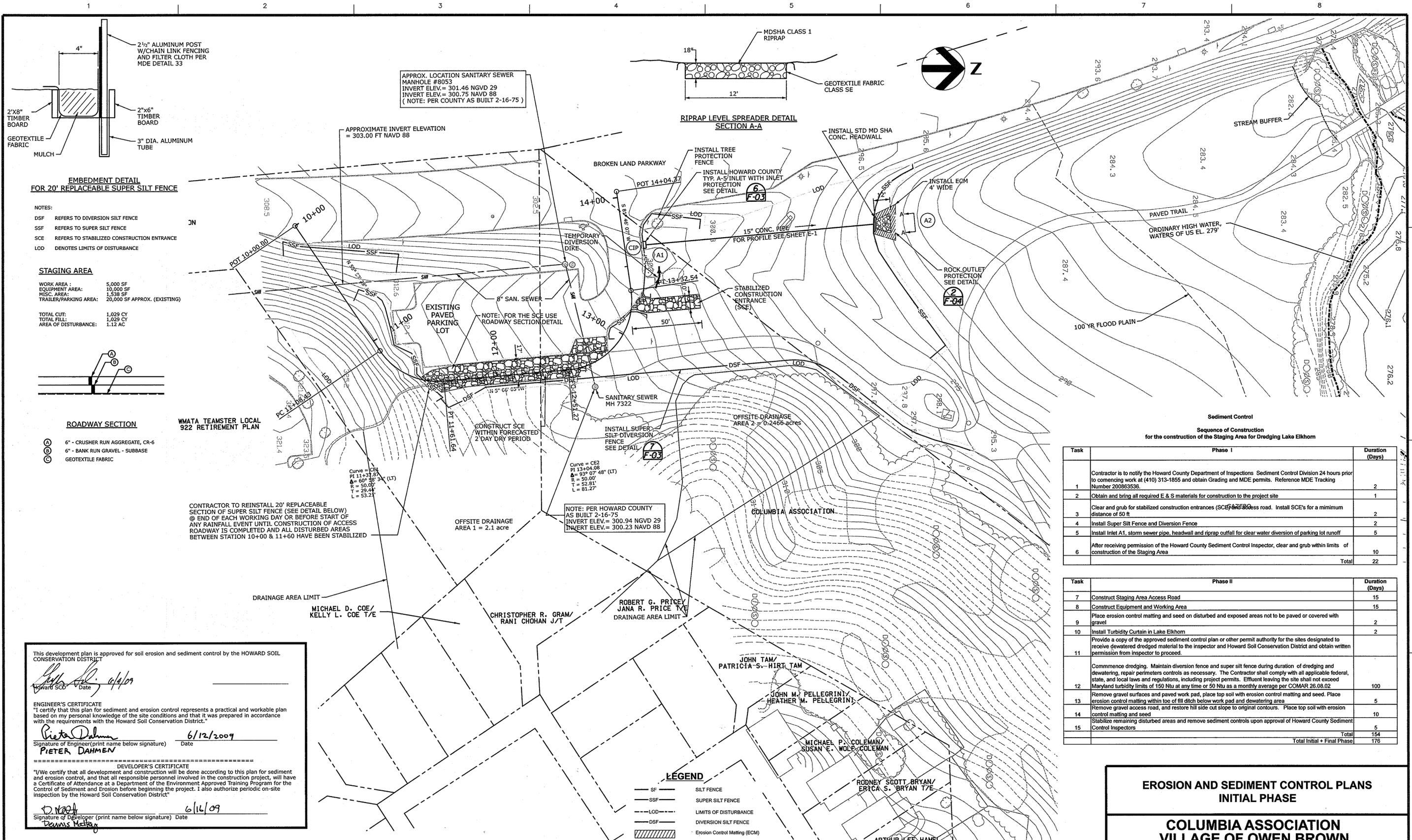
**COLUMBIA ASSOCIATION  
VILLAGE OF OWEN BROWN  
SECTION 1, AREA 1, LOT 280**

**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

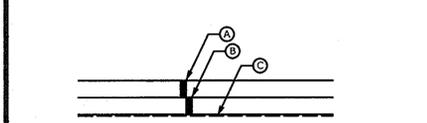




**EMBEDMENT DETAIL FOR 20' REPLACEABLE SUPER SILT FENCE**

**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

WMATA TEAMSTER LOCAL 922 RETIREMENT PLAN

CONTRACTOR TO REINSTALL 20' REPLACEABLE SECTION OF SUPER SILT FENCE (SEE DETAIL BELOW) @ END OF EACH WORKING DAY OR BEFORE START OF ANY RAINFALL EVENT UNTIL CONSTRUCTION OF ACCESS ROADWAY IS COMPLETED AND ALL DISTURBED AREAS BETWEEN STATION 10+00 & 11+60 HAVE BEEN STABILIZED

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

*[Signature]* 6/14/09  
 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 Metzger**

**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**

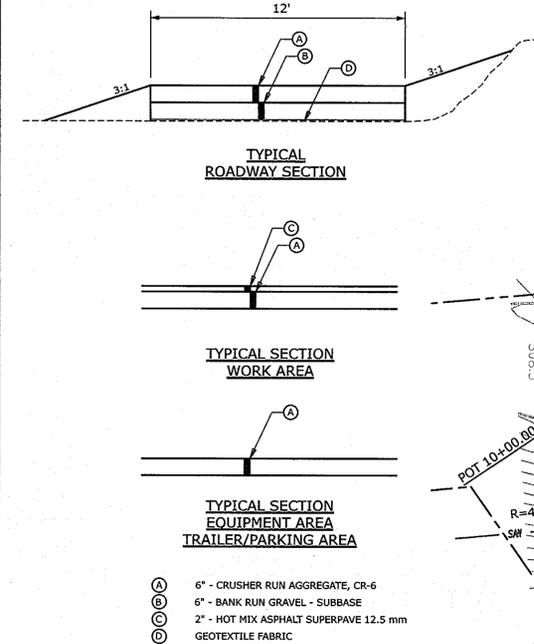
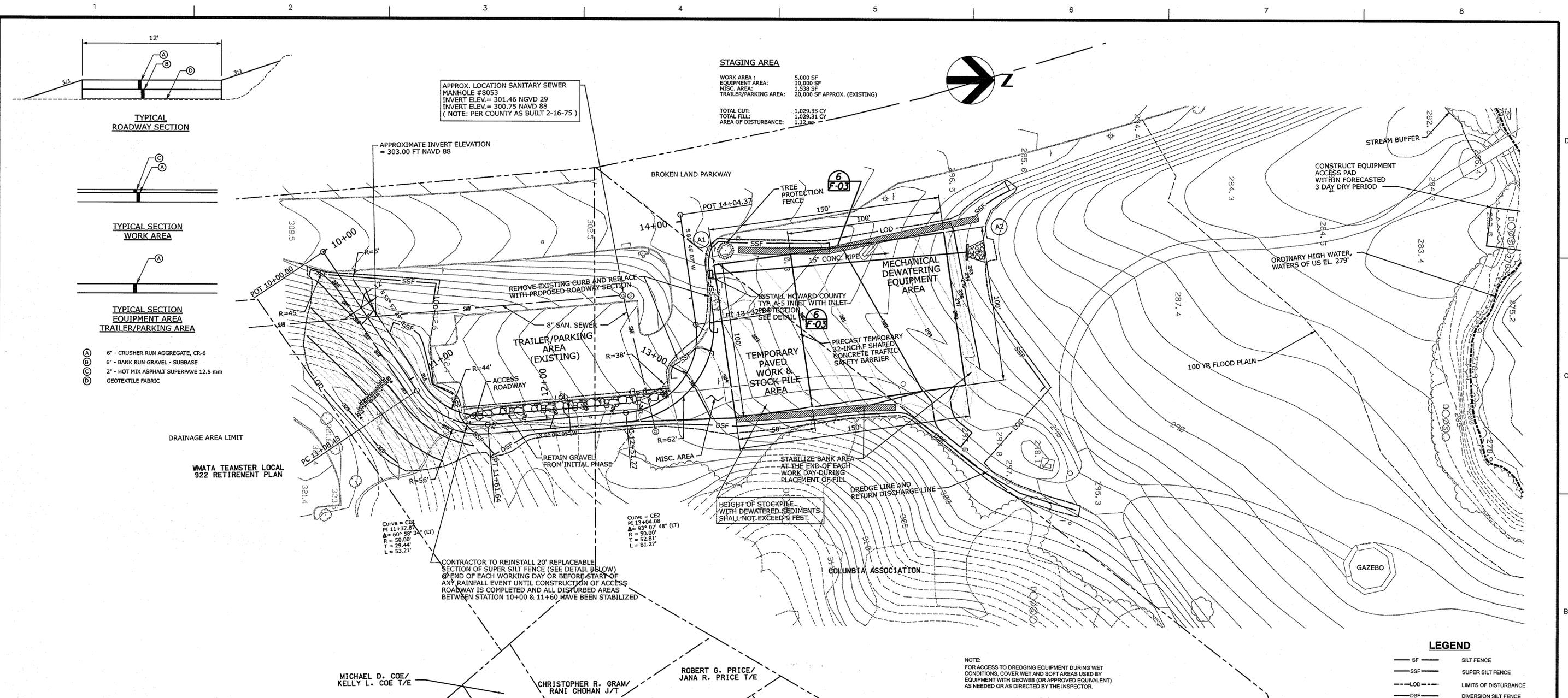
MINOR GRADING IN SUPPORT OF LAKE ELKHORN RESTORATION  
 ELECTION DISTRICT 3, HOWARD COUNTY MD.  
 TAX MAP 36 AND 42

SCALE AS SHOWN  
 FEBRUARY 6, 2009

**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 200863538.	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) for 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
	<b>Total</b>	<b>22</b>

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 perimeters 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 out 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
	<b>Total</b>	<b>154</b>
	<b>Total Initial + Final Phase</b>	<b>176</b>



- (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

APPROXIMATE INVERT ELEVATION = 303.00 FT NAVD 88

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)

REMOVE EXISTING CURB AND REPLACE WITH PROPOSED ROADWAY SECTION

8" SAN. SEWER

TRAILER/PARKING AREA (EXISTING)

ACCESS ROADWAY

RETAIN GRAVEL FROM INITIAL PHASE

MISC. AREA

STABILIZE BANK AREA AT THE END OF EACH WORK DAY DURING PLACEMENT OF FILL

HEIGHT OF STOCKPILE WITH DEWATERED SEDIMENTS SHALL NOT EXCEED 9 FEET.

DREDGE LINE AND RETURN DISCHARGE LINE

CONTRACTOR TO REINSTALL 20' REPLACEABLE SECTION OF SUPER SILT FENCE (SEE DETAIL BELOW) @ END OF EACH WORKING DAY OR BEFORE START OF ANY RAINFALL EVENT UNTIL CONSTRUCTION OF ACCESS ROADWAY IS COMPLETED AND ALL DISTURBED AREAS BETWEEN STATION 10+00 & 11+60 HAVE BEEN STABILIZED

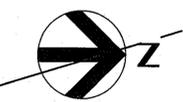
Curve = CE1  
 PI 11+37.87  
 Δ = 60° 58' 30" (LT)  
 R = 50.00'  
 T = 29.44'  
 L = 53.21'

Curve = CE2  
 PI 13+04.08  
 Δ = 93° 07' 48" (LT)  
 R = 30.00'  
 T = 52.81'  
 L = 81.27'

**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



- 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

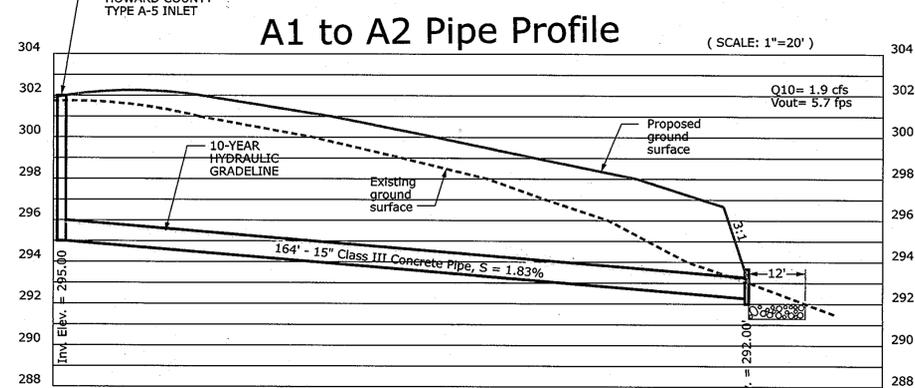
*[Signature]* Date 6/14/09  
 Howard SCD

**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]* Date 06/12/2009  
 Signature of Engineer (print name below signature) **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]* Date 6/16/09  
 Signature of Developer (print name below signature) **Dennis Mark**



**APPROVED: DEPARTMENT OF PLANNING AND ZONING**

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

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

*[Signature]* Date 2/7/05  
 Director

Maryland Department of the Environment  
 Water Management Administration  
 Dam Safety Division

*[Signature]* Date 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

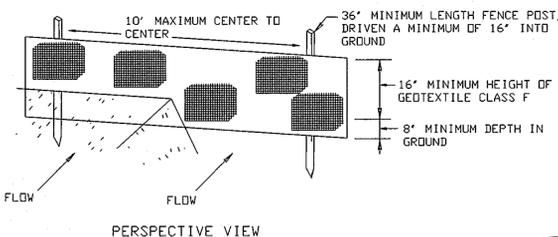
- Fence posts shall be a minimum of 36' long driven 16' minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pound per linear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

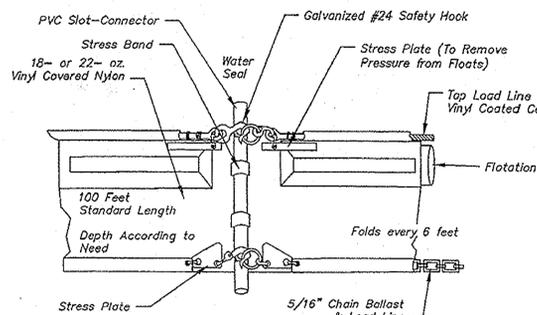
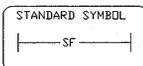
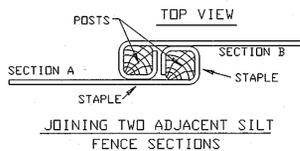
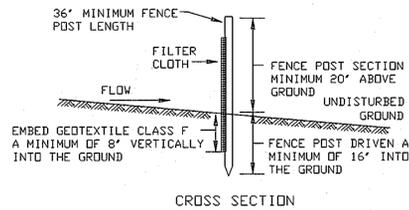
Silt Fence Design Criteria

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.



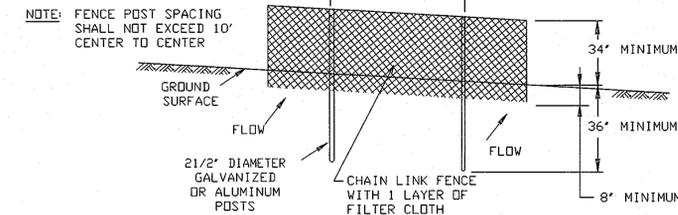
**SILT FENCE** 5  
F-03



**TYPE II**  
Not to Scale

- 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



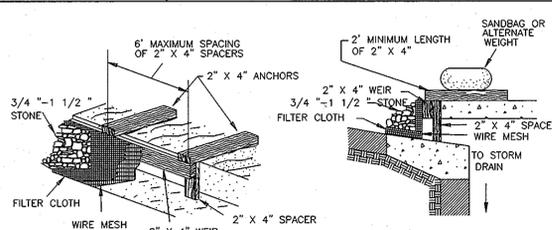
\*IF MULTIPLE LAYERS ARE REQUIRED TO ATTAIN 42"

Construction Specifications

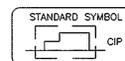
- Fencing shall be 42' in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42' fabric and 6' length posts.
- Chain link fence shall be fastened securely to the fence posts with wire 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 <sup>2</sup> /minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

**SUPER SILT FENCE** 4  
F-03



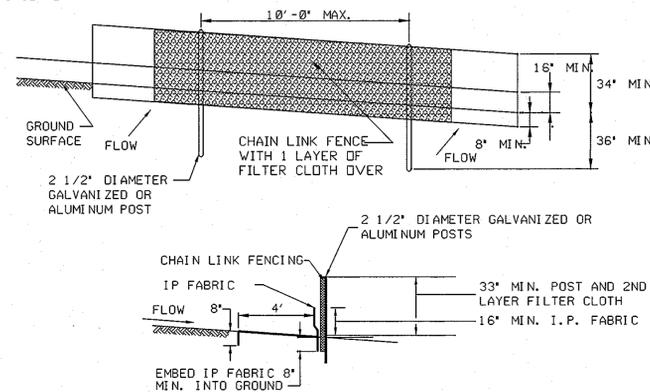
MAX. DRAINAGE AREA = 1/4 ACRE



- 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

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



**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 RESISTANT 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

**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-03, SHEET 28 OF 29

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

*[Signature]* 6/16/09  
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  
Carmen Healey

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]* 7/7/09  
Director Date

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

*[Signature]* 4/13/09  
V. P. Dalal  
Regulatory & Compliance Engineer

THIS PLAN SET HAS BEEN PREPARED BY:

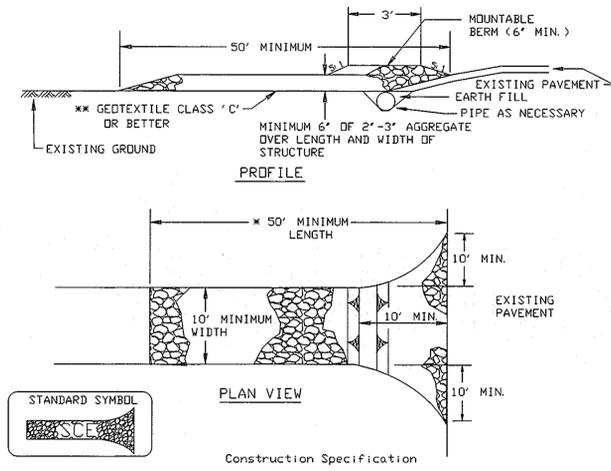
**HDR**  
HDR Engineering, Inc.  
5700 LAKE WRIGHT DRIVE  
SUITE 300  
NORFOLK, VIRGINIA 23502  
757-222-1500

PLANS HAVE BEEN DESIGNED UNDER MY SUPERVISION

**PIETER DAHMEN, PE**  
HDR ENGINEERING INC.

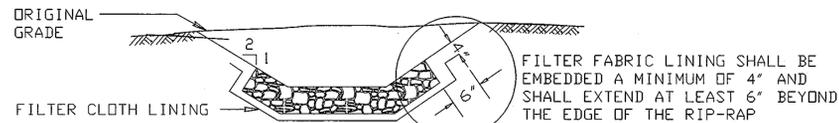
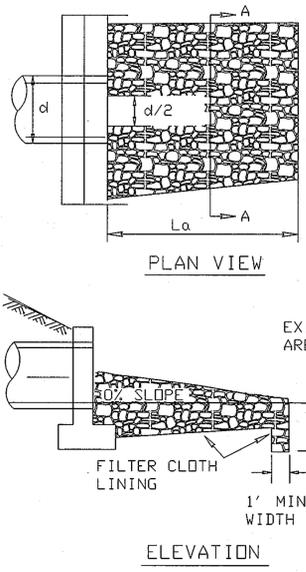
*[Professional Engineer Seal]*  
Professional Engineer  
March 31, 2009

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



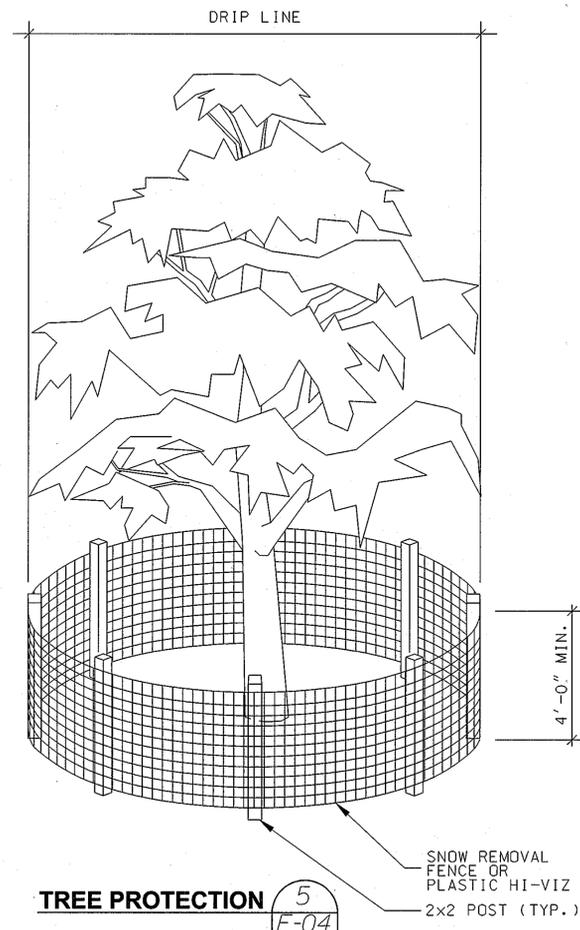
- Construction Specification**
- Length - minimum of 50' (≧30' for single residence lot).
  - Width - 10' minimum, should be flared at the existing road to provide a turning radius.
  - Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. The plan approval 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

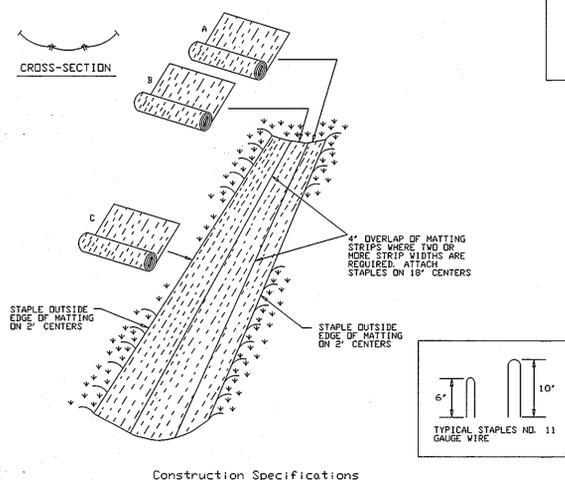


- Construction Specifications**
- The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
  - The rock or gravel shall conform to 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 spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.
  - 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.

**ROCK OUTLET PROTECTION TYPE III** (2) F-04

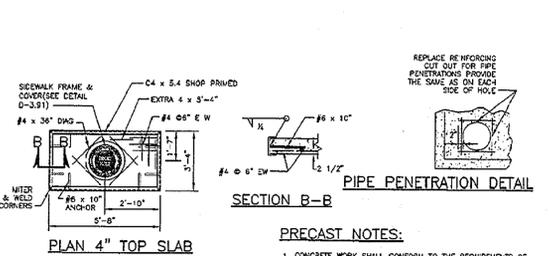
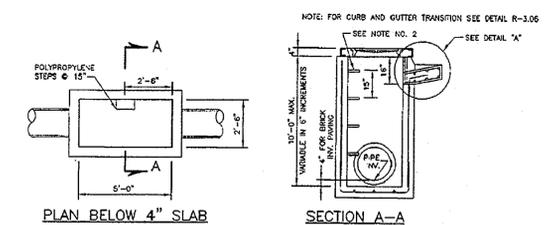


**TREE PROTECTION** (5) F-04



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

**EROSION CONTROL MATTING** (6) 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-SSS 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 subsoils and shall contain less than 3% by volume of cinders, stones, slag, fragments, gravel, sticks, roots, trash, or other materials larger than 1" in diameter.
    - Topsoil must be free of plants or plant parts such as Bermuda grass, quackgrass, Johnsongrass, nutgrass, poison ivy, thistle, 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 40 to 60 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 under 5 acres:
    - Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section 1 - 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:
      - 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 seed 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.
    - 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.
    - Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section 1 - 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, a 4" - 8" higher in elevation.
    - Topsoil shall be uniformly distributed in a 4" - 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.
    - 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.

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

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

*[Signature]* 4/16/09  
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

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

**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]* 2/2/09  
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

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**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