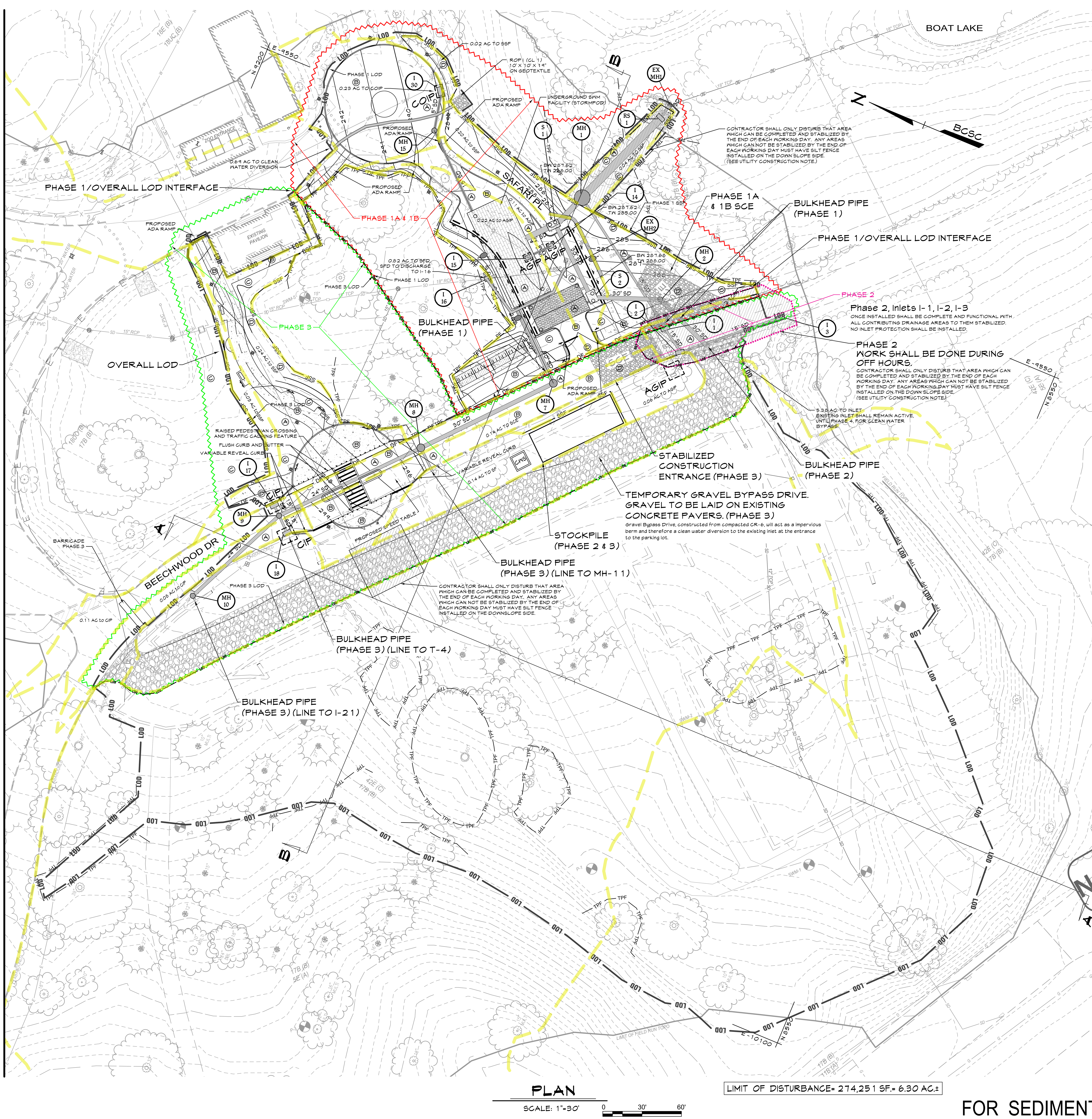


FOR SEDIMENT CONTROL ONLY

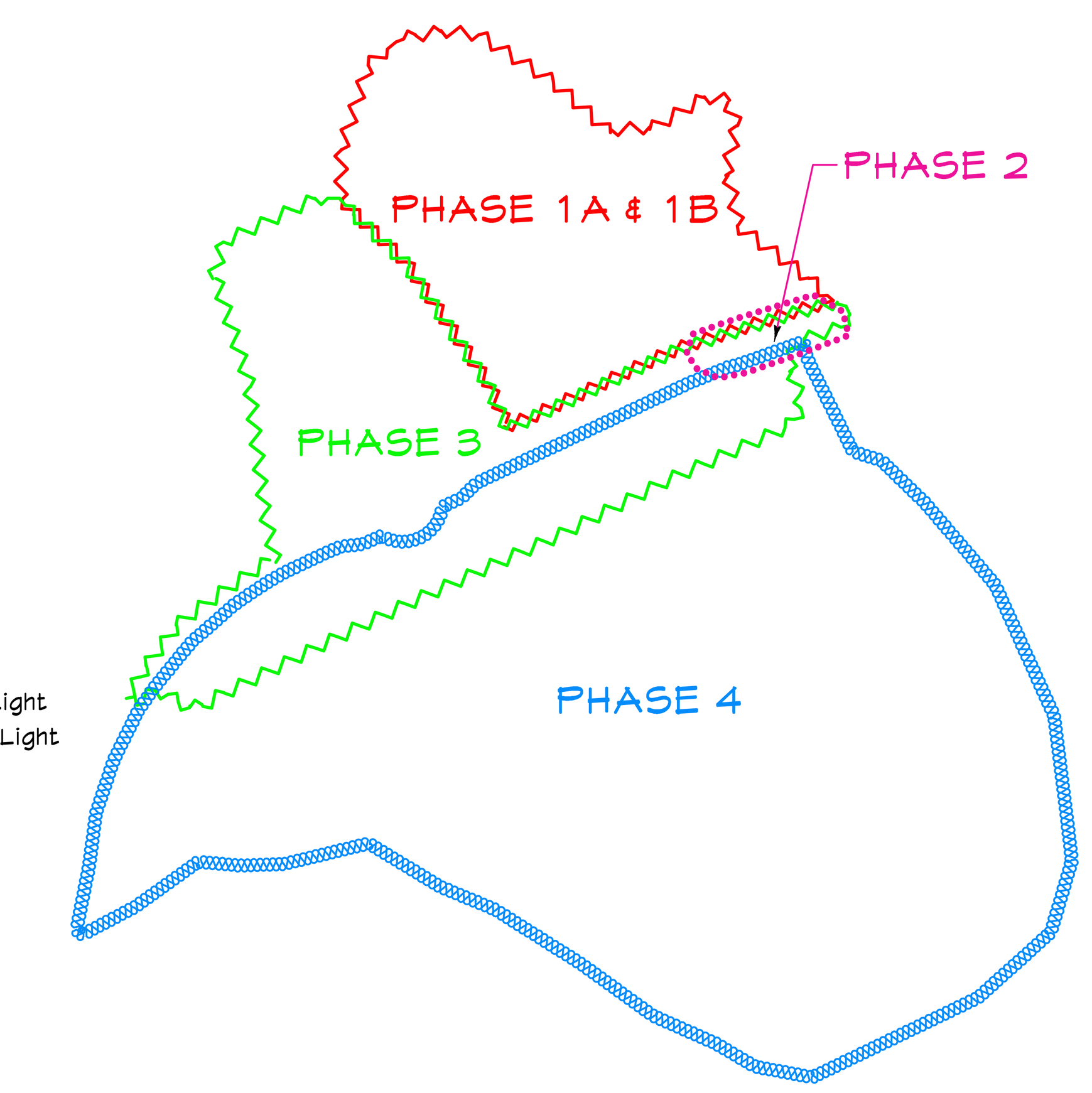
LEGEND

NOTE: DUE TO THE VARIED NATURE OF EACH PLAN ALL SYMBOLS SHOWN ON LEGEND MAY NOT BE PRESENT ON ALL PLAN SHEETS.

- Existing Minor Contour
- Existing Major Contour
- Existing Edge of Road
- Existing Storm Drain
- Existing Water
- Existing Sewer
- Existing Gas Line
- Existing Underground Electric Line
- Existing Curb and Gutter
- Existing Retaining Wall
- Existing Edge of Paving
- Existing Sidewalk
- Existing Tree Line
- Existing Building/Structure
- Water Edge or Stream Centerline
- Existing Fence
- Existing Pavement
- Existing Sign
- Existing Light
- Existing Bollard
- Proposed Major Contour
- Proposed Minor Contour
- Proposed Inlet
- Proposed Curb and Gutter
- Proposed Retaining Wall
- Proposed Edge of Pavement
- Proposed Guardrail
- Proposed Concrete Sidewalk
- Proposed Fence
- Proposed Tree Line
- Proposed Underground SWM Facility
- Proposed Underground Sand Filter
- Tree Protection Fence
- Proposed ADA Route
- Proposed ADA Parking Sign
- Proposed ADA Parking Space
- Proposed Bollards
- Proposed Guard Shack
- Proposed Pedestrian "Acorn" Type Light
- Proposed Parking Lot "Cobra" Type Light
- Proposed Fence
- Proposed Crosswalk

NOTES:

- THIS PLAN REFLECTS FULL BUILD OUT OF ALL PROPOSED PARKING LOTS. CONSTRUCTION WILL PROCEED IN PHASES DEPENDENT UPON FUNDING.
- REFER TO LANDSCAPE PLANS ON SHEETS C-070 TO C-073 FOR PROPOSED TREES AND PLANTINGS.
- REFER TO GRADING PLAN FOR ADDITIONAL DETAILS AND SPOT ELEVATIONS.
- CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE TO CURB/GUTTER FROM BOTTOM OF ADA RAMP.



PHASE LINE LEGEND

NOT TO SCALE

STABILIZATION SCHEDULE

AREA	SQ.FT.	STABILIZATION TYPE	SEQUENCE #
(A) UTILITY WORK	9,848	SEEDING/STONE (TEMPORARY)	---
		SEED/SOD PAVING (PERMANENT)	---
(B) CURBS, SIDEWALKS, FOUNDATIONS	101,670	SEEDING/STONE (TEMPORARY)	#7,8,9
		CONCRETE CURBS/WALKS (PERMANENT) & PAVING	#12
(C) PERVIOUS AREAS	117,054	SEEDING/STONE (TEMPORARY)	#7,8,9
		SEED/SOD/SYN.TURF (PERMANENT)	#11
(D) SEDIMENT CONTROLS	45,679	SEEDING/STONE (TEMPORARY)	#3,4&5
		SEED/SOD (PERMANENT)	#13

AREAS ARE TO BE VEGETATIVELY STABILIZED TO SATISFY THE 3/7 DAY REQUIREMENT AS PER THE BALTIMORE CITY STANDARD EROSION AND SEDIMENT CONTROL NOTES.

UTILITY CONSTRUCTION NOTE

SEDIMENT CONTROL FOR UTILITY CONSTRUCTION FOR AREAS OUTSIDE OF DESIGNED CONTROLS OR AS DIRECTED BY ENGINEER OR CITY INSPECTOR:

A. CALL "MISS UTILITY" AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF ANY WORK.

B. EXCAVATED TRENCH MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF THE TRENCH.

C. TRENCHES FOR UTILITY INSTALLATION SHALL BE BACKFILLED, COMPACTED, AND STABILIZED AT THE END OF EACH WORKING DAY. NO MORE TRENCH SHALL BE OPENED THAN CAN BE COMPLETED THE SAME DAY.

D. ANY SEDIMENT CONTROLS DISTURBED DURING UTILITY CONSTRUCTION ARE TO BE REPAIRED IMMEDIATELY.

NOT FOR CONSTRUCTION

DATA SOURCES

1. Existing topography and structures shown hereon outside of the limits of field run topography are from the Baltimore City Office of Technology - GIS Lab.
2. Existing topography from field run survey by Century Engineering Inc. dated Aug-Sept. 2020
3. Coordinates & elevations are referred to the Baltimore City Survey Control System and are tied to the following control stations:
   35800 N 7963.820 E -9323.550 Elev. 301.060
   35801 N 8240.190 E -9800.600 Elev. 324.640
4. Public utilities shown hereon are from public drawings, field location and other sources.

ESC LEGEND

- LOD — Limit Of Disturbance (LOD)
- SF — Silt Fence
- SSF — Super Silt Fence
- DF — Diversion Fence
- Baffle Boards
- B-2 — Earth Dike (Type B-2)
- COIP — Combination Inlet Protection
- SIP(A) — Standard Inlet Protection (Type A)
- AGIP — At Grade Inlet Protection
- CIP — Curb Inlet Protection
- GP — Gabion Inflow Protection
- Mountable Berm
- ESC Drainage Divide
- CWS — Concrete Washout Structure

OWNER:
Mayor & City Council of Baltimore
One Calvert Plaza
201E Baltimore Street
Baltimore MD 21202
(410)-675-3651

DEVELOPER:
The Maryland Zoo in Baltimore
1876 Mansion House Drive
Baltimore MD 21217
C/O Karl Kranz
(410)-396-7102

DATE	BY	REVISIONS

CENTURY ENGINEERING
A Kleinfelder Company
10710 Gilroy Road, Hunt Valley, MD 21031
Phone: 443.589.2400 www.centuryeng.com

INTERIM EROSION SEDIMENT CONTROL PLAN 1
(PHASES 1B, 2 & 3)
THE MARYLAND ZOO IN BALTIMORE PARKING LOT REHABILITATION

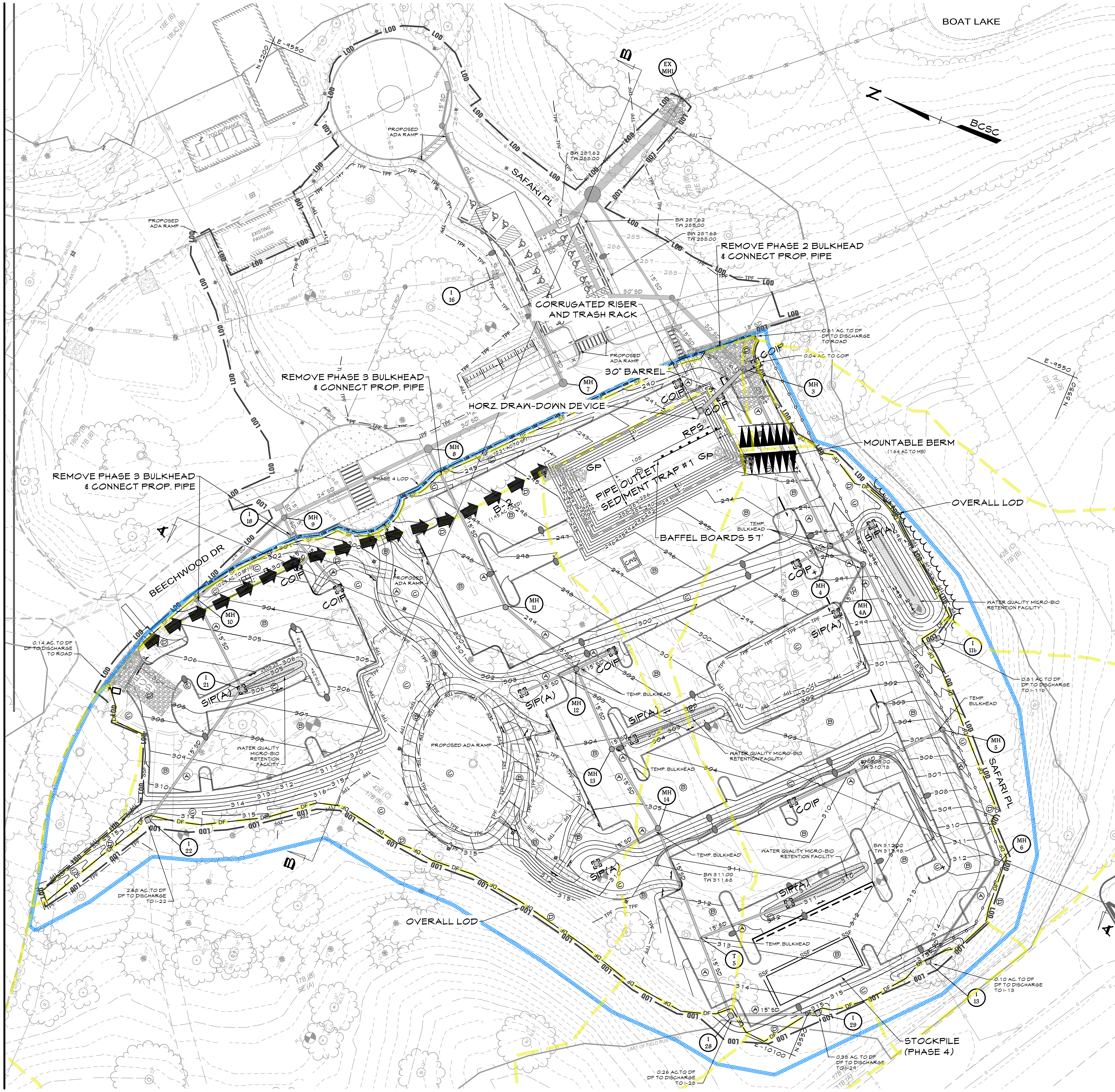
BALTIMORE, MARYLAND
WARD 13 SECTION 5 BLOCK 3499 LOT 001

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.: 32574
EXPIRATION DATE: 1/16/2024

STATE OF MARYLAND ANTHONY JOSEPH ... No. 32574 PROFESSIONAL ENGINEER 7/15/22

DRAWN BY: AA
DESIGN BY: DRS/KRB
REVIEW BY: AJD
REVIEW DATE: 7/15/2022
SCALE: 1"=30'
PROJECT No.: 201069.00
DRAWING: C-052A

ESD # 7969



PLAN

SCALE: 1"=30'

LIMIT OF DISTURBANCE= 274,251 SF.= 6.30 AC.±

LEGEND

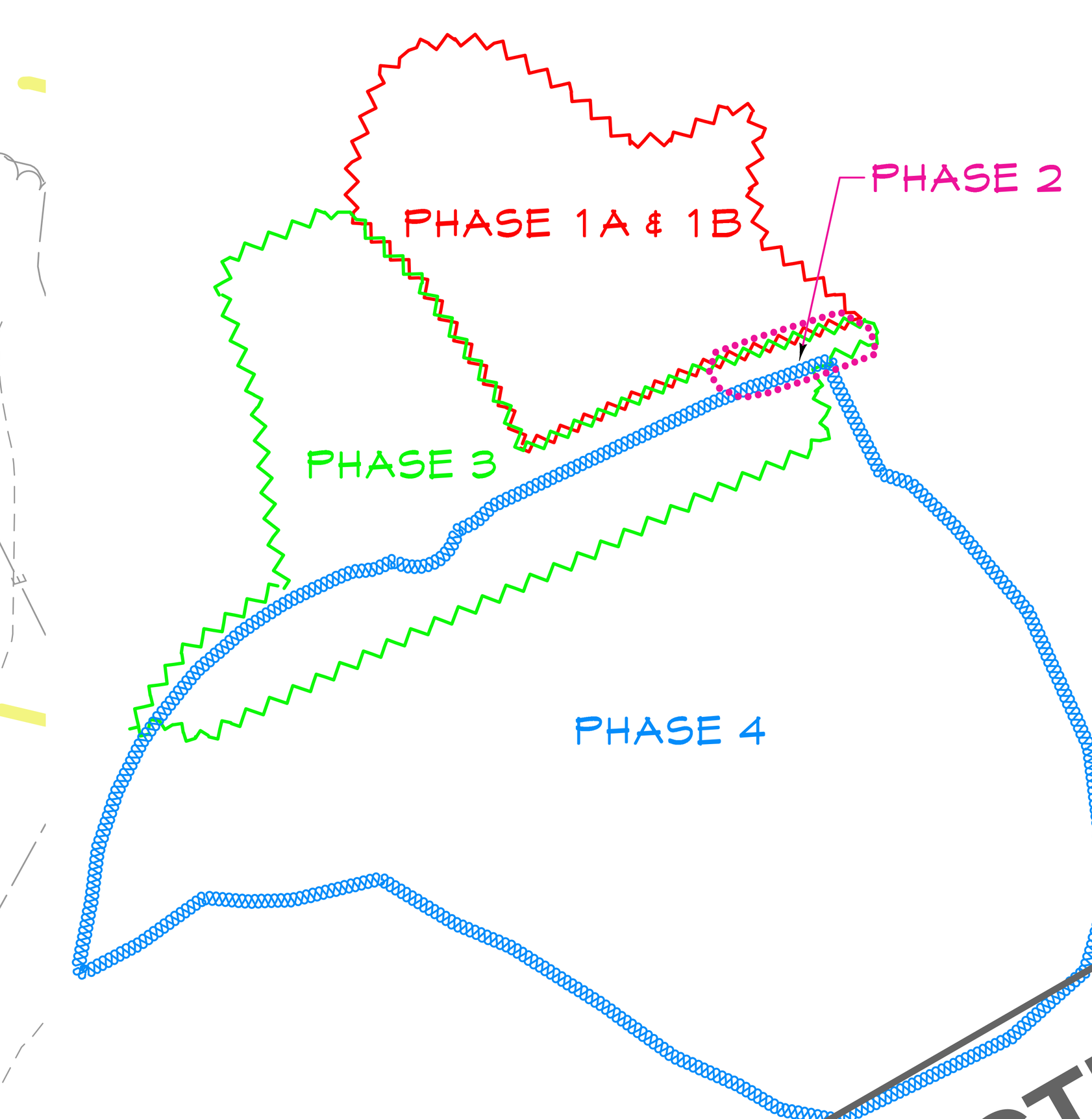
NOTE: DUE TO THE VARIED NATURE OF EACH PLAN ALL SYMBOLS SHOWN ON LEGEND MAY NOT BE PRESENT ON ALL PLAN SHEETS.

- Existing Minor Contour
- Existing Major Contour
- Existing Edge of Road
- Existing Storm Drain
- Existing Water
- Existing Sewer
- Existing Gas Line
- Existing Underground Electric Line
- Existing Curb and Gutter
- Existing Retaining Wall
- Existing Edge of Paving
- Existing Sidewalk
- Existing Tree Line
- Existing Building/Structure
- Water Edge or Stream Centerline
- Existing Fence
- Existing Pavement
- Existing Sign
- Existing Light
- Existing Bollard
- Proposed Major Contour
- Proposed Minor Contour
- Proposed Inlet
- Proposed Curb and Gutter
- Proposed Retaining Wall
- Proposed Edge of Pavement
- Proposed Guardrail
- Proposed Concrete Sidewalk
- Proposed Fence
- Proposed Tree Line
- Proposed Underground SWM Facility
- Proposed Underground Sand Filter
- Tree Protection Fence
- Proposed ADA Route
- Proposed ADA Parking Sign
- Proposed ADA Parking Space
- Proposed Bollards
- Proposed Guard Shack
- Proposed Pedestrian "Acorn" Type Light
- Proposed Parking Lot "Cobra" Type Light
- Proposed Fence
- Proposed Crosswalk

PIPE OUTLET SEDIMENT TRAP ST-I, TRAP NO. 1		
DRAINAGE AREA – INTIAL	4.4	ACRES
DRAINAGE AREA – INTERIM	4.4	ACRES
DRAINAGE AREA – FINAL	1.3	ACRES
TOTAL STORAGE REQUIRED	15,840	CF
TOTAL STORAGE PROVIDED	16,118	CF
WET STORAGE REQUIRED	7,920	CF
WET STORAGE PROVIDED	8,058	CF
DRY STORAGE REQUIRED	7,920	CF
DRY STORAGE PROVIDED	8,060	CF
TRAP BOTTOM ELEVATION	286.00	FT
TRAP BOTTOM DIMENSIONS	108 x 41	FT x FT
RISER CREST (DRY STORAGE) ELEVATION	289.0	FT
OUTLET (WET STORAGE) ELEVATION	287.5	FT
CLEANOUT ELEVATION	286.75	FT
TOP OF EMBANKMENT ELEVATION	290.5	FT
SIDE SLOPE	2:1	H:V RATIO
EMBANKMENT TOP WIDTH	4	FT
PRINCIPAL SPILLWAY MATERIAL (BARREL, RISER, ANTI-SEEP COLLAR)	GALV. STEEL	
RISER DIAMETER	42	IN
BARREL DIAMETER	30	IN
TRASH RACK DIAMETER	60	IN
TRASH RACK HEIGHT	27	IN
ANTI-SEEP COLLAR DIMENSIONS	ACRES	FT
OUTLET PROTECTION – LENGTH	TRAP OUTFALLS TO A CLOSED STORM DRAIN SYSTEM	FT
OUTLET PROTECTION – WIDTH		FT
OUTLET PROTECTION – DEPTH		IN

ESC LEGEND

- SF — Silt Fence
- SSF — Super Silt Fence
- DF — Diversion Fence
- Baffel Boards
- B-2 — Earth Dike (Type B-2)
- COIP — Combination Inlet Protection
- SIP(A) — Standard Inlet Protection (Type A)
- AGIP — At Grade Inlet Protection
- CIP — Curb Inlet Protection
- GP — Gabion Inflow Protection
- Mountable Berm
- ESC Drainage Divide
- CWS — Concrete Washout Structure
- SD to be built with Utility Construction Note. SOC # 35



PHASE LINE LEGEND

NOT TO SCALE

DATA SOURCES

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2. Existing topography from field run survey by Century Engineering Inc. dated Aug-Sept. 2020
3. Coordinates & elevations are referred to the Baltimore City Survey Control System and are tied to the following control stations:
   - 35800 N 7963.820 E -9323.550 Elev. 301.060
   - 35801 N 8240.190 E -9800.600 Elev. 324.640
4. Public utilities shown hereon are from public drawings, field location and other sources.

DATE	BY	REVISIONS

UTILITY CONSTRUCTION NOTE

SEDIMENT CONTROL FOR UTILITY CONSTRUCTION FOR AREAS OUTSIDE OF DESIGNED CONTROLS OR AS DIRECTED BY ENGINEER OR CITY INSPECTOR

A. CALL "MISS UTILITY" AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF ANY WORK.

B. EXCAVATED TRENCH MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF THE TRENCH.

C. TRENCHES FOR UTILITY INSTALLATION SHALL BE BACKFILLED, COMPACTED, AND STABILIZED AT THE END OF EACH WORKING DAY. NO MORE TRENCH SHALL BE OPENED THAN CAN BE COMPLETED THE SAME DAY.

D. ANY SEDIMENT CONTROLS DISTURBED DURING UTILITY CONSTRUCTION ARE TO BE REPAIRED IMMEDIATELY.

NOT FOR CONSTRUCTION

NOTES:

- THIS PLAN REFLECTS FULL BUILD OUT OF ALL PROPOSED PARKING LOTS. CONSTRUCTION WILL PROCEED IN PHASES DEPENDENT UPON FUNDING
- REFER TO LANDSCAPE PLANS ON SHEETS C-070 TO C-073 FOR PROPOSED TREES AND PLANTINGS
- CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE TO CURB/GUTTER FROM BOTTOM OF ADA RAMP.

OWNER:
Mayor & City Council of Baltimore
One Calvert Plaza
201E Baltimore Street
Baltimore MD 21202
(410)-675-3651

DEVELOPER:
The Maryland Zoo in Baltimore
1876 Mansion House Drive
Baltimore MD 21217
C/O Karl Kranz
(410)-396-7102

FOR SEDIMENT CONTROL ONLY

CENTURY ENGINEERING
A Kleinfelder Company
10710 Gilroy Road, Hunt Valley, MD 21031
Phone: 443.589.2400 www.centuryeng.com

INTERIM EROSION SEDIMENT CONTROL PLAN 1

(PHASE 4)

THE MARYLAND ZOO IN BALTIMORE PARKING LOT REHABILITATION

BALTIMORE, MARYLAND
WARD 13 SECTION 5 BLOCK 3499 LOT 001

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.: 32574
EXPIRATION DATE: 1/16/2024

STATE OF MARYLAND ANTHONY JOSEPH ... No. 32574 PROFESSIONAL ENGINEER 7/15/22

DRAWN BY:	AA	REVIEW BY:	AJD
DESIGN BY:	DRS/KRB	REVIEW DATE:	7/15/2022
SCALE:	1"=30'	DRAWING:	C-052B
PROJECT No.:	201069.00		

ESD # 7969

T:\2020\Facilities\201069.00 MD Zoo Parking\Civil\CADD\Drawings\Construction\201069.00(C-052) Interim2 ESC Plan 1.dwg Jul 18, 2022 1:24pm dshanahan

PLAN
SCALE: 1"=30'

LIMIT OF DISTURBANCE= 274,251 SF.= 6.30 AC.±

LEGEND

NOTE: DUE TO THE VARIED NATURE OF EACH PLAN ALL SYMBOLS SHOWN ON LEGEND MAY NOT BE PRESENT ON ALL PLAN SHEETS.

- 676 — Existing Minor Contour
- 670 — Existing Major Contour
- Existing Edge of Road
- SD EX. 15" D. — Existing Storm Drain
- W EX. 12" W. — Existing Water
- SAN EX. 8" S. — Existing Sewer
- G EX. 8" G. — Existing Gas Line
- E — Existing Underground Electric Line
- Existing Curb and Gutter
- Existing Retaining Wall
- Existing Edge of Paving
- Existing Sidewalk
- Existing Tree Line
- Existing Building/Structure
- Water Edge or Stream Centerline
- —X—X—X— Existing Fence
- Existing Pavement
- Existing Sign
- Existing Light
- Existing Bollard
- 660 — Proposed Major Contour
- 658 — Proposed Minor Contour
- Proposed Inlet
- Proposed Curb and Gutter
- Proposed Retaining Wall
- Proposed Edge of Pavement
- Proposed Guardrail
- Proposed Concrete Sidewalk
- —X—X—X— Proposed Fence
- Proposed Tree Line
- Proposed Underground SWM Facility
- Proposed Underground Sand Filter
- TPF — TPF — Tree Protection Fence
- Proposed ADA Route
- Proposed ADA Parking Sign
- ♿ Proposed ADA Parking Space
- Proposed Bollards
- Proposed Guard Shack
- Proposed Pedestrian "Acorn" Type Light
- Proposed Parking Lot "Cobra" Type Light
- Proposed Fence
- Proposed Crosswalk

ESC LEGEND

- SF — Silt Fence
- SSF — Super Silt Fence
- SFD — Diversion Fence
- Baffle Boards
- B-2 — Earth Dike (Type B-2)
- COIP — Combination Inlet Protection
- SIP(A) — Standard Inlet Protection (Type A)
- AGIP — At Grade Inlet Protection
- CIP — Curb Inlet Protection
- GP — Gabion Inflow Protection
- Mountable Berm

* NO GRADING IS PROPOSED IN THIS AREA. DISTURBANCE IS LIMITED TO INSTALLATION OF NEW LIGHTS, PREFABRICATED GUARD SHACKS, AND GATES.

NOTES:

1. THERE ARE NO WETLANDS OR OTHER ENVIRONMENTALLY SENSITIVE AREAS OR THEIR REQUIRED BUFFERS ON SITE.
2. THERE ARE NO STREAMS, RIVERS, CREEKS, BROOKS, PONDS, DETENTION BASINS, OR DRAINAGE WAYS ON SITE.
3. THERE ARE NO HIGHLY ERODIBLE SOILS, ROCK OUTCROPS OR STEEP SLOPES ON SITE.
4. THE SITE IS NOT LOCATED WITHIN THE CHESAPEAKE BAY CRITICAL AREA (CBCA).
5. THERE ARE NO FORESTED AREAS ON SITE.

NOTE

SEE SHEET C-052A FOR STABILIZATION SCHEDULE.

UTILITY CONSTRUCTION NOTE

SEDIMENT CONTROL FOR UTILITY CONSTRUCTION FOR AREAS OUTSIDE OF DESIGNED CONTROLS OR AS DIRECTED BY ENGINEER OR CITY INSPECTOR:

A. CALL "MISS UTILITY" AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF ANY WORK.

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   35801 N 8240.190 E -9800.600 Elev. 324.640
4. Public utilities shown hereon are from public drawings, field location and other sources.

NOT FOR CONSTRUCTION

FOR SEDIMENT CONTROL ONLY

DATE	BY	REVISIONS

CENTURY ENGINEERING
A Kleinfelder Company
10710 Gilroy Road, Hunt Valley, MD 21031
Phone: 443.589.2400 www.centuryeng.com

INTERIM EROSION SEDIMENT CONTROL PLAN 2

THE MARYLAND ZOO IN BALTIMORE
PARKING LOT REHABILITATION
BALTIMORE, MARYLAND
WARD 13 SECTION 5 BLOCK 3499 LOT 001

0 30' 60'

OWNER:
Mayor & City Council of Baltimore
One Calvert Plaza
201E Baltimore Street
Baltimore MD 21202
(410)-675-3651

DEVELOPER:
The Maryland Zoo in Baltimore
1876 Mansion House Drive
Baltimore MD 21217
C/O Karl Kranz
(410)-396-7102

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.: 32574
EXPIRATION DATE: 1/16/2024

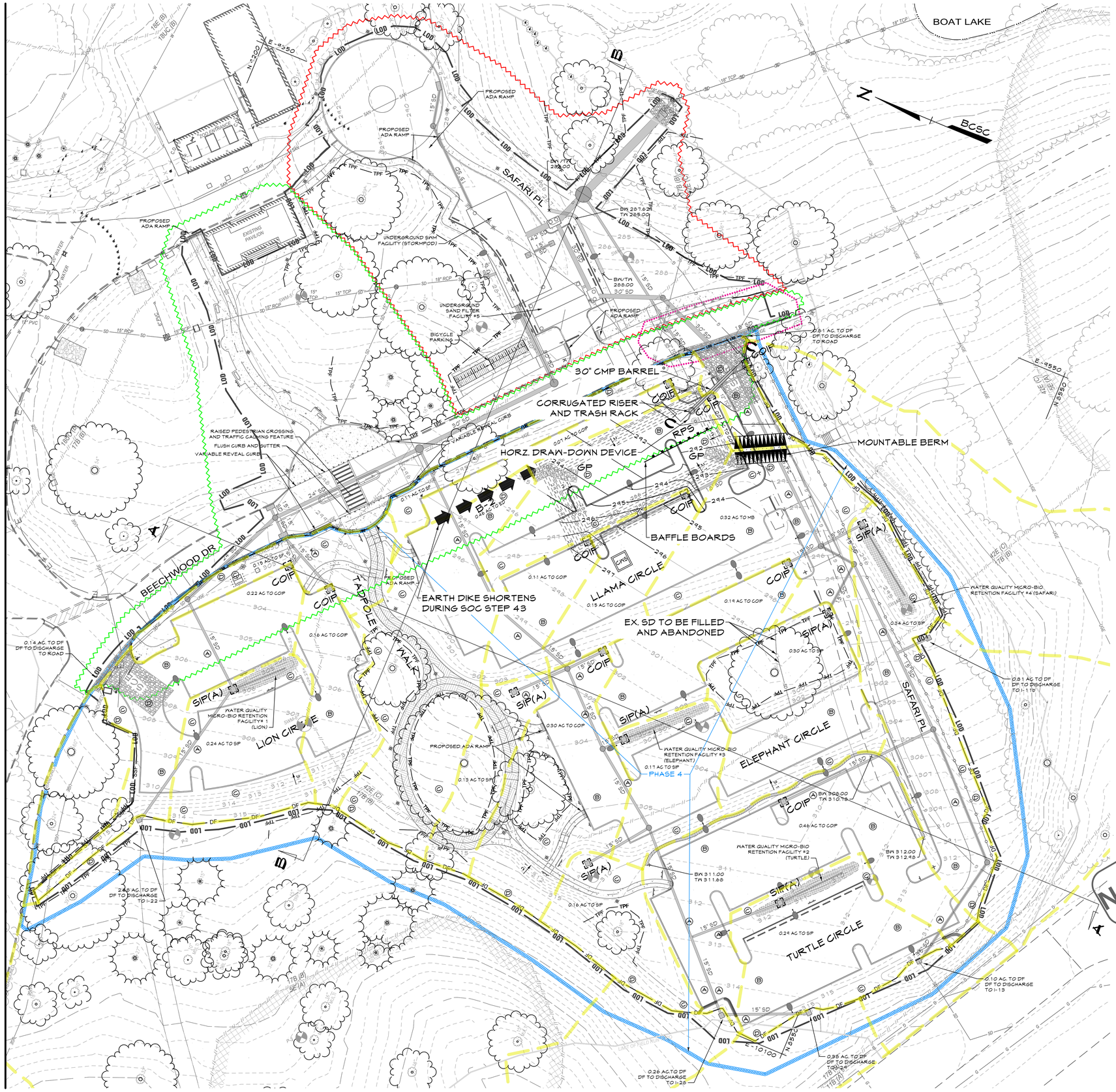
STATE OF MARYLAND ANTHONY JOSEPH [illegible] No. 32574 PROFESSIONAL ENGINEER
[illegible] 7/15/22

DRAWN BY:	AA	REVIEW BY:	AJD
DESIGN BY:	DRS/KRB	REVIEW DATE:	7/15/2022
SCALE:	1"=30'	DRAWING:	C-053
PROJECT No.:	201069.00		

ESD # 7969

T:\2020\Facilities\201069.00 MD Zoo Parking\CIVIL\CADD\Drawings\Construction\201069.00 (C-053) Interim ESC Plan 2.dwg Jul 18, 2022 1:24pm dshanahan

MATCHLINE - SEE SHEET C-055



PLAN

SCALE: 1"=30'

LIMIT OF DISTURBANCE= 274,251 SF.= 6.30 AC.±

FOR SEDIMENT CONTROL ONLY

LEGEND

NOTE: DUE TO THE VARIED NATURE OF EACH PLAN ALL SYMBOLS SHOWN ON LEGEND MAY NOT BE PRESENT ON ALL PLAN SHEETS.

- Existing Minor Contour
- Existing Major Contour
- Existing Edge of Road
- Existing Soils (18UC (B), 17B (B))
- Existing Storm Drain (EX. 15" D.)
- Existing Water (EX. 12" W.)
- Existing Sewer (EX. 8" S.)
- Existing Gas Line (EX. 8" G.)
- Existing Underground Electric Line
- Existing Curb and Gutter
- Existing Retaining Wall
- Existing Edge of Paving
- Existing Sidewalk
- Existing Tree Line
- Existing Building/Structure
- Water Edge or Stream Centerline
- Existing Fence
- Existing Pavement
- Existing Sign
- Existing Light
- Existing Bollard
- Proposed Major Contour
- Proposed Minor Contour
- Proposed Inlet
- Proposed Curb and Gutter
- Proposed Retaining Wall
- Proposed Edge of Pavement
- Proposed Guardrail
- Proposed Concrete Sidewalk
- Proposed Fence
- Proposed Tree Line
- Proposed Underground SWM Facility
- Proposed Underground Sand Filter
- Tree Protection Fence
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- Proposed ADA Parking Space
- Proposed Bollards
- Proposed Guard Shack
- Proposed Pedestrian "Acorn" Type Light
- Proposed Parking Lot "Cobra" Type Light
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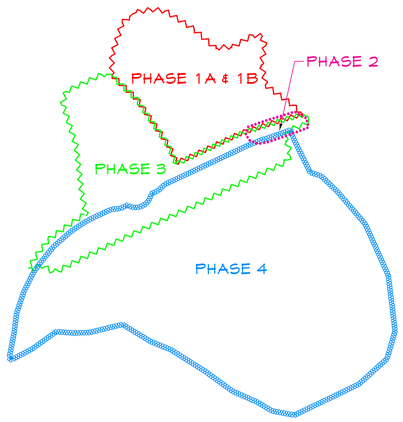
- Proposed Crosswalk



PHASE LINE LEGEND

NOT TO SCALE

STABILIZATION SCHEDULE

AREA	SQ.FT.	STABILIZATION TYPE	SEQUENCE #
(A) UTILITY WORK	13,276	SEEDING/STONE (TEMPORARY)	---
		SEED/SOD PAVING (PERMANENT)	---
(B) CURBS, SIDEWALKS, FOUNDATIONS	145,252	SEEDING/STONE (TEMPORARY)	#7,8,9
		CONCRETE CURBS/WALKS (PERMANENT) & PAVING	#12
(C) PERVIOUS AREAS	98,850	SEEDING/STONE (TEMPORARY)	#7,8,9
		SEED/SOD/SYN.TURF (PERMANENT)	#11
(D) SEDIMENT CONTROLS	16,873	SEEDING/STONE (TEMPORARY)	#3,445
		SEED/SOD (PERMANENT)	#13

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UTILITY CONSTRUCTION NOTE

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ESC LEGEND

- SF — Silt Fence
- SSF — Super Silt Fence
- DF — Diversion Fence
- Baffle Boards
- B-2 — Earth Dike (Type B-2)
- COIP — Combination Inlet Protection
- SIP(A) — Standard Inlet Protection (Type A)
- AGIP — At Grade Inlet Protection
- CIP — Curb Inlet Protection
- GP — Gabion Inflow Protection
- Mountable Berm
- ESC Drainage Divide
- CNS — Concrete Washout Structure

NOT FOR CONSTRUCTION

NOTES:

- THIS PLAN REFLECTS FULL BUILD OUT OF ALL PROPOSED PARKING LOTS. CONSTRUCTION WILL PROCEED IN PHASES DEPENDENT UPON FUNDING
- REFER TO LANDSCAPE PLANS ON SHEETS C-070 thru C-073 FOR PROPOSED TREES AND PLANTINGS
- CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE TO CURB/GUTTER FROM BOTTOM OF ADA RAMP.

DATA SOURCES

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   - 35901 N 8240.190 E 9800.600 Elev. 324.640
4. Public utilities shown hereon are from public drawings, field location and other sources.

DATE	BY	REVISIONS

CENTURY ENGINEERING
A Kleinfelder Company
10710 Gilroy Road, Hunt Valley, MD 21031
Phone: 443.589.2400 www.centuryeng.com

FINAL EROSION SEDIMENT CONTROL PLAN 1

THE MARYLAND ZOO IN BALTIMORE PARKING LOT REHABILITATION

BALTIMORE, MARYLAND
WARD 13 SECTION 5 BLOCK 3499 LOT 001

OWNER:
Mayor & City Council of Baltimore
One Calvert Plaza
201E Baltimore Street
Baltimore MD 21202
(410)-675-3651

DEVELOPER:
The Maryland Zoo in Baltimore
1876 Mansion House Drive
Baltimore MD 21217
C/O Karl Kranz
(410)-396-7102

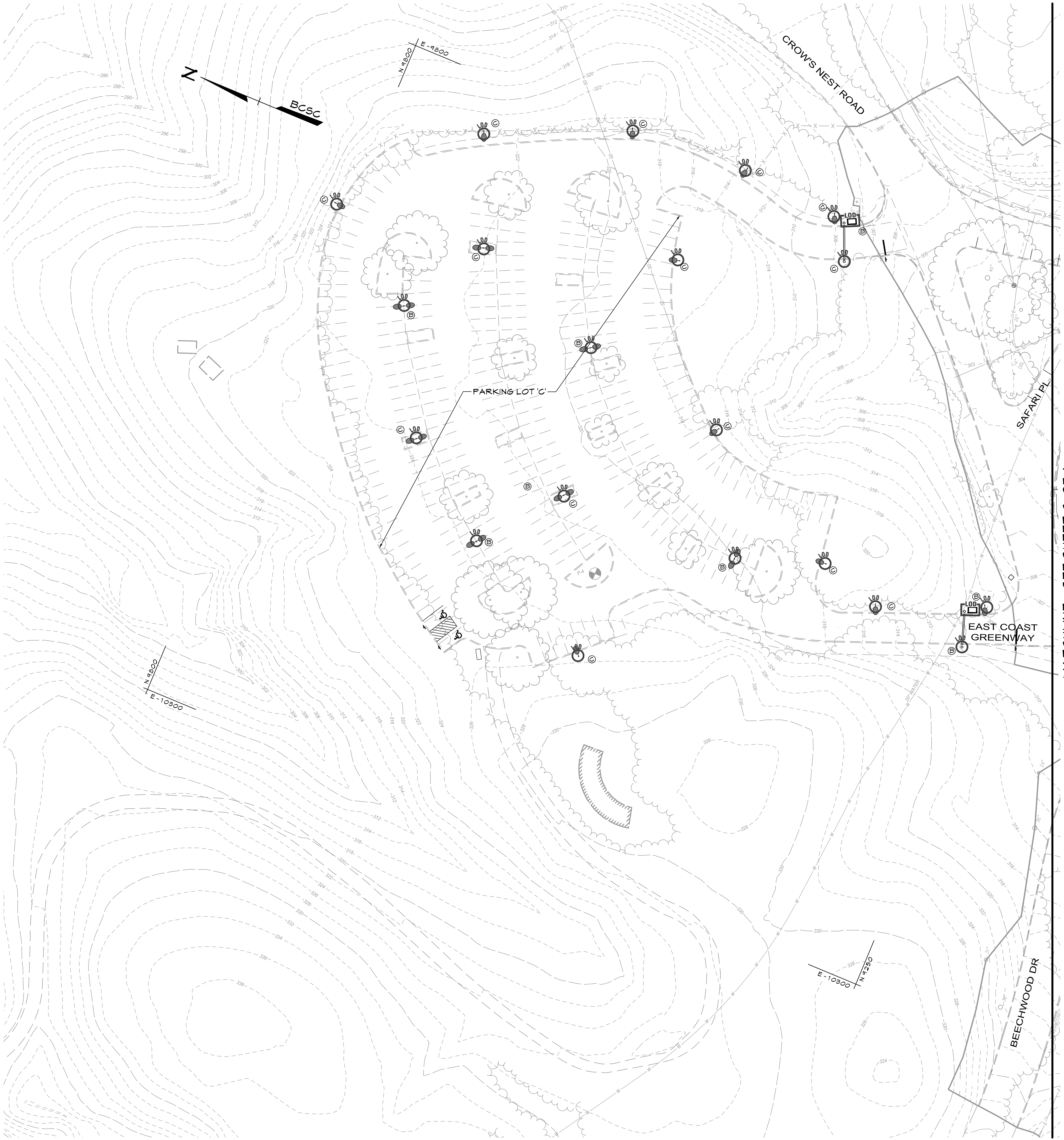
PROFESSIONAL CERTIFICATION

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.: 39574
EXPIRATION DATE: 1/16/2024

DRAWN BY:	AA	REVIEW BY:	AJD
DESIGN BY:	DRS/KRB	REVIEW DATE:	12/03/2021
SCALE:	1"=30'	DRAWING:	C-054
PROJECT No.:	201069.00		

ESD # 7969

T:\2020\Facilities\201069.00 MD Zoo Parking\CIVIL\CADD\Drawings\Construction\201069.00 (C-054) Final ESC Plan 1.dwg Jul 18, 2022 1:25pm dshanahan



PLAN

SCALE: 1"=30'

LIMIT OF DISTURBANCE= 274,251 SF.= 6.30 AC.±

LEGEND

676	Existing Minor Contour
670	Existing Major Contour
	Existing Edge of Road
18UC (B) / 17B (B)	Existing Soils
SD — EX. 15" D.	Existing Storm Drain
W — EX. 12" W.	Existing Water
SAN — EX. 8" S.	Existing Sewer
G — EX. 8" G.	Existing Gas Line
E	Existing Underground Electric Line
	Existing Curb and Gutter
	Existing Retaining Wall
	Existing Edge of Paving
	Existing Sidewalk
	Existing Tree Line
	Existing Building/Structure
	Water Edge or Stream Centerline
—X—X—X—	Existing Fence
	Existing Pavement
	Existing Sign
	Existing Light
	Existing Bollard
	Proposed ADA Parking Sign
	Proposed ADA Parking Space
	Proposed Guard Shack
	Proposed Pedestrian "Acorn" Type Light
	Proposed Parking Lot "Cobra" Type Light
LOD	Limit Of Disturbance (LOD)

ESC LEGEND

SF	Silt Fence
SSF	Super Silt Fence
DFS	Diversion Fence
	Baffle Boards
B-2	Earth Dike (Type B-2)
COIP	Combination Inlet Protection
SIP(A)	Standard Inlet Protection (Type A)
AGIP	At Grade Inlet Protection
CIP	Curb Inlet Protection
GP	Gabion Inflow Protection
	Mountable Berm

NOTES:

1. THERE ARE NO WETLANDS OR OTHER ENVIRONMENTALLY SENSITIVE AREAS OR THEIR REQUIRED BUFFERS ON SITE.
2. THERE ARE NO STREAMS, RIVERS, CREEKS, BROOKS, PONDS, DETENTION BASINS, OR DRAINAGE WAYS ON SITE.
3. THERE ARE NO HIGHLY ERODIBLE SOILS, ROCK OUTCROPS OR STEEP SLOPES ON SITE.
4. THE SITE IS NOT LOCATED WITHIN THE CHESAPEAKE BAY CRITICAL AREA (CBCA).
5. THERE ARE NO FORESTED AREAS ON SITE.

* NO GRADING IS PROPOSED IN THIS AREA. DISTURBANCE IS LIMITED TO INSTALLATION OF NEW LIGHTS, PREFABRICATED GUARD SHACKS, AND GATES.

NOTE

SEE SHEET C-054 FOR STABILIZATION SCHEDULE.

UTILITY CONSTRUCTION NOTE

SEDIMENT CONTROL FOR UTILITY CONSTRUCTION FOR AREAS OUTSIDE OF DESIGNED CONTROLS OR AS DIRECTED BY ENGINEER OR CITY INSPECTOR:

A. CALL "MISS UTILITY" AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF ANY WORK.
B. EXCAVATED TRENCH MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF THE TRENCH.
C. TRENCHES FOR UTILITY INSTALLATION SHALL BE BACKFILLED, COMPACTED, AND STABILIZED AT THE END OF EACH WORKING DAY. NO MORE TRENCH SHALL BE OPENED THAN CAN BE COMPLETED THE SAME DAY.
D. ANY SEDIMENT CONTROLS DISTURBED DURING UTILITY CONSTRUCTION ARE TO BE REPAIRED IMMEDIATELY.

DATA SOURCES

1. Existing topography and structures shown hereon outside of the limits of field run topography are from the Baltimore City Office of Technology - GIS Lab.
2. Existing topography from field run survey by Century Engineering Inc. dated Aug-Sept. 2020
3. Coordinates & elevations are referred to the Baltimore City Survey Control System and are tied to the following control stations:

35800	N 7963.820	E -9323.550	Elev. 301.060
35801	N 8240.190	E -9800.600	Elev. 324.640

4. Public utilities shown hereon are from public drawings, field location and other sources.

NOT FOR CONSTRUCTION

DATE	BY	REVISIONS

CENTURY ENGINEERING
A Kleinfelder Company
10710 Gilroy Road, Hunt Valley, MD 21031
Phone: 443.589.2400 www.centuryeng.com

FINAL EROSION SEDIMENT CONTROL PLAN 2

THE MARYLAND ZOO IN BALTIMORE PARKING LOT REHABILITATION

BALTIMORE, MARYLAND
WARD 13 SECTION 5 BLOCK 3499 LOT 001

0 30' 60'

OWNER:
Mayor & City Council of Baltimore
One Calvert Plaza
201E Baltimore Street
Baltimore MD 21202
(410)-675-3651

DEVELOPER:
The Maryland Zoo in Baltimore
1876 Mansion House Drive
Baltimore MD 21217
C/O Karl Kranz
(410)-396-7102

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.: 32574
EXPIRATION DATE: 1/16/2024

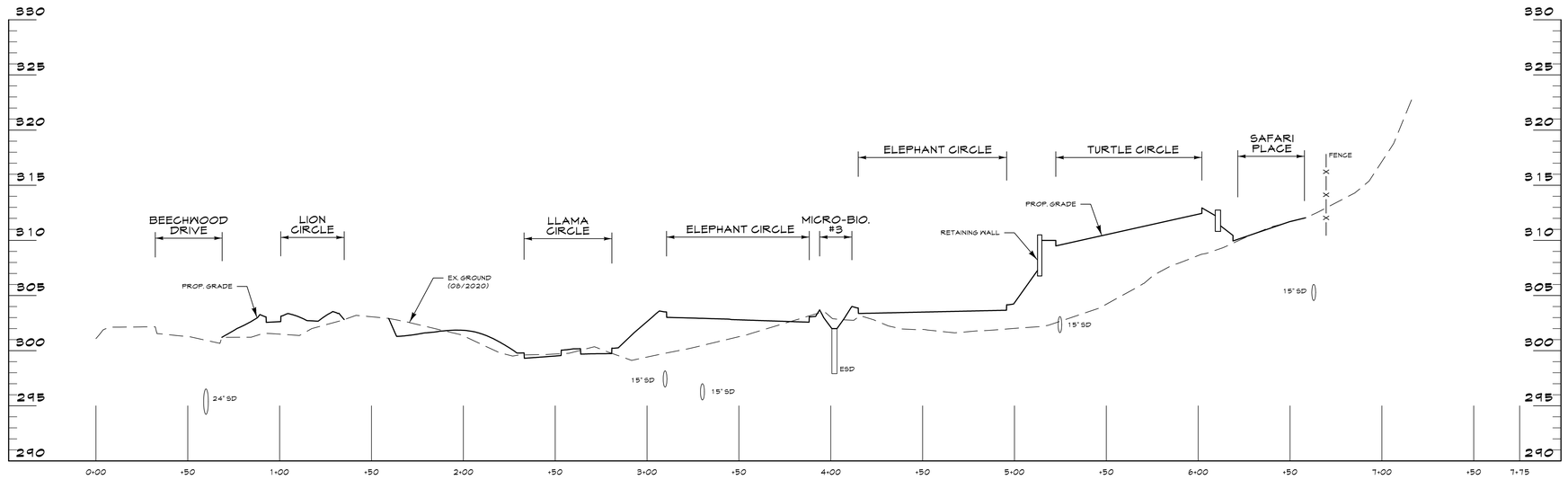
STATE OF MARYLAND · ANTHONY JOSEPH · No. 32574 · PROFESSIONAL ENGINEER
7/15/22

DRAWN BY:	AA	REVIEW BY:	AJD
DESIGN BY:	DRS/KRB	REVIEW DATE:	7/15/2022
SCALE:	1"=30'	DRAWING:	C-055
PROJECT No.:	201069.00		

FOR SEDIMENT CONTROL ONLY

ESD # 7969

T:\2020\Facilities\201069.00 MD Zoo Parking\CIVIL\CADD\Drawings\Construction\201069.00(C-055) Final ESC Plan 2.dwg Jul 18, 2022 1:25pm dshanahan



SECTION 'A-A'
SCALE: HORIZ: 1"=30'
VERT: 1"=5'

SECTION 'B-B'
SCALE: HORIZ: 1"=30'
VERT: 1"=5'

NOT FOR CONSTRUCTION

0 30' 60'

OWNER:
Mayor & City Council of Baltimore
One Calvert Plaza
201E Baltimore Street
Baltimore MD 21202
(410)-675-3651

DEVELOPER:
The Maryland Zoo in Baltimore
1876 Mansion House Drive
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DATE	BY	REVISIONS

CENTURY ENGINEERING
A Kleinfelder Company
10710 Gilroy Road, Hunt Valley, MD 21031
Phone: 443.589.2400 www.centuryeng.com

EROSION SEDIMENT CONTROL SITE CROSS-SECTIONS

THE MARYLAND ZOO IN BALTIMORE PARKING LOT REHABILITATION

BALTIMORE, MARYLAND
WARD 13 SECTION 5 BLOCK 3499 LOT 001

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.: 32574
EXPIRATION DATE: 1/16/2024

STATE OF MARYLAND · ANTHONY JOSEPH DIMINO · 32574 · PROFESSIONAL ENGINEER
7/15/22

DRAWN BY:	AA	REVIEW BY:	AJD
DESIGN BY:	DRS/KRB	REVIEW DATE:	7/15/2022
SCALE:	AS SHOWN	DRAWING:	C-056
PROJECT No.:	201069.00		

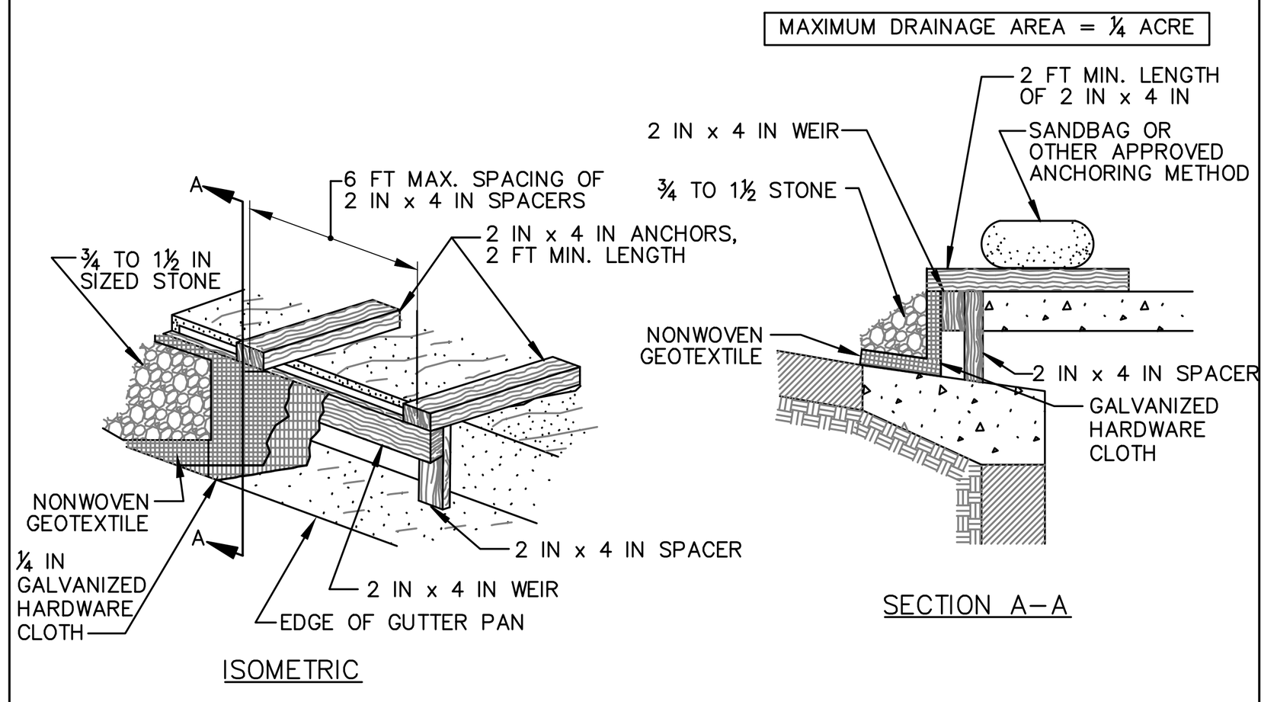
ESD # 7969

T:\2020\Facilities\201069.00 MD Zoo Parking\CIVIL\CADD\Drawings\Construction\201069.00 (C-056) ESC Site Cross Sections.dwg Jul 18, 2022 1:25pm dahanahan

DETAIL E-9-3 CURB INLET PROTECTION

STANDARD SYMBOL: CIP

MAXIMUM DRAINAGE AREA = ¼ ACRE



CONSTRUCTION SPECIFICATIONS

1. USE NOMINAL 2 INCH x 4 INCH LUMBER
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
3. NAIL THE 2x4 WEIR TO 9 INCH LONG VERTICAL SPACERS (MAXIMUM 6 FEET APART).
4. ATTACH A CONTINUOUS PIECE OF ¼ INCH GALVANIZED HARDWARE CLOTH, WITH A MINIMUM WIDTH OF 30 INCHES AND A MINIMUM LENGTH OF 4 FEET LONGER THAN THE THROAT OPENING, TO THE 2x4 WEIR, EXTENDING IT 2 FEET BEYOND THROAT ON EACH SIDE.
5. PLACE A CONTINUOUS PIECE OF NONWOVEN GEOTEXTILE OF THE SAME DIMENSIONS AS THE HARDWARE CLOTH OVER THE HARDWARE CLOTH AND SECURELY ATTACH TO THE 2x4 WEIR.
6. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL TO 2x4 ANCHORS (MINIMUM 2 FEET LENGTH). EXTEND THE ANCHORS ACROSS THE INLET TOP AND HOLD IN PLACE BY SANDBAGS OR OTHER APPROVED ANCHORING METHOD.
7. INSTALL END SPACERS A MINIMUM OF 1 FOOT BEYOND THE ENDS OF THE THROAT OPENING.
8. FORM THE HARDWARE CLOTH AND THE GEOTEXTILE TO THE CONCRETE GUTTER AND FACE OF CURB TO SPAN THE INLET OPENING. COVER THE HARDWARE CLOTH AND GEOTEXTILE WITH CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE.
9. AT NON–SUMP LOCATIONS, INSTALL A TEMPORARY SANDBAG OR ASPHALT BERM TO PREVENT INLET BYPASS.
10. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

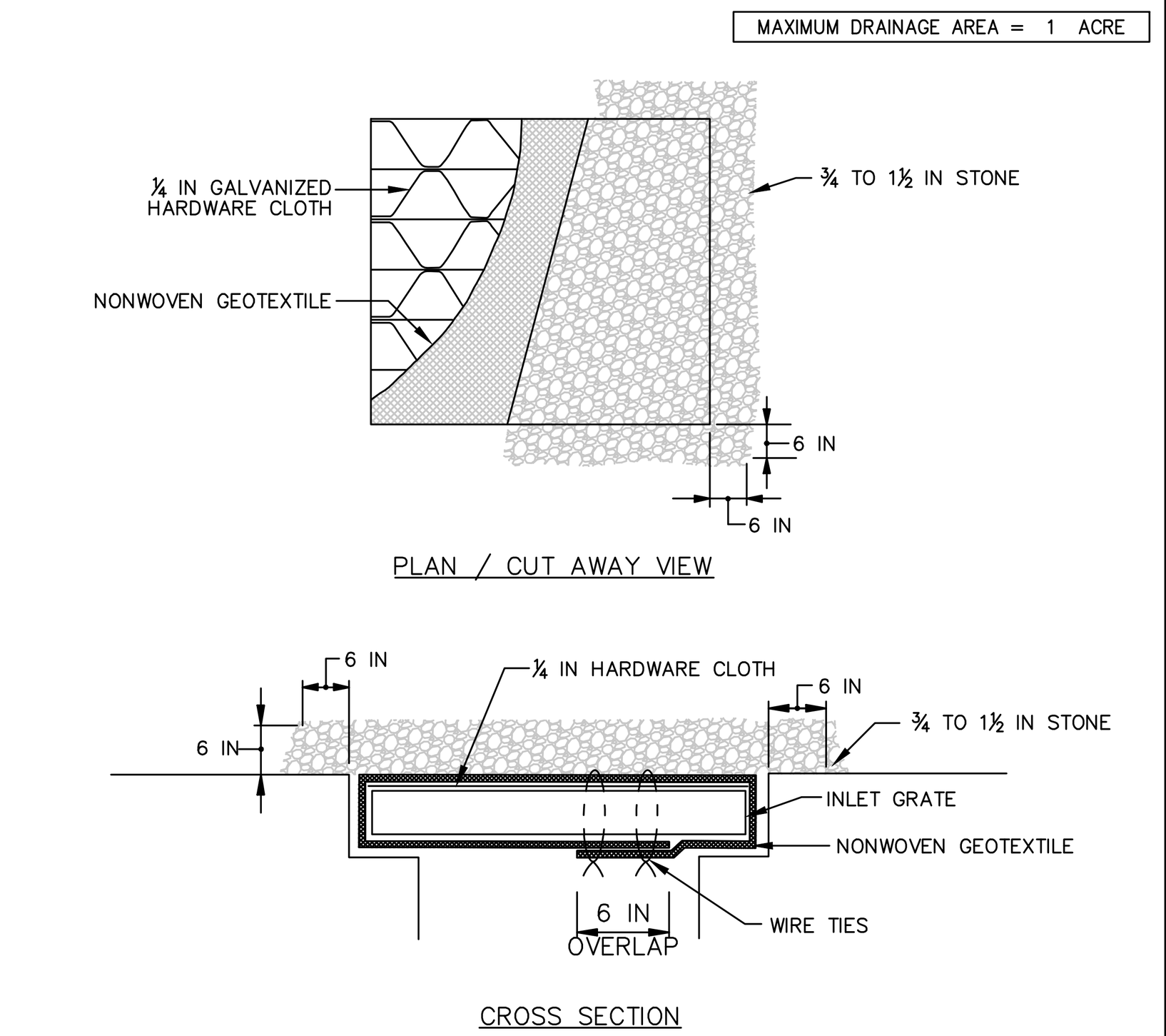
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-2 AT-GRADE INLET PROTECTION

STANDARD SYMBOL: AGIP

MAXIMUM DRAINAGE AREA = 1 ACRE



CONSTRUCTION SPECIFICATIONS

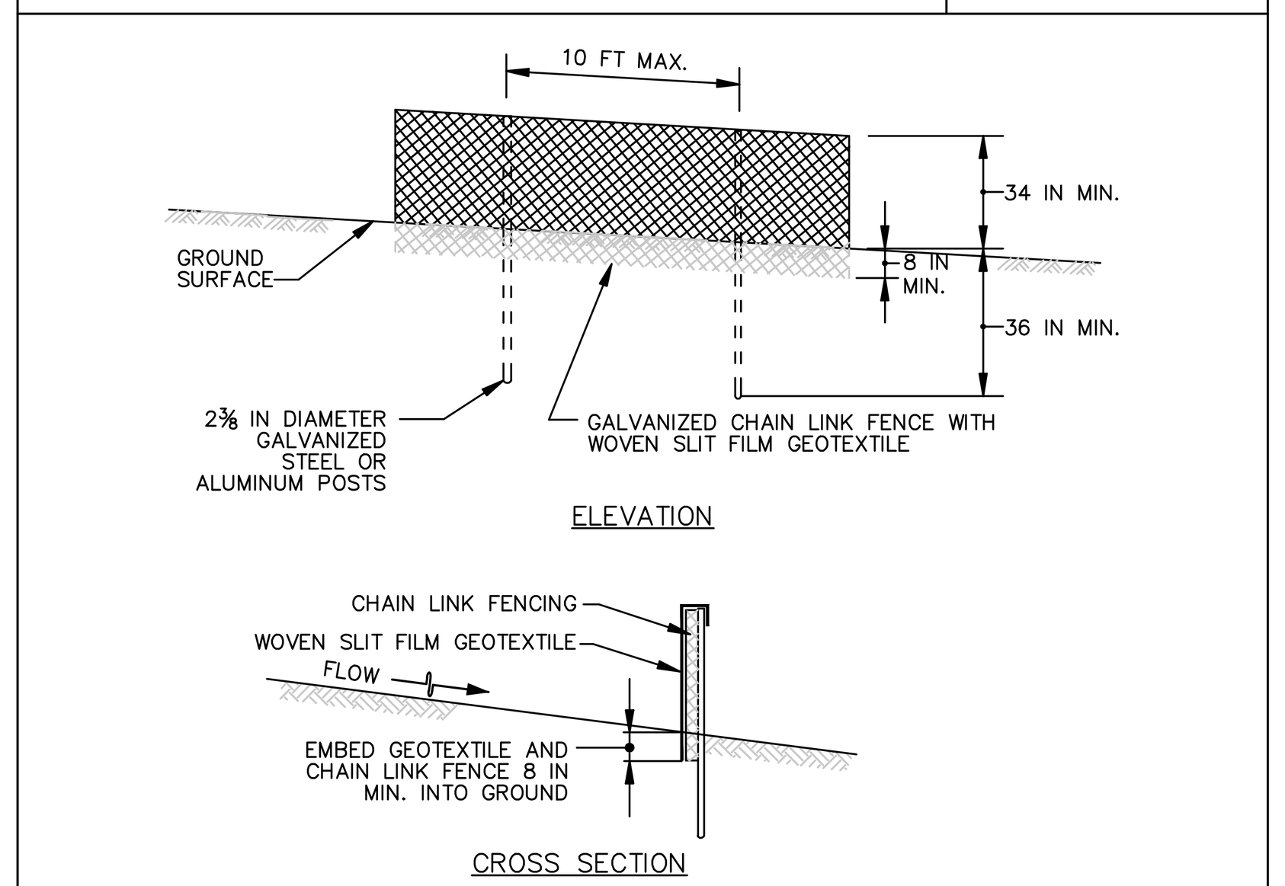
1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
2. LIFT GRATE AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS. SECURE WITH WIRE TIES AND SET GRATE BACK IN PLACE.
3. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE 6 INCHES THICK ON THE GRATE.
4. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF



CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H–1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

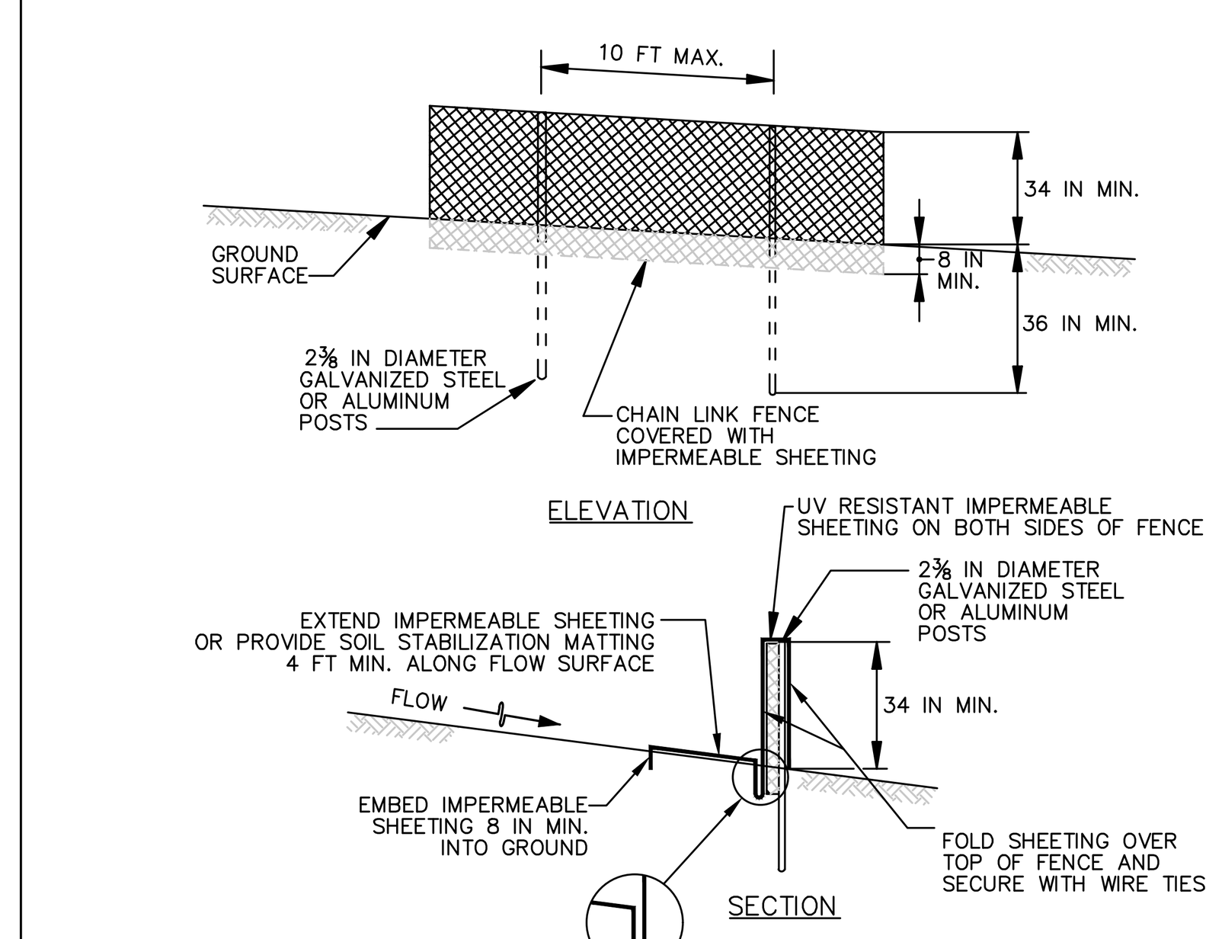
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-9 DIVERSION FENCE

STANDARD SYMBOL: DF

MAXIMUM DRAINAGE AREA = 2 ACRES



CONSTRUCTION SPECIFICATIONS

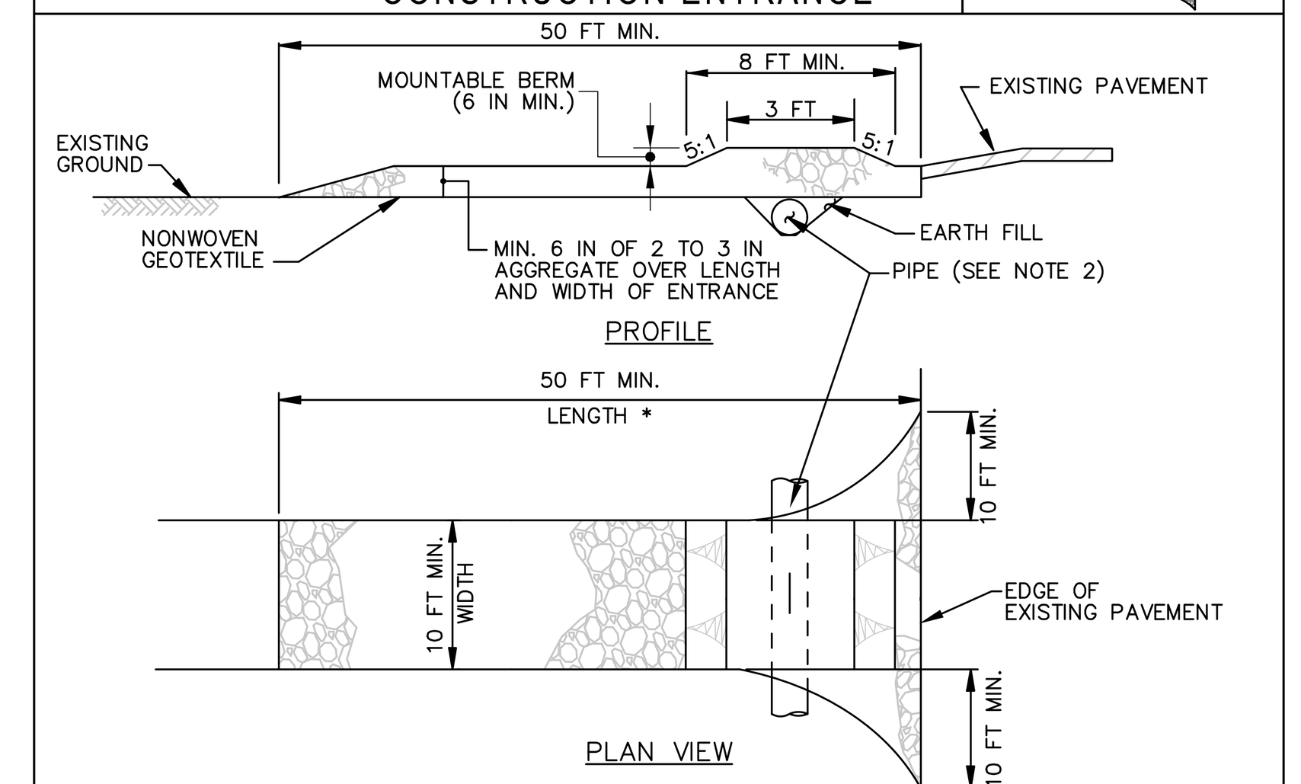
1. USE 42 INCH HIGH, 9 GAUGE OR THICKER CHAIN LINK FENCING (2⅜ INCH MAXIMUM OPENING).
2. USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
3. FASTEN CHAIN LINK FENCE SECURELY TO THE FENCE POSTS WITH WIRE TIES.
4. SECURE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING TO CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT TOP, MID SECTION, AND BELOW GROUND SURFACE.
5. EXTEND SHEETING A MINIMUM OF 4 FEET ALONG FLOW SURFACE AND EMBED END A MINIMUM OF 8 INCHES INTO GROUND. SOIL STABILIZATION MATTING MAY BE USED IN LIEU OF IMPERMEABLE SHEETING ALONG FLOW SURFACE.
6. WHEN TWO SECTIONS OF SHEETING ADJOIN EACH OTHER, OVERLAP BY 6 INCHES AND FOLD WITH SEAM FACING DOWNGRADE.
7. KEEP FLOW SURFACE ALONG DIVERSION FENCE AND POINT OF DISCHARGE FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE. REPLACE IMPERMEABLE SHEETING IF TORN. IF UNDERMINING OCCURS, REINSTALL 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

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

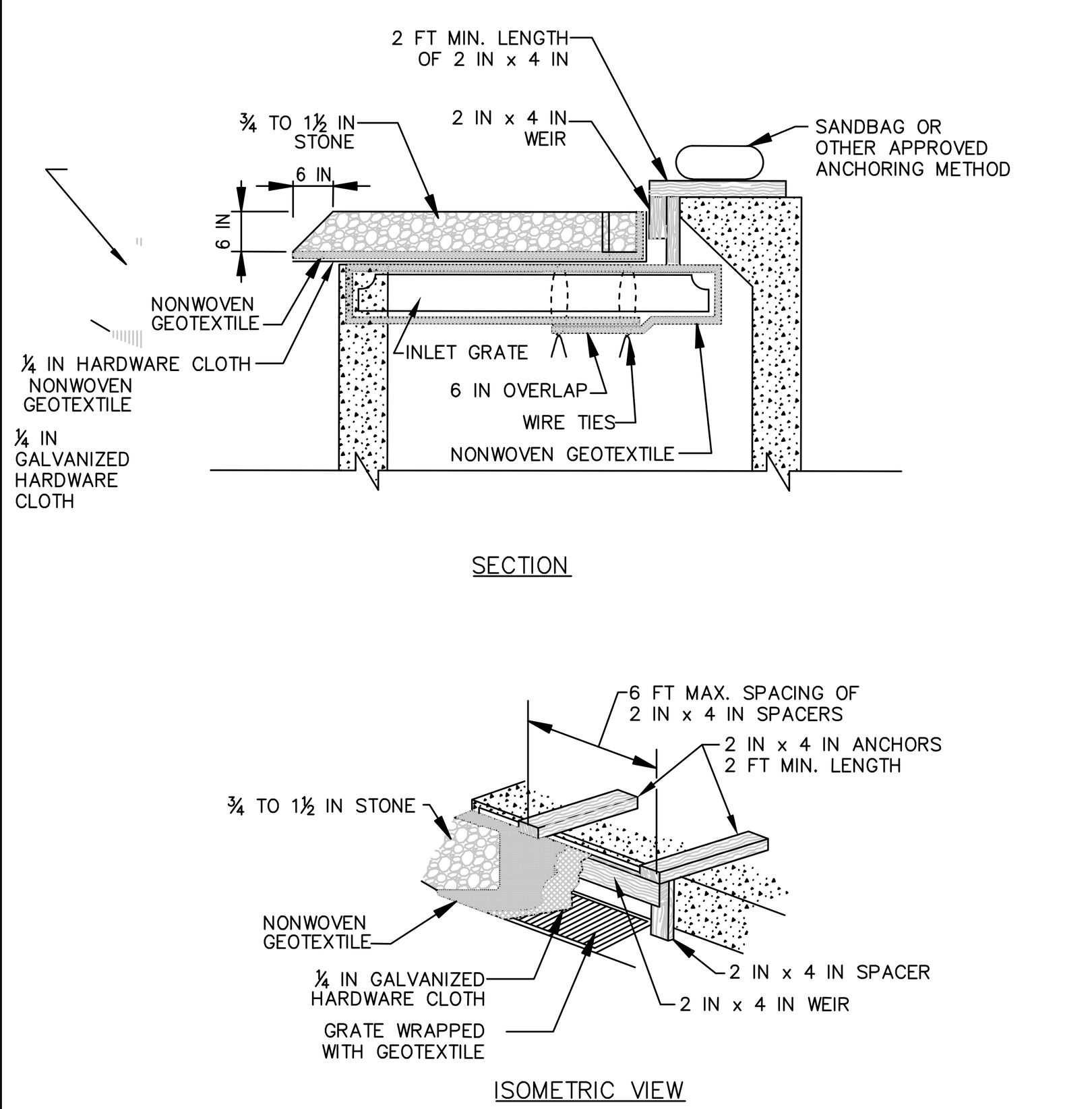
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-6 COMBINATION INLET PROTECTION

STANDARD SYMBOL: COIP

MAXIMUM DRAINAGE AREA = ¼ ACRE



1 OF 2

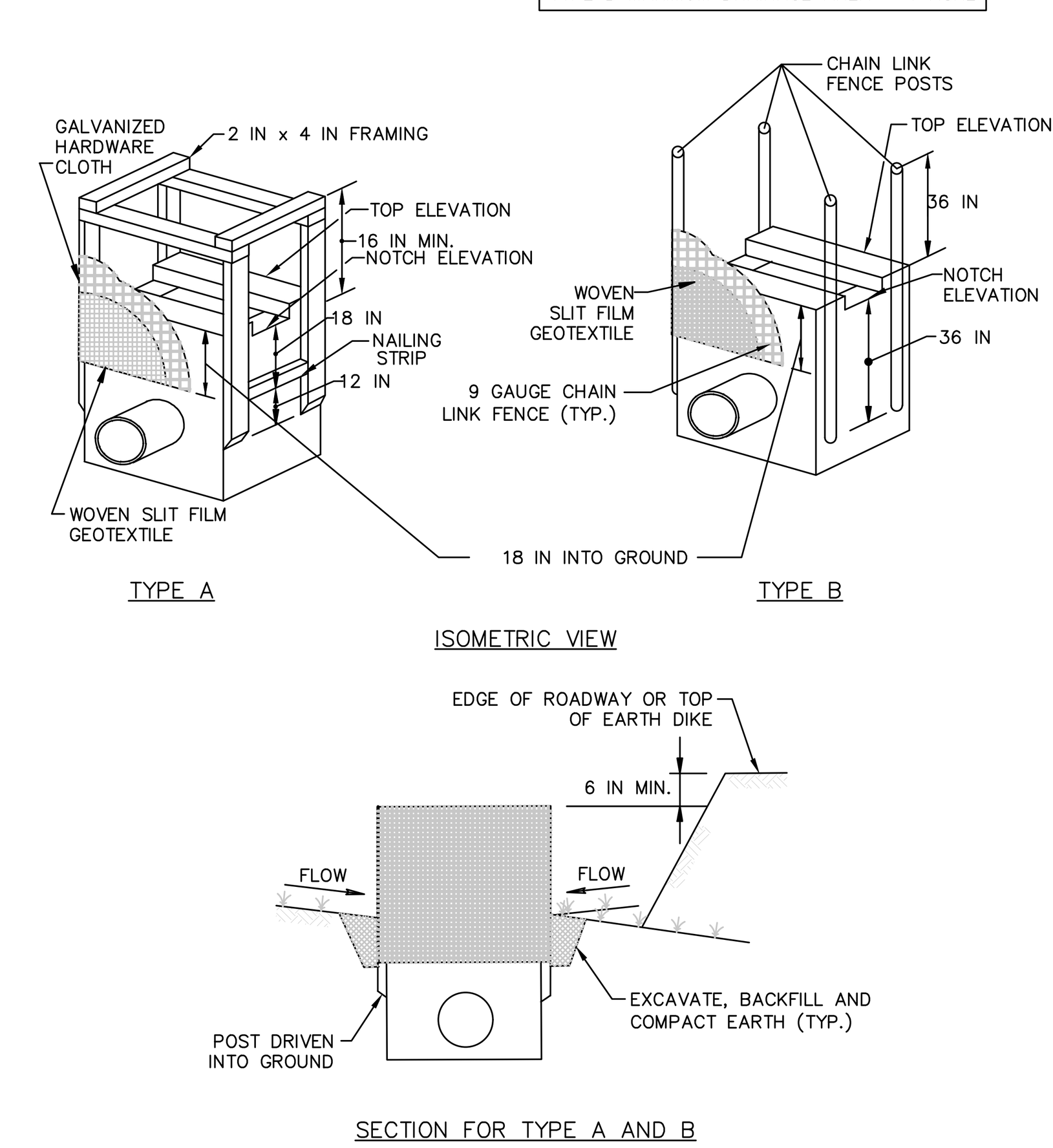
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SIP

TYPE A MAXIMUM DRAINAGE AREA = ¼ ACRE
TYPE B MAXIMUM DRAINAGE AREA = 1 ACRE



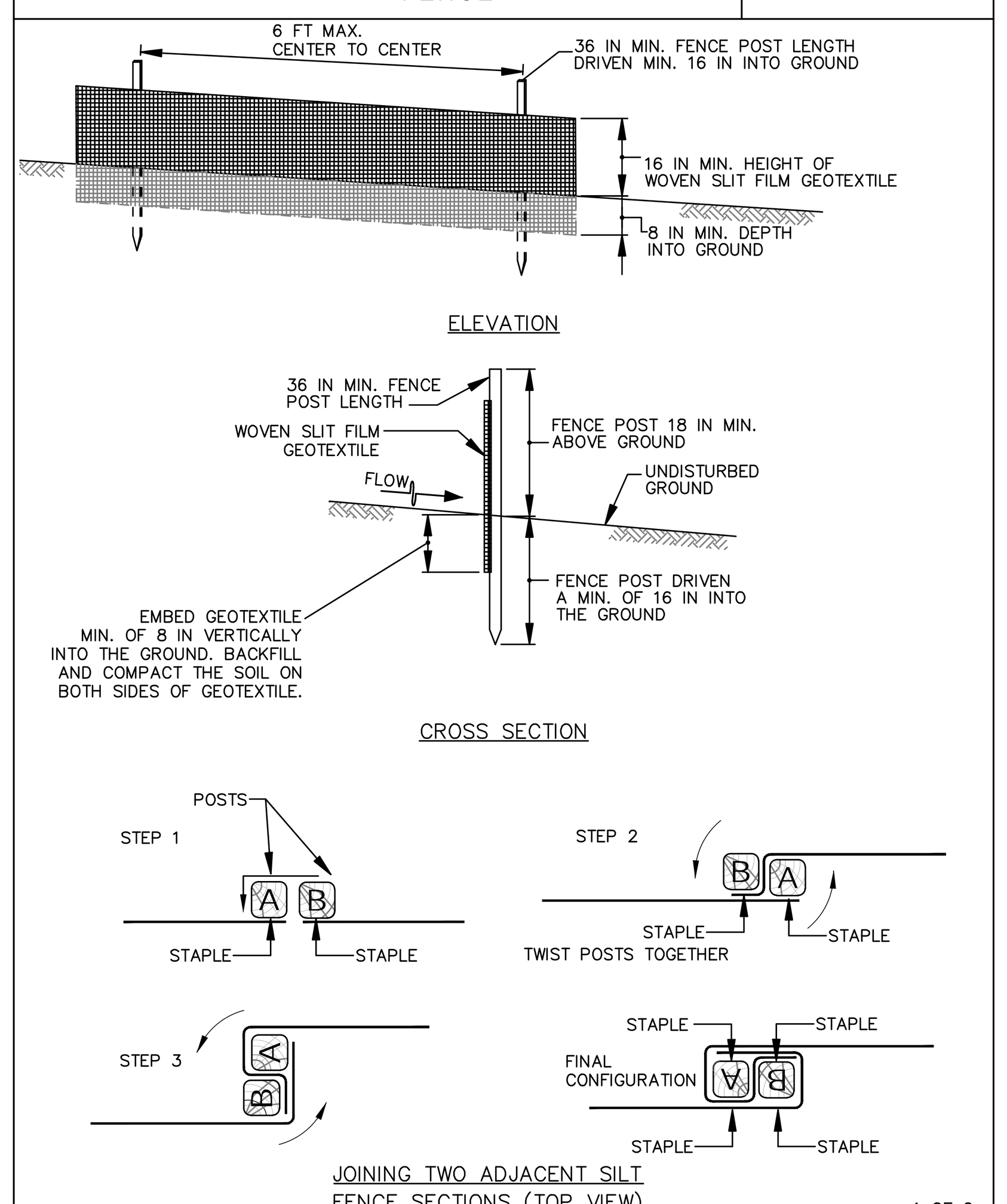
1 OF 2

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



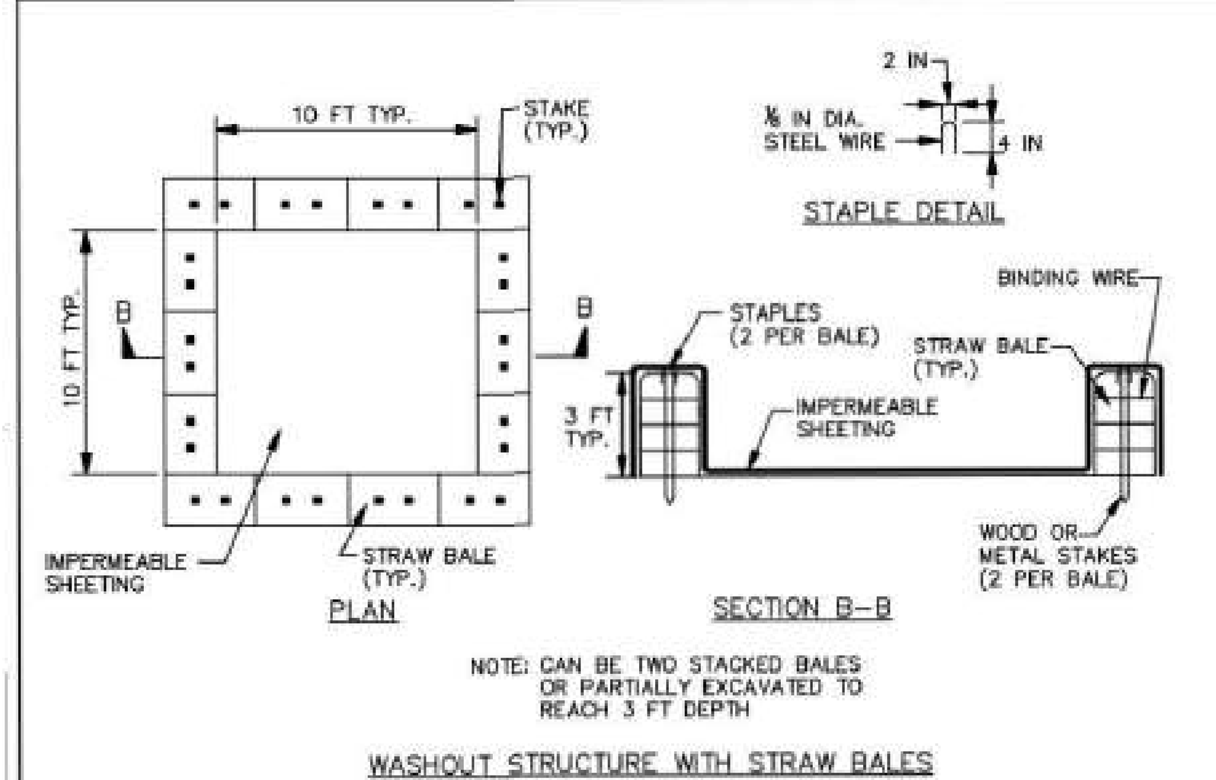
1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL H-6 ONSITE CONCRETE WASHOUT STRUCTURE

STANDARD SYMBOL: CWS



CONSTRUCTION SPECIFICATIONS

1. LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC.
2. SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
3. PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
4. PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
5. KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET–VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.

2 OF 2

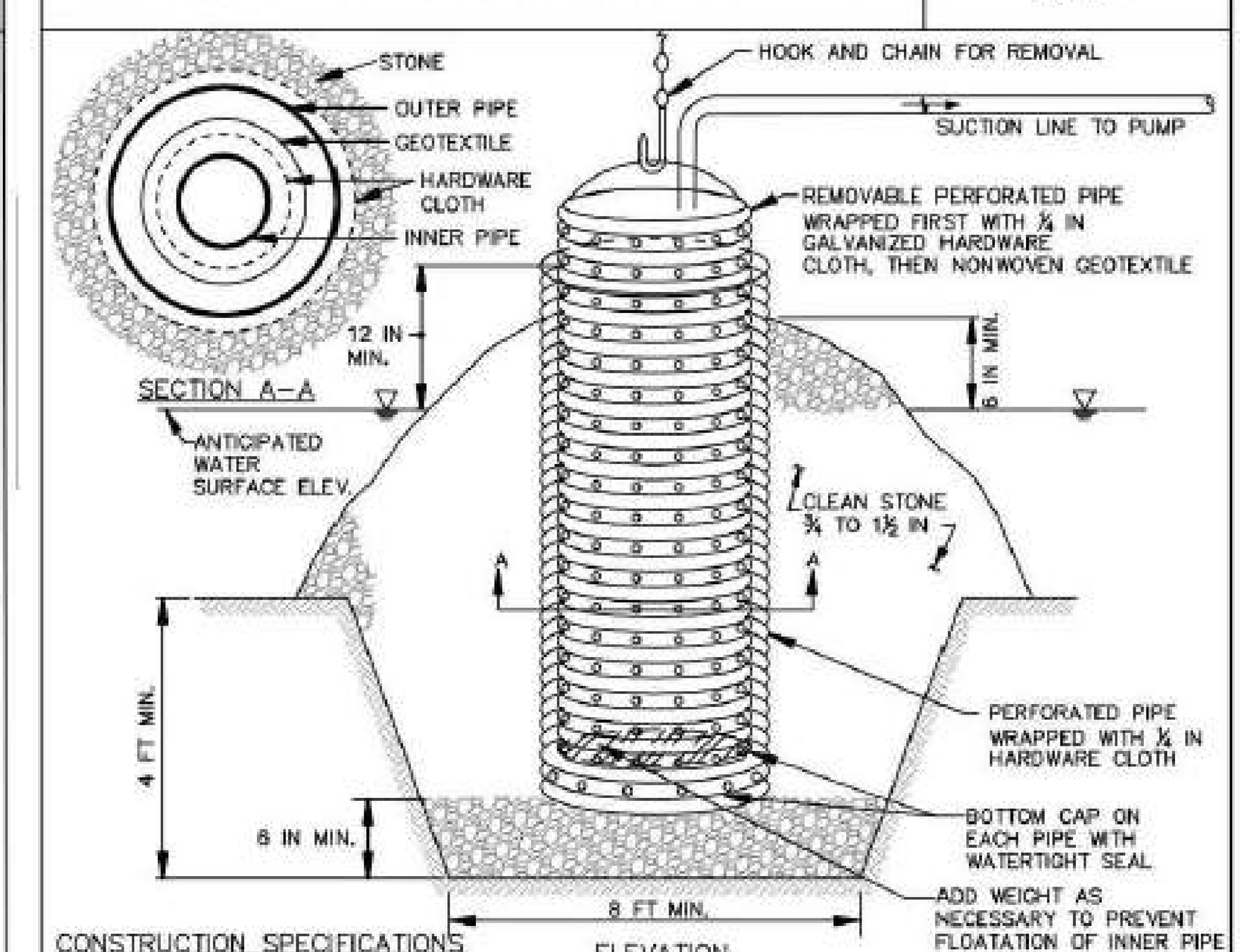
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

H.25

DETAIL F-1 REMOVABLE PUMPING STATION

STANDARD SYMBOL: RPS



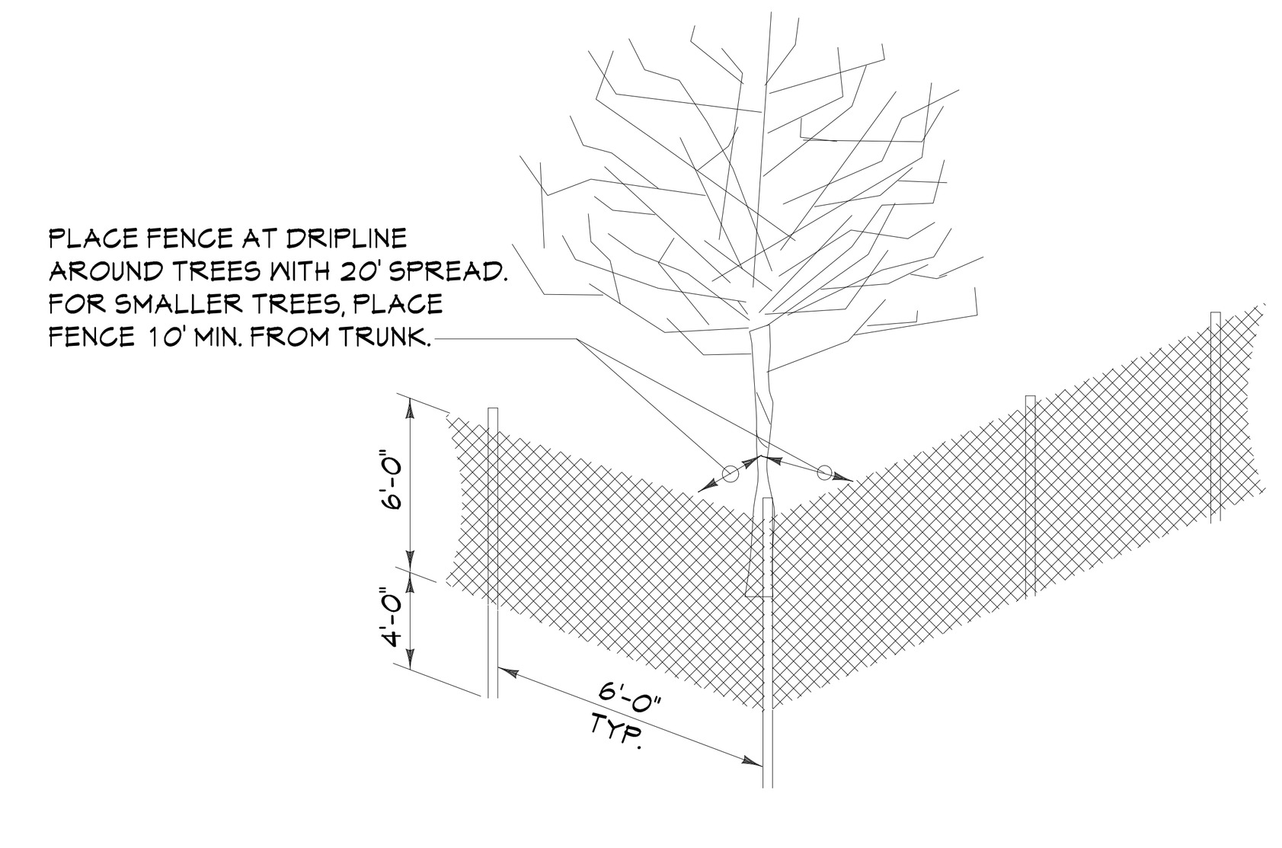
CONSTRUCTION SPECIFICATIONS

1. USE CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS 6 INCHES ON CENTER.
2. USE A MINIMUM 12 INCH DIAMETER INNER PIPE WITH AN OUTER PIPE A MINIMUM 6 INCHES LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
3. WRAP EACH PIPE WITH ¼ INCH GALVANIZED HARDWARE CLOTH. ON INNER PIPE WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, OVER THE HARDWARE CLOTH.
4. EXCAVATE 8 FEET X 8 FEET X 4 FEET DEEP PIT FOR PIPE PLACEMENT. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
5. SET TOP OF INNER AND OUTER PIPES MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION (OR RISER CREST ELEVATION WHEN DEWATERING A BASIN).
6. BACKFILL PIT AROUND THE OUTER PIPE WITH ¾ TO 1½ INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
7. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
8. A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

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

F.3



1. TREE PROTECTION FENCE SHALL BE 6'-0" HIGH CHAIN LINK FENCE WITH 2" O.D. POSTS AT 6'-0" ON CENTER. ALL POSTS SHALL BE HAND DUG INTO EXISTING GROUND WITH MINIMUM DISRUPTION TO EXISTING TREE ROOTS. SEE PLAN FOR LOCATION OF ALL TREE PROTECTION FENCES.
2. NO CONSTRUCTION EQUIPMENT MATERIALS OR EXCAVATED EARTH PERMITTED INSIDE TREE PROTECTION FENCES.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | G - 23 - 5 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

CHAIN LINK TREE PROTECTION FENCE

Not To Scale

DETAIL E-9-6 COMBINATION INLET PROTECTION

STANDARD SYMBOL: COIP

CONSTRUCTION SPECIFICATIONS

1. USE NOMINAL 2 INCH x 4 INCH LUMBER.
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
3. LIFT GRATE, AND WRAP WITH NONWOVEN GEOTEXTILE TO COMPLETELY COVER ALL OPENINGS, THEN SET GRATE BACK IN PLACE.
4. ATTACH A CONTINUOUS PIECE OF ½ INCH GALVANIZED HARDWARE CLOTH WITH A MINIMUM WIDTH OF 30 INCHES AND A MINIMUM LENGTH OF 4 FEET LONGER THAN THE THROAT OPENING, TO THE 2X4 WEIR, EXTENDING 2 FEET BEYOND THROAT ON EACH SIDE.
5. PLACE A CONTINUOUS PIECE OF NONWOVEN GEOTEXTILE THE SAME DIMENSIONS AS THE HARDWARE CLOTH OVER THE HARDWARE CLOTH AND SECURELY ATTACH IT TO THE WEIR.
6. NAIL THE 2X4 WEIR TO THE TOP OF A 9 INCH LONG VERTICAL SPACER TO BE LOCATED BETWEEN THE WEIR AND THE INLET FACE (MAXIMUM 4 FEET APART).
7. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL TO 2X4 ANCHORS (MINIMUM 2 FOOT LENGTHS OF 2x4 INCH TO THE TOP OF THE WEIR AT SPACER LOCATIONS). EXTEND 2X4 ANCHORS ACROSS THE INLET TOP AND HOLD IN PLACE BY SANDBAGS OR OTHER APPROVED ANCHORING METHOD.
8. INSTALL END SPACERS A MINIMUM OF 1 FOOT BEYOND BOTH ENDS OF THE THROAT OPENING.
9. FORM THE ¼ INCH HARDWARE CLOTH AND THE GEOTEXTILE TO THE CONCRETE GUTTER AND AGAINST THE FACE OF THE CURB ON BOTH SIDES OF THE INLET. PLACE CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE OVER THE HARDWARE CLOTH AND GEOTEXTILE IN SUCH A MANNER TO PREVENT WATER FROM ENTERING THE INLET UNDER OR AROUND THE GEOTEXTILE.
10. AT NON–SUMP LOCATIONS, INSTALL A TEMPORARY SANDBAG OR ASPHALT BERM TO PREVENT INLET BYPASS.
11. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SIP

CONSTRUCTION SPECIFICATIONS

1. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
2. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18 INCHES BELOW THE NOTCH ELEVATION.
3. FOR TYPE A, USE NOMINAL 2 INCH X 4 INCH CONSTRUCTION GRADE LUMBER POSTS, DRIVEN 1 FOOT INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2X4 FRAME AS SHOWN. STRETCH ½ INCH GALVANIZED HARDWARE CLOTH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. FASTEN GEOTEXTILE SECURELY TO THE HARDWARE CLOTH WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND HARDWARE CLOTH A MINIMUM OF 18 INCHES BELOW THE WEIR CREST. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED TO THE POST.

   FOR TYPE B, USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH, DRIVEN A MINIMUM OF 36 INCHES BELOW THE WEIR CREST AT EACH CORNER OF THE STRUCTURE. FASTEN 9 GAUGE OR HEAVIER CHAIN LINK FENCE, 42 INCHES IN HEIGHT, SECURELY TO THE FENCE POSTS WITH WIRE TIES. FASTEN GEOTEXTILE SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 18 INCHES BELOW THE WEIR CREST.
4. BACKFILL AROUND THE INLET IN LOOSE 4 INCH LIFTS AND COMPACT UNTIL SOIL IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.
5. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± ⅟16 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID–SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H–1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

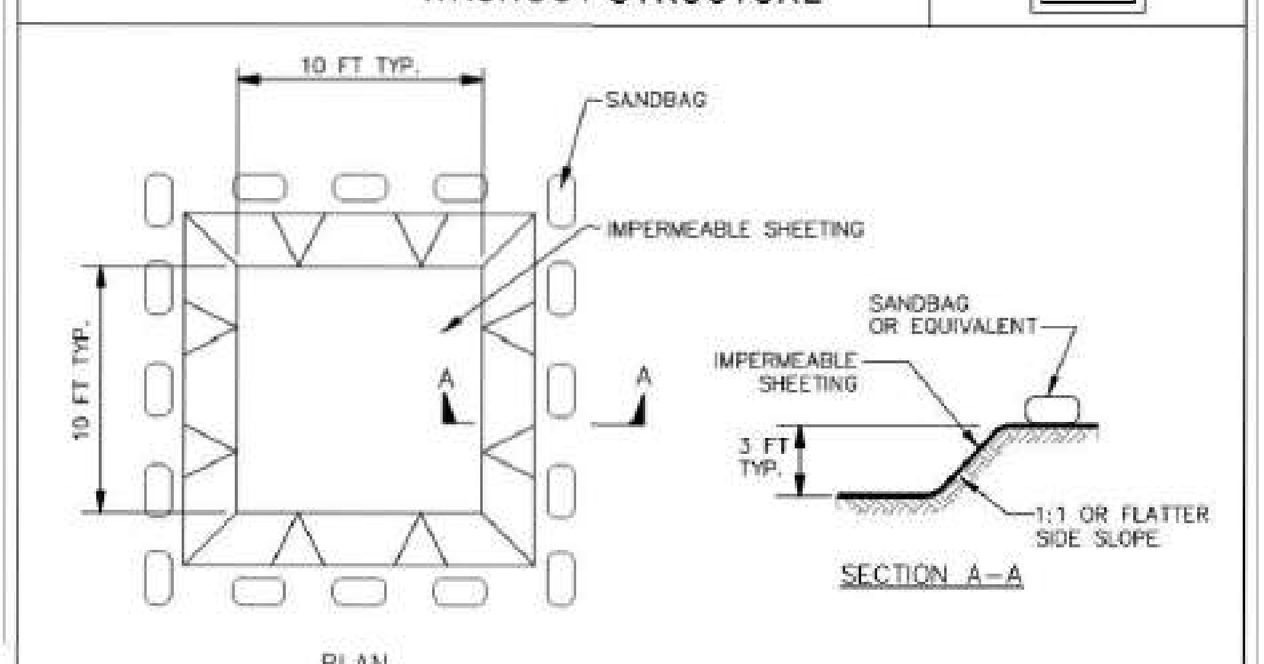
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

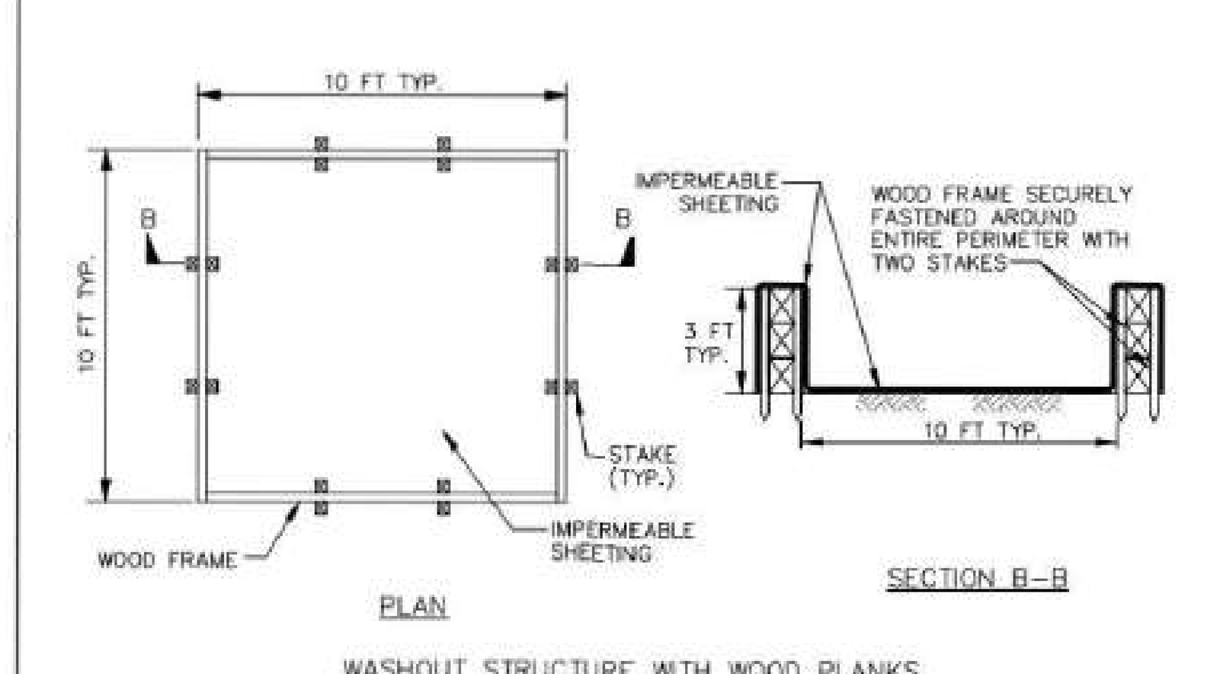
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL H-6 ONSITE CONCRETE WASHOUT STRUCTURE

STANDARD SYMBOL: CWS



EXCAVATED WASHOUT STRUCTURE



WASHOUT STRUCTURE WITH WOOD PLANKS

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

B-4-7 STANDARDS AND SPECIFICATIONS

FOR

HEAVY USE AREA PROTECTION

Definition

The stabilization of areas frequently and intensively used by surfacing with suitable materials (e.g., mulch and aggregate).

Purpose

To provide a stable, non-eroding surface for areas frequently used and to improve the water quality from the runoff of these areas.

Conditions Where Practice Applies

This practice applies to intensively used areas (e.g., equipment and material storage, staging areas, heavily used travel lanes).

Criteria

1. A minimum 4-inch base course of crushed stone or other suitable materials including wood chips over nonwoven geotextile should be provided as specified in Section H-1 Materials.
2. Select the stabilizing material based on the intended use, desired maintenance frequency, and runoff control.
3. The transport of sediments, nutrients, oils, chemicals, particulate matter associated with vehicular traffic and equipment, and material storage needs to be considered in the selection of material. Additional control measures may be necessary to control some of these potential pollutants.
4. Surface erosion can be a problem on large heavy use areas. In these situations, measures to reduce the flow length of runoff or erosive velocities need to be considered.

Maintenance

The heavy use areas must be maintained in a condition that minimizes erosion. This may require adding suitable material, as specified on the approved plans, to maintain a clean surface.

NOT FOR CONSTRUCTION

DAILY STABILIZATION NOTE

Contractor shall only disturb that area which can be completed and stabilized by the end of each working day.
Stabilization shall be as follows:
1. For areas to be paved, the application of stone base.
2. For areas to be vegetatively stabilized:
 a) Permanent seed and soil stabilization matting or sod for all steep slopes, channels or swales.
 b) Permanent seed and mulch for all other areas.
Any areas which can not be stabilized by the end of each working day must have silt fence installed on the downslope side.

NOTE

CONTRACTOR TO MAINTAIN POSITIVE DRAINAGE TO CURB & GUTTER FROM BOTTOM OF ADA RAMPS.

OWNER:

Mayor & City Council of Baltimore
One Calvert Plaza
201E Baltimore Street
Baltimore MD 21202
(410)-675-3651

DEVELOPER:

The Maryland Zoo in Baltimore
1876 Mansion House Drive
Baltimore MD 21217
C/O Karl Kranz
(410)-396-7102

DATE	BY	REVISIONS

CENTURY ENGINEERING
A Kleinfelder Company
10710 Gilroy Road, Hunt Valley, MD 21031
Phone: 443.589.2400 www.centuryeng.com

EXISTING EROSION SEDIMENT CONTROL SITE SECTIONS

THE MARYLAND ZOO IN BALTIMORE
PARKING LOT REHABILITATION

BALTIMORE, MARYLAND
WARD 13 SECTION 5 BLOCK 3499 LOT 001

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.: 32574
EXPIRATION DATE: 1/16/2024

STATE OF MARYLAND ANTHONY JOSEPH ... No. 32574 PROFESSIONAL ENGINEER 7/15/22

DRAWN BY:	AA	REVIEW BY:	AJD
DESIGN BY:	DRS/KRB	REVIEW DATE:	7/15/2022
SCALE:	AS SHOWN	DRAWING:	C-057
PROJECT No.:	201069.00		

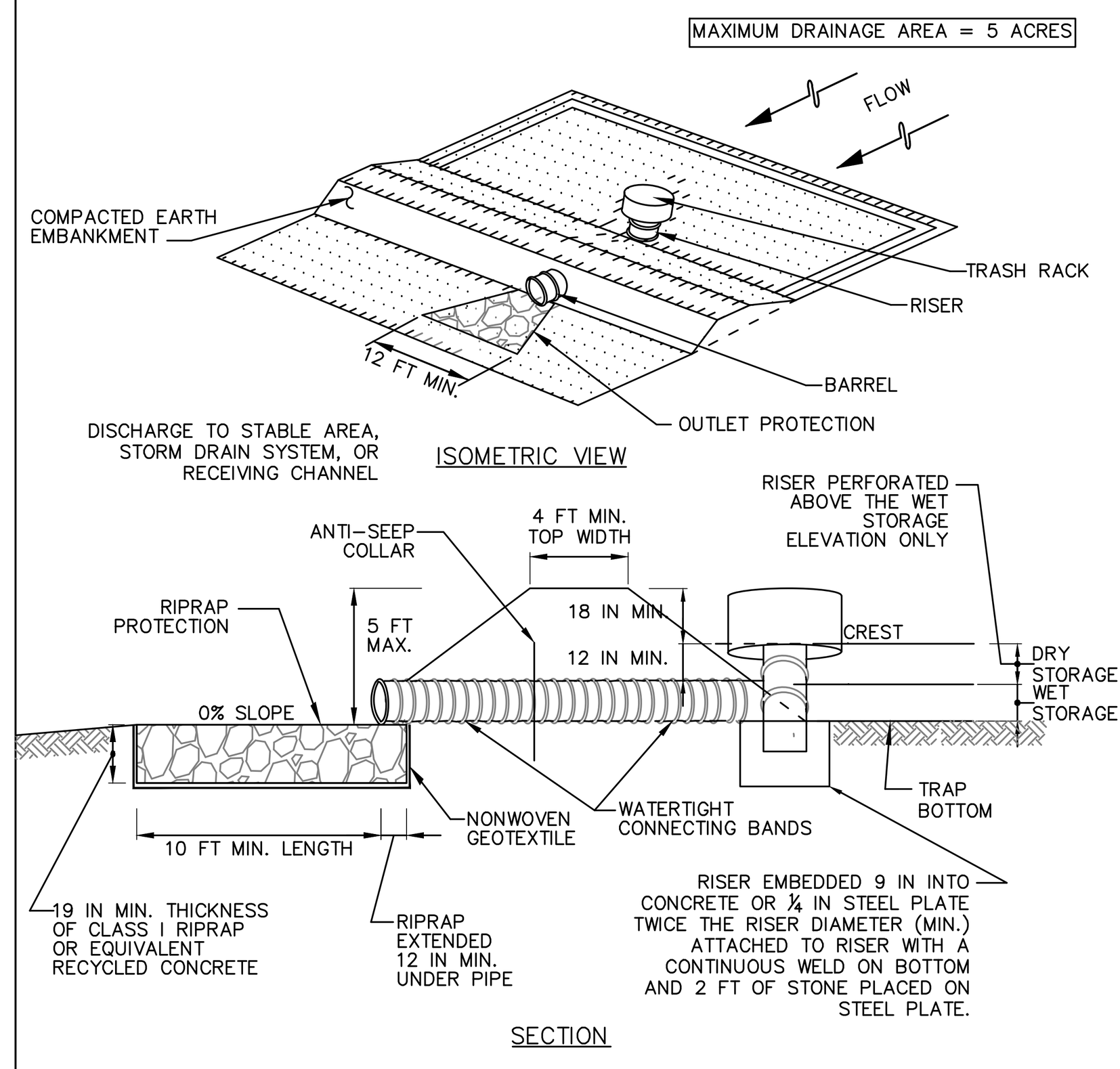
ESD # 7969

T:\2020\Facilities\201069.00 MD Zoo Parking\CIVIL\CADD\Drawings\Construction\201069.00(C-057) ESC Details.dwg Jul 18, 2022 1:25pm dshanahan

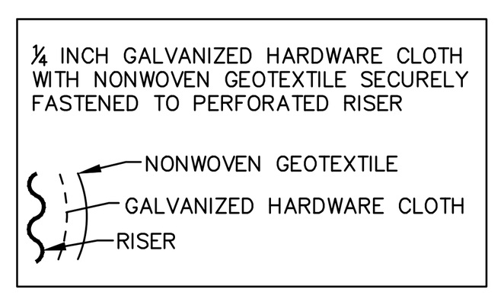
DETAIL G-1-1 PIPE OUTLET SEDIMENT TRAP ST-I

STANDARD SYMBOL: ST–I

MAXIMUM DRAINAGE AREA = 5 ACRES



NOTE:
REFER TO DETAIL G–2–1 – TYPICAL ANTI–SEEP COLLARS
REFER TO DETAIL G–2–2 – RISER BASE
REFER TO DETAIL G–2–3 – CONCENTRIC TRASH RACK AND ANTI–VORTEX DEVICE



1 OF 3

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 G-1-1 PIPE OUTLET SEDIMENT TRAP ST-I

STANDARD SYMBOL: ST–I

CONSTRUCTION SPECIFICATIONS

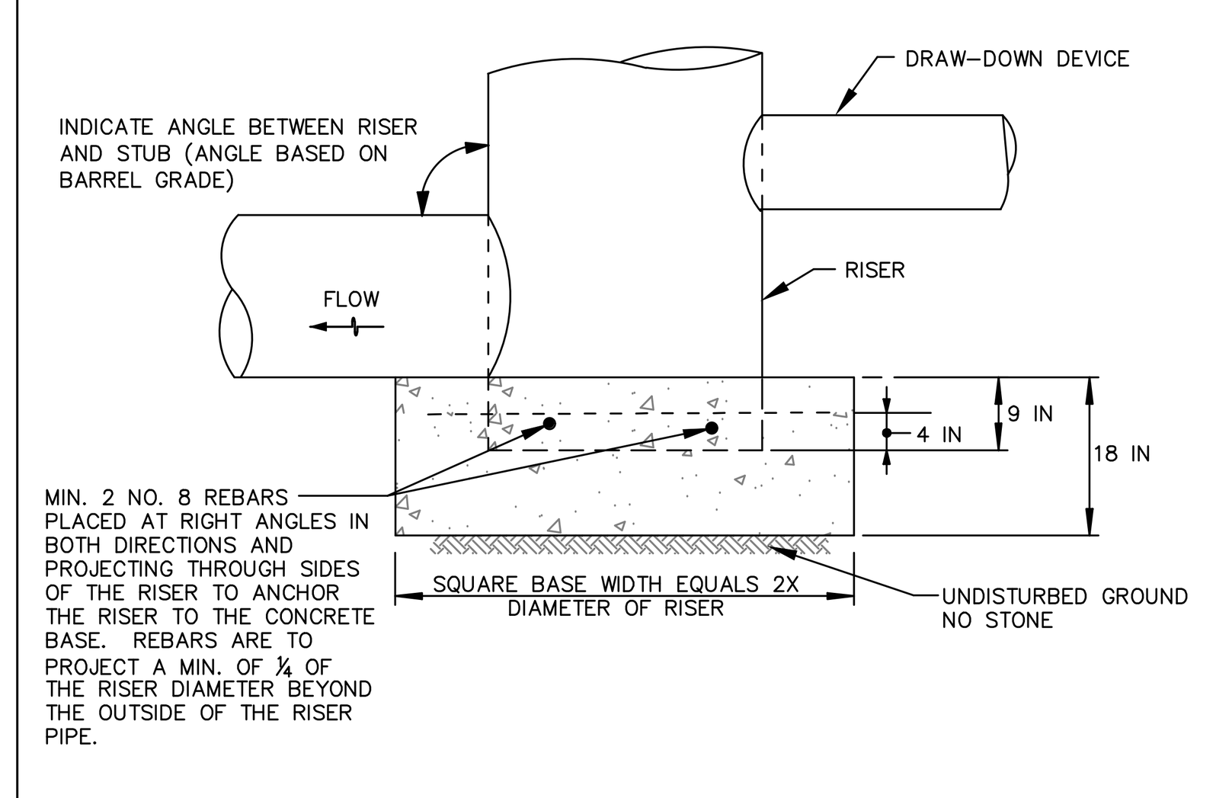
1. CONSTRUCT TRAP IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE AVOIDED.
2. CLEAR, GRUB, AND STRIP ANY VEGETATION AND ROOT MAT FROM THE AREA UNDER THE EMBANKMENT AND TRAP BOTTOM.
3. ~~PERFORATE THE RISER WITH 1 INCH DIAMETER HOLES SPACED 6 INCHES ON CENTER WITH THE LOWEST PERFORATIONS AT THE WET STORAGE ELEVATION OR~~ PROVIDE A HORIZONTAL ~~OR VERTICAL~~ DRAW–DOWN DEVICE PERFORATED ACCORDING TO APPROVED PLAN. ~~DO NOT PERFORATE THE RISER WITHIN 6 INCHES OF THE TOP OF THE HORIZONTAL BARREL.~~
4. SET RISER/BARREL ASSEMBLY PRIOR TO EMBANKMENT CONSTRUCTION. MAKE ALL PIPE CONNECTIONS WATERTIGHT. OFFSET RISER FROM EMBANKMENT TO ACCOMMODATE PLACEMENT OF THE TRASH RACK. ANCHOR THE RISER WITH EITHER A REINFORCED CONCRETE BASE OR STEEL PLATE BASE TO PREVENT FLOTATION. MAKE CONCRETE BASES AT LEAST TWICE THE RISER DIAMETER AND 18 INCHES THICK WITH THE RISER EMBEDDED 9 INCHES.
5. USE FILL MATERIAL FREE OF ROOTS, WOODY VEGETATION, OVERSIZED STONES, ROCKS, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIAL FOR THE EMBANKMENT.
6. HAND COMPACT IN 4 INCH LAYERS FILL MATERIAL AROUND THE PIPE SPILLWAY. PLACE A MINIMUM OF 2 FEET OF HAND COMPACTED BACKFILL OVER THE PIPE SPILLWAY BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.
7. CONSTRUCT TOP OF EMBANKMENT 1.5 FOOT MINIMUM ABOVE RISER CREST. COMPACT THE EMBANKMENT BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
8. MAKE ALL CUT AND FILL SLOPES 2:1 OR FLATTER.
9. ~~WRAP THE RISER WITH ¼ INCH GALVANIZED HARDWARE CLOTH THEN WRAP WITH NONWOVEN GEOTEXTILE. DO NOT WRAP WITH MORE THAN ONE LAYER OF GEOTEXTILE. EXTEND HARDWARE CLOTH AND GEOTEXTILE AT LEAST 6 INCHES ABOVE THE HIGHEST PERFORATIONS AND AT LEAST 6 INCHES BELOW THE LOWEST PERFORATIONS. OVERLAP, FOLD AND FASTEN WHERE ENDS OF GEOTEXTILE COME TOGETHER TO PREVENT BYPASS. REPLACE GEOTEXTILE AS NECESSARY TO PREVENT CLOGGING.~~
10. ~~USE STRAPS OR CONNECTING BANDS AT THE TOP AND BOTTOM OF THE GEOTEXTILE TO HOLD THE GEOTEXTILE AND HARDWARE CLOTH IN PLACE.~~
11. ~~USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.~~
12. STABILIZE THE EMBANKMENT AND INTERIOR SLOPES WITH SEED AND MULCH. STABILIZE POINTS OF CONCENTRATED INFLOW AS SHOWN ON APPROVED PLAN.
13. CONSTRUCT AND MAINTAIN THE OUTLET ACCORDING TO THE APPROVED PLAN AND IN SUCH A MANNER THAT EROSION AT OR BELOW THE OUTLET DOES NOT OCCUR.
14. REMOVE SEDIMENT AND RESTORE TRAP TO ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO CLEANOUT ELEVATION (50% OF WET STORAGE DEPTH). DEPOSIT REMOVED SEDIMENT IN AN APPROVED AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE. KEEP POINTS OF INFLOW AND OUTFLOW AS WELL AS INTERIOR OF THE TRAP FREE FROM EROSION, AND REMOVE ACCUMULATED DEBRIS. MAINTAIN EMBANKMENTS TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION. REMOVE ANY TREES, BRUSH, OR OTHER WOODY VEGETATION GROWING ON EMBANKMENT OR NEAR PRINCIPAL SPILLWAY. MAINTAIN LINE, GRADE, AND CROSS SECTION. MAINTAIN WATER TIGHT CONNECTIONS. REPLACE GEOTEXTILE AROUND PERFORATED RISER IF DRY STORAGE VOLUME DOES NOT DRAW DOWN WITHIN 10 HOURS.
15. WHEN DEWATERING TRAP, PASS REMOVED WATER THROUGH AN APPROVED SEDIMENT CONTROL PRACTICE.
16. UPON REMOVAL, GRADE AND STABILIZE THE AREA OCCUPIED BY TRAP.

2 OF 3

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 G-2-2 CORRUGATED RISER BASE

STANDARD SYMBOL



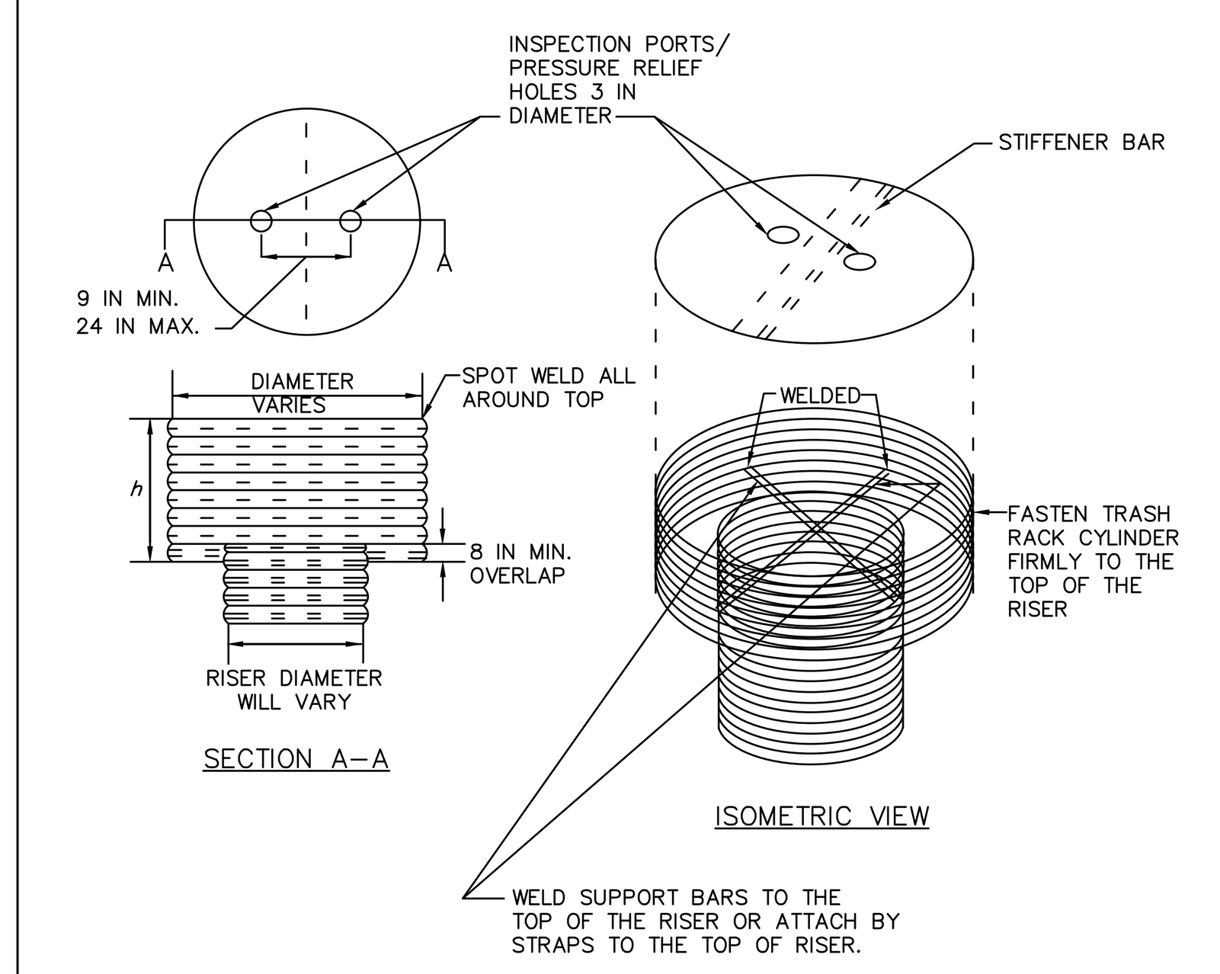
CONSTRUCTION SPECIFICATIONS

1. BOTTOM OF CONCRETE BASE TO BE PLACED ON UNDISTURBED, NATURAL GROUND.
2. NO STONE IS ALLOWED UNDER BASE. IF NECESSARY, TO ACHIEVE STABILITY INCREASE DEPTH OF CONCRETE BASE.

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 G-2-3 CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE

STANDARD SYMBOL: TR



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 G-2-3 CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE

STANDARD SYMBOL: TR

	TRASH RACK CYLINDER				MINIMUM TOP	
RISER DIAM. (IN)	DIAM. (IN)	THICKNESS (GAUGE)	h (IN)	MINIMUM SIZE SUPPORT BAR	THICKNESS (GAUGE)	STIFFENER
12	18	16	14	#6 REBAR	16	N/A
15	21	16	15	#6 REBAR	16	N/A
18	27	16	16	#6 REBAR	16	N/A
21	30	16	19	#6 REBAR	16	N/A
24	36	16	21	#6 REBAR	14	N/A
27	42	16	21	#6 REBAR	14	N/A
36	54	14	25	#8 REBAR	12	N/A
42	60	14	27	#8 REBAR	12	N/A
48	72	12	29	1¼ IN PIPE OR 1¼ x 1¼ x ¼ ANGLE	10	N/A
54	78	12	33	1¼ IN PIPE OR 1¼ x 1¼ x ¼ ANGLE	10	N/A
60	90	12	37	1½ IN PIPE OR 1½ x 1½ x ¼ ANGLE	8	N/A
66	96	10	41	2 IN PIPE OR 2 x 2 x 3/16 ANGLE	8	2 x 2 x ¼ ANGLE
72	102	10	44	2 IN PIPE OR 2 x 2 x 3/16 ANGLE	8	2½ x 2½ x ¼ ANGLE
78	114	10	47	2½ IN PIPE OR 2 x 2 x ¼ ANGLE	8	2½ x 2½ x ¼ ANGLE
84	120	10	50	2½ IN PIPE OR 2½ x 2½ x ¼ ANGLE	8	2½ x 2½ x 5/16 ANGLE

NOTE:
THE ABOVE TRASH RACK AND ANTI–VORTEX DEVICE INFORMATION IS FOR CORRUGATED METAL PIPE ONLY. CONCRETE RISERS MUST MEET THE REQUIREMENTS OF MD 378.

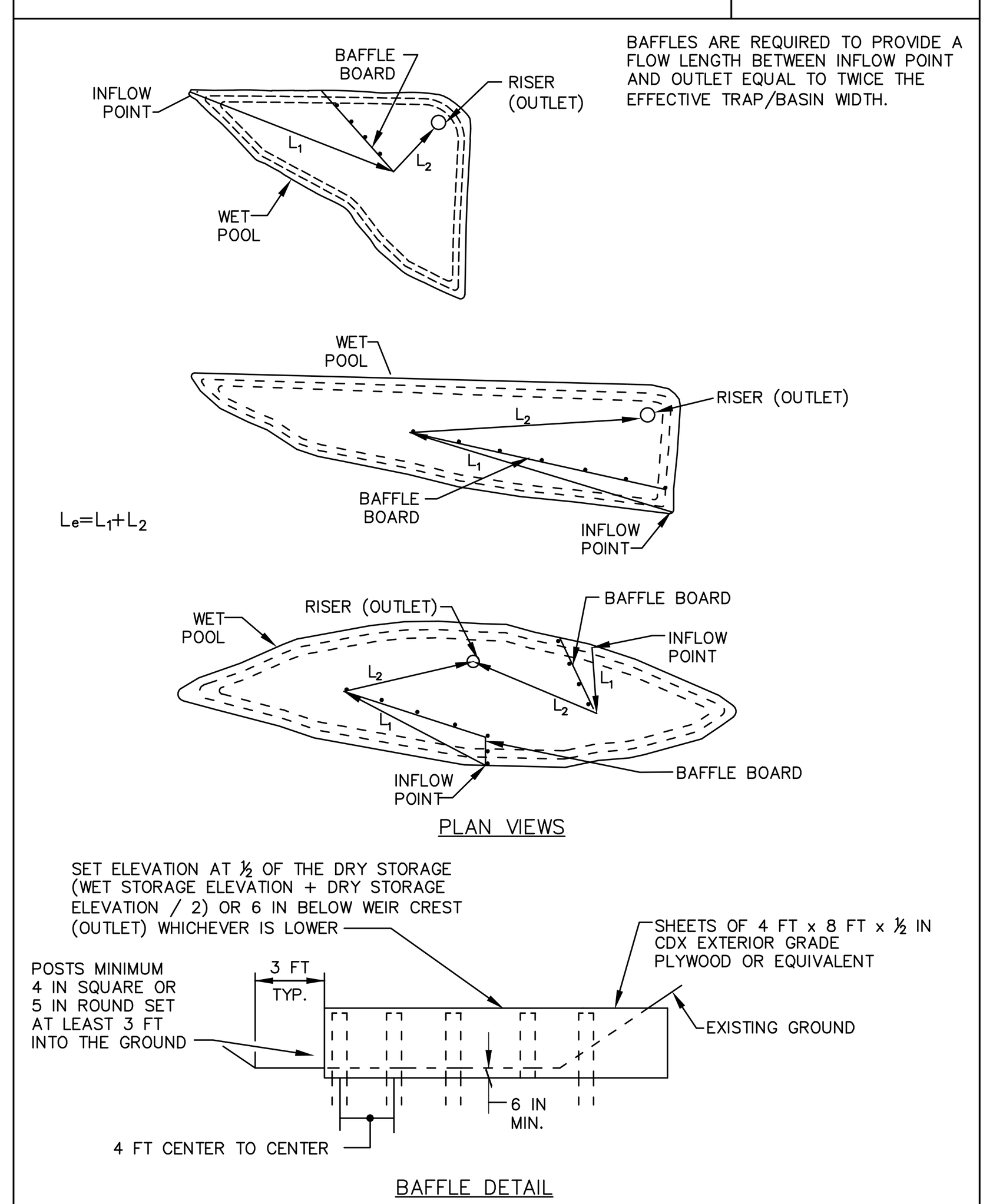
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL G-2-4 BAFFLE BOARDS

STANDARD SYMBOL: BB

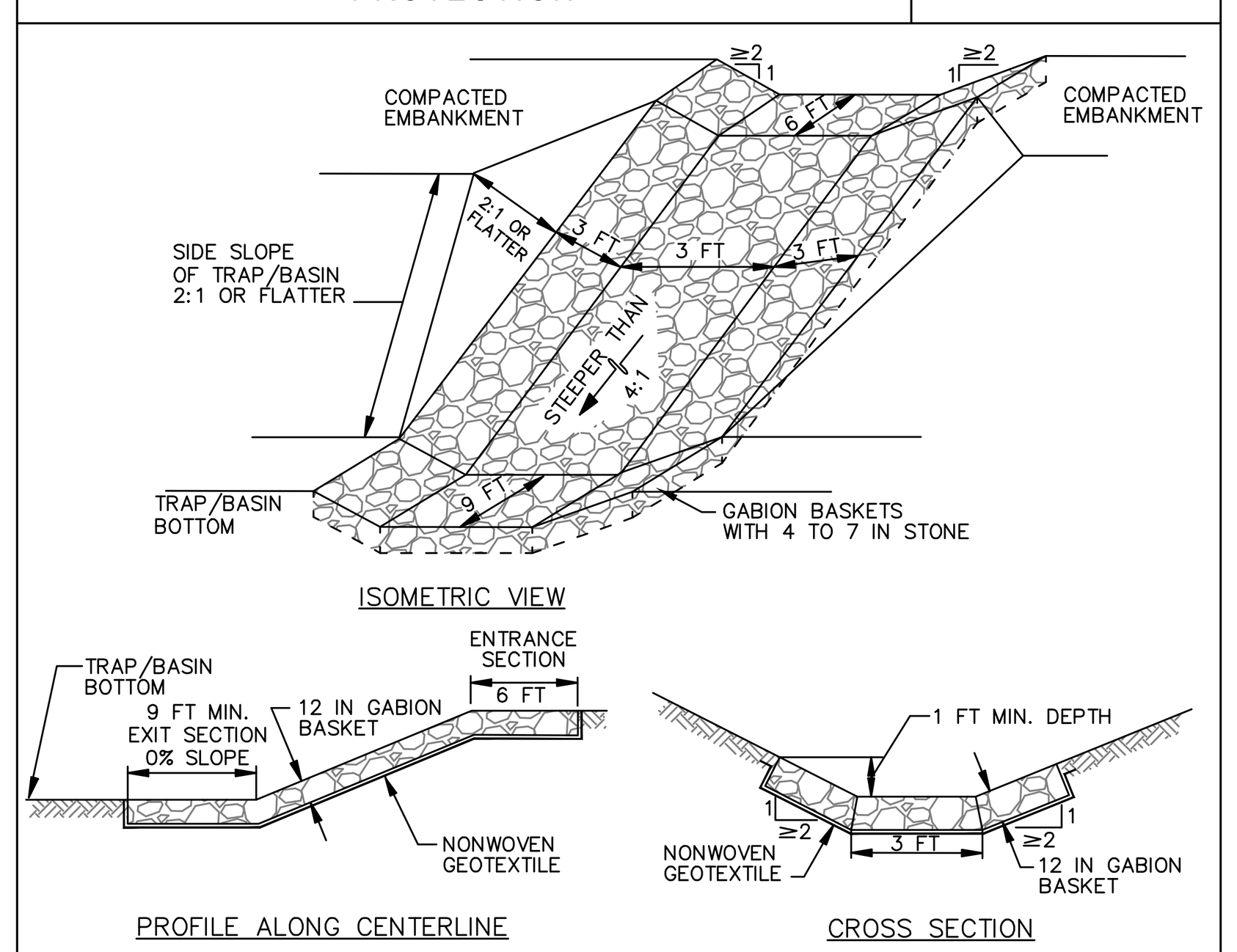
BAFFLES ARE REQUIRED TO PROVIDE A FLOW LENGTH BETWEEN INFLOW POINT AND OUTLET EQUAL TO TWICE THE EFFECTIVE TRAP/BASIN WIDTH.



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 D-3-2 GABION INFLOW PROTECTION

STANDARD SYMBOL: GP



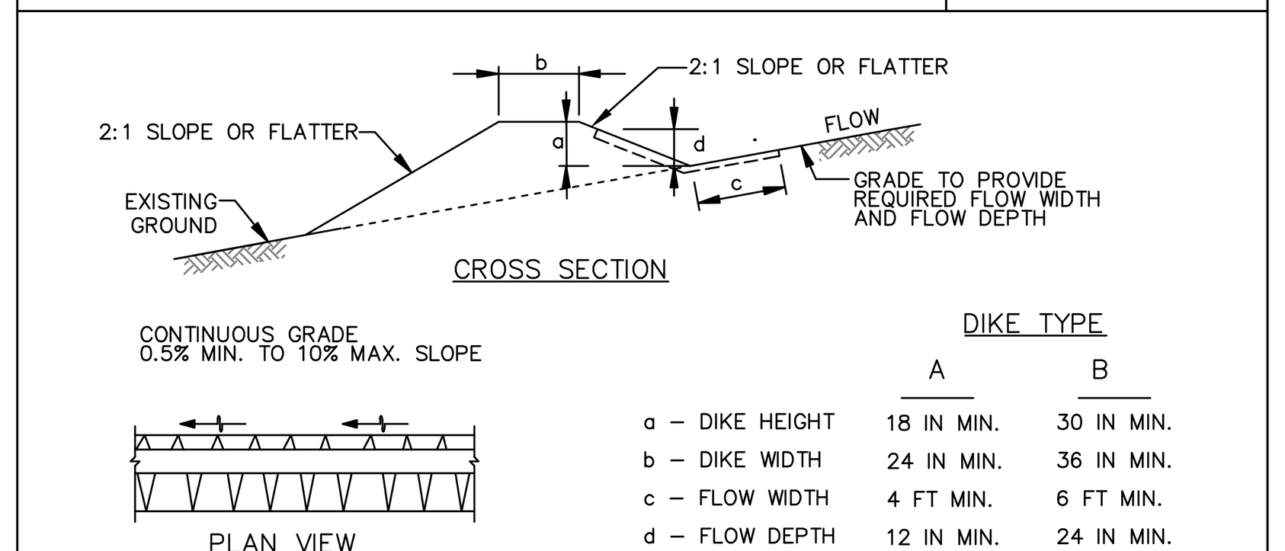
CONSTRUCTION SPECIFICATIONS

1. PROVIDE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, UNDER THE BOTTOM AND ALONG SIDES OF ALL GABION BASKETS.
2. USE BASKETS MADE OF MINIMUM 11 GAUGE WIRE.
3. CONSTRUCT GABION INFLOW PROTECTION BY ARRANGING 9 X 3 X 1 FOOT GABION BASKETS TO FORM A TRAPEZOIDAL SECTION WITH A 3 FOOT BOTTOM WIDTH, 1 FOOT MINIMUM DEPTH, 3 FOOT SIDE WALLS, AND 2:1 OR FLATTER SIDE SLOPES. FILL GABION BASKETS WITH 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE WITHOUT REBAR OR WEIR MESH.
4. INSTALL ENTRANCE AND EXIT SECTIONS AS SHOWN ON THE PROFILE.
5. INSTALL GABIONS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
6. BLEND GABIONS INTO EXISTING GROUND.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. KEEP POINTS OF INFLOW AND OUTFLOW FREE OF EROSION

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-1 EARTH DIKE

STANDARD SYMBOL: A–1
PLACE DESIGNATION (e.g. A–1) ON FLOW CHANNEL SIDE OF DIKE.



	DIKE TYPE A	DIKE TYPE B
a – DIKE HEIGHT	18 IN MIN.	30 IN MIN.
b – DIKE WIDTH	24 IN MIN.	36 IN MIN.
c – FLOW WIDTH	4 FT MIN.	6 FT MIN.
d – FLOW DEPTH	12 IN MIN.	24 IN MIN.

FLOW CHANNEL STABILIZATION

A–1 SEED WITH STRAW MULCH AND TACK. (NOT ALLOWED FOR CLEAR WATER DIVERSION.)
A–2/B–2 SEED WITH SOIL STABILIZATION MATTING OR LINE WITH SOD.
A–3/B–3 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PRESSED INTO SOIL A MINIMUM OF 7 INCHES AND FLUSH WITH GROUND.

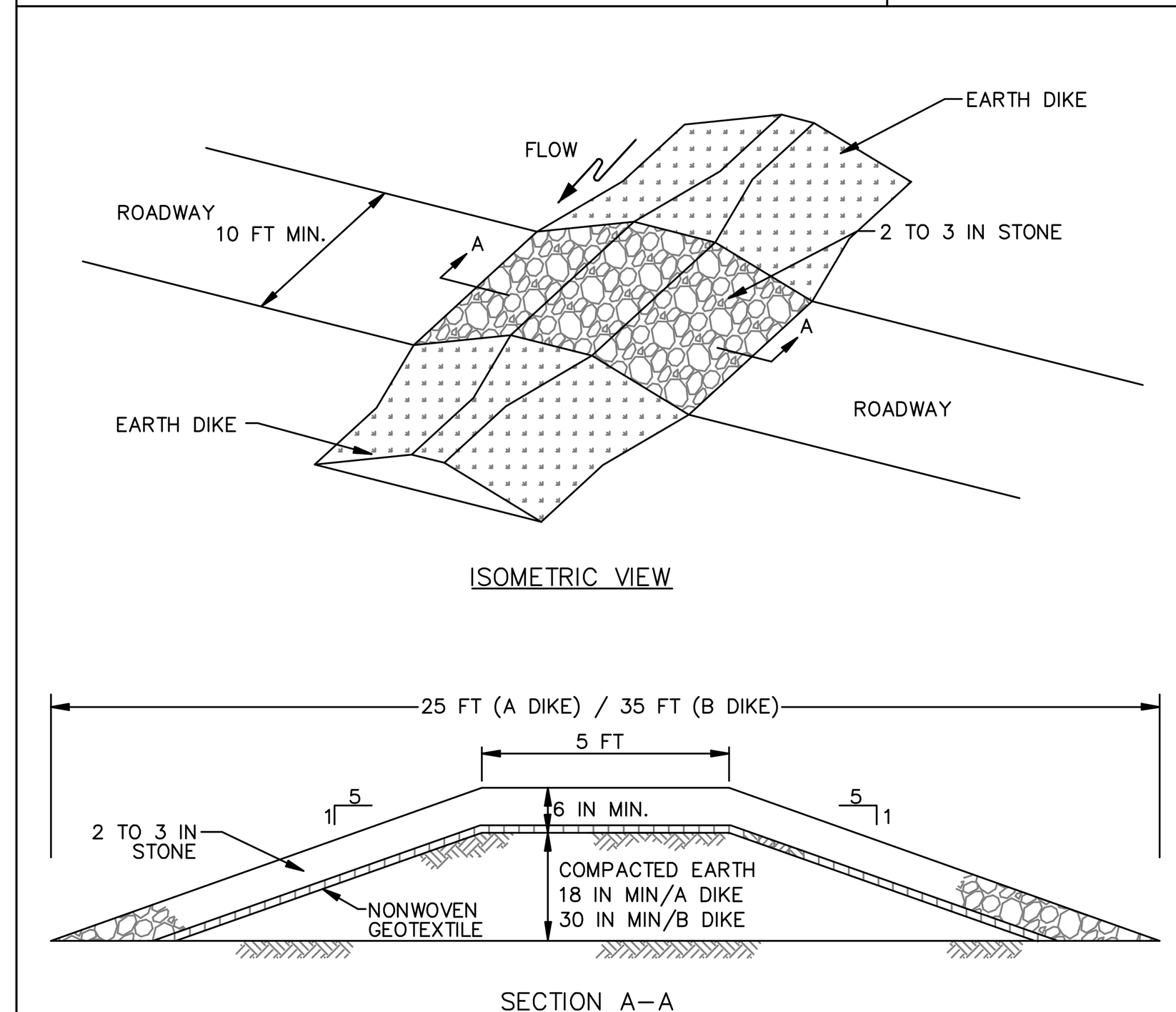
CONSTRUCTION SPECIFICATIONS

1. REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
2. EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
3. COMPACT FILL.
4. CONSTRUCT FLOW CHANNEL ON AN UNINTERRUPTED, CONTINUOUS GRADE, ADJUSTING THE LOCATION DUE TO FIELD CONDITIONS AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE.
5. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
6. STABILIZE EARTH DIKE WITHIN THREE DAYS OF INSTALLATION. STABILIZE FLOW CHANNEL FOR CLEAR WATER DIVERSION WITHIN 24 HOURS OF INSTALLATION.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS, AND MAINTAIN POSITIVE DRAINAGE. KEEP EARTH DIKE AND POINT OF DISCHARGE FREE OF EROSION, AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION.
8. UPON REMOVAL OF EARTH DIKE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS OF REMOVAL STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-8 MOUNTABLE BERM

STANDARD SYMBOL: MB



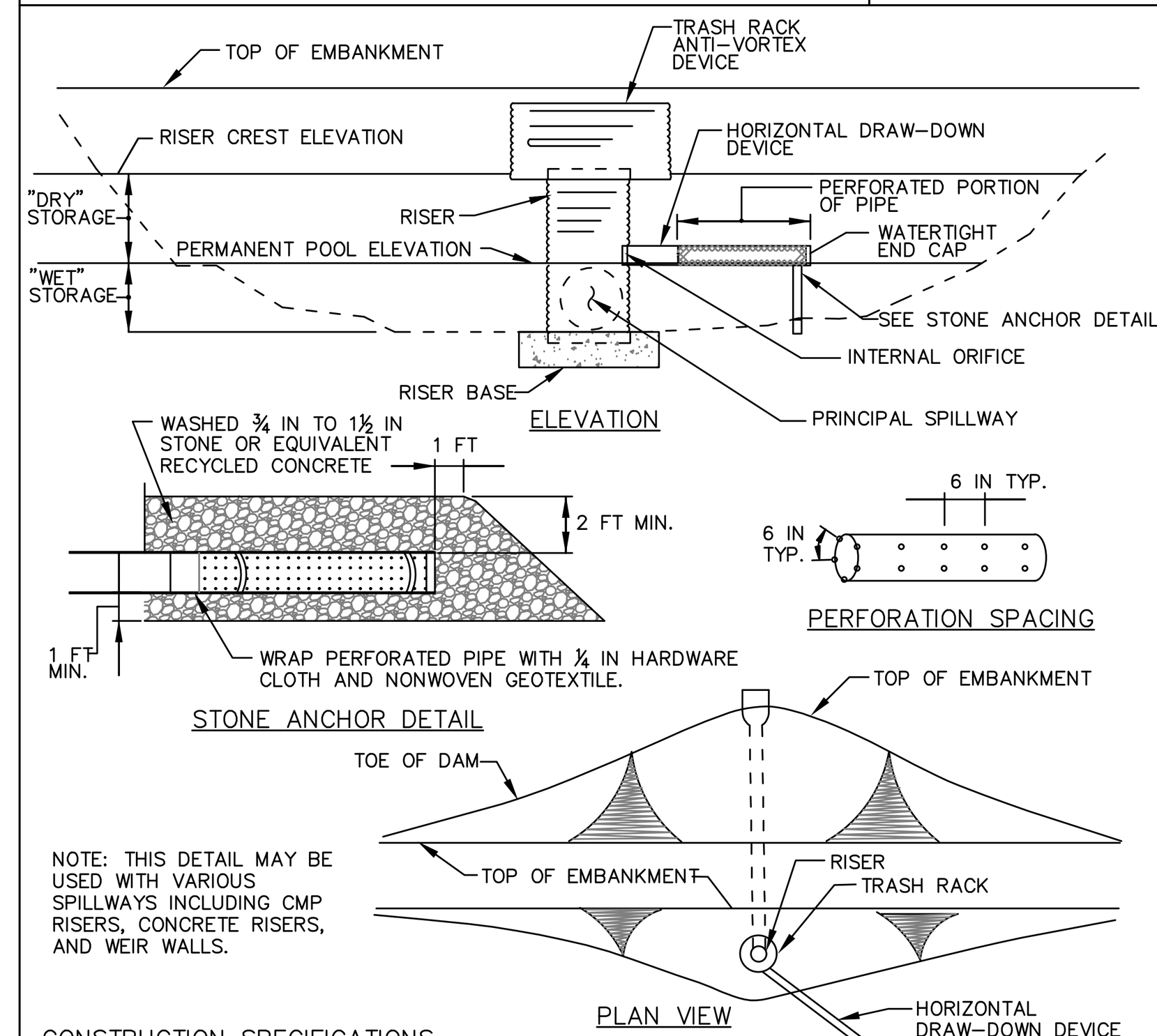
CONSTRUCTION SPECIFICATIONS

1. USE MINIMUM WIDTH OF 10 FEET TO ALLOW FOR VEHICULAR PASSAGE.
2. PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, OVER THE EARTH MOUND PRIOR TO PLACING STONE.
3. PLACE 2 TO 3 INCH STONE OR EQUIVALENT RECYCLED CONCRETE AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE MOUNTABLE BERM.
4. MAINTAIN LINE, GRADE, AND CROSS SECTION. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN SPECIFIED DIMENSIONS. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL G-2-6 SEDIMENT BASIN SCHEMATIC HORIZONTAL DRAW-DOWN DEVICE

STANDARD SYMBOL: HDDD



CONSTRUCTION SPECIFICATIONS

1. PERFORATE PIPE WITH 1 INCH DIAMETER PERFORATIONS SPACED 6 INCHES APART LONGITUDINALLY AND RADIALLY OR IN ACCORDANCE WITH APPROVED PLAN.
2. WRAP THE PERFORATED PORTION OF THE DRAW–DOWN DEVICE FIRST WITH ¼ INCH GALVANIZED HARDWARE CLOTH, THEN WITH NONWOVEN GEOTEXTILE. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS. DO NOT WRAP WITH MORE THAN ONE LAYER OF GEOTEXTILE.
3. AS AN ALTERNATE TO STONE ANCHORING, SECURE DRAW–DOWN DEVICE WITH TWO 1 INCH STEEL ANGLES SET 3 FEET MINIMUM INTO THE GROUND ATTACHED TO DRAW–DOWN DEVICE BY A 1 INCH WIDE GALVANIZED STEEL STRAP OR 12 GAUGE OR HEAVIER WIRE.
4. REMOVE SEDIMENT WHEN IT ACCUMULATES TO CLEANOUT ELEVATION (50% OF THE WET STORAGE DEPTH). DEPOSIT REMOVED SEDIMENT IN AN APPROVED AREA IN A SUCH A MANNER THAT IT WILL NOT ERODE. MAINTAIN WATER TIGHT CONNECTIONS. REPLACE GEOTEXTILE AROUND PERFORATED RISER IF DRY STORAGE VOLUME DOES NOT DRAW DOWN WITHIN 10 HOURS.

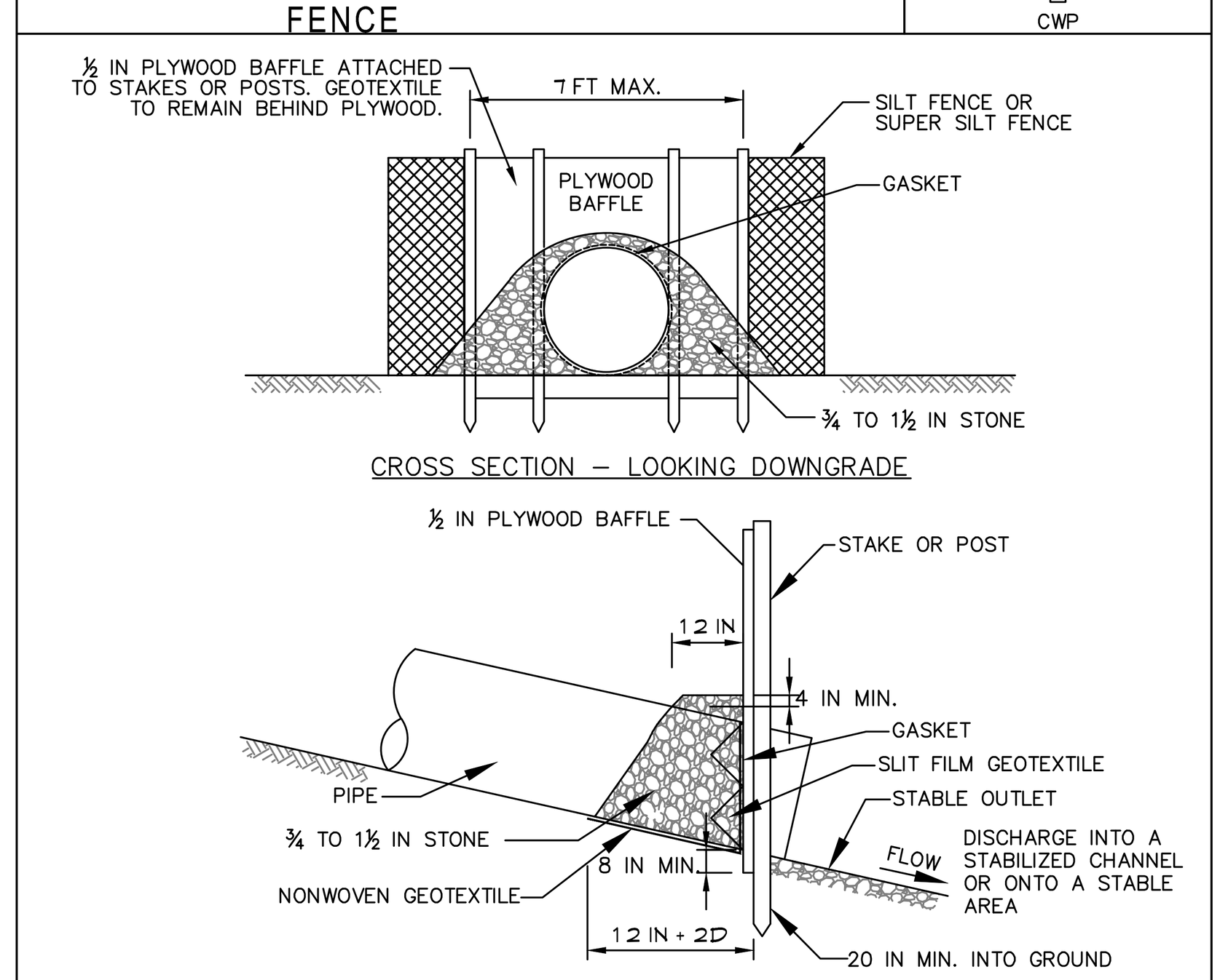
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

HORIZONTAL DRAW- DOWN PIPE

5 LF	6" PERFORATED PIPE
3	ROWS
30	1"HOLES/6" SPACING
2 5/8"	ORIFICE DIAMETER

DETAIL E-4 CLEAR WATER PIPE THROUGH SILT FENCE OR SUPER SILT FENCE

STANDARD SYMBOL: CWP



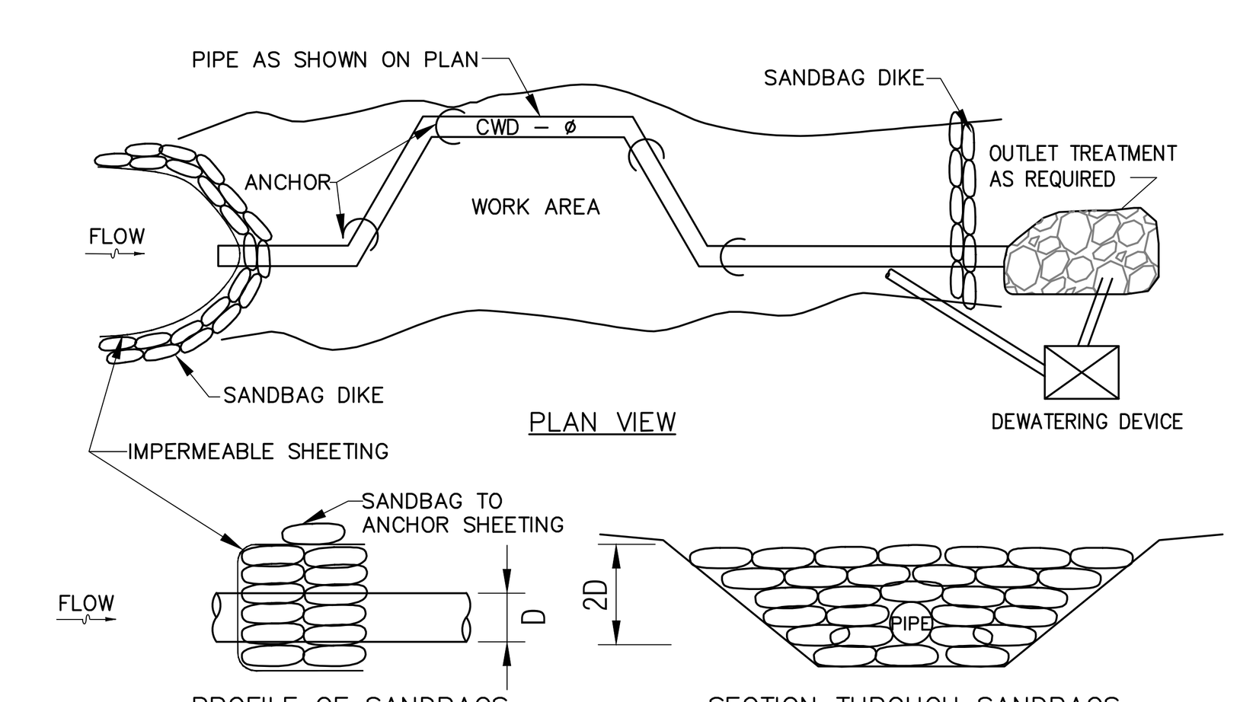
CONSTRUCTION SPECIFICATIONS

1. INSTALL SILT FENCE OR SUPER SILT FENCE IN ACCORDANCE WITH DETAIL E–1 OR DETAIL E–2.
2. AT THE PIPE LOCATION, CUT AND PULL BACK THE WOVEN SLIT FILM GEOTEXTILE AND CHAIN LINK FENCING. SECURE GEOTEXTILE TO PIPE WITH GASKET. INSTALL ADDITIONAL STAKES OR POSTS IF NECESSARY TO ACCOMMODATE THE INSTALLATION OF THE BAFFLE BOARD.
3. ENTRENCH ½ INCH PLYWOOD BAFFLE A MINIMUM OF 8 INCHES AND SECURE TO THE UPGRADE SIDE OF THE FENCE STAKES OR POSTS. BAFFLE SHOULD BE AT LEAST THE HEIGHT OF THE FENCE.
4. PLACE ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE BEHIND THE PLYWOOD BAFFLE ON NONWOVEN GEOTEXTILE AND EXTEND 12 INCH MIN. ALONG TOP OF PIPE AND TO A HEIGHT OF 4 INCHES ABOVE THE TOP OF PIPE.
5. USE NONWOVEN AND WOVEN SLIT FILM GEOTEXTILES AS SPECIFIED IN SECTION H–1 MATERIALS.
6. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN SEDIMENT REACHES 6 INCHES IN HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL BAFFLE, CHAIN LINK, AND GEOTEXTILE. REPLACE STONE IF DISPLACED. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-6 CLEAR WATER DIVERSION PIPE

STANDARD SYMBOL: CWD – 12
DESIGNATION CWD–12 REFERS TO 12 INCH CLEAR WATER DIVERSION.



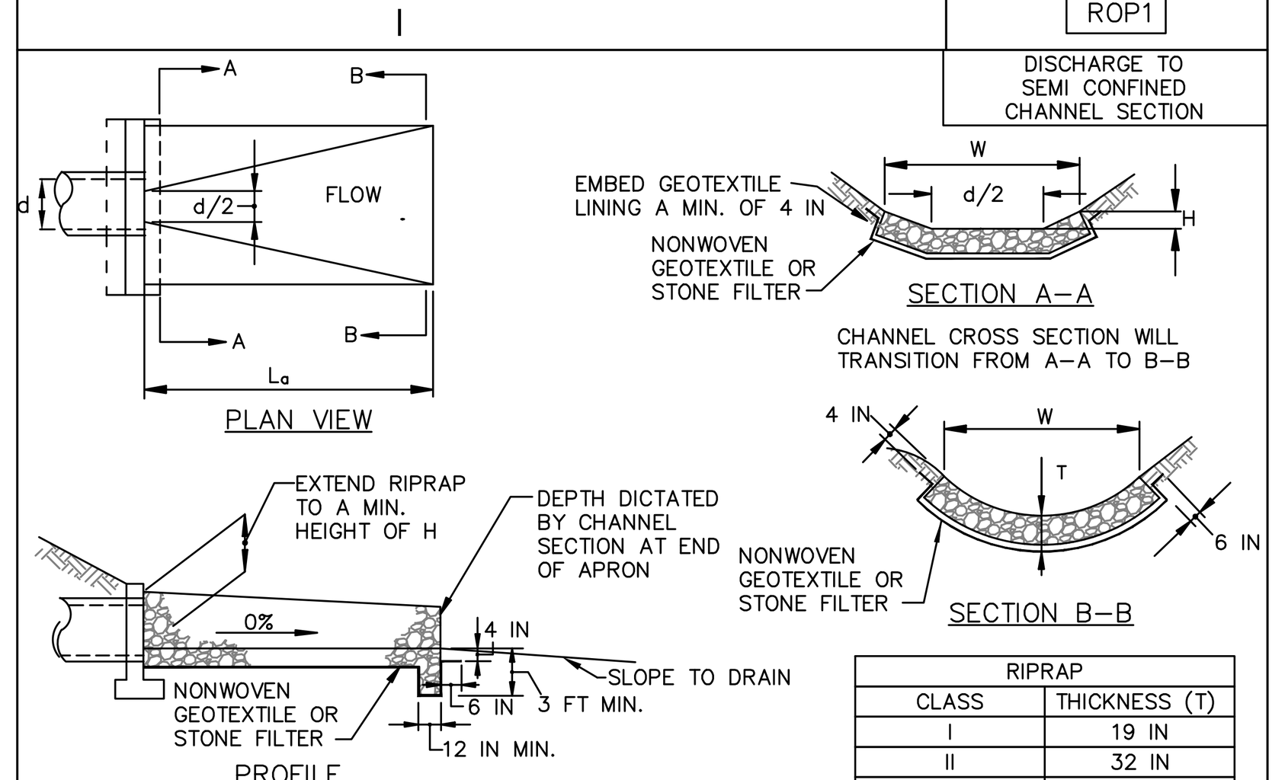
CONSTRUCTION SPECIFICATIONS

1. FLEXIBLE PIPE IS PREFERRED. HOWEVER, CORRUGATED METAL PIPE OR EQUIVALENT PVC PIPE CAN BE USED. MAKE ALL JOINTS WATERTIGHT.
2. FOR SANDBAGS USE MATERIALS THAT ARE RESISTANT TO ULTRA–VIOLENT RADIATION, TEARING, AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL.
3. USE 10 MIL OR THICKER, UV RESISTANT, IMPERMEABLE SHEETING OR OTHER APPROVED MATERIAL THAT IS IMPERMEABLE AND RESISTANT TO PUNCTURING AND TEARING.
4. PLACE IMPERMEABLE SHEETING SUCH THAT UPGRADE PORTION OVERLAPS DOWNGRADE PORTION BY A MINIMUM OF 18 INCHES.
5. SET HEIGHT OF SANDBAG DIKE AT TWICE THE PIPE DIAMETER. MAINTAIN HEIGHT ALONG LENGTH OF SANDBAG DIKE. PLACE DOUBLE ROW OF SANDBAGS.
6. AT A MINIMUM, SECURELY ANCHOR DIVERSION PIPE AT EACH DOWNGRADE JOINT.
7. SET OUTLET END OF DIVERSION PIPE LOWER THAN INLET END.
8. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
9. DEWATER WORK AREA USING AN APPROVED EROSION AND SEDIMENT CONTROL PRACTICE AS SPECIFIED ON APPROVED PLAN.
10. KEEP POINT OF DISCHARGE FREE OF EROSION. MAINTAIN WATER TIGHT CONNECTIONS AND POSITIVE DRAINAGE. REPLACE SANDBAGS AND IMPERMEABLE SHEETING IF TORN.

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 D-4-1-A ROCK OUTLET PROTECTION I

STANDARD SYMBOL: ROP1
DISCHARGE TO SEMI CONFINED CHANNEL SECTION



RIPRAP	
CLASS	THICKNESS (T)
I	19 IN
II	32 IN
III	46 IN

CONSTRUCTION SPECIFICATIONS

1. RIPRAP AND STONE MUST CONFORM TO THE SPECIFIED CLASS.
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS, AND PROTECT FROM PUNCTURING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE TOGETHER.
3. PREPARE THE SUBGRADE FOR GEOTEXTILE OR STONE FILTER (⅜ TO 1½ INCH STONE FOR 6 INCH MINIMUM DEPTH) AND RIPRAP TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
4. EXTEND GEOTEXTILE AT LEAST 6 INCHES BEYOND EDGES OF RIPRAP AND EMBED AT LEAST 4 INCHES AT SIDES OF THE RIPRAP.
5. CONSTRUCT RIPRAP OUTLET TO FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. PLACE STONE FOR RIPRAP OUTLET IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE RIPRAP IN A MANNER TO PREVENT DAMAGE TO THE STONE FILTER BLANKET OR GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
6. WHERE NO ENDWALL IS USED, CONSTRUCT THE UPSTREAM END OF THE APRON SO THAT THE WIDTH IS TWO TIMES THE DIAMETER OF THE OUTLET PIPE, AND EXTEND THE STONE UNDER THE OUTLET BY A MINIMUM OF 18 INCHES.
7. CONSTRUCT APRON WITH 0% SLOPE ALONG ITS LENGTH AND WITHOUT OBSTRUCTIONS. PLACE STONE SO THAT IT BLENDS IN WITH EXISTING GROUND.
8. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

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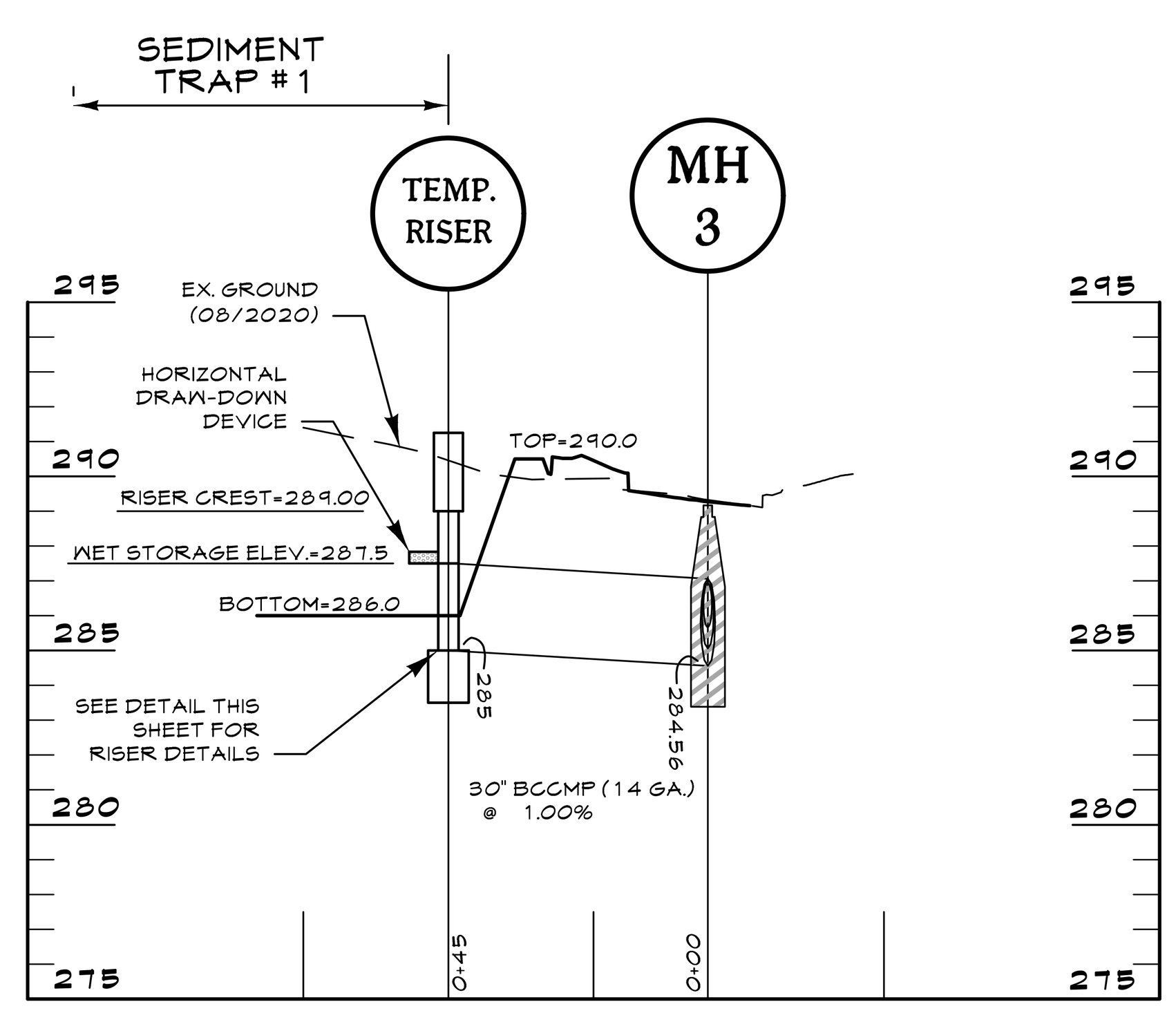
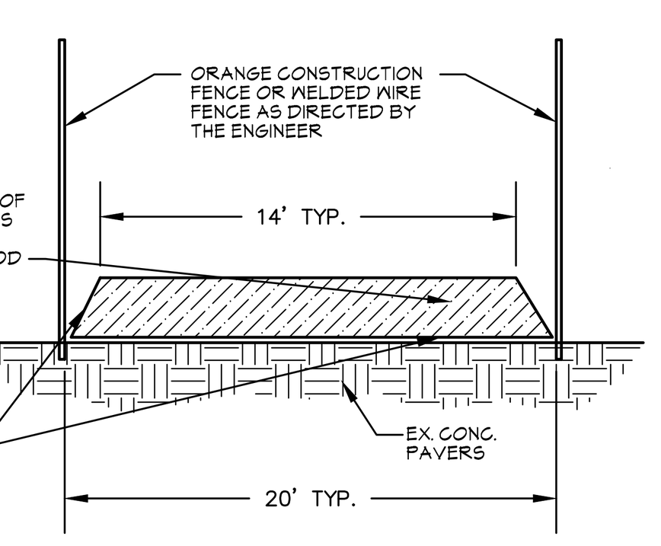
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

SEDIMENT TRAP #1

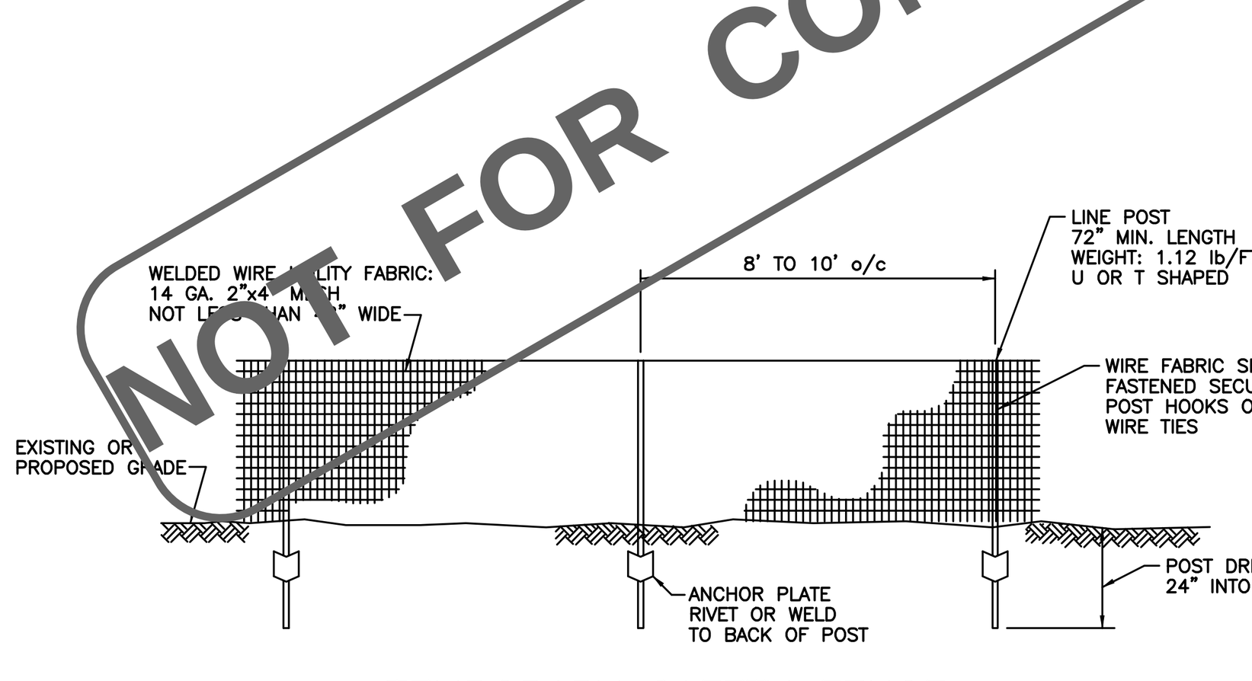


SECTION 'C-C'
SCALE: HORIZ: 1"=30' VERT: 1"=5'

NOTES:
1. ACCESS ROUTES TO BE VERIFIED BY ENGINEER AT PRE-CONSTRUCTION MEETING. REVISIONS TO THE ALIGNMENT THAT MINIMIZE TREE DISTURBANCE ARE ENCOURAGED AND REQUIRE REVIEW AND APPROVAL BY THE ENGINEER.
2. GEOTEXTILE SHALL BE PLACED WITH SEAMS PARALLEL TO THE FLOW OF TRAFFIC. OVERLAP FABRIC BY 18" MINIMUM AT SEAMS.
3. CONTRACTOR SHALL MAINTAIN CR-6 THROUGHOUT CONSTRUCTION PERIOD. UPON COMPLETION OF PHASE 3 STONE AND BE REMOVED AND RECYCLED.
4. THE HAUL ROAD IS DESIGNED TO PROVIDE ACCESS TO PEOPLE USING BEECHWOOD DRIVE AROUND THE CONSTRUCTION SITE IT IS NOT FOR USE OF THE CONTRACTOR.



TEMPORARY STONE ACCESS ROAD DETAIL
NOT TO SCALE



TEMPORARY SAFETY FENCE
FOR SEDIMENT TRAPPING DEVICES
NOT TO SCALE

NOTE: "FENCING SHALL BE INSTALLED TO PREVENT ACCESS TO THE BASIN BY CHILDREN"

NOT FOR CONSTRUCTION

OWNER:
Mayor & City Council of Baltimore
One Calvert Plaza
201E Baltimore Street
Baltimore MD 21202
(410)-675-3651

DEVELOPER:
The Maryland Zoo in Baltimore
1876 Mansion House Drive
Baltimore MD 21217
C/O Karl Kranz
(410)-396-7102

DATE	BY	REVISIONS

CENTURY ENGINEERING
A Kleinfelder Company
10710 Gilroy Road, Hunt Valley, MD 21031
Phone: 443.589.2400 www.centuryeng.com

EXISTING EROSION SEDIMENT CONTROL SITE SECTIONS

THE MARYLAND ZOO IN BALTIMORE PARKING LOT REHABILITATION

BALTIMORE, MARYLAND
WARD 13 SECTION 5 BLOCK 3499 LOT 001

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.: 32574
EXPIRATION DATE: 1/16/2024

DRAWN BY: AA	REVIEW BY: AJD
DESIGN BY: DRS/KRB	REVIEW DATE: 7/15/2022
SCALE: AS SHOWN	DRAWING: C-058
PROJECT No.: 201069.00	

ESD # 7969

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T:\2020\Facilities\201069.00 MD Zoo Parking\CIVIL\CADD\Drawings\Construction\201069.00 (C-059) ESC Specifications.dwg Jul 18, 2022 1:25pm dshanahan

B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

DEFINITION
Using vegetation as cover to protect exposed soil from erosion.

PURPOSE
To promote the establishment of vegetation on exposed soil.

CONDITIONS WHERE PRACTICE APPLIES
On all disturbed areas not stabilized by other methods. This specification is divided into sections on incremental stabilization; soil preparation, soil amendments and topsoiling; seeding and mulching; temporary stabilization; and permanent stabilization.

EFFECTS ON WATER QUALITY AND QUANTITY
Stabilization practices are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas.

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff, infiltration, evaporation, transpiration, percolation, and groundwater recharge. Over time, vegetation will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth.

Vegetation will help reduce the movement of sediment, nutrients, and other chemical carried by runoff to receiving waters. Plants will also help protect groundwater supplies by assimilating those substances present within the root zone.

SEDIMENT CONTROL PRACTICES MUST REMAIN IN PLACE DURING GRADING, SEEDBED PREPARATION, SEEDING, MULCHING, AND VEGETATIVE ESTABLISHMENT.

ADEQUATE VEGETATIVE ESTABLISHMENT
Inspect seeded areas for vegetative establishment and make necessary repairs, replacements, and reseedings within the planting season.

1. Adequate vegetative stabilization requires 95 percent groundcover.
2. If an area has less than 40 percent groundcover, restabilize following the original recommendations for lime, fertilizer, seedbed preparation, and seeding.
3. If an area has between 40 and 94 percent groundcover, over-seed and fertilize using half of the rates originally specified.
4. Maintenance fertilizer rates for permanent seeding are shown in Table B.6.

B-4-1 STANDARDS AND SPECIFICATIONS FOR INCREMENTAL STABILIZATION

DEFINITION
Establishment of vegetative cover on cut and fill slopes.

PURPOSE
To provide timely vegetative cover on cut and fill slopes as work progresses.

CONDITIONS WHERE PRACTICE APPLIES
Any cut or fill slope greater than 15 feet in height. This practice also applies to stockpiles.

CRITERIA

A. Incremental Stabilization - Cut Slopes
1. Excavate and stabilize cut slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all cut slopes as the work progresses.
2. Construction sequence example (Refer to Figure B.1):
 2.a. Construct and stabilize all temporary swales or dikes that will be used to convey runoff around the excavation.
 2.b. Perform Phase I excavation, prepare seedbed, and stabilize.
 2.c. Perform Phase 2 excavation, prepare seedbed, and stabilize. Overseed Phase 1 areas as necessary.
 2.d. Perform final phase excavation, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

NOTE: ONCE EXCAVATION HAS BEGUN, THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.

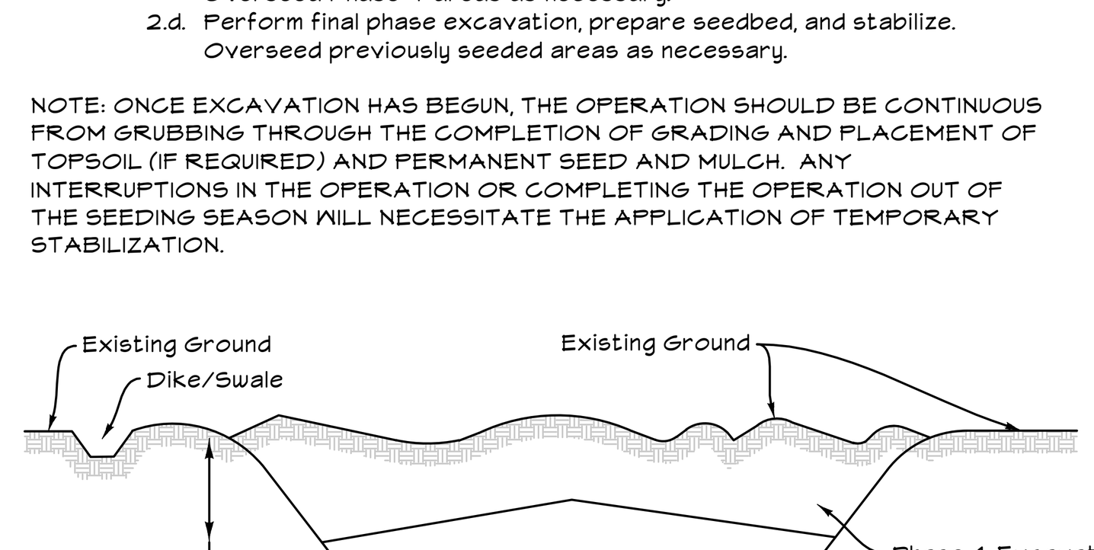


Figure B.1: Incremental Stabilization - Cut

B. Incremental Stabilization - Fill Slopes
1. Construct and stabilize fill slopes in increments not to exceed 15 feet in height. Prepare seedbed and apply seed and mulch on all slopes as the work progresses.
2. Stabilize slopes immediately when the vertical height of a lift reaches 15 feet or when the grading operation ceases as prescribed in the plans.
3. At the end of each day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
4. Construction sequence example (Refer to Figure B.2):
 4.a. Construct and stabilize all temporary swales or dikes that will be used to divert runoff around the fill. Construct silt fence on low side of fill unless other methods shown on the plans address this area.
 4.b. At the end of the day, install temporary water conveyance practice(s), as necessary, to intercept surface runoff and convey it down the slope in a non-erosive manner.
 4.c. Place Phase 1 fill, prepare seedbed, and stabilize.
 4.d. Place Phase 2 fill, prepare seedbed, and stabilize.
 4.e. Place final phase fill, prepare seedbed, and stabilize. Overseed previously seeded areas as necessary.

NOTE: ONCE THE PLACEMENT OF FILL HAS BEGUN, THE OPERATION SHOULD BE CONTINUOUS FROM GRUBBING THROUGH THE COMPLETION OF GRADING AND PLACEMENT OF TOPSOIL (IF REQUIRED) AND PERMANENT SEED AND MULCH. ANY INTERRUPTIONS IN THE OPERATION OR COMPLETING THE OPERATION OUT OF THE SEEDING SEASON WILL NECESSITATE THE APPLICATION OF TEMPORARY STABILIZATION.

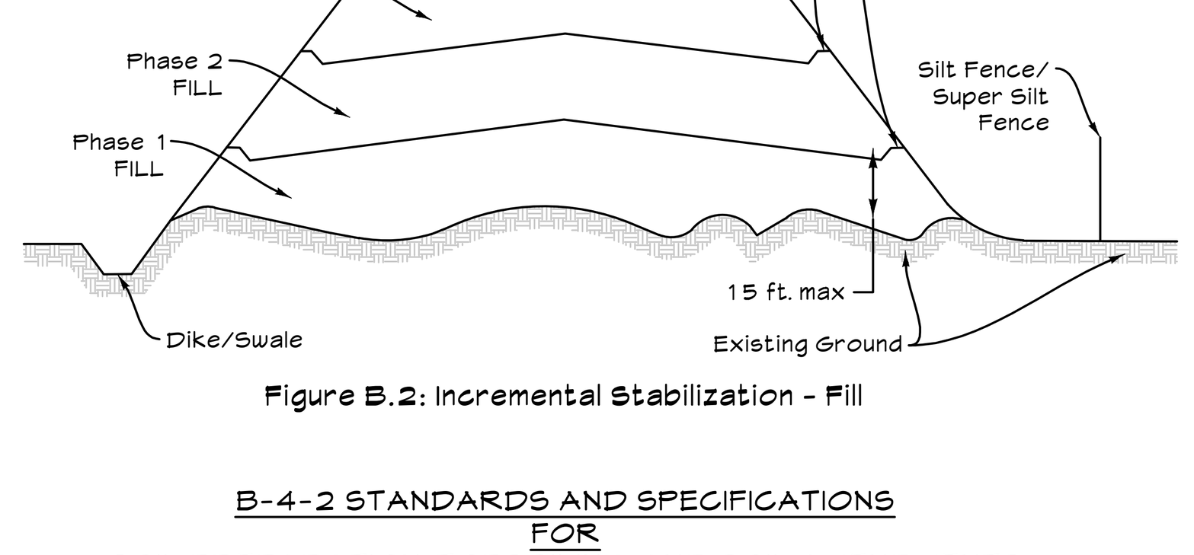


Figure B.2: Incremental Stabilization - Fill

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
1. Temporary Stabilization
 1.a. Seed 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 soil is loosened, it must not be rolled or dragged smooth but left in roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
 1.b. Apply fertilizer and lime as prescribed on the plans.
 1.c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means
2. Permanent Stabilization
 2.a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
  a. Soil pH between 6.0 to 7.0.
  b. Soluble salts less than 500 parts per million (ppm).
  c. 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 lovegrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable
  d. Soil contains 1.5 percent minimum organic matter by weight.
  e. Soil contains sufficient pore space to permit adequate root penetration.
 2.a. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
 2.b. 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.
 2.c. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
 2.d. 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
1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in representative soil profile section in the Soil Survey published by USDA-NRCS.
3. Topsoiling is limited to areas having 2:1 or flatter slopes where:
 3.a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
 3.b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant material.
 3.c. The original soil to be vegetated contains material toxic to plant growth.
 3.d. The soil is so acidic that treatment with limestone is not feasible.
4. Areas having slopes steeper than 2:1 require special consideration and design.
5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
 5.a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 ½ inches in diameter.
 5.b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
 5.c. Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
6. Topsoil Application
 6.a. Erosion and sediment control practices must be maintained when applying topsoil.
 6.b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations must be corrected in order to prevent the formation of depressions or water pockets.
 6.c. Topsoil must not be placed if the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

C. Soil Amendments (Fertilizer and Lime Specifications)
1. 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.
2. 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.
3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) 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.
4. 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.
5. 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
1. Specifications
 1.a. All seed must meet the requirement 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.
 1.b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
 1.c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. use four times the recommended rate when hydroseeding. Note: it is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
 1.d. Sod and seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
2. Application
 2.a. Dry seeding: This includes use of conventional drop or broadcast spreaders.
  a. 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.
  b. 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.
 2.b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
  a. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least ¼ inch of soil covering. Seedbed must be firm after planting.
  b. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
 2.c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
  a. If fertilizer is being applied at the time of seeding, the application rates should be exceed the following: nitrogen, 100 pounds per acre total soluble nitrogen; P_2O_5 (phosphorous), 200 pounds per acre; K_2O (potassium), 200 pounds per acre.
  b. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
  c. Mix seed and fertilizer on site and seed immediately and without interruption.
  d. When hydroseeding, do not incorporate into the soil.

B. Mulching
1. Mulch Materials (in order of preference)
 1.a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonable bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland See Law and not musty, moldy, caked, decayed, or excessively dusty. Note: Use only sterile straw mulch in areas where one species of grass is desired.
 1.b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
  a. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
  b. WCFM, including dye, must contain no germination or growth inhibiting factors.
  c. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogenous slurry. the mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
  d. WCFM material must not contain elements or compounds at concentration levels that will by phyto-toxic.
  e. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
2. Application
 2.a. Apply mulch to all seeded areas immediately after seeding.
 2.b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
 2.c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 100 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
 3.a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
  a. 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.
  b. 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.
  c. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly prohibited.
  d. 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.

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

A. 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 the Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
B. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soils tests are not required for Temporary Seeding.
C. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch along as prescribed in Section B-4-3.A.1.1b and maintain until the next seeding season.

Temporary Seeding Summary

Hardiness Zone: 7A Seed Mixture: N/A					Fertilizer Rate (10-20-20)	Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths		
N/A	Annual Ryegrass (*Lolium perenne ssp. multiflorum*)	40	Feb 15 to Apr 30; Aug 15 to Nov 30	0.5 in.	436 lb/ac (10 lb/1000sf)	2 tons/ac (90 lb/1000 sf)
	Barley (*Hordeum vulgare*)	96	Feb 15 to Apr 30; Aug 15 to Nov 30	1.0 in.		
	Foxtail Millet (*Setaria italica*)	30	May 1 to Aug 14	0.5 in.		
	Pearl Millet (*Pennisetum glaucum*)	20	May 1 to Aug 14	0.5 in.		

B-4-4 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 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
 1.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.
 1.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.
 1.c. For sites having disturbed area over 5 acres, use and show the rates recommended by the soil testing agency.
 1.d. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 ½ 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
 2.a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.
 2.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:
  a. 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 total mixture by weight.
  b. 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.
  c. 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.
  d. 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 60 to 70 percent. Seeding Rate: 1 ½ 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.
3. Ideal Times of Seeding for Turf Grass Mixtures
 Western Maryland: March 15 to June 1, August 1 to October 1 (Hardiness Zones: 5b, 6a)
 Central Maryland: 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 (Hardness Zones: 7a, 7b)
4. 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 ½ inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.
5. If soil moisture is deficient, supply new seedings with adequate water for plant growth (½ to 1 inch ever 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

Hardiness Zone: 7A Seed Mixture: Cool-Season Grass Mix					Fertilizer Rate (10-20-20)			Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	N	P_2O_5	K_2O	
9	Tall Fescue (*Lolium arundinaceum*)	60	Feb 15 to Apr 30; Aug 15 to Oct 31; Nov 1 to Nov 30	¼ to ½ in.	45 lb/ac (1 lb/ 1000sf)	90 lb/ac (2 lb/ 1000sf)	90 lb/ac (2 lb/ 1000sf)	2 tons/ac (90 lb/ 1000 sf)
	Kentucky Bluegrass (*Poa pratensis*)	40		¼ to ½ in.				
	Perennial Ryegrass (*Lolium perenne*)	20		¼ to ½ in.				

Permanent Seeding Summary

Hardiness Zone: 7A Seed Mixture: Warm-Season Grass Mix					Fertilizer Rate (10-20-20)			Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	N	P_2O_5	K_2O	
4	Deertongue (*Dichanthelium clandestinum*)	15			45 lb/ac (1 lb/ 1000sf)	90 lb/ac (2 lb/ 1000sf)	90 lb/ac (2 lb/ 1000sf)	2 tons/ac (90 lb/ 1000 sf)
	Creeping Red Fescue (*Festuca rubra var. rubra*)	20	Feb 15 to Apr 30; May 1 to May 20	¼ to ½ in.				
	Virginia Wild Rye (*Elymus virginicus*)	5						

B-4-8 STANDARDS AND SPECIFICATIONS FOR STOCKPILE AREAS

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

A. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
B. 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.
C. Runoff from the stockpile area must drain to a suitable sediment control practice.
D. Access the stockpile area from the upgrade side.
E. Clear water runoff into the stockpile area must be minimized by use of a diversion fence such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
F. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
G. 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.
H. 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.

EROSION AND SEDIMENT CONTROL NOTES

1. THE CONTRACTOR WILL COMPLY WITH ALL REQUIREMENTS OF SEDIMENT AND EROSION CONTROL AS SET FORTH IN THE MARYLAND SEDIMENT AND EROSION MANUAL AND BALTIMORE CITY CODE ARTICLE 7.
2. SUBMIT A WRITTEN NOTIFICATION TO: THE DEPARTMENT OF PUBLIC WORKS, THE OFFICE OF COMPLIANCE AND LABORATORIES, PLANS AND INSPECTIONS SECTION: 3001 DRUID PARK DRIVE, ROOM 228, BALTIMORE, MD 21215, PHONE NUMBER, 410-396-0732, FAX 410-523-9047, INSPECTIONS:DPW.ESCINSPECTIONS@BALTIMORECITY.GOV,, AT LEAST 72 HOURS PRIOR TO START OF CONSTRUCTION STATING:
 A. REQUEST A PRECONSTRUCTION MEETING
 B. WHEN THE CONTRACTOR INTENDS TO BEGIN CONSTRUCTION
 C. WHEN THE CONTRACTOR INTENDS TO INSTALL STORMWATER MANAGEMENT FACILITIES
 D. SOURCE OF BORROW MATERIAL
 E. LOCATION OF DISPOSAL AREA OF SITE MATERIAL
 F. CONTRACTOR'S TENTATIVE CLOSING DATE.
3. INITIAL DISTURBANCE WILL BE LIMITED TO THAT NECESSARY TO GAIN ENTRANCE TO THE SITE AND INSTALL NECESSARY SEDIMENT CONTROLS AS PER THE APPROVED PLANS.
4. ALL SEDIMENT CONTROLS AND CRITICAL SLOPES MUST BE STABILIZED WITHIN THREE CALENDAR DAYS. ALL OTHER INACTIVE DISTURBED AREAS ON THE PROJECT SITE MUST BE STABILIZED WITHIN SEVEN CALENDAR DAYS.
5. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE HIGH SIDE WHENEVER POSSIBLE AND CONFINED TO AN AREA WHERE IT WILL NOT BE OBSTRUCT THE NORMAL COURSE OF DRAINAGE.
6. PUMPING OF SEDIMENT LADEN WATER WILL NOT BE ALLOWED UNLESS IT IS FILTERED BY WAY OF AN APPROVED SEDIMENT TRAPPING DEVICE.
7. CONTINUOUS INSPECTION AND MAINTENANCE OF ALL SEDIMENT CONTROL DEVICES IS MANDATORY.
8. ANY SEDIMENT CONTROL DEVICES DISTURBED DURING UTILITY CONSTRUCTION MUST BE RESTORED IMMEDIATELY.
9. ALL POINTS OF INGRESS AND EGRESS SHALL BE PROTECTED TO MINIMIZE TRACKING OF MUD ON TO PUBLIC RIGHT-OF-WAYS.
10. ANY EARTH, GRAVEL, AND/OR OTHER MATERIAL TRACKED, SPILLED OR WASHED ON TO ADJACENT ROADS MUST BE IMMEDIATELY REMOVED AND DISPOSED OF IN A PROPER MANNER. NO FLUSHING WILL BE PERMITTED. ALL MATERIAL MUST BE REMOVED BY MEANS OF SHOVELING AND SWEEPING.
11. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 5,000 SQ. FT , THE CONTRACTOR SHALL HAVE A BALTIMORE CITY EROSION AND SEDIMENT CONTROL INSPECTOR INSPECT AND APPROVE THE WORK COMPLETED AT THE STAGES OF CONSTRUCTION SPECIFIED BELOW:
 A. UPON COMPLETION OF THE INSTALLATION OF THE PERIMETER SEDIMENT CONTROLS;
 B. DURING ALL GRADING AND BUILDING OPERATIONS;
 C. UPON FINAL STABILIZATION OF THE ENTIRE SITE PRIOR TO REMOVAL OF THE SEDIMENT CONTROLS.
12. THE CONTRACTOR SHALL NOT DEVIATE FROM THE APPROVED SEDIMENT AND EROSION CONTROL PLAN WITHOUT FIRST RECEIVING APPROVAL FROM THE OFFICE OF COMPLIANCE AND LABORATORIES, PLANS AND INSPECTIONS SECTION. VARIATIONS TO THE ORIGINAL PLAN MUST BE SUBMITTED IN WRITING WITH ALL PROPOSED MODIFICATIONS STILL BEING HIGHLIGHTED. SUBSTANTIAL CHANGES WILL NECESSITATE AMENDMENT OF THE GRADING /BUILDING PERMIT.

ANALYSIS:

TOTAL AREA OF SITE	= 744 ACRES-DRUID HILL PARK: 135 ACRES LEASED TO ZOO
AREA DISTURBED	= 6.30 ACRES
AREA TO BE ROOFED OR PAVED	= 3.34 ACRES
AREA TO BE VEGETATIVELY STABILIZED	= 2.96 ACRES
TOTAL CUT	= 6,273 CUBIC YARDS
TOTAL FILL	= 1,075 CUBIC YARDS
RATIO	= CUT/FILL = 6,273/1,075 = 5.835
OFF-SITE WASTE/BORROW LOCATION	YES - LOCATION TO BE DETERMINED

SEQUENCE OF CONSTRUCTION

1. Obtain proper permits.

2. Notify the Office Of Compliance and Research (OCR), Plans and Inspections Section at:
 Ashburton Treatment Plant
 Room 228
 3001 Druid Park Dr.
 Baltimore, MD 21215
 Phone: (410) 396-0732
 Fax: (410) 523-9047
 In writing at least 72 hours prior to beginning work stating:
 A. When contractor intends to begin work
 B. Source of borrow material
 C. Disposal site for excess material
 D. Staging and/or stockpile locations

PHASE 0
3. Install tree protection fence throughout the LOD.

PHASE 1A
4. Clear and grub along Limit Of Disturbance (LOD), In Phase 1 only, and remove impervious material only as-necessary to install sediment controls.

5. Install Stabilized Construction Entrance (SCE), Super Silt Fence (SSF), Diversion Fence (DF), and Inlet Protection.

6. Install 12" Clean Water Diversion Pipe, Clean Water Pipe Through Silt Fence and Outlet Protection.

7. Install silt fence on the down hill side of the temporary stockpile area.

8. Install inlet I-16 and 18" temporary storm drain from I-16 to Ex MH 2. Follow requirements as directed in the Utility Construction Note. Stabilize area on upstream side of diversion fence in and around I-16 with SOD.

9. Notify the Office Of Compliance and Research, Plans and Inspections Section, upon completion of said installation.

PHASE 1B
10. With the written approval of Office Of Compliance and Research, Plans and Inspections Section, clear and grub remainder of site inside Phase 1. Contractor shall make daily inspections and maintain all sediment control measures as require, including, but not limited to the removal of all accumulated sediment along super silt fence.

Note: Use caution while working around the existing trees. All trees to remain shall be evaluated by an arborist prior to any excavating in/or around the critical root zone. The arborist shall make recommendations on how to proceed around all trees to remain.

11. Remove paving as required.

12. Begin mass grading. All material removed from site shall be disposed of at a site with a proper grading permit.

13. After achieving mass grades begin installation of:
 A. Underground quantity management structure (UG),
 B. SWM release structure (S-1), MH-1, Outfall Structure (RS-1), and associated piping from UG to Ex MH 1.
 C. When RS-1 is installed and the tie into Ex MH-1 is made the temporary bypass pipe from I-16 to Ex MH-2 shall be removed and I-16 tied into the underground quantity management structure, at the same time.

14. Install Underground Sand Filter Structure, Sand Filter Diversion Structure (S-2), and associated piping, from S-1 to S-2 and from S-2 to the sand filter, block pipes into the sand filter.

15. Install remainder of Storm Drains and structures in Phase 1, including I-14, I-15, I-30, MH-2 and associated piping. Pipes crossing Beechwood Drive shall be bulkheaded at the north curb line.

16. Grade remainder of site.

17. Begin placing road base and install curb and gutter, retaining wall, sidewalk, paving, and bike rack.

18. Finish grading and stabilize disturbed areas according to permanent seeding specifications.

19. Notify the office of compliance and laboratories, plans review inspection section, upon completion of said installation.

PHASE 2
20. With the written permission from the Office Of Compliance and Research, Plans and Inspections Section, following the Utility Construction Note and during off hours, install inlets I-1, I-2, I-3 and associated 15" and 18" SD's as well as 30" SD crossing the Beechwood Road from MH-2 to MH-3 removing the Phase I bulkhead and bulkhead at the south curb line of the road.

21. Stabilize remaining disturbed areas according to permanent seeding specifications.

22. Notify the Office Of Compliance and Research, Plans and Inspections Section, upon completion of said installation.

PHASE 3
23. With the written permission from the Office of Compliance and Research ,Plans Review and Inspections Section, following the Utility Construction Note install temporary gravel bypass drive. Once Bypass drive is established close Beechwood Road between the two ends of where Safari Place meets Beechwood Drive and redirect traffic onto temporary gravel bypass drive.

24. Inspect Tree protection fence and repair as necessary.

25. With the written permission from the Office of Compliance and Laboratories, Plans Review and Inspections Section, clear and grub along Limit Of Disturbance (LOD), In Phase 3 only, and remove impervious material only as-necessary to install sediment controls.

26. Install Stabilized Construction Entrance (SCE), Super Silt Fence (SSF), Diversion Fence (DF), and Inlet Protection.

27. With written permission from the Office of Compliance and Research, Plans Review and Inspections Section, install:
 A. Removing the Phase II bulkhead and tie in to the 30" storm drain at the ROW that drains to the SWM Underground Quantity Structure.
 B. Storm drains from MH-7 to MH-10 including MH-8, MH-9, I-17, I-18 and associated piping, including.
 C. Stabilize all storm drain work at the end of each working day.
 D. Install inlet protection on inlets as they are installed and become active.
 E. Bulkhead pipes 2 feet behind the face of curb for pipes from MH-8 towards MH-11, from I-18 towards T-4.
 F. Bulkhead pipe from MH-10 towards I-21 at the manhole.

28. Grade sidewalk and area of the road for the speed table and pedestrian crossing.

29. Begin placing road base and install curb and gutter, bollards, pave the road and sidewalks.

30. Fine grade and stabilize disturbed areas according to permanent seeding specifications.

31. Once Beechwood Road cross walk and speed table is completed, remove Stabilized Construction Entrance and repair/replace pavement in Beechwood Road that has been disturbed or damaged during this phase of construction.

32. Once Beechwood Road is complete and with written permission from the Office of Compliance and Research, Plans Review and Inspections Section, remove barricades and return Beechwood Road to service.

PHASE 4
33. Inspect and repair as necessary the tree protection fence in this phase.

34. With written permission from the Office of Compliance and Research, Plans Review and Inspections Section install the stone construction entrance.

35. With written permission from the Office of Compliance and Research, Plans Review and Inspections Section, install the following storm drains for clean water diversion, following the Utility Construction Note, and blocking pipes between work days:
 A. Storm drain from MH-2 to I-13 and T-3 to I-11b, bulkhead all branches.
 B. Storm drain from MH-8 to I-29, bulkhead all branches.
 C. Storm drain from MH-10 to I-22, Install inlet protection on I-21.
 Stabilize area on upstream side of diversion fence in and around all inlets with SOD.

36. With the written permission from the Office of Compliance and Research, Plans Review and Inspections Section, clear and grub along Limit Of Disturbance (LOD), In Phase 4 only, and remove impervious material only as-necessary to install sediment controls including Diversion Fence (DF), Silt Fence (SF), and Super Silt Fence (SSF).

37. Install:
 A. Pipe Outlet Sediment Trap (ST-1), Trap #1
 B. Pipe outfall to MH-3
 C. Removable Pumping Station
 D. Horizontal Draw-Down Device
 E. Earth Dike

38. Notify Baltimore City Office of Compliance and Research, Plans Review and Inspections Section, upon completion of sediment & erosion control measures installation.

39. With the written approval of Office of Compliance and Research, Plans and Inspections Section, clear and grub remainder of site inside Phase 4. Contractor shall make daily inspections and maintain all sediment control measures as require, including, but not limited to the removal of all accumulated sediment along silt fence.

40. Remove paving as required.

41. Begin mass grading. All material removed from site shall be disposed of at a site with a proper grading permit. As grading progresses adjust Earth Dike to maintain positive drainage to the sediment trap.

42. After achieving mass grades begin installation of storm drains, as inlets are installed and become active install inlet protection.

43. Begin placing road base and install curb and gutter. Adjust Earth Dike as shown on sheet C-054.

44. Complete fine grading and stabilize disturbed areas according to permanent seeding specifications. Finish walkways, travel paths and paving.

45. Once up stream areas are stabilized and with the approval of the Office of Compliance and Research, Plans and Inspections Section, dewater sediment trap with removable pumping station, remove the sediment trap and install, storm drains, curbs, paving and disturbed areas according to permanent seeding specifications.

46. After contributing areas are permanently stabilized and with the approval of the Office of Compliance and Research, Plans and Inspections Section, begin construction of water quality facilities. Notify as-built certifying engineer a minimum of 72 hours prior to construction.

47. Install landscaping

48. Upon stabilization of site with established vegetation and with the approval of the Office of Compliance and Research, Plans and Inspections Section, flush storm drain system and begin to remove sediment trap. Dewater trap and clean out trap pool during removal process. Remove sediment control measures and stabilize those areas disturbed by this process. As built shall be completed within 30 days of SWM facility completion, and submitted to the Department of Public Works, Office of Compliance and Research for review.

49. With the approval of the Office of Compliance and Research, Plans and Inspections Section, remove any remaining sediment control measures and stabilize those areas disturbed by this process.

NOT FOR CONSTRUCTION

OWNER:
Mayor & City Council of Baltimore
One Calvert Plaza
201E Baltimore Street
Baltimore MD 21202
(410)-675-3651

DEVELOPER:
The Maryland Zoo in Baltimore
1876 Mansion House Drive
Baltimore MD 21217
C/O Karl Kranz
(410)-396-7102

DATE	BY	REVISIONS

CENTURY ENGINEERING
A Kleinfelder Company
10710 Gilroy Road, Hunt Valley, MD 21031
Phone: 443.589.2400 www.centuryeng.com

EROSION SEDIMENT CONTROL SPECIFICATIONS

THE MARYLAND ZOO IN BALTIMORE
PARKING LOT REHABILITATION
BALTIMORE, MARYLAND
WARD 13 SECTION 5 BLOCK 3499 LOT 001

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.: 32574
EXPIRATION DATE: 1/16/2024

STATE OF MARYLAND · ANTHONY JOSEPH DIETZ · No. 32574 · PROFESSIONAL ENGINEER · 7/15/22

DRAWN BY:	AA	REVIEW BY:	AJD
DESIGN BY:	DRS/KRB	REVIEW DATE:	7/15/2022
SCALE:	N.T.S.	DRAWING:	C-059
PROJECT No.:	201069.00		

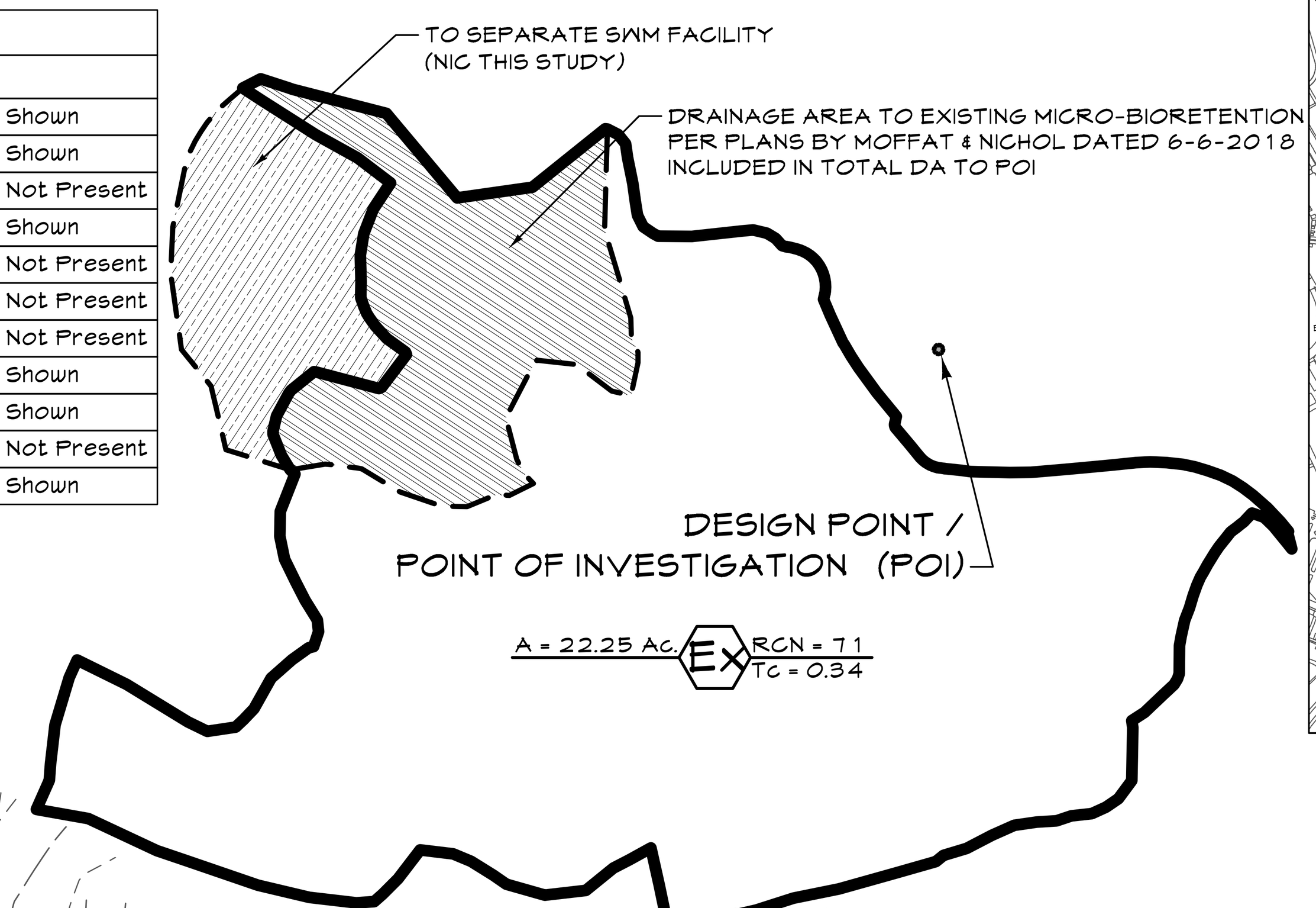
ESD # 7969

LEGEND

NOTE: DUE TO THE VARIED NATURE OF EACH PLAN ALL SYMBOLS SHOWN ON LEGEND MAY NOT BE PRESENT ON ALL PLAN SHEETS.

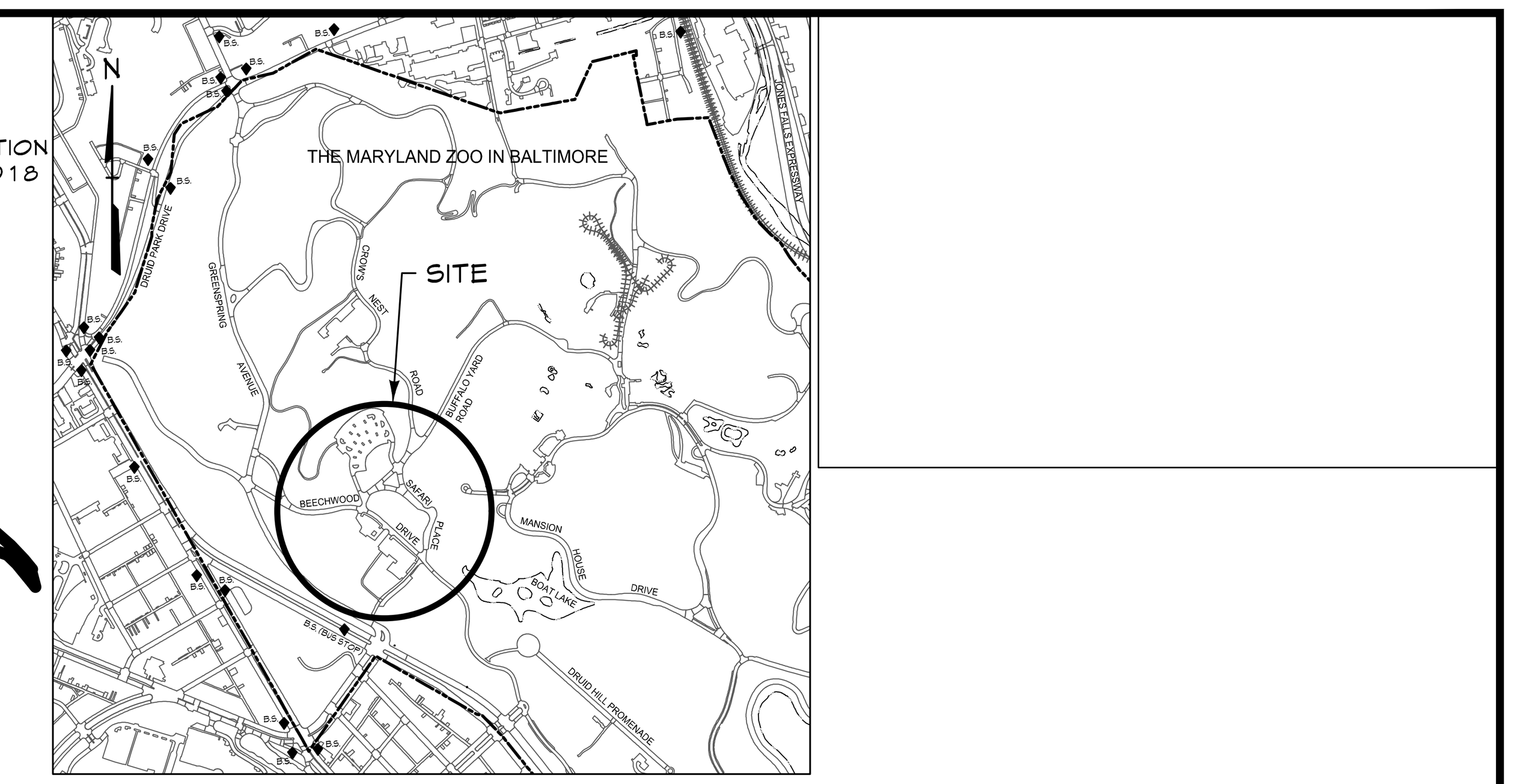
- Existing Minor Contour
- Existing Major Contour
- Existing Edge of Road
- Existing Soils
- Existing Storm Drain
- Existing Water
- Existing Sewer
- Existing Gas Line
- Existing Underground Electric Line
- Existing Curb and Gutter
- Existing Retaining Wall
- Existing Edge of Paving
- Existing Sidewalk
- Existing Tree Line
- Existing Building/Structure
- Water Edge or Stream Centerline
- Existing Fence
- Existing Pavement
- Existing Sign
- Existing Light
- Existing Bollard
- Existing Impervious Area in DA
- Time of Concentration (Tc) Path
- Limit Of Disturbance (LOD)
- Drainage Area to Design Point
- Drainage Area to Facilities
- Area of Steep Slopes
- Highly Erodible Soil
- Soil Series / Soils Line / Hydrologic Soil Group
- Soil Boring
- Existing Deciduous Tree
- Existing Conifer Tree

Table 5.1 Natural Resources and the Corresponding Regulatory Authorities					
FEDERAL		STATE		LOCAL	
Wetlands	Not Present	Tidal and Non-Tidal Wetlands	Not Present	Steep Slopes	Shown
Major Waterways	Not Present	Wetlands of Special State Concern	Not Present	Highly Erodible Soils	Shown
Floodplains	Not Present	Wetland Buffers	Not Present	Enhanced Stream Buffers	Not Present
		Stream Buffers	Not Present	Topography/Slopes	Shown
		Perennial Streams	Not Present	Springs	Not Present
		Floodplains	Not Present	Seeps	Not Present
		Forests	Not Present	Intermittent Streams	Not Present
		Forest Buffers	Not Present	Vegetative Cover	Shown
		Critical Areas	Not Present	Soils	Shown
				Bedrock/Geology	Not Present
				Existing Drainage Areas	Shown



QUANTITY MANAGEMENT D.A.'S

SCALE: 1"=200'



VICINITY MAP

SCALE: 1"=1000'

ESDv SUMMARY TABLE

The required ESDv for the new impervious in the LOD is 3261 cu.ft.

Required ESDv and provided for the individual facilities is shown in the chart below:

ESD FACILITY NUMBER	FACILITY DESCRIPTION	Drainage Area (Acres)	Impervious Area (Acres)	PE Required	ESDv (Storage Required) cu.ft.	ESDv (Storage provided) cu.ft.	PE Provided
XXXX-1	MICRO-BIORETENTION (LION CIRCLE)	0.224	0.131	2.0	934	280	0.6
XXXX-2	MICRO-BIORETENTION (TURTLE CIRCLE)	0.301	0.181	2.0	1289	651	1.0
XXXX-3	MICRO-BIORETENTION (ELEPHANT CIRCLE)	0.163	0.107	1.9	722	445	1.2
XXXX-4	MICRO-BIORETENTION (SAFARI PLACE)	0.457	0.262	1.9	1786	1199	1.3
XXXX-5	UNDERGROUND SAND FILTER (UNDER ADA PARKING)	3.512	1.456	1.0	5393	6869	1.3
Total Provided		6.112 Ac.	2.136 Ac.	1.2	9,542 cu. ft. Minimum	9,787 cu. ft. Provided	1.0" Required 1.23 Achieved

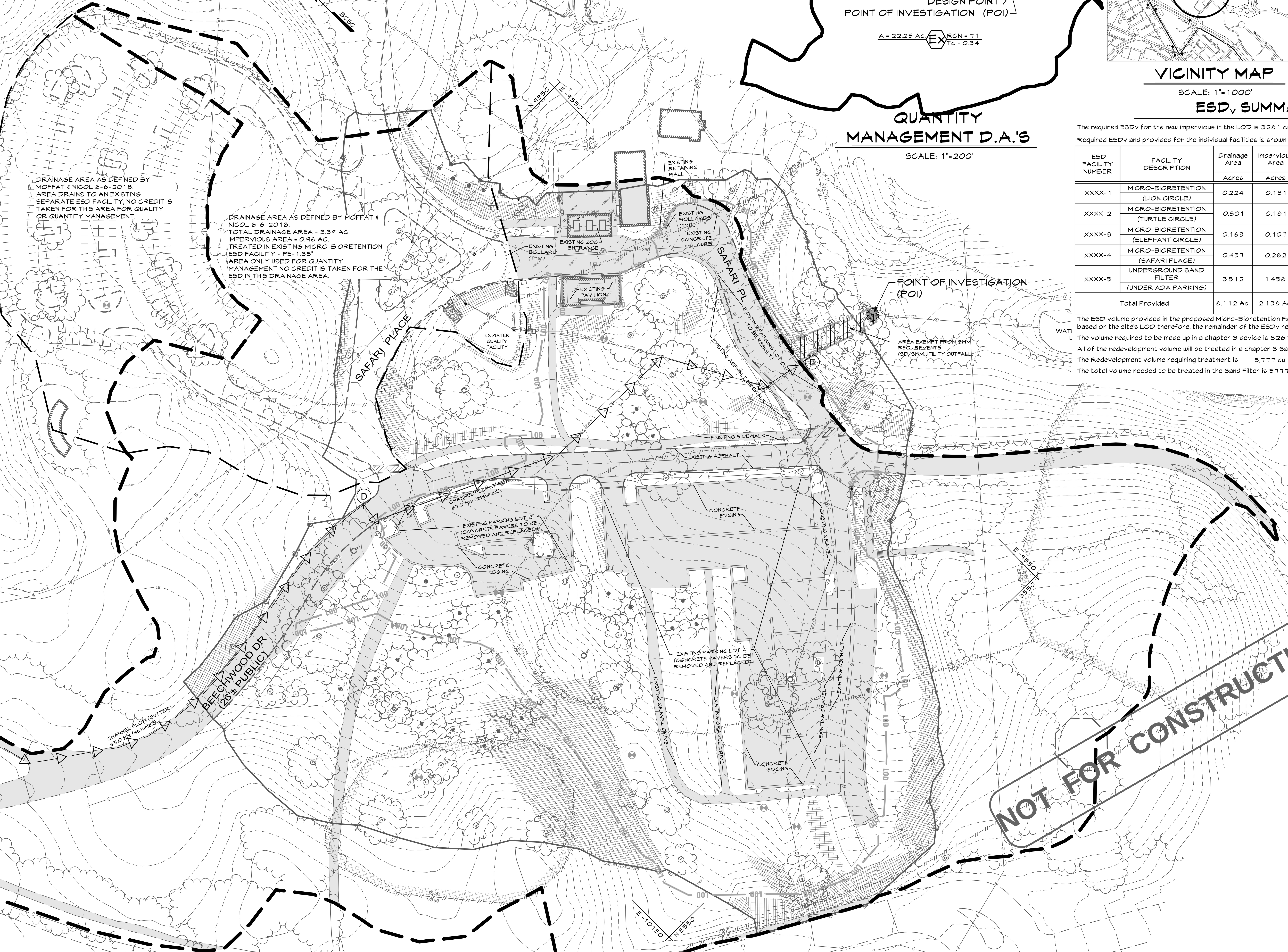
The ESD volume provided in the proposed Micro-Bioretention Facilities (M-6) is less than the the volumes needed to be treated based on the site's LOD therefore, the remainder of the ESDv needs to be made up in a chapter 3 device.

The volume required to be made up in a chapter 3 device is 3261 cu.ft. - 2918 = 343 cu.ft. (1" Minimum however is provided)

All of the redevelopment volume will be treated in a chapter 3 Sand Filter (F-2) in addition to the remainder of the ESDv.

The Redevelopment volume requiring treatment is 5,777 cu. ft.

The total volume needed to be treated in the Sand Filter is 5777 c.f. -3257 c.f. = 2,520 cu. ft.



PLAN

SCALE: 1"=50'

COMBINED SITE DEVELOPMENT/ FINAL SWM PLAN

SITE INFORMATION:

TOTAL SITE AREA = 744 Ac.

LIMIT OF DISTURBANCE = 6.29 Ac.

REDEVELOPMENT IMPERVIOUS = 2.84 Ac.

NEW IMPERVIOUS = 3.34 Ac.

IART = 1.92 Ac.

TOTAL IA TREATED = 2.14 Ac. (IN MICRO-BIORETENTION AND SAND FILTER)

TOTAL CUT = 8,990 c.y.

TOTAL FILL = 8,990 c.y.

THE SITE IS NOT LOCATED IN THE CRITICAL AREA

THE SITE IS NOT LOCATED IN A FLOOD PLAIN (PER FIRM MAP 24000870010E)

CALL "MISS UTILITY" AT 1-800-257-7777
72 Hours Before Start Of Construction

DATA SOURCES

1. Existing topography and structures shown hereon outside of the limits of field run topography are from the Baltimore City Office of Technology - GIS Lab.
2. Existing topography from field run survey by Century Engineering Inc. dated Aug-Sept. 2020
3. Coordinates & elevations are referred to the Baltimore City Survey Control System and are tied to the following control stations:
   35800 N 7963.820 E -9323.550 Elev. 301.060
   35801 N 8240.190 E -9800.600 Elev. 324.640
4. Public utilities shown hereon are from public drawings, field location and other sources.

NRCS HYDROLOGIC SOIL GROUP - BALTIMORE CITY, MARYLAND

MAP UNIT SYMBOL	MAP UNIT NAME	HSG RATING*	K RATING
5E	Brandywine loam, 15-60% Slopes	A	0.37**
11B	Galestown loamy sand, 0-8% Slopes	A	0.15
17B	Legore loam, 0-8% Slopes	B	0.32
18E	Legore loam, 15-50% Slopes	B	0.17
18UC	Legore-Urban land complex, 8-15% Slopes	B	0.32
42E	Udorthents, 0-35% Slopes	C	0.10

* HSG Rating provided from the NRCS soils mapping and does not reflect soils rating found during site-specific Geotechnical Assessment.
** Highly erodible soil Kf > 0.35.

OWNER:
Mayor & City Council of Baltimore
One Calvert Plaza
201E Baltimore Street
Baltimore MD 21202
(410)-675-3651

DEVELOPER:
The Maryland Zoo in Baltimore
1876 Mansion House Drive
Baltimore MD 21217
C/O Karl Kranz
(410)-396-7102

DATE	BY	REVISIONS

CENTURY ENGINEERING
A Kleinfelder Company
10710 Gilroy Road, Hunt Valley, MD 21031
Phone: 443.589.2400 www.centuryeng.com

EXISTING CONDITIONS & STORMWATER MANAGEMENT DRAINAGE AREA AND ENVIRONMENTAL DELINEATION MAP

THE MARYLAND ZOO IN BALTIMORE PARKING LOT REHABILITATION

BALTIMORE, MARYLAND
WARD 13 SECTION 5 BLOCK 3499 LOT 001

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.: 32574
EXPIRATION DATE: 1/16/2024

STATE OF MARYLAND ANTHONY JOSEPH ... No. 32574 PROFESSIONAL ENGINEER 7/15/22

DRAWN BY:	AA	REVIEW BY:	AJD
DESIGN BY:	DRS/KRB	REVIEW DATE:	7/15/2022
SCALE:	1"=50'	DRAWING:	C-060
PROJECT No.:	201069.00		

ESD # 7969

T:\2020\Facilities\201069.00 MD Zoo Parking\CIVIL\CADD\Drawings\Construction\201069.00(C-060) Existing SWM Drainage Area Map.dwg Jul 18, 2022 1:26pm dshanahan