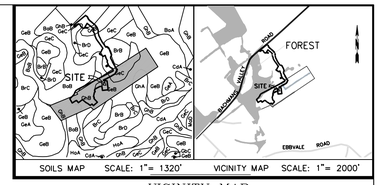
FINAL SITE DEVELOPMENT PLAN

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema
Andinet Monastery

COMMISSIONER DISTRICT 2
ELECTION DISTRICT 6



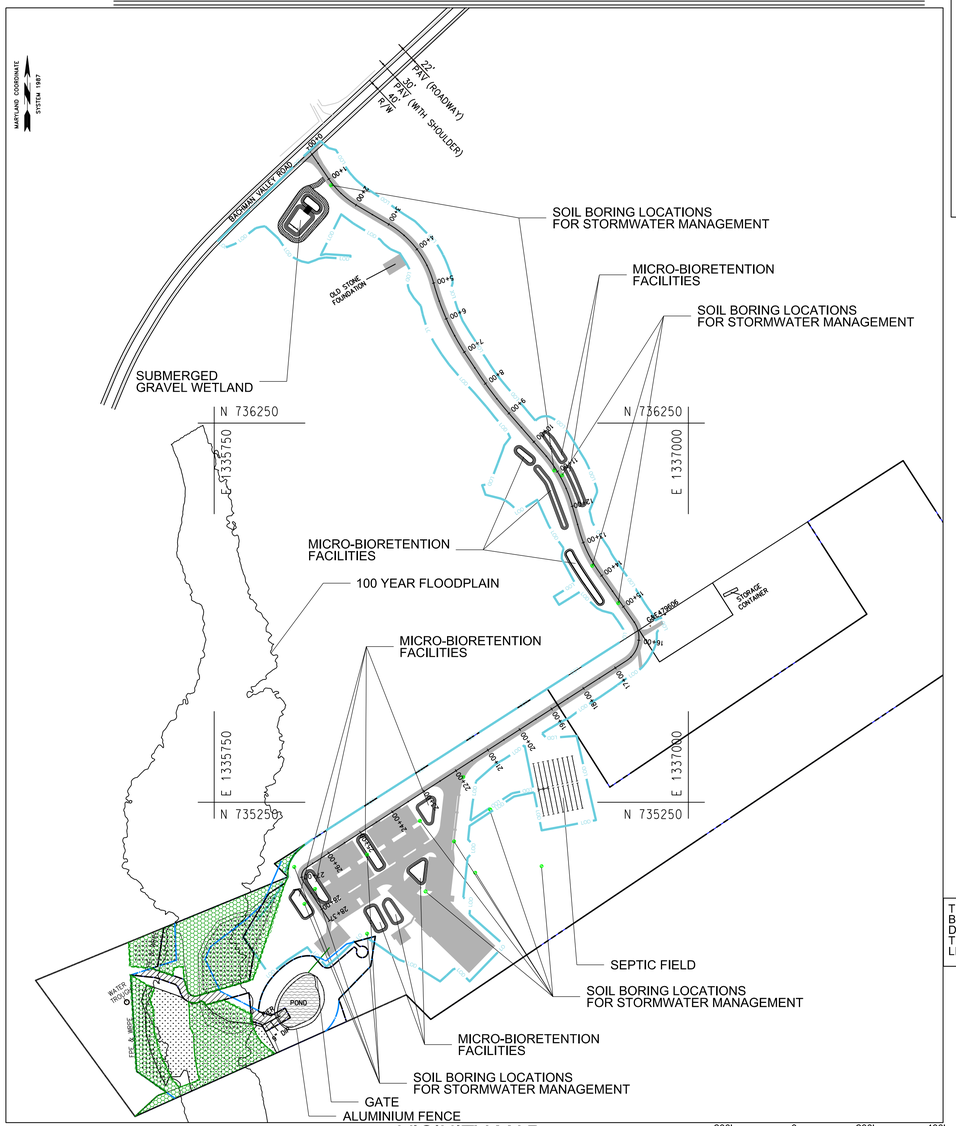
VICINITY MAP

SITE GENERAL NOTES

1. EXISTING ZONING: AGRICULTURAL
2. PROPOSED USE: RELIGIOUS ESTABLISHMENT
3. TOTAL AREA OF THE SITE IN ACRES: 25.70 ACRES
4. TOTAL DEVELOPED AREA IN SQUARE FEET: 536,801.78 SF (12.32 AC.)
5. TAX MAP 14, PARCEL NUMBER 79, BLOCK 21
6. PARKING TABULATION:
   NUMBER OF SEATS: 500
   MAXIMUM CAPACITY FOR THE USES ON THE SITE: 500
   REQUIRED PARKING SPACE RATIO: ONE(1) SPACE PER FOUR(4) SEATS.
   PARKING SPACE REQUIRED: 125
   TOTAL PARKING SPACE PROVIDED: 132
   STANDARD PARKING SPACES PROVIDED: 125 (TYP. 9' BY 20')
   HANDICAP ACCESSIBLE SPACES PROVIDED: 7
   NO EXISTING PARKING SPACES.
   NUMBER OF BUS PARKING PROVIDED: 3
7. EXISTING USES OF THE BUILDINGS:
   7.1 EXISTING BUILDING 1 - ARCHIVE AND PRAYER/HOLY WATER IMMERSION.
   7.2 EXISTING BUILDING 2 - ASSEMBLY HALL.
   7.3 EXISTING BUILDING 3 - RESIDENCE BUILDING (THE HOUSE WHERE PRIESTS REST BEFORE AND AFTER CHURCH SERVICES.
8. PROPOSED USES OF THE BUILDINGS:
   8.1 ARCHIVE AND PRAYER - A PRAYER PLACE FOR PEOPLE AND TO STORE HISTORICAL AND RELIGIOUS ARTIFACTS.
   8.2 CHURCH - THE MAIN CONGREGATION PLACE FOR REGULAR RELIGIOUS SERVICES.
   8.3 PRIEST HOUSE - A HOUSE WHERE PRIESTS REST BEFORE AND AFTER CHURCH SERVICES.
9. THIS PROJECT INTENDS TO IMPLEMENT A DRY PIPE SYSTEM THAT CONFORMS TO THE REQUIREMENTS OF NFPA 13 FOR COMMERCIAL SPRINKLER SYSTEMS.
10. THE SITE IS LOCATED IN A SURFACE WATER PROTECTION AREA.
11. THE CHURCH/MONASTERY WILL BE OPEN TO THE PUBLIC FROM 7:00 AM TO 4:00 PM.
12. THERE WILL BE NO USE, TRANSFER, OR STORAGE OF HAZARDOUS/REGULATED SUBSTANCES ON SITE.
13. THE AVERGAE NUMBER OF LARGE EVENTS HELD ANNUALLY: 3
14. TRAFFIC GENERATION NOTE:
    14.1 THIS SITE GENERATES 7 "AM PICK HOUR TRIPS", 6 "PM PEAK HOUR TRIPS", AND 100 "WEEKEND PEAK HOUR TRIPS".
    14.2 TRIP RATES WERE DERIVED FROM THE TRIP GENERATION MANUAL, 10TH EDITION, 2018.
15. THE LOCATION OF EXISTING UTILITIES SHOWN HEREON ARE APPROXIMATE ONLY. CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION, AND DEPTH OF ANY EXISTING UTILITIES AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING WORK.
16. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 THREE WORKING DAYS PRIOR TO BEGINNING ANY WORK IN THE VICINITY OF EXISTING UTILITIES.
17. THE CONTRACTOR SHALL NOTE THAT IN CASE OF A DISCREPANCY BETWEEN THE SCALED AND FIGURED DIMENSIONS SHOWN ON THESE PLANS, THE FIGURED DIMENSIONS SHALL GOVERN.
18. ANY CHANGES TO THIS PLAN WILL REQUIRE AN AMENDED SITE DEVELOPMENT PLAN TO BE APPROVED BY THE CARROLL COUNTY PLANNING AND ZONING COMMISSION.
19. FLOODPLAIN EASEMENT WILL BE GRANTED TO CARROLL COUNTY.
20. THIS SITE PLAN SHALL BECOME VOID EIGHTEEN MONTHS AFTER THE DATE OF APPROVAL IF NO BUILDING PERMIT OR ZONING CERTIFICATE HAS BEEN ISSUED FOR THIS PROJECT. UNLESS AN EXTENSION OF THIS TIME LIMIT IS ISSUED BY THE DIRECTOR OF THE DEPARTMENT OF PLANNING AND LAND MANAGEMENT.
21. THIS SITE CONTAINS PRIVATE STORMWATER MANAGEMENT FACILITIES. A STORMWATER MANAGEMENT EASEMENT AND MAINTENANCE AGREEMENT IS TO BE GRANTED TO THE COUNTY COMMISSIONERS OF CARROLL COUNTY AS AN EASEMENT OF ACCESS TO THE COUNTY COMMISSIONERS OR AUTHORIZED REPRESENTATIVES BY A DEED TO BE RECORDED SIMULTANEOUSLY HEREWITH.
22. THE REQUIRED SETBACKS ARE 100 ft. FROM FRONT, AND 50 ft. FROM THE SIDE AND REAR.
23. ANY FUTURE ADDITIONS TO THE SITE WILL REQUIRE GOING BEFORE THE BOARD OF ZONING APPEALS.

ADJOINING PROPERTY OWNER INFORMATION

MAP–BLOCK–PARCEL ACCT ID PREMISE ADDRESS	OWNER NAME MAILING ADDRESS	TITLE REFERENCE	ZONING
14–15–47 06–014089 New Bachmans Valley Rd	Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidist Arsema 2239 Bachman Valley Road Manchester MD 21102	CLR10625 P343	AGRICULTURAL
14–21–150 06–010067 2510 Ebbvale Rd Manchester 21102–1308	Lemmon Kendall L & Lemmon Vicky L 2510 Ebbvale Rd Manchester MD 21102–1308	CLR2825 P583	AGRICULTURAL
14–21–344 06–014100 2243 Bachman Valley Rd Manchester 21102–1328	Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidist Arsema 2239 Bachman Valley Rd Manchester MD 21102–1328	CLR9384 P415	AGRICULTURAL
14–21–688 06–068774 2245 Bachman Valley Rd Manchester 21102	Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidist Arsema 2239 Bachman Valley Road Manchester MD 21102	CLR10914 P463	AGRICULTURAL
14–15–162 06–005330 Bachmans Valley Rd	Dell Francis Lee & Dell Marian V 2401 Bachman Valley Rd Manchester MD 21102–1325	CLR4061 P227	AGRICULTURAL
14–20–458 L12, 6–030343 2049 Bachman Valley Rd Manchester 21102–1332	Glover Wilbur W Jr & Glover Doris M 2049 Bachman Valley Rd Manchester MD 21102–1332	CLR766 P402 PB19 P2	AGRICULTURAL
14–20–668 06–065376 2300 Ebbvale Rd Manchester 21102–1312	Dell Francis Lee L/E Etal 2401 Bachman Valley Rd Manchester MD 21102	CLR8953 P274	AGRICULTURAL
14–14–696 06–069290 2128 Bachman Valley Rd Manchester 21102	Dell Matthew Lee 2401 Bachman Valley Rd Manchester MD 21102	CLR9649 P333	AGRICULTURAL



VICINITY MAP

SITE DEVELOPMENT PLAN INSPECTION SEQUENCE NOTES:

1. CONTRACTOR SHALL NOTIFY THE CARROLL COUNTY BUREAU OF PERMITS AND INSPECTIONS AT 410-386-2674 AT LEAST ONE DAY PRIOR TO BEGINNING ANY WORK.
2. SITE COMPLIANCE INSPECTIONS ARE REQUIRED AT THE FOLLOWING STAGES DURING CONSTRUCTION:
   (A) PROPOSED STRUCTURES STAKED OUT IN PROPER LOCATIONS AS SHOWN ON THESE APPROVED PLANS.
   (B) PROPOSED FOUNDATIONS INSTALLED FOR ALL BUILDINGS SHOWN ON THESE APPROVED PLANS.
   (C) SUB-GRADES ESTABLISHED FOR ALL DRIVES, PARKING LOTS, AND SURROUNDING GRADING.
   (D) COMPLETION OF ALL DRIVES, PARKING LOTS, AND SURROUNDING GRADING.
   (E) COMPLETION OF ALL WORK SHOWN ON PLANS.

   IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE CARROLL COUNTY BUREAU OF PERMITS AND INSPECTIONS AT 410-386-2674 UPON COMPLETION OF EACH PHASE OF CONSTRUCTION.
3. CONTRACTOR SHALL NOTIFY CARROLL COUNTY BUREAU OF RESOURCES MANAGEMENT, ENVIRONMENTAL INSPECTION SERVICES DIVISION AT 410-386-2210 PRIOR TO BEGINNING ANY WORK. ALL FOREST CONSERVATION PLAN DEVICES MUST BE IN PLACE PRIOR TO ANY CONSTRUCTION.
4. FINAL LANDSCAPING INSPECTION SHALL BE ARRANGED THROUGH BUREAU OF RESOURCE MANAGEMENT, ENVIRONMENTAL INSPECTION SERVICES DIVISION AT 410-386-2210 BY THE CONTRACTOR/DEVELOPER OR AGENT. WRITTEN APPROVAL FROM THE LANDSCAPE REVIEW SPECIALIST, BUREAU OF RESOURCES MANAGEMENT, MUST BE OBTAINED FOR ANY DEVIATIONS FROM THE LANDSCAPING OR FOREST CONSERVATION PLANS OR MODIFICATIONS IN THE PLANT MATERIAL.
5. THE CONTRACTOR SHALL NOT PROCEED TO THE NEXT PHASE OF CONSTRUCTION UNTIL GIVEN APPROVAL OF PRIOR PHASE.

INDEX OF SHEETS

SHEET 1	COVER SHEET
SHEET 2	LOCATION MAP, RETAINING WALL, SECTION, AND PROFILE
SHEET 3	TOPOGRAPHIC SURVEY
SHEET 4-5	GEOMETRIC PLAN AND TRAFFIC SIGN
SHEET 6-13	EXISTING AND PROPOSED PAVING PLANS
SHEET 14-15	EXISTING AND PROPOSED VERTICAL PROFILE
SHEET 16	TYPICAL ROAD SECTION, PROFILE, AND MISCELLANEOUS DETAILS
SHEET 17	HANDRAIL, ADA RAMP, AND STAIR DETAILS
SHEET 18	EXISTING CONDITION DRAWING
SHEET 19	1ST CONDITION PROPOSED DRAWING
SHEET 20	2ND CONDITION PROPOSED DRAWING
SHEET 21	2ND CONDITION PROPOSED DRAWING WITH CONTOURS AND DRAINAGE
SHEET 22	EXISTING CONDITION DRAINAGE AREA MAP
SHEET 23	PROPOSED CONDITION DRAINAGE AREA MAP
SHEET 24	SITE RESOURCES MAP
SHEET 25	100-YEAR FLOODPLAIN MAP
SHEET 26-43	STORMWATER MANAGEMENT FACILITIES SECTIONS, PROFILES, NOTES, INSTALLATION & INSPECTION CHARTS, AND CHECKLISTS
SHEET 44-56	DRAINAGE PROFILES, DETAILS, SCHEDULES, STRUCTURE & CHANNEL DRAINAGE AREAS
SHEET 57-75	EROSION AND SEDIMENT CONTROL NOTES, DETAILS, PLANS, AND DRAINAGE AREAS
SHEET 76-79	GRADING PLANS
SHEET 80-81	SIMPLIFIED FOREST STAND DELINEATION
SHEET 82	FOREST CONSERVATION, WATER RESOURCES & FLOODPLAIN EASEMENTS
SHEET 83-84	LANDSCAPE & FOREST CONSERVATION PLANS
SHEET 85	LANDSCAPE AND FOREST CONSERVATION DETAILS
SHEET 86-90	SEPTIC PLANS
SHEET 91	INTERSECTION SITE DISTANCE AND PROFILE
SHEET 92	STOPPING SIGHT DISTANCE AND PROFILE
SHEET 93-96	BUILDING ELEVATIONS

CARROLL SOIL CONSERVATION DISTRICT

The Development Plan is approved for Soil Erosion and Sediment Control by the Carroll Soil Conservation District.
Approved _____ Carroll S.C.D./Date

OWNER'S CERTIFICATION

I/We hereby certify that all proposed work shown on these construction drawing(s) has been reviewed by me/us and that I/we fully understand what is necessary to accomplish this work and that the work will be conducted in strict accordance with these plans. I/We also understand that any changes to these plans will require an amended plan to be reviewed and approved by the Carroll County Planning and Zoning Commission before any change in the work is made.

TESFAYE MEKOYA ASSEGID Name(s) Printed/Date
_____ Signed/Date 05/05/2025

OWNER/DEVELOPER

I certify that this plan of Soil Erosion & Sediment Control will be implemented to the fullest extent, and all structures will be installed to the design and specifications as spelled out in this plan and that any responsible personnel involved in construction of this project will have a certification of attendance at a Department of the Environment approved training program for the control of soil erosion and sediment before beginning the project. I also authorize periodic on-site evaluation by the Carroll Soil Conservation District personnel and cooperating agencies.

05/05/2025
Developer Date

TESFAYE MEKOYA ASSEGID
Printed Name of Developer

TSERHA TSION MENFES KIDUS CHURCH AND MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY
Developer Company Name

202-706-4114
Developer Phone Number

CARROLL COUNTY PLANNING AND ZONING COMMISSION

BY _____ DATE _____

THE PROPERTY SHOWN HEREON IS OWNED BY TESFAYE MEKOYA ASSEGID, BY DEED DATED JULY 31, 2017, RECORDED AMONG THE LAND RECORDS OF CARROLL COUNTY IN LIBER 8767, FOLLIO 49.

OWNER & DEVELOPER

TESFAYE MEKOYA ASSEGID
2239 BACHMAN VALLEY ROAD
MANCHESTER, MD 21102
PHONE NO. 202-706-4114

ENGINEER

I certify that this plan of Sediment Control is designed with my personal knowledge of the site condition and has been designed to the Standards and Specifications adopted by the Carroll Soil Conservation District.

05/05/2025 Engineer/Date

Engineer's Design Certification

I hereby certify that these plans have been designed according to Chapter 151 of the Code of Public Local Laws and Ordinances of Carroll County and I hereby certify that these documents were prepared or approved by me, and I am a duly licensed Professional Engineer or Professional Land Surveyor, as appropriate, under the laws of the State of Maryland.

Signed _____ Date 05/05/2025
License No. 48396 Expiration Date 01/15/2026

Developer's Certification

I hereby certify that all proposed work shown on these construction drawing(s) will be conducted in strict accordance with these plans. I also understand that it is my responsibility to have the construction supervised and certified, including the submittal of "as- Built" plans certified by a registered Professional Engineer or Professional Land Surveyor, as appropriate, within thirty (30) days of completion of work on the stormwater management facility/facilities. I also certify that this/these stormwater management facility/facilities will be inspected during construction by a registered Professional Engineer or Professional Land Surveyor, as appropriate, in accordance with Sections § 151.095 and § 151.096 of the Code of Public Local Laws and Ordinances of Carroll County.

Signed _____ Date 05/05/2025

Engineer's "As-Built" Certification

I hereby certify that the facility/facilities shown on this/these plan(s) was constructed as shown on the "As-Built" plans and meets the approved plans and specifications. I also certify that this/these facilities were inspected in accordance with Sections § 151.095 and § 151.096 of the Code of Public Local Laws and Ordinances of Carroll County and I hereby certify that these documents were prepared or approved by me, and I am a duly licensed Professional Engineer or Professional Land Surveyor, as appropriate, under the laws of the State of Maryland.

Signed _____ Date _____
License No. _____ Expiration Date _____

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT,
CONSULTING ENGINEERS
5120 WILLET BRIDGE ROAD,
BETHESDA MD 20816
TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

STATE OF MARYLAND — MELVIN A. BEVERLY — 48396 — REGISTERED PROFESSIONAL ENGINEER — 01/15/2026

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

COVER SHEET

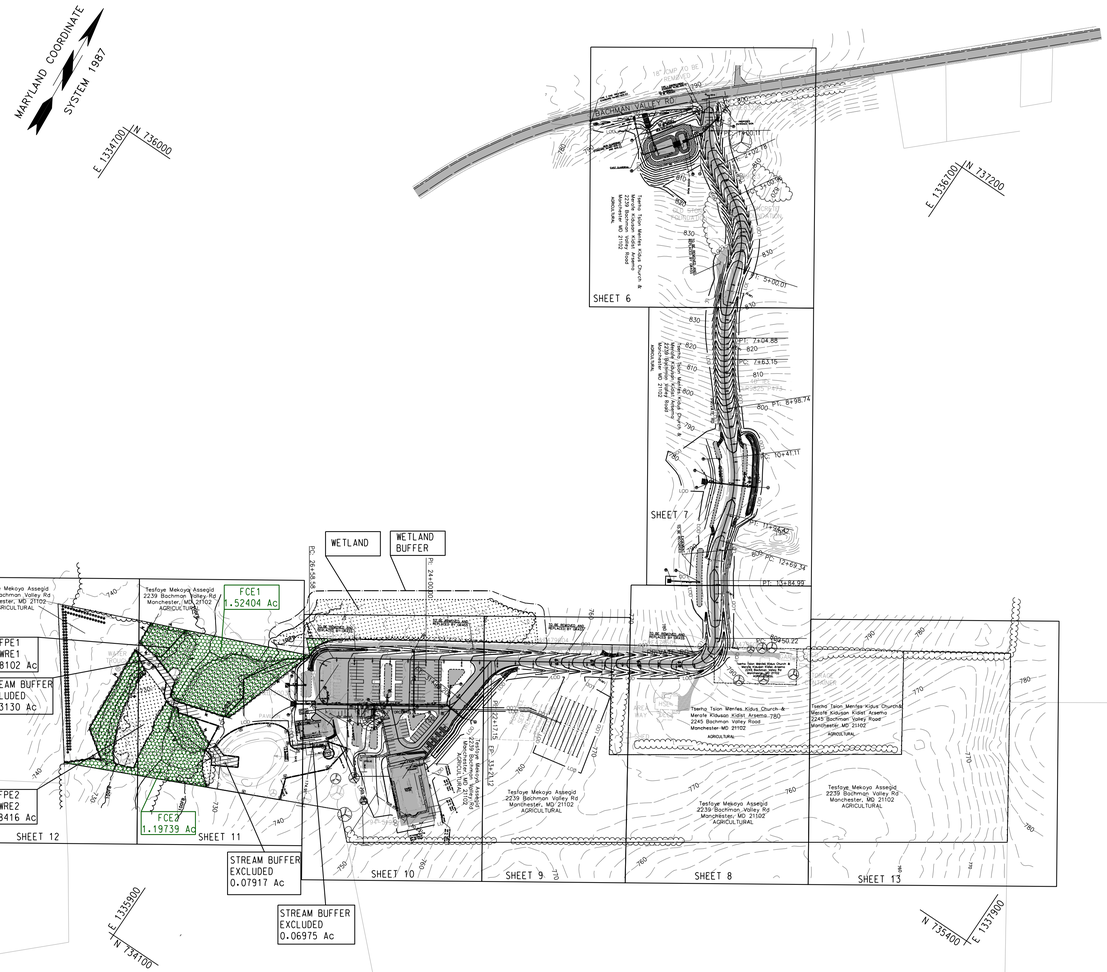
PROJECT ENG. M.B.
DESIGNED BY A.H.
CHECKED BY M.B.
DRAWN BY A.H.
PROJECT MGR. E.B.

PROGRAM MANAGER

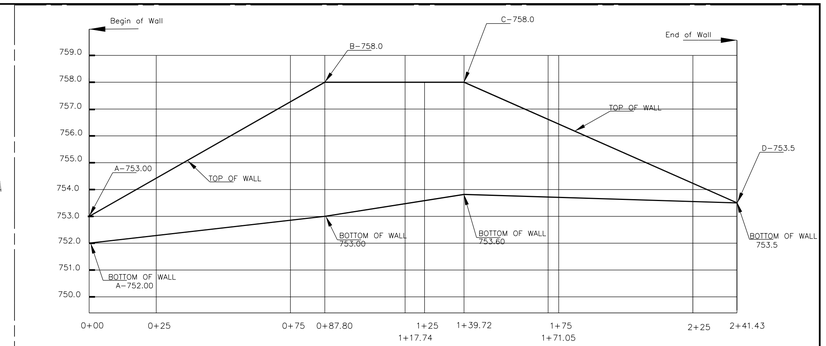
DATE 05/05/2025
FILE S-20-0030

LEGEND

- Edge of Road
- Edge of Shoulder
- Feature separation distance in feet
- Fenceline — X —
- Forest
- Guardrail
- Index Contours — 410 —
- Intermediate Contours
- Overhead Lines — OH —
- Plat Outline
- Right-Of-Way Line — ROW —
- Soil Type
- Storm Drain Line
- Stream
- Asphalt Pav.
- Concrete
- Wetlands
- Gravel
- Forest Conservation Easement
- I.Pin Set
- Clean Out
- Mail Box
- Sign
- Spring
- Structure
- Utility Pole
- Utility Pole w/Guy Wire
- Well
- Proposed Contour — 600 —
- Limit of Disturbance
- Conservation Area — C —
- 100-Yr Floodplain Boundary
- Asphalt Pav.
- SPOT ELEV. X= 763.0'
- REMOVE TREE

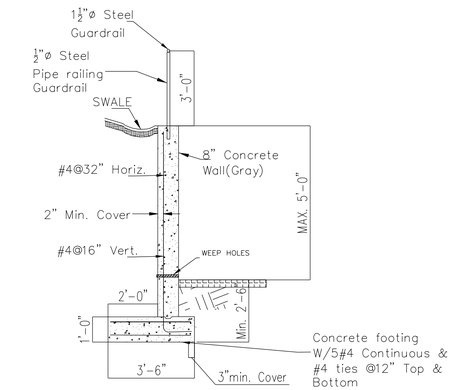


LOCATION MAP



RC RETAINING WALL PROFILE

SCALE: HORIZONTAL 1" = 20'
VERTICAL 1" = 2'



RETAINING WALL SECTION
SCALE: NTS

200' 0 200' 400'
GRAPHIC SCALE: 1"=200'

PROFESSIONAL CERTIFICATION
"I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland."
License Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT, 5120 WILLET BRIDGE ROAD, BETHESDA MD 20816
CONSULTING ENGINEERS
TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

STATE OF MARYLAND — 28395 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE
	REVISIONS		

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

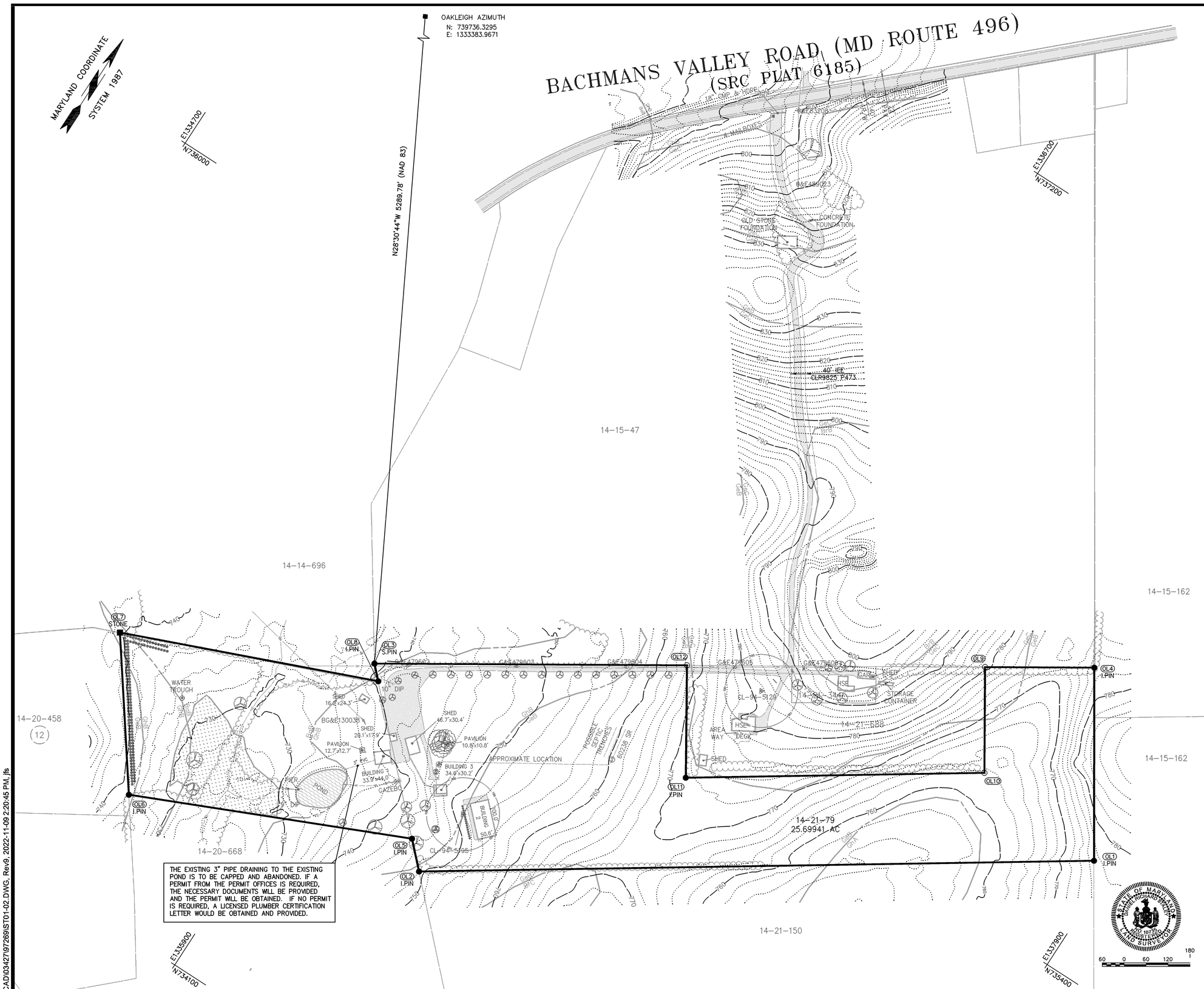
FINAL SITE DEVELOPMENT PLAN

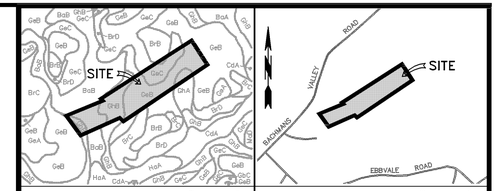
LOCATION MAP, AND RETAINING WALL SECTION & PROFILE

PROJECT ENG. M.B.
DESIGNED BY A.H.
CHECKED BY M.B.
DRAWN BY A.H.
PROJECT MGR. E.H.

PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030





SOILS MAP SCALE: 1"= 1320'

VICINITY MAP SCALE: 1"= 2000'

General Note

1. Current Title Reference:
   Map 14 Block 21 Parcel 79
   Owner: Tesfaye Mekoya Assegid
   County Land Record 8767 Page 49
   2017–July–31
   Grantor: Ms Sara Gebru and Ms Woleba Getachew
2. The topography shown hereon was field run by D.R.S. & Associates and supplemented with flown by Carroll County and based on Bare Earth LIDAR Data Spring 2006 NAD88 U.S.Feet.
3. The horizontal datum shown hereon is based on Maryland Coordinate System of 1987 U.S.Feet.

TOTAL AREA

Name	North	East	Bearing	Distance
OL1	735707.55	1337853.03		
OL2	734677.51	1336320.95	S 56°05'11"W	1846.14
OL5	734742.16	1336256.09	N 45°05'35"W	91.57
OL6	734421.40	1335541.15	S 65°50'11"W	783.60
OL7	734780.33	1335278.95	N 36°08'56"W	444.50
OL8	735053.17	1335944.07	N 67°41'45"E	718.91
OL3	735088.12	1335909.01	N 45°05'35"W	49.50
OL12	735549.42	1336628.35	N 57°19'42"E	854.55
OL11	735289.99	1336793.02	S 32°24'17"E	307.28
OL10	735746.08	1337470.68	N 56°03'29"E	816.85
OL9	735989.52	1337314.62	N 32°39'46"W	289.17
OL4	736150.89	1337566.26	N 57°19'42"E	298.94
OL1	735707.55	1337853.03	S 32°53'45"E	528.00

Total Area 1119466.20 sf 25.69941 acres +/–

Surveyor's Certification

I Hereby certify that these documents/plans were prepared and approved by me and that I am duly licensed land surveyor under the laws of the State of Maryland, Maryland License No.10735 Expiration Date 2026-01-18 2025-04-14

LEGEND

Edge of Rd
Edge of Shoulder
Feature separation distance in feet
Fenceline
Forest
Guardrail
Index Contours
Intermediate Contours
Overhead Lines
Plat Outline
Right-Of-Way Line
Soil Type
Storm Drain Line
Stream
Bit. Conc. Pav.
Concrete
Wetlands
Point ID
I.Pin Set
Clean Out
Mail Box
Sign
Spring
Structure
Utility Pole
Utility Pole w/Guy Wire
Well

ADJOINING PROPERTY OWNER INFORMATION

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14–14–696 06–069290 2128 Bachman Valley Rd Manchester 21102	Dell Matthew Lee 2401 Bachman Valley Rd Manchester MD 21102	CLR9649 P333	AGRICULTURAL

TOPOGRAPHICAL SURVEY
Tesfaye Mekoya Assegid
Property

ON BACHMANS VALLEY ROAD NEAR MANCHESTER
6TH ELECTION DISTRICT CARROLL COUNTY, MD.

OWNERS
Tesfaye Mekoya Assegid
2239 Bachman Valley Rd
Manchester, MD 21102
202–706–4114

D.R.S. & ASSOCIATES
LAND DESIGN CONSULTANTS
52 WINTERS STREET WESTMINSTER, MARYLAND 21157
410–848–4060 410–876–6040 F. 410–848–8818

REV.No.	DATE	BY	DESCRIPTION
1	2021-12-07	DRS/jfs	PER CCBDR 2021–10–18
2	2022–01–03	DRS/jfs	PER CLIENT 2021–12–22
3	2022–01–07	DRS/jfs	PER DRS 2021–01–07 CHANGE DRAWING SCALE
4	2022–02–17	DRS/jfs	PER CLIENT 2022–02–10
5	2022–02–23	DRS/jfs	UPDATE ADJOINER INFORMATION
6	2022–03–08	DRS/jfs	PER CLIENT 2022–03–05
7	2022–07–01	DRS/jfs	PER CLIENT 2022–06–27
8	2022–10–21	DRS/jfs	PER CLIENT 2022–10–18
9	2022–11–08	DRS/jfs	PER CLIENT 2022–11–07

DATE: 05/05/2025
SCALE: 1"=120'
SHT.NO. 3 OF 96
DWG.: ST01–02

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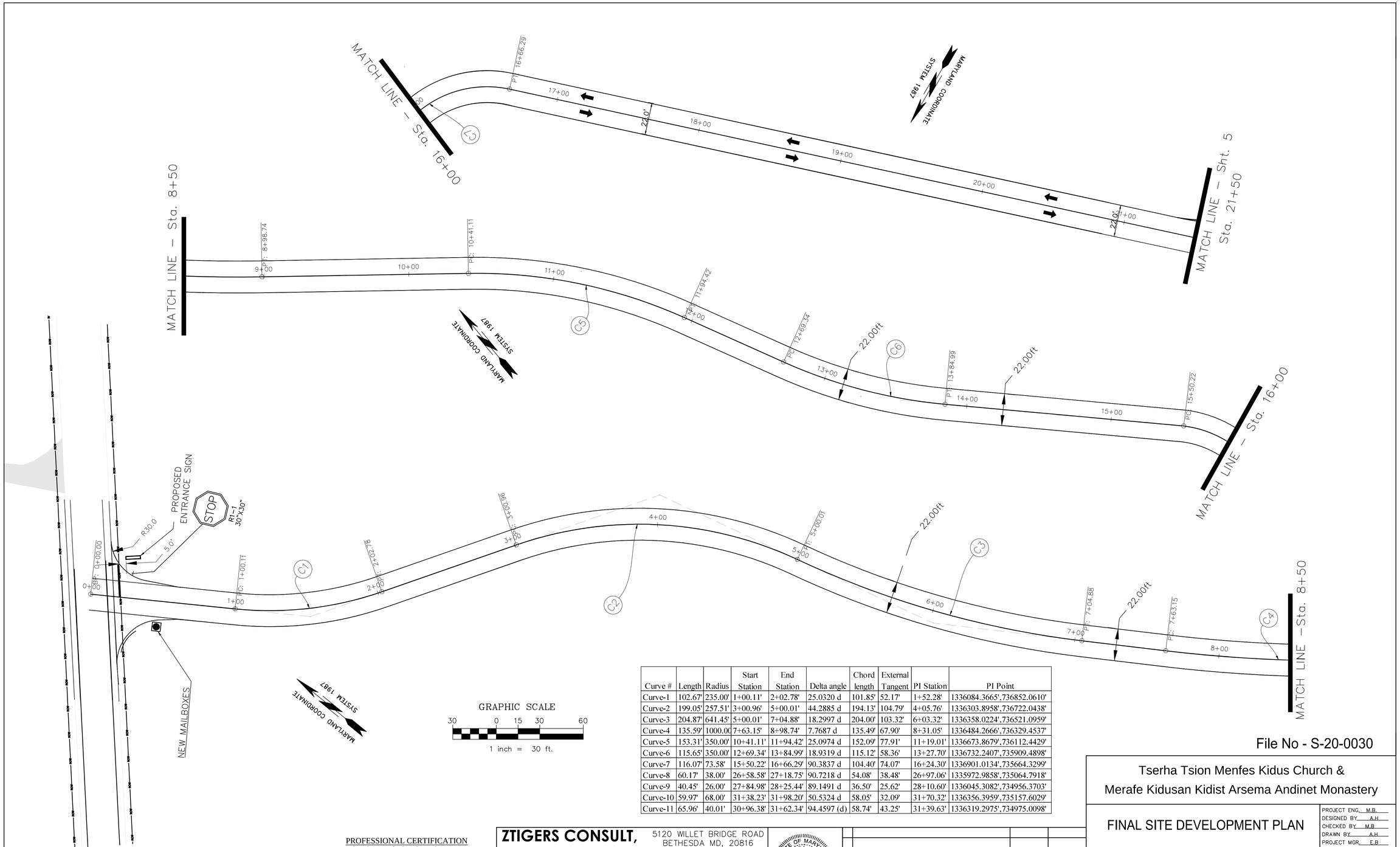
CaCoFile S–20–0030

STATE OF MARYLAND DONNIE RICHARD SWEITZER NO. 10735 REGISTERED LAND SURVEYOR

I:\CAD\03427\9726\ST01-02.DWG, Rev9, 2022-11-09 2:20:45 PM, jfs



Curve #	Length	Radius	Start Station	End Station	Delta angle	Chord length	External Tangent	PI Station	PI Point
Curve-1	102.67'	235.00'	1+00.11'	2+02.78'	25.0320 d	101.85'	52.17'	1+52.28'	1336084.3665',736852.0610'
Curve-2	199.05'	257.51'	3+00.96'	5+00.01'	44.2885 d	194.13'	104.79'	4+05.76'	1336303.8958',736722.0438'
Curve-3	204.87'	641.45'	5+00.01'	7+04.88'	18.2997 d	204.00'	103.32'	6+03.32'	1336358.0224',736521.0959'
Curve-4	135.59'	1000.00	7+63.15'	8+98.74'	7.7687 d	135.49'	67.90'	8+31.05'	1336484.2666',736329.4537'
Curve-5	153.31'	350.00'	10+41.11'	11+94.42'	25.0974 d	152.09'	77.91'	11+19.01'	1336673.8679',736112.4429'
Curve-6	115.65'	350.00'	12+69.34'	13+84.99'	18.9319 d	115.12'	58.36'	13+27.70'	1336732.2407',735909.4898'
Curve-7	116.07'	73.58'	15+50.22'	16+66.29'	90.3837 d	104.40'	74.07'	16+24.30'	1336901.0134',735664.3299'
Curve-8	60.17'	38.00'	26+58.58'	27+18.75'	90.7218 d	54.08'	38.48'	26+97.06'	1335972.9858',735064.7918'
Curve-9	40.45'	26.00'	27+84.98'	28+25.44'	89.1491 d	36.50'	25.62'	28+10.60'	1336045.3082',734956.3703'
Curve-10	59.97'	68.00'	31+38.23'	31+98.20'	50.5324 d	58.05'	32.09'	31+70.32'	1336356.3959',735157.6029'
Curve-11	65.96'	40.01'	30+96.38'	31+62.34'	94.4597 (d)	58.74'	43.25'	31+39.63'	1336319.2975',734975.0098'

File No - S-20-0030

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

GEOMETRY PLAN AND TRAFFIC SIGN–1

PROJECT ENG. M.B.
DESIGNED BY A.H
CHECKED BY M.B
DRAWN BY A.H
PROJECT MGR. E.B

PROGRAM MANAGER

DATE 05/05/2025
FILE NO – S–20–0030
SHEET 4 OF 96

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT,
CONSULTING ENGINEERS

5120 WILLET BRIDGE ROAD
BETHESDA MD, 20816

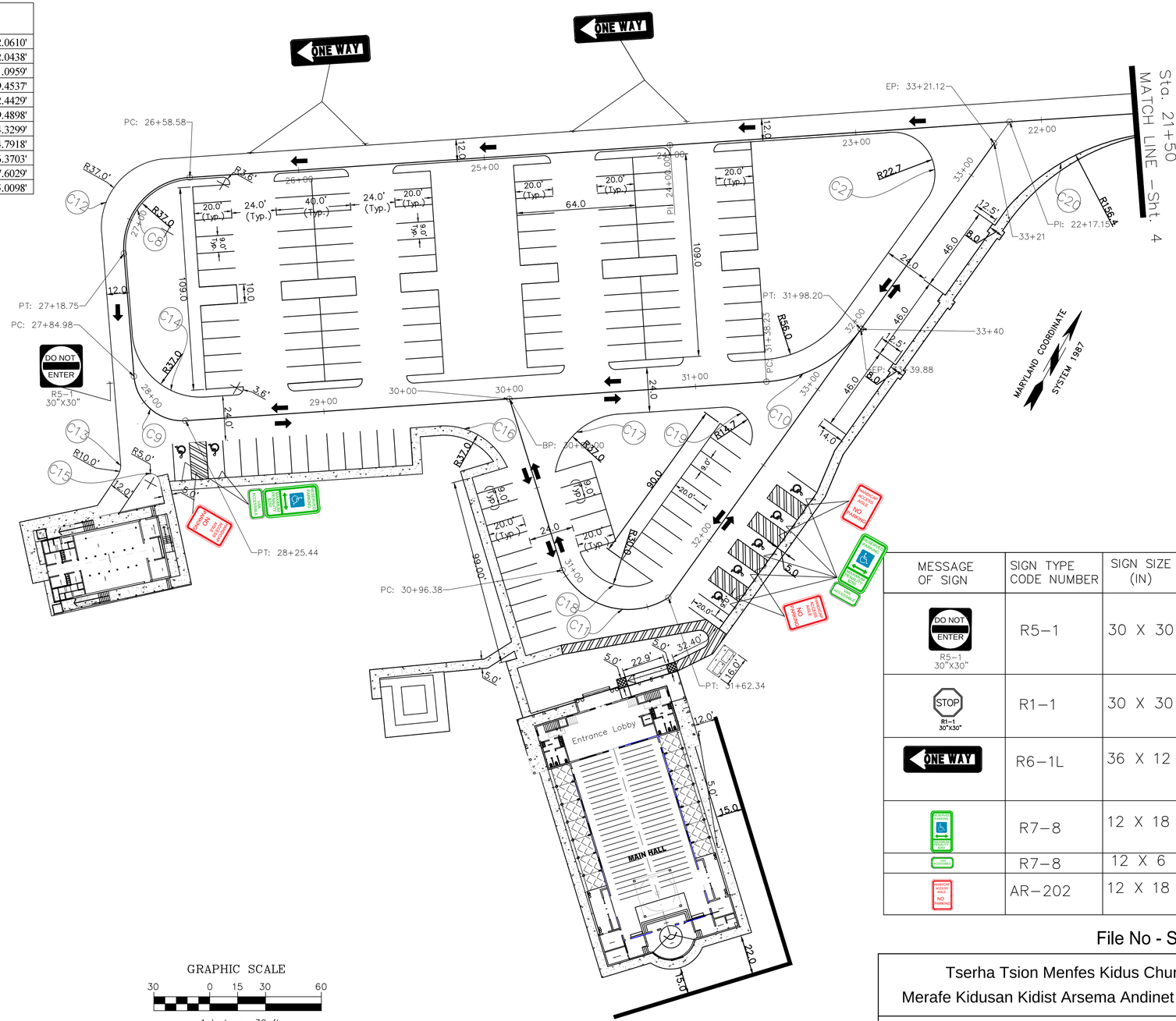
TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

NO	DESCRIPTION	NAME	DATE

REVISIONS

$DATE$

Curve #	Length	Radius	Start Station	End Station	Delta angle	Chord length	External Tangent	PI Station	PI Point
Curve-1	102.67'	235.00'	1+00.11'	2+02.78'	25.0320 d	101.85'	52.17'	1+52.28'	1336084.3665',736852.0610'
Curve-2	199.05'	257.51'	3+00.96'	5+00.01'	44.2885 d	194.13'	104.79'	4+05.76'	1336303.8958',736722.0438'
Curve-3	204.87'	641.45'	5+00.01'	7+04.88'	18.2997 d	204.00'	103.32'	6+03.32'	1336358.0224',736521.0959'
Curve-4	135.59'	1000.00	7+63.15'	8+98.74'	7.7687 d	135.49'	67.90'	8+31.05'	1336484.2666',736329.4537'
Curve-5	153.31'	350.00'	10+41.11'	11+94.42'	25.0974 d	152.09'	77.91'	11+19.01'	1336673.8679',736112.4429'
Curve-6	115.65'	350.00'	12+69.34'	13+84.99'	18.9319 d	115.12'	58.36'	13+27.70'	1336732.2407',735909.4898'
Curve-7	116.07'	73.58'	15+50.22'	16+66.29'	90.3837 d	104.40'	74.07'	16+24.30'	1336901.0134',735664.3299'
Curve-8	60.17'	38.00'	26+58.58'	27+18.75'	90.7218 d	54.08'	38.48'	26+97.06'	1335972.9858',735064.7918'
Curve-9	40.45'	26.00'	27+84.98'	28+25.44'	89.1491 d	36.50'	25.62'	28+10.60'	1336045.3082',734956.3703'
Curve-10	59.97'	68.00'	31+38.23'	31+98.20'	50.5324 d	58.05'	32.09'	31+70.32'	1336356.3959',735157.6029'
Curve-11	65.96'	40.01'	30+96.38'	31+62.34'	94.4597 (d)	58.74'	43.25'	31+39.63'	1336319.2975',734975.0098'



Curve #	Easting	Northing	Radius(ft)
Curve-12-1	1335989.13	735088.25	37
Curve-12-2	1335978.46	735036.63	
Curve-13-1	1336047.59	734933.10	10
Curve-13-2	1336049.24	734926.70	
Curve-14-1	1336061.76	734932.31	5
Curve-14-2	1336070.50	734935.18	
Curve-15-1	1336019.11	734997.18	37
Curve-15-1	1336070.53	734986.93	
Curve-16-1	1336187.53	735034.02	37
Curve-16-2	1336230.01	735032.40	
Curve-17-1	1336253.93	735042.67	37
Curve-17-2	1336268.59	735086.46	
Curve-18-1	1336290.00	735008.04	30
Curve-18-2	1336328.04	735016.81	
Curve-19-1	1336338.36	735106.21	14.7
Curve-19-2	1336315.69	735116.89	
Curve-20-1	1336398.00	735292.21	80
Curve-20-2	1336450.86	735361.00	
Curve-21-1	1336320.27	735288.15	22.7
Curve-21-2	1336357.32	735270.54	

GRAPHIC SCALE

30 0 15 30 60

1 inch = 30 ft.

MESSAGE OF SIGN	SIGN TYPE CODE NUMBER	SIGN SIZE (IN)	NO. OF SIGNS REQUIRED
DO NOT ENTER R5–1 30"X30"	R5–1	30 X 30	1
STOP R1–1 30"X30"	R1–1	30 X 30	1
ONE WAY	R6–1L	36 X 12	4
	R7–8	12 X 18	7
	R7–8	12 X 6	7
	AR–202	12 X 18	5

File No - S-20-0030

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

GEOMETRY PLAN AND TRAFFIC SIGN–2

PROJECT ENG. M.B.
DESIGNED BY A.H.
CHECKED BY M.B
DRAWN BY A.H.
PROJECT MGR. E.B

PROGRAM MANAGER

DATE 05/05/2025

FILE NO – S–20–0030

SHEET 5 OF 96

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT,
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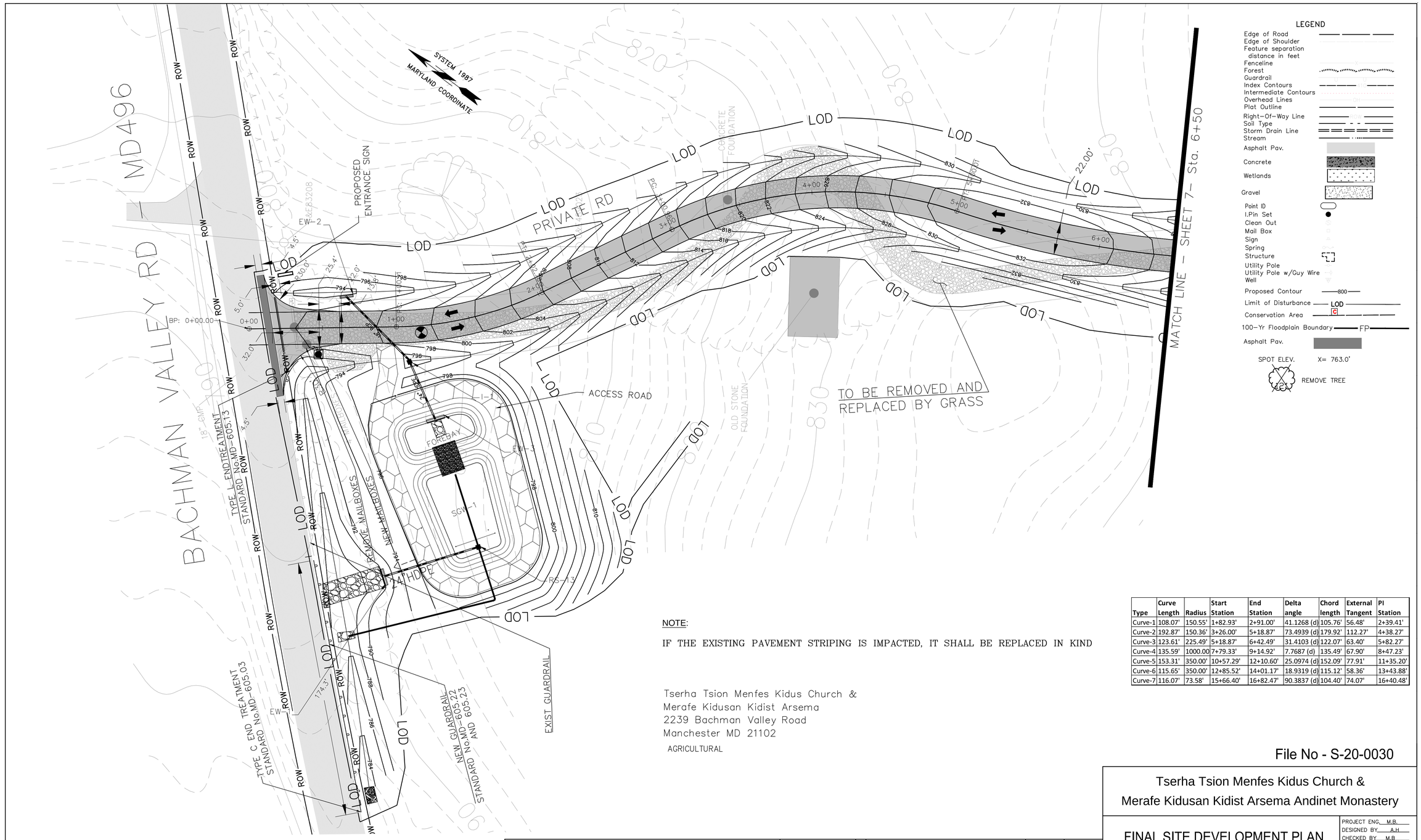
BETHESDA MD, 20816
TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

NO	DESCRIPTION	NAME	DATE

REVISIONS

$DATE$



Type	Curve Length	Radius	Start Station	End Station	Delta angle	Chord length	External Tangent	PI Station
Curve-1	108.07'	150.55'	1+82.93'	2+91.00'	41.1268 (d)	105.76'	56.48'	2+39.41'
Curve-2	192.87'	150.36'	3+26.00'	5+18.87'	73.4939 (d)	179.92'	112.27'	4+38.27'
Curve-3	123.61'	225.49'	5+18.87'	6+42.49'	31.4103 (d)	122.07'	63.40'	5+82.27'
Curve-4	135.59'	1000.00	7+79.33'	9+14.92'	7.7687 (d)	135.49'	67.90'	8+47.23'
Curve-5	153.31'	350.00'	10+57.29'	12+10.60'	25.0974 (d)	152.09'	77.91'	11+35.20'
Curve-6	115.65'	350.00'	12+85.52'	14+01.17'	18.9319 (d)	115.12'	58.36'	13+43.88'
Curve-7	116.07'	73.58'	15+66.40'	16+82.47'	90.3837 (d)	104.40'	74.07'	16+40.48'

NOTE:

IF THE EXISTING PAVEMENT STRIPING IS IMPACTED, IT SHALL BE REPLACED IN KIND

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema
2239 Bachman Valley Road
Manchester MD 21102
AGRICULTURAL

File No - S-20-0030

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

EXISTING & PROPOSED PAVING PLAN -1
STA. 0+00 To STA. 6+50

PROJECT ENG. M.B.
DESIGNED BY A.H.
CHECKED BY M.B.
DRAWN BY A.H.
PROJECT MGR. E.B.

PROGRAM MANAGER

DATE 05/05/2025
FILE NO - S-20-0030
SHEET 6 OF 96

GRAPHIC SCALE
30 0 15 30 60
1 inch = 30 ft.

$DATE$

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BETHESDA MD, 20816
TEL (202) 248 6000
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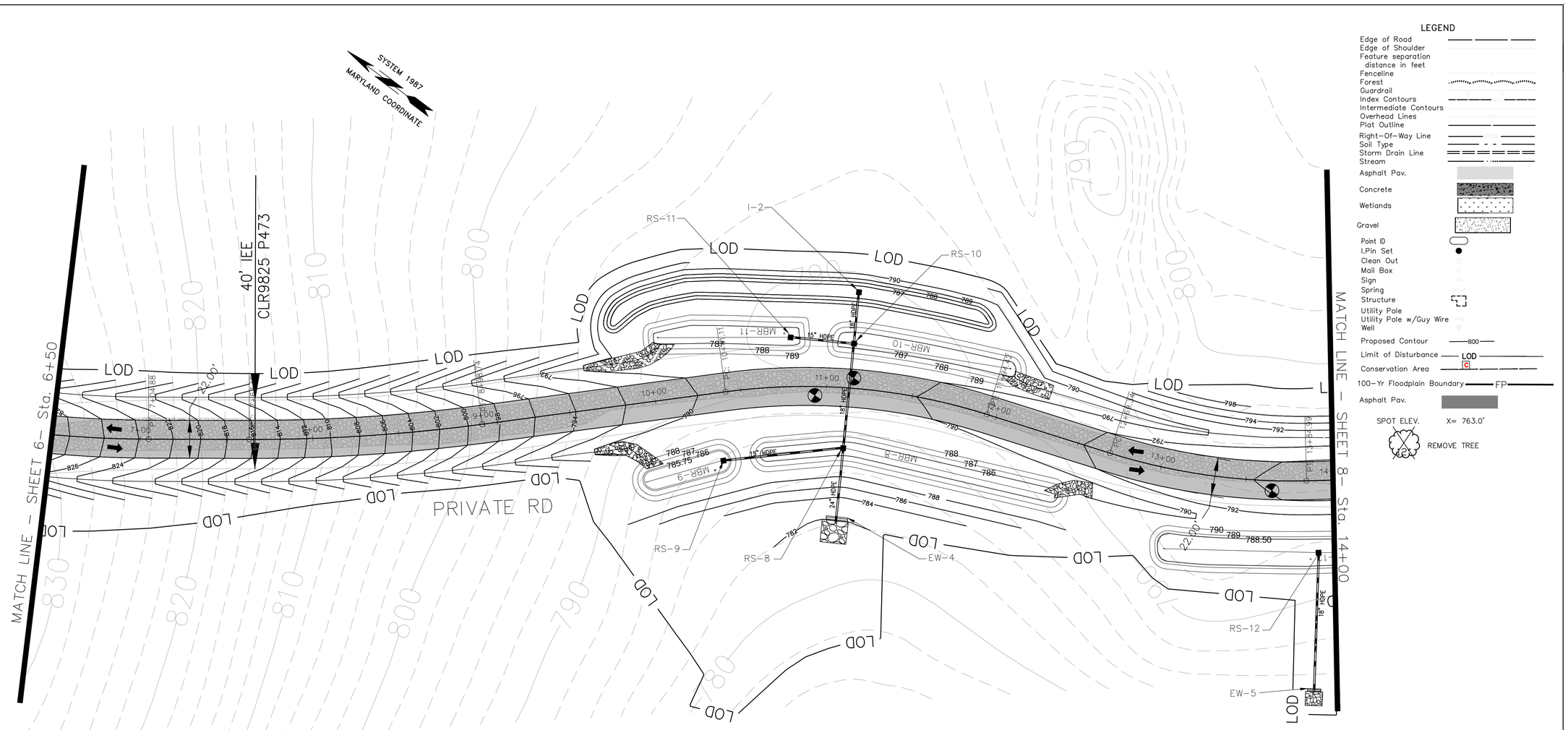
FAX (301) 500 0483
WWW.ZTIGERS.COM

NO	DESCRIPTION	NAME	DATE

REVISIONS



LEGEND

- Edge of Road
- Edge of Shoulder
- Feature separation distance in feet
- Fenceline
- Forest
- Guardrail
- Index Contours
- Intermediate Contours
- Overhead Lines
- Plat Outline
- Right–Of–Way Line
- Soil Type
- Storm Drain Line
- Stream
- Asphalt Pav.
- Concrete
- Wetlands
- Gravel
- Point ID
- I.Pin Set
- Clean Out
- Mail Box
- Sign
- Spring
- Structure
- Utility Pole
- Utility Pole w/Guy Wire
- Well
- Proposed Contour — 800
- Limit of Disturbance — LOD
- Conservation Area — C
- 100–Yr Floodplain Boundary — FP
- Asphalt Pav.
- SPOT ELEV. X= 763.0'
- REMOVE TREE

Type	Curve Length	Radius	Start Station	End Station	Delta angle	Chord length	External Tangent	PI Station
Curve-1	108.07'	150.55'	1+82.93'	2+91.00'	41.1268 (d)	105.76'	56.48'	2+39.41'
Curve-2	192.87'	150.36'	3+26.00'	5+18.87'	73.4939 (d)	179.92'	112.27'	4+38.27'
Curve-3	123.61'	225.49'	5+18.87'	6+42.49'	31.4103 (d)	122.07'	63.40'	5+82.27'
Curve-4	135.59'	1000.00	7+79.33'	9+14.92'	7.7687 (d)	135.49'	67.90'	8+47.23'
Curve-5	153.31'	350.00'	10+57.29'	12+10.60'	25.0974 (d)	152.09'	77.91'	11+35.20'
Curve-6	115.65'	350.00'	12+85.52'	14+01.17'	18.9319 (d)	115.12'	58.36'	13+43.88'
Curve-7	116.07'	73.58'	15+66.40'	16+82.47'	90.3837 (d)	104.40'	74.07'	16+40.48'

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema
2239 Bachman Valley Road
Manchester MD 21102
AGRICULTURAL

File No - S-20-0030

GRAPHIC SCALE
30 0 15 30 60
1 inch = 30 ft.

$DATE$

PROFESSIONAL CERTIFICATION
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License Number: 48396
Expiration Date: 01-15-2026

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TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

NO	DESCRIPTION	NAME	DATE

REVISIONS

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

EXISTING & PROPOSED PAVING PLAN –2
STA. 6+50 To STA. 14+00

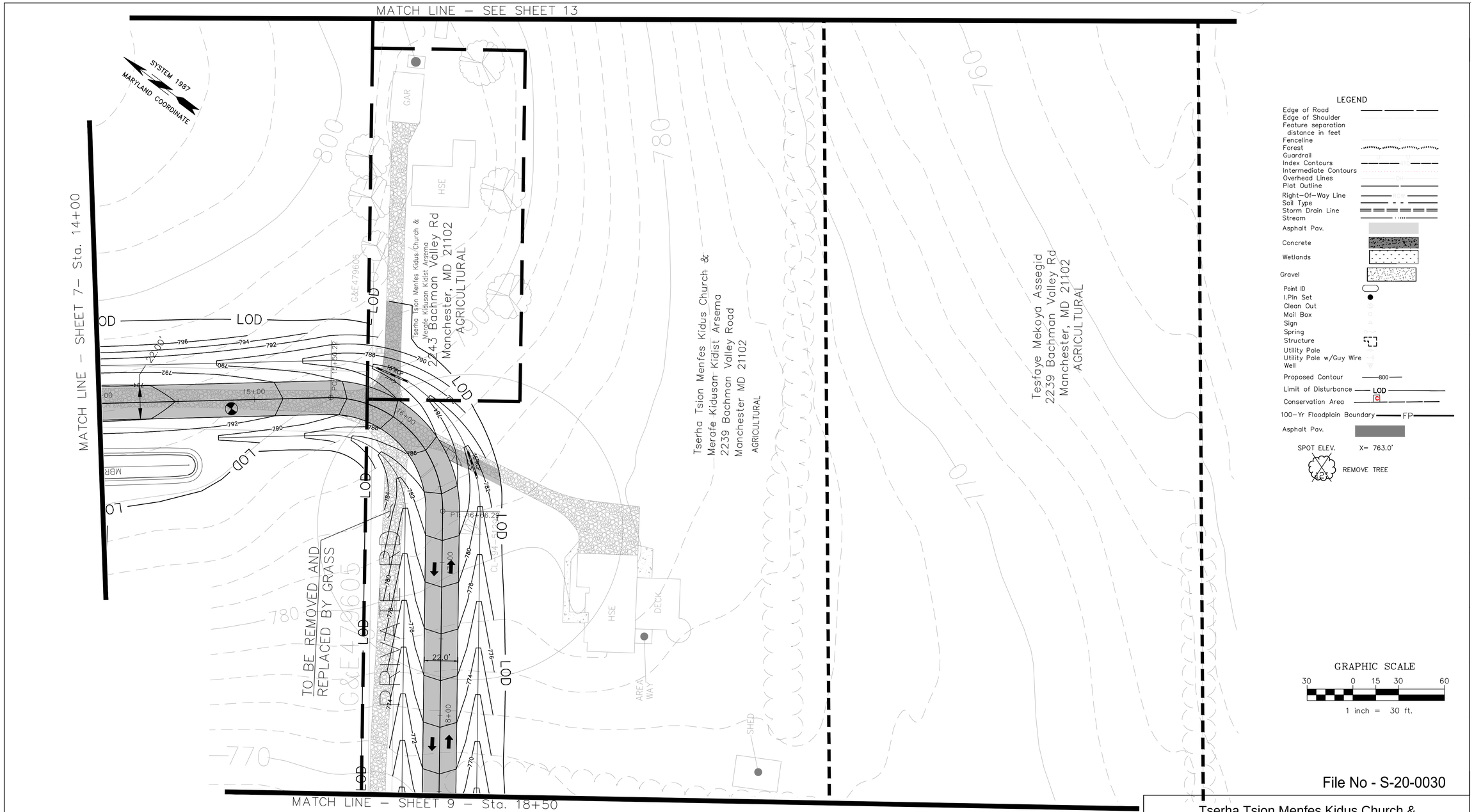
PROJECT ENG. M.B.
DESIGNED BY A.H
CHECKED BY M.B
DRAWN BY A.H
PROJECT MGR. E.B

PROGRAM MANAGER

DATE 05/05/2025

FILE NO – S–20–0030

SHEET 7 OF 96



File No - S-20-0030

Type	Curve Length	Radius	Start Station	End Station	Delta angle	Chord length	External Tangent	PI Station
Curve-1	108.07'	150.55'	1+82.93'	2+91.00'	41.1268 (d)	105.76'	56.48'	2+39.41'
Curve-2	192.87'	150.36'	3+26.00'	5+18.87'	73.4939 (d)	179.92'	112.27'	4+38.27'
Curve-3	123.61'	225.49'	5+18.87'	6+42.49'	31.4103 (d)	122.07'	63.40'	5+82.27'
Curve-4	135.59'	1000.00	7+79.33'	9+14.92'	7.7687 (d)	135.49'	67.90'	8+47.23'
Curve-5	153.31'	350.00'	10+57.29'	12+10.60'	25.0974 (d)	152.09'	77.91'	11+35.20'
Curve-6	115.65'	350.00'	12+85.52'	14+01.17'	18.9319 (d)	115.12'	58.36'	13+43.88'
Curve-7	116.07'	73.58'	15+66.40'	16+82.47'	90.3837 (d)	104.40'	74.07'	16+40.48'

PROFESSIONAL CERTIFICATION
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License Number: 48396
Expiration Date: 01-15-2026

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TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

STATE OF MARYLAND
MELMONT BEYENE
48396
PROFESSIONAL ENGINEER

NO	DESCRIPTION	NAME	DATE

REVISIONS

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

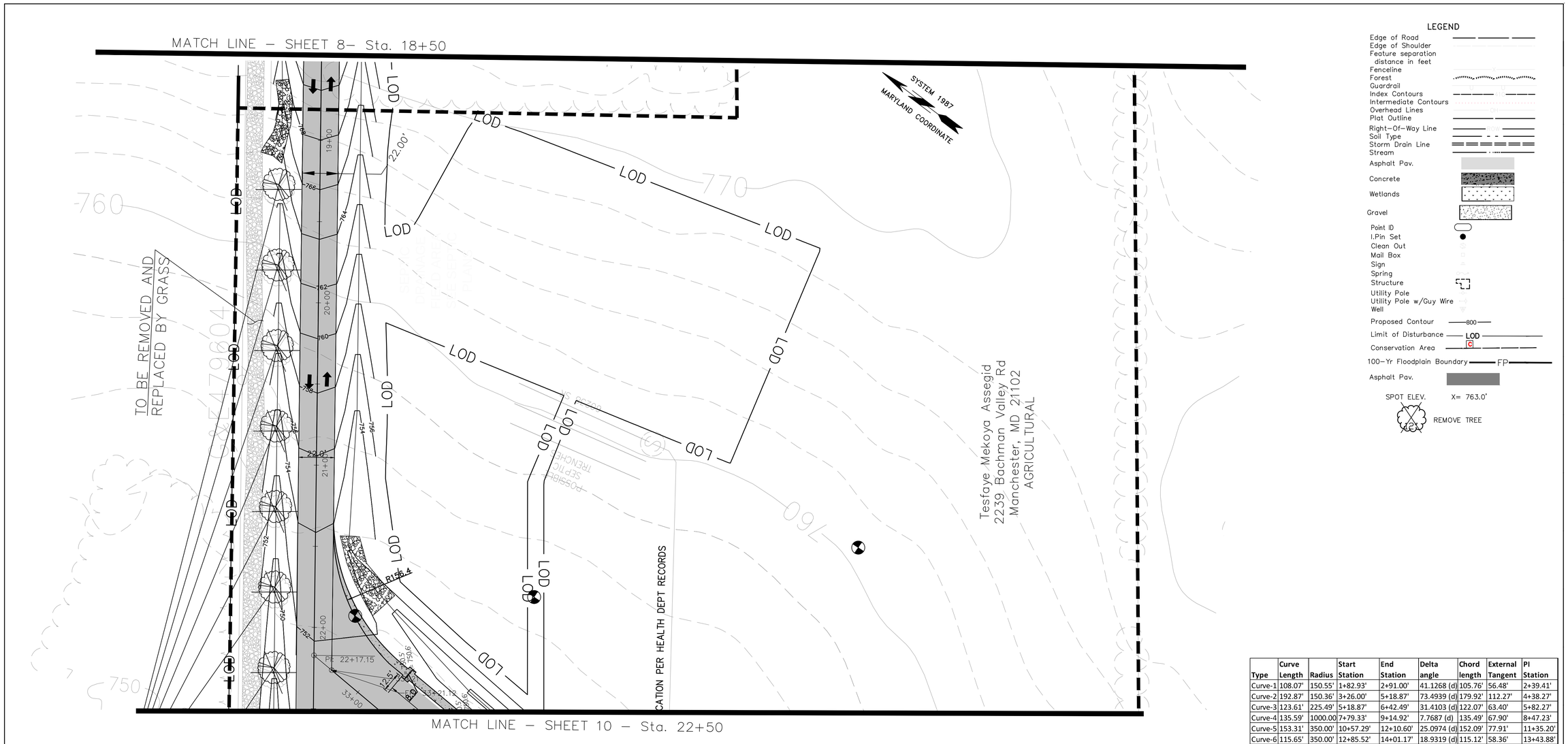
EXISTING & PROPOSED PAVING PLAN –3
STA. 14+00 To STA. 18+50

PROJECT ENG. M.B.
DESIGNED BY A.H
CHECKED BY M.B
DRAWN BY A.H
PROJECT MGR. E.B

PROGRAM MANAGER

DATE 05/05/2025
FILE NO – S-20-0030
SHEET 8 OF 96

$DATE$



LEGEND

- Edge of Road
- Edge of Shoulder
- Feature separation distance in feet
- Fenceline
- Forest
- Guardrail
- Index Contours
- Intermediate Contours
- Overhead Lines
- Plat Outline
- Right–Of–Way Line
- Soil Type
- Storm Drain Line
- Stream
- Asphalt Pav.
- Concrete
- Wetlands
- Gravel
- Point ID
- I.Pin Set
- Clean Out
- Mail Box
- Sign
- Spring
- Structure
- Utility Pole
- Utility Pole w/Guy Wire
- Well
- Proposed Contour 800
- Limit of Disturbance LOD
- Conservation Area C
- 100–Yr Floodplain Boundary FP
- Asphalt Pav.
- SPOT ELEV. X= 763.0'
- REMOVE TREE

Type	Curve Length	Radius	Start Station	End Station	Delta angle	Chord length	External Tangent	PI Station
Curve-1	108.07'	150.55'	1+82.93'	2+91.00'	41.1268 (d)	105.76'	56.48'	2+39.41'
Curve-2	192.87'	150.36'	3+26.00'	5+18.87'	73.4939 (d)	179.92'	112.27'	4+38.27'
Curve-3	123.61'	225.49'	5+18.87'	6+42.49'	31.4103 (d)	122.07'	63.40'	5+82.27'
Curve-4	135.59'	1000.00	7+79.33'	9+14.92'	7.7687 (d)	135.49'	67.90'	8+47.23'
Curve-5	153.31'	350.00'	10+57.29'	12+10.60'	25.0974 (d)	152.09'	77.91'	11+35.20'
Curve-6	115.65'	350.00'	12+85.52'	14+01.17'	18.9319 (d)	115.12'	58.36'	13+43.88'
Curve-7	116.07'	73.58'	15+66.40'	16+82.47'	90.3837 (d)	104.40'	74.07'	16+40.48'

File No - S-20-0030

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

EXISTING & PROPOSED PAVING PLAN –4
STA. 18+50 To STA. 22+50

PROJECT ENG. M.B.
DESIGNED BY A.H.
CHECKED BY M.B
DRAWN BY A.H.
PROJECT MGR. E.B

PROGRAM MANAGER

DATE 05/05/2025

FILE NO – S–20–0030

SHEET 9 OF 96

GRAPHIC SCALE
30 0 15 30 60
1 inch = 30 ft.

$DATE$

PROFESSIONAL CERTIFICATION
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License Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT,
CONSULTING ENGINEERS
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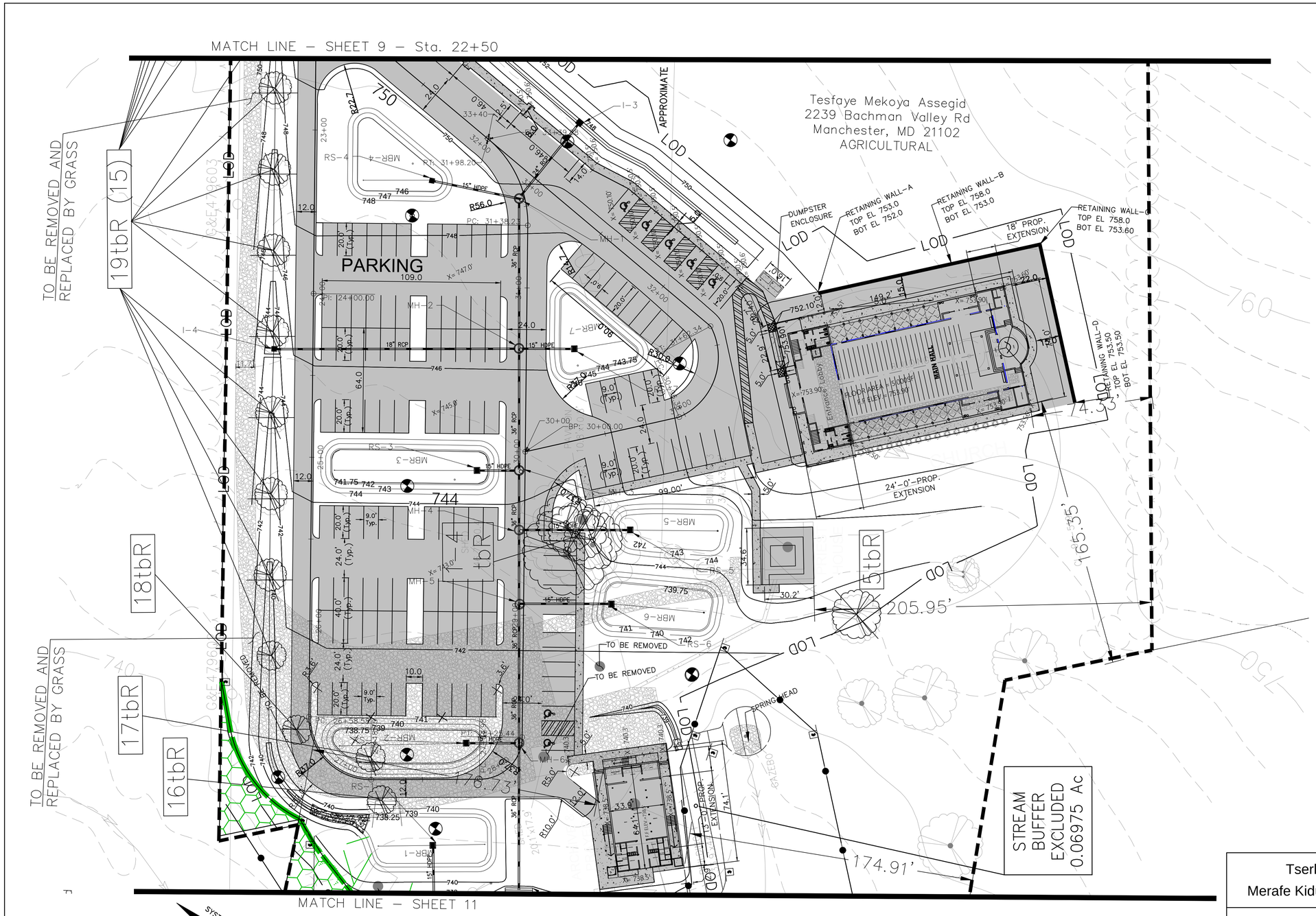
BETHESDA MD, 20816
TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

STATE OF MARYLAND — 48396 — PROFESSIONAL ENGINEER

NO	DESCRIPTION	NAME	DATE

REVISIONS



LEGEND

- Edge of Road
- Edge of Shoulder
- Feature separation distance in feet
- Fenceline
- Forest
- Guardrail
- Index Contours
- Intermediate Contours
- Overhead Lines
- Plat Outline
- Right-Of-Way Line
- Soil Type
- Storm Drain Line
- Stream
- Asphalt Pav.
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- Gravel
- Point ID
- I.Pin Set
- Clean Out
- Mail Box
- Sign
- Spring
- Structure
- Utility Pole
- Utility Pole w/Guy Wire
- Well
- Proposed Contour — 800
- Limit of Disturbance — LOD
- Conservation Area — C
- 100-Yr Floodplain Boundary — FP
- Asphalt Pav.
- SPOT ELEV. X= 763.0'
- REMOVE TREE

NOTE:

THE ULTIMATE EASEMENT WILL BE THE MAXIMUM OF THE WATER RESURCE BUFFER, THE 100-YEAR FLOODPLAIN BOUNDARY, THE FOREST CONSERVATION BOUNDARY, THE 25ft WETLAND BUFFER AND THE 50ft POND BUFFER

File No - S-20-0030

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

EXISTING & PROPOSED PAVING PLAN-5

PROJECT ENG. M.B.
DESIGNED BY A.H
CHECKED BY M.B
DRAWN BY A.H
PROJECT MGR. E.B

PROGRAM MANAGER

DATE 05/05/2025
FILE NO – S-20-0030
SHEET 10 OF 96

GRAPHIC SCALE
30 0 15 30 60
1 inch = 30 ft.

PROFESSIONAL CERTIFICATION
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License Number: 48396
Expiration Date: 01-15-2026

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CONSULTING ENGINEERS

5120 WILLET BRIDGE ROAD
BETHESDA MD, 20816

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FAX (301) 500 0483
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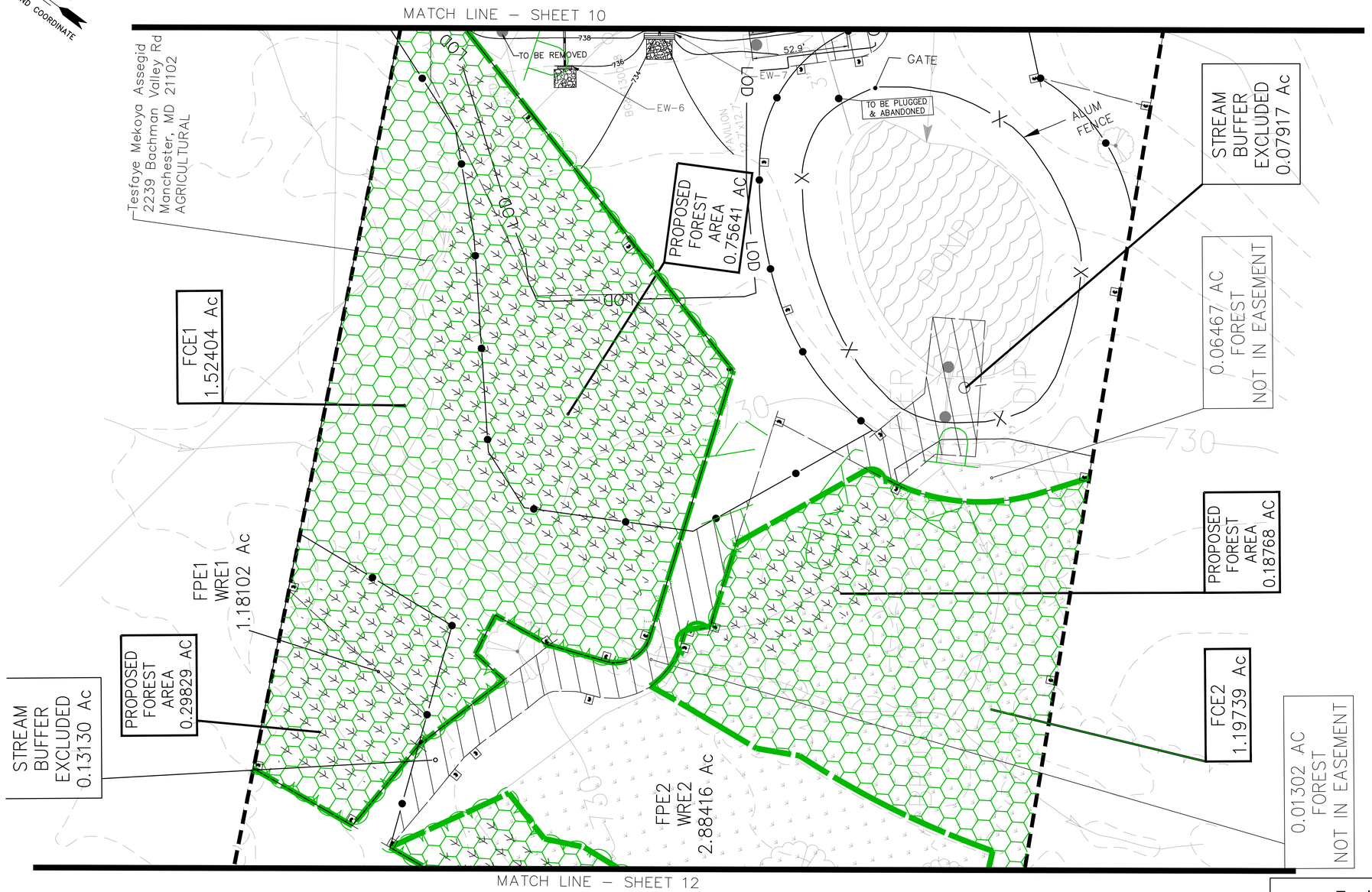
NO	DESCRIPTION	NAME	DATE
	REVISIONS		

$DATE$

SYSTEM 1987
MARYLAND COORDINATE



LEGEND

- Edge of Road
- Edge of Shoulder
- Feature separation distance in feet
- Fenceline
- Forest
- Guardrail
- Index Contours
- Intermediate Contours
- Overhead Lines
- Plat Outline
- Right-Of-Way Line
- Soil Type
- Storm Drain Line
- Stream
- Asphalt Pav.
- Concrete
- Wetlands
- Gravel
- Point ID
- I.Pin Set
- Clean Out
- Mail Box
- Sign
- Spring
- Structure
- Utility Pole
- Utility Pole w/Guy Wire
- Well
- Proposed Contour 800
- Limit of Disturbance LOD
- Conservation Area C
- 100-Yr Floodplain Boundary FP
- Asphalt Pav.
- SPOT ELEV. X= 763.0'
- REMOVE TREE

NOTE:

THE ULTIMATE EASEMENT WILL BE THE MAXIMUM OF THE WATER RESURCE BUFFER, THE 100-YEAR FLOODPLAIN BOUNDARY, THE FOREST CONSERVATION BOUNDARY, THE 25ft WETLAND BUFFER AND THE 50ft POND BUFFER

THE EXISTING 3" PIPE DRAINING TO THE EXISTING POND IS TO BE CAPPED AND ABANDONED. IF A PERMIT FROM THE PERMIT OFFICES IS REQUIRED, THE NECESSARY DOCUMENTS WILL BE PROVIDED AND THE PERMIT WILL BE OBTAINED. IF NO PERMIT IS REQUIRED, A LICENSED PLUMBER CERTIFICATION LETTER WOULD BE OBTAINED AND PROVIDED.

File No - S-20-0030

GRAPHIC SCALE
30 0 15 30 60
1 inch = 30 ft.

$DATE$

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 Number: 48396
Expiration Date: 01-15-2026

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CONSULTING ENGINEERS
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BETHESDA MD, 20816
TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

NO	DESCRIPTION	NAME	DATE

REVISIONS

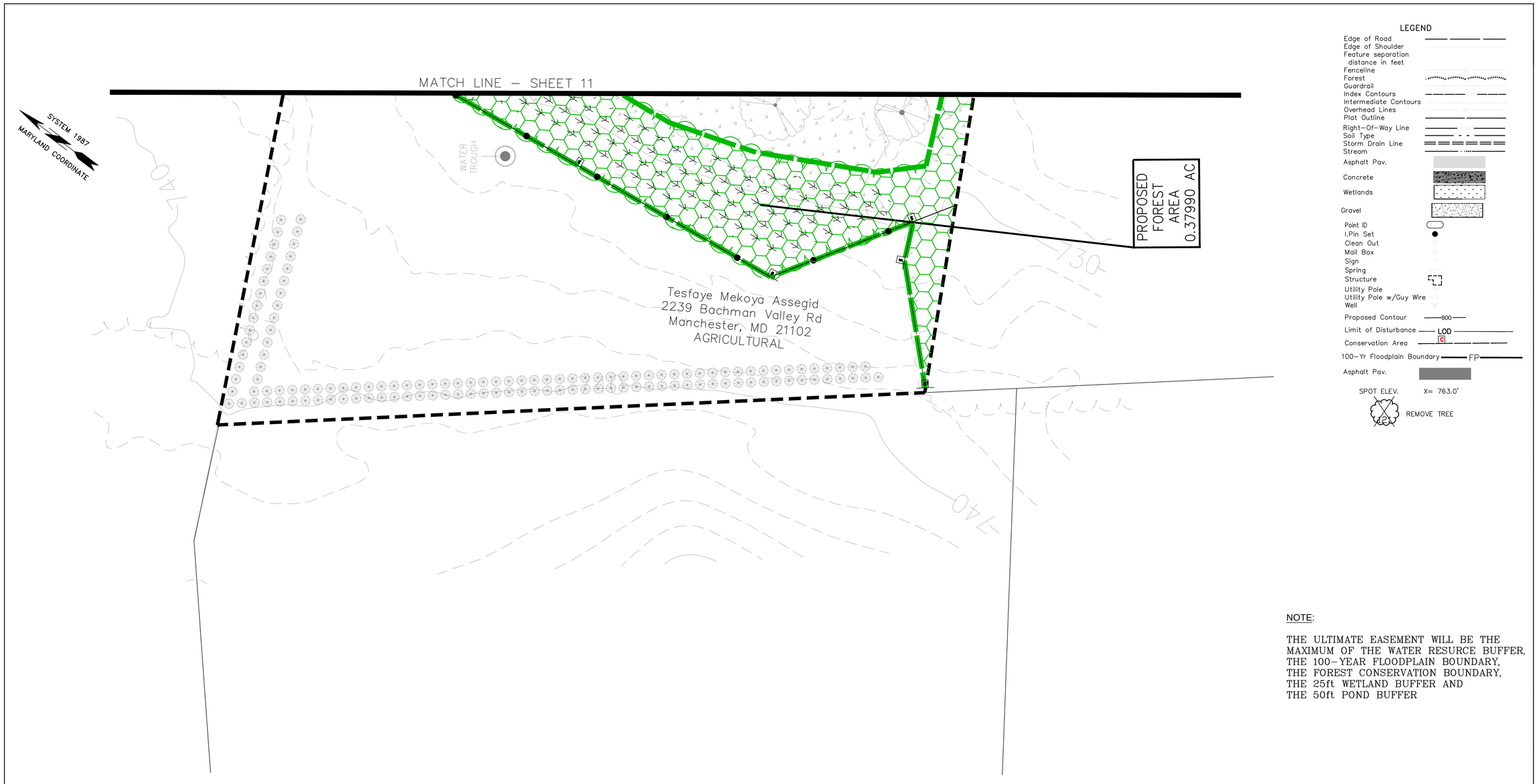
Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

PROJECT ENG. M.B.
DESIGNED BY A.H.
CHECKED BY M.B.
DRAWN BY A.H.
PROJECT MGR. E.B.

EXISTING & PROPOSED PAVING PLAN-6

PROGRAM MANAGER
DATE 05/05/2025
FILE NO - S-20-0030
SHEET 11 OF 96



LEGEND

- Edge of Road
- Edge of Shoulder
- Feature separation distance in feet
- Fenceline
- Forest
- Guardrail
- Index Contours
- Intermediate Contours
- Overhead Lines
- Plat Outline
- Right-Of-Way Line
- Soil Type
- Storm Drain Line
- Stream
- Asphalt Pav.
- Concrete
- Wetlands
- Gravel
- Point ID
- I.Pin Set
- Clean Out
- Mail Box
- Sign
- Spring
- Structure
- Utility Pole
- Utility Pole w/Guy Wire
- Well
- Proposed Contour 800
- Limit of Disturbance LOD
- Conservation Area C
- 100-Yr Floodplain Boundary FP
- Asphalt Pav.
- SPOT ELEV. X= 763.0'
- REMOVE TREE

NOTE:

THE ULTIMATE EASEMENT WILL BE THE MAXIMUM OF THE WATER RESURCE BUFFER, THE 100-YEAR FLOODPLAIN BOUNDARY, THE FOREST CONSERVATION BOUNDARY, THE 25ft WETLAND BUFFER AND THE 50ft POND BUFFER

GRAPHIC SCALE

30 0 15 30 60

1 inch = 30 ft.

$DATE$

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NO	DESCRIPTION	NAME	DATE

REVISIONS

File No - S-20-0030

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

EXISTING & PROPOSED PAVING PLAN-7

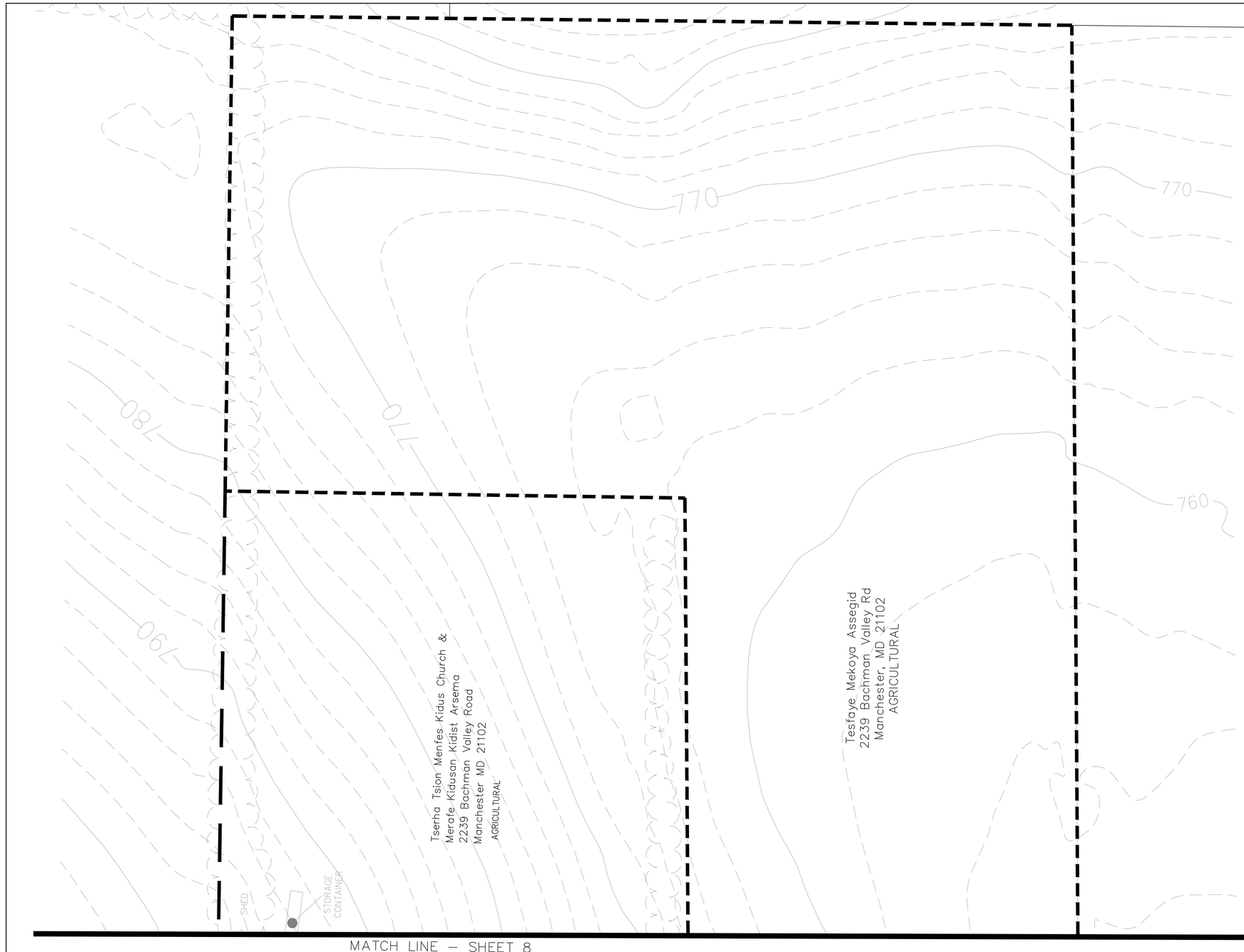
PROJECT ENG. M.B.
DESIGNED BY A.H.
CHECKED BY M.B
DRAWN BY A.H.
PROJECT MGR. E.B

PROGRAM MANAGER

DATE 05/05/2025

FILE NO - S-20-0030

SHEET 12 OF 96



LEGEND

- Edge of Road
- Edge of Shoulder
- Feature separation distance in feet
- Fenceline
- Forest
- Guardrail
- Index Contours
- Intermediate Contours
- Overhead Lines
- Plat Outline
- Right-Of-Way Line
- Soil Type
- Storm Drain Line
- Stream
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- Concrete
- Wetlands
- Gravel
- Point ID
- I.Pin Set
- Clean Out
- Mail Box
- Sign
- Spring
- Structure
- Utility Pole
- Utility Pole w/Guy Wire
- Well
- Proposed Contour 800
- Limit of Disturbance LOD
- Conservation Area C
- 100-Yr Floodplain Boundary FP
- Asphalt Pav.
- SPOT ELEV. X= 763.0'
- REMOVE TREE

No work on this sheet. This page is intended to show continuation of property boundary from plan sheet 8.

GRAPHIC SCALE
30 0 15 30 60
1 inch = 30 ft.

$DATE$

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NO	DESCRIPTION	NAME	DATE

REVISIONS

File No - S-20-0030

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

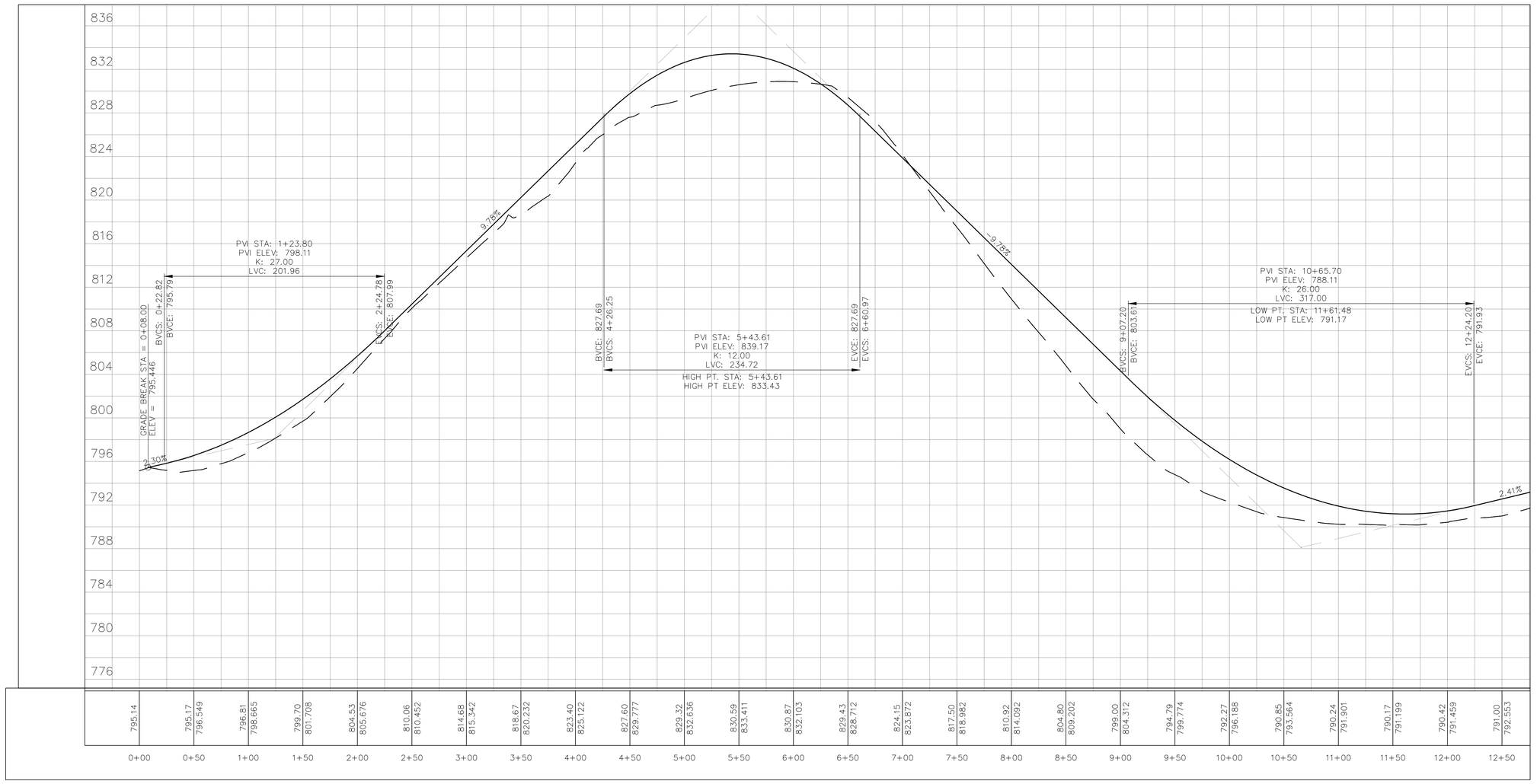
FINAL SITE DEVELOPMENT PLAN

EXISTING & PROPOSED PAVING PLAN-8

PROJECT ENG. M.B.
DESIGNED BY A.H
CHECKED BY M.B.
DRAWN BY A.H.
PROJECT MGR. E.B

PROGRAM MANAGER

DATE 05/05/2025
FILE NO - S-20-0030
SHEET 13 OF 96



VERTICAL PROFILE

File No - S-20-0030

HORIZONTAL SCALE

50 0 25 50 100

1 inch = 50 ft.

VERTICAL SCALE

10 0 5 10 20

1 inch = 5 ft.

$DATE$

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NO	DESCRIPTION	NAME	DATE

REVISIONS

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

EXISTING & PROPOSED VERTICAL PROFILE – 1

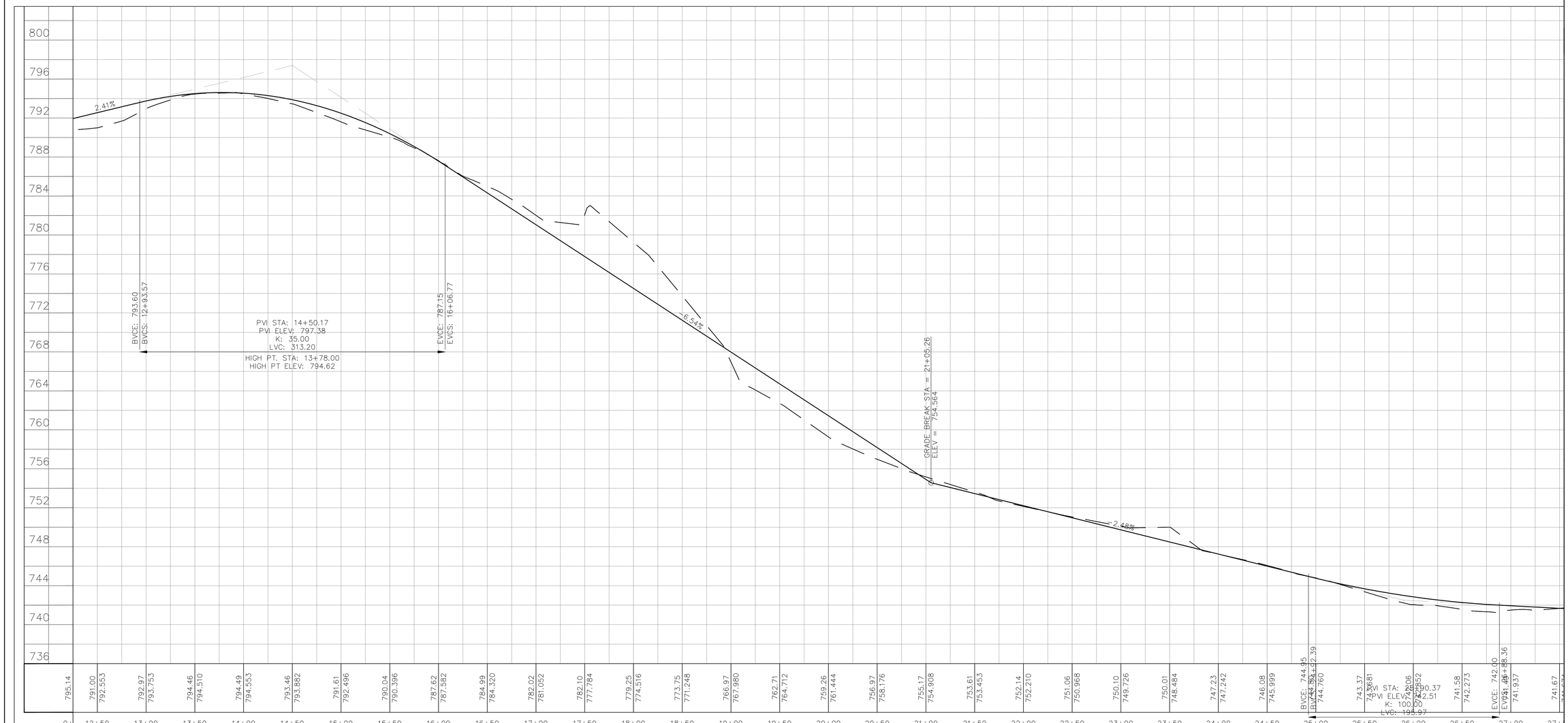
PROJECT ENG. M.B.
DESIGNED BY A.H.
CHECKED BY M.B.
DRAWN BY A.H.
PROJECT MGR. E.B.

PROGRAM MANAGER

DATE 05/05/2025

FILE NO – S-20-0030

SHEET 14 OF 96



VERTICAL PROFILE

HORIZONTAL SCALE

50 0 25 50 100

1 inch = 50 ft.

VERTICAL SCALE

10 0 5 10 20

1 inch = 5 ft.

$DATE$

PROFESSIONAL CERTIFICATION
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NO.	DESCRIPTION	NAME	DATE

REVISIONS

File No - S-20-0030

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

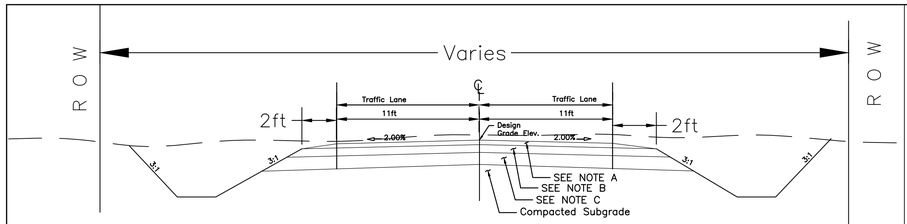
FINAL SITE DEVELOPMENT PLAN

EXISTING & PROPOSED VERTICAL PROFILE – 2

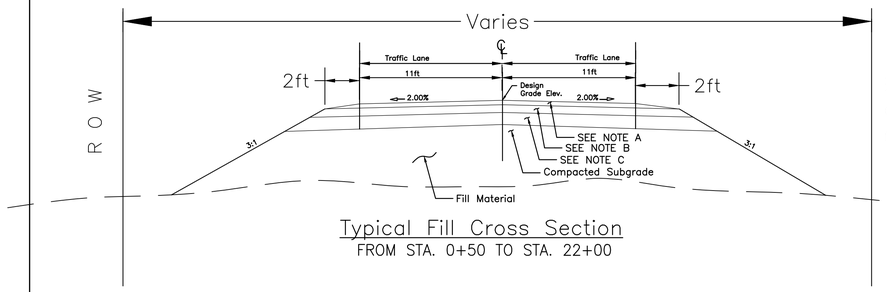
PROJECT ENG. M.B.
DESIGNED BY A.H
CHECKED BY M.B.
DRAWN BY A.H
PROJECT MGR. E.B

PROGRAM MANAGER

DATE 05/05/2025
FILE NO – S–20–0030
SHEET 15 OF 96



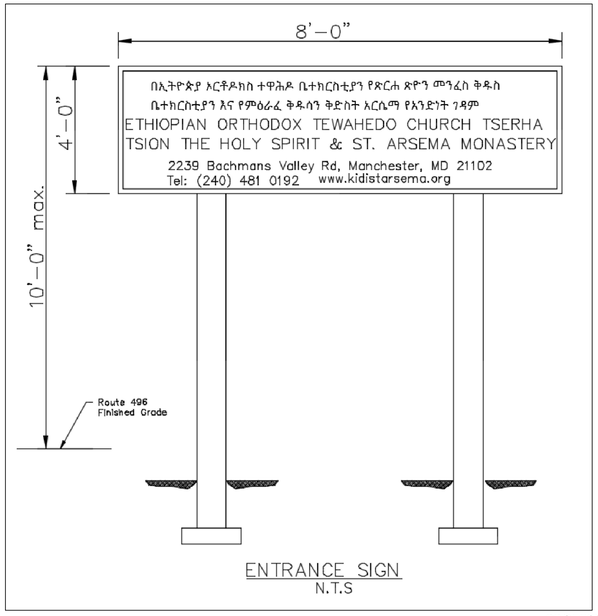
Typical Cut Cross Section
FROM STA. 0+50 TO STA. 22+00



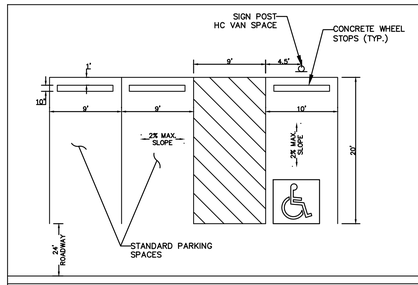
Typical Fill Cross Section
FROM STA. 0+50 TO STA. 22+00

NOTE:

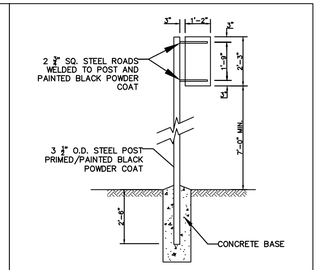
A) 1.5"Superpave Asphalt Mix 9.5mm for Surface –PG 64S–22, Level 2
B) 6"Superpave Asphalt Mix 19.0mm for Base –PG 64S–22, Level 2 (Two 3"lifts)
C) 6"Graded Aggregate Base



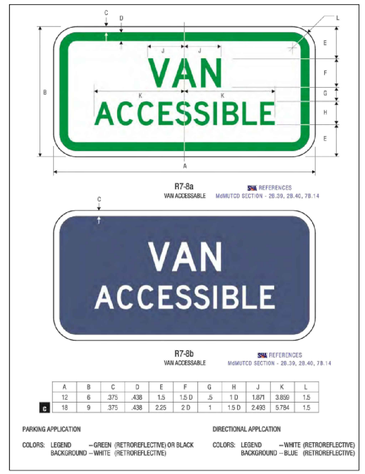
ENTRANCE SIGN
N.T.S



1 TYPICAL HANDICAP & REGULAR PARKING NOT TO SCALE



2 SIGN POST DETAIL NOT TO SCALE



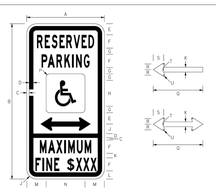
R7-8a
VAN ACCESSIBLE
SHA REFERENCES
MdMUTCD SECTION - 2B.39, 2B.40, 7B.14

R7-8b
VAN ACCESSIBLE
SHA REFERENCES
MdMUTCD SECTION - 2B.39, 2B.40, 7B.14

	A	B	C	D	E	F	G	H	J	K	L
	12	6	.375	.438	1.5	1.5 D	.5	1 D	1.871	3.859	1.5
B	18	9	.375	.438	2.25	2 D	1	1.5 D	2.493	5.784	1.5

PARKING APPLICATION
COLORS: LEGEND –GREEN (RETROREFLECTIVE) OR BLACK
BACKGROUND – WHITE (RETROREFLECTIVE)

DIRECTIONAL APPLICATION
COLORS: LEGEND –WHITE (RETROREFLECTIVE)
BACKGROUND – BLUE (RETROREFLECTIVE)



NOTES:
1. ARROW MAY BE REMOVED IF NECESSARY.
2. FOR SYMBOL DESIGN REFER TO THE APPENDIX-GRID SECTION FROM FHWA'S STANDARD HIGHWAY SIGNS BOOK-APPENDIX SECTION.

SIGN SIZE	DIMENSIONS (INCHES) A	B	C	D	E	F	G	H	J	K
STD	12	24	3/8	5/8	1-3/4	28	1	4	1-1/2	3/4

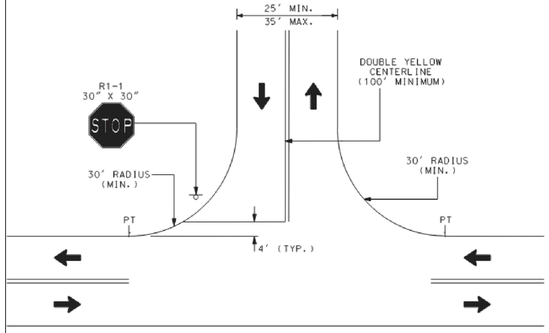
SIGN SIZE	DIMENSIONS (INCHES) L	M	N	P	Q	R	S	T	U
STD	1-1/4	3	6	1/2	7-1/16	7/8	1-5/8	1/8	9/64

REFERENCES
MdMUTCD SECTION - 2B.39, 2B.40, 2B.41, 7B.14

COLORS
LEGEND - GREEN
BACKGROUND - WHITE
HANDICAP INLAY - WHITE ON BLUE

APPROVED Two Wide signature on File
DIRECTOR – OFFICE OF TRAFFIC AND SAFETY

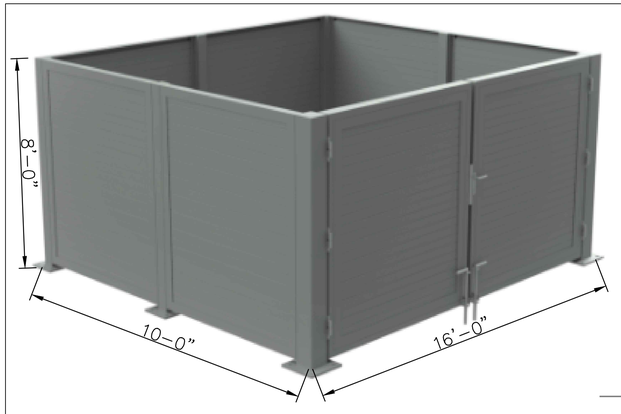
Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
MARYLAND STANDARD HIGHWAY SIGNS
RESERVED PARKING (HANDICAP SYMBOL)
MAXIMUM FINE $XXX
SIGN NUMBER R7-8(3)



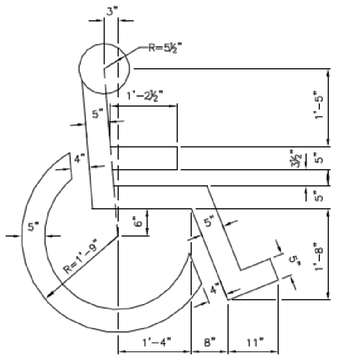
NOTES:
1. MINIMUM CHANNELIZATION IS SHOWN.
2. TURNING LANES ARE NOT SHOWN.
3. REFER TO 11.0 FOR ENTRANCE DESIGN STANDARDS.

COMMERCIAL
TWO-WAY ENTRANCE
ENGINEERING ACCESS PERMITS

ONSITE PARKING PAVEMENT DETAIL
NOT TO SCALE



GRAY DUMPSTER ENCLOSURE
N.T.S



L–29, L–29T
DISABLED PERSON SYMBOL

File No - S-20-0030

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

PROJECT ENG. M.B.
DESIGNED BY A.H.
CHECKED BY M.B.
DRAWN BY A.H.
PROJECT MGR. E.B.

TYPICAL ROAD SECTION AND MISC. DETAILS

PROGRAM MANAGER
DATE 05/05/2025
FILE NO – S–20–0030
SHEET 16 OF 96

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FAX (301) 500 0483
WWW.ZTIGERS.COM

STATE OF MARYLAND
48396
PROFESSIONAL ENGINEER
MEZMUR A. BEYENE

NO	DESCRIPTION	NAME	DATE

REVISIONS

$DATE$

MARYLAND COORDINATE SYSTEM 1987

N 735260
E 1336000

N 735260
E 1336510

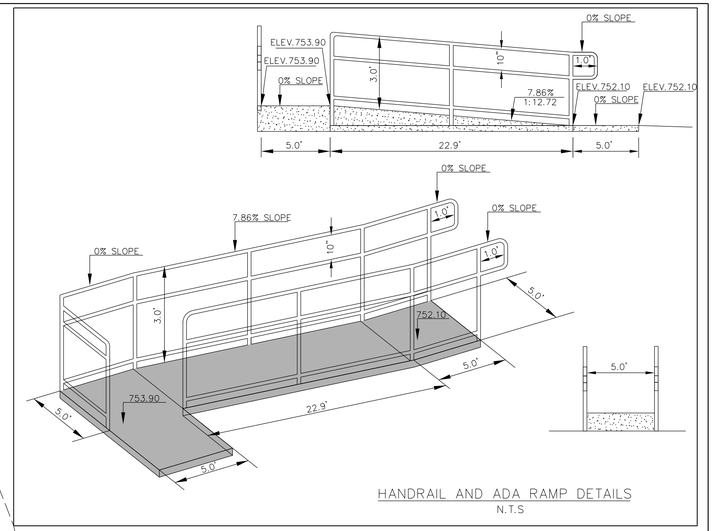
E 1335990
N 734810

E 1336510
N 734810

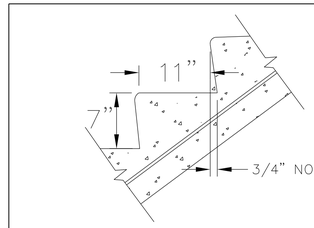
MBR-1 738.25 740.25 738.25
MBR-2 740.25 742.25 740.25
MBR-3 742.75 744.75 742.75
MBR-4 746.47 748.47 746.47
MBR-5 744.00 746.00 744.00
MBR-6 740.00 742.00 740.00
MBR-7 744.75 746.75 744.75

Entrance Lobby
MAIN HALL
1st FLR. ELEV.=753.90'
752.10
753.90
RETAINING WALL-A TOP EL 753.0 BOT EL 752.0
RETAINING WALL-B TOP EL 758.0 BOT EL 753.0
RETAINING WALL-C TOP EL 758.0 BOT EL 753.6
RETAINING WALL-D TOP EL 753.50 BOT EL 753.50

HANDICAP ACCESS AISLE NO PARKING
RESERVED PARKING HANDICAP PENALTY $250 VAN ACCESSIBLE
HANDICAP ACCESS AISLE NO PARKING
PARKING ON ONE SIDE ONLY
RESERVED PARKING HANDICAP PENALTY $250 VAN ACCESSIBLE



HANDRAIL AND ADA RAMP DETAILS
N.T.S



STAIR DETAIL
NTS

SLOPES ALONG THE SIDEWALK AND RAMP PATHS INTERCONNECTING BUILDINGS

FROM	ELEV.	TO	ELEV.	LENGTH	SLOPE	REMARK
1	740.30	2	742.00	68	3.38%	FLATTER THAN 1:20
2	742.00	3	743.50	68	2.21%	FLATTER THAN 1:20
3	743.50	4	743.50	20	0.00%	FLATTER THAN 1:20
4	743.50	5	744.00	37	1.35%	FLATTER THAN 1:20
5	744.00	6	744.50	16	3.13%	FLATTER THAN 1:20
6	744.50	7	744.90	19	2.11%	FLATTER THAN 1:20
7	744.90	8	746.00	22	5.00%	1:20
8	746.00	9	748.00	40	5.00%	1:20
9	748.00	10	750.15	43	5.00%	1:20
10	750.15	11	750.15	21	0.00%	FLATTER THAN 1:20
11	750.15	12	750.35	77	0.26%	FLATTER THAN 1:20
12	750.35	13	750.68	10	3.30%	FLATTER THAN 1:20
13	750.67	14	751.15	10	4.80%	FLATTER THAN 1:20
14	751.15	15	752.10	20	4.75%	FLATTER THAN 1:20
15	746.33	17	748.00	42	3.98%	FLATTER THAN 1:20
17	748.00	18	748.55	18	3.06%	FLATTER THAN 1:20
18	748.55	19	749.70	18	1.15%	FLATTER THAN 1:20
13	752.10	5	753.90	22.9	7.86%	FLATTER THAN 1:12

NOTES: 1. (1) AND (2) ARE THE 5'X 5' LANDINGS AT THE BEGINNING AND END OF THE RAMP TOWARDS THE MAIN HALL, THE LANDINGS ARE AT 0% SLOPE.
2. MEASUREMENTS ARE TAKEN AT THE CENTER LINE OF THE SIDEWALKS AND RAMPS.

30' 0 30' 60'
SCALE: 1" = 30'

File No - S-20-0030

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WWW.ZTIGERS.COM

STATE OF MARYLAND — BERHANU BEYENE — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

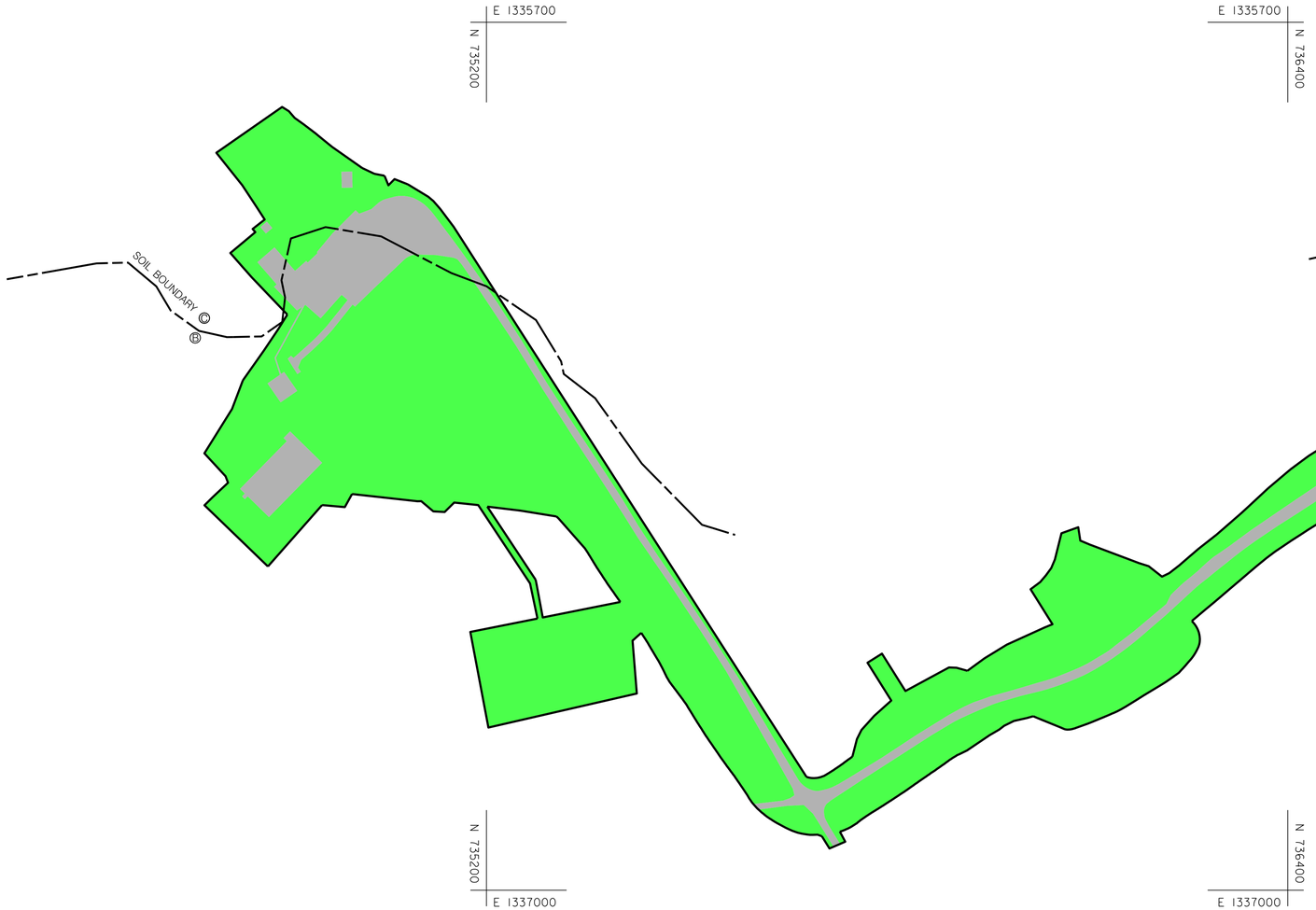
TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

HANDRAIL, ADA RAMP, AND STAIR DETAILS

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030

MARYLAND COORDINATE SYSTEM 1987



File No - S-20-0030

LEGEND

- SOIL BOUNDARY
- © SOIL TYPE
- IMPERVIOUS
- MEADOW
- PROJECT BOUNDARY

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

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STATE OF MARYLAND — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

pEX-01 - EXISTING CONDITION DRAWING

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 18 OF 96



File No - S-20-0030

LEGEND

- SOIL BOUNDARY
- SOIL TYPE
- IMPERVIOUS
- OPEN SPACE
- LOD — LIMIT OF DISTURBANCE/ PROJECT BOUNDARY

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

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NO.	DESCRIPTION	NAME	DATE

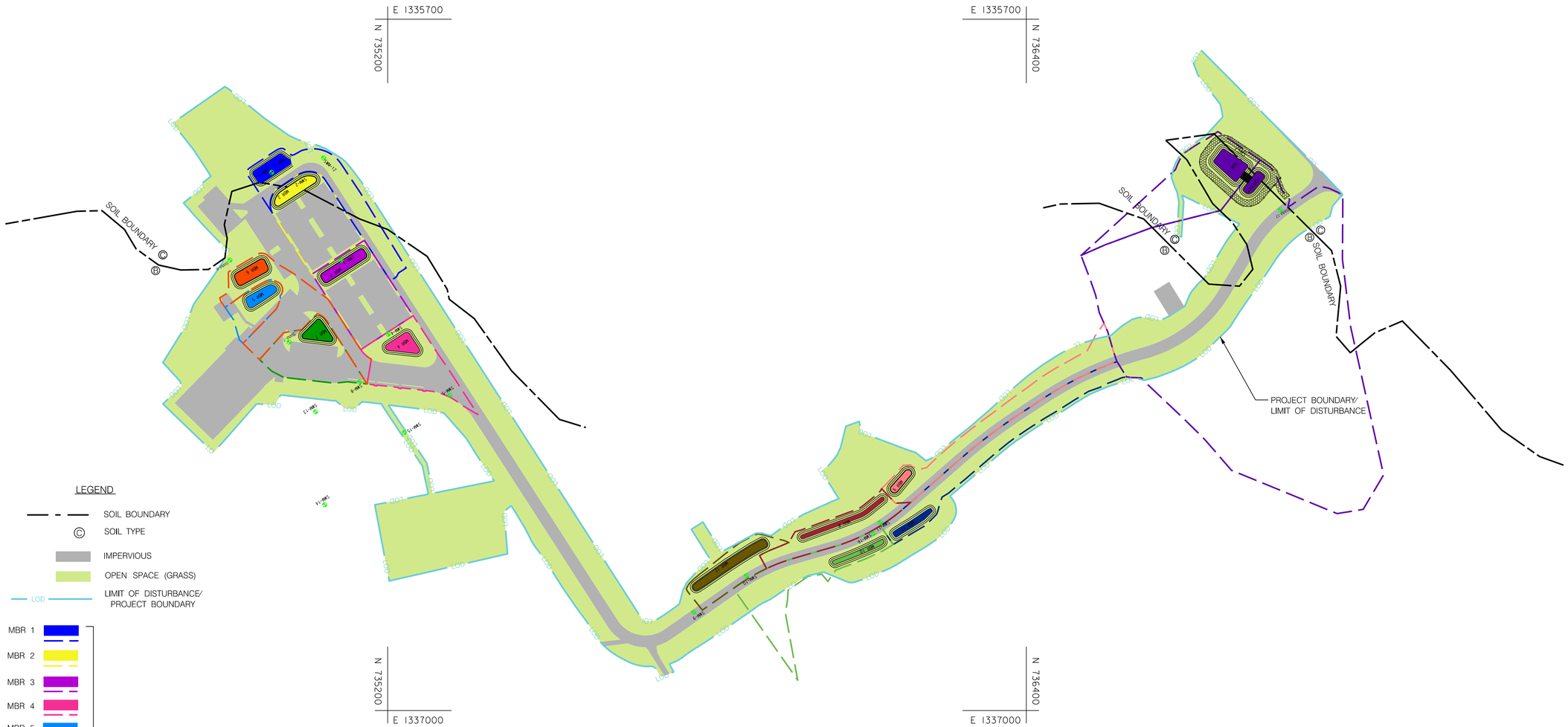
REVISIONS

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

pPR-1ST PROPOSED CONDITION DRAWING

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 19 OF 96



LEGEND

SOIL BOUNDARY

SOIL TYPE

IMPERVIOUS

OPEN SPACE (GRASS)

LOD — LIMIT OF DISTURBANCE/ PROJECT BOUNDARY

MBR 1
MBR 2
MBR 3
MBR 4
MBR 5
MBR 6
MBR 7
MBR 8
MBR 9
MBR 10
MBR 11
MBR 12
SGW 1

BMPs SURFACES AND DA BOUNDARIES

SWM ⊗ SWM BORING LOCATIONS

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

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

pPR-2ND PROPOSED CONDITION DRAWING

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030
SHEET 20 OF 96

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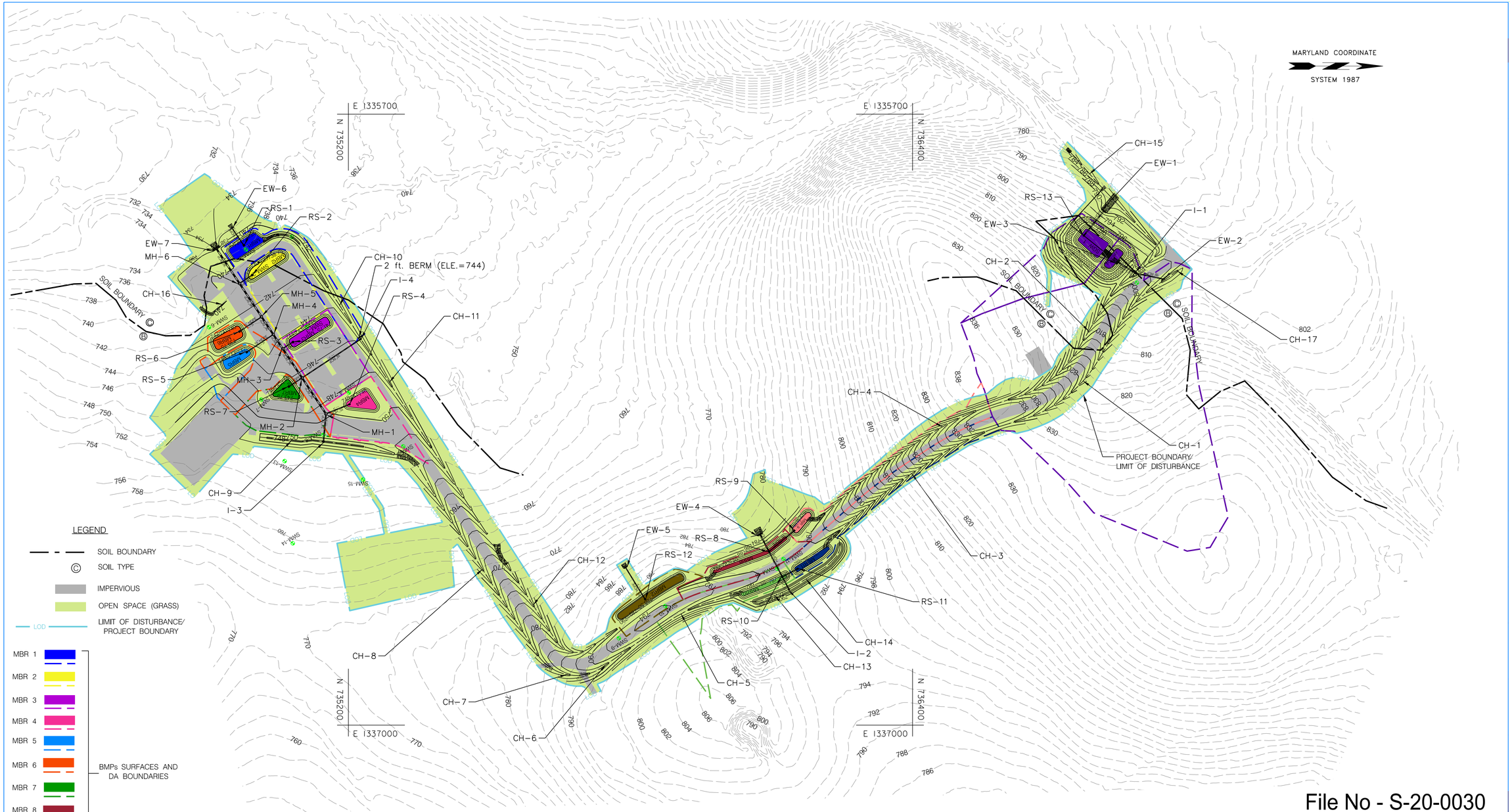
STATE OF MARYLAND
MELANIA BEYENE
48396
PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS



File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

pPR-2ND PROPOSED CONDITION DRAWING
WITH CONTOURS AND DRAINAGE

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030
SHEET 21 OF 96

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REVISIONS



LEGEND

- SOIL BOUNDARY
- DRAINAGE AREA BOUNDARY
- (C) SOIL TYPE
- IMPERVIOUS
- MEADOW
- OPEN SPACE
- LOD — LIMIT OF DISTURBANCE/ PROJECT BOUNDARY
- Tc PATH

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STATE OF MARYLAND — BEVERLY ANN MUNROE — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

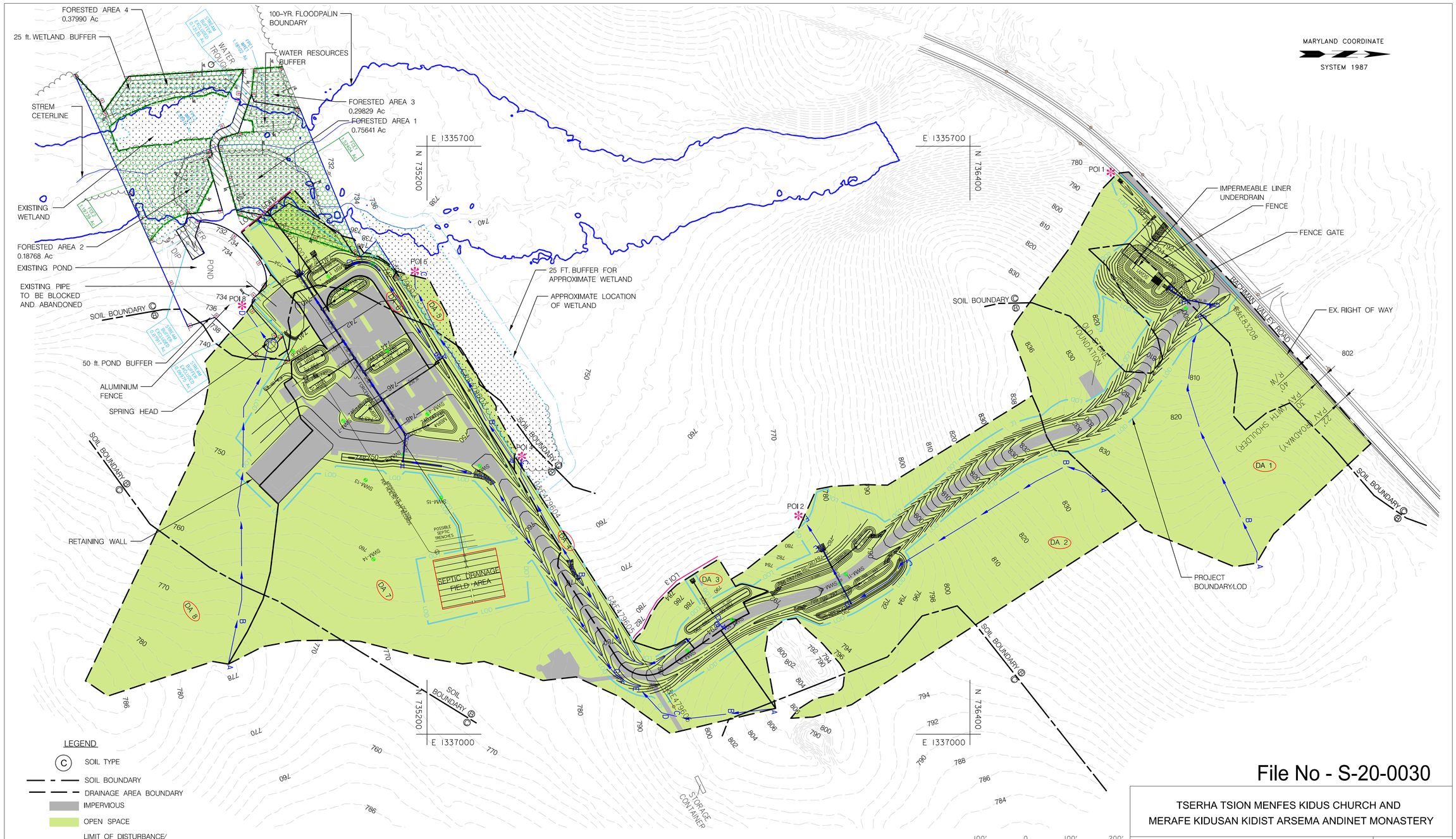
File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

pEX-01-EXISTING DRAINAGE AREA

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 22 OF 96



File No - S-20-0030

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MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

pPR-01-PROPOSED DRAINAGE AREA

PROJECT ENG.
DESIGNED BY
CHECKED BY
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PROJECT MGR.

PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030
SHEET 23 OF 96

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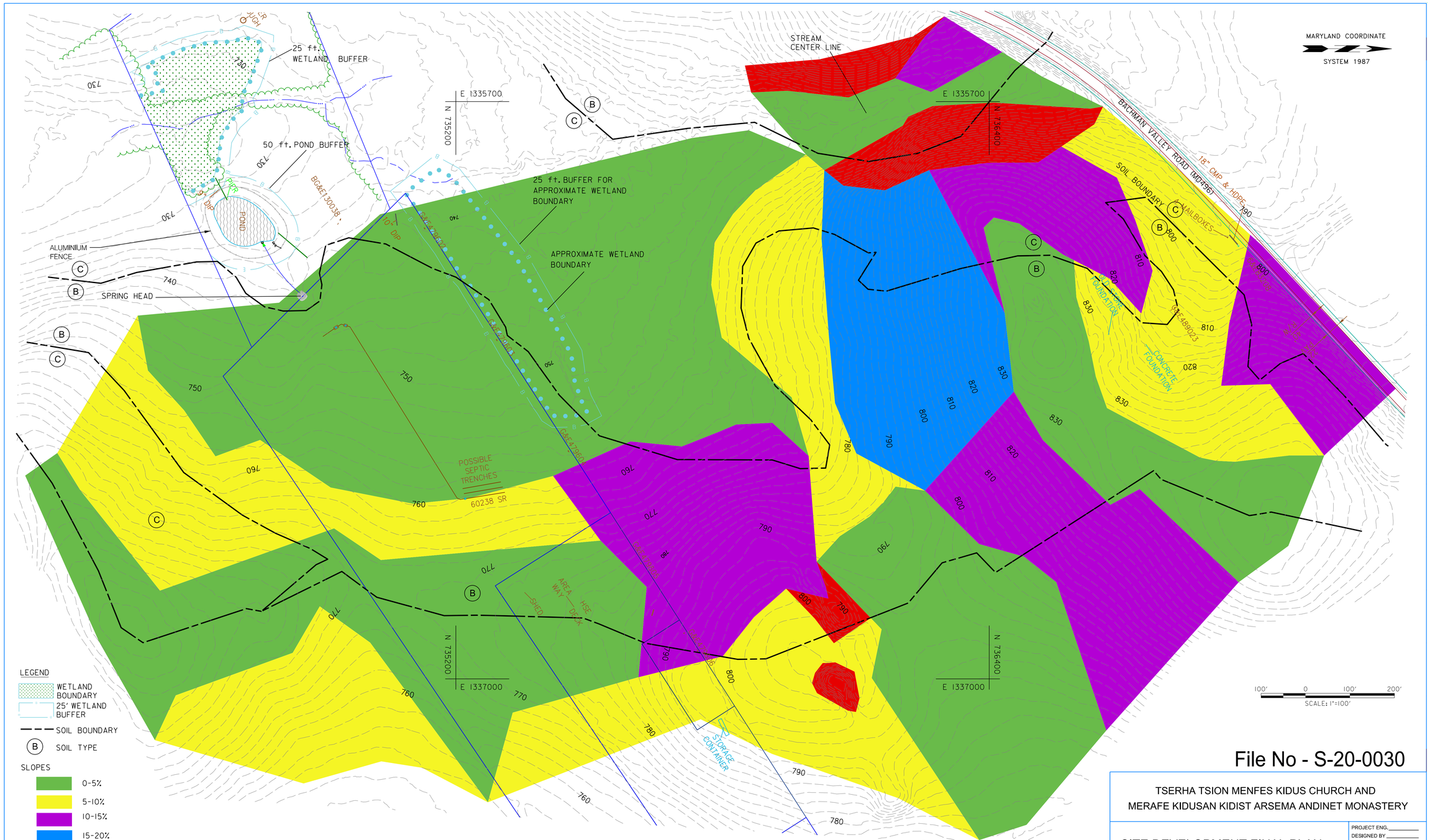

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TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

pSR-01 SITE RESOURCES MAP

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 24 OF 96

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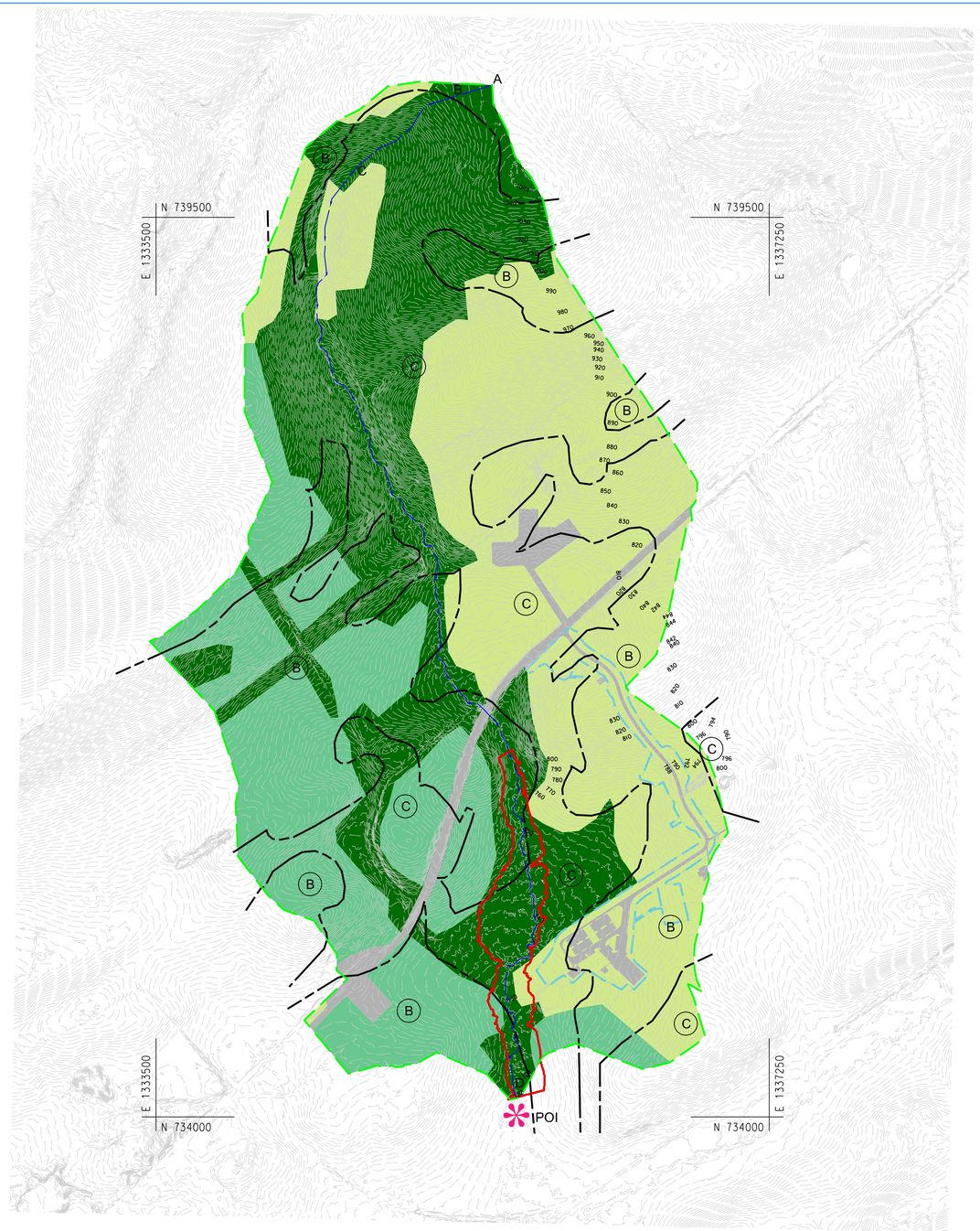

MARYLAND COORDINATE SYSTEM 1987

LEGEND

- SOIL BOUNDARY
- (C) SOIL TYPE
- IMPERVIOUS
- AGRICULTURE
- OPEN SPACE
- WOOD
- LOD LIMIT OF DISTURBANCE
- 100 YEAR FLOODPLAIN BOUNDARY
- Tc PATH

400' 0 400' 800'
SCALE: 1"=400'

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

100-YEAR FLOODPLAIN MAP

PROJECT ENG._____
DESIGNED BY:_____
CHECKED BY:_____
DRAWN BY:_____
PROJECT MGR:_____
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 25 OF 96

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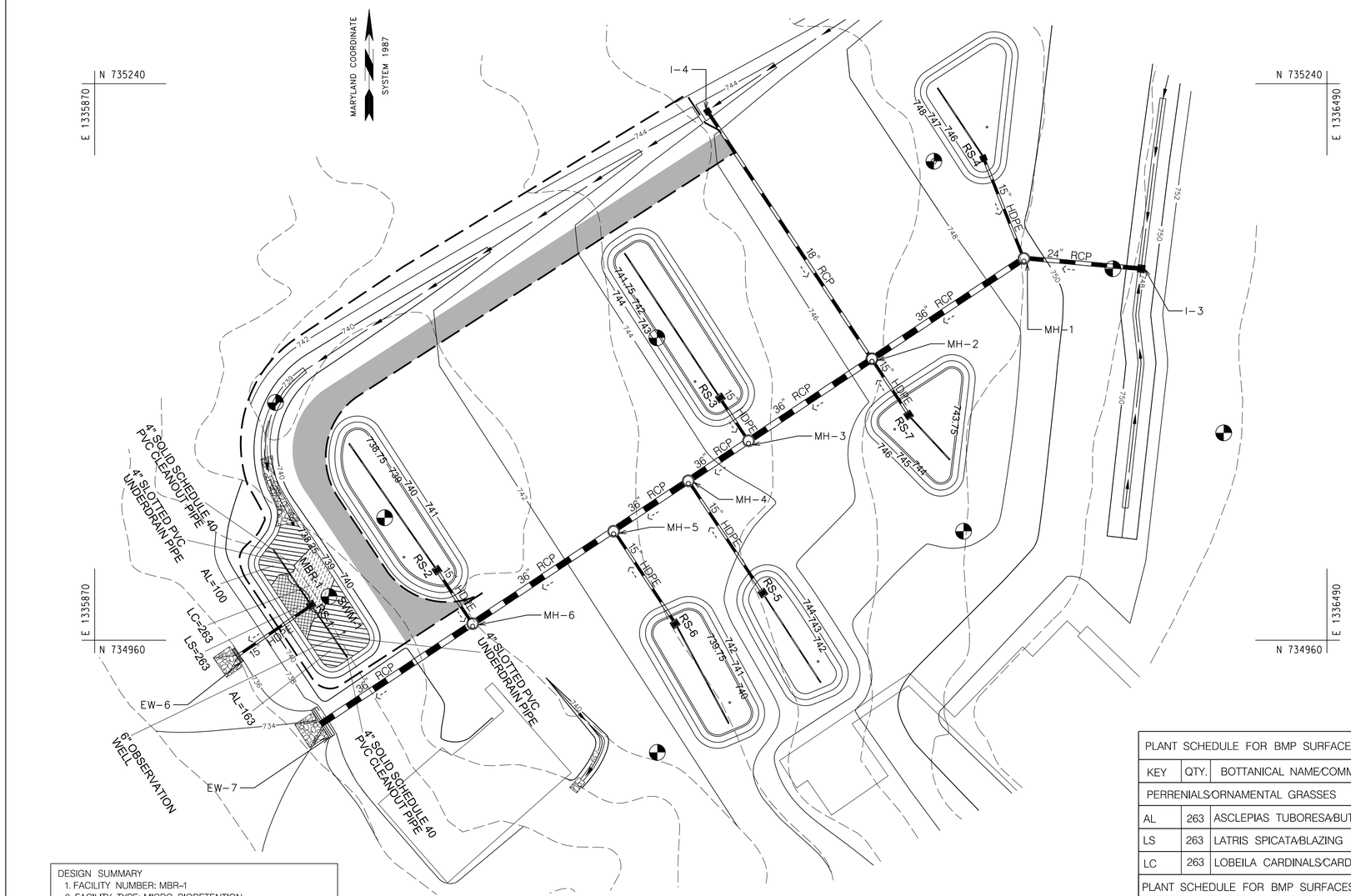
NO.	DESCRIPTION	NAME	DATE

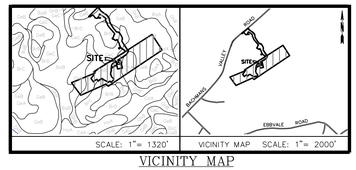
REVISIONS



M-6 MICRO-BIORETENTION FACILITY (MBR-1) SCALE 1:30

DESIGN SUMMARY
1. FACILITY NUMBER: MBR-1
2. FACILITY TYPE: MICRO-BIORETENTION
3. DRAINAGE AREA: 18,066.17 SQ. FT.
4. BOTTOM ELEVATION: 738.25
5. ESDv SURFACE STORAGE: 841.21 CU. FT.
6. TOTAL ESDv ACHIEVED: 1,121.61 CU. FT.
7. ESDv WSE: 738.63
8. 10-YEAR WSE: 738.88
9. 10-YEAR STORAGE VOULME: 1,380.06 CU. FT.
10. INLET TYPE: MODIFIED STANDARD YARD INLET CARROLL COUNTY, MD DPW PLATE 59*
11. NON-WOVEN GEOTEXTILE FABRIC TO SIDES
12. 4" SLOTTED PVC UNDERDRAIN PIPE
13. 4" SOLID SCHEDULE 40 PVC CLEANOUT PIPE, 6" ABOVE ESDv WSE, WITH WATER TIGHT SCREW LID
14. 6" OBSERVATION WELL, SLOTTED PVC PIPE UPTO THE TOP OF THE #8 STONE LAYER AND SOLID SCHEDULE 40 PVC ABOVE THE #8 STONE LAYER.
15. MAINTENANCE RESPONSIBILITY: OWNER
16. IF ROCK IS ENCOUNTERED, UNDER CUT 18" AND BACKFILL WITH CL TYPE SOIL
17. NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

* THIS STRUCTURE MUST BE MONOLITHIC CONSTRUCTION. NO BRICK PIERS ALLOWED.



VICINITY MAP

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 20 of 35

Project No.: 21-1024 **Project Description:** Proposed Arsema Development
Boring No. SWM-1 **Station:** , **Ground Surface Elevation:** 738.7 ft
Easting; 1335992.636 **Northing;** 734974.889 **Logged by;**
Date Started: 6/8/21 **Date Completed:** 6/8/21
Inspector: Findling **Driller;** Chad Chism

Rig Type	CME Truck 75
Rig No.	R-8
Drive Hammer Weight	140 LB
Auger Size	3.25 IN
Size of Core	IN
Size of Bit OD	IN
Hammer Energy Ratio	%
Auger Depth	16 FT

WATER TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
▼ 9.00	729.68	END	6/8/21
▽ 5.75	732.93	24 hrs.	6/9/21

CAVE-IN TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
▼ 12.00	726.68	END	6/8/21
▼			6/9/21

DEPTH IN FEET	ELEV. IN FEET	MATL	MATERIAL DESCRIPTION	SPT SPOON/ROCK CORE SAMPLE NO.	BLOWS/ RQD	SAMPLE DEPTH	REC. SPT(in) or Core (%)	LAB. INDEX TESTS NMC (%)	LL (%)	PI (%)	REMARKS
0.4	738.26		Top soil, 5 inches thick								
2.0	736.68		Light brown, moist, medium stiff Silt, trace Mica, trace Sand and Gravel (FILL)	1	5-7-9-6	0.0-2.0	6				
			Light brown, moist, medium dense Clayey SAND, some Mica (SC)	2	6-11-14-11	2.0-4.0	20				
				3	6-7-9-9	4.0-6.0	24				
				4	6-7-7-7	6.0-8.0	18				
8.0	730.68		Light brown, moist to wet, soft SILT, some Mica, trace Sand and rock fragments (ML)	5	4-5-4-4	8.0-10.0	24				Water on rods@9'
				6	3-3-3-3	10.0-12.0	19				
				7	3-4-7-9	12.0-14.0	17				
				8	5-5-5-8	14.0-16.0	19				
16.0	722.68		Bottom of Boring @ 16'								

Legend: NMC - Natural Moisture Content; PI - Plasticity Index; REC - Recovery; MATL - Material Graphics; SPT - Standard Penetration Test; RQD - Rock Quality Designation; LL - Liquid Limit; Elev - Elevation; Geotech - Geotechnical; OD - Outside Diameter; Boring and Sampling Conforms to ASTM D420/D1586

Z:\1094 MKAMA PROPOSED ARSEMA DEVELOPMENT\DP-2-8.MDT

PLANT SCHEDULE FOR BMP SURFACES					
KEY	QTY.	BOTTANICAL NAME/COMMON NAME	SIZE	COND.	COMMENTS
PERRENIALS/ORNAMENTAL GRASSES					
AL	263	ASCLEPIAS TUBORESA/BUTTERFLY MILKWEED	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
LS	263	LATRIS SPICATA/BLAZING STAR	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
LC	263	LOBEILA CARDINALS/CARDINAL FLOWER	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
PLANT SCHEDULE FOR BMP SURFACES					
SHRUB	QTY. 20	SIZE: 30" HT. #3 CG min.	PLUG	PLANT AT 30" O.C.	

NOTES
1. PLANT QTY. PER 100 SQ. FT. OF BMP FLOOR AREA: 40
2. BMP FLOOR AREA (ROUNDED UP): 1970 SQ. FT.
3. APPROXIMATE TOTAL QTY: 788
4. MINIMUM # OF SPECIES: 3
5. QTY OF EACH SPECIES (EQUALLY DIVIDED): 263
6. BMP PERIMETER (ROUNDED UP): 190 FT.
7. SHRUB QUANTITY FOR PERIMETER: 10 PER 100 LF.
8. TURFGRASS ESTABLISHMENT WITH TYPE A SOIL STABILIZATION MATTING ABOVE THE ESDv ELEVATION

File No - S-20-0030

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STATE OF MARYLAND — MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY — 48396 — PROFESSIONAL ENGINEER — 05/05/2025

NO.	DESCRIPTION	NAME	DATE

REVISIONS

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

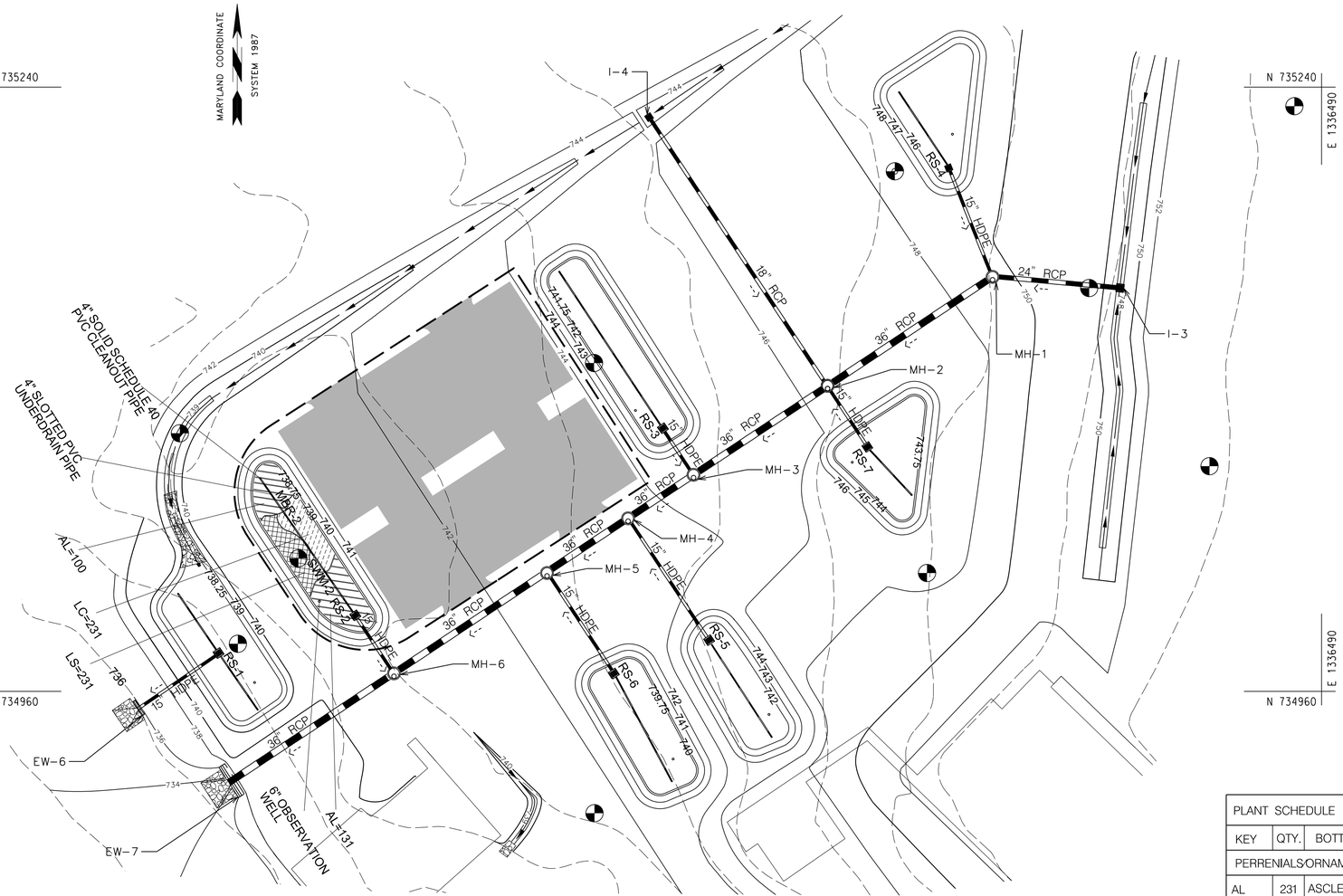
SITE DEVELOPMENT FINAL PLAN

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

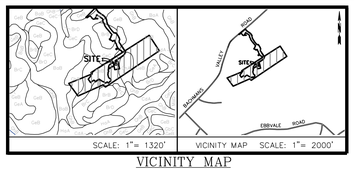
SWM FACILITY DETAILS
MBR-1

PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030

SHEET 26 OF 96



M-6 MICRO-BIORETENTION FACILITY (MBR-2) SCALE 1:30



VICINITY MAP

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 21 of 35

Project No.: 21-1024 **Project Description:** Proposed Arsema Development
Boring No. SWM-2 **Station:** , **Ground Surface Elevation:** 741.6 ft
Easting: 1336021.305 **Northing:** 735014.769 **Logged by:**
Date Started: 6/16/21 **Date Completed:** 6/16/21
Inspector: Findling **Driller:** David Pryor

Rig Type	CME ATV 45
Rig No.	R-3
Drive Hammer Weight	140 LB
Auger Size	3.25 IN
Size of Core	IN
Size of Bit OD	IN
Hammer Energy Ratio	%
Auger Depth	16 FT

WATER TABLE

	Depth Below Surface		Time (hours)	Date
	Depth (ft)	Elev (ft)		
▼1			END	6/16/21
▼2				

CAVE-IN TABLE

	Depth Below Surface		Time (hours)	Date
	Depth (ft)	Elev (ft)		
▼1	7.90	733.73	END	6/16/21
▼2				

DEPTH IN FEET	ELEV. IN FEET	MATL	MATERIAL DESCRIPTION	SPT SPOON/ROCK CORE: SAMPLE NO.	BLOWS/ROD	SAMPLE DEPTH	REC. SPT(in) or Core (%)	LAB. INDEX TESTS: NMC (%)	LL (%)	PI (%)	REMARKS
0.3	741.38		Top soil, 3 inches thick								
2.0	739.63		Brown, moist, medium stiff Silt, trace Mica, trace Sand and Gravel (FILL)	1	4-5-5-5	0.0-2.0	20				
			Dark brown, gray, moist to wet, medium dense Clayey SAND, some Silt and rock fragments (SC)	2	2-3-3-5	2.0-4.0	24				
				3	5-7-9-10	4.0-6.0	24				
				4	6-7-5-7	6.0-8.0	18				
				5	4-2-4-2	8.0-10.0	24				
				6	3-4-3-3	10.0-12.0	24				
14.0	727.63			7	3-3-2-2	12.0-14.0	24				
16.0	725.63		Multi brown, wet, Vary stiff SILT, rock fragemnts, some Mica (Chattaryated Rock) Bottom of Boring @ 16'	8	3-4-50/2"	14.0-16.0	14				

Legend: NMC - Natural Moisture Content; PI - Plasticity Index; REC - Recovery; MATL - Material Graphics; SPT - Standard Penetration Test; RQD - Rock Quality Designation; LL - Liquid Limit; Elev - Elevation; Geotech - Geotechnical; OD - Outside Diameter

Boring and Sampling Conforms to ASTM D420/D1586

21-1024 LMKAM PROPOSED ARSEMA REVISED DRWENT GPJ 9/19/21

PLANT SCHEDULE FOR BMP SURFACES					
KEY	QTY.	BOTTANICAL NAME/COMMON NAME	SIZE	COND.	COMMENTS
PERRENIALS/ORNAMENTAL GRASSES					
AL	231	ASCLEPIAS TUBORESA/BUTTERFLY MILKWEED	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
LS	231	LATRIS SPICATA/BLAZING STAR	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
LC	231	LOBEILA CARDINALS/CARDINAL FLOWER	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
PLANT SCHEDULE FOR BMP SURFACES					
SHRUB	QTY. 20	SIZE: 30" HT. #3 CG min.	PLUG	PLANT AT 30" O.C.	

NOTES
1. PLANT QTY. PER 100 SQ. FT. OF BMP FLOOR AREA: 40
2. BMP FLOOR AREA (ROUNDED UP): 1728 SQ. FT.
3. APPROXIMATE TOTAL QTY: 692
4. MINIMUM # OF SPECIES: 3
5. QTY OF EACH SPECIES (EQUALLY DIVIDED): 231
6. BMP PERIMETER (ROUNDED UP): 200 FT.
7. SHRUB QUANTITY FOR PERIMETER: 10 PER 100 LF.
8. TURFGRASS ESTABLISHMENT WITH TYPE A SOIL STABILIZATION MATTING ABOVE THE ESDv ELEVATION

DESIGN SUMMARY
1. FACILITY NUMBER: MBR-2
2. FACILITY TYPE: MICRO-BIORETENTION
3. DRAINAGE AREA: 19,438.30 SQ. FT.
4. BOTTOM ELEVATION: 738.75
5. ESDv SURFACE STORAGE: 2,044.16 CU. FT.
6. TOTAL ESDv ACHIEVED: 2,725.55 CU. FT.
7. ESDv WSE: 739.75
8. 10-YEAR WSE: 740.00
9. 10-YEAR STORAGE VOULME: 2,555.20 CU. FT.
10. INLET TYPE: MODIFIED STANDARD YARD INLET CARROLL COUNTY, MD DPW PLATE 59*
11. NON-WOVEN GEOTEXTILE FABRIC TO SIDES
12. 4" SLOTTED PVC UNDERDRAIN PIPE
13. 4" SOLID SCHEDULE 40 PVC CLEANOUT PIPE, 6" ABOVE ESDv WSE, WITH WATER TIGHT SCREW LID
14. 6" OBSERVATION WELL, SLOTTED PVC PIPE UPTO THE TOP OF THE #8 STONE LAYER AND SOLID SCHEDULE 40 PVC ABOVE THE #8 STONE LAYER.
15. MAINTENANCE RESPONSIBILITY: OWNER
16. IF ROCK IS ENCOUNTERED, UNDER CUT 18" AND BACKFILL WITH CL TYPE SOIL
17. NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

* THIS STRUCTURE MUST BE MONOLITHIC CONSTRUCTION. NO BRICK PIERS ALLOWED

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STATE OF MARYLAND — MELISSA K. TSEGAYE — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

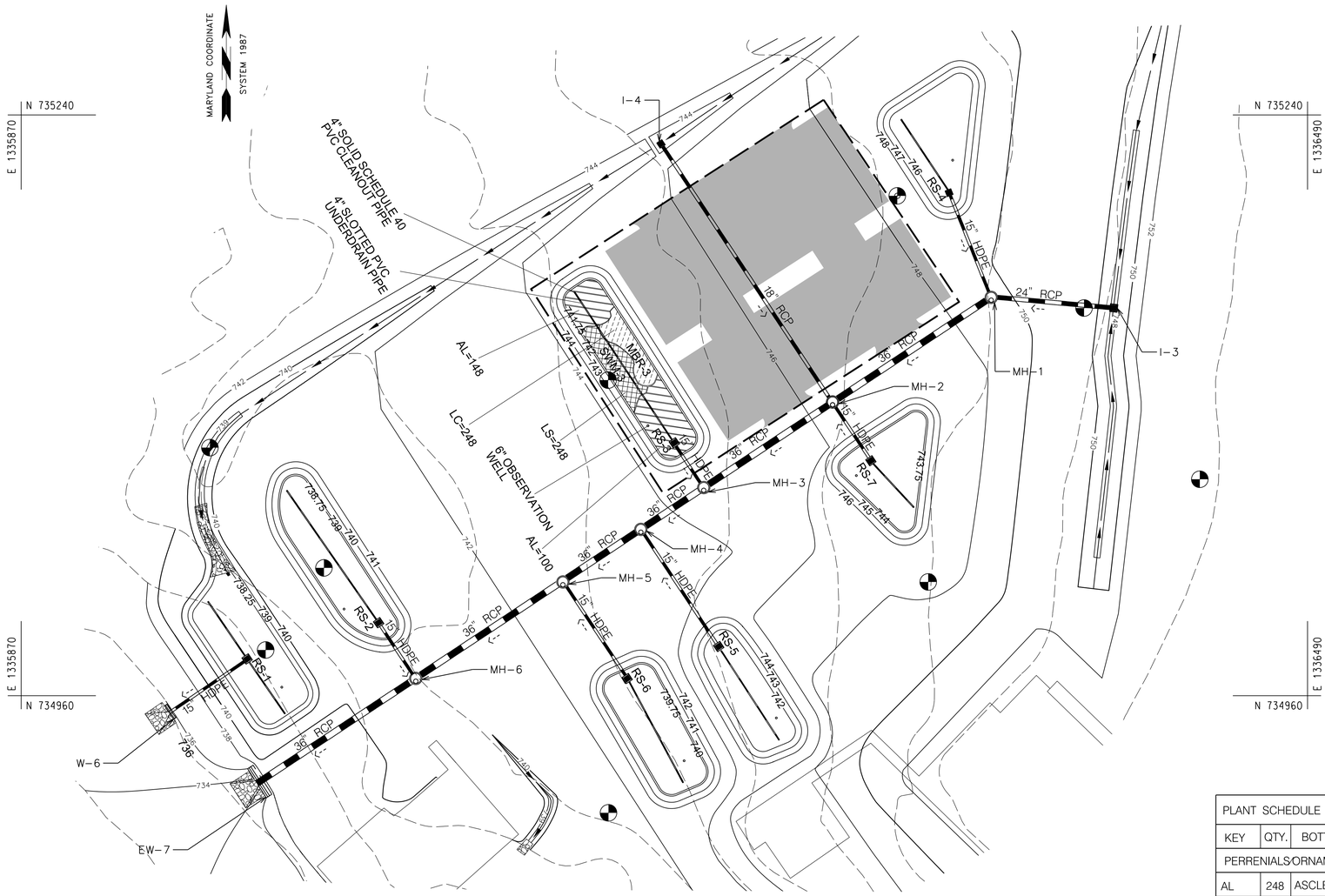
SITE DEVELOPMENT FINAL PLAN

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

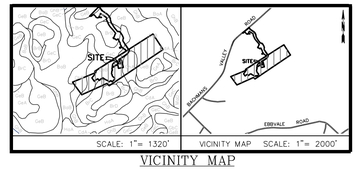
SWM FACILITY DETAILS MBR-2

PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030

SHEET 27 OF 96



M-6 MICRO-BIORETENTION FACILITY (MBR-3) SCALE 1:30



VICINITY MAP

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 22 of 35

Project No.: 21-1024 **Project Description:** Proposed Arsema Development
Boring No. SWM-3 **Station:** , ' **Ground Surface Elevation:** 744.4 ft
Easting: 1336158.668 **Northing:** 735105.522 **Logged by:**
Date Started: 6/16/21 **Date Completed:** 6/16/21
Inspector: Findling **Driller:** David Pryor

Rig Type	CME ATV 45
Rig No.	R-3
Drive Hammer Weight	140 LB
Auger Size	3.25 IN
Size of Core	IN
Size of Bit OD	IN
Hammer Energy Ratio	%
Auger Depth	16 FT

WATER TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
▼ 3.20	741.20	END	6/16/21
▽ 1.70	742.70	24 hrs.	6/17/21

CAVE-IN TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
▼ 9.00	735.40	END	6/16/21
▽ 4.33	740.07	24 hrs.	6/17/21

DEPTH IN FEET	ELEV. IN FEET	MATL	MATERIAL DESCRIPTION	SPT SPOON/ROCK CORE: SAMPLE NO.	BLOWS/ RQD	SAMPLE DEPTH	REC. SPT(in) or Core (%)	LAB. INDEX TESTS: NMC (%)	LL (%)	PI (%)	REMARKS
0.3	744.15		Top soil, 3 inches thick								
3.0	741.40		Light brown, moist, medium stiff Silt, trace Mica, trace Sand and Gravel (FILL) ▼	1	1-3-4-4	0.0-2.0	19				
				2	4-3-4-3	2.0-4.0	19				
			Multi brown, moist to wet, medium dense Silty SAND, trace Mica, trace Gravel (SM)	3	3-3-4-4	4.0-6.0	24				
				4	3-3-4-6	6.0-8.0	21				Water on rods @8'
				5	3-3-4-5	8.0-10.0	24				
12.0	732.40			6	3-3-5-5	10.0-12.0	24				
			Light brown, moist to wet, soft SILT, some Mica, trace Sand and rock fragments (ML)	7	3-3-4-6	12.0-14.0	24				
16.0	728.40			8	4-3-5-6	14.0-16.0	24				
			Bottom of Boring @ 16'								

Legend: MNC - Natural Moisture Content; PI - Plasticity Index; REC - Recovery; MATL - Material Graphics; SPT - Standard Penetration Test; RQD - Rock Quality Designation; LL - Liquid Limit; Elev - Elevation; Geotech - Geotechnical; OD - Outside Diameter; Boring well Sampling Continues to ADDENDUM/Pm

PLANT SCHEDULE FOR BMP SURFACES					
KEY	QTY.	BOTTANICAL NAME/COMMON NAME	SIZE	COND.	COMMENTS
PERRENIALS/ORNAMENTAL GRASSES					
AL	248	ASCLEPIAS TUBORESA/BUTTERFLY MILKWEED	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
LS	248	LATRIS SPICATA/BLAZING STAR	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
LC	248	LOBEILA CARDINALS/CARDINAL FLOWER	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
PLANT SCHEDULE FOR BMP SURFACES					
SHRUB	QTY. 22	SIZE: 30" HT. #3 CG min.	PLUG	PLANT AT 30" O.C.	

NOTES
1. PLANT QTY. PER 100 SQ. FT. OF BMP FLOOR AREA: 40
2. BMP FLOOR AREA (ROUNDED UP): 1853 SQ. FT.
3. APPROXIMATE TOTAL QTY: 742
4. MINIMUM # OF SPECIES: 3
5. QTY OF EACH SPECIES (EQUALLY DIVIDED): 248
6. BMP PERIMETER (ROUNDED UP): 220 FT.
7. SHRUB QUANTITY FOR PERIMETER: 10 PER 100 LF.
8. TURFGRASS ESTABLISHMENT WITH TYPE A SOIL STABILIZATION MATTING ABOVE THE ESDv ELEVATION

DESIGN SUMMARY
1. FACILITY NUMBER: MBR-3
2. FACILITY TYPE: MICRO-BIORETENTION
3. DRAINAGE AREA: 19,809.53 SQ. FT.
4. BOTTOM ELEVATION: 741.75
5. ESDv SURFACE STORAGE: 2,061.43 CU. FT.
6. TOTAL ESDv ACHIEVED: 2,748.57 CU. FT.
7. ESDv WSE: 742.69
8. 10-YEAR WSE: 742.94
9. 10-YEAR STORAGE VOULME: 2,745.06 CU. FT.
10. INLET TYPE: MODIFIED STANDARD YARD INLET CARROLL COUNTY, MD DPW PLATE 59*
11. NON-WOVEN GEOTEXTILE FABRIC TO SIDES
12. 4" SLOTTED PVC UNDERDRAIN PIPE
13. 4" SOLID SCHEDULE 40 PVC CLEANOUT PIPE, 6" ABOVE ESDv WSE, WITH WATER TIGHT SCREW LID
14. 6" OBSERVATION WELL, SLOTTED PVC PIPE UPTO THE TOP OF THE #8 STONE LAYER AND SOLID SCHEDULE 40 PVC ABOVE THE #8 STONE LAYER.
15. MAINTENANCE RESPONSIBILITY: OWNER
16. IF ROCK IS ENCOUNTERED, UNDER CUT 18" AND BACKFILL WITH CL TYPE SOIL
17. NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

* THIS STRUCTURE MUST BE MONOLITHIC CONSTRUCTION. NO BRICK PIERS ALLOWED

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT, CONSULTING ENGINEERS
5120 WILLET BRIDGE ROAD, BETHESDA MD 20816
TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

STATE OF MARYLAND — 48396 — PROFESSIONAL ENGINEER — MELVIN L. BOYCE

NO.	DESCRIPTION	NAME	DATE

REVISIONS

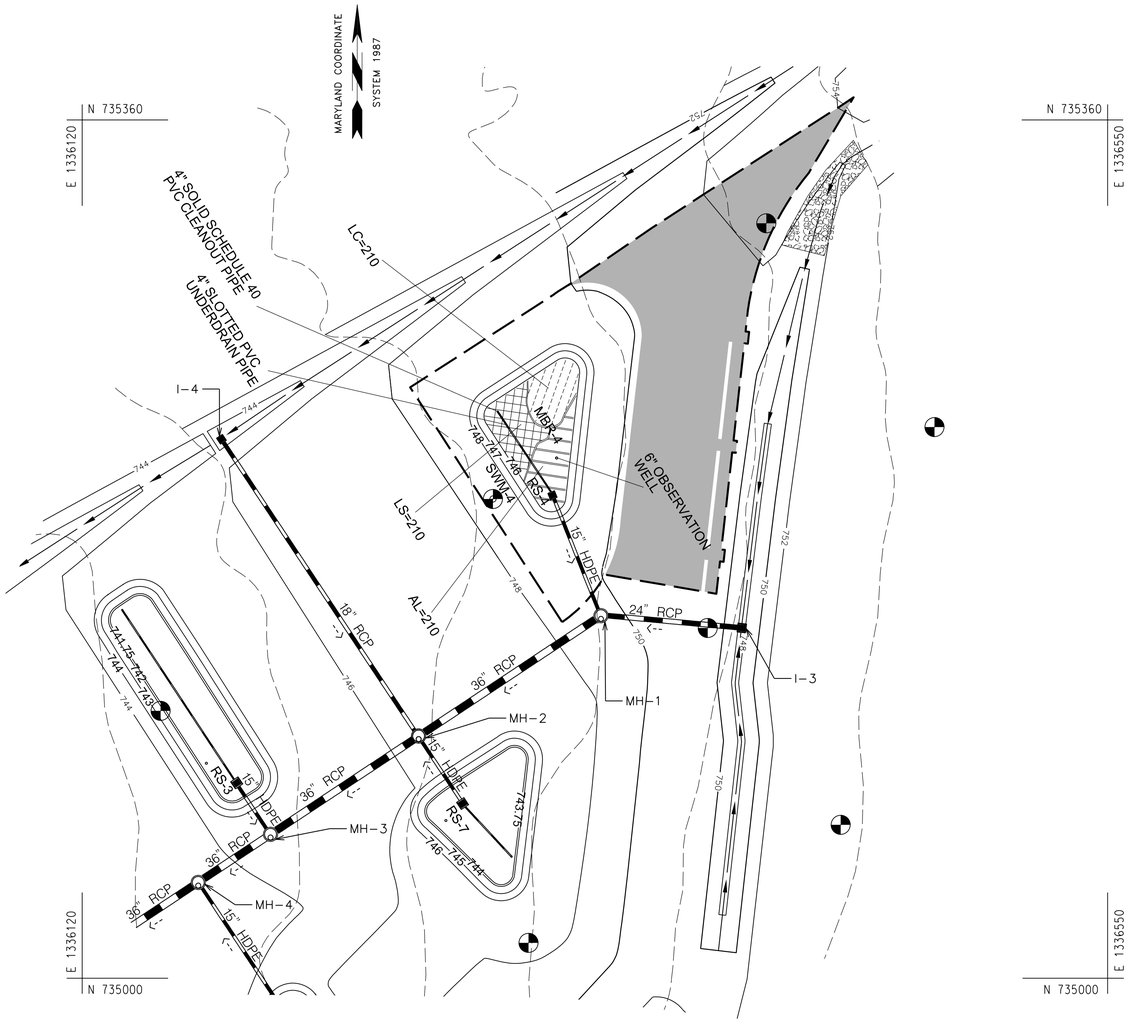
File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

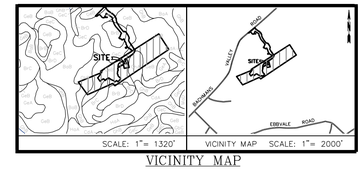
SITE DEVELOPMENT FINAL PLAN

SWM FACILITY DETAILS MBR 3

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 28 OF 96



M-6 MICRO-BIORETENTION FACILITY (MBR-4) SCALE 1:30



VICINITY MAP

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 23 of 35

Project No.: 21-1024 **Project Description:** Proposed Arsema Development
Boring No. SWM-4 **Station:** , ' **Ground Surface Elevation:** 748.2 ft
Easting: 1336299.784 **Northing:** 735194.416 **Logged by:**
Date Started: 6/14/21 **Date Completed:** 6/14/21
Inspector: Findling **Driller:** David Pryor

Rig Type	CME ATV 45	
Rig No.	R-3	
Drive Hammer Weight	140	LB
Auger Size	3.25	IN
Size of Core		IN
Size of Bit OD		IN
Hammer Energy Ratio		%
Auger Depth	16	FT

WATER TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
4.00	744.20	END	6/14/21
2.20	746.00	48 hrs.	**6/15/21**

CAVE-IN TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
10.75	737.45	END	6/14/21
6.50	741.70	48 hrs.	6/15/21

DEPTH IN FEET	ELEV. IN FEET	MATL	MATERIAL DESCRIPTION	SPT SPOONROCK CORE SAMPLE NO.	BLOWS/ RQD	SAMPLE DEPTH	REC. SPT(in) or Core (%)	LAB. INDEX TESTS NMC (%)	LL (%)	PI (%)	REMARKS
0.3	747.90		Top soil, 3 inches thick								
2.0	746.20		Light brown, moist, medium stiff to stiff Silt, some Mica, trace to little rock fragments (FILL)	1	2-2-3-3	0.0-2.0	18				
				2	3-4-4-5	2.0-4.0	18				
			Light brown, gray, moist, medium dense Silty SAND, some Mica, some Gravel (SM)	3	5-3-5-5	4.0-6.0	24				
				4	4-3-4-6	6.0-8.0	24				
				5	3-3-4-6	8.0-10.0	24				Water on rods @6'
				6	3-4-4-7	10.0-12.0	24				
				7	3-3-5-9	12.0-14.0	24				
				8	7-6-7-9	14.0-16.0	24				
16.0	732.20		Bottom of Boring @ 16'								

21-1024 MAXAM PROPOSED ARSEMA DEVELOPMENT.GPJ 8/18/21

Legend: NMC - Natural Moisture Content; PI - Plasticity Index; REC - Recovery; MATL - Material Graphics; SPT - Standard Penetration Test; HxW - Hole Quality Designation; LL - Liquid Limit; Elev - Elevation; Unidentified - Unidentified; OD - Outside Diameter; Boring and Sampling Continue to ASTM D420/D18

PLANT SCHEDULE FOR BMP SURFACES					
KEY	QTY.	BOTTANICAL NAME/COMMON NAME	SIZE	COND.	COMMENTS
PERRENIALS/ORNAMENTAL GRASSES					
AL	210	ASCLEPIAS TUBORESA/BUTTERFLY MILKWEED	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
LS	210	LATRIS SPICATA/BLAZING STAR	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
LC	210	LOBEILA CARDINALS/CARDINAL FLOWER	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
PLANT SCHEDULE FOR BMP SURFACES					
SHRUB	QTY. 17	SIZE: 30" HT. #3 CG min.	PLUG	PLANT AT 30" O.C.	

NOTES
1. PLANT QTY. PER 100 SQ. FT. OF BMP FLOOR AREA: 40
2. BMP FLOOR AREA (ROUNDED UP): 1569 SQ. FT.
3. APPROXIMATE TOTAL QTY: 628
4. MINIMUM # OF SPECIES: 3
5. QTY OF EACH SPECIES (EQUALLY DIVIDED): 210
6. BMP PERIMETER (ROUNDED UP): 162 FT.
7. SHRUB QUANTITY FOR PERIMETER: 10 PER 100 LF.
8. TURFGRASS ESTABLISHMENT WITH TYPE A SOIL STABILIZATION MATTING ABOVE THE ESDv ELEVATION

DESIGN SUMMARY
1. FACILITY NUMBER: MBR-4
2. FACILITY TYPE: MICRO-BIORETENTION
3. DRAINAGE AREA: 16,581.58 SQ. FT.
4. BOTTOM ELEVATION: 746.00
5. ESDv SURFACE STORAGE: 1,313.57 CU. FT.
6. TOTAL ESDv ACHIEVED: 1,751.43 CU. FT.
7. ESDv WSE: 746.72
8. 10-YEAR WSE: 746.97
9. 10-YEAR STORAGE VOULME: 1,775.71 CU. FT.
10. INLET TYPE: MODIFIED STANDARD YARD INLET CARROLL COUNTY, MD DPW PLATE 59*
11. NON-WOVEN GEOTEXTILE FABRIC TO SIDES
12. 4" SLOTTED PVC UNDERDRAIN PIPE
13. 4" SOLID SCHEDULE 40 PVC CLEANOUT PIPE, 6" ABOVE ESDv WSE, WITH WATER TIGHT SCREW LID
14. 6" 0BSERVATION WELL, SLOTTED PVC PIPE UPTO THE TOP OF THE #8 STONE LAYER AND SOLID SCHEDULE 40 PVC ABOVE THE #8 STONE LAYER.
15. MAINTENANCE RESPONSIBILITY: OWNER
16. IF ROCK IS ENCOUNTERED, UNDER CUT 18" AND BACKFILL WITH CL TYPE SOIL
17. NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

* THIS STRUCTURE MUST BE MONOLITHIC CONSTRUCTION. NO BRICK PIERS ALLOWED

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."
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Expiration Date: 01-15-2026

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STATE OF MARYLAND — MELANIE BEVERLY — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

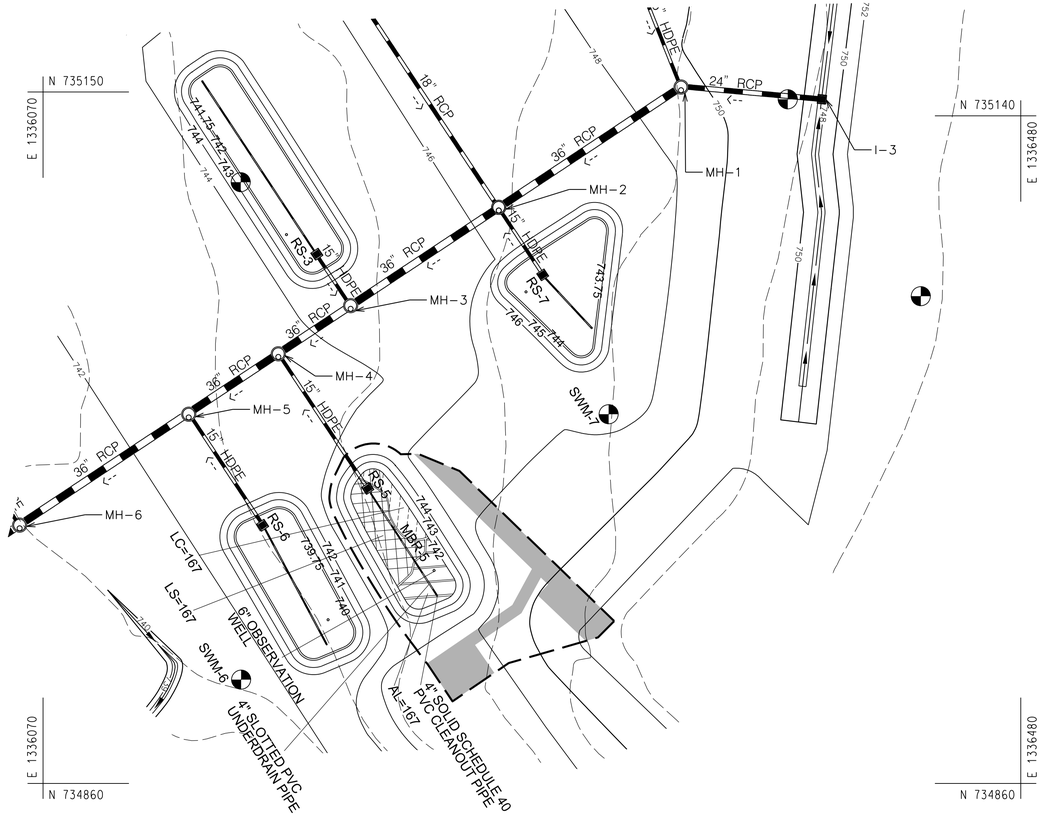
File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

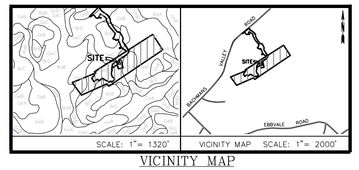
SITE DEVELOPMENT FINAL PLAN

SWM FACILITY DETAILS
MBR-4

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 29 OF 96



M–6 MICRO–BIORETENTION FACILITY (MBR–5) SCALE 1:30



VICINITY MAP

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 25 of 35

Project No.: 21-1024 **Project Description:** Proposed Arsema Development
Boring No. SWM-6 **Station:** , ' **Ground Surface Elevation:** 743.0 ft
Easting: 1336160.378 **Northing:** 734910.353 **Logged by:**
Date Started: 6/14/21 **Date Completed:** 6/14/21
Inspector: Findling **Driller:** David Pryor

Rig Type	CME ATV 45
Rig No.	R-3
Drive Hammer Weight	140 LB
Auger Size	3.25 IN
Size of Core	IN
Size of Bit OD	IN
Hammer Energy Ratio	%
Auger Depth	16 FT

WATER TABLE

Depth Below Surface	Elev (ft)	Time (hours)	Date
▼ 2.20	739.82	END	6/14/21
▽ 2.00	741.02	48 hrs.	5/15/21

CAVE-IN TABLE

Depth Below Surface	Elev (ft)	Time (hours)	Date
▼ 9.60	733.42	END	6/14/21
▽ 3.40	739.62	48 hrs.	6/15/21

DEPTH IN FEET	ELEV. IN FEET	MATL	MATERIAL DESCRIPTION	SPT SPOON/ROCK CORE SAMPLE NO.	BLOWS/ RQD	SAMPLE DEPTH	REC. SPT(in) or Core (%)	LAB. INDEX TESTS NMC (%)	LL (%)	PI (%)	REMARKS
0.3	742.77		Top soil, 3 inches thick	1	2-2-3-2	0.0-2.0	18				
3.0	740.02		Light brown, moist, medium stiff Silt, trace Mica, trace Sand and Gravel (FILL)	2	3-2-2-3	2.0-4.0	19				
			Multi brown, moist to wet, medium dense Silty SAND, trace-Mica, trace Gravel (SM)	3	4-4-3-5	4.0-6.0	24				
				4	3-4-4-6	6.0-8.0	24				Water on rods @6'
				5	2-2-2-2	8.0-10.0	24				
				6	2-2-2-2	10.0-12.0	24				
12.0	731.02		Light brown, moist to wet, soft SILT, some Mica, trace Sand and rock fragments (ML)	7	2-3-4-5	12.0-14.0	24				
16.0	727.02		Bottom of Boring @ 16 '	8	3-4-4-3	14.0-16.0	19				

Legend: NMC - Natural Moisture Content; PI - Plasticity Index; REC - Recovery; MATL - Material Graphics; SPT- Standard Penetration Test; HUGI - Hook Quality Designation; LL - Liquid Limit; Elev - Elevation; GM/SM/CH - GM/SM/CH Soil; OD - Outside Diameter; Boring and Sampling Conforms to ASTM D420/D1452

2\--1024 MIXAAM PROPOSED ARSEMA DEVELOPMENT.GPJ 8/18/21

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 26 of 35

Project No.: 21-1024 **Project Description:** Proposed Arsema Development
Boring No. SWM-7 **Station:** , ' **Ground Surface Elevation:** 749.2 ft
Easting: 1336305.781 **Northing:** 735016.053 **Logged by:**
Date Started: 6/14/21 **Date Completed:** 6/14/21
Inspector: Findling **Driller:** David Pryor

Rig Type	CME ATV 45
Rig No.	R-3
Drive Hammer Weight	140 LB
Auger Size	3.25 IN
Size of Core	IN
Size of Bit OD	IN
Hammer Energy Ratio	%
Auger Depth	16 FT

WATER TABLE

Depth Below Surface	Elev (ft)	Time (hours)	Date
▼ 9.40	739.84	END	6/14/21
▽ 6.90	742.34	48 hrs.	6/15/21

CAVE-IN TABLE

Depth Below Surface	Elev (ft)	Time (hours)	Date
▼ 10.00	739.24	END	6/14/21
▽ 9.25	739.99	48 hrs.	6/15/21

DEPTH IN FEET	ELEV. IN FEET	MATL	MATERIAL DESCRIPTION	SPT SPOON/ROCK CORE SAMPLE NO.	BLOWS/ RQD	SAMPLE DEPTH	REC. SPT(in) or Core (%)	LAB. INDEX TESTS NMC (%)	LL (%)	PI (%)	REMARKS
0.3	748.99		Top soil, 3 inches thick	1	2-2-3-3	0.0-2.0	20				
4.0	745.24		Light brown, moist, medium stiff Silt, trace Mica, some Sand (FILL)	2	2-2-2-3	2.0-4.0	24				
6.0	743.24		Multi brown, moist, medium dense Silty Gravel, some Mica, trace rock fragments, sand lenses (ML)	3	2-1-1-3	4.0-6.0	24				
10.0	739.24		Multi brown, moist, medium stiff to stiff Sandy SILT, some Mica, trace rock fragments, sand lenses (ML)	4	2-3-3-4	6.0-8.0	24				
			Light brown, mottled, moist to wet, soft SILT, some Mica, trace Sand and rock fragments (ML)	5	3-3-4-5	8.0-10.0	24				
				6	3-3-3-5	10.0-12.0	24				
				7	2-2-3-5	12.0-14.0	24				
				8	4-4-4-6	14.0-16.0	24				Water on rods @13.5'
16.0	733.24		Bottom of Boring @ 16 '								

Legend: NMC - Natural Moisture Content; PI - Plasticity Index; REC - Recovery; MATL - Material Graphics; SPT- Standard Penetration Test; HUGI - Hook Quality Designation; LL - Liquid Limit; Elev - Elevation; GM/SM/CH - GM/SM/CH Soil; OD - Outside Diameter; Boring and Sampling Conforms to ASTM D420/D1452

2\--1024 MIXAAM PROPOSED ARSEMA DEVELOPMENT.GPJ 8/18/21

PLANT SCHEDULE FOR BMP SURFACES					
KEY	QTY.	BOTTANICAL NAME/COMMON NAME	SIZE	COND.	COMMENTS
PERRENIALS/ORNAMENTAL GRASSES					
AL	167	ASCLEPIAS TUBORESA/BUTTERFLY MILKWEED	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
LS	167	LATRIS SPICATA/BLAZING STAR	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
LC	167	LOBEILA CARDINALS/CARDINAL FLOWER	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
PLANT SCHEDULE FOR BMP SURFACES					
SHRUB	QTY. 16	SIZE: 30" HT. #3 CG min.	PLUG	PLANT AT 30" O.C.	

NOTES
1. PLANT QTY. PER 100 SQ. FT. OF BMP FLOOR AREA: 40
2. BMP FLOOR AREA (ROUNDED UP): 1247 SQ. FT.
3. APPROXIMATE TOTAL QTY: 499
4. MINIMUM # OF SPECIES: 3
5. QTY OF EACH SPECIES (EQUALLY DIVIDED): 167
6. BMP PERIMETER (ROUNDED UP): 154 FT.
7. SHRUB QUANTITY FOR PERIMETER: 10 PER 100 LF.
8. TURFGRASS ESTABLISHMENT WITH TYPE A SOIL STABILIZATION MATTING ABOVE THE ESDv ELEVATION

DESIGN SUMMARY
1. FACILITY NUMBER: MBR–5
2. FACILITY TYPE: MICRO–BIORETENTION
3. DRAINAGE AREA: 6,665.32 SQ. FT.
4. BOTTOM ELEVATION: 742.00
5. ESDv SURFACE STORAGE: 279.11 CU. FT.
6. TOTAL ESDv ACHIEVED: 372.15 CU. FT.
7. ESDv WSE: 742.19
8. 10–YEAR WSE: 742.44
9. 10–YEAR STORAGE VOULME: 655.78 CU. FT.
10. INLET TYPE: MODIFIED STANDARD YARD INLET CARROLL COUNTY, MD DPW PLATE 59*
11. NON–WOVEN GEOTEXTILE FABRIC TO SIDES
12. 4" SLOTTED PVC UNDERDRAIN PIPE
13. 4" SOLID SCHEDULE 40 PVC CLEANOUT PIPE, 6" ABOVE ESDv WSE, WITH WATER TIGHT SCREW LID
14. 6" 0BSERVATION WELL, SLOTTED PVC PIPE UPTO THE TOP OF THE #8 STONE LAYER AND SOLID SCHEDULE 40 PVC ABOVE THE #8 STONE LAYER.
15. MAINTENANCE RESPONSIBILITY: OWNER
16. IF ROCK IS ENCOUNTERED, UNDER CUT 18" AND BACKFILL WITH CL TYPE SOIL
17. NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

* THIS STRUCTURE MUST BE MONOLITHIC CONSTRUCTION. NO BRICK PIERS ALLOWED

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT, CONSULTING ENGINEERS
5120 WILLET BRIDGE ROAD, BETHESDA MD 20816
TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

STATE OF MARYLAND — MERAFE KIDUSAN KIDIST ARSEMA — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

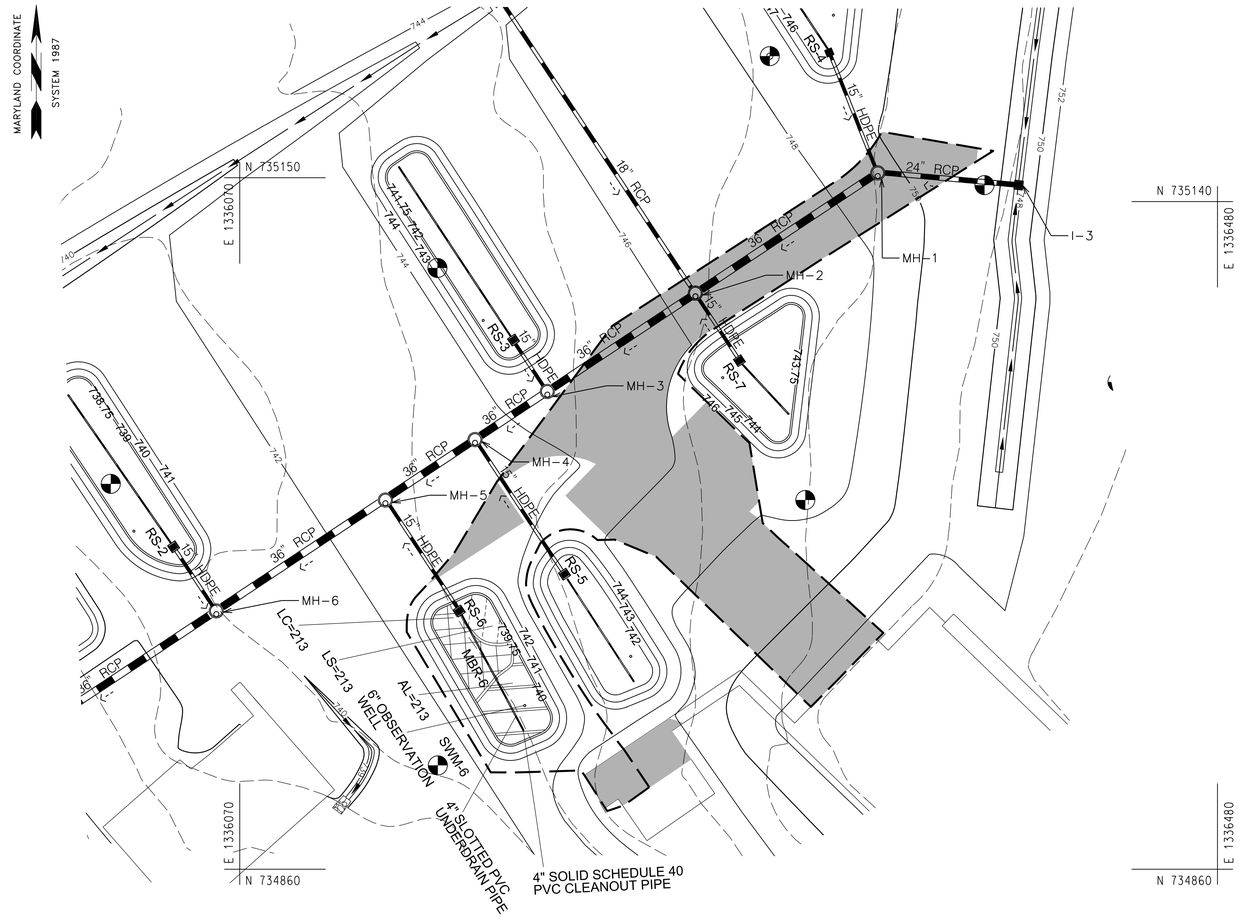
SITE DEVELOPMENT FINAL PLAN

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

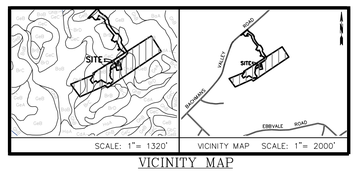
SWM FACILITY DETAILS
MBR 5

PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030

SHEET 30 OF 96



M-6 MICRO-BIORETENTION FACILITY (MBR-6) SCALE 1:30



VICINITY MAP

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 25 of 35

Project No.: 21-1024 **Project Description:** Proposed Arsema Development
Boring No. SWM-6 **Station:** , **Ground Surface Elevation:** 743.0 ft
Easting; 1336160.378 **Northing;** 734910.353 **Logged by:**
Date Started: 6/14/21 **Date Completed:** 6/14/21
Inspector: Findling **Driller;** David Pryor

Rig Type	CME ATV 45	
Rig No.	R-3	
Drive Hammer Weight	140	LB
Auger Size	3.25	IN
Size of Core		IN
Size of Bit OD		IN
Hammer Energy Ratio		%
Auger Depth	16	FT

WATER TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
▼ 3.20	739.82	END	6/14/21
▽ 2.00	741.02	48 hrs.	6/15/21

CAVE-IN TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
▼ 9.60	733.42	END	6/14/21
▽ 3.40	739.62	48 hrs.	6/15/21

DEPTH IN FEET	ELEV. IN FEET	MAT'L	MATERIAL DESCRIPTION	SAMPLE NO.	BLOWS/ RQD	SAMPLE DEPTH	REC. SPT(in) or Core (%)	LAB. INDEX TESTS NMC (%)	LL (%)	PI (%)	REMARKS
0.3	742.77		Top soil, 3 inches thick								
			Light brown, moist, medium stiff Silt, trace Mica, trace Sand and Gravel (FILL)	1	2-2-3-2	0.0-2.0	18				
3.0	740.02			2	3-2-2-3	2.0-4.0	19				
			Multi brown, moist to wet, medium dense Silty SAND, trace Mica, trace Gravel (SM)	3	4-4-3-5	4.0-6.0	24				
				4	3-4-4-6	6.0-8.0	24				Water on rods @6'
				5	2-2-2-2	8.0-10.0	24				
12.0	731.02			6	2-2-2-2	10.0-12.0	24				
			Light brown, moist to wet, soft SILT, some Mica, trace Sand and rock fragments (ML)	7	2-3-4-5	12.0-14.0	24				
16.0	727.02			8	3-4-4-3	14.0-16.0	19				
			Bottom of Boring @ 16'								

Z:\21-1024 MASAM PROPOSED ARSEMA DEVELOPMENT\GPJ\ 8"X14"

Legend: NMC - Natural Moisture Content; PI - Plasticity Index; REC - Recovery; MAT'L - Material Graphics; SPT - Standard Penetration Test; RQD - Rock Quality Designation; LL - Liquid Limit; Elev - Elevation; Geotech - Geotechnical; OD - Outside Diameter; Boring and Sampling conforms to ASTM D420/D1586

DESIGN SUMMARY
1. FACILITY NUMBER: MBR-6
2. FACILITY TYPE: MICRO-BIORETENTION
3. DRAINAGE AREA: 19,693.94 SQ. FT.
4. BOTTOM ELEVATION: 739.75
5. ESDv SURFACE STORAGE: 1,859.57 CU. FT.
6. TOTAL ESDv ACHIEVED: 2,479.73 CU. FT.
7. ESDv WSE: 740.75
8. 10-YEAR WSE: 741.00
9. 10-YEAR STORAGE VOULME: 2,324.46 CU. FT.
10. INLET TYPE: MODIFIED STANDARD YARD INLET CARROLL COUNTY, MD DPW PLATE 59*
11. NON-WOVEN GEOTEXTILE FABRIC TO SIDES
12. 4" SLOTTED PVC UNDERDRAIN PIPE
13. 4" SOLID SCHEDULE 40 PVC CLEANOUT PIPE, 6" ABOVE ESDv WSE, WITH WATER TIGHT SCREW LID
14. 6" OBSERVATION WELL, SLOTTED PVC PIPE UPTO THE TOP OF THE #8 STONE LAYER AND SOLID SCHEDULE 40 PVC ABOVE THE #8 STONE LAYER.
15. MAINTENANCE RESPONSIBILITY: OWNER
16. IF ROCK IS ENCOUNTERED, UNDER CUT 18" AND BACKFILL WITH CL TYPE SOIL
17. NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

* THIS STRUCTURE MUST BE MONOLITHIC CONSTRUCTION. NO BRICK PIERS ALLOWED.

PLANT SCHEDULE FOR BMP SURFACES					
KEY	QTY.	BOTTANICAL NAME/COMMON NAME	SIZE	COND.	COMMENTS
PERRENIALS/ORNAMENTAL GRASSES					
AL	191	ASCLEPIAS TUBORESA/BUTTERFLY MILKWEED	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
LS	191	LATRIS SPICATA/BLAZING STAR	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
LC	191	LOBEILA CARDINALS/CARDINAL FLOWER	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
PLANT SCHEDULE FOR BMP SURFACES					
SHRUB	QTY. 17	SIZE: 30" HT. #3 CG min.	PLUG	PLANT AT 30" 0.C.	

NOTES
1. PLANT QTY. PER 100 SQ. FT. OF BMP FLOOR AREA: 40
2. BMP FLOOR AREA (ROUNDED UP): 1593 SQ. FT.
3. APPROXIMATE TOTAL QTY: 638
4. MINIMUM # OF SPECIES: 3
5. QTY OF EACH SPECIES (EQUALLY DIVIDED): 213
6. BMP PERIMETER (ROUNDED UP): 169 FT.
7. SHRUB QUANTITY FOR PERIMETER: 10 PER 100 LF.
8. TURFGRASS ESTABLISHMENT WITH TYPE A SOIL STABILIZATION MATTING ABOVE THE ESDv ELEVATION

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT, CONSULTING ENGINEERS
5120 WILLET BRIDGE ROAD, BETHESDA MD 20816
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STATE OF MARYLAND — MELVIN L. BEVERLY — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

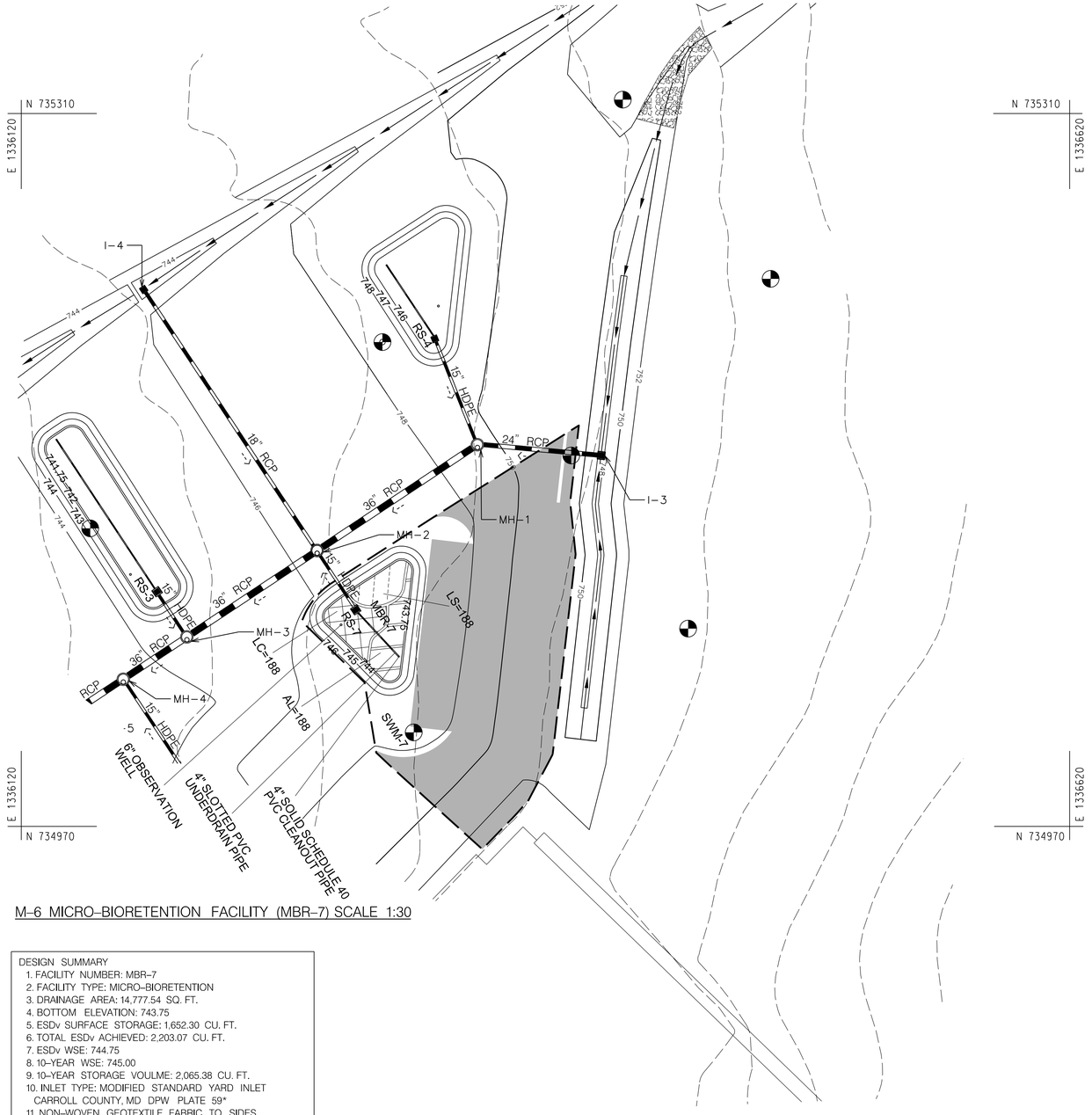
File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

SWM FACILITY DETAILS
MBR-6

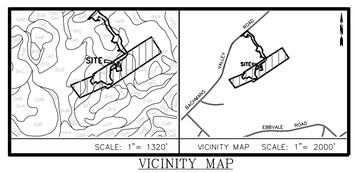
PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 31 OF 96



M-6 MICRO-BIORETENTION FACILITY (MBR-7) SCALE 1:30

DESIGN SUMMARY
1. FACILITY NUMBER: MBR-7
2. FACILITY TYPE: MICRO-BIORETENTION
3. DRAINAGE AREA: 14,777.54 SQ. FT.
4. BOTTOM ELEVATION: 743.75
5. ESDv SURFACE STORAGE: 1,652.30 CU. FT.
6. TOTAL ESDv ACHIEVED: 2,203.07 CU. FT.
7. ESDv WSE: 744.75
8. 10-YEAR WSE: 745.00
9. 10-YEAR STORAGE VOULME: 2,065.38 CU. FT.
10. INLET TYPE: MODIFIED STANDARD YARD INLET CARROLL COUNTY, MD DPW PLATE 59*
11. NON-WOVEN GEOTEXTILE FABRIC TO SIDES
12. 4" SLOTTED PVC UNDERDRAIN PIPE
13. 4" SOLID SCHEDULE 40 PVC CLEANOUT PIPE, 6" ABOVE ESDv WSE, WITH WATER TIGHT SCREW LID
14. 6" OBSERVATION WELL, SLOTTED PVC PIPE UPTO THE TOP OF THE #8 STONE LAYER AND SOLID SCHEDULE 40 PVC ABOVE THE #8 STONE LAYER.
15. MAINTENANCE RESPONSIBILITY: OWNER
16. IF ROCK IS ENCOUNTERED, UNDER CUT 18" AND BACKFILL WITH CL TYPE SOIL
17. NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

* THIS STRUCTURE MUST BE MONOLITHIC CONSTRUCTION. NO BRICK PIERS ALLOWED.



VICINITY MAP

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 26 of 35

Project No.: 21-1024 **Project Description:** Proposed Arsema Development
Boring No. SWM-7 **Station:** , ' **Ground Surface Elevation:** 749.2 ft
Easting: 1336305.781 **Northing:** 735016.053 **Logged by:**
Date Started: 6/14/21 **Date Completed:** 6/14/21
Inspector: Findling **Driller:** David Pryor

Rig Type	CME ATV 45	
Rig No.	R-3	
Drive Hammer Weight	140	LB
Auger Size	3.25	IN
Size of Core		IN
Size of Bit OD		IN
Hammer Energy Ratio		%
Auger Depth	16	FT

WATER TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
▼ 9.40	739.84	END	6/14/21
▽ 6.90	742.34	48 hrs	6/15/21

CAVE-IN TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
▼ 10.00	739.24	END	6/14/21
▽ 9.25	739.99	48 hrs	6/15/21

DEPTH IN FEET	ELEV. IN FEET	MATL	MATERIAL DESCRIPTION	SPT SPOON/ROCK CORE SAMPLE NO.	BLOWS/ RQD	SAMPLE DEPTH	REC. SPT(in) or Core (%)	LAB. INDEX TESTS NMC (%)	LL (%)	PI (%)	REMARKS
0.3	748.99		Top soil, 3 inches thick								
			Light brown, moist, medium stiff Silt, trace Mica, some Sand (FILL)	1	2-2-3-3	0.0-2.0	20				
4.0	745.24			2	2-2-2-3	2.0-4.0	24				
6.0	743.24		Multi brown, moist, medium dense Silty Gravel, some Mica, trace rock fragments, sand lenses (ML)	3	2-1-1-3	4.0-6.0	24				
			Multi brown, moist, medium stiff to stiff Sandy SILT, some Mica, trace rock fragments, sand lenses (ML)	4	2-3-3-4	6.0-8.0	24				
10.0	739.24			5	3-3-4-5	8.0-10.0	24				
			Light brown, mottled, moist to wet, soft SILT, some Mica, trace Sand and rock fragments (ML)	6	3-3-3-5	10.0-12.0	24				
				7	2-2-3-5	12.0-14.0	24				
16.0	733.24			8	4-4-4-6	14.0-16.0	24				Water on rods @13.5'
			Bottom of Boring @ 16'								

21-1024 ARKAAH PROPOSED ARSEMA DEVELOPMENT.GPJ 8.5"X11"

Legend: NMC - Natural Moisture Content; RQD - Rock Quality Designation; PI - Plasticity Index; LL - Liquid Limit; REC - Recovery; Elev - Elevation; MATL - Material Graphics; Geotech - Geotechnical; SPT- Standard Penetration Test; OD - Outside Diameter

Boring well sampling Continues to ASTM/AASHTO

PLANT SCHEDULE FOR BMP SURFACES					
KEY	QTY.	BOTTANICAL NAME/COMMON NAME	SIZE	COND.	COMMENTS
PERRENIALS/ORNAMENTAL GRASSES					
AL	188	ASCLEPIAS TUBORESA/BUTTERFLY MILKWEED	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
LS	188	LATRIS SPICATA/BLAZING STAR	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
LC	188	LOBEILA CARDINALS/CARDINAL FLOWER	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
PLANT SCHEDULE FOR BMP SURFACES					
SHRUB	QTY. 16	SIZE: 30" HT. #3 CG min.	PLUG	PLANT AT 30" 0.C.	

NOTES
1. PLANT QTY. PER 100 SQ. FT. OF BMP FLOOR AREA: 40
2. BMP FLOOR AREA (ROUNDED UP): 1406 SQ. FT.
3. APPROXIMATE TOTAL QTY: 563
4. MINIMUM # OF SPECIES: 3
5. QTY OF EACH SPECIES (EQUALLY DIVIDED): 188
6. BMP PERIMETER (ROUNDED UP): 155 FT.
7. SHRUB QUANTITY FOR PERIMETER: 10 PER 100 LF.
8. TURFGRASS ESTABLISHMENT WITH TYPE A SOIL STABILIZATION MATTING ABOVE THE ESDv ELEVATION

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 Number: 48396
Expiration Date: 01-15-2026

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STATE OF MARYLAND — MELANIE BEVERLY — 48396 — PROFESSIONAL ENGINEER — 01-15-2026

NO.	DESCRIPTION	NAME	DATE

REVISIONS

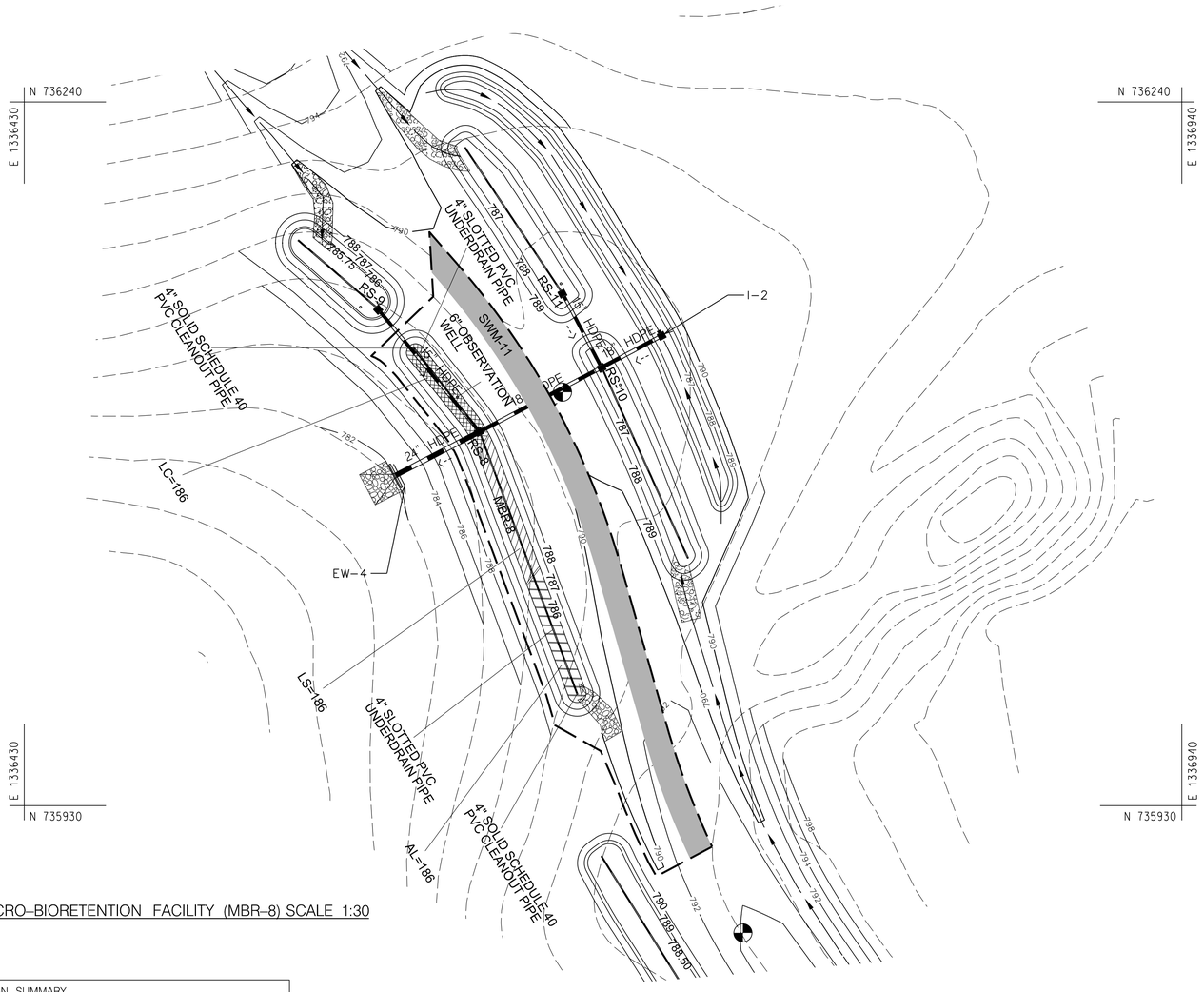
File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

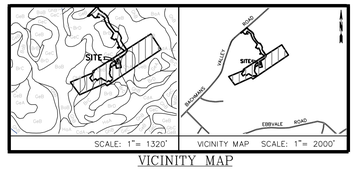
SITE DEVELOPMENT FINAL PLAN

SWM FACILITY DETAILS
MBR-7

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030



M-6 MICRO-BIORETENTION FACILITY (MBR-8) SCALE 1:30



VICINITY MAP

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 30 of 35

Project No.: 21-1024 **Project Description:** Proposed Arsema Development
Boring No. SWM-11 **Station:** , -
Ground Surface Elevation: 784.8 ft
Easting; 1336620.066 **Northing;** 736100.969 **Logged by:**
Date Started: 7/8/21 **Date Completed:** 7/8/21
Inspector: Findling **Driller;** Sunny L.

Rig Type	CME ATV 45
Rig No.	R-3
Drive Hammer Weight	140 LB
Auger Size	3.25 IN
Size of Core	IN
Size of Bit OD	IN
Hammer Energy Ratio	%
Auger Depth	16 FT

WATER TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
▼		END	7/8/21
▽		24 hrs.	7/9/21

CAVE-IN TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
◪ 9.00	775.77	END	7/8/21
◪ 8.60	776.17	24 hrs.	7/9/21

DEPTH IN FEET	ELEV. IN FEET	MATL	MATERIAL DESCRIPTION	SPT SPOON/ROCK CORE SAMPLE NO.	BLOWS/ RQD	SAMPLE DEPTH	REC. SPT(in) or Core (%)	LAB. INDEX TESTS NMC (%)	LL (%)	PI (%)	REMARKS
0.3	784.52		Top soil, 3 inches thick								
			Light brown, moist, medium stiff Silt, trace Mica, some Sand and Gravel (FILL)	1	7-25-20-20	0.0-2.0	20				
4.0	780.77			2	8-10-7-7	2.0-4.0	20				
			Brown, gray moist to wet, medium dense Clayey SAND, some Mica, trace rock fragments (SC)	3	5-5-5-7	4.0-6.0	20				
				4	5-5-7-8	6.0-8.0	20				
				5	6-7-8-10	8.0-10.0	24				
				6	7-8-8-10	10.0-12.0	24				
				7	6-8-10-11	12.0-14.0	6				
				8	4-4-3-3	14.0-16.0	14				
16.0	768.77		Bottom of Boring @ 16'								

Legend: NMC - Natural Moisture Content; PI - Plasticity Index; REC - Recovery; MATL - Material Graphics; SPT- Standard Penetration Test; RQD - Rock Quality Designation; LL - Liquid Limit; Elev - Elevation; Geotech - Geotechnical; OD - Outside Diameter; Borings and Samples Conform to ASTM D420-09

27-1024 MINIUM PROPOSED ARSEMA DEVELOPMENT GPJ 8.1 MDOT1

PLANT SCHEDULE FOR BMP SURFACES					
KEY	QTY.	BOTTANICAL NAME/COMMON NAME	SIZE	COND.	COMMENTS
PERRENIALS/ORNAMENTAL GRASSES					
AL	186	ASCLEPIAS TUBORESA/BUTTERFLY MILKWEED	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
LS	186	LATRIS SPICATA/BLAZING STAR	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
LC	186	LOBEILA CARDINALS/CARDINAL FLOWER	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
PLANT SCHEDULE FOR BMP SURFACES					
SHRUB	QTY. 37	SIZE: 30" HT. #3 CG min.	PLUG	PLANT AT 30" 0.C.	

NOTES
1. PLANT QTY. PER 100 SQ. FT. OF BMP FLOOR AREA: 40
2. BMP FLOOR AREA (ROUNDED UP): 1,391 SQ. FT.
3. APPROXIMATE TOTAL QTY: 557
4. MINIMUM # OF SPECIES: 3
5. QTY OF EACH SPECIES (EQUALLY DIVIDED): 186
6. BMP PERIMETER (ROUNDED UP): 361 FT.
7. SHRUB QUANTITY FOR PERIMETER: 10 PER 100 LF.
8. TURFGRASS ESTABLISHMENT WITH TYPE A SOIL STABILIZATION MATTING ABOVE THE ESDv ELEVATION

DESIGN SUMMARY
1. FACILITY NUMBER: MBR-8
2. FACILITY TYPE: MICRO-BIORETENTION
3. DRAINAGE AREA: 12,397.26 SQ. FT.
4. BOTTOM ELEVATION: 786.00
5. ESDv SURFACE STORAGE: 550.13 CU. FT.
6. TOTAL ESDv ACHIEVED: 733.50 CU. FT.
7. ESDv WSE: 786.28
8. 10-YEAR WSE: 786.53
9. 10-YEAR STORAGE VOULME: 1,030.87 CU. FT.
10. INLET TYPE: PRECAST STANDARD SINGLE OR DOUBLE OPENING TYPE K INLET OPEN-END GRATE (MD 378.11)
11. NON-WOVEN GEOTEXTILE FABRIC TO SIDES
12. 4" SLOTTED PVC UNDERDRAIN PIPE
13. 4" SOLID SCHEDULE 40 PVC CLEANOUT PIPE, 6" ABOVE ESDv WSE, WITH WATER TIGHT SCREW LID
14. 6" OBSERVATION WELL, SLOTTED PVC PIPE UPTO THE TOP OF THE #8 STONE LAYER AND SOLID SCHEDULE 40 PVC ABOVE THE #8 STONE LAYER.
15. MAINTENANCE RESPONSIBILITY: OWNER
16. IF ROCK IS ENCOUNTERED, UNDER CUT 18" AND BACKFILL WITH CL TYPE SOIL
17. NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT, CONSULTING ENGINEERS
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WWW.ZTIGERS.COM

STATE OF MARYLAND — MELANIE A. BEVERLY — 48396 — REGISTERED PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

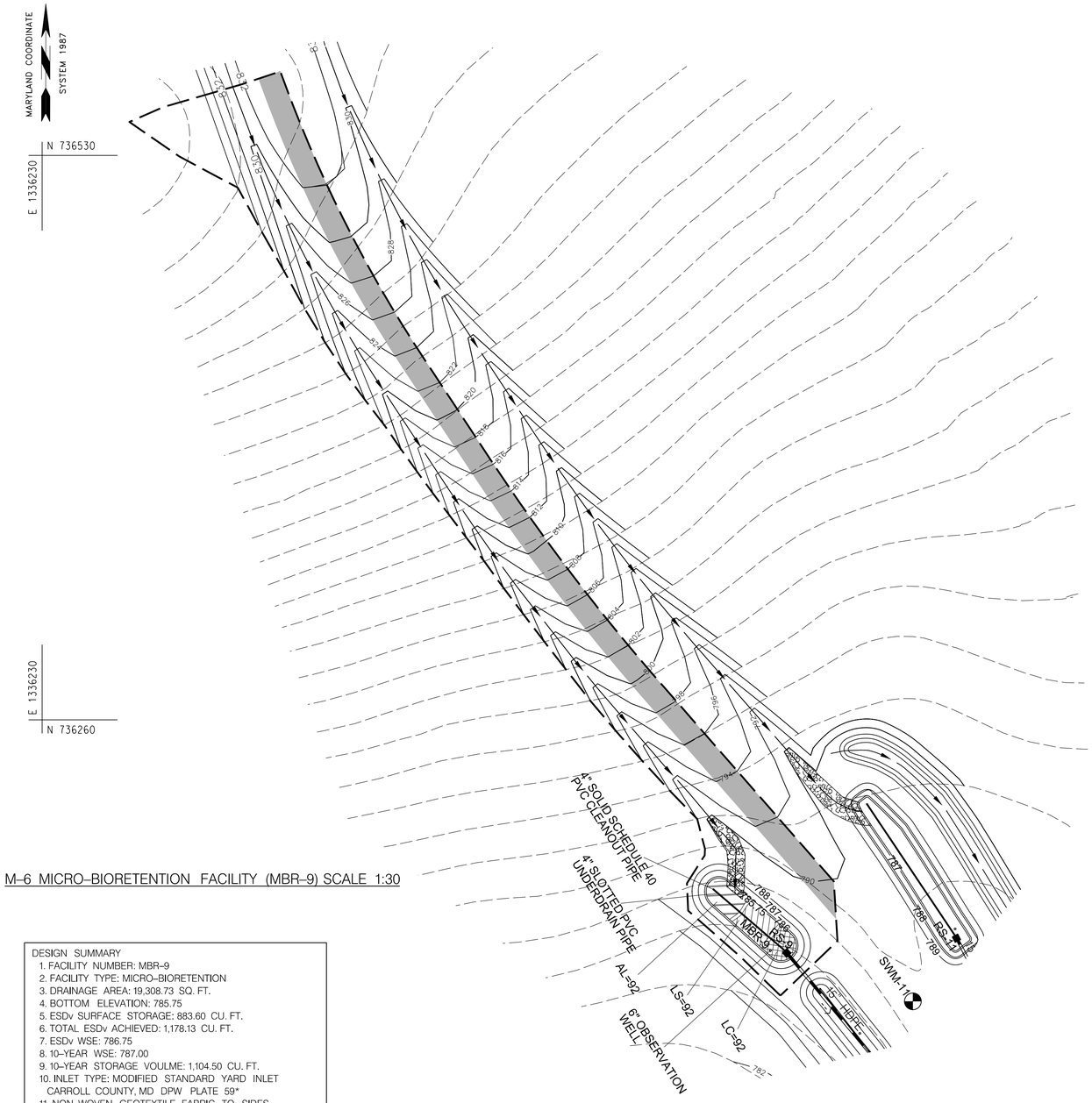
File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

SWM FACILITY DETAILS
MBR-8

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030


MARYLAND COORDINATE SYSTEM 1987
N 736530
E 1336230
E 1336800
N 736260
4" SOLID SCHEDULE 40 PVC CLEANOUT PIPE
4" SLOTTED PVC UNDERDRAIN PIPE
6" OBSERVATION WELL
AL-92
LS-92
LC-92
MBR-9
RS-1
RS-2
SWM-11
15" HDPE
787
788
789
790
791
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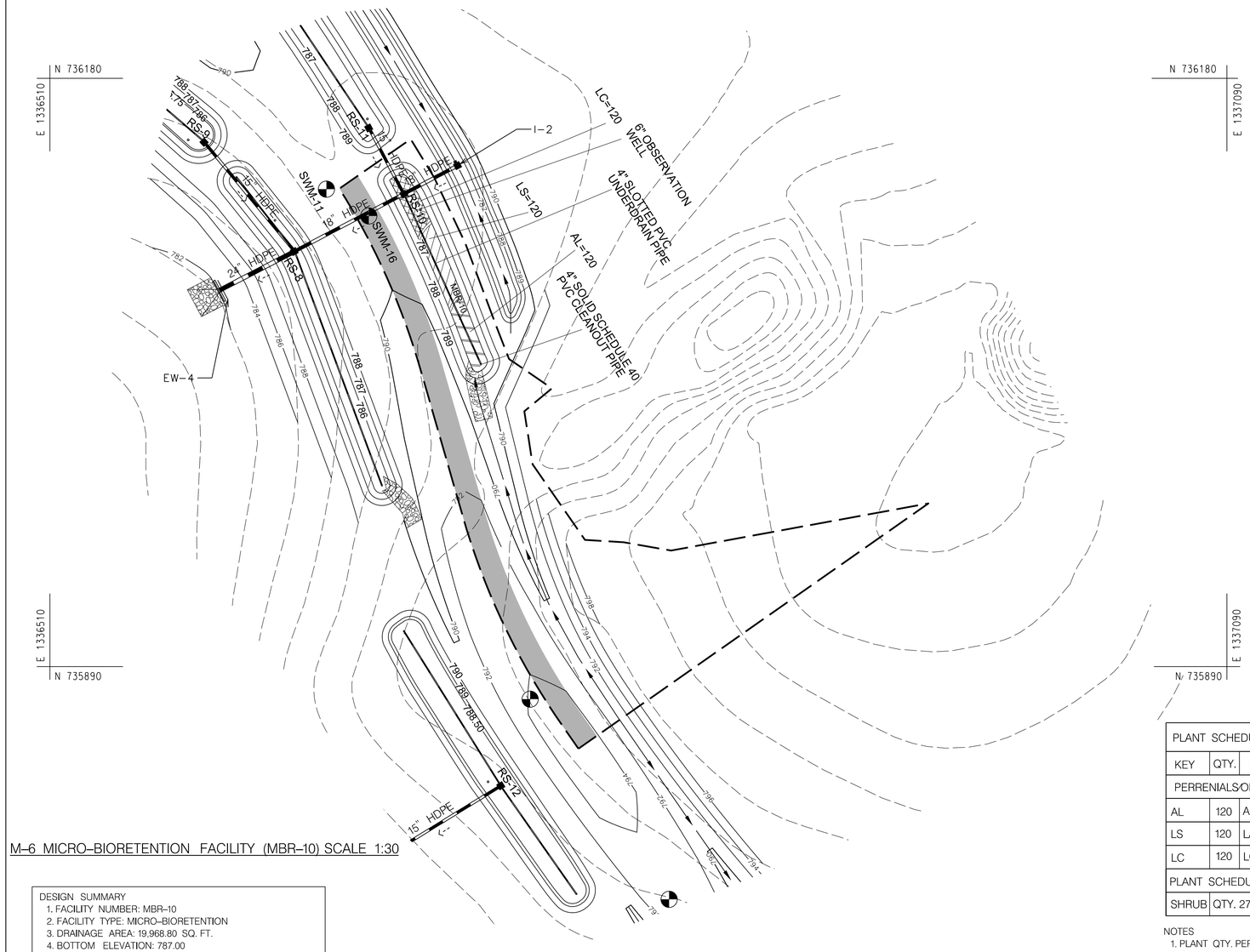
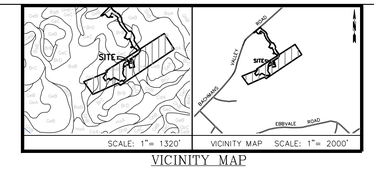


M-6 MICRO-BIORETENTION FACILITY (MBR-10) SCALE 1:30



VICINITY MAP

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 35 of 35

Project No.: 21-1024 **Project Description:** Proposed Arsema Development
Boring No. SWM-16 **Station:** , **Ground Surface Elevation:** 789.2 ft
Easting; 1336701.912 **Northing;** 736135.308 **Logged by:**
Date Started: 7/8/21 **Date Completed:** 7/8/21
Inspector: Findling **Driller;** Sunny L.

Rig Type	CME ATV 45
Rig No.	R-3
Drive Hammer Weight	140 LB
Auger Size	3.25 IN
Size of Core	IN
Size of Bit OD	IN
Hammer Energy Ratio	%
Auger Depth	16 FT

WATER TABLE

Depth Below Surface Depth (ft)	Elev (ft)	Time (hours)	Date
▼		END	7/8/21
▽		24 hrs.	7/9/21

CAVE-IN TABLE

Depth Below Surface Depth (ft)	Elev (ft)	Time (hours)	Date
9.00	780.20	END	7/8/21
10.30	778.90	24 hrs.	7/9/21

DEPTH IN FEET	ELEV. IN FEET	MATL	MATERIAL DESCRIPTION	SAMPLE NO.	BLOWS/ RQD	SAMPLE DEPTH	REC. SPT(in) or Core (%)	LAB. INDEX TESTS NMC (%)	LL (%)	PI (%)	REMARKS
0.3	788.95		Top soil, 3 inches thick								
			Light brown, moist, medium stiff Silt, trace Mica, some Sand (FILL)	1	3-4-5-5	0.0-2.0	18				
4.0	785.20			2	4-4-5-5	2.0-4.0	20				
			Brown, gray, moist to wet, medium stiff to stiff Sandy Silt, some Mica, some rock fragments (ML)	3	4-6-7-7	4.0-6.0	20				
				4	6-6-7-7	6.0-8.0	24				
				5	4-5-7-7	8.0-10.0	24				
				6	7-7-8-8	10.0-12.0	24				
				7	7-8-9-12	12.0-14.0	24				
				8	7-11-9-8	14.0-16.0	24				
16.0	773.20		Bottom of Boring @ 16'								

P:\21-1024 MHAMM PROPOSED ARSEMA DEVELOPMENT\ GP # 1 MAP1

Legend: NMC - Natural Moisture Content, RQD - Rock Quality Designation, PI - Plasticity Index, LL - Liquid Limit, REC - Recovery, Elev - Elevation, MATL - Material Graphics, Geotech - Geotechnical, SPT- Standard Penetration Test, OD - Outside Diameter

Boring and Sampling conforms to ASTM D420/D1586

PLANT SCHEDULE FOR BMP SURFACES					
KEY	QTY.	BOTTANICAL NAME/COMMON NAME	SIZE	COND.	COMMENTS
PERRENIALS/ORNAMENTAL GRASSES					
AL	120	ASCLEPIAS TUBORESA/BUTTERFLY MILKWEED	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
LS	120	LATRIS SPICATA/BLAZING STAR	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
LC	120	LOBEILA CARDINALS/CARDINAL FLOWER	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
PLANT SCHEDULE FOR BMP SURFACES					
SHRUB	QTY. 27	SIZE: 30" HT. #3 CG min.	PLUG	PLANT AT 30" O.C.	

NOTES
1. PLANT QTY. PER 100 SQ. FT. OF BMP FLOOR AREA: 40
2. BMP FLOOR AREA (ROUNDED UP): 895 SQ. FT.
3. APPROXIMATE TOTAL QTY: 358
4. MINIMUM # OF SPECIES: 3
5. QTY OF EACH SPECIES (EQUALLY DIVIDED): 120
6. BMP PERIMETER (ROUNDED UP): 261 FT.
7. SHRUB QUANTITY FOR PERIMETER: 10 PER 100 LF.
8. TURFGRASS ESTABLISHMENT WITH TYPE A SOIL STABILIZATION MATTING ABOVE THE ESDv ELEVATION

DESIGN SUMMARY
1. FACILITY NUMBER: MBR-10
2. FACILITY TYPE: MICRO-BIORETENTION
3. DRAINAGE AREA: 19,968.80 SQ. FT.
4. BOTTOM ELEVATION: 787.00
5. ESDv SURFACE STORAGE: 624.02 CU. FT.
6. TOTAL ESDv ACHIEVED: 832.03 CU. FT.
7. ESDv WSE: 787.50
8. 10-YEAR WSE: 787.75
9. 10-YEAR STORAGE VOULME: 955.61 CU. FT.
10. INLET TYPE: PRECAST STANDARD SINGLE OR DOUBLE OPENING TYPE K INLET OPEN-END GRATE (MD 378.11)
11. NON-WOVEN GEOTEXTILE FABRIC TO SIDES
12. 4" SLOTTED PVC UNDERDRAIN PIPE
13. 4" SOLID SCHEDULE 40 PVC CLEANOUT PIPE, 6" ABOVE ESDv WSE, WITH WATER TIGHT SCREW LID
14. 6" 0BSERVATION WELL, SLOTTED PVC PIPE UPTO THE TOP OF THE #8 STONE LAYER AND SOLID SCHEDULE 40 PVC ABOVE THE #8 STONE LAYER.
15. MAINTENANCE RESPONSIBILITY: OWNER
16. IF ROCK IS ENCOUNTERED, UNDER CUT 18" AND BACKFILL WITH CL TYPE SOIL
17. NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT, CONSULTING ENGINEERS
5120 WILLET BRIDGE ROAD, BETHESDA MD 20816
TEL (202) 248 6000
TEL (301) 500 0854
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STATE OF MARYLAND — MEHARI FIKRU BEYENE — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

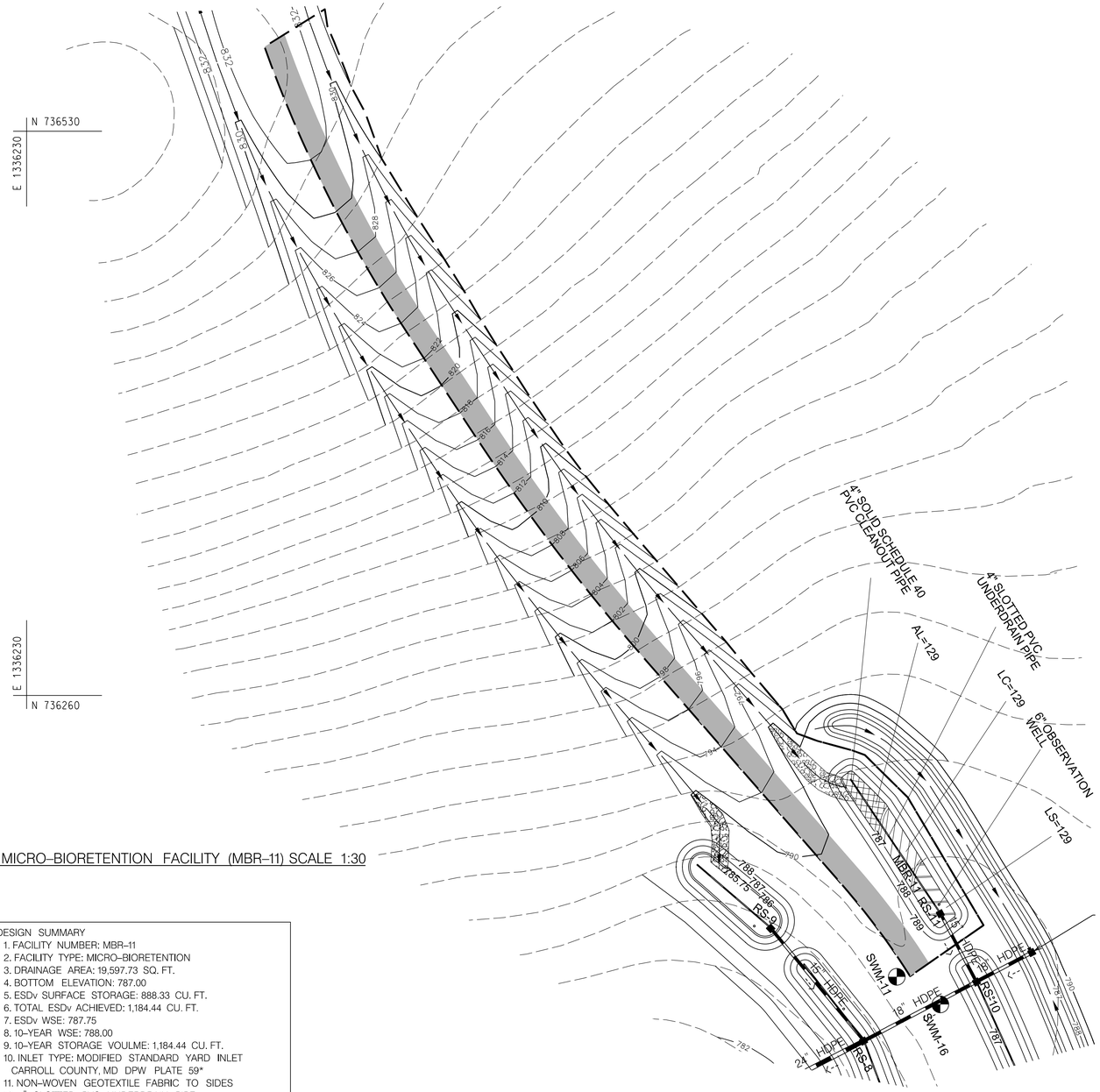
File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

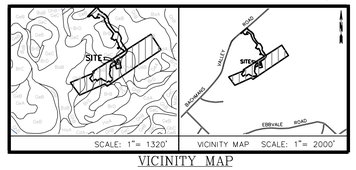
SITE DEVELOPMENT FINAL PLAN

SWM FACILITY DETAILS
MBR-10

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 35 OF 96



M–6 MICRO–BIORETENTION FACILITY (MBR–11) SCALE 1:30



VICINITY MAP

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 35 of 35

Project No.: 21-1024 **Project Description:** Proposed Arsema Development
Boring No. SWM-16 **Station:** , **Ground Surface Elevation;** 789.2 ft
Easting; 1336701.912 **Northing;** 736135.308 **Logged by;**
Date Started: 7/8/21 **Date Completed:** 7/8/21
Inspector: Findling **Driller;** Sunny L.

Rig Type	CME ATV 45	
Rig No.	R-3	
Drive Hammer Weight	140	LB
Auger Size	3.25	IN
Size of Core		IN
Size of Bit OD		IN
Hammer Energy Ratio		%
Auger Depth	16	FT

WATER TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
▼		END	7/8/21
▽		24 hrs.	7/9/21

CAVE-IN TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
9.00	780.20	END	7/8/21
10.30	778.90	24 hrs.	7/9/21

DEPTH IN FEET	ELEV. IN FEET	MATL	MATERIAL DESCRIPTION	SPT SPOON/ROCK CORE SAMPLE NO.	BLOWS/ RQD	SAMPLE DEPTH	REC. SPT(in) or Core (%)	LAB. INDEX TESTS NMC (%)	LL (%)	PI (%)	REMARKS
0.3	788.95		Top soil, 3 inches thick								
			Light brown, moist, medium stiff Silt, trace Mica, some Sand (FILL)	1	3-4-5-5	0.0-2.0	18				
4.0	785.20			2	4-4-5-5	2.0-4.0	20				
			Brown, gray, moist to wet, medium stiff to stiff Sandy Silt, some Mica, some rock fragments (ML)	3	4-6-7-7	4.0-6.0	20				
				4	6-6-7-7	6.0-8.0	24				
				5	4-5-7-7	8.0-10.0	24				
				6	7-7-8-8	10.0-12.0	24				
				7	7-8-9-12	12.0-14.0	24				
				8	7-11-9-8	14.0-16.0	24				
16.0	773.20		Bottom of Boring @ 16'								

Legend: NMC - Natural Moisture Content PI - Plasticity Index REC - Recovery MATL - Material Graphics SPT- Standard Penetration Test
RQD - Rock Quality Designation LL - Liquid Limit Elev - Elevation Geotech - Geotechnical OD - Outside Diameter
Boring and Sampling conforms to ASTM D420/D4220

2" VSNA MINIMUM PROPOSED ARSEMA DEVELOPMENT GP # 1 MD21

PLANT SCHEDULE FOR BMP SURFACES					
KEY	QTY.	BOTTANICAL NAME/COMMON NAME	SIZE	COND.	COMMENTS
PERRENIALS/ORNAMENTAL GRASSES					
AL	129	ASCLEPIAS TUBORESA/BUTTERFLY MILKWEED	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
LS	129	LATRIS SPICATA/BLAZING STAR	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
LC	129	LOBEILA CARDINALS/CARDINAL FLOWER	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
PLANT SCHEDULE FOR BMP SURFACES					
SHRUB	QTY. 23	SIZE: 30" HT. #3 CG min.	PLUG	PLANT AT 30" 0.C.	

NOTES
1. PLANT QTY. PER 100 SQ. FT. OF BMP FLOOR AREA: 40
2. BMP FLOOR AREA (ROUNDED UP): 966 SQ. FT.
3. APPROXIMATE TOTAL QTY: 387
4. MINIMUM # OF SPECIES: 3
5. QTY OF EACH SPECIES (EQUALLY DIVIDED): 129
6. BMP PERIMETER (ROUNDED UP): 224 FT.
7. SHRUB QUANTITY FOR PERIMETER: 10 PER 100 LF.
8. TURFGRASS ESTABLISHMENT WITH TYPE A SOIL STABILIZATION MATTING ABOVE THE ESDv ELEVATION

DESIGN SUMMARY
1. FACILITY NUMBER: MBR–11
2. FACILITY TYPE: MICRO–BIORETENTION
3. DRAINAGE AREA: 19,597.73 SQ. FT.
4. BOTTOM ELEVATION: 787.00
5. ESDv SURFACE STORAGE: 888.33 CU. FT.
6. TOTAL ESDv ACHIEVED: 1,184.44 CU. FT.
7. ESDv WSE: 787.75
8. 10–YEAR WSE: 788.00
9. 10–YEAR STORAGE VOULME: 1,184.44 CU. FT.
10. INLET TYPE: MODIFIED STANDARD YARD INLET CARROLL COUNTY, MD DPW PLATE 59*
11. NON–WOVEN GEOTEXTILE FABRIC TO SIDES
12. 4" SLOTTED PVC UNDERDRAIN PIPE
13. 4" SOLID SCHEDULE 40 PVC CLEANOUT PIPE, 6" ABOVE ESDv WSE, WITH WATER TIGHT SCREW LID
14. 6" 0BSERVATION WELL, SLOTTED PVC PIPE UPTO THE TOP OF THE #8 STONE LAYER AND SOLID SCHEDULE 40 PVC ABOVE THE #8 STONE LAYER.
15. MAINTENANCE RESPONSIBILITY: OWNER
16. IF ROCK IS ENCOUNTERED, UNDER CUT 18" AND BACKFILL WITH CL TYPE SOIL
17. NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

* THIS STRUCTURE MUST BE MONOLITHIC CONSTRUCTION. NO BRICK PIERS ALLOWED.

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 Number: 48396
Expiration Date: 01-15-2026

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5120 WILLET BRIDGE ROAD, BETHESDA MD 20816
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TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

STATE OF MARYLAND — MELANIE J. BEVERLY — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

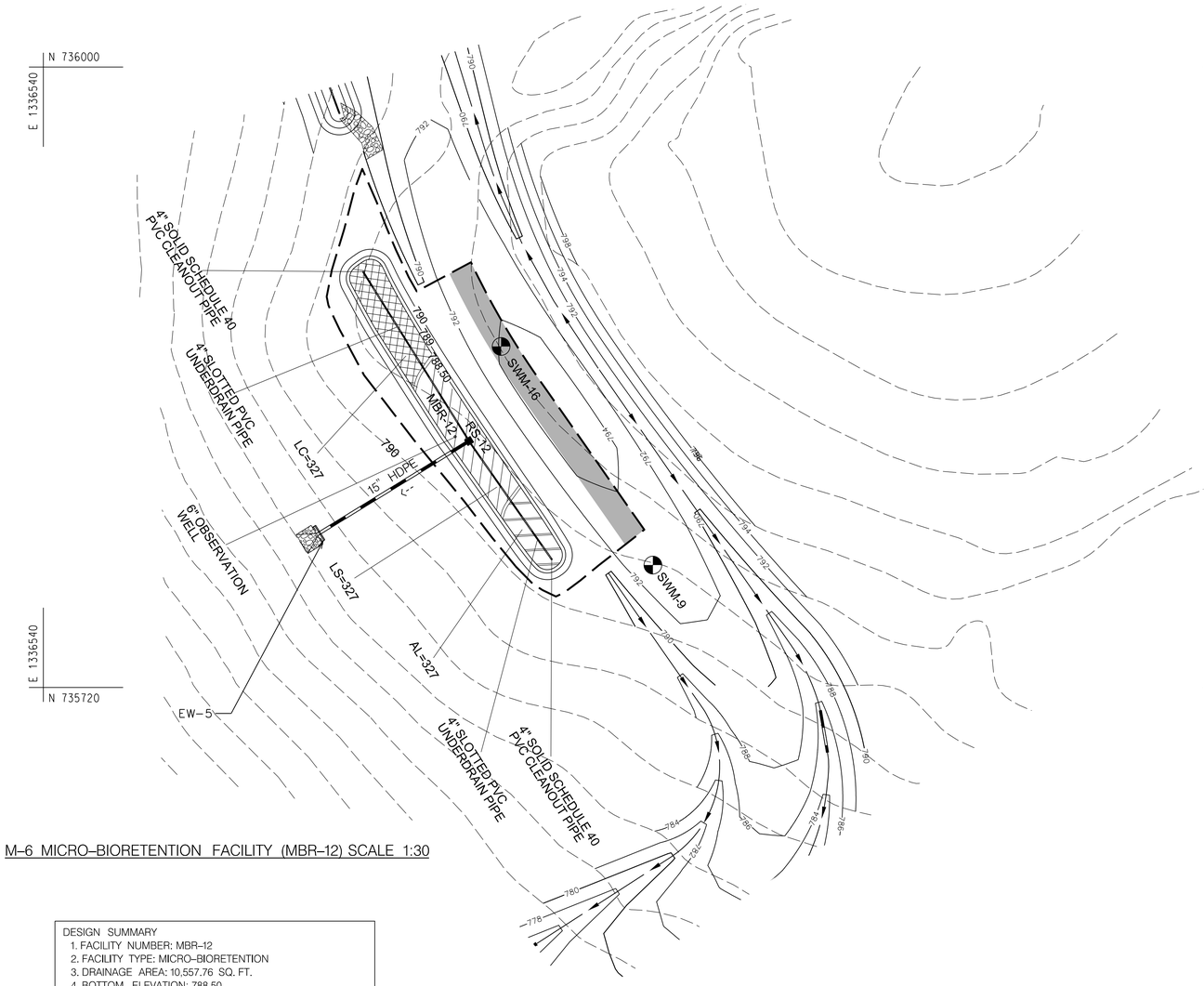
File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

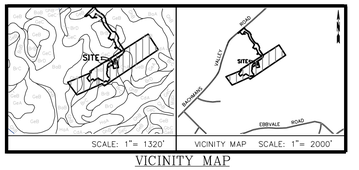
SWM FACILITY DETAILS MBR-11

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 36 OF 96



M-6 MICRO-BIORETENTION FACILITY (MBR-12) SCALE 1:30

MARYLAND COORDINATE SYSTEM 1987



VICINITY MAP

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 35 of 35

Project No.: 21-1024 **Project Description:** Proposed Arsema Development
Boring No. SWM-16 **Station:** , **Ground Surface Elevation:** 789.2 ft
Easting; 1336701.912 **Northing;** 736135.308 **Logged by:**
Date Started: 7/8/21 **Date Completed:** 7/8/21
Inspector: Findling **Driller;** Sunny L.

Rig Type	CME ATV 45	
Rig No.	R-3	
Drive Hammer Weight	140	LB
Auger Size	3.25	IN
Size of Core		IN
Size of Bit OD		IN
Hammer Energy Ratio		%
Auger Depth	16	FT

WATER TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
▼		END	7/8/21
▽		24 hrs.	7/9/21

CAVE-IN TABLE

Depth Below Surface		Time (hours)	Date
Depth (ft)	Elev (ft)		
9.00	780.20	END	7/8/21
10.30	778.90	24 hrs.	7/9/21

DEPTH IN FEET	ELEV. IN FEET	MATL	MATERIAL DESCRIPTION	SPT SPOON/ROCK CORE SAMPLE NO.	BLOWS/ RQD	SAMPLE DEPTH	REC. SPT(in) or Core (%)	LAB. INDEX TESTS NMC (%)	LL (%)	PI (%)	REMARKS
0.3	788.95		Top soil, 3 inches thick								
			Light brown, moist, medium stiff Silt, trace Mica, some Sand (FILL)	1	3-4-5-5	0.0-2.0	18				
4.0	785.20			2	4-4-5-5	2.0-4.0	20				
			Brown, gray, moist to wet, medium stiff to stiff Sandy SILT, some Mica, some rock fragments (ML)	3	4-6-7-7	4.0-6.0	20				
				4	6-6-7-7	6.0-8.0	24				
				5	4-5-7-7	8.0-10.0	24				
				6	7-7-8-8	10.0-12.0	24				
				7	7-8-9-12	12.0-14.0	24				
				8	7-11-9-8	14.0-16.0	24				
16.0	773.20		Bottom of Boring @ 16'								

Z:\1504 MKAAM PROPOSED ARSEMA DEVELOPMENT GP #1\MBR1

Legend: NMC - Natural Moisture Content; PI - Plasticity Index; REC - Recovery; MATL - Material Graphics; SPT - Standard Penetration Test; RQD - Rock Quality Designation; LL - Liquid Limit; Elev - Elevation; Geotech - Geotechnical; OD - Outside Diameter

Boring and Sampling conforms to ASTM D420/D1586

PLANT SCHEDULE FOR BMP SURFACES					
KEY	QTY.	BOTTANICAL NAME/COMMON NAME	SIZE	COND.	COMMENTS
PERRENIALS/ORNAMENTAL GRASSES					
AL	327	ASCLEPIAS TUBORESA/BUTTERFLY MILKWEED	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
LS	327	LATRIS SPICATA/BLAZING STAR	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
LC	327	LOBEILA CARDINALS/CARDINAL FLOWER	2" DIA 5" DEPTH	PLUG	PLANT AT 18" 0.C.
PLANT SCHEDULE FOR BMP SURFACES					
SHRUB	QTY. 35	SIZE: 30" HT. #3 CG min.	PLUG	PLANT AT 30" 0.C.	

NOTES
1. PLANT QTY. PER 100 SQ. FT. OF BMP FLOOR AREA: 40
2. BMP FLOOR AREA (ROUNDED UP): 2451 SQ. FT.
3. APPROXIMATE TOTAL QTY: 981
4. MINIMUM # OF SPECIES: 3
5. QTY OF EACH SPECIES (EQUALLY DIVIDED): 327
6. BMP PERIMETER (ROUNDED UP): 345 FT.
7. SHRUB QUANTITY FOR PERIMETER: 10 PER 100 LF.
8. TURFGRASS ESTABLISHMENT WITH TYPE A SOIL STABILIZATION MATTING ABOVE THE ESDv ELEVATION

DESIGN SUMMARY
1. FACILITY NUMBER: MBR-12
2. FACILITY TYPE: MICRO-BIORETENTION
3. DRAINAGE AREA: 10,557.76 SQ. FT.
4. BOTTOM ELEVATION: 788.50
5. ESDv SURFACE STORAGE: 306.83 CU. FT.
6. TOTAL ESDv ACHIEVED: 409.11 CU. FT.
7. ESDv WSE: 788.61
8. 10-YEAR WSE: 788.86
9. 10-YEAR STORAGE VOULME: 976.61 CU. FT.
10. INLET TYPE: MODIFIED STANDARD YARD INLET CARROLL COUNTY, MD DPW PLATE 59*
11. NON-WOVEN GEOTEXTILE FABRIC TO SIDES
12. 4" SLOTTED PVC UNDERDRAIN PIPE
13. 4" SOLID SCHEDULE 40 PVC CLEANOUT PIPE, 6" ABOVE ESDv WSE, WITH WATER TIGHT SCREW LID
14. 6" OBSERVATION WELL, SLOTTED PVC PIPE UPTO THE TOP OF THE #8 STONE LAYER AND SOLID SCHEDULE 40 PVC ABOVE THE #8 STONE LAYER.
15. MAINTENANCE RESPONSIBILITY: OWNER
16. IF ROCK IS ENCOUNTERED, UNDER CUT 18" AND BACKFILL WITH CL TYPE SOIL
17. NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

* THIS STRUCTURE MUST BE MONOLITHIC CONSTRUCTION. NO BRICK PIERS ALLOWED.

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 Number: 48396
Expiration Date: 01-15-2026

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WWW.ZTIGERS.COM

STATE OF MARYLAND — MELVIN BEYENE — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

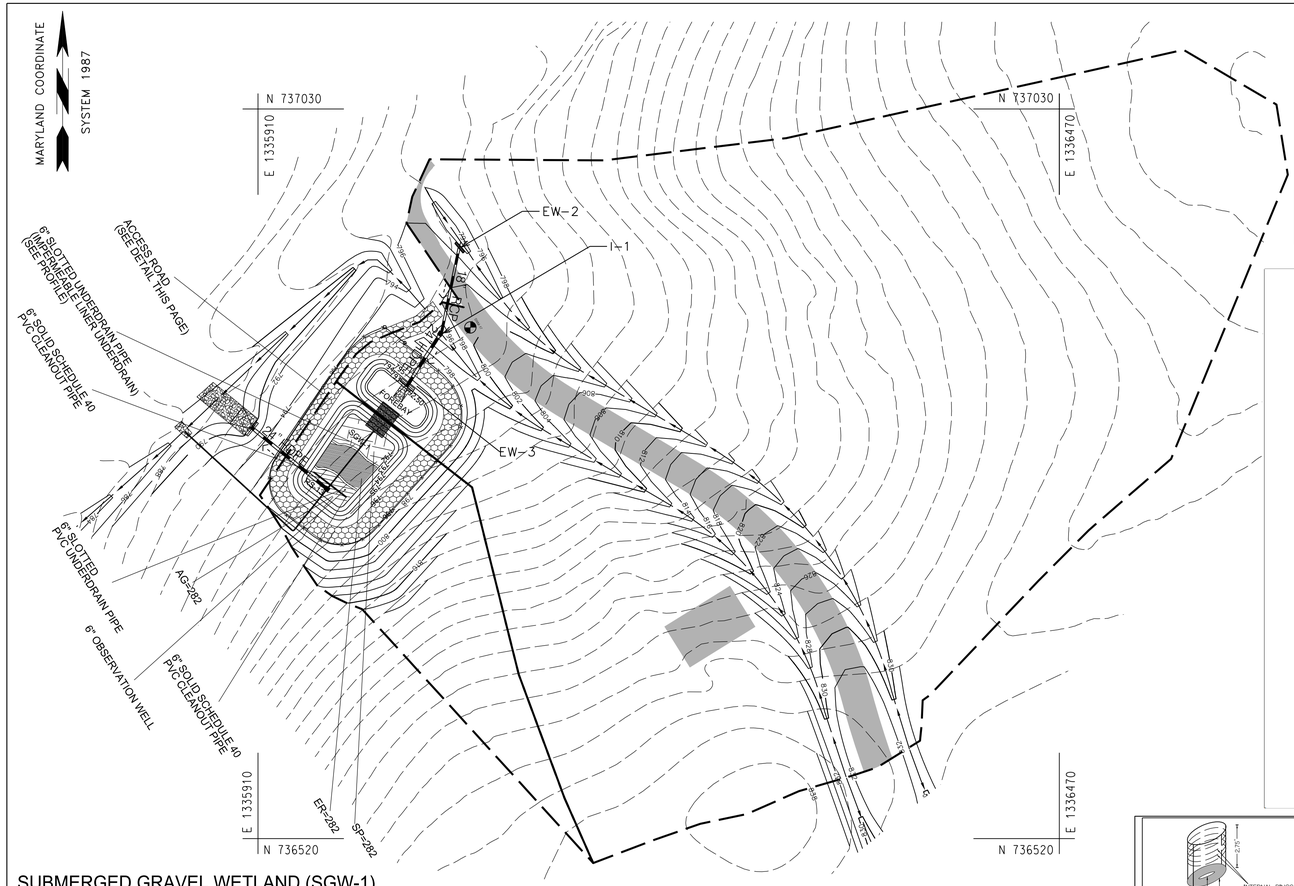
SITE DEVELOPMENT FINAL PLAN

SWM FACILITY DETAILS MBR-12

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

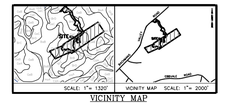
PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030



SUBMERGED GRAVEL WETLAND (SGW-1)
SCALE 1:50

PLANT SCHEDULE FOR BMP SURFACES					
KEY	QTY.	BOTTANICAL NAME/COMMON NAME	SIZE	COND.	COMMENTS
PERRENIALS/ORNAMENTAL GRASSES					
SP	282	SPARTINA PATENS/CORDGRASS SALTMEADOW	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
AG	282	ALOPECURUS GENICULATUS/FOXTAIL MEADOW	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
ER	282	ERAGROSTICS REFRACTA/LOVEGRASS MEADOW	2" DIA 5" DEPTH	PLUG	PLANT AT 18" O.C.
PLANT SCHEDULE FOR BMP SURFACES					
SHRUB	QTY. 4	SIZE: 30" HT. #3 CG min.	PLUG	PLANT AT 30" O.C.	



VICINITY MAP

NOTES
1. PLANT QTY. PER 100 SQ. FT. OF BMP FLOOR AREA: 40
2. BMP FLOOR AREA (ROUNDED UP): 2112 SQ. FT.
3. APPROXIMATE TOTAL QTY: 845
4. MINIMUM # OF SPECIES: 3
5. QTY OF EACH SPECIES (EQUALLY DIVIDED): 282
6. BMP PERIMETER (ROUNDED UP): 184 FT.
7. SHRUB QUANTITY FOR PERIMETER: 2 PER 100 LF.
8. WET MEADOW ESTABLISHMENT WITH TYPE D SSM
9. NO WOODY PLANTS WITHIN THE LIMITS OF BMP SURFACE

FINDLING, INC.

BORING LOG

Sheet 1 of 1
Boring 36 of 95

Project No.: 21-1024 Project Description: Proposed Arsema Development
Boring No. SWM-17 Station: -
Easting: 1336034.361 Northing: 736842.346 Ground Surface Elevation: 798.6 ft
Date Started: 7/8/21 Date Completed: 7/8/21 Logged by:
Inspector: Finding Driller: Sunny L.

WATER TABLE	Depth Below Surface Depth (ft)	Elev (ft)	Time (hours)	Date
▼ 10.00	788.57	END	7/8/21	
▽ 7.90	791.27	24 hrs.	7/9/21	

CAVE-IN TABLE	Depth Below Surface Depth (ft)	Elev (ft)	Time (hours)	Date
▼ 7.60	790.97	END	7/8/21	
▽ 7.60	790.97	24 hrs.	7/9/21	

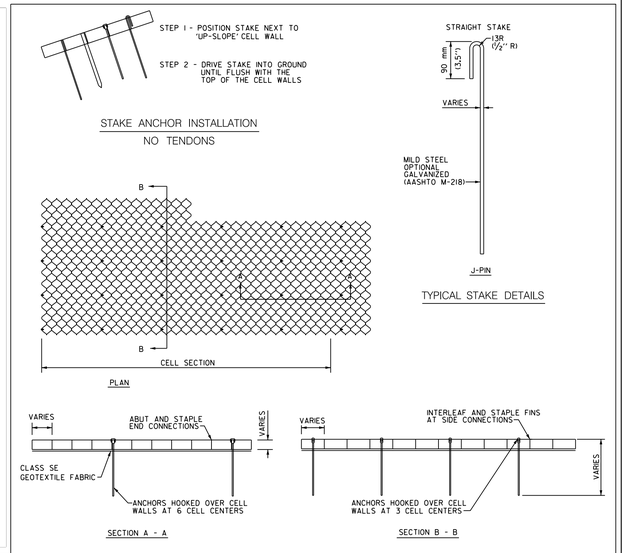
Rig Type	CME ATV 45
Rig No	RL3
Drive Hammer Weight	140 LB
Auger Size	3.25 IN
Size of Core	IN
Size of Bit OD	IN
Hammer Energy Ratio	%
Auger Depth	15 FT

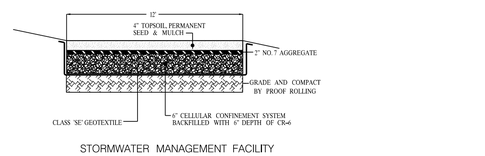
DEPTH IN FEET	ELEV. IN FEET	MATERIAL DESCRIPTION	SAMPLE NO.	BLOWS / ROD	SAMPLE DEPTH	REC. / SPT(N) or Core (%)	NMC (%)	LL (%)	PI (%)	REMARKS
0.3	798.30	Top soil, 3 inches thick								
3.0	795.67	Light brown, moist, medium stiff Silt, trace Mica, some Sand (FILL)	1	6-6-7-6	0.0-2.0	26				
		Brown, moist to wet, medium dense Silty SAND, some Mica, some rock fragments (SM)	2	7-7-10-7	2.0-4.0	26				
			3	7-7-10-15	4.0-6.0	24				
			4	8-10-12-14	5.0-8.0	24				
			5	4-4-8-8	8.0-19.0	26				
			6	4-4-6-8	10.0-12.0	26				
			7	6-8-12-14	12.0-14.0	24				Water on rods @13'
			8	12-14-16-26	14.0-16.0	18				
16.0	782.67	Bottom of Boring @ 16'								

21-1024 ENUM PROPOSED ARSEMA SCUS (PHOTOFOIT).A.S.B.T

Legend: MAC - Natural Moisture Content PI - Plasticity Index REC - Recovery MATS - Material Graphics SPT- Standard Penetration Test
HAZ - Hand Auxiliary Investigation LL - Liquid Limit Elev - Elevation Geotech - Geotechnical QD - Outside Diameter

Boring and Sampling conducted by ASTM D1586/AASHTO T206





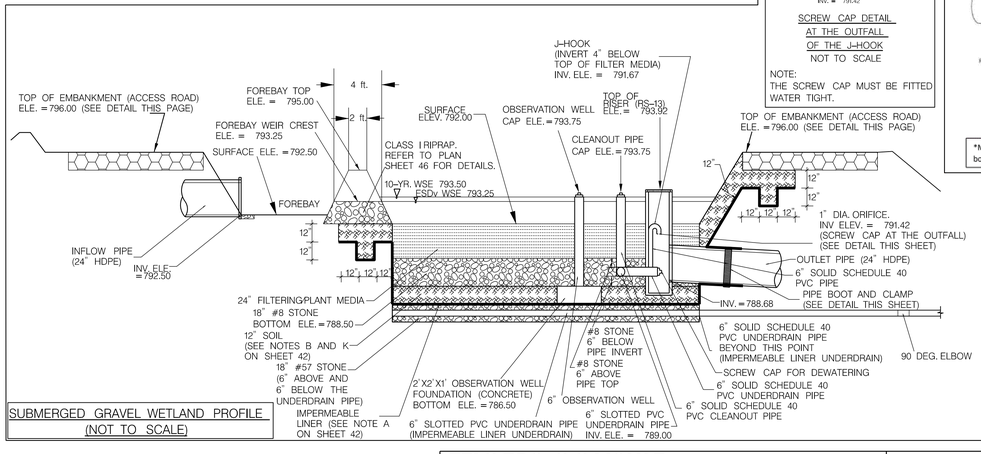
STORMWATER MANAGEMENT FACILITY
MAINTENANCE ACCESS ROAD
CELLULAR CONFINEMENT LOAD SUPPORT SYSTEM

NOT TO SCALE

DESIGN SUMMARY
1. FACILITY NUMBER: SGW-1
2. FACILITY TYPE: SUBMERGED GRAVEL WETLAND
3. DRAINAGE AREA: 222,997.83 SQ. FT.*
4. BOTTOM ELEVATION: 792.00
5. ESDv SURFACE STORAGE: 3,096.28 CU. FT. **
6. TOTAL ESDv ACHIEVED: 4,738.70 CU. FT. **
7. ESDv WSE: 793.25
8. 10-YEAR WSE: 793.50
9. 10-YEAR STORAGE VOULME: 4,630.13 CU. FT. **
10. INLET TYPE: PRECAST STANDARD SINGLE OR DOUBLE OPENING TYPE K INLET OPEN-END GRATE (MD 378.11)
11. IMPERMEABLE LINER AT THE BOTTOM AND SIDES
12. 6" SLOTTED PVC UNDERDRAIN PIPE
13. 6" SOLID SCHEDULE 40 PVC CLEANOUT PIPE, 6" ABOVE ESDv WSE, WITH WATER TIGHT SCREW LID
14. 6" OBSERVATION WELL, SLOTTED PVC PIPE UPTO THE TOP OF THE #8 STONE LAYER AND SOLID SCHEDULE 40 PVC ABOVE THE #8 STONE LAYER.
15. MAINTENANCE RESPONSIBILITY: OWNER
16. IF ROCK IS ENCOUNTERED, UNDER CUT 18" AND BACKFILL WITH CL TYPE SOIL
17. NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

* THE DRAINAGE AREA CONSIDERED IN THE ESDv VOLUME COMPUTATIONS IS THE AREA THAT DRAINS TO THE SGW THROUGH THE FOREBAY ONLY.

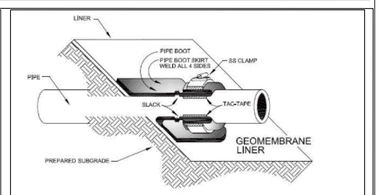
** THE ESDv SURFACE STORAGE VOLUME REPORTED IN THE SUMMARY TABLE IS FOR THE SGW MAIN BODY ONLY. THE TOTAL ESDv ACHIEVED AND THE 10-YEAR STORAGE VOLUMES INCLUDE STORAGE IN THE FOREBAY.



SUBMERGED GRAVEL WETLAND PROFILE
(NOT TO SCALE)

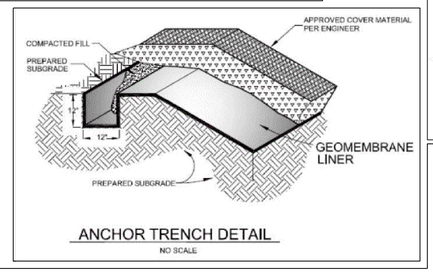
SCREW CAP DETAIL AT THE OUTFALL OF THE J-HOOK
NOT TO SCALE

NOTE:
THE SCREW CAP MUST BE FITTED WATER TIGHT.

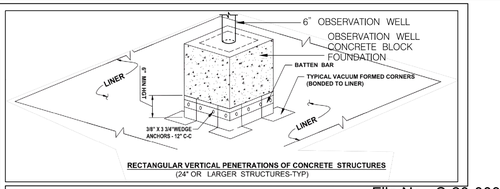


PIPE BOOT DETAIL*
NO SCALE

*Must be a manufactured (not field fabricated) pipe boot. Follow manufacturer's pipe boot installation procedure.



ANCHOR TRENCH DETAIL
NO SCALE



RECTANGULAR VERTICAL PENETRATIONS OF CONCRETE STRUCTURES
(24" OR LARGER STRUCTURES-TYP)

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

SGW-1 PLAN, PROFILE, SECTION, AND DETAILS

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 38 OF 96

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 Number: 48396
Expiration Date: 01-15-2026

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BETHESDA MD 20816
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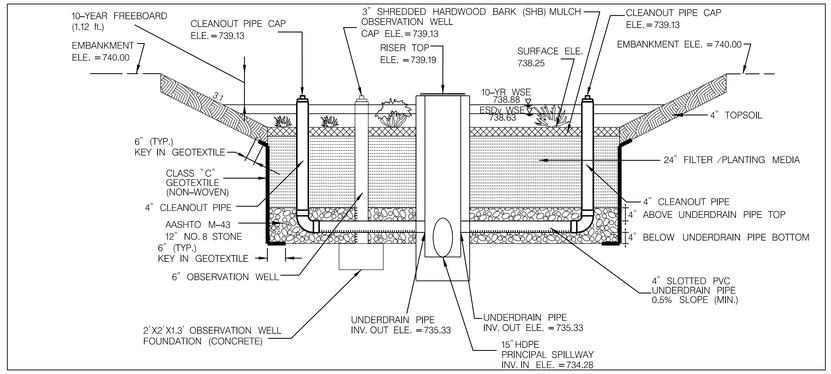
WWW.ZTIGERS.COM

STATE OF MARYLAND — MICHAEL BOVENE — 48396 — PROFESSIONAL ENGINEER

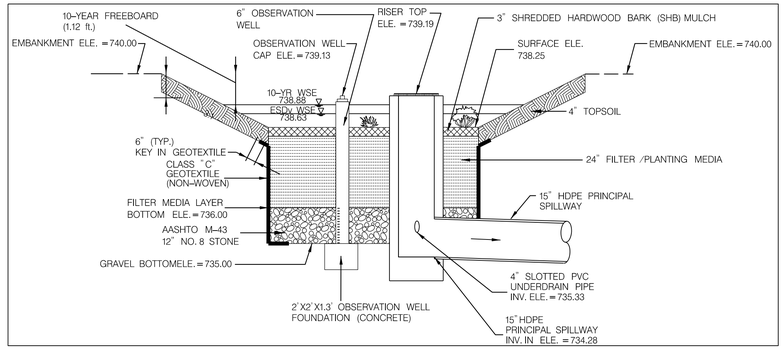
NO.	DESCRIPTION	NAME	DATE

REVISIONS



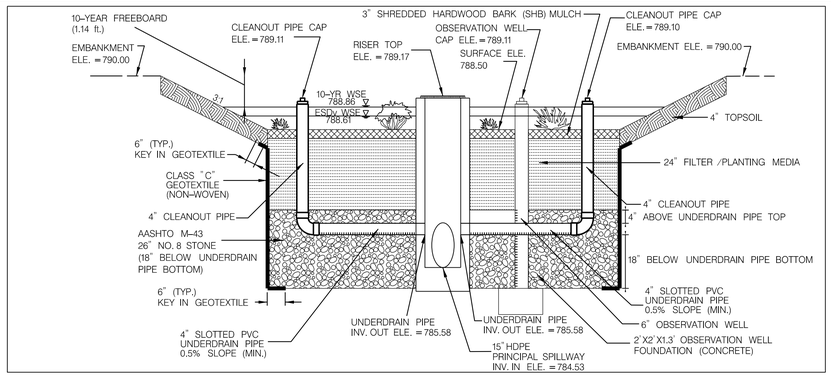
TYPICAL MBR PROFILE (MBR 1)

(NOT TO SCALE)



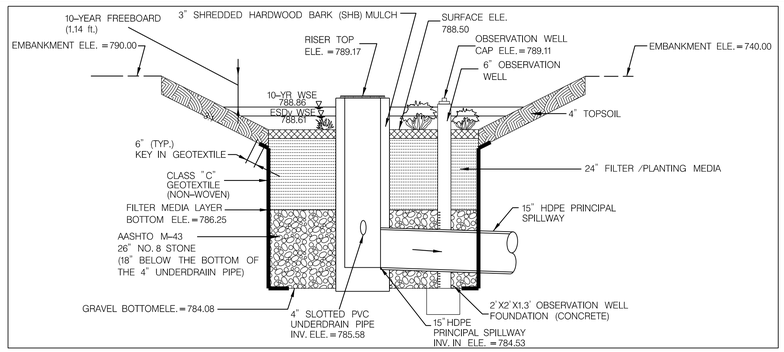
TYPICAL MBR SECTION (MBR 1)

(NOT TO SCALE)



TYPICAL MBR PROFILE (MBR 12)

(NOT TO SCALE)



TYPICAL MBR SECTION (MBR 12)

(NOT TO SCALE)

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

MICRO-BIORETENTION
TYPICAL PROFILE AND SECTION
MBR 1 AND MBR 12

PROJECT ENG._____
DESIGNED BY_____
CHECKED BY_____
DRAWN BY_____
PROJECT MGR._____

PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030

SHEET 39 OF 96

PROFESSIONAL CERTIFICATION
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License Number: 48396
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BETHESDA MD 20816
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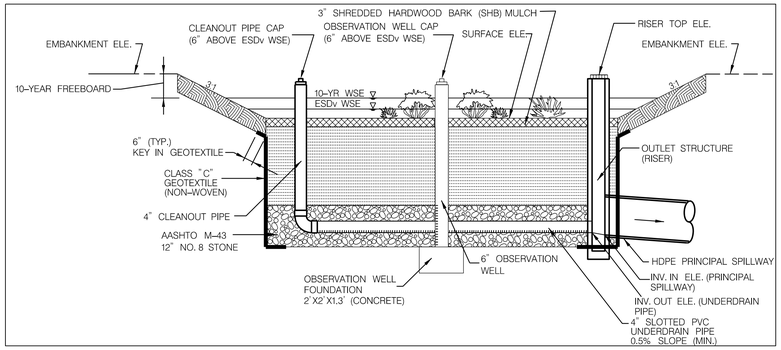
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

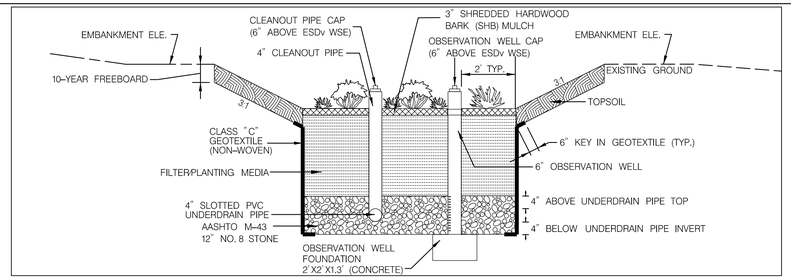
NO.	DESCRIPTION	NAME	DATE

REVISIONS



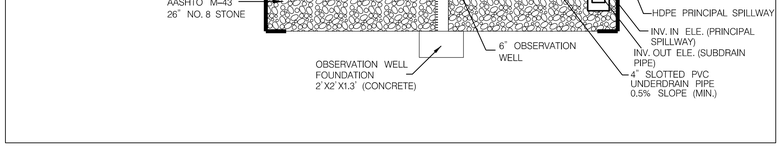
TYPICAL MBRs PROFILE (MBRs 2 THROUGH 7)
SEE SUMMARY CHART FOR SPECIFIC DIMENSIONS AND ELEVATIONS OF EACH MBR

(NOT TO SCALE)



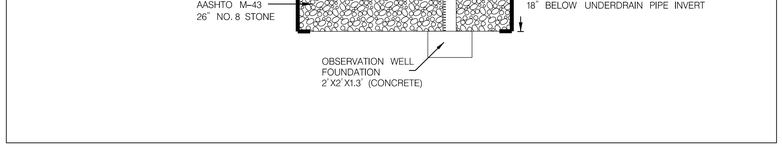
TYPICAL MBRs SECTION (MBRs 2 THROUGH 7)
SEE SUMMARY CHART FOR SPECIFIC DIMENSIONS AND ELEVATIONS OF EACH MBR

(NOT TO SCALE)



TYPICAL MBRs PROFILE (MBR 9 AND MBR 11)
SEE SUMMARY CHART FOR SPECIFIC DIMENSIONS AND ELEVATIONS OF EACH MBR

(NOT TO SCALE)



TYPICAL MBRs SECTION (MBR 9 AND MRB 11)
SEE SUMMARY CHART FOR SPECIFIC DIMENSIONS AND ELEVATIONS OF EACH MBR

(NOT TO SCALE)

SUMMARY CHART FOR SPECIFIC DIMENSIONS OF THE MICRO-BIORETENTION FACILITIES

BMP	SURFACE ELE. (ft.)	ESDv WSE. (ft.)	10-YR. WSE. (ft.)	10-YR. FB. (ft.)	RISER STR.	RISER TOP ELE. (ft.)	EMBANKMENT ELE. (ft.)	4" SLOTTED PVC UNDERDRAIN PIPE INV. OUT ELE. (ft.)	GRAVEL LAYER BOTTOM ELE. (ft.)	HDPE PRINCIPAL SPILLWAY		OBSERVATION WELL AND CLEANOUT PIPE CAP TOP ELE. (ft.)
										DIAMETER (in)	INV. IN ELE. (ft.)	
MBR-2	738.75	739.75	740.00	1.00	RS-2	740.31	741.00	735.83	735.50	15	735.79	740.25
MBR-3	741.75	742.69	742.94	1.06	RS-3	743.25	744.00	738.83	738.50	15	738.79	743.19
MBR-4	746.00	746.72	746.97	1.03	RS-4	747.28	748.00	743.08	742.75	15	743.04	747.22
MBR-5	742.00	742.19	742.44	1.56	RS-5	742.75	744.00	739.08	738.75	15	739.04	742.69
MBR-6	739.75	740.75	741.00	1.00	RS-6	741.31	742.00	736.83	736.50	15	736.79	741.25
MBR-7	743.75	744.75	745.00	1.00	RS-7	745.31	746.00	740.83	740.50	15	740.79	745.25
MBR-9	785.75	786.75	787.00	1.00	RS-9	787.31	788.00	782.83	781.33	15	782.79	787.25
MBR-11	787.00	787.75	788.00	1.00	RS-11	788.31	789.00	784.08	782.58	15	784.04	788.25

File No - S-20-0030

PROFESSIONAL CERTIFICATION
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STATE OF MARYLAND — BEKELE MELAKU — 48396 — NATIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

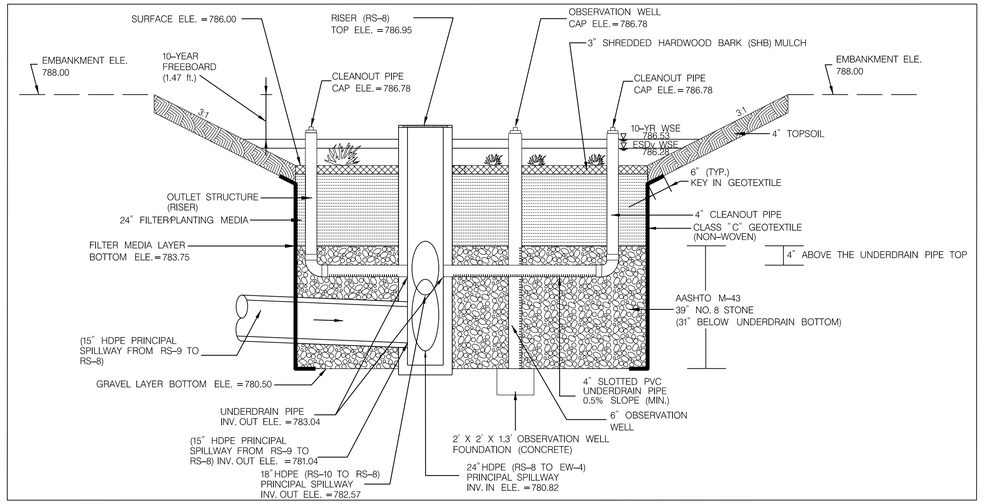
REVISIONS

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

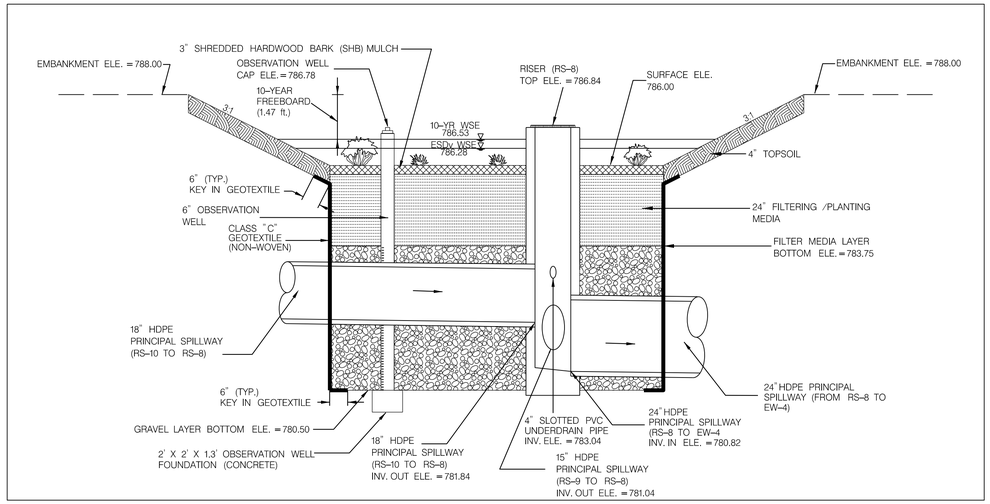
MICRO BIORETENTION
TYPICAL PROFILE, SECTION
AND
SUMMARY CHART
MBRs 2, 3, 4, 5, 6, 7, 9, AND 11

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 40 OF 96



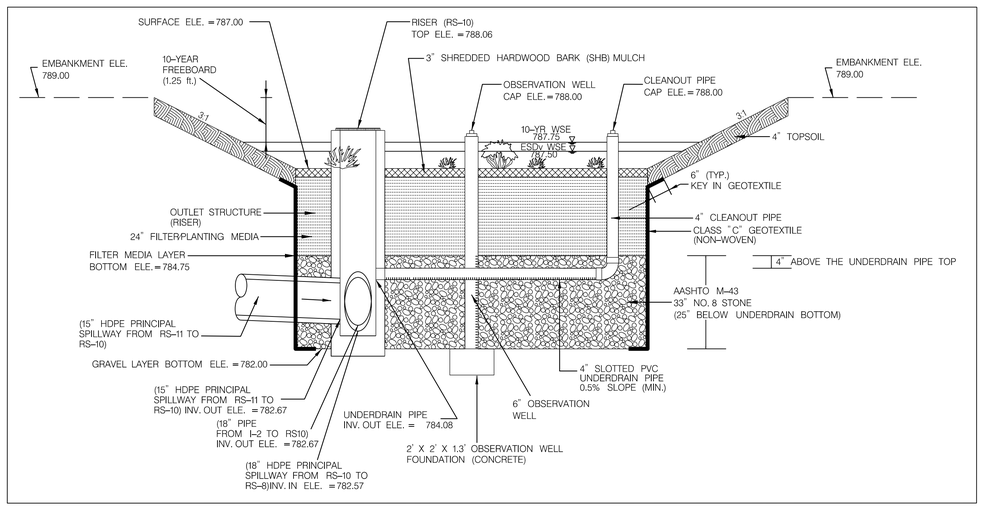
TYPICAL MBR PROFILE (MBR 8)

(NOT TO SCALE)



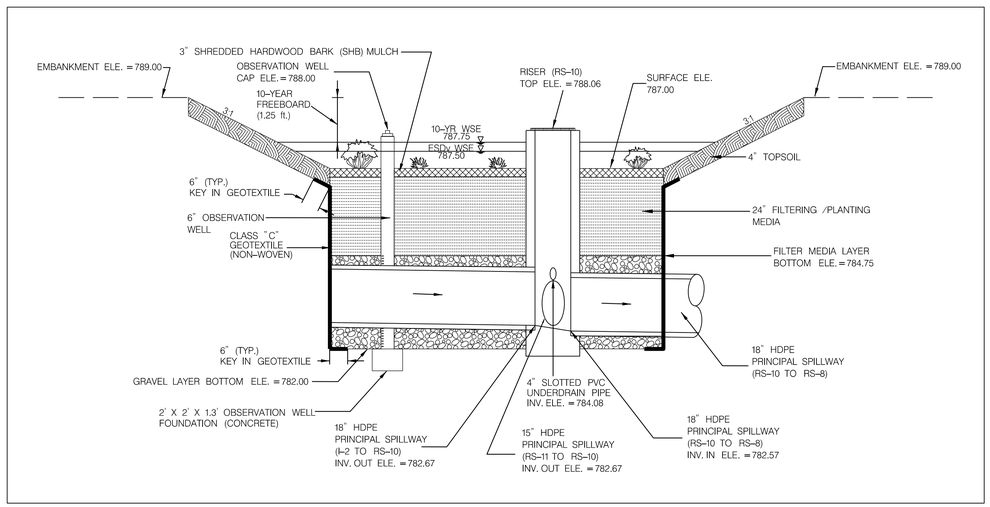
TYPICAL MBR SECTION (MBR 8)

(NOT TO SCALE)



TYPICAL MBR PROFILE (MBR 10)

(NOT TO SCALE)



TYPICAL MBR SECTION (MBR 10)

(NOT TO SCALE)

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

MICRO-BIORETENTION
TYPICAL PROFILE AND SECTION
MBR 8 AND MBR 10

PROJECT ENG.:
DESIGNED BY:
CHECKED BY:
DRAWN BY:
PROJECT MGR.:
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 41 OF 96

PROFESSIONAL CERTIFICATION
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WWW.ZTIGERS.COM

STATE OF MARYLAND — MICHAEL BEVENE — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

SUBMERGED GRAVEL WELAND INSPECTION CHART

	STAGE	INSPECTOR'S APPR. INITIALS	DATE	ENGINEER
1.	ENTIRE CONTRIBUTING DRAINAGE AREA TO THE SUBMERGED GRAVEL WETLAND IS STABILIZED.			
2.	FOREBAY AND SGW ARE MASS EXCAVATED AND ROUGH GRADED PER APPROVED PLAN.			
3.	WDF BETWEEN THE FOREBAY AND THE SGW MAIN BODY IS INSTALLED PER APPROVED PLAN.			
4.	EMBANKMENT CONSTRUCTED PER SOIL COMPACTION DETAIL AND PER SPECIFICATION. SEE DETAIL ON THIS SHEET.			GEOTECH
5.	CONTRACTOR SUBMITTED IMPERMEABLE LINER DETAILS AND SPECIFICATIONS AND ARE APPROVED BY THE INSPECTOR.			
6.	THE IMPERMEABLE LINER TO THE SGW AND ITS ACCESSORIES ARE INSTALLED PER APPROVED PLAN. SEE DETAILS ON SHEET 38.			
7.	THE PRECAST CONCRETE RISER STRUCTURE (RS-13) IS PLACED AND BACKFILLED.			
8.	THE 6" SLOTTED UNDERDRAIN PIPES ARE INSTALLED PER APPROVED PLAN.			
9.	THE 6" CLEANOUT PIPES AND CAPS ARE INSTALLED PER APPROVED PLAN.			
10.	THE 6" OBSERVATION WELL, ITS FOUNDATION AND CAP ARE INSTALLED PER APPROVED PLAN.			
11.	THE 24" HDPE PRINCIPAL SPILLWAY IS INSTALLED PER APPROVED PLAN. WATERTIGHT PRINCIPAL SPILLWAY INSTALLATION IS CONFIRMED.			
12.	EMBANKMENT CONSTRUCTED TO PLAN LINE AND GRADE. EMBANKMENT CONSTRUCTION IS INSPECTED AND LOGS ARE PREPARED BY GEOTECHNICAL ENGINEER.			GEOTECH
13.	THE 18" THICK #8 STONE IS INSTALLED PER APPROVED PLAN.			
14.	THE 24" THICK FILTERING/PLANTING MEDIA LAYER IS INSTALLED PER APPROVED PLAN.			
15.	RIPRAP PROTECTIONS AT THE OUTFALLS OF EW-1, EW-3, AND THE IMPERMEABLE LINER UNDERDRAIN PIPE ARE INSTALLED PER APPROVED PLAN.			
16.	FOR SGW PLANTINGS ARE COMPLETED. SEE PLAN SHEET 38 FOR SGW PLANTINGS.			
17.	ANY REMAINING DISTURBED AREAS ARE STABILIZED.			
18.	SIGNED AND CERTIFIED AS-BUILT PLAN IS SUBMITTED TO CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT.			

• NOTIFY CERTIFYING ENGINEER 48 HOURS PRIOR TO COMMENCING CONSTRUCTION

ENGINEER'S NAME: _____ PHONE #: _____

SGW SEQUENCE OF CONSTRUCTION

1. CONTACT THE CERTIFYING INSPECTOR AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

2. REMOVE ANY ACCUMULATED SEDIMENTS AND STANDING WATER.

3. MASS EXCAVATE AND ROUGH GRADE THE FOREBAY AND MAIN BODY OF THE SGW PER APPROVED PLANS. REFER TO STEP 3 OF THE FINAL PHASE ESC SOC FOR MORE INFORMATION.

4. CONSTRUCT THE EMBANKMENT PER SOILS COMPACTION DETAIL THIS SHEET.

5. FINE GRADE THE FOREBAY AND THE SGW PER APPROVED PLANS.

6. SUBMIT THE IMPERMEABLE LINER DETAILS AND SPECIFICATIONS TO THE INSPECTOR. ONCE APPROVED, INSTALL THE IMPERMEABLE LINER, ALONG WITH THE #57 SVOID LAYER AND UNDERDRAIN PIPE UNDER IT, PER THE APPROVED PLAN. SEE THE NOTES ON THIS SHEET AND DETAILS ON PLAN SHEET 38.

7. INSTALL RISER STRUCTURE (RS-13), UNDERDRAIN PIPE (6", SLOTTED), CLEANOUT PIPES, OBSERVATION WELL WITH ITS FOUNDATION, AND THE PRINCIPAL SPILLWAY PER APPROVED PLANS. THE PRINCIPAL SPILLWAY MUST BE SINGLE 20 FOOT SECTION OF PIPE THROUGH THE EMBANKMENT, NO JOINTS.

8. INSTALL 12" SOIL, 18" #8 STONE, AND 24" PLANTING MEDIA PER APPROVED PLANS. FOR ADDITIONAL INFORMATION REGARDING MATERIALS, REFER TO THE CARROLL COUNTY SUPPLEMENTAL MATERIAL SPECIFICATIONS FOR SUBMERGED GRAVEL WETLAND ON PLAN SHEET 43. ALSO REFER TO THE NOTES ON THIS SHEET REGARDING THE 12" SOIL.

9. STABILIZE ALL DISTURBED AREAS.

10. SUBMIT SIGNED AND CERTIFIED AS-BUILT PLANS TO THE CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT WITHIN 60 DAYS.

MICRO BIORETENTION 1 (MBR-1) INSPECTION CHART

	STAGE	INSPECTOR'S APPR. INITIALS	DATE	ENGINEER
1.	ENTIRE CONTRIBUTING DRAINAGE AREA TO THE MBR-1 IS STABILIZED.			
2.	MBR-1 MASS EXCAVATED AND ROUGH GRADED.			
3.	EMBANKMENT CONSTRUCTED PER SOIL COMPACTION DETAIL AND PER SPECIFICATION. SEE DETAIL ON THIS SHEET.			GEOTECH
4.	THE NON-WOVEN GEOTEXTILE IS INSTALLED PER APPROVED PLAN.			
5.	THE PRECAST CONCRETE RISER STRUCTURE (RS-1) PLACED AND BACKFILLED.			
6.	THE 4" SLOTTED UNDERDRAIN PIPES ARE INSTALLED PER APPROVED PLAN.			
7.	THE 4" CLEANOUT PIPE AND ITS CAP ARE INSTALLED PER APPROVED PLAN.			
8.	THE 6" OBSERVATION WELL, ITS FOUNDATION, AND CAP ARE INSTALLED PER APPROVED PLAN.			
9.	THE 15" HDPE PRINCIPAL SPILLWAY IS INSTALLED PER APPROVED PLAN. WATERTIGHT PRINCIPAL SPILLWAY INSTALLATION IS CONFIRMED.			
10.	EMBANKMENT CONSTRUCTED TO PLAN LINE AND GRADE. EMBANKMENT CONSTRUCTION IS INSPECTED AND LOGS ARE PREPARED BY GEOTECHNICAL ENGINEER.			GEOTECH
11.	THE 12" THICK #8 STONE IS INSTALLED PER APPROVED PLAN.			
12.	THE 24" THICK FILTERING/PLANTING MEDIA LAYER IS INSTALLED PER APPROVED PLAN.			
13.	THE 3" THICK SHREDDED HARDWOOD LAYER IS INSTALLED PER APPROVED PLAN.			
14.	MBR-1 PLANTINGS ARE COMPLETED. SEE PLAN SHEET 26 FOR MBR-1 PLANTINGS.			
15.	ANY REMAINING DISTURBED AREAS ARE STABILIZED.			
16.	SIGNED AND CERTIFIED AS-BUILT PLAN IS SUBMITTED TO CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT.			

• NOTIFY CERTIFYING ENGINEER 48 HOURS PRIOR TO COMMENCING CONSTRUCTION

ENGINEER'S NAME: _____ PHONE #: _____

MBR-1 SEQUENCE OF CONSTRUCTION

1. CONTACT THE CERTIFYING INSPECTOR AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

2. REMOVE ANY ACCUMULATED SEDIMENTS AND STANDING WATER.

3. MASS EXCAVATE AND ROUGH GRADE MBR-1 PER APPROVED PLAN. REFER TO STEP 12 OF THE FINAL PHASE ESC SOC FOR MORE INFORMATION.

4. CONSTRUCT THE EMBANKMENT PER SOILS COMPACTION DETAIL THIS SHEET.

5. FINE GRADE THE MBR PER APPROVED PLAN TO THE BOTTOM OF THE FACILITY.

6. INSTALL RISER STRUCTURE (RS-1) AND BACKFILL. INSTALL THE UNDERDRAIN PIPE (4" SLOTTED PIPE), 4" CLEANOUTPIPE, OBSERVATION WELL WITH ITS FOUNDATION, AND THE PRINCIPAL SPILLWAY PER APPROVED PLANS. THE PRINCIPAL SPILLWAY MUST BE SINGLE 20 FOOT SECTION OF PIPE THROUGH THE EMBANKMENT, NO JOINTS.

7. INSTALL THE NON-WOVEN GEOTEXTILE, 12" #8 STONE, 24" PLANTING MEDIA, AND 3" SHREDDED HARDWOOD PER APPROVED PLANS. FOR ADDITIONAL INFORMATION REGARDING MATERIALS, REFER TO THE CARROLL COUNTY SUPPLEMENTAL MATERIAL SPECIFICATIONS FOR BIO-SWALE, BIORETENTION & RAIN GARDENS ON PLAN SHEET 43.

8. STABILIZE ALL DISTURBED AREAS.

9. SUBMIT SIGNED AND CERTIFIED AS-BUILT PLANS TO THE CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT WITHIN 30 DAYS OF COMPLETION.

MICRO BIORETENTION 2 (MBR-2) INSPECTION CHART

	STAGE	INSPECTOR'S APPR. INITIALS	DATE	ENGINEER
1.	ENTIRE CONTRIBUTING DRAINAGE AREA TO THE MBR-2 IS STABILIZED.			
2.	MBR-2 MASS EXCAVATED AND ROUGH GRADED.			
3.	EMBANKMENT CONSTRUCTED PER SOIL COMPACTION DETAIL AND PER SPECIFICATION. SEE DETAIL ON THIS SHEET.			GEOTECH
4.	THE NON-WOVEN GEOTEXTILE IS INSTALLED PER APPROVED PLAN.			
5.	THE PRECAST CONCRETE RISER STRUCTURE (RS-2) PLACED AND BACKFILLED.			
6.	THE 4" SLOTTED UNDERDRAIN PIPE IS INSTALLED PER APPROVED PLAN.			
7.	THE 4" CLEANOUT PIPE AND ITS CAP ARE INSTALLED PER APPROVED PLAN.			
8.	THE 6" OBSERVATION WELL, ITS FOUNDATION, AND CAP ARE INSTALLED PER APPROVED PLAN.			
9.	THE 15" HDPE PRINCIPAL SPILLWAY IS INSTALLED PER APPROVED PLAN. WATERTIGHT PRINCIPAL SPILLWAY INSTALLATION IS CONFIRMED.			
10.	EMBANKMENT CONSTRUCTED TO PLAN LINE AND GRADE. EMBANKMENT CONSTRUCTION IS INSPECTED AND LOGS ARE PREPARED BY GEOTECHNICAL ENGINEER.			GEOTECH
11.	THE 12" THICK #8 STONE IS INSTALLED PER APPROVED PLAN.			
12.	THE 24" THICK FILTERING/PLANTING MEDIA LAYER IS INSTALLED PER APPROVED PLAN.			
13.	THE 3" THICK SHREDDED HARDWOOD LAYER IS INSTALLED PER APPROVED PLAN.			
14.	MBR-2 PLANTINGS ARE COMPLETED. SEE PLAN SHEET 27 FOR MBR-2 PLANTINGS.			
15.	ANY REMAINING DISTURBED AREAS ARE STABILIZED.			
16.	SIGNED AND CERTIFIED AS-BUILT PLAN IS SUBMITTED TO CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT.			

• NOTIFY CERTIFYING ENGINEER 48 HOURS PRIOR TO COMMENCING CONSTRUCTION

ENGINEER'S NAME: _____ PHONE #: _____

MBR-2 SEQUENCE OF CONSTRUCTION

1. CONTACT THE CERTIFYING INSPECTOR AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

2. REMOVE ANY ACCUMULATED SEDIMENTS AND STANDING WATER.

3. MASS EXCAVATE AND ROUGH GRADE MBR-2 PER APPROVED PLAN. REFER TO STEP 12 OF THE FINAL PHASE ESC SOC FOR MORE INFORMATION.

4. CONSTRUCT THE EMBANKMENT PER SOILS COMPACTION DETAIL THIS SHEET.

5. FINE GRADE THE MBR PER APPROVED PLAN TO THE BOTTOM OF THE FACILITY.

6. INSTALL RISER STRUCTURE (RS-2) AND BACKFILL. INSTALL THE UNDERDRAIN PIPE (4" SLOTTED PIPE), 4" CLEANOUTPIPE, OBSERVATION WELL WITH ITS FOUNDATION, AND THE PRINCIPAL SPILLWAY PER APPROVED PLANS. THE PRINCIPAL SPILLWAY MUST BE SINGLE 20 FOOT SECTION OF PIPE THROUGH THE EMBANKMENT, NO JOINTS.

7. INSTALL THE NON-WOVEN GEOTEXTILE, 12" #8 STONE, 24" PLANTING MEDIA, AND 3" SHREDDED HARDWOOD PER APPROVED PLANS. FOR ADDITIONAL INFORMATION REGARDING MATERIALS, REFER TO THE CARROLL COUNTY SUPPLEMENTAL MATERIAL SPECIFICATIONS FOR BIO-SWALE, BIORETENTION & RAIN GARDENS ON PLAN SHEET 43.

8. STABILIZE ALL DISTURBED AREAS.

9. SUBMIT SIGNED AND CERTIFIED AS-BUILT PLANS TO THE CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT WITHIN 30 DAYS OF COMPLETION.

MICRO BIORETENTION 3 (MBR-3) INSPECTION CHART

	STAGE	INSPECTOR'S APPR. INITIALS	DATE	ENGINEER
1.	ENTIRE CONTRIBUTING DRAINAGE AREA TO THE MBR-3 IS STABILIZED.			
2.	MBR-3 MASS EXCAVATED AND ROUGH GRADED.			
3.	EMBANKMENT CONSTRUCTED PER SOIL COMPACTION DETAIL AND PER SPECIFICATION. SEE DETAIL ON THIS SHEET.			GEOTECH
4.	THE NON-WOVEN GEOTEXTILE IS INSTALLED PER APPROVED PLAN.			
5.	THE PRECAST CONCRETE RISER STRUCTURE (RS-3) PLACED AND BACKFILLED.			
6.	THE 4" SLOTTED UNDERDRAIN PIPE IS INSTALLED PER APPROVED PLAN.			
7.	THE 4" CLEANOUT PIPE AND ITS CAP ARE INSTALLED PER APPROVED PLAN.			
8.	THE 6" OBSERVATION WELL, ITS FOUNDATION, AND CAP ARE INSTALLED PER APPROVED PLAN.			
9.	THE 15" HDPE PRINCIPAL SPILLWAY IS INSTALLED PER APPROVED PLAN. WATERTIGHT PRINCIPAL SPILLWAY INSTALLATION IS CONFIRMED.			
10.	EMBANKMENT CONSTRUCTED TO PLAN LINE AND GRADE. EMBANKMENT CONSTRUCTION IS INSPECTED AND LOGS ARE PREPARED BY GEOTECHNICAL ENGINEER.			GEOTECH
11.	THE 12" THICK #8 STONE IS INSTALLED PER APPROVED PLAN.			
12.	THE 24" THICK FILTERING/PLANTING MEDIA LAYER IS INSTALLED PER APPROVED PLAN.			
13.	THE 3" THICK SHREDDED HARDWOOD LAYER IS INSTALLED PER APPROVED PLAN.			
14.	MBR-3 PLANTINGS ARE COMPLETED. SEE PLAN SHEET 28 FOR MBR-3 PLANTINGS.			
15.	ANY REMAINING DISTURBED AREAS ARE STABILIZED.			
16.	SIGNED AND CERTIFIED AS-BUILT PLAN IS SUBMITTED TO CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT.			

• NOTIFY CERTIFYING ENGINEER 48 HOURS PRIOR TO COMMENCING CONSTRUCTION

ENGINEER'S NAME: _____ PHONE #: _____

MBR-3 SEQUENCE OF CONSTRUCTION

1. CONTACT THE CERTIFYING INSPECTOR AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

2. REMOVE ANY ACCUMULATED SEDIMENTS AND STANDING WATER.

3. MASS EXCAVATE AND ROUGH GRADE MBR-3 PER APPROVED PLAN. REFER TO STEP 12 OF THE FINAL PHASE ESC SOC FOR MORE INFORMATION.

4. CONSTRUCT THE EMBANKMENT PER SOILS COMPACTION DETAIL THIS SHEET.

5. FINE GRADE THE MBR PER APPROVED PLAN TO THE BOTTOM OF THE FACILITY.

6. INSTALL RISER STRUCTURE (RS-3) AND BACKFILL. INSTALL THE UNDERDRAIN PIPE (4" SLOTTED PIPE), 4" CLEANOUTPIPE, OBSERVATION WELL WITH ITS FOUNDATION, AND THE PRINCIPAL SPILLWAY PER APPROVED PLANS. THE PRINCIPAL SPILLWAY MUST BE SINGLE 20 FOOT SECTION OF PIPE THROUGH THE EMBANKMENT, NO JOINTS.

7. INSTALL THE NON-WOVEN GEOTEXTILE, 12" #8 STONE, 24" PLANTING MEDIA, AND 3" SHREDDED HARDWOOD PER APPROVED PLANS. FOR ADDITIONAL INFORMATION REGARDING MATERIALS, REFER TO THE CARROLL COUNTY SUPPLEMENTAL MATERIAL SPECIFICATIONS FOR BIO-SWALE, BIORETENTION & RAIN GARDENS ON PLAN SHEET 43.

8. STABILIZE ALL DISTURBED AREAS.

9. SUBMIT SIGNED AND CERTIFIED AS-BUILT PLANS TO THE CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT WITHIN 30 DAYS OF COMPLETION.

MICRO BIORETENTION 4 (MBR-4) INSPECTION CHART

	STAGE	INSPECTOR'S APPR. INITIALS	DATE	ENGINEER
1.	ENTIRE CONTRIBUTING DRAINAGE AREA TO THE MBR-4 IS STABILIZED.			
2.	MBR-4 MASS EXCAVATED AND ROUGH GRADED.			
3.	EMBANKMENT CONSTRUCTED PER SOIL COMPACTION DETAIL AND PER SPECIFICATION. SEE DETAIL ON THIS SHEET.			GEOTECH
4.	THE NON-WOVEN GEOTEXTILE IS INSTALLED PER APPROVED PLAN.			
5.	THE PRECAST CONCRETE RISER STRUCTURE (RS-4) PLACED AND BACKFILLED.			
6.	THE 4" SLOTTED UNDERDRAIN PIPE IS INSTALLED PER APPROVED PLAN.			
7.	THE 4" CLEANOUT PIPE AND ITS CAP ARE INSTALLED PER APPROVED PLAN.			
8.	THE 6" OBSERVATION WELL, ITS FOUNDATION, AND CAP ARE INSTALLED PER APPROVED PLAN.			
9.	THE 15" HDPE PRINCIPAL SPILLWAY IS INSTALLED PER APPROVED PLAN. WATERTIGHT PRINCIPAL SPILLWAY INSTALLATION IS CONFIRMED.			
10.	EMBANKMENT CONSTRUCTED TO PLAN LINE AND GRADE. EMBANKMENT CONSTRUCTION IS INSPECTED AND LOGS ARE PREPARED BY GEOTECHNICAL ENGINEER.			GEOTECH
11.	THE 12" THICK #8 STONE IS INSTALLED PER APPROVED PLAN.			
12.	THE 24" THICK FILTERING/PLANTING MEDIA LAYER IS INSTALLED PER APPROVED PLAN.			
13.	THE 3" THICK SHREDDED HARDWOOD LAYER IS INSTALLED PER APPROVED PLAN.			
14.	MBR-4 PLANTINGS ARE COMPLETED. SEE PLAN SHEET 29 FOR MBR-4 PLANTINGS.			
15.	ANY REMAINING DISTURBED AREAS ARE STABILIZED.			
16.	SIGNED AND CERTIFIED AS-BUILT PLAN IS SUBMITTED TO CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT.			

• NOTIFY CERTIFYING ENGINEER 48 HOURS PRIOR TO COMMENCING CONSTRUCTION

ENGINEER'S NAME: _____ PHONE #: _____

MBR-4 SEQUENCE OF CONSTRUCTION

1. CONTACT THE CERTIFYING INSPECTOR AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

2. REMOVE ANY ACCUMULATED SEDIMENTS AND STANDING WATER.

3. MASS EXCAVATE AND ROUGH GRADE MBR-4 PER APPROVED PLAN. REFER TO STEP 12 OF THE FINAL PHASE ESC SOC FOR MORE INFORMATION.

4. CONSTRUCT THE EMBANKMENT PER SOILS COMPACTION DETAIL THIS SHEET.

5. FINE GRADE THE MBR PER APPROVED PLAN TO THE BOTTOM OF THE FACILITY.

6. INSTALL RISER STRUCTURE (RS-4) AND BACKFILL. INSTALL THE UNDERDRAIN PIPE (4" SLOTTED PIPE), 4" CLEANOUTPIPE, OBSERVATION WELL WITH ITS FOUNDATION, AND THE PRINCIPAL SPILLWAY PER APPROVED PLANS. THE PRINCIPAL SPILLWAY MUST BE SINGLE 20 FOOT SECTION OF PIPE THROUGH THE EMBANKMENT, NO JOINTS.

7. INSTALL THE NON-WOVEN GEOTEXTILE, 12" #8 STONE, 24" PLANTING MEDIA, AND 3" SHREDDED HARDWOOD PER APPROVED PLANS. FOR ADDITIONAL INFORMATION REGARDING MATERIALS, REFER TO THE CARROLL COUNTY SUPPLEMENTAL MATERIAL SPECIFICATIONS FOR BIO-SWALE, BIORETENTION & RAIN GARDENS ON PLAN SHEET 43.

8. STABILIZE ALL DISTURBED AREAS.

9. SUBMIT SIGNED AND CERTIFIED AS-BUILT PLANS TO THE CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT WITHIN 30 DAYS OF COMPLETION.

MICRO BIORETENTION 5 (MBR-5) INSPECTION CHART

	STAGE	INSPECTOR'S APPR. INITIALS	DATE	ENGINEER
1.	ENTIRE CONTRIBUTING DRAINAGE AREA TO THE MBR-5 IS STABILIZED.			
2.	MBR-5 MASS EXCAVATED AND ROUGH GRADED.			
3.	EMBANKMENT CONSTRUCTED PER SOIL COMPACTION DETAIL AND PER SPECIFICATION. SEE DETAIL ON THIS SHEET.			GEOTECH
4.	THE NON-WOVEN GEOTEXTILE IS INSTALLED PER APPROVED PLAN.			
5.	THE PRECAST CONCRETE RISER STRUCTURE (RS-5) PLACED AND BACKFILLED.			
6.	THE 4" SLOTTED PERFORATED UNDERDRAIN PIPE IS INSTALLED PER APPROVED PLAN.			
7.	THE 4" CLEANOUT PIPE AND ITS CAP ARE INSTALLED PER APPROVED PLAN.			
8.	THE 6" OBSERVATION WELL, ITS FOUNDATION, AND CAP ARE INSTALLED PER APPROVED PLAN.			
9.	THE 15" HDPE PRINCIPAL SPILLWAY IS INSTALLED PER APPROVED PLAN. WATERTIGHT PRINCIPAL SPILLWAY INSTALLATION IS CONFIRMED.			
10.	EMBANKMENT CONSTRUCTED TO PLAN LINE AND GRADE. EMBANKMENT CONSTRUCTION IS INSPECTED AND LOGS ARE PREPARED BY GEOTECHNICAL ENGINEER.			GEOTECH
11.	THE 12" THICK #8 STONE IS INSTALLED PER APPROVED PLAN.			
12.	THE 24" THICK FILTERING/PLANTING MEDIA LAYER IS INSTALLED PER APPROVED PLAN.			
13.	THE 3" THICK SHREDDED HARDWOOD LAYER IS INSTALLED PER APPROVED PLAN.			
14.	MBR-5 PLANTINGS ARE COMPLETED. SEE PLAN SHEET 30 FOR MBR-5 PLANTINGS.			
15.	ANY REMAINING DISTURBED AREAS ARE STABILIZED.			
16.	SIGNED AND CERTIFIED AS-BUILT PLAN IS SUBMITTED TO CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT.			

• NOTIFY CERTIFYING ENGINEER 48 HOURS PRIOR TO COMMENCING CONSTRUCTION

ENGINEER'S NAME: _____ PHONE #: _____

MBR-5 SEQUENCE OF CONSTRUCTION

1. CONTACT THE CERTIFYING INSPECTOR AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

2. REMOVE ANY ACCUMULATED SEDIMENTS AND STANDING WATER.

3. MASS EXCAVATE AND ROUGH GRADE MBR-5 PER APPROVED PLAN. REFER TO STEP 12 OF THE FINAL PHASE ESC SOC FOR MORE INFORMATION.

4. CONSTRUCT THE EMBANKMENT PER SOILS COMPACTION DETAIL THIS SHEET.

5. FINE GRADE THE MBR PER APPROVED PLAN TO THE BOTTOM OF THE FACILITY.

6. INSTALL RISER STRUCTURE (RS-5) AND BACKFILL. INSTALL THE UNDERDRAIN PIPE (4" SLOTTED PIPE), 4" CLEANOUTPIPE, OBSERVATION WELL WITH ITS FOUNDATION, AND THE PRINCIPAL SPILLWAY PER APPROVED PLANS. THE PRINCIPAL SPILLWAY MUST BE SINGLE 20 FOOT SECTION OF PIPE THROUGH THE EMBANKMENT, NO JOINTS.

7. INSTALL THE NON-WOVEN GEOTEXTILE, 12" #8 STONE, 24" PLANTING MEDIA, AND 3" SHREDDED HARDWOOD PER APPROVED PLANS. FOR ADDITIONAL INFORMATION REGARDING MATERIALS, REFER TO THE CARROLL COUNTY SUPPLEMENTAL MATERIAL SPECIFICATIONS FOR BIO-SWALE, BIORETENTION & RAIN GARDENS ON PLAN SHEET 43.

8. STABILIZE ALL DISTURBED AREAS.

9. SUBMIT SIGNED AND CERTIFIED AS-BUILT PLANS TO THE CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT WITHIN 30 DAYS OF COMPLETION.

MICRO BIORETENTION 6 (MBR-6) INSPECTION CHART

	STAGE	INSPECTOR'S APPR. INITIALS	DATE	ENGINEER
1.	ENTIRE CONTRIBUTING DRAINAGE AREA TO THE MBR-6 IS STABILIZED.			
2.	MBR-6 MASS EXCAVATED AND ROUGH GRADED.			
3.	EMBANKMENT CONSTRUCTED PER SOIL COMPACTION DETAIL AND PER SPECIFICATION. SEE DETAIL ON THIS SHEET.			GEOTECH
4.	THE NON-WOVEN GEOTEXTILE IS INSTALLED PER APPROVED PLAN.			
5.	THE PRECAST CONCRETE RISER STRUCTURE (RS-6) PLACED AND BACKFILLED.			
6.	THE 4" SLOTTED UNDERDRAIN PIPE IS INSTALLED PER APPROVED PLAN.			
7.	THE 4" CLEANOUT PIPE AND ITS CAP ARE INSTALLED PER APPROVED PLAN.			
8.	THE 6" OBSERVATION WELL, ITS FOUNDATION, AND CAP ARE INSTALLED PER APPROVED PLAN.			
9.	THE 15" HDPE PRINCIPAL SPILLWAY IS INSTALLED PER APPROVED PLAN. WATERTIGHT PRINCIPAL SPILLWAY INSTALLATION IS CONFIRMED.			
10.	EMBANKMENT CONSTRUCTED TO PLAN LINE AND GRADE. EMBANKMENT CONSTRUCTION IS INSPECTED AND LOGS ARE PREPARED BY GEOTECHNICAL ENGINEER.			GEOTECH
11.	THE 12" THICK #8 STONE IS INSTALLED PER APPROVED PLAN.			
12.	THE 24" THICK FILTERING/PLANTING MEDIA LAYER IS INSTALLED PER APPROVED PLAN.			
13.	THE 3" THICK SHREDDED HARDWOOD LAYER IS INSTALLED PER APPROVED PLAN.			
14.	MBR-6 PLANTINGS ARE COMPLETED. SEE PLAN SHEET 31 FOR MBR-6 PLANTINGS.			
15.	ANY REMAINING DISTURBED AREAS ARE STABILIZED.			
16.	SIGNED AND CERTIFIED AS-BUILT PLAN IS SUBMITTED TO CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT.			

• NOTIFY CERTIFYING ENGINEER 48 HOURS PRIOR TO COMMENCING CONSTRUCTION

ENGINEER'S NAME: _____ PHONE #: _____

MBR-6 SEQUENCE OF CONSTRUCTION

1. CONTACT THE CERTIFYING INSPECTOR AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

2. REMOVE ANY ACCUMULATED SEDIMENTS AND STANDING WATER.

3. MASS EXCAVATE AND ROUGH GRADE MBR-6 PER APPROVED PLAN. REFER TO STEP 12 OF THE FINAL PHASE ESC SOC FOR MORE INFORMATION.

4. CONSTRUCT THE EMBANKMENT PER SOILS COMPACTION DETAIL THIS SHEET.

5. FINE GRADE THE MBR PER APPROVED PLAN TO THE BOTTOM OF THE FACILITY.

6. INSTALL RISER STRUCTURE (RS-6) AND BACKFILL. INSTALL THE UNDERDRAIN PIPE (4" SLOTTED PIPE), 4" CLEANOUTPIPE, OBSERVATION WELL WITH ITS FOUNDATION, AND THE PRINCIPAL SPILLWAY PER APPROVED PLANS. THE PRINCIPAL SPILLWAY MUST BE SINGLE 20 FOOT SECTION OF PIPE THROUGH THE EMBANKMENT, NO JOINTS.

7. INSTALL THE NON-WOVEN GEOTEXTILE, 12" #8 STONE, 24" PLANTING MEDIA, AND 3" SHREDDED HARDWOOD PER APPROVED PLANS. FOR ADDITIONAL INFORMATION REGARDING MATERIALS, REFER TO THE CARROLL COUNTY SUPPLEMENTAL MATERIAL SPECIFICATIONS FOR BIO-SWALE, BIORETENTION & RAIN GARDENS ON PLAN SHEET 43.

8. STABILIZE ALL DISTURBED AREAS.

9. SUBMIT SIGNED AND CERTIFIED AS-BUILT PLANS TO THE CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT WITHIN 30 DAYS OF COMPLETION.

MICRO BIORETENTION 7 (MBR-7) INSPECTION CHART

	STAGE	INSPECTOR'S APPR. INITIALS	DATE	ENGINEER
1.	ENTIRE CONTRIBUTING DRAINAGE AREA TO THE MBR-7 IS STABILIZED.			
2.	MBR-7 MASS EXCAVATED AND ROUGH GRADED.			
3.	EMBANKMENT CONSTRUCTED PER SOIL COMPACTION DETAIL AND PER SPECIFICATION. SEE DETAIL ON THIS SHEET.			GEOTECH
4.	THE NON-WOVEN GEOTEXTILE IS INSTALLED PER APPROVED PLAN.			
5.	THE PRECAST CONCRETE RISER STRUCTURE (RS-7) PLACED AND BACKFILLED.			
6.	THE 4" SLOTTED UNDERDRAIN PIPE IS INSTALLED PER APPROVED PLAN.			
7.	THE 4" CLEANOUT PIPE AND ITS CAP ARE INSTALLED PER APPROVED PLAN.			
8.	THE 6" OBSERVATION WELL, ITS FOUNDATION, AND CAP ARE INSTALLED PER APPROVED PLAN.			
9.	THE 15" HDPE PRINCIPAL SPILLWAY IS INSTALLED PER APPROVED PLAN. WATERTIGHT PRINCIPAL SPILLWAY INSTALLATION IS CONFIRMED.			
10.	EMBANKMENT CONSTRUCTED TO PLAN LINE AND GRADE. EMBANKMENT CONSTRUCTION IS INSPECTED AND LOGS ARE PREPARED BY GEOTECHNICAL ENGINEER.			GEOTECH
11.	THE 12" THICK #8 STONE IS INSTALLED PER APPROVED PLAN.			
12.	THE 24" THICK FILTERING/PLANTING MEDIA LAYER IS INSTALLED PER APPROVED PLAN.			
13.	THE 3" THICK SHREDDED HARDWOOD LAYER IS INSTALLED PER APPROVED PLAN.			
14.	MBR-7 PLANTINGS ARE COMPLETED. SEE PLAN SHEET 32 FOR MBR-7 PLANTINGS.			
15.	ANY REMAINING DISTURBED AREAS ARE STABILIZED.			
16.	SIGNED AND CERTIFIED AS-BUILT PLAN IS SUBMITTED TO CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT.			

• NOTIFY CERTIFYING ENGINEER 48 HOURS PRIOR TO COMMENCING CONSTRUCTION

ENGINEER'S NAME: _____ PHONE #: _____

MBR-7 SEQUENCE OF CONSTRUCTION

1. CONTACT THE CERTIFYING INSPECTOR AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

2. REMOVE ANY ACCUMULATED SEDIMENTS AND STANDING WATER.

3. MASS EXCAVATE AND ROUGH GRADE MBR-7 PER APPROVED PLAN. REFER TO STEP 12 OF THE FINAL PHASE ESC SOC FOR MORE INFORMATION.

4. CONSTRUCT THE EMBANKMENT PER SOILS COMPACTION DETAIL THIS SHEET.

5. FINE GRADE THE MBR PER APPROVED PLAN TO THE BOTTOM OF THE FACILITY.

6. INSTALL RISER STRUCTURE (RS-7) AND BACKFILL. INSTALL THE UNDERDRAIN PIPE (4" SLOTTED PIPE), 4" CLEANOUTPIPE, OBSERVATION WELL WITH ITS FOUNDATION, AND THE PRINCIPAL SPILLWAY PER APPROVED PLANS. THE PRINCIPAL SPILLWAY MUST BE SINGLE 20 FOOT SECTION OF PIPE THROUGH THE EMBANKMENT, NO JOINTS.

7. INSTALL THE NON-WOVEN GEOTEXTILE, 12" #8 STONE, 24" PLANTING MEDIA, AND 3" SHREDDED HARDWOOD PER APPROVED PLANS. FOR ADDITIONAL INFORMATION REGARDING MATERIALS, REFER TO THE CARROLL COUNTY SUPPLEMENTAL MATERIAL SPECIFICATIONS FOR BIO-SWALE, BIORETENTION & RAIN GARDENS ON PLAN SHEET 43.

8. STABILIZE ALL DISTURBED AREAS.

9. SUBMIT SIGNED A

STORMWATER MAINTENANCE SCHEDULE
Submerged Gravel Wetland
Modified to Correspond to Carroll County Details

Inspection Item	Inspection Requirements	Remedial Action
MONTHLY INSPECTION		
Debris and Trash	Check for trash and debris in facility including inlets, outlets, conveyance systems, and area around facility.	Remove all trash and debris and dispose in an acceptable manner. Unclog all openings.
Plant Composition and Health	Compare plant composition with approved plans. Check for invasive species or weeds. Check for dead or dying vegetation.	Remove invasive species and weeds. Replace dead plants in accordance with approved landscaping plan **OR** Reseed and Remulch per Filter Bed Mix.
Vegetative Cover	Check for channelizing, erosion, and bare spots. Check for vegetation blocking inlets, weirs, and outlet.	Remove or cut back vegetation around inlet and outlet structures. Mow side slopes and embankment when grass exceeds 12 inches in height, but do not mow filter bed (Woody vegetation is prohibited on the embankment). If using Filter Bed Mix, may mow bed twice per year. Remove grass clippings. Re-seed or re-plant in accordance with approved landscaping plans.
No. 8 Stone Layer	Check No. 8 stone for sediment accumulation and evidence of erosion.	Stabilize or replace No. 8 stone according to plan specifications.
SEASONAL INSPECTION AND AFTER A MAJOR STORM		
Inspection Item	**Inspection Requirements**	**Remedial Action**
Dewatering	Check ponding levels. Surface storage must dewater within 48 hours of rainfall. Noticeable odors, stained water on the filter surface or at the outlet, or the presence of algae or aquatic vegetation are indicators of anaerobic conditions and inadequate dewatering of the facility.	Remove and replace top six inches of No. 8 stone in chimney. Confirm adequate dewatering with follow-up inspections. If the facility does not function as intended after the above action, the entire system including underdrain may need refurbishing.
Erosion	Check inlets, wetland, outlets, and side slopes for erosion, rills, gullies, and runoff channelization.	Re-grading may be required when concentrated flow causes rills or gullying through the facility. Grade, vegetate, and/or armor to provide stable conveyance in accordance with approved plans.
Check Dams	Check for evidence of flow cutting around edges of structure and evidence of erosion at the sidewinstream toe.	Re-grade and repair with topsoil, seed, and matting. Provide stone at downstream toe.
Sediment Accumulation	Check for accumulated sediment in forebay. Check for accumulated sediment in No. 8 chimneys and wetland area. Check for clogged openings	When sediment in forebay accumulates to 6 inches depth, clean out sediment. When sediment in No. 8 chimney or wetland area accumulates to 1 inch in depth, remove sediment. Remove sediment from clogged openings. Discharge any sediment-laden water through a filter bag or other dewatering device. Dispose of all sediment in an acceptable location
Blockages	Check overflow inlet (riser), piping, and underdrain for blockages. Check observation wells for water level	Clear out any blockages.
ANNUAL INSPECTION		
Inspection Item	**Inspection Requirements**	**Remedial Action**
Structural Components	Check for evidence of structural deterioration, spalling, or cracking. Inlet and outlet structures as well as riprap outfalls must be in good condition.	Repair to good condition according to specifications on the approved plans.
Overall Function of Facility	Check that practice is functioning as designed.	Repair to good condition according to specifications on the approved plans.

NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

STORMWATER MAINTENANCE SCHEDULE
MICRO-BIORETENTION
Modified to Correspond to Carroll County Details

Inspection Item	Inspection Requirements	Remedial Action
MONTHLY INSPECTION		
Debris and Trash	Check for trash and debris in facility including inlets, outlets, conveyance systems, and area around facility.	Remove all trash and debris and dispose in an acceptable manner. Unclog all openings.
Plant Composition and Health	Compare plant composition with approved plans. Check for invasive species or weeds. Check for dead or dying vegetation.	Remove invasive species and weeds. Replace dead plants in accordance with approved landscaping plan **OR** Reseed and Remulch per Filter Bed Mix.
Vegetative Cover	Check for channelizing, erosion, and bare spots. Check for vegetation blocking inlet and outlet.	Remove or cut back vegetation around inlet and outlet structures. Mow side slopes and embankment when grass exceeds 12 inches in height, but do not mow filter bed (Woody vegetation is prohibited on the embankment). If using Filter Bed Mix, may mow bed twice per year. Remove grass clippings. Re-seed or re-plant in accordance with approved landscaping plans.
Mulch Layer	Check mulch for adequate cover, sediment accumulation, or discoloration.	Replace and remove old mulch and excess sediment. Provide adequate mulch cover according to approved design.
SEASONAL INSPECTION AND AFTER A MAJOR STORM		
Inspection Item	**Inspection Requirements**	**Remedial Action**
Dewatering	Check ponding level. Surface storage must dewater within 48 hours of rainfall. Noticeable odors, stained water on the filter surface or at the outlet, or the presence of algae or aquatic vegetation are indicators of anaerobic conditions and inadequate dewatering of the facility.	Remove and replace top few inches of media. If the facility does not function as intended after the above action, excavate, remove, clean, and replace stone, underdrain, media, and plants in accordance with approved plans.
Erosion	Check inlets, filter bed, outlets, and side slopes for erosion, rills, gullies, and runoff channelization.	Re-grading may be required when concentrated flow causes rills or gullying through the facility. Grade, vegetate, and/or armor to provide stable conveyance in accordance with approved plans.
Sediment Accumulation	Check for accumulated sediment in conveyance systems and on filter bed. Check for clogged openings (blockages).	When sediment accumulates to 1 inch depth, remove sediment. Remove sediment from clogged openings. Dispose of all sediment in an acceptable location
ANNUAL INSPECTION		
Inspection Item	**Inspection Requirements**	**Remedial Action**
Structural Components	Check for evidence of structural deterioration, spalling, or cracking. Inlet and outlet structures as well as riprap outfalls must be in good condition.	Repair to good condition according to specifications on the approved plans.
Overall Function of Facility	Check that practice is functioning as designed.	Repair to good condition according to specifications on the approved plans.

NO WOODY VEGETATION IS ALLOWED ON THE EMBANKMENT.

Carroll County Supplemental Materials Specifications for Bio-Swale, Bioretention, Micro-Bioretention & Rain Gardens

Material	Specification	Size	Notes
Plantings	See Landscape Plan	N/A	Plantings are site specific and per approved landscape plan
Seed Mix	Filter Bed Mix – Use Wet Meadow Mix per MD Standards and Specifications §707. See Table 3 (1 lb. minimum/micro-bioretention)	N/A	Used with straw mulch in place of shredded hardwood mulch Incorporate seed evenly in top ½" of filter media
Mulch	Shredded Hardwood	N/A	Aged 6 months, minimum
Straw Mulch	MD Standards and Specifications §920.04. (200 lb. minimum/micro-bioretention)	N/A	1" Straw mulch over seed bed (facility bottom)
Geotextile	Class "C" – Apparent opening size (ASTM-D-4751), Grab Tensile Strength (ASTM-D-4632), Puncture Resistance (ASTM-D-4833)	N/A	Sides only Not on bottom unless specified on the plans
Underdrain and Reservoir Gravel	AASHTO M-43 No. 8 Stone	¾" – ⅛"	Stone must be clean and washed
Underdrain and Observation Well Piping	Slotted PVC or Slotted HDPE Type "SP" Pipes Solid: Scheduled 40 PVC or HDPE Type "S"	See Plan	Refer to the Carroll County SWM Supplement Pg. 87 All pipes must be double walled (smooth core) and slotted (no circular holes)
Sand	ASTM-C-33 (3 parts to 6 within Filter Media)	0.02" – 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonate or dolomitic sand substitutions are acceptable. No "rock-dust" can be used for sand. Manufactured sand from approved sources may be used for filters. Manufactured sand may not be used in dams.
Soil	Engineer approved loam with 20% or less clay. (1 part to 6 within Filter Media)	N/A	
Wood Chips	Untreated "Green" (2 parts to 6 within Filter Media)	N/A	Untreated "green" wood chips
Filter/Planting Media	Comprised of 3 parts sand, 2 parts wood chips, 1 part soil	N/A	See individual material specifications
Embankments & Trench Backfill (non-378)	Soils used for embankments and trench backfill shall be uniform and in accordance with MD 378 Code, except that fill material shall conform to Unified Soil Classification, GC, SC, SM, MH, ML, CH, or CL and be compacted to a density of not less than 95% of maximum dry density. Woody vegetation is prohibited on embankments.	N/A	See Earth Fill and Structure Backfill, Carroll County Construction Specifications Carroll County SWM Supplement, Page 130
Principal Spillway Pipe (non-378)	Shall be in accordance with MD 378 Code, except that all pipe joints are to be gasketed and completely watertight. Pipes connected to risers (inlets) shall be a single piece 20-feet long with no joints.	See Plan	See Pipe Conduits, Carroll County Construction Specifications Carroll County SWM Supplement, Page 131

Carroll County Supplemental Materials Specifications for Submerged Gravel Wetlands (SGWs)

Material	Specification	Size	Notes
Plantings	See Landscape Plan (At least 3 different wetland species)	N/A	Plantings are site specific and per approved landscape plan
Seed Mix	Filter Bed Mix – Use Wet Meadow Mix per MD Standards and Specifications §707. See Table 3 (13 lbs. /acre of SGW bottom)	N/A	Used with straw mulch in place of shredded hardwood mulch Incorporate seed evenly in top ½" of planting media
Mulch	Shredded Hardwood	N/A	Aged 6 months, minimum
Straw Mulch	MD Standards and Specifications §920.04. (200 lb. minimum/micro-bioretention)	N/A	1" Straw mulch over seed bed (SGW bottom)
Geotextile	Class "C" – Apparent opening size (ASTM-D-4751), Grab Tensile Strength (ASTM-D-4632), Puncture Resistance (ASTM-D-4833)	N/A	Sides only – Not needed with no. 8 perimeter chimney and reservoir Not on bottom unless specified on the plans
Underdrain, Choker Layer and Chimney Gravel	AASHTO M-43 No. 8 Stone	⅜" – ⅛"	Stone must be clean and washed If used as choker layer, above no. 57 stone, 4" minimum thickness
Reservoir Gravel	AASHTO M-43 No. 8 Stone (Preferred) or No. 57 (1" – ¼")	⅜" – ⅛"	Stone must be clean and washed
Chimney, Observation Well, and Underdrain Piping	Slotted PVC or Slotted HDPE Type "SP" Pipes Solid: Scheduled 40 PVC or HDPE Type "S"	See Plan	Refer to the Carroll County SWM Supplement Pg. 87 All pipes must be double walled (smooth core) and slotted (no circular holes)
Sand	ASTM-C-33 (3 parts to 6 within Filter Media)	0.02" – 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonate or dolomitic sand substitutions are acceptable. No "rock-dust" can be used for sand. Manufactured sand from approved sources may be used for filters. Manufactured sand may not be used in dams.
Soil	Engineer approved loam with 20% or less clay (1 part to 6 within Filter Media)	N/A	
Wood Chips	Untreated "Green" (2 parts to 6 within Filter Media)	N/A	Untreated "green" wood chips
Filter/Planting Media	Comprised of 3 parts sand, 2 parts wood chips, 1 part soil	2 ft Minimum	See individual material specifications
Impervious Liner	Polyvinyl Chloride (PVC) or approved equal	30 Mil Minimum Thickness	Bottom and Sides See Carroll County Standard details and notes

FLEXIBLE MEMBRANE LINERS
MATERIAL AND INSTALLATION SPECIFICATIONS

Design and install the liner in accordance with manufacturer recommendations. Follow manufacturer's recommendations with regard to protection from weather and ultraviolet exposure. The installer or manufacturer must certify that the liner installation meets the material and installation requirements of the plans and specifications.

Materials. Geomembrane materials must meet the type and thickness requirements below:

TYPE	MATERIAL	MINIMUM THICKNESS (mil)
LLDPE	Linear Low-Density Polyethylene	30
LLDPE-R	Reinforced Linear Low-Density Polyethylene	30
FPP	Flexible Polypropylene	30
PVC	Polyvinyl Chloride	30 (mil = 1/1000 inch)

Geomembrane materials must meet the criteria in NRCS National Engineering Handbook (NEH), Part 642, Chapter 3, "Material Specification 594 - Geomembrane Liner."

Cushion. Place a cushion layer above and beneath the liner if the subgrade or cover soil particles contain sharp angular stones that could damage the liner or particles greater than 3/8 inch for geomembrane liners. The cushion may be a 10-ounce-per-square-yard or heavier nonwoven geotextile. Geotextile cushion material must meet the requirements of the Geosynthetic Research Institute (GRI) Test Method GT12(a). Follow the manufacturer's recommendations for any additional protective measures.

Subgrade preparation. Prepare the subgrade to conform to manufacturer's recommendations. The subgrade materials must be free from sharp, angular stones, and the surface free from oversized particles, or any objects that could damage the liner. If angular particles are present, treat the subgrade by placing a cushion layer between the subgrade and the liner. The subgrade surface must provide a smooth, flat, and unyielding foundation for the liner. Compact / prepare the bottom surface with a vibratory plate or drum roller. No standing water, mud, vegetation, snow, frozen subgrade, or excessive moisture may be present at the time of liner placement.

Liner protection. Protect liners from mechanical damage from all sources, including equipment access points and agitation operations. Measures to ensure the integrity of the liner include increasing the liner thickness above the minimum values listed above, or providing protective ramps and aprons at agitation locations. .

Anchorage. Anchor the liner to prevent uplift due to wind or slippage down the side slope, in accordance with manufacturer's recommendations.

Penetrations. Install penetrations through the liner in accordance with manufacturer's recommendations. Penetrations must be watertight.

Cover soil. Cover Geomembrane Liners with a minimum of 12 inches of soil measured perpendicular to the finished surface. Do not use cover soil that contains sharp, angular stones or any objects that could damage the liner. The maximum allowable particle size of soil cover material is 3/8 inch for geomembrane liners. Use cover materials that are stable against slippage down the slope under all operational and exposure conditions, such as rapid drawdown or saturation by precipitation or snowmelt. Place cover soil within 24 hours after placement of the liner to minimize the potential for damage from various sources, including precipitation, wind, and ultraviolet light exposure.

CARROLL COUNTY, PRIVATE FACILITIES
CONSTRUCTED BY OWNER
STORMWATER MANAGEMENT MAINTENANCE AGREEMENT SCHEDULE

1. THE STORMWATER MANAGEMENT FACILITY/FACILITIES SHOWN ON THESE PLANS SHALL BE CONSTRUCTED AND MAINTAINED BY THE OWNER(S).
2. OWNER/HIS HEIRS OR ASSIGNS SHALL BE RESPONSIBLE FOR CONTINUING MAINTENANCE OF THE FACILITY/FACILITIES, WHICH SHALL INCLUDE SUCH ITEMS AS MOWING, CLEANING AND REMOVING SEDIMENT, TREES, SHRUBS AND DEBRIS. REQUIREMENTS AND SCHEDULES FOR SPECIFIC TYPES OF FACILITIES AND PRACTICES AS LISTED ON THE PLANS ARE HEREBY INCLUDED. THE TIME PERIOD FOR THIS CONTINUING MAINTENANCE SHALL BE ON *AS–NEEDED* BASIS BUT SHALL NOT BE DELAYED LONGER THAN THIRTY (30) DAYS.
3. OWNER, HIS HEIRS OR ASSIGNS SHALL BE RESPONSIBLE FOR ANY STRUCTURAL DAMAGES OR FAILURE WHICH MAY OCCUR AS A RESULT OF NEGLIGENCE, ACCIDENT OR MISUSE. IN THE EVENT OF STRUCTURAL DAMAGE, OWNER SHALL BE RESPONSIBLE TO MAKE THE NECESSARY REPAIRS AS QUICKLY AS POSSIBLE BUT IN ANY CASE WITHIN THIRTY (30) DAYS.
4. IF AFTER NOTICE BY THE COUNTY/TOWN/CITY TO CORRECT A VIOLATION REQUIRING MAINTENANCE WORK, SATISFACTORY CORRECTIONS ARE NOT MADE BY THE OWNER(S) WITHIN (30) DAYS THE COUNTY/TOWN/CITY MAY PERFORM ALL NECESSARY WORK TO PLACE THE FACILITY IN PROPER WORKING CONDITION. THE OWNERS OF THE FACILITY SHALL BE ASSESSED THE COST OF THE WORK AND ANY PENALTIES. THESE MONIES SHALL BE COLLECTED FROM A BOND, WHICH THE DEVELOPER IS REQUIRED TO POST WITH THE COUNTY/TOWN/CITY TO COVER SUCH EXPENSES UNTIL *COMPLETION OF THE FACILITY*. *COMPLETION OF THE FACILITY* IS CONSTRUED TO MEAN THAT ALL CONTRIBUTORY DRAINAGE AREAS ARE PAVED OR SUPPORTING A 2* STAND OF DENSE GRASS AND THAT THE CARROLL COUNTY BUREAU OF RESOURCE MANAGEMENT HAS INSPECTED CONSTRUCTION AND A REGISTERED PROFESSIONAL ENGINEER HAS CERTIFIED THAT THE *AS–BUILT* PLANS MEET THE PLANS AND SPECIFICATIONS FOR CONSTRUCTION. AFTER *COMPLETION OF THE FACILITY* THE MONEYS MAY BE COLLECTED BY PLACING A LIEN ON THE PROPERTY, OR BY INCLUDING THE COSTS AND PENALTIES ON THE PROPERTY TAX BILL AND COLLECTING THEM AS ORDINARY TAXES BY THE COUNTY/TOWN/CITY.
5. OWNER(S) SHALL GRANT RIGHT OF ENTRY TO AUTHORIZED COUNTY/TOWN/CITY PERSONNEL FOR PURPOSES OF INSPECTION MONITORING AND/OR REPAIR. SITE VISITS FOR INSPECTION AND/OR MONITORING SHALL BE CONDUCTED ONLY DURING NORMAL COUNTY WORKING HOURS (8:00 A.M. TO 5:00 P.M. MONDAY – FRIDAY).
6. THIS AGREEMENT INCLUDING RIGHT–OF ENTRY FOR INSPECTION/MAINTENANCE AND REPAIR SHALL BE RECORDED IN THE LAND RECORDS OF THE COUNTY.

ALL OF THE PROPOSED SWM FACILITIES QUALIFY FOR EXEMPTION FROM A FORMAL REVIEW BY THE CARROLL COUNTY SCD. CONFORM TO THE FOLLOWING MATERIAL & CONSTRUCTION SPECIFICATIONS

1. NO CUT-OFF TRENCH OR EMBANKMENT CORE IS REQUIRED.
2. SITE PREPARATION SHALL BE IN ACCORDANCE WITH PAGE 378-15 OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE, MARYLAND, CONSERVATION PRACTICE STANDARD (NRCS – MARYLAND, JANUARY 2000), AS APPLICABLE.
3. EARTH FILL FOR EMBANKMENT MATERIAL & CONSTRUCTION SHALL BE IN ACCORDANCE WITH PAGES 378-15 OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE, MARYLAND, CONSERVATION PRACTICE STANDARD (NRCS – MARYLAND, JANUARY 2000).
4. PIPE CONDUIT: ALL PVC AND HDPE PIPES MUST MEET THE REQUIREMENTS STATED ON PAGE 378-18, ITEMS 1 AND 3, OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE, MARYLAND, CONSERVATION PRACTICE STANDARD (NRCS – MARYLAND, JANUARY 2000).
5. COMPACTION SHALL BE AS IN ACCORDANCE WITH PAGES 378-15 OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE, MARYLAND, CONSERVATION PRACTICE STANDARD (NRCS – MARYLAND, JANUARY 2000).
6. CONCRETE MUST MEET MINIMUM MD SHA REQUIREMENTS – MIX #6 FOR PRECAST STRUCTURES AND MIX #3 FOR CAST IN PLACE STRUCTURES.
7. THE REINFORCED CONCRETE PIPES MUST MEET THE MATERIALS, BEDDING, AND LAYING REQUIREMENTS STATED ON PAGES 378-17 AND 378-18 OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE, MARYLAND, CONSERVATION PRACTICE STANDARD (NRCS – MARYLAND, JANUARY 2000).
8. STABILIZATION SHALL BE IN ACCORDANCE WITH PAGES 378-19 OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE, MARYLAND, CONSERVATION PRACTICE STANDARD (NRCS – MARYLAND, JANUARY 2000).
9. FENCE: THE SUBMERGED GRAVEL WETLAND SHALL BE FENCED WITH BLACK, VINYL-COATED, CHAIN LINK FENCE WITH BARBED WIRE 42" HIGH WITH SWING GATE. THE GATE SHALL BE 12 FEET WIDE. LOCKING DEVICE MUST BE PROVIDED ON THE GATE. BARBED WIRE, CONFORMING TO ASTM A121, MUST BE USED. IT SHALL CONSIST OF TWO 12 ½-GAUGE TWISTED LINE WIRES WITH 14-GAUGE ROUND ALUMINUM WIRE BARBS, HAVING 4 POINTS AND SPACED 5 INCHES ON CENTER. THE BARBED WIRE SUPPORT ARMS SHALL BE SINGLE ARM, FOR 3 STRANDS OF BARBED WIRE AND BE AT AN ANGLE OF 45 DEGREES, WITH THE TOP STRAND OF BARBED WIRE BEING 12" ABOVE AND 12" OUT FROM THE FENCE LINE.
10. FILTER CLOTH: GEOTEXTILE SHALL BE PLACED IN ACCORDANCE WITH PAGES 378-18 OF THE USDA NATURAL RESOURCES CONSERVATION SERVICE, MARYLAND, CONSERVATION PRACTICE STANDARD (NRCS – MARYLAND, JANUARY 2000).

Engineer's Design Certification

I hereby certify that these plans have been designed according to Chapter 151 of the Code of Public Local Laws and Ordinances of Carroll County and I hereby certify that these documents were prepared or approved by me, and I am a duly licensed Professional Engineer or Professional Land Surveyor, as appropriate, under the laws of the State of Maryland.

Signed _____ Date 05/05/2025
License No. 48396 Expiration Date 01/15/2026

Developer's Certification

I hereby certify that all proposed work shown on these construction drawing(s) will be conducted in strict accordance with these plans. I also understand that it is my responsibility to have the construction supervised and certified, including the submittal of "as- Built" plans certified by a registered Professional Engineer or Professional Land Surveyor, as appropriate, within thirty (30) days of completion of work on the stormwater management facility/facilities. I also certify that this/these stormwater management facility/facilities will be inspected during construction by a registered Professional Engineer or Professional Land Surveyor, as appropriate, in accordance with Sections § 151.095 and § 151.096 of the Code of Public Local Laws and Ordinances of Carroll County.

Signed _____ Date 05/05/2025

Engineer's "As-Built" Certification

I hereby certify that the facility/facilities shown on this/these plan(s) was constructed as shown on the "As-Built" plans and meets the approved plans and specifications. I also certify that this/these facilities were inspected in accordance with Sections § 151.095 and § 151.096 of the Code of Public Local Laws and Ordinances of Carroll County and I hereby certify that these documents were prepared or approved by me, and I am a duly licensed Professional Engineer or Professional Land Surveyor, as appropriate, under the laws of the State of Maryland.

Signed _____ Date _____
License No. _____ Expiration Date _____

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT,
CONSULTING ENGINEERS
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WWW.ZTIGERS.COM

STATE OF MARYLAND — MELANIE BEVERLY — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

File No. S-20-0030

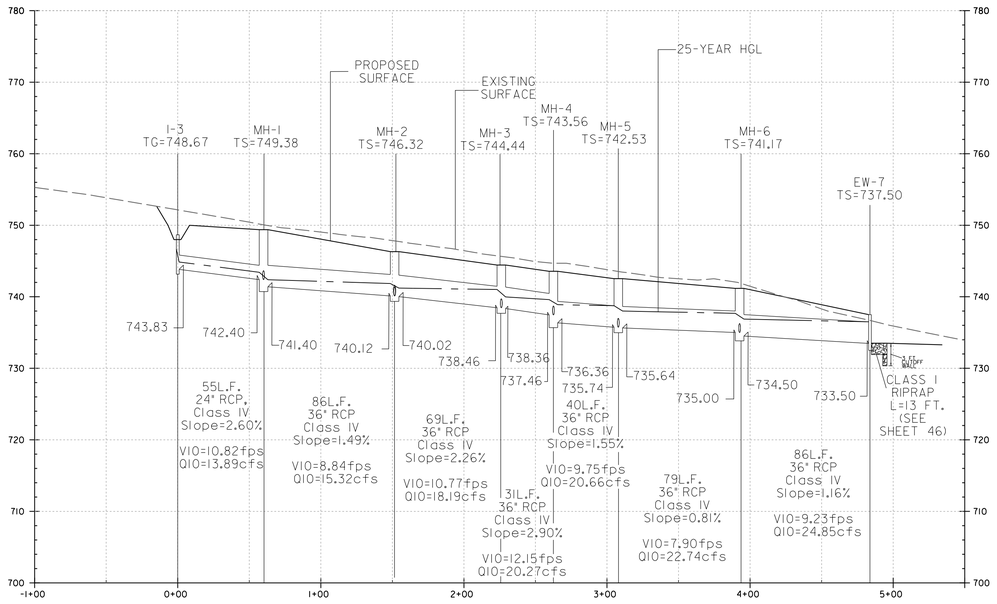
TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

PROJECT ENG. _____
DESIGNED BY _____
CHECKED BY _____
DRAWN BY _____
PROJECT MGR. _____

SWM NOTES, MATERIAL SPECIFICATIONS AND INSPECTION CHECKLISTS

PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 43 OF 96



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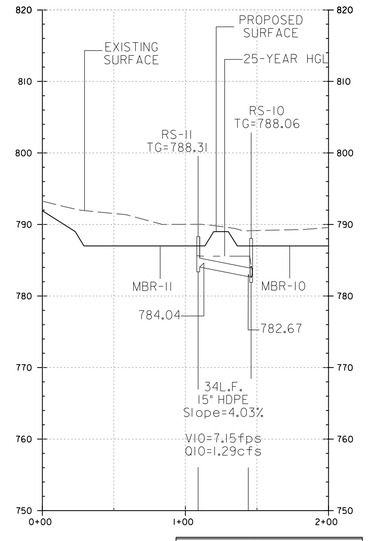

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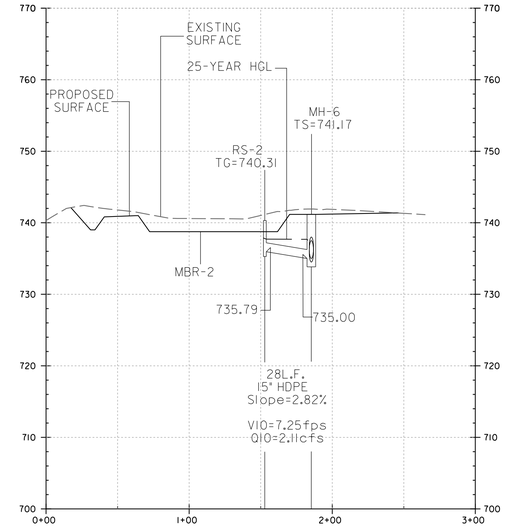

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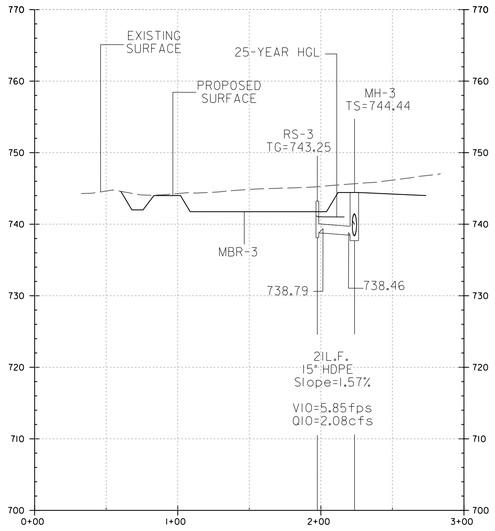

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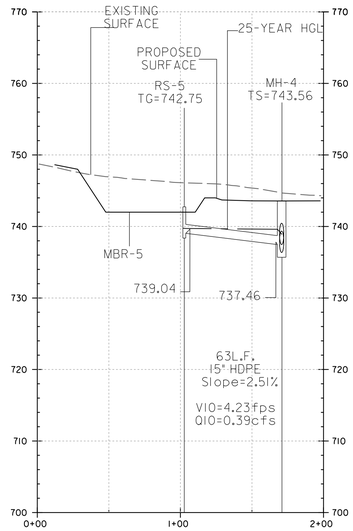

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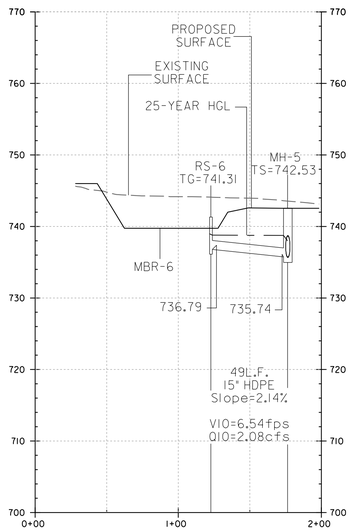

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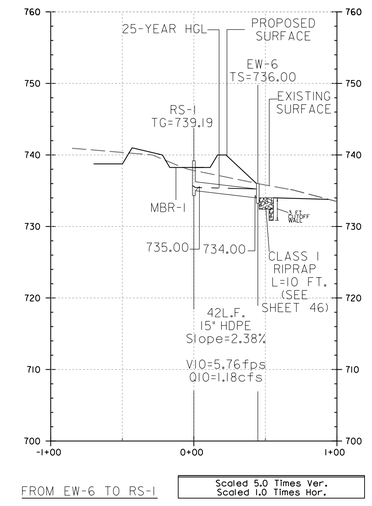

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File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

DP–01 DRAINAGE PROFILES

PROJECT ENG._____
DESIGNED BY _____
CHECKED BY_____
DRAWN BY_____
PROJECT MGR._____

PROGRAM MANAGER

DATE 05052025
FILE S-20-0030

SHEET 44 OF 96

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT, CONSULTING ENGINEERS
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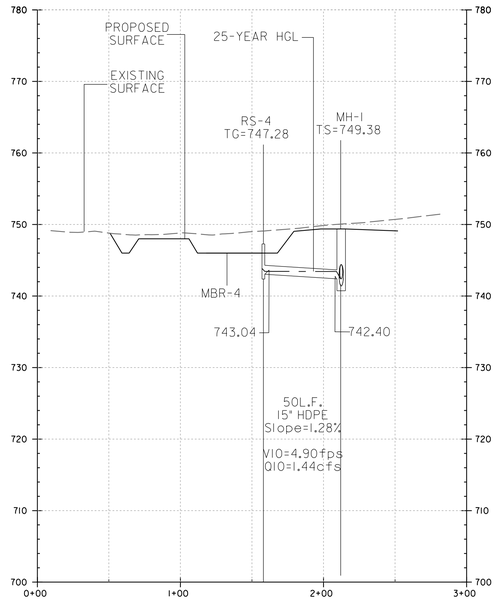
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

NO.	DESCRIPTION	NAME	DATE

REVISIONS



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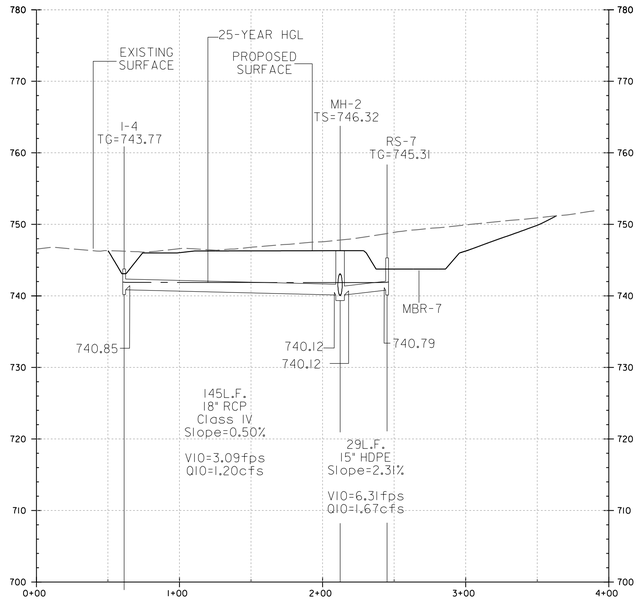

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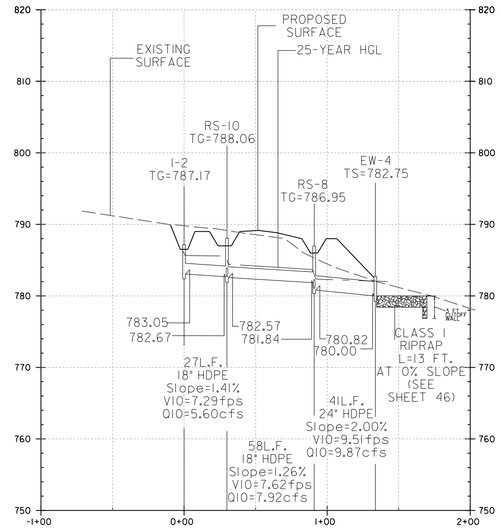

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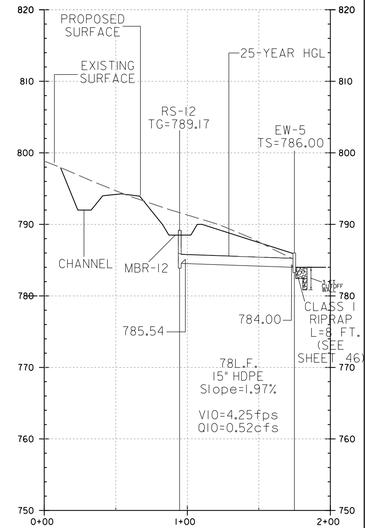

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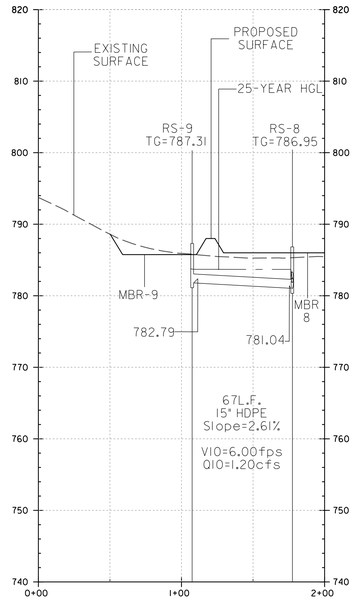

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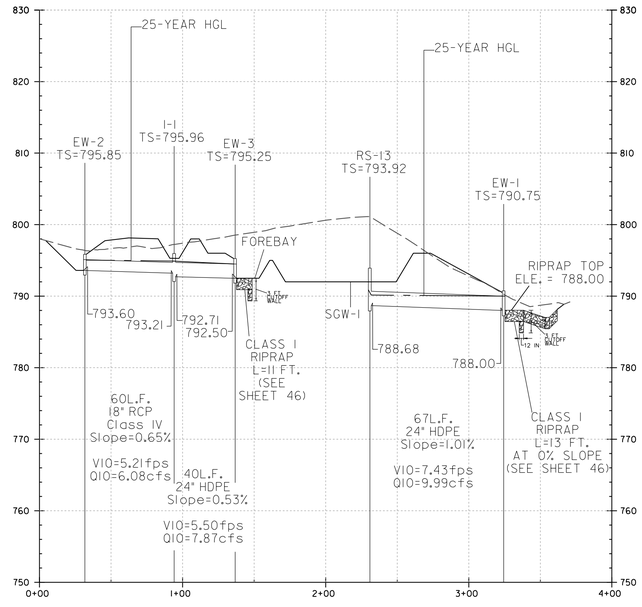

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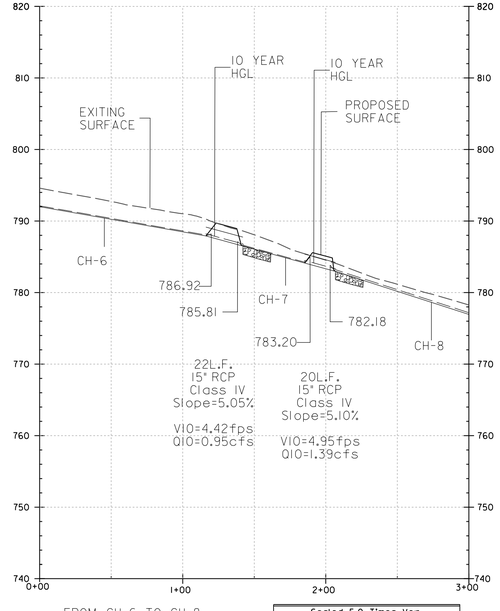

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File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

DP–02 DRAINAGE PROFILES

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

PROGRAM MANAGER

DATE 05052025
FILE S-20-0030

SHEET 45 OF 96

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."
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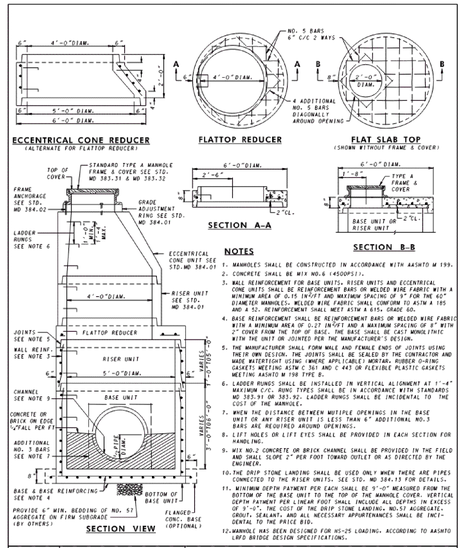
NO.	DESCRIPTION	NAME	DATE

REVISIONS



SPECIFICATION	CATEGORY CODE ITEMS
305	

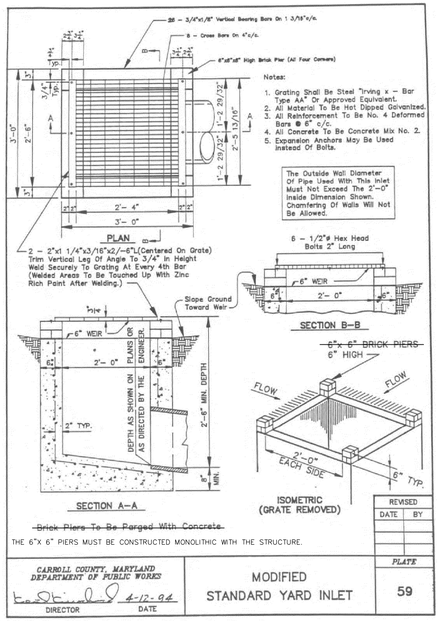
APPROVED _____ DIRECTOR – OFFICE OF HIGHWAY DEVELOPMENT

	APPROVAL + SHA REVISIONS	APPROVAL + FEDERAL HIGHWAY ADMINISTRATION
ORIGINAL	2-21-91	1-2-91
REVISED	10-7-14	9-29-16
REVISED		
REVISED		

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES

60" DIAMETER PRECAST MANHOLE FOR 27" TO 36" PIPES

STANDARD NO. MD 384.03



REVISED	
DATE	BY

PLATE 59

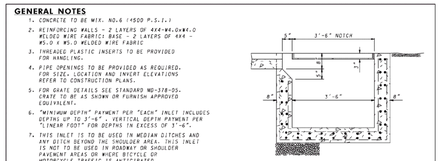
CARROLL COUNTY, MARYLAND DEPARTMENT OF PUBLIC WORKS

DIRECTOR _____ DATE 4-12-94

MODIFIED STANDARD YARD INLET

GENERAL NOTES

1. CONCRETE TO BE MIX. NO.6 (4500 P.S.I.)
2. REINFORCING WALLS – 2 LAYERS OF 4X4-W4.0xW4.0 WELDED WIRE FABRICS BASE – 2 LAYERS OF 4X4 – W5.0 x W5.0 WELDED WIRE FABRIC
3. THREADED PLASTIC INSERTS TO BE PROVIDED FOR HANGING.
4. PIPE OPENINGS TO BE PROVIDED AS REQUIRED. FOR SIZES, LOCATION AND INVERT ELEVATIONS REFER TO CONSTRUCTION PLANS.
5. FOR GRATE DETAILS SEE STANDARD NO-378-05. GRATE TO BE AS SHOWN OR FURNISH APPROVED EQUIVALENT.
6. "MINIMUM DEPTH" PAYMENT PER "EACH" INLET INCLUDES DEPTHS UP TO 3'-6" . VERTICAL DEPTH PAYMENT PER "LINEAR FOOT" FOR DEPTHS IN EXCESS OF 3'-6".
7. THIS INLET IS TO BE USED IN MEDIAN DITCHES AND ANY DITCH BEYOND THE SHOULDER AREA. THIS INLET IS NOT TO BE USED IN ROADWAY OR SHOULDER PAVEMENT AREAS OR WHERE BICYCLE OR MOTORCYCLE TRAFFIC IS ANTICIPATED.
8. INLET HAS BEEN DESIGNED FOR H5-25 LOADING. ACCORDING TO AASHTOLRFD BRIDGE DESIGN SPECIFICATIONS



SPECIFICATION	CATEGORY CODE ITEMS
305	

APPROVED _____ DIRECTOR – OFFICE OF HIGHWAY DEVELOPMENT

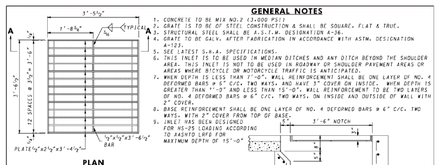
	APPROVAL + SHA REVISIONS	APPROVAL + FEDERAL HIGHWAY ADMINISTRATION
ORIGINAL	4-4-85	8-1-84
REVISED	10-1-91	6-23-87
REVISED	10-7-14	9-29-16
REVISED		

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
PRECAST STANDARD SINGLE OR DOUBLE OPENING TYPE K INLET OPEN-END GRATE

STANDARD NO. MD 378.11

GENERAL NOTES

1. CONCRETE TO BE MIX NO.2 (4500 PSI)
2. GRATE IS TO BE OF STEEL CONSTRUCTION & SHALL BE SQUARE, FLAT & TRUE.
3. STRUCTURAL STEEL SHALL BE A-3 I.M. DESIGNATION A-36.
4. GRATE TO BE GALV. AFTER FABRICATION IN ACCORDANCE WITH ASTM. DESIGNATION A-123.
5. SEE LATEST S.H.A. SPECIFICATIONS.
6. THIS INLET IS TO BE USED IN MEDIAN DITCHES AND ANY DITCH BEYOND THE SHOULDER AREA. THIS INLET IS NOT TO BE USED IN ROADWAY OR SHOULDER PAVEMENT AREAS OR WHERE BICYCLE OR MOTORCYCLE TRAFFIC IS ANTICIPATED.
7. BASE REINFORCEMENT SHALL BE ONE LAYER OF NO. 4 DEFORMED BARS @ 6" C/C. TWO MAYS. AND HAVE 3" COVER ON INSIDE. WITH DEPTH IS GREATER THAN 1'-0" AND LESS THAN 15'-0". WALL REINFORCEMENT TO BE TWO LAYERS OF NO. 4 DEFORMED BARS @ 6" C/C. TWO WAYS. ON INSIDE AND OUTSIDE OF WALL WITH 2" COVER.
8. BASE REINFORCEMENT SHALL BE ONE LAYER OF NO. 4 DEFORMED BARS @ 6" C/C. TWO WAYS. WITH 2" COVER FROM TOP OF BASE.
9. INLET HAS BEEN DESIGNED FOR H5-25 LOADING ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS MAXIMUM DEPTH OF 15'-0"



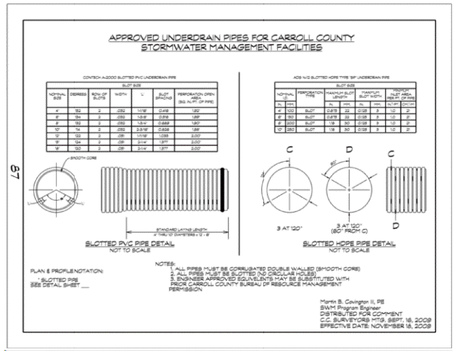
SPECIFICATION	CATEGORY CODE ITEMS
305	

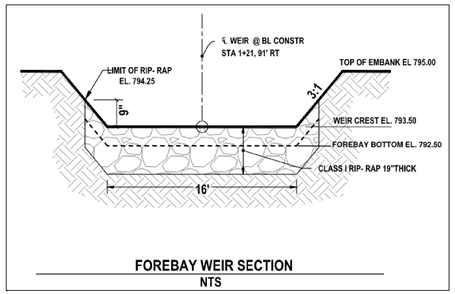
APPROVED _____ DIRECTOR – OFFICE OF HIGHWAY DEVELOPMENT

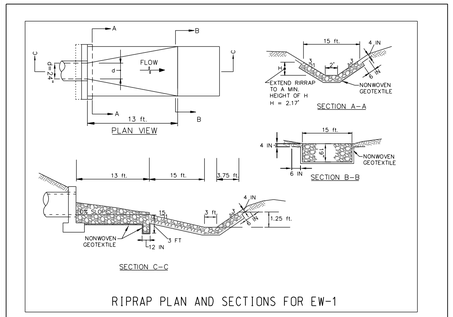
	APPROVAL + SHA REVISIONS	APPROVAL + FEDERAL HIGHWAY ADMINISTRATION
ORIGINAL	5-28-83	
REVISED	10-1-91	6-23-87
REVISED	10-7-14	9-29-16
REVISED		

Maryland Department of Transportation
STATE HIGHWAY ADMINISTRATION
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES
STANDARD SINGLE OR DOUBLE OPENING TYPE K INLET OPEN – END GRATE

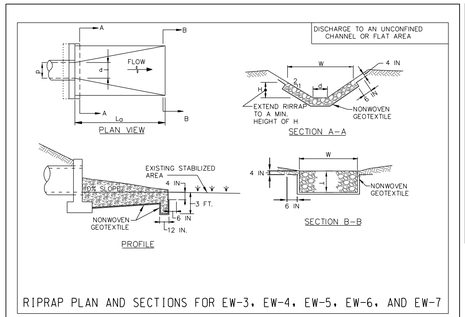
STANDARD NO. MD 378.05







THE MINIMUM HEIGHT AT SECTION A-A IS BASED ON MAINTAINING THE DOWNSTREAM RIPRAP WIDTH.

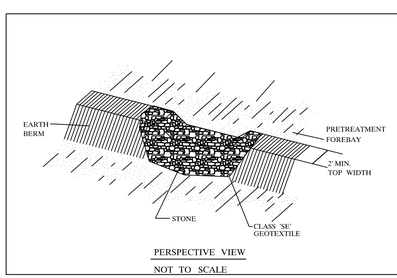


OUTFALL LOCATION	d (in)	La(ft)	T (in)	W(ft)	H(ft)
EW-3	24	11	19	7	1.25
EW-4	24	13	19	15	3.25
EW-5	15	8	19	10	2.00
EW-6	15	10	19	12	2.50
EW-7	36	11	19	14	3.00

THE MINIMUM HEIGHT AT SECTION A-A IS BASED ON MAINTAINING THE DOWNSTREAM RIPRAP WIDTH.

CONSTRUCTION SPECIFICATIONS FOR OUTFALL PROTECTION RIPRAPS

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 (¾ TO 1½ INCH MINIMUM 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 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 FILTER BLANKET OR GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
6. CONSTRUCT APRON WITH 0% SLOPE ALONG ITS LENGTH AND WITHOUT OBSTRUCTIONS. PLACE STONE SO THAT IT BLENDS IN WITH EXISTING GROUND.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND RIPRAP DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.



File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

DP–03 DRAINAGE DETAILS

PROJECT ENG:_____
DESIGNED BY:_____
CHECKED BY:_____
DRAWN BY:_____
PROJECT MGR:_____

PROGRAM MANAGER

DATE 05052025
FILE S–20–0030

SHEET 46 OF 96

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT, CONSULTING ENGINEERS
5120 WILLET BRIDGE ROAD, BETHESDA MD 20816
TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

NO.	DESCRIPTION	NAME	DATE

REVISIONS

PIPE SCHEDULE

FROM	TO	SIZE	TYPE	LENGTH	INV.IN	INV.OUT	REMARK
EW-2	I-1	18"	RCP, CLASS IV	60'	793.60'	793.21'	
I-1	EW-3	24"	HDPE	40'	792.71'	792.50'	
I-2	RS-10	18"	HDPE	27'	783.05'	782.67'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
I-3	MH-1	24"	RCP, CLASS IV	55'	743.83'	742.40'	
I-4	MH-2	18"	RCP, CLASS IV	145'	740.85'	740.12'	
MH-1	MH-2	36"	RCP, CLASS IV	86'	741.40'	740.12'	
MH-2	MH-3	36"	RCP, CLASS IV	69'	740.02'	738.46'	
MH-3	MH-4	36"	RCP, CLASS IV	31'	738.36'	737.46'	
MH-4	MH-5	36"	RCP, CLASS IV	40'	736.36'	735.74'	
MH-5	MH-6	36"	RCP, CLASS IV	79'	735.64'	735.00'	
MH-6	EW-7	36"	RCP, CLASS IV	86'	734.50'	733.50'	
RS-1	EW-6	15"	HDPE	42'	735.00'	734.00'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
RS-2	MH-6	15"	HDPE	28'	735.79'	735.00'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
RS-3	MH-3	15"	HDPE	21'	738.79'	738.46'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
RS-4	MH-1	15"	HDPE	50'	743.04'	742.40'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
RS-5	MH-4	15"	HDPE	63'	739.04'	737.46'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
RS-6	MH-5	15"	HDPE	49'	736.79'	735.74'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT

PIPE SCHEDULE

FROM	TO	SIZE	TYPE	LENGTH	INV.IN	INV.OUT	REMARK
RS-7	MH-2	15"	HDPE	29'	740.79'	740.12'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
RS-8	EW-4	24"	HDPE	41'	780.82'	780.00'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
RS-9	RS-8	15"	HDPE	67'	782.79'	781.04'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
RS-10	RS-8	18"	HDPE	58'	782.57'	781.84'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
RS-11	RS-10	15"	HDPE	34'	784.04'	782.67'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
RS-12	EW-5	15"	HDPE	78'	785.54'	784.00'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
RS-13	EW-1	24"	HDPE	67'	788.68'	788.00'	WATERTIGHT, NO JOINTS THROUGH EMBANKMENT
CH-6	CH-7	15"	RCP, CLASS IV	22'	786.92'	785.81'	
CH-7	CH-8	15"	RCP, CLASS IV	20'	783.20'	782.18'	

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

DS-01 DRAINAGE SCHEDULE – PIPES

PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT,
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BETHESDA MD 20816
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TEL (301) 500 0854
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WWW.ZTIGERS.COM

STATE OF MARYLAND
MELBOURNE BEYENE
48396
PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

STRUCTURE SCHEDULE

NO.	STATION	OFFSET	BASELINE	CARROLL COUNTY DPW STANDARD NAME, PLATE NO.	T.G. ELEV.	WEIR CREST ELEV.	REMARKS
I-1	01+07.57	24.50 RT	PRIVATE ROAD	PRECAST STANDARD SINGLE OR DOUBLE OPENING TYPE K INLET OPEN-END GRATE	795.96'	795.29'	MD 378.11
I-2	11+15.06	55.89 LT	PRIVATE ROAD	PRECAST STANDARD SINGLE OR DOUBLE OPENING TYPE K INLET OPEN-END GRATE	787.17'	786.50'	MD 378.11
I-3	22+91.45	162.91 LT	PRIVATE ROAD	PRECAST STANDARD SINGLE OR DOUBLE OPENING TYPE K INLET OPEN-END GRATE	748.67'	748.00'	MD 378.11
I-4	24+33.25	24.50 RT	PRIVATE ROAD	PRECAST STANDARD SINGLE OR DOUBLE OPENING TYPE K INLET OPEN-END GRATE	743.77'	743.10'	MD 378.11
RS-1	27+61.43	40.12 RT	PRIVATE ROAD	MODIFIED STANDARD YARD INLET, PLATE 59	739.19'	738.63'	CARROLL COUNTY MD DPW
RS-2	27+83.44	22.39 LT	PRIVATE ROAD	MODIFIED STANDARD YARD INLET, PLATE 59	740.31'	739.75'	CARROLL COUNTY MD DPW
RS-3	25+07.41	100.80 LT	PRIVATE ROAD	MODIFIED STANDARD YARD INLET, PLATE 59	743.25'	742.69'	CARROLL COUNTY MD DPW
RS-4	23+30.94	71.82 LT	PRIVATE ROAD	MODIFIED STANDARD YARD INLET, PLATE 59	747.28'	746.72'	CARROLL COUNTY MD DPW
RS-5	25+50.00	194.78 LT	PRIVATE ROAD	MODIFIED STANDARD YARD INLET, PLATE 59	742.75'	742.19'	CARROLL COUNTY MD DPW
RS-6	25+86.00	182.24 LT	PRIVATE ROAD	MODIFIED STANDARD YARD INLET, PLATE 59	741.31'	740.75'	CARROLL COUNTY MD DPW
RS-7	24+33.38	159.45 LT	PRIVATE ROAD	MODIFIED STANDARD YARD INLET, PLATE 59	745.31'	744.75'	CARROLL COUNTY MD DPW
RS-8	11+11.23	35.21 RT	PRIVATE ROAD	PRECAST STANDARD SINGLE OR DOUBLE OPENING TYPE K INLET OPEN-END GRATE	786.95'	786.28'	MD 378.11
RS-9	10+34.73	39.47 RT	PRIVATE ROAD	MODIFIED STANDARD YARD INLET, PLATE 59	787.31'	786.75'	CARROLL COUNTY MD DPW
RS-10	11+13.85	25.80 LT	PRIVATE ROAD	MODIFIED STANDARD YARD INLET, PLATE 59	788.06'	787.50'	CARROLL COUNTY MD DPW
RS-11	10+79.69	28.32 LT	PRIVATE ROAD	MODIFIED STANDARD YARD INLET, PLATE 59	788.31'	787.75'	CARROLL COUNTY MD DPW
RS-12	13+91.38	41.99 RT	PRIVATE ROAD	MODIFIED STANDARD YARD INLET, PLATE 59	789.17'	788.61'	CARROLL COUNTY MD DPW
RS-13	1+27.80	157.18 RT	PRIVATE ROAD	PRECAST STANDARD SINGLE OR DOUBLE OPENING TYPE K INLET OPEN-END GRATE	793.92'	793.25'	MD 378.11

NOTE: THE STRUCTURE (MODIFIED STANDARD YARD INLET, PLATE 59), MUST BE MONOLITHIC CONSTRUCTION. NO BRICK PIERS ALLOWED.

File No - S-20-0030

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NO.	DESCRIPTION	NAME	DATE

REVISIONS

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

DS–02 DRAINAGE SCHEDULE – STRUCTURES

PROJECT ENG.:
DESIGNED BY:
CHECKED BY:
DRAWN BY:
PROJECT MGR.:
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030

STRUCTURE SCHEDULE

NO.	STATION	OFFSET	BASELINE	STANDARD NAME	T.S. ELEV.	REMARKS
MH-1	23+42.95	124.45 LT	PRIVATE ROAD	60" DIAMETER PRECAST MANHOLE FOR 27" TO 36" PIPES	749.38'	MD 384.03
MH-2	24+33.56	125.74 LT	PRIVATE ROAD	60" DIAMETER PRECAST MANHOLE FOR 27" TO 36" PIPES	746.32'	MD 384.03
MH-3	25+07.91	126.67 LT	PRIVATE ROAD	60" DIAMETER PRECAST MANHOLE FOR 27" TO 36" PIPES	744.44'	MD 384.03
MH-4	25+43.60	126.35 LT	PRIVATE ROAD	60" DIAMETER PRECAST MANHOLE FOR 27" TO 36" PIPES	743.56'	MD 384.03
MH-5	25+89.16	127.93 LT	PRIVATE ROAD	60" DIAMETER PRECAST MANHOLE FOR 27" TO 36" PIPES	742.53'	MD 384.03
MH-6	27+82.90	22.21 LT	PRIVATE ROAD	60" DIAMETER PRECAST MANHOLE FOR 27" TO 36" PIPES	741.17'	MD 384.03
EW-1	00+50.00	180.40 RT	PRIVATE ROAD	STANDARD TYPE C ENDWALL ROUND PIPE, PLATE 79	790.75'	CARROLL COUNTY MD DPW
EW-2	00+63.91	21.40 LT	PRIVATE ROAD	STANDARD TYPE C ENDWALL ROUND PIPE, PLATE 79	795.85'	CARROLL COUNTY MD DPW
EW-3	01+15.33	64.29 RT	PRIVATE ROAD	STANDARD TYPE C ENDWALL ROUND PIPE, PLATE 79	795.25'	CARROLL COUNTY MD DPW
EW-4	11+07.95	86.50 RT	PRIVATE ROAD	STANDARD TYPE C ENDWALL ROUND PIPE, PLATE 79	782.75'	CARROLL COUNTY MD DPW
EW-5	13+92.43	121.49 RT	PRIVATE ROAD	STANDARD TYPE C ENDWALL ROUND PIPE, PLATE 79	786.00'	CARROLL COUNTY MD DPW
EW-6	27+61.70	84.14 RT	PRIVATE ROAD	STANDARD TYPE C ENDWALL ROUND PIPE, PLATE 79	736.00'	CARROLL COUNTY MD DPW
EW-7	28+15.41	66.65 RT	PRIVATE ROAD	STANDARD TYPE C ENDWALL ROUND PIPE, PLATE 79	737.50'	CARROLL COUNTY MD DPW

File No - S-20-0030

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NO.	DESCRIPTION	NAME	DATE

REVISIONS

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

DS-03 DRAINAGE SCHEDULE – STRUCTURES

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030

DITCH SCHEDULE (CHANNEL 1)				
STATION	C/L OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
1+20.00	24.50 LT	736890.6498	1336080.0534	796.42
1+40.00	24.50 LT	736876.9981	1336092.1811	797.85
1+60.00	24.50 LT	736864.4272	1336105.4263	799.62
1+80.00	24.50 LT	736853.0400	1336119.7000	800.56
2+00.00	24.50 LT	736842.8851	1336134.8756	803.22
2+20.00	24.50 LT	736832.8151	1336151.8497	805.01
2+40.00	24.50 LT	736822.6233	1336169.0581	806.87
2+60.00	24.50 LT	736812.4316	1336186.2665	808.61
2+80.00	24.50 LT	736802.2399	1336203.4749	810.42
3+00.00	24.50 LT	736792.0481	1336220.6833	812.22
3+20.00	24.50 LT	736780.4391	1336238.7929	814.03
3+40.00	24.50 LT	736767.4180	1336256.0102	815.80
3+60.00	24.50 LT	736753.1002	1336272.1654	817.61
3+80.00	24.50 LT	736737.5721	1336287.1609	819.40
4+00.00	24.50 LT	736720.9273	1336300.9065	821.22
4+20.00	24.50 LT	736703.2661	1336313.3191	823.02
4+40.00	24.50 LT	736684.6952	1336324.3239	824.81
4+60.00	24.50 LT	736665.3263	1336333.8547	826.54
4+80.00	24.50 LT	736645.2763	1336341.8539	827.88
5+00.00	24.50 LT	736624.6663	1336348.2733	828.81
5+20.00	24.50 LT	736606.0532	1336353.5994	829.33
5+40.00	24.50 LT	736587.6153	1336359.5032	829.43

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SYNTHETIC FIBER MATTING

DITCH SCHEDULE (CHANNEL 2)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
1+07.57	24.50 RT	736871.6422	1336038.3039	795.29
1+20.00	24.50 RT	736864.7252	1336048.2900	799.62
1+40.00	24.50 RT	736848.4800	1336062.7241	797.85
1+60.00	24.50 RT	736833.5198	1336078.4868	796.42
1+80.00	24.50 RT	736819.9535	1336095.4635	829.43
2+00.00	24.50 RT	736807.8794	1336113.5308	829.33
2+20.00	24.50 RT	736797.5379	1336130.9567	828.81
2+40.00	24.50 RT	736787.3461	1336148.1651	827.89
2+60.00	24.50 RT	736777.1544	1336165.3735	826.54
2+80.00	24.50 RT	736766.9627	1336182.5818	824.83
3+00.00	24.50 RT	736756.7709	1336199.7902	823.02
3+20.00	24.50 RT	736746.8024	1336215.3499	821.22
3+40.00	24.50 RT	736735.7016	1336230.0281	819.41
3+60.00	24.50 RT	736723.4954	1336243.8007	817.62
3+80.00	24.50 RT	736710.2573	1336256.5847	815.81
4+00.00	24.50 RT	736696.0673	1336268.3031	814.01
4+20.00	24.50 RT	736681.0108	1336278.8851	812.22
4+40.00	24.50 RT	736665.1786	1336288.2670	810.42
4+60.00	24.50 RT	736648.6663	1336296.3922	808.62
4+80.00	24.50 RT	736631.5732	1336303.2117	806.81
5+00.00	24.50 RT	736614.0027	1336308.6843	805.02
5+20.00	24.50 RT	736594.1606	1336314.3621	803.22
5+40.00	24.50 RT	736574.5053	1336320.6557	801.41

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SOLID SODDING

DITCH SCHEDULE (CHANNEL 3)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
5+60.00	24.50 LT	736569.3704	1336365.9789	829.11
5+80.00	24.50 LT	736551.3362	1336373.0202	828.40
6+00.00	24.50 LT	736533.5303	1336380.6203	827.25
6+20.00	24.50 LT	736515.9700	1336388.7718	825.71
6+40.00	24.50 LT	736498.6724	1336397.4668	823.91
6+60.00	24.50 LT	736481.6542	1336406.6967	822.11
6+80.00	24.50 LT	736464.9320	1336416.4528	820.31
7+00.00	24.50 LT	736448.5221	1336426.7254	818.54
7+20.00	24.50 LT	736431.9405	1336437.6271	816.69
7+40.00	24.50 LT	736415.2388	1336448.6293	814.93
7+60.00	24.50 LT	736398.5370	1336459.6316	813.12
7+80.00	24.50 LT	736382.2010	1336470.5596	811.34
8+00.00	24.50 LT	736366.1371	1336481.7716	809.54
8+20.00	24.50 LT	736350.3007	1336493.3026	807.75
8+40.00	24.50 LT	736334.6981	1336505.1479	805.91

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SOLID SODDING

DITCH SCHEDULE (CHANNEL 4)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
5+60.00	24.50 RT	736555.0557	1336327.5590	829.12
5+80.00	24.50 RT	736535.8308	1336335.0652	828.39
6+00.00	24.50 RT	736516.8492	1336343.1671	827.26
6+20.00	24.50 RT	736498.1294	1336351.8568	825.71
6+40.00	24.50 RT	736479.6897	1336361.1259	823.91
6+60.00	24.50 RT	736461.5478	1336370.9653	822.11
6+80.00	24.50 RT	736443.7215	1336381.3656	820.30
7+00.00	24.50 RT	736426.2281	1336392.3164	818.50
7+20.00	24.50 RT	736409.3858	1336403.3884	816.69
7+40.00	24.50 RT	736392.6841	1336414.3907	814.93
7+60.00	24.50 RT	736375.9823	1336425.3930	813.26
7+80.00	24.50 RT	736358.8947	1336436.4459	811.31
8+00.00	24+50 RT	736341.9379	1336447.8287	809.55
8+20.00	24+50 RT	736325.2080	1336459.5552	807.72
8+40.00	24+50 RT	736308.7121	1336471.6210	805.50
8+60.00	24+50 RT	736292.4573	1336484.0215	802.11
8+80.00	24+50 RT	736276.4504	1336496.7518	799.98
9+00.00	24+50 RT	736260.6446	1336509.7014	797.84
9+20.00	24+50 RT	736244.6448	1336521.7861	795.80
9+40.00	24+50 RT	736227.8685	1336532.9822	793.77
9+60.00	24+50 RT	736210.0337	1336542.9667	790.89

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SOLID SODDING

DITCH SCHEDULE (CHANNEL 5)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
12+20.00	24.50 LT	736017.1262	1336719.5031	788.72
12+40.00	24.50 LT	735997.9054	1336725.0313	789.35
12+60.00	24.50 LT	735978.6846	1336730.5596	789.98
12+80.00	24.50 LT	735960.1083	1336736.0618	790.61
13+00.00	24.50 LT	735942.3545	1336742.3243	791.24
13+20.00	24.50 LT	735924.9873	1336749.5906	791.84
13+40.00	24.50 LT	735908.0634	1336757.8369	792.28
13+60.00	24.50 LT	735891.6381	1336767.0363	792.59
13+80.00	24.50 LT	735875.7651	1336777.1588	792.75

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SEED AND MULCH

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 Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT, 5120 WILLET BRIDGE ROAD, BETHESDA MD 20816
CONSULTING ENGINEERS
TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

NO.	DESCRIPTION	NAME	DATE

REVISIONS

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

DS-04 DRAINAGE SCHEDULE – DITCHES

PROGRAM MANAGER
DATE 05-05-2025
FILE S-20-0030
SHEET 50 OF 96

DITCH SCHEDULE (CHANNEL 6)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
14+00.00	24.50 LT	735859.5969	1336788.4299	792.78
14+20.00	24.50 LT	735843.2095	1336799.8952	792.65
14+40.00	24.50 LT	735826.8221	1336811.3604	792.39
14+60.00	24.50 LT	735810.4346	1336822.8257	791.98
14+80.00	24.50 LT	735794.0472	1336834.2909	791.42
15+00.00	24.50 LT	735777.6597	1336845.7561	790.72
15+20.00	24.50 LT	735761.2723	1336857.2214	789.88
15+40.00	24+50 LT	735744.8848	1336868.6866	788.89
15+60.00	24.50 LT	735725.1089	1336881.0339	787.77

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SEED AND MULCH

DITCH SCHEDULE (CHANEL 7)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
16+00.00	24.50 LT	735675.3649	1336889.8395	785.20
16+20.00	24.50 LT	735650.5573	1336883.9646	783.90

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SOLID SODDING

DITCH SCHEDULE (CHANNEL 8)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
16+60.00	24.50 LT	735610.0458	1336853.7848	782.00
16+80.00	24.50 LT	735597.9710	1336835.6941	781.30
17+00.00	24.50 LT	735587.1365	1336818.8830	780.00
17+20.00	24.50 LT	735576.3019	1336802.0719	778.70
17+40.00	24.50 LT	735565.4674	1336785.2608	777.39
17+60.00	24.50 LT	735554.6329	1336768.4497	776.09
17+80.00	24.50 LT	735543.7984	1336751.6386	774.81
18+00.00	24.50 LT	735532.9638	1336734.8275	773.50
18+20.00	24.50 LT	735522.1293	1336718.0164	772.20
18+40.00	24.50 LT	735511.2948	1336701.2053	770.90
18+60.00	24.50 LT	735500.4603	1336684.3942	769.60
18+80.00	24.50 LT	735489.6257	1336667.5831	768.30
19+00.00	24.50 LT	735478.7912	1336650.7720	767.00
19+20.00	24.50 LT	735467.9567	1336633.9609	765.70
19+40.00	24.50 LT	735457.1222	1336617.1498	764.40
19+60.00	24.50 LT	735446.2876	1336600.3387	763.11
19+80.00	24.50 LT	735435.4531	1336583.5276	761.83
20+00.00	24.50 LT	735424.6186	1336566.7165	760.62
20+20.00	24.50 LT	735413.7841	1336549.9054	759.44
20+40.00	24.50 LT	735402.9495	1336533.0943	758.31
20+60.00	24.50 LT	735392.1150	1336516.2832	757.24
20+80.00	24.50 LT	735381.2805	1336499.4721	756.20
21+00.00	24.50 LT	735370.4286	1336482.6722	755.21
21+20.00	24.50 LT	735359.5684	1336465.8777	754.26
21+40.00	24.50 LT	735348.7081	1336449.0832	753.38
21+60.00	24.85 LT	735332.8669	1336435.5022	752.52
21+80.00	38.20 LT	735309.1293	1336427.0156	751.16
22+00.00	56.46 LT	735283.4896	1336419.7562	749.50
22+07.90	67.04 LT	735272.6750	1336417.3360	748.36
22+20.00	78.95 LT	735256.0990	1336413.6264	747.82
22+40.00	99.22 LT	735228.2277	1336407.8067	747.66
22+60.00	123.05 LT	735197.3562	1336403.9227	747.30
22+80.00	146.89 LT	735166.4846	1336400.0386	747.00

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SYNTHETIC FIBER MATTING

DITCH SCHEDULE (CHANNEL 9)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
23+00.00	170.94 LT	735135.4369	1336396.2683	747.15
23+20.00	203.42 LT	735097.3013	1336397.0707	747.40
23+40.00	228.06 LT	735065.7475	1336393.6268	747.61
23+60.00	252.71 LT	735034.1937	1336390.1830	747.89
23+80.00	277.36 LT	735002.6399	1336386.7391	749.68

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SOLID SODDING

DITCH SCHEDULE (CHANNEL 10)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
24+40.00	24.50 RT	735220.5250	1336174.7653	744.06
24+60.00	24.50 RT	735209.6856	1336157.9573	743.57
24+80.00	24.50 RT	735198.8463	1336141.1493	743.09
25+00.00	24.50 RT	735188.0069	1336124.3413	742.61
25+20.00	24.50 RT	735177.1676	1336107.5333	742.13
25+40.00	24.50 RT	735166.3283	1336090.7253	741.65
25+60.00	24.50 RT	735155.4889	1336073.9173	741.17
25+80.00	24.50 RT	735144.6496	1336057.1093	740.70
26+00.00	24.50 RT	735133.8102	1336040.3013	740.21
26+20.00	24.50 RT	735122.9600	1336023.5004	739.78
26+40.00	24.50 RT	735112.0994	1336006.7061	739.42
26+60.00	24.50 RT	735101.2388	1335989.9118	739.13
26+80.00	24.50 RT	735083.5941	1335968.5780	738.90
27+00.00	24.50 RT	735050.0743	1335960.3213	738.73

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SEED AND MULCH

DITCH SCHEDULE (CHANNEL 11)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
20+80.00	24.50 RT	735415.6331	1336477.3092	755.21
21+00.00	24.50 RT	735404.7937	1336460.5012	754.27
21+20.00	24.50 RT	735393.9544	1336443.6932	753.37
21+40.00	24.50 RT	735383.1151	1336426.8852	752.53
21+60.00	24.50 RT	735372.2757	1336410.0772	751.73
21+80.00	24.50 RT	735361.4364	1336393.2692	750.96
22+00.00	24.50 RT	735350.5970	1336376.4612	750.27
22+20.00	24.50 RT	735339.7577	1336359.6532	749.61
22+40.00	24.50 RT	735328.9184	1336342.8452	748.97
22+60.00	24.50 RT	735318.0790	1336326.0372	748.42
22+80.00	24.50 RT	735307.2397	1336309.2293	747.89
23+00.00	24.50 RT	735296.4003	1336292.4213	747.41
23+20.00	24.50 RT	735285.5610	1336275.6133	746.93
23+40.00	24.50 RT	735274.7217	1336258.8053	746.45
23+60.00	24.50 RT	735263.8823	1336241.9973	745.97
23+80.00	24.50 RT	735253.0430	1336225.1893	745.49
24+00.00	24.50 RT	735242.2036	1336208.3813	745.01
24+20.00	24.50 RT	735231.3643	1336191.5733	744.53

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SEED AND MULCH

File No - S-20-0030

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 Number: 48396
Expiration Date: 01-15-2026

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STATE OF MARYLAND — MEZMUR BEYENE — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

DS–05 DRAINAGE SCHEDULE – DITCHES

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 51 OF 96

DITCH SCHEDULE (CHANNEL 12)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
15+60.00	24.50 RT	735707.3850	1336844.0627	787.77
15+80.00	24.50 RT	735693.6923	1336848.4658	786.50
16+00.00	24.50 RT	735679.3202	1336849.0308	785.20
16+20.00	24.50 RT	735665.3242	1336845.7163	783.90
16+40.00	24.50 RT	735652.7319	1336838.7656	782.60
16+60.00	24.50 RT	735642.4682	1336828.6893	781.29
16+80.00	24.50 RT	735632.4232	1336813.4670	780.01
17+00.00	24.50 RT	735621.5887	1336796.6559	778.70
17+20.00	24.50 RT	735610.7541	1336779.8448	777.40
17+40.00	24.50 RT	735599.9196	1336763.0337	776.10
17+60.00	24.50 RT	735589.0851	1336746.2226	774.81
17+80.00	24.50 RT	735578.2505	1336729.4115	773.51
18+00.00	24.50 RT	735567.4160	1336712.6004	772.19
18+20.00	24.50 RT	735556.5815	1336695.7893	770.91
18+40.00	24.50 RT	735545.7470	1336678.9782	769.61
18+60.00	24.50 RT	735534.9124	1336662.1671	768.29

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SOLID SODDING

DITCH SCHEDULE (CHANNEL 13)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
11+20.00	51.72 LT	736129.3082	1336710.3081	786.70
11+40.00	50.94 LT	736108.4547	1336719.8744	786.60
11+60.00	50.60 LT	736087.2945	1336728.6307	786.50

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SEED AND MULCH

DITCH SCHEDULE (CHANNEL 14)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
10+20.00	57.04 LT	736223.0101	1336649.0116	787.00
10+40.00	57.34 LT	736208.1435	1336662.3934	786.90
10+60.00	54.31 LT	736188.5025	1336674.7522	786.80
10+80.00	52.61 LT	736168.9386	1336687.0624	786.70
11+00.00	52.22 LT	736149.4758	1336699.3090	786.60

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SOLID SODDING

DITCH SCHEDULE (CHANNEL 15)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
0+40.00	62.62 RT	736907.9419	1335966.6626	786.68
0+50.00	124.08 RT	736865.0227	1335921.5512	787.79
0+60.00	185.95 RT	736821.8676	1335876.0944	789.54
0+70.00	25.23 RT	736904.2519	1336014.4528	793.83
0+80.00	24.50 RT	736896.3942	1336020.7084	795.50

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SOLID SODDING

DITCH SCHEDULE (CHANNEL 16)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
26+56.77	171.33 LT	734941.6015	1336097.2404	740.00
26+51.37	201.74 LT	734918.0151	1336118.1767	739.00
26+59.65	222.28 LT	734897.2029	1336122.8791	738.22
26+63.16	223.49 LT	734894.1038	1336120.6800	738.12
26+69.26	225.43 LT	734889.3136	1336116.4304	738.00

DITCH BOTTOM WIDTH = 0 ft.
DITCH STABILIZATION = SEED AND MULCH

DITCH SCHEDULE (CHANNEL 17)				
STATION	OFFSET(FT)	NORTHING	EASTING	C/L ELEVATION
0+20.00	24.60 LT	736973.6241	1336027.3727	794.12
0+30.00	24.50 LT	736964.9955	1336032.4697	794.00
0+40.00	24.50 LT	736956.7264	1336038.0932	793.88
0+50.00	24.50 LT	736948.5465	1336043.8034	793.77
0+60.00	24.50 LT	736940.2935	1336049.4941	793.65
0+63.91	24.50 LT	736937.0841	1336051.7208	793.60

DITCH BOTTOM WIDTH = 3 ft.
DITCH STABILIZATION = SEED AND MULCH

File No - S-20-0030

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"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."
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STATE OF MARYLAND · 48396 · PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

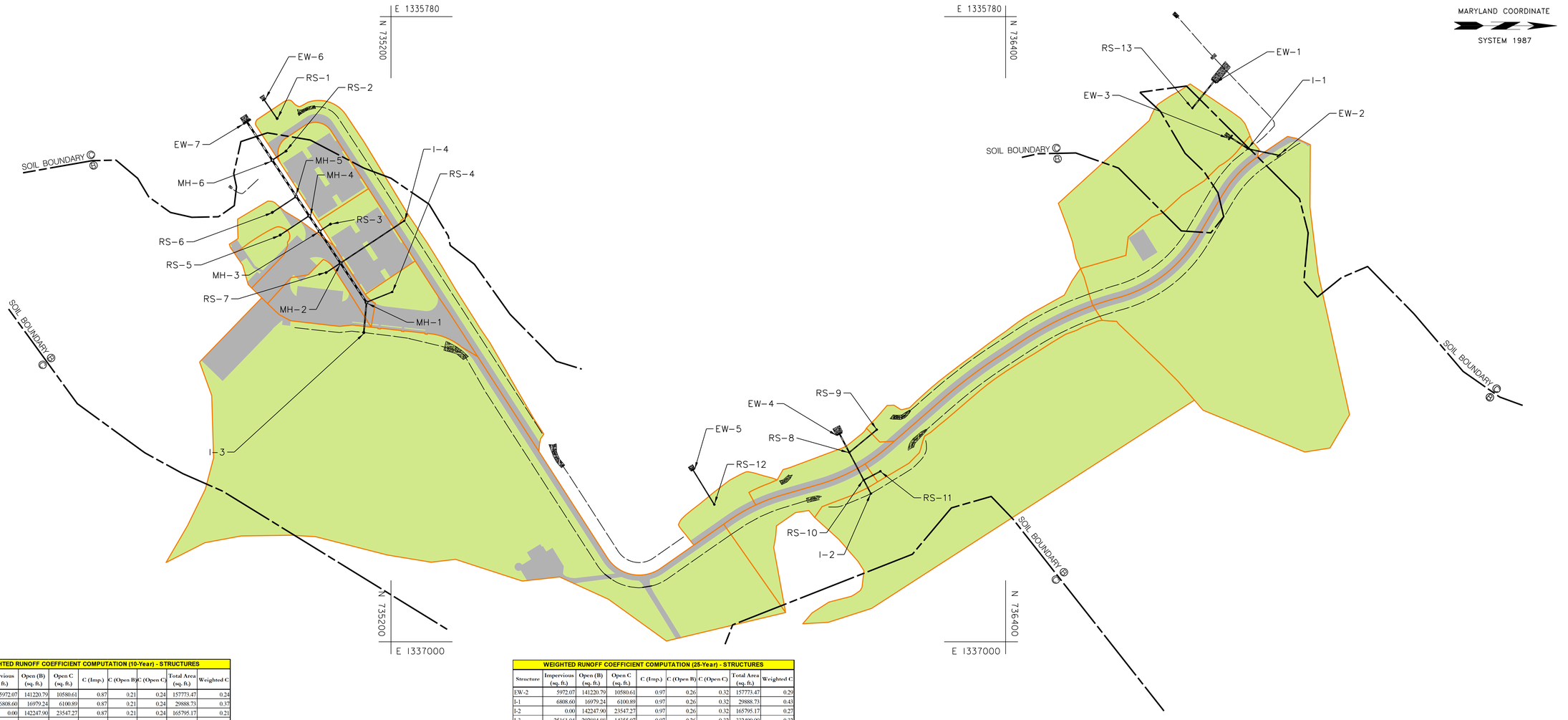
REVISIONS

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

DS–06 DRAINAGE SCHEDULE – DITCHES

PROJECT ENG.:
DESIGNED BY:
CHECKED BY:
DRAWN BY:
PROJECT MGR.:
PROGRAM MANAGER
DATE 04/03/2025
FILE S–20–0030



WEIGHTED RUNOFF COEFFICIENT COMPUTATION (10-Year) - STRUCTURES

Structure	Impervious (sq. ft.)	Open (B) (sq. ft.)	Open C (sq. ft.)	C (Imp.)	C (Open B)	C (Open C)	Total Area (sq. ft.)	Weighted C
EW-2	5972.07	141220.79	10580.61	0.87	0.21	0.24	157773.47	0.24
I-1	6808.60	16979.24	6100.89	0.87	0.21	0.24	29888.73	0.37
I-2	0.00	142247.90	23547.27	0.87	0.21	0.24	165795.17	0.21
I-3	25161.04	292884.88	14355.07	0.87	0.21	0.24	332400.99	0.26
I-4	5847.02	11203.17	0.00	0.87	0.21	0.24	17050.19	0.44
RS-1	4973.77	3322.15	9770.25	0.87	0.21	0.24	18066.17	0.41
RS-2	13572.34	3873.75	1992.21	0.87	0.21	0.24	19438.30	0.67
RS-3	13566.70	6242.83	0.00	0.87	0.21	0.24	19809.53	0.66
RS-4	8411.19	8170.39	0.00	0.87	0.21	0.24	16581.58	0.54
RS-5	1617.39	5047.93	0.00	0.87	0.21	0.24	6665.32	0.37
RS-6	13373.95	6319.99	0.00	0.87	0.21	0.24	19693.94	0.66
RS-7	10936.84	3840.70	0.00	0.87	0.21	0.24	14777.54	0.70
RS-8	3223.55	9173.71	0.00	0.87	0.21	0.24	12397.26	0.38
RS-9	5296.33	14012.40	0.00	0.87	0.21	0.24	19308.73	0.39
RS-10	3321.31	16594.99	52.50	0.87	0.21	0.24	19968.80	0.32
RS-11	5988.22	13609.51	0.00	0.87	0.21	0.24	19597.73	0.41
RS-12	1594.25	8963.51	0.00	0.87	0.21	0.24	10557.76	0.31
RS-13	0.00	38180.79	22002.93	0.87	0.21	0.24	60183.72	0.22

WEIGHTED RUNOFF COEFFICIENT COMPUTATION (25-Year) - STRUCTURES

Structure	Impervious (sq. ft.)	Open (B) (sq. ft.)	Open C (sq. ft.)	C (Imp.)	C (Open B)	C (Open C)	Total Area (sq. ft.)	Weighted C
EW-2	5972.07	141220.79	10580.61	0.97	0.26	0.32	157773.47	0.29
I-1	6808.60	16979.24	6100.89	0.97	0.26	0.32	29888.73	0.43
I-2	0.00	142247.90	23547.27	0.97	0.26	0.32	165795.17	0.27
I-3	25161.04	292884.88	14355.07	0.97	0.26	0.32	332400.99	0.32
I-4	5847.02	11203.17	0.00	0.97	0.26	0.32	17050.19	0.50
RS-1	4973.77	3322.15	9770.25	0.97	0.26	0.32	18066.17	0.49
RS-2	13572.34	3873.75	1992.21	0.97	0.26	0.32	19438.30	0.76
RS-3	13566.70	6242.83	0.00	0.97	0.26	0.32	19809.53	0.75
RS-4	8411.19	8170.39	0.00	0.97	0.26	0.32	16581.58	0.62
RS-5	1617.39	5047.93	0.00	0.97	0.26	0.32	6665.32	0.43
RS-6	13373.95	6319.99	0.00	0.97	0.26	0.32	19693.94	0.74
RS-7	10936.84	3840.70	0.00	0.97	0.26	0.32	14777.54	0.79
RS-8	3223.55	9173.71	0.00	0.97	0.26	0.32	12397.26	0.44
RS-9	5296.33	14012.40	0.00	0.97	0.26	0.32	19308.73	0.45
RS-10	3321.31	16594.99	52.50	0.97	0.26	0.32	19968.80	0.38
RS-11	5988.22	13609.51	0.00	0.97	0.26	0.32	19597.73	0.48
RS-12	1594.25	8963.51	0.00	0.97	0.26	0.32	10557.76	0.37
RS-13	0.00	38180.79	22002.93	0.97	0.26	0.32	60183.72	0.28

STORM FREQUENCIES LESS THAN 25 YEARS

	Soil B (6%+)	Soil C (6%+)
Impervious	0.87	0.87
Open Space	0.21	0.24

Weighted C = [Impervious * C (Imp.) + Open (B) * C (Open B) + Open C * C (Open C)] / Total Area

STORM FREQUENCIES 25 YEARS OR GREATER

	Soil B (6%+)	Soil C (6%+)
Impervious	0.97	0.97
Open Space	0.26	0.32

Weighted C = [Impervious * C (Imp.) + Open (B) * C (Open B) + Open C * C (Open C)] / Total Area

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."
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Expiration Date: 01-15-2026

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STATE OF MARYLAND — MELANIE A. BEVERLY — 48396 — REGISTERED PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

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

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

DA FOR RATIONAL METHOD (STRUCTURES)

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 53 OF 96



WEIGHTED RUNOFF COEFFICIENT COMPUTATION (10-Year) - CHANNELS

CHANNE	Impervious	Open (B)	Open (C)	C (Imp.)	C (Open B)	C (Open C)	Total Area	Weighted C
CH-1	5,059.27	139,361.34	3,646.49	0.87	0.21	0.24	148067.10	0.23
CH-2	6,870.74	16,979.24	6,125.66	0.87	0.21	0.24	29975.64	0.37
CH-3	4,608.70	9,327.97	0.00	0.87	0.21	0.24	13936.67	0.43
CH-4	4,629.94	10,656.18	0.00	0.87	0.21	0.24	15286.12	0.41
CH-5	1,860.82	11,982.56	52.50	0.87	0.21	0.24	13895.88	0.30
CH-6	1,957.08	19,921.64	171.09	0.87	0.21	0.24	22049.81	0.27
CH-7	1,347.39	7,319.54	121.06	0.87	0.21	0.24	8786.75	0.31
CH-8	11,751.85	167,356.39	533.20	0.87	0.21	0.24	179300.22	0.25
CH-9	10,104.72	98,287.31	13,529.72	0.87	0.21	0.24	121545.48	0.27
CH-10	3,598.94	2,975.52	5,746.38	0.87	0.21	0.24	12324.07	0.42
CH-11	5,846.92	11,203.17	0.00	0.87	0.21	0.24	17050.09	0.44
CH-12	4,518.66	8,889.80	0.00	0.87	0.21	0.24	13408.46	0.43
CH-13	0.00	15,569.63	10,735.29	0.87	0.21	0.24	26304.92	0.22
CH-14	0.00	126,678.27	12,811.98	0.87	0.21	0.24	139490.25	0.21
CH-15	9,053.04	37,853.05	84,805.29	0.87	0.21	0.24	131711.38	0.27
CH-16	284.42	3,626.94	188.27	0.87	0.21	0.24	4099.63	0.26
CH-17	912.80	1,859.45	6,934.12	0.87	0.21	0.24	9707.66	0.29

STORM FREQUENCIES LESS THAN 25 YEARS

	Soil B (6%+)	Soil C (6%+)
Impervious	0.87	0.87
Open Space	0.21	0.24

Weighted C = [Impervious * C (Imp.) + Open (B) * C (Open B) + Open C * C (Open C)] / Total Area

Weighted C = [Impervious * C (Imp.) + Open (B) * C (Open B) + Open C * C (Open C)] / Total Area

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

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

DA FOR RATIONAL METHOD
(CHANNELS)

PROFESSIONAL CERTIFICATION
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NO.	DESCRIPTION	NAME	DATE

REVISIONS

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030



File No - S-20-0030

LEGEND

- SOIL BOUNDARY
- SOIL TYPE
- IMPERVIOUS
- OPEN SPACE (GRASS)
- SWM BORING LOCATIONS

PROFESSIONAL CERTIFICATION
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NO.	DESCRIPTION	NAME	DATE

REVISIONS

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

DRAINAGE AREA FOR STRUCTURES WITH CONTOURS

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 55 OF 96


MARYLAND COORDINATE SYSTEM 1987
E 1335700
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E 1335700
N 736400
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SWM-48
SWM-49
SWM-50

STANDARD AND SPECIFICATION FOR LAND GRADING

DESIGN CRITERIA

THE GRADING PLAN SHOULD BE BASED ON THE INCORPORATION OF BUILDING DESIGNS AND STREET LAYOUTS THAT FIT AND UTILIZE EXISTING TOPOGRAPHY AND DESIRABLE NATURAL SURROUNDINGS TO AVOID EXTREME GRADE MODIFICATIONS.INFORMATION SUBMITTED MUST PROVIDE SUFFICIENT TOPOGRAPHIC SURVEYS AND SOIL INVESTIGATIONS TO DETERMINE LIMITATIONS THAT MUST BE IMPOSED ON THE GRADING OPERATION RELATED TO SLOPE STABILITY, ADJACENT PROPERTIES, DRAINAGE PATTERNS, MEASURES FOR WATER REMOVAL, AND VEGETATIVE TREATMENT, ETC.

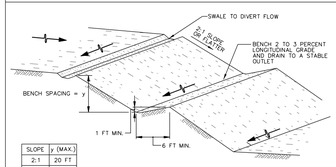
MANY JURISDICTIONS HAVE REGULATIONS AND DESIGN PROCEDURES ALREADY ESTABLISHED FOR LAND GRADING THAT MUST BE FOLLOWED. THE PLAN MUST SHOW EXISTING AND PROPOSED CONTOURS FOR THE AREA(S) TO BE GRADED INCLUDING PRACTICES FOR EROSION CONTROL, SLOPE STABILIZATION, AND SAFE CONVEYANCE OF RUNOFF (E.G., WATERWAYS, LINED CHANNELS, REVERSE BENCHES, GRADE STABILIZATION STRUCTURES). THE GRADING/CONSTRUCTION PLANS ARE TO INCLUDE THE PHASING OF THESE PRACTICES AND CONSIDERATION OF THE FOLLOWING:

1. PROVISIONS TO SAFELY CONVEY SURFACE RUNOFF TO STORM DRAINS, PROTECTED OUTLETS OR STABLE WATER COURSES TO ENSURE THAT SURFACE RUNOFF WILL NOT DAMAGE SLOPES OR OTHER GRADED AREAS;
2. CUT AND FILL SLOPES STABILIZED WITH GRASSES NO STEEPER THAN 2:1, WHERE THE SLOPE IS TO BE MOWED, THE SLOPE SHOULD BE NO STEEPER THAN 3:1, BUT 4:1 IS PREFERRED BECAUSE OF SAFETY FACTORS RELATED TO MOWING.
STEEP SLOPES:) SLOPES STEEPER THAN 2:1, REQUIRE SPECIAL DESIGN AND STABILIZATION CONSIDERATIONS TO BE SHOWN ON THE PLANS.
3. BENCHING PER DETAIL B-3-1 WHENEVER THE VERTICAL INTERVAL (HEIGHT) OF ANY 2:1 SLOPE EXCEEDS 20 FEET; FOR 3:1 SLOPES WHEN IT EXCEEDS 30 FEET; AND FOR 4:1 SLOPES, WHEN IT EXCEEDS 40 FEET, LOCATE BENCHES TO DIVIDE THE SLOPE FACE AS EQUALLY AS POSSIBLE AND TO CONVEY THE WATER TO A STABLE OUTLET. SOILS, SEEPS, ROCK OUTCROPS, ETC., ARE TO BE TAKEN INTO CONSIDERATION WHEN DESIGNING BENCHES.
A. PROVIDE BENCHES WITH A MINIMUM WIDTH OF SIX FEET FOR EASE OF MAINTENANCE.
B. DESIGN BENCHES WITH A REVERSE SLOPE OF 6:1, OR FLATTER TO THE TOE OF THE UPPER SLOPE AND WITH A MINIMUM OF ONE FOOT IN DEPTH. GRADE THE LONGITUDINAL SLOPE OF THE BENCH BETWEEN 2 PERCENT AND 3 PERCENT, UNLESS ACCOMPANIED BY APPROPRIATE DESIGN AND COMPUTATIONS.
C. THE MAXIMUM ALLOWABLE FLOW LENGTH WITHIN A BENCH IS 800 FEET UNLESS ACCOMPANIED BY APPROPRIATE DESIGN AND COMPUTATIONS.
4. DIVERSION OF SURFACE WATER FROM THE FACE OF ALL CUT AND FILL SLOPES USING EARTH DIKES OR SWALES. CONVEY SURFACE WATER DOWN SLOPE USING A DESIGNED STRUCTURE, AND:
A. PROTECT THE FACE OF ALL GRADED SLOPES FROM SURFACE RUNOFF UNTIL THEY ARE STABILIZED,
B. DO NOT SUBJECT THE SLOPE'S FACE TO ANY CONCENTRATED FLOW OF SURFACE WATER SUCH AS FROM NATURAL DRAINAGE WAYS, GRADED SWALES, DOWNSPOUTS, ETC.
C. PROTECT THE FACE OF THE SLOPE BY SPECIAL EROSION CONTROL MATERIALS TO INCLUDE, BUT NOT BE LIMITED TO, APPROVED VEGETATIVE STABILIZATION PRACTICES, RIPRAP OR OTHER APPROVED STABILIZATION METHODS.
5. SERRATED SLOPE AS SHOWN IN DETAIL B-3-2. THE STEEPEST ALLOWABLE SLOPE FOR RIPABLE ROCK IS 1.5:1. FOR NON ROCK SURFACES, THE SLOPES ARE TO BE 2:1 OR FLATTER. THESE STEPS WILL WEATHER AND ACT TO HOLD MOISTURE, LIME, FERTILIZER AND SEED THUS PRODUCING A MUCH QUICKER AND LONGER LIVED VEGETATIVE COVER AND BETTER SLOPE STABILIZATION.
6. SUBSURFACE DRAINAGE PROVISIONS. PROVIDE SUBSURFACE DRAINAGE WHERE NECESSARY TO INTERCEPT SEEPAGE THAT WOULD OTHERWISE ADVERSELY AFFECT SLOPE STABILITY OR CREATE EXCESSIVELY WET SITE CONDITIONS.
7. PROXIMITY TO ADJACENT PROPERTY. SLOPES MUST NOT BE CREATED CLOSE TO PROPERTY LINES WITHOUT ADEQUATE PROTECTION AGAINST SEDIMENTATION, EROSION, SURFACE, SETTLEMENT, SUBSIDENCE, OR OTHER RELATED DAMAGES.
8. QUALITY OF FILL MATERIAL. FILL MATERIAL MUST BE FREE OF BRUSH, RUBBISH, LOGS, STUMPS, BUILDING DEBRIS, AND OTHER OBJECTIONABLE MATERIAL. DO NOT PLACE FROZEN MATERIALS IN THE FILL NOR PLACE THE FILL MATERIAL ON A FROZEN FOUNDATION.
9. STABILIZATION. STABILIZE ALL DISTURBED AREAS STRUCTURALLY OR VEGETATIVELY IN COMPLIANCE WITH SECTION B-4STANDARDS AND SPECIFICATIONS FOR STABILIZATION PRACTICES.

MAINTENANCE

THE LINE, GRADE, AND CROSS SECTION OF BENCHING AND SERRATED SLOPES MUST BE MAINTAINED. BENCHES AND SERRATED SLOPES MUST CONTINUOUSLY MEET THE REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

DETAIL B-3-1 BENCHING

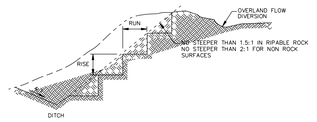


SLOPE	y (MAX.)
2:1	20 FT
3:1	30 FT
4:1	40 FT

CONSTRUCTION SPECIFICATIONS

1. USE FILL MATERIAL FREE OF BRUSH, RUBBISH, ROCKS, LOGS, STUMPS, BUILDING DEBRIS, AND OTHER OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.
2. DO NOT INCORPORATE FROZEN, SOFT, MUCKY, OR HIGHLY COMPRESSIBLE MATERIALS INTO FILL SLOPES OR STRUCTURAL FILLS. DO NOT PLACE FILL ON A FROZEN FOUNDATION.
3. PLACE ALL FILL IN LOOSE LIFTS NOT TO EXCEED 8 INCHES AND THEN COMPACT.
4. COMPACT ALL FILLS AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, OR OTHER RELATED PROBLEMS. COMPACT FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES, CONDUITS, ETC., IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.
5. HANDLE SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION IN ACCORDANCE WITH SECTION H-2 SUBSURFACE DRAINS OR OTHER APPROVED METHODS.
6. MAINTAIN LINE, GRADE, AND CROSS SECTION OF BENCHING. STABILIZE IN ACCORDANCE WITH THE 3/7 DAY STABILIZATION CRITERIA OR AS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN. INSTALLATION OF EROSION CONTROL MATTING MAY BE NECESSARY IN BENCH/SWALE INVERTS. CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
7. KEEP ALL BENCHES FREE OF SEDIMENT DURING ALL PHASES OF DEVELOPMENT.

DETAIL B-3-2 SERRATED SLOPE



TYPICAL SECTION

CONSTRUCTION SPECIFICATIONS

1. DIVERT OVERLAND FLOW FROM THE TOP OF ALL SERRATED CUT SLOPES AND CARRY TO A SUITABLE OUTLET.
2. MAKE SERRATIONS AS THE EXCAVATION PROGRESSES.
3. CONSTRUCT EACH STEP OR SERRATION ON THE CONTOUR. RISE & RUN DIMENSIONS WILL VARY DEPENDING ON FINAL SLOPE RATIO. FOR RIPABLE ROCK SURFACES, MAKE TWO FOOT VERTICAL (RISE) AND THREE FOOT HORIZONTAL (RUN) SERRATIONS AT A SLOPE RATIO NO STEEPER THAN 1.5:1. FOR NON ROCK SURFACES, MAKE TWO FOOT VERTICAL (RISE) AND FOUR FOOT HORIZONTAL (RUNS) SERRATIONS AT A SLOPE RATIO NO STEEPER THAN 2:1.
4. KEEP ALL BENCHES FREE OF SEDIMENT DURING ALL PHASES OF CONSTRUCTION.
5. HANDLE SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION IN ACCORDANCE WITH SECTION H-2 SUBSURFACE DRAINS OR OTHER APPROVED METHODS.
6. MAINTAIN LINE, GRADE, AND CROSS SECTION OF SERRATED SLOPES. TEMPORARILY OR PERMANENTLY STABILIZE UNCOATED, NON ROCK SURFACES IN ACORDANCE WITH THE 3/7 DAY STABILIZATION REQUIREMENTS OR AS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN. CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

B-4 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

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 CHEMICALS CARRIED BY RUNOFF TO RECEIVING WATERS. PLANTS WILL ALSO HELP PROTECT GROUNDWATER SUPPLIES BY ASSIMILIATING 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.

STANDARD AND SPECIFICATION FOR INCREMENTAL STABILIZATION

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):
A. CONSTRUCT AND STABILIZE ALL TEMPORARY SWALES OR DIKES THAT WILL BE USED TO CONVEY RUNOFF AROUND THE EXCAVATION.
B. PERFORM PHASE 1 EXCAVATION, PREPARE SEEDBED, AND STABILIZE.
C. PERFORM PHASE 2 EXCAVATION, PREPARE SEEDBED, AND STABILIZE. OVERSEED PHASE 1 AREAS AS NECESSARY.
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.

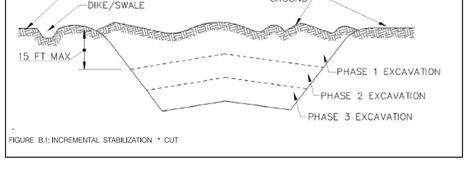


FIGURE B.1: INCREMENTAL STABILIZATION * CUT

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):
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.
B. 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.
C. PLACE PHASE 1 FILL, PREPARE SEEDBED, AND STABILIZE.
D. PLACE PHASE 2 FILL, PREPARE SEEDBED, AND STABILIZE.
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.

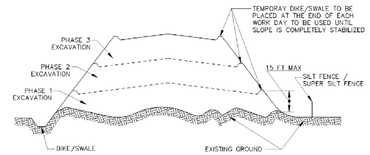


FIGURE B.2: INCREMENTAL STABILIZATION * FILL

STANDARD AND SPECIFICATION FOR SOIL PREPARATION, TOP SOILING, AND SOIL AMENDMENTS

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
A. SEEDBED PREPARATION CONSISTS OF LOOSENING SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT. SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENED, IT MUST NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPES 3:1 OR FLATTER ARE TO BE TRACKED WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
B. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE PLANS.
C. INCOPPORATE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
2. PERMANENT STABILIZATION
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:
I. SOIL PH BETWEEN 6.0 AND 7.0,
II. SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM),
III. 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.
IV. SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT,
V. SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
B. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
C. 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.
D. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
E. 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 THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA–NRCS.
3. TOPSOILING IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
A. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
B. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.
C. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
D. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
4. AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN.
5. TOPSOIL SPECIFICATIONS: SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING CRITERIA:
A. TOPSOIL MUST BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, OR LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. TOPSOIL MUST NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND MUST CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1" INCHES IN DIAMETER.
B. TOPSOIL MUST BE FREE OF NOXIOUS PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, NUT SEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
C. TOPSOIL SUBSTITUTES OR AMENDMENTS AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.
6. TOPSOIL APPLICATION
A. EROSION AND SEDIMENT CONTROL PRACTICES MUST BE MAINTAINED WHEN APPLYING TOPSOIL.
B. UNIFORMLY DISTRIBUTE TOPSOIL IN A 5 TO 8 INCH LAYER AND LIGHTLY COMPACT TO A MINIMUM THICKNESS OF 4 INCHES. SPREADING IS TO BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS MUST BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
C. TOPSOIL MUST NOT BE PLACED IF THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.
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.

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 Number: 48396
Expiration Date: 01-15-2026

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REVISIONS

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

ESC NOTES

PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 57 OF 96

CARROLL COUNTY TEMPORARY SEEDING NOTES

SCOPE

PLANTING SHORT TERM (NO MORE THAN 6 MONTHS) VEGETATION TO TEMPORARILY STABILIZE ANY AREAS WHERE SOIL DISTURBANCE HAS OCCURRED, UNTIL THE AREA CAN BE PERMANENTLY STABILIZED WITH VEGETATIVE OR NON-VEGETATIVE PRACTICES.

STANDARDS

THE FOLLOWING NOTES SHALL CONFORM TO SECTION B-4 OF THE "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" PUBLISHED JOINTLY BY THE MARYLAND DEPARTMENT OF ENVIRONMENT – WATER MANAGEMENT ADMINISTRATION, THE NATIONAL RESOURCE CONSERVATION SERVICE AND THE MARYLAND ASSOCIATION OF SOIL CONSERVATION DISTRICTS.

1. THE SEED BED SHALL BE PREPARED BY LOOSENING THE SOIL TO A DEPTH OF 3 TO 5 INCHES AND INCORPORATING THE LIME AND FERTILIZER INTO THIS LOOSENED LAYER OF SOIL. SEE SECTION B-4-2.
2. FOR TEMPORARY STABILIZATION, FERTILIZER SHALL CONSIST OF A MIXTURE OF 10-20-20 AND BE APPLIED AT A RATE OF 436 LB. PER ACRE (10 LB. PER 1000 SQ.FT.) AND WILL MEET THE REQUIREMENTS IN SECTION B-4-2. LIME SHALL BE APPLIED AT A RATE OF 2 TONS PER ACRE (90 LB. PER SQ.FT.) AND SHALL MEET THE REQUIREMENTS IN SECTION B-4-2 AND B-4-4.
3. SEED TYPE AND APPLICATION SHALL MEET THE REQUIREMENTS IN SECTION B-4-3. SEED TAGS SHALL BE MADE AVAILABLE TO THE INSPECTOR TO VERIFY THE TYPE AND RATE OF SEED USED. MULCH TYPE AND ITS APPLICATION WILL MEET THE REQUIREMENTS IN SECTION B-4-3 A, B AND C AND WILL BE APPLIED ALONG WITH THE SEED OR IMMEDIATELY AFTER SEEDING.
4. SEEDING MIXTURES SHALL BE SELECTED FROM OR WILL BE EQUAL TO THOSE ON TABLE B.1 (PAGE B.20).

CARROLL COUNTY PERMANENT SEEDING NOTES

SCOPE

PLANTING PERMANENT, LONG LIVED VEGETATIVE COVER ON GRADED AND/ OR CLEARED AREAS AND AREAS THAT HAVE BEEN IN TEMPORARY VEGETATION FOR MORE THAN 6 MONTHS.

STANDARDS

THE FOLLOWING NOTES SHALL CONFORM TO SECTION B-4 OF THE "2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" PUBLISHED JOINTLY BY THE MARYLAND DEPARTMENT OF ENVIRONMENT – WATER MANAGEMENT ADMINISTRATION, THE NATIONAL RESOURCE CONSERVATION SERVICE AND THE MARYLAND ASSOCIATION OF SOIL CONSERVATION DISTRICTS.

1. THE SEED BED SHALL BE PREPARED BY LOOSENING THE SOIL TO A DEPTH OF 3 TO 5 INCHES AND INCORPORATING THE LIME AND FERTILIZER INTO THIS LOOSENED LAYER OF SOIL. SEE SECTION B-4-2.
2. FOR SITES OVER 5 ACRES, SOIL TESTS WILL BE PERFORMED. SOIL TEST WILL BE CONDUCTED BY THE UNIVERSITY OF MARYLAND OR A RECOGNIZED COMMERCIAL LABORATORY. MINIMUM SOIL CONDITIONS SHALL MEET THE REQUIREMENTS OF SECTION B-4-2-1-2-A. OTHERWISE SOIL AMENDMENTS OR TOPSOIL WILL NEED TO BE APPLIED. TOPSOILING MAY OCCUR WHEN SOIL CONDITIONS MEET THE MINIMUM REQUIREMENTS AS STATED IN SECTION B-4-2-B. SOIL AMENDMENTS MUST MEET THE REQUIREMENTS AS SET FORTH IN SECTION B-4-2-C AND MUST BE APPLIED AS INDICATED BY THE SOILS TESTS.
3. FOR SITES OF 5 ACRES OR LESS OF DISTURBANCE, THE FOLLOWING FERTILIZER AND LIME RATES SHALL APPLY. FERTILIZER SHALL CONSIST OF A MIXTURE OF 10-20-20 AND BE APPLIED AT THE FOLLOWING RATES:
   A. N=45 LB. PER ACRE (1 LB. PER 1000 SQ.FT.)
   B. P2O5= 90 LB. PER ACRE (2 LB. PER 1000 SQ.FT.)
   C. K2O= 90 LB. PER ACRE (2 LB. PER 1000 SQ.FT.)
   D. LIME SHALL BE APPLIED AT A RATE OF 2 TONS PER ACRE (90 LB. PER 1000 SQ.FT.)
4. SEED TYPE, TURFGRASS OR SOD APPLICATION SHALL MEET THE REQUIREMENTS IN SECTION B-4-5. SEED TAGS SHALL BE MADE AVAILABLE TO THE INSPECTOR TO VERIFY THE TYPE AND APPLICATION RATE OF SEED USED. MULCH TYPE AND ITS APPLICATION WILL MEET THE REQUIREMENTS IN SECTION B-4-3A, B, AND C, AND WILL BE APPLIED ALONG WITH SEED OR IMMEDIATELY AFTER SEEDING.
5. SEEDING MIXTURES SHALL BE SELECTED FROM OR WILL BE EQUAL TO THOSE ON TABLE B-3.

STANDARDS AND SPECIFICATIONS FOR MULCHING

A. MULCH MATERIALS (IN ORDER OF PREFERENCE)
   a. STRAW CONSISTING OF THOROUGHLY THRESHED WHEAT, RYE, OAT, OR BARLEY AND REASONABLY BRIGHT IN COLOR. STRAW IS TO BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW AND NOT MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY. NOTE: USE ONLY STERILE STRAW MULCH IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.
   b. WOOD CELLULOSE FIBER MULCH (WCFM) CONSISTING OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
      i. WCFM IS TO BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.
      ii. WCFM, INCLUDING DYE, MUST CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
      iii. WCFM MATERIALS ARE TO BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL MUST FORM A NON-CAPILLARY-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND MUST COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.
      iv. WCFM MATERIAL MUST NOT CONTAIN ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
      v. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH OF APPROXIMATELY 10 MILLIMETERS, DIAMETER APPROXIMATELY 1 MILLIMETER, PH RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6 PERCENT MAXIMUM AND WATER HOLDING CAPACITY OF 90 PERCENT MINIMUM.

A. APPLICATION
   a. APPLY MULCH TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
   b. WHEN STRAW MULCH IS USED, SPREAD IT OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS PER ACRE TO A UNIFORM LOOSE DEPTH OF 1 TO 2 INCHES. APPLY MULCH TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. WHEN USING A MULCH ANCHORING TOOL, INCREASE THE APPLICATION RATE TO 2.5 TONS PER ACRE.
   c. WOOD CELLULOSE FIBER USED AS MULCH MUST BE APPLIED AT A NET DRY WEIGHT OF 1500 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER TO ATTAIN A MIXTURE WITH A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.

C. ANCHORING
   a. PERFORM MULCH ANCHORING IMMEDIATELY FOLLOWING APPLICATION OF MULCH TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON THE SIZE OF THE AREA AND EROSION HAZARD:
      i. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF 2 INCHES. THIS PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PRACTICE SHOULD FOLLOW THE CONTOUR.
      ii. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. APPLY THE FIBER BINDER AT A NET DRY WEIGHT OF 750 POUNDS PER ACRE. MIX THE WOOD CELLULOSE FIBER WITH WATER AT A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
      iii. SYNTHETIC BINDERS SUCH AS ACRYLIC DLR (AGRO-TACK), DCA-70, PETROSET, TERRA TAX II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED. FOLLOW APPLICATION RATES AS SPECIFIED BY THE MANUFACTURER. APPLICATION OF LIQUID BINDERS NEEDS TO BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. USE OF ASPHALT BINDERS IS STRICTLY PROHIBITED.
      iv. LIGHTWEIGHT PLASTIC NETTING MAY BE STAPLED OVER THE MULCH ACCORDING TO MANUFACTURER RECOMMENDATIONS. NETTING IS USUALLY AVAILABLE IN ROLLS 4 TO 15 FEET WIDE AND 300 TO 3,000 FEET LONG.

STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

PURPOSE

TO USE FAST GROWING VEGETATION THAT PROVIDES COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES

EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR A PERIOD OF 6 MONTHS OR LESS. FOR LONGER DURATION OF TIME, PERMANENT STABILIZATION PRACTICES ARE REQUIRED.

CRITERIA

1. SELECT ONE OR MORE OF THE SPECIES OR SEED MIXTURES LISTED IN TABLE B.1 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3), AND ENTER THEM IN THE TEMPORARY SEEDING SUMMARY BELOW ALONG WITH APPLICATION RATES, SEEDING DATES AND SEEDING DEPTHS. IF THIS SUMMARY IS NOT PUT ON THE PLAN AND COMPLETED, THEN TABLE B.1 PLUS FERTILIZER AND LIME RATES MUST BE PUT ON THE PLAN.
2. FOR SITES HAVING SOIL TESTS PERFORMED, USE AND SHOW THE RECOMMENDED RATES BY THE TESTING AGENCY. SOIL TESTS ARE NOT REQUIRED FOR TEMPORARY SEEDING.
3. WHEN STABILIZATION IS REQUIRED OUTSIDE OF A SEEDING SEASON, APPLY SEED AND MULCH OR STRAW MULCH ALONE AS PRESCRIBED IN SECTION B-4-3.A.1.B AND MAINTAIN UNTIL THE NEXT SEEDING SEASON.

TEMPORARY SEEDING TABLE

HARDINESS ZONE (FROM FIGURE B.3): 6B					FERTILIZER RATE (10-20-20)	LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS		
1	BARLEY	96	2/1-5/31 8/11-10/15	1.0"	436 LB/AC (10LB/1000SF)	2 TONS/AC (90LB/1000SF
2	CEREAL RYE	112	3/1-5/15 8/1-11/15	1.0"		
3	FOXTAIL MILLET	30	5/17-7/31	0.5"		

STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

PURPOSE

TO USE LONG-LIVED PERENNIAL GRASSES AND LEGUMES TO ESTABLISH PERMANENT GROUND COVER ON DISTURBED SOILS.

CONDITIONS WHERE PRACTICE APPLIES

EXPOSED SOILS WHERE GROUND COVER IS NEEDED FOR 6 MONTHS OR MORE.

CRITERIA

1. SEED MIXTURES
   A. GENERAL USE
      a. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED IN TABLE B.3 FOR THE APPROPRIATE PLANT HARDINESS ZONE (FROM FIGURE B.3) AND BASED ON THE SITE CONDITIONS OR PURPOSE FOUND ON TABLE B.2. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
      b. ADDITIONAL PLANTING SPECIFICATIONS FOR EXCEPTIONAL SITES SUCH AS SHORELINES, STREAM BANKS, OR DUNES OR FOR SPECIAL PURPOSES SUCH AS WILDLIFE OR AESTHETIC TREATMENT MAY BE FOUND IN USDA-NRCS TECHNICAL FIELD OFFICE GUIDE, SECTION 342 – CRITICAL AREA PLANTING.
      c. FOR SITES HAVING DISTURBED AREA OVER 5 ACRES, USE AND SHOW THE RATES RECOMMENDED BY THE SOIL TESTING AGENCY.
      d. FOR AREAS RECEIVING LOW MAINTENANCE, APPLY UREA FORM FERTILIZER (46-0-0) AT 3 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.
   B. TURFGRASS MIXTURES
      a. AREAS WHERE TURFGRASS MAY BE DESIRED INCLUDE LAWNS, PARKS, PLAYGROUNDS, AND COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE.
      b. SELECT ONE OR MORE OF THE SPECIES OR MIXTURES LISTED BELOW BASED ON THE SITE CONDITIONS OR PURPOSE. ENTER SELECTED MIXTURE(S), APPLICATION RATES, AND SEEDING DATES IN THE PERMANENT SEEDING SUMMARY. THE SUMMARY IS TO BE PLACED ON THE PLAN.
      i. KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN AREAS THAT RECEIVE INTENSIVE MANAGEMENT. IRRIGATION REQUIRED IN THE AREAS OF CENTRAL MARYLAND AND EASTERN SHORE. RECOMMENDED CERTIFIED KENTUCKY BLUEGRASS CULTIVARS SEEDING RATE: 1.5 TO 2.0 POUNDS PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
      ii. KENTUCKY BLUEGRASS/PERENNIAL RYE: FULL SUN MIXTURE: FOR USE IN FULL SUN AREAS WHERE RAPID ESTABLISHMENT IS NECESSARY AND WHEN TURF WILL RECEIVE MEDIUM TO INTENSIVE MANAGEMENT. CERTIFIED PERENNIAL RYEGRASS CULTIVARS/CERTIFIED KENTUCKY BLUEGRASS SEEDING RATE: 2 POUNDS MIXTURE PER 1000 SQUARE FEET. CHOOSE A MINIMUM OF THREE KENTUCKY BLUEGRASS CULTIVARS WITH EACH RANGING FROM 10 TO 35 PERCENT OF THE TOTAL MIXTURE BY WEIGHT.
      iii. TALL FESCUE/KENTUCKY BLUEGRASS: FULL SUN MIXTURE: FOR USE IN DROUGHT PRONE AREAS AND/OR FOR AREAS RECEIVING LOW TO MEDIUM MANAGEMENT IN FULL SUN TO MEDIUM SHADE. RECOMMENDED MIXTURE INCLUDES: CERTIFIED TALL FESCUE CULTIVARS 95 TO 100 PERCENT, CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 0 TO 5 PERCENT. SEEDING RATE: 5 TO 8 POUNDS PER 1000 SQUARE FEET. ONE OR MORE CULTIVARS MAY BE BLENDED.
      iv. KENTUCKY BLUEGRASS/FINE FESCUE: SHADE MIXTURE: FOR USE IN AREAS WITH SHADE IN BLUEGRASS LAWNS. FOR ESTABLISHMENT IN HIGH QUALITY, INTENSIVELY MANAGED TURF AREA. MIXTURE INCLUDES: CERTIFIED KENTUCKY BLUEGRASS CULTIVARS 30 TO 40 PERCENT AND CERTIFIED FINE FESCUE AND 60 TO 70 PERCENT. SEEDING RATE: 1½ TO 3 POUNDS PER 1000 SQUARE FEET.
      NOTES:
      SELECT TURFGRASS VARIETIES FROM THOSE LISTED IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND" CHOOSE CERTIFIED MATERIAL. CERTIFIED MATERIAL IS THE BEST GUARANTEE OF CULTIVAR PURITY. THE CERTIFICATION PROGRAM OF THE MARYLAND DEPARTMENT OF AGRICULTURE, TURF AND SEED SECTION, PROVIDES A RELIABLE MEANS OF CONSUMER PROTECTION AND ASSURES A PURE GENETIC LINE.
      c. IDEAL TIMES OF SEEDING FOR TURF GRASS MIXTURES
      WESTERN MD: MARCH 15 TO JUNE 1, AUGUST 1 TO OCTOBER 1 (HARDINESS ZONES: 5B, 6A)
      CENTRAL MD: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONE: 6B)
      SOUTHERN MD, EASTERN SHORE: MARCH 1 TO MAY 15, AUGUST 15 TO OCTOBER 15 (HARDINESS ZONES: 7A, 7B)
      d. ILL 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 1½ INCHES IN DIAMETER. THE RESULTING SEEDBED MUST BE IN SUCH CONDITION THAT FUTURE MOWING OF GRASSES WILL POSE NO DIFFICULTY.
      e. IF SOIL MOISTURE IS DEFICIENT, SUPPLY NEW SEEDINGS WITH ADEQUATE WATER FOR PLANT GROWTH (½ TO 1 INCH EVERY 3 TO 4 DAYS DEPENDING ON SOIL TEXTURE) UNTIL THEY ARE FIRMLY ESTABLISHED. THIS IS ESPECIALLY TRUE WHEN SEEDINGS ARE MADE LATE IN THE PLANTING SEASON, IN ABNORMALLY DRY OR HOT SEASONS, OR ON ADVERSE SITES.

PERMANENT SEEDING TABLE

HARDINESS ZONE (FROM FIGURE B.3): 6B					FERTILIZER RATE (10-20-20)			LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS	N	P2O5	K2O	
4	DEERTONGUE CREEPING RED FESCUE VIRGINIA WILD RYE	15 20 5	2/15-5/30 5/16-6/15	0.5"	45LB/AC (1LB/1000SF)	90LB/AC (2LB/1000SF)	90LB/AC (2LB/1000SF)	2 TONS/AC (90LB/1000SF)
6	TALL FESCUE PERENNIAL RYEGRASS WHITE CLOVER	40 25 5	2/15-5/30 5/16-6/15	0.5"				
9	TALL FESCUE KENTUCKY BLUEGRASS	60 40	2/15-5/30 5/16-6/15	0.5"				

2. SOD: TO PROVIDE QUICK COVER ON DISTURBED AREAS (2:1 GRADE OR FLATTER).
   A. GENERAL SPECIFICATIONS
      a. CLASS OF TURFGRASS SOD MUST BE MARYLAND STATE CERTIFIED. SOD LABELS MUST BE MADE AVAILABLE TO THE JOB FOREMAN AND INSPECTOR.
      b. SOD MUST BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF ¾ INCH, PLUS OR MINUS ¼ INCH, AT THE TIME OF CUTTING. MEASUREMENT FOR THICKNESS MUST EXCLUDE TOP GROWTH AND THATCH. BROKEN PADS AND TORN OR UNEVEN ENDS WILL NOT BE ACCEPTABLE.
      c. STANDARD SIZE SECTIONS OF SOD MUST BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE WHEN SUSPENDED VERTICALLY WITH A FIRM GRASP ON THE UPPER 10 PERCENT OF THE SECTION.
      d. SOD MUST NOT BE HARVESTED OR TRANSPLANTED WHEN MOISTURE CONTENT (EXCESSIVELY DRY OR WET) MAY ADVERSELY AFFECT ITS SURVIVAL.
      e. SOD MUST BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD OF 36 HOURS. SOD NOT TRANSPLANTED WITHIN THIS PERIOD MUST BE APPROVED BY AN AGRONOMIST OR SOIL SCIENTIST PRIOR TO ITS INSTALLATION.
   B. SOD INSTALLATION
      a. DURING PERIODS OF EXCESSIVELY HIGH TEMPERATURE OR IN AREAS HAVING DRY SUBSOIL, LIGHTLY IRRIGATE THE SUBSOIL IMMEDIATELY PRIOR TO LAYING THE SOD.
      b. LAY THE FIRST ROW OF SOD IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO IT AND TIGHTLY WEDGED AGAINST EACH OTHER. STAGGER LATERAL JOINTS TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE AIR DRYING OF THE ROOTS.
      c. WHEREVER POSSIBLE, LAY SOD WITH THE LONG EDGES PARALLEL TO THE CONTOUR AND WITH STAGGERING JOINTS. ROLL AND TAMP, PEG OR OTHERWISE SECURE THE SOD TO PREVENT SLIPPAGE ON SLOPES. ENSURE SOLID CONTACT EXISTS BETWEEN SOD ROOTS AND THE UNDERLYING SOIL SURFACE.
      d. WATER THE SOD IMMEDIATELY FOLLOWING ROLLING AND TAMPING UNTIL THE UNDERSIDE OF THE NEW SOD PAD AND SOIL SURFACE BELOW THE SOD ARE THOROUGHLY WET. COMPLETE THE OPERATIONS OF LAYING, TAMPING AND IRRIGATING FOR ANY PIECE OF SOD WITHIN EIGHT HOURS.
   C. SOD MAINTENANCE
      a. IN THE ABSENCE OF ADEQUATE RAINFALL, WATER DAILY DURING THE FIRST WEEK OR AS OFTEN AND SUFFICIENTLY AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF 4 INCHES. WATER SOD DURING THE HEAT OF THE DAY TO PREVENT WILTING.
      b. AFTER THE FIRST WEEK, SOD WATERING IS REQUIRED AS NECESSARY TO MAINTAIN ADEQUATE MOISTURE CONTENT.
      c. DO NOT MOW UNTIL THE SOD IS FIRMLY ROOTED. NO MORE THAN ⅓ OF THE GRASS LEAF MUST BE REMOVED BY THE INITIAL CUTTING OR SUBSEQUENT CUTTINGS. MAINTAIN A GRASS HEIGHT OF AT LEAST 3 INCHES UNLESS OTHERWISE SPECIFIED.

GEOTEXTILE FABRICS

		WOVEN SILT FILM GEOTEXTILE		WOVEN MONOFILAMENT GEOTEXTILE		NONWOVEN GEOTEXTILE	
		MINIMUM AVERAGE ROLL VALUE[1]					
PROPERTY	TEST METHOD	MD	CD	MD	CD	MD	CD
GRAB TENSILE STRENGTH	ASTM D-4632	200 LB	200 LB	370 LB	250 LB	200 LB	200 LB
GRAB TENSILE ELONGATION	ASTM D-4632	15%	10%	15%	15%	50%	50%
TRAPEZOIDAL TEAR STRENGTH	ASTM D-4533	75 LB	75 LB	100 LB	60 LB	80 LB	80 LB
PUNCTURE STRENGTH	ASTM D-6241	450 LB		900 LB		450 LB	
APPARENT OPENING SIZE[2]	ASTM D-4751	U.S. SIEVE 30 (0.59 mm)		U.S. SIEVE 70 (0.21 mm)		U.S. SIEVE 70 (0.21 mm)	
PERMITTIVITY	ASTM D-4491	0.05 SEC^{-1}		0.28 SEC^{-1}		1.1 SEC^{-1}	
ULTRAVIOLET RESISTEANCE RETAINED AT 500 HOURS	ASTM D-4355	70% STRENGTH		70% STRENGTH		70% STRENGTH	

ALL NUMERIC VALUES EXCEPT APPARENT OPENING SIZE (AOS) REPRESENT MINIMUM AVERAGE ROLL VALUES (MARV). MARV IS CALCULATED AS THE TYPICAL MINUS TWO STANDARD DEVIATIONS. MD IS MACHINE DIRECTION; CD IS CROSS DIRECTION.

VALUES FOR AOS REPRESENT THE AVERAGE MAXIMUM OPENING.

GEOTEXTILES MUST BE EVALUATED BY THE NATIONAL TRANSPORTATION PRODUCT EVALUATION PROGRAM (NTPEP) AND CONFORM TO THE VALUES IN TABLE H.1.

THE GEOTEXTILE MUST BE INERT TO COMMONLY ENCOUNTERED CHEMICALS AND HYDROCARBONS AND MUST BE ROT AND MILDEW RESISTANT. THE GEOTEXTILE MUST BE MANUFACTURED FROM FIBERS CONSISTING OF LONG CHAIN SYNTHETIC POLYMERS AND COMPOSED OF A MINIMUM OF 95 PERCENT BY WEIGHT OF POLYOLEFINS OR POLYESTERS, AND FORMED INTO A STABLE NETWORK SO THE FILAMENTS OR YARNS RETAIN THEIR DIMENSIONAL STABILITY RELATIVE TO EACH OTHER, INCLUDING SELVAGES.

WHEN MORE THAN ONE SECTION OF GEOTEXTILE IS NECESSARY, OVERLAP THE SECTIONS BY AT LEAST ONE FOOT. THE GEOTEXTILE MUST BE PULLED TAUT OVER THE APPLIED SURFACE. EQUIPMENT MUST NOT RUN OVER EXPOSED FABRIC. WHEN PLACING RIPRAP ON GEOTEXTILE, DO NOT EXCEED A ONE FOOT DROP HEIGHT.

1. THIS CLASSIFICATION IS TO BE USED ON THE UPSTREAM FACE OF STONE OUTLETS AND CHECK DAMS.
2. THIS CLASSIFICATION IS TO BE USED FOR GABIONS.
3. OPTIMUM GRADATION IS 50 PERCENT OF THE STONE BEING ABOVE AND 50 PERCENT BELOW THE MIDSIZE.

STONE MUST BE COMPOSED OF A WELL GRADED MIXTURE OF STONE SIZED SO THAT FIFTY (50) PERCENT OF THE PIECES BY WEIGHT ARE LARGER THAN THE SIZE DETERMINED BY USING THE CHARTS. A WELL GRADED MIXTURE, AS USED HEREIN, IS DEFINED AS A MIXTURE COMPOSED PRIMARILY OF LARGER STONE SIZES BUT WITH A SUFFICIENT MIXTURE OF OTHER SIZES TO FILL THE SMALLER VOIDS BETWEEN THE STONES. THE DIAMETER OF THE LARGEST STONE IN SUCH A MIXTURE MUST NOT EXCEED THE RESPECTIVE D_{100} SELECTED FROM TABLE H.2. THE D50 REFERS TO THE MEDIAN DIAMETER OF THE STONE. THIS IS THE SIZE FOR WHICH 50 PERCENT, BY WEIGHT, WILL BE SMALLER AND 50 PERCENT WILL BE LARGER.

NOTE: RECYCLED CONCRETE EQUIVALENT MAY BE SUBSTITUTED FOR ALL STONE CLASSIFICATIONS FOR TEMPORARY CONTROL MEASURES ONLY. CONCRETE BROKEN INTO THE SIZES MEETING THE APPROPRIATE CLASSIFICATION, CONTAINING NO STEEL REINFORCEMENT, AND HAVING A MINIMUM DENSITY OF 150 POUNDS PER CUBIC FOOT MAY BE USED AS AN EQUIVALENT.

TABLE H.2: STONE SIZE

TYPE	SIZE RANGE	D_{50}	D_{100}	AASHTO	MIDSIZE, WEIGHT[3]
NUMBER 57[1]	3/8 TO 1-1/2 INCH	1/2 IN	1-1/2 IN	M-43	N/A
NUMBER 1	2 TO 3 INCH	2-1/2 IN	3 IN	M-43	N/A
RIPRAP[2] (CLASS 0)	4 TO 7 INCH	5-1/2 IN	7 IN	N/A	N/A
CLASS I	N/A	9-1/2 IN	15 IN	N/A	40 LB
CLASS II	N/A	16 IN	24 IN	N/A	200 LB
CLASS III	N/A	23 IN	34 IN	N/A	600 LB

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 Number: 48396
Expiration Date: 01-15-2026

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STATE OF MARYLAND — MELANIE A. BEVENI — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

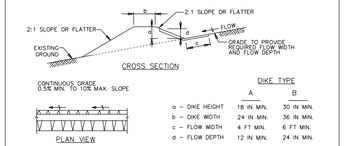
PROJECT ENG.:
DESIGNED BY:
CHECKED BY:
DRAWN BY:
PROJECT MGR.:

ESC NOTES

PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030

DETAIL C-1 EARTH DIKE

STANDARD SYMBOL: A-1 (PLACE SPECIFICATION NO. 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

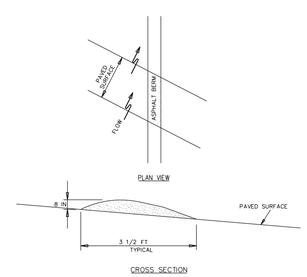
1. REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
2. EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
3. COMPACT 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-5 TEMPORARY ASPHALT BERM

STANDARD SYMBOL: TAB



CONSTRUCTION SPECIFICATIONS

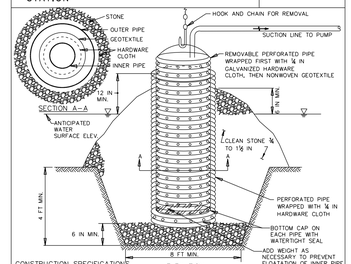
1. CONSTRUCT BERM ON AN UNINTERRUPTED, CONTINUOUS GRADE.
2. INSTALL BERM TO CONFORM TO CROSS SECTION DIMENSIONS OF A UNIFORM HEIGHT OF 8 INCHES MINIMUM AND APPROXIMATE WIDTH OF 3½ FEET.
3. PROVIDE OUTLET PROTECTION AS REQUIRED ON PLAN.
4. COMPACT ASPHALT BERM.
5. REPAIR DAMAGED ASPHALT. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE.
6. UPON REMOVAL OF ASPHALT BERM, RETURN TO ORIGINAL CONDITIONS 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 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.

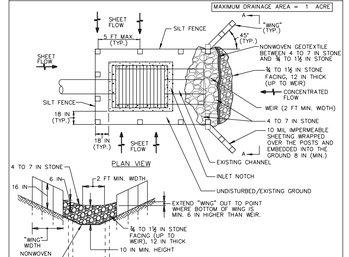
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-9-4 MEDIAN INLET PROTECTION

STANDARD SYMBOL: MIP

MAXIMUM DRAINAGE AREA = 1 ACRE



CONSTRUCTION SPECIFICATIONS

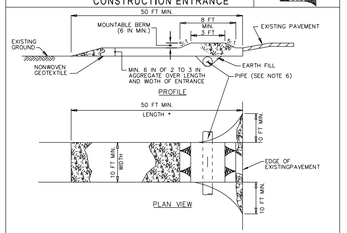
1. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION H–1 MATERIALS.
2. INSTALL SILT FENCE ON ALL SIDES OF INLET RECEIVING SHEET FLOW. FENCE IS TO BE INSTALLED IN ACCORDANCE WITH SILT FENCE DETAIL C–1, EXCEPT POSTS ARE TO BE SPACED A MAXIMUM OF 5 FEET APART.
3. INSTALL STONE STRUCTURE WITH THE WEIR 10 INCHES ABOVE THE INVERT OF THE CHANNEL AND THE WEIR OPENING THE SAME WIDTH AS THE CHANNEL BOTTOM OR 2 FEET MINIMUM. USE CLEAN 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE. PLACE NONWOVEN GEOTEXTILE ON THE UPSTREAM FACE AND COVER WITH A 12 INCH THICK LAYER OF CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE.
4. CONSTRUCT "WINGS" IN ACCORDANCE WITH DIVERSION FENCE DETAIL C–9.
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.

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

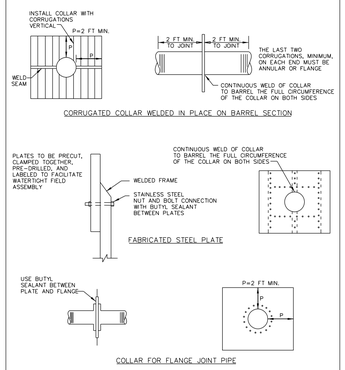
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*30 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING 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	201 1	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL G-2-1 TYPICAL ANTI-SEEP COLLARS

STANDARD SYMBOL:

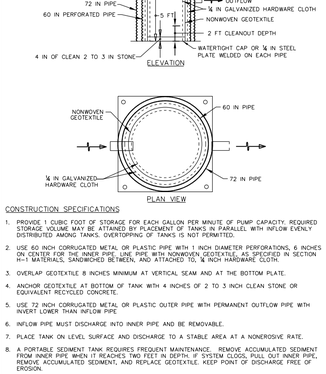


MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL F-3 PORTABLE SEDIMENT TANK

STANDARD SYMBOL: ☒PST



CONSTRUCTION SPECIFICATIONS

1. PROVIDE 1 CUBIC FOOT OF STORAGE FOR EACH GALLON PER MINUTE OF PUMP CAPACITY. REQUIRED STORAGE VOLUME MAY BE ATTAINED BY PLACEMENT OF TANKS IN PARALLEL WITH INFLOW EVENLY DISTRIBUTED AMONG TANKS. OVERTOPPING OF TANKS IS NOT PERMITTED.
2. USE 60 INCH CORRUGATED METAL OR PLASTIC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER FOR THE INNER PIPE. LINE PIPE WITH NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, SANDWICHED BETWEEN, AND ATTACHED TO, ¼ INCH HARDWARE CLOTH.
3. OVERLAP GEOTEXTILE 8 INCHES MINIMUM AT VERTICAL SEAM AND AT THE BOTTOM PLATE.
4. ANCHOR GEOTEXTILE AT BOTTOM OF TANK WITH 4 INCHES OF 2 TO 3 INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE.
5. USE 72 INCH CORRUGATED METAL OR PLASTIC OUTER PIPE WITH PERMANENT OUTFLOW PIPE WITH INVERT LOWER THAN INFLOW PIPE
6. INFLOW PIPE MUST DISCHARGE INTO INNER PIPE AND BE REMOVABLE.
7. PLACE TANK ON LEVEL SURFACE AND DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
8. A PORTABLE SEDIMENT TANK REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT FROM INNER PIPE WHEN IT REACHES TWO FEET IN DEPTH. IF SYSTEM CLOGS, PULL OUT INNER PIPE, REMOVE ACCUMULATED SEDIMENT, AND REPLACE GEOTEXTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

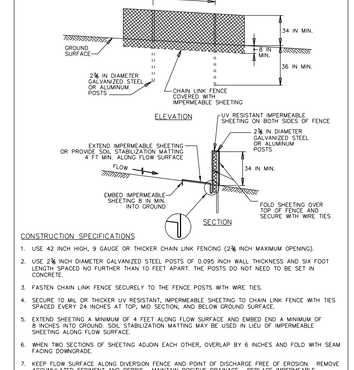
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

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 (2¼ INCH MAXIMUM OPENING).
2. USE 2¾ 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.

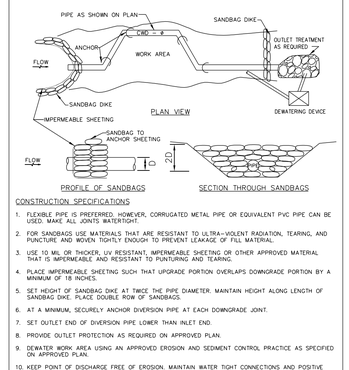
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL 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 PUNTURING 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

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

PROJECT ENG.:_____
DESIGNED BY:_____
CHECKED BY:_____
DRAWN BY:_____
PROJECT MGR.:_____

ESC DETAILS

PROGRAM MANAGER

DATE 05/05/2025

FILE S-20-0030

SHEET 59 OF 96

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 Number: 48396
Expiration Date: 01-15-2026

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STATE OF MARYLAND — 48396 — PROFESSIONAL ENGINEER — 01-15-2026

NO.	DESCRIPTION	NAME	DATE

REVISIONS

SEDIMENT AND EROSION CONTROL NOTES

1. ALL EROSIONSEDIMENT CONTROL MEASURES SHALL COMPLY WITH THE "MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT, WATER MANAGEMENT ADMINISTRATION IN ASSOCIATION WITH THE NATURAL RESOURCES CONSERVATION SERVICE AND THE MARYLAND ASSOCIATION OF SOIL CONSERVATION DISTRICTS (REFERENCED AS THE 2011 STANDARDS AND SPECS).
2. AREAS THAT HAVE BEEN CLEARED AND/OR GRADED, BUT WILL NOT BE CONSTRUCTED ON OR PERMANENTLY VEGETATED FOR MORE THAN 7 DAYS (3 DAYS FOR SEDIMENT CONTROL MEASURES AND FOR STEEP SLOPES) MUST BE STABILIZED WITH MULCH OR TEMPORARY STABILIZATION. ANY AREAS THAT ARE IN TEMPORARY VEGETATION FOR OVER 6 MONTHS WILL NEED TO BE PERMANENTLY VEGETATED.
3. FOR SPECIFICATIONS ON PERMANENT OR TEMPORARY STABILIZATION, SEE B-4-4 AND B-4-5.
4. MULCHING ONLY IS RESTRICTED TO USE ON DISTURBED AREAS AS A TEMPORARY COVER WHERE VEGETATION IS NOT FEASIBLE OR WHERE SEEDING GERMINATION CANNOT BE COMPLETED BECAUSE OF WEATHER CONDITIONS. FOR SPECIFICATIONS SEE B-4-3, A-1.B
5. FOR SPECIFICATIONS ON THE STABILIZATION OF CUT AND FILL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL, SEE INCREMENTAL STABILIZATION B-4-1
6. THE EXISTING TOPSOIL FROM ON OR OFF SITE THAT IS USED MUST MEET THE MINIMUM SPECIFICATION IN B-4-2
7. THE REQUIRED SEQUENCE OF CONSTRUCTION MUST BE FOLLOWED DURING SITE DEVELOPMENT. ANY CHANGES IN THE SEQUENCE OF CONSTRUCTION MUST BE APPROVED BY THE SOIL CONSERVATION DISTRICT.
8. ANY REVISIONS TO THE SEDIMENT CONTROL PLAN, NOT COVERED UNDER THE LIST OF PLAN MODIFICATIONS THAT CAN BE APPROVED BY THE SEDIMENT CONTROL INSPECTOR, NEED TO BE SUBMITTED TO THE SOIL CONSERVATION DISTRICT FOR APPROVAL.
9. NO PROPOSED SLOPE THAT IS REQUIRED TO BE SEEDED AND/OR MULCHED SHALL BE STEEPER THAN 2:1. SLOPES STEEPER THEN 2:1 SHALL REQUIRE A ENGINEERED DESIGN FOR STABILIZATION
10. ALL SEDIMENT CONTROL STRUCTURES WILL BE INSPECTED ONCE A WEEK AND AFTER EACH RAINFALL AND WILL BE REPAIRED, AS NEEDED, SO THAT THE STRUCTURE MEETS THE MINIMUM SPECIFICATIONS AS SHOWN IN THE 2011 STANDARDS AND SPECS.
11. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL SEDIMENT AND EROSION CONTROL MEASURES UNTIL THE DISTURBED AREAS ARE PERMANENTLY STABILIZED.
12. THE DISTRICT APPROVAL FOR THIS SEDIMENT CONTROL PLAN IS GOOD FOR 2 YEARS. AT THE END OF 2 YEARS, IF CONSTRUCTION OF THE PLAN HAS NOT STARTED, THE PLAN WILL NEED TO BE RESUBMITTED TO THE SOIL CONSERVATION DISTRICT FOR REVIEW AND RE-APPROVAL. ANY PLANS THAT ARE CURRENTLY UNDER CONSTRUCTION AFTER 2 YEARS MAY BE REQUIRED TO BE RESUBMITTED TO THE SOIL CONSERVATION DISTRICT BY THE SEDIMENT CONTROL INSPECTOR.
13. WITH APPROVAL FROM THE SEDIMENT CONROL INSPECTOR, ONE OR MORE STEPS IN EACH PHASE MAY BE PERFORMED CONCURRENTLY.

SEQUENCE OF CONSTRUCTION

INITIAL PHASE (PLAN SHEETS pES 61 – pES-64)

1. CONTACT THE CARROLL COUNTY SEDIMENT CONTROL INSPECTOR (1-410-386-2210) 24 HOURS PRIOR TO ANY EARTH DISTURBANCE TO SET UP A PRE-CONSTRUCTION MEETING.
2. NOTIFY MISS UTILITY (1-800-257-7777) AT LEAST 48 HOURS BEFORE ANY EARTH DISTURBANCE.
3. STAKE OUT THE LOD.
4. CLEAR AND GRUB AREAS NEEDED TO INSTALL THE EROSION AND SEDIMENT CONTROLS ONLY.
5. INSTALL THE EROSION AND SEDIMENT CONTROLS SHOWN ON THE INITIAL PHASE ESC PLANS.
6. ONCE THE ESC MEASURES ARE IN PLACE, WITH APPROVAL FROM THE INSPECTOR, CLEAR AND GRUB THE SITE.
7. REMOVE THE SHADES.
8. ONCE CLEARING AND GRUBBING IS COMPLETED, AND THE SHADES ARE REMOVED, WITH APPROVAL FROM THE INSPECTOR, PROCEED TO THE INTERIM PHASE.

INTERIM PHASE (PLAN SHEETS pES 65 – pES-68)

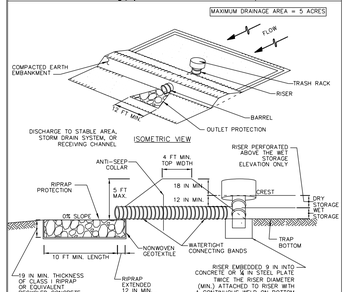
1. WITH APPROVAL FROM THE INSPECTOR, ADJUST THE LOD FOLLOWING THE ACTIVE LOD LINES SHOWN ON THE INTERIM PHASE PLANS.
2. GRADE THE PARKING LOT, THE ROADWAY, AND THE DITCHES, FROM DOWNSTREAM TO UPSTREAM. INSTALL THE PIPES AND INLETS AS SHOWN. CAP THE ENDS OF THE PIPES AND SEAL INLET I-1.
3. INSTALL MIP-68-1 AND SIP 68-1 IMMEDIATELY AFTER INLETS I-3 AND I-4 ARE INSTALLED. BUILD THE ROADWAY AND THE PARKING LOT UP TO AND INCLUDING THE GRADED AGGREGATE BASE (GAB).
4. UPGRADE THE EXISTING BUILDINGS TO THEIR ULTIMATE CONDITION PER THE BUILDING PLANS. ALSO INSTALL THE SEPTIC SYSTEM PER THE SEPTIC PLANS.
5. INSTALL SBD-65-1, PST-65-1, CWD 65-1, AND RRP 65-1, GRADE THE DITCH ALONG BACHMAN VALLEY ROAD.
6. ONCE THE DITCH IS STABILIZED, WITH APPROVAL FROM THE INSPECTOR, REMOVE CBD-65-1.
7. WITH APPROVAL FROM THE INSPECTOR, PROCEED TO FINAL PHASE.

FINAL PHASE (PLAN SHEETS pES 69 – pES-72)

1. WITH APPROVAL FROM THE INSPECTOR, ADJUST THE LOD FOLLOWING THE ACTIVE LOD LINES SHOWN ON THE PLAN. ALSO ADJUST SCE-61-1 AS SHOWN ON THE PLAN.
2. INSTALL SF-69-1, REMOVE TGOS-61-1, AND FILL THE TEMPORARY GRADING TO THE FINAL GRADE. IN THE PROCESS OF REMOVING TGOS-61-1 AND FILLING THE TEMPORARY GRADING, INSTALL THE STORMDRAIN SYSTEM FROM EW-1 TO RS-13, EXCEPT RS-13. CUP THE PIPE, STABILIZE THE FILL, FINALIZE THE DITCH GRADING, INCLUDING INSTALLING RRP-69-1. REMOVAL OF TGOS 61-1, FINALIZING THE DITCH GRADING, INSTALLING THE STORMDRAIN SYSTEM FROM EW-1 TO RS-13 (EXCEPT RS-13), AND INSTALLING RRP-69-1 MUST BE COMPLETED THE SAME DAY.
3. GRADE THE SLOPE TOWARDS THE SGW AND STABILIZE THE GRADED SLOPE. ROUGH GRADE THE FOREBAY AND THE SGW BUT DO NOT INSTALL THE SGW MEDIA. USE PST-69-1 DURING THE ROUGH GRADING OF THE SGW.
4. INSTALL THE STORMDRAIN SYSTEMS FROM EW-3 TOWARDS I-1. REMOVE THE CAP FROM THE DOWNSTREAM END OF THE PIPE AND CONNECT WITH THE NEWLY INSTALLED PIPE.
5. ONCE THE DRAINAGE AREA CONTRIBUTING TO SGW-1 IS PERMANENTLY STABILIZED, GRADE THE FOREBAY TO FINAL GRADE. INSTALL THE WEIR BETWEEN THE FOREBAY AND THE SGW MAIN BODY. INSTALL THE IMPERMEABLE LINER AND THE SGW MEDIA. INSTALL THE ACCESS ROAD TO THE SGW. INSTALL THE FENCE AND GATE. REFER TO PLAN SHEET 42 FOR THE DETAILED SOC FOR CONSTRUCTION OF THE SGW AND THE CORRESPONDING ENGINEER'S INSPECTION CHART.
6. WITH APPROVAL FROM THE INSPECTOR, REMOVE TSOS 61-1, AND FINALIZE THE DITCH GRADING. IMMEDIATELY STABILIZE THE DITCH. IN THE PROCESS OF FINALIZING THE DITCH GRADING, REMOVE THE CAP FROM UPSTREAM END OF THE PIPE AND COMPLTE THE STORMDRAIN INSTALLATION UP TO AND INCLUDING EW-2. REMOVAL OF TSOS 61-1, FINALIZING THE DITCH GRADING, AND COMPLETING THE STORMDRAIN SYSTEM MUST BE PERFORMED THE SAME DAY.
7. WITH APPROVAL FROM THE INSPECTOR, REMOVE ED-61-2, SBD-61-1, AND PST-69-1, IMMEDIATELY STABILIZE ANY DISTURBANCE CAUSED BY REMOVAL OF THE ESC MEASURES. FILL THE EXISTING 18" CMP WITH FLOWABLE BACKFILL.
8. INSTALL SCE-70-1. ADJUST SBD-62-1 AND CWD-62-1 AS SHOWN ON THE FINAL PHASE PLANS. WITH A NOAA 3-DAY DRY WEATHER FORECAST, ROUGH GRADE MBRs 8, 9, 10, 11, 12 AND THE SWALE NORTH OF SCE 70-1. DURING THIS PROCESS, INSTALL THE STORMDRAIN SYSTEMS INCLUDING THE RISER STRUCTURES OF THE MBRs AND I-2. AFTER EACH RISER STRUCTURE AND I-2 ARE IN PLACE, IMMEDIATELY INSTALL THE CORRESPONDING INLET PROTECTIONS.
9. ONCE THE SWALE NORTH OF SCE-70-1 IS STABILIZED, DISCHARGE CWD-70-1 INTO I-2.
10. FINALIZE INSTALLATION OF MBRs 8, 9, 10, 11, AND 12. REFER TO PLAN SHEETS 42 FOR THE DETAILED SOCs FOR EACH MBR AND THE CORRESPONDING ENGINEER'S INSPECTION CHARTS.
11. INSTALL SCE-71-1 AND THE ESC MEAURES AS SHOWN ON PLAN SHEET pES-71.
12. ROUGH GRADE MBRs 1 THROUGH 7, DURING THIS PROCESS, INSTALL THE STORMDRAIN SYSTEMS AND THE RISER STRUCTURES OF THE MBRs. AFTER EACH RISER STRUCTURE IS IN PLACE, IMMEDIATELY INSTALL THE CORRESPONDING INLET PROTECTION.
13. FINE GRADE THE ROADWAY AND PARKING LOT.
14. FINALIZE INSTALLATION OF MBRs 1 THORUHG 7. REFER TO PLAN SHEETS 42 FOR THE DETAILED SOCs FOR EACH MBR AND THE CORRESPONDING ENGINEER'S INSPECTION CHARTS.
15. WITH APPROVAL FROM THE INSPECTOR, REMOVE SEDIMENT TRAP ST-64-1, FILL THE TEMPORARY GRADING AND STABILIZE THE AREA.
16. WITH APPROVAL FROM THE INSPECTOR REMOVE THE REMAINING ESC MEASURES. IMMEDIATELY STABILIZE AREAS DISTURBED DURING THE REMOVAL PROCESS.

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

STANDARD SYMBOL: ST-1



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-1

STANDARD SYMBOL: ST-1

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 DRAIN-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 EMBANKEMENT TO ACCOMODATE 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 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 SEDIMENT AS NECESSARY. WHEN THE TRAP IS REMOVED, BRING THE AREA TO GRADE AND ESTABLISH IT 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.

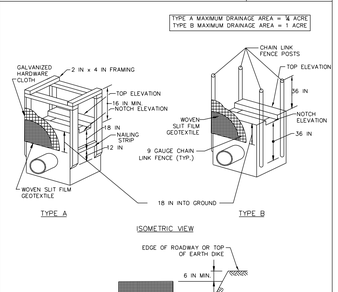
2 OF 3

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 E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SP



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: SP

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 4 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 FROM 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.

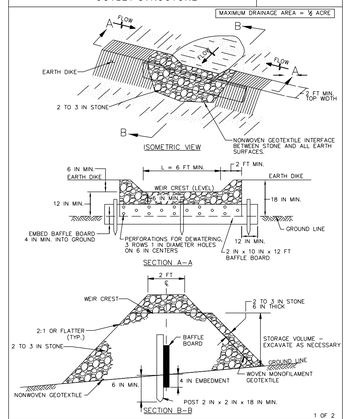
2 OF 2

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-7 TEMPORARY STONE OUTLET STRUCTURE

STANDARD SYMBOL: TSOS



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-7 TEMPORARY STONE OUTLET STRUCTURE

STANDARD SYMBOL: TSOS

CONSTRUCTION SPECIFICATIONS

1. PROVIDE STORAGE VOLUME AS SPECIFIED ON APPROVED PLANS.
2. USE NONWOVEN GEOTEXTILE ON INTERFACE BETWEEN GROUND AND STONE.
3. PERFORATE BAFFLE BOARD WITH 3 ROWS OF 1 INCH DIAMETER HOLES 6 INCHES ON CENTER, EMBED A MINIMUM OF 4 INCHES INTO GROUND, AND EXTEND BAFFEL BOARD MINIMUM OF 12 INCHES INTO EARTH DIKE.
4. USE CLEAN 2 TO 3 INCH STONE OR EQUIVALENT RECYCLED CONCRETE. PLACE WOVEN MONOFILAMENT GEOTEXTILE ON UPSTREAM FACE AND COVER WITH A MINIMUM OF 6 INCHES OF ADDITIONAL STONE.
5. USE NONWOVEN AND WOVEN MONOFILAMENT GEOTEXTILES AS SPECIFIED IN SECTION H-1 MATERIALS.
6. SET WEIR CREST OF STONE 6 INCHES LOWER THAN THE TOP OF EARTH DIKE. USE MINIMUM LENGTH OF 6 FEET FOR WEIR CREST.
7. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO WITHIN 6 INCHES OF WEIR CREST. REPLACE GEOTEXTILE AND STONE FACING WHEN STRUCTURE CEASES TO DRAIN. MAINTAIN LINE, GRADE, AND CROSS SECTION.
8. UPON REMOVAL OF STONE OUTLET STRUCTURE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

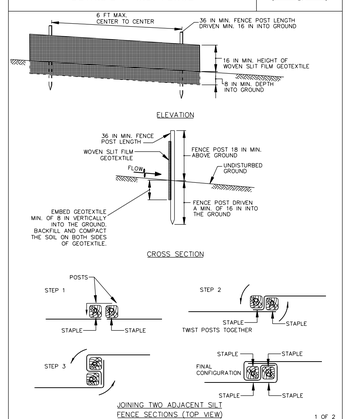
2 OF 2

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



1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

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

DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1⅛ X 1⅛ ± 1/8 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
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

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

ESC SOC AND DETAILS

PROJECT ENG._____
DESIGNED BY:_____
CHECKED BY:_____
DRAWN BY:_____
PROJECT MGR._____

PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030

SHEET 60 OF 96

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 Number: 48396
Expiration Date: 01-15-2026

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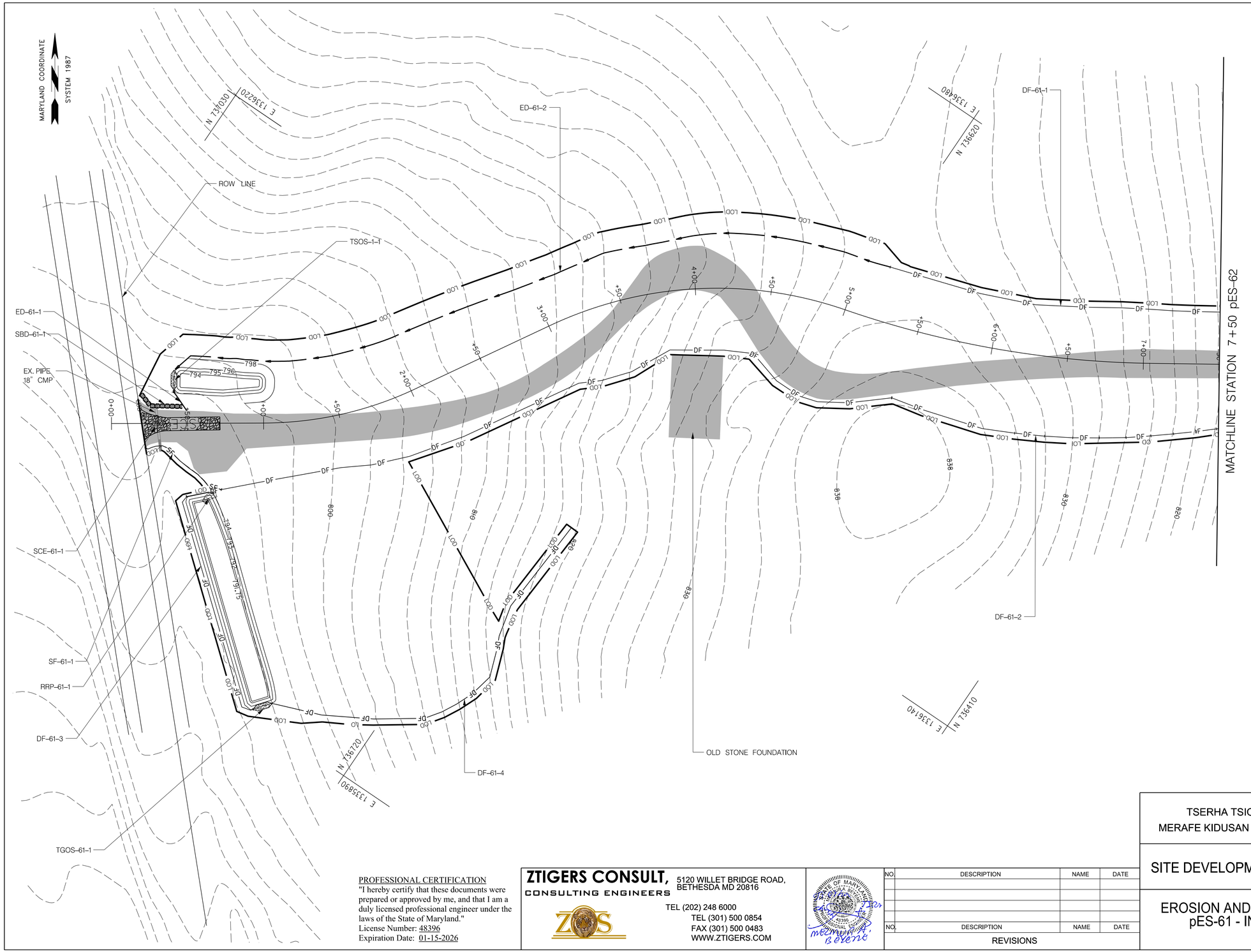
STATE OF MARYLAND — 48396 — PROFESSIONAL ENGINEER — BEYENE

NO.	DESCRIPTION	NAME	DATE

REVISIONS



STABILIZED CONSTRUCTION ENTRANCE			
ITEM	UNIT	QUANTITY	STATION
SCE 61-1	EACH	1	0+08

EARTH DIKE (TYPE A-2)			
ITEM	UNIT	QUANTITY	STATION
ED 61-1	LF	16	0+41 LT. TO 0+50 LT.
ED 61-2	LF	491	0+41 LT. TO 5+20 LT.

DIVERSION FENCE			
ITEM	UNIT	QUANTITY	STATION
DF 61-1	LF	220	5+20 LT. TO 7+50 LT.
DF 61-2	LF	709	0+50 RT. TO 7+50 RT.
DF 61-3	LF	153	0+48 RT. TO 0+91 RT.
DF 61-4	LF	266	1+05 RT. TO 2+60 RT.

TEMPORARY STONE OUTLET STRUCTURE			
ITEM	UNIT	QUANTITY	STATION
TSOS 61-1	EACH	1	0+41 LT.
DRAINAGE AREA		0.49 AC.	
STORAGE REQUIRED		882 CU. FT.	
STORAGE PROVIDED		905.74 CU. FT.	
WEIR CREST ELEV.		795.50	
TOP ELEV.		796.00	

TEMPORARY GABION OUTLET STRUCTURE			
ITEM	UNIT	QUANTITY	STATION
TGOS 61-1	EACH	1	0+98 RT.
DRAINAGE AREA		1.34 AC.	
STORAGE REQUIRED		2412 CU. FT.	
STORAGE PROVIDED		2551.66 CU. FT.	
WEIR CREST ELEV.		793.00	
TOP ELEV.		794.00	

SILT FENCE			
ITEM	UNIT	QUANTITY	STATION
SF 61-1	LF	61	0+23 RT. TO 0+72 RT.

SANDBAG DIVERSION			
ITEM	UNIT	QUANTITY	STATION
SBD 61-1	LF	31	0+20 LT. TO 0+46 LT.

CLASS I RIPRAP			
ITEM	UNIT	QUANTITY	STATION
RRP 61-1	CY	5	0+62 RT.

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-61 - INTIAL PHASE

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 61 OF 96

PROFESSIONAL CERTIFICATION
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ZTIGERS BETEGHEL
48396
PROFESSIONAL ENGINEER
MELMUN A. BEYENE

NO.	DESCRIPTION	NAME	DATE
NO.	DESCRIPTION	NAME	DATE

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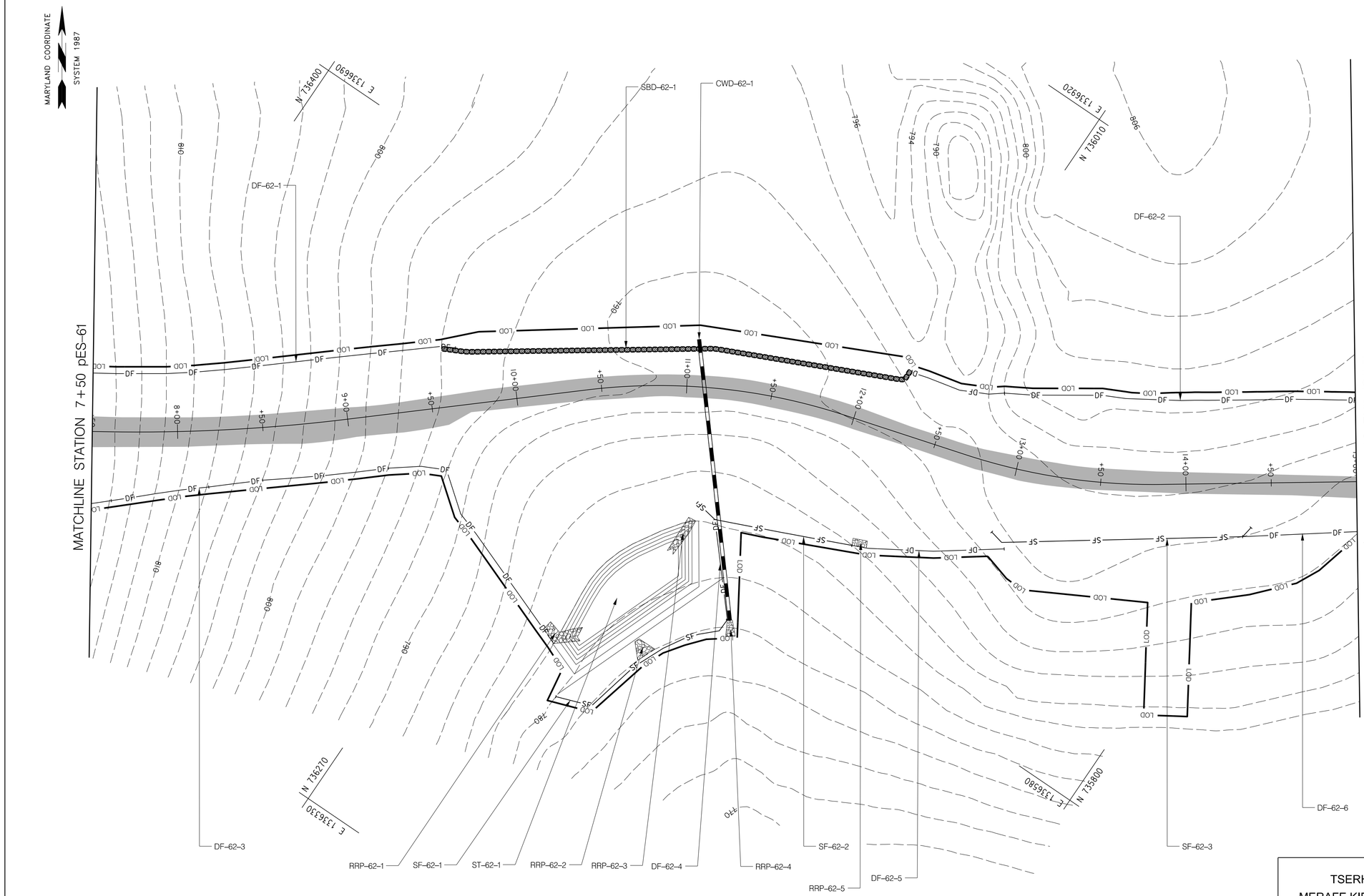

DIVERSION FENCE			
ITEM	UNIT	QUANTITY	STATION
DF 62-1	LF	204	7+50 LT. TO 9+60 LT.
DF 62-2	LF	262	12+25 LT. TO 15+00 RT.
DF 62-3	LF	331	7+50 RT. TO 10+03 RT.
DF 62-4	LF	59	11+21 RT. TO 11+47 RT.
DF 62-5	LF	89	12+19 RT. TO 13+03 RT.
DF 62-6	LF	67	14+33 RT. TO 15+00 RT.

CLASS I RIPRAP			
ITEM	UNIT	QUANTITY	STATION
RRP 62-1	CY	6	10+10 RT.
RRP 62-2	CY	5	10+59 RT.
RRP 62-3	CY	6	11+00 RT.
RRP 62-4	CY	5	11+50 RT.
RRP 62-5	CY	5	12+25 RT.

SILT FENCE			
ITEM	UNIT	QUANTITY	STATION
SF 62-1	LF	118	10+00 RT. TO 11+47 RT.
SF 62-2	LF	96	11+08 RT. TO 12+19 RT.
SF 62-3	LF	157	12+94 RT. TO 14+38 RT.

SNADBAG DIVERSION			
ITEM	UNIT	QUANTITY	STATION
SBD 62-1	LF	286	9+45 LT. TO 12+25 LT.

CLEARWATER DIVRSION PIPE (24") (DA = 3.90 AC.)			
ITEM	UNIT	QUANTITY	STATION
CWD 62-1	LF	166	11+05 LT. TO 11+50 RT.

PIPE OUTLET SEDIMENT TRAP ST-1, TRAP NO. ST-2-1		
DRAINAGE AREA – INTIAL	1.26	ACRES
DRAINAGE AREA – INTERIM	0.82	ACRES
DRAINAGE AREA – FINAL	NA	ACRES
TOTAL STORAGE REQUIRED	4536	CF
TOTAL STORAGE PROVIDED	6232	CF
WET STORAGE REQUIRED	2268	CF
WET STORAGE PROVIDED	3147	CF
DRY STORAGE REQUIRED	2268	CF
DRY STORAGE PROVIDED	3085	CF
TRAP BOTTOM ELEVATION	780.00	FT
TRAP BOTTOM DIMENSIONS	24X78	FT x FT
RISER CREST (DRY STORAGE) ELEVATION	783.00	FT
OUTLET (WET STORAGE) ELEVATION	781.75	FT
CLEANOUT ELEVATION	780.88	FT
TOP OF EMBANKMENT ELEVATION	784.00	FT
SIDE SLOPE	2:1	H:V RATIO
EMBANKMENT TOP WIDTH	4	FT
PRINCIPAL SPILLWAY MATERIAL (BARREL, RISER, ANTI-SEEP COLLAR)		
RISER DIAMETER	27	IN
BARREL DIAMETER	21	IN
TRASH RACK DIAMETER	42	IN
TRASH RACK HEIGHT	18	IN
ANTI-SEEP COLLAR DIMENSIONS	1.5	FT
OUTLET PROTECTION – LENGTH	10	FT
OUTLET PROTECTION – WIDTH	15	FT
OUTLET PROTECTION – DEPTH	19	IN

File No - S-20-0030

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STATE OF MARYLAND – MELVIN BEVERLY – 48396 – PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

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TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-62 - INTIAL PHASE

PROJECT ENG.:
DESIGNED BY:
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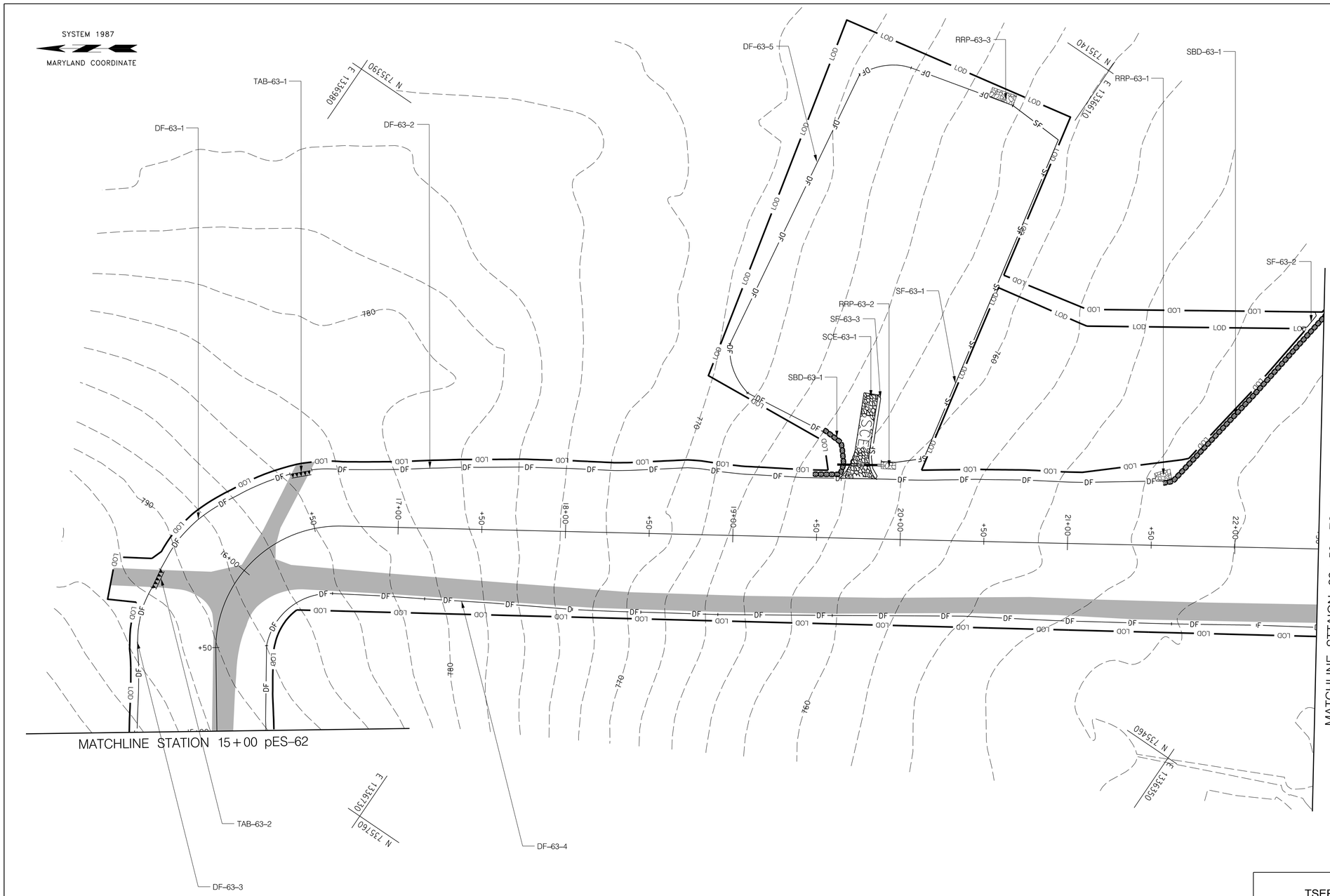
PROJECT MGR.:
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030



DIVERSION FENCE			
ITEM	UNIT	QUANTITY	STATION
DF 63-1	LF	99	15+81 LT. TO 16+45 LT.
DF 63-2	LF	514	16+54 LT. TO 21+55 LT.
DF 63-3	LF	88	15+00 LT. TO 15+70 LT.
DF 63-4	LF	761	15+00 RT. TO 22+50 RT.
DF 63-5	LF	358	19+52 LT. TO 20+69 LT.

CLASS I RIPRAP			
ITEM	UNIT	QUANTITY	STATION
RRP 63-1	CY	5	21+55 RT.
RRP 63-2	CY	5	19+93 LT.
RRP 63-3	CY	5	20+58 LT.

TEMPORARY ASPHALT BERM			
ITEM	UNIT	QUANTITY	STATION
TAB 63-1	LF	12	15+70 RT. TO 15+81 LT.
TAB 63-2	LF	12	16+45 RT. TO 16+54 LT.

SNADBAG DIVERSION			
ITEM	UNIT	QUANTITY	STATION
SBD 63-1	LF	138	21+56 LT. TO 22+50 LT.
SBD 63-2	LF	49	19+47 LT. TO 19+55 LT.

SILT FENCE			
ITEM	UNIT	QUANTITY	STATION
SF 63-1	LF	266	19+88 LT. TO 20+67 LT.
SF 63-2	LF	14	22+37 LT. TO 22+48 LT.
SF 63-3	LF	52	19+85 LT. TO 19+87 LT.

STABILIZED CONSTRUCTION ENTRANCE			
ITEM	UNIT	QUANTITY	STATION
SCE 63-1	EA	1	19+76 LT.

File No - S-20-0030

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SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-63 - INTIAL PHASE

PROJECT ENG._____
DESIGNED BY._____
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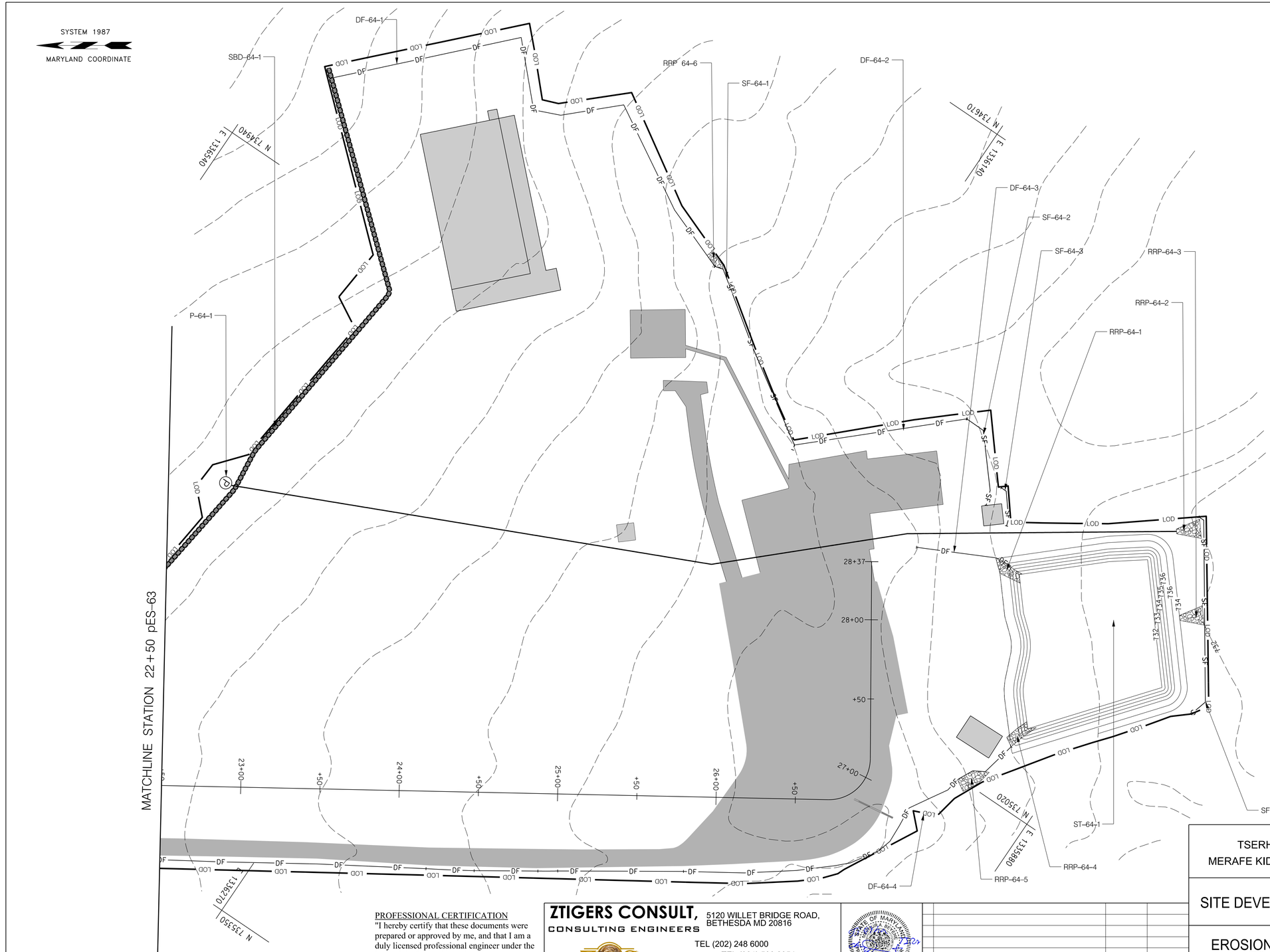
PROJECT MGR._____

PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030



DIVERSION FENCE			
ITEM	UNIT	QUANTITY	STATION
DF 64-1	LF	345	23+59 LT. TO 26+00 LT.
DF 64-2	LF	514	26+41 LT. TO NA.•
DF 64-3	LF	61	28+35 RT. TO NA.•
DF 64-4	LF	564	22+50 RT. TO 27+17 RT.

• OUTSIDE THE ROADWAY BASELINE LIMIT

CLASS I RIPRAP			
ITEM	UNIT	QUANTITY	STATION
RRP 64-1	CY	6	28+32 RT.
RRP 64-2	CY	6	28+37 RT.
RRP 64-3	CY	9	28+02 RT.
RRP 64-4	CY	6	27+25 RT.
RRP 64-5	CY	6	27+13 RT.
RRP 64-6	CY	6	26+00 LT.

SILT FENCE			
ITEM	UNIT	QUANTITY	STATION
SF 64-1	LF	129	26+00 LT. TO 26+34 LT.
SF 64-2	LF	59	NA. TO NA.•
SF 64-3	LF	26	NA. TO NA.•
SF 64-4	LF	146	27+13 RT. TO 28+37 RT.

• OUTSIDE THE ROADWAY BASELINE LIMIT

SNADBAG DIVERSION			
ITEM	UNIT	QUANTITY	STATION
SBD 64-1	LF	370	22+50 LT. TO 23+59 LT.

PUMP DIVERSION			
ITEM	UNIT	QUANTITY	STATION
P 64-1	EA	1	22+86 LT.

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

STANDARD SYMBOL: ST-I

PIPE OUTLET SEDIMENT TRAP ST-I, TRAP NO. ST-1		
DRAINAGE AREA – INTIAL	4.37	ACRES
DRAINAGE AREA – INTERIM	4.65	ACRES
DRAINAGE AREA – FINAL	4.84	ACRES
TOTAL STORAGE REQUIRED	17424	CF
TOTAL STORAGE PROVIDED	20937	CF
WET STORAGE REQUIRED	8712	CF
WET STORAGE PROVIDED	11996	CF
DRY STORAGE REQUIRED	8712	CF
DRY STORAGE PROVIDED	8941	CF
TRAP BOTTOM ELEVATION	732.00	FT
TRAP BOTTOM DIMENSIONS	79X90	FT x FT
RISER CREST (DRY STORAGE) ELEVATION	734.50	FT
OUTLET (WET STORAGE) ELEVATION	733.50	FT
CLEANOUT ELEVATION	732.75	FT
TOP OF EMBANKMENT ELEVATION	736.00	FT
SIDE SLOPE	2:1	H:V RATIO
EMBANKMENT TOP WIDTH	4	FT
PRINCIPAL SPILLWAY MATERIAL (BARREL, RISER, ANTI-SEEP COLLAR)		
RISER DIAMETER	42	IN
BARREL DIAMETER	30	IN
TRASH RACK DIAMETER	60	IN
TRASH RACK HEIGHT	18	IN
ANTI-SEEP COLLAR DIMENSIONS	1.5	FT
OUTLET PROTECTION – LENGTH	10	FT
OUTLET PROTECTION – WIDTH	15	FT
OUTLET PROTECTION – DEPTH	19	IN

3 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

SCALE: 1"=30'

File No - S-20-0030

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STATE OF MARYLAND — MERAFE KIDUSAN KIDIST ARSEMA ANDINET — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

REVISIONS

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-64 - INTIAL PHASE

PROJECT ENG.
DESIGNED BY
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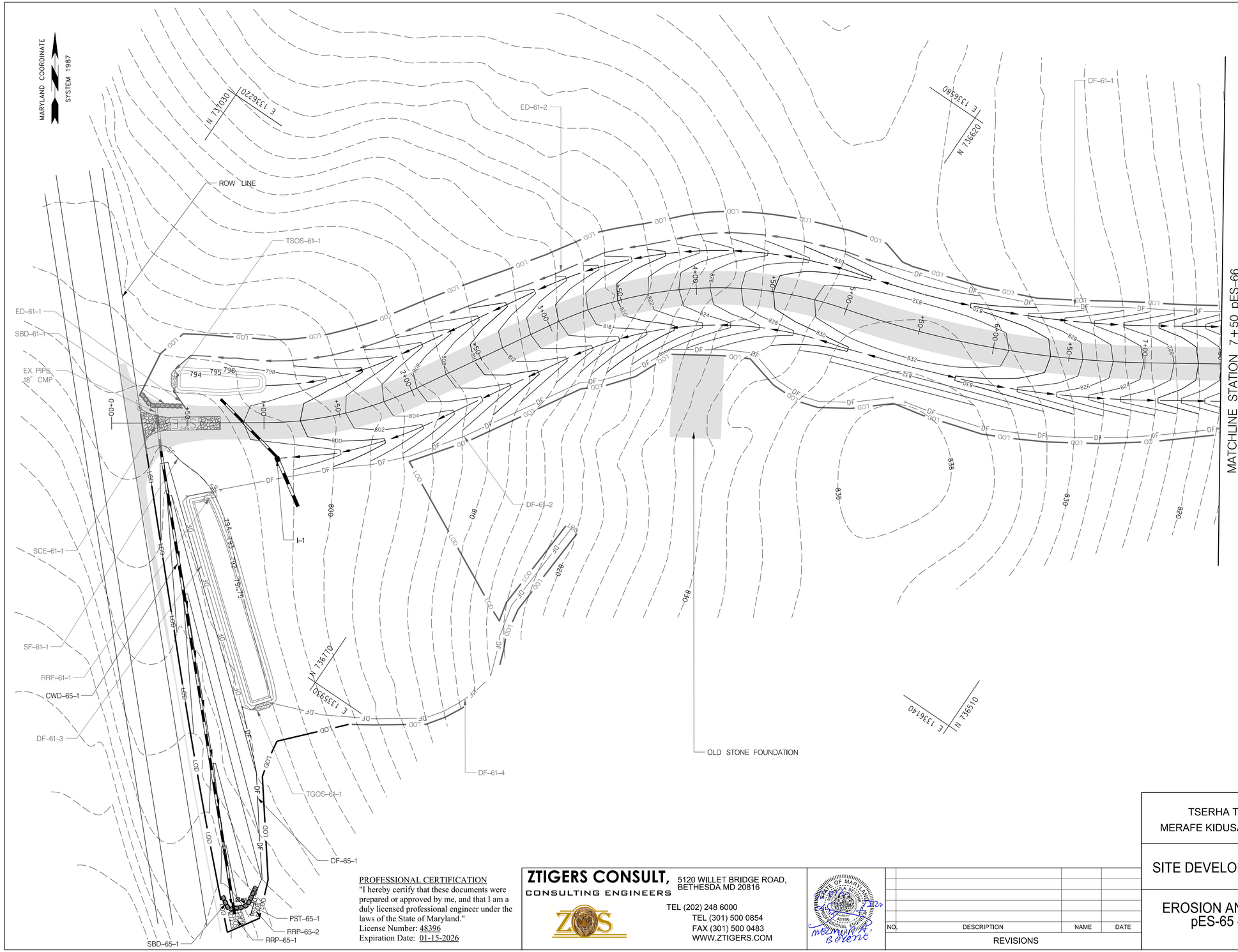
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030



CLEARWATER DIVERSION PIPE (18")			
ITEM	UNIT	QUANTITY	STATION
CWD 65-1	LF	308	0+32 RT. TO 0+80 RT.

DIVERSION FENCE			
ITEM	UNIT	QUANTITY	STATION
DF 65-1	LF	134	0+86 RT. TO 0+91 RT.

CLASS I RIPRAP			
ITEM	UNIT	QUANTITY	STATION
RRP 65-1	CY	5.50	0+81 RT.
RRP 65-2	CY	5.00	0+95 RT.

SABDBAG DIVERSION			
ITEM	UNIT	QUANTITY	STATION
SBD 65-1	LF	36	0+72 RT. TO 0+95 RT.

PORTABLE SEDIMENT TANK			
ITEM	UNIT	QUANTITY	STATION
PST 65-1	EA	1	0+81 RT.

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STATE OF MARYLAND — MEHRIYAR BEHENI — 48396 — PROFESSIONAL ENGINEER

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File No - S-20-0030

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MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-65 - INTERIM PHASE

PROJECT ENG.
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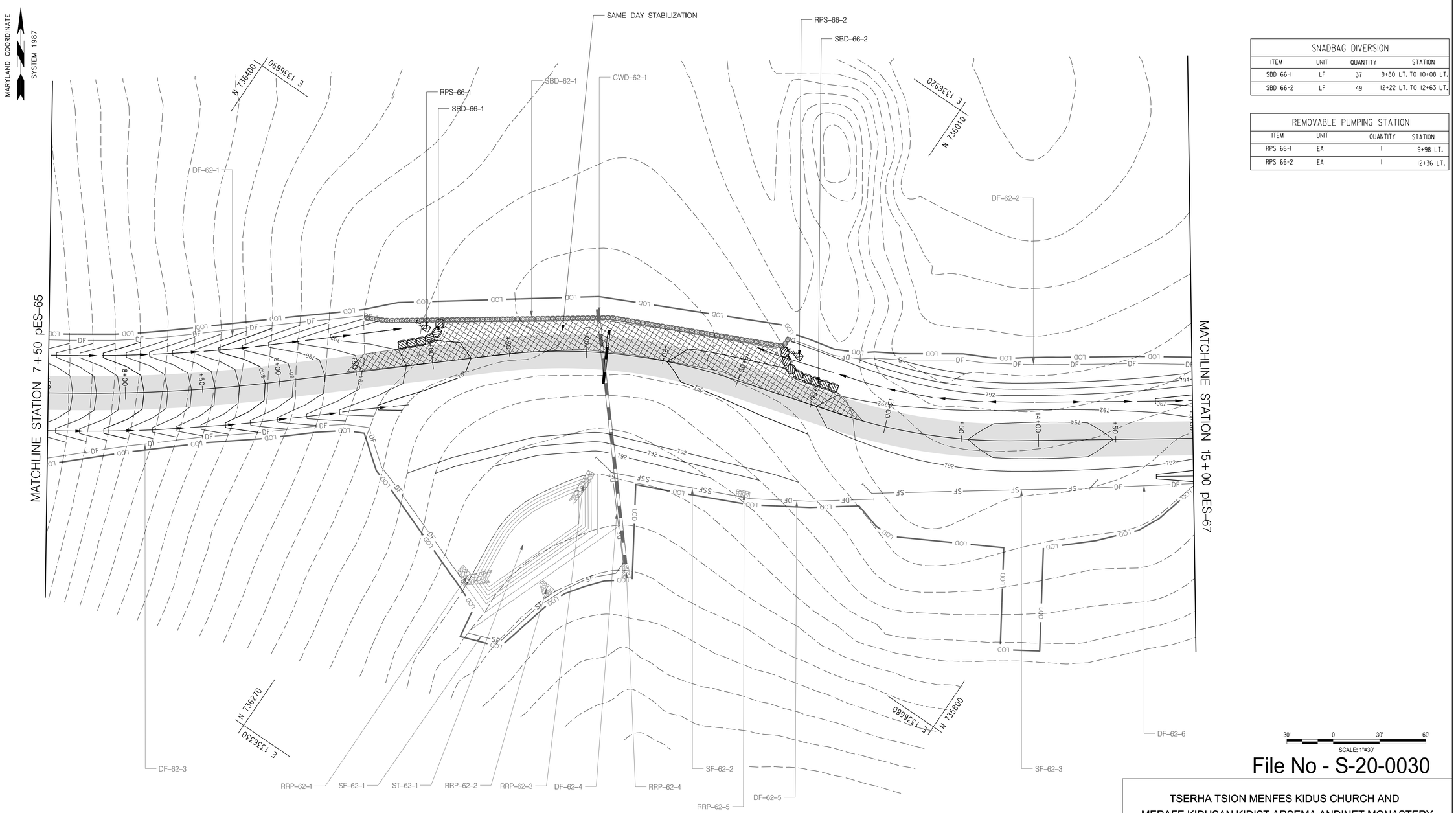
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030



SNADBAG DIVERSION			
ITEM	UNIT	QUANTITY	STATION
SBD 66-1	LF	37	9+80 LT. TO 10+08 LT.
SBD 66-2	LF	49	12+22 LT. TO 12+63 LT.

REMOVABLE PUMPING STATION			
ITEM	UNIT	QUANTITY	STATION
RPS 66-1	EA	1	9+98 LT.
RPS 66-2	EA	1	12+36 LT.

File No - S-20-0030

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STATE OF MARYLAND — 29396 — PROFESSIONAL ENGINEER — Beverly Mzumunya

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SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-66 - INTERIM PHASE

PROJECT ENG.:
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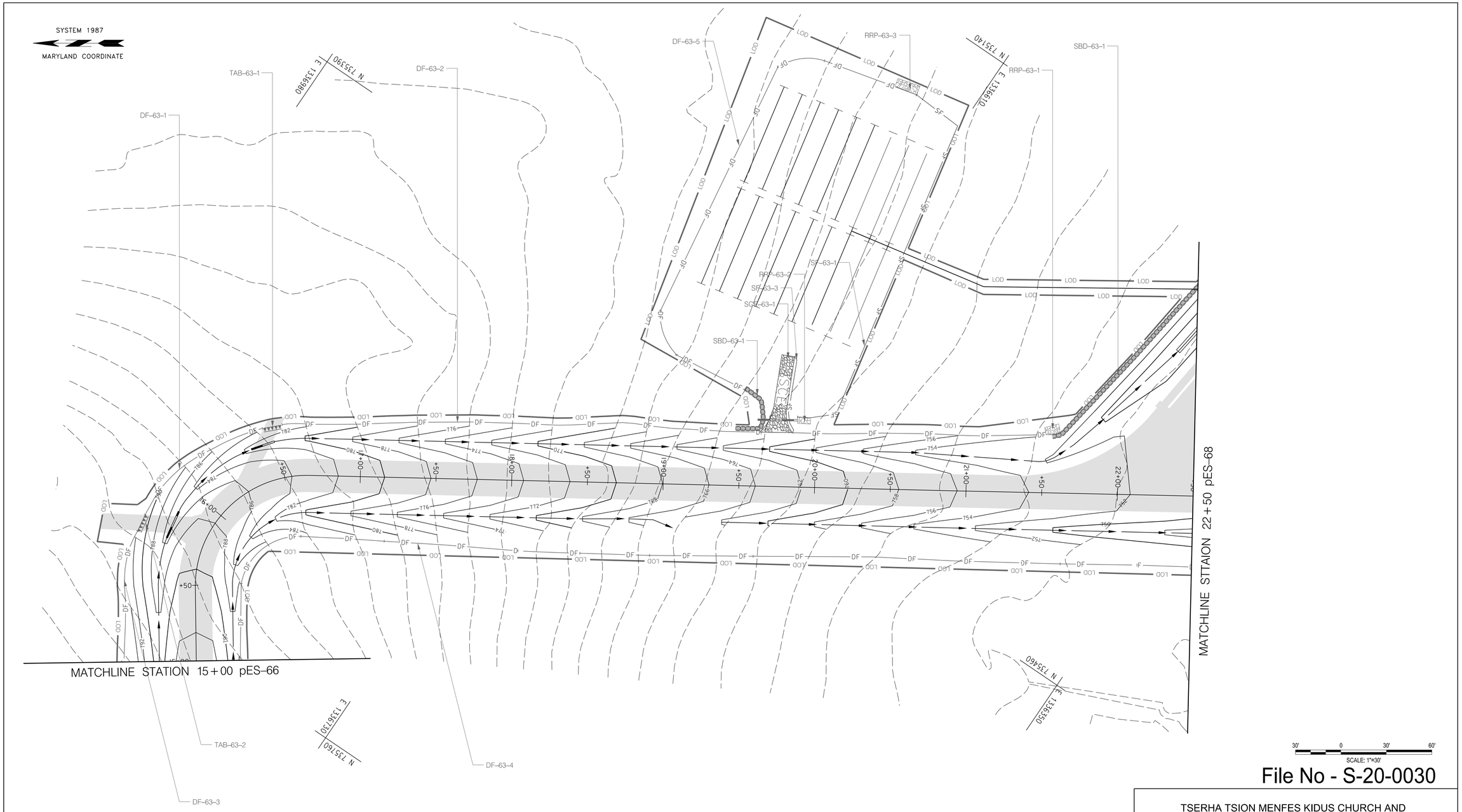
PROJECT MGR.:
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 66 OF 96



File No - S-20-0030

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SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-67 - INTERIM PHASE

PROJECT ENG.
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SHEET 67 OF 96

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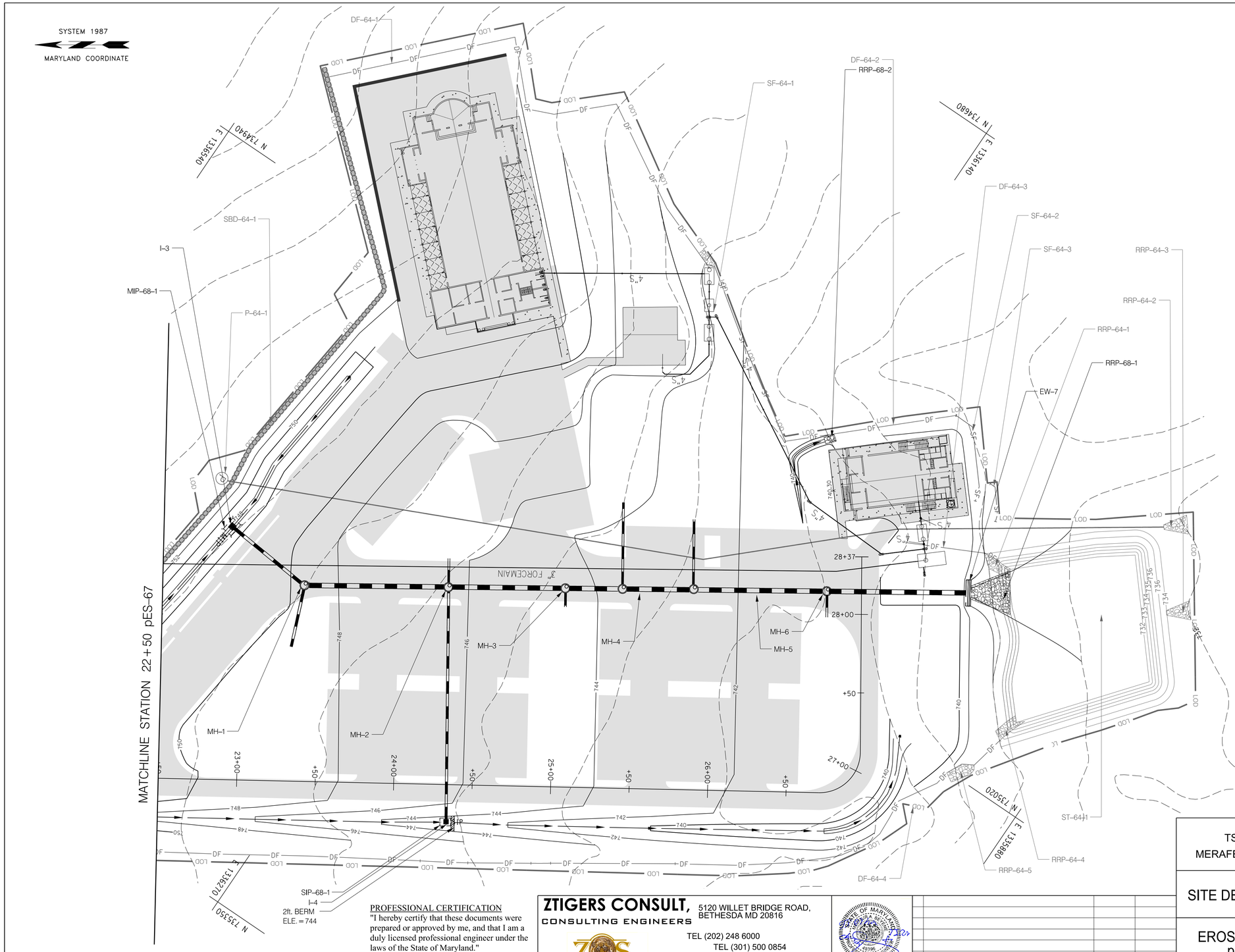

CLASS I RIPRAP			
ITEM	UNIT	QUANTITY	STATION
RRP 68-1	CY	27	28+15 RT.
RRP 68-2	CY	6	26+30 LT.

STANDARD INLET PROTECTION (TYPE B)			
ITEM	UNIT	QUANTITY	STATION
SIP 68-1	EA	1	24+36 RT.

MEDIAN INLET PROTECTION			
ITEM	UNIT	QUANTITY	STATION
MIP 68-1	EA	1	22+90 LT.

30' 0 30' 60'
SCALE: 1"=30'

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-68 - INTERIM PHASE

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SHEET 68 OF 96

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STATE OF MARYLAND
SHERIFA BEYENE
48396
PROFESSIONAL ENGINEER
Mohamed Beyene

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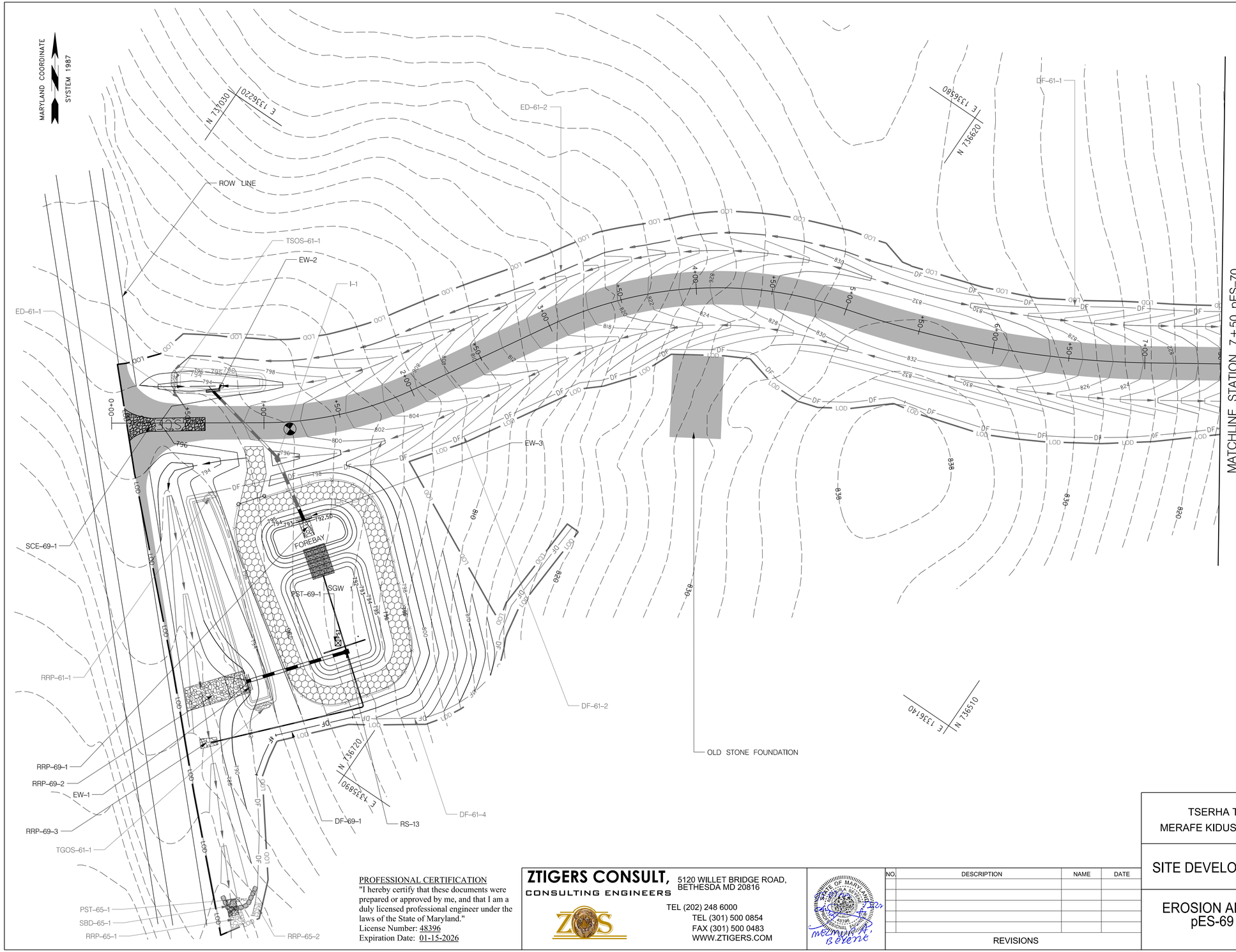

CLASS I RIPRAP			
ITEM	UNIT	QUANTITY	STATION
RRP 69-1	CY	5	1+02 RT.
RRP 69-2	CY	21	0+62 RT.
RRP 69-3	CY	5	0+65 RT.

DIVERSION FENCE			
ITEM	UNIT	QUANTITY	STATION
DF 69-1	LF	81	0+79 RT. TO 1+33 RT.

PORTABLE SEDIMENT TANK			
ITEM	UNIT	QUANTITY	STATION
PST 69-1	EA	1	1+32 RT.

STABILIZED CONSTRUCTION ENTRANCE			
ITEM	UNIT	QUANTITY	STATION
SCE 69-1	EA	1	0+10

File No - S-20-0030

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SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-69 - FINAL PHASE

PROJECT ENG.
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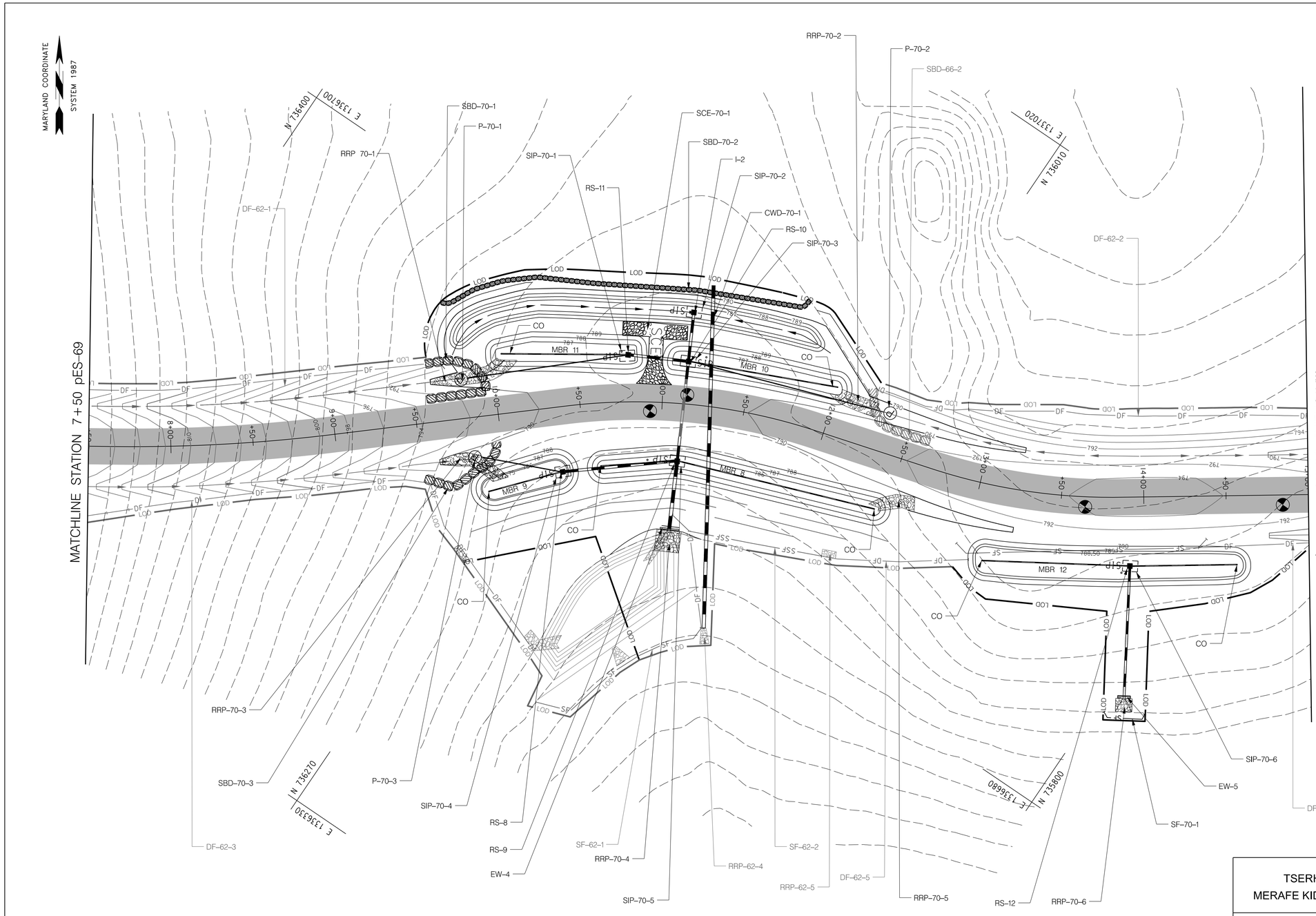
FILE S-20-0030
SHEET 69 OF 96



STABILIZED CONSTRUCTION ENTRANCE			
ITEM	UNIT	QUANTITY	STATION
SCE 70-1	EA	1	10+95 LT.

SNADBAG DIVERSION			
ITEM	UNIT	QUANTITY	STATION
SBD 70-1	LF	37	9+58 LT. TO 9+64 LT.
SBD 70-2	LF	232	9+76 LT. TO 11+71 LT.
SBD 70-3	LF	49	9+52 RT. TO 9+96 RT.

CLASS I RIPRAP			
ITEM	UNIT	QUANTITY	STATION
RRP-70-1	CY	23	9+88 LT.
RRP-70-2	CY	13	12+14 LT.
RRP-70-3	CY	17	9+86 RT.
RRP-70-4	CY	12	11+06 RT.
RRP-70-5	CY	11	12+50 RT.
RRP-70-6	CY	5	13+89 RT.

STANDARD INLET PROTECTION			
ITEM	UNIT	QUANTITY	STATION
SIP-70-1	EA	1	10+78 LT.
SIP-70-2	EA	1	11+15 LT.
SIP-70-3	EA	1	11+15 LT.
SIP-70-4	EA	1	10+34 RT.
SIP-70-5	EA	1	11+10 RT.
SIP-70-6	EA	1	13+92 RT.

PUMP DIVERSION			
ITEM	UNIT	QUANTITY	STATION
P 70-1	EA	1	9+81 LT.
P 70-2	EA	1	12+34 LT.
P 70-3	EA	1	9+83 RT.

CLEAR WATER DIVERSION PIPE (24")			
ITEM	UNIT	QUANTITY	STATION
CWD 70-1	LF	209	11+25 LT. TO 11+50 RT.

SILT FENCE			
ITEM	UNIT	QUANTITY	STATION
SF 70-1	LF	29	13+79 RT. TO 14+00 RT.

30' 0 30' 60'
SCALE: 1"=30'

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-70 - FINAL PHASE

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030
SHEET 70 OF 96

PROFESSIONAL CERTIFICATION
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License Number: 48396
Expiration Date: 01-15-2026

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BETHESDA MD 20816
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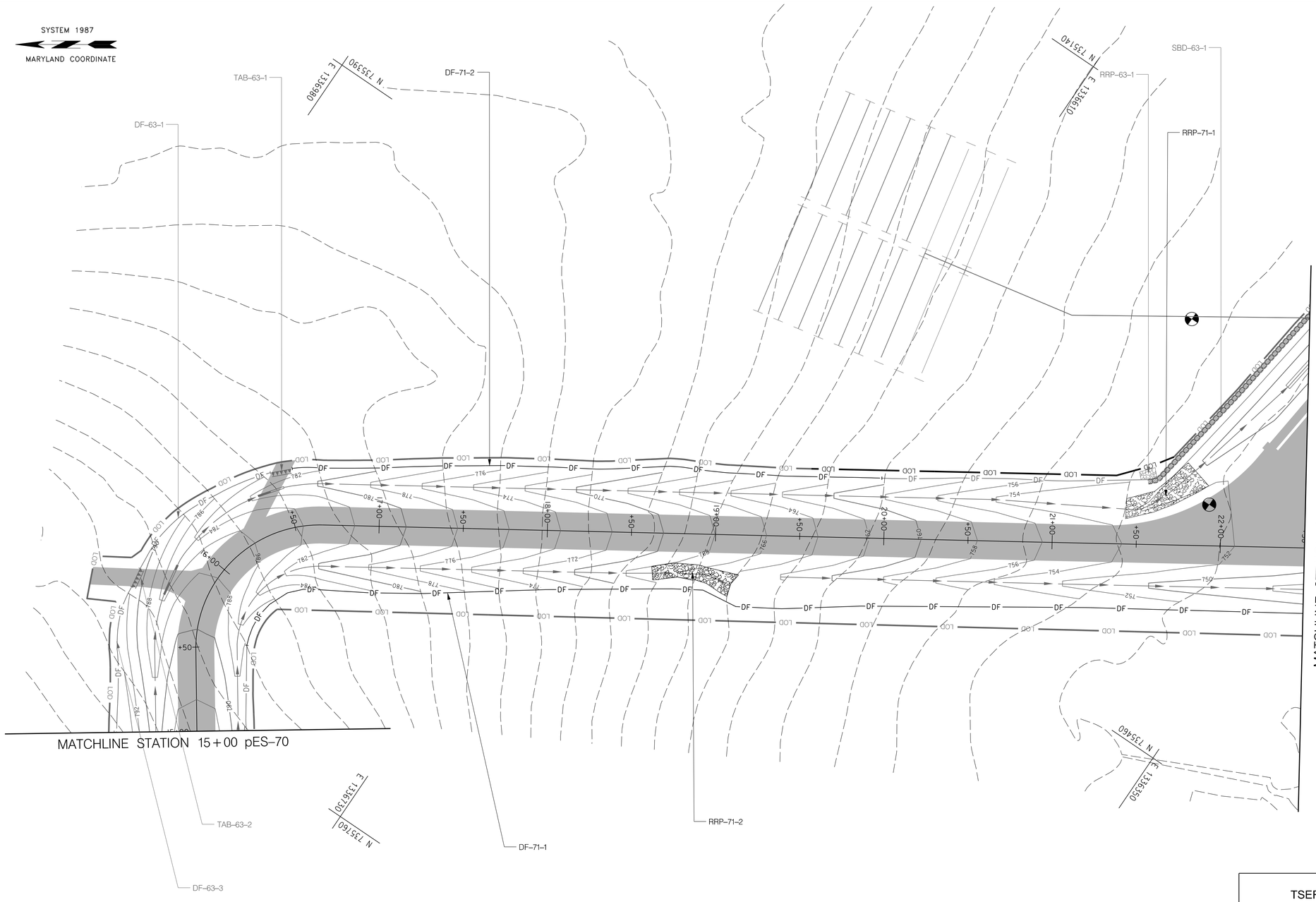
NO.	DESCRIPTION	NAME	DATE

REVISIONS



CLASS I RIPRAP			
ITEM	UNIT	QUANTITY	STATION
RRP 71-1	CY	38	21+67 LT.
RRP 71-2	CY	27	18+89 RT.

DIVERSION FENCE			
ITEM	UNIT	QUANTITY	STATION
DF 71-1	LF	647	15+50 RT. TO 22+50 RT.
DF 71-2	LF	351	16+53 LT. TO 20+00 LT.

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-71 - FINAL PHASE

PROJECT ENG.
DESIGNED BY
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PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030
SHEET 71 OF 96

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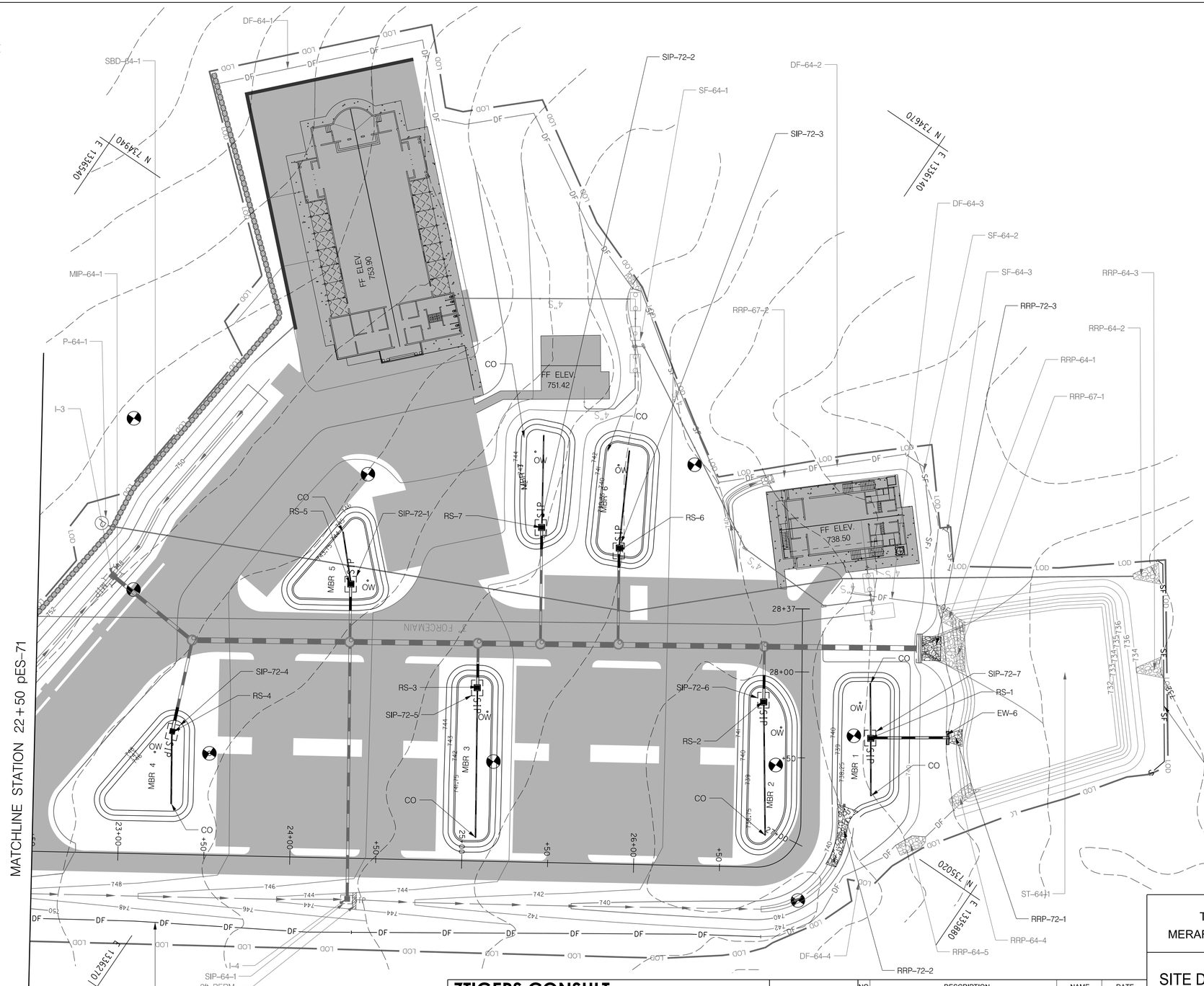

CLASS I RIPRAP			
ITEM	UNIT	QUANTITY	STATION
RRP 72-1	CY	3.5	27+62 RT.
RRP 72-2	CY	13	27+10 RT.
RRP 72-3	CY	14	28+14 RT.

STANDARD INLET PROTECTION			
ITEM	UNIT	QUANTITY	STATION
SIP-72-1	EA	1	24+31 LT.
SIP-72-2	EA	1	25+37 LT.
SIP-72-3	EA	1	25+90 LT.
SIP-72-4	EA	1	23+29 LT.
SIP-72-5	EA	1	25+07 LT.
SIP-72-6	EA	1	26+72 LT.
SIP-72-7	EA	1	27+62 RT.

SILT FENCE			
ITEM	UNIT	QUANTITY	STATION
SF 72-1	LF	146	27+13 RT. TO 28+37 RT.

DIVERSION FENCE			
ITEM	UNIT	QUANTITY	STATION
DF 72-1	LF	425	22+50 RT. TO 27+17 RT.

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-72 - FINAL PHASE

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030
SHEET 72 OF 96

PROFESSIONAL CERTIFICATION
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File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

pES-73 – ESC DRAINAGE AREA
INITIAL PHASE

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.

PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030

SHEET 73 OF 96

PROFESSIONAL CERTIFICATION
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STATE OF MARYLAND
MELMUNDI BEYENE
48396
PROFESSIONAL ENGINEER
Melmundi Beyene

NO.	DESCRIPTION	NAME	DATE

REVISIONS



File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

pES-74 – ESC DRAINAGE AREA
INTERIM PHASE

PROJECT ENG.:
DESIGNED BY:
CHECKED BY:
DRAWN BY:
PROJECT MGR.:

PROGRAM MANAGER

DATE 05052025

FILE S-20-0030

SHEET 74 OF 96

PROFESSIONAL CERTIFICATION
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STATE OF MARYLAND — 48396 — PROFESSIONAL ENGINEER

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REVISIONS



File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

pES-75 – ESC DRAINAGE AREA
FINAL PHASE

PROJECT ENG._____
DESIGNED BY_____
CHECKED BY_____
DRAWN BY_____
PROJECT MGR._____

PROGRAM MANAGER

DATE 05052025
FILE S-20-0030

SHEET 75 OF 96

PROFESSIONAL CERTIFICATION
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STATE OF MARYLAND — MEZMUR BEYENE — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

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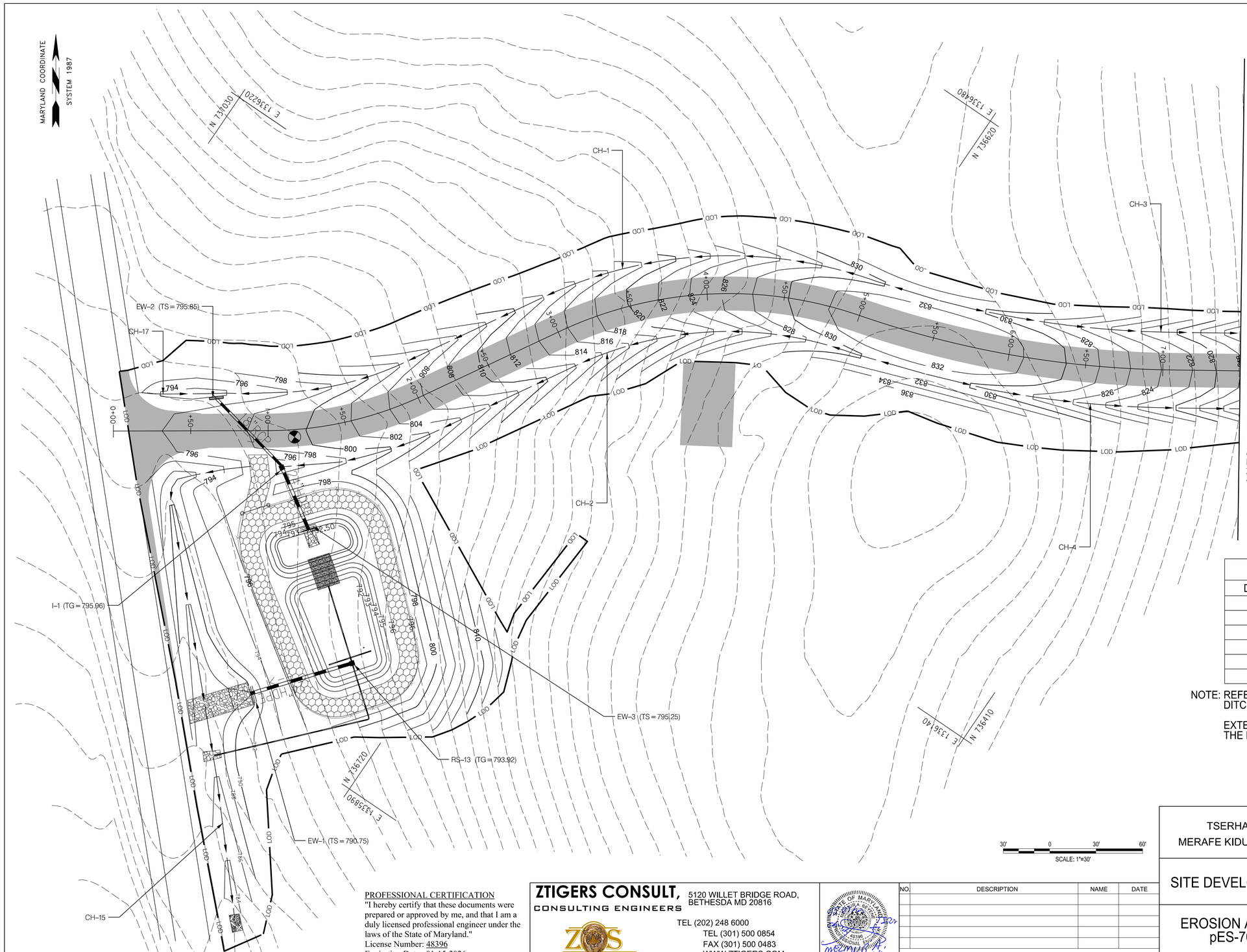

DITCH STABILIZATION	
DITCH ID	STABILIZATION
CH-1	SYNTHETIC FIBER MATTING
CH-2	SOLID SODDING
CH-3	SOLID SODDING
CH-4	SOLID SODDING
CH-15	SOLID SODDING
CH-17	SEED AND MULCH

NOTE: REFER TO PLAN SHEETS 50-52 FOR THE DITCH STAKEOUT INFORMATION

EXTEND THE STABILIZATION 6" ABOVE THE BOTTOM OF THE DITCHES.

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL pES-76 - GRADING PLAN

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030
SHEET 76 OF 96

PROFESSIONAL CERTIFICATION
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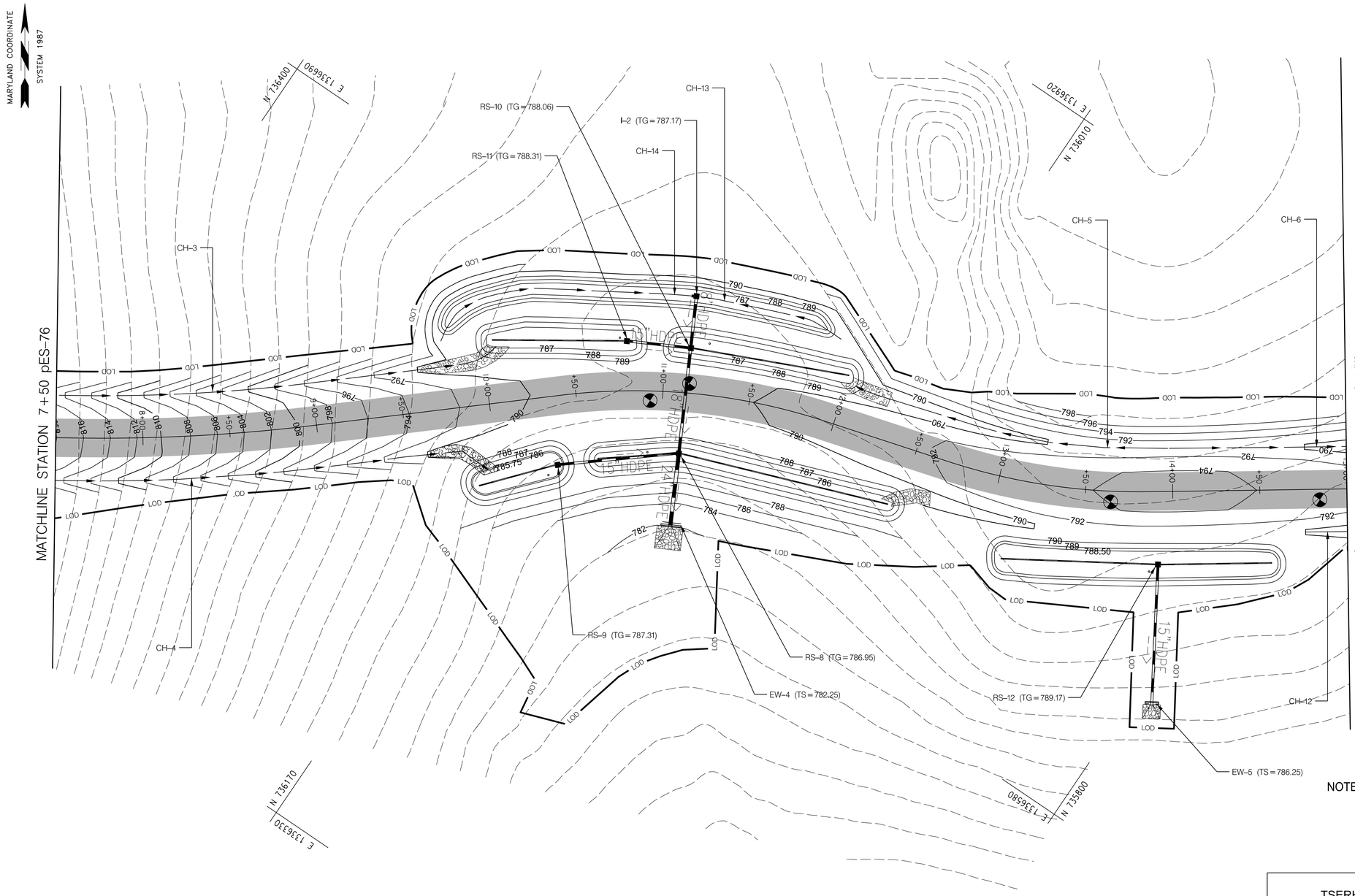

DITCH STABILIZATION	
DITCH ID	STABILIZATION
CH-3	SOLID SODDING
CH-4	SOLID SODDING
CH-5	SEED AND MULCH
CH-6	SEED AND MULCH
CH-12	SOLID SODDING
CH-13	SEED AND MULCH
CH-14	SOLID SODDING

NOTE: REFER TO PLAN SHEETS 50-52 FOR THE DITCH STAKEOUT INFORMATION

EXTEND THE STABILIZATION 6" ABOVE THE BOTTOM OF THE DITCHES.

File No - S-20-0030

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License Number: 48396
Expiration Date: 01-15-2026

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STATE OF MARYLAND — MELAKU TEFERA BEYENE — 48396 — PROFESSIONAL ENGINEER

NO.	DESCRIPTION	NAME	DATE

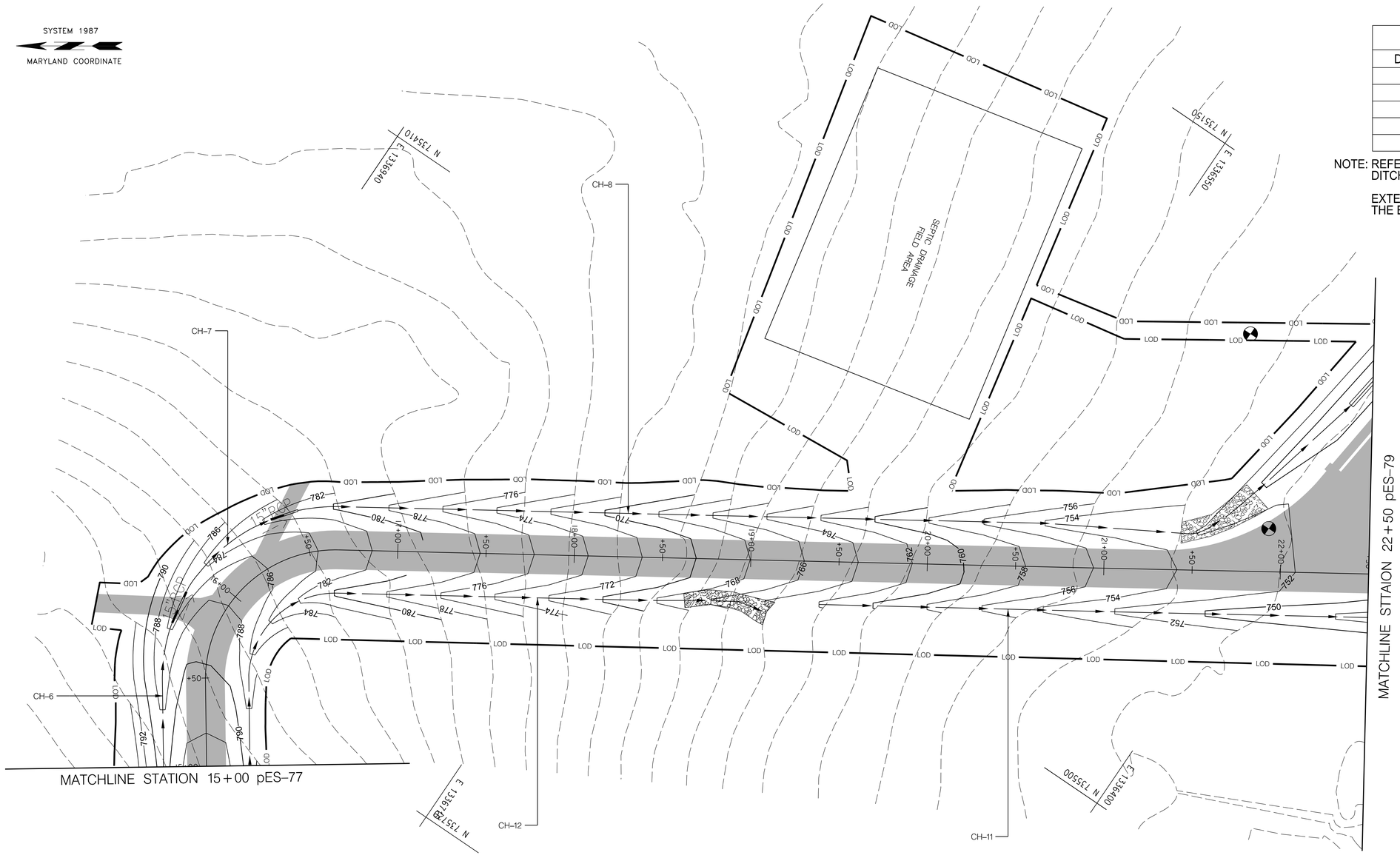
REVISIONS

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-77 - GRADING PLAN

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05052025
FILE S-20-0030



DITCH STABILIZATION	
DITCH ID	STABILIZATION
CH-6	SEED AND MULCH
CH-7	SOLID SODDING
CH-8	SYNTHETIC FIBER MATTING
CH-11	SEED AND MULCH
CH-12	SOLID SODDING

NOTE: REFER TO PLAN SHEETS 50-52 FOR THE DITCH STAKEOUT INFORMATION

EXTEND THE STABILIZATION 6" ABOVE THE BOTTOM OF THE DITCHES.

30' 0 30' 60'
SCALE: 1"=30'

File No - S-20-0030

TSERHA TSION MENFES KIDUS CHURCH AND
MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL
pES-78 - GRADING PLAN

PROJECT ENG.
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PROJECT MGR.

PROGRAM MANAGER

DATE 05/05/2025
FILE S-20-0030
SHEET 78 OF 96

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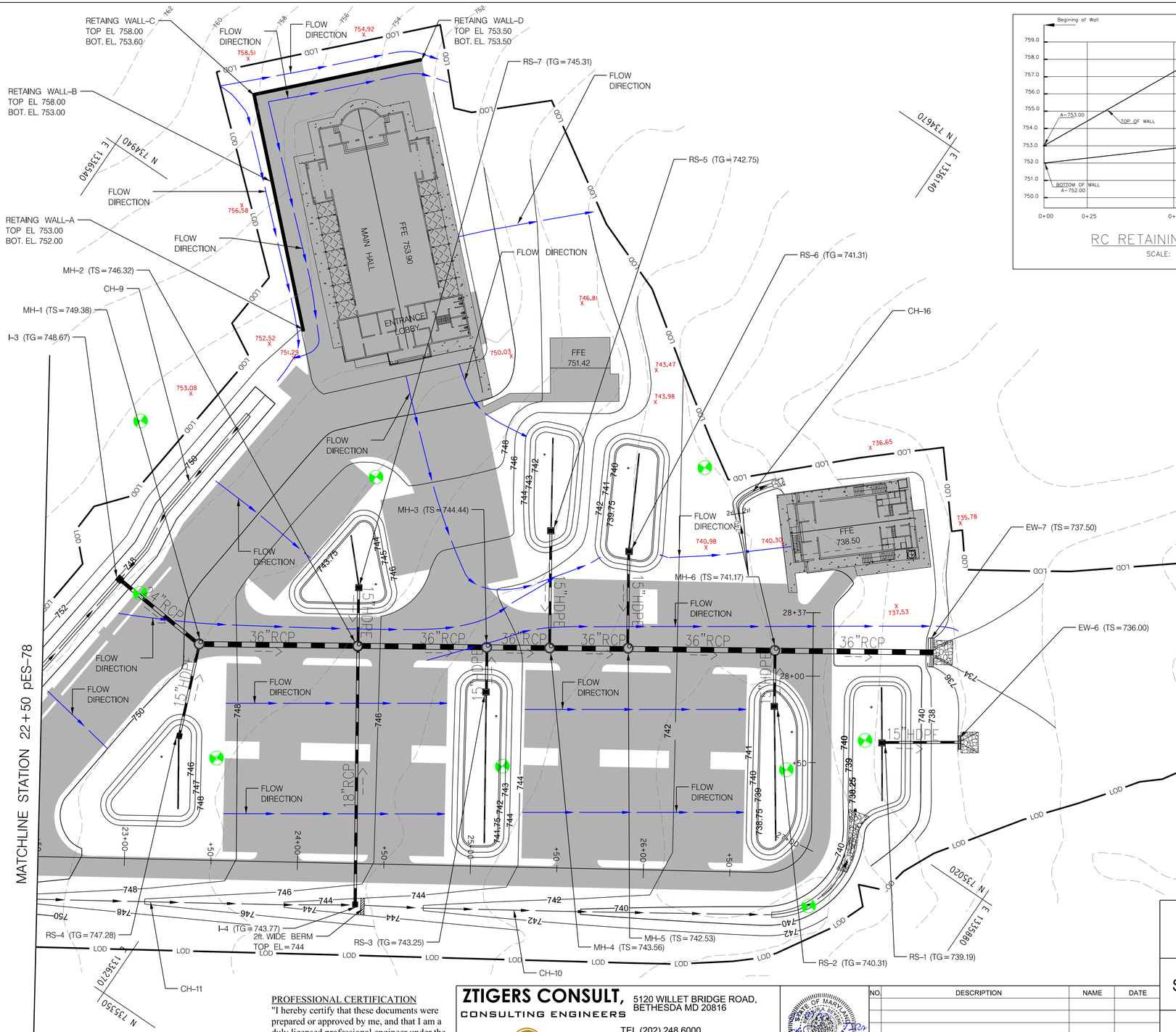
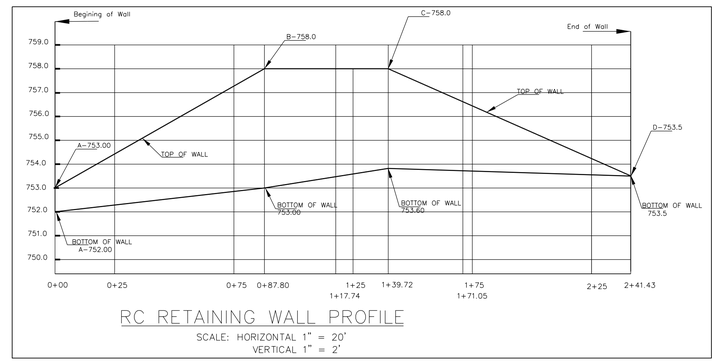
SYSTEM 1987

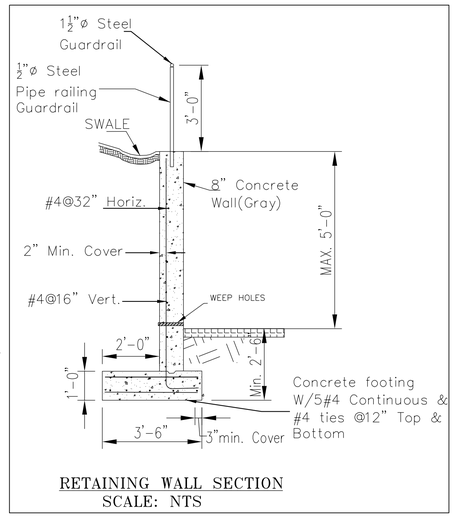
MARYLAND COORDINATE





RC RETAINING WALL PROFILE

SCALE: HORIZONTAL 1" = 20'
VERTICAL 1" = 2'



RETAINING WALL SECTION

SCALE: NTS

DITCH STABILIZATION	
DITCH ID	STABILIZATION
CH-9	SOLID SODDING
CH-10	SEED AND MULCH
CH-11	SEED AND MULCH
CH-16	SEED AND MULCH

NOTE: REFER TO PLAN SHEETS 50-52 FOR THE DITCH STAKEOUT INFORMATION

EXTEND THE STABILIZATION 6" ABOVE THE BOTTOM OF THE DITCHES.

30' 0 30' 60'

SCALE: 1"=30'

File No - S-20-0030

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TSERHA TSION MENFES KIDUS CHURCH AND MERAFE KIDUSAN KIDIST ARSEMA ANDINET MONASTERY

SITE DEVELOPMENT FINAL PLAN

EROSION AND SEDIMENT CONROL pES-79 - GRADING PLAN

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
PROGRAM MANAGER
DATE 05/05/2025
FILE S-20-0030

LEGEND

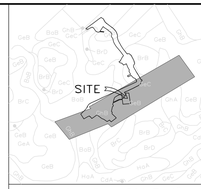
	Existing	Proposed
Cable Line	C	C
Center Line Rd		
Curb		
Easement		
Electric	E	E
Edge of Rd		
Edge of Shoulder		
Feature separation distance in feet	4'	4'
Fenceline	X	X
100 Yr. Flood Boundry		
Forest		
Flow Line(Swale,Ditch,Waterway)		
Gas Line	G	G
Guardrail		
Index Contours	410	700
Intermediate Contours		
Limits of Disturbance	LOD	LOD
Lot Line		
Municipal Boundary		
Overhead Lines	OH	OH
Plat Outline		
Railroad		
Right-Of-Way Line		
Septic Area		
Set Back Line		
Sewer Line		
Soil Type		
Storm Drain Line		
Stream		
Stream Intermittent		
Soil Survey		
Stream Buffer		
Surfacewater Management Zone		
Telephone	T	T
Tier II Waters		
Tree Protection Fence		
Underground Cable	UG	UG
Water Line	W	
Zoning Line		
Bit. Conc. Pav.		
Concrete		
Ingress and Egress Easement		
FCE		
Forest Conservation Easement		
Rip-Rap/Gravel		
Rock Outcrop		
Septic Area		
Soil Type (Group)	Soil Type (Group) BrB(C)	
Wetlands		

	Existing	Proposed
Point ID		
Cable Marker		
Clean Out, Sewer/Drain		
Coniferous Tree		
Deciduous Tree		
Discharge Flow (to swale,ditch,waterway)		
Dry Hole		
Dry Well	DW	DW
Electric Transformer		
Fire Hydrant		
Flow Upon Ground		
Inlet		
Mail Box		
Manhole		
Pole Light		
Shrub		
Sign		
Soil Test Boring		
Forest Conservation Easement Sign		
Sinkhole		
Specimen Candidate Tree		
Spring		
Structure		
Telephone Pedestal		
Water Curb Box		
Water Meter		
Water Valve		
Utility Pole		
Utility Pole w/Guy Wire		
Well		

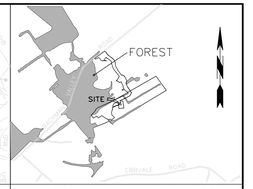
ABBREVIATIONS

100FB	100 year Flood Boundary
100FWB	100 year Floodway Boundary
500FB	500 year Flood Boundary
AASHTO	American Association of State Highway & Transportation Officials
ADT	Average Daily Trip
ALCMP	ALuminum Corrugated Metal Pipe
App	Approved
B	Basement floor elevation or Book
BCCMP	Bituminous Coated Corrugated Metal Pipe
Beg	Begin
Bk	Break
BL	BaseLine
Bldg	Building
BLP	Begin Linear Profile
Bot	Bottom/Bottom of trench
BoW	Bottom of Wall
C-C	Center to Center
C-D-S	Cul-De-Sac
Ca	Carroll
CC	Carroll County
CCBDR	Carroll County Bureau of Development Review
CCBoE	Carroll County Bureau of Engineering
CCBoU	Carroll County Bureau of Utilities
CCBRM	Carroll County Bureau of Resource Management
CCBRO	Carroll County Bureau of Roads Operations
CCC	Carroll County Commissioners
CCERD	Carroll County Engineering Review Division
CCHD	Carroll County Health Department
CCLM	Carroll County Landscape Manual
CCMIB	Carroll County Modified Infiltration Berm
CCOPS	Carroll County Office of Public Safety
CCP	Carroll County Plate number
CCSCD	Carroll County Soil Conservation District
CDB	County (Road) Deed Book
CCDPW	Carroll County Dept of Public Works
CCSWM	Carroll County Supplement to the 2000 Maryland Stormwater Design Manual Volumes I&II
CCZA	Carroll County Zoning Administration
CL	CenterLine or Class
CLR	County Land Record
CMP	Corrugated Metal Pipe
Co	Clean out/County
CPLLO	Code of Public Local Laws and Ordinances
CoW	City of Westminster
CRPB	County Road Plat Book
Dia	Diameter
Dn	Depth normal
DND	Do Not Disturb
DUE	Drainage Utility Easement
Dwy	Driveway
E	Entrance elevation
EASE	EASEment
EL	ELevation
EER	Elevation Ex Road
ELP	End Linear Profile
ESE	Emergency Spillway Elevation
Ex	Existing
ExGd	Existing Ground
F	First floor elevation
FBFM	Flood Boundary and Floodway Map
FCE	Forest Conservation Easement
FEMA	Federal Emergency Management Agency (Hec 2 Data)
FG	Finished Grade
FIRM	Flood Insurance Rate Map
FoW	Face of Wall
FPE	Flood Plain Easement
FWRPE	Forested Water Resource Protection Easement
G	Garage floor elevation
Gar	Garage
GR	Guard Rail
GWw	Grass Waterway
HDPE	High Density PolyEthylene
HG	Hydraulic Gradient
Hor	Horizontal
HP	High Point
Hse	House
IDE	Invert Ditch Elevation
IEE	Ingress & Egress Easement
Inv	Invert
IT	Infiltration Trench
L	Left or Lot
LF	Linear Feet
LoD	Limits of Disturbance
LoP	Limits of Paving
LP	Low Point
LPG	Linear Profile Grade
LS	Level Spreader
LVC	Length of Vertical Curve
M	Minutes
MPH	Miles Per Hour
NAD	North America Datum
NAVD	North America Vertical Datum
NDC	Nose Down Curb
NFWRPE	Non Forested Water Resource Protection Easement
NIC	Not In Contract
Os	Offset
OW	Observation Well
P	Page
PB	Plat Book
PC	Point of Curve
PEDF	Perpetual Easement Drainage Facility
PG	Proposed Grade
PGL	Profile Grade Line
PHT	Peak Hourly Trip
PL	Property Line
PlBk	Plan Book
Pr	Profile
PSE	Proposed Shoulder Elevation
PT	Point of Tangent
PVC	Point of Vertical Curve
PVI	Point of Vertical Intersection
PVT	Point of Vertical Tangent
PWA	Public Works Agreement
Q	cubic feet per second
R	Right or Radius
RBCCR	Record Book Carroll County Roads
RCP	Reinforced Concrete Pipe
Rem	Remainder
RP	Remaining Portion
S	Sewer
SBL	Set Back Line
SC	Sewer Connection
SD	Storm Drain
SgD	Subgrade Drain
SHA	State Highway Administration (Maryland)
Sh	Sheet
SRC	State Roads Commission
SS	Sanitary Sewer
STD	Standard
SWMF	StormWater ManagementFacility
tbD	to be Determined
tbR	to be Removed
TCB	Top Constructed Berm
TCD	Top Constructed Dam
ToB	Top of Berm or Bank
ToC	Top of Curb
ToD	Top of Dam
ToF	Top of Footer
ToG	Top of Grate
Top	Top
ToR	Top of Rim
ToW	Top of Wall
TRANS	Transition
Typ	Typical
UE	Utility Easement
U-I-C	Use-In-Common
V	Velocity (feet per second)
Vert	Vertical
W	Water
WC	Water Connection
WL	WaterLine
WO	WalkOut
WQB	Water Quality Basin
WQS	Water Quality Swale
WQT	Water Quality Trench
WS	Wide Shoulder/ Weir Station
WSE	Water Surface Elevation





SOILS MAP SCALE: 1"= 1320'



VICINITY MAP SCALE: 1"= 2000'

TOTAL AREA

Name	North	East	Bearing	Distance
OL1	735707.55	1337853.03		
			S 56°05'11"W	1846.14
OL2	734677.51	1336320.95		
			N 45°05'35"W	91.57
OL5	734742.16	1336256.09		
			S 65°50'11"W	783.60
OL6	734421.40	1335541.15		
			N 36°08'56"W	444.50
OL7	734780.33	1335278.95		
			N 67°41'45"E	718.91
OL8	735053.17	1335944.07		
			N 45°05'35"W	49.50
OL3	735088.12	1335909.01		
			N 57°19'42"E	854.55
OL12	735549.42	1336628.35		
			S 32°24'17"E	307.28
OL11	735289.99	1336793.02		
			N 56°03'29"E	816.85
OL10	735746.08	1337470.68		
			N 32°39'46"W	289.17
OL9	735989.52	1337314.62		
			N 57°19'42"E	298.94
OL4	736150.89	1337566.26		
			S 32°53'45"E	528.00
OL1	735707.55	1337853.03		

Total Area 1119466.20 sf 25.69941 acres +/-

ADJOINING PROPERTY OWNER INFORMATION

MAP-BLOCK-PARCEL ACCT ID PREMISE ADDRESS	OWNER NAME MAILING ADDRESS	TITLE REFERENCE
14-15-47 06-014089 New Bachmans Valley Rd	Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidist Arsema 2239 Bachman Valley Road Manchester MD 21102	CLR10625 P343 Agricultural
14-21-150 06-010067 2510 Ebbvale Rd Manchester 21102-1308	Lemmon Kendall L & Lemmon Vicky L 2510 Ebbvale Rd Manchester MD 21102-1308	CLR2825 P583 Agricultural
14-21-344 06-014100 2243 Bachman Valley Rd Manchester 21102-1328	Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidist Arsema 2239 Bachman Valley Rd Manchester MD 21102-1328	CLR9384 P415 Agricultural
14-21-688 06-068774 2245 Bachman Valley Rd Manchester 21102	Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidist Arsema 2239 Bachman Valley Rd Manchester MD 21102-1328	CLR9237 P201 Agricultural
14-15-162 06-005330 Bachmans Valley Rd	Dell Francis Lee & Dell Marian V 2401 Bachman Valley Rd Manchester MD 21102-1325	CLR4061 P227 Agricultural
14-20-458 L12 06-030343 2049 Bachman Valley Rd Manchester 21102-1332	Glover Wilbur W Jr & Glover Doris M 2049 Bachman Valley Rd Manchester MD 21102-1332	CLR766 P402 Agricultural PB19 P2
14-20-668 06-065376 2300 Ebbvale Rd Manchester 21102-1312	Dell Francis Lee L/E Etal 2401 Bachman Valley Rd Manchester MD 21102	CLR8953 P274 Agricultural
14-14-696 06-069290 2128 Bachman Valley Rd Manchester 21102	Dell Matthew Lee 2401 Bachman Valley Rd Manchester MD 21102	CLR9649 P333 Agricultural

PROPERTY OWNER INFORMATION

MAP-BLOCK-PARCEL ACCT ID PREMISE ADDRESS	OWNER NAME MAILING ADDRESS	TITLE REFERENCE ZONING
0014-0021-0079 06-015255 2239 Bachman Valley Rd Manchester 21102-1328	Assegid Tesfaye Mekoya 2239 Bachman Valley Rd Manchester Md 21102-1328	CLR8767 P49 Agricultural

REV.No.	DATE	BY	DESCRIPTION
1	2022-02-23	DRS/jfs	UPDATE ADJOINER INFORMATION
2	2022-03-08	DRS/jfs	PER CLIENT 2022-03-05
3	2022-05-12	DRS/jfs	PER CCBRM/lsfc 2022-05-02
5	2022-09-13	DRS/jfs	NO CHANGE
6	2022-10-19	DRS/jfs	NO CHANGE
7	2022-11-08	DRS/jfs	PER CLIENT 2022-11-07
8	2024-04-02	DRS/jfs	UPDATE PLAN
9	2024-08-09	DRS/jfs	UPDATE PLAN
12	2024-04-14	DRS/jfs	PER CLIENT 2025-04-11

REVISIONS

DRS ASSOCIATES
LAND DESIGN CONSULTANTS
52 WINTERS STREET WESTMINSTER, MARYLAND 21157
410-848-4060 410-876-6040 F. 410-848-8818

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STATE OF MARYLAND · DAVID RICHARD SMITH · 21677 · REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR

DSN: drs	DFT:	CHK: drs	SCALE: 1"=200'

STATE OF MARYLAND · DAVID RICHARD SMITH · 21677 · REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR

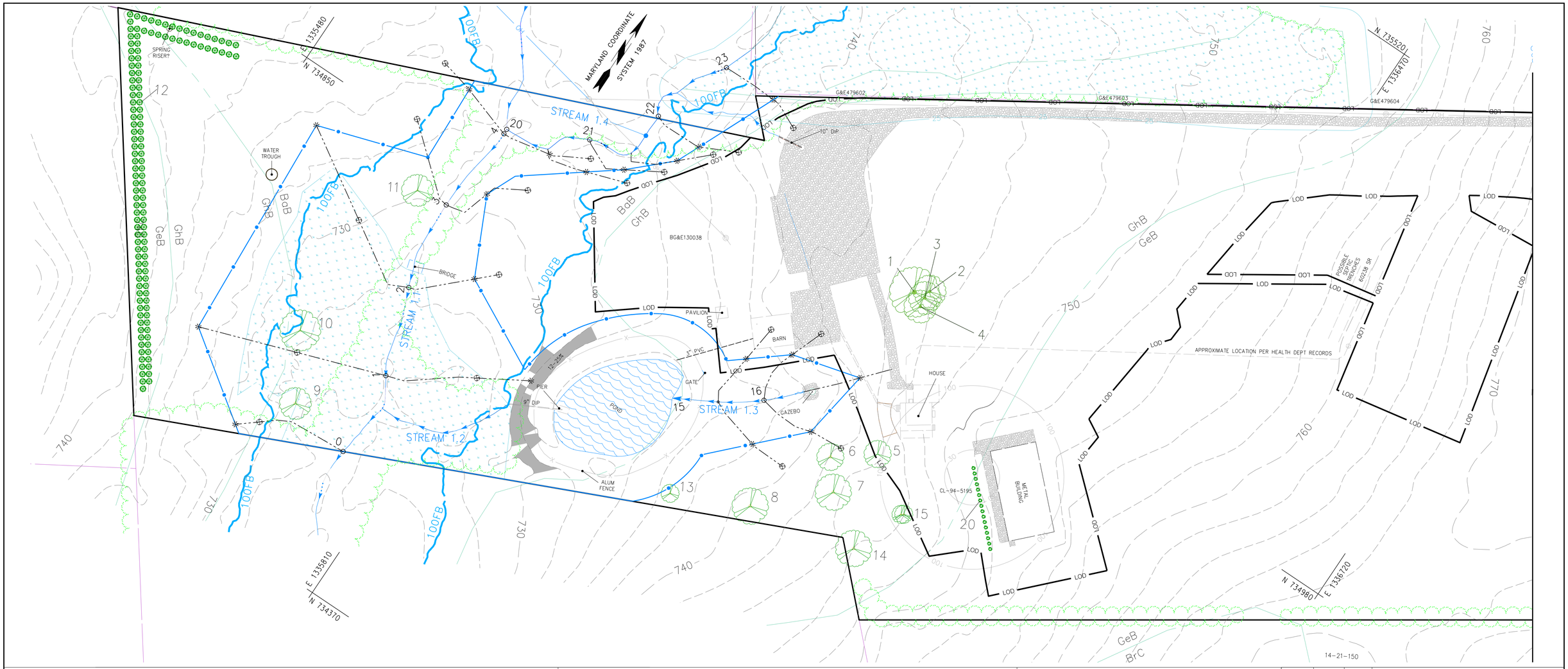
100 0 100 200 300

Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery

SIMPLIFIED FOREST STAND DELINEATION

ON BACHMANS VALLEY ROAD NEAR MANCHESTER
6TH ELECTION DISTRICT CARROLL COUNTY, MD.

DATE: 2021-07-09	CaCoFile S-20-0030	SHEET NO. 80 OF 96

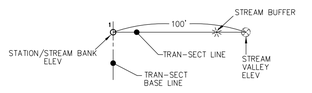


VARIABLE-WIDTH STREAM BUFFER CALCULATIONS

STREAM #1 LEFT BANK								STATION	STREAM #1 RIGHT BANK							
STREAM BUFFER (Ft.)	SLOPES >25% (Ft.)	WETLANDS (Ft.)	ADDITIONAL STREAM VALLEY BUFFER (Ft.)	AVERAGE STREAM VALLEY SLOPE (Ft./100Ft.)	STREAM VALLEY ELEV (Ft.)	STREAM BANK ELEV (Ft.)	MINIMUM BUFFER (Ft.)		MINIMUM BUFFER (Ft.)	STREAM BANK ELEV (Ft.)	STREAM VALLEY ELEV (Ft.)	AVERAGE STREAM VALLEY SLOPE (Ft./100Ft.)	ADDITIONAL STREAM VALLEY BUFFER (Ft.)	WETLANDS (Ft.)	SLOPES >25% (Ft.)	STREAM BUFFER (Ft.)
								Stream 1.1								
126. 35	0. 00	67. 25	9. 10	4. 55	729. 08	724. 53	50. 00	0+00	50. 00							
211. 16	0. 00	157. 36	3. 80	1. 90	727. 82	725. 92	50. 00	1+00	50. 00	725. 92	726. 94	1. 02	2. 04	107. 02	0. 00	159. 06
213. 14	0. 00	158. 22	4. 92	2. 46	730. 12	727. 66	50. 00	2+00	50. 00	727. 66	729. 10	1. 44	2. 88	19. 96	0. 00	72. 84
56. 76	0. 00	0. 00	6. 76	3. 38	732. 78	729. 40	50. 00	3+00	50. 00	729. 40	730. 91	1. 51	3. 02	0. 00	0. 00	53. 02
61. 10	0. 00	0. 00	11. 10	5. 55	735. 53	729. 98	50. 00	4+00	50. 00	729. 98	732. 37	2. 39	4. 78	0. 00	0. 00	54. 78
								Stream 1.3								
58. 06	0. 00	0. 00	8. 06	4. 03	739. 11	735. 08	50. 00	15+50	50. 00	735. 08	739. 68	4. 60	9. 20	0. 00	0. 00	59. 20
61. 18	0. 00	0. 00	11. 18	5. 59	741. 47	735. 88	50. 00	16+00	50. 00	735. 88	742. 11	6. 23	12. 46	0. 00	0. 00	62. 46
63. 46	0. 00	0. 00	13. 46	6. 73	744. 59	737. 86	50. 00	spr inghd								
								Stream 1.4								
								20+50	50. 00	731. 29	733. 32	2. 03	4. 06	0. 00	0. 00	54. 06
								21+00	50. 00	731. 38	734. 37	2. 99	5. 98	0. 00	0. 00	55. 98
								21+50	50. 00	731. 92	736. 99	5. 07	10. 14	0. 00	0. 00	60. 14
								22+00	50. 00	735. 35	738. 59	3. 24	6. 48	0. 00	0. 00	56. 48
								23+00	50. 00	736. 33	742. 25	5. 92	11. 84	0. 00	0. 00	61. 84

WATER RESOURCE MANAGEMENT AREAS LEGEND

AQUIFER RECHARGE AREAS	NONE
Municipal well existing	NONE
Municipal spring existing	NONE
Municipal well proposed	NONE
Municipal Wellhead Protection area	NONE
CARBONATE ROCK AREA	NONE
SURFACE WATERSHED AREA	ENTIRE PROPERTY
SURFACE WATER MANAGEMENT ZONE	NONE
2500 Reservoir Buffer	NONE
5000 Upstream radius to water intake	NONE
3000 Upstream radius to water intake	NONE
Stream Buffer	3.77449 Ac



STREAM BUFFER, TRANS-SECT LINE LEGEND

FOREST STAND NARRATIVE

Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery (church property) is 25.66941 acres on the south side of Bachmans Valley Road (Maryland Route 496), approximately 4,700 feet from the intersection of Bachmans Valley Road and Hanover Pike (Maryland Route 30), as shown on Carroll County Tax Map 14 Grid 21 Parcel 79. The church property is rectangular in shape, oriented in a east-west direction with a small stand of forest on the west side. Access to the property is provided by a 1,900 foot long right of way from the property to the publicly maintained Bachmans Valley Road. The church property is a mixed land use of crop production and church/monastery, both of these are principal permitted use in the Agricultural District. Adjoining land uses are cropland on the north, east, and south sides with residential on the west side. Drainage areas are split with the east side draining to Big Pipe Creek and the west side draining to unnamed tributary to Big Pipe Creek, both stream use IV-P, within the Double Pipe Creek watershed, and not shown on the FEMA Flood Insurance Rate Map 24013C0095D, effective 10/02/2015. The property has a high point on the east side of the northern boundary of 781 and a low point in the stream on the west side of the southern boundary of 725 with the drainage divide running in a north-south line splitting the property 1/3 east and 2/3 west. There is a 0.25 acre pond on the west side of the west drainage area and discharges into forested area which the unnamed tributary flows through, furthermore, there are approximately 1.28 acres of wetlands on the west side of the property. The soils are Baile, Glenelg and Glenville series with the east drainage area being mostly hydrologic soil group B with some C/D on the south side and the west drainage area being mostly hydrologic soil group C/D with some B on the eastern portion. There are two larger forested areas which total 1.15540 acres of existing on site forest on the west side of the property, connected by a thin forested area along the unnamed tributary running through the property. Red Maple is the dominant species of the early to mid successional stage forested area with scattered Black Walnut and Sycamore. There are seven isolated Red Maple specimen trees on the west side of the property, around the existing house and farm buildings, three south of the house and four in a group to the north of the house. An additional Red Maple specimen tree located in the edge of the existing forest. The location of the existing forest along the perennial stream crossing the property is a Priority area 1 or High priority for forest retention as are the isolated specimen trees.

CANDIDATE SPECIMEN TREE LEGEND

TREE ID	SIZE AND SPECIES OF TREE	CONDITION	COMMENTS
1	55" Red Maple	fair condition	
2	35" Red Maple	fair condition	Multi Trunk
3	36" Red Maple	fair condition	
4	36" Red Maple	fair condition	Multi Trunk
5		dead	
6	34" Red Maple	fair condition	Broken Branches
7	30" Red Maple	poor condition	Half Dead
8	36" Red Maple	fair condition	
9	36" Red Maple	poor condition	

FOREST STAND LEGEND

Ex. Stream
Ex. Soils
Ex. Forest
Ex. 100 Yr. Floodplain
Ex. Wetlands
Ex. Rock Outcrop
Slopes Greater than 25%
Ex. Guardrail
Ex. Fenceline
Ex. Zoning Line
Ex. Municipal Boundary
Ex. Structure
Ex. Utility Pole w/Guy Wire
Existing Utility Pole
Ex. Water Line
Ex. Storm drain
Ex. Sewer
Ex. Overhead Lines
Forest Stand Division
Forest Stand Identification

Ex. Spring
Ex. Shrub
Ex. Individual Tree (Coniferous)
Ex. Individual Tree (Deciduous)
Ex. Specimen Candidate Tree
K>0.35 with slopes >15%
Slopes 15% - 25%
Ex. Pole Light
Ex. Well
Ex. Dry Hole
Ex. Clean Out
Ex. Electric Transformer
Ex. Mail Box
Ex. Sign
Ex. Telephone Pedestal
Ex. Cable Marker
Forest Sample Point
Ex. Land Use (LAND USE)

REV.No.	DATE	BY	DESCRIPTION
1	2022-02-23	DRS/jfs	UPDATE ADJOINER INFORMATION
2	2022-03-08	DRS/jfs	PER CLIENT 2022-03-05
3	2022-05-12	DRS/jfs	PER CCBRM/lsfc 2022-05-02
5	2022-09-13	DRS/jfs	NO CHANGE
6	2022-10-19	DRS/jfs	PER CCBRM/wrm 2022-10-14
7	2022-11-08	DRS/jfs	PER CLIENT 2022-11-07
8	2024-04-02	DRS/jfs	UPDATE PLAN
9	2024-08-09	DRS/jfs	UPDATE PLAN
11	2024-09-18	DRS/jfs	PER CCBRM/wrm 2024-09-18
12	2024-04-14	DRS/jfs	PER CLIENT 2025-04-11

REVISIONS

DRS ASSOCIATES
LAND DESIGN CONSULTANTS
52 WINTERS STREET WESTMINSTER, MARYLAND 21157
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STATE OF MARYLAND — DANIEL RICHARD SCHWARTZ — No. 10731 — REGISTERED PROFESSIONAL LAND SURVEYOR

DSN: drs | DFT: | CHK: drs | SCALE: 1"=50' (25 0 25 50 75)

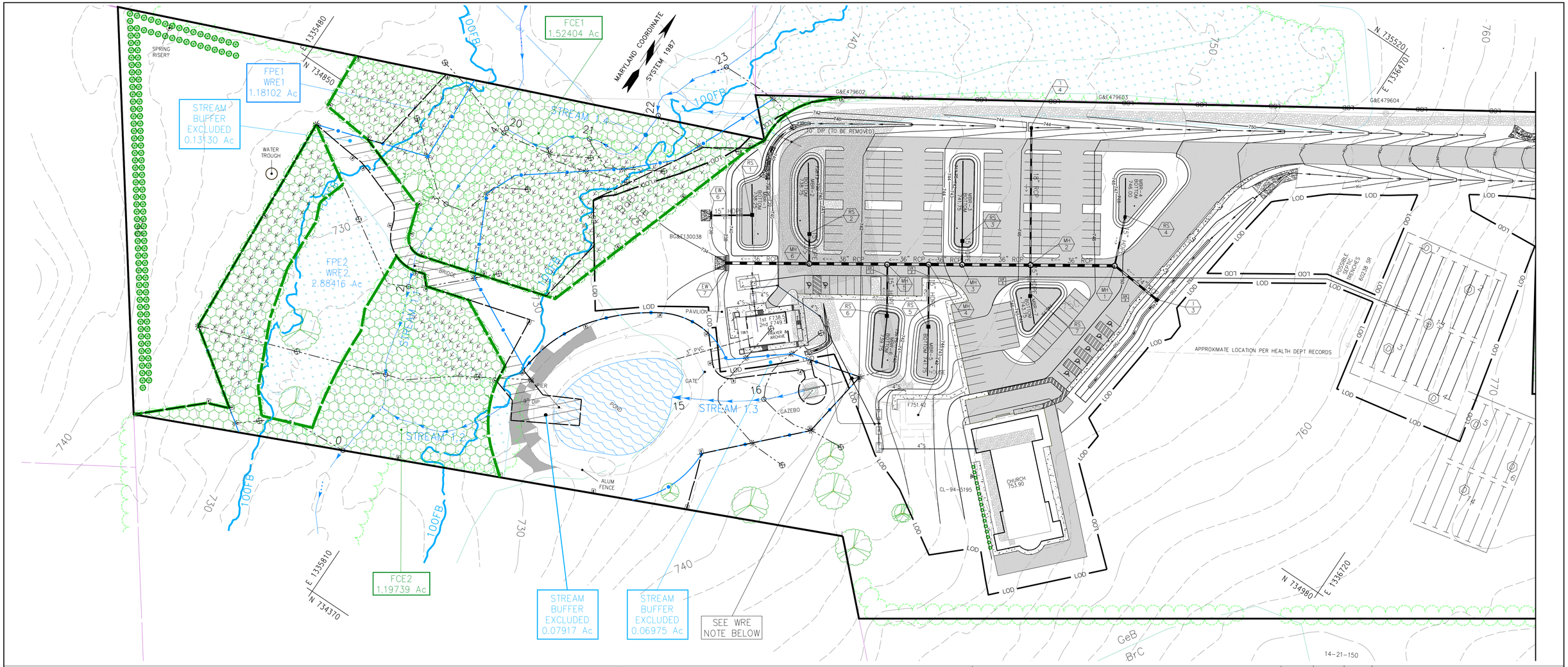
Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery
SIMPLIFIED
FOREST STAND DELINEATION

ON BACHMANS VALLEY ROAD NEAR MANCHESTER
6TH ELECTION DISTRICT CARROLL COUNTY, MD.

DATE: 2021-07-09 | CaCoFile S-20-0030 | SHEET NO. 81 OF 96

STATE OF MARYLAND — MARK WILLIAM PUGH — LICENSED PROFESSIONAL ENGINEER

14-21-150

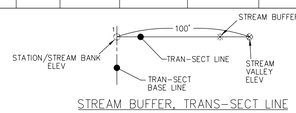


VARIABLE-WIDTH STREAM BUFFER CALCULATIONS

STREAM #1 LEFT BANK									STATION	STREAM #1 RIGHT BANK								
STREAM BUFFER (Ft.)	LENGTH EXCLUDED	SLOPES >25% (Ft.)	WETLANDS (Ft.)	ADDITIONAL STREAM VALLEY BUFFER (Ft.)	AVERAGE STREAM VALLEY SLOPE (Ft./100Ft.)	STREAM VALLEY ELEV (Ft.)	STREAM BANK ELEV (Ft.)	MINIMUM BUFFER (Ft.)		MINIMUM BUFFER (Ft.)	STREAM BANK ELEV (Ft.)	STREAM VALLEY ELEV (Ft.)	AVERAGE STREAM VALLEY SLOPE (Ft./100Ft.)	ADDITIONAL STREAM VALLEY BUFFER (Ft.)	WETLANDS (Ft.)	SLOPES >25% (Ft.)	LENGTH EXCLUDED	STREAM BUFFER (Ft.)
									Stream 1.1									
126.35		0.00	67.25	9.10	4.55	729.08	724.53	50.00	0+00	50.00								
211.16		0.00	157.36	3.80	1.90	727.82	725.92	50.00	1+00	50.00	725.92	726.94	1.02	2.04	107.02	0.00		59.06
213.14		0.00	158.22	4.92	2.46	730.12	727.66	50.00	2+00	50.00	727.66	729.10	1.44	2.88	19.96	0.00	52.91	19.93
56.76		0.00	0.00	6.76	3.38	732.78	729.40	50.00	3+00	50.00	729.40	730.91	1.51	3.02	0.00	0.00		53.02
61.10		0.00	0.00	11.10	5.55	735.53	729.98	50.00	4+00	50.00	729.98	732.37	2.39	4.78	0.00	0.00		54.78
									Stream 1.3									
28.43	29.63	0.00	0.00	8.06	4.03	739.11	735.08	50.00	15+50	50.00	735.08	739.68	4.60	9.20	0.00	0.00		59.20
29.18	32.00	0.00	0.00	11.18	5.59	741.47	735.88	50.00	16+00	50.00	735.88	742.11	6.23	12.46	0.00	0.00		62.46
63.46		0.00	0.00	13.46	6.73	744.59	737.86	50.00	spr:righd									
									Stream 1.4									
									20+50	50.00	731.29	733.32	2.03	4.06	0.00	0.00		54.06
									21+00	50.00	731.38	734.37	2.99	5.98	0.00	0.00		55.98
									21+50	50.00	731.92	736.99	5.07	10.14	0.00	0.00		60.14
									22+00	50.00	735.35	738.59	3.24	6.48	0.00	0.00		56.48
									23+00	50.00	736.33	742.25	5.92	11.84	0.00	0.00		61.84

WATER RESOURCE MANAGEMENT AREAS LEGEND

AQUIFER RECHARGE AREAS	NONE
Municipal well existing	NONE
Municipal spring existing	NONE
Municipal well proposed	NONE
Municipal Wellhead Protection area	NONE
CARBONATE ROCK AREA	NONE
SURFACE WATERSHED AREA	ENTIRE PROPERTY
SURFACE WATER MANAGEMENT ZONE	NONE
2500 Reservoir Buffer	NONE
5000 Upstream radius to water intake	NONE
3000 Upstream radius to water intake	NONE
Stream Buffer Area	3.77449 Ac
Stream Buffer Excluded Area	0.28022 Ac
Stream Buffer W/in Water Resource Easement	3.49427 Ac



STREAM BUFFER, TRANS-SECT LINE LEGEND

WATER RESOURCE EASEMENT DISTURBANCE

A area of disturbance within the Water Resource Easement is proposed on the east side of the pond. The septic line from the septic tank to the pump tank crosses a corner of the Water Resource Easement and could not be avoided. Setback from septic components, to infiltration facilities, Micro-Bioretention, is 25 feet. The plan is to open cut the 1.3+/- feet of trench and install the 4" PVC pipe and backfill. Stabilization of disturbed area will be completed in accordance with specifications as shown on sheet 57.

General Note

1. Owner: Tesfaye Mekoya Assegid
   County Land Record #767 Page 49
   2017-July-31
   Grantor: Ms Sara Gebru and Ms Woleba Getachew
2. Developer: Tesfaye Mekoya Assegid
   2239 Bachman Valley Rd
   Manchester, MD 21102
   410-568-5791
3. Map 14, Block 21, Parcel 79
4. Zoning District: Agricultural
5. National Flood Insurance Rate: Map 240015 0050 B
6. The topography shown hereon was field run by D.R.S. & Associates and supplemented with flown by Carroll County and based on Bare Earth LIDAR Data Spring 2006 NAVD88 U.S.Feet.
7. The horizontal datum shown hereon is based on Maryland Coordinate System of 1987 U.S.Feet.
8. Total area of property: 25.69941 Ac
9. There are no Tier II Waters on site.
10. The area shown hereon as a Forrested Water Resource Easement shall be granted to the Carroll County Commissioners by deed intended to be recorded simultaneously herewith or intended to be recorded prior to issuance of permits if no plat.
11. The area shown hereon as a Water Resource Easement shall be granted to the Carroll County Commissioners by deed intended to be recorded simultaneously herewith or intended to be recorded prior to issuance of permits if no plat.
12. The area shown hereon as a Forest Conservation Easement shall be granted to the Carroll County Commissioners by deed intended to be recorded simultaneously herewith or intended to be recorded prior to issuance of permits if no plat.
13. The area shown hereon as a Floodplain Easement shall be granted to the Carroll County Commissioners by deed intended to be recorded simultaneously herewith or intended to be recorded prior to issuance of permits if no plat.

	Existing	Proposed		Existing	Proposed
Cable Marker			Mail Box		
Clean Out, Sewer/Drain			Pole Light		
Coniferous Tree			Shrub		
Deciduous Tree			Sign		
Discharge Flow (to swale,ditch,waterway)			Forest Conservation Easement Sign		
Dry Well			Specimen Candidate Tree		
Electric Transformer			Spring		
Forest Conservation Plantings			Structure		
Inlet			Telephone Pedestal		
			Utility Pole		
			Utility Pole w/Guy Wire		
			Well		

LEGEND

Existing	Proposed
Center Line Rd	Center Line Rd
Easement	Easement
Electric — E —	Electric — E —
Edge of Rd	Edge of Rd
Edge of Shoulder	Edge of Shoulder
Feature separation distance in feet	Feature separation distance in feet
Fenceline — X —	Fenceline — X —
Flood Boundry 100 Yr.	
Forest	Forest
Flow Line(Swale,Ditch,Waterway)	Flow Line(Swale,Ditch,Waterway)
Guardrail	Guardrail
Index Contours — 410 —	Index Contours — 760 —
Intermediate Contours	Intermediate Contours
Limits of Disturbance — LOD —	Limits of Disturbance — LOD —
Lot Line	Lot Line
Overhead Lines — OH —	Overhead Lines — OH —
Right-Of-Way Line	Right-Of-Way Line
Septic Area	Septic Area
Set Back Line	Set Back Line
Sewer Line	Sewer Line
Soil Type	
Storm Drain Line	Storm Drain Line
Stream	
Stream Intermittent	
Stream Buffer	
Telephone — T —	Telephone — T —
Tree Protection Fence	Tree Protection Fence
Water Line — W —	Water Line
Bit. Conc. Pav.	Bit. Conc. Pav.
Concrete	Concrete
Forest Conservation Easement	Forest Conservation Easement
Rip-Rap/Gravel	Rip-Rap/Gravel
Septic Area	Septic Area
Wetlands	

REV.No.	DATE	BY	DESCRIPTION
1	2021-03-04	DRS/jfs	UPDATE PER CLIENT 2022-01-18
2	2021-03-08	DRS/jfs	PER CLIENT 2022-03-05
3	2022-05-06	DRS/jfs	PER CCBRM/wrm 2022-03-23
4	2022-05-12	DRS/jfs	PER CCBRM/lsfc 2022-05-02 & CCBRM/lsfc 2022-08-05
5	2022-09-13	DRS/jfs	PER CCBRM/lsfc 2022-08-05, CCBRM/wrm 2022-07-29 & PER CLIENT 2022-09-13
6	2022-10-19	DRS/jfs	PER CCBRM/wrm 2022-10-14
7	2022-11-08	DRS/jfs	PER CLIENT 2022-11-07
8	2024-04-02	DRS/jfs	PER CCBRM/lsfc 2024-01-04 & UPDATE PLAN PER CLIENT
9	2024-08-09	DRS/jfs	UPDATE PLAN
11	2024-09-18	DRS/jfs	PER CCBRM/wrm 2024-09-18
12	2025-04-14	DRS/jfs	PER CLIENT 2025-04-11

REVISIONS

DRS ASSOCIATES
LAND DESIGN CONSULTANTS
52 WINTERS STREET WESTMINSTER, MARYLAND 21157
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STATE OF MARYLAND — RICHARD — 10738 — REGISTERED PROFESSIONAL LAND SURVEYOR

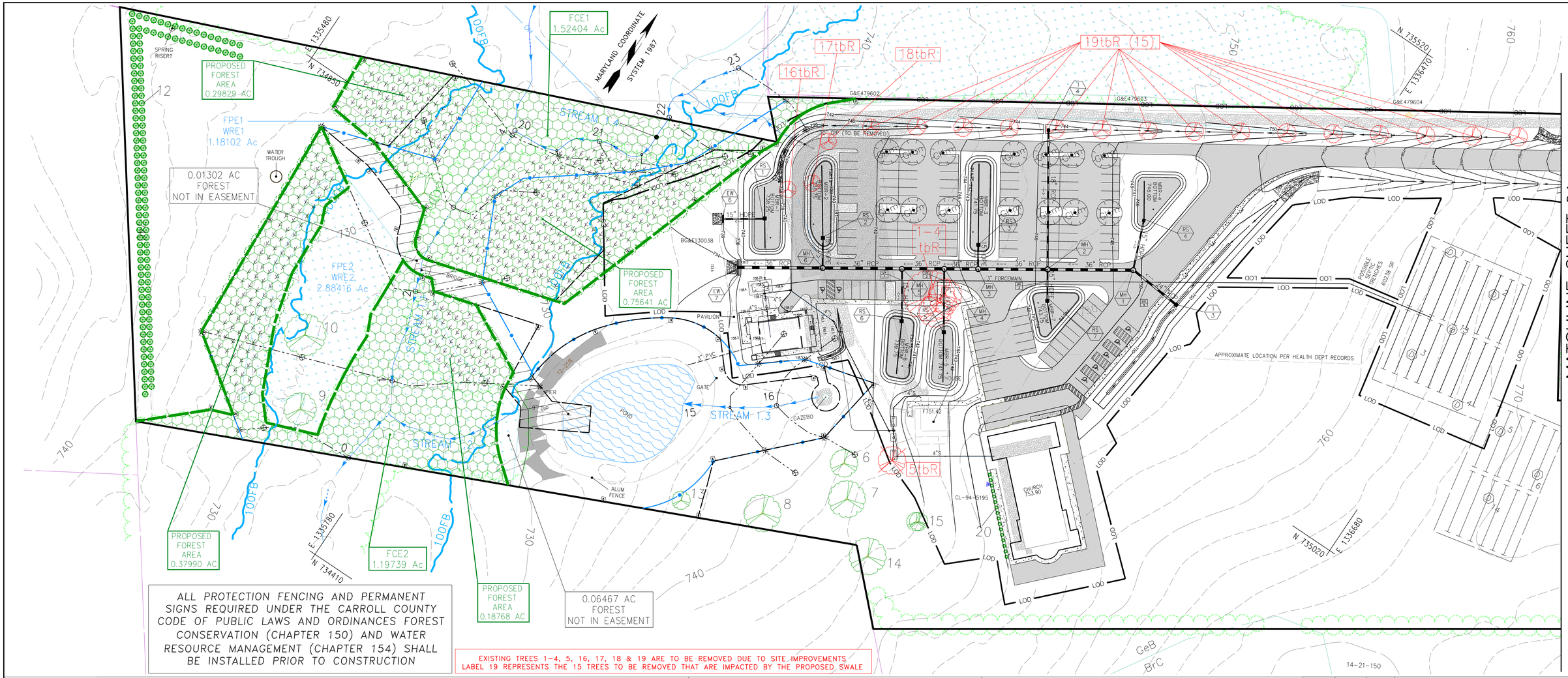
DSN:drs | DFT: | CHK:drs | SCALE: 1"=50' (25 0 25 50 75)

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidst Arsema Andinet Monastery

EASEMENT PLAN

FOREST CONSERVATION, WATER RESOURCE PROTECTION & FLOODPLAIN EASEMENTS

DATE: 2021-08-26 | CaCoFile S-20-0030 | SHEET NO. 82 OF 96



ALL PROTECTION FENCING AND PERMANENT SIGNS REQUIRED UNDER THE CARROLL COUNTY CODE OF PUBLIC LAWS AND ORDINANCES FOREST CONSERVATION (CHAPTER 150) AND WATER RESOURCE MANAGEMENT (CHAPTER 154) SHALL BE INSTALLED PRIOR TO CONSTRUCTION

EXISTING TREES 1-4, 5, 16, 17, 18 & 19 ARE TO BE REMOVED DUE TO SITE IMPROVEMENTS
LABEL 19 REPRESENTS THE 15 TREES TO BE REMOVED THAT ARE IMPACTED BY THE PROPOSED SWALE

LEGEND

	Existing	Proposed
Cable Marker		
Clean Out, Sewer/Drain		
Coniferous Tree		
Deciduous Tree		
Discharge Flow (to swale,ditch,waterway)		
Dry Well		
Electric Transformer		
Forest Conservation Plantings		
Inlet		

	Existing	Proposed
Mail Box		
Pole Light		
Shrub		
Sign		
Forest Conservation Easement Sign		
Specimen Candidate Tree		
Spring		
Structure		
Telephone Pedestal		
Utility Pole		
Utility Pole w/Guy Wire		
Well		

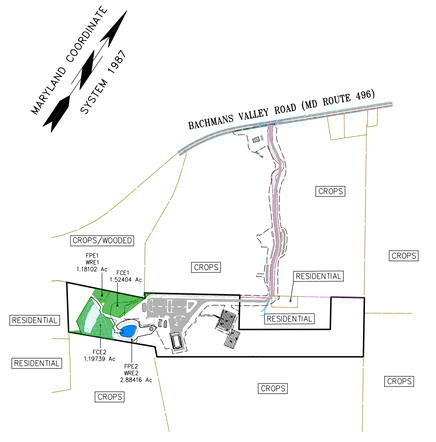
Existing	Proposed
Center Line Rd	Center Line Rd
Easement	Easement
Electric	Electric
Edge of Rd	Edge of Rd
Edge of Shoulder	Edge of Shoulder
Feature separation	Feature separation
distance in feet	distance in feet
Fenceline	Fenceline
Flood Boundry 100 Yr.	Forest
Forest	Flow Line(Swale,Ditch,Waterway)
Flow Line(Swale,Ditch,Waterway)	Guardrail
Guardrail	Index Contours
Index Contours	Intermediate Contours
Intermediate Contours	Limits of Disturbance
Limits of Disturbance	Lot Line
Lot Line	Overhead Lines
Overhead Lines	Right-Of-Way Line
Right-Of-Way Line	Septic Area
Septic Area	Set Back Line
Set Back Line	Sewer Line
Sewer Line	Storm Drain Line
Soil Type	Telephone
Storm Drain Line	Tree Protection Fence
Stream	Water Line
Stream Intermittent	
Stream Buffer	
Telephone	
Tree Protection Fence	
Water Line	
Bit. Conc. Pav.	Bit. Conc. Pav.
Concrete	Concrete
Forest Conservation Easement	Forest Conservation Easement
Rip-Rap/Gravel	Rip-Rap/Gravel
Septic Area	Septic Area
Wetlands	

FOREST CONSERVATION NARRATIVE

Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery (church property) is 25.69941 acres on the south side of Bachmans Valley Road (Maryland Route 496), approximately 4,700 feet from the intersection of Bachmans Valley Road and Hanover Pike (Maryland Route 30), as shown on Carroll County Tax Map 14 Grid 21 Parcel 79. Access to the property is provided by a 1,900 foot long right of way from the property to the publicly maintained, Bachmans Valley Road. The Net Tract Area is the Limits of Disturbance area (12.32327 acres) plus the existing forest area (1.15540 acres), which equals 13.47867 Ac. The afforestation threshold for institutional purposes is 15% of the net tract or a forested area of 2.02180 acres. There is no existing forest within the limits of disturbance. Afforestation planting will be utilized to address Chapter 150 of Carroll County Code by protecting 1.07771 acres of the existing on site forest which will be retained in an easement and planting 0.94409 acres of forest adjacent to the existing forested areas for a total of 2.02180 acres of protected forest resources.

CANDIDATE SPECIMEN TREE LEGEND

TREE ID	SIZE AND SPECIES OF TREE	CONDITION	COMMENTS
1	55" Red Maple	fair condition	Multi Trunk tbR
2	36" Red Maple	fair condition	Multi Trunk tbR
3	36" Red Maple	fair condition	Multi Trunk tbR
4	36" Red Maple	fair condition	Multi Trunk tbR
5		dead	tbR
6	34" Red Maple	fair condition	Broken Branches
7	30" Red Maple	poor condition	Half Dead
8	36" Red Maple	fair condition	
9	36" Red Maple	poor condition	



KEY MAP
SCALE: 1"=600'

REV.No.	DATE	BY	DESCRIPTION
1	2021-03-04	DRS/jfs	UPDATE PER CLIENT 2022-01-18
2	2021-03-08	DRS/jfs	PER CLIENT 2022-03-05
4	2022-05-12	DRS/jfs	PER CCBRM/lsfc 2022-05-02
5	2022-09-13	DRS/jfs	PER CCBRM/lsfc 2022-08-05, CCBRM/wrm 2022-07-29 & PER CLIENT 2022-09-13
6	2022-10-19	DRS/jfs	PER CCBRM/wrm 2022-10-14, CCBRM/lsfc 2022-10-18
7	2022-11-08	DRS/jfs	PER CLIENT 2022-11-07
8	2024-04-02	DRS/jfs	PER CCBRM/lsfc 2024-01-04 & UPDATE PLAN PER CLIENT
9	2024-08-09	DRS/jfs	UPDATE PLAN
10	2024-09-06	DRS/jfs	PER CCBRM/lsfc 2024-09-06
11	2024-09-18	DRS/jfs	PER CCBRM/wrm 2024-09-18
12	2025-04-14	DRS/jfs	PER CLIENT 2025-04-11

REVISIONS

DRS ASSOCIATES
LAND DESIGN CONSULTANTS
52 WINTERS STREET WESTMINSTER, MARYLAND 21157
410-848-4060 410-876-6040 F. 410-848-8818

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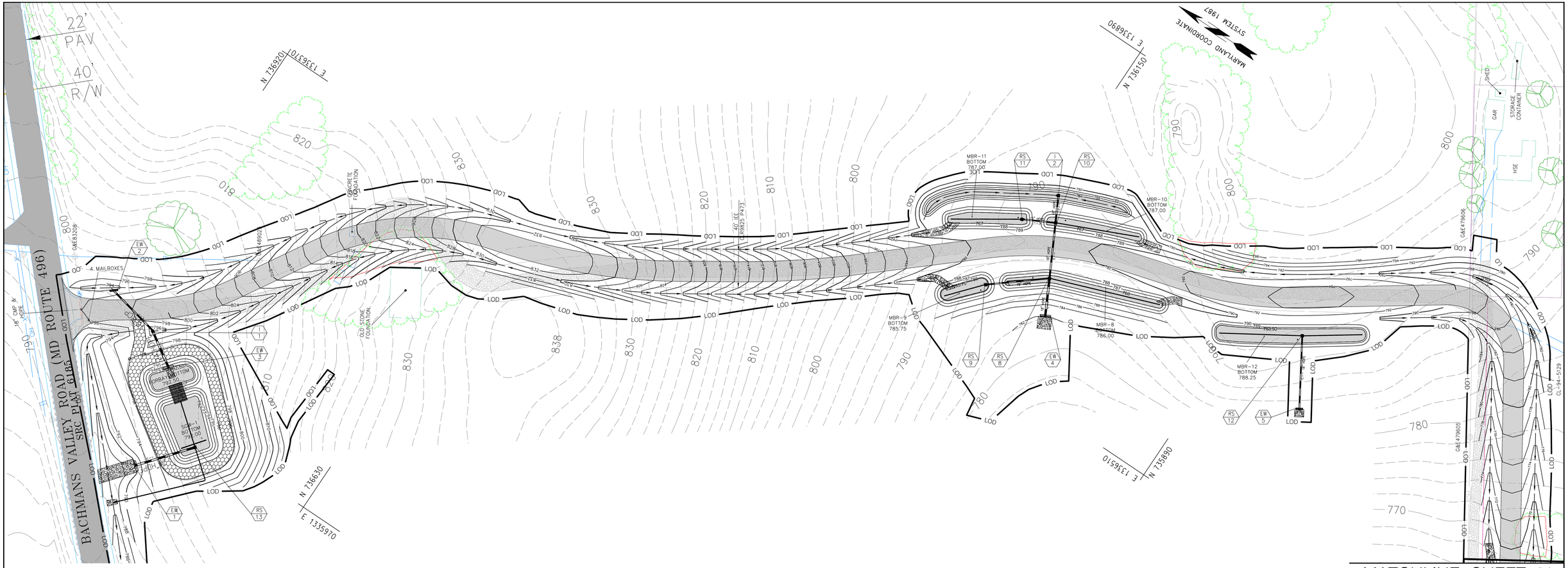
STATE OF MARYLAND JEFFREY F. SCHNEIDER No. 21401 PROFESSIONAL ENGINEER

DSN: drs	DFT:	CHK: drs	SCALE: 1"=50'	25 0 25 50 75

Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery

LANDSCAPE & FOREST CONSERVATION PLAN

DATE: 2021-08-26	CaCoFile S-20-0030	SHEET NO. 83 OF 96



MATCHLINE SHEET 83

REV.No.	DATE	BY	DESCRIPTION
1	2021-03-04	DRS/jfs	UPDATE PER CLIENT 2022-01-18
2	2021-03-08	DRS/jfs	PER CLIENT 2022-03-05
4	2022-05-12	DRS/jfs	PER CCBRM/lsfc 2022-05-02
5	2022-09-13	DRS/jfs	PER CCBRM/lsfc 2022-08-05, CCBRM/wrm 2022-07-29 & PER CLIENT 2022-09-13
6	2022-10-19	DRS/jfs	NO CHANGE
7	2022-11-08	DRS/jfs	PER CLIENT 2022-11-07
8	2024-04-02	DRS/jfs	PER CCBRM/lsfc 2024-01-04 & UPDATE PLAN PER CLIENT
9	2024-08-09	DRS/jfs	UPDATE PLAN
10	2024-09-06	DRS/jfs	NO CHANGE
12	2024-04-14	DRS/jfs	PER CLIENT 2025-04-11

REVISIONS

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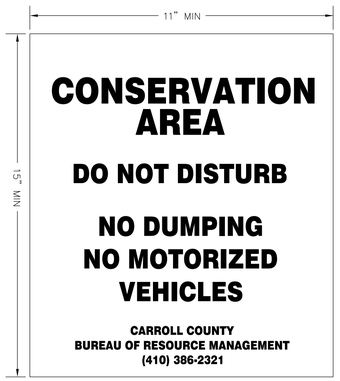
STATE OF MARYLAND MARK A. HURT CERTIFIED PROFESSIONAL ENGINEER

DSN: drs | DFT: | CHK: drs | SCALE: 1"=50' 25 0 25 50 75

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidst Arsema Andinet Monastery

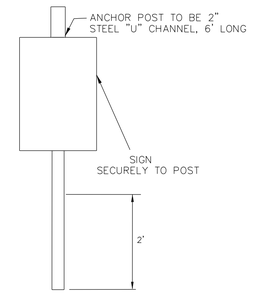
LANDSCAPE & FOREST CONSERVATION PLAN

DATE: 2021-08-26 | CaCoFile S-20-0030 | SHEET NO. 84 OF 96



CONSERVATION AREA SIGNAGE DETAIL
NOT TO SCALE

Total number of signs: 43 signs required



1. Avoid root damage when placing anchor post.
2. Device should be properly maintained.
3. Post to be placed at 100' intervals max.
4. Number of signs required = 42

AREA SIGNAGE AND POST DETAIL
PERMANENT CONSERVATION

PROPOSED FOREST PLANTING ANAYLSIS

Proposed Forest Area	1.62228 Ac
Proposed Forest Setback Area	−0.50914 Ac
Proposed Forest Planted Area	=1.11314 Ac
Proposed Tree Shelters (302 trees per acre)	=337 trees
Proposed Tree without Shelters (436 trees per acre)	=486 trees

FOREST CONSERVATION EASEMENT
Forest Planting Information

Landowner's Objectives: To satisfy the requirements of Chapter 150 Forest Conservation Ordinance.

Property Overview: The planting area is located in the south western corner of the property. The area is adjacent to the existing forest and wetlands.

Soils Information: The soils within the proposed area are classified as:
BaB Baile Silt Loam, 3 to 8% slopes
GeB Glenelg Channery Loam, 3 to 8% slopes
GhB Glenville Silt Loam, 3 to 8% slopes

Existing Cover: A mixture of wetlands, brush area and open field.

Planting Recommendations:

Easement Area Acreage Provided: FCE 1 =1.52404 Ac, FCE 2 =1.19739 Ac, Total =2.72143 Ac

Tree Planting Spacing: 10' x 10' and 12' x 12'

Forest Area Required: 1.61802 Ac
Forest Area Provided: 1.62228 Ac
Forest Planted Area : 1.11314 Ac
(Subtracting Setback)

Minimum Number of Trees Required: Trees With Shelter at 12' x 12' spacing = 302 Trees/Ac
1.11314 Ac x 302 Trees/Ac = 337 Trees

Trees Without Shelter at 10' x 10' spacing = 436 Trees/Ac
1.11314 Ac x 436 Trees/Ac = 486 Trees

Plants: 9 species; 2 mesic wet species, 3 mesic species 4 wet species

Plant Material Size: 2'-0" bare root whips

Planting Method: Machine or Hand Planted

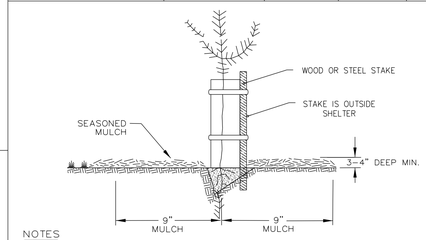
Planting Instructions:
Trees will be planted in straight rows on 10' x 10' or 12' x 12' spacing. The entire area will be planted with a random mix of tree species and shrubs.

Site Preparation:
The entire area should be mowed before planting is done. The area is thick with choke cherry it should be removed by spot spraying of chemicals. Recommendation for the chemicals to be used can be obtained from the MD Dept. of Agriculture – Extension Service.

Maintenance:
Spot spray with recommended herbicide to eliminate competing vegetation, noxious and nuisance weeds as needed. Competing vegetation will need to be controlled for a minimum of three years. Replace bare root whips that die to maintain a stocking level of 75% Survival check should be done during the second growing season The shelters should be removed within five years or as needed.

Trees Required

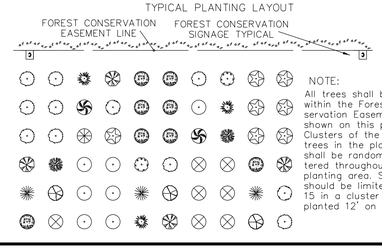
Species Scientific Name	Common Name	Condition	Quantity W/Shelter	Quantity W Out/Shelter
Acer Rubrum	Red Maple	Mesic/Wet	33	52
Cercis Canadensis	Eastern Redbud	Mesic	40	54
Fagus Grandifolia	American Beech	Mesic	40	55
Liriodendron Tulipifera	Yellow Poplar	Mesic	40	55
Quercus Palustris	Pin Oak	Mesic/Wet	38	52
Vaccinium Corymbosum	Highbush Blueberry	Mesic	40	57
Platanus Occidentalis	American Sycamore	Wet	33	57
Salis Nigra	Black Willow	wet	40	52
Cephananthus Occientalis	Buttonbush	Wet	33	52
TOTAL			337	486



NOTES
1. Care shall be taken so that whip is not planted to deeply. Plant at the same or slightly higher than the ground line of the nursery.
2. Slip the shelter over the plant.
3. Install the stake on the outside of the shelter.
4. Wrap 1–2 times around the outside top of the shelter and stake with:
UV protected outdoor tape as a tie
A 4 foot shelter will need a second tie at the middle of the shelter.
5. Mound soil 3–4" high around the base of the shelter.

BAREROOT WHIP W/ SHELTER PLANTING DETAIL
NOT TO SCALE

TYPICAL PLANTING LAYOUT



NOTE:
All trees shall be planted within the Forest Conservation Easement as shown on this plan. Clusters of the same trees in the plant list shall be randomly scattered throughout the planting area. Species should be limited to 5–15 in a cluster and planted 12' on center.

FOREST CONSERVATION NARRATIVE

Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery is a religious establishment in the Agricultural District on the south side of Bachmans Valley Road (Maryland Route 496), approximately 4,700 feet from the intersection of Bachmans Valley Road and Hanover Pike (Maryland Route 30), as shown on Carroll County Tax Map 14 Grid 21 Parcel 79.

1. PURPOSE:
The purpose of this Forest Conservation Plan is to address Site Plan requirements of Chapter 150 Code of Carroll County, Maryland.

2. DETERMINATION OF FOREST REQUIREMENTS:
A mixed use of crop production and religious establishment in the Agricultural District. The property is 25.69941 acres. The limits of disturbance is 12.32327 acres. There is a total of 1.15540 acres of existing on site forest, out of which 1.07771 acres will be retained within a forest conservation easement. The Net Tract Area is the Limit of Disturbance (12.32327 acres) plus the existing forest area (1.15540 acres), which equals 13.47867 acres. There is no forest clearing due to the project. The minimum threshold required is 20% of the net tract area or 2.69573 acres. The minimum forest threshold of 2.69573 acres less the area of existing forest within the easement (1.07771 acres) is 1.61802 acres. Hence, 1.61802 acres of on site planting is required to address afforesatation requirements. With no forest clearing proposed, there is no reforestation requirement.

3. IDENTIFICATION AND LOCATION OF AREA TO BE FORESTED:
The developer has chosen to plant the required 1.61802 acres in an area adjacent to the existing forested area and along the perennial stream to provide a buffer and enhance water quality to the unnamed tributary of Big Pipe Creek. The actual proposed forest area is 1.62228 acre, which is 0.00426 acre more than the required.

4. METHOD OF FORESTATION:
Retention of 1.15540 acres of existing forest (1.07771 acres of which will be retained within forest conservation easement) and on site planting of 1.62228 acres of forest to meet the afforestation requirements are proposed.

5. POST CONSTRUCTION MANAGEMENT & LONG–TERM PROTECTION:
A Forest Conservation Easement (FCE) will be deeded to Carroll County Commissioners and recorded among the Land Records of Carroll County for long term protection of forest resources. Additionally, when warranted by damage to the retention area during construction, the following may be required: stress reduction measures including root pruning, crown reduction or pruning, watering, fertilizing, mulching, and tree or limb removal or replacement planting.

FOREST CONSERVATION WORKSHEET

A. Area of Forest Clearing:	0.00000 Ac
B. Area Reforestation Required:	0.00000 Ac
(Forest which is cut or cleared, measured to the nearest one–tenth acre, shall be reforested at at ratio of one acre planted or blanket for every one acre of forest removed.)	
Area LOD	12.32327 Ac
Ex Forest	1.15540 Ac
C. Area Net Tract:	13.47867 Ac
D. Area of Threshold (20%)	2.69573 Ac
E. Area of Forest in Easement:	1.07771 Ac
F. Area of Forest to be Retained (E–A=):	1.07771 Ac
G. Area of Forest Credit (B+F):	1.07771 Ac
H. Afforestation Required (D–G):	1.61802 Ac
(Afforestation may be addressed by retaining in an forest easement that is within the net tract area, planting, or banking. If H<0, no afforestation is required.)	

"This plan is in compliance with the requirements of the Code of of Carroll County Chapter 150 Forest Conservation. Any disturbance beyond those limits delineated on this plan may require the developer or lot owner to address the penalties and or requirements of Carroll County Chapter 150."

EXISTING PLANTING SCHEDULE

ID	QUANTITY	COMMON NAME	SIZE	COMMENTS	CATEGORY	PLANTING UNITS
1	1	Red Maple	55"		Major	tbR
2	1	Red Maple	36"	Multi Trunk	Major	tbR
3	1	Red Maple	36"		Major	tbR
4	1	Red Maple	36"	Multi Trunk	Major	tbR
5	1					tbR
6	1	Red Maple	34"	Broken Branches	Major	1
7	1	Red Maple	30"	Half Dead	Major	1
8	1	Red Maple	36"		Major	1
9	1	Red Maple	36"		Major	1
10	1	Sycamore	24"		Major	1
11	1	Sycamore	20"		Major	1
12	130	Leyland Cypress	2"		Minor	.5
13	1	Wild Cherry	21"		Minor	.5
14	1	Silver Maple	17.5"		Major	1
15	2	Holly Trees	15"		Minor	1
16	1					tbR
17	1					tbR
18	1					tbR
19	15	Bradford Pear	12.5"		Minor	tbR
20	16	Arborvitae			Shrub	3.2

TOTAL EXISTING PLANTING UNITS PROVIDED ON SITE 12.2

PLANTING SCHEDULE

SYMBOL	QTY	COMMON NAME	BOTANICAL NAME	SIZE	COMMENTS	PLANTING SPACING	CATEGORY	PLANTING UNITS
GKm	14	Maidenhair tree	Ginkgo biloba 'autumn gold' male	2.5"cal	B&B	AS SHOWN	Major	14

LANDSCAPE DESIGN DATA:
Carroll County Landscape Manual Part Two: Landscaping Requirements

II. Non–Residential (Commercial, Industrial, Institutional and Governmental)
A. Buildings
1. Adjacent to public rights–of–way (no parking lot in between), screening shall comply with Class B requirements.....N/A
2. Adjacent to residential zones or uses, a minimum 10–foot wide Class A screen is required
*Letter from parcel 14–21–688
3. For redevelopment, a brick or decorative block wall may be utilized where a landscape strip is not feasible.
4. Berms and grade changes may be used to screen buildings.

B. Parking Lots/Parking Structures
1. Perimeter Screening
a. Adjacent to public rights of way, screening shall comply with Class B requirements.....N/A
b. A minimum 6–foot Class B landscape strip between paved surfaces of the site and adjacent residential parking lots is required. Plantings are to be at one PU per 20 linear feet parking perimeter.....N/A
c. Adjacent to residential zones or uses (other than parking areas) a minimum 10 foot wide Class A screen is required.....
*Letter from parcel 14–21–688
d. For redevelopment, a brick or decorative block may be utilized where a landscape strip is not feasible.....N/A
e. Berms and grade changes may be used to screen parking areas.....N/A

2. Interior Landscaping
a. Reserve minimum 10% of the parking lot area for interior landscaping. Required interior landscaping shall be installed in peninsulas, islands or planting breaks to separate:
i. Parking lot entrances from adjacent parking spaces.
ii. Interior roads with no public right–of–way from parking bays.
iii. Changes in aisle and bay orientation.
iv. Interior drives from parking spaces.
v. Plantings are to be at one PU per 12 parking spaces.....132 spaces/12 = 11 PU
b. Landscape islands and medians shall be mounded, unless utilized for stormwater management measures.
c. The minimum width of parking lot medians or islands shall be 10 feet from face of curb to face of curb.
d. Parking lots containing less than 5,000 square feet of paved area are exempt from interior landscaping.
e. Landscape islands shall be required after every 12 parking spaces.
f. Grade changes may be utilized within parking lot medians.
g. Interior landscape areas may be consolidated to preserve specimen trees pursuant to 134–6G of the Code.
h. The interior landscaping requirements may be modified at the discretion of the County.

3. Parking Structures:.....N/A

C. Outside Display Areas.....N/A

D. Service Lanes.....N/A

E. Outdoor Storage and Loading Areas.....N/A

F. Automotive Uses (Fuel Stations and Car Washes).....N/A

Planting Units Required.....11 PU
Planting Units Proposed.....14 PU
Existing Planting Units to remain.....12.20 PU
TOTAL.....26.20 PU

FINAL LANDSCAPE PLAN
OWNER CERTIFICATION FORM

I certify that I have reviewed this Final Landscape Plan; that I have read and understood the regulations presented in the Carroll County Landscape Manual; and I agree to comply with these regulations and all applicable policy, guidelines and ordinances. I agree to certify the implementation of this approved Final Landscape Plan no later than one year from the date of approval of this plan to the Department of Planning, Bureau of Resource Management, Room 209, 225 N. Center Street, Westminster, MD 21157–5194.

05/05/2025

Assegid Tesfaye Mekoya Date
2239 Bachman Valley Rd
Manchester Md 21102–1328

File S–20–0030

CARROLL COUNTY, MARYLAND
DEPARTMENT OF LAND
& RESOURCE MANAGEMENT
LANDSCAPE CERTIFICATION

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidst Arsema Andinet Monastery

Assegid Tesfaye Mekoya
2239 Bachman Valley Rd
Manchester Md 21102–1328

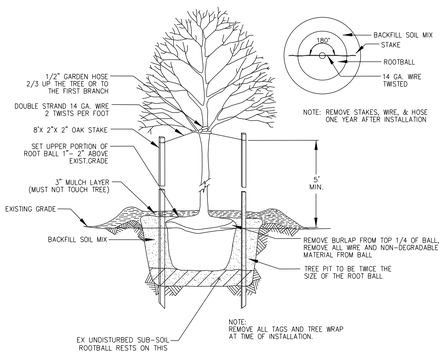
This is to certify that landscape installation requirements have been fulfilled, as set forth in the approved final landscape plan and as specified by The Carroll County Landscape Manual.

Assegid Tesfaye Mekoya Date

Qualified Landscape Designer Signature Date
File S–20–0030

LANDSCAPE NARRATIVE

Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery (church property) is 25.69941 acres on the south side of Bachmans Valley Road (Maryland Route 496), approximately 4,700 feet from the intersection of Bachmans Valley Road and Hanover Pike (Maryland Route 30), as shown on Carroll County Tax Map 14 Grid 21 Parcel 79. Access to the property is provided by a 1,900 foot long right of way from the property to the publicly maintained roadway, Bachmans Valley Road. The site is currently utilized for religious purposes and many trees which have been planted lining driveway and variously throughout the site. All trees have been field verified and tallied for compliance with this requirement. We are providing parking lot landscaping to address Chapter 157 of the Code of Carroll County, Maryland.



MAJOR TREE PLANTING AND STAKING DETAIL
1–1/2" CALIPER OR LARGER

LANDSCAPE SPECIFICATIONS

A. All plants shall be identified in accordance with the latest Edition of Hortus Third, by "The Staff of the Hororium".
B. All nursery stock shall conform to American Association of Nurserymen, Inc., standards as described in American Standard for Nursery Stock, current ANSI A–300 specifications.
C. Landscape specifications shall conform to Landscape Guidelines for Maryland, Washington, D.C., and Virginia, latest edition. All nursery stock shall be planted in accordance with the procedures outlined in the guidelines.
D. Three (3) inches topsoil on all disturbed areas to be landscaped, seeded or sodded is required.
E. A separate plan labeled "Landscape Plan" (may be combined with Forest Conservation Plan) is required. Landscape requirements may not be combined with Forest Conservation Plan.

INSTALLATION

1. Standards to conform to the most recent version of the ANSI A300 standards Part 6–– Transplanting and Landscape Specifications Guidelines of the Landscape Contractors Association, Maryland, District of Columbia and Virginia.
2. Planting on individual lots shall be installed upon final grading inspection. No final grading approval shall be given on the building permit until landscaping is complete.

MAINTENANCE RESPONSIBILITY

The owner of any property on which landscaping has been installed pursuant to Chapter shall maintain the landscaping in good condition in perpetuity. A landscape Maintenance Agreement shall be required. Failure to replace dead or dying PUs or the removal of any installed PUs is a violation of this chapter.

INSPECTIONS

A minimum of 2 inspections will be required: No inspection shall be finalized from November 1st. To be considered acceptable, no more than 1/3 of a plant may be dead.
(1) Initial Inspection. This inspection shall be performed by the County when planting is completed to verify compliance with the approved planting plan.
(2) Final Inspection. This inspection shall be performed by the County 12 months after the initial planting.

REV.No.	DATE	BY	DESCRIPTION
1	2021–03–04	DRS/jfs	UPDATE PER CLIENT 2022–01–18
2	2021–03–08	DRS/jfs	PER CLIENT 2022–03–05
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5	2022–09–13	DRS/jfs	PER CCBRM/lsfc 2022–08–05, CCBRM/wrm 2022–07–29 & PER CLIENT 2022–09–13
6	2022–10–19	DRS/jfs	PER CCBRM/wrm 2022–10–14, CCBRM/lsfc 2022–10–18
7	2022–11–08	DRS/jfs	PER CLIENT 2022–11–07
8	2024–04–02	DRS/jfs	PER CCBRM/lsfc 2024–01–04 & UPDATE PLAN PER CLIENT
9	2024–08–09	DRS/jfs	UPDATE PLAN
10	2024–09–06	DRS/jfs	PER CCBRM/lsfc 2024–09–06
12	2025–04–14	DRS/jfs	PER CLIENT 2025–04–11

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STATE OF MARYLAND · JAMES F. STEVENS III · LICENSED PROFESSIONAL ENGINEER

DSN: drs | DFT: | CHK: drs | SCALE: 1"=100'

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidst Arsema Andinet Monastery

FOREST CONSERVATION & LANDSCAPE DETAILS

DATE: 2021–08–26 | CaCoFile S–20–0030 | SHEET NO. 85 OF 96

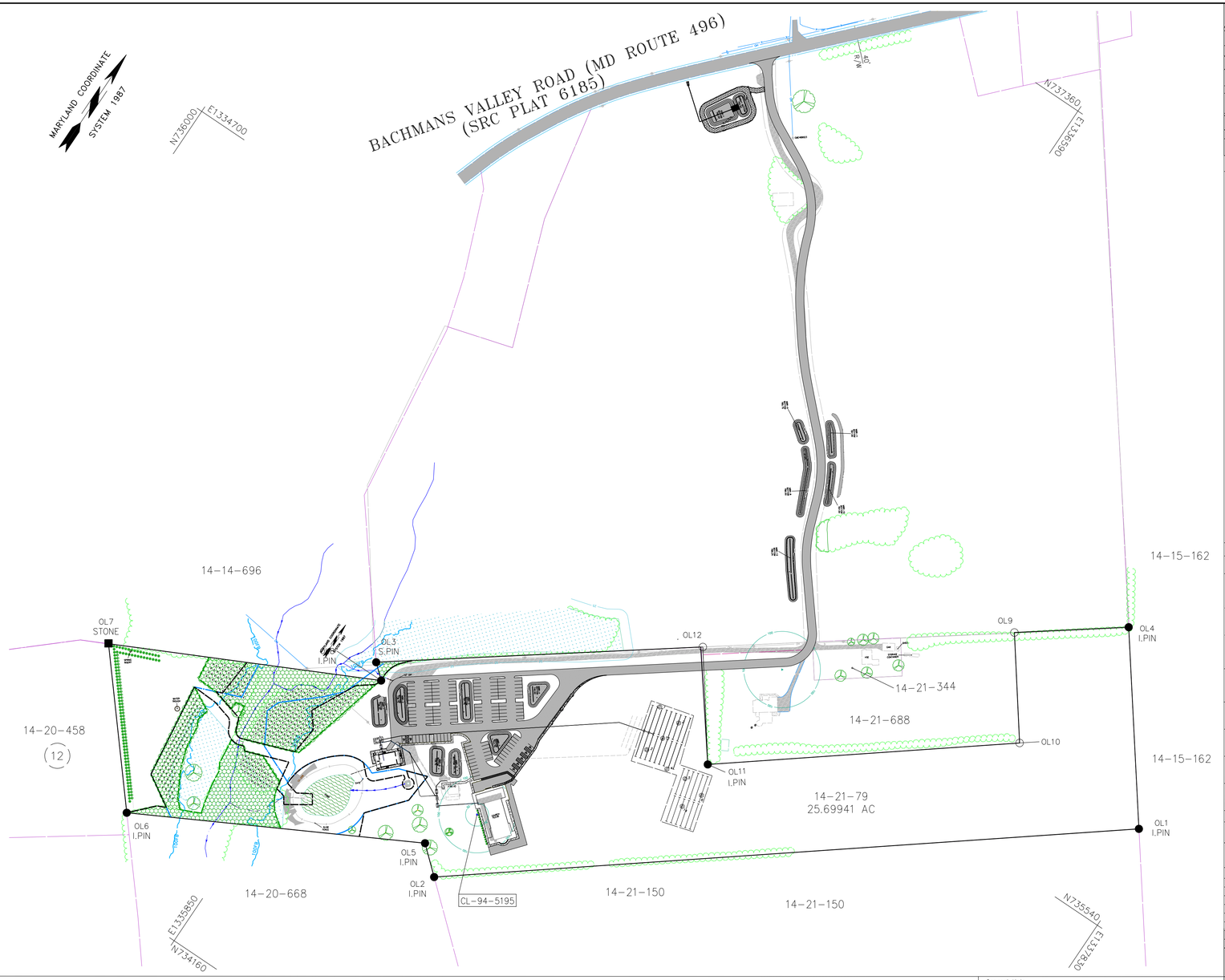
LEGEND

Existing	Proposed
Cable Line C	Cable Line C
Center Line Rd	Center Line Rd
Curb	Curb
Easement	Easement
Electric E	Electric E
Edge of Rd	Edge of Rd
Edge of Shoulder	Edge of Shoulder
Feature separation distance in feet 6'	Feature separation distance in feet 6'
Fenceline X	Fenceline X
100 Yr. Flood Boundry	
Forest	Forest
Flow Line(Swale,Ditch,Waterway)	Flow Line(Swale,Ditch,Waterway)
Gas Line G	Gas Line G
Guardrail	Guardrail
Index Contours 410	Index Contours (410)
Intermediate Contours	Intermediate Contours
Limits of Disturbance	Limits of Disturbance
Lot Line	Lot Line
Municipal Boundary	Municipal Boundary
Overhead Lines OH	Overhead Lines OH
Plat Outline	Plat Outline
Railroad	
Right-Of-Way Line	Right-Of-Way Line
Septic Area	Septic Area
Set Back Line	Set Back Line
Sewer Line	Sewer Line
Soil Type	
Storm Drain Line	Storm Drain Line
Stream	
Stream Intermittent	
Stream Buffer	
Surfacewater Management Zone	
Telephone T	Telephone T
Tree Protection Fence	Tree Protection Fence
Underground Cable UG	Underground Cable UG
Water Line W	Water Line
Zoning Line	Zoning Line
Bit. Conc. Pav.	Bit. Conc. Pav.
Concrete	Concrete
Ingress and Egress Easement	Ingress and Egress Easement
FCE	FCE
Perpetual Easement for Drainage Facility Carroll County Commisioners	Perpetual Easement for Drainage Facility Carroll County Commisioners
Rip-Rap/Gravel	Rip-Rap/Gravel
Rock Outcrop	
Septic Area	Septic Area
Soil/Sand Mix	Soil/Sand Mix
Wetlands	

Existing	Proposed
Point ID	
Cable Marker	
Clean Out, Sewer/Drain	
Coniferous Tree	
Deciduous Tree	
Discharge Flow (to swale,ditch,waterway)	
Dry Hole	
Dry Well	
Electric Transformer	
Fire Hydrant	
Flow Upon Ground	
Inlet	
Mail Box	
Manhole	
Pole Light	
Shrub	
Sign	
Specimen	
Candidate Tree	
Spring	
Structure	
Telephone Pedestal	
Water Curb Box	
Water Meter	
Water Valve	
Utility Pole	
Utility Pole w/Guy Wire	
Well	

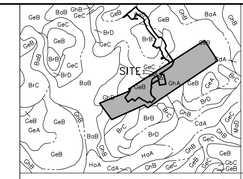
ABBREVIATIONS

100FB 100 year Flood Boundary	
100FWB 100 year Floodway Boundary	
500FB 500 year Flood Boundary	
AASHTO American Association of State Highway & Transportation Officials	
ADT Average Daily Trip	
ALCMP ALuminum Corrugated Metal Pipe	
App Approved	
B Basement floor elevation or Book	
BCCMP Bituminous Coated Corrugated Metal Pipe	
Beg Begin	
Bk Break	
BL BaseLine	
Bldg Building	
BLP Begin Linear Profile	
Bot Bottom/Bottom of trench	
BoW Bottom of Wall	
BR BioRetention	
C-C Center to Center	
C-D-S Cul-De-Sac	
Ca Carroll	
CC Carroll County	
CCBDR Carroll County Bureau of Development Review	
CCBoE Carroll County Bureau of Engineering	
CCBoU Carroll County Bureau of Utilities	
CCBRM Carroll County Bureau of Resource Management	
CCBRO Carroll County Bureau of Roads Operations	
CCC Carroll County Commissioners	
CCERD Carroll County Engineering Review Division	
CCHD Carroll County Health Department	
CCLM Carroll County Landscape Manual	
CCMIB Carroll County Modified Infiltration Berm	
CCOPS Carroll County Office of Public Safety	
CCP Carroll County Plate number	
CCSCD Carroll County Soil Conservation District	
CDB County (Road) Deed Book	
CCDPW Carroll County Dept of Public Works	
CCSWM Carroll County Supplement to the 2000 Maryland Stormwater Design Manual Volumes I&II	
CCZA Carroll County Zoning Administration	
CL CenterLine or CLass	
CLR County Land Record	
CMP Corrugated Metal Pipe	
Co Clean out/County	
CPLLO Code of Public Local Laws and Ordinances	
CoW City of Westminster	
CRPB County Road Plat Book	
Dia Diameter	
Dn Depth normal	
DND Do Not Disturb	
DUE Drainage Utility Easement	
Dwy Driveay	
E Entrance elevation	
EASE EASEment	
EL ELevation	
EER Elevation Ex Road	
ELP End Linear Profile	
ESE Emergency Spillway Elevation	
Ex Existing	
ExGd Existing Ground	
F First floor elevation	
FBFM Flood Boundary and Floodway Map	
FCE Forest Conservation Easement	
FEMA Federal Emergency Management Agency (Hec 2 Data)	
FG Finished Grade	
FIRM Flood Insurance Rate Map	
FoW Face of Wall	
FPE Flood Plain Easement	
FWRE Forested Water Resource Easement	
G Garage floor elevation	
Gar Garage	
GR Guard Rail	
GWw Grass Waterway	
HDPE High Density PolyEthylene	
HG Hydraulic Gradient	
Hor Horizontal	
HP High Point	
Hse House	
IDE Invert Ditch Elevation	
IEE Ingress & Egress Easement	
Inv Invert	
IT Infiltration Trench	
L Left or Lot	
LF Linear Feet	
LoD Limits of Disturbance	
LoP Limits of Paving	
LP Low Point	
LPG Linear Profile Grade	
LS Level Spreader	
LVC Length of Vertical Curve	
M Minutes	
MBR Micro BioRetention	
MPH Miles Per Hour	
NAD North America Datum	
NAVD North America Vertical Datum	
NDC Nose Down Curb	
NIC Not In Contract	
Os Offset	
OW Observation Well	
P Page	
PB Plat Book	
PC Point of Curve	
PEDF Perpetual Easement Drainage Facility	
PG Proposed Grade	
PGL Profile Grade Line	
PHT Peak Hourly Trip	
PL Property Line	
PlBk Plan Book	
Pr Profile	
PSE Proposed Shoulder Elevation	
PT Point of Tangent	
PVC Point of Vertical Curve	
PVI Point of Vertical Intersection	
PVT Point of Vertical Tangent	
PWA Public Works Agreement	
Q cubic feet per second	
R Right or Radius	
RBCCR Record Book Carroll County Roads	
RCP Reinforced Concrete Pipe	
Rem Remainder	
RP Remaining Portion	
S Sewer	
SBL Set Back Line	
SC Sewer Connection	
SD Storm Drain	
SgD Subgrade Drain	
SHA State Highway Administration (Maryland)	
Sh Sheet	
SRC State Roads Commission	
SS Sanitary Sewer	
STD Standard	
SWMF StormWater ManagementFacility	
tbD to be Determined/Demo	
tbR to be Removed	
TCB Top Constructed Berm	
TCD Top Constructed Dam	
ToB Top of Berm or Bank	
ToC Top of Curb	
ToD Top of Dam	
ToF Top of Footer	
ToG Top of Grate	
Top Top	
ToR Top of Rim	
ToW Top of Wall	
TRANS Transition	
Typ Typical	
UE Utility Easement	
U-I-C Use-In-Common	
V Velocity (feet per second)	
Vert Vertical	
W Water	
WC Water Connection	
WL WaterLine	
WO WalkOut	
WQB Water Quality Basin	
WQS Water Quality Swale	
WQT Water Quality Trench	
WRE Non Forested Water Resource Protection Easement	
WS Wide Shoulder/ Weir Station	
WSE Water Surface Elevation	



General Note

1. Owner: Tesfaye Mekoya Assegid
   County Land Record 8767 Page 49
   2017-July-31
   Grantor: Ms Woleba Getachew
2. Developer: Tesfaye Mekoya Assegid
   2239 Bachman Valley Rd
   Manchester, MD 21102
3. Map 14, Block 21, Parcel 79
4. Zoning District: Agricultural
5. National Flood Insurance Rate: Map 240015 0050 B
6. The topography shown hereon was field run by DRS Associates and supplemented with flown by Carroll County and based on Base Earth LiDAR Data Spring 2006 NAVD88 U.S.Feet.
7. The horizontal datum shown hereon is based on Maryland Coordinate System of 1987 U.S.Feet.
8. Total area of property: 25.6941 Ac
9. For Construction of dwellings exceeding a three bedroom house size (450 gpd), it must be demonstrated that there is adequate area for an initial and two (2) replacement septic systems in accordance with COMAR 26.04.02.04F (effective 11/18/85).
10. There are no wells or septic systems/areas within 100 feet of the property unless otherwise shown hereon.
11. If gravity flow to a sewage disposal area cannot be ensured, a pumped sewage disposal system will be required.
12. A percolation test is only one of the criteria used in considering a lot for installation of a septic system. Additional testing can be required and may be subject to scheduling during the seasonal wet weather period. The entire lot is evaluated when application for a septic permit is made. Adjoining property history, percolation test methodology, adjoining wells and septic systems, proposed number of bedrooms, history of failing septic systems and wells, design, soil and geological conditions, and topography in the immediate area are then used to determine if the lot is suitable for the underground disposal of sewage. Issuance of a septic system permit constitutes lot approval by the Health Department.
13. Location and distance to the nearest existing or proposed water supply. Manchester 4.5± miles



SOILS MAP SCALE: 1"= 1320' | VICINITY MAP SCALE: 1"= 2000'

VICINITY MAP

TOTAL AREA

Name	North	East	Bearing	Distance
OL1	735707.55	1337853.03		
			S 56°05'11"W	1846.14
OL2	734677.51	1336320.95		
			N 45°05'35"W	91.57
OL5	734742.16	1336256.09		
			S 65°50'11"W	783.60
OL6	734421.40	1335541.15		
			N 36°08'56"W	444.50
OL7	734780.33	1335278.95		
			N 67°41'45"E	718.91
OL8	735053.17	1335944.07		
			N 45°05'35"W	49.50
OL3	735088.12	1335909.01		
			N 57°19'42"E	854.55
OL12	735549.42	1336628.35		
			S 32°24'17"E	307.28
OL11	735289.99	1336793.02		
			N 56°03'29"E	816.85
OL10	735746.08	1337470.68		
			N 32°39'46"W	289.17
OL9	735989.52	1337314.62		
			N 57°19'42"E	298.94
OL4	736150.89	1337566.26		
			S 32°53'45"E	528.00
OL1	735707.55	1337853.03		

Total Area 1119466.20 sf 25.69941 acres +/-

ADJOINING PROPERTY OWNER INFORMATION

MAP-BLOCK-PARCEL ACCT ID PREMISE ADDRESS	OWNER NAME MAILING ADDRESS	TITLE REFERENCE
14-15-47 06-014089 New Bachmans Valley Rd	Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidist Arsema 2239 Bachman Valley Road Manchester MD 21102	CLR10625 P343 Agricultural
14-21-150 06-010067 2510 Ebbvale Rd Manchester 21102-1308	Lemmon Kendall L & Lemmon Vicky L 2510 Ebbvale Rd Manchester MD 21102-1308	CLR2825 P583 Agricultural
14-21-344 06-014100 2243 Bachman Valley Rd Manchester 21102-1328	Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidist Arsema 2243 Bachman Valley Rd Manchester MD 21102-1328	CLR9384 P415 Agricultural
14-21-688 06-068774 2245 Bachman Valley Rd Manchester 21102	Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidist Arsema 2239 Bachman Valley Road Manchester MD 21102	CLR9237 P201 Agricultural
14-15-162 06-005330 Bachmans Valley Rd	Dell Francis Lee & Dell Marian V 2401 Bachman Valley Rd Manchester MD 21102-1325	CLR4061 P227 Agricultural
14-20-458 L12 06-030343 2049 Bachman Valley Rd Manchester 21102-1332	Glover Wilbur W Jr & Glover Doris M 2049 Bachman Valley Rd Manchester MD 21102-1332	CLR766 P402 Agricultural PB19 P2
14-20-668 06-065376 2300 Ebbvale Rd Manchester 21102-1312	Dell Francis Lee L/E Etal 2401 Bachman Valley Rd Manchester MD 21102	CLR8953 P274 Agricultural
14-14-696 06-069290 2128 Bachman Valley Rd Manchester 21102	Dell Matthew Lee 2401 Bachman Valley Rd Manchester MD 21102	CLR9649 P333 Agricultural

PROPERTY OWNER INFORMATION

MAP-BLOCK-PARCEL ACCT ID PREMISE ADDRESS	OWNER NAME MAILING ADDRESS	TITLE REFERENCE ZONING
0014-0021-0079 06-015255 2239 Bachman Valley Rd Manchester 21102-1328	Assegid Tesfaye Mekoya 2239 Bachman Valley Rd Manchester Md 21102-1328	CLR8767 P49 Agricultural

REV.No.	DATE	BY	DESCRIPTION
9	2024-08-09	DRS/jfs	UPDATE PLAN
12	2025-04-14	DRS/jfs	PER CLIENT 2025-04-11

REVISIONS

DRS ASSOCIATES
LAND DESIGN CONSULTANTS
52 WINTERS STREET WESTMINSTER, MARYLAND 21157
410-848-4060 410-876-6040 F. 410-848-8818

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STATE OF MARYLAND JEFFREY HOWARD SCHAFFER 21157 REGISTERED LAND SURVEYOR

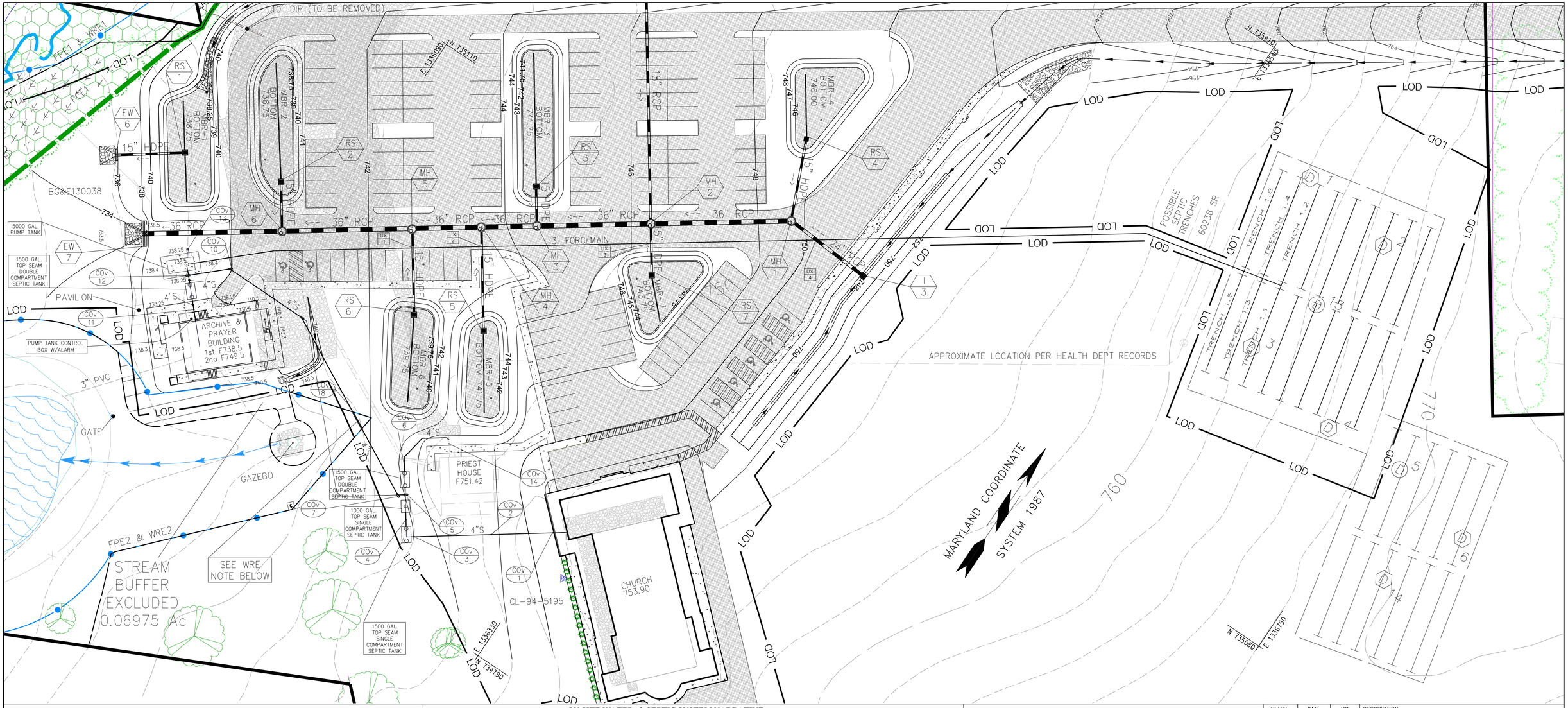
DSN: drs | DFT: | CHK: drs | SCALE: 1"=150' | 75 0 75 150 225

SEPTIC PLAN
TITLE SHEET
Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery

ON BACHMANS VALLEY ROAD NEAR MANCHESTER
6TH ELECTION DISTRICT CARROLL COUNTY, MD.

OWNER/DEVELOPER
Tesfaye Mekoya Assegid
2239 Bachman Valley Rd
Manchester, MD 21102

DATE: 2024-02-14 | CaCoFile S-20-0030 | SHEET NO. 86 OF 96



WATER RESOURCE EASEMENT DISTURBANCE

An area of disturbance within the Water Resource Easement is proposed on the east side of the pond. The septic line from the septic tank to the pump tank crosses a corner of the Water Resource Easement and could not be avoided. Setback from septic components, to infiltration facilities, Micro-Bioretention, is 25 feet. The plan is to open cut the 13+/- feet of trench and install the 4" PVC pipe and backfill. Stabilization of disturbed area will be completed in accordance with specifications as shown on sheet 57.

ON SITE WATER & SEPTIC SYSTEM NARRATIVE

Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery (church property) is 25.69941 acre property on the south side of Bachmans Valley Road (Maryland Route 496), approximately 4,700 feet from the intersection of Bachmans Valley Road and Hanover Pike (Maryland Route 30), as shown on Carroll County Tax Map 14 Grid 21 Parcel 79. Access to the property is provided by a 1,900 foot long right of way from the property to the publicly maintained roadway, Bachmans Valley Road. The Site Plan proposes grading and construction for a church with associated buildings and parking area. The existing well will be utilized for water service, the on site sewerage disposal system will be designed for three buildings having plumbing systems. The Church with 500 seats without a kitchen (3 gallons per seat per day) which will be the main congregation place for regular religious services/uses. A Priest House with three bedrooms (150 gallons per day per bedroom) which is where the priests rest before and after church services. The Archive and Prayer Building with 64 seats (3 gallons per seat per day) and showering room (10 gallons per shower per day) which is analyzed for 20 showers per day.

SEPTIC SYSTEM DESIGN DATA

Church
500 seats no Kitchen 3 GPDPP .....= 1,500 GPD

Priest House
3 Bedroom x 150 GPDPB.....= 450 GPD

Archive & Prayer Building
64 seats no kitchen 3 GPDPP x 64.....= 192 GPD
Showers 10 GPDPP x 20 showers.....= 200 GPD

Total.....= 2,342 GPD

Average Perc Rate= 10.42 min Application Rate= 0.8 GPSqFtPD
2,342 GPD/0.8/3' trench = 975.83 LF Standard Trench
Deep Trench w/4' stone 4'-8' deep = 41.667% standard trench
975.83 x 0.41667 = 406.60 Deep Trench 6 lines @ 67.77'
Use 6 lines @ 68.00'

FUTURE SEPTIC SYSTEM DESIGN DATA

Future Church
500 seats no Kitchen 3 GPDPP .....= 1,500 GPD
Holly Water Building 30 GPDPP x 30.....= 90 GPD

Total.....= 1,590 GPD

Average Perc Rate= 3.0 min Application Rate= 0.8 GPSqFtPD
1,590 GPD/0.8/3' trench = 662.50 LF Standard Trench
Deep Trench w/4' stone 4'-8' deep = 41.667% standard trench
662.50 x 0.41667 = 276.04 Deep Trench 4 lines @ 69.01'
Use 4 lines @ 70.00'

SEPTIC TEST LEGEND

- ◯ proposed perc
- Ⓓ Approved Deep Trench Perc
- Ⓖ Approved Grade Mound Perc
- Ⓜ Approved Sand Mound Perc
- Ⓢ Approved Standard Trench Perc
- Ⓓ Approved Deep Trench Observation Hole
- Ⓒ Approved Grade Mound Observation Hole
- Ⓜ Approved Sand Mound Observation Hole
- Ⓢ Approved Standard Trench Observation Hole
- ◯ Proposed Observation Hole
- Failed Deep Trench Perc
- ● Failed Grade Mound Perc
- Failed Sand Mound Perc
- Failed Standard Trench Perc
- Failed Deep Trench Observation Hole
- ● Failed Grade Mound Observation Hole
- Failed Sand Mound Observation Hole
- Failed Standard Trench Observation Hole

SEPTIC TEST RESULTS

TEST ID	TEST TYPE	TEST COMMENTS	SAN	TEST DATE
A		>30m@1.00', >2m@7.42'	cs	2017-05-23
B		>30m@3.00', >2m@9.5'	cs	2017-05-23
C		>60m@2.00'	cs	2017-05-23
1	Ⓓ	16m@4.0',11m@8.0', >2m@12.0'	dr	2022-01-12
2	Ⓓ	10m@4.0',11m@8.0', >2m@12.0'	dr	2022-01-12
3	Ⓓ	29m@4.0',13m@8.0', >2m@12.0'	dr	2022-01-12
4	Ⓓ	10m@4.0',13m@8.0', >2m@12.0'	dr	2022-01-12
5	Ⓓ	>2m@12.0'	dr	2022-01-12
6	Ⓓ	4m@4.0',3m@8.0', >2m@12.0'	dr	2022-01-12
13	Ⓓ	>2m@12.0'	dr	2022-01-12
14	Ⓓ	2m@4.0',3m@8.0', >2m@12.0'	dr	2022-01-12

THIS IS TO CERTIFY THAT THE PERCOLATION TESTS ARE ACCURATELY SHOWN AS PERFORMED IN THE FIELD.

DANIEL R. STALEY L.S. 10735 — 2025-04-14 DATE

REV.No.	DATE	BY	DESCRIPTION
1	2021-03-04	DRS/jfs	UPDATE PER CLIENT 2022-01-18
2	2021-03-08	DRS/jfs	PER CLIENT 2022-03-05
4	2022-05-12	DRS/jfs	PER CCBRM/lsfc 2022-05-02
5	2022-09-13	DRS/jfs	PER CCBRM/lsfc 2022-08-05, CCBRM/wrm 2022-07-29 & PER CLIENT 2022-09-13
6	2022-10-19	DRS/jfs	PER CCBRM/wrm 2022-10-14, CCBRM/lsfc 2022-10-18
7	2022-11-08	DRS/jfs	PER CLIENT 2022-11-07
8	2024-04-02	DRS/jfs	PER CCBRM/lsfc 2024-01-04 & UPDATE PLAN PER CLIENT
9	2024-08-09	DRS/jfs	UPDATE PLAN

REVISIONS

DRS ASSOCIATES
LAND DESIGN CONSULTANTS
52 WINTERS STREET WESTMINSTER, MARYLAND 21157
410-848-4060 410-876-6040 F. 410-848-8818

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STATE OF MARYLAND — DANIEL RICHARD STALEY — 10735 — REGISTERED PROFESSIONAL LAND SURVEYOR

DSN: drs | DFT: | CHK: drs | SCALE: 1"=30' (15 0 15 30 45)

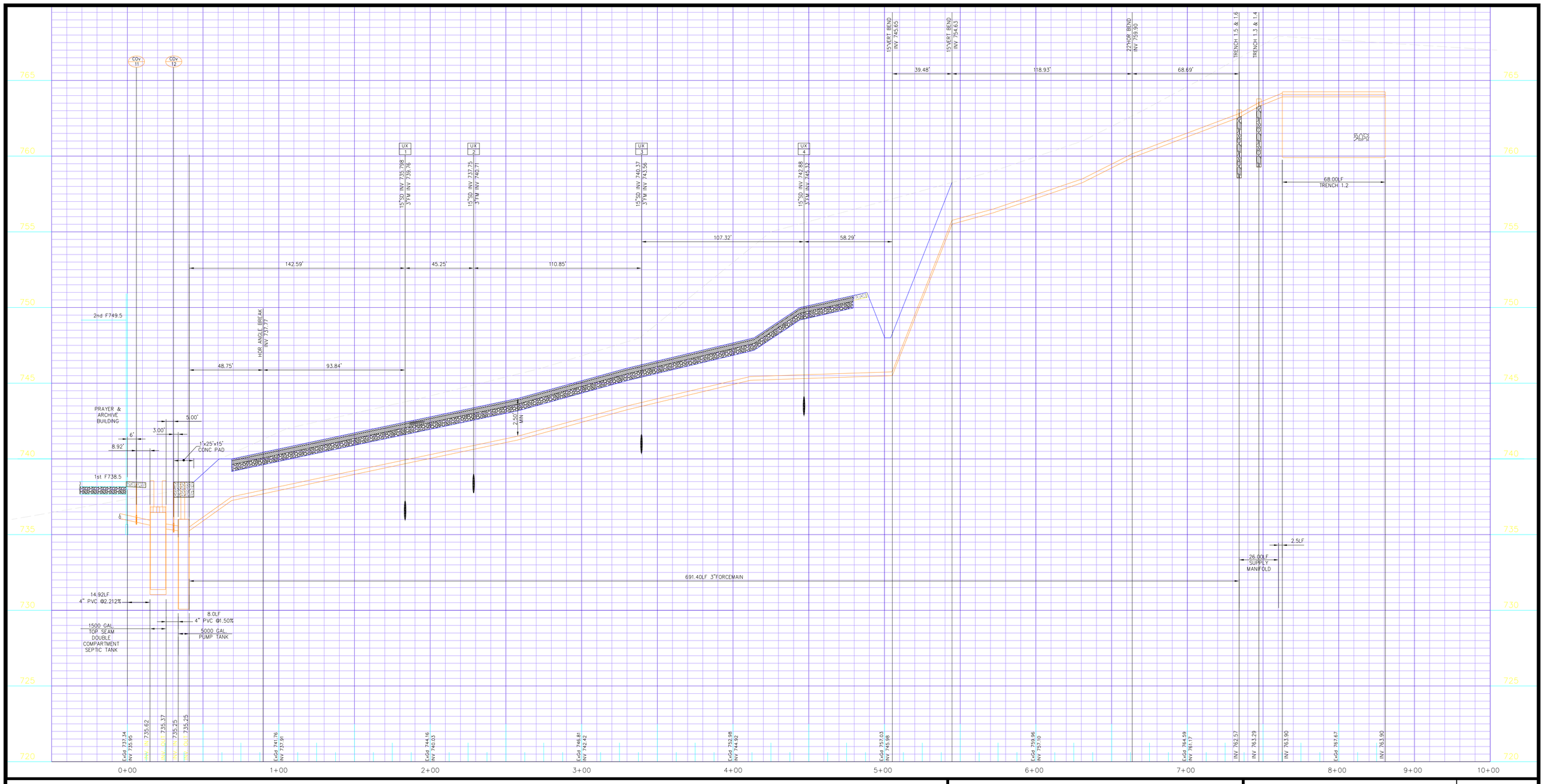
SEPTIC PLAN LAYOUT

Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery

ON BACHMANS VALLEY ROAD NEAR MANCHESTER
6TH ELECTION DISTRICT CARROLL COUNTY, MD.

OWNER/DEVELOPER
Tesfaye Mekoya Assegid
2239 Bachman Valley Rd
Manchester, MD 21102

DATE: 2021-06-23 | CaCoFile S-20-0030 | SHEET NO. 87 OF 96



REV.No.	DATE	BY	DESCRIPTION
8	2024-04-02	DRS/jfs	ADDED THIS SHEET TO PLAN
9	2024-08-09	DRS/jfs	UPDATE PLAN

REVISIONS

DRS ASSOCIATES
LAND DESIGN CONSULTANTS
52 WINTERS STREET WESTMINSTER, MARYLAND 21157
410-848-4060 410-876-6040 F. 410-848-8818

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STATE OF MARYLAND DANIEL RICHARD STALEY NO. 10738 REGISTERED LAND SURVEYOR

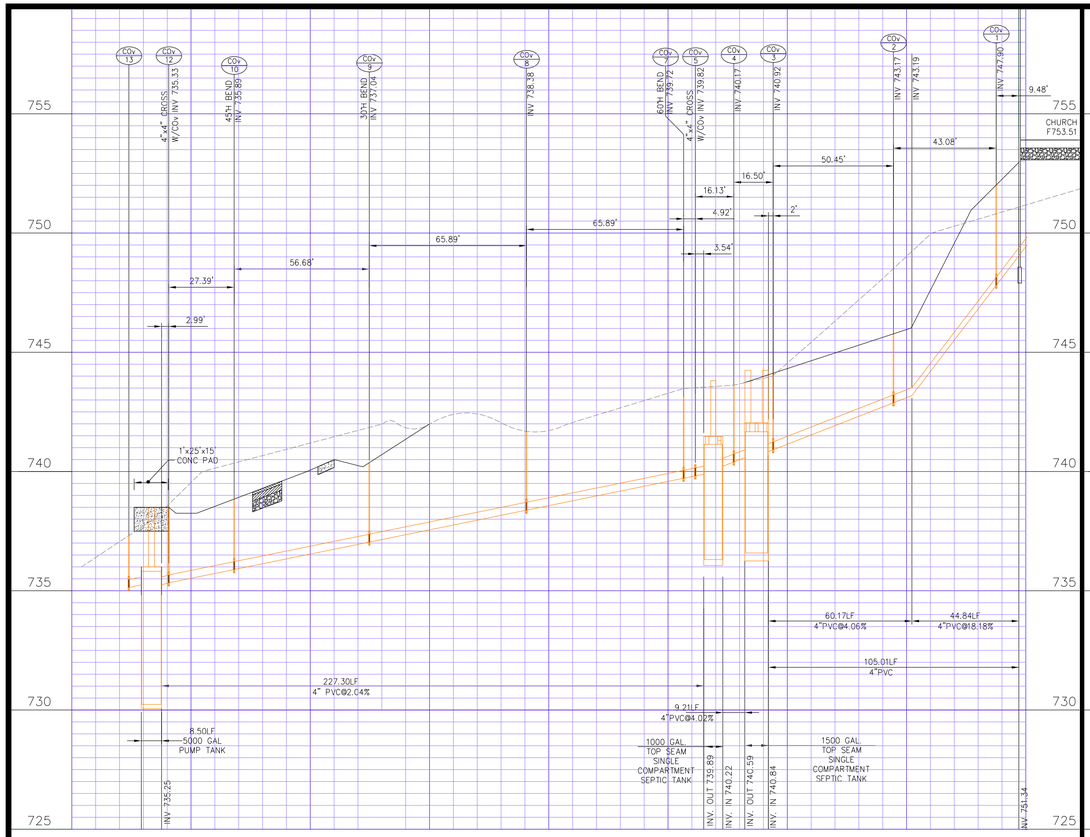
DSN: drs | DFT: | CHK: drs | SCALE: 1"=3'/1"=30' 15 0 15 30 45

SEPTIC PLAN
PROFILES
Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery

ON BACHMANS VALLEY ROAD NEAR MANCHESTER
6TH ELECTION DISTRICT CARROLL COUNTY, MD.

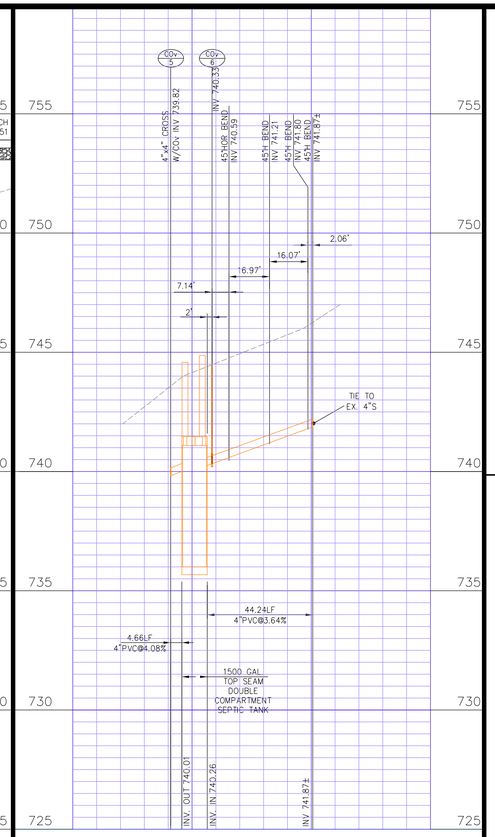
OWNER/DEVELOPER
Tesfaye Mekoya Assegid
2239 Bachman Valley Rd
Manchester, MD 21102

DATE: 2021-06-23 | CaCoFile S-20-0030 | SHEET NO. 88 OF 96



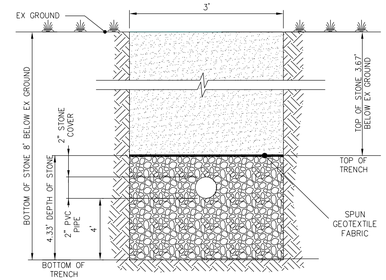
CHURCH TO PUMP TANK

SCALE: HOR: 1"=30' VERT: 1"=3'



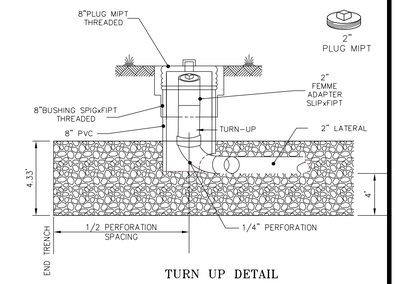
PRIEST HOUSE

SCALE: HOR: 1"=30' VERT: 1"=3'



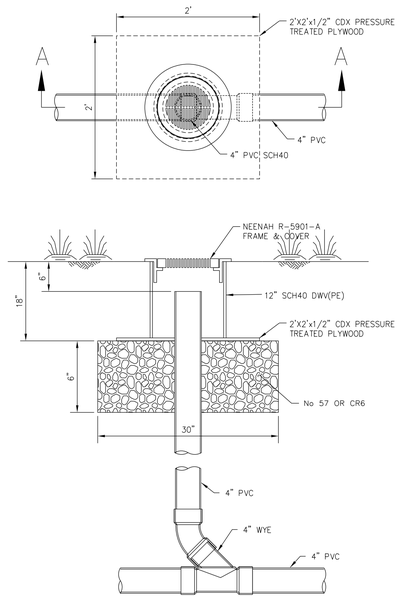
TRENCH DETAIL

NOT TO SCALE



TURN UP DETAIL

NO SCALE

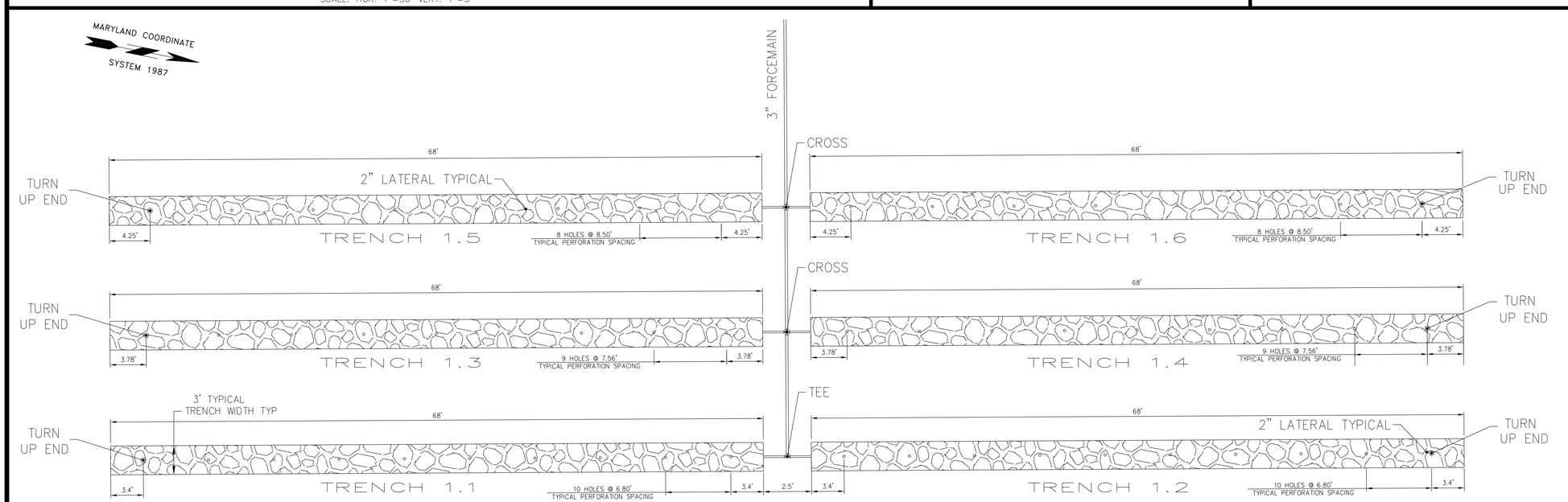


SECTION A – A

DETAIL

CLEANOUT VENTED (COv)

NO SCALE



TRENCH & LATERAL PERFORATION SPACING

SCALE 1"=6'

REV.No.	DATE	BY	DESCRIPTION
8	2024-04-02	DRS/jfs	ADDED THIS SHEET TO PLAN
9	2024-08-09	DRS/jfs	UPDATE PLAN

REVISIONS

DRS ASSOCIATES

LAND DESIGN CONSULTANTS

52 WINTERS STREET WESTMINSTER, MARYLAND 21157

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STATE OF MARYLAND RICHARD R. SHARPE 10735 REGISTERED PROFESSIONAL LAND SURVEYOR

DSN: drs	DFT:	CHK: drs	SCALE: As Shown

SEPTIC PLAN

PROFILES

Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery

ON BACHMANS VALLEY ROAD NEAR MANCHESTER

6TH ELECTION DISTRICT CARROLL COUNTY, MD.

OWNER/DEVELOPER

Tesfaye Mekoya Assegid

2239 Bachman Valley Rd

Manchester, MD 21102

DATE: 2021-06-23	CaCoFile S-20-0030	SHEET NO. 89 OF 96

Project: Tserha Tsion Menfes Kidus Church & Merafe Kidusan Kidst Arsema Andinet Monastery
File: 03427-77269

Date: 2024-03-11
By: jfs

Septic Tank Design

Version: V3_0_1

Design Flow=	2342.000 GPD
Minimum Septic Tank size= 1125+(1500x.75)=	2250.00 Gal.
Septic Tank	1-1,500.000, 1-1,000.000 Gal.

Trench Design

Average Percolation Rate	14.25 Min./In.
Application Rate	0.800 GPD/Ft2
Absorption Area=(Design Flow/Application Rate)	2927.499 S.F.
Trench Width (W)	3.000 Ft.
Depth of Stone below Invert of Lateral	4.000 Ft.
Total Length of Trench=(Absorption Area/Trench Width) Deep Trench X(w+2)/(w+1+2d)	975.833 Ft.

Distribution Network Design

Number of Trenches	6
Length Top Trench	68.000 Ft.
Initial Perforation Spacing Value	7.000 Ft.
Perforations Per Lateral Top Trench=(Trench Length/Initial Perforation Spacing Value Rounded up to Whole Number)	10.000
Perforation Spacing=(Top Trench Length/Number of Perforations)	6.800 Ft.
Distance between End of Trench and Last Perforation=(Perforation Spacing/2)	3.400 Ft.
Length of Longest Trench	68.000 Ft.
Lateral Diameter	2 In. T

LATERAL DIMENSIONS (PVC SCH.40)

LENGTH (ft.)	NOMINAL DIA. (in.)	INSIDE DIA. (in.)
Less then 23	1	1.049
between 23 and 36	1 1/4	1.380
between 36 and 50	1 1/2	1.610
between 50 and 75	2	2.067

Distance and Elevation Data

Top Lateral Invert Elevation	763.901 Ft.
Linear Feet of Forcemain between Top of Pump to Supply Manifold	701.827 Ft.
Invert Elevation In of Pump Tank	735.250 Ft.
Length of Supply Manifold	26.000 Ft.
Length of Equalization Manifold (enter 0 if no Equalization Manifold)	0.000 Ft.

Forcemain Specification

Schedule 40 PVC	3.000 In. S
Inside Diameter	3.068 In.

Dose Volume

Length of 3" Forcemain & Supply Manifold from Pump Off	727.827 Ft.
Length of Laterals	385.144 Ft.
Volume of Forcemain & Supply Manifold=(pi x [(D/2)/12]2 X Length of Forcemain & Supply Manifold X 7.48/C.Ft.)	279.511 Gal.
Volume of Laterals=(pi x [(D/2)/12]2 X (Length of Laterals) X 7.48/C.Ft.)	67.137 Gal.
Volume of Equalization Manifold = (pi x [(D/2)/12]2 X (Length Equalization Manifold) X 7.48/C.Ft.)	0.000 Gal.
Dose Volume=(greater of 5XLateral Volume+Forcemain+Supply Manifold+Equalization Manifold Volume or 1/6 Design Flow or 100 Gal)	615.198 Gal.
Dose Volume in C.FT.=(Dose Volume/7.48)	82.240 Cu.Ft.

Pump Tank Design (5,000 GAL)

Bottom of Pump Tank Elevation	730.073 Ft. U
6" Riser Block	0.500 Ft.
Bottom of Pump Elevation	730.573 Ft.
Distance Between Bottom of Pump to Pump Off Elevation	1.250 Ft.
Pump Off Elevation	731.823 Ft. V
Distance Between Pump On & Pump Off Elevation (Dose/Area of Pump Tank)	0.550 Ft.
Pump On Elevation	732.373 Ft. W
Per MDE Pump On to High Water Alarm (>0.50ft)	0.500 Ft.
High Water Alarm Elevation	732.873 Ft. X
Distance Between Pump On & Pump Tank Inlet (Design Flow/7.48/Area of Pump Tank)	2.095
Design Pump Tank Inlet Elevation	734.968 Ft.
Actual Pump Tank Inlet Elevation>Design Pump Tank Inlet Elevation	735.250 Ft. Y

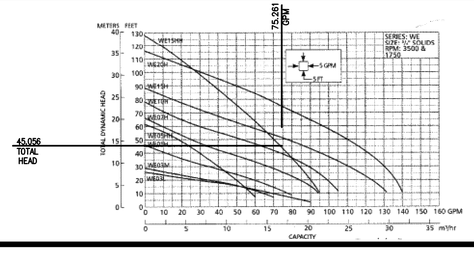
Equalize Low Pressure Dose at Varying Elevations

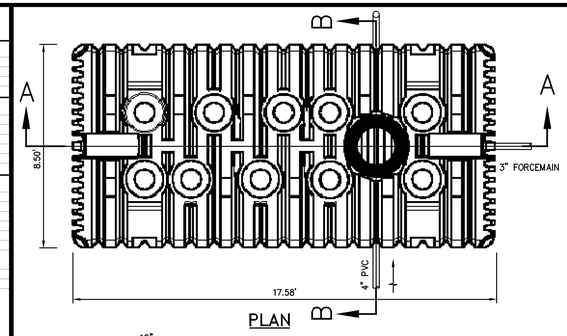
SYSTEM TRENCH NUMBER	1.1	1.2	1.3	1.4	1.5	1.6
TRENCH DATA						
Trench Length	68.000	68.000	68.000	68.000	68.000	68.000
Ground Elevation (ft.)	767.910	767.910	767.300	767.300	766.580	766.580
Trench Cover (ft.)	3.670	3.670	3.670	3.670	3.670	3.670
Stone Over Lateral (ft.)	0.167	0.167	0.167	0.167	0.167	0.167
Diameter Lateral (ft.)	0.172	0.172	0.172	0.172	0.172	0.172
Invert Lateral (ft.)	763.901	763.901	763.291	763.291	762.571	762.571
HEAD CALCULATION						
System Head (ft.)	3.000	3.000	3.610	3.610	4.330	4.330
Head Elevation	766.901	766.901	766.901	766.901	766.901	766.901
PERFORATION CALCULATION						
Perforation Dia. (in.)	0.250	0.250	0.250	0.250	0.250	0.250
Perforation Flow Rate (gpm)	1.276	1.276	1.400	1.400	1.533	1.533
FLOW CALCULATION						
Percent of Flow per Top Trench	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%	100.0000%
Lateral Flow Rate Design (gpm)	12.7630	12.7630	12.7630	12.7630	12.7630	12.7630
Lateral Flow Rate Actual (gpm)	12.7630	12.7630	12.6006	12.6006	12.2667	12.2667
Lateral Velocity (fps)	1.2203	1.2203	1.2048	1.2048	1.1728	1.1728
System Flow (gpm)	12.7630	25.5261	38.1267	50.7272	62.9939	75.2606
PERFORATION LOCATIONS						
Perforations Number Design	10.000	10.000	9.116	9.116	8.324	8.324
Perforation Number Used	10	10	9	9	8	8
Perforation Spacing (ft.)	6.800	6.800	7.556	7.556	8.500	8.500
Perforation from End (ft.)	3.400	3.400	3.778	3.778	4.250	4.250

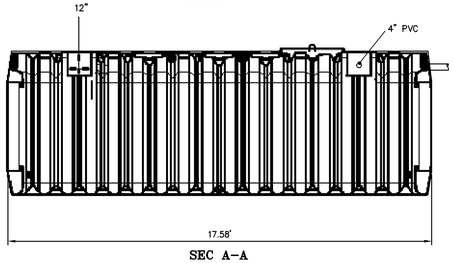
Pump Design

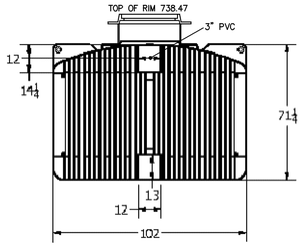
System Flow Rate	75.261 GPM
Length of Supply Manifold	26.000 Ft.
Length of 3" Forcemain & Supply Manifold from Bottom of Pump	729.077 Ft.
1 -Increasers (@ 3.0 FT. each)	3.000 Ft.
4 -90°Bend (@ 10.0 FT. each)	40.000 Ft.
0 -60°Bend (@ 8.0 FT. each)	0.000 Ft.
0 -45°Bend (@ 6.0 FT. each)	0.000 Ft.
0 -30°Bend (@ 4.5 FT. each)	0.000 Ft.
1 -22½°Bend (@ 3.0 FT. each)	3.000 Ft.
2 -15°Bend (@ 2.0 FT. each)	4.000 Ft.
0 -11¼°Bend (@ 1.5 FT. each)	0.000 Ft.
1 -Tee (@ 15 FT. each)	15.000 Ft.
Total Length	794.077 Ft.
Friction Loss per 100 Feet	1.257 Ft.
Pump Off Float Elevation	731.823 Ft.
Manifold Elevation	763.901 Ft.
Head Loss	32.078 Ft.
Total Friction Loss	9.978 Ft.
Required Head for Peak Flow	3.000 Ft.
Dynamic Head	45.056 Ft.

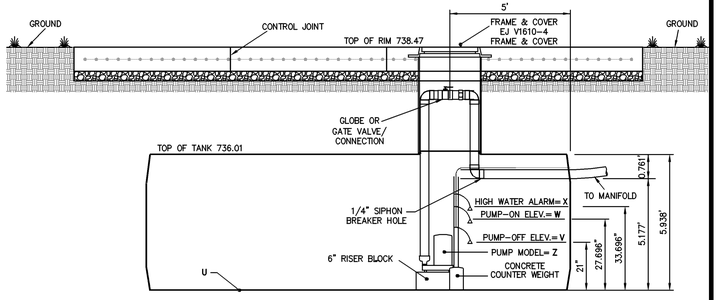
Goulds Submersible Effluent Pump
Z Model WE1512HH
Single Phase
H.P. 1 1/2
Amp 15.7
Volt 230V
R.P.M. 3500

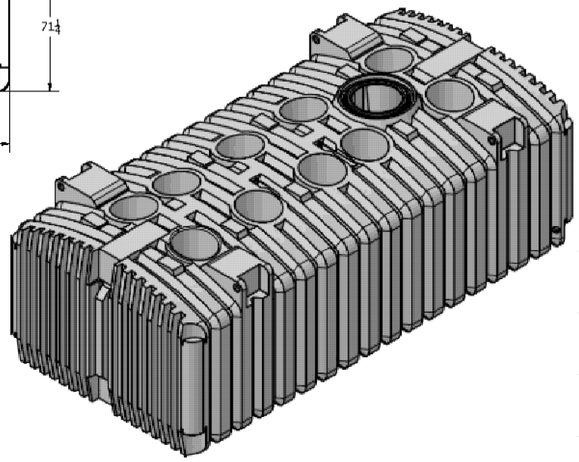


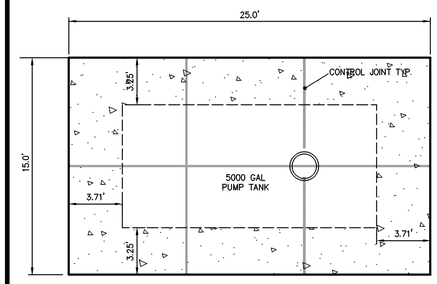


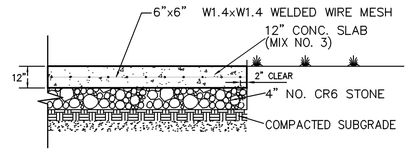








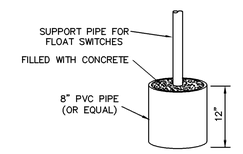




Note: Control joints as shown on plan.

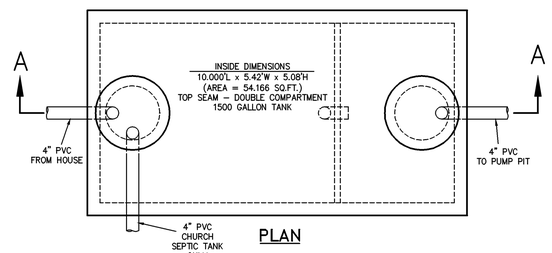
CONCRETE PAD DETAIL

PERFORATION PLACEMENT
NO SCALE



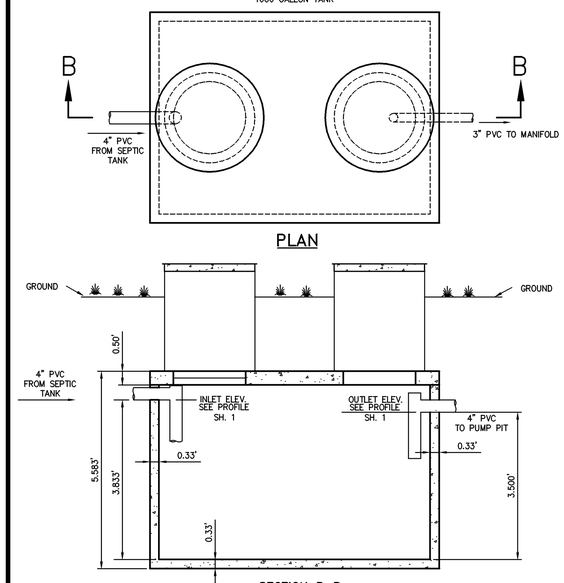
CONCRETE COUNTER WEIGHT DETAIL FOR FLOAT TREE
NO SCALE

DRAWN	7/28/2016	NORWESCO, INC. SAINT BONIFACIUS, MN
bolzer		TITLE: 5025 BELOW GROUND HOLDING
CHECKED		
QA		
MFG		
APPROVED		SIZE: B; DWG NO: 44876; REV:
		SCALE: 1"=3'



SECTION A-A

BABYLON VAULT COMPANY, INC.
1500 GAL SEPTIC TANK DETAIL
NO SCALE



SECTION B-B

BABYLON VAULT COMPANY, INC.
1000 GAL SEPTIC TANK DETAIL
No Scale

REV.No.	DATE	BY	DESCRIPTION
8	2024-04-02	DRS/jfs	ADDED THIS SHEET TO PLAN
9	2024-08-09	DRS/jfs	UPDATE PLAN

REVISIONS

DRS ASSOCIATES
LAND DESIGN CONSULTANTS
52 WINTERS STREET WESTMINSTER, MARYLAND 21157
410-848-4060 410-876-6040 F. 410-848-8818

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STATE OF MARYLAND — DANIEL RICHARD SHEAD — No. 21677 — REGISTERED PROFESSIONAL LAND SURVEYOR

DSN: drs	DFT:	CHK: drs	SCALE: N/A

SEPTIC PLAN DETAILS

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidst Arsema Andinet Monastery

ON BACHMANS VALLEY ROAD NEAR MANCHESTER
6TH ELECTION DISTRICT CARROLL COUNTY, MD.

OWNER/DEVELOPER
Tesfaye Mekoya Assegid
2239 Bachman Valley Rd
Manchester, MD 21102

DATE: 2021-06-23	CaCoFile S-20-0030	SHT.NO. : 90 OF 96

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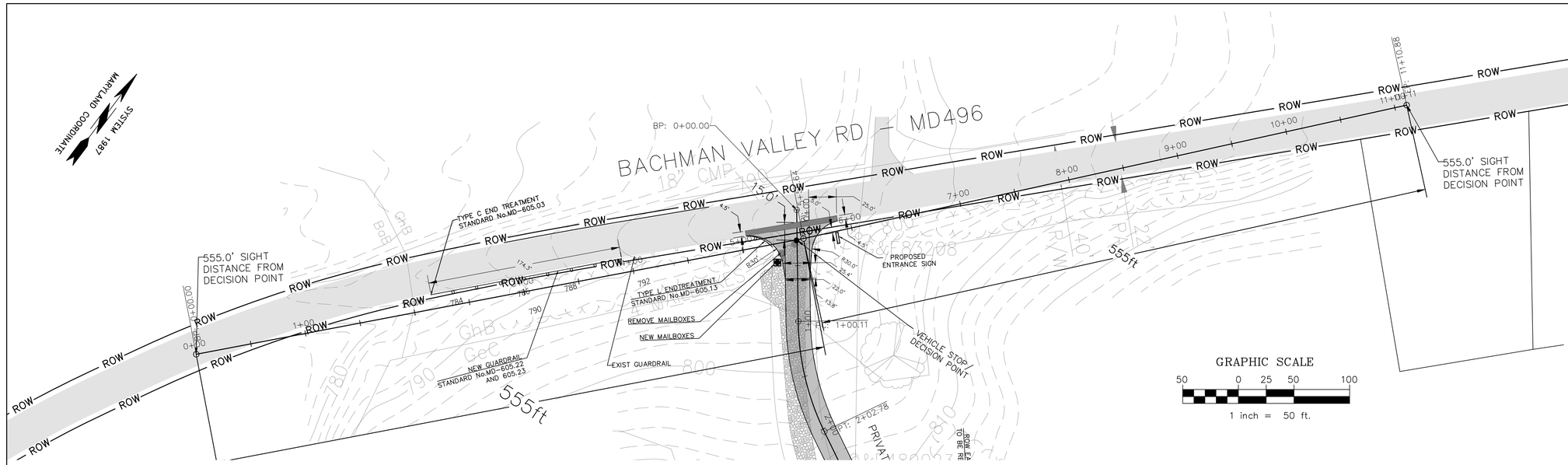
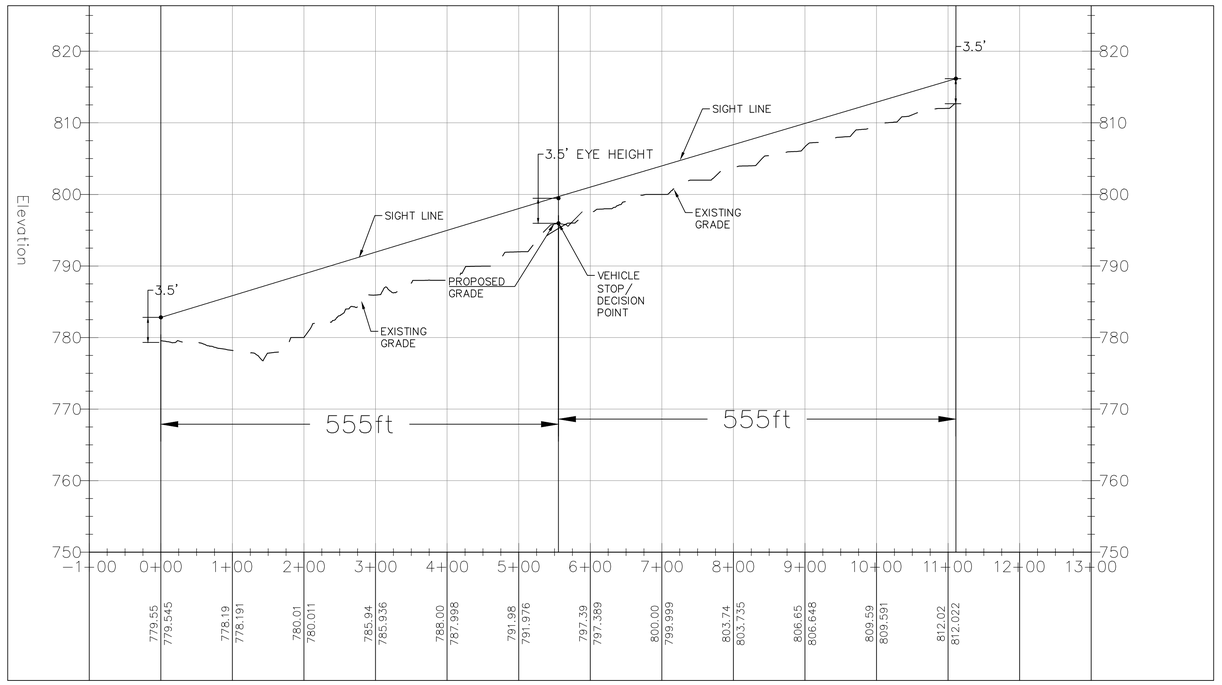


LEGEND

- Edge of Road
- Edge of Shoulder
- Feature separation distance in feet
- Fenceline
- Forest
- Guardrail
- Index Contours
- Intermediate Contours
- Overhead Lines
- Plat Outline
- Right-Of-Way Line
- Soil Type
- Storm Drain Line
- Stream
- Bit. Conc. Pav.
- Concrete
- Wetlands
- Gravel
- Point ID
- I.Pin Set
- Clean Out
- Mail Box
- Sign
- Spring
- Structure
- Utility Pole
- Utility Pole w/Guy Wire
- Well
- Proposed Contour
- Limit of Disturbance — LOD
- Conservation Area — C
- 100-Yr Floodplain Boundary — FP
- Asphalt Pav.
- SPOT ELEV. X= 763.0'
- REMOVE TREE



INTERSECTION SITE DISTANCE PROFILE

HORIZONTAL SCALE

100 0 50 100 200

1 inch = 100 ft.

VERTICAL SCALE

10 0 5 10 20

1 inch = 10 ft.

Sight Distance Measurement & Evaluation Worksheet

LEFT (North) RIGHT (South)

SITE

INTERSECTION SIGHT DISTANCE	MEASURMENT (ft)	
• 3.5' object placed at proposed access • 3.5' driver's eye height on approaching lane	LEFT	RIGHT
STOPPING SIGHT DISTANCE	**MEASURMENT (ft)**	
• 2.0' object placed at proposed access • 3.5' driver's eye height on approaching lane	LEFT	RIGHT

Evaluation

Posted Speed = 50 mph

Design Speed = Posted Speed + 10 mph = 60 mph (EAPD Policy)

Intersection Sigh Distance (ISD):

Turning Movement	State Standard ISD Requirement Based on Design Speed	Reduced ISD Requirement Based on Posted Speed *
Left Turn from Site Access	665	555
Left Turn into Site Access	405	490
Right Turn from Site Access	575	555

*Substandard condition meeting this requirement may be acceptable upon consideration of site specific traffic and safety conditions, feasibility constraints, etc. Mitigation may be required for any substandard condition.

Stopping Sigh Distance (SSD):

SSD Required for the Posted Speed: 570 ft (MUST be met)

Results

File No - S-20-0030

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

INTERSECTION SITE DISTANCE PLAN AND PROFILE

PROJECT ENG. M.B.
DESIGNED BY A.H.
CHECKED BY M.B.
DRAWN BY A.H.
PROJECT MGR. E.B.
PROGRAM MANAGER
DATE 05/05/2025
FILE NO - S-20-0030
SHEET 91 OF 96

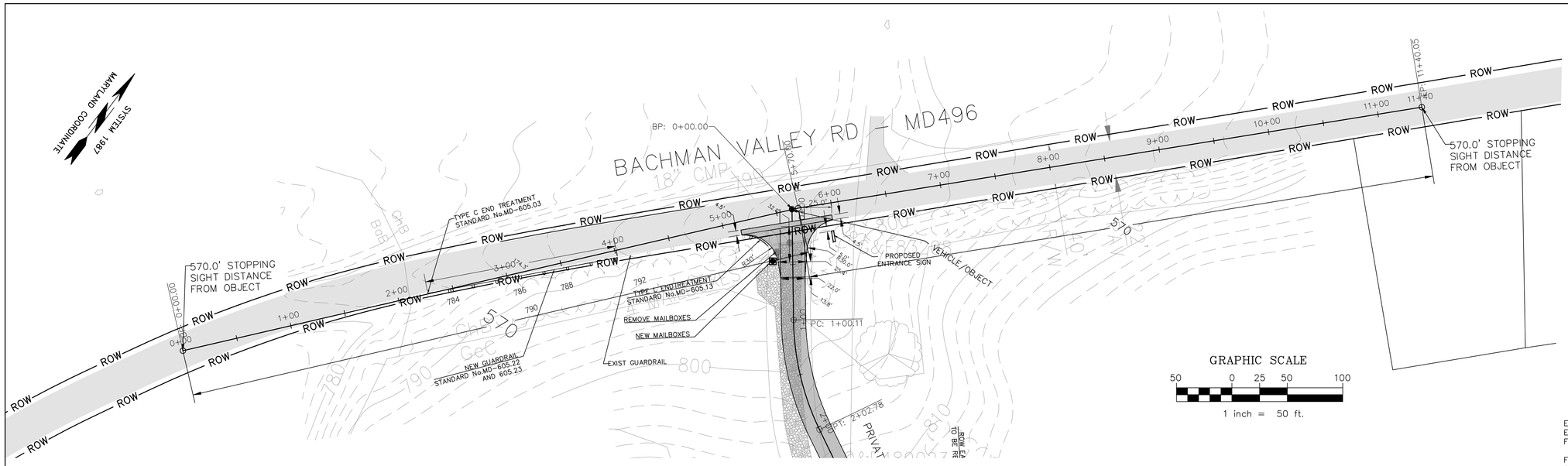
PROFESSIONAL CERTIFICATION
"I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland."
License Number: 48396
Expiration Date: 01-15-2026

ZTIGERS CONSULT, CONSULTING ENGINEERS
5120 WILLET BRIDGE ROAD
BETHESDA MD, 20816
TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

NO	DESCRIPTION	NAME	DATE

REVISIONS

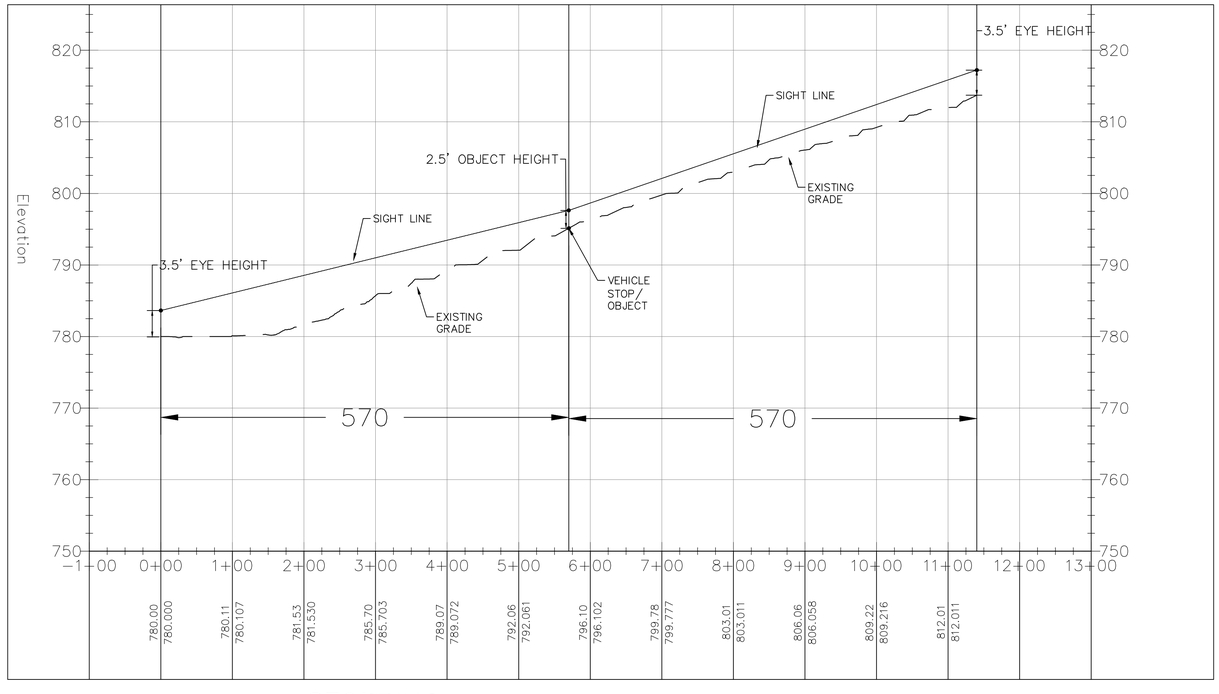
$DATE$



GRAPHIC SCALE

50 0 25 50 100

1 inch = 50 ft.



STOPPING SITE DISTANCE PROFILE

HORIZONTAL SCALE

100 0 50 100 200

1 inch = 100 ft.

VERTICAL SCALE

10 0 5 10 20

1 inch = 10 ft.

LEGEND

- Edge of Road
- Edge of Shoulder
- Feature separation distance in feet
- Fenceline
- Forest
- Guardrail
- Index Contours
- Intermediate Contours
- Overhead Lines
- Plat Outline
- Right-Of-Way Line
- Soil Type
- Storm Drain Line
- Stream
- Bit. Conc. Pav.
- Concrete
- Wetlands
- Gravel
- Point ID
- I.Pin Set
- Clean Out
- Mail Box
- Sign
- Spring
- Structure
- Utility Pole
- Utility Pole w/Guy Wire
- Well
- Proposed Contour
- Limit of Disturbance — LOD
- Conservation Area — C
- 100-Yr Floodplain Boundary — FP
- Asphalt Pav.

SPOT ELEV. X= 763.0'

REMOVE TREE

File No - S-20-0030

Tserha Tsion Menfes Kidus Church &
Merafe Kidusan Kidist Arsema Andinet Monastery

FINAL SITE DEVELOPMENT PLAN

PROJECT ENG. M.B.
DESIGNED BY A.H.
CHECKED BY M.B
DRAWN BY A.H.
PROJECT MGR. E.B

STOPPING SITE DISTANCE PLAN AND PROFILE

PROGRAM MANAGER

DATE 05/05/2025

FILE NO - S-20-0030

SHEET 92 OF 96

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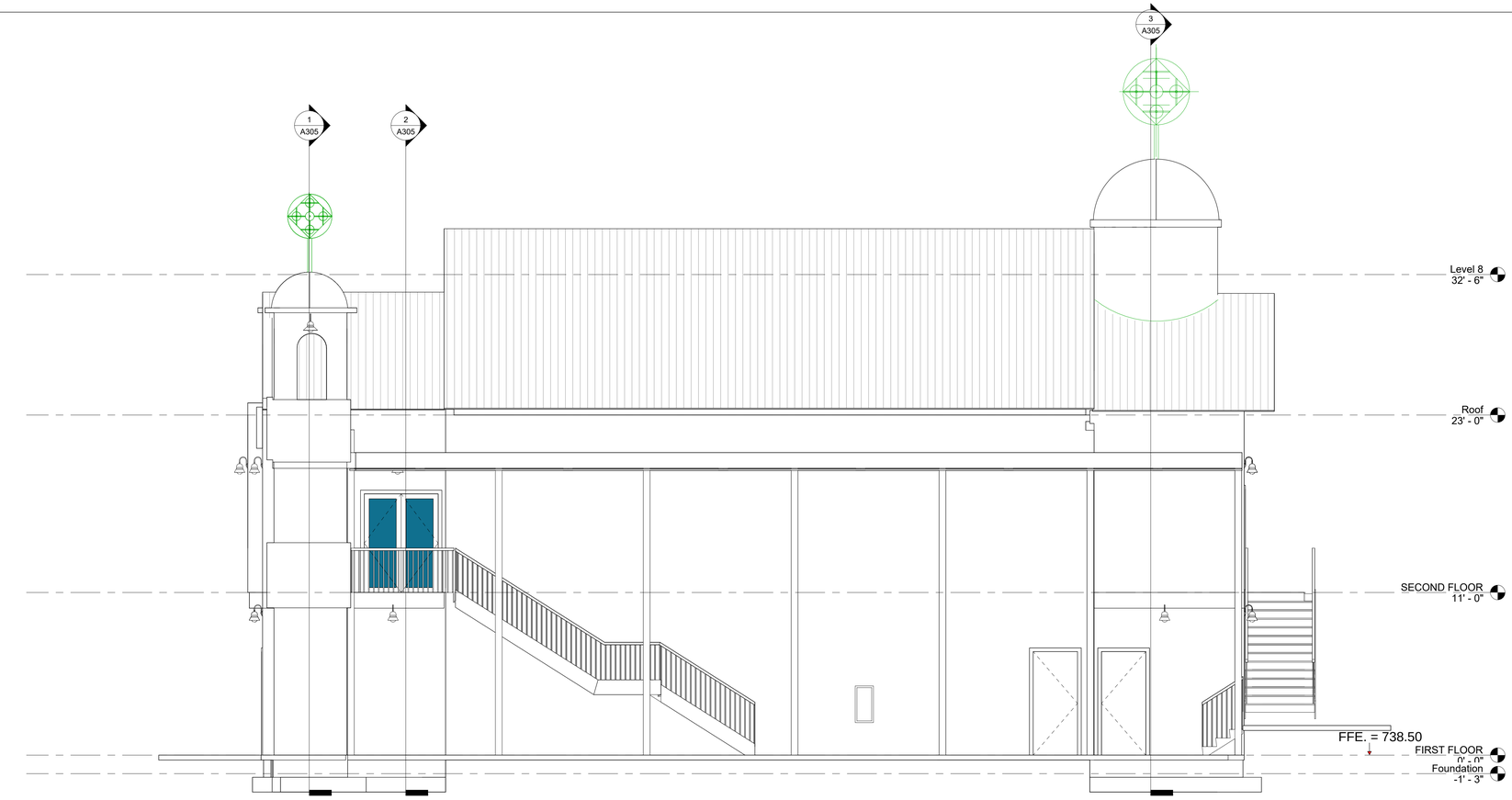
CONSULTING ENGINEERS
5120 WILLET BRIDGE ROAD
BETHESDA MD, 20816
TEL (202) 248 6000
TEL (301) 500 0854
FAX (301) 500 0483
WWW.ZTIGERS.COM

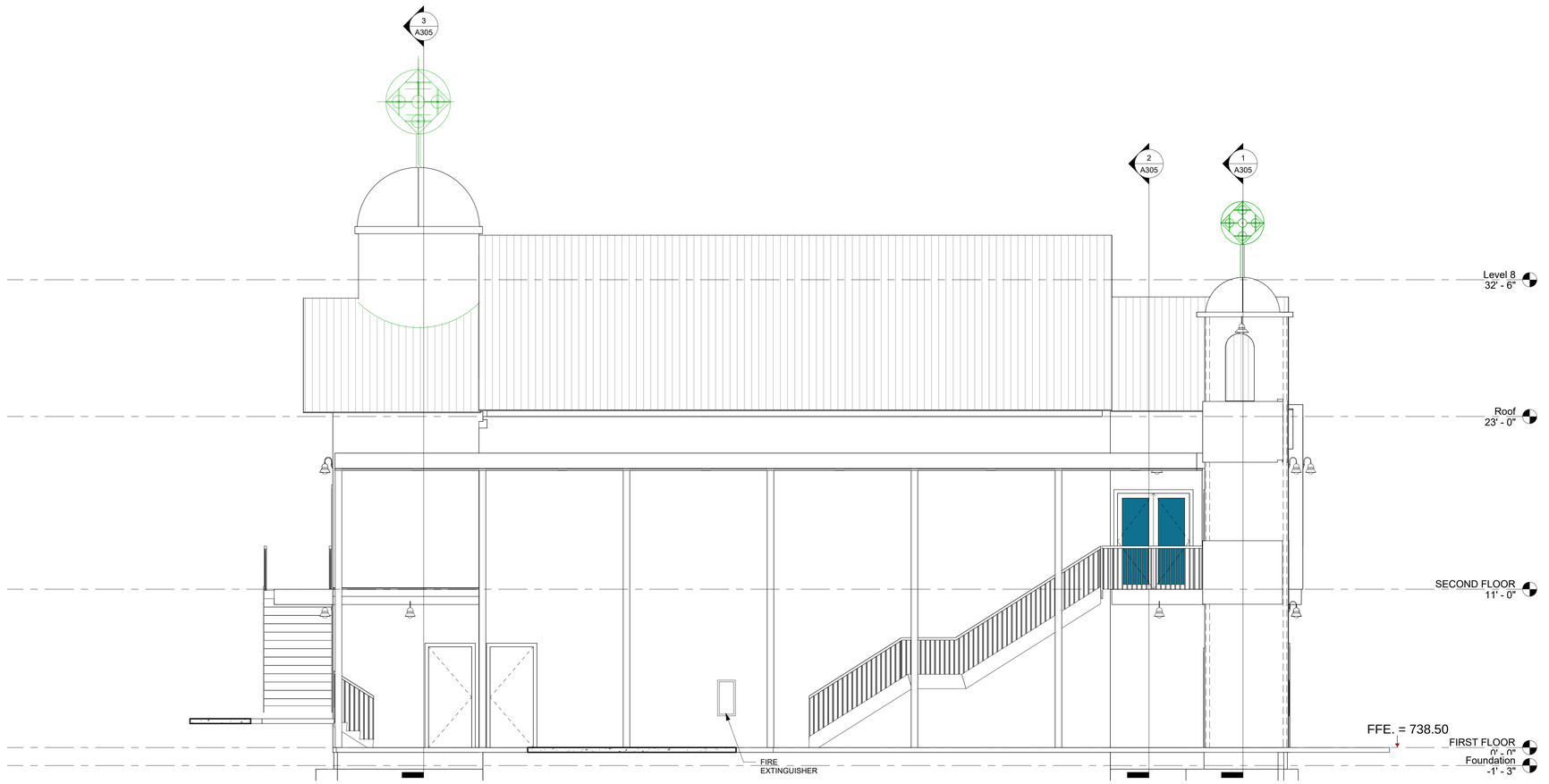
NO	DESCRIPTION	NAME	DATE

REVISIONS

$DATE$



1 East
1/4" = 1'-0"



2 West
1/4" = 1'-0"

VEGA ARCHITECTS LLC.
1612 BRADLEY AVE
ROCKVILLE, MD 20851
Phone: 2408930429
Fax
e-mail

FMC STRUCTURAL DESIGN GROUP, LLC
316 F STREET NE, ROOM 200A
WASHINGTON DC 20002
Phone : (301) 545-6740
Fax
e-mail

KK ENGINEERING, LLC
8850 COLUMBIA 100 PARKWAY, SUITE 316
COLUMBIA, MD, 21045
Phone : 393-1070 x 1006
Fax : 443-393-4963
e-mail

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DRAWINGS WERE PREPARED AND APPROVED BY ME, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. MY LICENSE EXPIRES 2/27/2025

STATE OF MARYLAND
ANTHONY PATRICK HOOKA
0015701
ARCHITECT

SEAL

No.	Description	Date
1	PERMIT SET	03/11/2024
2	PERMIT REVISION SET	01/24/2025

Owner

Tesfaye Mekoya Assegid

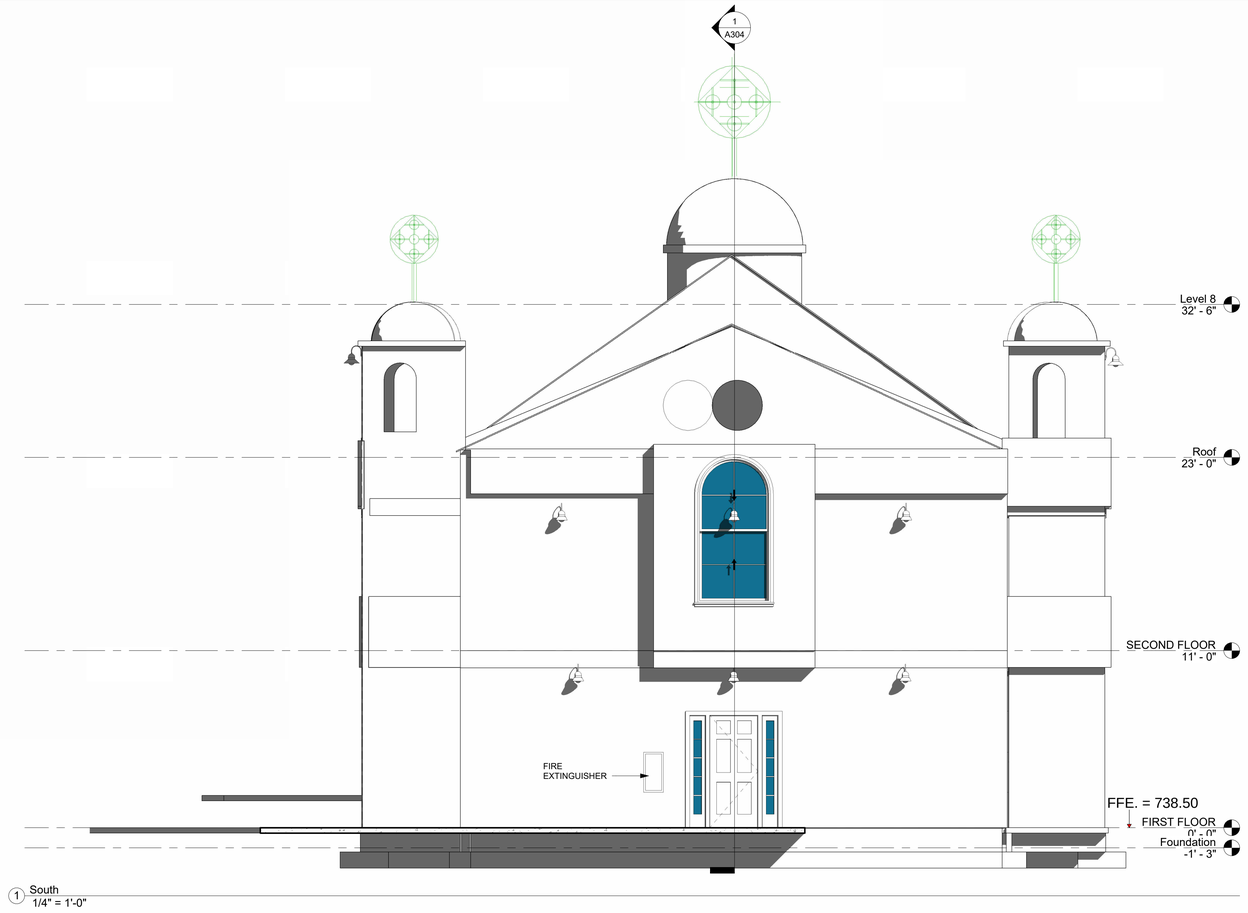
ARCHIVE & PRAYER BUILDING ELEVATIONS

Project number	Project Number
Date	Issue Date
Drawn by	Author
Checked by	Checker

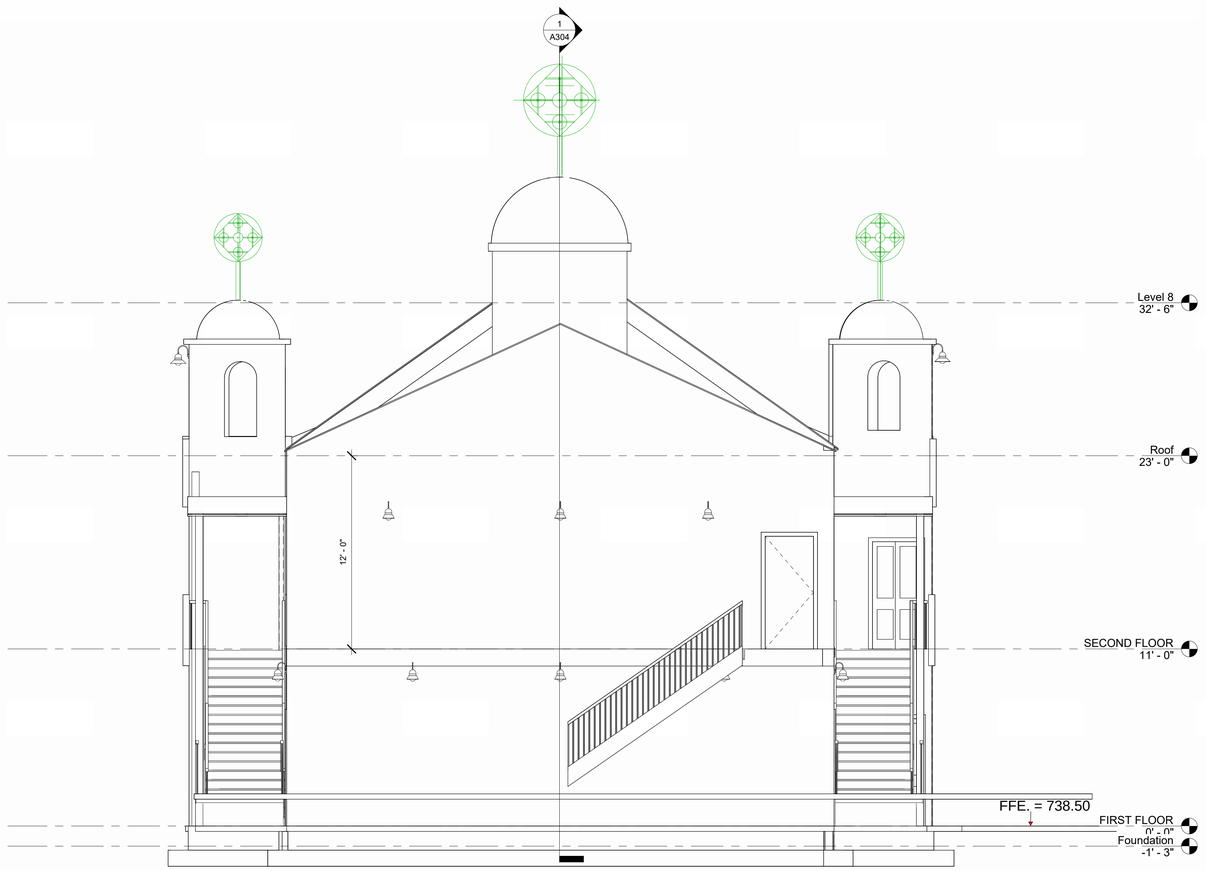
SHEET 93 OF 96

Scale	1/4" = 1'-0"

1/26/2025 4:54:02 PM



1 South
1/4" = 1'-0"



2 North
1/4" = 1'-0"

VEGA ARCHITECTS LLC.
1612 BRADLEY AVE
ROCKVILLE, MD 20851
Phone: 2408930429
Fax
e-mail

FMC STRUCTURAL DESIGN GROUP, LLC
316 F STREET NE, ROOM 200A
WASHINGTON DC 20002
Phone : (301) 545-6740
Fax
e-mail

KK ENGINEERING, LLC
8850 COLUMBIA 100 PARKWAY, SUITE 316
COLUMBIA, MD, 21045
Phone : 393-1070 x 1006
Fax : 443-393-4963
e-mail

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SEAL

No.	Description	Date
1	PERMIT SET	03/11/2024
2	PERMIT REVISION SET	01/24/2025

Owner

Tesfaye Mekoya Assegid

ARCHIVE & PRAYER BUILDING ELEVATIONS

Project number	Project Number
Date	Issue Date
Drawn by	Author
Checked by	Checker

SHEET 94 OF 96

Scale 1/4" = 1'-0"

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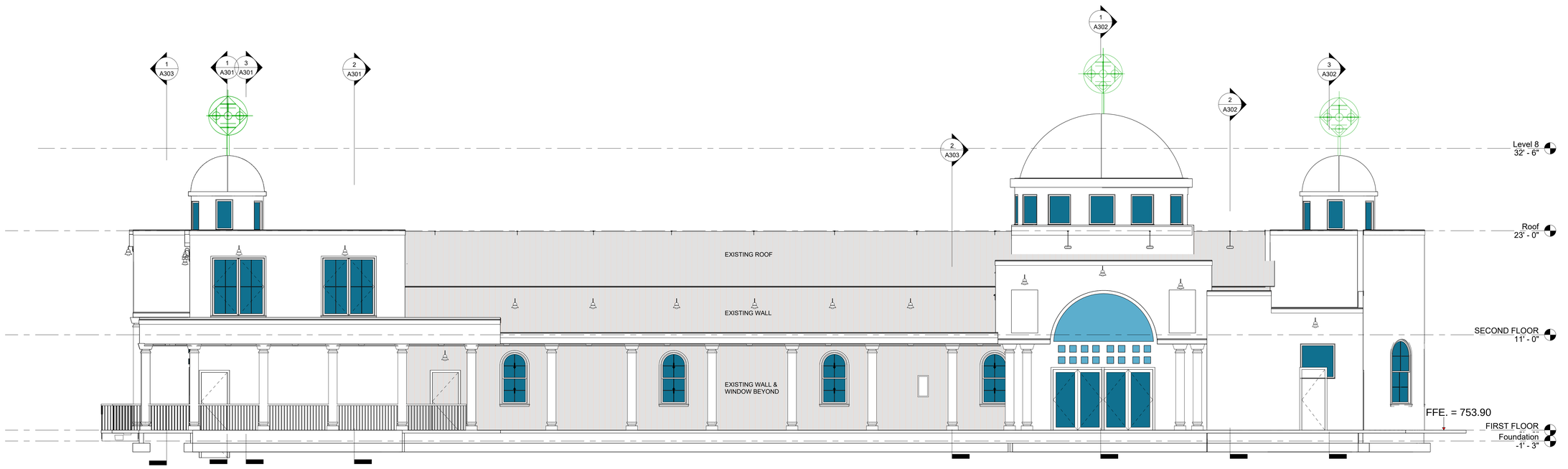

1 MP BUILDING EAST ELEVATION
3/16" = 1'-0"



2 MP BUILDING WEST ELEVATION
3/16" = 1'-0"

VEGA ARCHITECTS LLC.
1612 BRADLEY AVE
ROCKVILLE, MD 20851
Phone: 2408930429
Fax
e-mail

FMC STRUCTURAL DESIGN GROUP, LLC
316 F STREET NE, ROOM 200A
WASHINGTON DC 20002
Phone : (301) 545-6740
Fax
e-mail

KK ENGINEERING, LLC
8850 COLUMBIA 100 PARKWAY, SUITE 316
COLUMBIA, MD, 21045
Phone : 393-1070 x 1006
Fax : 443-393-4963
e-mail

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SEAL

No.	Description	Date
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2	PERMIT REVISION SET	01/24/2025

Owner

Tesfaye Mekoya Assegid

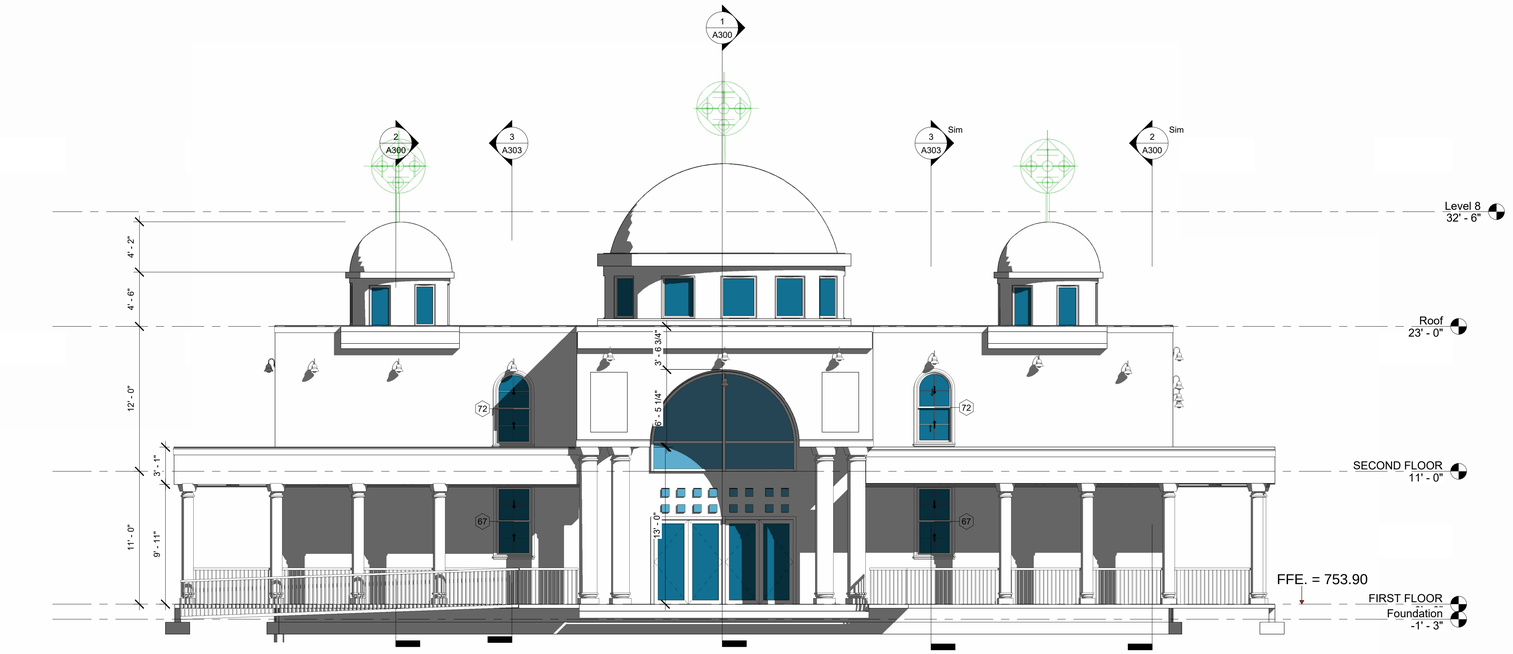
MP BUILDING ELEVATIONS

Project number	Project Number
Date	Issue Date
Drawn by	Author
Checked by	Checker

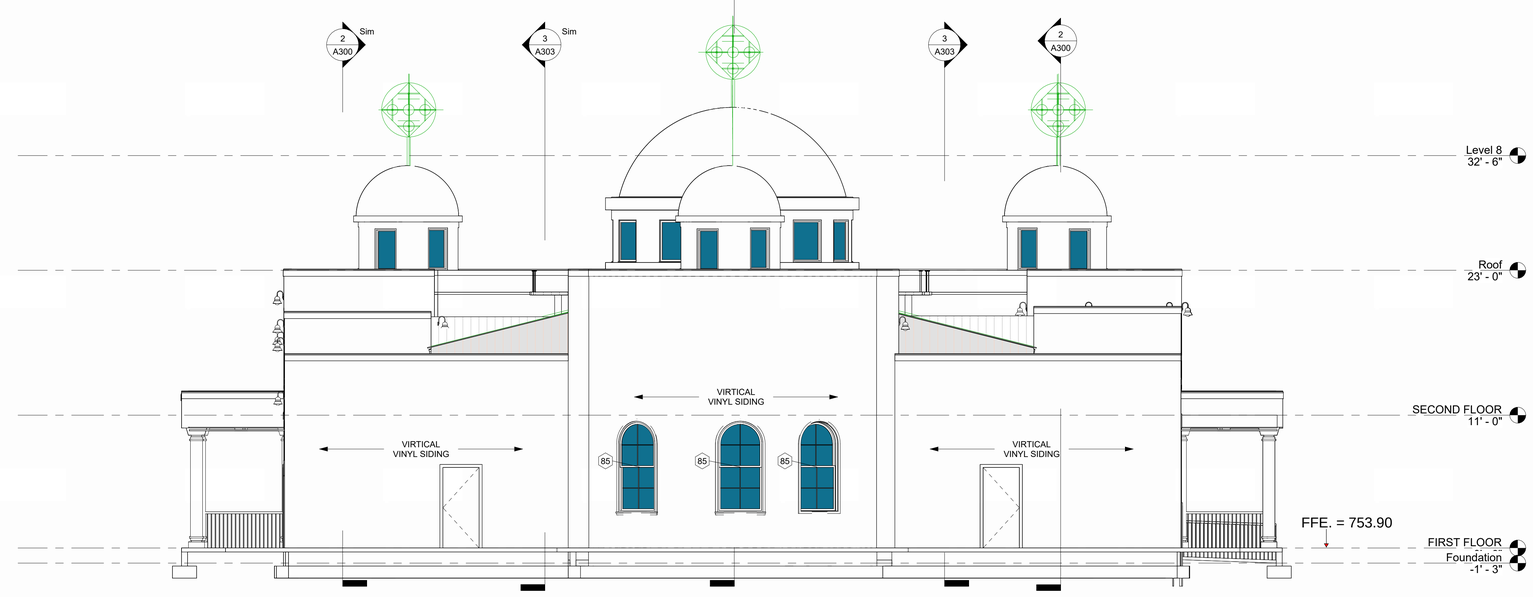
SHEET 95 OF 96

Scale 3/16" = 1'-0"

1/27/2025 9:11:28 PM



1 MP BUILDING LEFT ELEVATION
3/16" = 1'-0"



2 MP BUILDING RIGHT ELEVATION
3/16" = 1'-0"

VEGA ARCHITECTS LLC.
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ROCKVILLE, MD 20851
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e-mail

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DRAWINGS WERE PREPARED AND APPROVED BY ME, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND. MY LICENSE EXPIRES 2/27/2025

SEAL

No.	Description	Date
1	PERMIT SET	03/11/2024
2	PERMIT REVISION SET	01/24/2025

Owner

Tesfaye Mekoya Assegid

MP BUILDING ELEVATIONS

Project number	Project Number
Date	Issue Date
Drawn by	Author
Checked by	Checker
Scale	3/16" = 1'-0"

SHEET 96 OF 96

1/27/2025 9:11:40 PM