CLE-SR133-20.29
STAGE 3 DRAINAGE

PID 114264

Village of Williamsburg, Clermont County, Ohio

Prepared for: ODOT District 8
April 2023

Prepared by:

AECOM

OHIO DEPARTMENT OF TRANSPORTATION

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1. Project Overview

1.1 Project Overview

Improvements will include construction of 1,830 feet of shared use path along the south side of East Main Street (SR133/CR351) from the East Fork Little Miami River to the intersection of East Main St. and SR 133, including new curb and gutter, drainage improvement, driveway aprons, signage and pavement markings.

Current year (2021) ADT is 7,200. Design Speed is of 35MPH

AECOM designed the proposed storm sewer and drainage elements per the latest edition of the ODOT Location & Design Manual Volume II – Drainage Design.

In general, the drainage patterns flow from East to West on south side of the road and from south to north on the northside of the road thoughout the site. The storm water on the south ends up outletting to East Fork Little Miami River and the on the north to Five Mile Creek respectively. To the north there are 2-104" CMP existing culverts under Dela Palma Road carrying Five Mile Creek to East Fork Little Miami River.

The existing roadway is currently considered low speed (Posted speed limits 35 miles per hour).

The inlet spacing was based on the 5-year design storm frequency due to the facility being a rural high-volume highway (Over 6,000 ADT). The allowable spread per Table 1103-1 of the ODOT L&D Manual - Volume II is 6 feet for a 2-lane high volume highway under 45 miles per hour. This is 6 feet distance is measured into the travel lane. The proposed design has a combination curb and gutter, so the allowable pavement spread in this scenario is 8 feet (6 foot plus 2-foot gutter plate width), in general. A slotted drain has been proposed along the new curbed shared used path at the gas station to carry the storm, which will be collected in a catchbasin downstream, which then outlets into the ditch.

The proposed storm sewer system was sized for a 10-year design storm frequency with a 25-year hydraulic grade line check. The proposed storm sewer has been analyzed utilizing CDSS software.

Drainage area maps, inlet spacing calculations, storm sewer capacity calculations and ditch calculations are included herein.

Post Construction Best Management Practice (BMP) design was based on the latest edition of the ODOT Location & Design Manual Volume II – Drainage Design, specifically Section 1112. The project does have a Project Earth Disturbed Area (EDA) greater than 1 acre and would not be classified as a Routine Maintenance Project; therefore, BMPs are required. The project only needs to address Water Quality (WQ) treatment as there is no new permanent right of way.

We have chosen Vegetated Filter Strips as the BMP to address the WQ treatment requirements. The Vegetated Filter Strip was designed per Section 1113.2.1. Separate Post Construction BMP drainage area maps and calculations are also included herein. Location in the middle of the project site from Sta. 848+50 to Sta. 852+90 has been utilized for Vegetated Filter Strip. Since the project only includes the addition of a shared used path and no roadway improvements, a 10-foot wide Vegetated Filter Strip has been utilized to meet post-construction treatment requirements. The proposed Vegetated Filter Strip is inside the Village owned property.

The Notice of Intent Earth Disturbing Activities (NOI EDA) area was calculated using Figure 1109-1 of the latest edition of the ODOT Location & Design Manual Volume II – Drainage Design.

A portion of the project approximately (Sta. 841.67 to Sta. 845+00) is located within the FEMA designated Special Flood Hazard Area (Zonae AE) for the East Fork of the Little Miami River. The 100-year base flood elevation (BFE) is 803.1 The existing roadway would be inundated during a 100-year flood event. The project limits are located outside of the regulatory floodway. This project will have no impact upon the BFE, and no hydraulic analysis is required. No fill will be placed below the Ordinary Highwater Elevation of the East Fort of the Little Miami River.

A Letter of Notification of SFHA LD-53 Exemption will be provided to the Local Floodplain Coordinator at the Village of Williamsburg and copy to the project file.

In Stage 3, proposed catch basins D1, D2, and D3 have been removed since during the Village reconstruction of the driveway two catch basins have been placed around the same location. Existing condition inlet spacing calculations and storm sewer calculations have been provided with this report.

2. Drainage Computations

2.1 Drainage Area Maps

CLE-SR133-20.29

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DESIGNER	REVIEWER	PROJECT ID	SHEET	TOTAL
DL	NSP 04/10/23	114264	P.1	4

AECOM

DESIGN AGENCY

DRAINAGE AREA MAP
BEGINNING TO STA. 845+50.00

HORIZONTAL SCALE IN FEET
0 20
10 40

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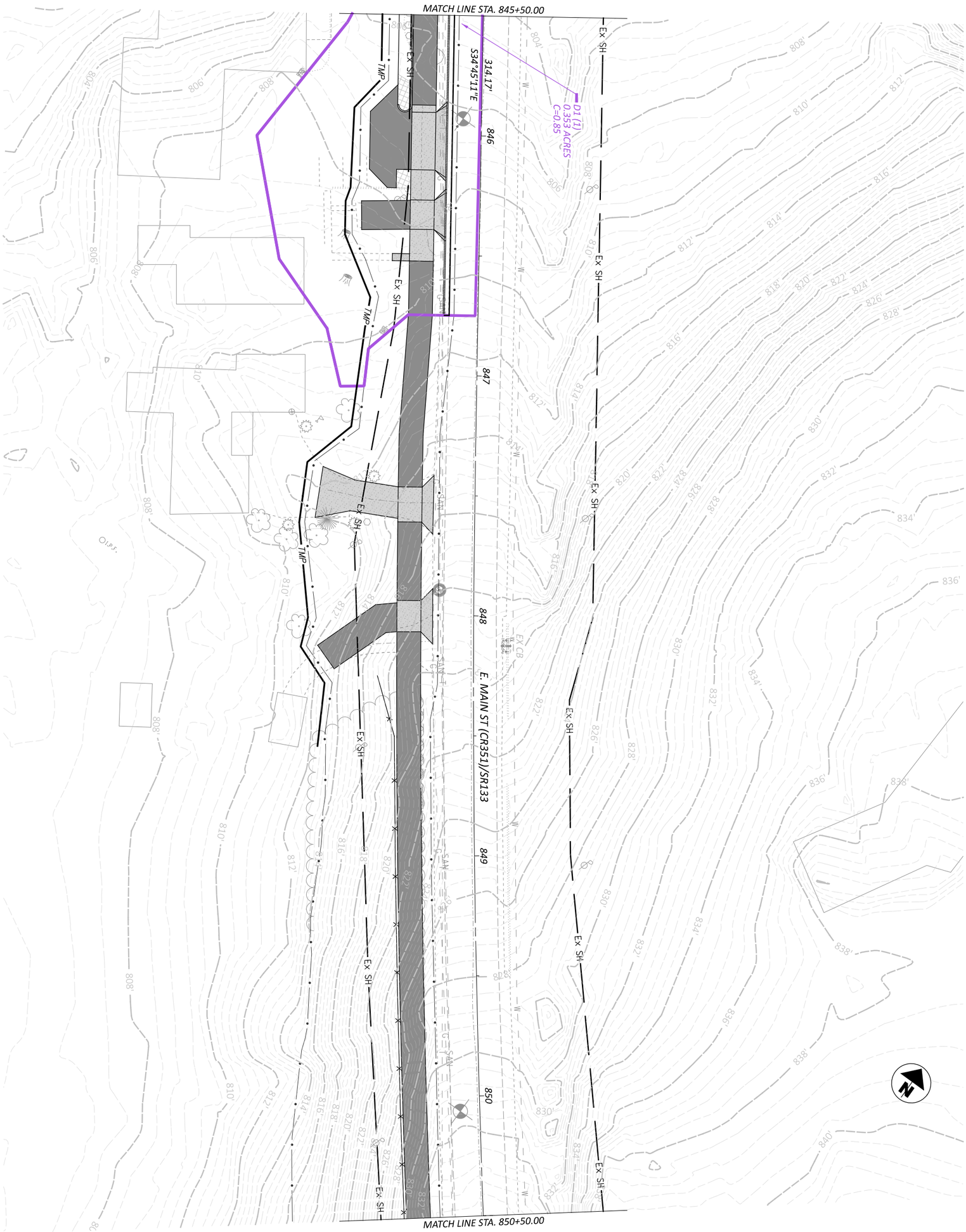


DRAINAGE AREA MAP
STA. 845+50.00 TO STA. 850+50.00

HORIZONTAL SCALE IN FEET
0 20
10 40

SHEET	TOTAL
P.2	4

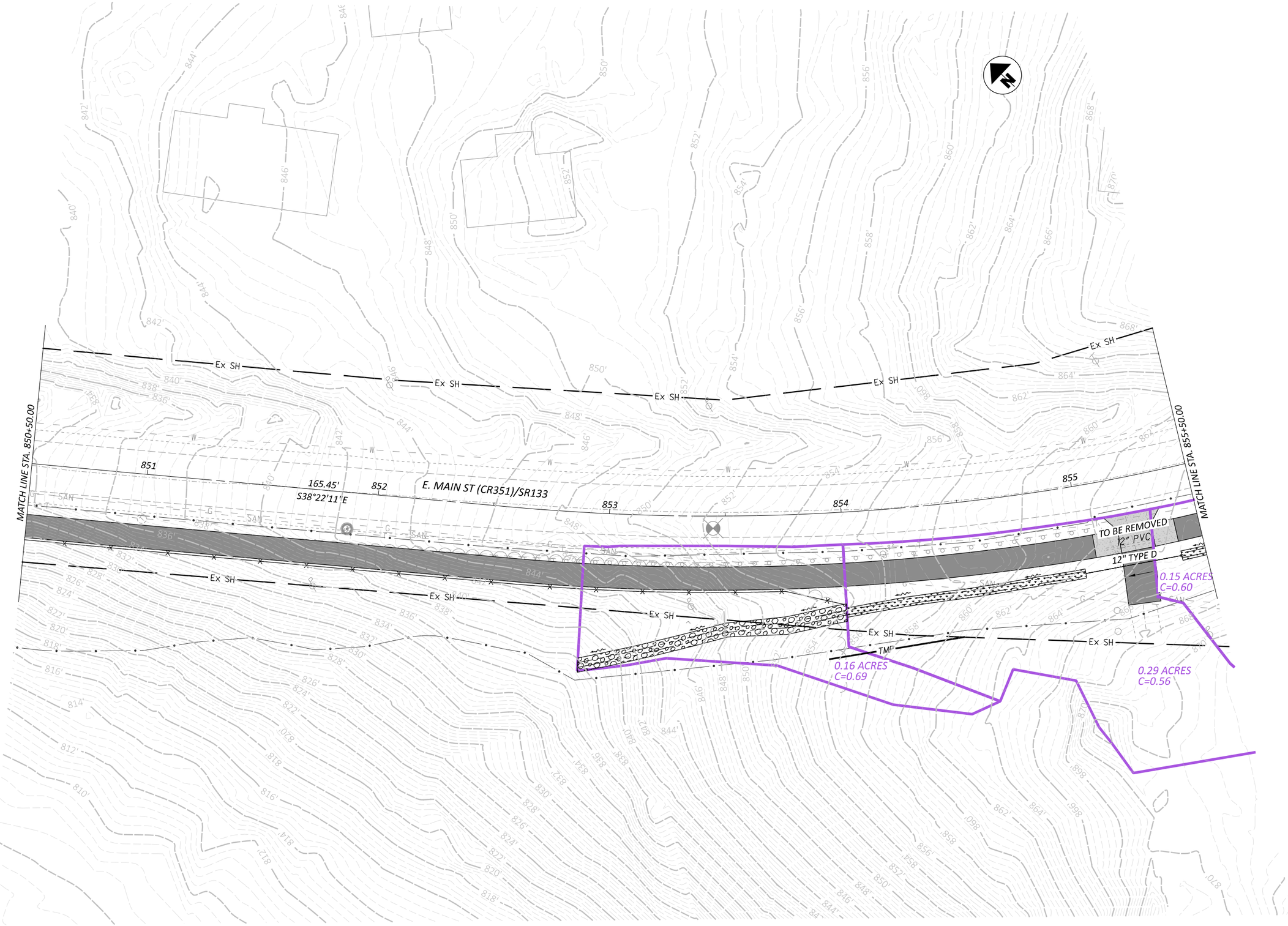
PROJECT ID: 114264

REVIEWER: NSP 04/10/23

DESIGNER: DL

AECOM

DESIGN AGENCY



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAINAGE AREA MAP
STA. 850+50.00 TO STA. 855+50.00

CLE-SR133-20.29

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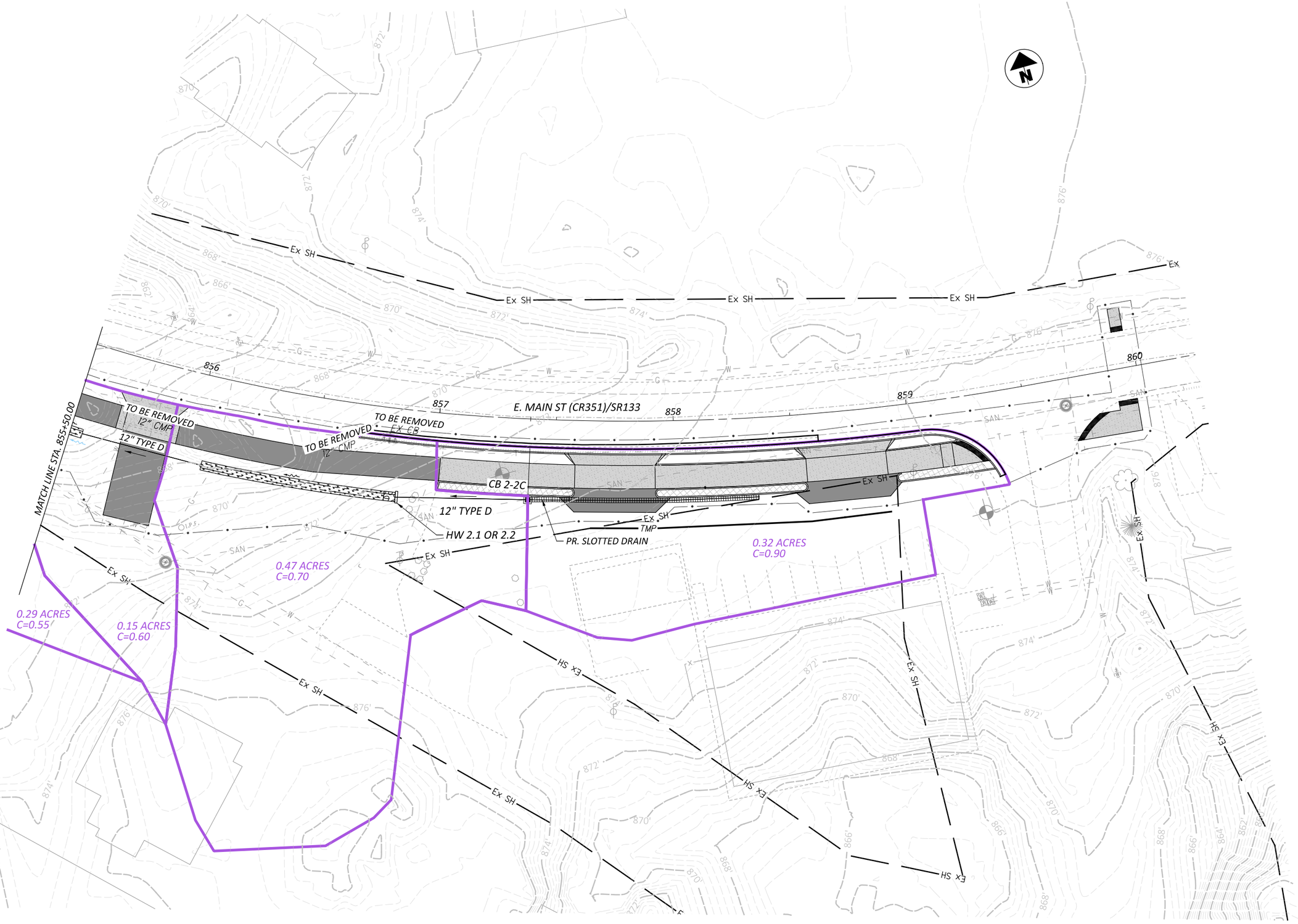
DESIGN AGENCY
AECOM

DESIGNER
DL

REVIEWER
NSP 04/10/23

PROJECT ID
114264

SHEET P.3 | TOTAL 4



HORIZONTAL SCALE IN FEET
0 10 20 40

DRAINAGE AREA MAP
STA. 855+50.00 TO END

DESIGN AGENCY	AECOM
DESIGNER	DL
REVIEWER	NSP 04/10/23
PROJECT ID	114264
SHEET	P.4
TOTAL	4

CLE-SR133-20.29

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2.2 Inlet Spacing Calculations

INLET SPACING DESIGN

PID : 114264 **Date :** 09/08/2022 **Project :** CLE-133-20.29 **Location :** Clermont County, Ohio

Description : CR133: Sta. 841+66.67 (HP) to Sta. 844+25.31(EX. CB3) to Sta. 846+75 (End Curb) **Designer :** DL

Rainfall Area: C **Storm Frequency (yr.) :** 5 **Total Allow. Spread (ft.) :** 6.00 +2' (Curb&Gutter) **Allowable Depth (ft.)** 0.42

	STATION	C.B. Type	GUTTER LENGTH (ft.)	RUNOFF COEF	AREA (acres)	CONC. TIME (min.)	GUTTER TIME (min.)	TIME USED (min.)	LONG. SLOPE (ft./ft.)	GUTT. SLOPE (ft./ft.)	PAVT. SLOPE (ft./ft.)	GUTT. WIDTH (ft.)	LOCAL DEPRESS. (ft.)	RAIN FALL (in./hrs.)	INTERCPTD FLOW (cfs.)	BYPASS FLOW (cfs.)	TOTAL FLOW (cfs.)	DEPTH FLOW (ft.)	PAVT. SPREAD (ft.)	
	841+67	Begin																		
EXCB1	844+00	CB-3A	233.00	0.86	0.22	10.00	2.06	12.06	0.0080	0.0833	0.0906	2.00	0.0000	4.21	0.77	0.02	0.79	0.229	2.69	
EXCB2	844+25	CB-3	25.00	0.90	0.02	10.00	0.80	10.80	0.0010	0.0833	0.0869	2.00	0.0000	4.38	******	******	0.11	0.160	1.92	Sag
	846+75	Begin																		
EXCB2	844+25	CB-3	250.00	0.85	0.35	10.00	4.37	14.32	0.0010	0.0833	0.0869	2.00	0.0000	3.92	******	******	1.18	0.393	4.61	End

SUMP DATA

Total Flow (cfs) : 1.28 **Ponded Depth (ft.) :** 0.110 **Spread on Pavement (ft.) :** 2.70

2.3 Storm Sewer Calculations

STORM SEWER SYSTEM

PID : 114264 **Date :** 09/08/2022 **Project :** CLE-133-20.29 **Location :** Clermont County, Ohio

Description : Ex. Storm Calcs CR133 Sta. 844+00 to Sta. 844+26 (EX. CB LP) Rt. **Designer :** DL

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From	To	ΔAREA ΣAREA (acres)	ΔCA ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'
EXCB1	EXCB2	844+26		0.38	0.32	10.00	5.30	6.47	1.7	2.1	12	20.0	0.0150	798.68	4.67	4.07	0.0045	799.28	800.78	1.50	1.10	CB 3
begin		844+00		0.38	0.32									798.38				799.19	801.13			0.015
EXCB2	EXHW	844+00		0.22	0.19	10.07	5.28	6.45	2.7	3.3	12	58.0	0.0955	798.38	10.43	10.27	0.0112	798.78	801.13	2.35	1.75	CB 3A
final		844+00		0.59	0.51									792.84				793.73	795.76			0.015

STORM SEWER SYSTEM

PID : 114264 **Date :** 09/08/2022 **Project :** CLE-133-20.29 **Location :** Clermont County, Ohio

Description : Proposed Slotted Drain CR133 Sta. 858+35 to Sta. 857+39 Rt. (CB-2-2C) to HW2 **Designer :** DL

Rainfall Area: C **Just Full Capacity Frequency (yrs.) :** 10 **Hydraulic Gradient Frequency (yrs.) :** 25

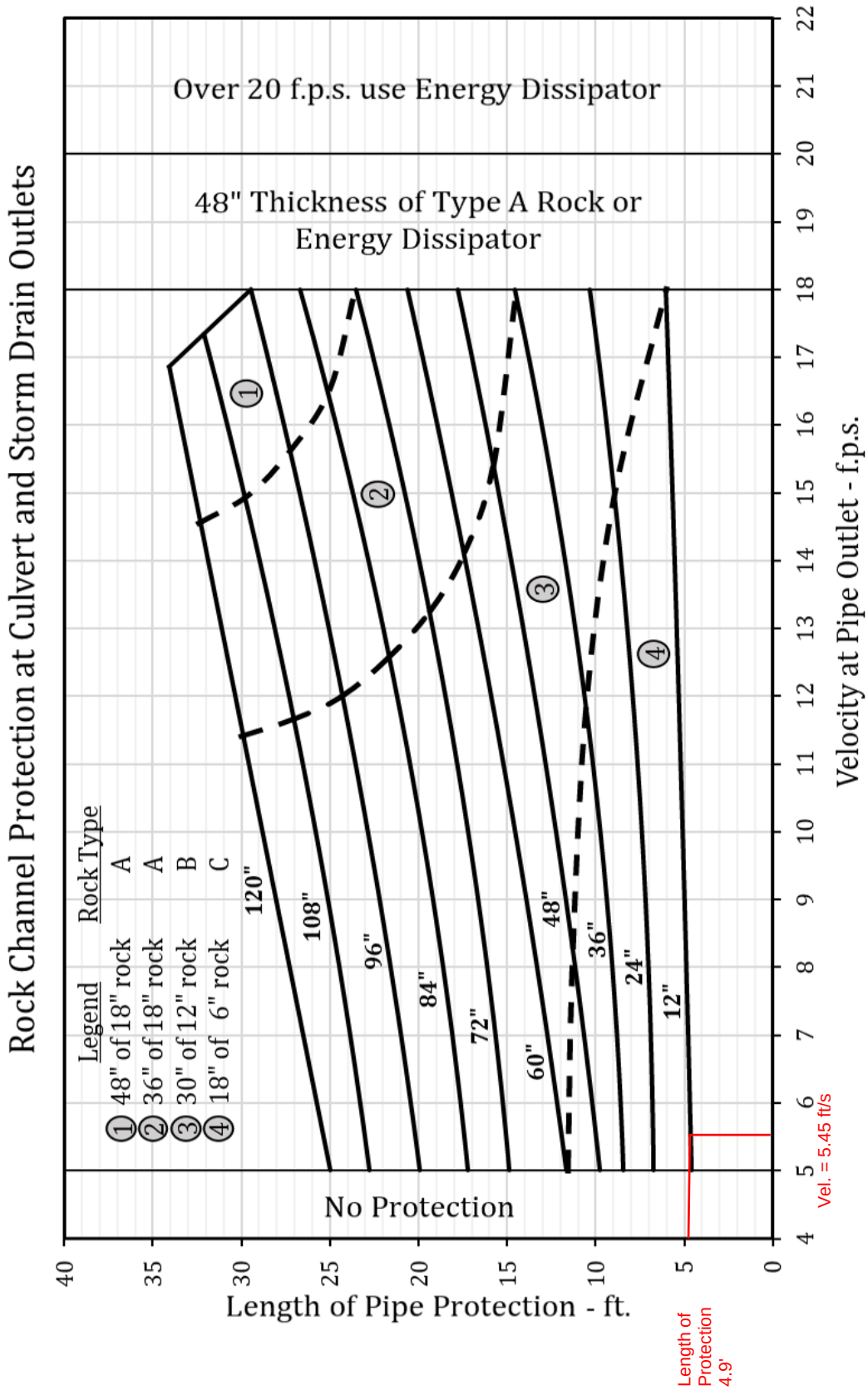
Minimum Pipe Size : 12.00 **Tailwater Elevation (ft.):** 0.00

JUNCTION From	To	STATION From / To	ΔAREA / ΣAREA (acres)	ΔCA / ΣCA	BEGIN TIME (min.)	RAINFALL INTENSITY (10 yrs.)	(25 yrs.)	DISCHARGE (cfs.) (10 yrs.)	(25 yrs.)	PIPE DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	F/L PIPE IN / OUT (ft.)	MEAN VEL (fps.)	JUST FULL CAPACITY (cfs.)	FRICT SLOPE (ft./ft.)	HYGR EL. IN / OUT (ft.)	COVER IN / OUT (ft.)	COVER MINUS HY GR	COVER MINUS CROWN	INLET TYPE MANNING'S 'n'	
D4	D3	858+35	0.32	0.29	10.00	5.30	6.41	1.5	1.9	12	100.0	0.0270	873.58	5.67	5.46	0.0036	874.00	875.08	1.08	0.50	~~MH 3~~	Slotted Drain
begin		857+39	0.32	0.29									870.88				871.67	873.52			0.015	
D3	HW2	857+39	0.00	0.00	10.29	5.24	6.36	1.5	1.8	12	56.0	0.0245	870.88	5.45	5.20	0.0035	871.31	873.52	2.21	1.64	~~CB 2-2B~~	CB 2-2C
final		856+83	0.32	0.29									869.51				870.30	871.51			0.015	

ROCK CHANNEL PROTECTION AT CULVERT AND STORM SEWER OUTLETS

1002-4

REFERENCE SECTION 1002.2.3



2.4 Ditch Calculations

DITCH ANALYSIS

PID : 114264 **Date :** 09/08/2022 **Project :** CLE-133-20.29 **Location :** Clermont County, Ohio

Description : CR133: Right Ditch From Sta. 856+83 to Sta. 852+90 **Designer :** DL

Rainfall Area : C

Allowable Shears

	Seed:	0.40	**Jute Mat:**	0.45	**Temporary Mat:**	1.00
Permanent Mat	**Type 1:**	3.00	**Type 2:**	4.00	**Type 3:**	5.00
RCP	**Type B:**	6.00				

(*) Warning: Grade is steeper than allowable. If value is parantheses, design parameters have been exceeded. - See user manual.

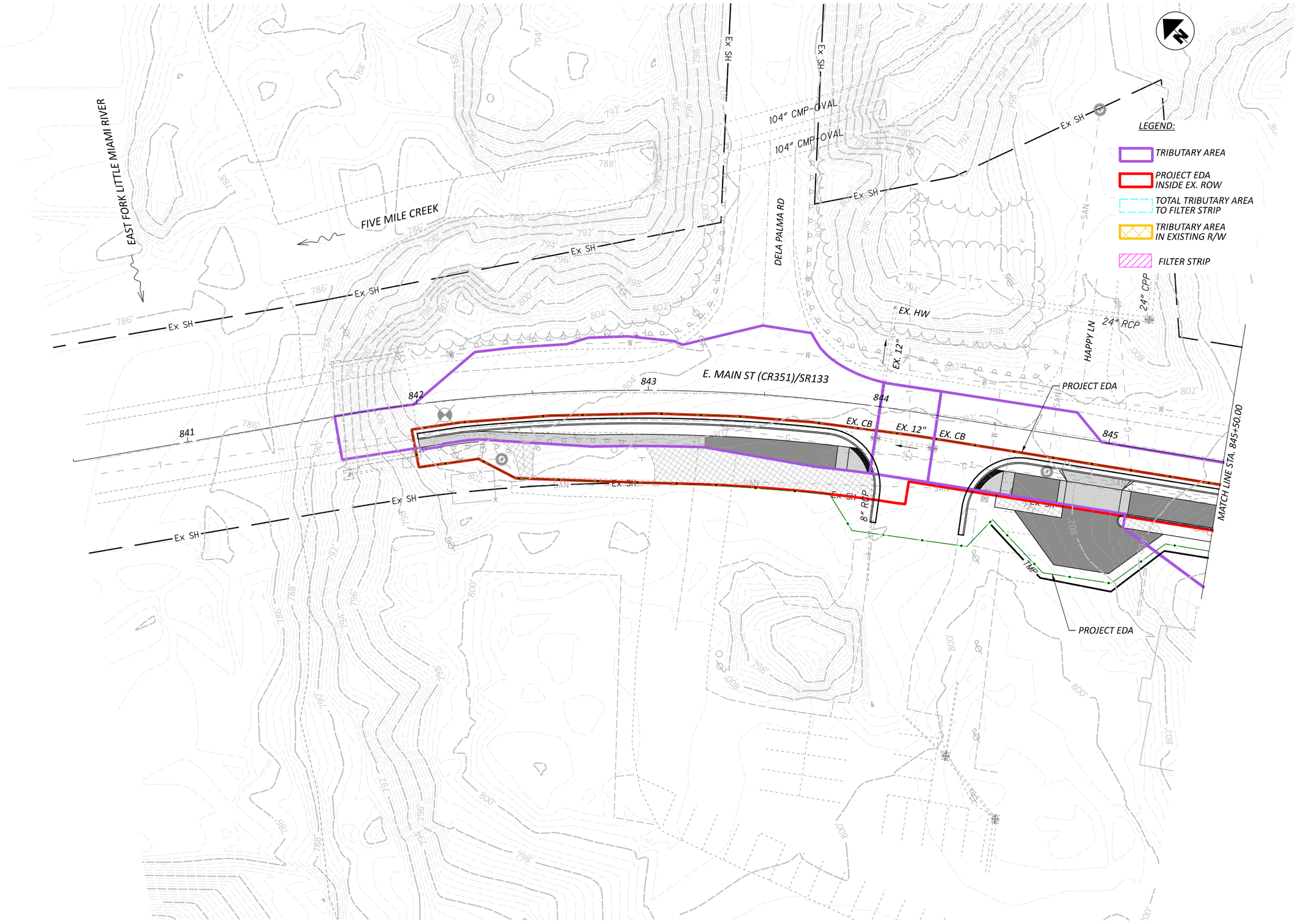
STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
856+85	Concent							0.32		0.90	0.29					10.00					
856+85	856+05	R	84.00	2.00	4.00	3.00	0.0732	0.47	0.79	0.70	0.62	Seed	3.81	5	0.030	15.35	4.03	0.97	2.35	0.21	3.49
												Jute Mat	3.80	5	0.040	15.42	3.29	1.13	2.35	0.25	3.74
												Temp. Mat	3.80	5	0.040	15.42	3.29	1.13	2.35	0.25	3.74
												Perm, Type 1	3.80	5	0.040	15.42	3.29	1.13	2.35	0.25	3.74
												Perm, Type 1	4.38	10	0.040	15.41	3.42	1.23	2.70	0.27	3.88
855+55	855+40	R	16.00	2.00	4.00	3.00	0.0567	0.15	0.94	0.60	0.71	Seed	3.79	5	0.030	15.49	3.83	0.87	2.69	0.25	3.72
												Jute Mat	3.79	5	0.040	15.51	3.13	1.01	2.69	0.29	4.00
												Temp. Mat	3.79	5	0.040	15.51	3.13	1.01	2.69	0.29	4.00
												Perm, Type 1	3.79	5	0.040	15.51	3.13	1.01	2.69	0.29	4.00
												Perm, Type 1	4.36	10	0.040	15.49	3.25	1.09	3.09	0.31	4.16
855+00	854+00	R	105.00	2.00	4.00	2.00	0.0687	0.29	1.23	0.56	0.87	Seed	3.75	5	0.030	15.90	4.44	1.13	3.26	0.26	3.58
												Jute Mat	3.74	5	0.040	15.99	3.62	1.32	3.25	0.31	3.84

DITCH ANALYSIS

STATION BEGIN	STATION END	SIDE	LENGTH (ft.)	RADIUS WIDTH (ft.)	IN SLOPE (ft./ft.)	BACK SLOPE (ft./ft.)	GRADE (ft./ft.)	AREA (acres)	AREA SUM (acres)	RUNOFF COEFF.	CA (Sum)	PROTECT TYPE	RAIN INT. (in./hr.)	STORM FREQ. (yrs.)	MANN. COEFF.	TIME FLOW (min.)	VEL. FLOW (fps.)	SHEAR (lbs./ sq.ft.)	DESIGN FLOW (cfs.)	DEPTH FLOW (ft.)	WIDTH FLOW (ft.)
												Temp. Mat	3.74	5	0.040	15.99	3.62	1.32	3.25	0.31	3.84
												Perm, Type 1	3.74	5	0.040	15.99	3.62	1.32	3.25	0.31	3.84
												Perm, Type 1	4.30	10	0.040	15.95	3.77	1.42	3.74	0.33	3.99
854+00	852+90	R	118.00	2.00	2.50	2.00	0.1568 *	0.16	1.39	0.69	0.98	Seed	3.70	5	0.030	16.30	6.34	2.23	3.62	0.23	3.02
												Jute Mat	3.70	5	0.040	16.37	5.20	2.61	3.62	0.27	3.20
												Temp. Mat	3.70	5	0.040	16.37	5.20	2.61	3.62	0.27	3.20
												Perm, Type 1	3.70	5	0.040	16.37	5.20	2.61	3.62	0.27	3.20
												Perm, Type 1	4.25	10	0.040	16.31	5.42	2.83	4.16	0.29	3.30

3. Post-Construction Storm Water BMP Calculations

3.1 PC-BMP Drainage Area Maps



HORIZONTAL SCALE IN FEET
0 10 20 40

PC - BMP DRAINAGE AREA MAPS
BEGINNING TO STA. 845+50.00

CLE-SR133-20.29

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DESIGNER DL
REVIEWER NSP 09/09/22
PROJECT ID 114264
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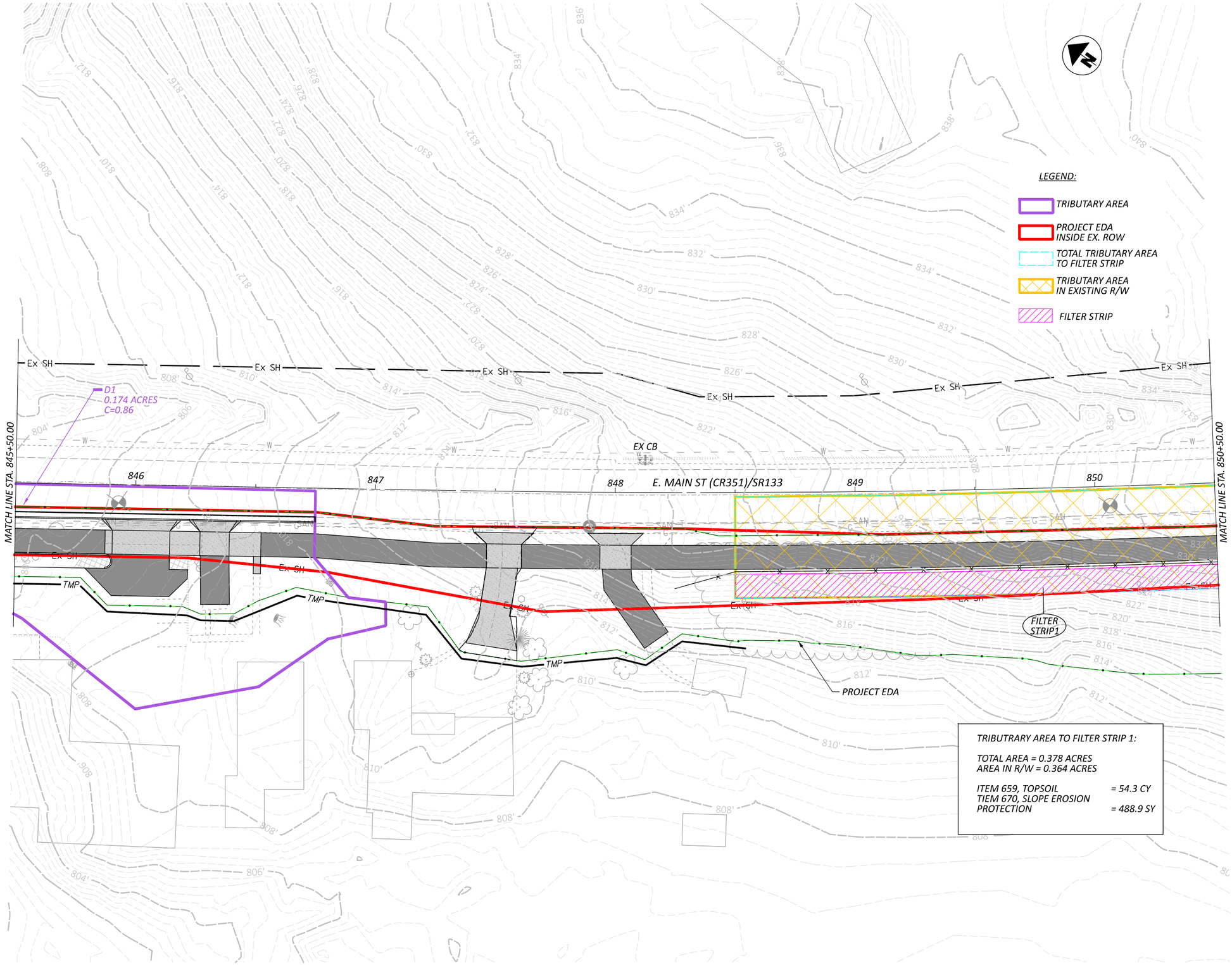

HORIZONTAL SCALE IN FEET
0 10 20 40

PC - BMP DRAINAGE AREA MAPS
STA. 845+50.00 TO STA. 850+50.00

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DESIGNER DL
REVIEWER NSP 09/09/22
PROJECT ID 114264
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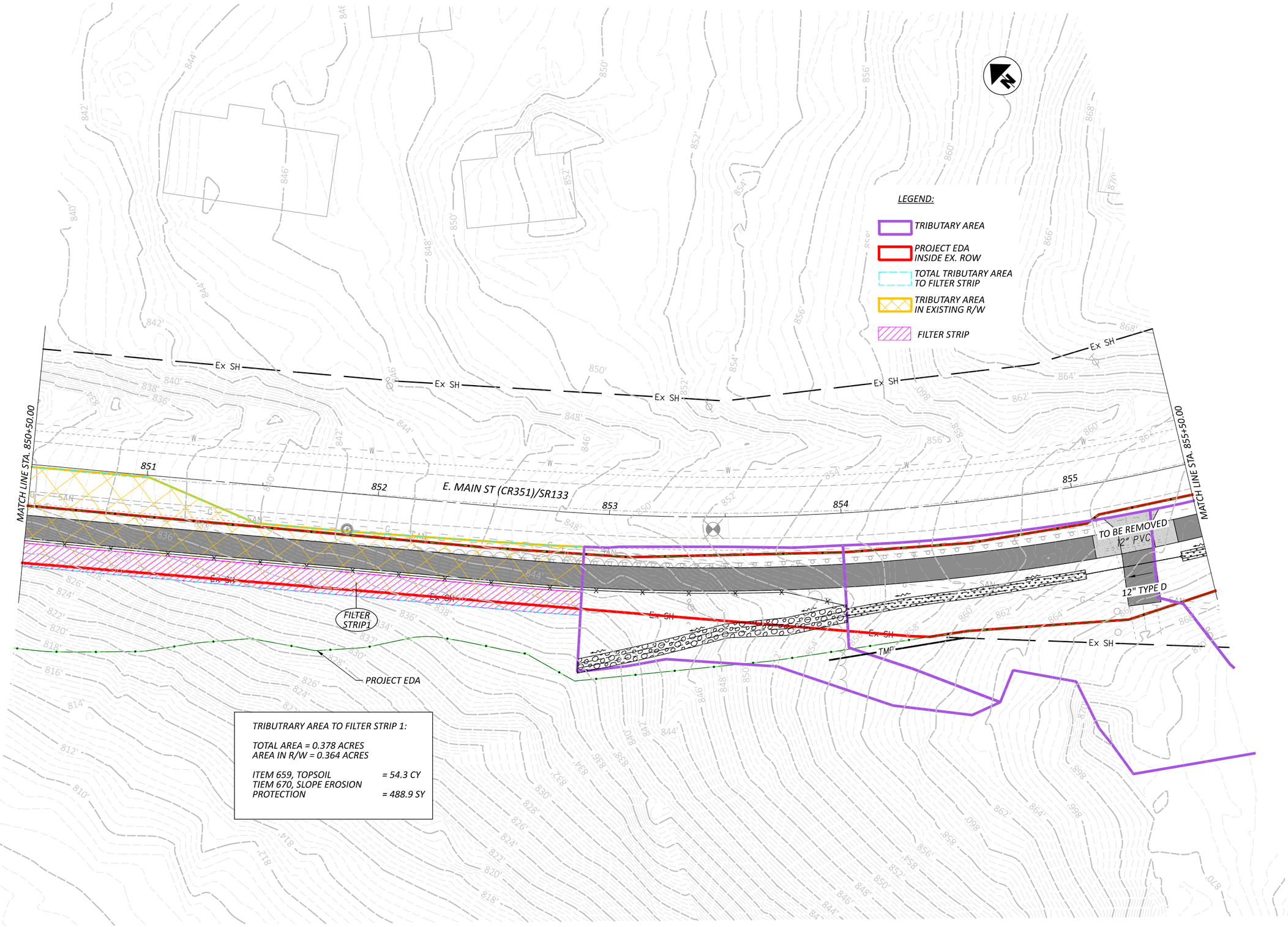

HORIZONTAL SCALE IN FEET
0 10 20 40

PC - BMP DRAINAGE AREA MAPS
STA. 850+50.00 TO STA. 855+50.00

CLE-SR133-20.29

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DESIGNER DL
REVIEWER NSP 04/10/23
PROJECT ID 114264
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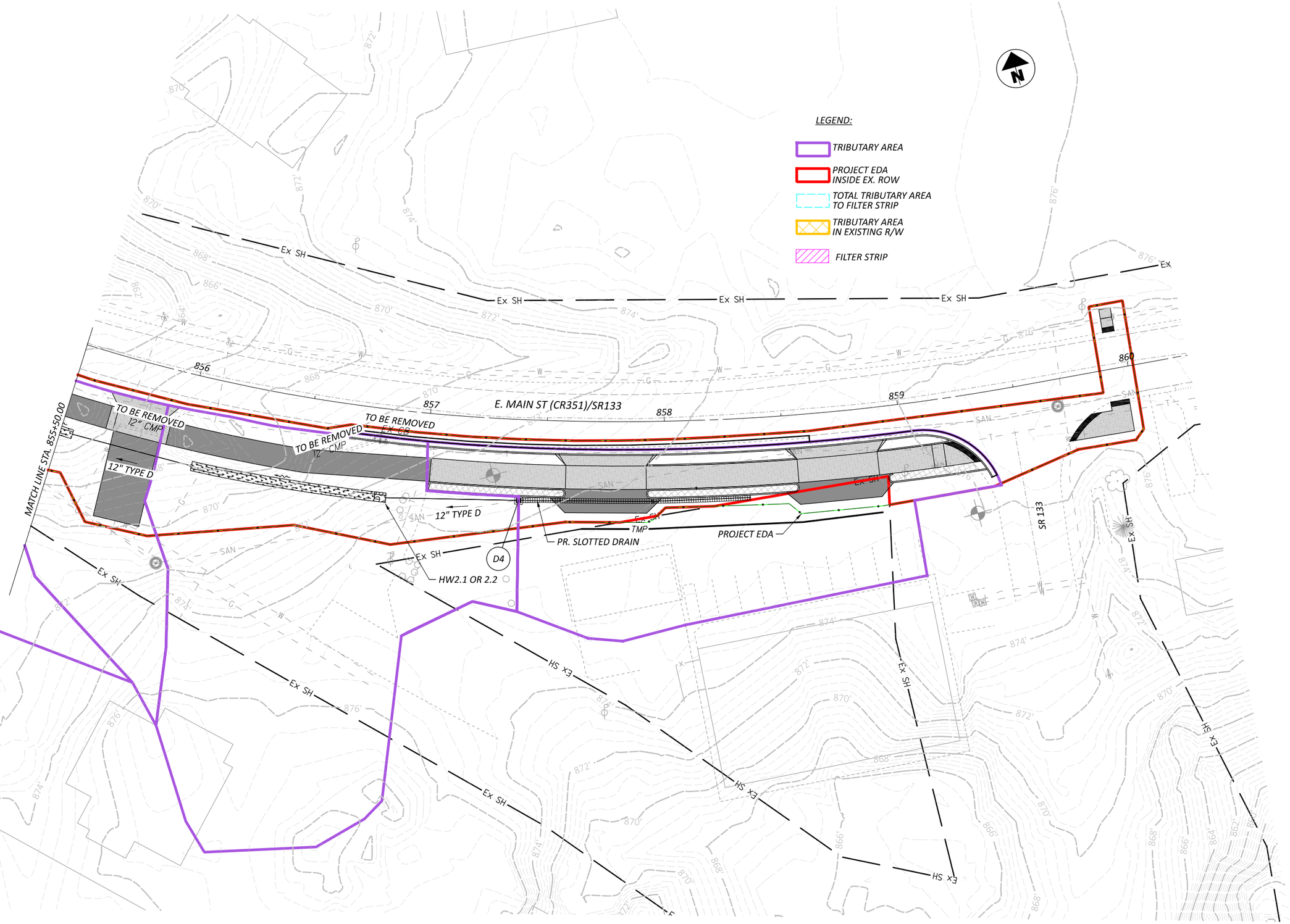

HORIZONTAL SCALE IN FEET
0 10 20 40

PC - BMP DRAINAGE AREA MAPS STA. 855+50.00 TO END

DESIGN AGENCY	AECOM
DESIGNER	DL
REVIEWER	NSP 04/10/23
PROJECT ID	114264
SHEET	P.4
TOTAL	4

CLE-SR133-20.29

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3.2 PC-BMP Calculations

Ohio Department of Transportation - Office of Hydraulic Engineering

Post-Construction BMP Calculation Spreadsheet

Post Construction - Project Summary

Project Data

		Units
Project EDA	1.79	acres
Is the Project Routine Maintenance per L&D Vol. 2, Sec. 1112.2	No	
BMPs Required?	**BMPs Required**	NA
Ain (New Impervious Area in New Permanent R/W	0.00	acres
Does Entire Site Drain to Large River (>100 sq. miles)?	No	
Water Quality Treatment Required	**Yes**	
Water Quantity Treatment Required	**No**	

Treatment Percent and Treatment Requirement

Aix (Project EDA that is inside the existing right-of-way)	1.30	acres
Ain (New Impervious Area in New Permanent R/W)	0.00	acres
T% (Treatment Percent)	**20.00**	**%**
Treatment Requirement	**0.36**	**acres**

BMPs Provided

BMP Name	BMP Type	Contributing Drainage Area (acres)	Contributing Drainage Area in ODOT R/W (acres)
FS 1	Vegetated Filter Strip	0.36	0.36

Treatment Provided

Total Area with ODOT R/W Treated (acres)	**0.36**
Treatment Requirements (acres)	**0.36**
Treatment Check	**Good**

BMP Submittal Requirements (Per L&D, Vol. 2, Sec. 1116.2)

1. Estimated Project Earth Disturbed Area	Yes	**Good**
2. Treatment Percent Calculation	Yes	**Good**
3. BMP Selected for use	Yes	**Good**
4. Drainage area mapping for post-construction BMPs that show the total contributing drainage area and the amount of contributing area within ODOT right-of-way	Yes	**Good**
5. Plan sheets showing locations of post-construction BMP	Yes	**Good**
6. Calculations for each BMP	Yes	**Good**
7. Explanation for any area that is not treated	Yes	**Good**

Ohio Department of Transportation - Office of Hydraulic Engineering

Post-Construction BMP Calculation Spreadsheet

Vegetated Filter Strip

Filter Strip	Route	Begin Station	End Station	Side	Pavement Width (FT)	Filter Strip Width (FT)	Filter Strip Slope (z:1)	Filter Strip Length (FT)	Drainage Area (acres)	Filter Strip Area (SF)	Item 659 Topsoil Volume (CY)	Item 670 Erosion Protection Area (SY)
Filter Strip #1	CR 351	848+50	852+90	RT	31	10	3	440	0.364	4,400	54.3	488.9
Filter Strip #2								0			0.0	0.0
Filter Strip #3								0			0.0	0.0
Filter Strip #4								0			0.0	0.0
Filter Strip #5								0			0.0	0.0
Filter Strip #6								0			0.0	0.0
Filter Strip #7								0			0.0	0.0
Filter Strip #8								0			0.0	0.0
Filter Strip #9								0			0.0	0.0
Filter Strip #10								0			0.0	0.0

Total Treatment Credit Earned from Vegetated Filter Strips **0.364** **acres**

(Treatment is for quality only, not quantity)

	BMP Design Considerations	Answer	Design Check
1	Is the min. filter strip width 15-25 ft wide depending on L&D Table 1117-3?	NA	CHECK DESIGN
2	Is the slope 3:1 or flatter for 34 ft or narrower pavement drainage width	Yes	Good
3	Is the slope 6:1 or flatter for 35 - 48 ft pavement drainage width	NA	Good
4	Is the only contributing drainage to the filter strip from the road and shoulder?	Yes	Good
5	Does any concentrated flow or any outlets discharge to the filter strip?	No	Good
6	Is 4" of Item 659, Topsoil, included for the filter strip?	Yes	Good
7	Is Item 670, Slope Erosion Protection, included for the filter strip?	Yes	Good

The project includes additon of a 10' shared used path but no roadway improvements are included.

4. Temporary Erosion and Sediment Control Calculations

4.1 Notice of Intent Acreage Calculation

January 2020

NOTICE OF INTENT (NOI) ACREAGE CALCULATION FORM	1112-1 Reference Section 1112

		Area (acres)
Project Earth Disturbing Activities		1.79
If the project is a Routine Maintenance Project, an NOI is not required. (See Section 1112)		
Contractor Earth Disturbing Activities		
Field Office per CMS Item 619:		
Enter 0.125 for Type A; 0.25 for Type B; or 1.00 for Type C		0.25
Batch Plant: Yes = 2.0; No = 0		0.00
Off-Project Waste / Borrow Pit:		
Add 1.0 acre per 15,000 CY of waste or borrow		0.50
Miscellaneous Other Off-Project Areas:		
Off-Project staging areas, stock yards, etc.		0.00
Contractor Earth Disturbing Activities	**Subtotal**	0.75
Total Earth Disturbing Activities (add Project EDA and Contractor EDA)	**TOTAL**	2.54
NOI Earth Disturbing Activities (see below to determine value)	**TOTAL**	4.90

Project Earth Disturbing Activities - Enter the area of earth disturbing activities directly related to project activities. Earth disturbing activity is defined as any activity that exposes bare ground or an erodible material to storm water as well as anywhere Item 659 Seeding, or Item 660 Sodding is being furnished.

Contractor Earth Disturbing Activities:

Field Office - These sizes were determined with regard to size of the trailer, parking, and some stock area for equipment and materials based on Item 619 Field Office.

Batch Plant - It is assumed that a typical batch plant would occupy 2 acres of ground. The designer should investigate the location of the project relative to existing plants, facilities, etc. to estimate whether a batch plant might be used by the Contractor. This is not needed for existing plants, it is only for plants set up for the specific project.

Off-Project Waste / Borrow - The specified estimation is based on approximately 10 feet of depth or fill over 1 acre. The designer may choose a different value based on knowledge of the project area, bedrock elevations, previous projects, etc. Consideration should be given for grindings, as well. (10ft. x 43560 s.f. / 27 = 16,133 c.y. ~ 15,000 c.y.)

NOI Earth Disturbing Activities - This is the combined Project and Contractor Earth Disturbed Area. Based on project conditions and activities, some flexibility in the area calculation should be provided to avoid the possibility of the estimated work being less than the actual work. This scenario would require submittal of an NOI for projects originally calculated to be less than one acre during construction.

For projects with Total EDA less than one acre: No NOI is required.

A Routine Maintenance Project consists of activities that do not change the line, grade, or hydraulic capacity of the existing condition and has less than 5 acres of earth disturbing activities (see section 1112.2).

4.2 Temporary Sediment Erosion Control Spreadsheet

Temporary Erosion Control Estimating
English Units

Version 10/18/13

Project Name	CLE-CR351-20.64
PID	114264
Estimated Construction Cost	
Project Type	Minor Widening
Planned Construction Seasons	1
Total of Temporary Erosion Control	$15,725
Percentage of Costruction Cost	#DIV/0!

#DIV/0!
#DIV/0!

Sediment Basins — CLICK FOR INPUT HELP

Project Earth Disturbed Area (acres)	1.79
Est. Contractor Disturbed Area (acres)	0.75
Total Acres	2.54

Do not enter information on Culvert Drainage Area

Contributing Drainage Area to Culverts — CLICK FOR INPUT HELP	Drainage Area (acres)	Settling Basin Size (cyd.)	Temporary Sediment & Erosion Cost
Culvert 1		0	
Culvert 2		0	
Culvert 3		0	
Culvert 4		0	
Culvert 5		0	
Culvert 6		0	
Culvert 7		0	
Culvert 8		0	
Culvert 9		0	
Culvert 10		0	
Culvert 11		0	
Culvert 12		0	
Culvert 13		0	
Culvert 14		0	
Culvert 15		0	
Culvert 16		0	
Culvert 17		0	
Culvert 18		0	
Culvert 19		0	
Culvert 20		0	
Culvert 21		0	
Culvert 22		0	
Culvert 23		0	
Culvert 24		0	
Culvert 25		0	
Total Sediment Basins (cyd.)		0	$0
Sediment Removal		0	$0

Constuction Seeding and Mulching — CLICK FOR INPUT HELP

	(Square. yd.)	($/Square Yard)	
Seeding Area	5000	$1.00	$7,500

Perimeter Filter Fabric Fence — CLICK FOR INPUT HELP		($/Foot)	
Length of project (ft)	915	$4.05	$5,559

Temporary Erosion Control Estimating
English Units

Version 10/18/13

Filter Fabric Ditch Check	**CLICK FOR INPUT HELP**	**Length (Ft)**		
	Length of project (ft)	915		
	Number of Filter Ditch Checks		4	
	Length of Filter Ditch Checks (ft)		44	$483
Rock Channel Protection w/ Filter	**CLICK FOR INPUT HELP**			
	Rock (cubic yards)		2	$192
Existing Stream Protection	**CLICK FOR INPUT HELP**			
Average Right of Way Width				
Number of Existing Streams				
		($/Foot)		
	Silt Fence Length (Ft)	$4.05	0	$0
		($/Square Yard)		
	Seeding (square yd)	$1.00	0	$0
Inlet Protection	**CLICK FOR INPUT HELP**			
Catch Basins				
New	1			
Adjusted	0			
	Catch Basin Protection (Ft.)		16	$180
Construction Entrance	**CLICK FOR INPUT HELP**			
	Length of project (ft)	915		
	Number of Entrances		1	$1,811

5. Appendix

5.1 FEMA FIRMETTE

National Flood Hazard Layer FIRMette

FEMA

84°3'17"W 39°3'21"N

84°2'40"W 39°2'53"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/15/2022 at 1:42 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.