

S.R. 73-21.02

PID 119452

SCIOTO COUNTY

Drainage Report

08/21/2026 - Final



Table of Contents

I. Project Narrative.....	3
A. Project Description	3
B. Existing Conditions.....	3
C. Proposed Design	3
II. Drainage Map.....	4-5
III. Storm Sewer Calculations	6-7
IV. Ditch Design Calculations	8-15
V. Best Management Practice Calculations	15-18

I. Project Narrative

A. Project Description

This project consists of roadway widening and intersection improvements on S.R. 73 at Noel Lane in Scioto County, Ohio. The work includes construction of a left turn lane, new curb ramps and sidewalk at the Noel Lane intersection, and a closed storm sewer system improvement. Additional items such as pavement markings, signing, and grading are included in the project.

B. Existing Conditions

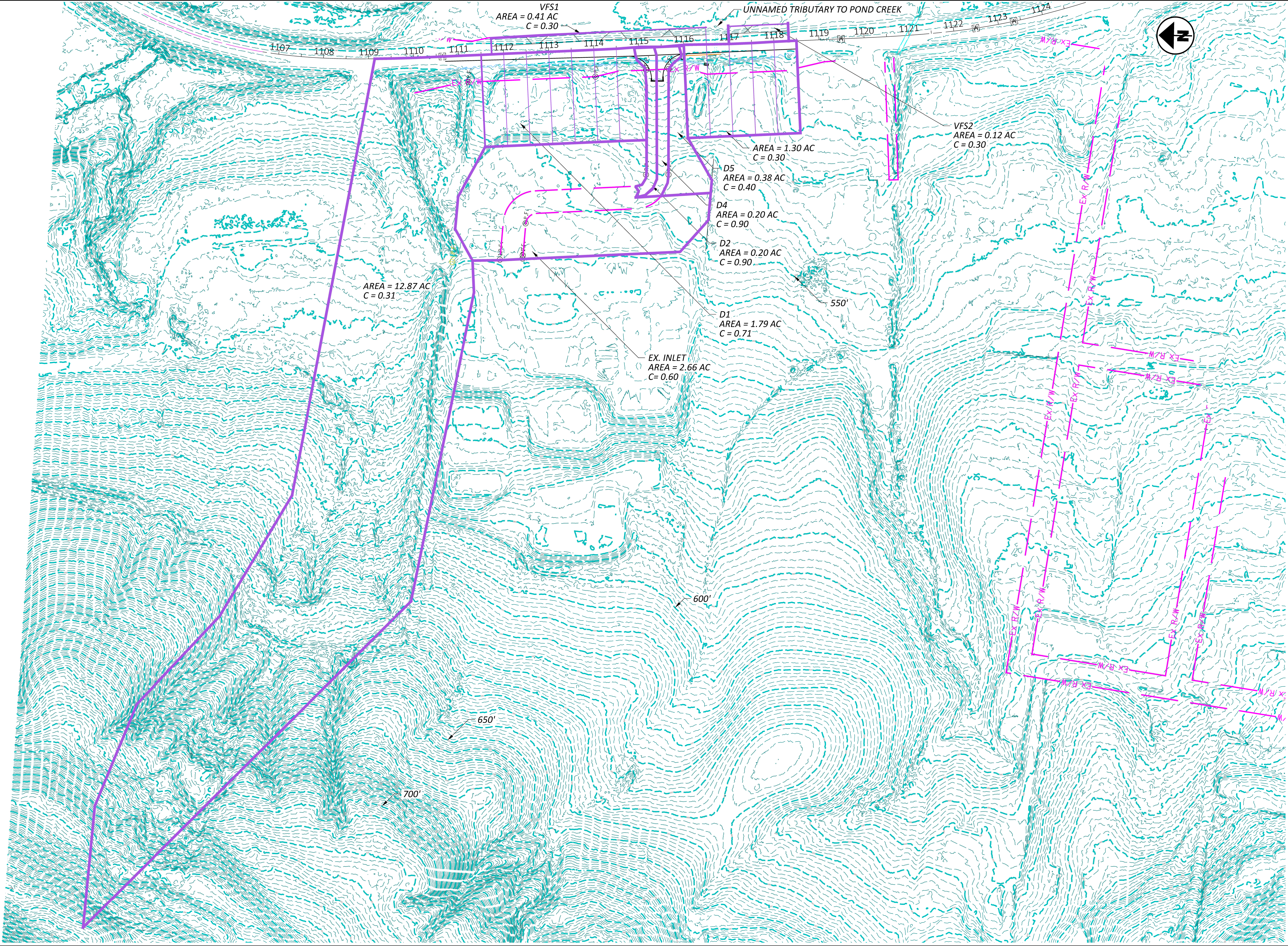
The existing roadway consists of a two-lane asphalt pavement section along S.R. 73. There are currently no dedicated turn lanes at the intersection of Noel Lane. An existing storm sewer system and roadside ditches run along portions of the existing corridor. There is an existing 24"x36" culvert under S.R. 73 just south of Noel Lane that directs storm water from west to east to unnamed tributary to Pond Creek. Noel Lane has existing sidewalks, but there are no existing curb ramps or marked crosswalks at the intersection. The existing utilities in the project limits include water, sanitary sewer, and overhead telephone.

C. Proposed Design

The proposed stormwater management system includes a closed storm sewer with roadside ditches. The system is designed to collect and convey stormwater runoff from both the roadway and the surrounding areas adjacent to the corridor. Most of the project water will continue to drain to the existing 24"x36" culvert and eventually to the unnamed tributary to Pond Creek. This project will require BMPs due to the earth disturbed area (EDA) being greater than one acre. The BMP for this project will be vegetated filter strips and will treat 0.53 acres worth of runoff.

II. Drainage Map

The drainage map shows the location of the proposed ditches, proposed storm sewer system, construction limits, and proposed right-of-way. The drainage areas were delineated from a combination of proposed work and existing terrain. Each drainage area is labeled with the total acreage, the runoff coefficient, and the catch basin the area drains to in the proposed storm sewer system if applicable. The drainage areas were used in all the drainage calculations including storm sewer design calculations, ditch design calculations, and BMPs calculations.



DRAINAGE MAP

DESIGN AGENCY	
	
DESIGNER	LCP
REVIEWER	BAA 07/26/26
PROJECT ID	119452
SHEET	TOTAL
P.01	1

III. Storm Sewer Calculations

The just-full capacity frequency used was 10% AEP and the hydraulic grade frequency used was 4% AEP. The required minimum pipe diameter is 12". Pipe inverts were set based on a minimum cover of 2'. There is one run which drains to a proposed ditch at station 1116+44.00. All project water subsequently drains from the proposed ditch into an existing culvert at station 1116+42.50.



STORM SEWER SYSTEM

PID : 119452 **Date :** 11/10/2025 **Project :** 0060_SCI-73-21.02

Location : Scioto County

Description : Storm right Sta. 1114+99 - Sta. 1116+44

Designer : LCP

Rainfall Area: C

Just Full Capacity Frequency (yrs.) : 10

Hydraulic Gradient Frequency (yrs.) : 25

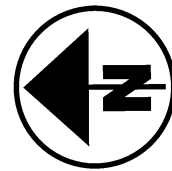
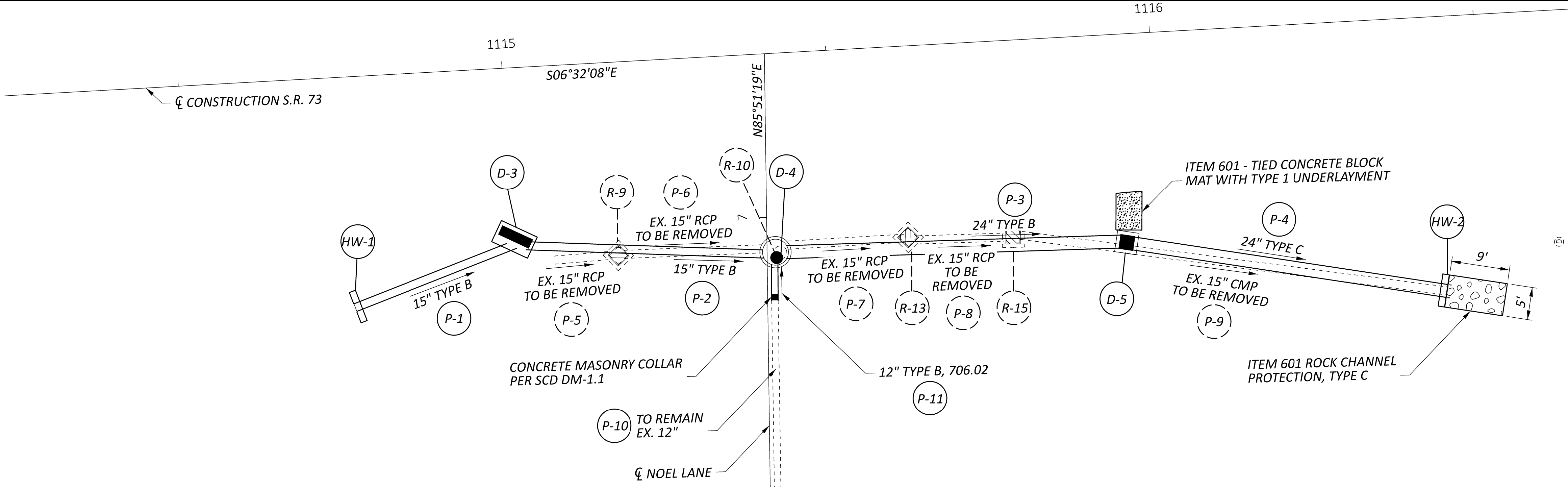
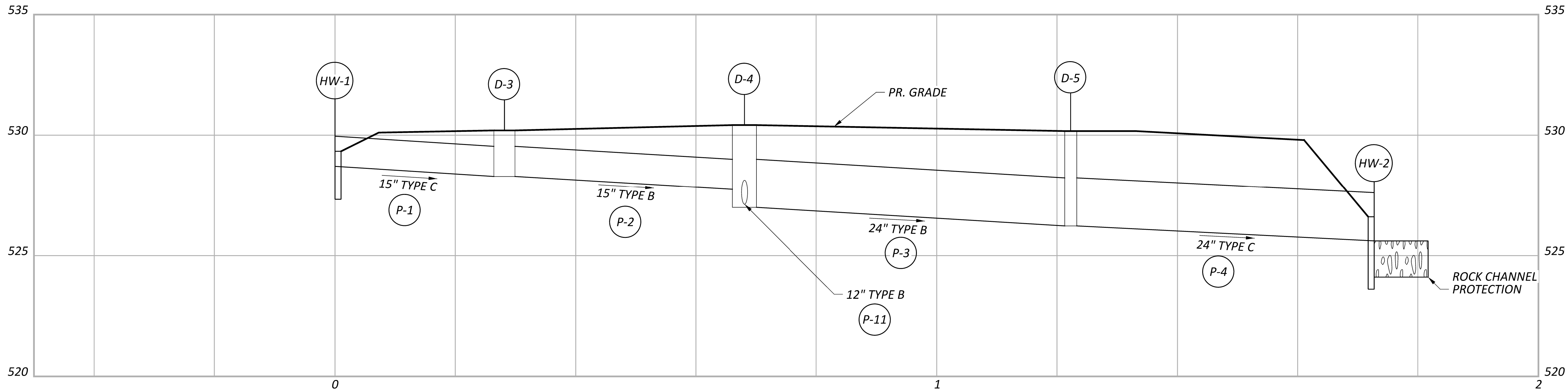
Minimum Pipe Size : 12.00

Tailwater Elevation (ft.): 526.44

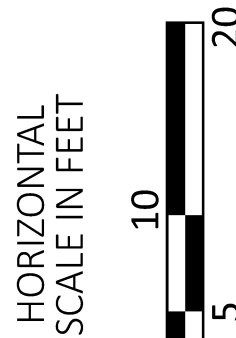
JUNCTION	STATION	ΔAREA	ΔCA	BEGIN	RAINFALL	DISCHARGE	PIPE			F/L PIPE	MEAN	JUST FULL	FRICT	HYGR EL.	COVER	COVER	COVER	INLET TYPE			
From	To	From	Σ AREA	Σ CA	TIME	INTENSITY	(cfs.)	DIAM.	LENGTH	SLOPE	IN / OUT	VEL	CAPACITY	SLOPE	IN / OUT	IN / OUT	MINUS	MINUS	MANNING'S		
		To	(acres)		(min.)	(10 yrs.)	(25 yrs.)	(10 yrs.)	(25 yrs.)	(in.)	(ft.)	(ft./ft.)	(ft.)	(fps.)	(cfs.)	(ft./ft.)	(ft.)	HY GR	CROWN	'n'	
D1	D2	1114+75	1.79	1.27	18.33	4.05	4.61	5.1	5.9	15	26.0	0.0162	528.71	6.32	7.65	0.0110	529.75	529.97	0.22	0.01	HW Half He
	begin	1115+01	1.79	1.27									528.29				529.47	530.20			0.015
D2	D3	1115+01	0.20	0.18	18.40	4.04	4.61	5.9	6.7	15	40.0	0.0135	528.29	6.00	7.00	0.0143	529.47	530.20	0.73	0.66	CB 3
		1115+41	1.99	1.45									527.75				528.90	530.53			0.015
EX1	D3	1115+41	2.66	1.60	16.80	4.24	4.78	6.8	7.6	12	285.0	0.0558	543.12	10.54	7.85	0.0609	545.56	545.92	0.36	1.80	CB 2-2B
	begin	1115+41	4.65	3.05									527.22				528.21	530.53			0.015
D3	D4	1115+41	0.00	0.00	18.51	4.03	4.60	12.3	14.0	24	51.0	0.0151	527.00	7.71	25.91	0.0051	528.16	530.53	2.37	1.53	MH 3
		1115+94	4.65	3.05									526.23				527.90	530.12			0.015
D4	D5	1115+95	0.15	0.06	18.62	4.02	4.59	12.5	14.3	24	50.0	0.0124	526.23	7.17	23.49	0.0053	527.55	529.44	1.89	1.21	CB 2-2B
	final	1116+44	4.80	3.11									525.61				527.29	524.88			0.015

DRAINAGE CONDUIT DETAILS									
REF NO.	LENGTH (FT)	SIZE	TYPE	SLOPE	START STRUCT. REF. NO.	START INVERT ELEV.	STOP STRUCT. REF. NO.	STOP INVERT ELEV.	EXISTING DISPOSITION
P-1	26	15"	TYPE B	1.62%	HW-1	528.71	D-3	528.29	
P-2	40	15"	TYPE B	1.35%	D-3	528.29	D-4	527.75	
P-3	51	24"	TYPE B	1.51%	D-4	527.00	D-5	526.23	
P-4	50	24"	TYPE C	1.24%	D-5	526.23	HW-2	525.61	
P-5	10	15"	EX. RCP	10.30%		528.71	R-9	527.68	TO BE REMOVED
P-6	24	15"	EX. RCP	2.92%	R-9	527.66	R-10	526.96	TO BE REMOVED
P-7	20	15"	EX. RCP	15.75%	R-10	529.96	R-13	526.81	TO BE REMOVED
P-8	16	15"	EX. RCP	1.31%	R-13	526.81	R-15	526.60	TO BE REMOVED
P-9	68	15"	EX. CMP	0.69%	R-15	526.28	OUT	525.81	TO BE REMOVED
P-10	280	12"	EX. RCP	5.58%	EX. INLET	543.12	R-10/D-4	527.50	TO REMAIN
	4	12"	EX. RCP	5.58%	EX. INLET	527.50	R-10/D-4	527.22	TO BE REMOVED
P-11	4	12"	TYPE B, 706.02	5.58%	EX. INLET	527.50	D-4	527.22	

DRAINAGE STRUCTURE DETAILS										
REF. NO.	REF. ALIGNMENT	STATION	OFFSET	SIDE	TYPE	GRATE/RIM ELEV.	INVERT ELEV.	CONNECTED PIPES		EXISTING DISPOSITION
HW-1	S.R. 73	1114+76.38	28.48'	RT	HW		528.71	(OUT) P1 15" S 528.71		
D-3	S.R. 73	1115+00.96	27.02'	RT	CB-3	530.02	528.29	(IN) P-1 15" N 528.29, (OUT) P-2 15" S 528.29		
D-4	S.R. 73	1115+40.56	30.63'	RT	MH-3, 48"	530.53	527.00	(IN) P-2 15" N 527.75, (OUT) P-3 24" S 527.00, (IN) P-12 12" W 527.22		
D-5	S.R. 73	1115+94.74	32.13'	RT	CB-2B	529.44	526.23	(IN) P-3 24" NE 526.23, (OUT) P-4 24" S 526.23		
HW-2	S.R. 73	1116+43.62	42.30'	RT	HW		525.61	(IN) P-4 24" N 525.61		
R-9	S.R. 73	1115+16.33	29.79'	RT	EX. CB	529.88	527.66	(IN) P-5 EX 15" N 527.68, (OUT) P-6 EX 15" S 527.66		TO BE REMOVED
R-10	S.R. 73	1115+40.56	30.63'	RT	EX. MH	530.42	526.96	(IN) P-6 EX 15" N 527.52, (IN) EX. 12" W 527.22, (OUT) P-7 EX 15" S 526.94		TO BE REMOVED
R-13	S.R. 73	1115+61.13	29.47'	RT	EX. CB	530.05	526.81	(IN) P-7 EX 15" N 526.83, (OUT) P-8 EX 15" S 526.81		TO BE REMOVED
R-15	S.R. 73	1116+77.28	30.24'	RT	EX. CB	529.63	526.28	(IN) P-8 EX 15" N 526.6, (OUT) P-9 EX 15" S 526.28		TO BE REMOVED



DRAINAGE PLAN AND PROFILE
S.R. 73



DESIGN AGENCY



DESIGNER

LCP

REVIEWER

BAA 08/21/26

PROJECT ID

119452

SHEET

P.38

TOTAL

40

IV. Ditch Design Calculations

The rainfall area is C. The depth storm frequency is 10% AEP and the shear stress storm frequency is 20% AEP. The proposed ditch has a width of 2' with a 4:1 foreslope and a 2:1 backslope. The total length of the ditches is 557.5' which includes 516.5' of which flows into the existing culvert and 41' that flows off site into an existing ditch. An adequate depth of flow was maintained throughout the entire ditch system.

Surveying	Engineering	Project Management
Job Name: SCI-73-21.02	Job No.: 119452	
Location: STA. 1111+11	Sheet: 1 of 3	
Task: TOC & WEIGHTED RUNOFF COEFFICIENT CALCULATIONS		
Calculated By: LCP	Date: 11/6/2025	
Checked By: BAA	Date: 11/6/2025	

Weighted Runoff Coefficient

Description of Area	Runoff Coefficient	Area (ac)
Impervious	0.90	0.68
Pervious	0.50	
Wooded	0.30	12.19
Upstream Structure	0.25	
Weight Runoff Coefficient (C)		0.34
Total Drainage Area (ac)		12.87

Overland Flow

$$t_o = \frac{1.8(1.1-C)L^{1/2}}{s^{1/3}} = \frac{(1.8) * (1.1 - 0.34) * (300)^{1/2}}{(30.97\%)^{1/3}} = 7.55 \text{ min}$$

$$C = 0.34$$

$$L = 300 \text{ ft}$$

$$s = 30.97 \%$$

$$\text{Begin El.} = 806.46$$

$$\text{End El.} = 713.56$$

Concentrated Flow

$$V = 3.3ks^{1/2} = (3.3) * (0.114) * (9.9\%)^{1/2} = 1.184 \text{ fps}$$

$$k = 0.114$$

$$s = 9.90 \%$$

$$\text{Begin El.} = 713.56$$

$$\text{End El.} = 529.88$$

$$t_s = \frac{L}{60V} = \frac{1862}{60 * 1.18} = 26.22 \text{ min}$$

$$L = 1862 \text{ ft}$$

Time of Concentration

$$T_C = t_o + t_s + t_{ds} = 33.77 \text{ min}$$

$$\text{Upstream Drainage Structure } (t_{ds}) = 0 \text{ min}$$

Intensity Zone C			
Freq.	a	b	c
2	56.299	10.000	0.876
5	67.933	11.000	0.869
10	84.550	13.000	0.882
25	95.736	14.000	0.871
50	96.783	14.000	0.850
100	80.436	11.500	0.794

$$i = \frac{a}{(t+b)^c}$$

$$Q = CiA$$

$$i_2 = 2.06 \text{ in/hr}$$

$$i_5 = 2.5 \text{ in/hr}$$

$$i_{10} = 2.85 \text{ in/hr}$$

$$i_{25} = 3.31 \text{ in/hr}$$

$$i_{50} = 3.62 \text{ in/hr}$$

$$i_{100} = 3.9 \text{ in/hr}$$

$$Q_2 = 9.02 \text{ cfs}$$

$$Q_5 = 10.94 \text{ cfs}$$

$$Q_{10} = 12.48 \text{ cfs}$$

$$Q_{25} = 14.49 \text{ cfs}$$

$$Q_{50} = 15.85 \text{ cfs}$$

$$Q_{100} = 17.07 \text{ cfs}$$



DITCH ANALYSIS

PID : 119452 **Date :** 06/30/2025 **Project :** 0060_SCI-73-21.02

Location : Scioto County

Description : S.R. 73 Ditch Right Sta. 1111+11 - Sta. 1110+70

Designer : LCP

Rainfall Area : C

Allowable Shears

	Seed:	0.40	Jute Mat:	0.45	Temporary Mat:	1.00
Permanent Mat	Type 1:	2.00	Type 2:	3.00	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.)
1111+11	1110+70	R	41.00	2.00	3.00	4.00	0.0051	12.87	12.87	0.31	3.99	Seed	2.35	5	0.030	37.04	2.26	0.27	9.37	0.84	7.87
												Seed	2.68	10	0.040	37.10	1.89	0.32	10.69	1.02	9.12

Surveying	Engineering	Project Management
Job Name: SCI-73-21.02	Job No.: 119452	
Location: STA. 1111+90	Sheet: 2 of 3	
Task: TOC & WEIGHTED RUNOFF COEFFICIENT CALCULATIONS		
Calculated By: LCP	Date: 11/6/2025	
Checked By: BAA	Date: 11/6/2025	

Weighted Runoff Coefficient

Description of Area	Runoff Coefficient	Area (ac)
Impervious	0.90	0.17
Pervious	0.50	
Wooded	0.30	0.09
Upstream Structure	0.25	
Weight Runoff Coefficient (C)		0.71
Total Drainage Area (ac)		0.26

Overland Flow

$$t_o = \frac{1.8(1.1-C)L^{1/2}}{s^{1/3}} = \frac{(1.8) * (1.1 - 0.71) * (108)^{1/2}}{(10.58\%)^{1/3}} = 3.32 \text{ min}$$

$$C = 0.71$$

$$L = 108 \text{ ft}$$

$$s = 10.58 \%$$

$$\text{Begin El.} = 550.71$$

$$\text{End El.} = 539.29$$

Concentrated Flow

$$V = 3.3ks^{1/2} = (3.3) * (0.491) * (11.6\%)^{1/2} = 5.519 \text{ fps}$$

$$k = 0.491$$

$$s = 11.60 \%$$

$$\text{Begin El.} = 539.29$$

$$\text{End El.} = 529.56$$

$$t_s = \frac{L}{60V} = \frac{84}{60 * 5.52} = 0.25 \text{ min}$$

$$L = 84 \text{ ft}$$

Time of Concentration

$$T_C = t_o + t_s + t_{ds} = 3.57 \text{ min}$$

$$\text{Upstream Drainage Structure } (t_{ds}) = 0 \text{ min}$$

Intensity Zone C			
Freq.	a	b	c
2	56.299	10.000	0.876
5	67.933	11.000	0.869
10	84.550	13.000	0.882
25	95.736	14.000	0.871
50	96.783	14.000	0.850
100	80.436	11.500	0.794

$$i = \frac{a}{(t+b)^c}$$

$$Q = CiA$$

$$i_2 = 4.09 \text{ in/hr}$$

$$Q_2 = 0.76 \text{ cfs}$$

$$i_5 = 4.63 \text{ in/hr}$$

$$Q_5 = 0.86 \text{ cfs}$$

$$i_{10} = 4.78 \text{ in/hr}$$

$$Q_{10} = 0.89 \text{ cfs}$$

$$i_{25} = 5.26 \text{ in/hr}$$

$$Q_{25} = 0.98 \text{ cfs}$$

$$i_{50} = 5.7 \text{ in/hr}$$

$$Q_{50} = 1.06 \text{ cfs}$$

$$i_{100} = 6.68 \text{ in/hr}$$

$$Q_{100} = 1.24 \text{ cfs}$$



DITCH ANALYSIS

PID : 119452 **Date :** 06/30/2025 **Project :** 0060_SCI-73-21.02

Location : Scioto County

Description : S.R. 73 Ditch Right Sta. 1111+90 - Sta. 1114+98

Designer : LCP

Rainfall Area : C

Allowable Shears

	Seed:	0.40	Jute Mat:	0.45	Temporary Mat:	1.00
Permanent Mat	Type 1:	2.00	Type 2:	3.00	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 (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.)
1111+90	1112+00	R	10.00	2.00	4.00	2.00	0.0050	0.26	0.26	0.71	0.18	Seed	3.98	5	0.030	15.15	1.13	0.07	0.72	0.24	3.42
												Seed	4.45	10	0.040	15.18	0.96	0.09	0.81	0.29	3.76
1112+00	1112+50	R	50.00	2.00	4.00	2.00	0.0050	0.26	0.52	0.70	0.36	Seed	3.91	5	0.030	15.75	1.38	0.11	1.42	0.34	4.05
												Seed	4.35	10	0.040	15.89	1.16	0.13	1.58	0.42	4.51
1112+50	1113+00	R	50.00	2.00	4.00	2.00	0.0050	0.26	0.77	0.70	0.54	Seed	3.84	5	0.030	16.28	1.54	0.13	2.08	0.42	4.50
												Seed	4.27	10	0.040	16.53	1.29	0.16	2.31	0.51	5.05
1113+00	1113+50	R	50.00	2.00	4.00	2.00	0.0078	0.26	1.03	0.71	0.72	Seed	3.79	5	0.030	16.71	1.95	0.21	2.74	0.43	4.57
												Seed	4.20	10	0.040	17.04	1.62	0.25	3.04	0.52	5.14
1113+50	1114+00	R	50.00	2.00	4.00	2.00	0.0100	0.26	1.28	0.30	0.80	Seed	3.74	5	0.030	17.09	2.18	0.26	2.99	0.42	4.52
												Seed	4.15	10	0.040	17.50	1.83	0.32	3.32	0.51	5.08
1114+00	1114+50	R	50.00	2.00	4.00	2.00	0.0058	0.26	1.54	0.30	0.88	Seed	3.69	5	0.030	17.54	1.84	0.18	3.23	0.50	5.01
												Seed	4.09	10	0.040	18.04	1.53	0.22	3.58	0.61	5.67
1114+50	1114+75	R	25.00	2.00	4.00	2.00	0.0053	0.26	1.79	0.30	0.95	Seed	3.67	5	0.030	17.77	1.81	0.18	3.49	0.53	5.21



DITCH ANALYSIS

STATION		SIDE LENGTH	RADIUS	IN	BACK	GRADE	AREA	AREA	RUNOFF	CA	PROTECT	RAIN	STORM	MANN.	TIME	VEL.	SHEAR	DESIGN	DEPTH	WIDTH
BEGIN	END	(ft.)	WIDTH	SLOPE	SLOPE	(ft./ft.)	(acres)	SUM	COEFF.	(Sum)	TYPE	INT.	FREQ.	COEFF.	FLOW	FLOW	(lbs./	FLOW	FLOW	FLOW
			(ft.)	(ft./ft.)	(ft./ft.)			(acres)				(in./hr.)	(yrs.)		(min.)	(fps.)	sq.ft.)	(cfs.)	(ft.)	(ft.)
											Seed	4.05	10	0.040	18.31	1.51	0.21	3.86	0.65	5.89

Surveying	Engineering	Project Management
Job Name: SCI-73-21.02	Job No.: 119452	
Location: STA. 1118+00	Sheet: 3	of 3
Task: TOC & WEIGHTED RUNOFF COEFFICIENT CALCULATIONS		
Calculated By: LCP	Date: 11/6/2025	
Checked By: BAA	Date: 11/6/2025	

Weighted Runoff Coefficient

Description of Area	Runoff Coefficient	Area (ac)
Impervious	0.90	0.03
Pervious	0.50	
Wooded	0.30	0.23
Upstream Structure	0.25	
Weight Runoff Coefficient (C)		0.38
Total Drainage Area (ac)		0.26

Overland Flow

$$t_o = \frac{1.8(1.1-C)L^{1/2}}{s^{1/3}} = \frac{(1.8) * (1.1 - 0.38) * (175)^{1/2}}{(3.83\%)^{1/3}} = 10.96 \text{ min}$$

$$C = 0.38$$

$$L = 175 \text{ ft}$$

$$s = 3.83 \%$$

$$\text{Begin El.} = 535.445$$

$$\text{End El.} = 528.76$$

Concentrated Flow

$$V = 3.3ks^{1/2} = \text{fps}$$

$$k = \text{N/A}$$

$$s = \%$$

$$\text{Begin El.} = \text{N/A}$$

$$\text{End El.} = \text{N/A}$$

$$t_s = \frac{L}{60V} = \text{min}$$

$$L = \text{ft}$$

Time of Concentration

$$T_C = t_o + t_s + t_{ds} = 10.96 \text{ min}$$

$$\text{Upstream Drainage Structure } (t_{ds}) = 0 \text{ min}$$

Intensity Zone C			
Freq.	a	b	c
2	56.299	10.000	0.876
5	67.933	11.000	0.869
10	84.550	13.000	0.882
25	95.736	14.000	0.871
50	96.783	14.000	0.850
100	80.436	11.500	0.794

$$i = \frac{a}{(t+b)^c}$$

$$Q = CiA$$

$$i_2 = 3.92 \text{ in/hr}$$

$$Q_2 = 0.39 \text{ cfs}$$

$$i_5 = 4.64 \text{ in/hr}$$

$$Q_5 = 0.46 \text{ cfs}$$

$$i_{10} = 5.14 \text{ in/hr}$$

$$Q_{10} = 0.51 \text{ cfs}$$

$$i_{25} = 5.81 \text{ in/hr}$$

$$Q_{25} = 0.58 \text{ cfs}$$

$$i_{50} = 6.29 \text{ in/hr}$$

$$Q_{50} = 0.63 \text{ cfs}$$

$$i_{100} = 6.8 \text{ in/hr}$$

$$Q_{100} = 0.68 \text{ cfs}$$



DITCH ANALYSIS

PID : 119452 **Date :** 06/30/2025 **Project :** 0060_SCI-73-21.02

Location : Scioto County

Description : S.R. 73 Ditch Right Sta. 1118+00 - Sta. 1116+80

Designer : LCP

Rainfall Area : C

Allowable Shears

	Seed:	0.40	Jute Mat:	0.45	Temporary Mat:	1.00
Permanent Mat	Type 1:	2.00	Type 2:	3.00	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.)
1117+98	1117+50	R	48.00	2.00	4.00	2.00	0.0186	0.24	0.24	0.38	0.09	Seed	3.93	5	0.030	15.57	1.41	0.12	0.35	0.11	2.64
												Seed	4.38	10	0.040	15.66	1.21	0.16	0.39	0.13	2.81
1117+50	1117+00	R	50.00	2.00	4.00	2.00	0.0104	0.24	0.47	0.30	0.16	Seed	3.85	5	0.030	16.17	1.37	0.11	0.62	0.18	3.06
												Seed	4.29	10	0.040	16.37	1.17	0.14	0.69	0.22	3.32
1117+00	1116+80	R	20.00	2.00	4.00	2.00	0.0190	0.24	0.71	0.30	0.23	Seed	3.83	5	0.030	16.34	1.90	0.22	0.88	0.18	3.10
												Seed	4.26	10	0.040	16.58	1.60	0.27	0.98	0.23	3.37

V. Best Management Practice Calculations

The proposed project earth disturbed area is 1.18 acres. BMPs are required to treat 20.34% of the area for water quality only which is 0.24 acres. For this project, a vegetated filter strip will be placed on the left side of S.R. 73 from stations 1110+73.53 to 1116+50 and 1117+00 to 1118+33.05. The total treatment credit earned will be 0.53 acres.



Ohio Department of Transportation - Office of Hydraulic Engineering

Post-Construction BMP Calculation Spreadsheet

Post Construction - Project Summary

Project Data

Project EDA	1.18	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)	1.18	acres
Ain (New Impervious Area in New Permanent R/W)	0	acres
T% (Treatment Percent)	20.00	%
Treatment Requirement	0.24	acres

BMPs Provided

BMP Name	BMP Type	Contributing Drainage Area (acres)	Contributing Drainage Area in ODOT R/W (acres)
VFS	Vegetated Filter Strip	0.53	0.53

Treatment Provided

Total Area with ODOT R/W Treated (acres)	0.53
Treatment Requirements (acres)	0.24
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)
VFS1	S.R. 73	1110+73.53	1116+50	LT	22	18	4	576	0.44	8,193	101.1	910.3
VSF2	S.R. 73	1117+00	1118+33.05	LT	22	17	4	133	0.09	2,261	27.9	251.2
								0			0.0	0.0
								0			0.0	0.0
								0			0.0	0.0
								0			0.0	0.0
								0			0.0	0.0
								0			0.0	0.0
								0			0.0	0.0
								0			0.0	0.0

Total Treatment Credit Earned from Vegetated Filter Strips **0.53** 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?	Yes	Good
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