



# STORM SEWER SYSTEM

**PID :** 121899      **Date :** 01/30/2026      **Project :** WAR\_LOV\_2401

**Location :** Loveland Ohio

**Description :** SR48 Sidewalk Reconstruction - Outlet 109+00

**Designer :** NES

**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		STATION	Δ AREA	Δ CA	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.)	(cfs.)	(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.)	(ft.)	HY GR	CROWN	'n'
D15	OUT	109+28	3.56	0.89	40.00	2.55	2.96	2.3	2.6	12	36.1	0.0054	595.30	3.29	2.44	0.0073	596.30	597.27	0.97	0.97	CB 2-2B
	begin	108+92	3.56	0.89									595.11				595.95	597.27			0.015



# STORM SEWER SYSTEM

PID : 121899 Date : 01/30/2026 Project : WAR\_LOV\_2401

Location : Loveland Ohio

Description :SR48 Sidewalk Reconstruction - Outlet 115+05

Designer : NES

Rainfall Area: C

Just Full Capacity Frequency (yrs.) : 10

Hydraulic Gradient Frequency (yrs.) : 25

Minimum Pipe Size : 12.00

Tailwater Elevation (ft.): 609.00

JUNCTION	STATION	Δ AREA	Δ CA	BEGIN	RAINFALL	DISCHARGE		PIPE			F/L PIPE	MEAN	JUST FULL	FRICT	HYGR EL.	COVER	COVER	COVER	INLET TYPE	
From	To	Σ AREA	Σ CA	TIME	INTENSITY	(cfs.)	(cfs.)	DIAM.	LENGTH	SLOPE	IN / OUT	VEL	CAPACITY	SLOPE	IN / OUT	IN / OUT	MINUS	MINUS	MANNING'S	
	From To	(acres)		(min.)	(10 yrs.) (25 yrs.)	(10 yrs.) (25 yrs.)	(in.)	(ft.)	(ft./ft.)	(ft.)	(ft.)	(fps.)	(cfs.)	(ft./ft.)	(ft.)	(ft.)	HY GR	CROWN	'n'	
D2	37	16.32	8.98	25.00	3.42	3.94	30.7	35.3	24	21.4	0.1228	608.62	21.25	73.90	0.0324	609.69	611.37	1.68	0.75	HW Half He
	begin	16.32	8.98									606.00				609.00	610.91			0.015

reduce slope to reduce the velocity

the other storm sewer pipes need included. hopefully the downstream velocity isnt this high!

Even though CDSS allows you to select the half height headwall, the program does not analyze the effects of this inlet condition. Please additionally analyze this segment using Culvert Analysis to determine if the headwater at the inlet is effected by the proposed storm sewer system. The HGL from the SS analysis should be used as the tailwater for the proposed culvert analysis. The existing culvert will also need to be run using the existing downstream channel tailwater to compare the existing and proposed headwaters in the culvert analysis.



# STORM SEWER SYSTEM

PID : 121899 Date : 01/30/2026 Project : WAR\_LOV\_2401

Location : Loveland Ohio

Description :SR48 Sidewalk Reconstruction - 119+28 Outlet

Designer : NES

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	STATION	Δ AREA	Δ CA	BEGIN	RAINFALL	DISCHARGE		PIPE			F/L PIPE	MEAN	JUST FULL	FRICT	HYGR EL.	COVER	COVER	COVER	INLET TYPE		
From	To	Σ AREA	Σ CA	TIME	INTENSITY	(cfs.)	(cfs.)	DIAM.	LENGTH	SLOPE	IN / OUT	VEL	CAPACITY	SLOPE	IN / OUT	IN / OUT	MINUS	MINUS	MANNING'S		
		(acres)		(min.)	(10 yrs.) (25 yrs.)	(10 yrs.) (25 yrs.)		(in.)	(ft.)	(ft./ft.)	(ft.)	(fps.)	(cfs.)	(ft./ft.)	(ft.)	(ft.)	HY GR	CROWN	'n'		
4	3	120+65	0.07	0.06	10.00	5.32	6.00	0.3	0.4	12	12.8	0.0800	625.45	5.36	9.40	0.0001	625.59	628.18	2.59	1.73	CB 3
	begin	120+65	0.07	0.06									624.43				625.05	628.35		0.015	
3	28	120+65	0.04	0.02	10.04	5.31	5.86	0.4	0.5	12	133.8	0.0170	624.43	3.32	4.33	0.0002	624.65	628.35	3.70	2.93	CB 2-2B
	final	119+28	0.11	0.08									622.15				622.79	626.65		0.015	



# STORM SEWER SYSTEM

PID : 121899      Date : 01/30/2026      Project : WAR\_LOV\_2401

Location : Loveland Ohio

Description :SR48 Sidewalk Reconstruction - 122+29 Outlet

Designer : NES

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		STATION		Δ AREA	Δ CA	BEGIN	RAINFALL		DISCHARGE		PIPE			F/L PIPE	MEAN	JUST FULL	FRICT	HYGR EL.	COVER	COVER	COVER	INLET TYPE
From	To	From	To	Σ AREA	Σ CA	TIME	INTENSITY	(cfs.)	(cfs.)	DIAM.	LENGTH	SLOPE	IN / OUT	VEL	CAPACITY	SLOPE	IN / OUT	IN / OUT	MINUS	MINUS	MINUS	MANNING'S
		To		(acres)		(min.)	(10 yrs.)	(25 yrs.)	(10 yrs.)	(in.)	(ft.)	(ft./ft.)	(ft.)	(fps.)	(cfs.)	(ft./ft.)	(ft.)	(ft.)	(ft.)	HY GR	CROWN	'n'
5	6	122+29		1.03	0.21	15.00	4.47	5.09	0.9	1.0	12	11.6	0.0100	634.62	3.44	3.32	0.0012	635.23	637.44	2.21	1.82	CB 2-2B
	begin	122+29		1.03	0.21									634.50				635.22	637.00			0.015
6	OUT	122+29		0.07	0.06	15.06	4.47	5.07	1.2	1.4	12	30.8	0.0100	634.50	3.69	3.32	0.0019	635.00	637.00	2.00	1.50	CB 3
	final	122+29		1.10	0.27									634.19				634.94	637.00			0.015



# STORM SEWER SYSTEM

PID : 121899 Date : 01/30/2026 Project : WAR\_LOV\_2401

Location : Loveland Ohio

Description :SR48 Sidewalk Reconstruction - 124+68 Outlet

Designer : NES

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	STATION	Δ AREA	Δ CA	BEGIN	RAINFALL	DISCHARGE		PIPE			F/L PIPE	MEAN	JUST FULL	FRICT	HYGR EL.	COVER	COVER	COVER	INLET TYPE		
From	To	Σ AREA	Σ CA	TIME	INTENSITY	(cfs.)	(cfs.)	DIAM.	LENGTH	SLOPE	IN / OUT	VEL	CAPACITY	SLOPE	IN / OUT	IN / OUT	MINUS	MINUS	MANNING'S		
		(acres)		(min.)	(10 yrs.) (25 yrs.)	(10 yrs.) (25 yrs.)	(in.)	(ft.)	(ft./ft.)	(ft.)	(fps.)	(cfs.)	(ft./ft.)	(ft.)	(ft.)	(ft.)	HY GR	CROWN	'n'		
9	8A	126+73	0.05	0.05	10.00	5.32	5.91	0.2	0.3	12	122.9	0.0516	657.16	4.18	7.55	0.0001	657.29	660.18	2.89	2.03	CB 3
	begin	125+53	0.05	0.05									650.82				651.42	650.61			0.015
8B	8A	125+53	0.63	0.13	10.00	5.32	6.01	0.7	0.8	12	8.9	0.1700	652.34	8.63	13.69	0.0006	652.50	660.00	7.50	6.66	CB 2-2A
	begin	125+53	0.68	0.17									650.82				651.50	655.21			0.015
8A	8	125+53	0.00	0.00	10.49	5.22	5.86	0.9	1.0	12	85.4	0.0535	650.82	6.19	7.68	0.0011	651.07	655.21	4.14	3.39	MH 3
		124+68	0.68	0.17									646.25				646.96	650.67			0.015
E21	8	124+68	2.64	0.55	10.00	5.32	6.00	3.0	3.3	12	37.1	0.0634	648.00	9.23	8.37	0.0116	648.46	653.55	5.09	4.55	MH 3
	begin	124+68	3.32	0.73									645.65				646.54	650.67			0.015
7	8	124+33	0.10	0.02	10.00	5.32	5.94	0.1	0.1	12	37.6	0.0101	646.69	1.86	3.34	0.0000	646.88	649.61	2.73	1.92	CB 3
	begin	124+68	3.42	0.75									646.31				646.88	650.67			0.015
8	OUT	124+68	0.07	0.06	10.72	5.18	5.84	4.2	4.7	18	54.0	0.1803	644.97	14.32	41.58	0.0027	645.32	650.67	5.35	4.20	CB 3
	final	124+68	3.49	0.81									635.23				636.40	640.00			0.015

For storm sewers, provide sufficient slope to maintain a minimum velocity of 3 feet per second, for self-cleansing, as detailed in L&D Volume 2, Section 1104.2.1.G.



# STORM SEWER SYSTEM

**PID :** 121899      **Date :** 01/30/2026      **Project :** WAR\_LOV\_2401

**Location :** Loveland Ohio

**Description :** SR48 Sidewalk Reconstruction - Station 128+17 Outlet

**Designer :** NES

**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		STATION	Δ AREA	Δ CA	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.)	(cfs.)	(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.)	(ft.)	HY GR	CROWN	'n'
10	E60	128+17	2.91	0.61	15.00	4.47	5.09	2.7	3.1	15	28.4	0.0889	660.02	10.02	17.95	0.0031	660.39	664.99	4.61	3.72	CB 3
	begin	128+17	2.91	0.61									657.50				658.48	663.05			0.015



# STORM SEWER SYSTEM

PID : 121899      Date : 01/30/2026      Project : WAR\_LOV\_2401

Location : Loveland Ohio

Description :SR48 Sidewalk Reconstruction - Station 129+95 Outlet

Designer : NES

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		STATION		Δ AREA	Δ CA	BEGIN	RAINFALL		DISCHARGE		PIPE			F/L PIPE	MEAN	JUST FULL	FRICT	HYGR EL.	COVER	COVER	COVER	INLET TYPE
From	To	From	To	Σ AREA (acres)	Σ CA	TIME (min.)	(10 yrs.)	(25 yrs.)	(10 yrs.)	(25 yrs.)	DIAM. (in.)	LENGTH (ft.)	SLOPE (ft./ft.)	IN / OUT (ft.)	VEL (fps.)	CAPACITY (cfs.)	SLOPE (ft./ft.)	IN / OUT (ft.)	IN / OUT (ft.)	MINUS HY GR	MINUS CROWN	MANNING'S 'n'
12A	12	130+94		0.65	0.20	15.00	4.47	5.09	0.9	1.0	12	19.3	0.0172	667.26	4.11	4.36	0.0010	667.66	673.00	5.34	4.74	CB 2-2A
	begin	130+92		0.65	0.20									666.93				667.64	669.91			0.015
12	11	130+92		0.05	0.05	15.08	4.46	5.03	1.1	1.2	12	98.7	0.0150	666.93	4.14	4.07	0.0015	667.32	669.91	2.59	1.98	CB 3
		129+95		0.70	0.24									665.45				666.18	668.41			0.015
11	OUT	129+95		0.03	0.03	15.48	4.41	5.01	1.2	1.3	12	70.6	0.1680	664.29	10.09	13.62	0.0019	664.51	668.41	3.90	3.12	CB 3
	final	129+95		0.73	0.27									652.43				653.17	656.00			0.015



# INLET SPACING DESIGN

**PID :** 121899    **Date :** 02/02/2026    **Project :** WAR-LOV-2401

**Location :** Loveland Ohio

**Description :** Sidewalk Reconstruction of Sidewalk on SR 48

**Designer :** NES

**Rainfall Area:** C

**Storm Frequency (yr.) :** 5

**Total Allow. Spread (ft.) :** 4.00

**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.)
131+50	Begin																	
130+91	CB-3	59.00	0.90	0.05	10.00	0.47	10.47	0.0256	0.0833	0.0200	2.00	0.0000	4.73	0.21	0.00	0.21	0.113	1.35
129+95	CB-3	96.00	0.90	0.03	10.00	1.00	11.00	0.0180	0.0833	0.0200	2.00	0.0000	4.63	0.13	0.00	0.13	0.099	1.18
128+17	CB-3	178.00	0.90	0.05	10.00	1.60	11.60	0.0190	0.0833	0.0200	2.00	0.0000	4.52	0.20	0.00	0.20	0.117	1.41
126+74	CB-3	143.00	0.90	0.05	10.00	1.04	11.04	0.0330	0.0833	0.0200	2.00	0.0000	4.62	0.21	0.00	0.21	0.107	1.28
124+67	CB-3	207.00	0.38	0.07	10.00	1.53	11.53	0.0460	0.0833	0.0200	2.00	0.0000	4.54	0.12	0.00	0.12	0.082	0.98
122+32	CB-3	235.00	0.90	0.07	10.00	1.29	11.29	0.0560	0.0833	0.2000	2.00	0.0000	4.58	0.29	0.00	0.29	0.109	1.31
120+64	CB-3	168.00	0.90	0.05	10.00	1.02	11.02	0.0537	0.0833	0.0200	2.00	0.0000	4.63	0.21	0.00	0.21	0.097	1.17

Stage 1 comment: Since curb is being added from approximately STA 100+76 to STA 106+00, inlet spacing calculations are needed.