

STORMWATER DRAINAGE REPORT



For

Noah's Event Venue – **Public Roadway Improvements**

Located At

Shier Rings Rd and Eiterman Rd
Dublin, OH

Prepared by:

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January 10, 2019

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I. Project Narrative

The public right of way improvement project site is located along Eiterman Rd, directly north of Shier Rings Rd in the City of Dublin, Franklin County, Ohio. Roadway Improvements are required due to the proposed Noah's Event Venue at the northeast corner of Shier Rings and Eiterman Rd. Project consist of road widening for the installation of a Right Turn Lane and Left Turn Lane on Eiterman Rd. The land disturbance associated with the roadway project is 0.54 ac.

II. Existing Drainage Conditions

The existing right of way consist of a north bound lane, south bound lane and left turn lane at the intersection. North of the intersection, the roadway tapers down to a 2 lane roadway. Existing roadway crosses over Cosgrey Creek/ ditch with 2 60" storm culverts. The majority of storm water sheet flows off the roadway into the adjacent pervious areas where it is conveyed to Cosgrey creek. The remaining runoff is conveyed to existing public stormwater sewers. Refer to Appendix A for Pre-Developed Drainage Plan.

III. Proposed Drainage Conditions

The proposed drainage conditions will mimic the existing conditions so not to negatively impact the existing public stormwater system. The road widening has been designed to match existing grades and slopes, conveying runoff to existing ditches/ stormwater sewers. Given the road widening both sides of the existing 60" covert pipes will be extend to maintain conveyance under Eiterman Rd. Refer to Appendix A for Post-Developed Drainage Plan.

IV. Stormwater Quantity Runoff Summary

Project disturbance is less than 1 ac. therefore water quantity measures are not required.

V. Stormwater Conveyance System Summary

The conveyance system was designed using a 5-year, 24-hour storm in accordance with section 4.A,2 (Flow Conveyance) in the City of Dublin Stormwater Manual . The system was designed so that no surcharge from runoff is caused by the 5 year, 24 hour storm and that the hydraulic grade line of the storm sewer stays below the gutter flow line of the overlying roadway, or below the top of drainage structures outside the roadway during the 10 year, 24 hour storm. Calculations can be found in Appendix D.

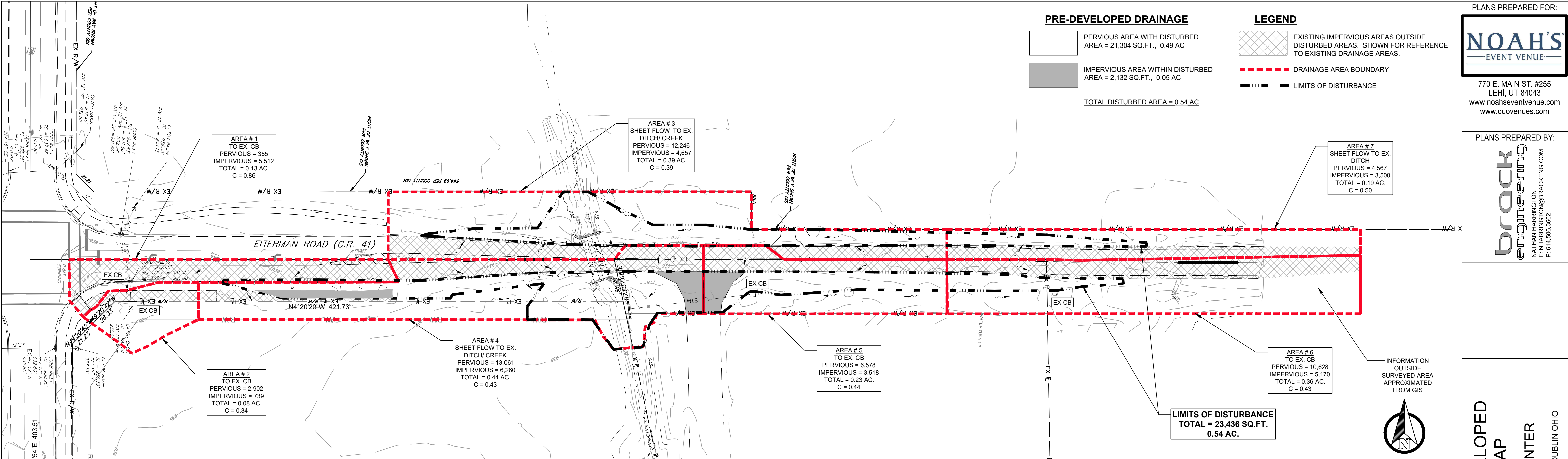
VI. Stormwater Quality Runoff Summary

Project disturbance is less than 1 ac. therefore water quality measures are not required.

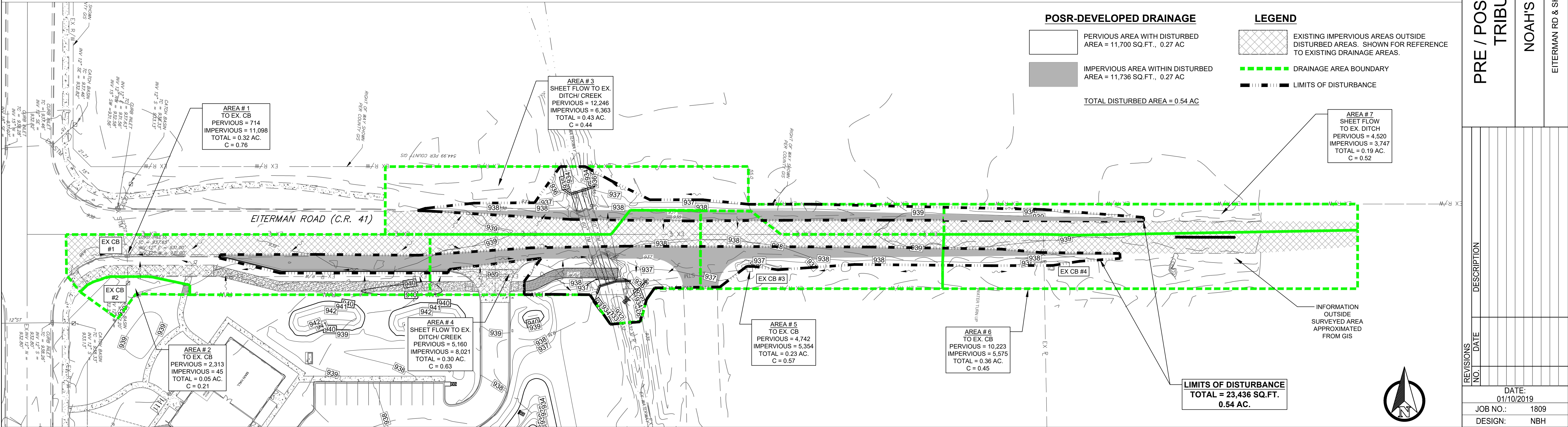
VII. Erosion Control Requirements

Per the current NPDES permit OHC000005 standards this site will require Erosion and Sediment control BMPs during construction. During construction silt fence and inlet protection will be utilized for to protect the stormwater management system and sediment release off site.

APPENDIX A
PRE- AND POST-DEVELOPED DRAINAGE PLANS



PRE-DEVELOPED DRAINAGE



POST-DEVELOPED DRAINAGE

PLANS PREPARED FOR:

NOAH'S
EVENT VENUE

770 E. MAIN ST. #255
LEHI, UT 84043
www.noahsevenvenue.com
www.duovenues.com

PLANS PREPARED BY:

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PRE / POST - DEVELOPED
TRIBUTARY MAP

NOAH'S EVENT CENTER

EITERMAN RD & SHIER RINGS RD., DUBLIN OHIO

REVISIONS
NO. DATE DESCRIPTION

DATE: 01/10/2019
JOB NO.: 1809
DESIGN: NBH
CHECKED: NBH
SHEET NO.

APPENDIX B
STORM SEWERS



BRACK ENGINEERING, LLC
 5659 Greystone Ln
 Hilliard, OH 43026
 (614) 506-3662

INFROMATION ASSUMED, BASED OFF MIN. VALUES

Discharge										Storm Sewer Size								Hydraulic Gradient						
Inlet Location	Runoff Coefficient "C"	Drainage Area "A"	C*A	Σ(C*A)	Inlet or Conduit Travel Time	Time of Concentration	Rainfall Intensity 5 year Storm	Runoff Q=I(C*A)	Total Runoff "Q"	Pipe Diameter	Length "L"	% Slope	Inv. of Inlet	Inv. of Outlet	Full Capacity	% Full	Velocity	Cover	Rainfall Intensity 10 year Storm	Total Runoff "Q"	% Slope	Head Loss	Elevation of Hydraulic Gradient	Top of Casting
		Acres			Min.	Min.	in./hr.	cfs.	cfs.	in.	ft.				cfs.		fps.	ft.	in./hr.	cfs.		ft.		
Storm Profile 2-1																								
2	0.21	0.05	0.01	0.01	10.0	10.0	4.71	0.05	0.05				932.25	932.25					5.28	0.1			932.36	937.65
EX. CB #2										12	22	17.60			14.99	0.3%	19.1	4.40						
1	0.76	0.32	0.24	0.25	0.1	10.1	4.71	1.18	1.18				931.56	931.56					5.28	1.2			932.36	937.63
CB										12	40	1.40			4.23	28%	5.4	5.07			0.11%	0.04		
Storm Profile 3-4																								
4	0.43	0.36	0.15	0.15	10.0	10.0	4.71	0.71	0.71				933.10	933.10					5.28	0.8			933.10	936.10
CB										12	250	0.50			2.53	28%	3.2	2.00			0.05%	0.13		
3	0.44	0.23	0.10	0.25	0.5	10.5	4.71	1.18	1.18				931.85	931.85					5.28	1.3			932.65	935.20
CB										24	104	0.20			10.15	12%	3.2	1.35						

APPENDIX C

DITCH CALCULATIONS

DITCH ANALYSIS

PID :

Date : 01/10/2019

Project : Dublin OH

Location : Eiterman Rd

Description :

Designer : Brack Engineering

Rainfall Area : A

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		SIDE	LENGTH	RADIUS	IN	BACK	GRADE	AREA	AREA	RUNOFF	CA	PROTECT	RAIN	STORM	MANN.	TIME	VEL.	SHEAR	DESIGN	DEPTH	WIDTH
BEGIN	END		(ft.)	WIDTH																	
				(ft.)	(ft./ft.)	(ft./ft.)			(acres)				(in./hr.)	(yrs.)		(min.)	(fps.)		(cfs.)	(ft.)	(ft.)
8+00	5+00	L	300.00	0.00	4.00	10.00	0.0050	0.17	0.17	0.53	0.09	Seed	4.22	5	0.030	10.52	0.85	0.08	0.38	0.25	3.53
												Seed	4.81	10	0.040	11.38	0.74	0.09	0.43	0.29	4.06
8+00	9+25	L	125.00	0.00	10.00	10.00	0.0031	0.19	0.36	0.52	0.19	Seed	3.85	5	0.030	13.10	0.79	0.06	0.73	0.30	6.07
												Seed	4.28	10	0.040	14.49	0.65	0.07	0.81	0.35	7.04
8+00	5+50	R	250.00	0.00	3.00	10.00	0.0098	0.23	0.59	0.57	0.32	Seed	3.53	5	0.030	15.82	1.49	0.21	1.13	0.34	4.43
												Seed	3.83	10	0.040	17.79	1.23	0.24	1.23	0.39	5.10
8+00	9+25	R	125.00	0.00	5.00	10.00	0.0018	0.36	0.95	0.45	0.48	Seed	3.28	5	0.030	18.29	0.83	0.06	1.58	0.50	7.57
												Seed	3.50	10	0.040	20.79	0.68	0.06	1.69	0.58	8.66

APPENDIX D
CULVERT CALCULATIONS

CULVERT ANALYSIS

PID :	Date :	Project : 1809	Location : Dublin OH
Description :			Designer : Brack

HEADWATER CONTROL CODES:

- INLET - Inlet Control.
- OUTLET - Outlet Control.
- OUTLET* - Outlet Control with backwater curve used to compute headwater. See Figure III - 7E in HDS 5 for type flow.
- OUTLET** - Outlet Control - See Figure III - 7D in HDS 5 for type flow.
- N/A - Flow is supercritical with low headwater and low tailwater. Control Section is at the inlet.

Pipe Number : 1	Use HW : 1	Inlet Invert Elevation (ft.) : 933.00	Outlet Invert Elevation (ft.) : 932.40
Pipe Quantity : 2			
Culvert Type : Circular Corrugated		Pipe Length (ft.) : 81.00	Culvert Slope (ft./ft.) : 0.0074
Corrugation Type : Corrugated Metal Pipe (2 2/3 x 1/2 in. corrugations)			
Pipe Size : 60 in.			
Design Manning 'n' : (default)			
Entrance Type : Full Headwall		Loss Coef. Ke : 0.2500	

	FLOW	HEAD LOSS	HWI	HWO	FLOW TYPE	VELOCITY	DN	DC	MANNING N	HEADWATER CONTROL	BURIED DEPTH	TAILWATER ELEVATION
	(cfs.)	(ft.)	(ft.)	(ft.)		(fps.)	(ft.)	(ft.)			(ft.)	(ft.)
	12.50	0.01	934.40	936.41	1 - B	0.74	1.07	0.97	0.0232	OUTLET	0.00	936.40
	25.00	0.06	934.91	936.46	1 - B	1.48	1.51	1.38	0.0232	OUTLET	0.00	936.40
	37.50	0.12	935.36	936.52	1 - B	2.23	1.87	1.71	0.0232	OUTLET	0.00	936.40
	50.00	0.22	935.78	936.62	1 - B	2.97	2.19	1.98	0.0232	OUTLET	0.00	936.40
	62.50	0.34	936.16	936.74	1 - B	3.71	2.49	2.23	0.0232	OUTLET	0.00	936.40
	75.00	0.50	936.53	936.90	1 - B	4.45	2.78	2.45	0.0232	OUTLET	0.00	936.40
	87.50	0.68	936.88	937.08	1 - B	5.20	3.07	2.65	0.0232	OUTLET	0.00	936.40
	100.00	0.88	937.22	937.28	1 - B	5.94	3.37	2.85	0.0232	OUTLET	0.00	936.40



CULVERT ANALYSIS

FLOW (cfs.)	HEAD LOSS (ft.)	HWI (ft.)	HWO (ft.)	FLOW TYPE	VELOCITY (fps.)	DN (ft.)	DC (ft.)	MANNING N	HEADWATER CONTROL	BURIED DEPTH (ft.)	TAILWATER ELEVATION (ft.)
112.50	2.38	937.56	937.80	1 - B	6.68	3.69	3.03	0.0232	OUTLET*	0.00	936.40
125.00	2.48	937.92	938.08	1 - A	7.42	4.08	3.20	0.0232	OUTLET*	0.00	936.40