

U.S. 27 DRAINAGE CALCULATIONS

BUT IR 75/VAR/5.22/VAR

**STATE OF OHIO
BETHEL TOWNSHIP
COUNTY OF MIAMI**

DATE: 08/29/2025

PREPARED FOR

Ohio Department of Transportation – District 8
505 S. State Route 741
Lebanon, Ohio 45036

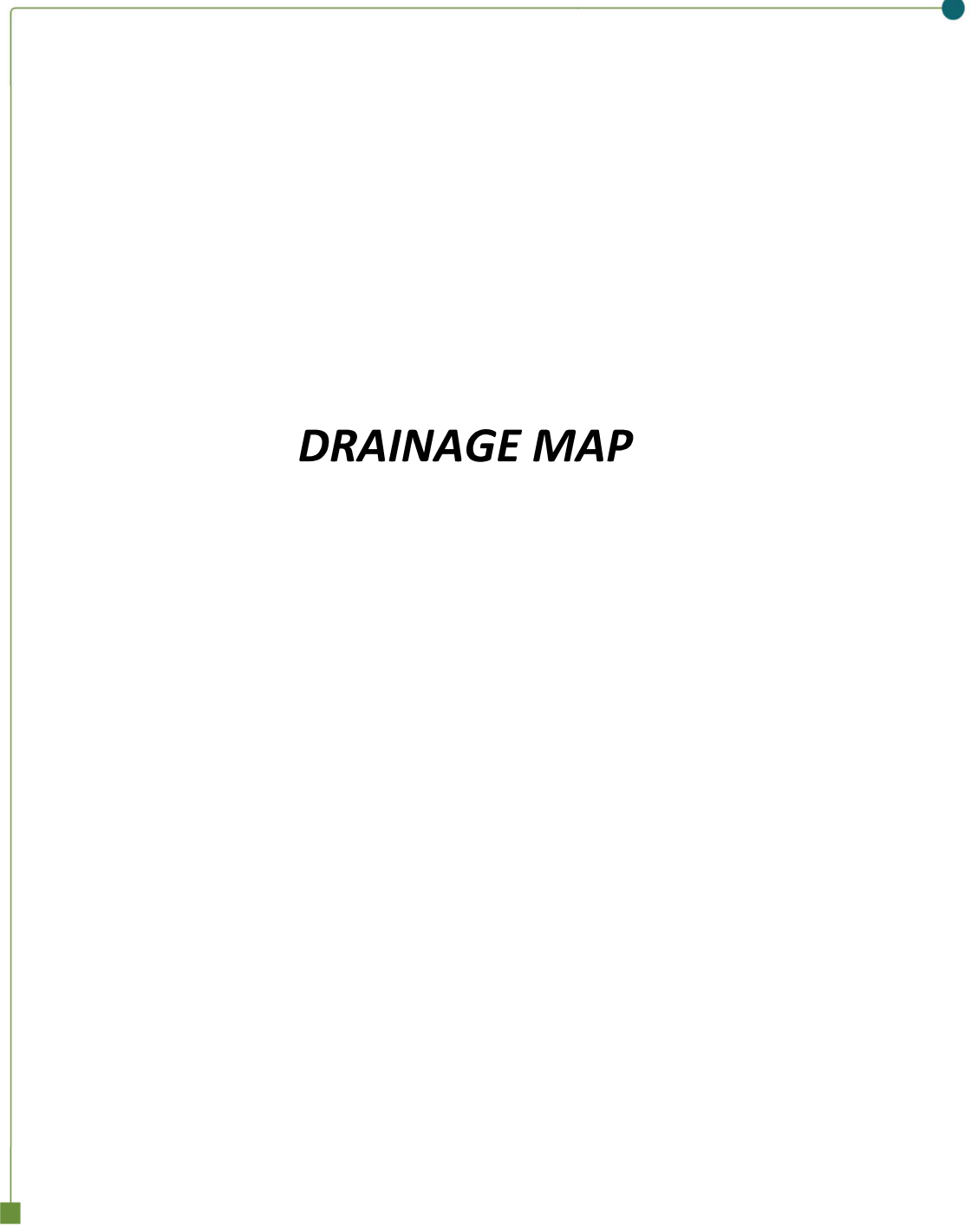


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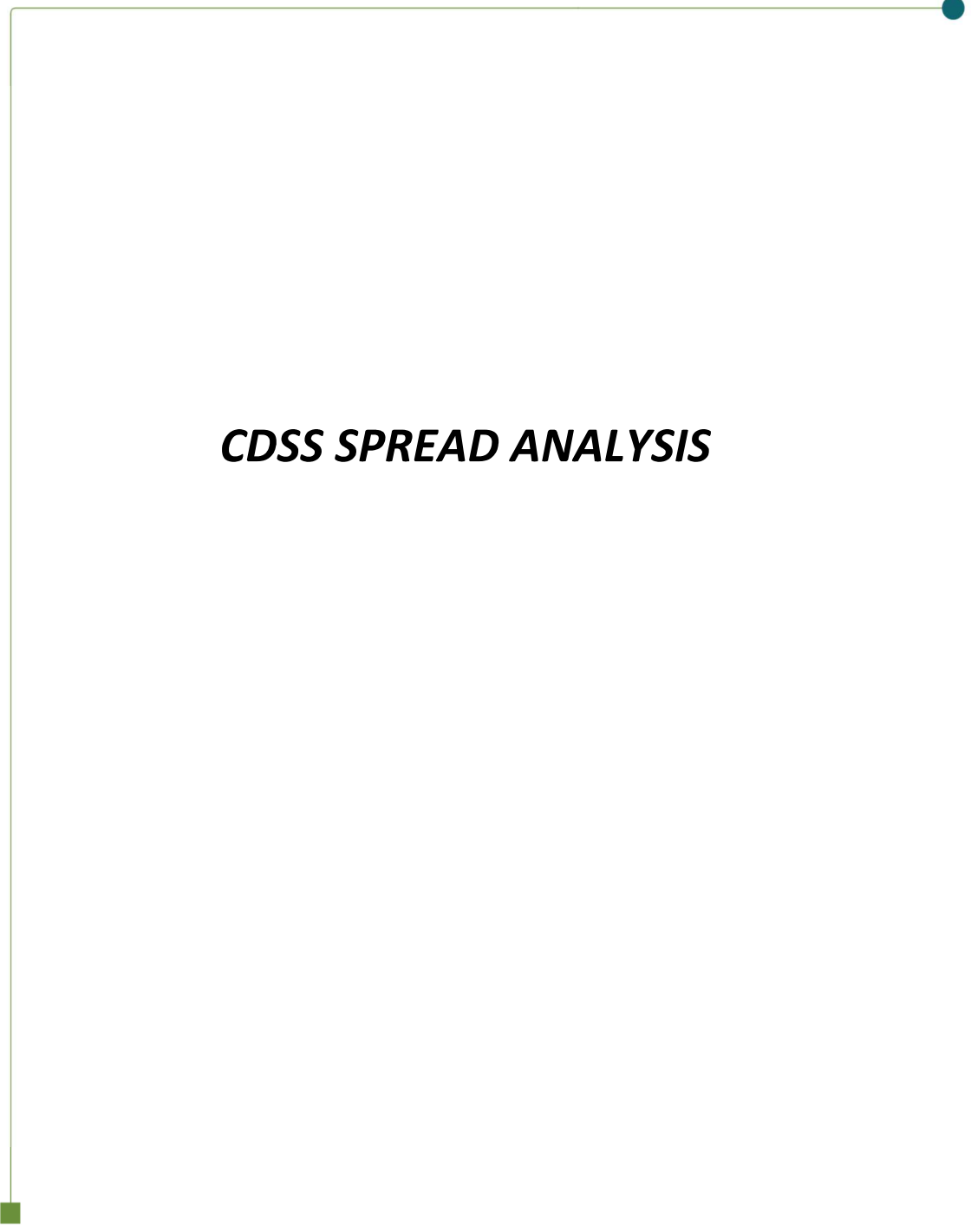
REVIEW COMPLETE

PM	
BRIDGES	
CONSTRUCT	
DRAINAGE	
ENVIRON	
GEOTECH	
ITS	
MOT	
PAVEMENT	
ROADWAY	
R/W	
SURVEY	
TRAFFIC	
UTILITIES	
OTHER	
OTHER	



DRAINAGE MAP





CDSS SPREAD ANALYSIS



INLET SPACING DESIGN

PID : 117275 Date : 08/29/2025 Project : BUT IR 75/VAR/5.22/VAR Location : US-27

Description : Pavement Spread at Left Side

Designer : SDK

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.)
22+50	Begin**																	
20+96	CB-3	154.04	0.78	0.13	10.00	2.19	12.19	0.0100	0.0160	0.0160	0.00	0.0420	4.42	0.39	0.06	0.45	0.096	5.99***
17+78	CB-3	317.58	0.79	0.26	10.00	2.83	12.83	0.0210	0.0160	0.0160	0.00	0.0420	4.32	0.67	0.28	0.95	0.110	6.89****
15+25	CB-3	253.72	0.82	0.41	10.00	1.23	11.23	0.0412	0.0346	0.0346	2.00*	0.0420	4.59	1.44	0.38	1.82	0.166	4.80*
13+50	CB-3	173.39	0.68	0.39	10.00	0.84	10.84	0.0415	0.0390	0.0390	2.00*	0.0420	4.66	1.37	0.25	1.62	0.166	4.25*
11+43	CB-3	204.80	0.79	0.44	10.00	1.03	11.03	0.0341	0.0400	0.0390	4.00*	0.0420	4.62	1.53	0.33	1.86	0.183	4.58*
9+72	CB-3A*****	171.00	0.90	0.11	10.00	1.54	11.54	0.0127	0.0400	0.0160	4.00*	0.0000	4.53	*****	*****	0.78	0.159	3.97* End

The allowable spread is acceptable, but the Total flow warrants an additional catch basin. Otherwise, there will be major erosion issues when the curb ends

Since the shoulder width warrants adding an Allow Width here. It would be 4' pl gutter width

*4.0' spread allowed in through lane, add gutter and/or varying shoulder widths through limits.

**Not true high point, beginning of CDSS analysis is 2 upstream structures outside of survey limits to account for Bypass Flow onto project limits.

***2 ft was added to spread limit since a 14' lane is proposed.

****Note that the allowable spread is exceeded however this catch basins falls outside of the project limits.

*****This is not a drainage structure, this is the last segment adjacent to the barrier before entering the ditch, showing the spread won't exceed the limit.



INLET SPACING DESIGN

PID : 117275 **Date :** 08/29/2025 **Project :** BUT IR 75/VAR/5.22/VAR **Location :** US-27

Description : Pavement Spread at Right Side - Sag at STA 8+70

Designer : SDK

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.)
10+35	Begin																	
8+70	CB-3	230.28	0.90	0.08	10.00	4.88	14.88	0.0025	0.0400	0.0160	6.45*	0.0420	4.02	*****	*****	0.29	0.149	3.72 Sag
8+16	Begin																	
8+70	CB-3	54.24	0.90	0.02	10.00	1.58	11.58	0.0025	0.0400	0.0160	6.45*	0.0420	4.53	*****	*****	0.08	0.092	2.31 End

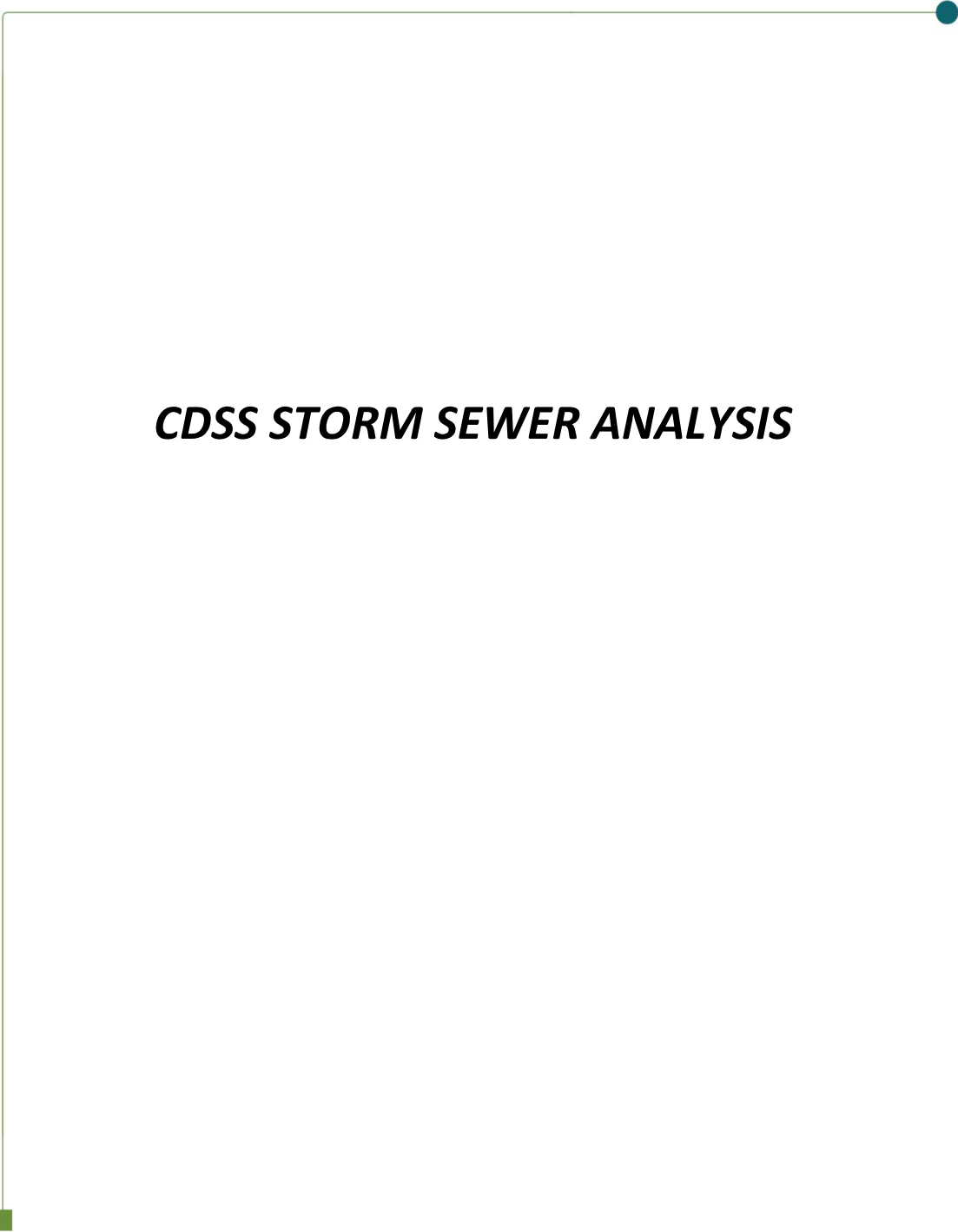
SUMP DATA

Total Flow (cfs) : 0.37

Ponded Depth (ft.) : 0.024

Spread on Pavement (ft.) : 1.62

* 4.0' spread allowed in through lane, add gutter and/or varying shoulder widths through limits.



CDSS STORM SEWER ANALYSIS



STORM SEWER SYSTEM

PID : 117275 **Date :** 08/29/2025 **Project :** BUT IR 75/VAR/5.22/VAR **Location :** US-27

Description : US-27 Drainage Network

Designer : SDK

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		ΔAREA	ΔCA	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'
BC28	BC27	17+75		5.04	3.73	35.00	2.78	3.21	10.4	12.0	21	127.3	0.0203	908.18	8.25	21.03	0.0076	909.17	909.93	0.76	0.00	MH 3
	begin	16+48		5.04	3.73									905.60				907.12	907.35			0.015
D224	BC27	16+47		0.49	0.32	15.00	4.47	3.20	1.4	1.0	12	70.9	0.0457	908.84	6.68	7.10	0.0011	909.10	911.91	2.81	2.07	CB 2-2B
	begin	16+48		5.53	4.05									905.60				906.64	906.60			0.015
BC27	D10	16+48		0.00	0.00	35.26	2.77	3.20	11.2	13.0	21	123.0	0.0203	905.60	8.41	21.06	0.0089	906.64	907.35	0.71	0.00	MH BC
		15+23		5.53	4.05									903.10				904.65	912.15			0.015
D11	D10	15+24		0.41	0.34	10.00	5.32	5.98	1.8	2.0	12	46.4	0.0192	907.00	5.20	4.60	0.0043	907.48	910.40	2.92	2.40	CB 3
	begin	15+23		5.94	4.39									906.11				906.91	912.15			0.015
D10	BC26	15+23		0.00	0.00	35.50	2.76	3.18	12.1	14.0	21	171.9	0.0277	903.25	9.63	24.58	0.0103	904.24	912.15	7.91	7.15	MH 3
		13+54		5.94	4.39									898.49				900.06	900.26			0.015
D9	BC26	13+50		0.39	0.27	10.00	5.32	3.18	1.4	0.8	12	53.7	0.0210	899.62	5.05	4.82	0.0008	899.92	903.12	3.20	2.50	CB 3
	begin	13+54		6.33	4.65									898.49				899.52	899.49			0.015
BC26	D218	13+54		0.00	0.00	35.80	2.74	3.18	12.8	14.8	21	53.4	0.0270	898.49	9.66	24.26	0.0116	899.52	900.24	0.72	0.00	MH BC
		13+00		6.33	4.65									897.05				898.64	903.03			0.015
D220	D8	300+30		1.15	0.79	25.00	3.42	3.92	2.7	3.1	12	82.8	0.0164	899.10	5.43	4.26	0.0100	899.77	902.67	2.90	2.57	CB 2-2B
	begin	13+00		7.48	5.44									897.74				898.62	900.43			0.015

BC = BLIND CONNECTION



STORM SEWER SYSTEM

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 To	Σ AREA (acres)	Σ CA	TIME (min.)	INTENSITY (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'
D8	D218	200+40 13+00	0.69 8.17	0.37 5.82	25.25	3.40	3.91	4.0	4.6	18	11.7	0.0264	897.28 896.97	7.09	15.91	0.0025	898.16 898.13	900.43 903.03	2.27	1.65	CB 2-2B 0.015
D218	D216	13+00 12+00	0.00 8.17	0.00 5.82	35.89	2.74	3.17	15.9	18.4	24	102.4	0.0325	896.97 893.64	10.97	38.03	0.0088	897.99 895.41	903.03 897.76	5.04	4.06	MH 3 0.015
D217	D216	200+84 begin 12+00	0.20 8.37	0.16 5.98	15.00	4.47	5.08	0.7	0.8	12	32.4	0.0782	897.12 894.59	6.74	9.29	0.0007	897.33 895.28	899.16 897.76	1.83	1.04	CB 2-2B 0.015
D216	D7	12+00 11+43	0.16 8.53	0.09 6.07	36.05	2.73	3.16	16.6	19.2	24	80.5	0.0309	893.50 891.01	10.85	37.10	0.0096	894.57 892.80	897.76 894.50	3.19	2.26	CB 2-2B 0.015
D215	D7	11+44 begin 11+43	0.48 9.01	0.28 6.34	15.00	4.47	5.09	1.2	1.4	12	29.2	0.2904	900.29 891.82	12.39	17.90	0.0021	900.49 892.57	903.38 894.50	2.89	2.09	CB 2-2B 0.015
D7	BC24	11+43 10+76	0.44 9.45	0.35 6.69	36.17	2.72	3.16	18.2	21.1	24	67.5	0.0297	890.72 888.72	10.96	36.32	0.0116	891.87 890.54	895.72 890.72	3.85	3.00	MH 3 0.015
D5	BC24	10+76 begin 10+76	0.17 9.62	0.11 6.80	15.00	4.47	3.08	0.5	0.3	12	38.9	0.0527	890.77 888.72	5.22	7.62	0.0001	890.92 889.89	894.34 889.72	3.42	2.57	CB 2-2B 0.015
BC24	D211	10+76 9+89	0.00 9.62	0.00 6.80	36.27	2.72	3.08	18.5	20.9	24	87.2	0.0276	888.72 886.31	10.70	35.06	0.0114	889.89 888.25	890.72 891.53	0.83	0.00	MH BC 0.015
D211	D4	9+89 9+54	0.09 9.71	0.07 6.88	36.41	2.71	3.08	18.6	21.2	24	34.8	0.0273	886.31 885.36	10.67	34.83	0.0116	888.25 887.84	891.53 890.94	3.28	3.22	CB 2-2B 0.015
D3	D4	9+45 begin 9+54	0.01 9.72	0.01 6.89	15.00	4.47	3.08	0.0	0.0	12	40.5	0.0435	887.94 886.18	2.34	6.92	0.0000	887.99 887.84	890.79 890.94	2.80	1.85	CB 2-2B 0.015
D4	BC22	9+54 9+18	0.00 9.72	0.00 6.89	36.46	2.71	3.08	18.7	21.2	36	35.9	0.0017	884.81 884.75	3.71	25.43	0.0013	887.84 887.79	890.94 887.75	3.10	3.13	MH 3 0.015

BC = BLIND CONNECTION



STORM SEWER SYSTEM

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	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'
D208	BC22	9+19		1.00	0.63	20.00	3.87	3.08	2.4	1.9	12	9.9	0.0031	884.78	3.09	1.86	0.0039	887.83	888.87	1.04	3.09	CB 2-2B
	begin	9+18		10.72	7.51						Warning*		884.75					887.79	885.75			0.015
BC22	D1	9+18		0.00	0.00	36.62	2.70	3.08	20.3	23.1	36	56.2	0.0013	884.75	3.38	22.56	0.0016	887.79	887.75	-0.04**	0.00	MH BC
		8+62		10.72	7.51									884.68				887.70	889.84			0.015
D2	D1	8+70		0.10	0.09	10.00	5.32	3.08	0.5	0.3	12	44.1	0.0195	885.54	3.61	4.64	0.0001	887.71	890.05	2.34	3.51	CB 3
	begin	8+62		10.82	7.60									884.68				887.70	889.84			0.015
D1	BC21	8+62		0.00	0.00	36.90	2.69	3.08	20.4	23.4	36	130.4	0.0015	884.68	3.54	23.73	0.0016	887.70	889.84	2.14	2.16	MH 3
		7+32		10.82	7.60									884.49				887.49	887.49			0.015
D204	BC21	7+32		0.77	0.45	20.00	3.87	3.08	1.7	1.4	12	5.4	0.2119	885.63	12.22	15.29	0.0020	887.50	888.87	1.37	2.24	CB 2-2B
	begin	7+32		11.59	8.05									884.49				887.49	885.49			0.015
BC21	D203	7+32		0.00	0.00	37.51	2.66	3.08	21.4	24.8	36	49.7	0.0014	884.49	3.50	23.34	0.0018	887.49	887.49	0.00	0.00	MH BC
		6+82		11.59	8.05									884.42				886.72	889.53			0.015
D201	D202	6+82		3.41	1.92	30.00	3.06	3.54	5.9	6.8	39***	62.2	0.0257	886.11	7.27	123.45	0.0001	886.65	889.11	2.46	-0.25	HW Half He
	begin	6+84		15.00	9.97									884.51				886.54	889.39			0.015
D202	D203	6+84		0.61	0.43	30.14	3.06	3.53	7.2	8.3	36	6.1	0.0229	884.51	7.47	94.12	0.0002	886.33	889.39	3.06	1.88	CB 2-4
		6+82		15.61	10.40						Warning****			884.37				886.33	889.53			0.015
D203	OUT	6+82		0.00	0.00	37.75	2.65	3.07	27.6	31.9	36	81.6	0.0105	884.42	8.24	63.84	0.0030	886.23	889.53	3.30	2.11	MH 3
	final	0+00		15.61	10.40									883.56				885.98	886.56			0.015

BC = BLIND CONNECTION

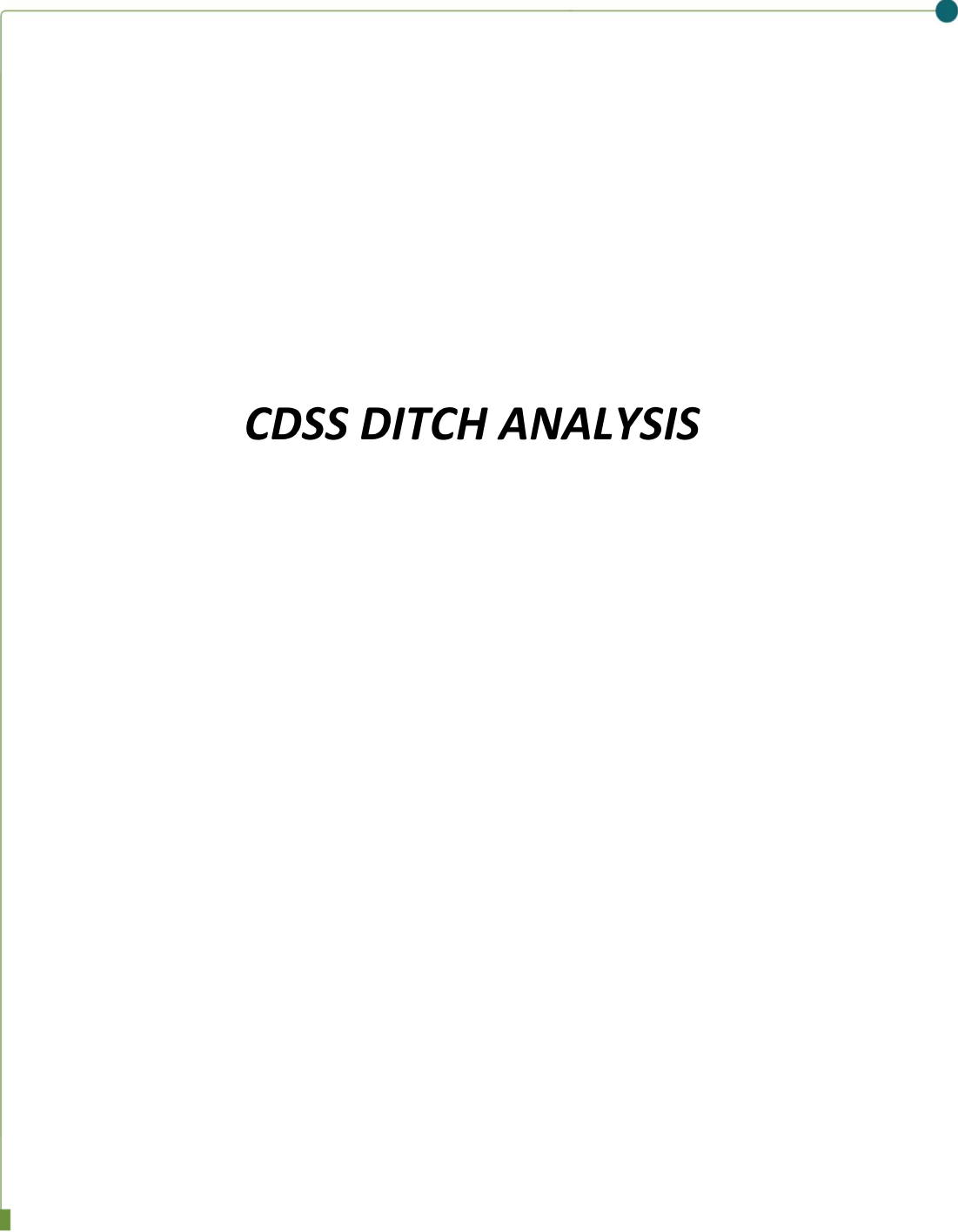
* EXISTING PIPE CANNOT HANDLE 10 YEAR JUST FULL CAPACITY, BUT DOES NOT DISCHARGE OUT THE CASTING.

** HY GR IS ABOVE PIPE BUT BELOW GROUND

*** PIPE IS 3X3 CULVERT, A 39" DIAMETER PIPE IS AN EQUIVALENT DIAMETER FOR FLUID FLOW.

**** WARNING MESSAGE BECAUSE 36" CONTINUES FROM 39" (3X3 CULVERT). THESE ARE EXISTING CONDITIONS AND CAN BE IGNORED.

The -0.04 means it is above the manhole cover, not above the pipe crown. This isnt really accurate since there isnt a manhole at this location. This will affect the upstream manhole D4. For D4, since the Cover minus HGL is 3.0, it seems unlikely that this would cause problems

A thin green line starts from a small green square at the bottom left, goes vertically up, then horizontally right to a small teal dot at the top right.

CDSS DITCH ANALYSIS



DITCH ANALYSIS

PID : 117275 **Date :** 08/29/2025 **Project :** BUT IR 75/VAR/5.22/VAR **Location :** US-27

Description : Ditch Analysis RT - STA 13+00 to STA 16+35

Designer : SDK

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.)
16+35	14+50	R	185.00	4.00	6.00	2.00	0.0341	0.22	0.22	0.54	0.12	Seed	3.75	5	0.030	17.02	1.49	0.15	0.45	0.07	4.56
												Seed	4.17	10	0.040	17.31	1.28	0.19	0.50	0.09	4.71
14+50	13+00	R	150.00	4.00	6.00	2.00	0.0410	0.17	0.39	0.54	0.21	Seed	3.61	5	0.030	18.30	1.91	0.23	0.76	0.09	4.73
												Seed	4.00	10	0.040	18.80	1.66	0.29	0.84	0.11	4.91

Ditch calculations are needed for the paved gutters to confirm depth of flow



DITCH ANALYSIS

PID : 117275 **Date :** 08/29/2025 **Project :** BUT IR 75/VAR/5.22/VAR **Location :** US-27

Description : Ditch Analysis LT - STA 9+21.41 to STA 9+86.91

Designer : SDK

Rainfall Area : C

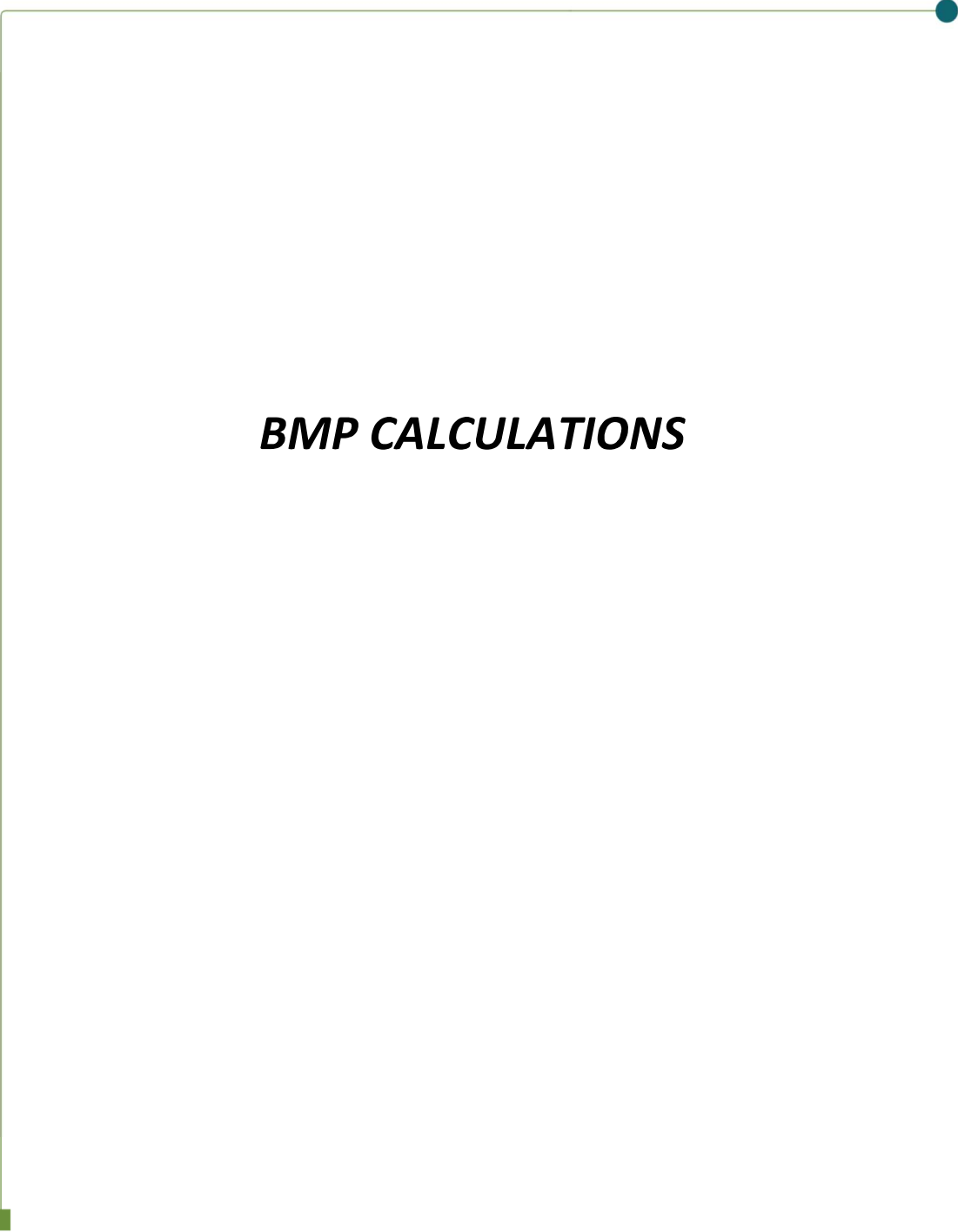
Allowable Shears

	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.)
9+87	9+21	L	66.00	2.00	4.00	2.00	0.0311	0.31	0.31	0.74	0.23	Seed	3.94	5	0.030	15.48	2.26	0.31	0.90	0.16	2.97
												Seed	4.40	10	0.040	15.57	1.92	0.39	1.01	0.20	3.21

A thin green line starts from a small green square at the bottom left, goes vertically up, then horizontally right to a small teal dot at the top right.

BMP CALCULATIONS



Ohio Department of Transportation - Office of Hydraulic Engineering

Post-Construction BMP Calculation Spreadsheet

Post Construction - Project Summary

Project Data

		Units
Project EDA	1.77	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	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)	1.54	acres
Ain (New Impervious Area in New Permanent R/W)	0	acres
T% (Treatment Percent)	20.00	%
Treatment Requirement	0.35	acres

BMPs Provided

BMP Name	BMP Type	Contributing Drainage Area (acres)	Contributing Drainage Area in ODOT R/W (acres)
VBF	Vegetated Biofilter	0.39	0.39

Treatment Provided

Total Area with ODOT R/W Treated (acres)	0.39
Treatment Requirements (acres)	0.35
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



Water Quality Flow Rate (WQ_F)

Drainage Area #1	Area (acres)	Coefficient of Runoff (C)
Tributary Area within Existing R/W	0.39	0.9
Impervious Trib. Area Outside Existing R/W	0.00	
Tributary Area Land Use #3	0.00	
Tributary Area Land Use #4	0.00	
Total Tributary Area	0.39	0.900
BMP Type	Vegetated Biofilter	
Time of Concentration (minutes)	NA	
Intensity, i (in/hr)	0.65	
Water Quality Flow (WQ _F)	0.228	cfs



Ohio Department of Transportation - Office of Hydraulic Engineering
Post-Construction BMP Calculation Spreadsheet

Vegetated Biofilter

Location Information					Hydrology			Channel Characteristics					Analysis Results			
VBF	Route	Begin Station	End Station	Side	Total Drainage Area (acres)	EDA Treatment Credit (acres) ¹	WQ _F (cfs)	VBF Bottom Width (ft) ^{note2}	VBF Fore Slope (z:1)	VBF Back Slope (z:1)	VBF Longitudinal Slope (ft/ft)	Manning's Roughness Coefficient ³	Depth of Runoff at WQ _F (inches) ⁴	Velocity of Runoff at WQ _F (ft/sec) ⁴	Standard Ditch Width (feet) ⁵	Required Ditch Width (feet)
VBF#1	US 27	13+00	16+35	RT	0.39	0.39	0.228	4	6	2	0.041	0.15	1.38	0.44	4	4
VBF#2																
VBF#3																
VBF#4																
VBF#5																
VBF#6																
VBF#7																
VBF#8																
VBF#9																
VBF#10																

Total Treatment Credit Earned from VBFs (within R/W): **0.39** acres
 (Treatment is for quality only, not quantity)

Yellow: Requires Input (See instructions tab)

BMP Design Considerations

1	Do the VBF characteristics match the calculated flow and velocity checks using Manning's Equation above?	Yes	Good
2	Is the VBF a trapezoidal ditch with a flat bottom, not a radius ditch?	Yes	Good
3	Is the VBF width at least 4 feet?	Yes	Good
4	Is the depth of runoff for the WQ _F for each VBF less than or equal to 4 inches?	Yes	Good
5	Is the velocity of runoff for the WQ _F for each VBF less than or equal to 1.0 ft/sec?	Yes	Good
6	Does the "Total Drainage Area" include all onsite and off-site drainage to the VBF?	Yes	Good
7	Does each VBF include 4" of Item 659 Topsoil on the vegetated portion of the shoulder and foreslope?	Yes	Good
8	Does each VBF include Item 670, Ditch Erosion Protection?	Yes	Good
9	Are the station ranges and locations of the VBFs labeled on the Project Site Plan drawing?	Yes	Good