General Information

Instructions | *General* | Volume | Rate | Quality

Project Name: **QVSD High School**

Application Type: **Individual NPDES Application**

County: **Allegheny**

Municipality: **Leet Township**

Project Type: **Other**

(●) New Project ( ) Minor / Major Amendment

Area: **62.84** acres
(In Watershed)

Total Earth Disturbance: **62.84** acres
(In Watershed)

No. of Post-Construction Discharge Points: **2**

Start DP Numbering at: **001**

Discharge Point (DP) No.	Drainage Area (DA) (acres)	Earth Disturbance in DA (acres)	Existing Impervious in DA (acres)	Proposed Impervious in DA (acres)	Receiving Waters	Ch. 93 Class	Structural BMP(s)
001	41.60	41.60	0.99	15.55	Ohio River	WWF	Yes
002	2.81	2.81	0.26	0.00	Ohio River	WWF	Yes
Undetained Areas	18.43	18.43	0.00	0.00	Ohio River	WWF	
Totals:	**62.84**	**62.84**	**1.25**	**15.55**			

Volume Management

Project: QVSD High School

Instructions | General | *Volume* | Rate | Quality

2-Year / 24-Hour Storm Event (NOAA Atlas 14): _____ inches

Alternative 2-Year / 24-Hour Storm Event **2.33** inches

Alternative Source: **Leet Township SWM Ordinance 2018-04 ARTICLE V**

Pre-Construction Conditions: *No. Rows:* **9** ☐ *Exempt from Meadow in Good Condition* ☑ *Automatically Calculate CN, Ia, Runoff and Volume*

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Pervious as Meadow	2.67	B	58	1.448	0.10	928
Impervious as Meadow	0.04	B	58	1.448	0.10	14
Forested (Good Condition)	2.83	B	55	1.636	0.05	557
Impervious Areas: Paved Parking Lots, Roofs, Driveways, Etc. (Excluding ROW)	0.16	B	98	0.041	2.10	1,221
Impervious Areas: Streets and Roads - Dirt (Including ROW)	0.25	B	82	0.439	0.88	794
Pervious as Meadow	12.91	C	71	0.817	0.41	19,167
Impervious as Meadow	0.21	C	71	0.817	0.41	312
Impervious Areas: Paved Parking Lots, Roofs, Driveways, Etc. (Excluding ROW)	0.84	C	98	0.041	2.10	6,409
Forested (Good Condition)	36.27	C	70	0.857	0.38	49,598
TOTAL (ACRES):	**56.18**				**TOTAL (CF):**	**78,999**

Post-Construction Conditions: *No. Rows:* **6**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Impervious Areas: Paved Parking Lots, Roofs, Driveways, Etc. (Excluding ROW)	7.23	B	98	0.041	2.10	55,162
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	5.19	B	61	1.279	0.15	2,797
Impervious Areas: Streets and Roads - Paved; Curbs and Storm Sewers (Excluding ROW)	9.23	C	98	0.041	2.10	70,421
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	25.10	C	74	0.703	0.52	46,933
Meadow-Continuous Grass, Protected from Grazing and Generally Mowed for Hay	5.00	C	71	0.817	0.41	7,424
Woods (Good Condition)	11.09	C	70	0.857	0.38	15,165
TOTAL (ACRES):	**62.84**				**TOTAL (CF):**	**197,902**

IET CHANGE IN VOLUME TO MANAGE (CF): **118,903**

Non-Structural BMP Volume Credits:

☑ Tree Planting Credit

Number of new deciduous trees that will be planted within disturbed area: 448 **CREDIT (CF):** **2,688**

Number of new evergreen trees that will be planted within disturbed area: 54 **CREDIT (CF):** **540**

☐ Other (attach calculations):

Structural BMP Volume Credits: *No. Structural BMPs:* **12** *Start BMP Numbering at:* **1**

DP No.	BMP No.	BMP Name	MRC?	Discharge	Incremental BMP DA (acres)	Volume Routed to BMP (CF)	Infiltration / Vegetated Area (SF)	Infiltration Rate (in/hr)	Infiltration Period (hrs)	Vegeta-ted?	Media Depth (ft)	Storage Volume (CF)	Infiltration Credit (CF)	ET Credit (CF)
001	1	Rain Garden / Bioretention	-	to BMP No. 12	1.34	6,962	7,405	0.00	24	Yes	2.0	6,962	**0**	**3,895**

001	2	Rain Garden / Bioretention	-	to BMP No. 12	1.35	7,074	7,256	0.00	24	Yes	2.0	7,074	**0**	**3,817**
001	3	Rain Garden / Bioretention	-	to BMP No. 12	0.53	1,498	1,968	0.00	24	Yes	2.0	1,498	**0**	**1,035**
001	4	Rain Garden / Bioretention	-	to BMP No. 5	4.84	26,129	13,742	0.00	24	Yes	2.0	10,414	**0**	**7,228**
001	5	Rain Garden / Bioretention	-	to BMP No. 12	0.49	29,204	8,537	0.00	24	Yes	2.0	7,980	**0**	**4,490**
001	6	Rain Garden / Bioretention	-	to BMP No. 5	0.77	6,399	4,784	0.00	24	Yes	2.0	4,136	**0**	**2,516**
001	7	Rain Garden / Bioretention	-	to BMP No. 5	1.00	6,211	3,745	0.00	24	Yes	2.0	1,873	**0**	**1,970**
001	8	Rain Garden / Bioretention	-	to BMP No. 11	0.92	5,885	6,860	0.00	24	Yes	2.0	3,430	**0**	**3,608**
001	9	Rain Garden / Bioretention	-	to BMP No. 11	1.68	13,858	8,422	0.00	24	Yes	2.0	8,961	**0**	**4,430**
001	10	Infiltration Trench	-	to BMP No. 11	3.22	12,069	4,100	0.00	24	No	3.0	4,920	**0**	
001	11	Dry Extended Detention Basin	Y	Off-Site	20.09	65,013	7,380	0.00	24	Yes	2.0	37,168	**0**	**3,882**
001	12	Dry Extended Detention Basin	-	Off-Site	11.13	66,333	12,000	0.00	24	Yes	0.5	11,216	**0**	**2,058**
												Totals:		**38,930**

INFILTRATION & ET CREDITS (CF):	**38,930**
MANAGED RELEASE CREDIT (CF):	**61,131**
NET CHANGE IN VOLUME TO MANAGE (CF):	**118,903**
TOTAL CREDITS (CF):	**103,289**

VOLUME REQUIREMENT NOT SATISFIED

Rate Control

Project: QVSD High School

Instructions | General | Volume | *Rate* | Quality

Precipitation Amounts:

NOAA 2-Year 24-Hour Storm Event (in):		Alternative 2-Year 24-Hour Storm Event (in):	**2.33**
NOAA 10-Year 24-Hour Storm Event (in):		Alternative 10-Year 24-Hour Storm Event (in):	**3.27**
NOAA 50-Year 24-Hour Storm Event (in):		Alternative 50-Year 24-Hour Storm Event (in):	**4.36**
NOAA 100-Year 24-Hour Storm Event (in):		Alternative 100-Year 24-Hour Storm Event (in):	**4.87**

☑ **Report Summary of Peak Rates Only**

Attach model input and output data or other calculations to support the rates reported below.

	Peak Discharge Rates (cfs)			
	Pre-Construction	**Post-Construction**	**Net Change**	
2-Year Storm:	**41.64**	**34.53**	**-7.11**	***Rate Control Satisfied***
10-Year Storm:	**102.80**	**79.77**	**-23.03**	***Rate Control Satisfied***
50-Year Storm:	**188.12**	**143.86**	**-44.26**	***Rate Control Satisfied***
100-Year Storm:	**231.61**	**221.15**	**-10.46**	***Rate Control Satisfied***

Water Quality

Project: QVSD High School

PRINT

Instructions | General | Volume | Rate | *Quality*

Pre-Construction Pollutant Loads:

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Pervious as Meadow	Grassland/Herbaceous	2.67	B	928	48.8	0.22	2.30	2.83	0.01	0.13
Impervious as Meadow	Grassland/Herbaceous	0.04	B	14	48.8	0.22	2.30	0.04	0.00	0.00
Forested (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	2.83	B	557	45.0	0.13	1.05	1.56	0.00	0.04
Impervious Areas: Paved Parking Lots, Roofs, Driveways, Etc. (Excluding ROW)	Residential	0.16	B	1,221	65.0	0.29	2.05	4.95	0.02	0.16
Impervious Areas: Streets and Roads - Dirt (Including ROW)	Highway (general)	0.25	B	794	141.0	0.43	2.65	6.99	0.02	0.13
Pervious as Meadow	Grassland/Herbaceous	12.91	C	19,167	48.8	0.22	2.30	58.41	0.26	2.75
Impervious as Meadow	Grassland/Herbaceous	0.21	C	312	48.8	0.22	2.30	0.95	0.00	0.04
Impervious Areas: Paved Parking Lots, Roofs, Driveways, Etc. (Excluding ROW)	Residential	0.84	C	6,409	65.0	0.29	2.05	26.01	0.12	0.82

Forested (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	36.27	C	49,598	45.0	0.13	1.05	139.37	0.40	3.25
	TOTAL (ACRES):	**56.18**					**TOTALS:**	**241.11**	**0.85**	**7.33**

Post-Construction Pollutant Loads (without BMPs):

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Impervious Areas: Paved Parking Lots, Roofs, Driveways, Etc. (Excluding ROW)	Residential	7.23	B	55,162	65.0	0.29	2.05	223.89	1.00	7.06
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	5.19	B	2,797	78.0	0.25	1.25	13.62	0.04	0.22
Impervious Areas: Streets and Roads - Paved; Curbs and Storm Sewers (Excluding ROW)	Urban Highway	9.23	C	70,421	142.0	0.32	3.00	624.41	1.41	13.19
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	25.10	C	46,933	78.0	0.25	1.25	228.59	0.73	3.66
Meadow-Continuous Grass, Protected from Grazing and Generally Mowed for Hay	Grassland/Herbaceous	5.00	C	7,424	48.8	0.22	2.30	22.62	0.10	1.07
Woods (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	11.09	C	15,165	45.0	0.13	1.05	42.61	0.12	0.99
	TOTAL (ACRES):	**62.84**					**TOTALS:**	**######**	**3.41**	**26.19**

POLLUTANT LOAD REDUCTION REQUIREMENTS (LBS):	**914.63**	**2.56**	**18.87**

☐ **Characterize Undetained Areas (for Untreated Stormwater)**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)

Non-Structural BMP Water Quality Credits:

☐ Pervious Undetained Area Credit

☐ Other (attach calculations)

Structural BMP Water Quality Credits:

☑ *Use default BMP Outflows and Median BMP Outflow Concentrations*

DP No.	BMP No.	BMP Name	MRC?	BMP DA (acres)	Vol. Routed to BMP (CF)	Inf. & ET Credits (CF)	Capture & Buffer Credits (CF)	Outflow (CF)	Outflow Conc. (mg/L)			Pollutant Loads (lbs)		
									TSS	TP	TN	TSS	TP	TN
001	1	Rain Garden / Bioretention	-	1.34	6,962	3,895		3,067	-	-	-	-	-	-
001	2	Rain Garden / Bioretention	-	1.35	7,074	3,817		3,257	-	-	-	-	-	-
001	3	Rain Garden / Bioretention	-	0.53	1,498	1,035		463	-	-	-	-	-	-
001	4	Rain Garden / Bioretention	-	4.84	26,129	7,228		18,901	-	-	-	-	-	-
001	5	Rain Garden / Bioretention	-	0.49	29,204	4,490		24,714	-	-	-	-	-	-
001	6	Rain Garden / Bioretention	-	0.77	6,399	2,516		3,883	-	-	-	-	-	-
001	7	Rain Garden / Bioretention	-	1.00	6,211	1,970		4,241	-	-	-	-	-	-
001	8	Rain Garden / Bioretention	-	0.92	5,885	3,608		2,277	-	-	-	-	-	-

001	9	Rain Garden / Bioretention	-	1.68	13,858	4,430		9,428	-	-	-	-	-	-
001	10	Infiltration Trench	-	3.22	12,069	0		12,069	-	-	-	-	-	-
001	11	Dry Extended Detention Basin	Y	20.09	65,013	3,882		61,131	-	-	-	-	-	-
001	12	Dry Extended Detention Basin	-	11.13	66,333	2,058		64,275	22.00	0.19	1.22	88.30	0.76	4.90

	TSS	TP	TN
POLLUTANT LOADS FROM STRUCTURAL BMP (TREATED) OUTFLOWS (LBS):	**88.30**	**0.76**	**4.90**
POLLUTANT LOADS FROM UNTREATED STORMWATER (LBS):	**177.17**	**0.52**	**4.02**
NON-STRUCTURAL BMP WATER QUALITY CREDITS (LBS):			
NET POLLUTANT LOADS FROM SITE, POST-CONSTRUCTION (LBS):	**265.47**	**1.28**	**8.91**
POLLUTANT LOADS FROM SITE, PRE-CONSTRUCTION (LBS):	**241.11**	**0.85**	**7.33**

WATER QUALITY REQUIREMENT NOT SATISFIED

CERTIFICATION

I certify under penalty of law and subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities) that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I further certify that the structure, function, and calculations contained in this spreadsheet have not been modified in comparison to the spreadsheet DEP has posted to its website or, if modifications were made, an explanation of the modifications made is attached to this spreadsheet.

Kerry L Frech	6/25/2025
Spreadsheet User Name	Date

General Information

Instructions | *General* | Volume | Rate | Quality

Project Name: **QVSD High School**

Application Type: **Individual NPDES Application**

County: **Allegheny**

Municipality: **Leet Township**

Project Type: **Other**

(●) New Project ( ) Minor / Major Amendment

Area: **13.03** acres
(In Watershed)

Total Earth Disturbance: **13.03** acres
(In Watershed)

No. of Post-Construction Discharge Points: **4**

Start DP Numbering at: **003**

Discharge Point (DP) No.	Drainage Area (DA) (acres)	Earth Disturbance in DA (acres)	Existing Impervious in DA (acres)	Proposed Impervious in DA (acres)	Receiving Waters	Ch. 93 Class	Structural BMP(s)
003	0.00	0.00	0.00	0.00	Little Sewickley Creek	HQ-CWF	No
004	0.00	0.00	0.00	0.00	Little Sewickley Creek	HQ-CWF	No
005	0.00	0.00	0.00	0.00	Little Sewickley Creek	HQ-CWF	No
006	0.00	0.00	0.00	0.00	Little Sewickley Creek	HQ-CWF	No

Undetained Areas	6.40	6.40	0.61	0.00	Little Sewickley Creek	HQ-CWF	
Totals:	**6.40**	**6.40**	**0.61**				

Volume Management

Project: QVSD High School

Instructions | General | *Volume* | Rate | Quality

2-Year / 24-Hour Storm Event (NOAA Atlas 14): _____ inches

Alternative 2-Year / 24-Hour Storm Event **2.33** inches

Alternative Source: **Leet Township SWM Ordinance 2018-04 Article V**

Pre-Construction Conditions: *No. Rows:* **9** ☐ *Exempt from Meadow in Good Condition* ☑ *Automatically Calculate CN, Ia, Runoff and Volume*

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Pervious as Meadow	6.50	B	58	1.448	0.10	2,258
Impervious as Meadow	0.10	B	58	1.448	0.10	35
Forested (Good Condition)	4.34	B	55	1.636	0.05	854
Impervious Areas: Streets and Roads - Dirt (Including ROW)	0.20	B	82	0.439	0.88	635
Impervious Areas: Paved Parking Lots, Roofs, Driveways, Etc. (Excluding ROW)	0.41	B	98	0.041	2.10	3,128
Pervious as Meadow	0.40	C	71	0.817	0.41	594
Impervious as Meadow	0.02	C	71	0.817	0.41	30
Forested (Good Condition)	0.98	C	70	0.857	0.38	1,340
Impervious Areas: Paved Parking Lots, Roofs, Driveways, Etc. (Excluding ROW)	0.08	C	98	0.041	2.10	610
TOTAL (ACRES):	**13.03**				**TOTAL (CF):**	**9,484**

Post-Construction Conditions: *No. Rows:* 5

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	1.69	B	61	1.279	0.15	911
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	0.63	C	74	0.703	0.52	1,178
Woods (Good Condition)	1.31	B	55	1.636	0.05	258
Woods (Good Condition)	0.77	C	70	0.857	0.38	1,053
Meadow-Continuous Grass, Protected from Grazing and Generally Mowed for Hay	2.00	B	58	1.448	0.10	695
TOTAL (ACRES):	**6.40**				**TOTAL (CF):**	**4,094**

NET CHANGE IN VOLUME TO MANAGE (CF): -5,390

Non-Structural BMP Volume Credits:

☐ Tree Planting Credit

☐ Other (attach calculations):

Structural BMP Volume Credits: *No. Structural BMPs:* *Start BMP Numbering at:*

DP No.	BMP No.	BMP Name	MRC?	Discharge	Incremental BMP DA (acres)	Volume Routed to BMP (CF)	Infiltration / Vegetated Area (SF)	Infiltration Rate (in/hr)	Infiltration Period (hrs)	Vegeta-ted?	Media Depth (ft)	Storage Volume (CF)	Infiltration Credit (CF)	ET Credit (CF)
												Totals:		

INFILTRATION & ET CREDITS (CF):

NET CHANGE IN VOLUME TO MANAGE (CF): -5,390

TOTAL CREDITS (CF):

Rate Control

Project: QVSD High School

Instructions | General | Volume | *Rate* | Quality

Precipitation Amounts:

NOAA 2-Year 24-Hour Storm Event (in):		Alternative 2-Year 24-Hour Storm Event (in):	**2.33**
NOAA 10-Year 24-Hour Storm Event (in):		Alternative 10-Year 24-Hour Storm Event (in):	**3.27**
NOAA 50-Year 24-Hour Storm Event (in):		Alternative 50-Year 24-Hour Storm Event (in):	**4.36**
NOAA 100-Year 24-Hour Storm Event (in):		Alternative 100-Year 24-Hour Storm Event (in):	**4.87**

☐ **Report Summary of Peak Rates Only**

Attach model input and output data or other calculations to support the rates reported below.

	Peak Discharge Rates (cfs)			
	Pre-Construction	**Post-Construction**	**Net Change**	
2-Year Storm:	**0.75**	**0.40**	**-0.35**	***Rate Control Satisfied***
10-Year Storm:	**6.56**	**2.61**	**-3.95**	***Rate Control Satisfied***
50-Year Storm:	**17.37**	**6.84**	**-10.53**	***Rate Control Satisfied***
100-Year Storm:	**23.29**	**9.17**	**-14.12**	***Rate Control Satisfied***

Water Quality

Project: QVSD High School

PRINT

Instructions | General | Volume | Rate | *Quality*

Pre-Construction Pollutant Loads:

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Pervious as Meadow	Grassland/Herbaceous	6.50	B	2,258	48.8	0.22	2.30	6.88	0.03	0.32
Impervious as Meadow	Grassland/Herbaceous	0.10	B	35	48.8	0.22	2.30	0.11	0.00	0.00
Forested (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	4.34	B	854	45.0	0.13	1.05	2.40	0.01	0.06
Impervious Areas: Streets and Roads - Dirt (Including ROW)	Highway (general)	0.20	B	635	141.0	0.43	2.65	5.59	0.02	0.11
Impervious Areas: Paved Parking Lots, Roofs, Driveways, Etc. (Excluding ROW)	Residential	0.41	B	3,128	65.0	0.29	2.05	12.70	0.06	0.40
Pervious as Meadow	Grassland/Herbaceous	0.40	C	594	48.8	0.22	2.30	1.81	0.01	0.09
Impervious as Meadow	Grassland/Herbaceous	0.02	C	30	48.8	0.22	2.30	0.09	0.00	0.00
Forested (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	0.98	C	1,340	45.0	0.13	1.05	3.77	0.01	0.09

Impervious Areas: Paved Parking Lots, Roofs, Driveways, Etc. (Excluding ROW)	Residential	0.08	C	610	65.0	0.29	2.05	2.48	0.01	0.08
	TOTAL (ACRES):	**13.03**					**TOTALS:**	**35.82**	**0.14**	**1.15**

Post-Construction Pollutant Loads (without BMPs):

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	1.69	B	911	78.0	0.25	1.25	4.44	0.01	0.07
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	0.63	C	1,178	78.0	0.25	1.25	5.74	0.02	0.09
Woods (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	1.31	B	258	45.0	0.13	1.05	0.72	0.00	0.02
Woods (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	0.77	C	1,053	45.0	0.13	1.05	2.96	0.01	0.07
Meadow-Continuous Grass, Protected from Grazing and Generally Mowed for Hay	Grassland/Herbaceous	2.00	B	695	48.8	0.22	2.30	2.12	0.01	0.10
	TOTAL (ACRES):	**6.40**					**TOTALS:**	**15.97**	**0.05**	**0.35**

POLLUTANT LOAD REDUCTION REQUIREMENTS (LBS):	**0.00**	**0.00**	**0.00**

☐ **Characterize Undetained Areas (for Untreated Stormwater)**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)

Non-Structural BMP Water Quality Credits:

☐ Pervious Undetained Area Credit

☐ Other (attach calculations)

Structural BMP Water Quality Credits:

☑ *Use default BMP Outflows and Median BMP Outflow Concentrations*

DP No.	BMP No.	BMP Name	MRC?	BMP DA (acres)	Vol. Routed to BMP (CF)	Inf. & ET Credits (CF)	Capture & Buffer Credits (CF)	Outflow (CF)	Outflow Conc. (mg/L)			Pollutant Loads (lbs)		
									TSS	TP	TN	TSS	TP	TN

	TSS	TP	TN
POLLUTANT LOADS FROM STRUCTURAL BMP (TREATED) OUTFLOWS (LBS):	0.00	0.00	0.00
POLLUTANT LOADS FROM UNTREATED STORMWATER (LBS):	15.97	0.05	0.35
NON-STRUCTURAL BMP WATER QUALITY CREDITS (LBS):			
NET POLLUTANT LOADS FROM SITE, POST-CONSTRUCTION (LBS):	15.97	0.05	0.35
POLLUTANT LOADS FROM SITE, PRE-CONSTRUCTION (LBS):	35.82	0.14	1.15

WATER QUALITY REQUIREMENT SATISFIED

CERTIFICATION

I certify under penalty of law and subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities) that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I further certify that the structure, function, and calculations contained in this spreadsheet have not been modified in comparison to the spreadsheet DEP has posted to its website or, if modifications were made, an explanation of the modifications made is attached to this spreadsheet.

Kerry L Frech	6/25/2025
Spreadsheet User Name	Date

Quaker Valley High School - Pre Development Conditions

Sub Area	Soil	Hydrologic Soil Group	Cover Description	Impervious	CN	Area (ac.)	Product	Impervious area (ac.)	20% impervious (ac.)	Area (ac.)	Adjusted Product
Drainage Area to Ohio River	RycB	B	Meadow		58	2.67	154.9	0.00	0.00	2.71	157.2
	RycB.RycC	B	Paved Roads and Driveways	Yes	98	0.20	19.6	0.20	0.04	0.16	15.7
	RycB.RycC	B	Woods in good conditions		55	2.83	155.7	0.00	0.00	2.83	155.7
	ErB,EvD,GID,GQF,GSF,RycB,RycC,WhB	B	Unpaved Roads		82	0.25	20.5	0.00	0.00	0.25	20.5
	ErB,EvD,GID,GQF,GSF, URB	C	Paved Roads and Driveways	Yes	98	1.05	102.9	1.05	0.21	0.84	82.3
	EvD,GSF	C	Meadow		71	12.91	916.6	0.00	0.00	13.12	931.5
	ErB,EvD,GID,GpD,GQF,GSF	C	Woods in good condition		70	36.27	2538.9	0.00	0.00	36.27	2538.9
					Total	**56.18**	**3909.0**	**1.25**		**56.18**	**3901.8**
					Weighted CN		**69.6**	**2.2%**		**Adjusted CN**	**69.5**

Quaker Valley High School - Pre Development Conditions

Sub Area	Soil	Hydrologic Soil Group	Cover Description	Impervious	CN	Area (ac.)	Product	Impervious area (ac.)	20% impervious	Area (ac.)	Adjusted Product
Drainage Area to Little Sewickley Creek	RycB.RycC	B	Paved Roads and Driveways	Yes	98	0.51	50.4	0.51	0.10	0.41	40.3
	RycB.RycC	B	Meadow		58	6.49	376.5	0.00	0.00	6.59	382.2
	RycB.RycC	B	Unpaved Road		82	0.20	16.5	0.00	0.00	0.20	16.5
	RycB.RycC	B	Woods in good condition		55	4.34	238.9	0.00	0.00	4.34	238.9
	GpD,GQF	C	Meadow		71	0.40	28.5	0.00	0.00	0.45	32.0
	GpD,GQF	C	Paved Roads and Driveways	Yes	98	0.10	9.8	0.10	0.02	0.08	7.8
	GpD,GQF	C	Woods in good condition		70	0.98	68.8	0.00	0.00	0.98	68.8
					Total	**13.03**	**789.4**	**0.61**		**13.06**	**786.5**
					Weighted CN		**60.6**	**4.7%**		**Adjusted CN**	**60.2**

Quaker Valley High School - Post Development Conditions

Sub Area	Soil	Hydrologic Soil Group	Cover Description	Impervious	CN	Area (ac.)	Product	Impervious area (ac.)
Drainage Area to Ohio River	RycB	B	Meadow		58	0.00	0.0	0.00
	RycB.RycC	B	Paved Roads and Driveways	Yes	98	7.23	708.5	7.23
	RycB.RycC	B	Woods in good conditions		55	0.00	0.0	0.00
	ErB,EvD,GID,GQF,GSF,RycB, RycC,WhB	B	Grass		82	5.19	425.6	0.00
	ErB,EvD,GID,GQF,GSF, URB	C	Impervious	Yes	98	9.23	904.5	9.23
	ErB,EvD,GID,GQF,GSF, URB	C	Grass		74	25.10	1857.4	0.00
	EvD,GSF	C	Meadow		71	5.00	355.0	0.00
	ErB,EvD,GID,GpD,GQF,GSF	C	Woods in good condition		70	11.09	776.3	0.00
					Total	**62.84**	**5027.4**	**16.46**
					Weighted CN		**80.0**	**26.2%**

Quaker Valley High School - Post Development Conditions

Sub Area	Soil	Hydrologic Soil Group	Cover Description	Impervious	CN	Area (ac.)	Product	Impervious area (ac.)
Drainage Area to Little Sewickley Creek	RycB.RycC	B	Paved Roads and Driveways	Yes	98	0.00	0.0	0.00
	RycB.RycC	B	Meadow		58	2.01	116.6	0.00
	RycB.RycC	B	Unpaved Road		82	0.00	0.0	0.00
	RycB.RycC	B	Grass		61	1.69	102.9	0.00
	RycB.RycC	B	Woods in good condition		55	1.31	72.1	0.00
	GpD,GQF	C	Meadow		71	0.00	0.0	0.00
	GpD,GQF	C	Paved Roads and Driveways	Yes	98	0.00	0.0	0.00
	GpD,GQF	C	Woods in good condition		70	0.77	53.7	0.00
	GpD,GQF	C	Grass		74	0.63	46.4	0.00
					Total	**6.40**	**391.7**	**0.00**
					Weighted CN		**61.2**	**0.0%**

Quaker Valley High School - POST Development Conditions - Grass Field Stadium											
Sub Area	**Soil**	**Hydrologic Soil Group**	**Cover Description**	**CN**	**Area (ac.)**	**Product**	**S**	**P**	**Q**	**Runoff Volume**
Bio Area 1	RycB.RycC	B	Grass	61	0.46	28.1	6.3934	2.33	0.148	248
	RycB.RycC	B	Impervious	98	0.88	86.2	0.2041	2.33	2.102	6714
				Total	**1.34**	114.3				
				Weighted CN		**85.3**				6962

Sub Area	**Soil**	**Hydrologic Soil Group**	**Cover Description**	**CN**	**Area (ac.)**	**Product**	**S**	**P**	**Q**	**Runoff Volume**
Bio Area 2	EvD,GQF,GpD	C	Grass	74	0.56	41.4	3.5135	2.33	0.515	1047
	EvD,GQF,GpD	C	Impervious	98	0.79	77.4	0.2041	2.33	2.102	6027
				Total	**1.35**	118.9				
				Weighted CN		**88.0**				7074

Sub Area	**Soil**	**Hydrologic Soil Group**	**Cover Description**	**CN**	**Area (ac.)**	**Product**	**S**	**P**	**Q**	**Runoff Volume**
Bio Area 3	EvD,GQF,GpD	C	Grass	74	0.23	17.0	3.5135	2.33	0.515	430
	EvD,GQF,GpD	C	Impervious	98	0.14	13.7	0.2041	2.33	2.102	1068
				Total	**0.37**	30.7				
				Weighted CN		**83.1**				1498

Sub Area	**Soil**	**Hydrologic Soil Group**	**Cover Description**	**CN**	**Area (ac.)**	**Product**	**S**	**P**	**Q**	**Runoff Volume**
Bio Area 4	RycB.RycC	B	Grass	61	1.34	81.7	6.3934	2.33	0.148	722
	RycB.RycC	B	Impervious	98	3.33	326.3	0.2041	2.33	2.102	25406
				Total	**4.67**	408.1				
				Weighted CN		**87.4**				26129

Sub Area	Soil	Hydrologic Soil Group	Cover Description	CN	Area (ac.)	Product	S	P	Q	Runoff Volume
Bio Area 5	RycB.RycC	B	Grass	61	0.22	13.4	6.3934	2.33	0.148	119
	RycB.RycC	B	Impervious	98	0.27	26.5	0.2041	2.33	2.102	2060
				Total	**0.49**	39.9				
				Weighted CN		**81.4**				2179

Sub Area	Soil	Hydrologic Soil Group	Cover Description	CN	Area (ac.)	Product	S	P	Q	Runoff Volume
Bio Area 6	RycB.RycC	B	Grass	61	0.26	15.9	6.3934	2.33	0.148	140
	RycB.RycC	B	Impervious	98	0.51	50.0	0.2041	2.33	2.102	3891
				Total	**0.77**	65.8				
				Weighted CN		**85.5**				4031

Sub Area	Soil	Hydrologic Soil Group	Cover Description	CN	Area (ac.)	Product	S	P	Q	Runoff Volume
Bio Area 7	RycB.RycC	B	Grass	61	0.20	12.2	6.3934	2.33	0.148	108
	RycB.RycC	B	Impervious	98	0.80	78.4	0.2041	2.33	2.102	6104
				Total	**1.00**	90.6				
				Weighted CN		**90.6**				6211

Sub Area	Soil	Hydrologic Soil Group	Cover Description	CN	Area (ac.)	Product	S	P	Q	Runoff Volume
Bio Area 8	RycB.RycC	B	Grass	61	0.16	9.8	6.3934	2.33	0.148	86
	RycB.RycC	B	Impervious	98	0.76	74.5	0.2041	2.33	2.102	5798
				Total	**0.92**	84.2				
				Weighted CN		**91.6**				5885

Sub Area	Soil	Hydrologic Soil Group	Cover Description	CN	Area (ac.)	Product	S	P	Q	Runoff Volume
Bio Area 9	EvD,GQF,GpD	C	Grass	74	0.23	17.0	3.5135	2.33	0.515	430
	EvD,GQF,GpD	C	Impervious	98	1.76	172.5	0.2041	2.33	2.102	13428
				Total	**1.99**	189.5				
				Weighted CN		**95.2**				13858

Sub Area	Soil	Hydrologic Soil Group	Cover Description	CN	Area (ac.)	Product	S	P	Q	Runoff Volume
Rock Trench	EvD,GQF,GpD	C	Grass	74	2.17	160.6	3.5135	2.33	0.515	4058
	EvD,GQF,GpD	C	Impervious	98	1.05	102.9	0.2041	2.33	2.102	8011
				Total	**3.22**	263.5				
				Weighted CN		**81.8**				12069

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

MANAGED RELEASE CONCEPT (MRC) DESIGN SUMMARY

Complete One Design Summary Sheet for Each BMP Designed for MRC

GENERAL INFORMATION

Applicant Name:	Quaker Valley School District	Project Name:	Quaker Valley High School
Applicant Address:	100 Leetsdale Industrial Drive, Suite B	Municipality:	Leet Township
City, State, Zip:	Leetsdale, PA 15056	County:	Allegheny

Permit Type: ☐ NPDES PAG-02 ☒ NPDES IP ☐ ESCGP ☐ ESP

	Pre-Development	Post-Development	Change
Impervious Area (acres):	0.99	6.67	5.68

MRC BMP INFORMATION

MRC BMP Type: Dry Extended Detention Basin Stormwater BMP Manual Section: 6.6.3

Will the BMP Include Vegetation? ☒ Yes ☐ No

If Yes, Identify Proposed Vegetation: Native Detention Area Mix, ERNMIX183 or equivalent, with plugs, shrubs & trees

For Non-Vegetated BMPs Will There Be Pre- or Post-Treatment? ☐ Yes (Pre-) ☐ Yes (Post-) ☐ No

If Yes, Identify Proposed Pre- or Post-Treatment:

Name of Surface Water to Receive MRC BMP Discharges: Unnamed Tributary (UNT-2) of the Ohio River

Designated Use of Surface Water: WWF Existing Use of Surface Water (if different):

Is the Surface Water Impaired? ☒ Yes ☐ No

If Yes, Identify Cause(s): PCBs (source unknown), Dioxin (source unknown), Pathogens (source unknown)

Will the BMP have an impermeable liner? ☐ Yes ☒ No

If Yes, explain why a liner is proposed:

BMP Media Description: Modified Soil Mix

Are Any Deviations from MRC Design Standards Proposed? ☒ Yes ☐ No

If Yes, Identify Deviations: **2-yr ponding depth, maximum ponding depth, MRC Release Rate (per new standard), ponding time**

MRC BMP DESIGN VALUES AND STANDARDS

Parameter	Design Value	Design Standard
Actual Contributing Impervious Area to BMP (acres)	6.67	
Equivalent Contributing Impervious Area to BMP (acres)	7.60	
Total Drainage Area to BMP (acres)	22.75	
MRC BMP Release Rate (cfs) new standard is 0.02 cfs/ac	0.16	*No greater than 0.01 cfs / acre of equivalent contributing impervious*
Underdrain Outflow Rate During 1.2-Inch/2-Hour Storm (cfs)	0.13	*<= MRC BMP Release Rate (cfs)*
Maximum Storm Event Routed to MRC BMP	100-Year 24-Hour	

MRC BMP Design Summary
Revised, August 25, 2020

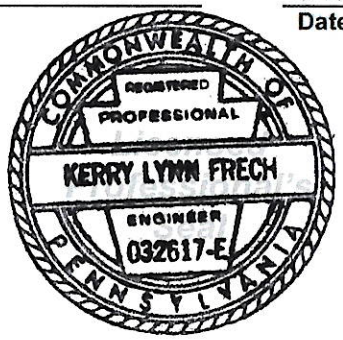
Parameter	Design Value	Design Standard
BMP Footprint Area (ft^2)	7380	
Bottom BMP Elevation (Native Soils) (ft)	853	
2-Yr/24-Hr Storm Ponding Depth (ft) 859.07-855	4.07	*1 ft (recommended) (2 ft max)*
Maximum Ponding Depth (ft) 861.0-855	6.90	*4 ft (max)*
Overflow Bypass Elevation (ft)	N/A	
Media Depth (ft)	2	*2 ft (min) – 4 ft (max)*
Media Void Space (%)	30	
Internal Water Storage (IWS) Depth (ft)	1	*1 ft recommended*
Top of IWS Elevation (ft)	854	
Underdrain Pipe Diameter (in)	8	
Underdrain Orifice Diameter (in)	1.6	
Underdrain Outlet Elevation (ft)	854	
IWS Available for Routing (%)	50	*50% max*
Separation Distance (Groundwater) (ft)	1	*1 ft (min) (2 ft recommended)*
Infiltration Rate (in/hr)	0	
Volume of Overflow During 1.2-Inch/2-Hour Storm (cf)	0	*0 (No overflow allowed)*
1-Yr/24-Hr **Pre**-Development Peak Rate (cfs)	6.0	
2-Yr/24-Hr **Post**-Development Peak Rate (cfs)	0.62	*1-Yr/24-Hr Pre-Development Peak Rate (or per approved Act 167 Plan)*
10-Yr/24-Hr **Post**-Development Peak Rate (cfs)	3.06	*10-Yr/24-Hr Pre-Development Peak Rate 103.2*
50-Yr/24-Hr **Post**-Development Peak Rate (cfs)	31.9	*50-Yr/24-Hr Pre-Development Peak Rate 188.8*
100-Yr/24-Hr **Post**-Development Peak Rate (cfs)	46.69	*100-Yr/24-Hr Pre-Development Peak Rate 232.4*
Total 2-Yr/24-Hr Runoff Volume Managed by BMP (cf)	65,013	
Ponding Time @ 2-Yr/24-Hr Storm (hrs)	70	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 10-Yr/24-Hr Storm (hrs)	93.7	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 50-Yr/24-Hr Storm (hrs)	106	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 100-Yr/24-Hr Storm (hrs)	106	*72 hrs (surface), 7 days (underground)*

Kerry L. Frech
Licensed P.E. Name

Licensed P.E. Signature

32617-E
License No.

5-16-2024
Date



Quaker Valley High School - POST Development Conditions - Grass Field Stadium							
Sub Area	**Soil**	**Hydrologic Soil Group**	**Cover Description**	**Impervious**	**CN**	**Area (ac.)**	**Product**
Drainage Area to POA_SWMF-1 Upper Detention Pond Off-site Ohio River	RycB	B	Residential		75	0.60	45.0
	RycB.RycC	B	Woods in good conditions		55	0.00	0.0
	GSF,GID,GQF,EvD	C	Residential		83	1.12	93.0
	GSF,GID,GQF,EvD	C	Meadow		71	0.00	0.0
	GSF,GID,GQF,EvD	C	Impervious	Yes	98	0.00	0.0
	GSF,GID,GQF,EvD	C	Woods in good conditions		70	0.94	65.8
					Total	**2.66**	203.8
					Weighted CN		**76.6**

Quaker Valley High School - POST Development Conditions - Grass Field Stadium							
Sub Area	**Soil**	**Hydrologic Soil Group**	**Cover Description**	**Impervious**	**CN**	**Area (ac.)**	**Product**
Drainage Area to POA_SWMF-1 Upper Detention Pond On Site Ohio River	RycB	B	Grass		61	0.97	59.2
	RycB.RycC	B	Impervious area	Yes	98	0.29	28.4
	RycB.RycC	B	Wooded		55	1.48	81.4
	EvD,GQF,GSF	C	Grass		74	4.69	347.1
	EvD,GID,GSF,GQF	C	Impervious area	Yes	98	1.57	153.9
	GID,GSF	C	Wooded		70	11.09	776.3
					Total	**20.09**	1446.2
					Weighted CN		**72.0**

Quaker Valley High School - POST Development Conditions - Grass Field Stadium									
Sub Area	**Soil**	**Hydrologic Soil Group**	**Cover Description**	**Impervious**	**CN**	**Area (ac.)**	**S**	**Precip (in)**	**Runoff Volume (cf)**
Drainage Area to POA_SWMF-1 Upper Off-Site	RycB	B	Residential		75	0.60	3.3	1.20	160.22
	RycB.RycC	B	Woods in good conditions		55	0.00	8.2	1.20	0.00
	GSF,GID,GQF,EvD	C	Residential		83	1.12	2.0	1.20	894.70
	GSF,GID,GQF,EvD	C	Meadow		71	0.00	4.1	1.20	0.00
	GSF,GID,GQF,EvD	C	Impervious	Yes	98	0.00	0.2	1.20	0.00
	GSF,GID,GQF,EvD	C	Woods in good conditions		70	0.94	4.3	1.20	86.66
					Total	**2.66**			1141.58
					Equivalent Contributing Imp. Area				0.31

Quaker Valley High School - POST Development Conditions - Grass Field Stadium									
Sub Area	**Soil**	**Hydrologic Soil Group**	**Cover Description**	**Impervious**	**CN**	**Area (ac.)**	**S**	**Precip (in)**	**Runoff Volume (cf)**
Drainage Area to POA_SWMF-1 Upper Detention Pond On Site Ohio River	RycB	B	Grass		61	1.48	6.4	1.20	5.27
	RycB.RycC	B	Impervious area	Yes	98	1.29	0.2	1.20	4615.52
	EvD,GQF,GSF	C	Grass		74	11.03	3.5	1.20	2468.78
	EvD,GID,GSF,GQF	C	Impervious area	Yes	98	5.38	0.2	1.20	19249.22
	GID,GSF	C	Wooded		70	0.00	4.3	1.20	0.00
	GID,GSF	C	Meadow		71	0.91	4.1	1.20	108.52
					Total	**20.09**			26447.30
					Equivalent Contributing Imp. Area				7.29

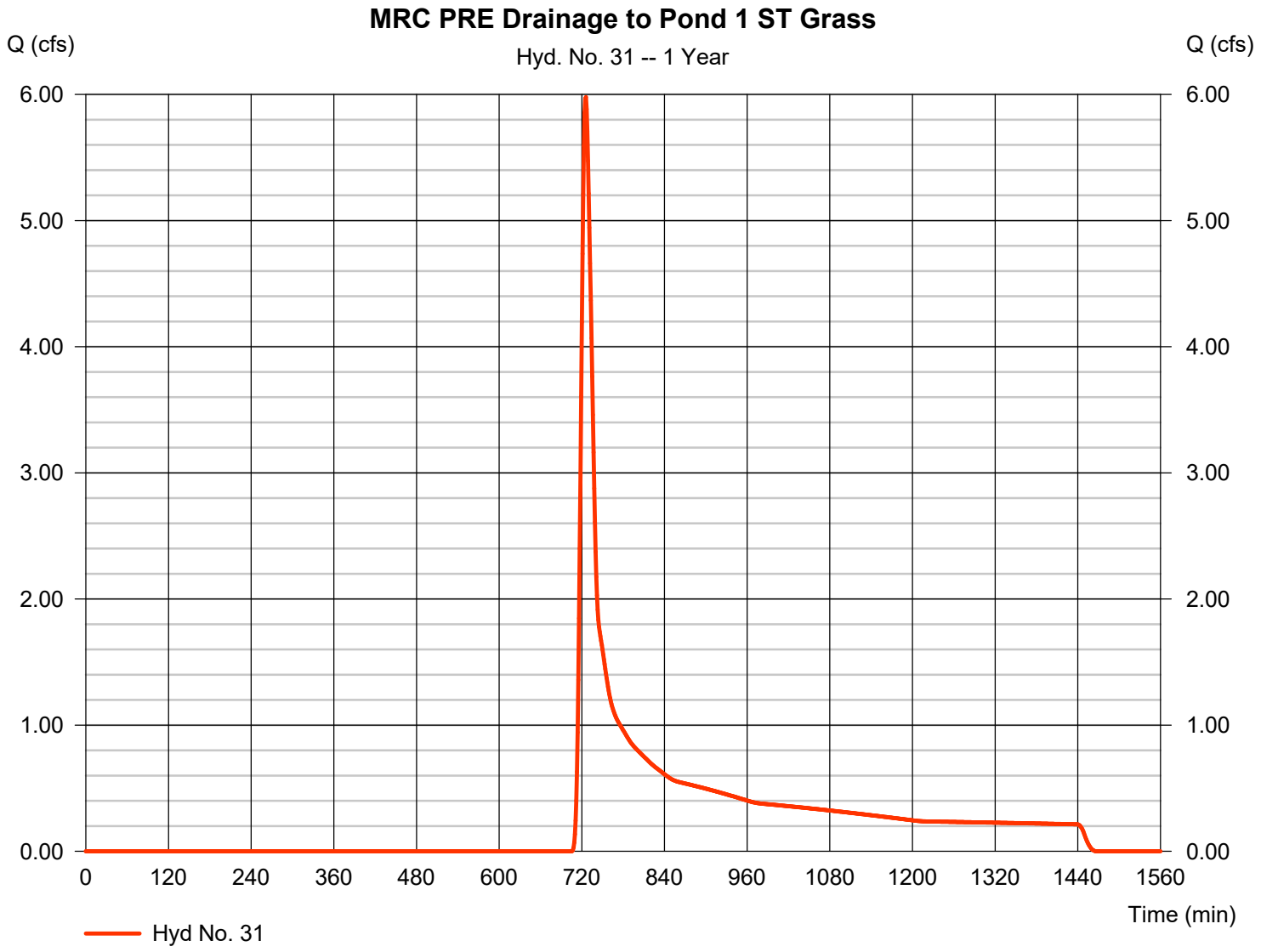
Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2025 Wednesday, 06 / 25 / 2025

Hyd. No. 31

MRC PRE Drainage to Pond 1 ST Grass

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.978 cfs
Storm frequency	=	1 yrs	Time to peak	=	726 min
Time interval	=	1 min	Hyd. volume	=	24,163 cuft
Drainage area	=	22.750 ac	Curve number	=	72.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.50 min
Total precip.	=	1.96 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

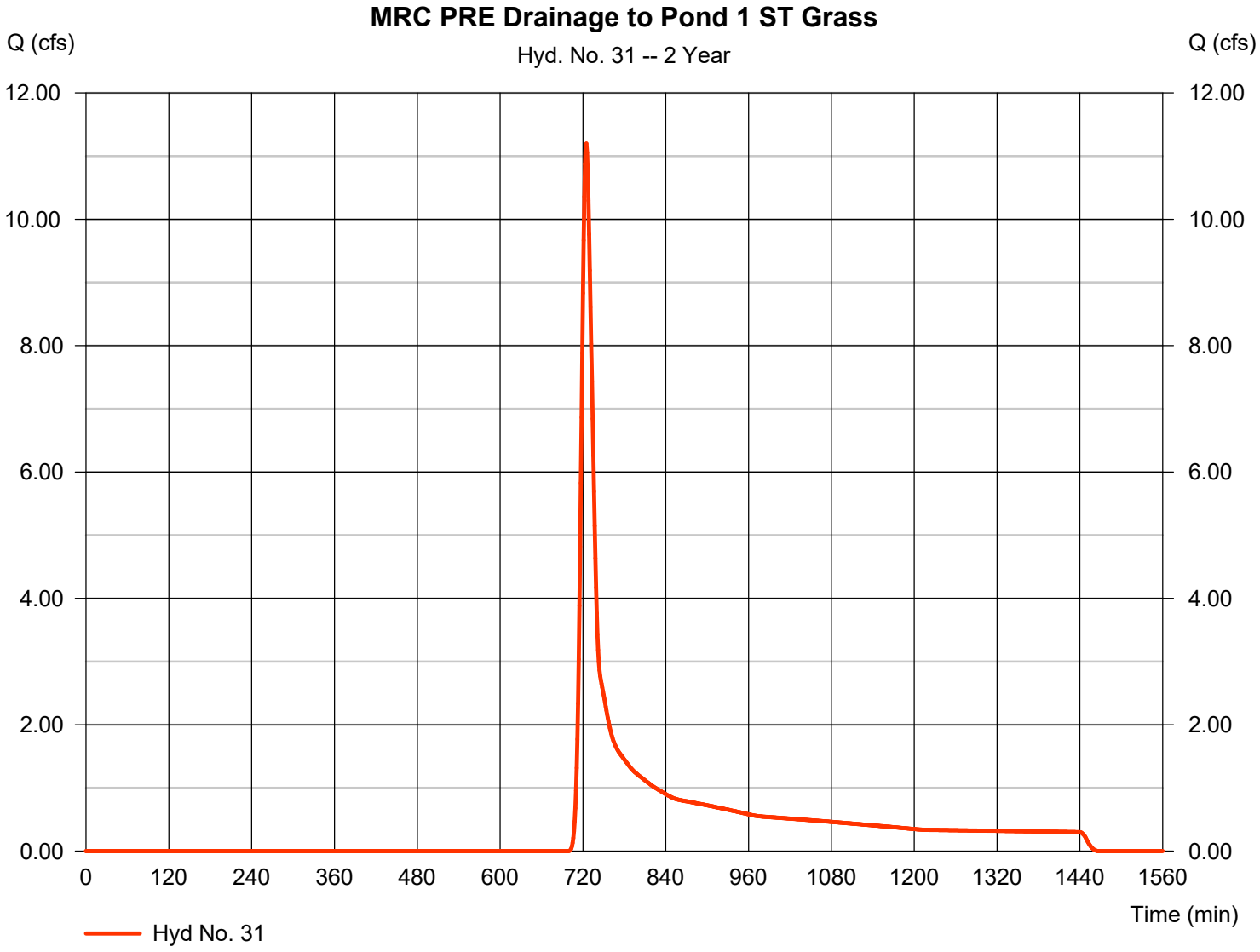


Hydrograph Report

Hyd. No. 31

MRC PRE Drainage to Pond 1 ST Grass

Hydrograph type	=	SCS Runoff	Peak discharge	=	11.20 cfs
Storm frequency	=	2 yrs	Time to peak	=	725 min
Time interval	=	1 min	Hyd. volume	=	38,487 cuft
Drainage area	=	22.750 ac	Curve number	=	72.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.50 min
Total precip.	=	2.33 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

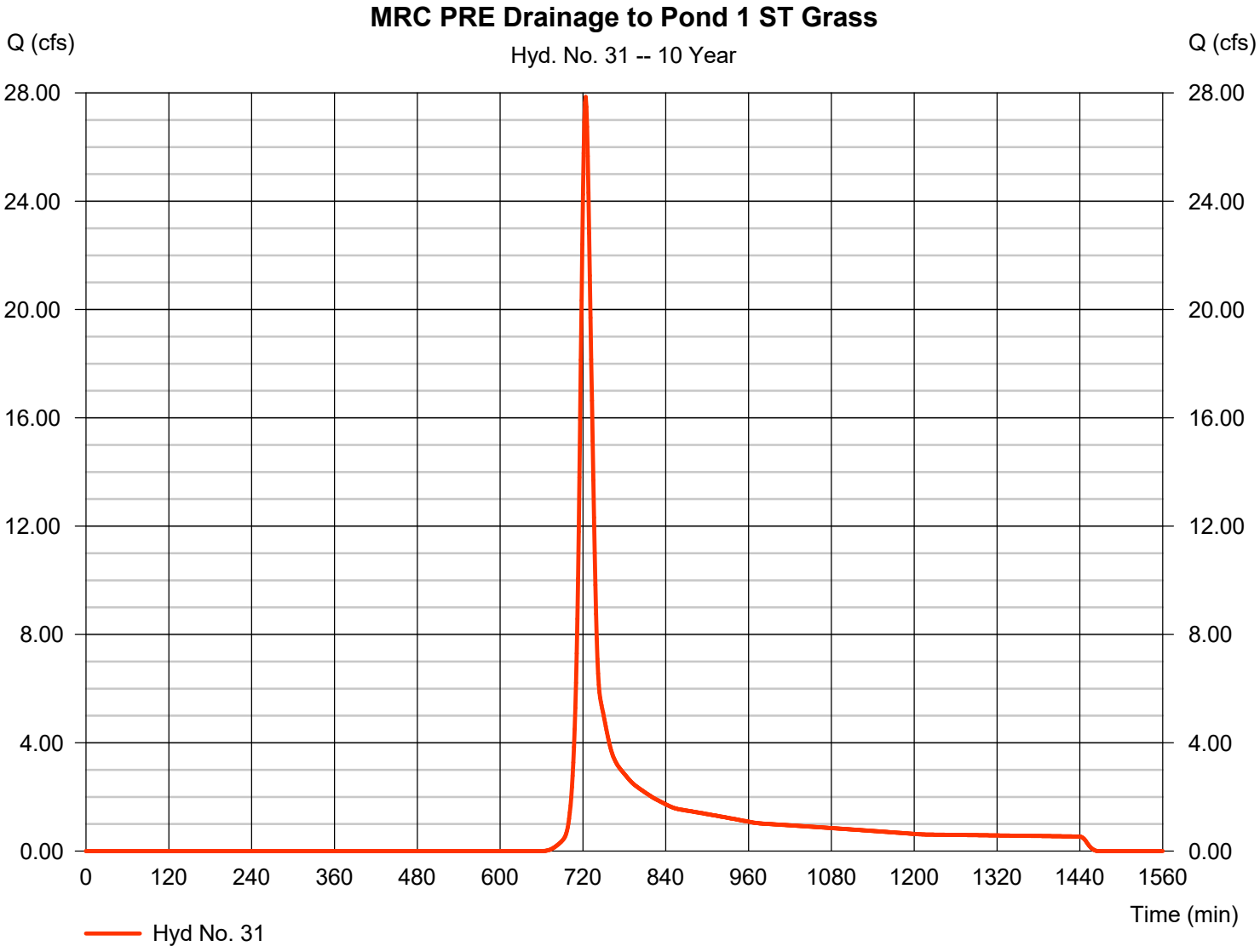


Hydrograph Report

Hyd. No. 31

MRC PRE Drainage to Pond 1 ST Grass

Hydrograph type	=	SCS Runoff	Peak discharge	=	27.85 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	83,648 cuft
Drainage area	=	22.750 ac	Curve number	=	72.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.50 min
Total precip.	=	3.27 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

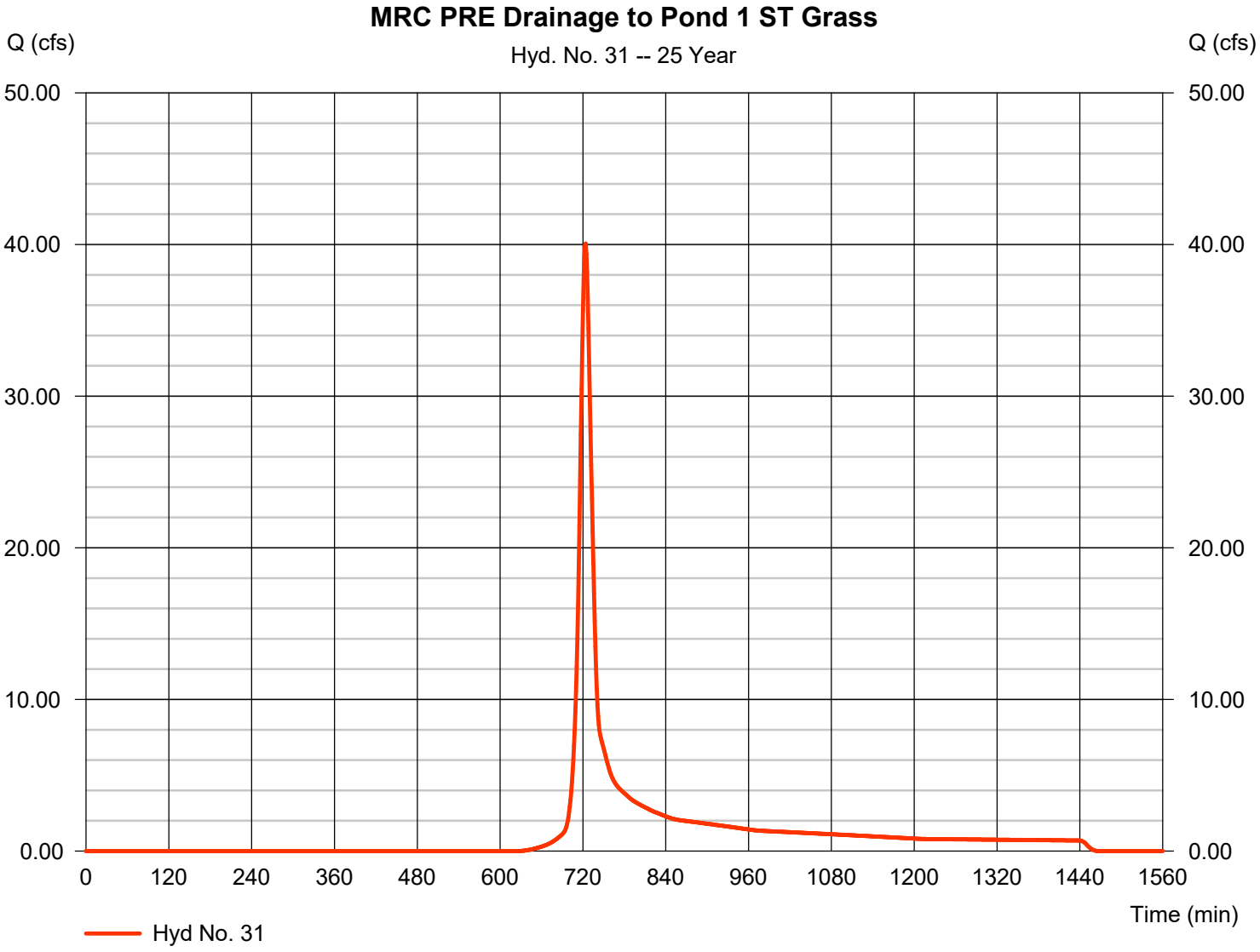


Hydrograph Report

Hyd. No. 31

MRC PRE Drainage to Pond 1 ST Grass

Hydrograph type	=	SCS Runoff	Peak discharge	=	40.06 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	117,235 cuft
Drainage area	=	22.750 ac	Curve number	=	72.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.50 min
Total precip.	=	3.87 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

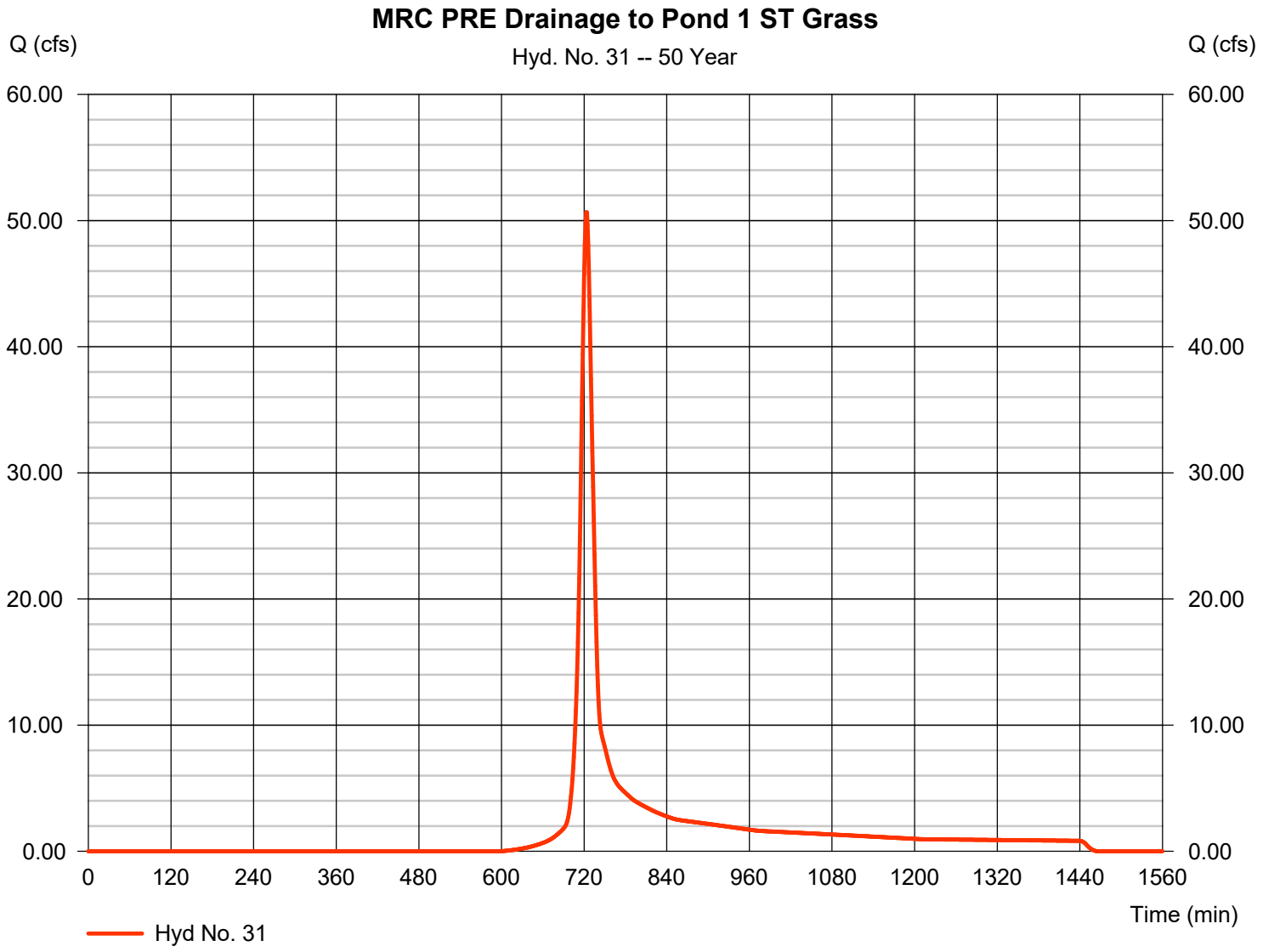


Hydrograph Report

Hyd. No. 31

MRC PRE Drainage to Pond 1 ST Grass

Hydrograph type	=	SCS Runoff	Peak discharge	=	50.65 cfs
Storm frequency	=	50 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	146,661 cuft
Drainage area	=	22.750 ac	Curve number	=	72.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.50 min
Total precip.	=	4.36 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

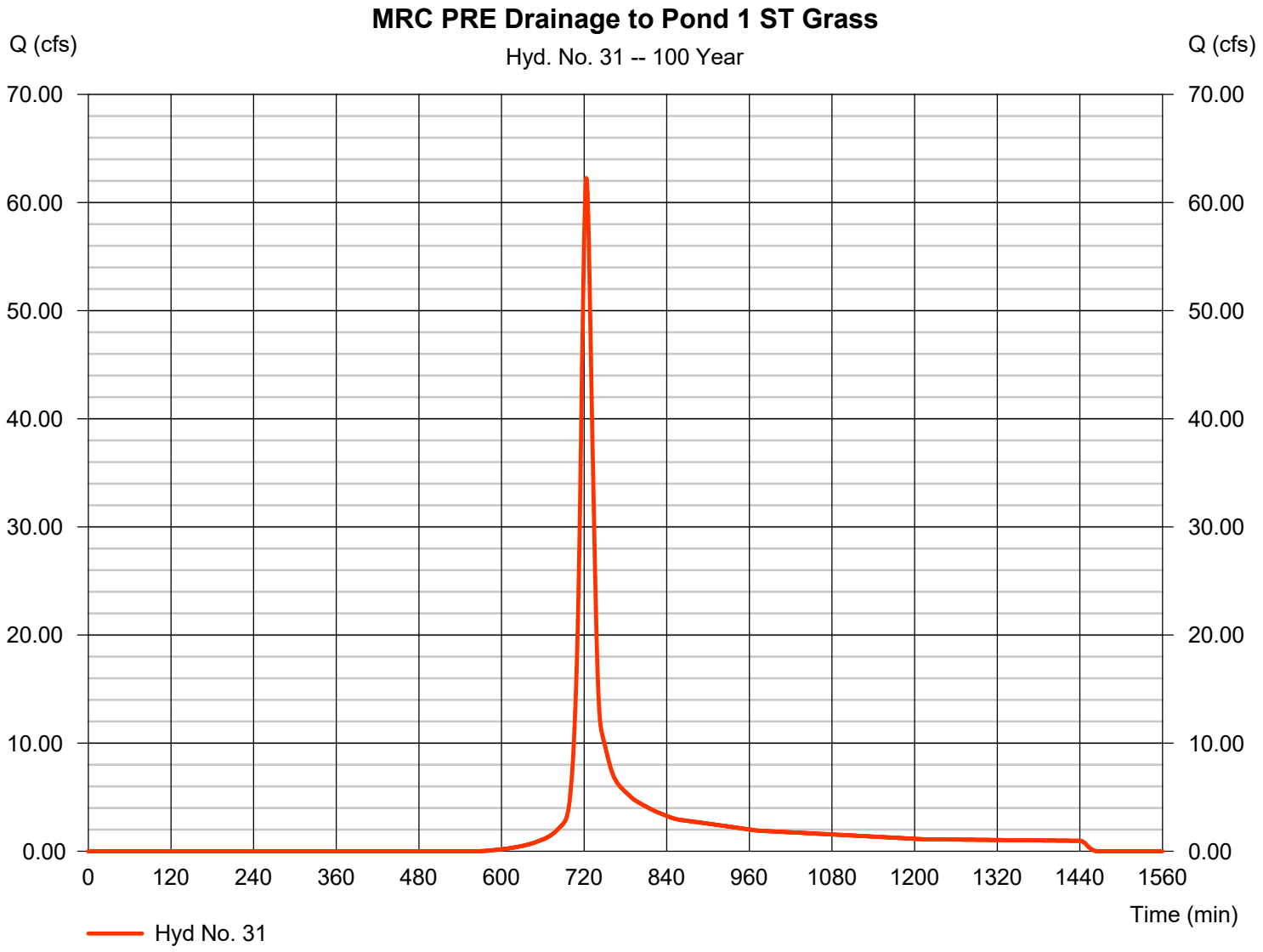


Hydrograph Report

Hyd. No. 31

MRC PRE Drainage to Pond 1 ST Grass

Hydrograph type	=	SCS Runoff	Peak discharge	=	62.25 cfs
Storm frequency	=	100 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	178,807 cuft
Drainage area	=	22.750 ac	Curve number	=	72.5
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.50 min
Total precip.	=	4.87 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



STREAMLINE ENGINEERING INC.	**CALCULATION SHEET**	**ORIGINATED BY:** KLF
		DATE: 3/20/2024
	PROJECT TITLE: QVSD Proposed High School Campus SWMF Dewatering Calculations	**CHECKED BY: MLF**
		DATE: 3/20/2024
		REV NO.: 3 6-25-2025
PROJECT NO.: 21-109		**PAGE NO.** 1

SWMF1 DEWATERING CALCULATION

PCSM Dewatering Orifice

Elevation (ft), Crest of Principal Spillway	861	
Elevation, Peak 2-year 24-hour water level in pond	859.07	*Hydraflow 6-25-2025*
Diameter (inches), Dewatering Orifice	4	
Elevation (ft), Invert of Dewatering Orifice	857.75	*SWMF-1 MRC worksheet*
Volume (cf) at Crest of Principal Spillway	69415	*Appendix D*
Volume (cf) at Invert of Dewatering Orifice	27756	*Appendix D*
Elevation, Bottom of Pond (ft)	855	
Volume (cf) at Bottom of Pond	2940	

all volumes from Hydraflow Pond Report for SWMF-1 in Appendix D

Orifice Area (sf)	0.087266	
Orifice Equation	$Q = C A (2gHo)^{1/2}$	
C	0.6	

Elevation		Volume (cf)	Orifice Head (ft)	Orifice Flow (cfs)	Average Orifice Flow (cfs)	Time to Dewater (hr)	Cumulative Time to Dewater (hr)
861	Crest, Principal Spillway	69415	3.08	0.74		0.00	0
					0.67		
860		54470	2.08	0.61		6.18	6.2
					0.53		
859.07	Peak 2-yr 24-hr level	43170	1.15	0.45		5.94	12.1
					0.44		
859		42319	1.08	0.44		0.53	12.6
					0.28		
858		30168	0.08	0.12		12.08	24.7
					0.06		
857.5	Inv., Dewatering Orifice	27756	0.00	0.00		11.05	35.8

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PROJECT NO.: 21-109		**PAGE NO.** 2

MRC DESIGN

MRC Draining Analysis

Equivalent Impervious Area	7.60	acres	
MRC Design Summary Sheet			
MRC Volume	27588	cf	
1 inch runoff over Equivalent Impervous Area			
Elevation corresponding to MRC Volume	857.73	ft	*Appendix D*
SET Elevation, Invert of Dewatering Orifice	857.75	ft	
Volume at Elevation, Invert of Dewatering Orifice	27756	cf	
interpolation from Pond Report SWMF-1			

MRC Orifice Design

SET Diameter (inches), MRC Underdrain Orifice	1.6		
Elevation (ft), Bottom of Pond (Top of Soil Media)	855		
Elevation, Invert of MRC Underdrain Orifice	854		
Elevation, Centerline of MRC Underdrain Orifice	854.07		
Area (sf) of MRC Underdrain Orifice	0.013963		
Volume (cf) at Invert of MRC Orifice	27756	*SWMF-1 Pond Report, Appendix D*	
Volume (cf) at Bottom of Pond	2940		
volumes from Hydraflow Pond Report for SWMF-1			
Orifice Coefficient	0.6		

Elevation		Volume (cf)	Orifice Head (ft)	Orifice Flow (cfs)	Average Orifice Flow (cfs)	Time to Dewater (hr)	Cumulative Time to Dewater (hr)
857.75	Invert, Dewatering Orifice	27756	3.68	0.13			0
					0.12		
857		20519	2.93	0.12		16.47	16.5
					0.10		
856		10869	1.93	0.09		25.70	42.2
					0.08		
855	Bottom of Pond	2940	0.93	0.06		27.80	70.0

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PROJECT NO.: 21-109		**PAGE NO.** 3

MRC Underdrain Sizing

Minimum flow capacity is	10	gpm/lf underdrain		
Estimated length of underdrain	155	ft		
Minimum Underdrain Flow Capacity	1550	gpm/lf	3.45	cfs
Number of Underdrains	2			
Manning Equation	Q = 1.49/n	$A^{5/3}$ $Pw^{-2/3}$ $S^{1/2}$		
Manning n	0.011	PVC pipe		
Diameter D	8	inches	trial & error	
Area A	0.35	sf		
Wetted Perimeter Pw	2.09	ft/ft		
Pipe Slope S	0.01	ft/ft		
Flow Q	2.86	cfs	each pipe	

PLANTING SCHEDULE - TREES

KEY	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
SHADE TREES					
AC RU	88	Acer rubrum 'Red Sunset'	Red Sunset Red Maple	3"-3.5" Cal.	**B&B**
CA SP	13	Catalpa Speciosa	Northern Catalpa	3"-3.5" Cal.	**B&B**
BE PO	33	Betula populifolia 'Whitespire'	Whitespire Birch	12'-14' Ht.	B&B
LI ST	40	Liquidambar styraciflua	Sweetgum	3"-3.5" Cal.	B&B
LI TU	17	Liriodendron tulipifera	Tulip Tree	3"-3.5" Cal.	**B&B**
NY SA	24	Nyssa sylvatica	Black Gum	3"-3.5" Cal.	B&B
PL AC	15	Planatus acerifolia 'Exclamation'	Exclamatuion London Planetree	3"-3.5" Cal.	B&B
QU AL	7	Quercus Alba	White Oak	3"-3.5" Cal.	B&B
TI CO	51	Tilia cordata 'Greenspire	Greenspire Little Leaf Linden	3"-3.5" Cal.	B&B
UL AM	29	Ulmus a. 'Princeton'	Princeton American Elm	3"-3.5" Cal.	B&B
EVERGREEN TREE					
PI AB	32	Picea abies	Norway Spruce	12'-14' Ht.	B&B
PI ST	22	Pinus strobus	Eastern White Pine	12'-14' Ht.	B&B
ORNAMENTAL TREE					
CE CA	62	Cercis canadensis	Eastern Red Bud	2.5"-3"	B&B
CR VI	48	Crataegus viridis 'Winter King'	Winter King Hawthorn	2.5"-3"	B&B
MA VI	21	Magnolia virginiana	Sweetbay Magnolia	2.5"-3"	B&B

PLANTING SCHEDULE - SHRUBS

KEY	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
SHRUBS					
Cl al	103	Clethra alnifolia 'Ruby Spice'	Ruby Spice Summersweet	24"-30" Ht.	B&B
Ce am	99	Ceanothus americanus	New Jersey Tea	24"-30" Ht.	B&B
Fo mt	154	Fothergilla 'Mt. Airy'	Mount Airy Fothergilla	24"-30" Ht.	B&B
Ix gl	40	Ilex glabra "Shamrock'	Red Sprite Winterberry	24"-30" Ht.	B&B
Ix rs	85	Ilex verticillata 'Red Sprite'	Red Sprite Winterberry	24"-30" Ht.	B&B
Ix sg	7	Ilex verticillata 'Southern Gentleman'	Southern Gentleman Winterberry	24"-30" Ht.	B&B
It vi	84	Itea virginica 'Henry Garnett'	Virginia Sweetspire	24"-30" Ht.	B&B
Ha ap	10	Hamamelis 'Arnold Promise'	Arnold Promise Witchhazel	36"-42" Ht.	B&B
Rh ar	65	Rhus aromatica	Gro-Low Sumac	24"-30" Ht.	B&B
Vi de	42	Viburnum dentatum 'Blue Muffin'	Arrowwood Viburnum	30"-36" Ht.	B&B
Vi la	17	Viburnum lantana 'Mohican'	Mohican Viburnum	30"-36" Ht.	B&B
Vi pl	12	Viburnum plicatum 'Mariesii	Doublefile Viburnum	30"-36" Ht.	B&B

PLANTING SCHEDULE - GRASSES AND PERENNIALS

KEY	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
GRASSES AND PERENNIALS					
an ge	31	Andropogan gerardii	Big bluestem	1 Gal.	
am hu	436	Amsonia hubrichtii	Bluestar	1 Gal.	
ba au	296	Baptisia australis	Blue False Indigo	1 Gal.	
ca ac	1216	Calamagrostis 'Karl Forester'	Feather Reed Grass	1 Gal.	
de ce	304	Deschampsia cespitosa 'Goldtau'	Tufted Hairgrass	1 Gal.	
ec pu	486	Echinacea purpurea	Purple Coneflower	1 Gal.	
eu du	80	Eutrochium dubium 'Little Joe'	Little Joe Joepye Weed	1 Gal.	
pa vi	1022	Panicum virgatum 'Shenandoah'	Red Switchgrass	1 Gal.	
sc sc	437	Schizachyrium scoparium	Little Bluestem	1 Gal.	
sp he	800	Sporobolus heterolepsis	Priarie Dropseed	1 Gal.	

PLANTING SCHEDULE - REFORESTATION

KEY	QNTY	BOTANICAL NAME	COMMON NAME	SIZE	COMMENTS
SHRUBS, GRASSES AND PERENNIALS					
	Min. 10000 Trees	Acer rubrum	Red Maple	1/2" Whip	
		Carya spp.	Hickory	1/2" Whip	
		Celtis occidentalis	Hackberry	1/2" Whip	
		Fagus grandifolia	American Beech	1/2" Whip	
		Liriodendron tulipifera	Yellow Poplar	1/2" Whip	
		Nyssa sylvatica	Black Gum	1/2" Whip	
		Quercus alba	White oak	1/2" Whip	
		Quercus palustris	Pin Oak	1/2" Whip	
		Quercus rubra	Red Oak	1/2" Whip	
		Sassafras albidum	Sassafras	1/2" Whip	
		Tilia americana	Basswood	1/2" Whip	
	430,358 SF	ERNMX-140 - Partially Shaded Area Roadside Mix			

PLANTING SCHEDULE - SLOPE/MEADOW PLANTING

KEY	QNTY	TYPE
SEED MIX		
	302,900	ERNMX-181 - Native Steep Slope Mix w/Annual Ryegrass

PLANTING SCHEDULE - RAIN GARDEN PLANTING

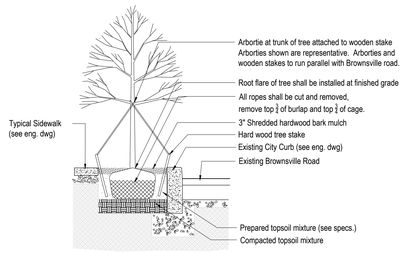
KEY	QNTY	TYPE
SEED MIX		
	20,600 SF	ERNMX-180 - Rain Garden Mix

PLANTING SCHEDULE - STORMWATER MANAGEMENT FACILITY

KEY	QNTY	TYPE
SEED MIX		
	28,425 SF	ERNMX-183 - Native Detention Area

PLANTING SCHEDULE - SEEDED LAWN

KEY	QNTY	TYPE
SEED MIX		
	415,785 SF	Pennington Pennsylvania State Grass Seed Mix

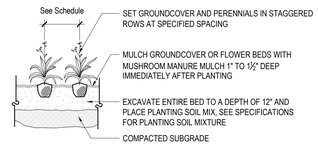


Note:
1. Plants dug with firm, natural balls of earth in which they are grown, with ball size not less than the diameter and depth recommended by ANSI Z60.1-1996 for type and size of tree or shrub required; wrapped, tied, rigidly supported, and drum-laced as recommended by ANSI Z60.1-1996.

1 TYPICAL DECIDUOUS TREE PLANTING
NOT TO SCALE

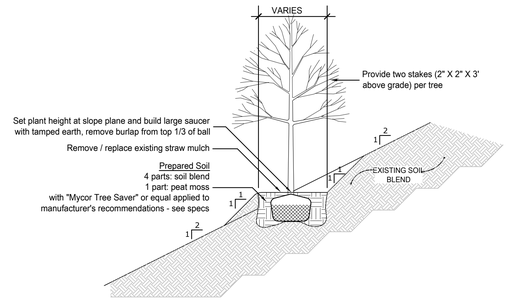
NOTE:
1. BALLED AND BURLAPPED PLANTS DUG WITH FIRM, NATURAL BALLS OF EARTH IN WHICH THEY ARE GROWN, WITH BALL SIZE NOT LESS THAN THE DIAMETER AND DEPTH RECOMMENDED BY ANSI Z60.1-1996 FOR TYPE AND SIZE OF TREE OR SHRUB REQUIRED; WRAPPED, TIED, RIGIDLY SUPPORTED, AND DRUM-LACED AS RECOMMENDED BY ANSI Z60.1-1996.
2. ALL CONTAINER GROWN PLANTS SHALL BE HEALTHY, VIGOROUS, WELL ROOTED, AND ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE GROWING. A CONTAINER GROWN PLANT SHALL HAVE A WELL-ESTABLISHED ROOT SYSTEM REACHING THE SIDES OF THE CONTAINER TO MAINTAIN A FIRM ROOT BALL. CONTAINER SHALL BE RIGID ENOUGH TO HOLD BALL SHAPE AND PROTECT ROOT MASS DURING SHIPPING AND BE SIZED ACCORDING TO ANSI Z60.1-1996 FOR KIND, TYPE, AND SIZE OF PLANT REQUIRED.

2 TYPICAL SHRUB PLANTING
NOT TO SCALE

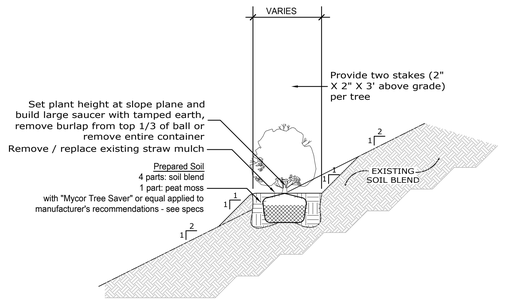


NOTE:
1. ALL CONTAINER GROWN GROUNDCOVER AND PERENNIAL PLANTS SHALL BE HEALTHY, VIGOROUS, WELL ROOTED AND ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE GROWING. A CONTAINER GROWN GROUNDCOVER AND PERENNIAL PLANT SHALL HAVE A WELL-ESTABLISHED ROOT SYSTEM REACHING THE SIDES OF THE CONTAINER TO MAINTAIN A FIRM ROOTBALL. CONTAINER SHALL BE RIGID ENOUGH TO HOLD BALL SHAPE AND PROTECT ROOT MASS DURING SHIPPING AND SIZED ACCORDING TO ANSI Z60.1-1996 FOR KIND, TYPE AND SIZE OF PLANT REQUIRED.

3 TYPICAL PERENNIAL/GROUNDCOVER PLANTING
NOT TO SCALE



4 DECIDUOUS TREE ON SLOPE
NOT TO SCALE



5 SHRUB PLANTING ON SLOPE
NOT TO SCALE

Notes:

1. All plants shall be furnished and installed in strict accordance with the latest version of "American Standard for Nursery Stock", ANSI Z60.1, as published and approved by the American Association of Nurserymen, and Section 808 of the latest version of PennDOT Form 408 specs.

2. Balled and burlapped plans shall be dug with firm, natural balls of which they are grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of tree or shrub required; wrapped, tied, rigidly supported, and drum-laced as recommended by ANSI Z60.1.

3. Container-grown plants shall be healthy, vigorous, well-rooted, and established in the container in which they are grown. A container-grown plant shall have a well-established root system reaching the sides of the container to maintain a firm root ball. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for kind, type, and size of plant required.

4. All plants to be staked in the field by Contractor for approval of Landscape Architect prior to planting installation.

5. Contractor shall install all plant materials in locations and to depths as shown on plan or on details. See specifications for planting mix.

6. Topsoil shall be supplied by the Contractor. Topsoil must be tested according to specifications prior to its use. Topsoil test results and amendment recommendations shall be provided by the Contractor to the Landscape Architect prior to installation. See plans, details, and specifications for topsoil depths.

7. All shrub beds shall be mulched with three 3" inches of double-shredded processed hardwood bark; all ground cover and perennial beds shall be mulched with 1-1/2" mushroom manure, as per Section 805 of the latest version of PennDOT Form 408 specifications.

8. All plant material shall be guaranteed by Contractor for a period of one calendar year after written notice of acceptance of all planting work.

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LBA Landscape Architecture

QUAKER VALLEY SCHOOL DISTRICT
NEW QUAKER VALLEY HIGH SCHOOL
LEETSDALE, PA 15056

Commission: 21017
Drawn: ML
Checked: JH
Sheet Title: Plant Schedule

Revisions:
| Description | Revision Date

Cad Number:

Date: February 23, 2024

L405