



Eberly Hill Mixed Use – 01/23/2017 – Summary Data – Dublin, OH#

Pre-Post – TR-55 and WQv:

Pre:

0.38 Acres
Pre: Drainage Area 0.38 Ac.
CN Composite: 86.5
Percent Impervious: %23.2.0

Post:

0.38 Acres
Post: Drainage Area 0.38 Acres
CN Composite: 95.2
Percent Impervious: %84.3

Q 10 Critical Storm – 3.74 CFS

Please call me at (614) 620-0331 if you have any questions concerning this fee proposal.

Additional services will be invoiced at the rates listed above.

Sincerely,

Steven L. Lamphear, PE, PS
Diamond V, LLC



Sanitary Manholes City of Dublin Other Ownership Proposed Abandoned	Sanitary Nodes City of Dublin, Blind Connection City of Dublin, Bulk Head City of Dublin, Cleanout City of Dublin, Fitting	City of Dublin, Unknown Private, Fitting Private, Lift Station Private, Bulk Head Private, Cleanout Sanitary Flow Meters	Sanitary Lift Stations <all other values> City of Dublin Private	Sanitary Mains Other Ownership City of Dublin Private Proposed	Abandoned Stream Outfalls Storm Lift Stations	0 20 40 Feet
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PRE - Development Composite CN

AREA = **0.380** Acres

Hydrologic Soil Type	% Area	% Impervious
A	0%	0%
B	0%	0%
C	100%	23%
D	0%	0%

PERVIOUS

IMPERVIOUS

	PERVIOUS			IMPERVIOUS		
	Area Pervious	CNp	Product	Area Impervious	CNi	Product
A soils	0.00	0	0	0.00	98	0
B soils	0.00	0	0	0.00	98	0
C soils	0.29	83	24	0.09	98	9
D soils	0.00	0	0	0.00	98	0
TOTALS =	0.29		24	0.09		9

Sum of Areas = 0.38 Acres

% Pervious = 76.8 %

% Impervious = 23.2 %

Composite CN = 86.47 PRE - Development

POST - Development Composite CN

Hydrologic Soil Type	% Area	% Impervious
A	0%	0%
B	0%	0%
C	100%	85%
D	0%	0%

PERVIOUS

IMPERVIOUS

	PERVIOUS			IMPERVIOUS		
	Area Pervious	CNp	Product	Area Impervious	CNi	Product
A soils	0.00	0	0	0.00	98	0
B soils	0.00	0	0	0.00	98	0
C soils	0.06	80	5	0.32	98	32
D soils	0.00	0	0	0.00	98	0
TOTALS =	0.06		5	0.32		32

Sum of Areas = 0.38 Acres

% Pervious = 15.7 %

% Impervious = 84.3 %

Composite CN = 95.18 POST - Development

County: **Franklin County**

Rainfall Frequency (Year)	24-Hour Rainfall (Inches)
1	2.20
2	2.63
5	3.24
10	3.74
25	4.44
50	5.02
100	5.63

PRE - Development Runoff		POST - Development Runoff	
CN =	86	CN =	96
S =	1.63 inches	S =	0.42 inches Equation 2-4
la =	0.326 inches	la =	0.083 inches Equation 2-2
Q1 =	1.00 inches	Q1 =	1.77 inches Equation 2-3
Q2 =	1.35 inches	Q2 =	2.19 inches
Q5 =	1.87 inches	Q5 =	2.79 inches
Q10 =	2.31 inches	Q10 =	3.28 inches
Q25 =	2.95 inches	Q25 =	3.98 inches
Q50 =	3.49 inches	Q50 =	4.55 inches
Q100 =	4.06 inches	Q100 =	5.16 inches

% Increase of Runoff Volume = 76.29% (1 Yr Frequency)
Critical Storm Frequency = 10 Year

Time of Concentration			
PRE - Development		POST- Development	
Total PRE	0.17 Hours	Total POST	0.17 Hours
Development Tc =	10.0 Minutes	Development Tc =	10.0 Minutes

PRE-Development Graphical Peak Discharge								
Freq =	1 Year	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	
P =	2.20	2.63	3.24	3.74	4.44	5.02	5.63	inches
Ia =	0.33	0.33	0.33	0.33	0.33	0.33	0.33	Intital Abstraction
Ia/P =	0.15	0.12	0.10	0.10	0.10	0.10	0.10	Figure 4-1
C0 =	2.54	2.54	2.55	2.55	2.55	2.55	2.55	Table F-1
C1 =	-0.62	-0.62	-0.62	-0.62	-0.62	-0.62	-0.62	Table F-1
C2 =	-0.15	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	Table F-1
log(qu)=	2.92	2.93	2.93	2.93	2.93	2.93	2.93	Exhibit 4-II
qu =	835	846	856	856	856	856	856	csm
Q =	1.00	1.35	1.87	2.31	2.95	3.49	4.06	inches
Am =	0.001	0.001	0.001	0.001	0.001	0.001	0.001	sq miles
Fp =	1.0	1.0	1.0	1.0	1.0	1.0	1.0	Table 4-2
qp =	0.50	0.68	0.95	1.18	1.50	1.77	2.06	Equation 4-1

POST-Development Graphical Peak Discharge								
Freq =	1 Year	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	
P =	2.20	2.63	3.24	3.74	4.44	5.02	5.63	inches
Ia =	0.08	0.08	0.08	0.08	0.08	0.08	0.08	Intital Abstraction
Ia/P =	0.10	0.10	0.10	0.10	0.10	0.10	0.10	Figure 4-1
C0 =	2.55	2.55	2.55	2.55	2.55	2.55	2.55	Table F-1
C1 =	-0.62	-0.62	-0.62	-0.62	-0.62	-0.62	-0.62	Table F-1
C2 =	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	Table F-1
log(qu)=	2.93	2.93	2.93	2.93	2.93	2.93	2.93	Exhibit 4-II
qu =	856	856	856	856	856	856	856	csm
Q =	1.77	2.19	2.79	3.28	3.98	4.55	5.16	inches
Am =	0.001	0.001	0.001	0.001	0.001	0.001	0.001	sq miles
Fp =	1.0	1.0	1.0	1.0	1.0	1.0	1.0	Table 4-2
qp =	0.90	1.11	1.42	1.67	2.02	2.31	2.62	Equation 4-1

Estimate Required Detention Volume

Critical Storm Frequency = 10 Year

Freq =	1	2	5	10	25	50	100	year
qo =	0.50	0.50	0.50	0.50	1.18	1.18	1.18	cfs
qi =	0.90	1.11	1.42	1.67	2.02	2.31	2.62	cfs
qo/qi =	0.55	0.45	0.35	0.30	0.58	0.51	0.45	
Vs/Vr =	0.26	0.30	0.35	0.38	0.25	0.27	0.30	Figure 6-1
Vr =	0.06	0.07	0.09	0.10	0.13	0.14	0.16	Equation 6-1
Vs =	0.01	0.02	0.03	0.04	0.03	0.04	0.05	Equation 6-2
Vs-25%	0.01	0.02	0.02	0.03	0.02	0.03	0.04	Ac-ft
Vs+25%	0.02	0.03	0.04	0.05	0.04	0.05	0.06	Ac-ft

Maximum Estimated Storage = **0.05** Ac-ft 2334 Cu. Ft.

TABLE F-1 TYPE II STORM

la/P	C0	C1	C2
0.10	2.5532	-0.6151	-0.1640
0.11	2.5488	-0.6155	-0.1617
0.12	2.5444	-0.6159	-0.1593
0.13	2.5400	-0.6162	-0.1569
0.14	2.5356	-0.6166	-0.1545
0.15	2.5313	-0.6170	-0.1522
0.16	2.5269	-0.6174	-0.1498
0.17	2.5225	-0.6177	-0.1474
0.18	2.5181	-0.6181	-0.1450
0.19	2.5137	-0.6185	-0.1427
0.20	2.5093	-0.6188	-0.1403
0.21	2.5049	-0.6192	-0.1379
0.22	2.5005	-0.6196	-0.1356
0.23	2.4961	-0.6200	-0.1332
0.24	2.4917	-0.6203	-0.1308
0.25	2.4873	-0.6207	-0.1284
0.26	2.4829	-0.6211	-0.1261
0.27	2.4785	-0.6215	-0.1237
0.28	2.4741	-0.6218	-0.1213
0.29	2.4697	-0.6222	-0.1189
0.30	2.4653	-0.6226	-0.1166
0.31	2.4560	-0.6212	-0.1109
0.32	2.4468	-0.6199	-0.1052
0.33	2.4375	-0.6186	-0.0995
0.34	2.4282	-0.6173	-0.0939
0.35	2.4190	-0.6159	-0.0882
0.36	2.4080	-0.6125	-0.0818
0.37	2.3970	-0.6090	-0.0754
0.38	2.3860	-0.6055	-0.0690
0.39	2.3751	-0.6020	-0.0626
0.40	2.3641	-0.5986	-0.0562
0.41	2.3497	-0.5929	-0.0495
0.42	2.3354	-0.5872	-0.0429
0.43	2.3211	-0.5815	-0.0362
0.44	2.3067	-0.5758	-0.0295
0.45	2.2924	-0.5701	-0.0228
0.46	2.2745	-0.5592	-0.0208
0.47	2.2566	-0.5484	-0.0187
0.48	2.2386	-0.5376	-0.0167
0.49	2.2207	-0.5268	-0.0146
0.50	2.2028	-0.5160	-0.0126

Pipe Capacity (12 in RCP)

Eberly Hill Mixed Us

Upstream	804.30
Downstream	803.57
Delta	0.73
L	86
s	0.0085 ft/ft

Manning's Eq. - Round Pipe

$$Q = (1.486/n) * (A * R^{2/3}) * s^{1/2}$$

$$V = Q/A$$

$$\pi = 3.1416$$

n	friction	0.013
R	Hydraulic Radius	0.25
s	ft/ft	0.0085

r = radius (feet) 0.500 12 inch dia.

A (area) $\pi * r^2$ 0.79

R (pipe) $\pi * r^2 / (2\pi * r)$ 0.250

Q = 3.28 ft³/sec

V = 4.18 ft/sec

Eberly Hill Mixed Use 1/23/2017						
Lot Drainage Area WQv						
WQv	$P \cdot C \cdot A / 12$	P	0.75	in.		
		C	0.66		14055	Bldg./ Pvmt.
		A	0.38	Ac.	16535	Area
$C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$						
	i	85%	impervious			
	C =	0.66				
WQv	0.0157	Ac-Ft	683.4 WQv			