

STORMWATER DRAINAGE REPORT

FOR

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CHESTER COUNTY, PENNSYLVANIA

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Project Narrative

This project consists of a proposed residential multi-family dwelling (6 apartments) on an existing developed lot containing 1.371 acres. This site is located at 556 Creek Road in Kennett Township, Chester County, Pennsylvania.

Stormwater drainage calculations have been provided for the proposed storm sewer pipe network draining the proposed parking area to the existing inlet in Creek Road.

Silt fence is proposed for erosion and sediment control for the site. All disturbed areas will be stabilized by seeding per the specifications referenced on the plans.

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Proposed Drainage Area To Inlet #1:

Total Area = 917 sq.ft = 0.02 acres

Pervious = 917 sq.ft

C Values:

Pervious C = 0.25

Composite C = 0.25

Time of Concentration:

Use 5 minute time of concentration.

$$Q-100 = CIA = (0.25)(8.52)(0.02) = 0.04 \text{ cfs}$$

Proposed Drainage Area To Inlet #2:

Total Area = 10,165 sq.ft = 0.23 acres

Impervious = 9,978 sq.ft

Pervious = 187 sq.ft

C Values:

Impervious C = 0.99

Pervious C = 0.25

Composite C = 0.98

Time of Concentration:

Use 5 minute time of concentration.

$$Q-100 = CIA = (0.98)(8.52)(0.23) = 1.92 \text{ cfs}$$

Proposed Drainage Area To Inlet #3:

Total Area = 19,009 sq.ft = 0.44 acres

Impervious = 10,862 sq.ft

Pervious = 8,147 sq.ft

C Values:

Impervious C = 0.99

Pervious C = 0.25

Composite C = 0.67

Time of Concentration:

Use 5 minute time of concentration.

$$Q-100 = CIA = (0.67)(8.52)(0.44) = 2.51 \text{ cfs}$$

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Inlet #1 to Existing Inlet:

Q-100 = 4.47 cfs

Tailwater Elevation = 282.25

Inlet Control - W.S. Elev. = $283.30 + 1.03 = 284.33$

Outlet Control - W.S. Elev. = 282.53

Inlet #2 to Inlet #1:

Q-100 = 4.43 cfs

Tailwater Elevation = 284.33

Inlet Control - W.S. Elev. = $286.80 + 1.19 = 287.99$

Outlet Control - W.S. Elev. = 284.87

Inlet #3 to Inlet #2:

Q-100 = 2.51 cfs

Tailwater Elevation = 287.99

Inlet Control - W.S. Elev. = $289.25 + 0.81 = 290.06$

Outlet Control - W.S. Elev. = 288.23

Inlet Control - Inlet #1 to Existing Inlet

CIRCULAR ORIFICES

HEAD					OPENING				
FT					INCHES				
0	1	2	3	4	5	6	12	15	18
1	0.0257	0.101	0.22	0.38	0.58	0.82	2.67	3.62	4.25
1.02	0.03	0.102	0.22	0.39	0.59	0.83	2.73	3.71	4.42
1.03	0.03	0.102	0.22	0.39	0.60	0.83	2.75	3.76	4.50

OUTLET CONTROL - Inlet #1 to Existing Inlet

DIAMETER (inches)	SLOPE	n	CAPACITY (mannings cfs)	INVERT IN (elevation)	C.L.OUTLET (elevation)	LENGTH (ft)	PIPE Q (cfs)
18	0.0208	0.012	16.4	282.50	282.25	48	4.28
18	0.021	0.012	16.6	282.52	282.25	48	4.45
18	0.021	0.012	16.7	282.53	282.25	48	4.53

Inlet Control - Inlet #2 to Inlet #1

CIRCULAR ORIFICES

HEAD					OPENING				
FT					INCHES				
0	1	2	3	4	5	6	12	15	
1	0.0257	0.101	0.22	0.38	0.58	0.82	2.67	3.62	
1.18	0.03	0.110	0.24	0.42	0.65	0.91	3.12	4.40	
1.19	0.03	0.111	0.24	0.43	0.65	0.92	3.14	4.44	

OUTLET CONTROL - Inlet #2 to Inlet #1

DIAMETER (inches)	SLOPE	n	CAPACITY (mannings cfs)	INVERT IN (elevation)	C.L.OUTLET (elevation)	LENGTH (ft)	PIPE Q (cfs)
15	0.0342	0.012	12.9	284.80	284.33	32	4.16
15	0.036	0.012	13.3	284.86	284.33	32	4.42
15	0.036	0.012	13.4	284.87	284.33	32	4.46

Inlet Control - Inlet #3 to Inlet #2

CIRCULAR ORIFICES

HEAD					OPENING				
FT					INCHES				
0	1	2	3	4	5	6	12	15	
0.8	0.0229	0.089	0.19	0.33	0.51	0.70	2.07	2.47	
0.81	0.02	0.090	0.20	0.34	0.51	0.71	2.11	2.54	

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OUTLET CONTROL - Inlet #3 to Inlet #2

DIAMETER (inches)	SLOPE	n	CAPACITY (mannings cfs)	INVERT IN (elevation)	C.L.OUTLET (elevation)	LENGTH (ft)	PIPE Q (cfs)
15	0.0079	0.012	6.2	288.00	287.99	80	0.52
15	0.011	0.012	7.2	288.22	287.99	80	2.49
15	0.011	0.012	7.3	288.23	287.99	80	2.55