

STORMWATER MANAGEMENT CALCULATIONS

Based on EPA 95th Percentile Storm Event Method

Prepared by KCI Technologies, Inc.

Proposed Limit of Disturbance (LOD): **34,795 sf**

Hydrologic Soil Group (HSG): B

Proposed Site Impervious Cover (I):

Existing Asphalt Road	6,540	sf
Columbarium Walls	899	sf
Concrete Walk Paving	6,765	sf
Asphalt Parking Pull-Off	1,614	sf
Total	15,818	sf

Proposed Site Pervious Cover (P):

Gravel Strips	599	sf
Planting Beds	1,319	sf
Lawn (after clearing)	17,059	sf
Total	18,977	sf

Proposed Impervious Area to Treat: **9,278 sf**

Effective Site Area (A):

LOD – Existing Impervious
34,795 sf – 6,540 sf = **28,255 sf**

Approximate 95th Percentile Storm Event for Michigan:

(Adapted from Hirschman, David and John Kosco, 2008)

Buffalo, NY	1.1"
Columbus, OH	1.3"
Cincinnati, OH	1.5"
Minneapolis, MN	1.4"
Average for MI	1.3"

Direct Determination of Runoff Volume (R):

Runoff = Rainfall – Depression Storage – Infiltration Loss

Rainfall = 95th Percentile Storm Event (inches)

Depression Storage = 0.1" for Impervious, 0.2" for Pervious

Infiltration Loss = 9.7" for HSG B, 4.4" for HSG C, 0.8" for HSG D

$$R_{\text{SITE}} = (R_i * A_i) + (R_p * A_p) / A$$

R_{SITE} = Site Runoff

$$R_i = \text{Impervious Runoff} = 1.3" - 0.1" - 0" = 1.2"$$

$$A_i = \text{Impervious Area} = 9,278 \text{ sf}$$

$$R_p = \text{Pervious Runoff} = 1.3" - 0.2" - 9.7" = 0"$$

$$A_p = \text{Pervious Area} = 18,977 \text{ sf}$$

$$R_{\text{SITE}} = [(1.2")(9,278 \text{ sf}) + (0")(18,977 \text{ sf})] / 28,255 \text{ sf} = 0.39"$$

$$\text{Volume Requiring Treatment} = (0.39" / 12") (28,255 \text{ sf}) = 918 \text{ cf}$$

Best Management Practices Employed to Manage Volume:

Dry Well:

Drainage Area: 4,745 sf

Impervious within drainage area: 3,790 sf

Volume generated by impervious: $(1.3''/12'')(3,790 \text{ sf}) = 411 \text{ cf}$

Infiltration Sump:

Drainage Area: 1,643 sf

Impervious within drainage area: 1,464 sf

Volume generated by impervious: $(1.3''/12'')(1,464 \text{ sf}) = 159 \text{ cf}$

Vegetated Swale:

Site impervious within drainage area: 4,024 sf

Volume generated by impervious: $(1.3''/12'')(4,024 \text{ sf}) = 436 \text{ cf}$

*Vegetated Swale is not a designed BMP, but captures use of an existing grass channel; runoff from the existing roadway, parking pull-off, and a portion of the concrete walk, drain offsite to the southwest via the swale, eventually emptying into Eagle Lake.

Total volume from impervious receiving treatment = **1006 cf**

1006 cf receiving treatment > 918 cf required treatment.