

# Storm Runoff Calculations

## Nordic Valley Condo/Parking - EDEN UT

10/22/2014 SKT

The following runoff calculations are based on the Rainfall - Intensity - Duration Frequency Curve for the Ogden UT area taken from data compiled by the NOAA Atlas 14, using a 100-year storm.

Runoff storm water has been calculated for two different sets of conditions, one being the existing undeveloped land and the other with land fully improved. The difference between the two quantities will be detained in a holding pond. All water that runs off and over the property at present will be diverted into the holding pond and released at a reduced rate into the existing drainage system.

The calculations are as follows:

- Runoff from the undeveloped existing land.

Runoff Quantity	Q =	0.2 cfs/acre
Acreage	A =	6.65 ACRES

$$Q(\text{out}) = 1.33 \text{ CFS}$$

- Runoff from developed land

Runoff Coefficients		
Paved Area	166937	C = 0.9
Landscaped Area	82517	C = 0.2
Roof	40164	C = 0.8

Weighted Runoff Coefficient	C = 0.69
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Rainfall Intensity	i = varies with time
Runoff Quantity	Q = CiA

- Detention Basin

Volume in	Q * t
Volume out	1.33 * t

The capacity of the detention basin is calculated as the maximum difference between the volume flowing in and the volume flowing out.

The outflow from the detention basin is limited to outflow if undeveloped.

Use 1.33 cfs for Q outflow

**The required volume of the detention is 31,188 cubic feet**

**USE A 5.3 INCH DIAMETER ORIFICE AT OUTLET**

directions

Total Square Feet	change
289618	
	change
	change
	change
total	check
289618	

Orifice Sizing [input Q and Head]

Q= 1.33  
Head = 3  
R =  $\text{SQRT}(Q/(1.948*(64.4*H)^{0.5}))$

R = 0.221609 feet  
2.659309 inches  
D = 5.318618 inches  
0.443218 feet