Kent Subdivison No. 2

Weber City, Utah

Storm Drainage Analysis - 100 Year Event

NOAA Atlas 14 Volume 1 Version 5. Station ID 42-6414. Sugar Factory, West Haven, Utah

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1. Drainage Area

Drain Area #1 -	26,528	sq ft	0.6090 acres	Asphalt and Concrete Surface
Drain Area #2 -	0	sq ft	0.0000 acres	Roof Area
Drain Area #3 -	259,617	sq ft	5.9600 acres	Landscape Area
Drain Area #4 -	0	sq ft	0.0000 acres	Gravel Surface
Drain Area #5 -	0	sq ft	0.0000 acres	Unimproved Surface
Drain Area #6 -	0	sq ft	0.0000 acres	Pond
		Total Area =	**6.5690 acres**	

2. Coefficient of Runoff:

Drain Area #1 -	Asphalt and Concrete Surface	**C = 0.85**
Drain Area #2 -	Roof Area	**C = 0.85**
Drain Area #3 -	Landscape Area	**C = 0.15**
Drain Area #4 -	Gravel Surface	**C = 0.90**
Drain Area #5 -	Unimproved Surface	**C = 0.15**
Drain Area #6 -	Pond	**C = 1.00**

Composite C = 0.21

3. Peak Run-off:

Using the "Rational Formula" to calculate the peak run-off Q:

Q = CIA

Q = Quantity of run-off (cfs)	= To be calculated
C = Coefficient of run-off based on surface type	= 0.21
I = Intensity of storm (in/hr)	= Shown in table
A = Area of drainage basin (acres)	= 6.569

4. Allowable Discharge:

Allowable discharge = 0.2 cfs/acre

= 0.2 cfs/acre x 6.5690 acres = 1.31 cfs

This flow rate is to be used as the allowable discharge from the detention basin.

5. 80th Percentile Storm:

Detention Required for 80th Percentile Storm. Use Table A-1, LID Manual, West Haven City.

80th Percentile Storm Per LID A-1 0.49 inch =	0.0408	ft
Total Area =	286,145	sf
Total Detention Volume First Half Inch	11,684	cf
Detention Volume for 80th Percentile Storm	**87,398**	**gallons**

6. Volume of Runoff - 100 year storm period:

Time	**Rainfall** NOAA Atlas 14 Vol 1 Ver 5	**Intensity**	**Allowable Discharge**	**Volume Generated**	**Detention Volume Required**
tc	South Weber	I	Not Detained	Inflow	Detention
(minutes)	(inches)	(in/hr)	(cu ft)	(cu ft)	(cu ft)
5	0.549	6.588	394	2,789.98	2,396
10	0.834	5.004	788	4,238.33	3,450
15	1.03	4.120	1,182	5,234.39	4,052
30	1.39	2.780	2,365	7,063.88	4,699
60	1.72	1.720	4,730	8,740.92	4,011
120	1.89	0.945	9,459	9,604.85	146
180	1.93	0.643	14,189	9,808.12	-4,381
360	2.15	0.358	28,378	10,926.15	-17,452

Total Detention Required: **4,699 Cubic Feet**

0.11 Acre Feet

35,149 Gallons

7. Orifice Sizing - 100 year storm period:

Given:

Q = 1.31 cfs

g= 32.2 ft/sec^2

H= 2 feet in basin from overflow to flowline of outlet pipe (estimated).

Cd= 0.62 for square edge openings

Ao = Area of orifice opening to be calculated.

Do = Diameter of orifice opening to be calculated

$Q = (Cd)\ (Ao)\ (2gH)^{1/2}$

Solving for Ao

$Ao = Q / [\ (CD)\ (2gH)^{1/2})\ ]$

Ao= 0.19 sq ft

Ao= 26.89 sq in

Do= 5.85 Inches

Use 2.93 inch radius orifice,