Garvey & Strathmore Apartments
Drainage Study
7849 Garvey Avenue
Rosemead, CA 91770

Date Prepared:
August 11, 2022

Prepared for:
Green Park Property, LLC
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Prepared By:

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Declaration of Responsible Charge:
I hereby declare that I am the engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in section 6703 of the business and professions code, and that the design is consistent with current standards. I understand that the check of the project drawings and specifications by the City of Rosemead is confined to a review only and does not relieve me, as an engineer of work, of my responsibilities for project design.

Patric T. de Boer RCE 83583
Registration Expires 3-31-2023

Table of Contents

Appendices

Site & Project Description

This drainage study has been prepared for the proposed project located at 7849 Garvey Avenue in the City of Rosemead. The project site is located 0.65 south of Interstate 10 at the northwest corner of the intersection of Garvey Avenue and Strathmore Avenue. See figure No.1 for a Vicinity Map.

The site is currently occupied by a paved parking lot and three commercial buildings. No existing storm drains or inlets are known to exist on the project site.

The proposed project involves the demolition and removal of all existing improvements and structures. A seven story apartment with an integrated parking garage will be constructed. The single building will cover the majority of the site.

Methodology

This drainage report has been prepared in accordance with current County of Los Angeles regulations and procedures.

The analyses of the existing and proposed conditions were performed using HydroCalc (Version 1.02) to calculate runoff flowrates and volumes. Given the area, length of flow path, average slope, design storm depth, imperviousness, and soil type, HydroCalc generates a hydrograph for the existing and proposed conditions. Soil and rainfall inputs were determined using the GIS data provided by maps the Los Angeles Flood Control District.

This report analyzes the flow generated by the 25, 50 and 100-year storm events for storm drain sizing and flood control purposes.

The following references were used in this report

(1) Handbook of Hydraulics, E.F. Brater & H.W. King, 6th Ed., 1976.
(2) Los Angeles County Department of Public Works Hydrology Manual, 2006

Existing Conditions

The existing 1.21 acre site is 100% impervious and underlain by soil type # 7. The site accepts offsite runoff from the alley and the properties west of the site. The offsite areas surface flow to the site and confluence with the on-site flow before draining to Strathmore Avenue. The entire site and the offsite areas drain east via surface flow to the gutter on Strathmore Ave., thence south to the existing curb inlet, and ultimately to the existing 24" pipe on the public storm drain system. This point is referred to as Discharge Point # 1 in this report.

Proposed Conditions

The proposed improvements consist of a seven-story apartment building, hardscape and on-site storm drain system. The proposed development will grade the entire site but will keep the same discharge point as the existing conditions. The proposed site will be 100% impervious. The majority of the site will be covered by the building.

Catch basins will be installed along the west end of the building and the westerly alley to accept the offsite runoff generated from the westerly properties and bypass via pipe flow to a connection point to the 24" storm drain in Strathmore Avenue. The roof drains of the building will drain directly to storm drain pipes in the ground level parking lot that will be connected to a proposed 8'x16' Modular Wetland System vault for treatment. Following treatment, the stormwater will drain out via pipe flow to a proposed storm drain pipe that will connect to the existing 24" RCP pipe on Strathmore. This point is referred to as Discharge Point # 1 in this report.

Existing HydroCalc Analysis

The existing condition was modeled as a single on-site basin and three off-site basins, referred to as E-1, O-1, O-2 and O-3 in this report. Below is a summary of the HydroCalc calculations for the existing conditions.

Basin #	Area (ac)	Soil Type	Imperv. (%)	I_{25} (in/hr)	I_{50} (in/hr)	I_{100} (in/hr)	Q_{25} (cfs)	Q_{50} (cfs)	Q_{100} (cfs)
E-1	1.21	7	100	3.25	3.70	4.15	3.54	4.03	4.52
O-1	0.36	7	100	3.25	3.70	4.15	1.05	1.20	1.35
O-2	0.17	7	100	3.25	3.70	4.15	0.50	0.57	0.64
O-3	0.29	7	45	3.25	3.70	4.15	0.85	0.97	1.08
				Total Combined Flow			5.93	6.76	7.58

The output data sheets from HydroCalc can be found at the end of this report.

Proposed HydroCalc Analysis

The proposed site was modeled as a single on-site basin and three offsite basins, referred to as P-1, O-1, O-2 and O-3 in this report.

Below is a summary of the HydroCalc calculations for the proposed conditions.

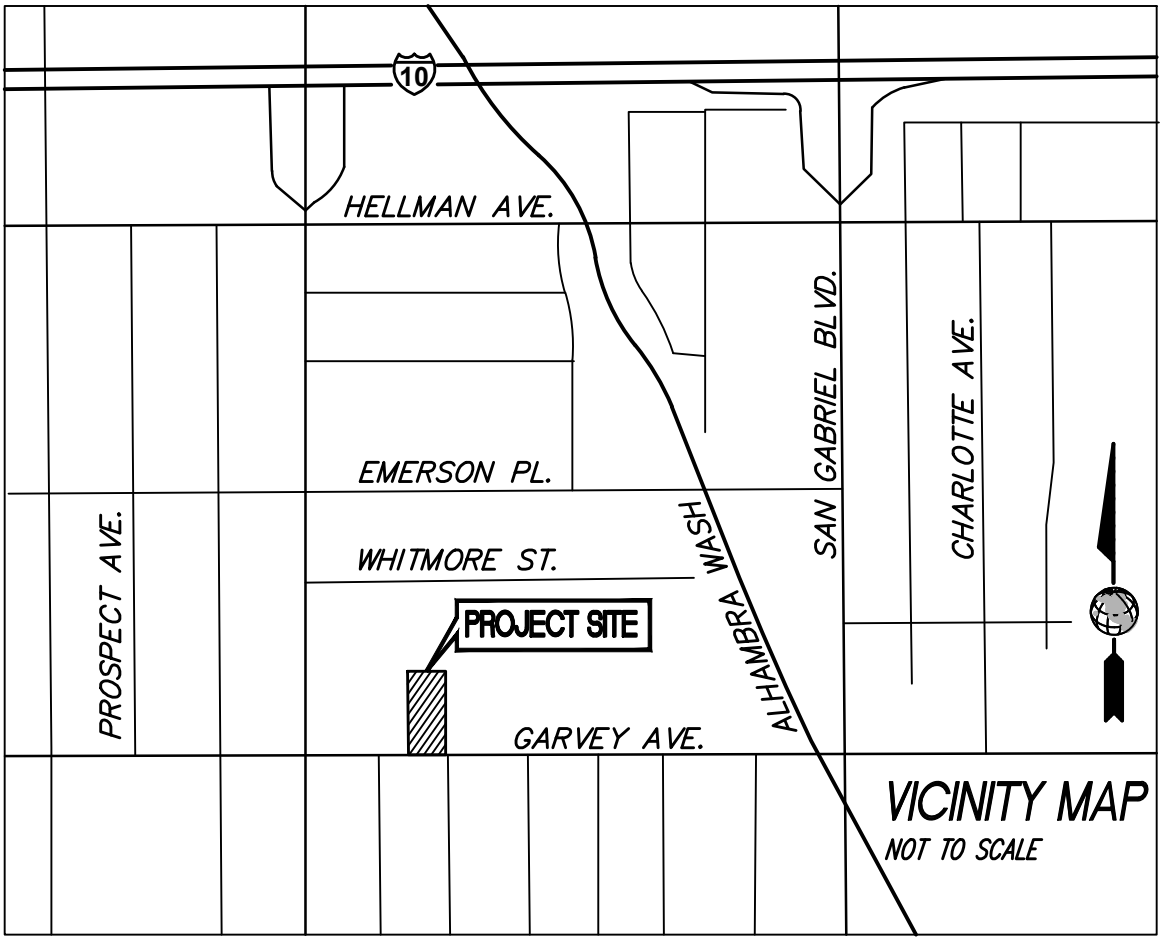
Basin #	Area (ac)	Soil Type	Imperv. (%)	I_{25} (in/hr)	I_{50} (in/hr)	I_{100} (in/hr)	Q_{25} (cfs)	Q_{50} (cfs)	Q_{100} (cfs)
P-1	1.21	7	100	3.25	3.70	4.15	3.54	4.03	4.52
O-1	0.36	7	100	3.25	3.70	4.15	1.05	1.20	1.35
O-2	0.17	7	100	3.25	3.70	4.15	0.50	0.57	0.64
O-3	0.29	7	45	3.25	3.70	4.15	0.85	0.97	1.08
				Total Combined Flow			5.93	6.76	7.58

The output data sheets from HydroCalc can be found at the end of this report.

Results and Conclusions

The proposed improvements result in no change to the peak runoff flowrate for the 25, 50 and 100-year storm events. This is because the site is 100 % impervious for both the existing and proposed conditions. The onsite flowpath was modified, but the time of concentration in both the existing and proposed conditions is below the 5.0 minute minimum allowed by the Rational Method. The offsite flowpath is modified in that runoff from the site will discharge directly to a new connection to the 24" storm drain in Strathmore Ave, rather than flowing to the existing curb inlet first.

It is the opinion of Omega Engineering Consultants that the project will not cause adverse effects to the downstream drainage facilities or receiving waters. A separate LID Plan has been prepared to discuss the water quality impacts of the proposed development.


10
HELLMAN AVE.
EMERSON PL.
WHITMORE ST.
PROJECT SITE
GARVEY AVE.
PROSPECT AVE.
ALHAMBRA WASH
SAN GABRIEL BLVD.
CHARLOTTE AVE.
VICINITY MAP
NOT TO SCALE

DRAINAGE BASIN DATA

BASIN #	AREA (AC)	SOIL TYPE	IMPERV. (%)	I_{25} (IN/HR)	I_{50} (IN/HR)	I_{100} (IN/HR)	Q_{25} (CFS)	Q_{50} (CFS)	Q_{100} (CFS)
E-1.1	1.21	7	100	3.25	3.70	4.15	3.54	4.03	4.52
O-1	0.36	7	100	3.25	3.70	4.15	1.05	1.20	1.35
O-2	0.17	7	100	3.25	3.70	4.15	0.50	0.57	0.64
O-3	0.29	7	45	3.25	3.70	4.15	0.85	0.97	1.08

LEGEND

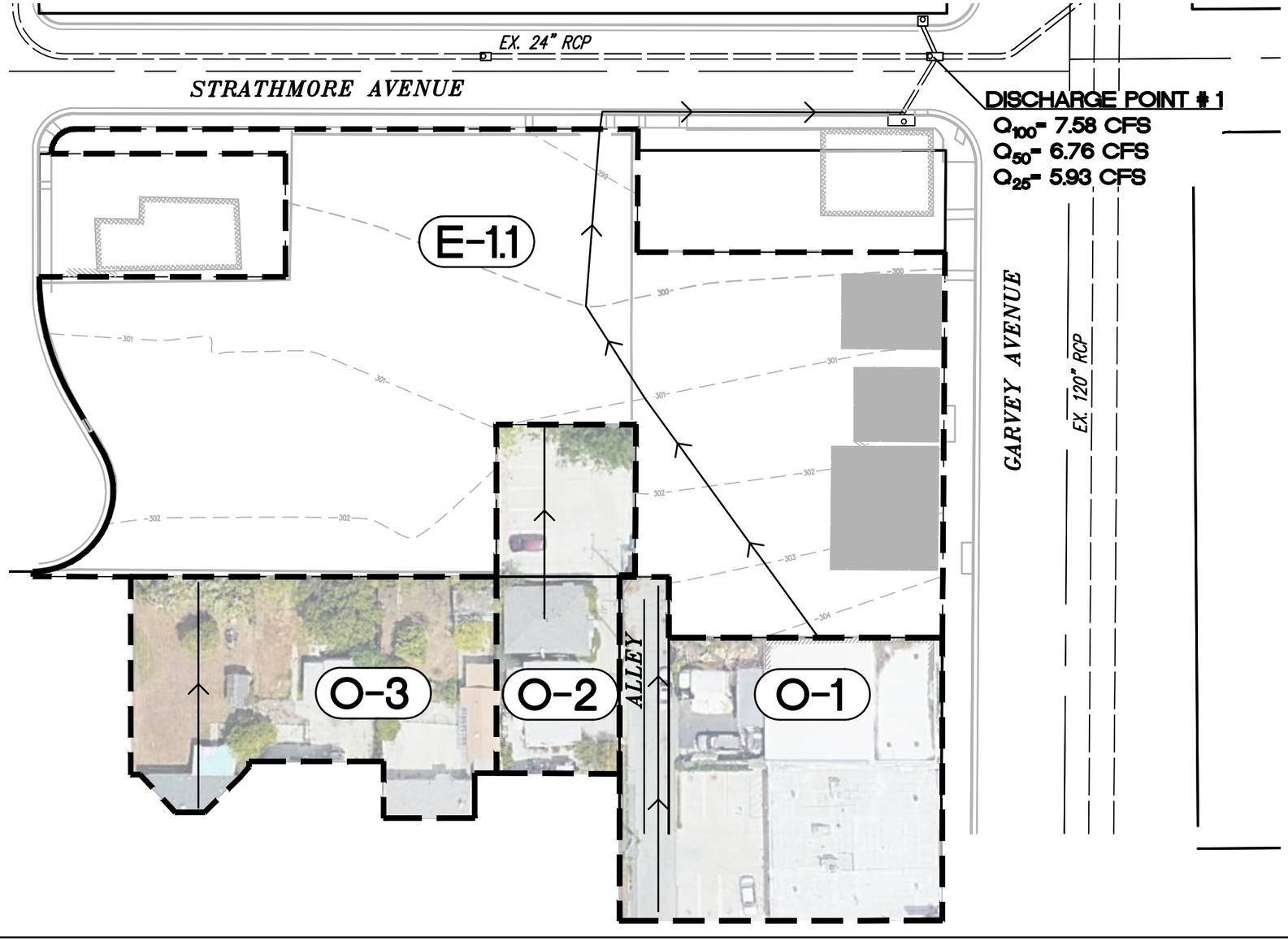
BASIN NUMBER ..... E-#

AREA LIMITS .....

DRAINAGE FLOW PATH .....

BUILDING AREA .....

PAVEMENT AREA .....



GRAPHICAL SCALE: 1" = 50'

0 25 50 100

STRATHMORE EXISTING HYDROLOGY EXHIBIT

OMEGA

EX. HYDROLOGY EXHIBIT

DRAINAGE BASIN DATA

BASIN #	AREA (AC)	SOIL TYPE	IMPERV. (%)	I_{25} (IN/HR)	I_{50} (IN/HR)	I_{100} (IN/HR)	Q_{25} (CFS)	Q_{50} (CFS)	Q_{100} (CFS)
P-1.1	1.21	7	100	3.25	3.70	4.15	3.54	4.03	4.52
O-1	0.36	7	100	3.25	3.70	4.15	1.05	1.20	1.35
O-2	0.17	7	100	3.25	3.70	4.15	0.50	0.57	0.64
O-3	0.29	7	45	3.25	3.70	4.15	0.85	0.97	1.08

LEGEND

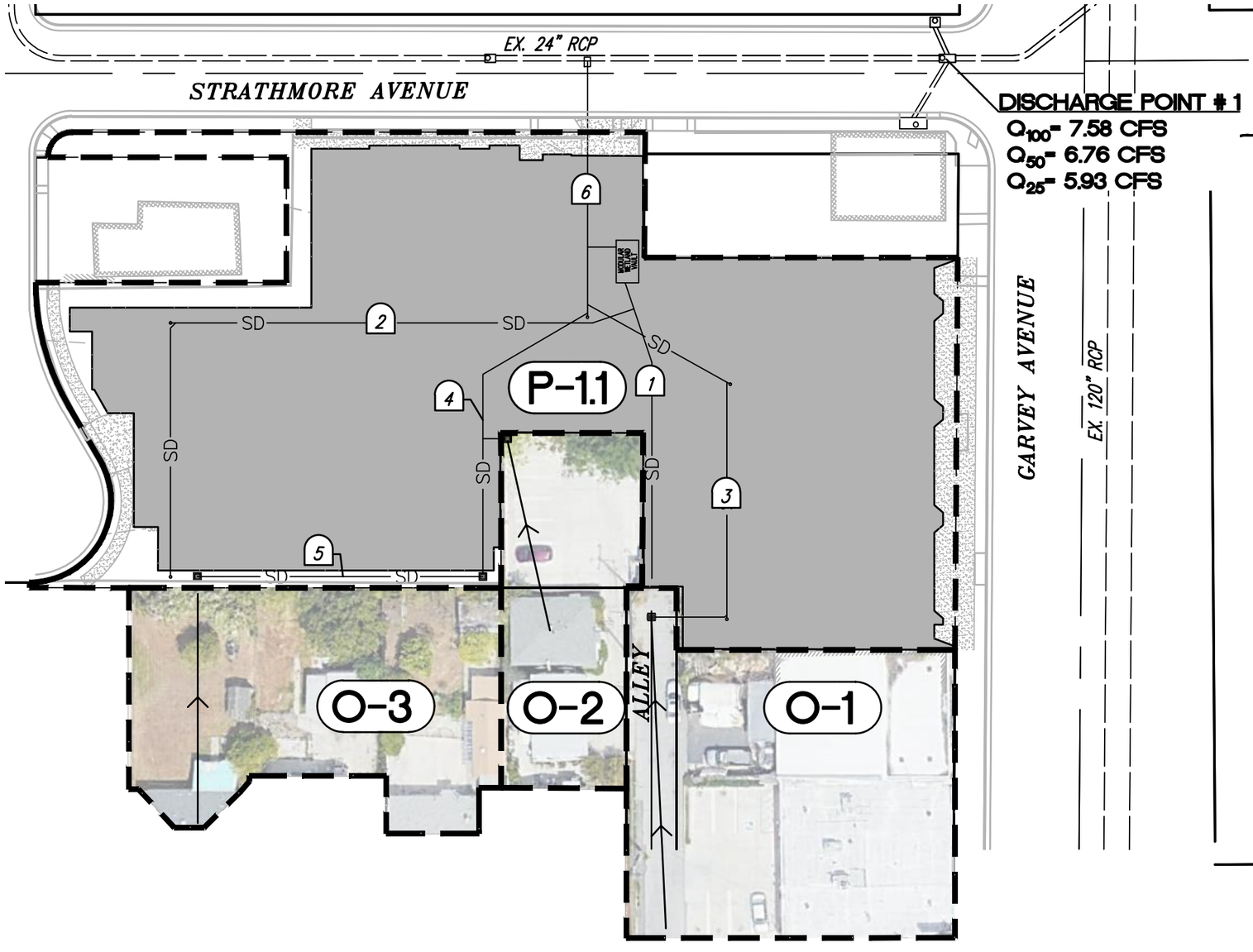
BASIN NUMBER ..... P-#

AREA LIMITS .....

DRAINAGE FLOW PATH .....

BUILDING AREA .....

PAVEMENT AREA .....



(X) PIPE DATA

PIPE #	DIAMETER (INCHES)	SLOPE (%)	DEPTH /DIA	V_{100} (FPS)	Q_{100} (CFS)
1	12	0.5	0.73	3.68	2.26
2	12	0.5	0.73	3.68	2.26
3	12	0.5	0.52	3.27	1.35
4	12	0.5	0.34	2.72	0.64
5	12	0.5	0.45	3.15	1.08
6	18	0.5	0.83	4.83	7.58

NOTE: THE ENTIRE BUILDING ROOF WILL DISCHARGE DIRECTLY VIA ROOF DRAINS TO A STORM DRAIN SYSTEM THAT ULTIMATELY DRAINS TO THE PUBLIC STORM DRAIN SYSTEM ON STRATHMORE AVENUE.

GRAPHICAL SCALE: 1" = 50'

0 25 50 100

STRATHMORE PROPOSED HYDROLOGY EXHIBIT

OMEGA

PROP. HYDROLOGY EXHIBIT

CONDUIT SIZING CALCULATIONS

The following chart details the sizing parameters and for conduits that convey runoff on the site.

K'= Discharge factor	=	$(Q*n)/(d^{8/3}*s^{1/2})$
n= Mannings coefficient	=	0.013 for PVC & HDPE
d=diameter of conduit (ft)	=	per chart
Q= Discharge	=	based off portions of basins tributary to outlet
s=Minimum Pipe Slope (ft/ft)	=	per chart
D=depth of flow	=	From table 7-4 See right
C_a= Flow factor	=	From table 7-14 See right
A=Cross sectional area of flow	=	C_a*d^2
V=Velocity	=	Q/A

Pipe Flow

Pipe	Tributary Areas	Q (cfs)	S (%)	d (in)	K'	D/d	C_a	A (sf)	V (fps)
1	**Half of proposed building roof**	2.26	0.5	12	0.4155	0.73	0.614	0.614	3.68
2	**Half of proposed building roof**	2.26	0.5	12	0.4155	0.73	0.614	0.614	3.68
3	**Basin O-1**	1.35	0.5	12	0.2482	0.52	0.413	0.413	3.27
4	**Basin O-2**	0.64	0.5	12	0.1177	0.34	0.236	0.236	2.72
5	**Basin O-3**	1.08	0.5	12	0.1986	0.45	0.343	0.343	3.15
6	**Entire proposed building roof and offsite basns**	7.58	0.5	18	0.4727	0.83	0.697	1.568	4.83

Table 7-4. For Determining the Area a of the Cross Section of a Circular Conduit Flowing Part Full

Let $\frac{\text{depth of water}}{\text{diameter of channel}} = \frac{D}{d}$ and C_a = the tabulated value. Then $a = C_a d^2$.

$\frac{D}{d}$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.0000	.0013	.0037	.0069	.0105	.0147	.0192	.0242	.0294	.0350
.1	.0409	.0470	.0534	.0600	.0668	.0739	.0811	.0885	.0961	.1039
.2	.1118	.1199	.1281	.1365	.1449	.1535	.1623	.1711	.1800	.1890
.3	.1982	.2074	.2167	.2260	.2355	.2450	.2546	.2642	.2739	.2836
.4	.2934	.3032	.3130	.3229	.3328	.3428	.3527	.3627	.3727	.3827
.5	.393	.403	.413	.423	.433	.443	.453	.462	.472	.482
.6	.492	.502	.512	.521	.531	.540	.550	.559	.569	.578
.7	.587	.596	.605	.614	.623	.632	.640	.649	.657	.666
.8	.674	.681	.689	.697	.704	.712	.719	.725	.732	.738
.9	.745	.750	.756	.761	.766	.771	.775	.779	.782	.784

Table 7-14. Values of K' for Circular Channels in the Formula

$$Q = \frac{K'}{n} d^{8/3} s^{1/2}$$

D = depth of water d = diameter of channel

$\frac{D}{d}$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0		.00007	.00031	.00074	.00138	.00222	.00328	.00455	.00604	.00775
.1	.00967	.0118	.0142	.0167	.0195	.0225	.0257	.0291	.0327	.0366
.2	.0406	.0448	.0492	.0537	.0585	.0634	.0686	.0738	.0793	.0849
.3	.0907	.0966	.1027	.1089	.1153	.1218	.1284	.1352	.1420	.1490
.4	.1561	.1633	.1705	.1779	.1854	.1929	.2005	.2082	.2160	.2238
.5	.232	.239	.247	.255	.263	.271	.279	.287	.295	.303
.6	.311	.319	.327	.335	.343	.350	.358	.366	.373	.380
.7	.388	.395	.402	.409	.416	.422	.429	.435	.441	.447
.8	.453	.458	.463	.468	.473	.477	.481	.485	.488	.491
.9	.494	.496	.497	.498	.498	.498	.496	.494	.489	.483
1.0	.463									

Peak Flow Hydrologic Analysis

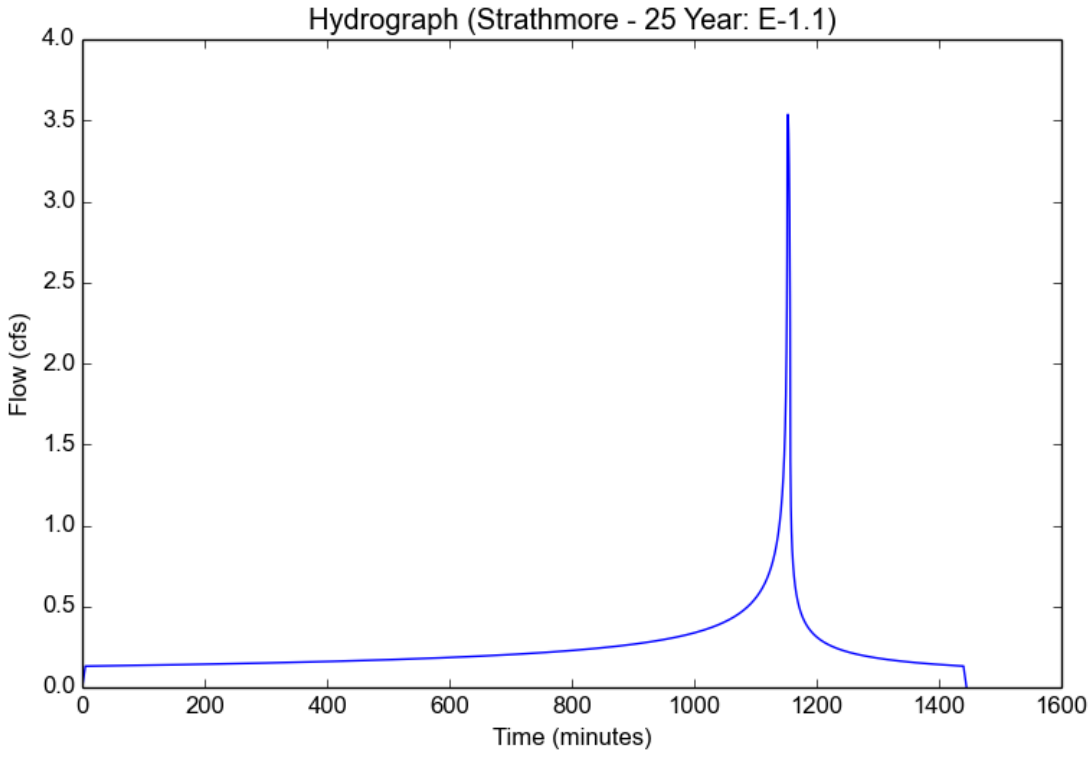
File location: P:/DWG OMEGA/0713 Strathmore and Garvey/STORMWATER/H&H/Calculations/25-Year/Strathmore - 25 Year - E-1.1.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 25 Year
Subarea ID	E-1.1
Area (ac)	1.21
Flow Path Length (ft)	235.0
Flow Path Slope (vft/hft)	0.0241
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.4436
Peak Intensity (in/hr)	3.2478
Undeveloped Runoff Coefficient (Cu)	0.6837
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.5369
Burned Peak Flow Rate (cfs)	3.5369
24-Hr Clear Runoff Volume (ac-ft)	0.4899
24-Hr Clear Runoff Volume (cu-ft)	21341.0961



Peak Flow Hydrologic Analysis

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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 25 Year
Subarea ID	P-1.1
Area (ac)	1.21
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.4436
Peak Intensity (in/hr)	3.2478
Undeveloped Runoff Coefficient (Cu)	0.6837
Developed Runoff Coefficient (Cd)	0.9
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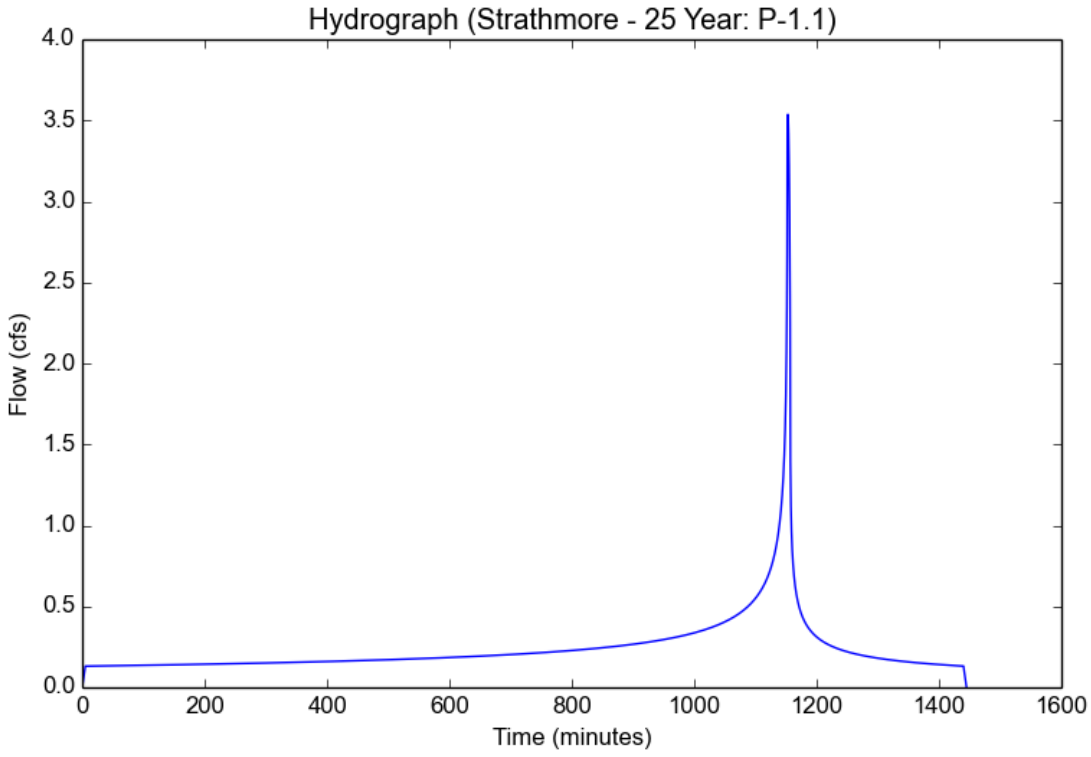
24-Hr Clear Runoff Volume (cu-ft)	21341.0961



Peak Flow Hydrologic Analysis

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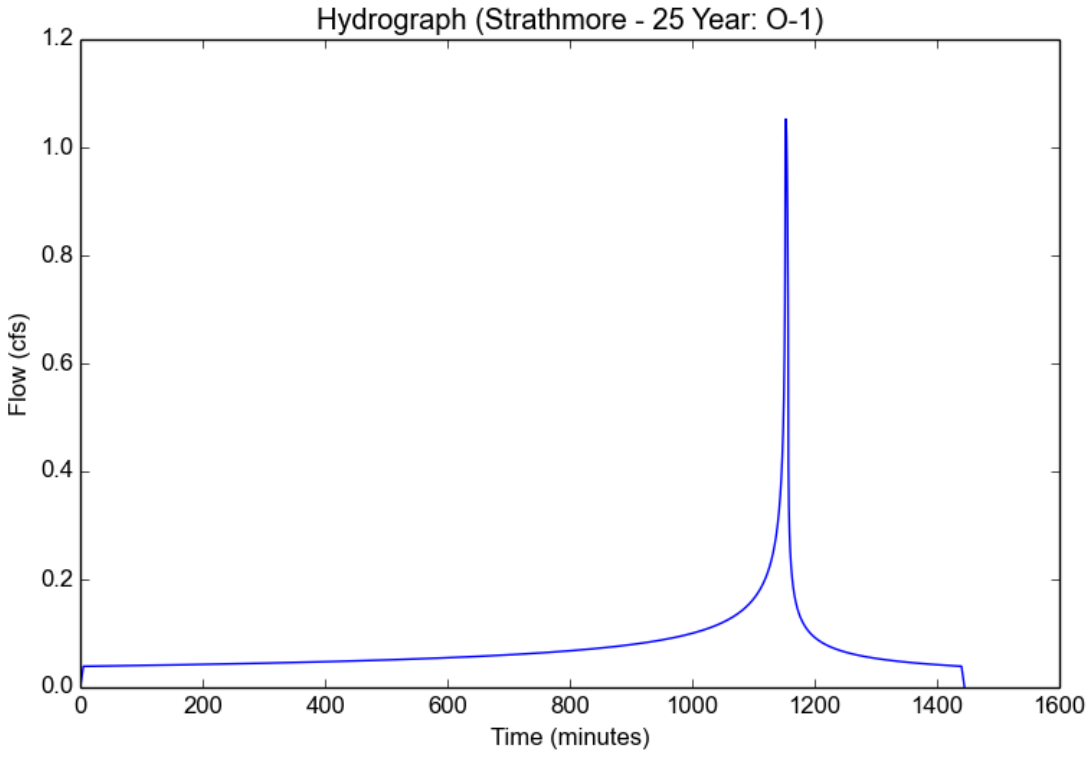
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 25 Year
Subarea ID	O-1
Area (ac)	0.36
Flow Path Length (ft)	130.0
Flow Path Slope (vft/hft)	0.0154
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.4436
Peak Intensity (in/hr)	3.2478
Undeveloped Runoff Coefficient (Cu)	0.6837
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.0523
Burned Peak Flow Rate (cfs)	1.0523
24-Hr Clear Runoff Volume (ac-ft)	0.1458
24-Hr Clear Runoff Volume (cu-ft)	6349.417



Peak Flow Hydrologic Analysis

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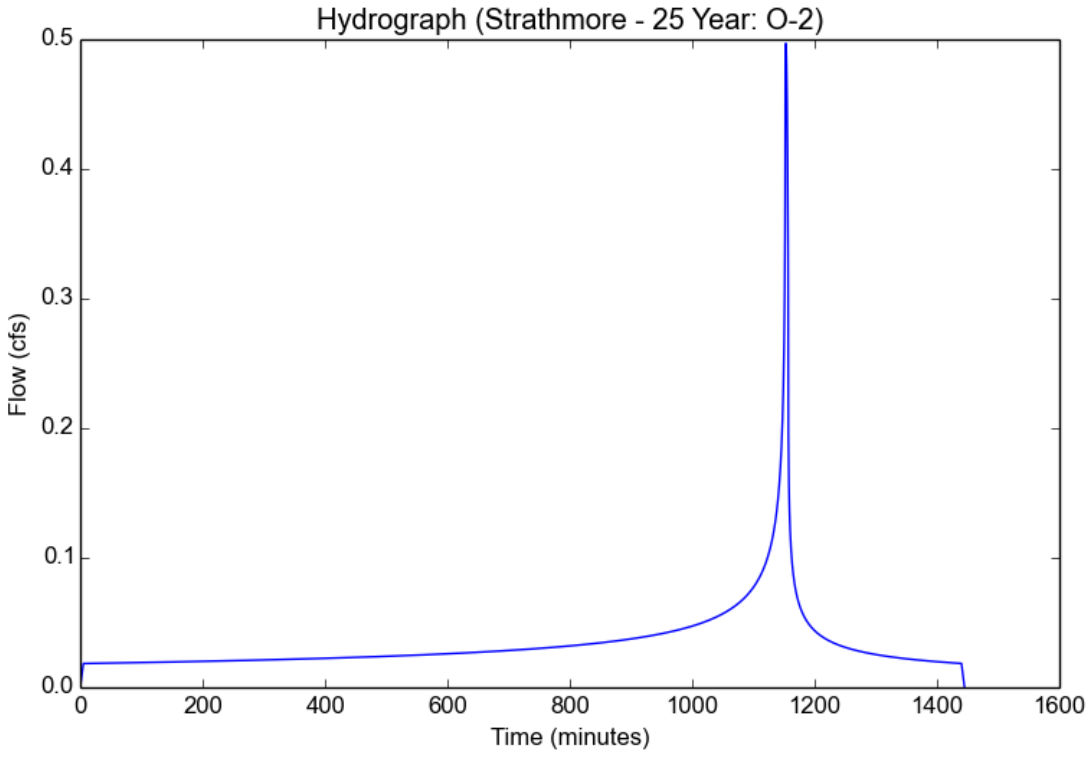
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 25 Year
Subarea ID	O-2
Area (ac)	0.17
Flow Path Length (ft)	80.0
Flow Path Slope (vft/hft)	0.025
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.4436
Peak Intensity (in/hr)	3.2478
Undeveloped Runoff Coefficient (Cu)	0.6837
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.4969
Burned Peak Flow Rate (cfs)	0.4969
24-Hr Clear Runoff Volume (ac-ft)	0.0688
24-Hr Clear Runoff Volume (cu-ft)	2998.3358



Peak Flow Hydrologic Analysis

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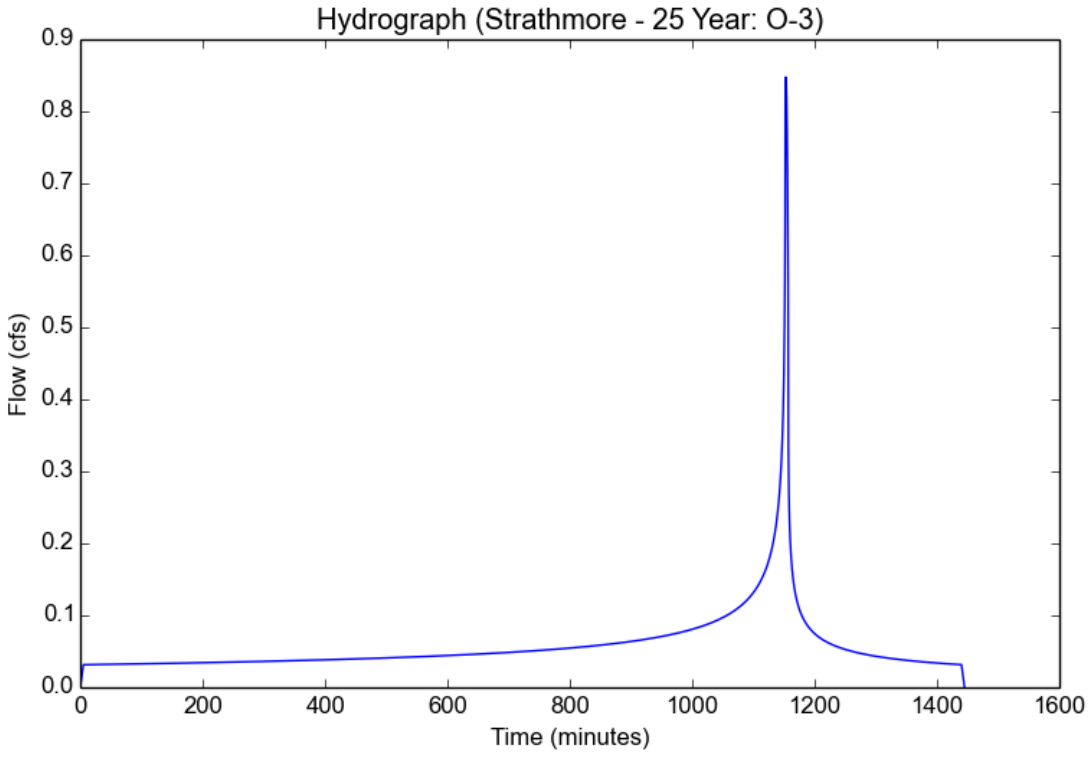
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 25 Year
Subarea ID	O-3
Area (ac)	0.29
Flow Path Length (ft)	90.0
Flow Path Slope (vft/hft)	0.0444
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	25-yr
Fire Factor	0
LID	False

Output Results

Modeled (25-yr) Rainfall Depth (in)	5.4436
Peak Intensity (in/hr)	3.2478
Undeveloped Runoff Coefficient (Cu)	0.6837
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.8477
Burned Peak Flow Rate (cfs)	0.8477
24-Hr Clear Runoff Volume (ac-ft)	0.1174
24-Hr Clear Runoff Volume (cu-ft)	5114.8082



Peak Flow Hydrologic Analysis

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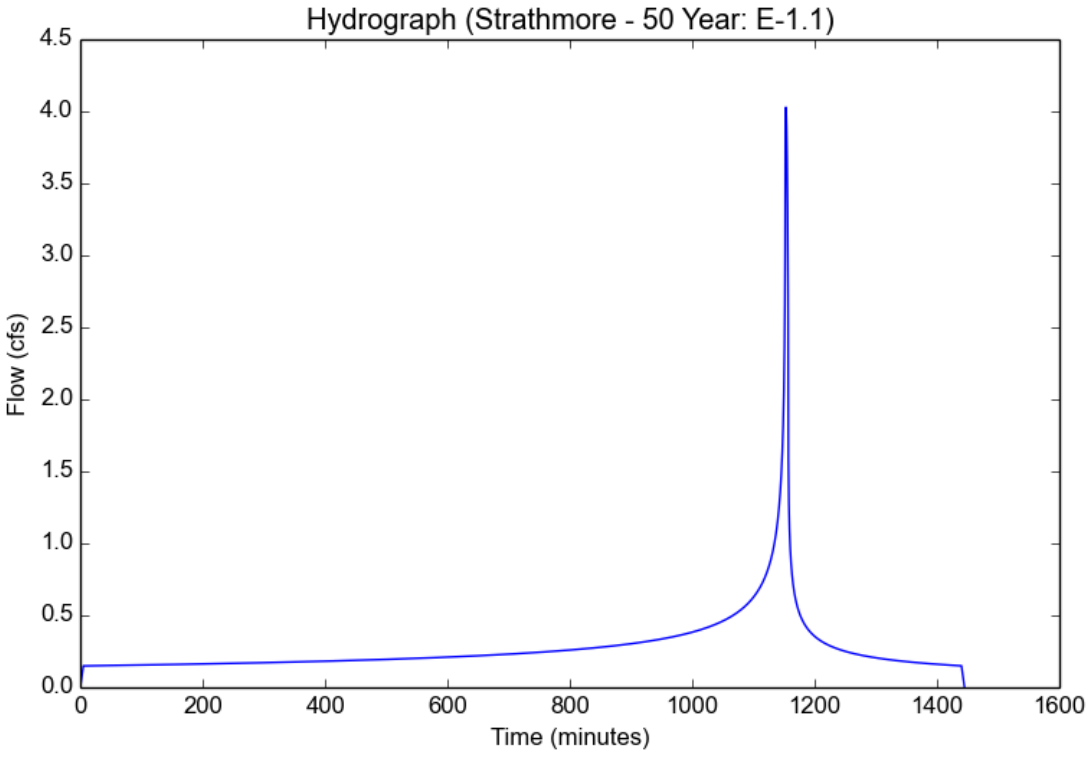
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 50 Year
Subarea ID	E-1.1
Area (ac)	1.21
Flow Path Length (ft)	235.0
Flow Path Slope (vft/hft)	0.0241
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.2
Peak Intensity (in/hr)	3.6991
Undeveloped Runoff Coefficient (Cu)	0.721
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.0283
Burned Peak Flow Rate (cfs)	4.0283
24-Hr Clear Runoff Volume (ac-ft)	0.558
24-Hr Clear Runoff Volume (cu-ft)	24306.4876



Peak Flow Hydrologic Analysis

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Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 50 Year
Subarea ID	P-1.1
Area (ac)	1.21
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.2
Peak Intensity (in/hr)	3.6991
Undeveloped Runoff Coefficient (Cu)	0.721
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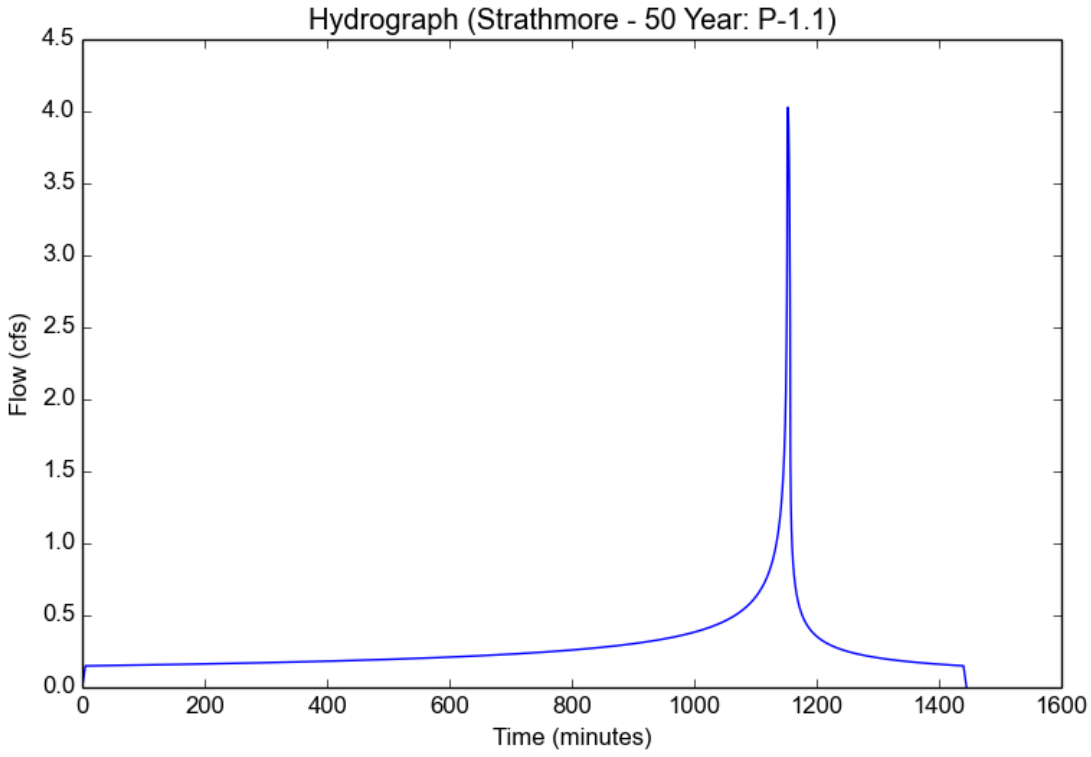

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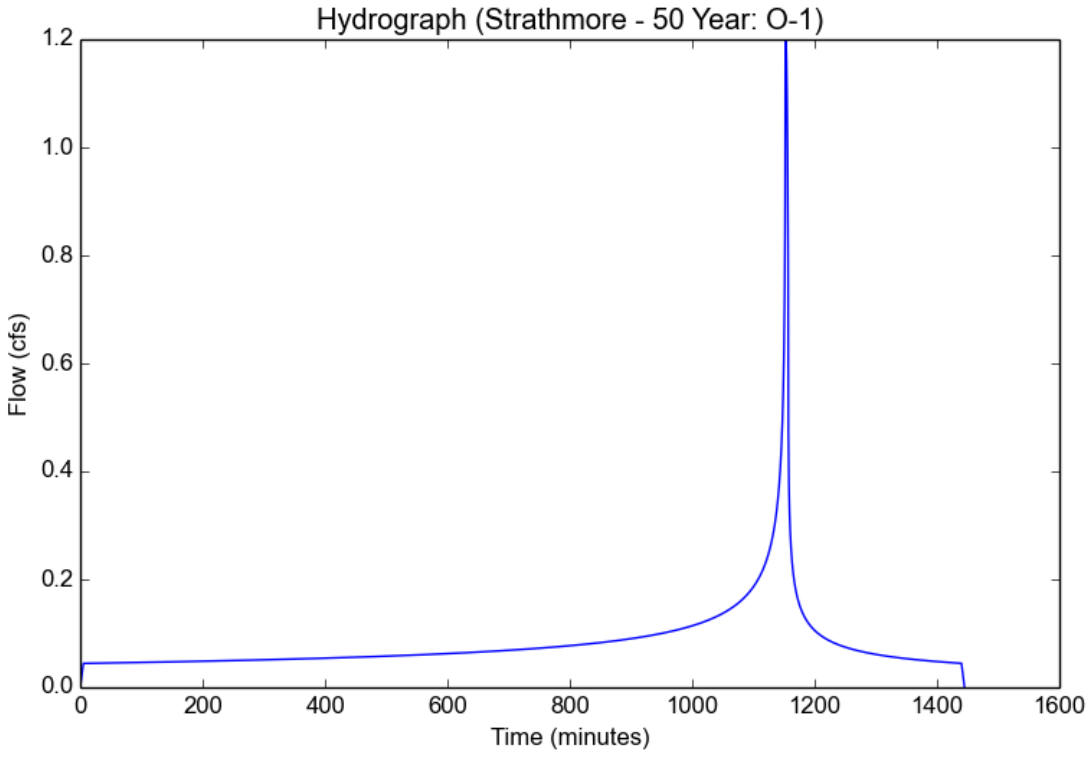
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 50 Year
Subarea ID	O-1
Area (ac)	0.36
Flow Path Length (ft)	130.0
Flow Path Slope (vft/hft)	0.0154
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.2
Peak Intensity (in/hr)	3.6991
Undeveloped Runoff Coefficient (Cu)	0.721
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.1985
Burned Peak Flow Rate (cfs)	1.1985
24-Hr Clear Runoff Volume (ac-ft)	0.166
24-Hr Clear Runoff Volume (cu-ft)	7231.6823



Peak Flow Hydrologic Analysis

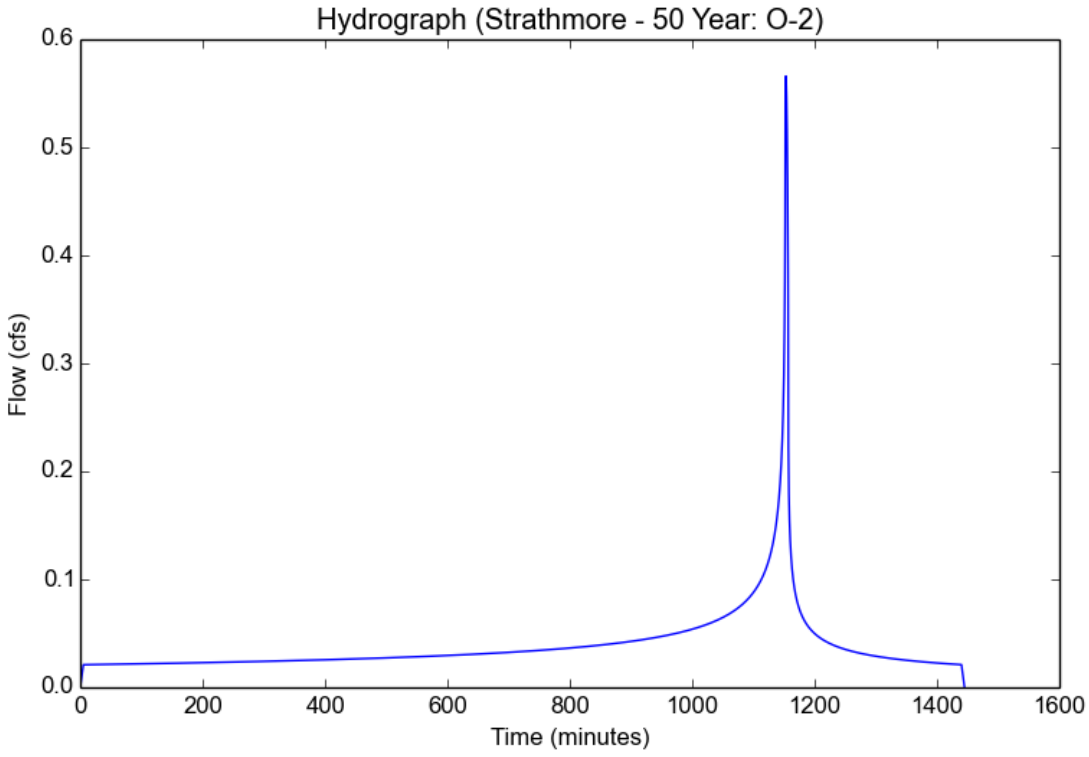
File location: P:/DWG OMEGA/0713 Strathmore and Garvey/STORMWATER REPORTS/H&H/Calculations/Offsite/50-Year/Strathmore - 50 Year - O-2.p
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 50 Year
Subarea ID	O-2
Area (ac)	0.17
Flow Path Length (ft)	80.0
Flow Path Slope (vft/hft)	0.025
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.2
Peak Intensity (in/hr)	3.6991
Undeveloped Runoff Coefficient (Cu)	0.721
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.566
Burned Peak Flow Rate (cfs)	0.566
24-Hr Clear Runoff Volume (ac-ft)	0.0784
24-Hr Clear Runoff Volume (cu-ft)	3414.9611



Peak Flow Hydrologic Analysis

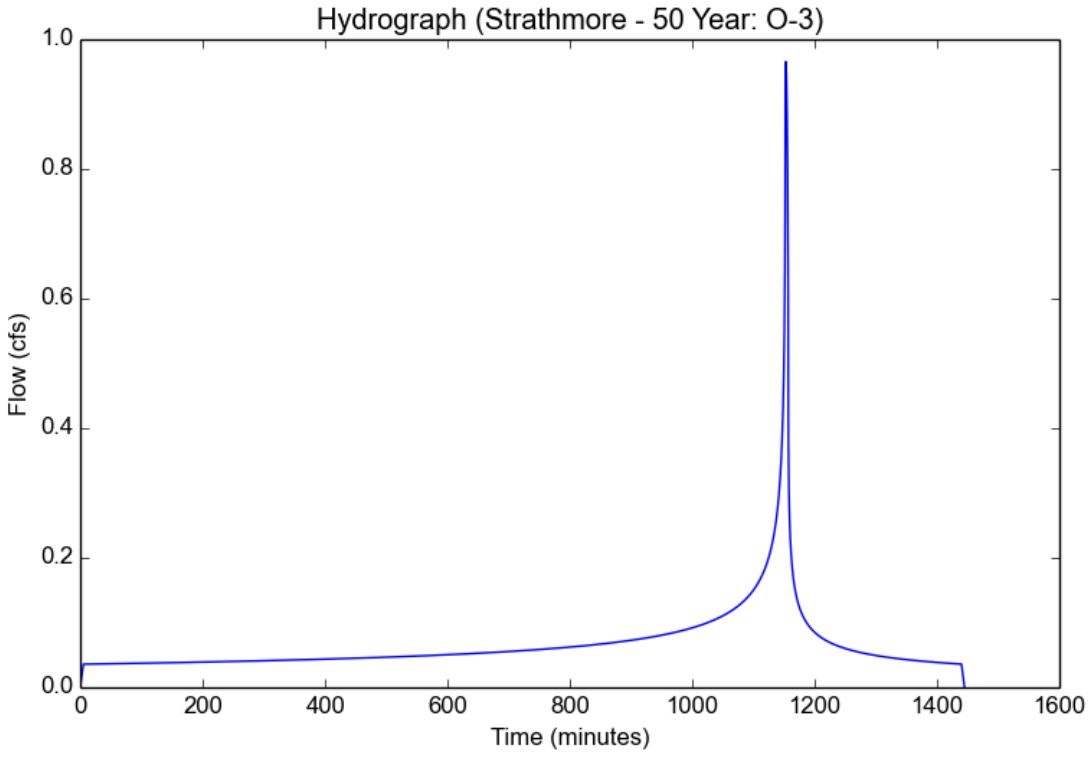
File location: P:/DWG OMEGA/0713 Strathmore and Garvey/STORMWATER REPORTS/H&H/Calculations/Offsite/50-Year/Strathmore - 50 Year - O-3.p
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 50 Year
Subarea ID	O-3
Area (ac)	0.29
Flow Path Length (ft)	90.0
Flow Path Slope (vft/hft)	0.0444
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	6.2
Peak Intensity (in/hr)	3.6991
Undeveloped Runoff Coefficient (Cu)	0.721
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.9655
Burned Peak Flow Rate (cfs)	0.9655
24-Hr Clear Runoff Volume (ac-ft)	0.1337
24-Hr Clear Runoff Volume (cu-ft)	5825.5218



Peak Flow Hydrologic Analysis

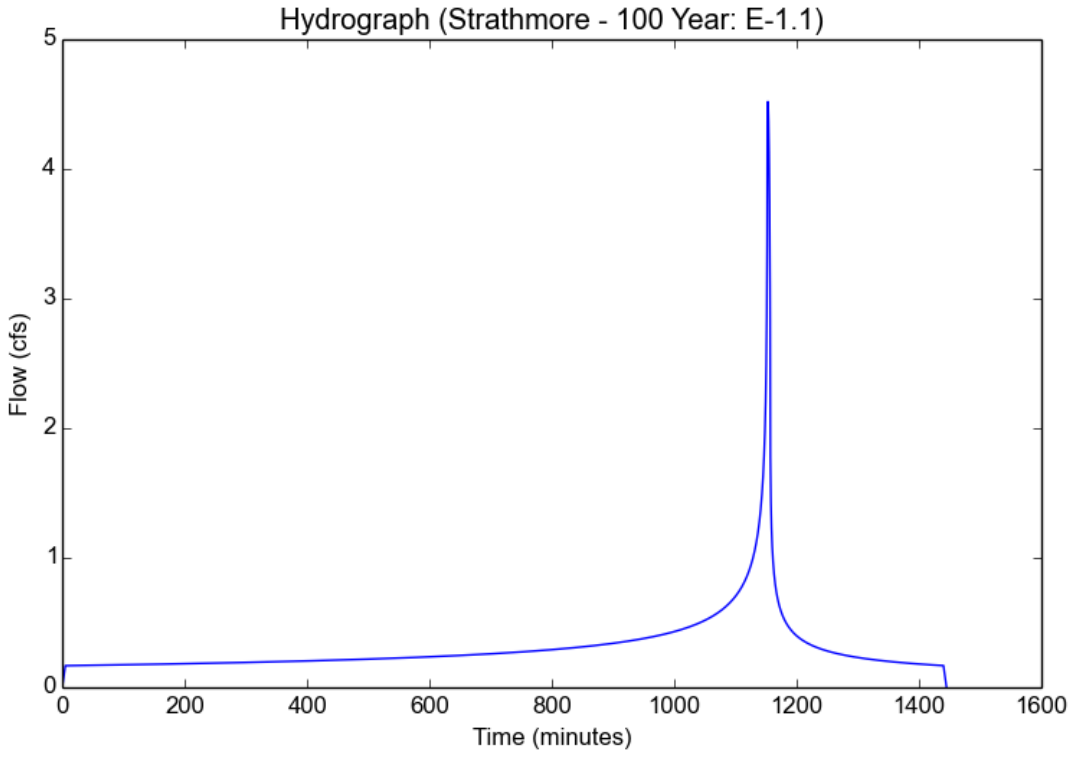
File location: P:/DWG OMEGA/0713 Strathmore and Garvey/STORMWATER/H&H/Calculations/100-Year/Strathmore - 100 Year - E-1.1.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 100 Year
Subarea ID	E-1.1
Area (ac)	1.21
Flow Path Length (ft)	235.0
Flow Path Slope (vft/hft)	0.0241
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.9564
Peak Intensity (in/hr)	4.1504
Undeveloped Runoff Coefficient (Cu)	0.7543
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.5198
Burned Peak Flow Rate (cfs)	4.5198
24-Hr Clear Runoff Volume (ac-ft)	0.6261
24-Hr Clear Runoff Volume (cu-ft)	27271.8791



Peak Flow Hydrologic Analysis

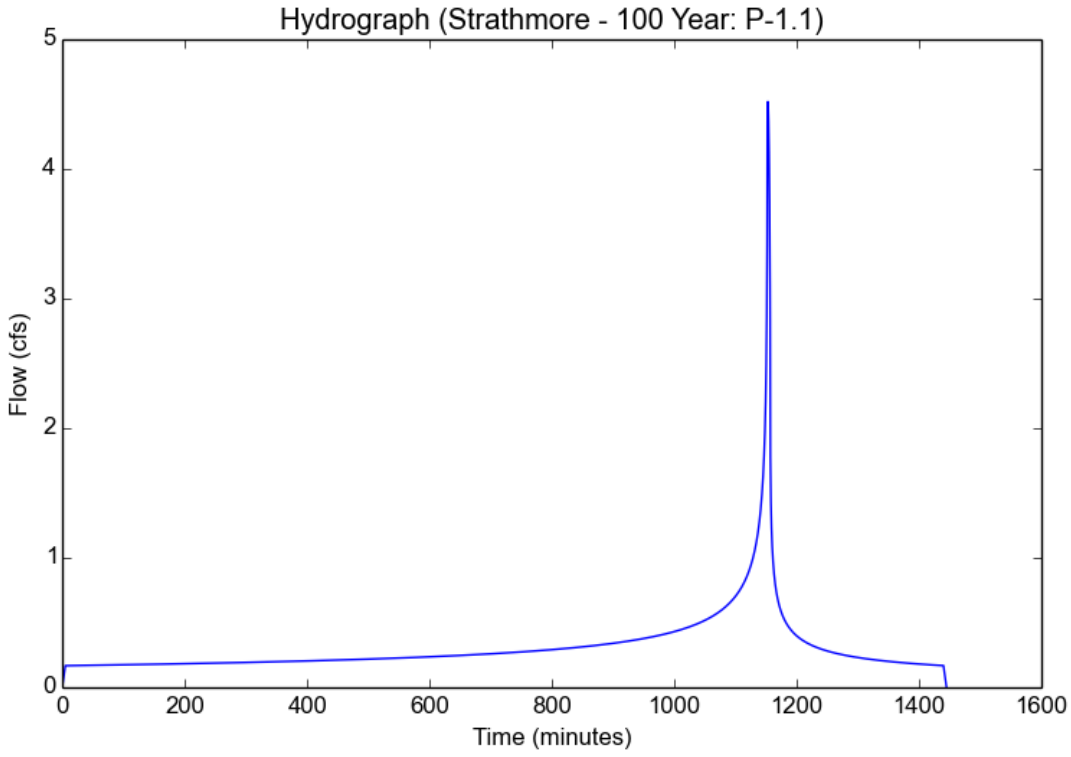
File location: P:/DWG OMEGA/0713 Strathmore and Garvey/STORMWATER/H&H/Calculations/Proposed/100-Year/Strathmore - 100 Year - P-1.1.pdf
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 100 Year
Subarea ID	P-1.1
Area (ac)	1.21
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.9564
Peak Intensity (in/hr)	4.1504
Undeveloped Runoff Coefficient (Cu)	0.7543
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.5198
Burned Peak Flow Rate (cfs)	4.5198
24-Hr Clear Runoff Volume (ac-ft)	0.6261
24-Hr Clear Runoff Volume (cu-ft)	27271.8791



Peak Flow Hydrologic Analysis

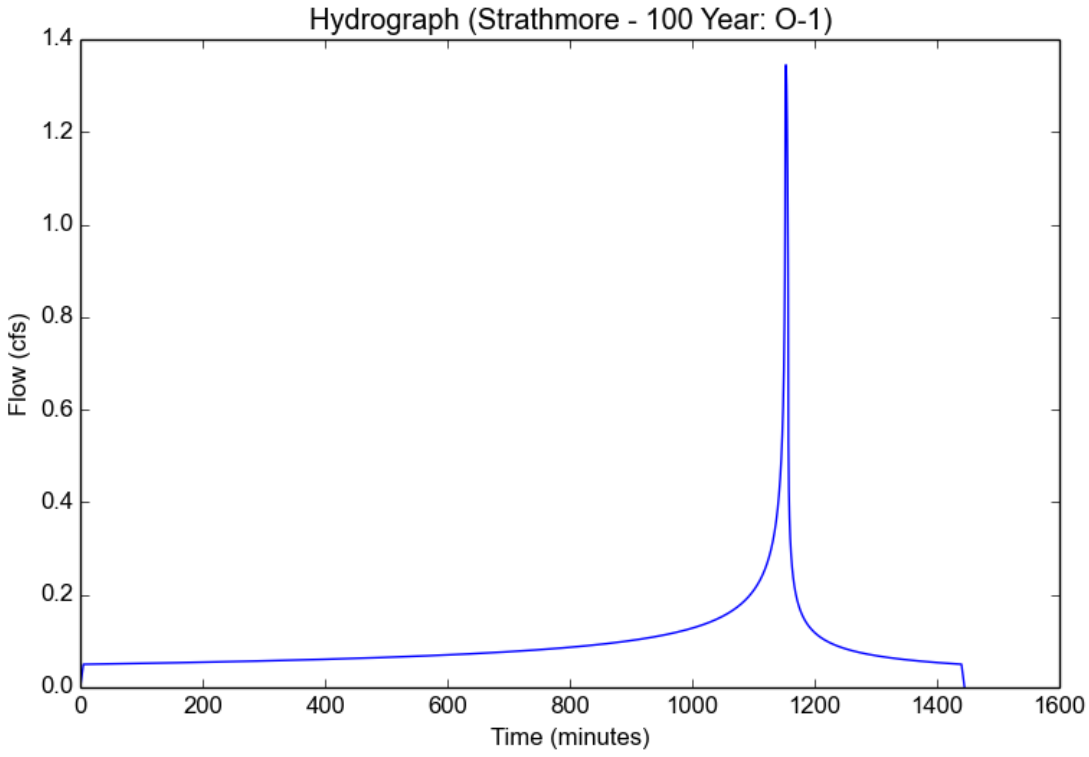
File location: P:/DWG OMEGA/0713 Strathmore and Garvey/STORMWATER REPORTS/H&H/Calculations/Offsite/100-Year/Strathmore - 100 Year - O-1
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 100 Year
Subarea ID	O-1
Area (ac)	0.36
Flow Path Length (ft)	130.0
Flow Path Slope (vft/hft)	0.0154
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.9564
Peak Intensity (in/hr)	4.1504
Undeveloped Runoff Coefficient (Cu)	0.7543
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.3447
Burned Peak Flow Rate (cfs)	1.3447
24-Hr Clear Runoff Volume (ac-ft)	0.1863
24-Hr Clear Runoff Volume (cu-ft)	8113.9475



Peak Flow Hydrologic Analysis

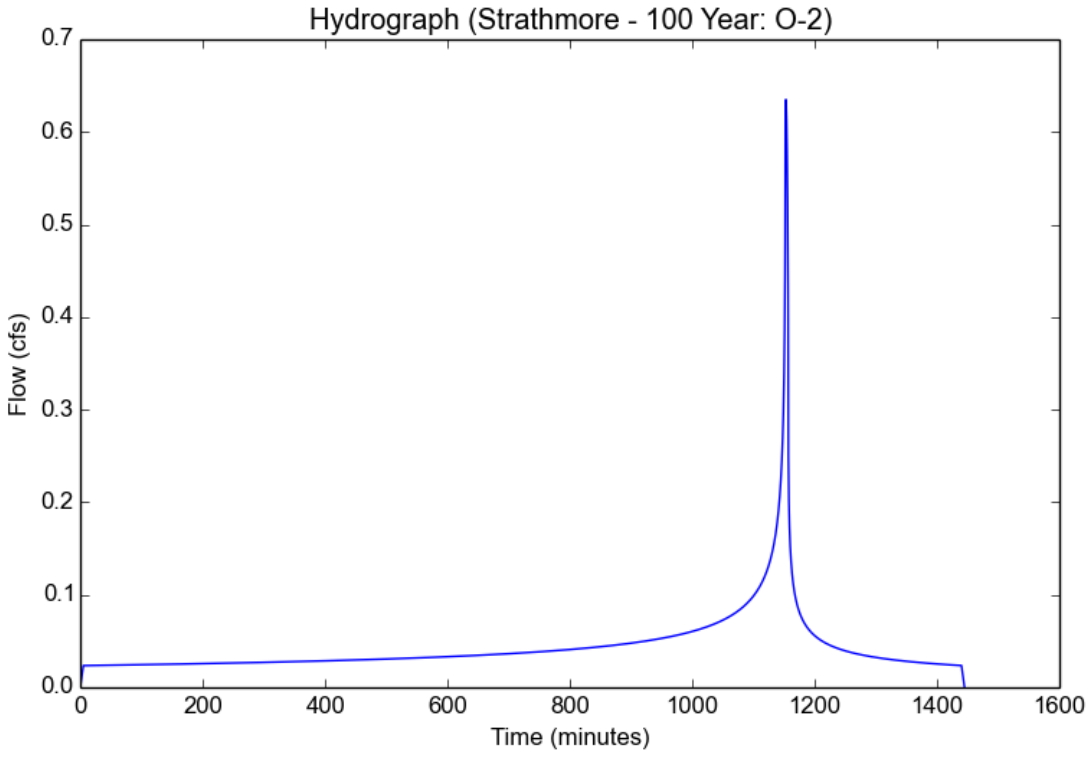
File location: P:/DWG OMEGA/0713 Strathmore and Garvey/STORMWATER REPORTS/H&H/Calculations/Offsite/100-Year/Strathmore - 100 Year - O-2
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 100 Year
Subarea ID	O-2
Area (ac)	0.17
Flow Path Length (ft)	80.0
Flow Path Slope (vft/hft)	0.025
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.9564
Peak Intensity (in/hr)	4.1504
Undeveloped Runoff Coefficient (Cu)	0.7543
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.635
Burned Peak Flow Rate (cfs)	0.635
24-Hr Clear Runoff Volume (ac-ft)	0.088
24-Hr Clear Runoff Volume (cu-ft)	3831.5863



Peak Flow Hydrologic Analysis

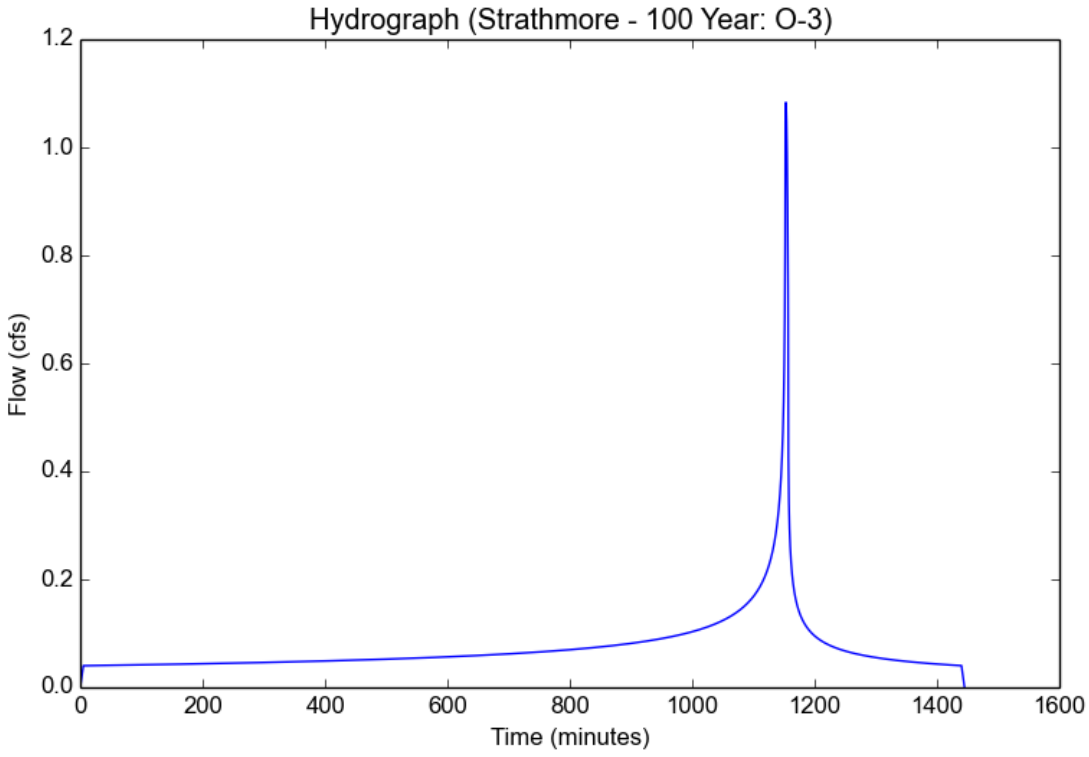
File location: P:/DWG OMEGA/0713 Strathmore and Garvey/STORMWATER REPORTS/H&H/Calculations/Offsite/100-Year/Strathmore - 100 Year - O-3
Version: HydroCalc 1.0.3

Input Parameters

Project Name	Strathmore - 100 Year
Subarea ID	O-3
Area (ac)	0.29
Flow Path Length (ft)	90.0
Flow Path Slope (vft/hft)	0.0444
50-yr Rainfall Depth (in)	6.2
Percent Impervious	1.0
Soil Type	7
Design Storm Frequency	100-yr
Fire Factor	0
LID	False

Output Results

Modeled (100-yr) Rainfall Depth (in)	6.9564
Peak Intensity (in/hr)	4.1504
Undeveloped Runoff Coefficient (Cu)	0.7543
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.0832
Burned Peak Flow Rate (cfs)	1.0832
24-Hr Clear Runoff Volume (ac-ft)	0.1501
24-Hr Clear Runoff Volume (cu-ft)	6536.2355



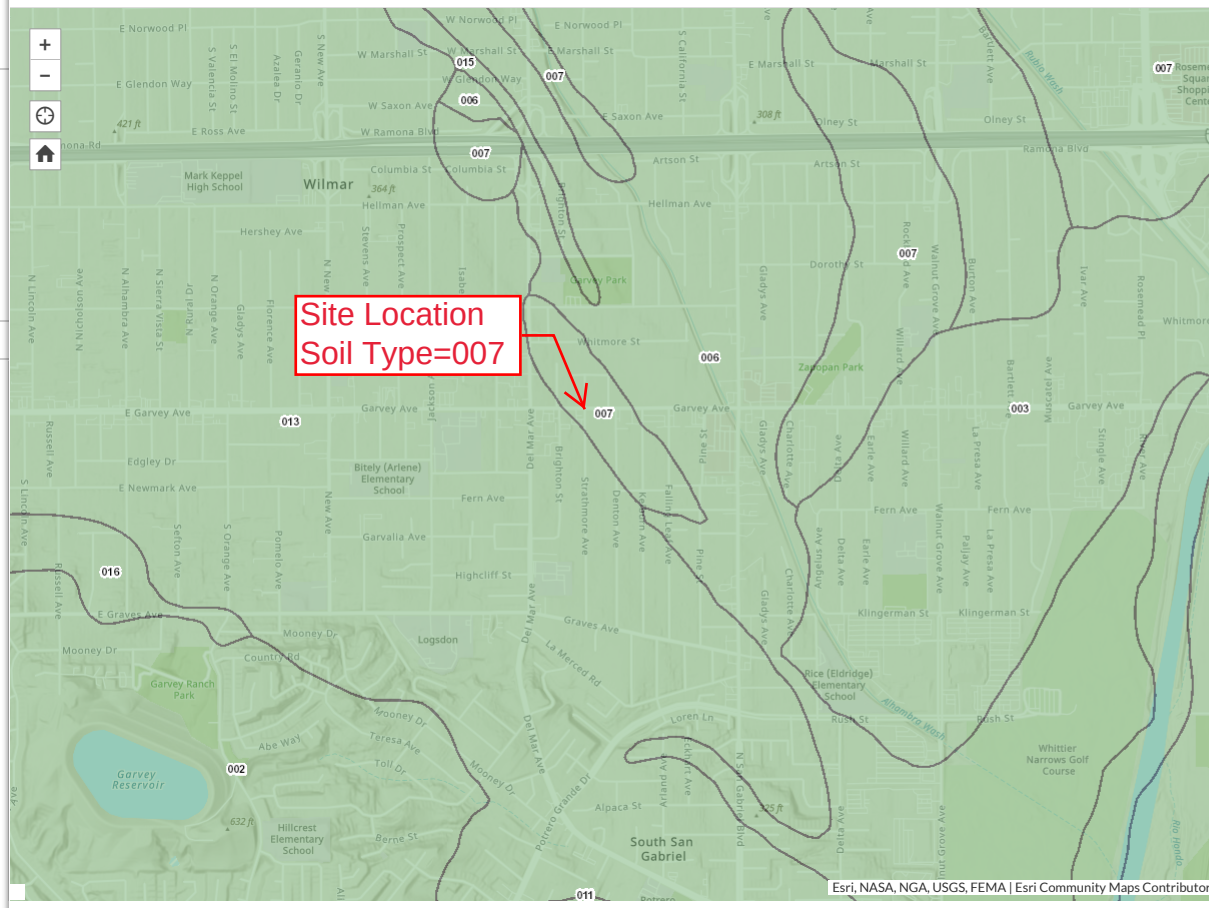
Appendix 1

About | Legend | Layers

Layers

- [x] Hydrology GIS
  - [ ] 50yr Two Tenths (Rainfall)
  - [ ] DPA Zones
  - [x] Soils 2004
  - [ ] Final 85th Percentile, 24-hr Rainfall
  - [ ] 1-year, 1-hour Rainfall Intensity
  - [ ] Final 95th Percentile, 24-hr Rainfall
- [x] LA County Parcels

LA County Hydrology Map



Appendix 2

About | Legend | Layers

Layers

- [x] Hydrology GIS
  - [x] 50yr Two Tenths (Rainfall)
  - [ ] DPA Zones
  - [ ] Soils 2004
  - [ ] Final 85th Percentile, 24-hr Rainfall
  - [ ] 1-year, 1-hour Rainfall Intensity
  - [ ] Final 95th Percentile, 24-hr Rainfall
- [x] LA County Parcels

LA County Hydrology Map