JACOB'S CORNER

Subdivision

DRAINAGE REPORT

FOR

City of Bryant, AR

DATE

10 Dec. 2020

Rudolph Road Bryant, AR

for

The City of Bryant

By:

HOPE
CONSULTING
ENGINEERS • SURVEYORS

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	12.11	1	27	19,620	------	------	------	PRE-development- IN BOUNDRY
2	Rational	13.66	1	27	22,125	------	------	------	POST-development- IN BOUNDARY

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	16.31	1	27	26,416	------	------	------	PRE-development- IN BOUNDRY
2	Rational	18.39	1	27	29,789	------	------	------	POST-development- IN BOUNDARY

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	18.85	1	27	30,534	------	------	------	PRE-development- IN BOUNDRY
2	Rational	21.25	1	27	34,432	------	------	------	POST-development- IN BOUNDARY

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	21.45	1	27	34,749	------	------	------	PRE-development- IN BOUNDRY
2	Rational	24.19	1	27	39,185	------	------	------	POST-development- IN BOUNDARY

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® by Autodesk, Inc. v2021

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Rational	23.08	1	27	37,393	------	------	------	PRE-development- IN BOUNDRY
2	Rational	26.03	1	27	42,166	------	------	------	POST-development- IN BOUNDARY

Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	59.0467	11.8000	0.8167	--------
3	0.0000	0.0000	0.0000	--------
5	0.0000	0.0000	0.0000	--------
10	46.3641	10.0000	0.6781	--------
25	48.6541	9.8000	0.6523	--------
50	79.0516	13.3000	0.7326	--------
100	54.7483	10.0000	0.6279	--------

File name: bryant.idf

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.89	4.76	4.03	3.50	3.11	2.80	2.55	2.35	2.18	2.03	1.91	1.80
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	7.39	6.08	5.23	4.62	4.16	3.80	3.51	3.27	3.06	2.89	2.73	2.60
25	8.39	6.94	5.99	5.31	4.80	4.40	4.07	3.80	3.57	3.37	3.20	3.05
50	9.40	7.87	6.83	6.06	5.47	5.00	4.62	4.29	4.02	3.79	3.58	3.40
100	10.00	8.34	7.25	6.47	5.87	5.40	5.02	4.69	4.42	4.19	3.98	3.80

Tc = time in minutes. Values may exceed 60.

Precip. file name: C:\Documents and Settings\Will\Desktop\Fleming\fleming.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	3.50	0.00	0.00	4.80	5.40	0.00	6.70

time of concentration, tc (min)	REGION 3 IDF			
Jacob's Corner (pre and post tc)				
Channel Dimensions and Time of Concentration, tc				
Area (ft2)	377229.6			
Area (Acre)	8.66			
Length, L (ft)	558.0			
Change in Elevation (ft)	15.1			
Slope, S (ft/ft)	0.027			
N	0.600		**h (ft)**	**S**
L(overland, ft)	50		12	0.060
L(channel 1, ft)	508		3.1	0.006
L(channel 2, ft)	0.0			
t_i	16.6	**v**		
t_{t1}	9.9	0.853581		
t_{t2}	0.0	8495.905		
time of concentration, tc (min)	26.5	or min. of 5 minutes		

TABLE 400-3 Values of N for Use in the Kerby Formula

N	Type of Surface
0.02	smooth impervious surfaces
0.10	smooth bare packed soil, free of stones
0.20	poor grass, cultivated row crops or moderately bare surfaces
0.40	pasture or average grass cover
0.60	deciduous timberland
0.80	conifer timberland, deciduous timberland with deep forest litter or dense grass cover

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.80	4.58	3.85	3.35	2.98	2.70	2.48	2.29	2.14	2.01	1.90	1.80
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	7.39	6.08	5.23	4.62	4.16	3.80	3.51	3.27	3.06	2.89	2.73	2.60
25	8.39	6.98	6.03	5.34	4.82	4.40	4.06	3.78	3.54	3.34	3.16	3.00
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	10.00	8.34	7.25	6.47	5.87	5.40	5.02	4.69	4.42	4.19	3.98	3.80

Tc = time in minutes. Values may exceed 60.