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Watershed Model Schematic

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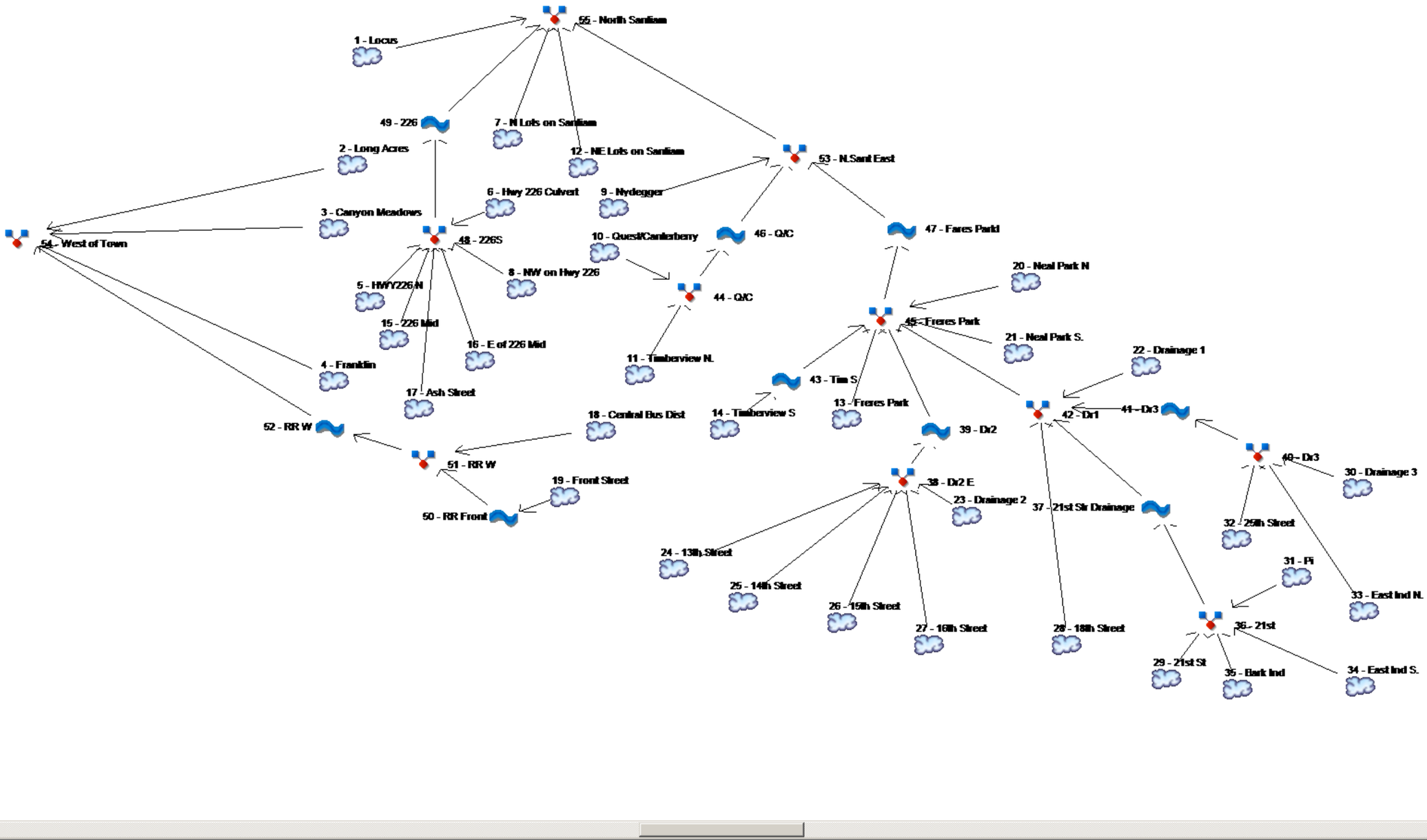
File Edit Design Storm Options Help

Open Save Reports IDF Precip Edit Plot Auto Insert Delete Units

SCS Rational Add Reach Pond Route Divert

Model Hydrographs Ponds



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Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SBUH Runoff	------	-------	0.072	-------	0.105	0.141	0.338	0.569	0.740	Locus
2	SBUH Runoff	------	-------	0.133	-------	0.193	0.260	0.427	0.639	0.800	Long Acres
3	SBUH Runoff	------	-------	1.791	-------	2.573	3.954	7.055	9.530	11.38	Canyon Meadows
4	SBUH Runoff	------	-------	1.657	-------	2.408	3.251	5.123	7.447	9.316	Franklin
5	SBUH Runoff	------	-------	1.550	-------	2.118	2.721	3.874	4.677	5.224	HWY226 N
6	SBUH Runoff	------	-------	0.133	-------	0.193	0.261	0.484	0.797	1.044	Hwy 226 Culvert
7	SBUH Runoff	------	-------	0.662	-------	1.011	1.394	2.147	2.686	3.058	N Lots on Santiam
8	SBUH Runoff	------	-------	1.196	-------	1.867	2.621	4.116	5.191	5.935	NW on Hwy 226
9	SBUH Runoff	------	-------	0.542	-------	0.847	1.187	1.860	2.343	2.678	Nydegger
10	SBUH Runoff	------	-------	1.882	-------	2.922	4.062	6.317	7.939	9.068	Quest/Canterberry
11	SBUH Runoff	------	-------	1.230	-------	1.905	2.664	4.193	5.301	6.072	Timberview N.
12	SBUH Runoff	------	-------	0.662	-------	1.011	1.394	2.147	2.686	3.058	NE Lots on Santiam
13	SBUH Runoff	------	-------	2.176	-------	3.162	4.268	6.727	9.778	12.23	Freres Park
14	SBUH Runoff	------	-------	0.877	-------	1.302	2.199	4.667	6.662	8.095	Timberview S
15	SBUH Runoff	------	-------	0.654	-------	0.912	1.191	1.728	2.105	2.362	226 Mid
16	SBUH Runoff	------	-------	0.842	-------	1.226	1.646	2.474	3.064	3.471	E of 226 Mid
17	SBUH Runoff	------	-------	0.606	-------	0.835	1.079	1.545	1.871	2.093	Ash Street
18	SBUH Runoff	------	-------	20.01	-------	23.90	27.79	34.78	39.41	42.49	Central Bus Dist
19	SBUH Runoff	------	-------	5.526	-------	6.587	7.646	9.547	10.81	11.65	Front Street
20	SBUH Runoff	------	-------	0.178	-------	0.258	0.348	0.563	0.839	1.050	Neal Park N
21	SBUH Runoff	------	-------	0.444	-------	0.644	0.870	1.510	2.255	2.877	Neal Park S.
22	SBUH Runoff	------	-------	3.322	-------	5.231	8.106	15.32	21.02	25.09	Drainage 1
23	SBUH Runoff	------	-------	0.864	-------	1.255	1.693	4.012	6.781	8.814	Drainage 2
24	SBUH Runoff	------	-------	5.156	-------	6.155	7.153	8.945	10.13	10.93	13th Street
25	SBUH Runoff	------	-------	2.507	-------	3.144	3.794	4.988	5.792	6.330	14th Street
26	SBUH Runoff	------	-------	0.570	-------	0.776	0.996	1.414	1.705	1.903	15th Street
27	SBUH Runoff	------	-------	2.736	-------	3.721	4.765	6.756	8.141	9.082	16th Street
28	SBUH Runoff	------	-------	2.146	-------	2.940	3.790	5.417	6.553	7.327	18th Street
29	SBUH Runoff	------	-------	0.527	-------	0.766	1.033	1.789	2.671	3.400	21st St
30	SBUH Runoff	------	-------	1.260	-------	1.851	2.923	5.594	7.786	9.367	Drainage 3
31	SBUH Runoff	------	-------	9.832	-------	11.72	13.61	17.01	19.26	20.75	Pi
32	SBUH Runoff	------	-------	2.584	-------	3.418	4.298	5.958	7.107	7.886	25th Street
33	SBUH Runoff	------	-------	12.38	-------	14.80	17.21	21.54	24.41	26.33	East Ind N.
34	SBUH Runoff	------	-------	9.816	-------	11.73	13.64	17.08	19.36	20.88	East Ind S.

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
35	SBUH Runoff	------	-------	6.182	-------	7.322	8.459	10.50	11.85	12.74	Bark Ind
36	Combine	29, 31, 34, 35	-------	25.74	-------	30.67	35.69	45.49	52.37	57.07	21st
37	Reach	36	-------	22.41	-------	26.88	31.47	40.33	46.61	50.92	21st Str Drainage
38	Combine	23, 24, 25, 26, 27,	-------	10.96	-------	13.79	17.25	25.99	32.51	37.05	Dr2 E
39	Reach	38	-------	9.844	-------	12.45	15.68	23.46	29.46	33.67	Dr2
40	Combine	30, 32, 33,	-------	15.20	-------	19.28	23.80	32.67	38.93	43.22	Dr3
41	Reach	40	-------	14.98	-------	19.01	23.49	32.29	38.49	42.75	Dr3
42	Combine	22, 28, 37, 41	-------	40.86	-------	52.73	66.04	92.83	112.18	125.58	Dr1
43	Reach	14	-------	0.877	-------	1.295	2.181	4.653	6.641	8.079	Tim S
44	Combine	10, 11,	-------	3.021	-------	4.743	6.659	10.46	13.20	15.09	Q/C
45	Combine	13, 20, 21, 39, 42, 43,	-------	50.80	-------	65.94	84.63	126.42	158.31	180.88	Freres Park
46	Reach	44	-------	3.021	-------	4.756	6.671	10.47	13.23	15.14	Q/C
47	Reach	45	-------	44.76	-------	58.60	75.86	114.19	143.59	164.55	Fares Parkl
48	Combine	5, 6, 8, 15, 16, 17,	-------	4.788	-------	6.913	9.268	14.10	17.62	20.05	226S
49	Reach	48	-------	3.899	-------	5.999	8.382	13.27	16.83	19.31	226
50	Reach	19	-------	5.417	-------	6.468	7.519	9.401	10.66	11.49	RR Front
51	Combine	18, 50	-------	25.40	-------	30.35	35.30	44.17	50.07	53.98	RR W
52	Reach	51	-------	24.99	-------	29.91	34.83	43.66	49.53	53.42	RR W
53	Combine	9, 46, 47,	-------	47.98	-------	63.39	82.36	124.18	156.17	178.96	N.Sant East
54	Combine	2, 3, 4, 52,	-------	25.46	-------	31.40	38.15	52.88	64.04	71.93	West of Town
55	Combine	1, 7, 12, 49, 53,	-------	52.69	-------	70.59	92.25	139.40	175.26	200.72	North Santiam

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8

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	SBUH Runoff	0.338	2	482	12,401	------	------	------	Locus
2	SBUH Runoff	0.427	2	548	22,864	------	------	------	Long Acres
3	SBUH Runoff	7.055	2	524	282,280	------	------	------	Canyon Meadows
4	SBUH Runoff	5.123	2	604	285,994	------	------	------	Franklin
5	SBUH Runoff	3.874	2	482	75,164	------	------	------	HWY226 N
6	SBUH Runoff	0.484	2	524	22,864	------	------	------	Hwy 226 Culvert
7	SBUH Runoff	2.147	2	480	36,940	------	------	------	N Lots on Santiam
8	SBUH Runoff	4.116	2	482	89,478	------	------	------	NW on Hwy 226
9	SBUH Runoff	1.860	2	482	39,403	------	------	------	Nydegger
10	SBUH Runoff	6.317	2	482	123,134	------	------	------	Quest/Canterberry
11	SBUH Runoff	4.193	2	488	110,821	------	------	------	Timberview N.
12	SBUH Runoff	2.147	2	480	36,940	------	------	------	NE Lots on Santiam
13	SBUH Runoff	6.727	2	604	375,512	------	------	------	Freres Park
14	SBUH Runoff	4.667	2	484	140,409	------	------	------	Timberview S
15	SBUH Runoff	1.728	2	480	30,323	------	------	------	226 Mid
16	SBUH Runoff	2.474	2	488	63,983	------	------	------	E of 226 Mid
17	SBUH Runoff	1.545	2	480	26,282	------	------	------	Ash Street
18	SBUH Runoff	34.78	2	480	583,860	------	------	------	Central Bus Dist
19	SBUH Runoff	9.547	2	476	135,226	------	------	------	Front Street
20	SBUH Runoff	0.563	2	552	30,615	------	------	------	Neal Park N
21	SBUH Runoff	1.510	2	540	76,343	------	------	------	Neal Park S.
22	SBUH Runoff	15.32	2	496	522,631	------	------	------	Drainage 1
23	SBUH Runoff	4.012	2	482	148,423	------	------	------	Drainage 2
24	SBUH Runoff	8.945	2	480	144,772	------	------	------	13th Street
25	SBUH Runoff	4.988	2	480	75,446	------	------	------	14th Street
26	SBUH Runoff	1.414	2	482	26,099	------	------	------	15th Street
27	SBUH Runoff	6.756	2	480	114,834	------	------	------	16th Street
28	SBUH Runoff	5.417	2	482	114,834	------	------	------	18th Street
29	SBUH Runoff	1.789	2	540	90,681	------	------	------	21st St
30	SBUH Runoff	5.594	2	496	200,088	------	------	------	Drainage 3
31	SBUH Runoff	17.01	2	480	259,316	------	------	------	Pi
32	SBUH Runoff	5.958	2	482	130,608	------	------	------	25th Street
33	SBUH Runoff	21.54	2	480	370,679	------	------	------	East Ind N.
34	SBUH Runoff	17.08	2	482	310,225	------	------	------	East Ind S.

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. v8

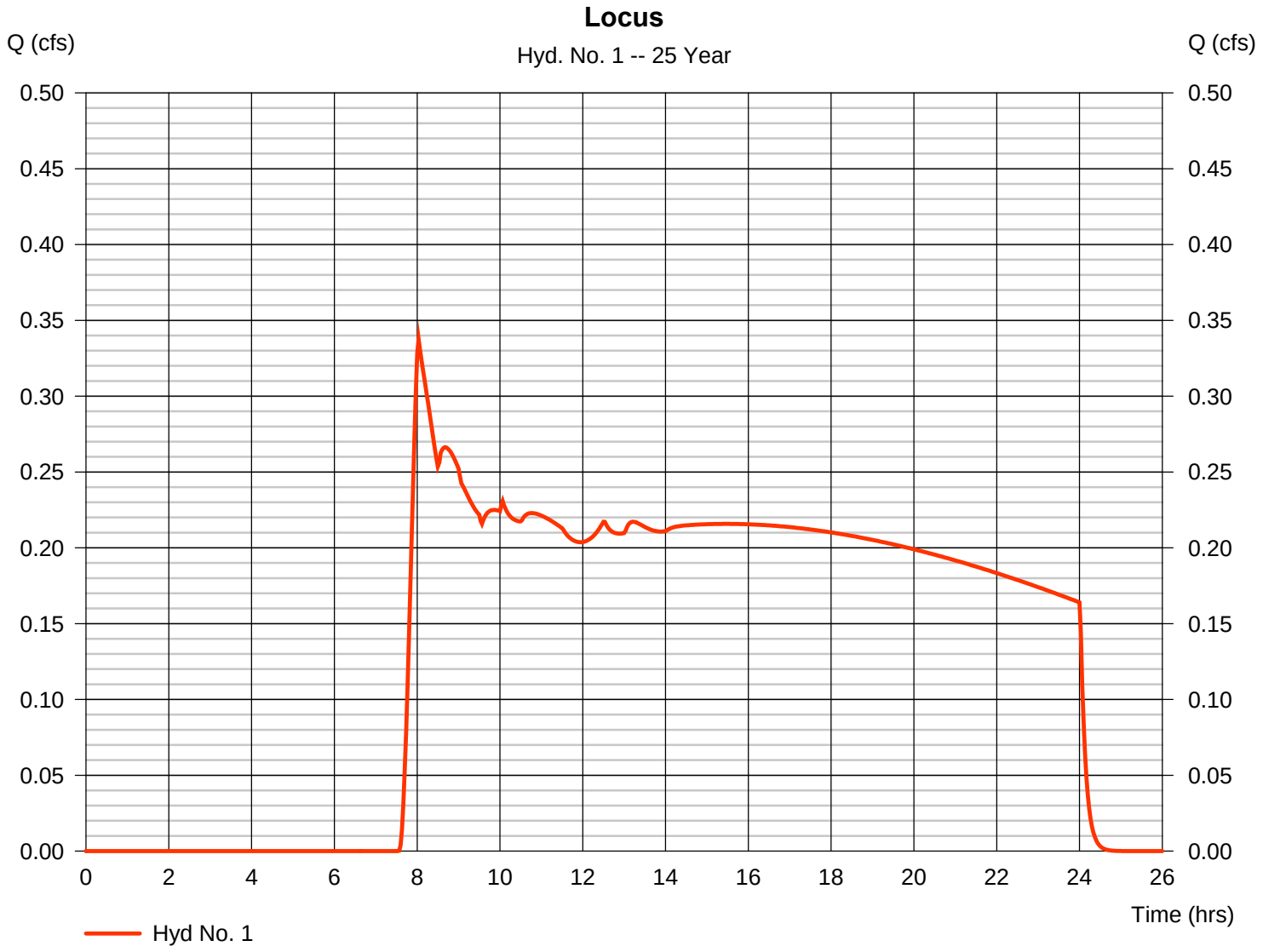
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
35	SBUH Runoff	10.50	2	476	150,040	------	------	------	Bark Ind
36	Combine	45.49	2	480	810,262	29, 31, 34, 35	------	------	21st
37	Reach	40.33	2	488	810,245	36	------	------	21st Str Drainage
38	Combine	25.99	2	480	509,573	23, 24, 25, 26, 27,	------	------	Dr2 E
39	Reach	23.46	2	488	509,564	38	------	------	Dr2
40	Combine	32.67	2	482	701,376	30, 32, 33,	------	------	Dr3
41	Reach	32.29	2	486	701,355	40	------	------	Dr3
42	Combine	92.83	2	488	2,149,063	22, 28, 37, 41	------	------	Dr1
43	Reach	4.653	2	488	140,397	14	------	------	Tim S
44	Combine	10.46	2	482	233,955	10, 11,	------	------	Q/C
45	Combine	126.42	2	488	3,281,496	13, 20, 21, 39, 42, 43,	------	------	Freres Park
46	Reach	10.47	2	482	233,941	44	------	------	Q/C
47	Reach	114.19	2	506	3,281,467	45	------	------	Fares Parkl
48	Combine	14.10	2	482	308,094	5, 6, 8, 15, 16, 17,	------	------	226S
49	Reach	13.27	2	492	308,073	48	------	------	226
50	Reach	9.401	2	482	135,222	19	------	------	RR Front
51	Combine	44.17	2	480	719,081	18, 50	------	------	RR W
52	Reach	43.66	2	484	719,070	51	------	------	RR W
53	Combine	124.18	2	504	3,554,811	9, 46, 47,	------	------	N.Sant East
54	Combine	52.88	2	486	1,310,208	2, 3, 4, 52,	------	------	West of Town
55	Combine	139.40	2	502	3,949,163	1, 7, 12, 49, 53,	------	------	North Santiam

Hydrograph Report

Hyd. No. 1

Locus

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.338 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	12,401 cuft
Drainage area	=	3.200 ac	Curve number	=	54
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.40 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 1

Locus

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 134.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 6.70		0.00		0.00		
Travel Time (min)	**= 7.41**	**+**	**0.00**	**+**	**0.00**	**=**	**7.41**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

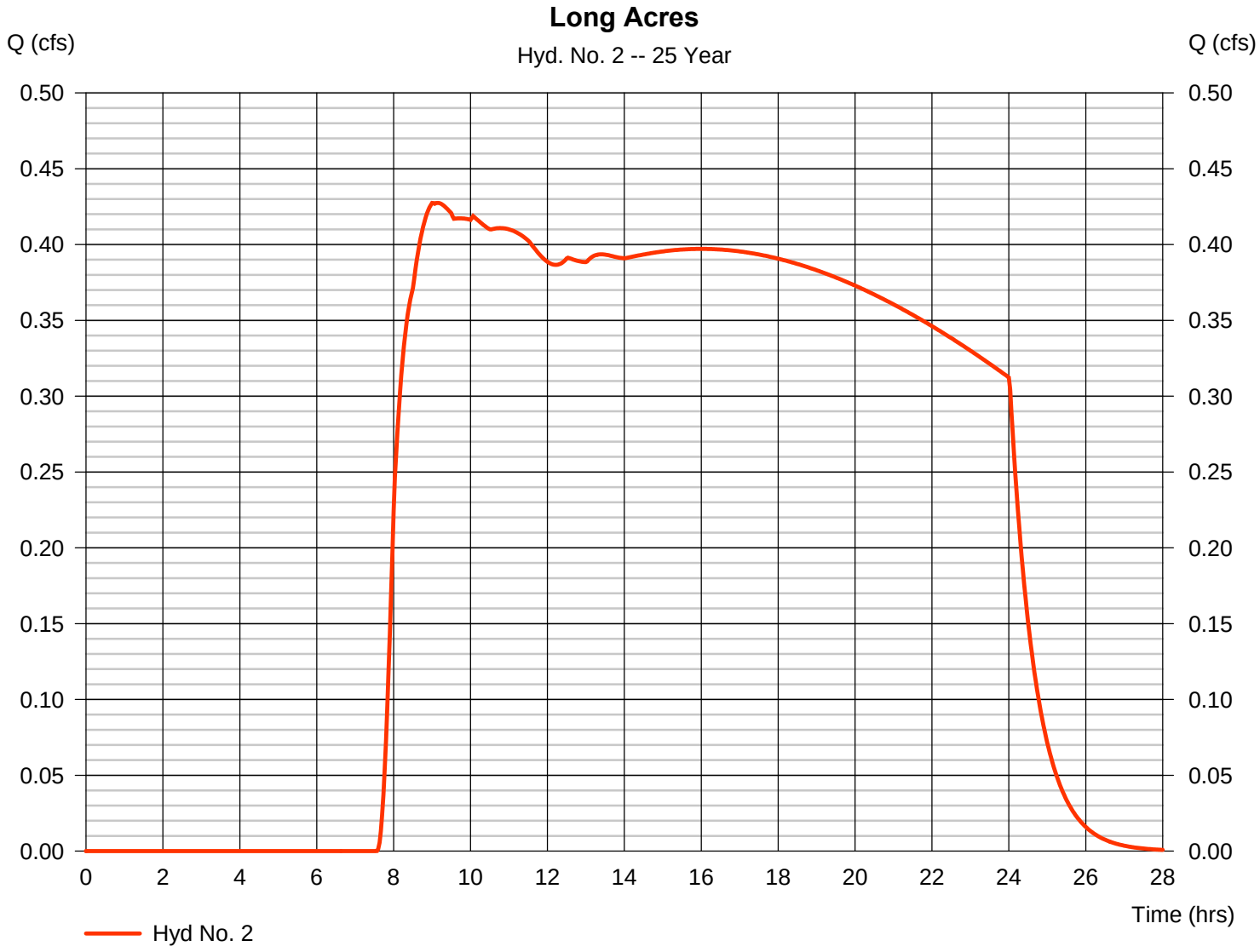
Total Travel Time, Tc ..... 7.40 min

Hydrograph Report

Hyd. No. 2

Long Acres

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.427 cfs
Storm frequency	=	25 yrs	Time to peak	=	9.13 hrs
Time interval	=	2 min	Hyd. volume	=	22,864 cuft
Drainage area	=	5.900 ac	Curve number	=	54
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	40.00 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 2

Long Acres

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 238.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 0.40		0.00		0.00		
Travel Time (min)	**= 36.21**	**+**	**0.00**	**+**	**0.00**	**=**	**36.21**
Shallow Concentrated Flow							
Flow length (ft)	= 433.00		0.00		0.00		
Watercourse slope (%)	= 0.90		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=1.93		0.00		0.00		
Travel Time (min)	**= 3.74**	**+**	**0.00**	**+**	**0.00**	**=**	**3.74**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 40.00 min

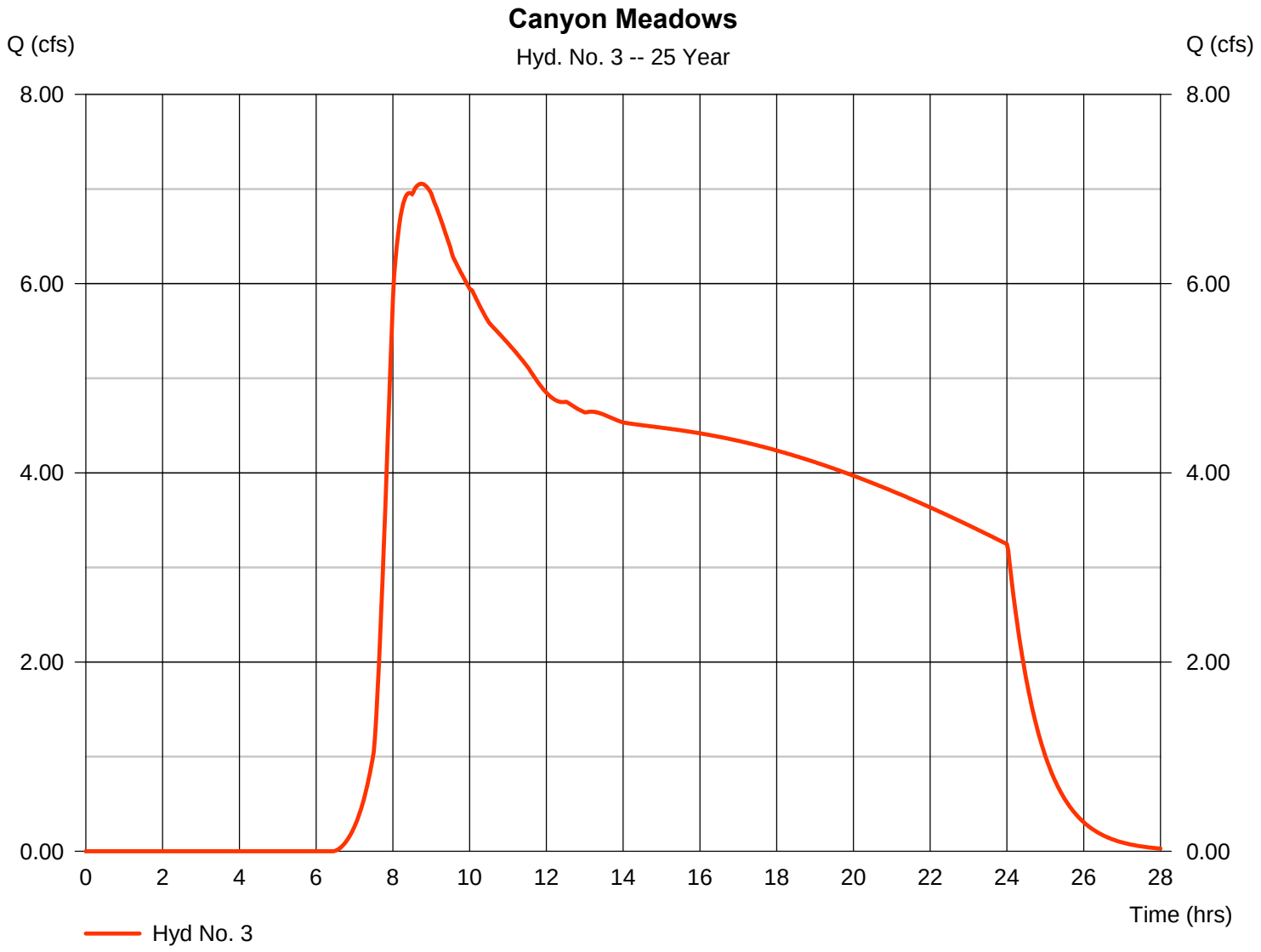
Hydrograph Report

Hyd. No. 3

Canyon Meadows

Hydrograph type	=	SBUH Runoff	Peak discharge	=	7.055 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.73 hrs
Time interval	=	2 min	Hyd. volume	=	282,280 cuft
Drainage area	=	47.800 ac	Curve number	=	62*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	50.50 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(24.000 x 54) + (23.800 x 70)] / 47.800



TR55 Tc Worksheet

Hyd. No. 3

Canyon Meadows

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 275.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 0.40		0.00		0.00		
Travel Time (min)	**= 40.65**	**+**	**0.00**	**+**	**0.00**	**=**	**40.65**
Shallow Concentrated Flow							
Flow length (ft)	= 801.00		0.00		0.00		
Watercourse slope (%)	= 0.70		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.35		0.00		0.00		
Travel Time (min)	**= 9.89**	**+**	**0.00**	**+**	**0.00**	**=**	**9.89**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

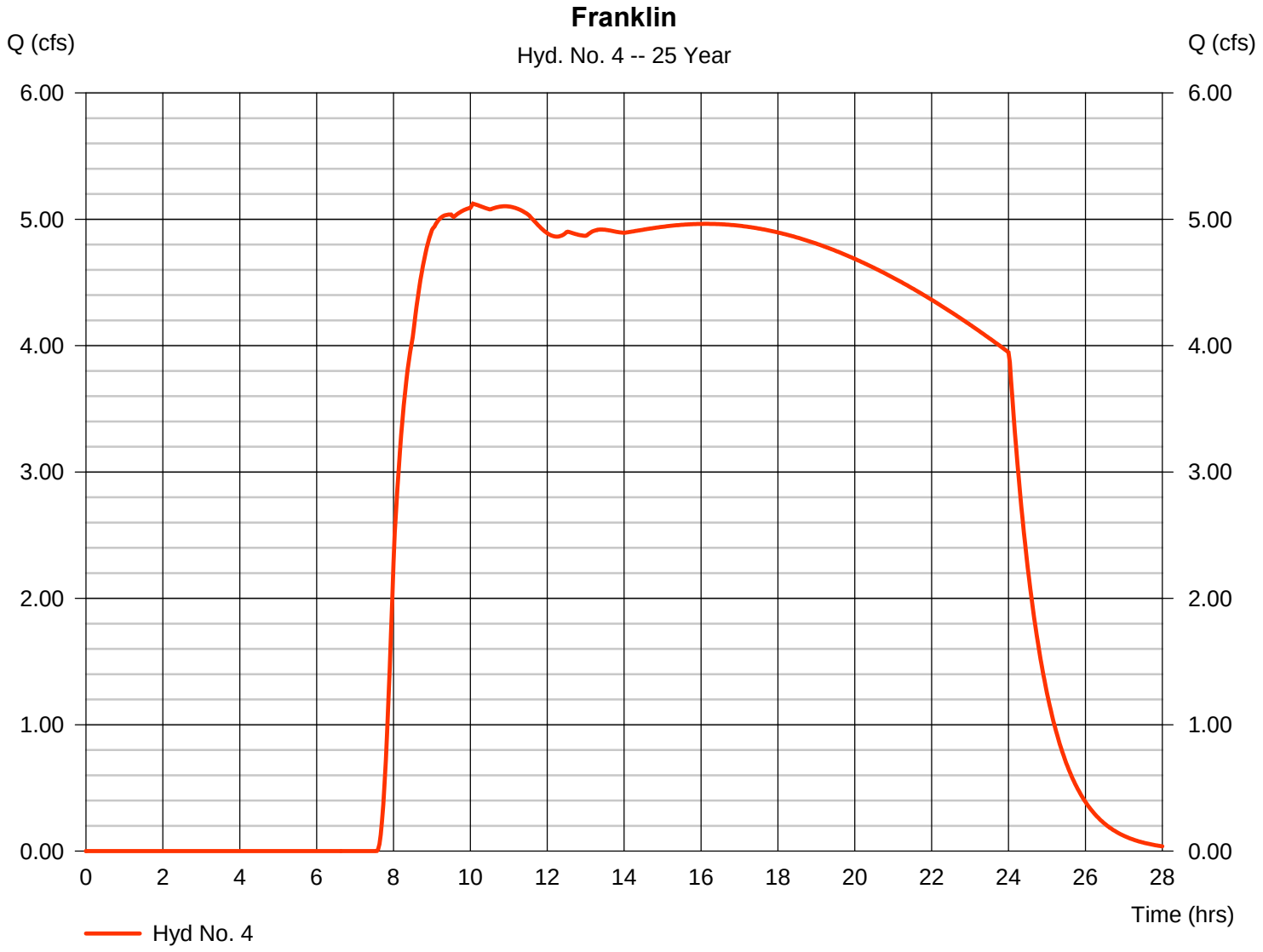
Total Travel Time, Tc ..... 50.50 min

Hydrograph Report

Hyd. No. 4

Franklin

Hydrograph type	=	SBUH Runoff	Peak discharge	=	5.123 cfs
Storm frequency	=	25 yrs	Time to peak	=	10.07 hrs
Time interval	=	2 min	Hyd. volume	=	285,994 cuft
Drainage area	=	73.800 ac	Curve number	=	54
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	51.40 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 4

Franklin

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 245.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 0.40		0.00		0.00		
Travel Time (min)	**= 37.06**	**+**	**0.00**	**+**	**0.00**	**=**	**37.06**
Shallow Concentrated Flow							
Flow length (ft)	= 1073.00		0.00		0.00		
Watercourse slope (%)	= 0.60		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.25		0.00		0.00		
Travel Time (min)	**= 14.31**	**+**	**0.00**	**+**	**0.00**	**=**	**14.31**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 51.40 min

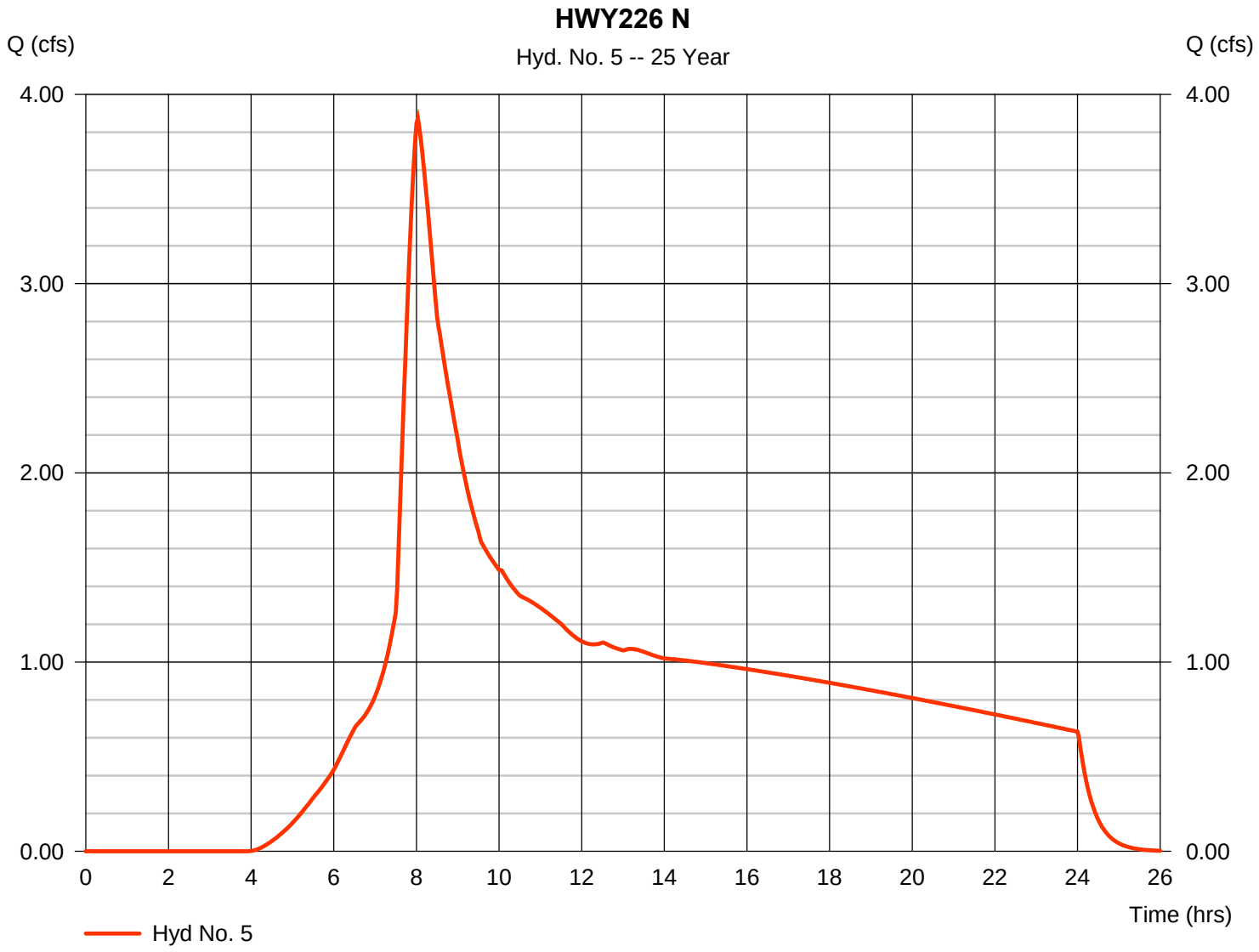
Hydrograph Report

Hyd. No. 5

HWY226 N

Hydrograph type	=	SBUH Runoff	Peak discharge	=	3.874 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	75,164 cuft
Drainage area	=	7.200 ac	Curve number	=	77*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.80 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(3.000 x 98) + (4.200 x 62)] / 7.200



TR55 Tc Worksheet

Hyd. No. 5

HWY226 N

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 200.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 21.84**	**+**	**0.00**	**+**	**0.00**	**=**	**21.84**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

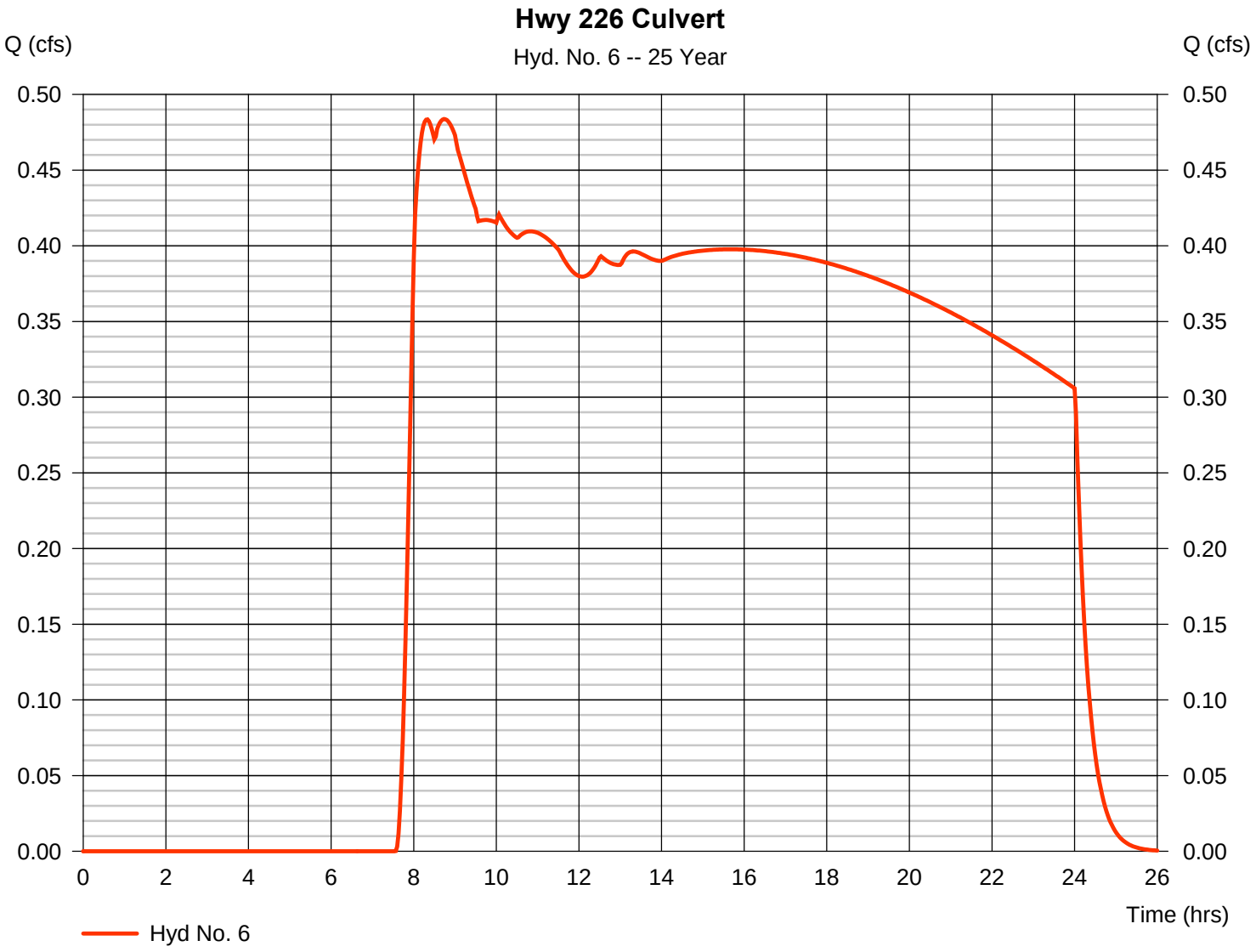
Total Travel Time, Tc ..... 21.80 min

Hydrograph Report

Hyd. No. 6

Hwy 226 Culvert

Hydrograph type	=	SBUH Runoff	Peak discharge	=	0.484 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.73 hrs
Time interval	=	2 min	Hyd. volume	=	22,864 cuft
Drainage area	=	5.900 ac	Curve number	=	54
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.50 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 6

Hwy 226 Culvert

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 150.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 13.15**	**+**	**0.00**	**+**	**0.00**	**=**	**13.15**
Shallow Concentrated Flow							
Flow length (ft)	= 430.00		0.00		0.00		
Watercourse slope (%)	= 0.70		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.35		0.00		0.00		
Travel Time (min)	**= 5.31**	**+**	**0.00**	**+**	**0.00**	**=**	**5.31**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 18.50 min

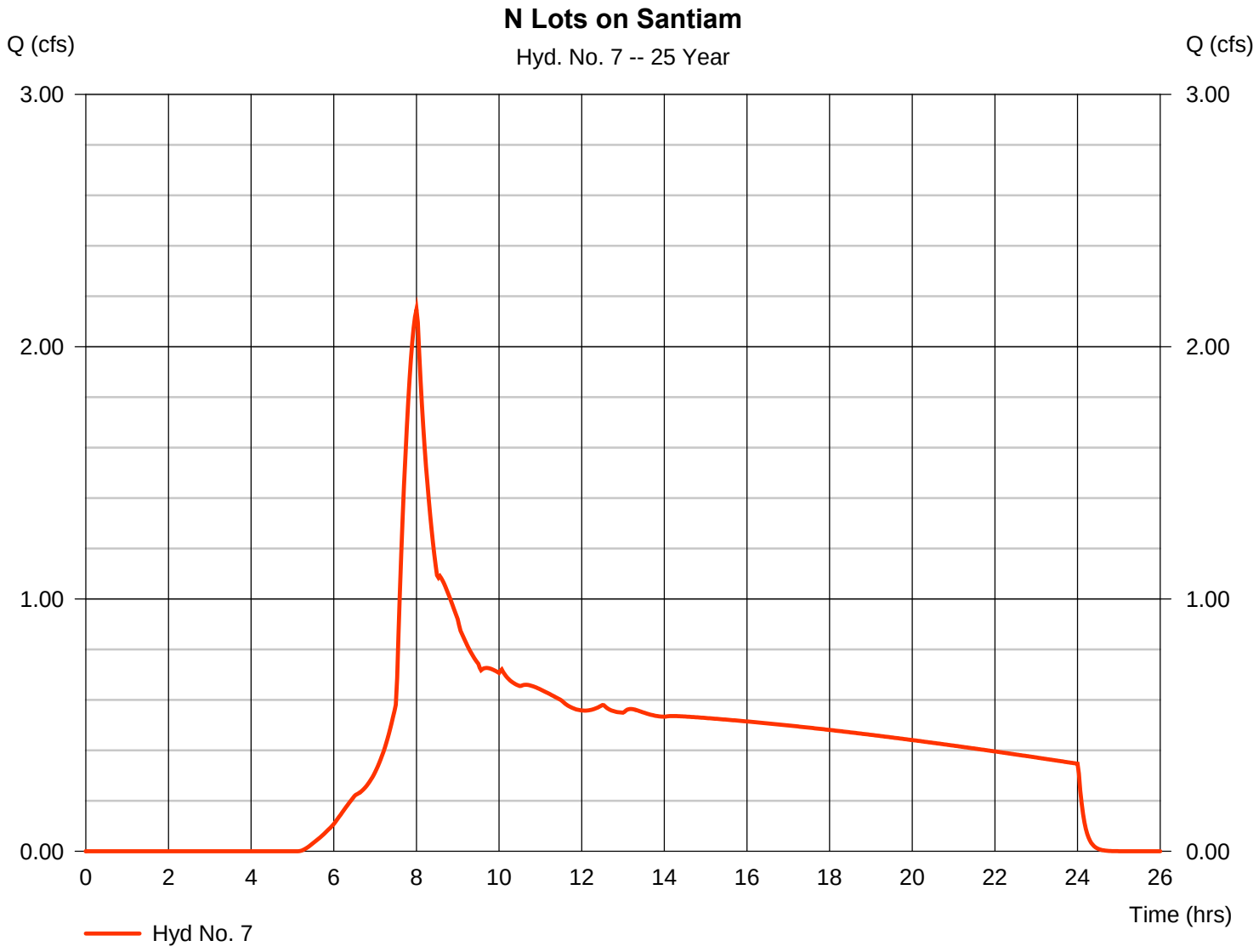
Hydrograph Report

Hyd. No. 7

N Lots on Santiam

Hydrograph type	=	SBUH Runoff	Peak discharge	=	2.147 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.00 hrs
Time interval	=	2 min	Hyd. volume	=	36,940 cuft
Drainage area	=	4.500 ac	Curve number	=	70*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.10 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(2.000 x 54) + (9.760 x 70)] / 4.500



TR55 Tc Worksheet

Hyd. No. 7

N Lots on Santiam

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 215.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 2.79		0.00		0.00		
Travel Time (min)	**= 15.35**	**+**	**0.00**	**+**	**0.00**	**=**	**15.35**
Shallow Concentrated Flow							
Flow length (ft)	= 500.00		0.00		0.00		
Watercourse slope (%)	= 0.20		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=0.72		0.00		0.00		
Travel Time (min)	**= 11.55**	**+**	**0.00**	**+**	**0.00**	**=**	**11.55**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

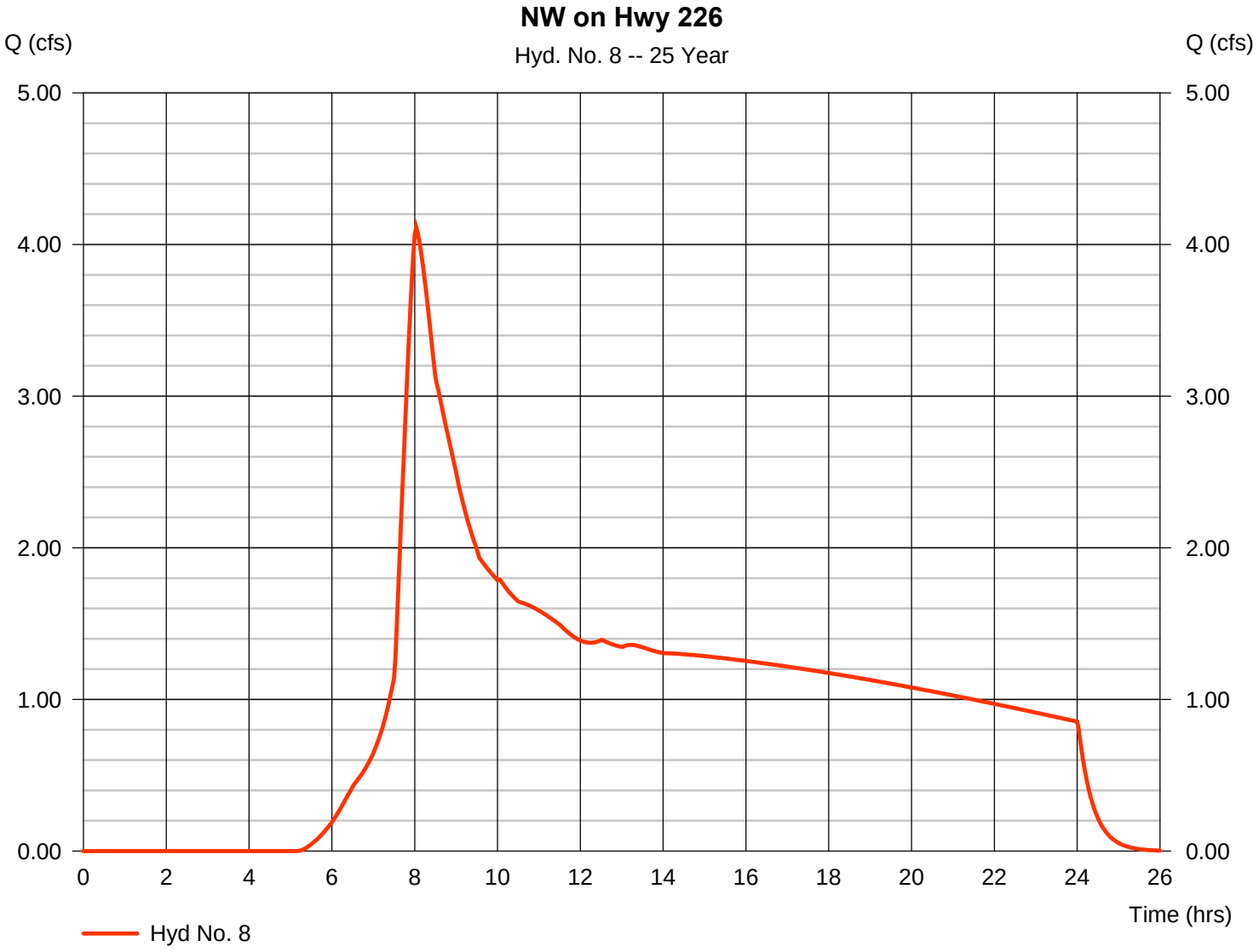
Total Travel Time, Tc ..... 8.10 min

Hydrograph Report

Hyd. No. 8

NW on Hwy 226

Hydrograph type	=	SBUH Runoff	Peak discharge	=	4.116 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	89,478 cuft
Drainage area	=	10.900 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.30 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 8

NW on Hwy 226

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 120.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 0.80		0.00		0.00		
Travel Time (min)	**= 15.87**	**+**	**0.00**	**+**	**0.00**	**=**	**15.87**
Shallow Concentrated Flow							
Flow length (ft)	= 518.00		0.00		0.00		
Watercourse slope (%)	= 0.60		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=1.57		0.00		0.00		
Travel Time (min)	**= 5.48**	**+**	**0.00**	**+**	**0.00**	**=**	**5.48**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

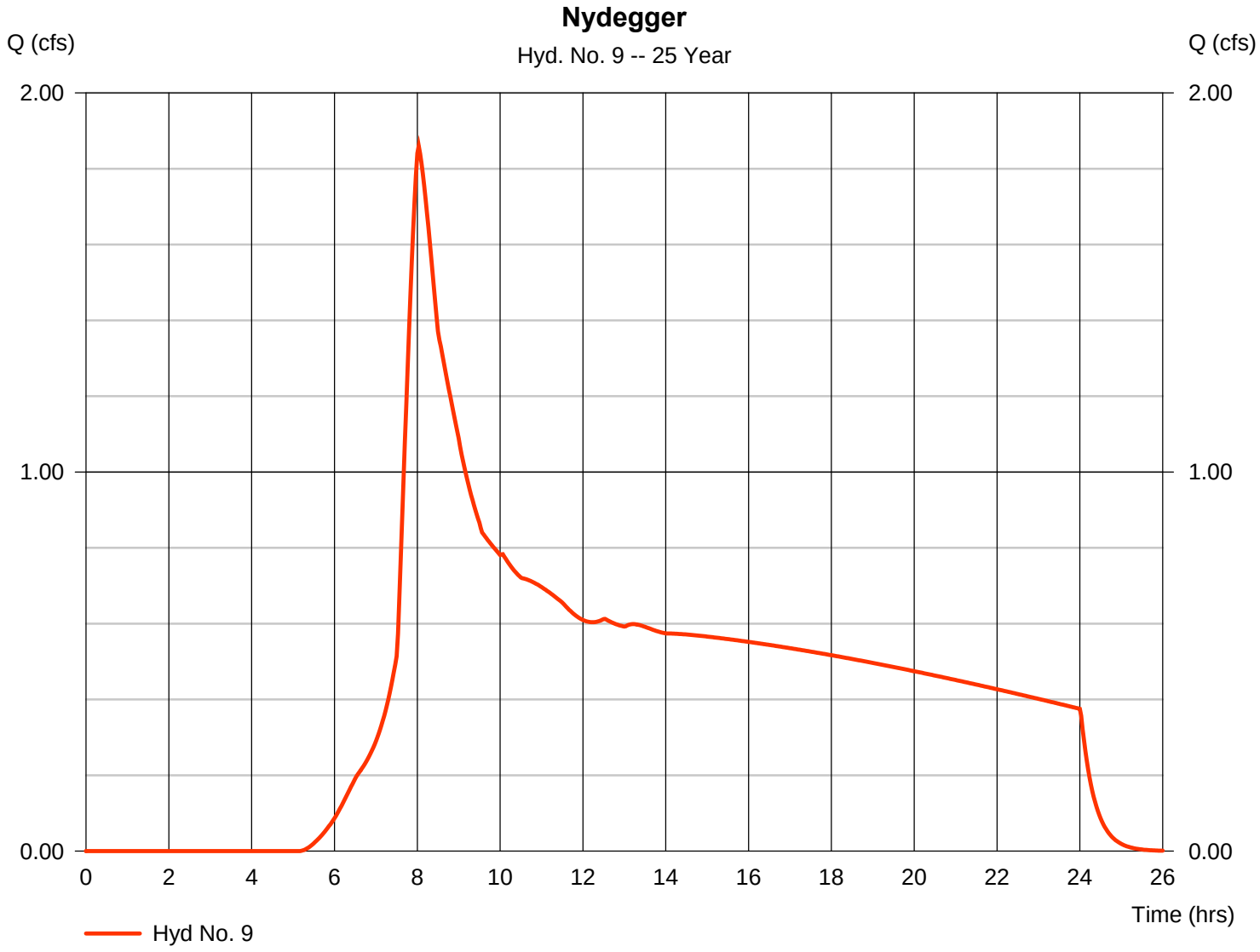
Total Travel Time, Tc ..... 21.30 min

Hydrograph Report

Hyd. No. 9

Nydegger

Hydrograph type	=	SBUH Runoff	Peak discharge	=	1.860 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	39,403 cuft
Drainage area	=	4.800 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	19.80 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 9

Nydegger

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 130.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 0.80		0.00		0.00		
Travel Time (min)	**= 16.92**	**+**	**0.00**	**+**	**0.00**	**=**	**16.92**
Shallow Concentrated Flow							
Flow length (ft)	= 200.00		0.00		0.00		
Watercourse slope (%)	= 0.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.14		0.00		0.00		
Travel Time (min)	**= 2.92**	**+**	**0.00**	**+**	**0.00**	**=**	**2.92**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

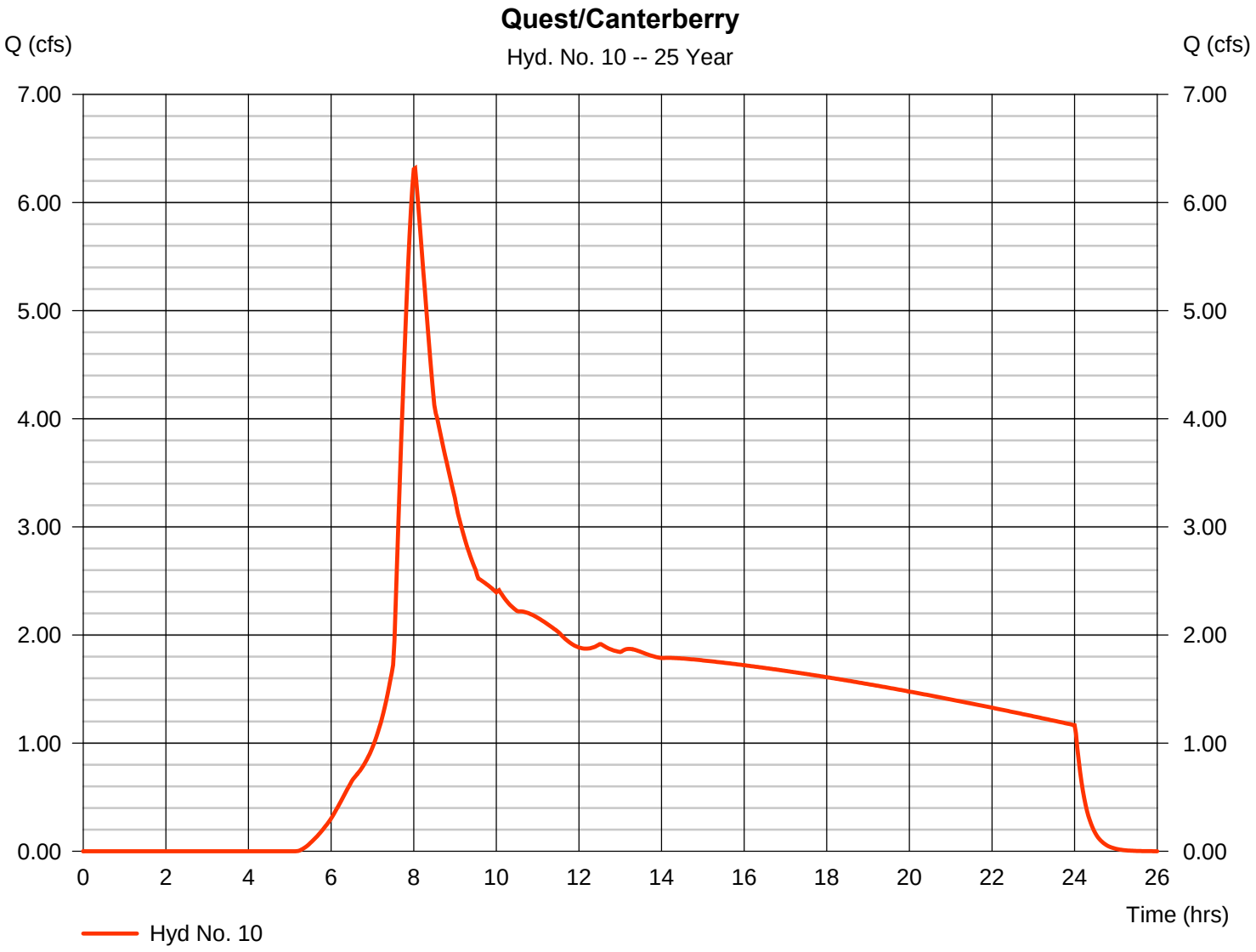
Total Travel Time, Tc ..... 19.80 min

Hydrograph Report

Hyd. No. 10

Quest/Canterberry

Hydrograph type	=	SBUH Runoff	Peak discharge	=	6.317 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	123,134 cuft
Drainage area	=	15.000 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	15.00 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 10

Quest/Canterberry

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 181.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 2.10		0.00		0.00		
Travel Time (min)	**= 14.98**	**+**	**0.00**	**+**	**0.00**	**=**	**14.98**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

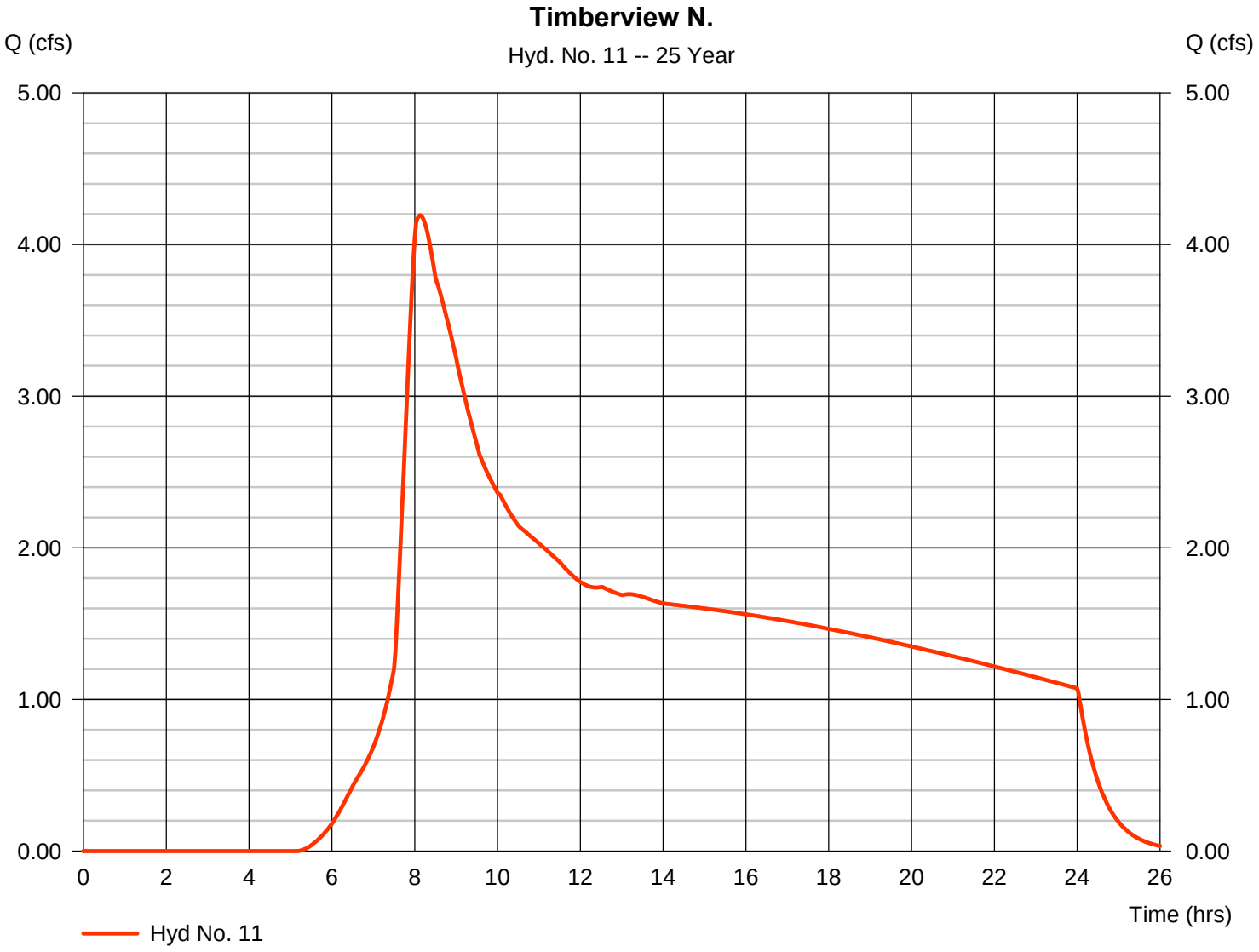
Total Travel Time, Tc ..... 15.00 min

Hydrograph Report

Hyd. No. 11

Timberview N.

Hydrograph type	=	SBUH Runoff	Peak discharge	=	4.193 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.13 hrs
Time interval	=	2 min	Hyd. volume	=	110,821 cuft
Drainage area	=	13.500 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	34.30 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 11

Timberview N.

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 294.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 0.70		0.00		0.00		
Travel Time (min)	**= 34.28**	**+**	**0.00**	**+**	**0.00**	**=**	**34.28**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

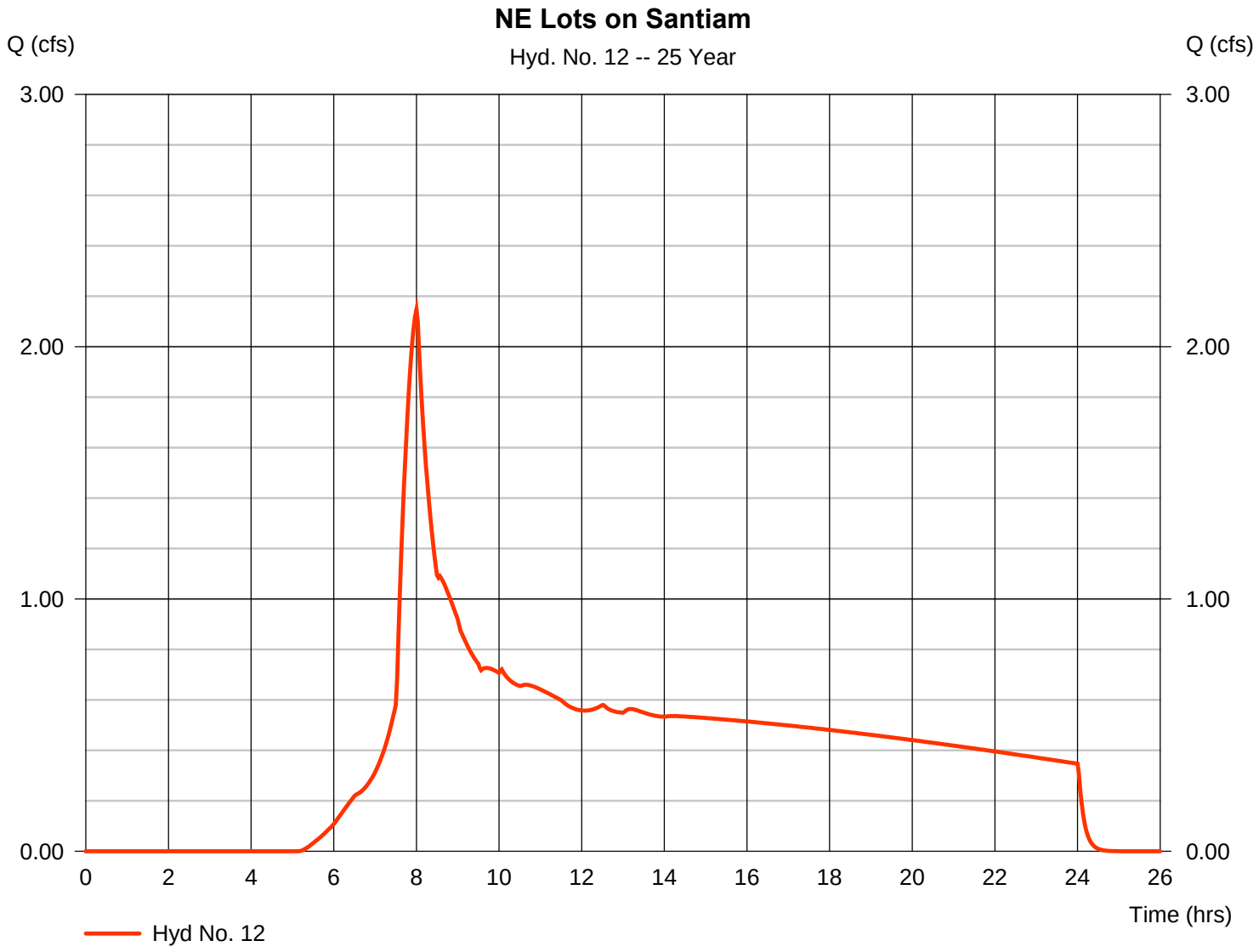
Total Travel Time, Tc ..... 34.30 min

Hydrograph Report

Hyd. No. 12

NE Lots on Santiam

Hydrograph type	=	SBUH Runoff	Peak discharge	=	2.147 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.00 hrs
Time interval	=	2 min	Hyd. volume	=	36,940 cuft
Drainage area	=	4.500 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.10 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 12

NE Lots on Santiam

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 168.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 8.33		0.00		0.00		
Travel Time (min)	**= 8.14**	**+**	**0.00**	**+**	**0.00**	**=**	**8.14**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

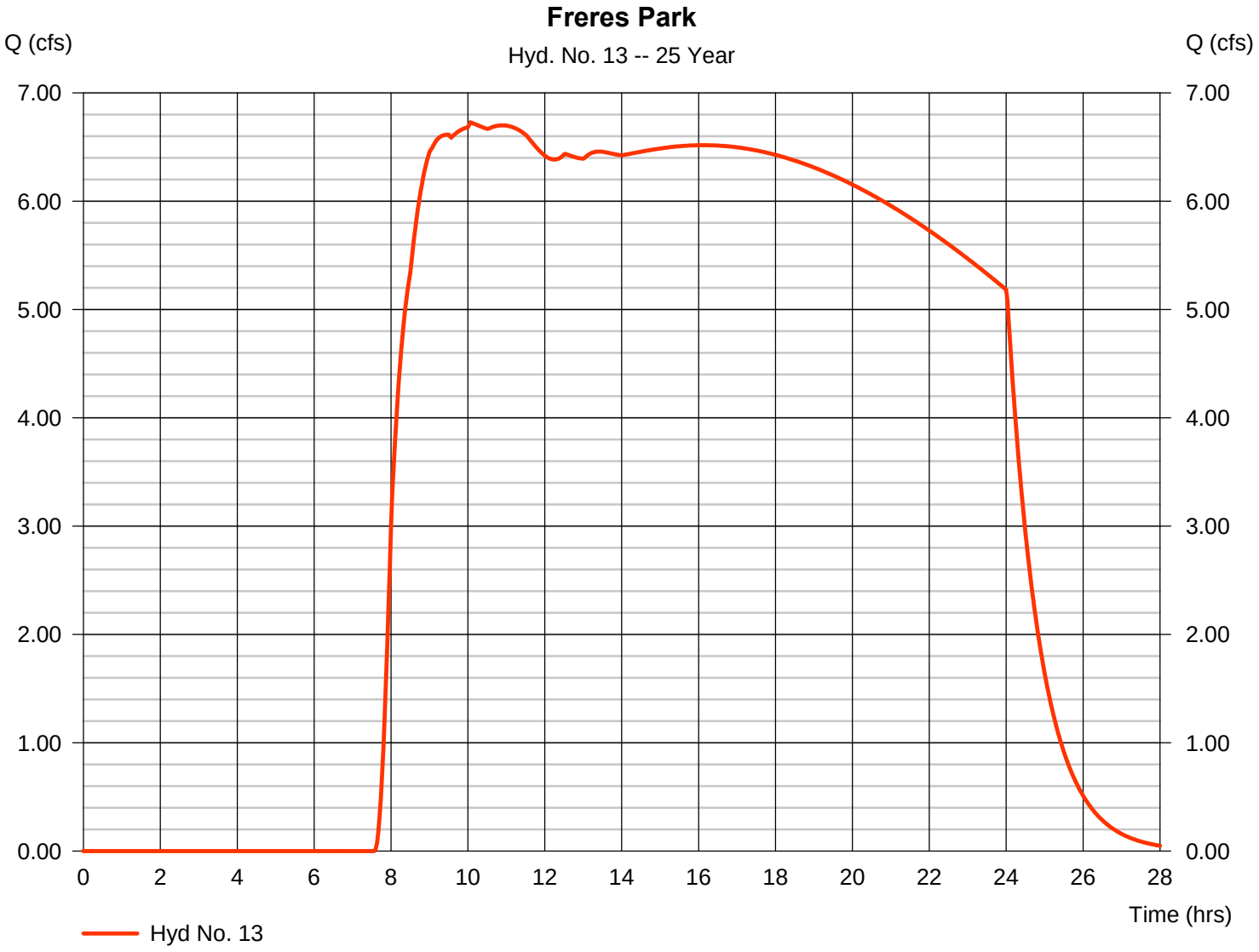
Total Travel Time, Tc ..... 8.10 min

Hydrograph Report

Hyd. No. 13

Freres Park

Hydrograph type	=	SBUH Runoff	Peak discharge	=	6.727 cfs
Storm frequency	=	25 yrs	Time to peak	=	10.07 hrs
Time interval	=	2 min	Hyd. volume	=	375,512 cuft
Drainage area	=	96.900 ac	Curve number	=	54
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	51.40 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 13

Freres Park

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 250.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 0.80		0.00		0.00		
Travel Time (min)	**= 41.57**	**+**	**0.00**	**+**	**0.00**	**=**	**41.57**
Shallow Concentrated Flow							
Flow length (ft)	= 950.00		0.00		0.00		
Watercourse slope (%)	= 1.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.61		0.00		0.00		
Travel Time (min)	**= 9.81**	**+**	**0.00**	**+**	**0.00**	**=**	**9.81**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 51.40 min

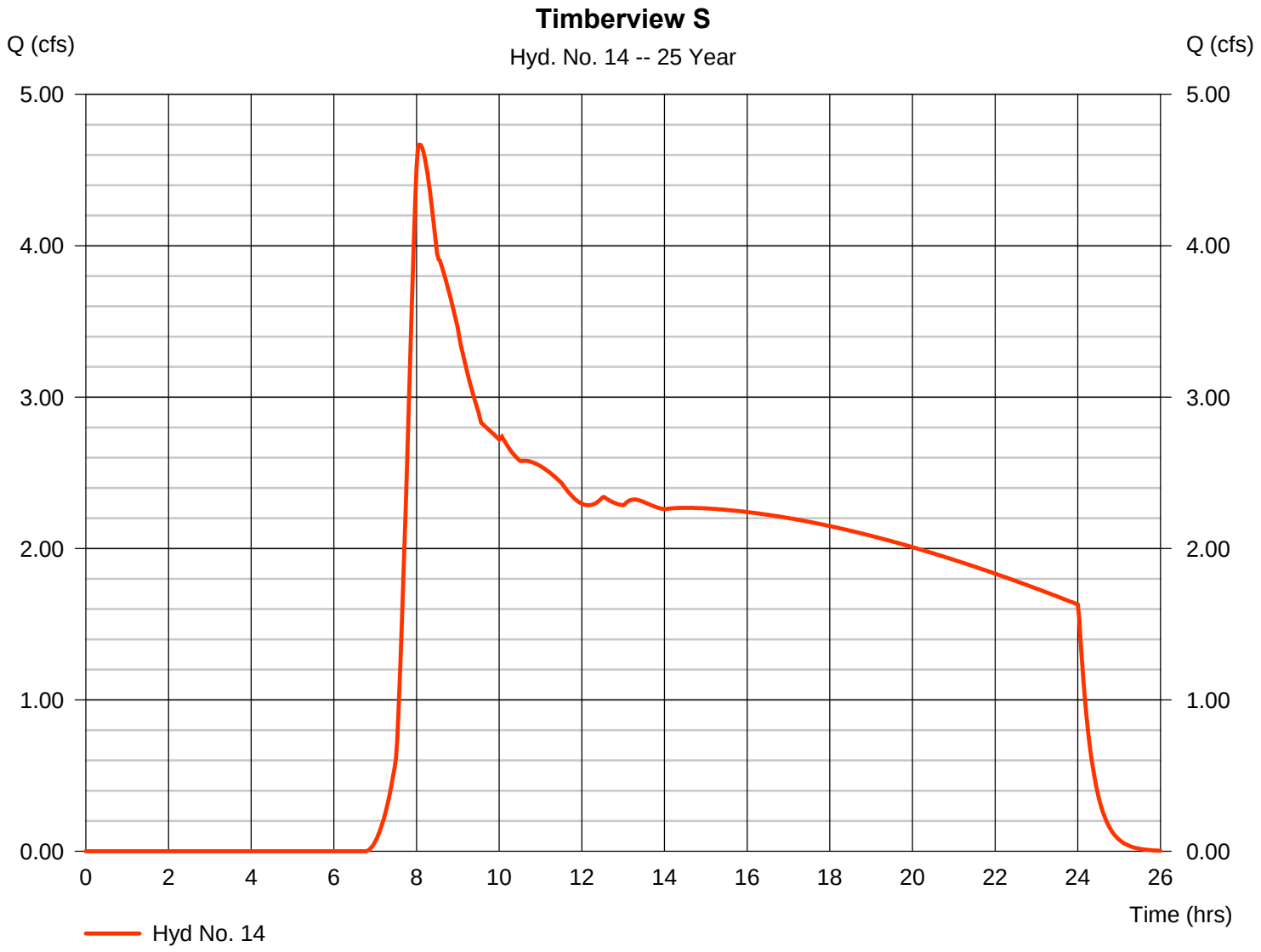
Hydrograph Report

Hyd. No. 14

Timberview S

Hydrograph type	=	SBUH Runoff	Peak discharge	=	4.667 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.07 hrs
Time interval	=	2 min	Hyd. volume	=	140,409 cuft
Drainage area	=	26.140 ac	Curve number	=	60*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	19.30 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = + (9.000 x 70) + (17.140 x 54)] / 26.140



TR55 Tc Worksheet

Hyd. No. 14

Timberview S

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 112.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 0.90		0.00		0.00		
Travel Time (min)	**= 14.32**	**+**	**0.00**	**+**	**0.00**	**=**	**14.32**
Shallow Concentrated Flow							
Flow length (ft)	= 520.00		0.00		0.00		
Watercourse slope (%)	= 1.15		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.73		0.00		0.00		
Travel Time (min)	**= 5.01**	**+**	**0.00**	**+**	**0.00**	**=**	**5.01**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 19.30 min

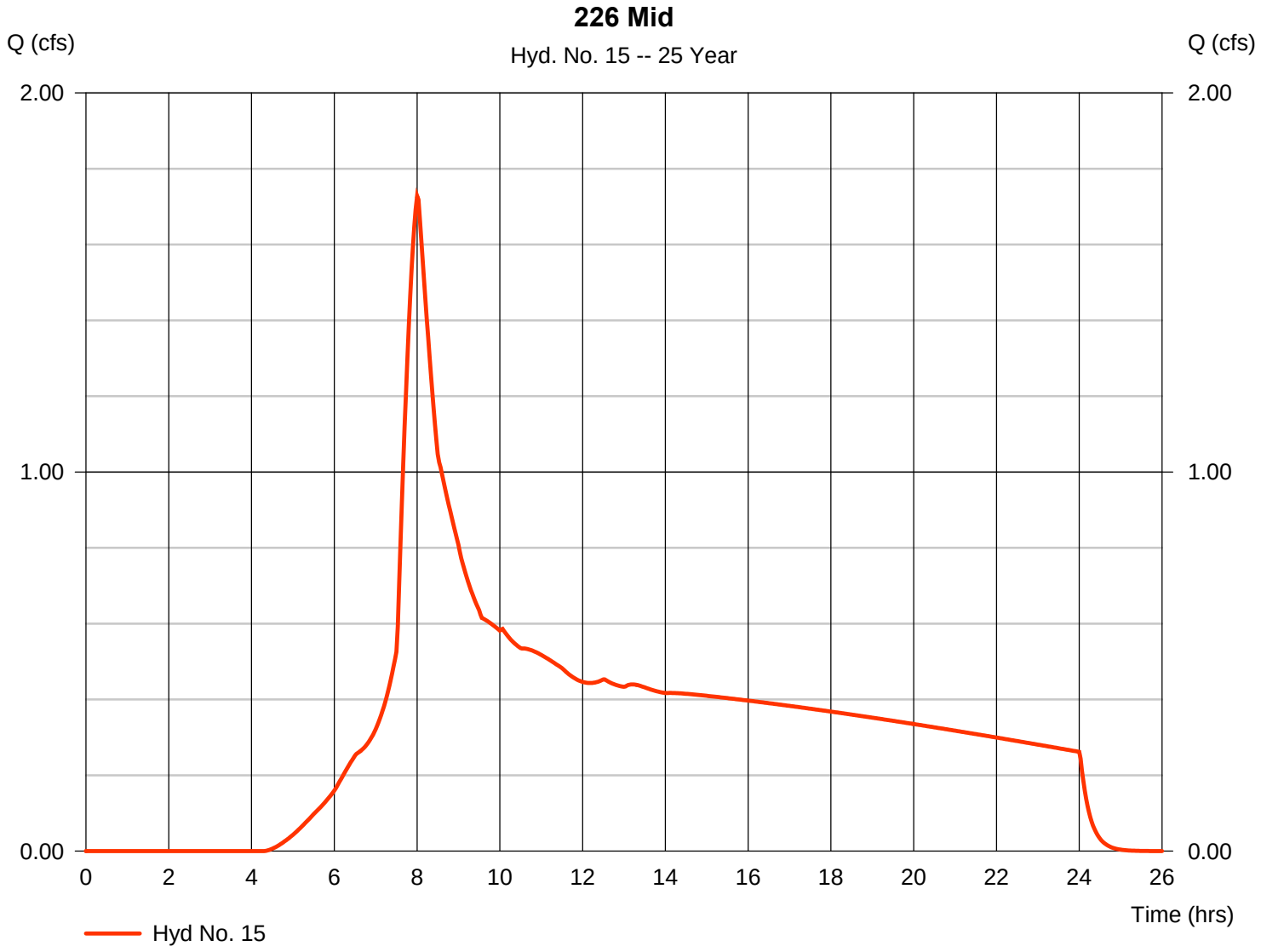
Hydrograph Report

Hyd. No. 15

226 Mid

Hydrograph type	=	SBUH Runoff	Peak discharge	=	1.728 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.00 hrs
Time interval	=	2 min	Hyd. volume	=	30,323 cuft
Drainage area	=	3.100 ac	Curve number	=	75*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.00 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = + (1.500 x 98) + (1.600 x 54)] / 3.100



TR55 Tc Worksheet

Hyd. No. 15

226 Mid

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 150.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 13.15**	**+**	**0.00**	**+**	**0.00**	**=**	**13.15**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 9.00		0.00		0.00		
Wetted perimeter (ft)	= 8.00		0.00		0.00		
Channel slope (%)	= 2.00		0.00		0.00		
Manning's n-value	= 0.011		0.015		0.015		
Velocity (ft/s)	=20.73						
			0.00				
					0.00		
Flow length (ft)	({0})1100.0		0.0		0.0		
Travel Time (min)	**= 0.88**	**+**	**0.00**	**+**	**0.00**	**=**	**0.88**

Total Travel Time, Tc ..... 14.00 min

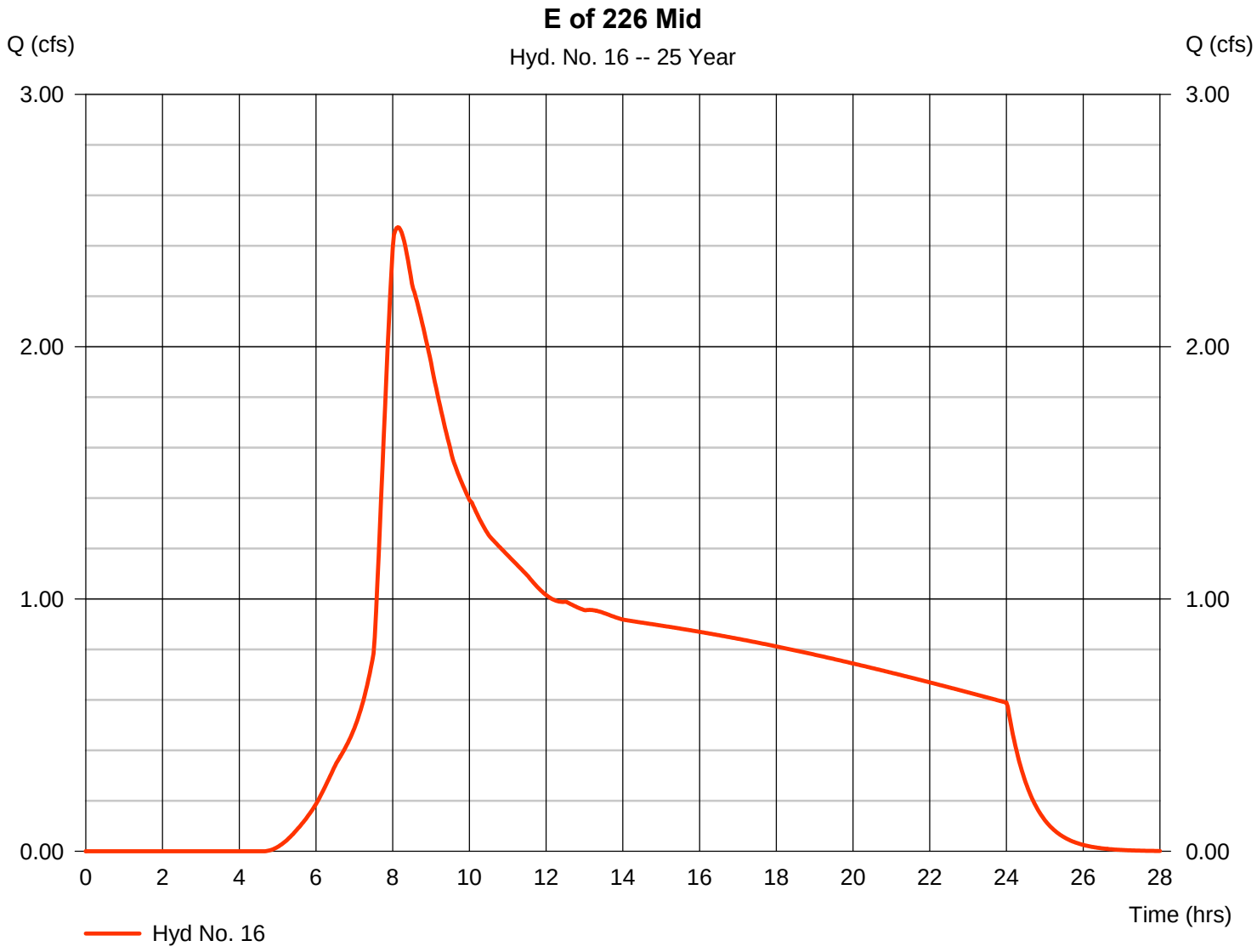
Hydrograph Report

Hyd. No. 16

E of 226 Mid

Hydrograph type	=	SBUH Runoff	Peak discharge	=	2.474 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.13 hrs
Time interval	=	2 min	Hyd. volume	=	63,983 cuft
Drainage area	=	7.000 ac	Curve number	=	73*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	37.80 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(3.000 x 98) + (4.000 x 54)] / 7.000



TR55 Tc Worksheet

Hyd. No. 16

E of 226 Mid

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 286.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 29.07**	**+**	**0.00**	**+**	**0.00**	**=**	**29.07**
Shallow Concentrated Flow							
Flow length (ft)	= 657.00		0.00		0.00		
Watercourse slope (%)	= 0.60		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.25		0.00		0.00		
Travel Time (min)	**= 8.76**	**+**	**0.00**	**+**	**0.00**	**=**	**8.76**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 37.80 min

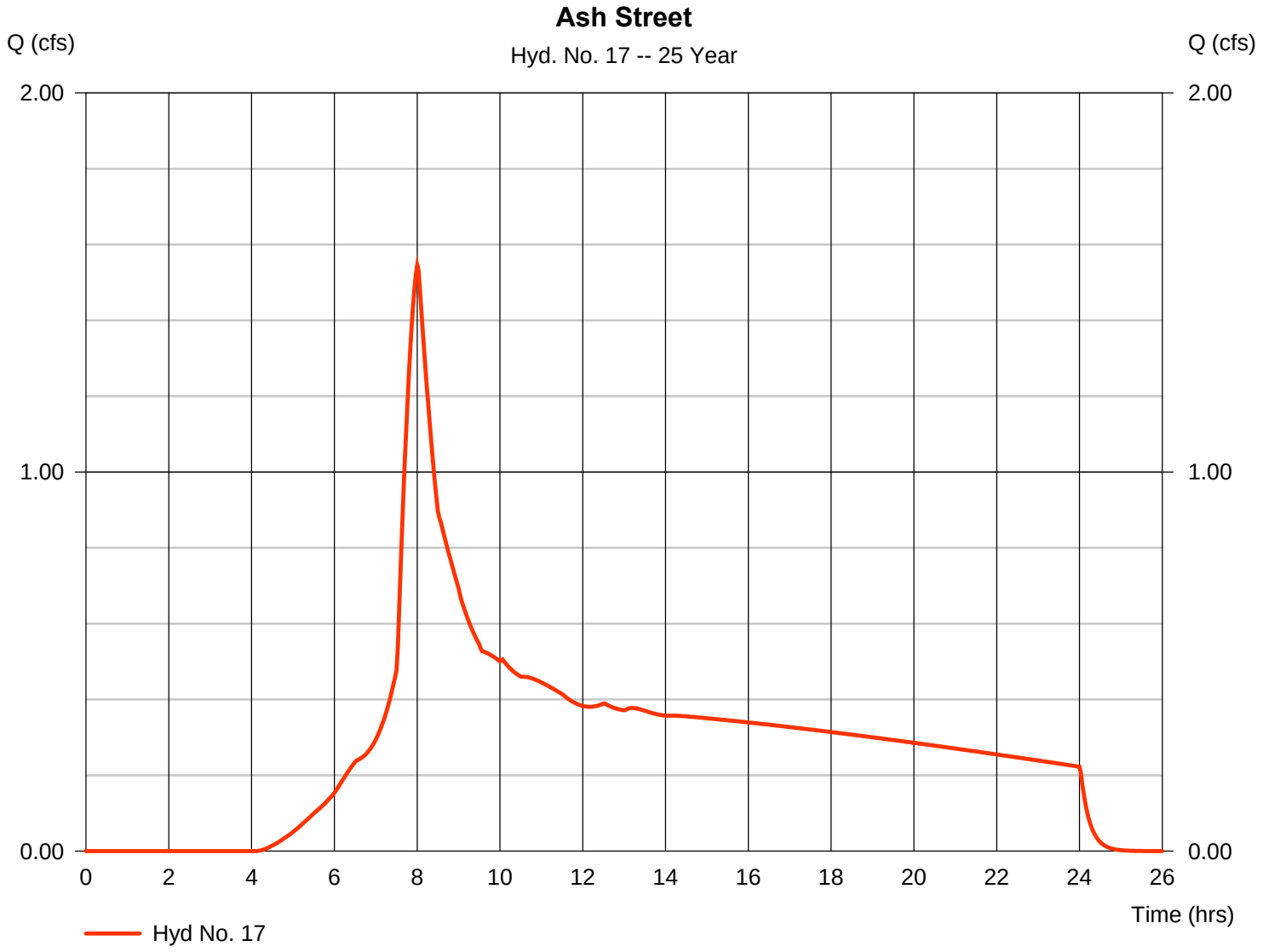
Hydrograph Report

Hyd. No. 17

Ash Street

Hydrograph type	=	SBUH Runoff	Peak discharge	=	1.545 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.00 hrs
Time interval	=	2 min	Hyd. volume	=	26,282 cuft
Drainage area	=	2.600 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.00 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = + (1.300 x 98) + (1.300 x 54)] / 2.600



TR55 Tc Worksheet

Hyd. No. 17

Ash Street

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 75.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 9.96**	**+**	**0.00**	**+**	**0.00**	**=**	**9.96**
Shallow Concentrated Flow							
Flow length (ft)	= 370.00		0.00		0.00		
Watercourse slope (%)	= 1.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=2.03		0.00		0.00		
Travel Time (min)	**= 3.03**	**+**	**0.00**	**+**	**0.00**	**=**	**3.03**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

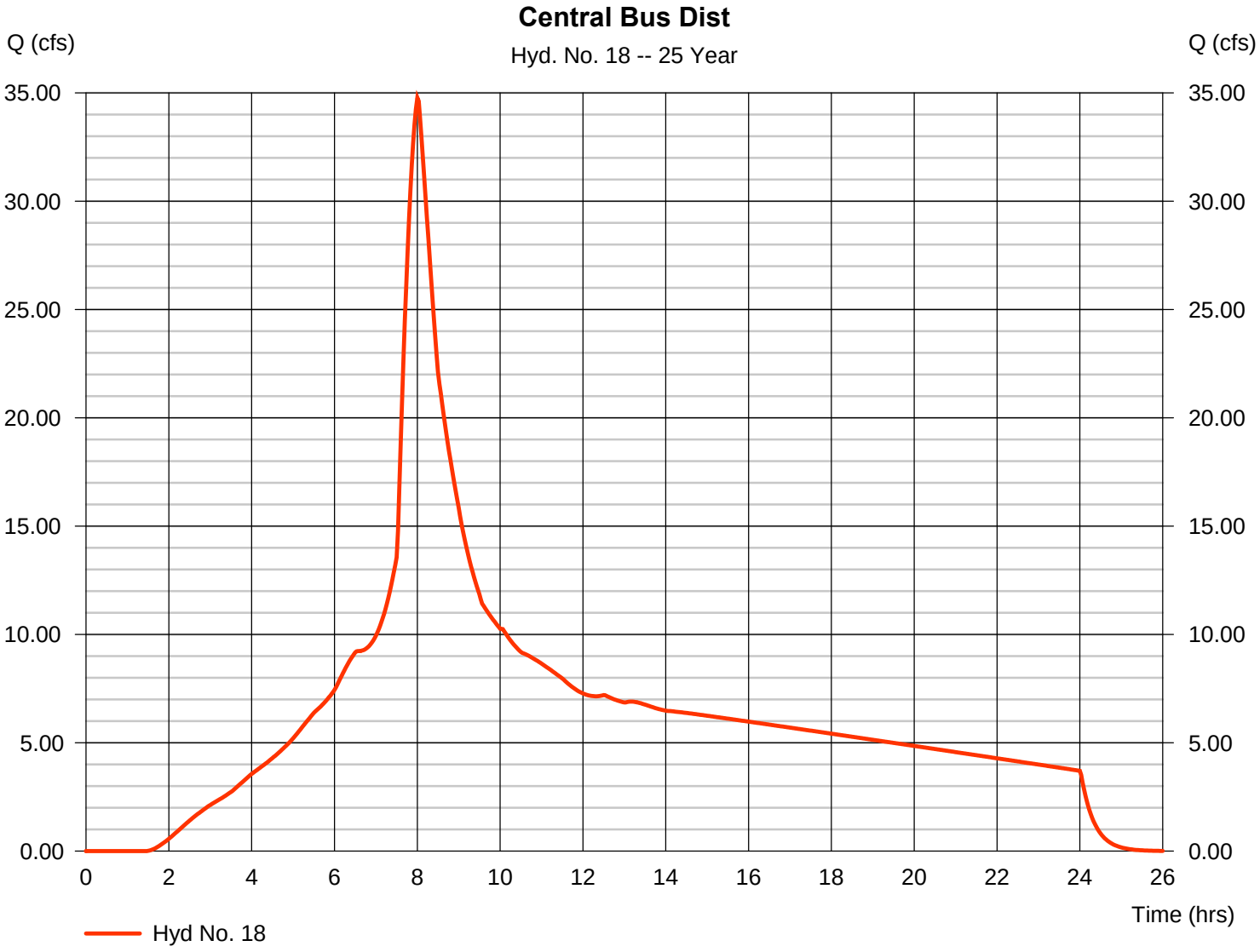
Total Travel Time, Tc ..... 13.00 min

Hydrograph Report

Hyd. No. 18

Central Bus Dist

Hydrograph type	=	SBUH Runoff	Peak discharge	=	34.78 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.00 hrs
Time interval	=	2 min	Hyd. volume	=	583,860 cuft
Drainage area	=	36.700 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	19.10 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 18

Central Bus Dist

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 191.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 1.60		0.00		0.00		
Travel Time (min)	**= 17.44**	**+**	**0.00**	**+**	**0.00**	**=**	**17.44**
Shallow Concentrated Flow							
Flow length (ft)	= 270.00		0.00		0.00		
Watercourse slope (%)	= 1.80		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=2.73		0.00		0.00		
Travel Time (min)	**= 1.65**	**+**	**0.00**	**+**	**0.00**	**=**	**1.65**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

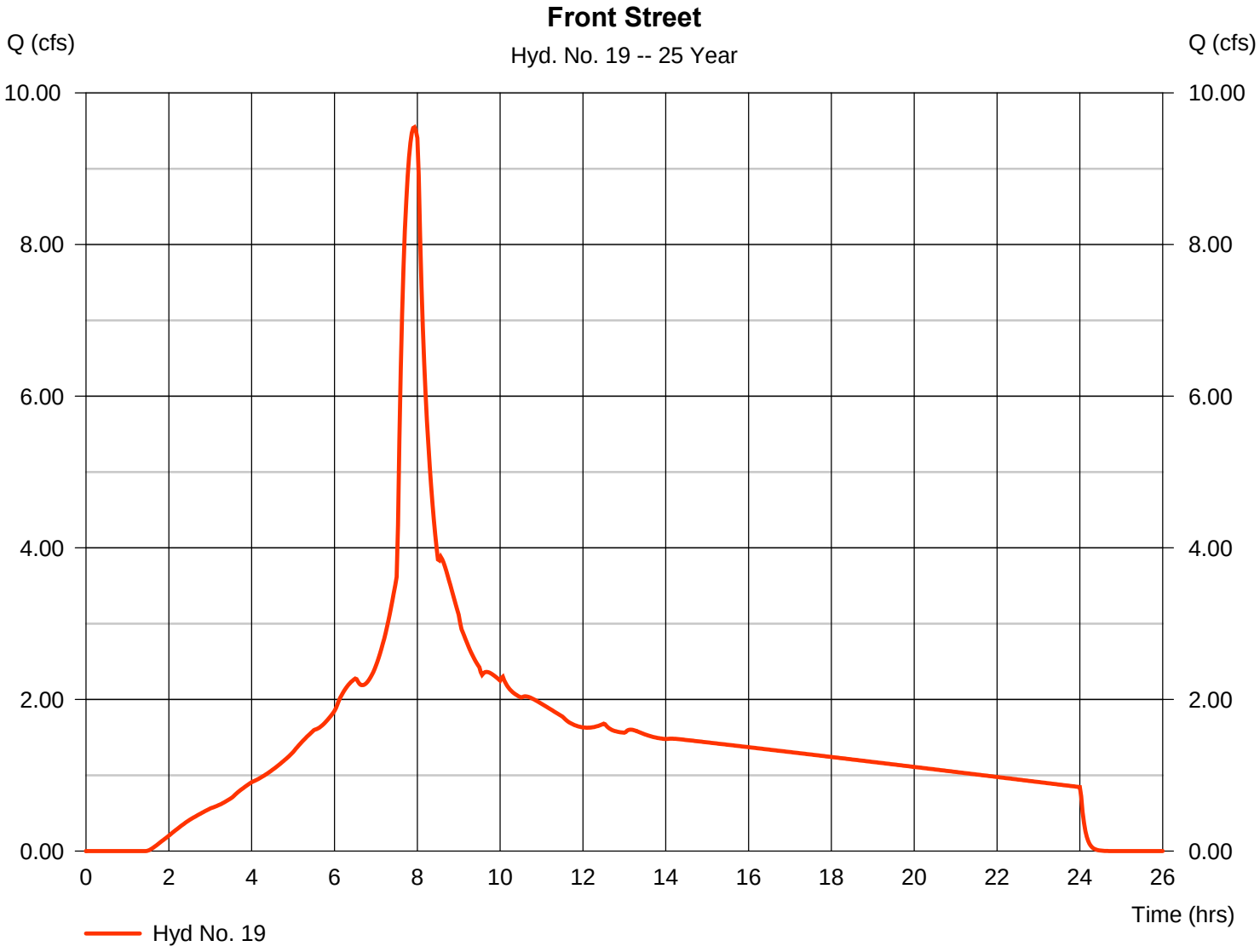
Total Travel Time, Tc ..... 19.10 min

Hydrograph Report

Hyd. No. 19

Front Street

Hydrograph type	=	SBUH Runoff	Peak discharge	=	9.547 cfs
Storm frequency	=	25 yrs	Time to peak	=	7.93 hrs
Time interval	=	2 min	Hyd. volume	=	135,226 cuft
Drainage area	=	8.500 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 19

Front Street

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 5.46**	**+**	**0.00**	**+**	**0.00**	**=**	**5.46**
Shallow Concentrated Flow							
Flow length (ft)	= 120.00		0.00		0.00		
Watercourse slope (%)	= 3.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=3.52		0.00		0.00		
Travel Time (min)	**= 0.57**	**+**	**0.00**	**+**	**0.00**	**=**	**0.57**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

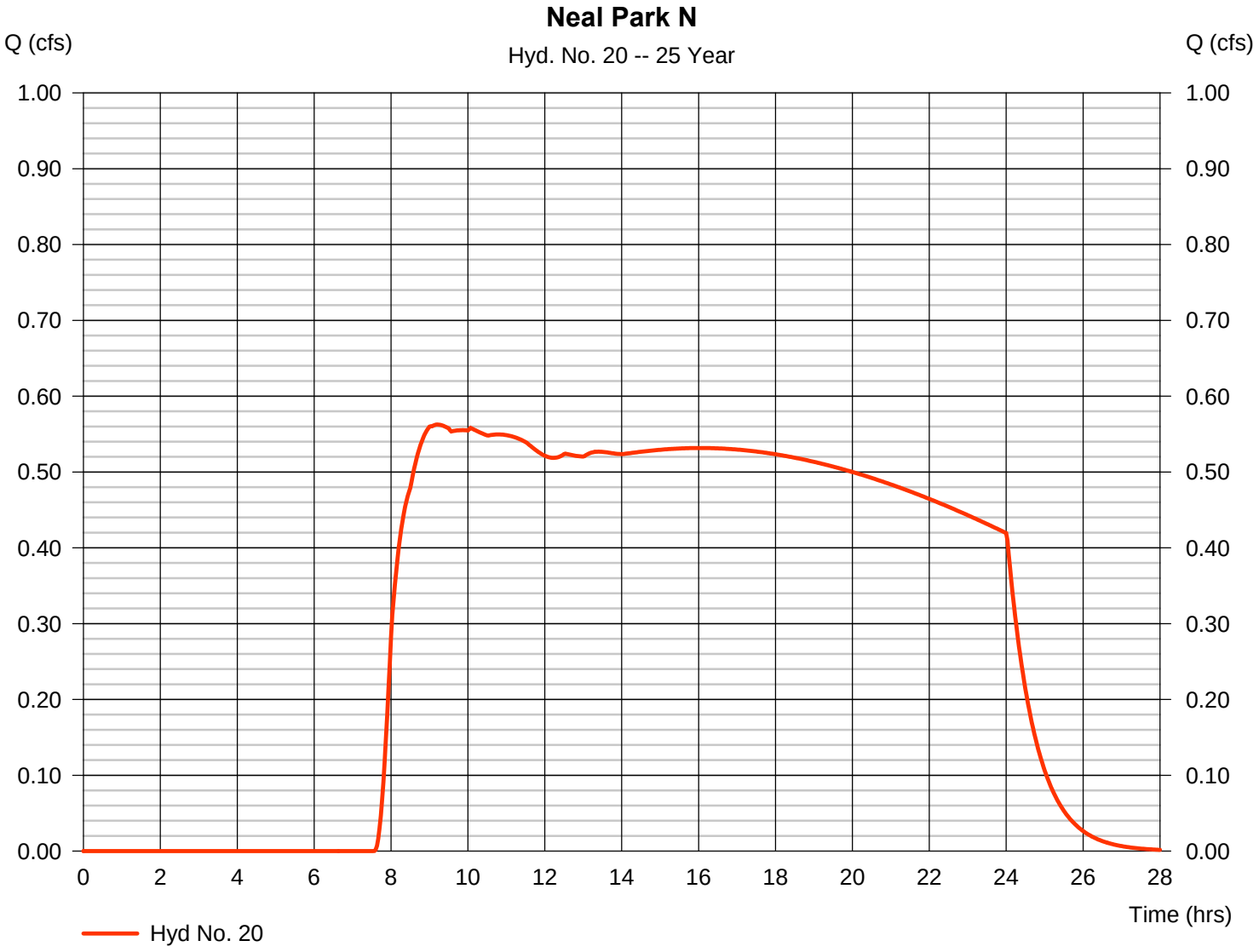
Total Travel Time, Tc ..... 6.00 min

Hydrograph Report

Hyd. No. 20

Neal Park N

Hydrograph type	= SBUH Runoff	Peak discharge	= 0.563 cfs
Storm frequency	= 25 yrs	Time to peak	= 9.20 hrs
Time interval	= 2 min	Hyd. volume	= 30,615 cuft
Drainage area	= 7.900 ac	Curve number	= 54
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 43.10 min
Total precip.	= 5.30 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a



TR55 Tc Worksheet

Hyd. No. 20

Neal Park N

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 200.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 0.25		0.00		0.00		
Travel Time (min)	**= 38.02**	**+**	**0.00**	**+**	**0.00**	**=**	**38.02**
Shallow Concentrated Flow							
Flow length (ft)	= 550.00		0.00		0.00		
Watercourse slope (%)	= 1.25		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.80		0.00		0.00		
Travel Time (min)	**= 5.08**	**+**	**0.00**	**+**	**0.00**	**=**	**5.08**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

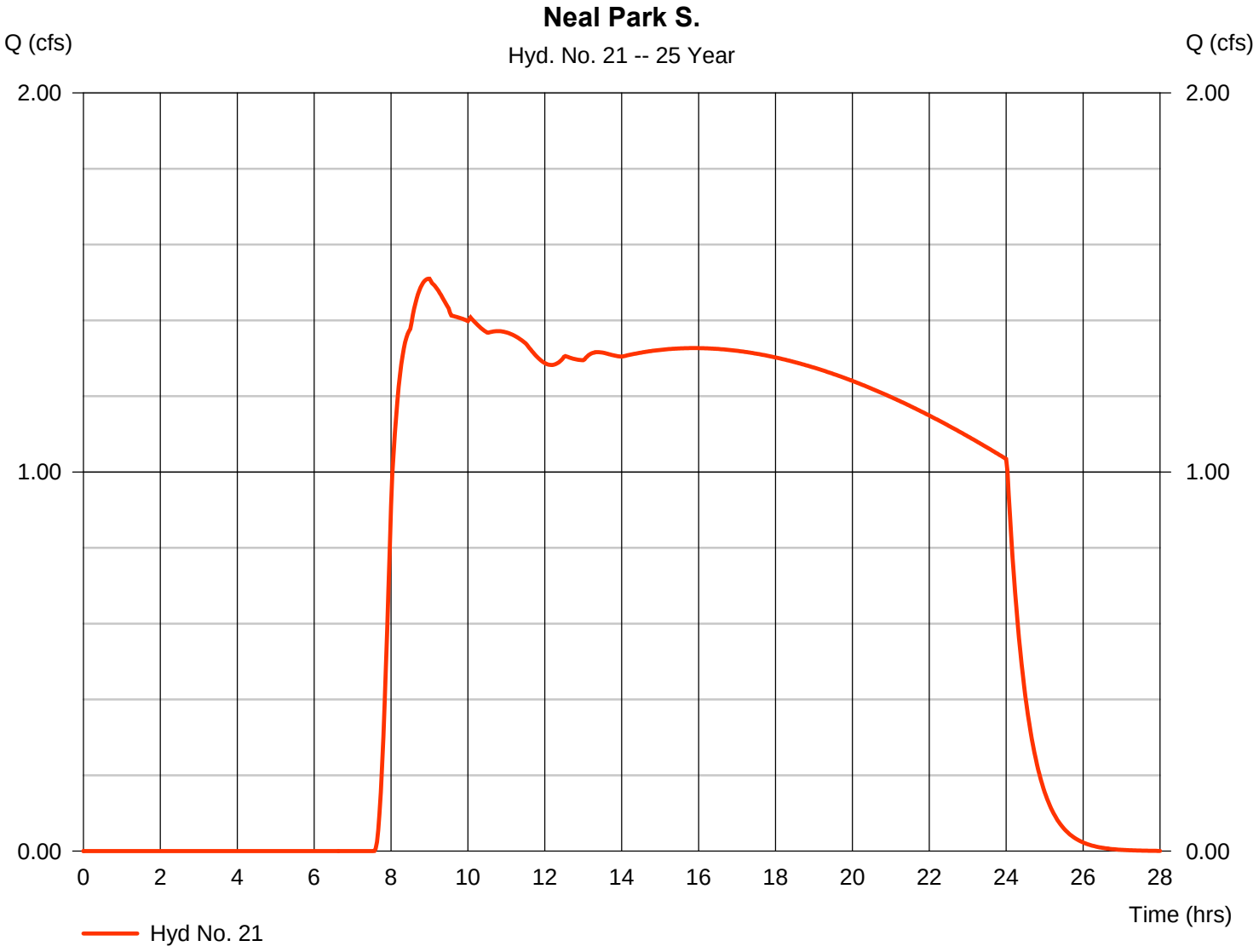
Total Travel Time, Tc ..... 43.10 min

Hydrograph Report

Hyd. No. 21

Neal Park S.

Hydrograph type	=	SBUH Runoff	Peak discharge	=	1.510 cfs
Storm frequency	=	25 yrs	Time to peak	=	9.00 hrs
Time interval	=	2 min	Hyd. volume	=	76,343 cuft
Drainage area	=	19.700 ac	Curve number	=	54
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	31.20 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 21

Neal Park S.

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 200.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 21.84**	**+**	**0.00**	**+**	**0.00**	**=**	**21.84**
Shallow Concentrated Flow							
Flow length (ft)	= 700.00		0.00		0.00		
Watercourse slope (%)	= 0.60		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.25		0.00		0.00		
Travel Time (min)	**= 9.34**	**+**	**0.00**	**+**	**0.00**	**=**	**9.34**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 31.20 min

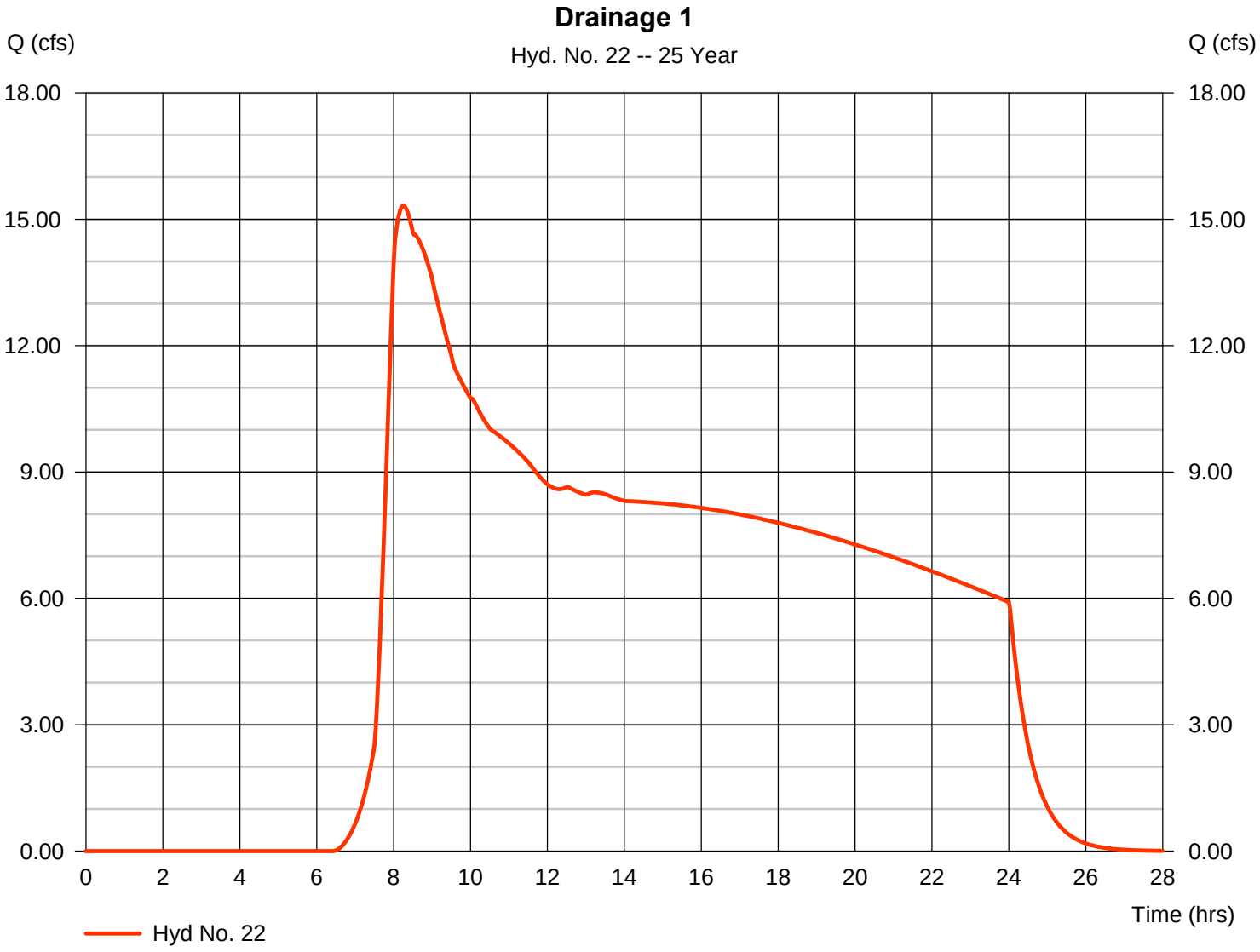
Hydrograph Report

Hyd. No. 22

Drainage 1

Hydrograph type	=	SBUH Runoff	Peak discharge	=	15.32 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.27 hrs
Time interval	=	2 min	Hyd. volume	=	522,631 cuft
Drainage area	=	88.500 ac	Curve number	=	62*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	34.20 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(44.000 x 54) + (44.500 x 70)] / 88.500



TR55 Tc Worksheet

Hyd. No. 22

Drainage 1

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 200.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 0.50		0.00		0.00		
Travel Time (min)	**= 28.82**	**+**	**0.00**	**+**	**0.00**	**=**	**28.82**
Shallow Concentrated Flow							
Flow length (ft)	= 300.00		0.00		0.00		
Watercourse slope (%)	= 0.33		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=0.93		0.00		0.00		
Travel Time (min)	**= 5.39**	**+**	**0.00**	**+**	**0.00**	**=**	**5.39**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

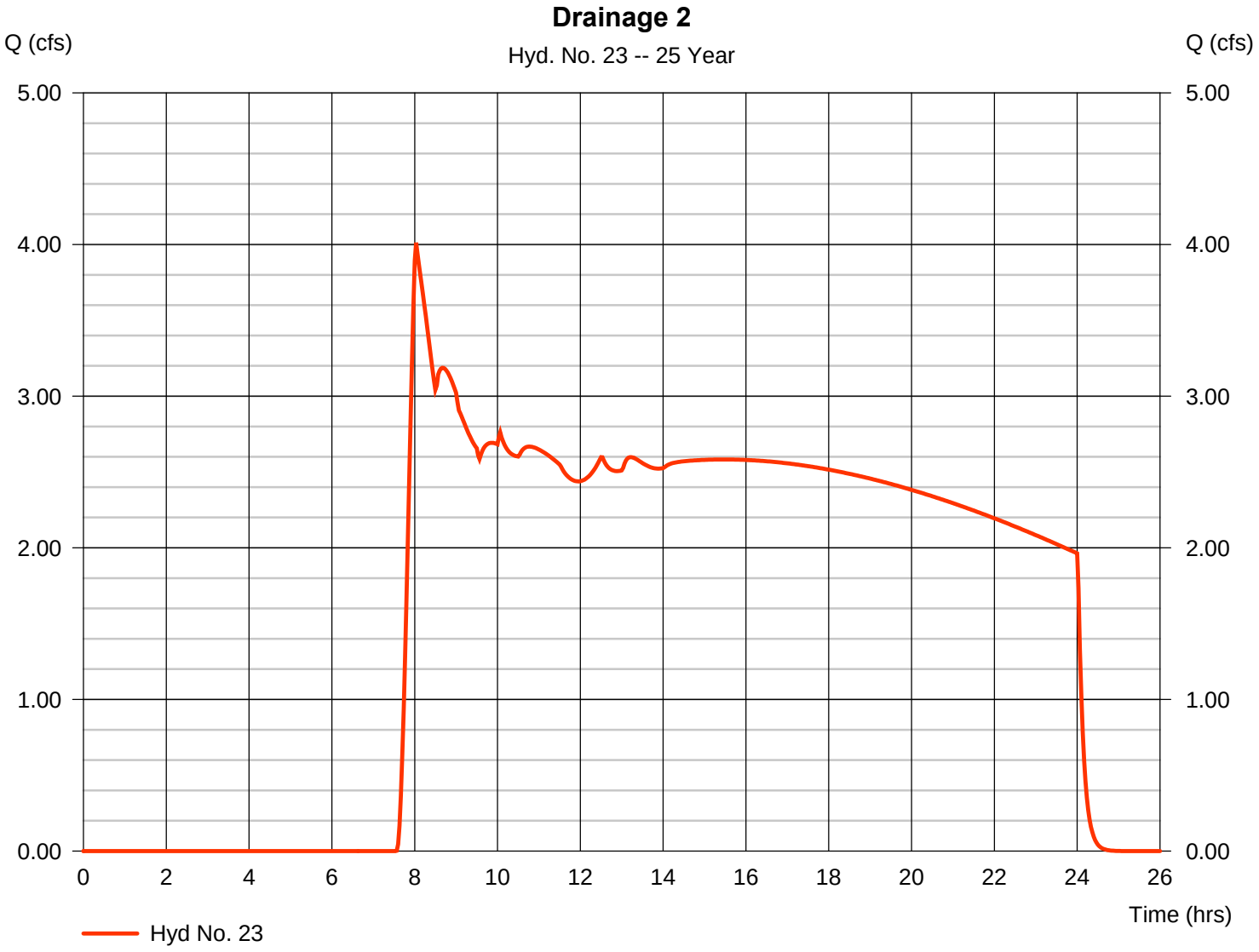
Total Travel Time, Tc ..... 34.20 min

Hydrograph Report

Hyd. No. 23

Drainage 2

Hydrograph type	=	SBUH Runoff	Peak discharge	=	4.012 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	148,423 cuft
Drainage area	=	38.300 ac	Curve number	=	54
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	7.60 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 23

Drainage 2

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 4.00		0.00		0.00		
Travel Time (min)	**= 7.20**	**+**	**0.00**	**+**	**0.00**	**=**	**7.20**
Shallow Concentrated Flow							
Flow length (ft)	= 100.00		0.00		0.00		
Watercourse slope (%)	= 8.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=4.56		0.00		0.00		
Travel Time (min)	**= 0.37**	**+**	**0.00**	**+**	**0.00**	**=**	**0.37**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

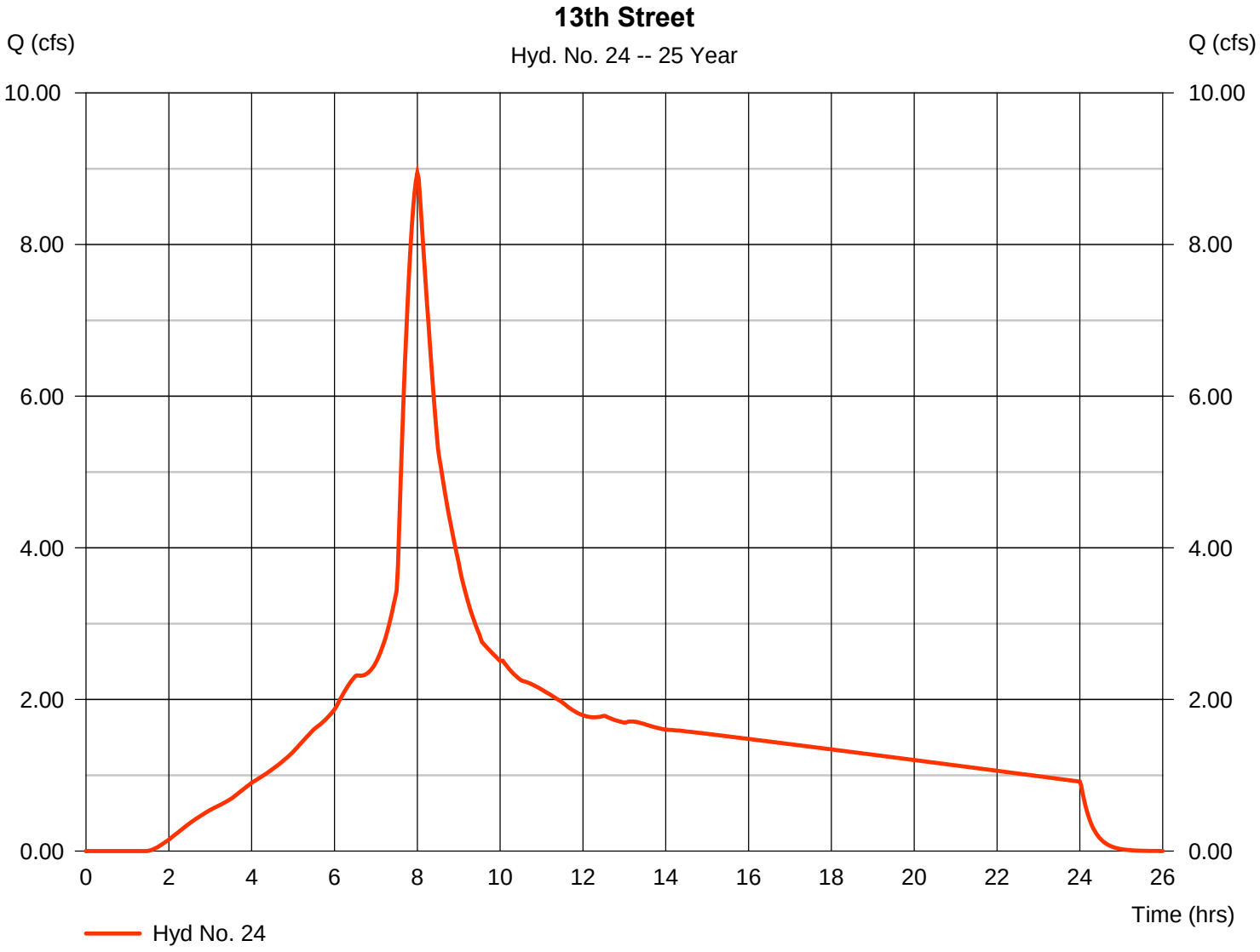
Total Travel Time, Tc ..... 7.60 min

Hydrograph Report

Hyd. No. 24

13th Street

Hydrograph type	=	SBUH Runoff	Peak discharge	=	8.945 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.00 hrs
Time interval	=	2 min	Hyd. volume	=	144,772 cuft
Drainage area	=	9.100 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.60 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 24

13th Street

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 12.54**	**+**	**0.00**	**+**	**0.00**	**=**	**12.54**
Shallow Concentrated Flow							
Flow length (ft)	= 530.00		0.00		0.00		
Watercourse slope (%)	= 1.13		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=2.16		0.00		0.00		
Travel Time (min)	**= 4.09**	**+**	**0.00**	**+**	**0.00**	**=**	**4.09**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

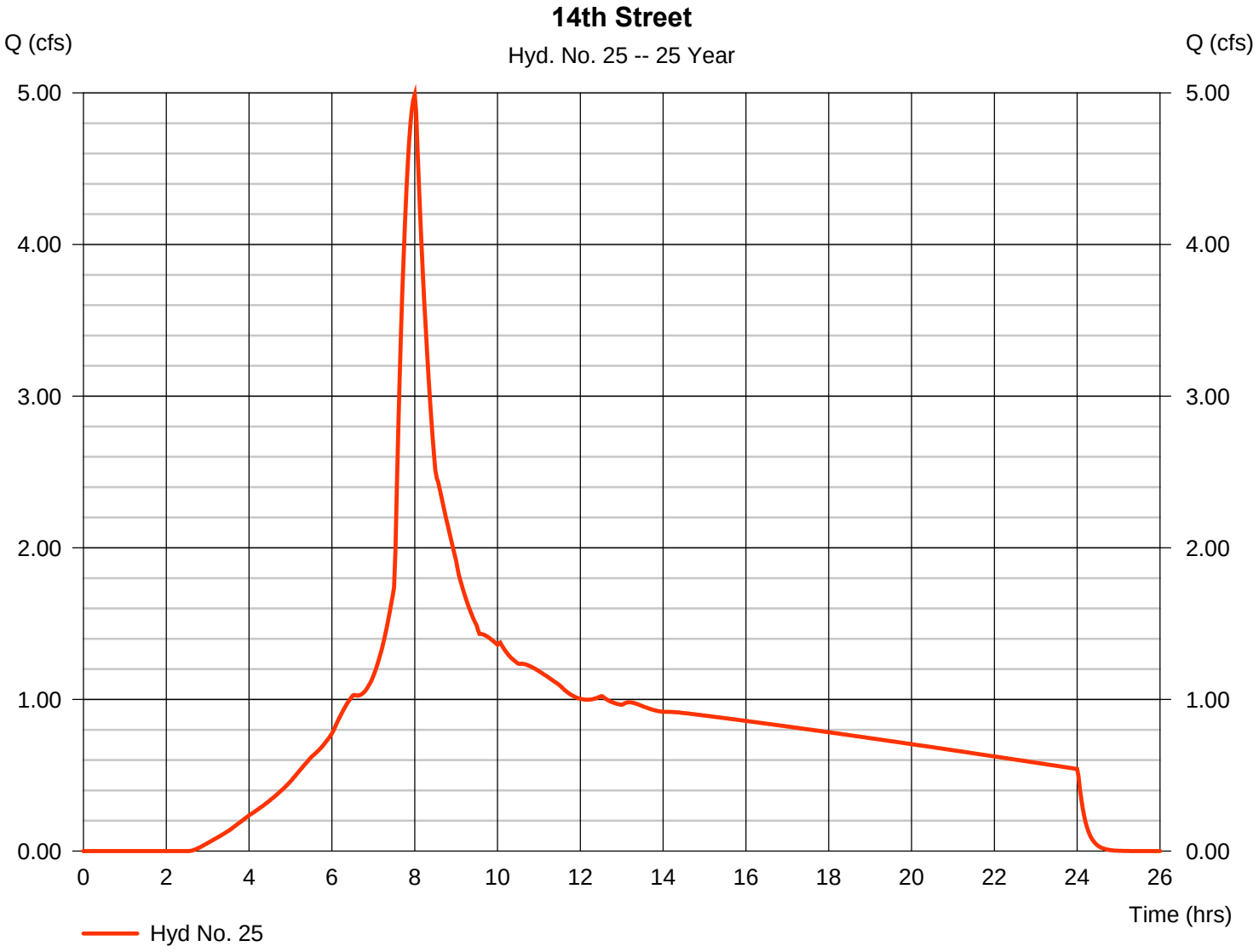
Total Travel Time, Tc ..... 16.60 min

Hydrograph Report

Hyd. No. 25

14th Street

Hydrograph type	= SBUH Runoff	Peak discharge	= 4.988 cfs
Storm frequency	= 25 yrs	Time to peak	= 8.00 hrs
Time interval	= 2 min	Hyd. volume	= 75,446 cuft
Drainage area	= 5.700 ac	Curve number	= 85
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 10.70 min
Total precip.	= 5.30 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a



TR55 Tc Worksheet

Hyd. No. 25

14th Street

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 4.00		0.00		0.00		
Travel Time (min)	**= 7.20**	**+**	**0.00**	**+**	**0.00**	**=**	**7.20**
Shallow Concentrated Flow							
Flow length (ft)	= 415.00		0.00		0.00		
Watercourse slope (%)	= 1.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=2.03		0.00		0.00		
Travel Time (min)	**= 3.40**	**+**	**0.00**	**+**	**0.00**	**=**	**3.40**
Channel Flow							
X sectional flow area (sqft)	= 1.00		0.00		0.00		
Wetted perimeter (ft)	= 3.00		0.00		0.00		
Channel slope (%)	= 5.00		0.00		0.00		
Manning's n-value	= 0.011		0.015		0.015		
Velocity (ft/s)	=14.51						
			0.00				
					0.00		
Flow length (ft)	({0})85.0		0.0		0.0		
Travel Time (min)	**= 0.10**	**+**	**0.00**	**+**	**0.00**	**=**	**0.10**

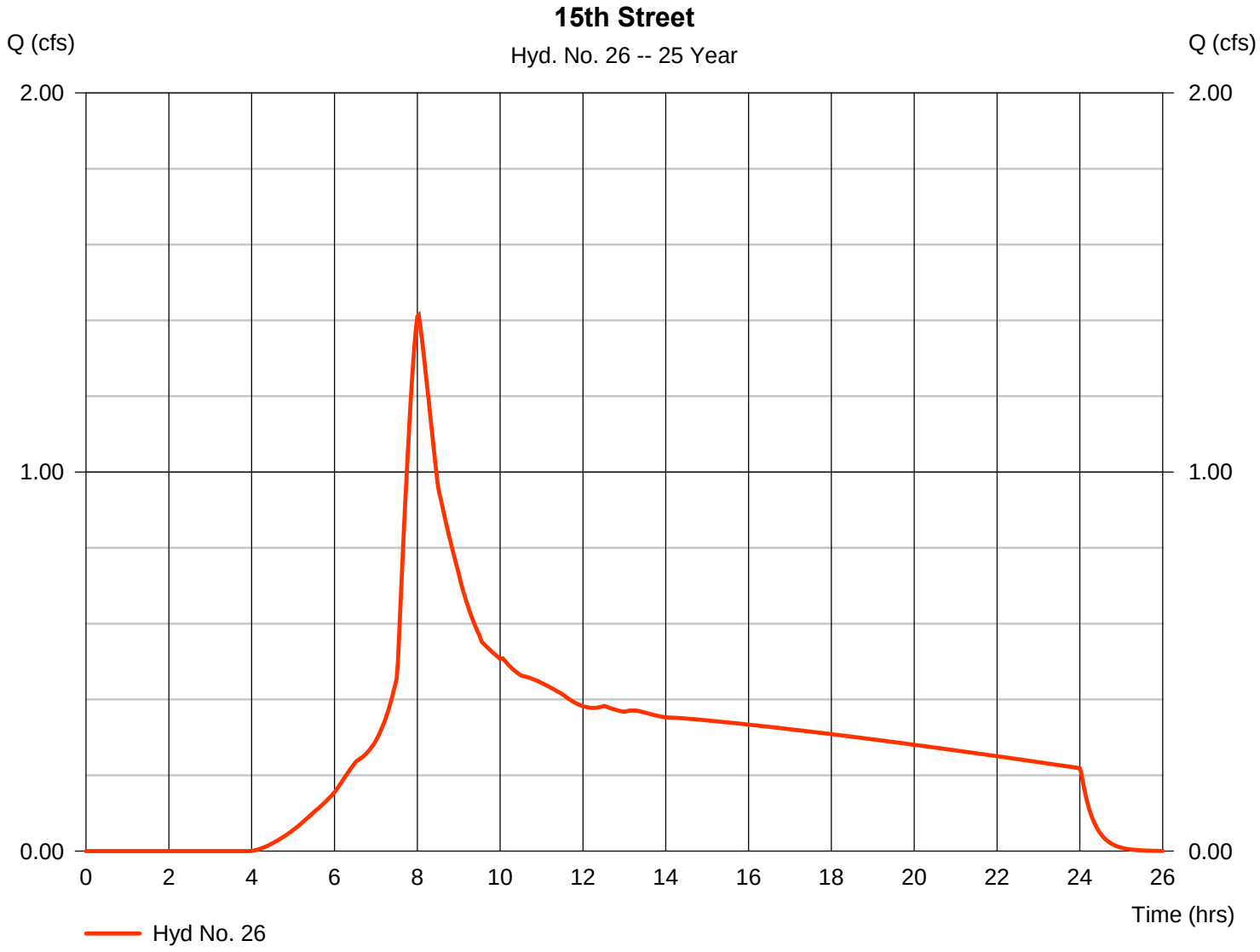
Total Travel Time, Tc ..... 10.70 min

Hydrograph Report

Hyd. No. 26

15th Street

Hydrograph type	=	SBUH Runoff	Peak discharge	=	1.414 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	26,099 cuft
Drainage area	=	2.500 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.60 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 26

15th Street

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 273.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 2.90		0.00		0.00		
Travel Time (min)	**= 18.30**	**+**	**0.00**	**+**	**0.00**	**=**	**18.30**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 1.00		0.00		0.00		
Wetted perimeter (ft)	= 3.00		0.00		0.00		
Channel slope (%)	= 5.00		0.00		0.00		
Manning's n-value	= 0.011		0.015		0.015		
Velocity (ft/s)	=14.51						
			0.00				
					0.00		
Flow length (ft)	({0})300.0		0.0		0.0		
Travel Time (min)	**= 0.34**	**+**	**0.00**	**+**	**0.00**	**=**	**0.34**

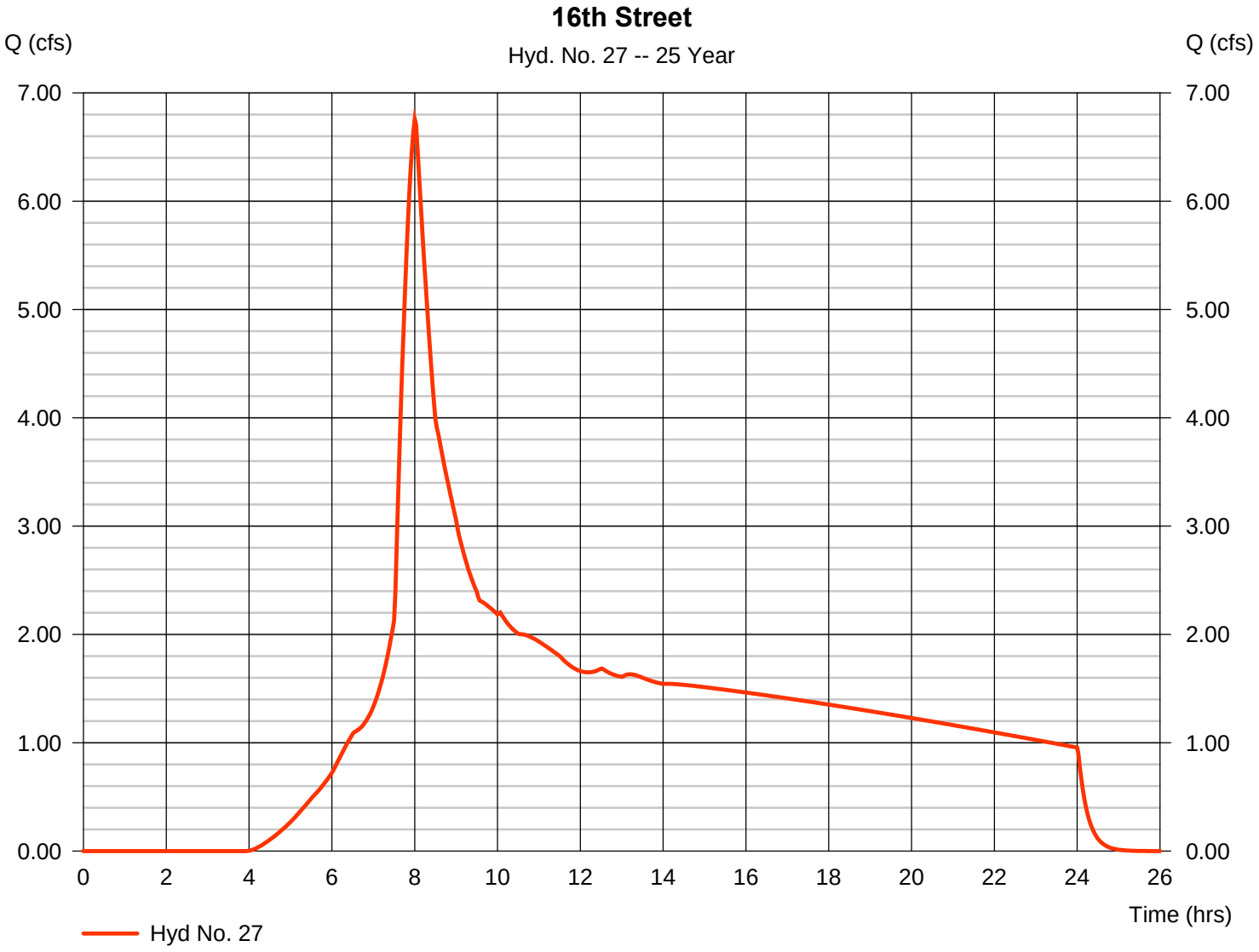
Total Travel Time, Tc ..... 18.60 min

Hydrograph Report

Hyd. No. 27

16th Street

Hydrograph type	=	SBUH Runoff	Peak discharge	=	6.756 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.00 hrs
Time interval	=	2 min	Hyd. volume	=	114,834 cuft
Drainage area	=	11.000 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.70 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 27

16th Street

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 9.51**	**+**	**0.00**	**+**	**0.00**	**=**	**9.51**
Shallow Concentrated Flow							
Flow length (ft)	= 482.00		0.00		0.00		
Watercourse slope (%)	= 1.70		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=2.65		0.00		0.00		
Travel Time (min)	**= 3.03**	**+**	**0.00**	**+**	**0.00**	**=**	**3.03**
Channel Flow							
X sectional flow area (sqft)	= 1.00		0.00		0.00		
Wetted perimeter (ft)	= 3.00		0.00		0.00		
Channel slope (%)	= 2.30		0.00		0.00		
Manning's n-value	= 0.011		0.015		0.015		
Velocity (ft/s)	=9.84						
			0.00				
					0.00		
Flow length (ft)	({0})690.0		0.0		0.0		
Travel Time (min)	**= 1.17**	**+**	**0.00**	**+**	**0.00**	**=**	**1.17**

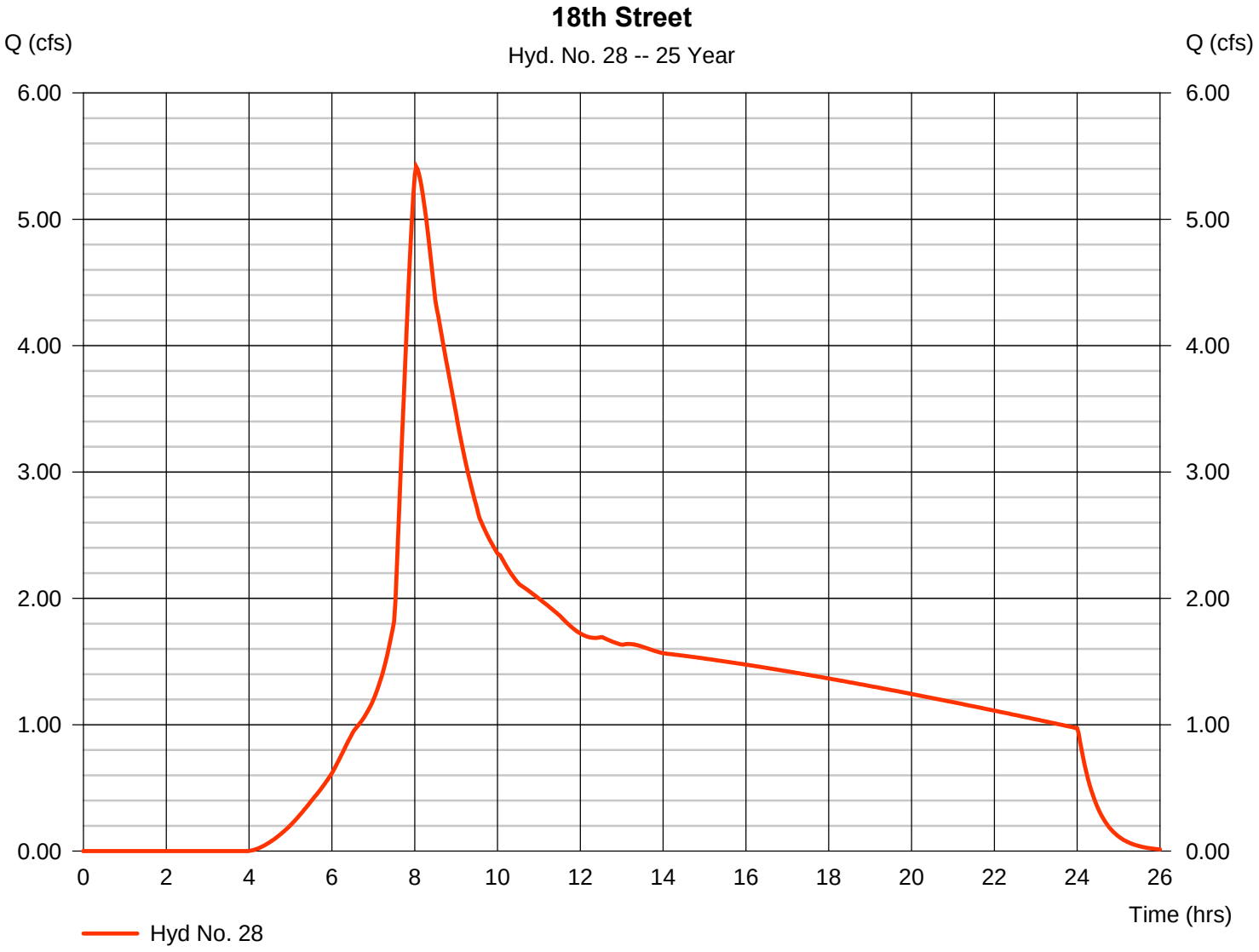
Total Travel Time, Tc ..... 13.70 min

Hydrograph Report

Hyd. No. 28

18th Street

Hydrograph type	=	SBUH Runoff	Peak discharge	=	5.417 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	114,834 cuft
Drainage area	=	11.000 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	27.70 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 28

18th Street

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 160.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 0.60		0.00		0.00		
Travel Time (min)	**= 22.41**	**+**	**0.00**	**+**	**0.00**	**=**	**22.41**
Shallow Concentrated Flow							
Flow length (ft)	= 700.00		0.00		0.00		
Watercourse slope (%)	= 1.60		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=2.57		0.00		0.00		
Travel Time (min)	**= 4.54**	**+**	**0.00**	**+**	**0.00**	**=**	**4.54**
Channel Flow							
X sectional flow area (sqft)	= 1.00		0.00		0.00		
Wetted perimeter (ft)	= 3.00		0.00		0.00		
Channel slope (%)	= 2.60		0.00		0.00		
Manning's n-value	= 0.011		0.015		0.015		
Velocity (ft/s)	=10.46						
			0.00				
					0.00		
Flow length (ft)	({0})469.0		0.0		0.0		
Travel Time (min)	**= 0.75**	**+**	**0.00**	**+**	**0.00**	**=**	**0.75**

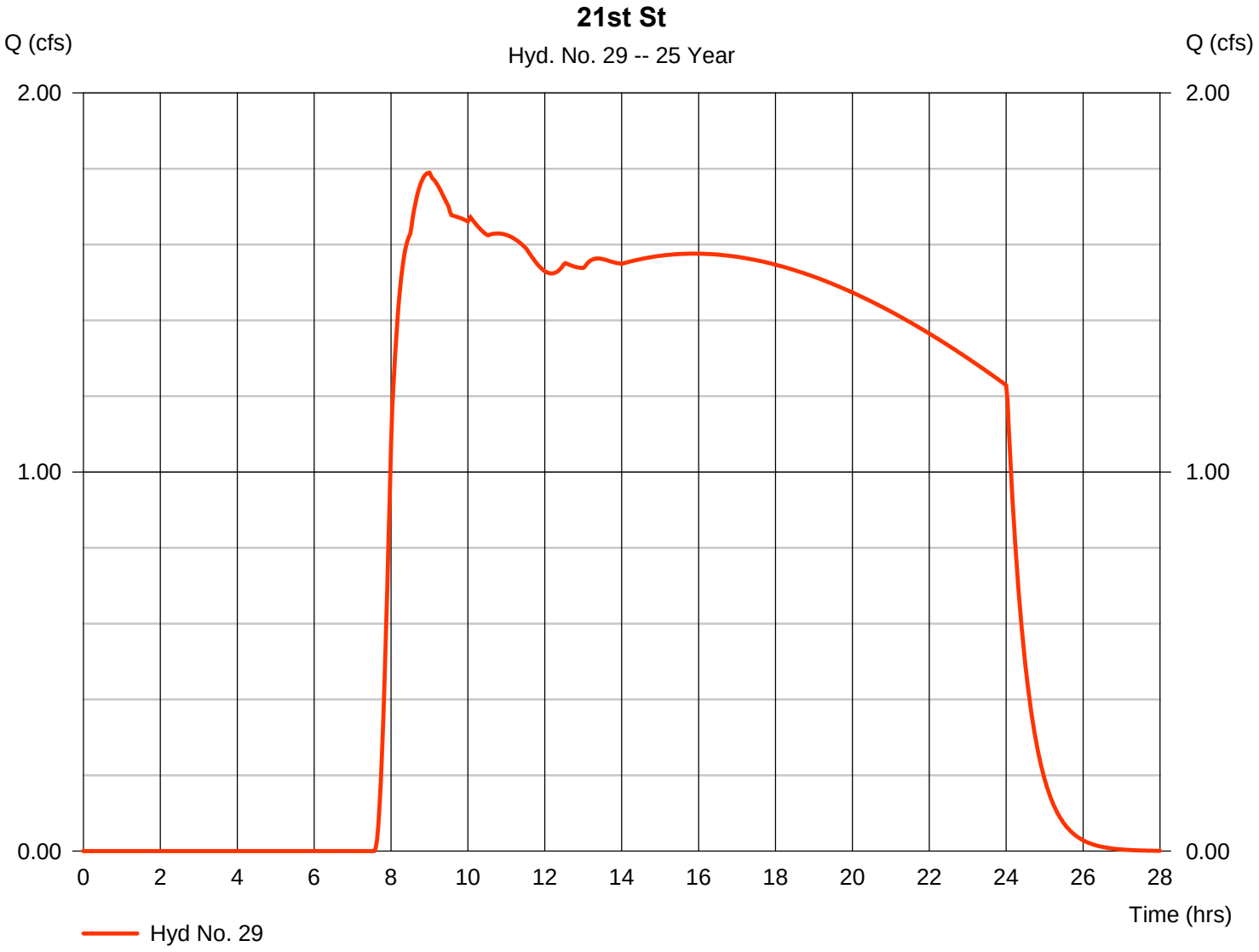
Total Travel Time, Tc ..... 27.70 min

Hydrograph Report

Hyd. No. 29

21st St

Hydrograph type	=	SBUH Runoff	Peak discharge	=	1.789 cfs
Storm frequency	=	25 yrs	Time to peak	=	9.00 hrs
Time interval	=	2 min	Hyd. volume	=	90,681 cuft
Drainage area	=	23.400 ac	Curve number	=	54
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	31.60 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 29

21st St

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 212.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 1.90		0.00		0.00		
Travel Time (min)	**= 17.70**	**+**	**0.00**	**+**	**0.00**	**=**	**17.70**
Shallow Concentrated Flow							
Flow length (ft)	= 600.00		0.00		0.00		
Watercourse slope (%)	= 0.20		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=0.72		0.00		0.00		
Travel Time (min)	**= 13.86**	**+**	**0.00**	**+**	**0.00**	**=**	**13.86**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.011		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 31.60 min

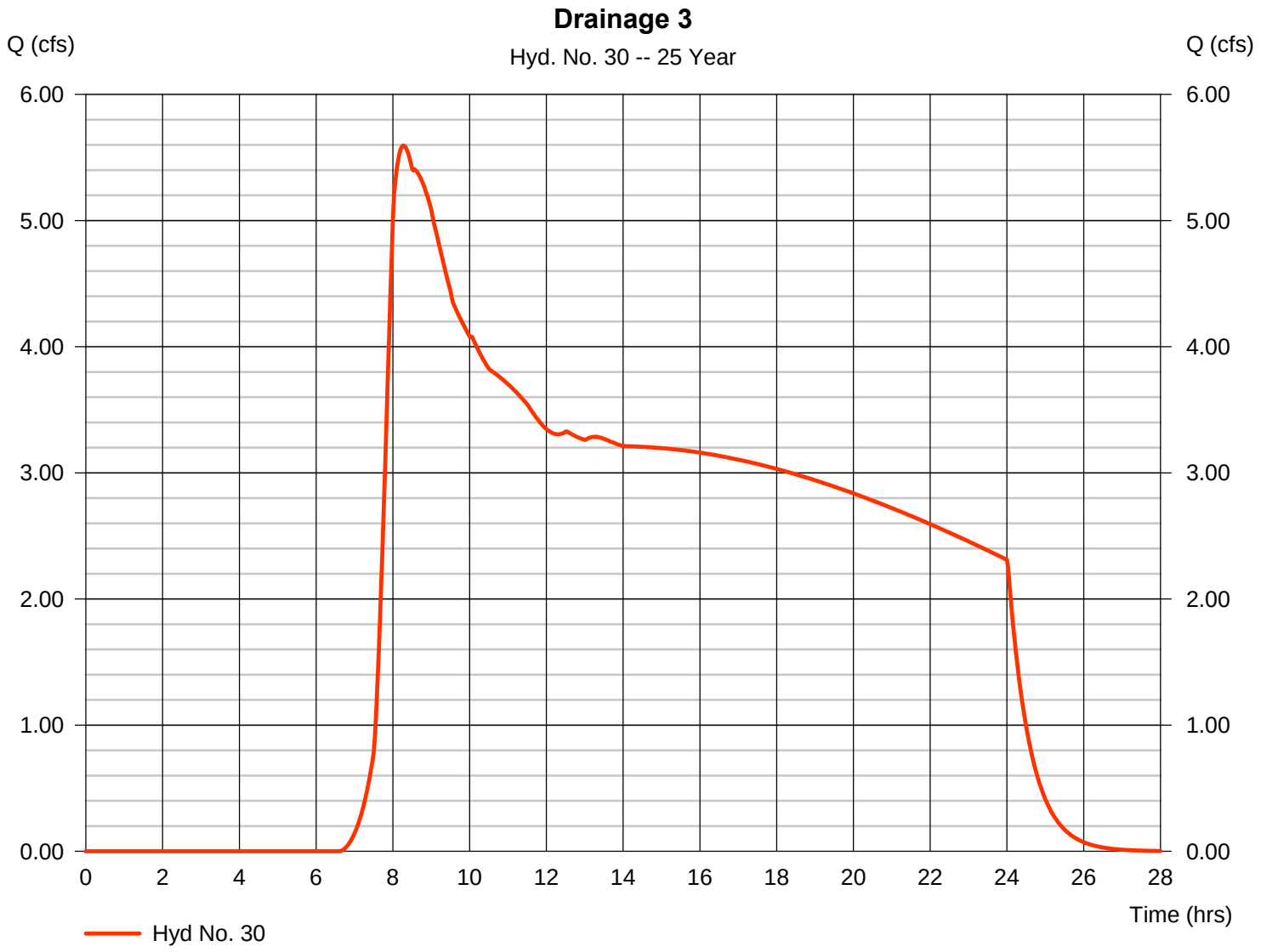
Hydrograph Report

Hyd. No. 30

Drainage 3

Hydrograph type	= SBUH Runoff	Peak discharge	= 5.594 cfs
Storm frequency	= 25 yrs	Time to peak	= 8.27 hrs
Time interval	= 2 min	Hyd. volume	= 200,088 cuft
Drainage area	= 35.500 ac	Curve number	= 61*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 34.30 min
Total precip.	= 5.30 in	Distribution	= Type IA
Storm duration	= 24 hrs	Shape factor	= n/a

* Composite (Area/CN) = [(20.000 x 54) + (15.500 x 70)] / 35.500



TR55 Tc Worksheet

Hyd. No. 30

Drainage 3

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 212.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 1.90		0.00		0.00		
Travel Time (min)	**= 17.70**	**+**	**0.00**	**+**	**0.00**	**=**	**17.70**
Shallow Concentrated Flow							
Flow length (ft)	= 1720.00		0.00		0.00		
Watercourse slope (%)	= 1.20		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.77		0.00		0.00		
Travel Time (min)	**= 16.22**	**+**	**0.00**	**+**	**0.00**	**=**	**16.22**
Channel Flow							
X sectional flow area (sqft)	= 1.00		0.00		0.00		
Wetted perimeter (ft)	= 3.00		0.00		0.00		
Channel slope (%)	= 5.00		0.00		0.00		
Manning's n-value	= 0.011		0.015		0.015		
Velocity (ft/s)	=14.51						
			0.00				
					0.00		
Flow length (ft)	({0})300.0		0.0		0.0		
Travel Time (min)	**= 0.34**	**+**	**0.00**	**+**	**0.00**	**=**	**0.34**

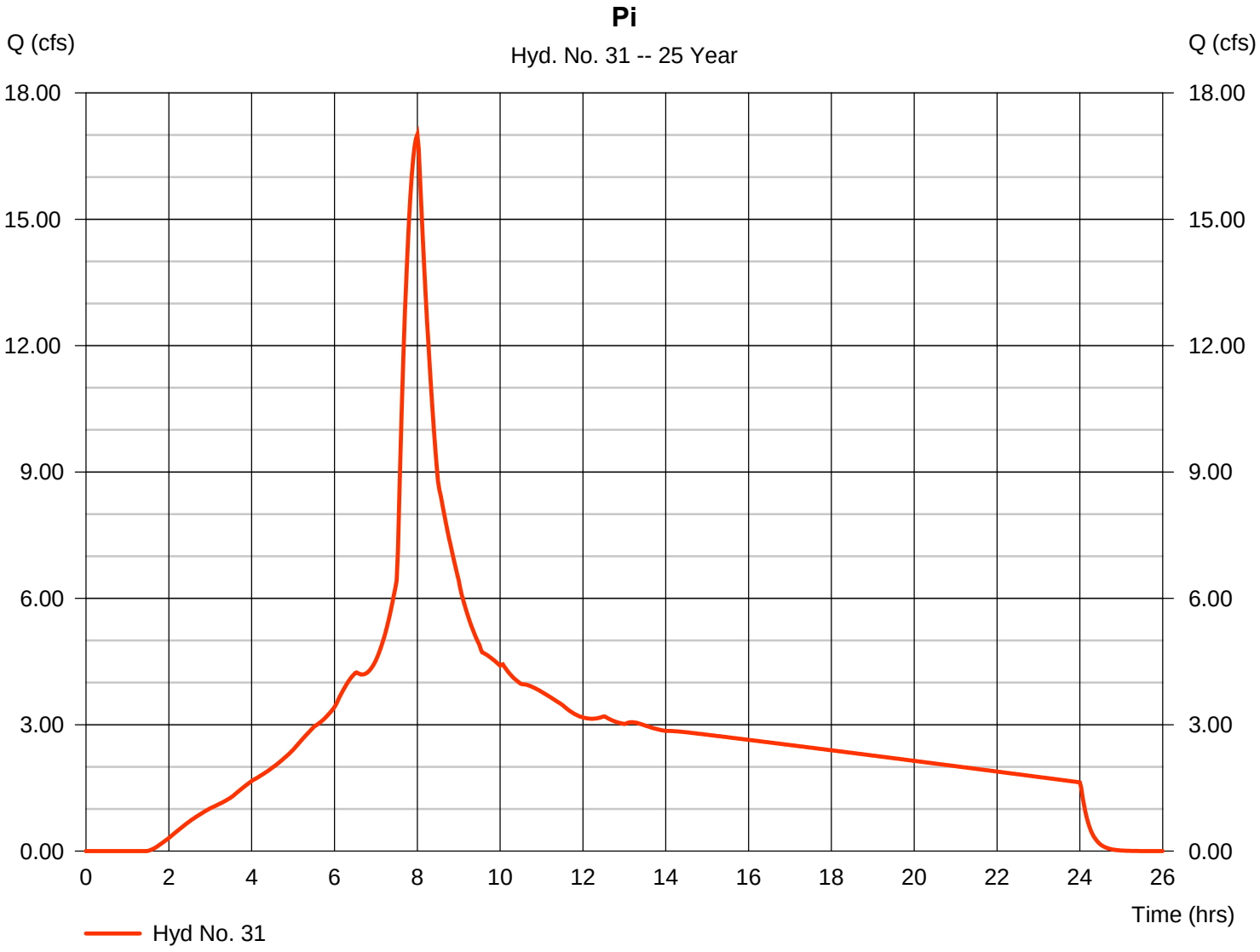
Total Travel Time, Tc ..... 34.30 min

Hydrograph Report

Hyd. No. 31

Pi

Hydrograph type	=	SBUH Runoff	Peak discharge	=	17.01 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.00 hrs
Time interval	=	2 min	Hyd. volume	=	259,316 cuft
Drainage area	=	16.300 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.40 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 31

Pi

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 80.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 1.25		0.00		0.00		
Travel Time (min)	**= 9.60**	**+**	**0.00**	**+**	**0.00**	**=**	**9.60**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 5.00		1.25		0.00		
Wetted perimeter (ft)	= 3.00		4.00		0.00		
Channel slope (%)	= 0.90		1.00		0.00		
Manning's n-value	= 0.025		0.011		0.015		
Velocity (ft/s)	=7.96						
			6.21				
					0.00		
Flow length (ft)	({0})800.0		430.0		0.0		
Travel Time (min)	**= 1.67**	**+**	**1.15**	**+**	**0.00**	**=**	**2.83**

Total Travel Time, Tc ..... 12.40 min

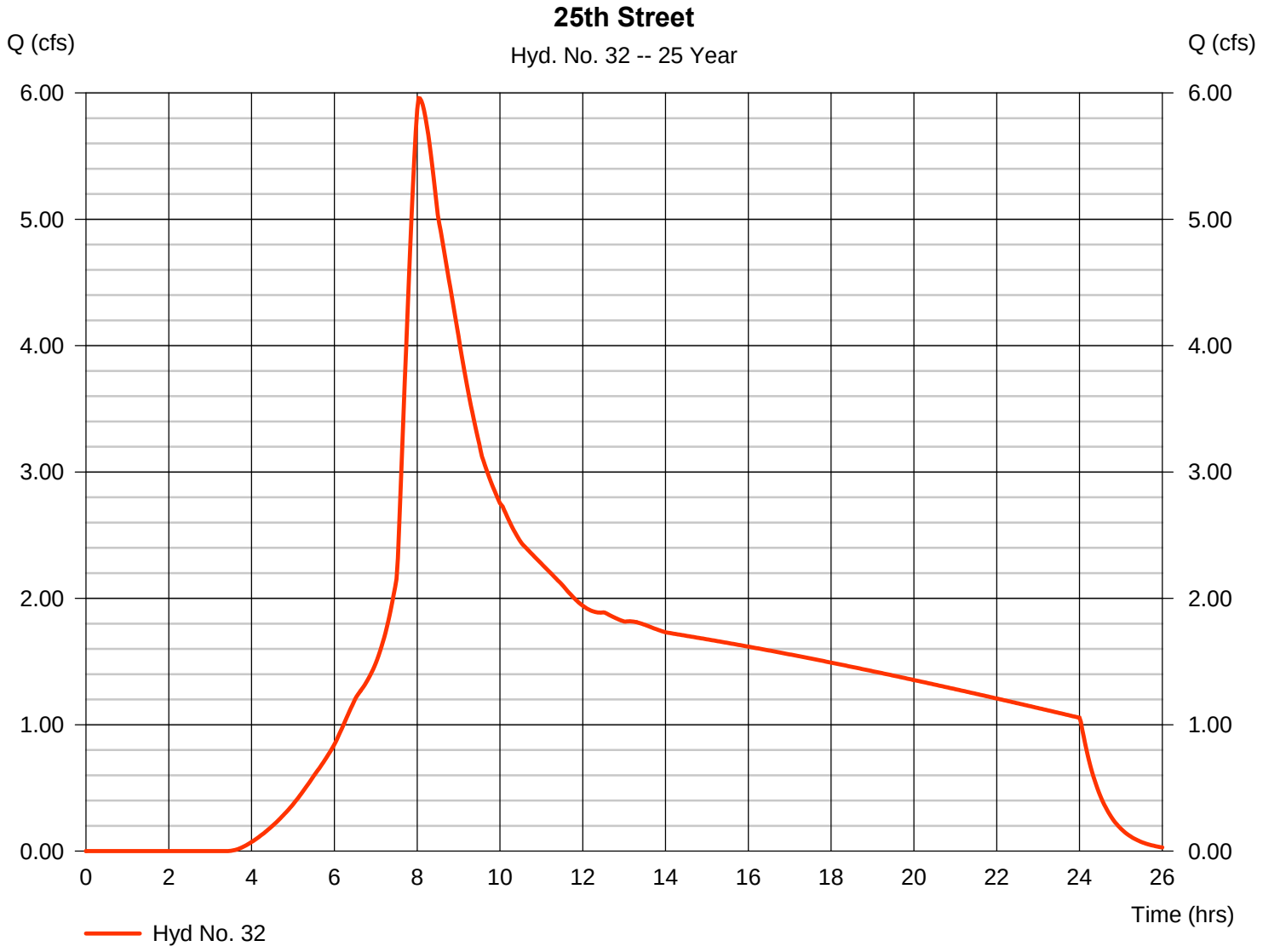
Hydrograph Report

Hyd. No. 32

25th Street

Hydrograph type	=	SBUH Runoff	Peak discharge	=	5.958 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	130,608 cuft
Drainage area	=	11.400 ac	Curve number	=	80*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	33.10 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a

* Composite (Area/CN) = [(5.000 x 92) + (6.400 x 70)] / 11.400



TR55 Tc Worksheet

Hyd. No. 32

25th Street

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 200.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 1.50		0.00		0.00		
Travel Time (min)	**= 18.57**	**+**	**0.00**	**+**	**0.00**	**=**	**18.57**
Shallow Concentrated Flow							
Flow length (ft)	= 1300.00		0.00		0.00		
Watercourse slope (%)	= 0.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.53		0.00		0.00		
Travel Time (min)	**= 14.16**	**+**	**0.00**	**+**	**0.00**	**=**	**14.16**
Channel Flow							
X sectional flow area (sqft)	= 1.00		0.00		0.00		
Wetted perimeter (ft)	= 3.00		0.00		0.00		
Channel slope (%)	= 5.00		0.00		0.00		
Manning's n-value	= 0.011		0.015		0.015		
Velocity (ft/s)	=14.51						
			0.00				
					0.00		
Flow length (ft)	({0})300.0		0.0		0.0		
Travel Time (min)	**= 0.34**	**+**	**0.00**	**+**	**0.00**	**=**	**0.34**

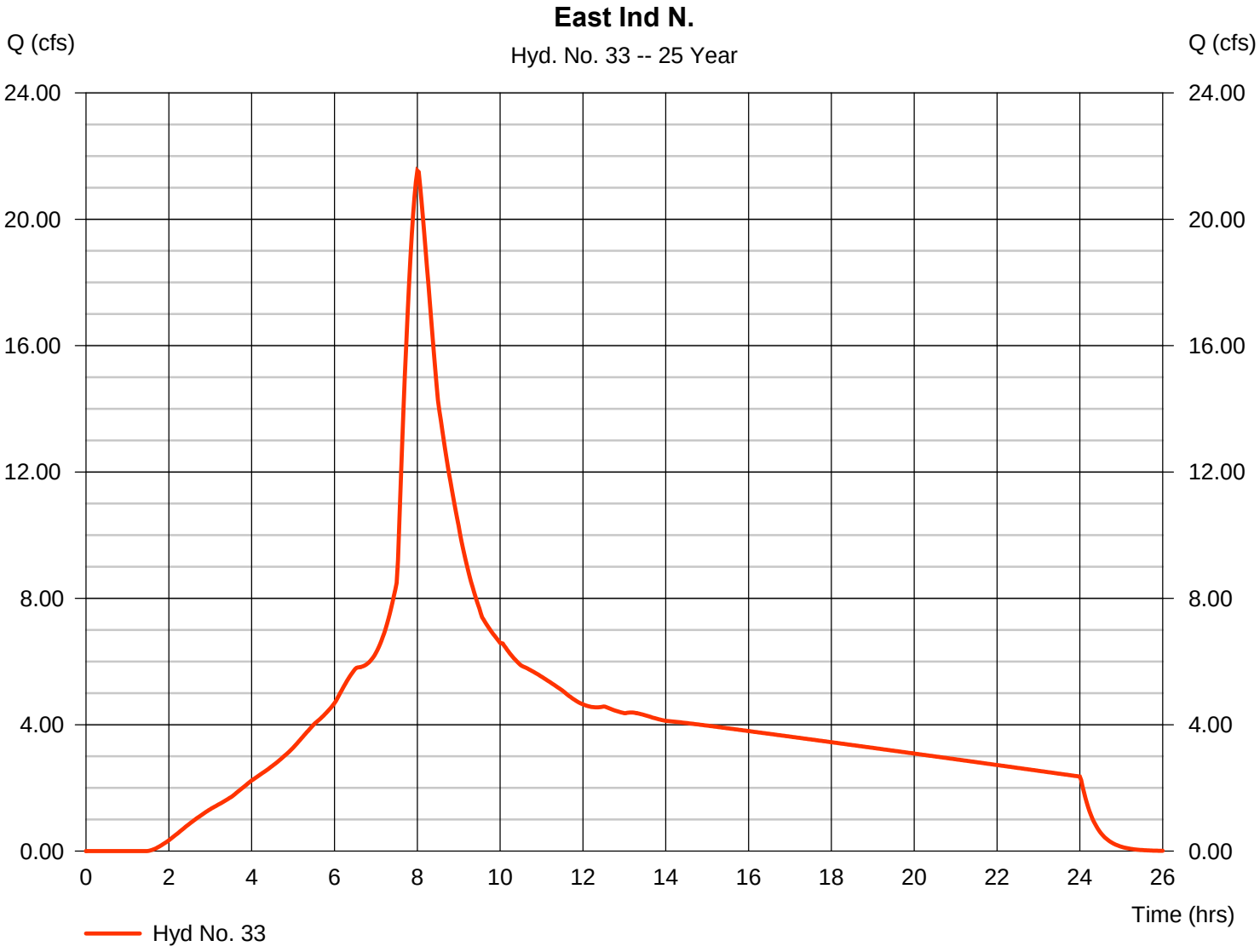
Total Travel Time, Tc ..... 33.10 min

Hydrograph Report

Hyd. No. 33

East Ind N.

Hydrograph type	=	SBUH Runoff	Peak discharge	=	21.54 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.00 hrs
Time interval	=	2 min	Hyd. volume	=	370,679 cuft
Drainage area	=	23.300 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	20.80 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 33

East Ind N.

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 12.54**	**+**	**0.00**	**+**	**0.00**	**=**	**12.54**
Shallow Concentrated Flow							
Flow length (ft)	= 1100.00		0.00		0.00		
Watercourse slope (%)	= 1.20		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=2.23		0.00		0.00		
Travel Time (min)	**= 8.23**	**+**	**0.00**	**+**	**0.00**	**=**	**8.23**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.011		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

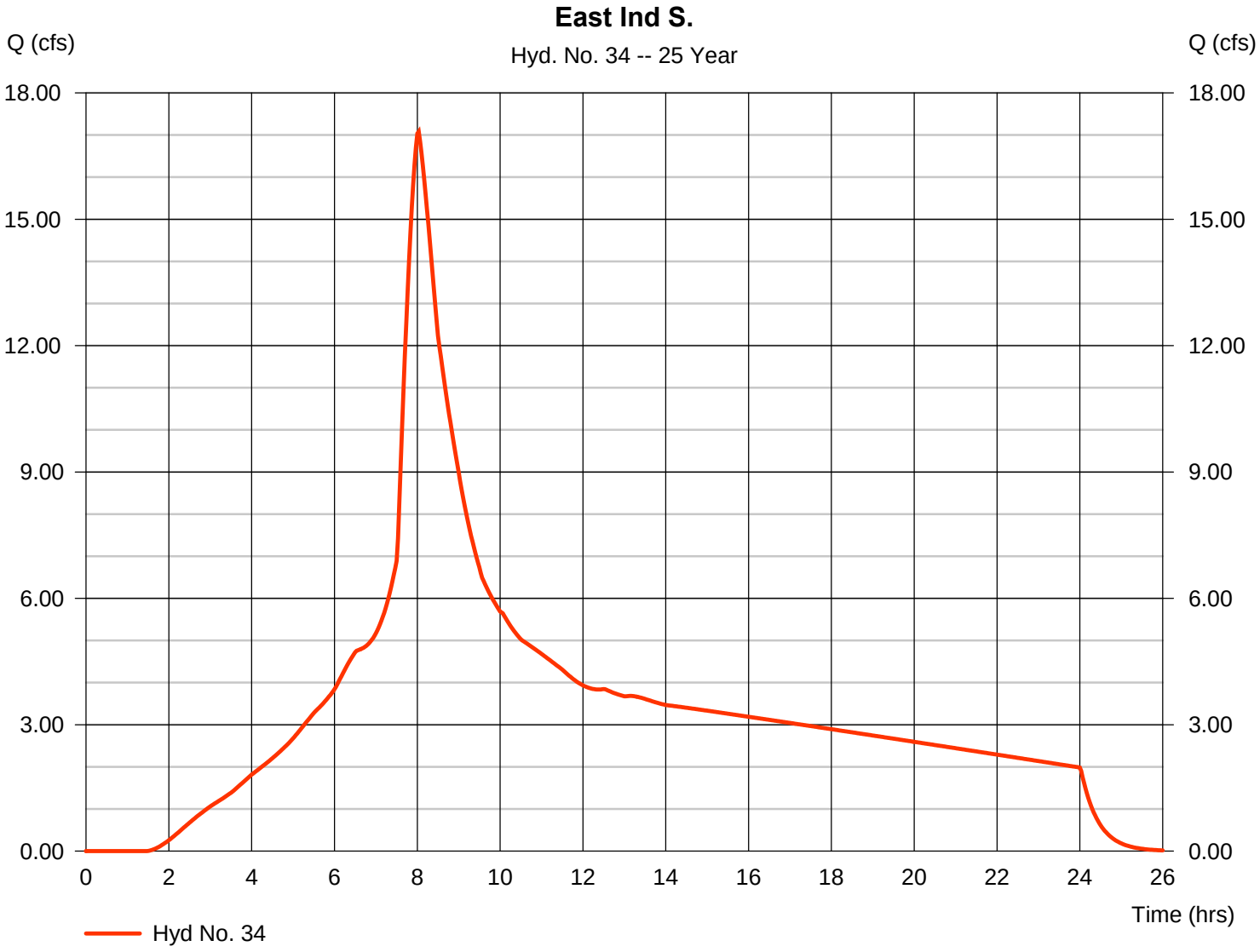
Total Travel Time, Tc ..... 20.80 min

Hydrograph Report

Hyd. No. 34

East Ind S.

Hydrograph type	=	SBUH Runoff	Peak discharge	=	17.08 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	310,225 cuft
Drainage area	=	19.500 ac	Curve number	=	92
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	24.80 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 34

East Ind S.

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.40		0.00		0.00		
Land slope (%)	= 1.00		0.00		0.00		
Travel Time (min)	**= 12.54**	**+**	**0.00**	**+**	**0.00**	**=**	**12.54**
Shallow Concentrated Flow							
Flow length (ft)	= 1250.00		0.00		0.00		
Watercourse slope (%)	= 0.70		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=1.70		0.00		0.00		
Travel Time (min)	**= 12.25**	**+**	**0.00**	**+**	**0.00**	**=**	**12.25**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.011		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

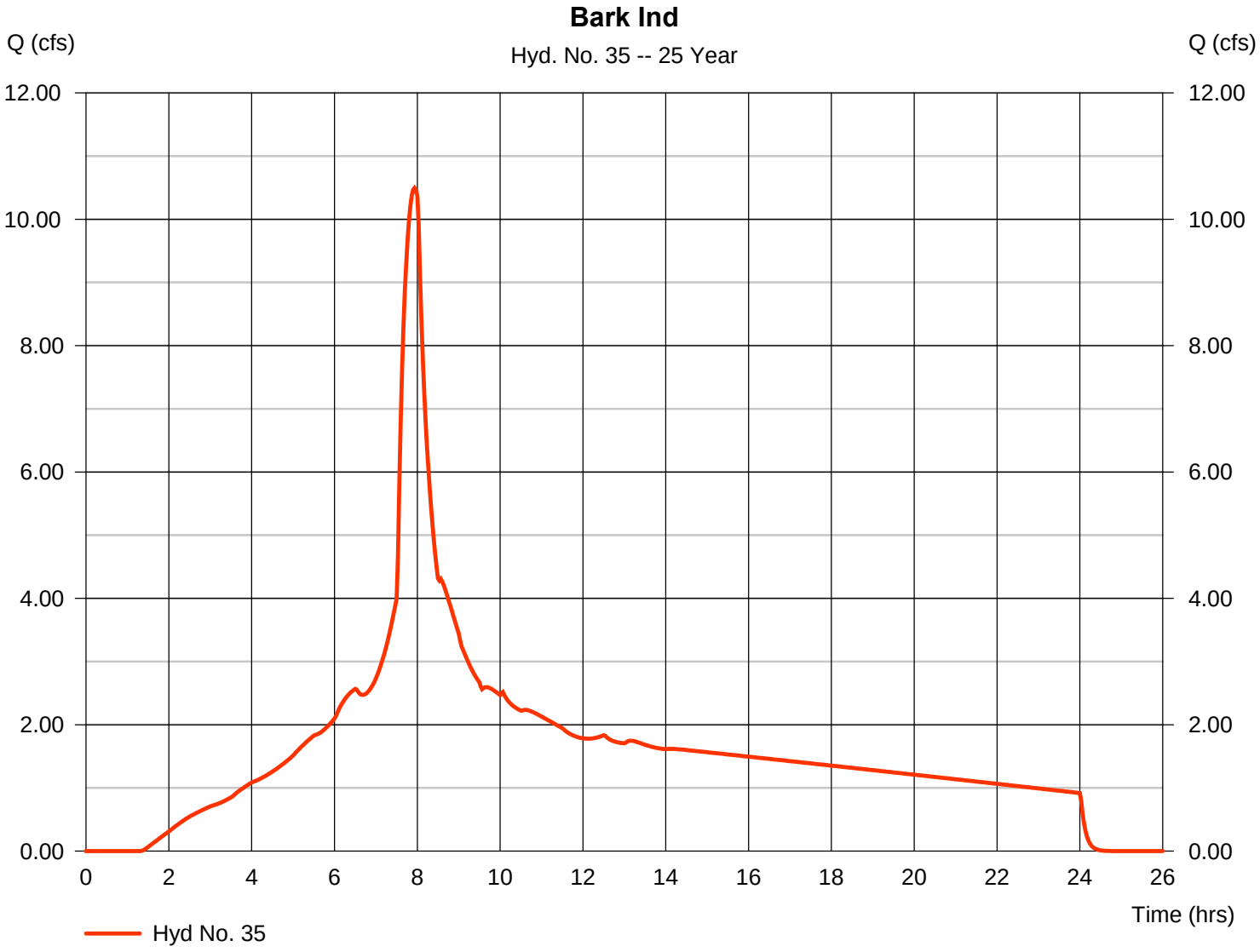
Total Travel Time, Tc ..... 24.80 min

Hydrograph Report

Hyd. No. 35

Bark Ind

Hydrograph type	=	SBUH Runoff	Peak discharge	=	10.50 cfs
Storm frequency	=	25 yrs	Time to peak	=	7.93 hrs
Time interval	=	2 min	Hyd. volume	=	150,040 cuft
Drainage area	=	9.200 ac	Curve number	=	93
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.70 min
Total precip.	=	5.30 in	Distribution	=	Type IA
Storm duration	=	24 hrs	Shape factor	=	n/a



TR55 Tc Worksheet

Hyd. No. 35

Bark Ind

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.000		0.000		0.000		
Flow length (ft)	= 0.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 0.00		0.00		0.00		
Land slope (%)	= 0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	=						
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.000		0.000		0.000		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

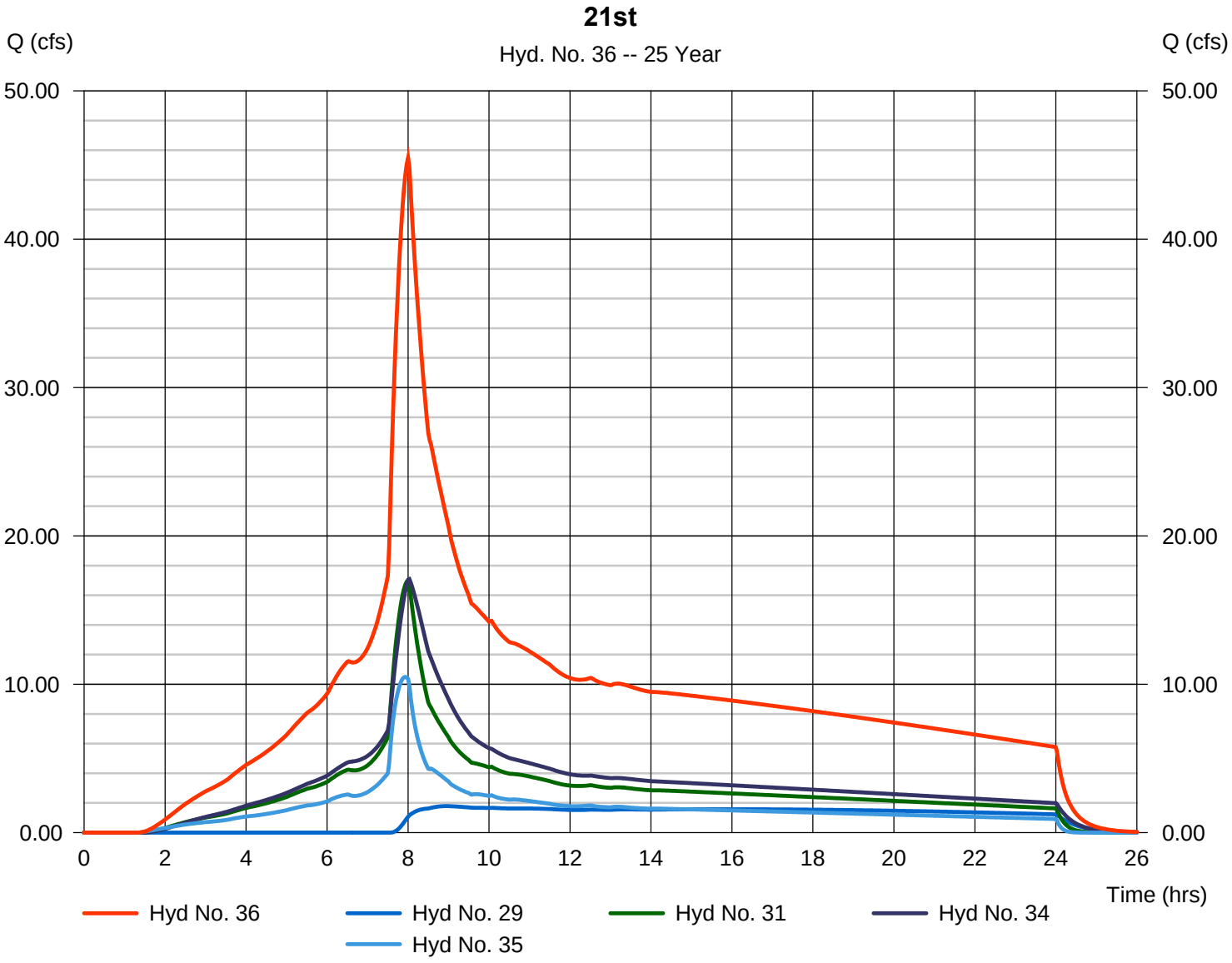
Total Travel Time, Tc ..... 6.70 min

Hydrograph Report

Hyd. No. 36

21st

Hydrograph type	=	Combine	Peak discharge	=	45.49 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.00 hrs
Time interval	=	2 min	Hyd. volume	=	810,262 cuft
Inflow hyds.	=	29, 31, 34, 35	Contrib. drain. area	=	68.400 ac



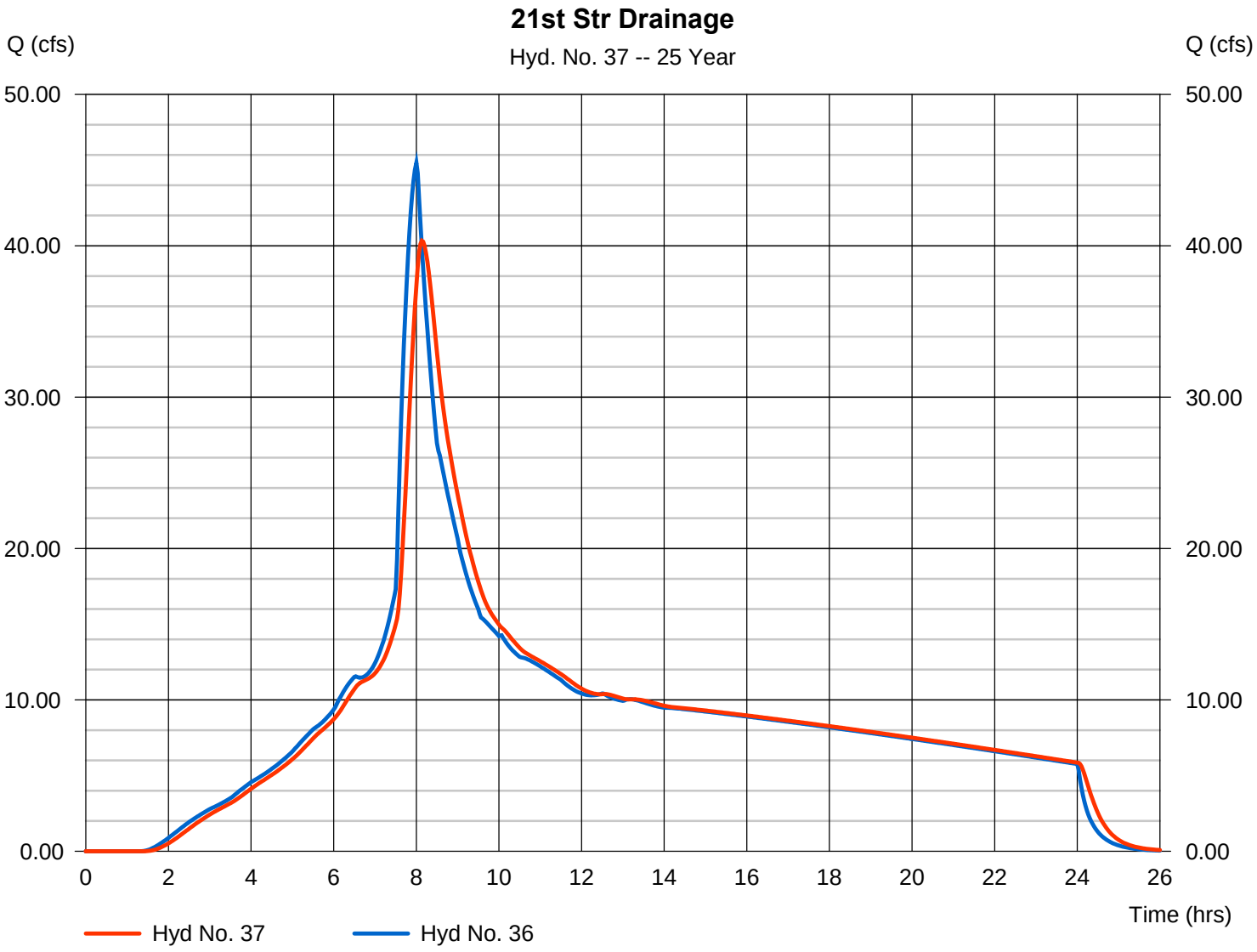
Hydrograph Report

Hyd. No. 37

21st Str Drainage

Hydrograph type	=	Reach	Peak discharge	=	40.33 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.13 hrs
Time interval	=	2 min	Hyd. volume	=	810,245 cuft
Inflow hyd. No.	=	36 - 21st	Section type	=	Trapezoidal
Reach length	=	4770.0 ft	Channel slope	=	0.9 %
Manning's n	=	0.025	Bottom width	=	2.0 ft
Side slope	=	3.0:1	Max. depth	=	4.0 ft
Rating curve x	=	3.561	Rating curve m	=	1.210
Ave. velocity	=	5.54 ft/s	Routing coeff.	=	0.1554

Modified Att-Kin routing method used.

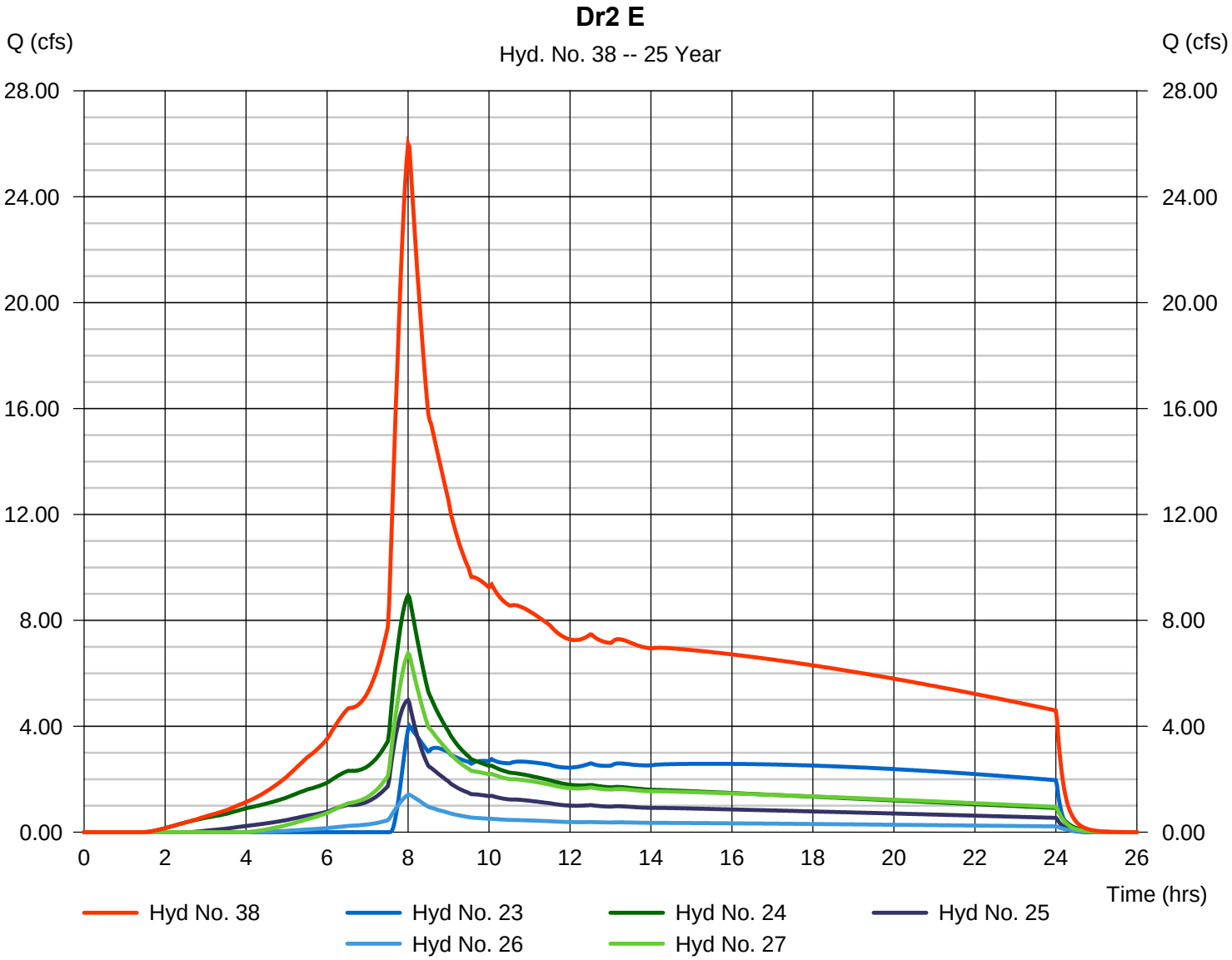


Hydrograph Report

Hyd. No. 38

Dr2 E

Hydrograph type	=	Combine	Peak discharge	=	25.99 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.00 hrs
Time interval	=	2 min	Hyd. volume	=	509,573 cuft
Inflow hyds.	=	23, 24, 25, 26, 27	Contrib. drain. area	=	66.600 ac



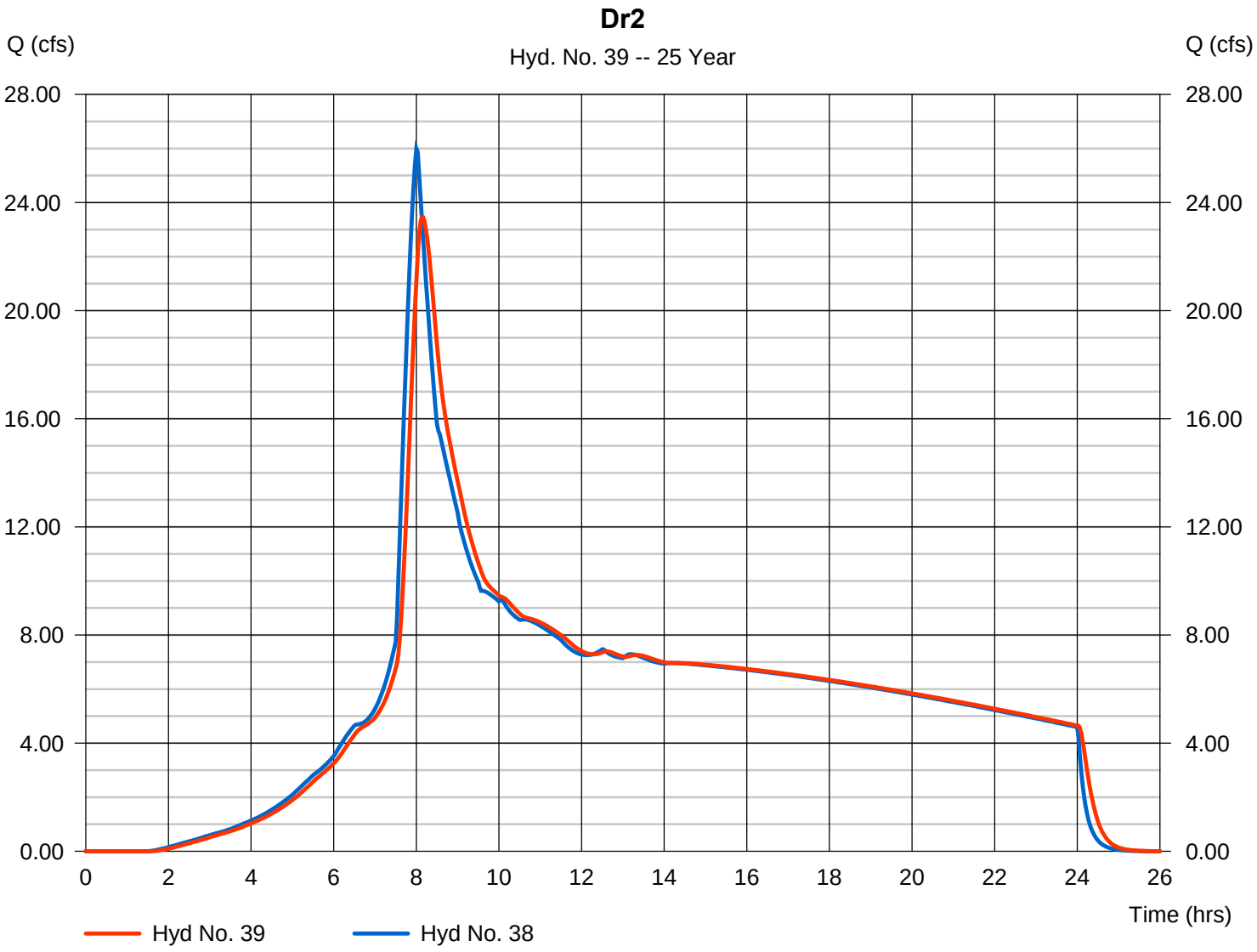
Hydrograph Report

Hyd. No. 39

Dr2

Hydrograph type	=	Reach	Peak discharge	=	23.46 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.13 hrs
Time interval	=	2 min	Hyd. volume	=	509,564 cuft
Inflow hyd. No.	=	38 - Dr2 E	Section type	=	Trapezoidal
Reach length	=	3000.0 ft	Channel slope	=	1.0 %
Manning's n	=	0.025	Bottom width	=	2.0 ft
Side slope	=	6.0:1	Max. depth	=	3.0 ft
Rating curve x	=	3.754	Rating curve m	=	1.147
Ave. velocity	=	4.81 ft/s	Routing coeff.	=	0.1988

Modified Att-Kin routing method used.

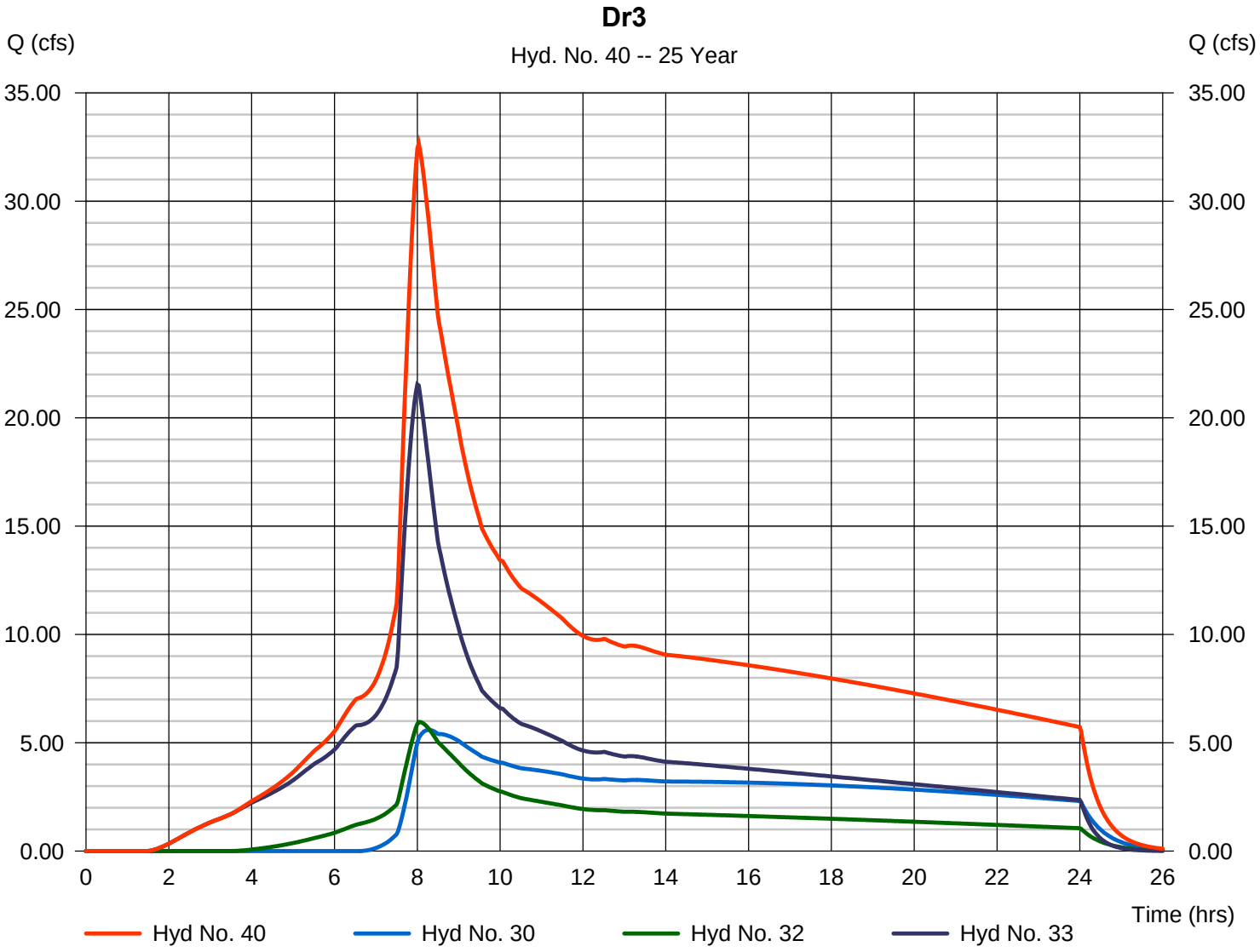


Hydrograph Report

Hyd. No. 40

Dr3

Hydrograph type	=	Combine	Peak discharge	=	32.67 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	701,376 cuft
Inflow hyds.	=	30, 32, 33	Contrib. drain. area	=	70.200 ac



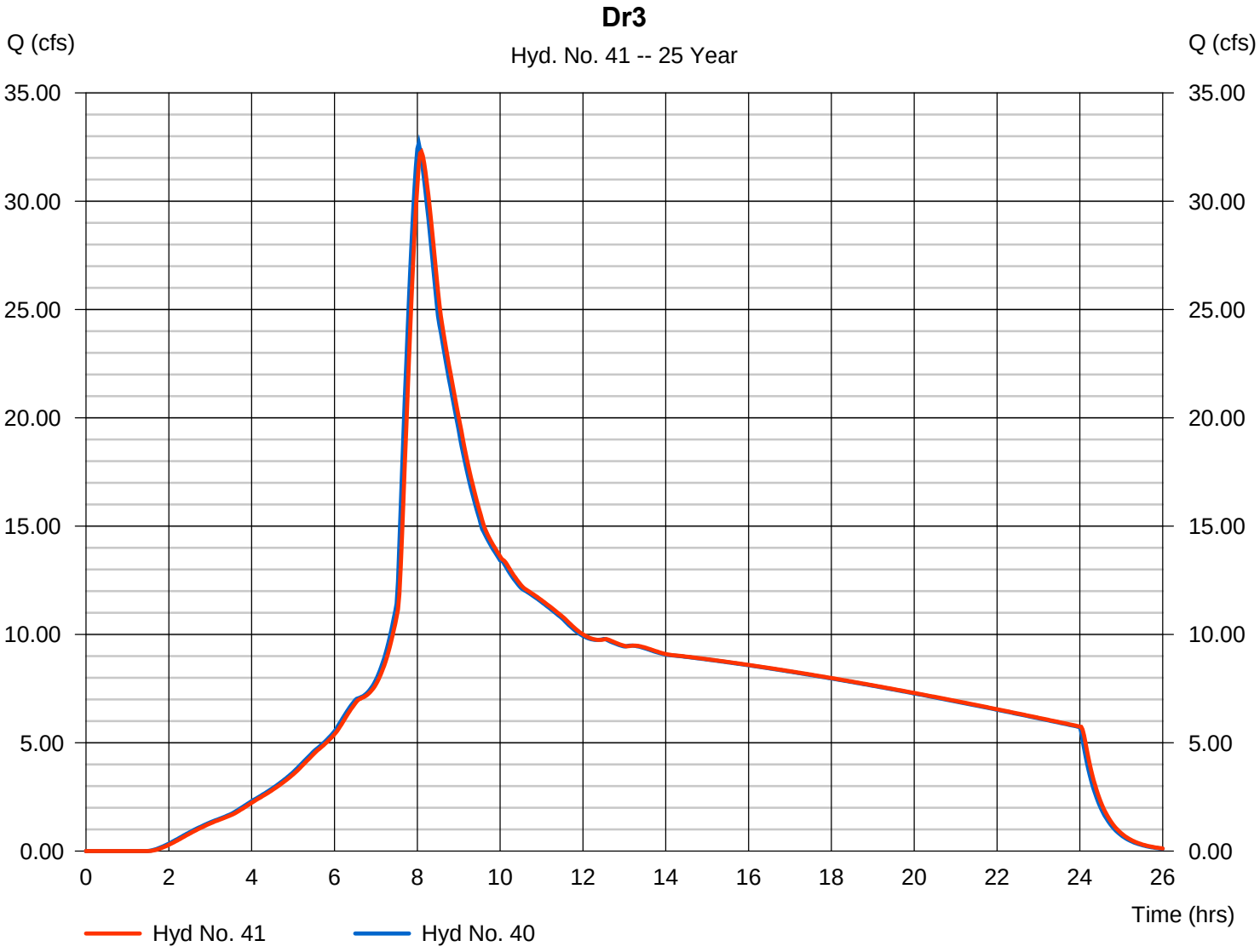
Hydrograph Report

Hyd. No. 41

Dr3

Hydrograph type	=	Reach	Peak discharge	=	32.29 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.10 hrs
Time interval	=	2 min	Hyd. volume	=	701,355 cuft
Inflow hyd. No.	=	40 - Dr3	Section type	=	Trapezoidal
Reach length	=	2314.0 ft	Channel slope	=	1.0 %
Manning's n	=	0.009	Bottom width	=	2.0 ft
Side slope	=	3.0:1	Max. depth	=	3.0 ft
Rating curve x	=	10.427	Rating curve m	=	1.183
Ave. velocity	=	12.44 ft/s	Routing coeff.	=	0.5524

Modified Att-Kin routing method used.

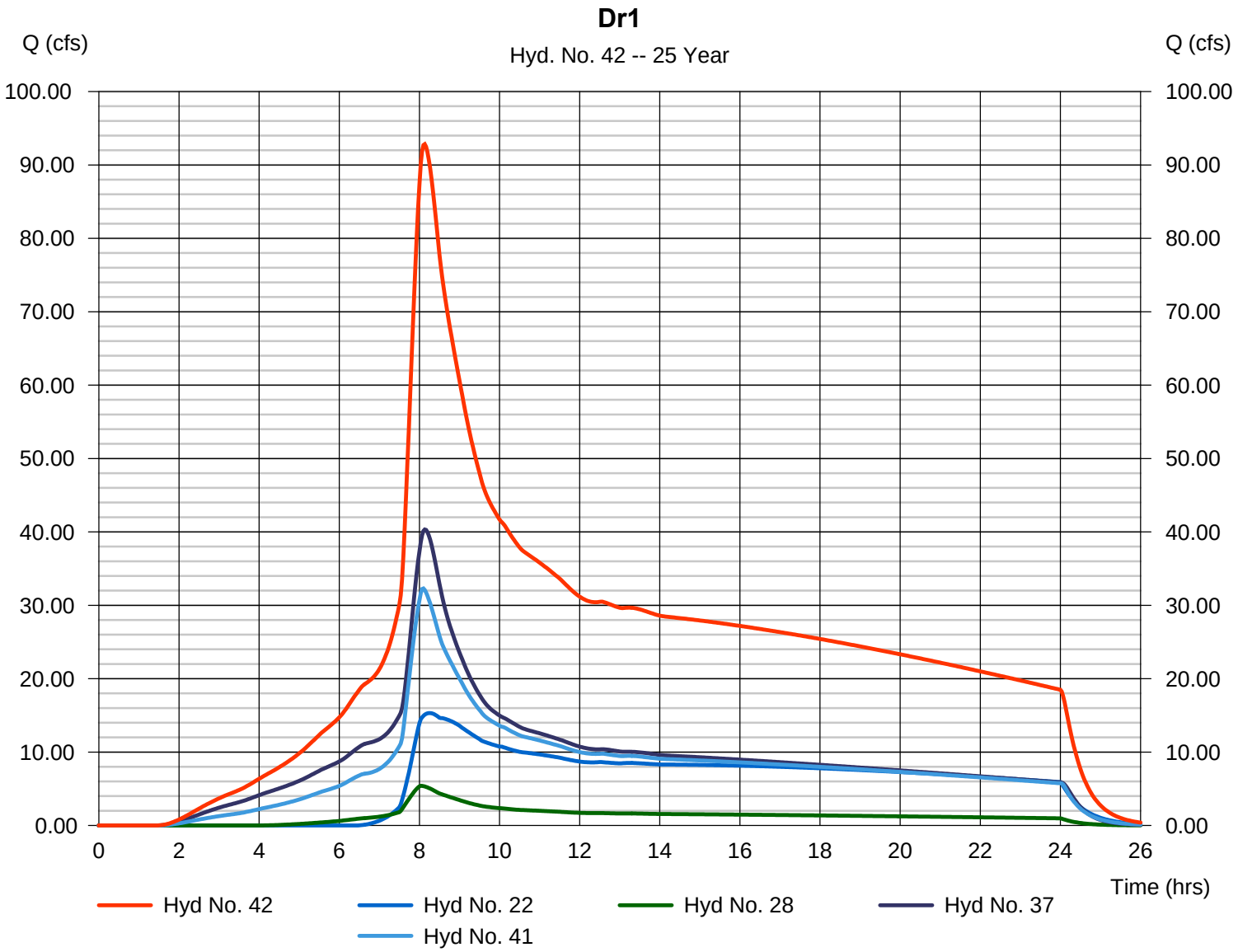


Hydrograph Report

Hyd. No. 42

Dr1

Hydrograph type	=	Combine	Peak discharge	=	92.83 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.13 hrs
Time interval	=	2 min	Hyd. volume	=	2,149,063 cuft
Inflow hyds.	=	22, 28, 37, 41	Contrib. drain. area	=	99.500 ac



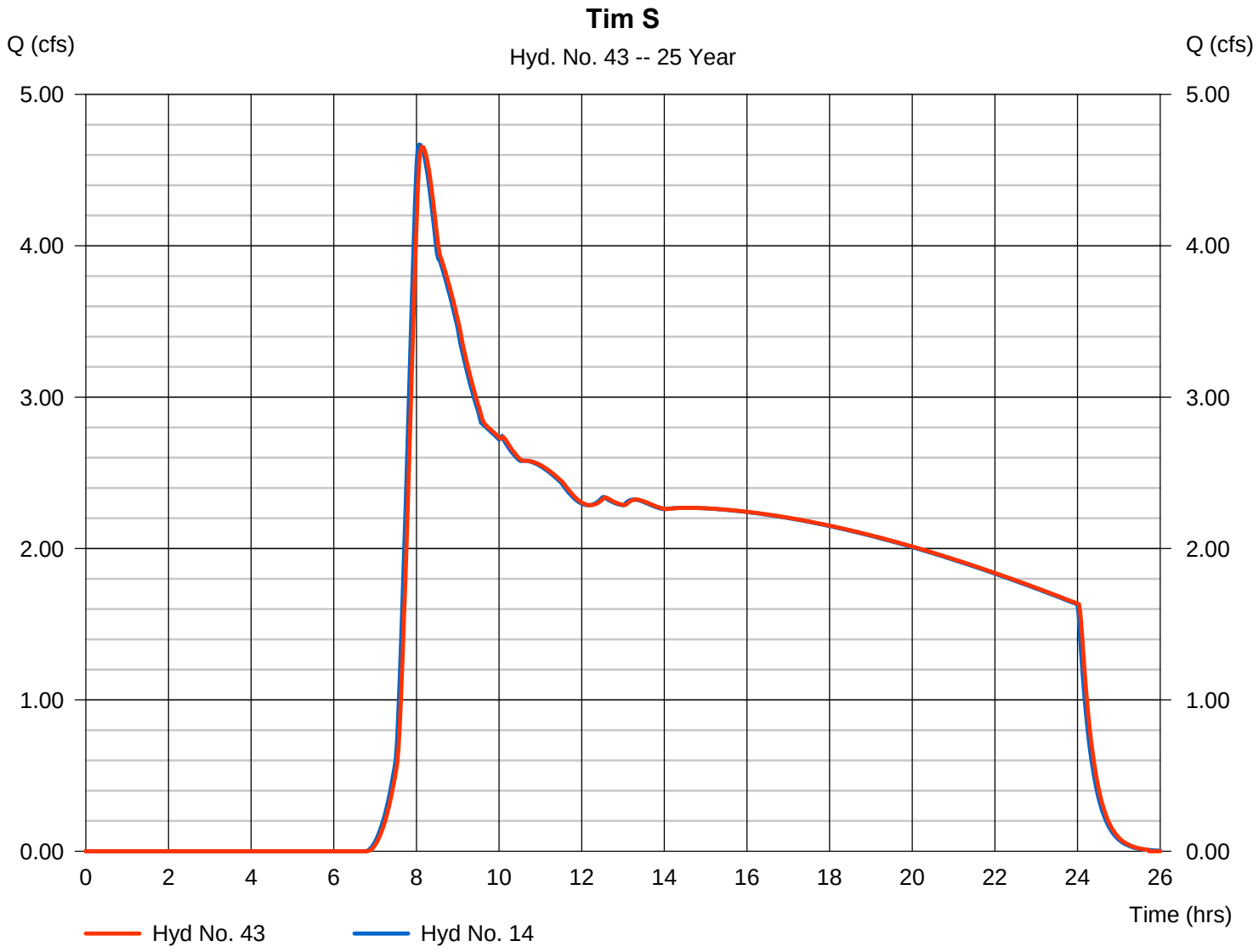
Hydrograph Report

Hyd. No. 43

Tim S

Hydrograph type	=	Reach	Peak discharge	=	4.653 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.13 hrs
Time interval	=	2 min	Hyd. volume	=	140,397 cuft
Inflow hyd. No.	=	14 - Timberview S	Section type	=	Circular
Reach length	=	925.0 ft	Channel slope	=	1.0 %
Manning's n	=	0.013	Bottom width	=	1.0 ft
Side slope	=	0.0:1	Max. depth	=	0.0 ft
Rating curve x	=	6.185	Rating curve m	=	1.250
Ave. velocity	=	5.94 ft/s	Routing coeff.	=	0.6503

Modified Att-Kin routing method used.

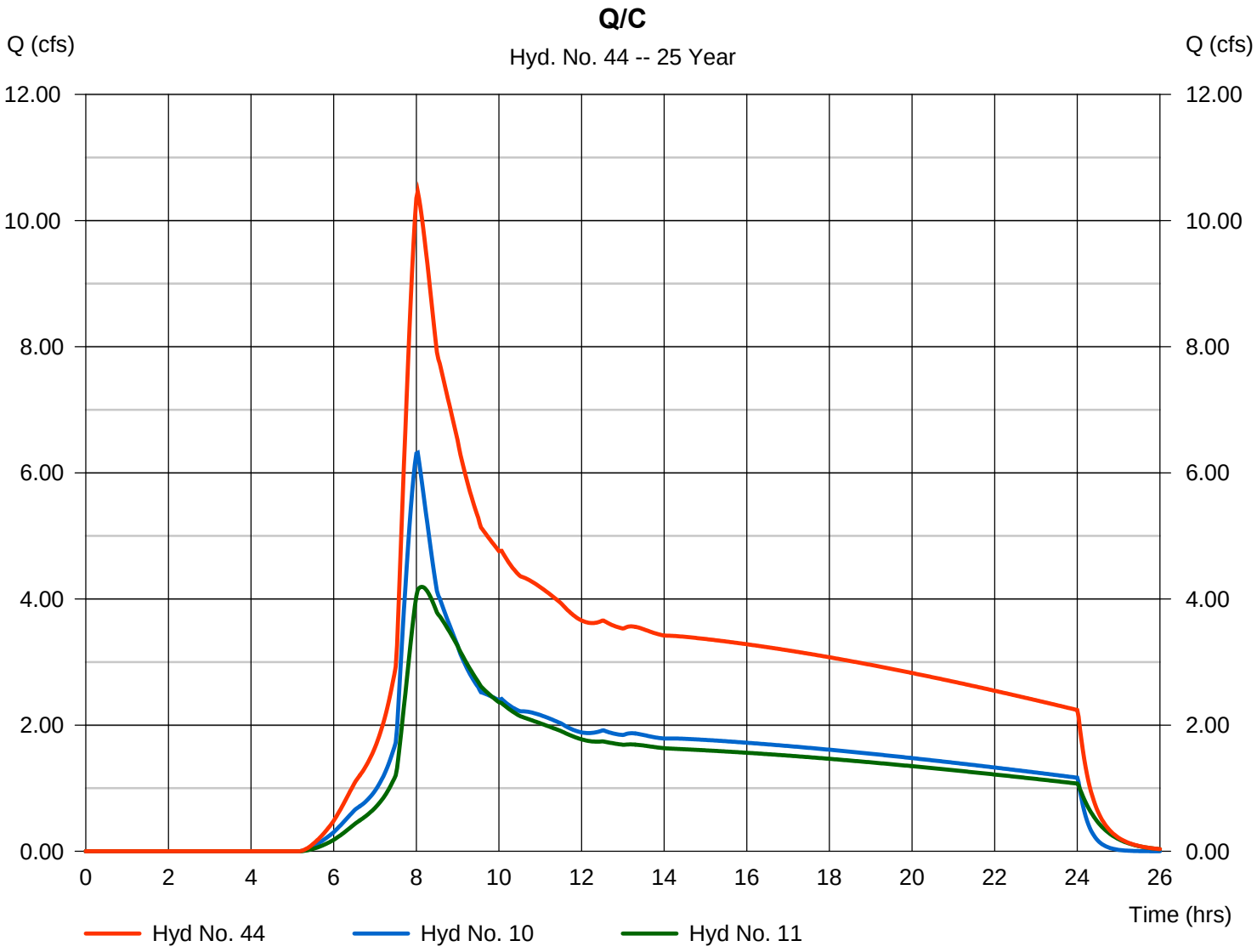


Hydrograph Report

Hyd. No. 44

Q/C

Hydrograph type	=	Combine	Peak discharge	=	10.46 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	233,955 cuft
Inflow hyds.	=	10, 11	Contrib. drain. area	=	28.500 ac

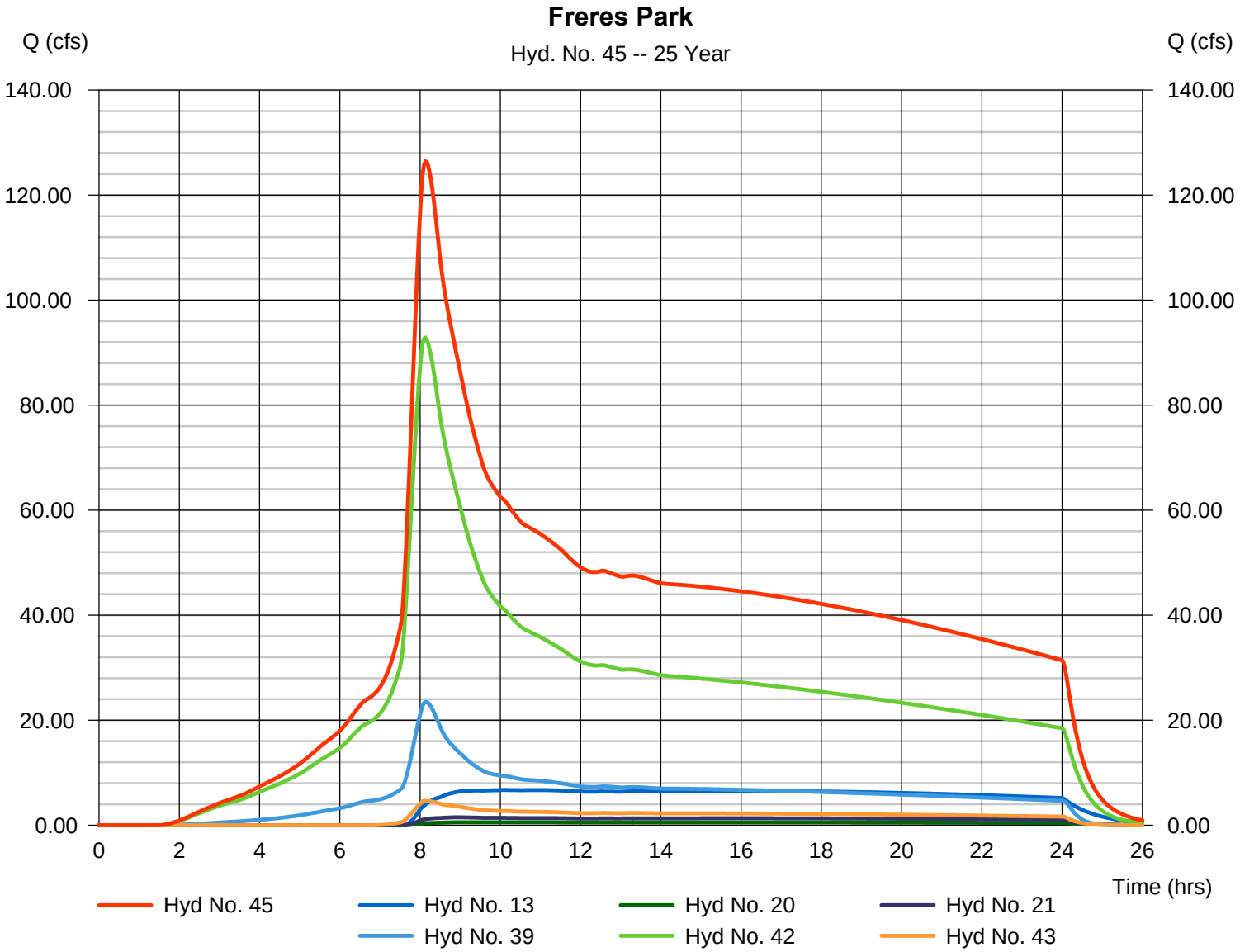


Hydrograph Report

Hyd. No. 45

Freres Park

Hydrograph type	=	Combine	Peak discharge	=	126.42 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.13 hrs
Time interval	=	2 min	Hyd. volume	=	3,281,496 cuft
Inflow hyds.	=	13, 20, 21, 39, 42, 43	Contrib. drain. area	=	124.500 ac



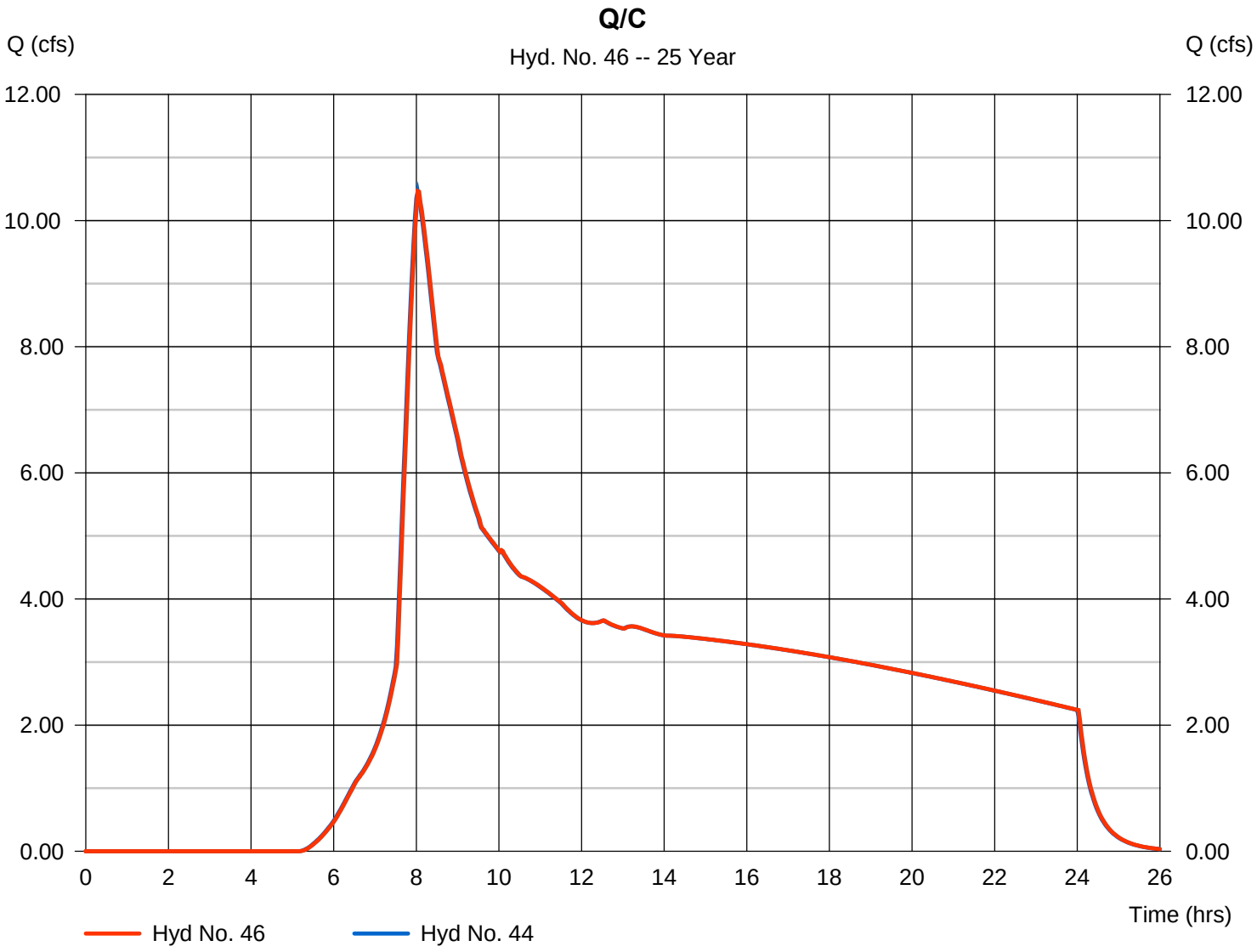
Hydrograph Report

Hyd. No. 46

Q/C

Hydrograph type	=	Reach	Peak discharge	=	10.47 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	233,941 cuft
Inflow hyd. No.	=	44 - Q/C	Section type	=	Circular
Reach length	=	300.0 ft	Channel slope	=	3.0 %
Manning's n	=	0.013	Bottom width	=	1.0 ft
Side slope	=	0.0:1	Max. depth	=	0.0 ft
Rating curve x	=	10.712	Rating curve m	=	1.250
Ave. velocity	=	13.32 ft/s	Routing coeff.	=	1.5381

Modified Att-Kin routing method used.



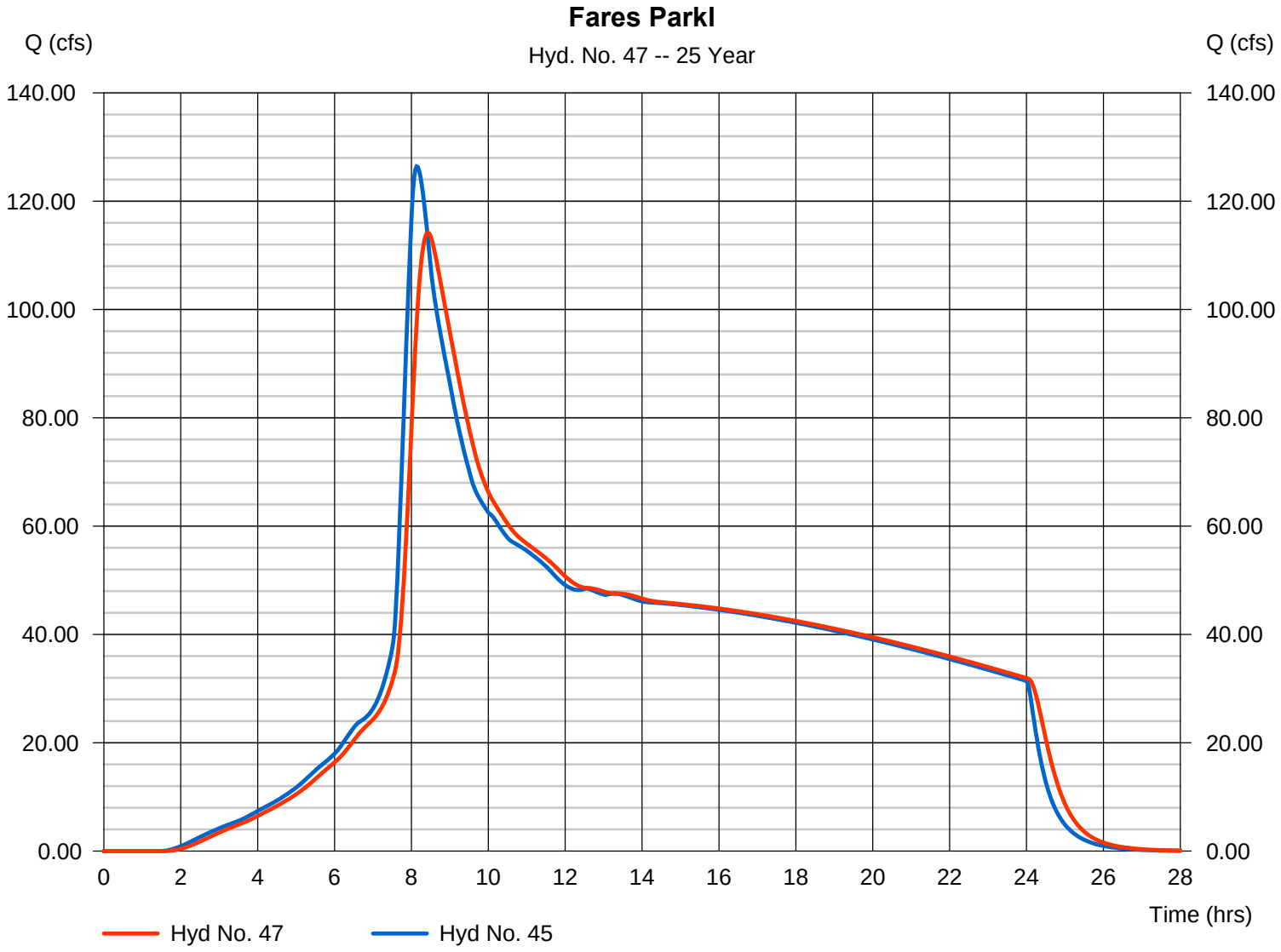
Hydrograph Report

Hyd. No. 47

Fares Parkl

Hydrograph type	=	Reach	Peak discharge	=	114.19 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.43 hrs
Time interval	=	2 min	Hyd. volume	=	3,281,467 cuft
Inflow hyd. No.	=	45 - Freres Park	Section type	=	Trapezoidal
Reach length	=	4100.0 ft	Channel slope	=	0.5 %
Manning's n	=	0.025	Bottom width	=	4.0 ft
Side slope	=	10.0:1	Max. depth	=	5.0 ft
Rating curve x	=	1.672	Rating curve m	=	1.243
Ave. velocity	=	3.89 ft/s	Routing coeff.	=	0.1322

Modified Att-Kin routing method used.

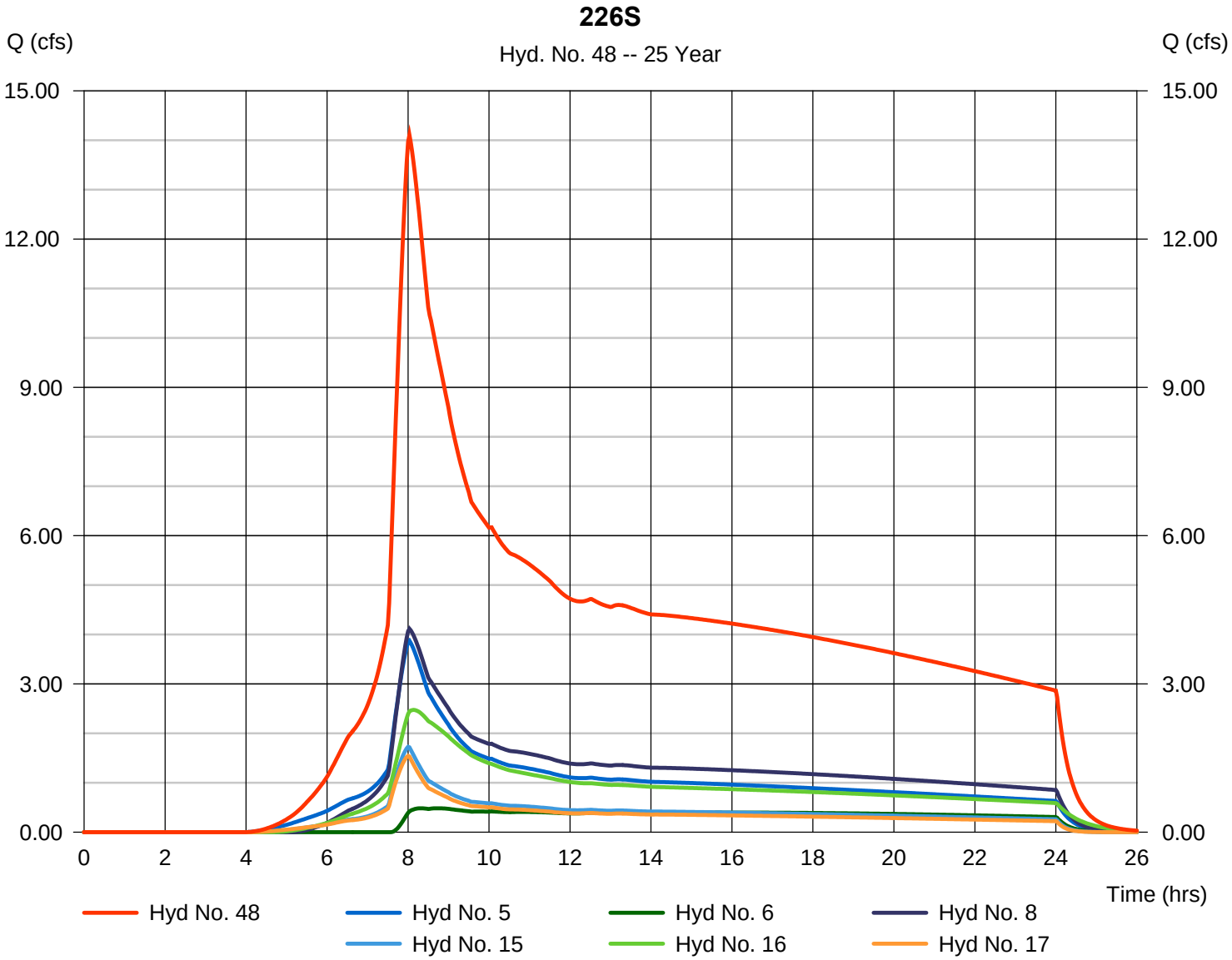


Hydrograph Report

Hyd. No. 48

226S

Hydrograph type	=	Combine	Peak discharge	=	14.10 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	308,094 cuft
Inflow hyds.	=	5, 6, 8, 15, 16, 17	Contrib. drain. area	=	36.700 ac



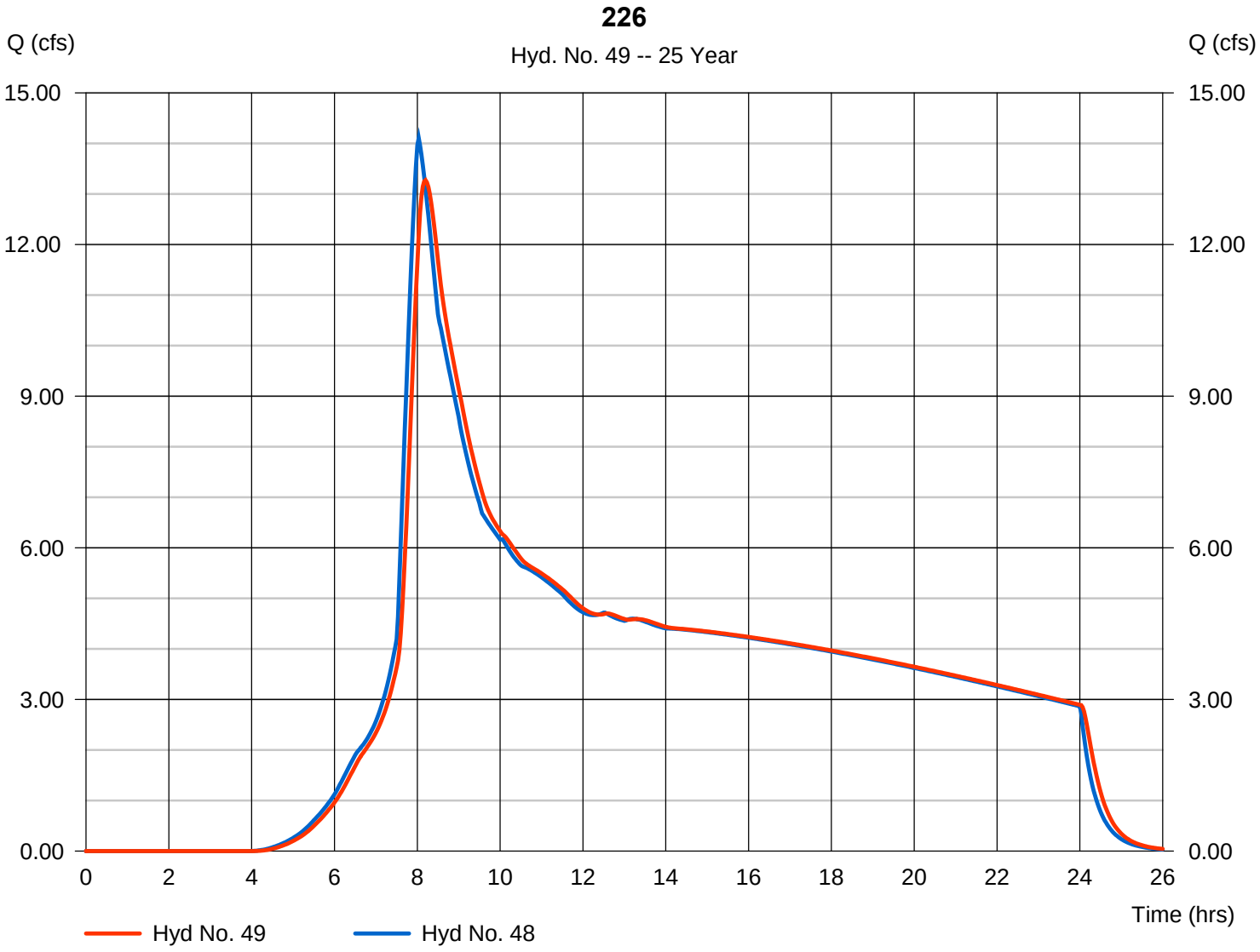
Hydrograph Report

Hyd. No. 49

226

Hydrograph type	=	Reach	Peak discharge	=	13.27 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.20 hrs
Time interval	=	2 min	Hyd. volume	=	308,073 cuft
Inflow hyd. No.	=	48 - 226S	Section type	=	Circular
Reach length	=	2485.0 ft	Channel slope	=	1.3 %
Manning's n	=	0.013	Bottom width	=	2.0 ft
Side slope	=	0.0:1	Max. depth	=	0.0 ft
Rating curve x	=	7.915	Rating curve m	=	1.250
Ave. velocity	=	4.49 ft/s	Routing coeff.	=	0.2387

Modified Att-Kin routing method used.



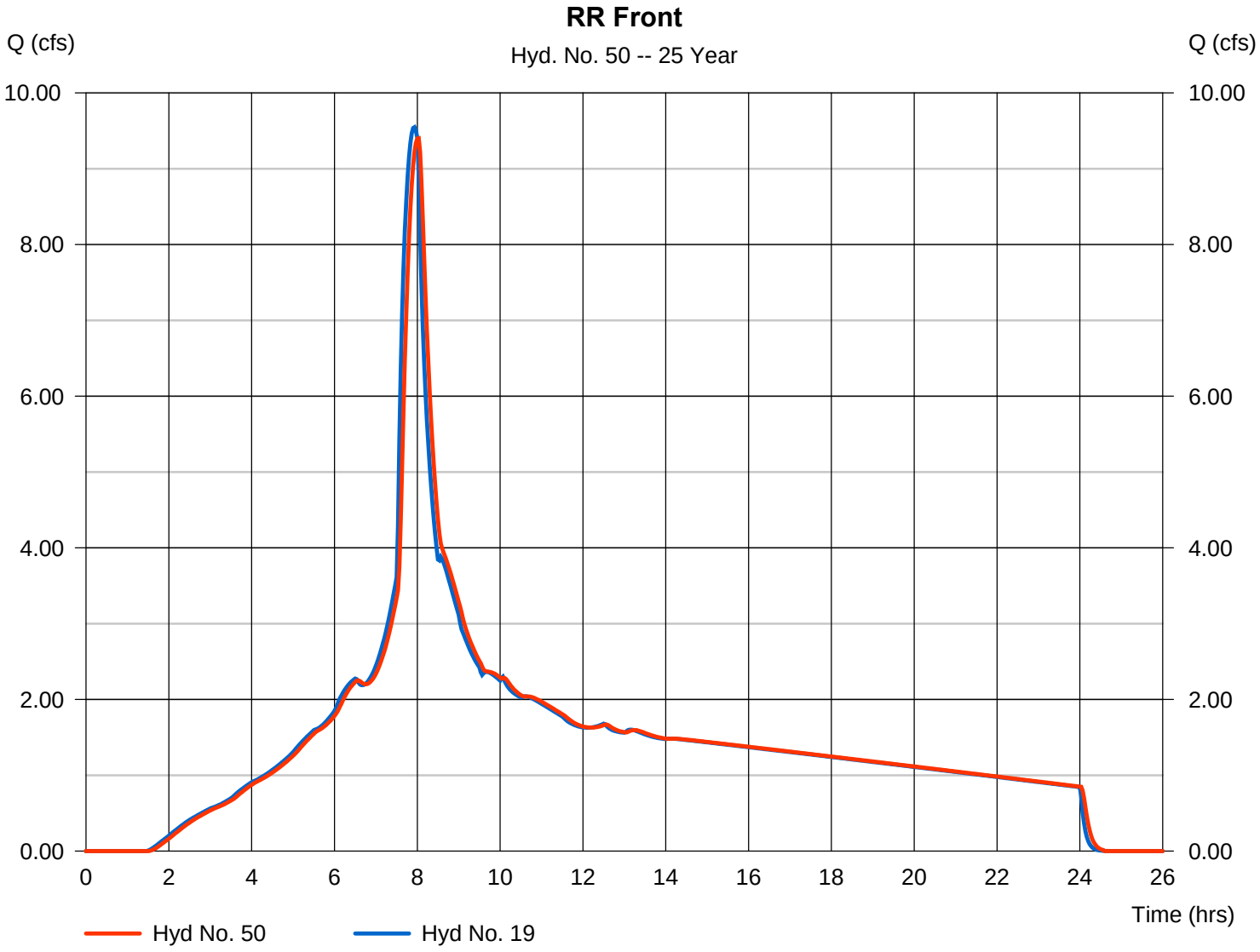
Hydrograph Report

Hyd. No. 50

RR Front

Hydrograph type	=	Reach	Peak discharge	=	9.401 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.03 hrs
Time interval	=	2 min	Hyd. volume	=	135,222 cuft
Inflow hyd. No.	=	19 - Front Street	Section type	=	Triangular
Reach length	=	1300.0 ft	Channel slope	=	1.0 %
Manning's n	=	0.025	Bottom width	=	0.0 ft
Side slope	=	3.0:1	Max. depth	=	0.0 ft
Rating curve x	=	2.608	Rating curve m	=	1.333
Ave. velocity	=	3.61 ft/s	Routing coeff.	=	0.3633

Modified Att-Kin routing method used.

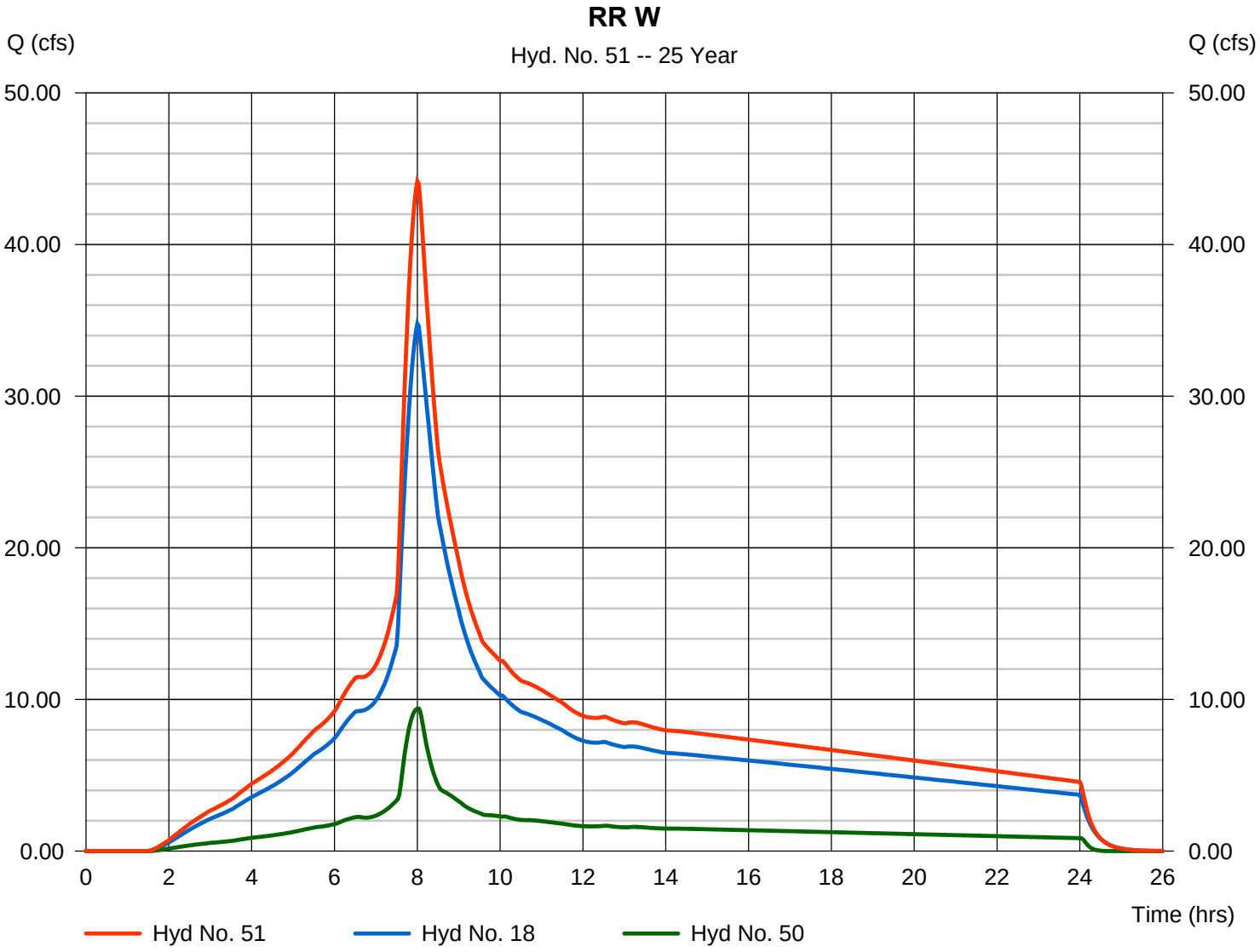


Hydrograph Report

Hyd. No. 51

RR W

Hydrograph type	=	Combine	Peak discharge	=	44.17 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.00 hrs
Time interval	=	2 min	Hyd. volume	=	719,081 cuft
Inflow hyds.	=	18, 50	Contrib. drain. area	=	36.700 ac



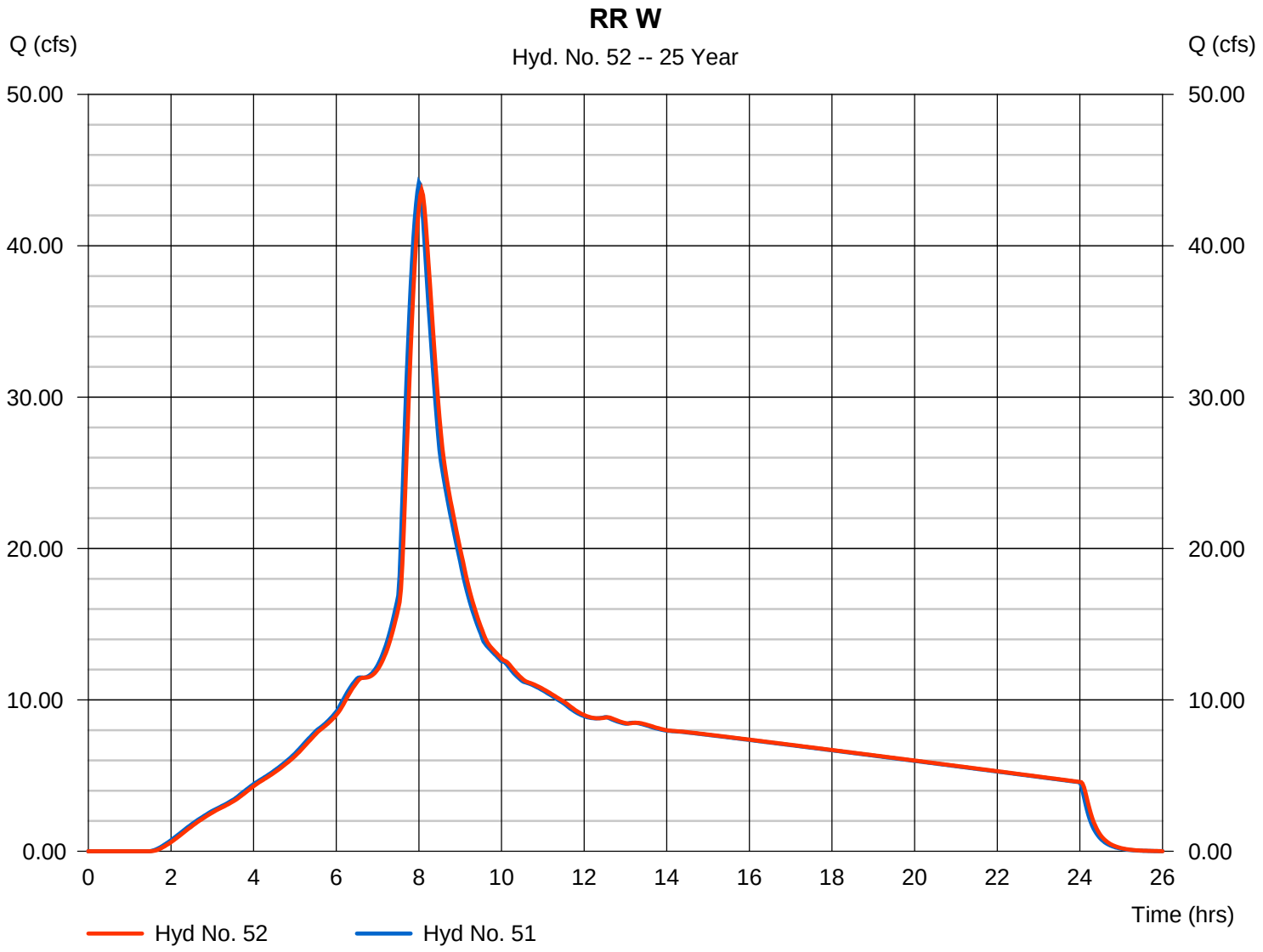
Hydrograph Report

Hyd. No. 52

RR W

Hydrograph type	=	Reach	Peak discharge	=	43.66 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.07 hrs
Time interval	=	2 min	Hyd. volume	=	719,070 cuft
Inflow hyd. No.	=	51 - RR W	Section type	=	Triangular
Reach length	=	1300.0 ft	Channel slope	=	1.0 %
Manning's n	=	0.025	Bottom width	=	0.0 ft
Side slope	=	3.0:1	Max. depth	=	0.0 ft
Rating curve x	=	2.608	Rating curve m	=	1.333
Ave. velocity	=	5.29 ft/s	Routing coeff.	=	0.4912

Modified Att-Kin routing method used.

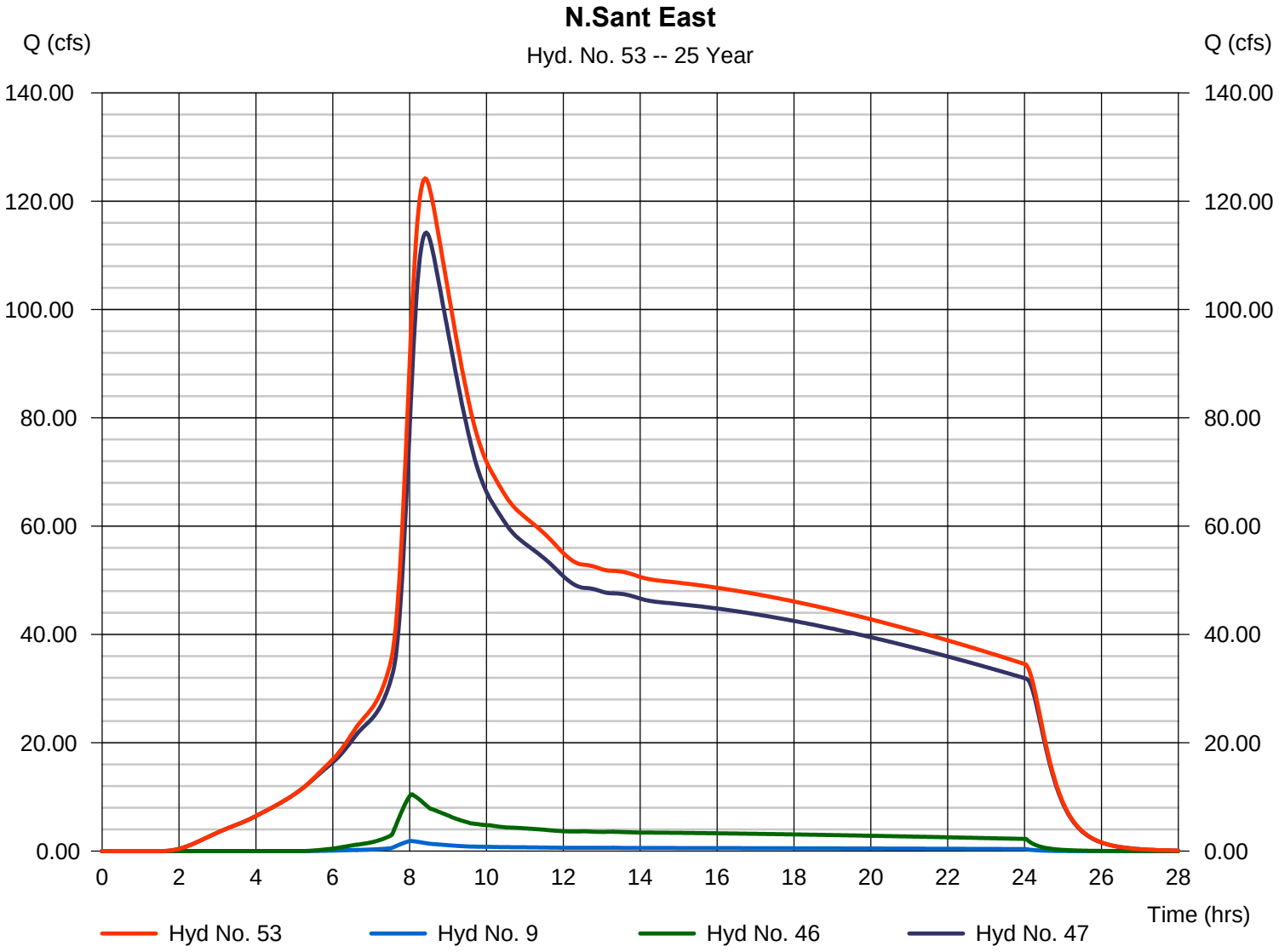


Hydrograph Report

Hyd. No. 53

N.Sant East

Hydrograph type	= Combine	Peak discharge	= 124.18 cfs
Storm frequency	= 25 yrs	Time to peak	= 8.40 hrs
Time interval	= 2 min	Hyd. volume	= 3,554,811 cuft
Inflow hyds.	= 9, 46, 47	Contrib. drain. area	= 4.800 ac

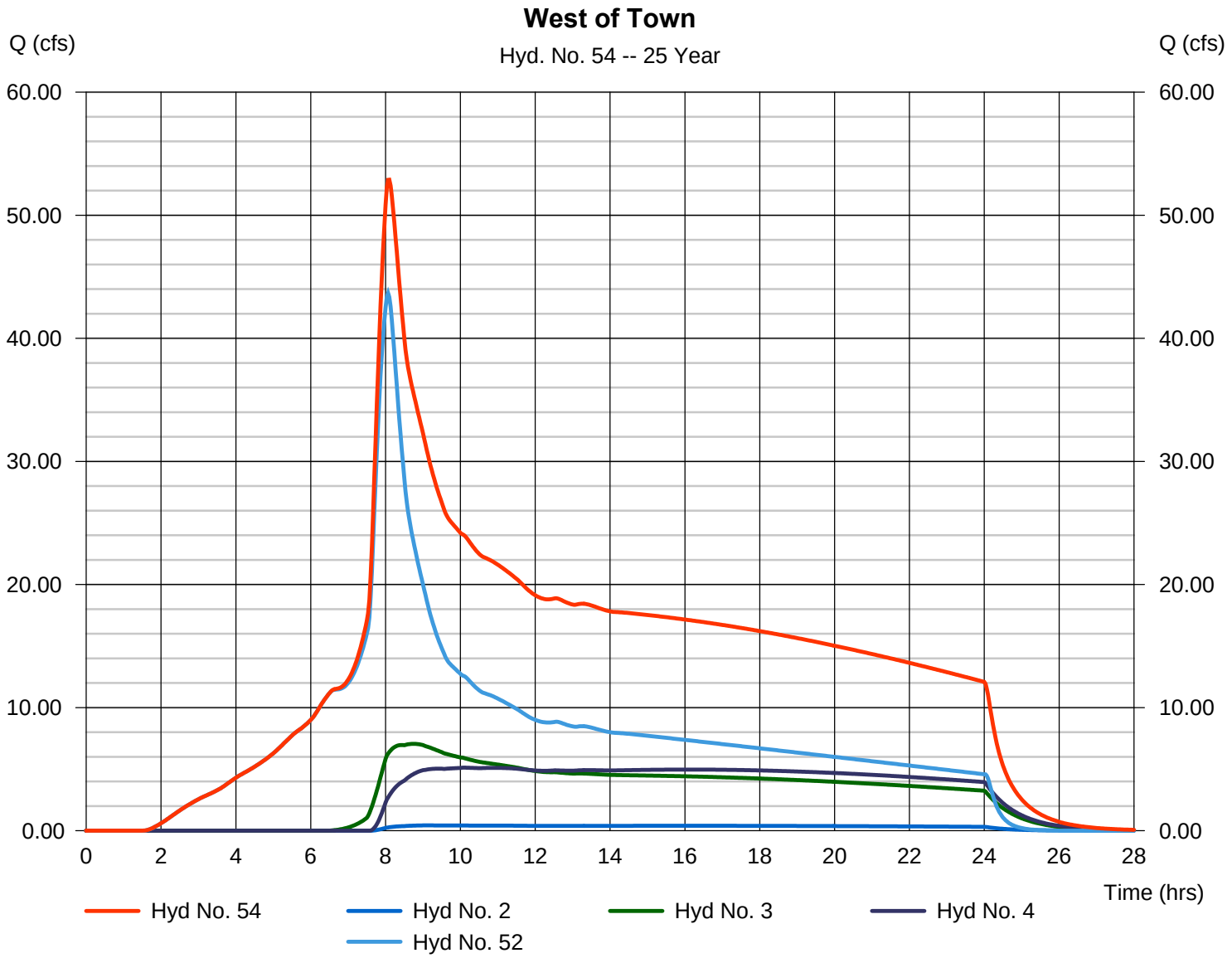


Hydrograph Report

Hyd. No. 54

West of Town

Hydrograph type	=	Combine	Peak discharge	=	52.88 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.10 hrs
Time interval	=	2 min	Hyd. volume	=	1,310,208 cuft
Inflow hyds.	=	2, 3, 4, 52	Contrib. drain. area	=	127.500 ac

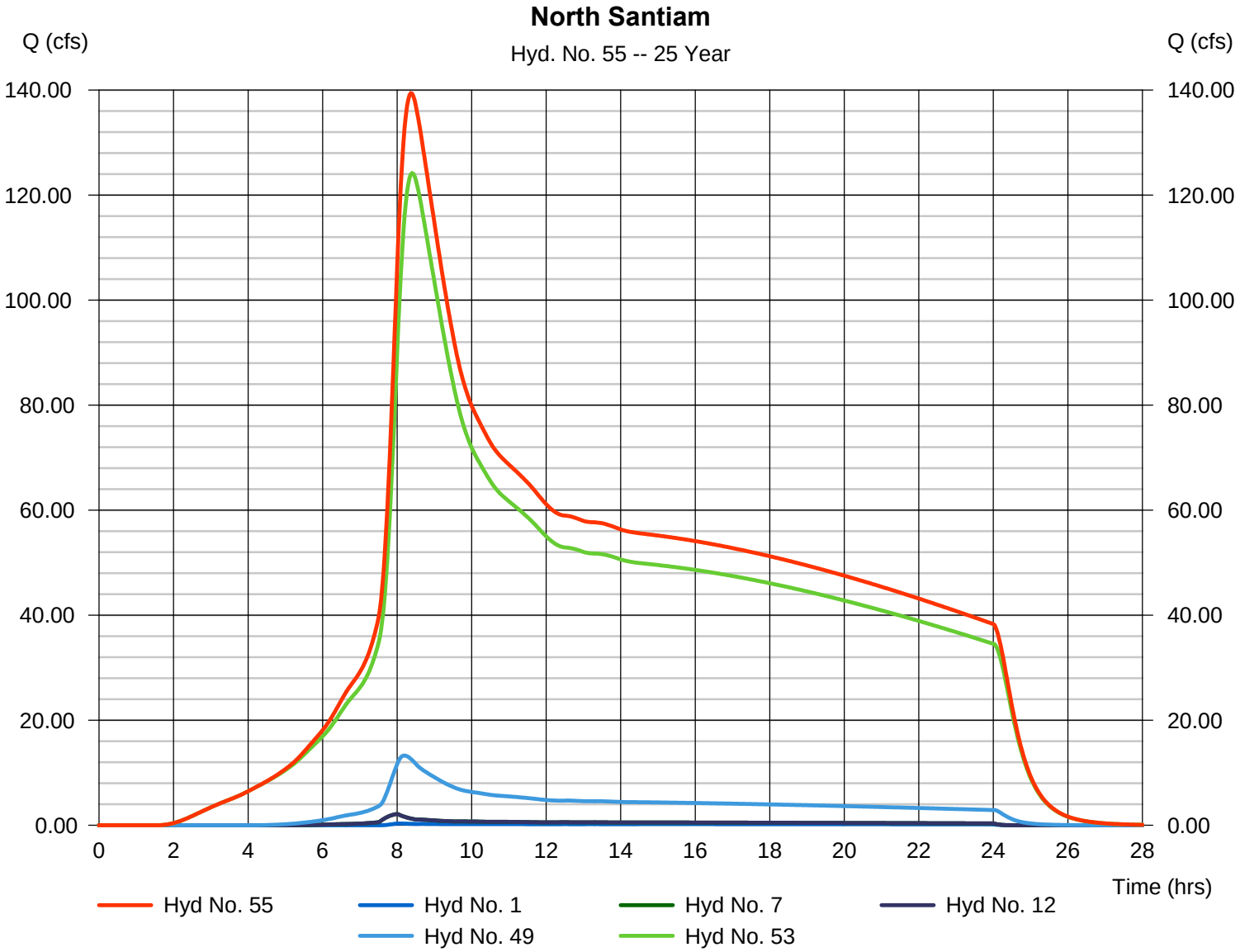


Hydrograph Report

Hyd. No. 55

North Santiam

Hydrograph type	=	Combine	Peak discharge	=	139.40 cfs
Storm frequency	=	25 yrs	Time to peak	=	8.37 hrs
Time interval	=	2 min	Hyd. volume	=	3,949,163 cuft
Inflow hyds.	=	1, 7, 12, 49, 53	Contrib. drain. area	=	12.200 ac



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	23.3899	10.7000	0.8283	--------
3	0.0000	0.0000	0.0000	--------
5	37.5000	10.7000	0.8283	--------
10	48.2560	10.7000	0.8283	--------
25	60.3999	10.7000	0.8283	--------
50	70.8089	10.7000	0.8283	--------
100	80.0614	10.7000	0.8283	--------

File name: Lyons.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	2.39	1.90	1.59	1.37	1.21	1.09	0.99	0.91	0.84	0.78	0.73	0.69
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	3.83	3.05	2.55	2.20	1.94	1.74	1.58	1.45	1.34	1.25	1.17	1.10
10	4.93	3.92	3.28	2.83	2.50	2.24	2.04	1.87	1.73	1.61	1.51	1.42
25	6.17	4.91	4.10	3.54	3.13	2.80	2.55	2.34	2.16	2.01	1.89	1.77
50	7.24	5.75	4.81	4.15	3.66	3.29	2.99	2.74	2.53	2.36	2.21	2.08
100	8.18	6.51	5.44	4.69	4.14	3.72	3.38	3.10	2.87	2.67	2.50	2.35

Tc = time in minutes. Values may exceed 60.

Precip. file name: C:\Lyons-Storm\Flow Calcs\Lyons.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	3.40	0.00	3.90	4.40	5.30	5.90	6.30
SCS 6-Hr	0.00	1.50	0.00	0.00	0.00	0.00	0.00	2.70
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix C - Hydraulic Constraints

The hydrologic analysis consists of the following report from Hydraflow Express Extensions for AutoCad Civil 3D.

1. Central Business District Discharge Pipe - Assumed 24" discharge pipe. No plans are available. Discharge pipe has assumed 0.002% slope per 1975 Drainage Map and County construction plans.

2. 24 th Street Culvert - Culvert data from 1975 Drainage plan

Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2011 by Autodesk, Inc. Wednesday, Apr 13 2011

CBD Discharge Pipe

Circular

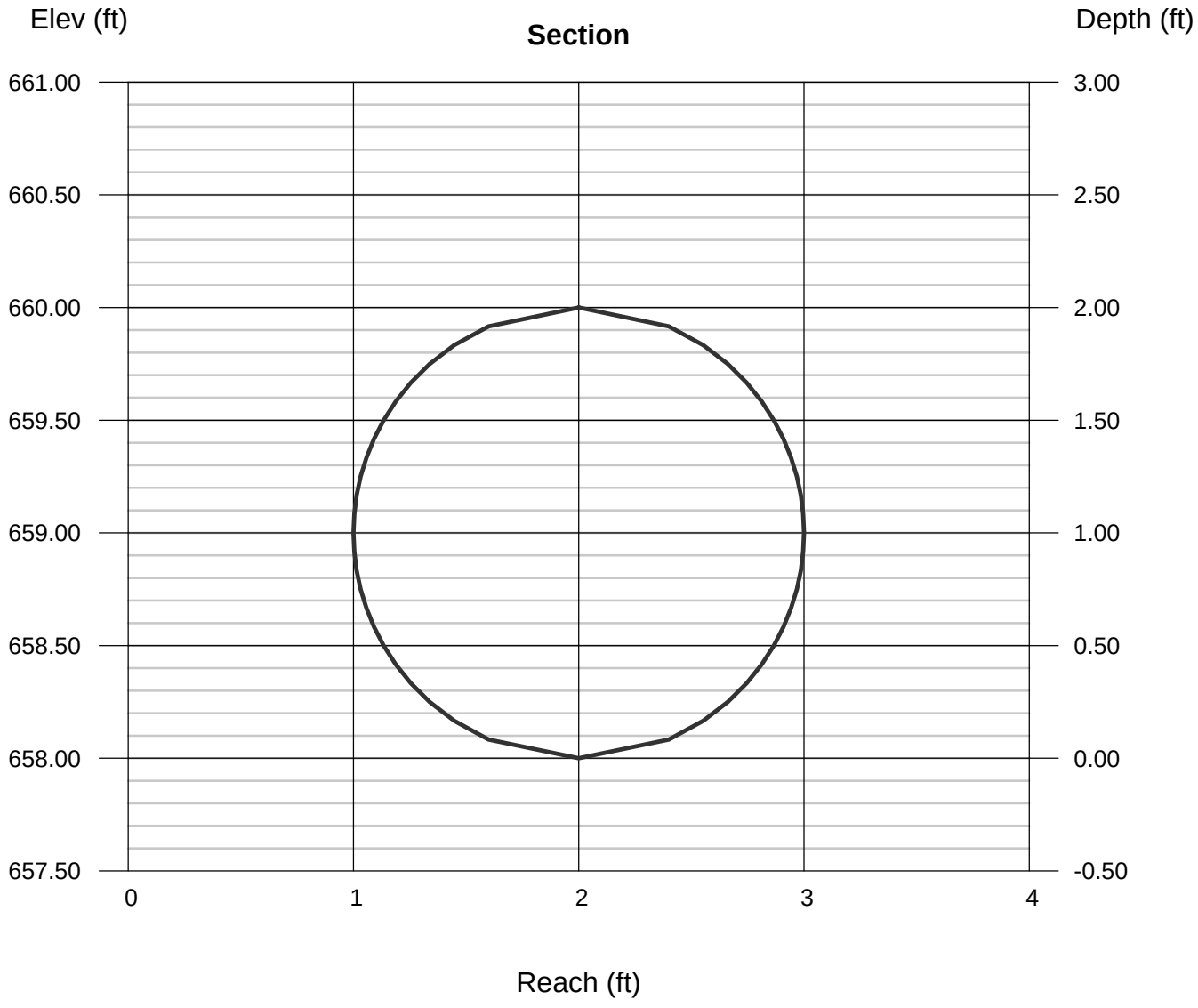
Diameter (ft)	= 2.00
Invert Elev (ft)	= 658.00
Slope (%)	= 0.10
N-Value	= 0.013

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 2.00
Q (cfs)	= 7.152
Area (sqft)	= 3.14
Velocity (ft/s)	= 2.28
Wetted Perim (ft)	= 6.28
Crit Depth, Yc (ft)	= 0.98
Top Width (ft)	= 0.00
EGL (ft)	= 2.08



Culvert Report

Cir Culvert

Invert Elev Dn (ft)	= 701.30
Pipe Length (ft)	= 75.00
Slope (%)	= 0.80
Invert Elev Up (ft)	= 701.90
Rise (in)	= 30.0
Shape	= Cir
Span (in)	= 30.0
No. Barrels	= 1
n-Value	= 0.012
Inlet Edge	= 0
Coeff. K,M,c,Y,k	= 0.0045, 2, 0.0317, 0.69, 0.5

Embankment

Top Elevation (ft)	= 706.00
Top Width (ft)	= 20.00
Crest Width (ft)	= 100.00

Calculations

Qmin (cfs)	= 20.00
Qmax (cfs)	= 45.00
Tailwater Elev (ft)	= (dc+D)/2

Highlighted

Qtotal (cfs)	= 45.00
Qpipe (cfs)	= 42.87
Qovertop (cfs)	= 2.13
Veloc Dn (ft/s)	= 8.96
Veloc Up (ft/s)	= 8.94
HGL Dn (ft)	= 703.65
HGL Up (ft)	= 704.25
Hw Elev (ft)	= 706.03
Hw/D (ft)	= 1.65
Flow Regime	= Inlet Control